SOIL VAPOUR SAMPLING PROGRAM – DECEMBER 2023
FORMER SEARS FUEL SITE AND ADJACENT HOUNSFIELD HEIGHTS AREA
1620 – 14th AVENUE NW
CALGARY, ALBERTA
SUNCOR OUTLET NO. 9445
ALBERTA ENVIRONMENT AND PROTECTED AREAS (AEPA) FILE NO. 00141934

Prepared for:
Suncor Energy Products Partnership
Suncor Energy Centre
P.O. Box 2844, 150 – 6 Avenue S.W.
Calgary, Alberta
T2P 3E3

Prepared by:

Suite 510, 214 - 11th Avenue SW
Calgary, Alberta
T2R 0K1
Phone: (403) 294-4200
Fax: (403) 294-4240

Job No.: 10-12832
Ref. No.: 478621.17113

Distribution:

1 copy – Suncor Energy Products Partnership
1 copy – Andrea Stenvig, Elise Chamberland and EAS Communications, Alberta Environment and Protected Areas
1 copy – Tyson Allan, The City of Calgary
1 copy – Carol Brittain, Alberta Health Services
1 copy – Beacon, Plume Committee, and General Manager, Hounsfield Heights Briar Hill
1 copy – Gary Molnar, Hounsfield Heights Landowners Group
1 copy – Linda Barron

SUMMARY

Site	1620 - 14th Avenue NW; the Mall Property; 14th Avenue NW; Lions Park; and the adjacent Hounsfield Heights community
Type of Facility	Former Sears Fuel Site
Applicable Soil Vapour Guidelines	Calculated soil vapour quality guidelines protective of indoor air quality; fine-grained and coarse-grained soils; residential and commercial land use; for various depths.
Date(s) of Soil Vapour Sampling	December 4 to December 7, 2023; and, December 18, 2023
Soil Vapour Wells with Soil Vapour Samples that Exceeded Guidelines:	None of the wells sampled exceed the calculated guidelines or the 90% trigger threshold.
Changes to Program and Future Work	• The condition of the RM&C Plan of five consecutive sampling events with concentrations less than 90% of the guidelines has been met. The soil vapour sampling program at the site will continue on a semi-annual basis. • The next soil vapour sampling event is scheduled for April 2024.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF DRAWINGS

LIST OF APPENDICES

1.0 INTRODUCTION

Parsons Inc. (Parsons) was retained by Suncor Energy Products Partnership (Suncor) to perform soil vapour sampling as a part of ongoing risk management for the Former Sears Fuel Site located at 1620 - 14th Avenue NW; also including the Mall Property; 14th Avenue NW; Lions Park; and the adjacent Hounsfield Heights community (collectively referred to as "the site").

1.1 PURPOSE

Soil vapour sampling was conducted between December 4 and December 7, 2023; and, December 18, 2023 in accordance with the Risk Management and Contingency (RM&C) Plan, which was developed to assess the indoor vapour inhalation pathway. The RM&C plan involves the sampling of specific wells four times a year and the installation of additional soil vapour monitoring wells (if deemed necessary). The RM&C plan is implemented if concentrations exceed 90% of the guidelines during a specific sampling event, which was used as a trigger threshold. This increased sampling frequency was to continue until five consecutive sampling events indicated concentrations less than 90% of the guidelines, or unless otherwise stipulated by the regulator (Clifton, 2016). The RM&C plan was initially triggered due to an exceedance measured in a soil vapour sample collected from well SV32, located in the laneway between 14th Street NW and 15th Street NW, in March 2019. Additional exceedances were measured in soil vapour samples collected from soil vapour monitoring wells SV32 and/or SV402 in June 2020, November 2021, May 2022, and June 2022.

1.2 SCOPE OF WORK

The following site activities were conducted on behalf of Suncor in December 2023:

- Collect soil vapour samples as a part of the RM&C Plan;
- Repair selected wells which were previously damaged or inaccessible, where possible; and,
- Prepare a report that describes the field activities and the results of the assessment.

A site location map, also showing municipal zoning, is presented as Drawing No. 1. The grade elevations are shown on Drawing No. 2.

2.0 SITE ACTIVITIES

Between December 4 and December 7, 2023; and, December 18, 2023, soil vapour samples were collected from eight soil vapour monitoring wells, as presented in Table 1. Soil vapour wells that

were sampled as part of the RM&C plan included SV32, SV321B, SV322, SV323, SV401, SV403, SV404 and SV501. Some of the soil vapour monitoring wells could not be sampled as they were damaged (SV402) or could not be located (SV500).

In addition, the sample collected from SV323 and its duplicate on December 7, 2023 was lost during shipping between lab locations. A replacement sample was collected from SV323 on December 18, 2023. During the resampling event, a duplicate sample was collected, however, the canister used for the duplicate sample was found to be compromised and therefore was not submitted for analysis.

Soil Vapour Monitoring Well Locations:	Drawing No. 3. It should be noted that soil vapour wells located on private property within the residential areas are not shown on the drawings.
Sampling/Investigation Date(s):	December 4 to December 7, 2023; and, December 18, 2023
Soil Vapour samples analyzed for:	☒Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) ☒Aliphatic and Aromatic Fractions ☒1,2-Dichloroethane (1,2-DCA) ☒Naphthalene ☐Matrix Gases (O_2, N_2, CO_2, and CH_4)
Laboratory:	Bureau Veritas
Field procedures shown in:	Appendix A: The field procedures were conducted in accordance with generally accepted industry practices.
Integrity and Leak Testing Results:	Appendix B
Purging and Sampling Details:	Appendix B

3.0 GUIDELINES REFERENCED

Soil vapour guidelines developed by Intrinsik have been referenced (Intrinsik 2022) and are summarized in Appendix C. These guidelines were developed following the Canadian Council of Minister of the Environment (CCME) protocol (CCME, 2014) and Alberta Environment and Parks (AEP, 2022a,b) guidance. Soil vapour concentrations were also compared to 90% of the calculated soil vapour guidelines, which was used as a trigger threshold to increase the sample frequency as per the RM&C Plan.

4.0 RESULTS OF THE INVESTIGATION

4.1 SOIL VAPOUR ANALYTICAL RESULTS

BTEX, Aliphatic and Aromatic Fractions, 1,2-DCA, and Naphthalene:	As presented in Table 1, None of the soil vapour samples collected and analyzed from the December 2023 sampling event exceeded the applicable guidelines or the 90% trigger threshold.
Spatial Summary of Analytical Results:	Presented as Drawing No. 4.
Historical Analytical Results:	As presented in Table 1, none of the soil vapour samples collected and analyzed from October 2022 to present exceeded the applicable guidelines or the 90% trigger threshold.
Laboratory Certificates:	Presented in Appendix D.

4.2 QUALITY ASSURANCE AND QUALITY CONTROL (QAQC) RESULTS

Laboratory QAQC:	Appendix D	No laboratory QAQC issues were identified that call into question the reliability of the laboratory data reported.
Field QAQC:	Appendix D	Duplicate (DUP-1) was collected but analysis was not completed due to sampling error.
QAQC Summary:	Appendix D	No QAQC issues were identified that would affect the overall conclusions of the assessment work presented in this report.

5.0 SUMMARY

Between December 4, 2023 and December 7, 2023; and, December 18, 2023, soil vapour samples were collected from eight soil vapour monitoring wells, as part of the RM&C Plan. Soil vapour guidelines developed by Intrinsik have been referenced (Intrinsik 2022); soil vapour concentrations were also compared to 90% of the calculated guidelines, as per the RM&C Plan.

The results of the December 2023 soil vapour sampling event are summarized as follows:

- Soil vapour concentrations of BTEX, aliphatic and aromatic fractions, 1,2-DCA and naphthalene measured in the soil vapour samples collected from SV32, SV321B, SV322, SV323, SV401, SV403, SV404 and SV501 were less than the calculated guidelines, and the 90% trigger threshold.

Based on a review of the soil vapour analytical results, the RM&C Plan condition of five consecutive sampling events with concentrations less than 90% of the guidelines has been met, for both soil vapour monitoring wells SV32 (as of December 2023) and SV402 (as of September 2023).

The soil vapour sampling program at the site will continue on a semi-annual basis. The next soil vapour sampling event is anticipated to be conducted in April of 2024.

6.0 LIMITATION OF LIABILITY, SCOPE OF REPORT AND THIRD-PARTY RELIANCE

This report has been prepared and the work referred to in this report has been undertaken by Parsons for Suncor Energy Products Partnership (Suncor). It is intended for the sole and exclusive use of Suncor Energy Inc., its affiliated companies and partners and their respective insurers, agents, employees and advisors (collectively, "Suncor"). Any use, reliance on or decision made by any person other than Suncor based on this report is the sole responsibility of such other person. Suncor and Parsons make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigations undertaken by Parsons with respect to this report and any conclusions or recommendations made in this report reflect Parsons' judgement based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information examined at the time of preparation of this report. This report has been prepared for specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed in the report. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by this investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions and recommendations in this report may be necessary.

Other than by Suncor, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of Parsons. Nothing in this report is intended to constitute or provide a legal opinion.

7.0 CLOSURE

We trust the foregoing information is satisfactory for your requirements. If there are any questions or concerns regarding this report, please do not hesitate to contact the undersigned.

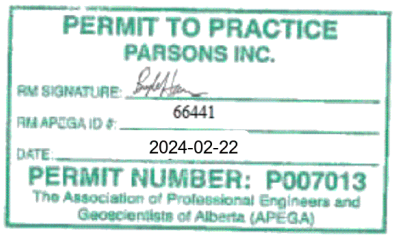
Respectfully submitted,

PARSONS INC.

Rebecca Neufeld, BSc.

Michelle S. Patterson, P.Tech.(Eng.)

B. Hann, P.Geol.



8.0 REFERENCES

AEP 2022a. *Alberta Tier 1 Soil and Groundwater Remediation Guidelines.* Land Policy Branch, Policy and Planning Division, Alberta Environment and Parks. August 24, 2022.

AEP 2022b. *Alberta Tier 2 Soil and Groundwater Remediation Guidelines.* Land Policy Branch, Policy and Planning Division, Alberta Environment and Parks. August 24, 2022.

CCME, 2014. *A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours.* Canadian Council of Ministers of the Environment.

Clifton, 2016. *Sears Canada Inc. Revised Soil Vapour Monitoring Program (Update Fall 2016), Hounsfield Heights and North Hill Mall, Calgary, Alberta.* Prepared by Clifton Associates Ltd. (Clifton) for Sears Canada Inc. Originally issued June 24, 2016, revised October 20, 2016.

Intrinsik, 2022. *Development of Soil Vapour and Groundwater Quality Guidelines*. Prepared by Intrinsik Corp. for Suncor Energy Products Partnership. December 2022.

Parsons, 2023. Annual Summary Report – 2022, Former Sears Fuel Site and Adjacent Hounsfield Heights Area, 1620 – 14th Avenue NW, Calgary, Alberta, Suncor Outlet No. 9445. Prepared by Parsons Inc. (Parsons) for Suncor Energy Products Partnership. March 31, 2023.

TABLE 1

RESULTS OF SOIL VAPOUR ANALYSES
PETROLEUM HYDROCARBON PARAMETERS, 1,2-DICHLOROETHANE, AND NAPHTHALENE

(units in µg/m3)

Sample Location	Total Well Depth (mbgs)	Date Sampled	Duplicate	CONSTITUENT Area	Benzene	Toluene	Ethylbenzene	Total Xylenes	Aliphatic >C5-C6	Aliphatic >C6-C8	Aliphatic >C8-C10	Aliphatic >C10-C12	Aliphatic >C12-C16	Aromatic C6-C8	Aromatic >C7-C8 (TEX Excl.)	Aromatic >C8-C10	Aromatic >C10-C12	Aromatic >C12-C16	1,2-Dichloroethane	Naphthalene
Guidelines[a]:																				
Residential: fine or coarse-grained: <1 m beneath foundation					6.3E+01	1.1E+05	1.0E+05	4.9E+03	NG	9.2E+05	4.8E+04	5.0E+04	5.0E+04	NG	NG	8.1E+03	1.0E+04	1.0E+04	3.8E+01	4.5E+02
Residential: fine-grained: 1 m beneath foundation					3.0E+04	5.5E+07	4.9E+07	2.4E+06	NG	4.7E+08	2.5E+07	2.6E+07	2.6E+07	NG	NG	4.2E+06	5.1E+06	5.1E+06	1.8E+03	2.3E+04
Residential: fine-grained: 1.5 m beneath foundation					3.2E+04	5.7E+07	5.1E+07	2.5E+06	NG	5.0E+08	2.6E+07	2.7E+07	2.7E+07	NG	NG	4.5E+06	5.5E+06	5.5E+06	1.9E+03	2.4E+04
Residential: fine-grained: 2 m beneath foundation					3.3E+04	5.9E+07	5.3E+07	2.6E+06	NG	5.3E+08	2.8E+07	2.9E+07	2.9E+07	NG	NG	4.7E+06	5.8E+06	5.8E+06	1.9E+03	2.5E+04
Residential: fine-grained: 2.5 m beneath foundation					3.4E+04	6.1E+07	5.6E+07	2.7E+06	NG	5.6E+08	2.9E+07	3.1E+07	3.1E+07	NG	NG	5.0E+06	6.1E+06	6.1E+06	2.0E+03	2.7E+04
Residential: fine-grained: 3 m beneath foundation					3.5E+04	6.3E+07	5.8E+07	2.8E+06	NG	5.9E+08	3.1E+07	3.2E+07	3.2E+07	NG	NG	5.3E+06	6.5E+06	6.5E+06	2.0E+03	2.8E+04
Residential: coarse-grained: 1 m beneath foundation					4.1E+03	7.4E+06	6.8E+06	3.3E+05	NG	7.4E+07	3.9E+06	4.0E+06	4.0E+06	NG	NG	6.6E+05	8.1E+05	8.1E+05	2.3E+02	3.4E+03
Residential: coarse-grained: 1.5 m beneath foundation					4.7E+03	8.5E+06	8.0E+06	3.9E+05	NG	9.0E+07	4.7E+06	4.9E+06	4.9E+06	NG	NG	8.0E+05	9.9E+05	9.9E+05	2.7E+02	4.1E+03
Residential: coarse-grained: 2 m beneath foundation					5.3E+03	9.7E+06	9.2E+06	4.5E+05	NG	1.1E+08	5.6E+06	5.8E+06	5.8E+06	NG	NG	9.5E+05	1.2E+06	1.2E+06	3.0E+02	4.8E+03
Residential: coarse-grained: 2.5 m beneath foundation					6.0E+03	1.1E+07	1.0E+07	5.0E+05	NG	1.2E+08	6.5E+06	6.7E+06	6.7E+06	NG	NG	1.1E+06	1.3E+06	1.3E+06	3.3E+02	5.5E+03
Residential: coarse-grained: 3 m beneath foundation					6.6E+03	1.2E+07	1.2E+07	5.6E+05	NG	1.4E+08	7.3E+06	7.6E+06	7.6E+06	NG	NG	1.2E+06	1.5E+06	1.5E+06	3.6E+02	6.1E+03
SV32	1.0	2022-10-05		Residential	<0.50	<0.75	<0.87	<1.8	-	<15	<15	<15	<15	<15	-	<15	<15	<15	<0.41	<5.2
		2022-10-05	Dup	Residential	<0.50	<0.75	<0.87	<1.8	-	<15	<15	<15	<15	<15	-	<15	<15	<15	<0.41	<5.2
		2023-01-24		Residential	<0.64	<0.75	<0.87	<2.2	-	173	<15	<15	<15	<15	-	<15	<15	<15	<0.40	<5.2
		2023-05-05		Residential	<0.32	0.50	<0.43	<1.3	<5.0	<5.0	<5.0	6.9	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0
		2023-09-07		Residential	0.34	0.48	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.40	<1.0
		2023-12-06		Residential	1.15	0.64	6.88	33.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	16.9	<5.0	<5.0	<0.4	<1.0
SV321B	1.09	2022-10-04		Residential	<0.50	<0.75	<0.87	<1.8	-	<15	<15	<15	<15	<15	-	<15	<15	<15	<0.41	<5.2
		2023-07-27		Residential	<0.32	<0.38	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.40	<1.0
		2023-12-06		Residential	5.45	<0.38	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	16.6	<5.0	<5.0	<0.4	<1.0
SV322	1.0	2022-10-04		Residential	1.0	<0.75	<0.87	<1.8	-	<15	<15	<15	<15	<15	-	<15	<15	<15	<0.41	<5.2
		2022-10-04	Dup	Residential	<0.50	<0.75	<0.87	<1.8	-	<15	<15	<15	<15	<15	-	<15	<15	<15	<0.41	<5.2
		2023-01-30		Residential	<0.64	<0.75	<0.87	<2.2	-	<15	<15	<15	<15	<15	-	<15	<15	<15	<0.40	<5.2
		2023-07-27		Residential	0.44	1.07	1.20	5.6	<5.0	6.4	10.2	70.0	9.2	-	<5.0	6.0	<5.0	<5.0	<0.40	<1.0
		2023-12-06		Residential	0.51	<0.38	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0

a - For the full set of depth-specific guidelines, for commercial and residential land use, fine-grained and coarse-grained guidelines, refer to Appendix A, and/or the report entitled *Development of Soil Vapour and Groundwater Quality Guidelines, Prepared by Intrinsik Corp. for Suncor Energy Products Partnership. December 2022.*
The RM&C Plan screening threshold is 90% of the guidelines; see report text for additional details. Guidelines <1 m beneath foundation are based on default attenuation coefficient of 0.01 (AEP 2022b).

NG - No guideline.

"-" - Not analyzed.

Dup - Duplicate Sample.

Italics - Greater than 90% of referenced guidelines (screening threshold).

Underline - Detection limit exceeds guideline.

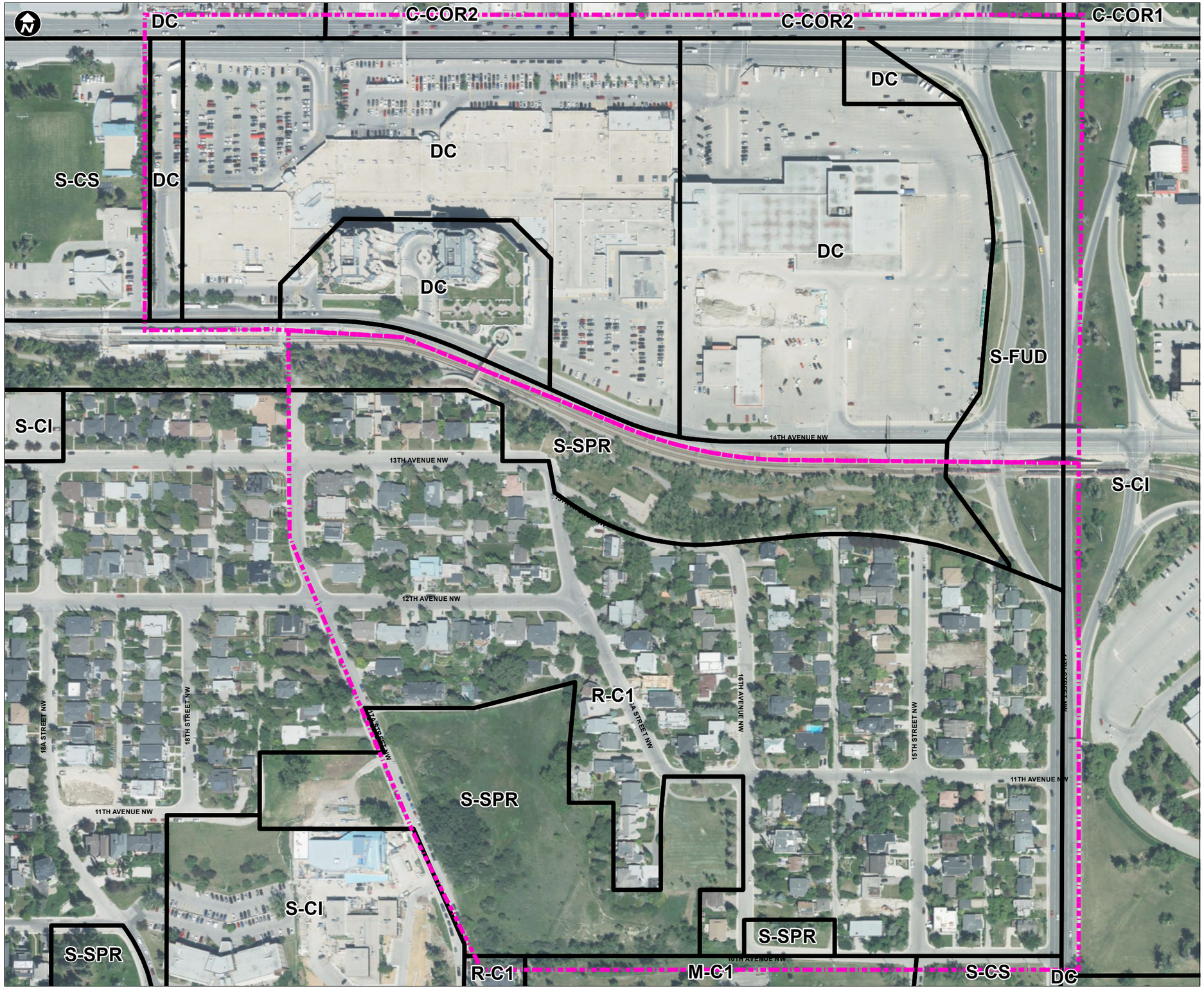
Shaded - Calculated guideline value results in a vapour concentration greater than the maximum possible vapour concentration for that chemical, assuming no NAPL is present. Maximum vapour concentration calculated according to Health Canada (2010) guidance.

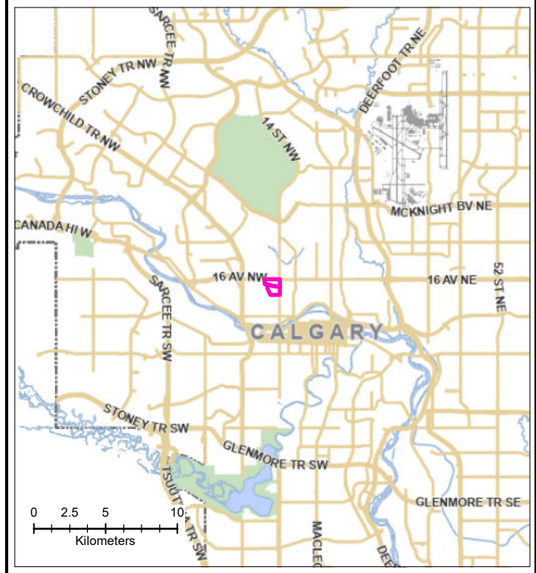
mbgs - metres below ground surface (unless otherwise specified)

BOLD - Exceeds referenced guidelines.

Results for all parameters are reported in micrograms per metre cubed (µg/m^3), unless otherwise specified.

Notes: All 2021 and 2022 analytical data was collected by Clifton Engineering Group Inc.





0 50 100 200
Metres

LEGEND

Site Boundary

City Of Calgary Zoning

Land Use Districts:

R-C1 (Residential - Contextual One Dwelling)
M-C1 (Multi-Residential - Contextual Low Profile)
M-CG (Multi-Residential - Contextual Ground Oriented)
C-COR1 (Commercial - Corridor 1)
C-COR2 (Commercial - Corridor 2)
S-SPR (Special Purpose - School, Park and Community Reserve)
S-CI (Special Purpose - Community Institution)
S-CS (Special Purpose - Community Service)
S-FUD (Special Purpose - Future Urban Development)
DC (Direct Control District)

Notes:..
- The ArcGIS Map Service based on City of Calgary Basemap (WMASP).
- The orthophoto based on City of Calgary Basemap (WMASP), July-August 2022.
- Land Use District data based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded March 2023.

Site Location Map

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: JDC	Ref. No.: 10-12832
	Reviewed By: MP	Date: 26-Mar-2023
PARSONS		Drawing No.: 1

LEGEND

- Grade Elevation Contour (masl) (1m
- Site Boundary

0 25 50 100
Metres

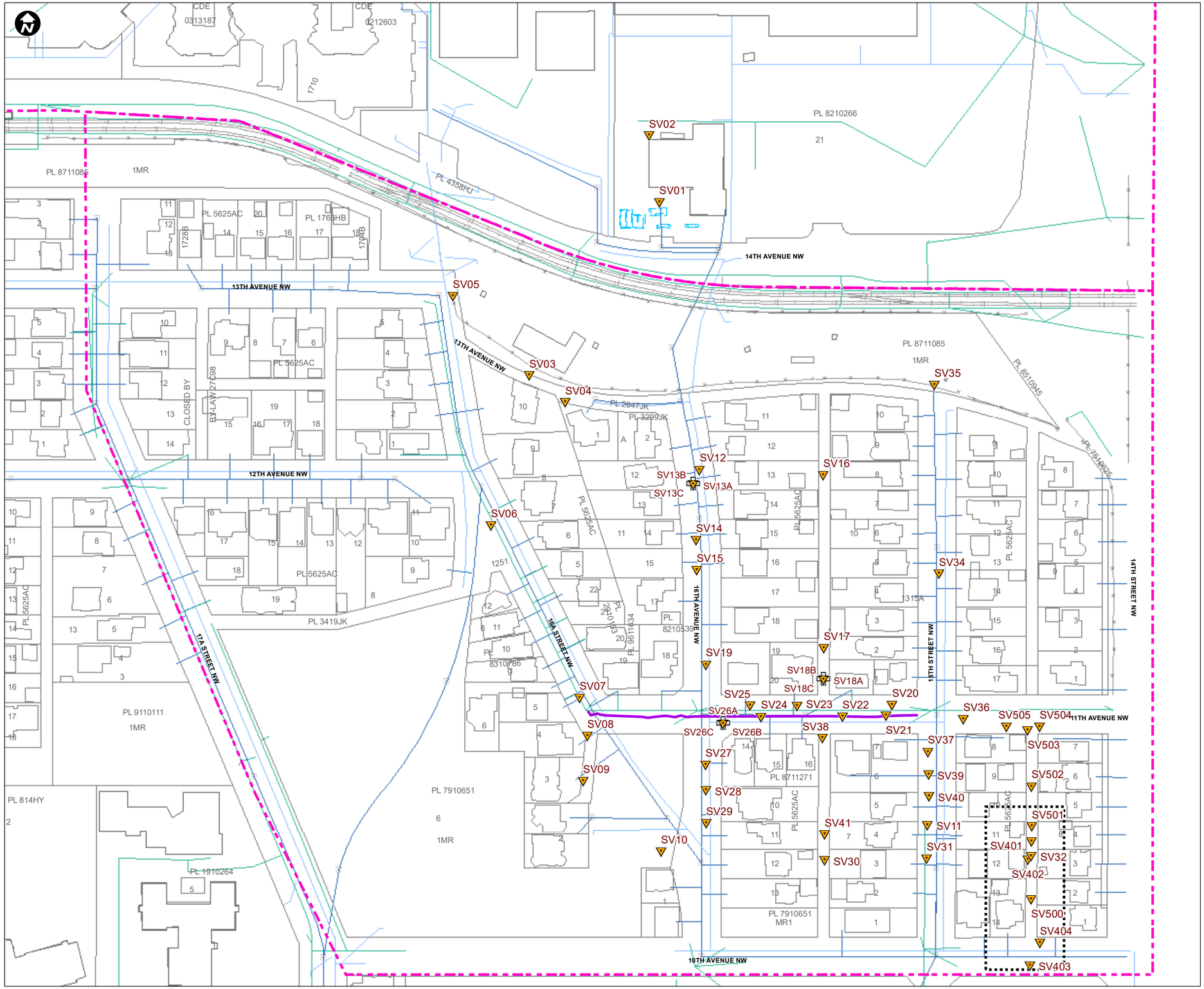
Notes:
- The orthophoto based on City of Calgary Basemap (WMASP), July-August 2022.
- Elevation data based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded January 2023.

Site Topography

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: JDC	Ref. No.: 10-12832
	Reviewed By: MP	Date: 29-Mar-2023
PARSONS		Drawing No.: 2

Document Path: C:\Z_Drive\10-12832\MXD\GW_Report\20231\2832_SiteTopo_March2023.mxd Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada



LEGEND

- Soil Vapour Monitoring Well
- Soil Vapour Monitoring Well (Nested)
- Former Facility/Feature
- LRT Tracks
- Water
- Storm Sewer
- Sanitary Sewer
- Permeable Reactive Barrier (Dec. 2019)
- Risk Management & Contingency (RM&C) Program Area
- Site Boundary

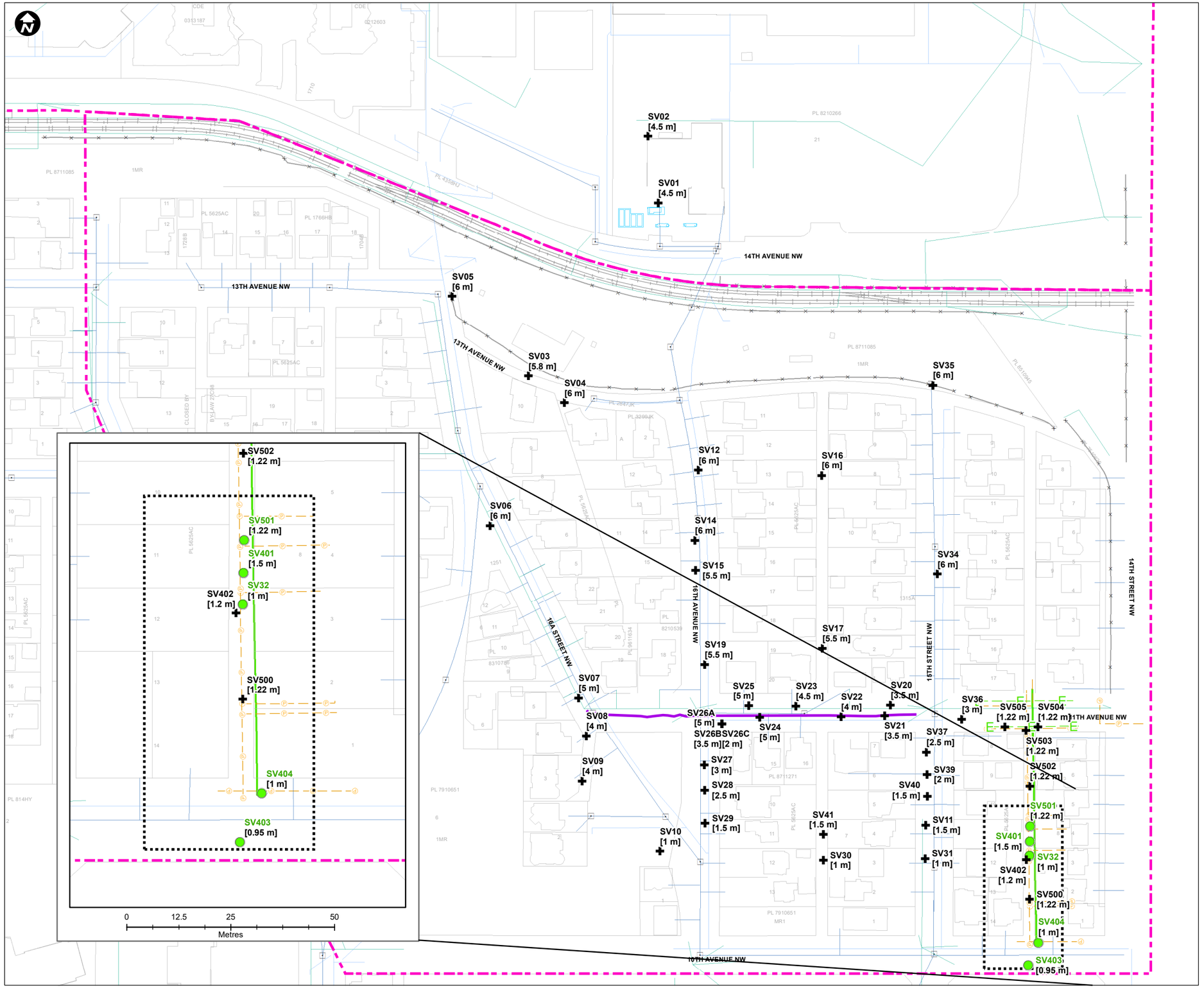
Notes:
- Well locations, site features provided as AutoCAD file by Clifton Engineering Group Inc..
- Property parcel and utility data based on City of Calgary's Open Data Portal, City Online, Geospatial Data service. Downloaded March 2023 ; note only City utilities are shown.
- Building based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded January 2023.
- Soil vapour well locations on private property are not shown.

Site Plan
Soil Vapour Sample Locations

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: JDC	Ref. No.: 10-12832
	Reviewed By: MP	Date: 13-Apr-2023
PARSONS		Drawing No.: 3

Document Path: C:\Z_Drive\10-12832\MXD\Air_Jan2023Report\12832_SitePlan_SV_April2023.mxd Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada



LEGEND

- One or more analytes exceeds referenced guidelines during the December 2023 sampling event
- All analytes less than referenced guidelines during the December 2023 sampling event
- Soil vapour monitoring well not sampled in December 2023
- Former Facility/Feature
- LRT Tracks
- Water
- Storm Sewer
- Sanitary Sewer
- Subsurface Powerline
- Gas Line
- Overhead Powerline
- Permeable Reactive Barrier (Dec. 2019)
- Risk Management & Contingency (RM&C) Program Area
- Site Boundary

[1.2 m] Total well depth (mbgs, unless otherwise specified)

[0.3 m][a] 0.3 m below foundation

Notes:
- Well locations, site features provided as AutoCAD file by Clifton Engineering Group Inc..
- Property parcel and utility data based on City of Calgary's Open Data Portal, City Online, Geospatial Data service. Downloaded March 2023; note only City utilities are shown.
- Building based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded January 2023.

Summary of Soil Vapour Analytical Results (December 2023 Sampling Events)

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: JDC	Ref. No.: 10-12832
	Reviewed By: MP	Date: 18-Jan-2024
PARSONS		Drawing No.: 4

Document Path: C:\Z_Drive\10-12832\MXD\DecemberSoilVapour\12832_SV_ExceedNoPrivate_December2023_New.mxd Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada

TABLE 1

RESULTS OF SOIL VAPOUR ANALYSES
PETROLEUM HYDROCARBON PARAMETERS, 1,2-DICHLOROETHANE, AND NAPHTHALENE

(units in µg/m3)

Sample Location	Total Well Depth (mbgs)	Date Sampled	Duplicate	CONSTITUENT Area	Benzene	Toluene	Ethylbenzene	Total Xylenes	Aliphatic >C5-C6	Aliphatic >C6-C8	Aliphatic >C8-C10	Aliphatic >C10-C12	Aliphatic >C12-C16	Aromatic C6-C8	Aromatic >C7-C8 (TEX Excl.)	Aromatic >C8-C10	Aromatic >C10-C12	Aromatic >C12-C16	1,2-Dichloroethane	Naphthalene
Guidelines[a]:																				
Residential: fine or coarse-grained: <1 m beneath foundation					6.3E+01	1.1E+05	1.0E+05	4.9E+03	NG	9.2E+05	4.8E+04	5.0E+04	5.0E+04	NG	NG	8.1E+03	1.0E+04	1.0E+04	3.8E+01	4.5E+02
Residential: fine-grained: 1 m beneath foundation					3.0E+04	5.5E+07	4.9E+07	2.4E+06	NG	4.7E+08	2.5E+07	2.6E+07	2.6E+07	NG	NG	4.2E+06	5.1E+06	5.1E+06	1.8E+03	2.3E+04
Residential: fine-grained: 1.5 m beneath foundation					3.2E+04	5.7E+07	5.1E+07	2.5E+06	NG	5.0E+08	2.6E+07	2.7E+07	2.7E+07	NG	NG	4.5E+06	5.5E+06	5.5E+06	1.9E+03	2.4E+04
Residential: fine-grained: 2 m beneath foundation					3.3E+04	5.9E+07	5.3E+07	2.6E+06	NG	5.3E+08	2.8E+07	2.9E+07	2.9E+07	NG	NG	4.7E+06	5.8E+06	5.8E+06	1.9E+03	2.5E+04
Residential: fine-grained: 2.5 m beneath foundation					3.4E+04	6.1E+07	5.6E+07	2.7E+06	NG	5.6E+08	2.9E+07	3.1E+07	3.1E+07	NG	NG	5.0E+06	6.1E+06	6.1E+06	2.0E+03	2.7E+04
Residential: fine-grained: 3 m beneath foundation					3.5E+04	6.3E+07	5.8E+07	2.8E+06	NG	5.9E+08	3.1E+07	3.2E+07	3.2E+07	NG	NG	5.3E+06	6.5E+06	6.5E+06	2.0E+03	2.8E+04
Residential: coarse-grained: 1 m beneath foundation					4.1E+03	7.4E+06	6.8E+06	3.3E+05	NG	7.4E+07	3.9E+06	4.0E+06	4.0E+06	NG	NG	6.6E+05	8.1E+05	8.1E+05	2.3E+02	3.4E+03
Residential: coarse-grained: 1.5 m beneath foundation					4.7E+03	8.5E+06	8.0E+06	3.9E+05	NG	9.0E+07	4.7E+06	4.9E+06	4.9E+06	NG	NG	8.0E+05	9.9E+05	9.9E+05	2.7E+02	4.1E+03
Residential: coarse-grained: 2 m beneath foundation					5.3E+03	9.7E+06	9.2E+06	4.5E+05	NG	1.1E+08	5.6E+06	5.8E+06	5.8E+06	NG	NG	9.5E+05	1.2E+06	1.2E+06	3.0E+02	4.8E+03
Residential: coarse-grained: 2.5 m beneath foundation					6.0E+03	1.1E+07	1.0E+07	5.0E+05	NG	1.2E+08	6.5E+06	6.7E+06	6.7E+06	NG	NG	1.1E+06	1.3E+06	1.3E+06	3.3E+02	5.5E+03
Residential: coarse-grained: 3 m beneath foundation					6.6E+03	1.2E+07	1.2E+07	5.6E+05	NG	1.4E+08	7.3E+06	7.6E+06	7.6E+06	NG	NG	1.2E+06	1.5E+06	1.5E+06	3.6E+02	6.1E+03
SV323	1.0	2022-10-03		Residential	1.47	4.90	3.34	65.7	-	42	18	33	<15	107	-	21.45	<15	<15	<0.41	<5.2
		2023-01-31		Residential	<0.64	<0.75	<0.87	<2.2	-	130	<15	<15	<15	<15	-	<15	<15	<15	<0.40	<5.2
		2023-05-11		Residential	0.53	0.95	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0
		2023-09-06		Residential	0.36	0.55	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.40	<1.0
		2023-12-18		Residential	1.55	0.44	<0.43	<1.3	<5.0	<5.0	<5.0	13.9	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0
SV401	1.5	2022-10-05		Residential	<0.50	<0.75	<0.87	<1.8	-	19	<15	<15	<15	<15	-	<15	<15	<15	<0.41	<5.2
		2023-05-11		Residential	0.37	1.03	<0.43	<1.3	<5.0	<5.0	<5.0	7.7	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0
		2023-09-06		Residential	<0.32	<0.38	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.40	<1.0
		2023-12-06		Residential	0.56	1.01	0.86	3.4	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0
SV402	1.5	2022-10-05		Residential	<0.50	<0.75	<0.87	<1.8	-	<15	<15	<15	<15	<15	-	<15	<15	<15	<0.41	<5.2
		2023-01-24		Residential	<0.64	<0.75	<0.87	<2.2	-	<15	<15	<15	<15	<15	-	<15	<15	<15	<0.40	<5.2
		2023-01-24	Dup	Residential	<0.64	<0.75	<0.87	<2.2	-	<15	<15	<15	<15	<15	-	<15	<15	<15	<0.40	<5.2
		2023-05-05		Residential	<0.32	0.94	<0.43	<1.3	<5.0	<5.0	<5.0	26.8	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0
		2023-09-07		Residential	1.54	1.19	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.40	<1.0

a - For the full set of depth-specific guidelines, for commercial and residential land use, fine-grained and coarse-grained guidelines, refer to Appendix A, and/or the report entitled *Development of Soil Vapour and Groundwater Quality Guidelines, Prepared by Intrinsik Corp. for Suncor Energy Products Partnership. December 2022.* The RM&C Plan screening threshold is 90% of the guidelines; see report text for additional details. Guidelines <1 m beneath foundation are based on default attenuation coefficient of 0.01 (AEP 2022b).

NG - No guideline.

"-" - Not analyzed.

Dup - Duplicate Sample.

Italics - Greater than 90% of referenced guidelines (screening threshold).

Underline - Detection limit exceeds guideline.

Shaded Calculated guideline value results in a vapour concentration greater than the maximum possible vapour concentration for that chemical, assuming no NAPL is present. Maximum vapour concentration calculated according to Health Canada (2010) guidance.

mbgs - metres below ground surface (unless otherwise specified)

BOLD - Exceeds referenced guidelines.

Results for all parameters are reported in micrograms per metre cubed (µg/m^3), unless otherwise specified.

Notes: All 2021 and 2022 analytical data was collected by Clifton Engineering Group Inc.

TABLE 1

RESULTS OF SOIL VAPOUR ANALYSES
PETROLEUM HYDROCARBON PARAMETERS, 1,2-DICHLOROETHANE, AND NAPHTHALENE

(units in µg/m3)

Sample Location	Total Well Depth (mbgs)	Date Sampled	Duplicate	CONSTITUENT Area	Benzene	Toluene	Ethylbenzene	Total Xylenes	Aliphatic >C5-C6	Aliphatic >C6-C8	Aliphatic >C8-C10	Aliphatic >C10-C12	Aliphatic >C12-C16	Aromatic C6-C8	Aromatic >C7-C8 (TEX Excl.)	Aromatic >C8-C10	Aromatic >C10-C12	Aromatic >C12-C16	1,2-Dichloroethane	Naphthalene
Guidelines[a]:																				
Residential: fine or coarse-grained: <1 m beneath foundation					6.3E+01	1.1E+05	1.0E+05	4.9E+03	NG	9.2E+05	4.8E+04	5.0E+04	5.0E+04	NG	NG	8.1E+03	1.0E+04	1.0E+04	3.8E+01	4.5E+02
Residential: fine-grained: 1 m beneath foundation					3.0E+04	5.5E+07	4.9E+07	2.4E+06	NG	4.7E+08	2.5E+07	2.6E+07	2.6E+07	NG	NG	4.2E+06	5.1E+06	5.1E+06	1.8E+03	2.3E+04
Residential: fine-grained: 1.5 m beneath foundation					3.2E+04	5.7E+07	5.1E+07	2.5E+06	NG	5.0E+08	2.6E+07	2.7E+07	2.7E+07	NG	NG	4.5E+06	5.5E+06	5.5E+06	1.9E+03	2.4E+04
Residential: fine-grained: 2 m beneath foundation					3.3E+04	5.9E+07	5.3E+07	2.6E+06	NG	5.3E+08	2.8E+07	2.9E+07	2.9E+07	NG	NG	4.7E+06	5.8E+06	5.8E+06	1.9E+03	2.5E+04
Residential: fine-grained: 2.5 m beneath foundation					3.4E+04	6.1E+07	5.6E+07	2.7E+06	NG	5.6E+08	2.9E+07	3.1E+07	3.1E+07	NG	NG	5.0E+06	6.1E+06	6.1E+06	2.0E+03	2.7E+04
Residential: fine-grained: 3 m beneath foundation					3.5E+04	6.3E+07	5.8E+07	2.8E+06	NG	5.9E+08	3.1E+07	3.2E+07	3.2E+07	NG	NG	5.3E+06	6.5E+06	6.5E+06	2.0E+03	2.8E+04
Residential: coarse-grained: 1 m beneath foundation					4.1E+03	7.4E+06	6.8E+06	3.3E+05	NG	7.4E+07	3.9E+06	4.0E+06	4.0E+06	NG	NG	6.6E+05	8.1E+05	8.1E+05	2.3E+02	3.4E+03
Residential: coarse-grained: 1.5 m beneath foundation					4.7E+03	8.5E+06	8.0E+06	3.9E+05	NG	9.0E+07	4.7E+06	4.9E+06	4.9E+06	NG	NG	8.0E+05	9.9E+05	9.9E+05	2.7E+02	4.1E+03
Residential: coarse-grained: 2 m beneath foundation					5.3E+03	9.7E+06	9.2E+06	4.5E+05	NG	1.1E+08	5.6E+06	5.8E+06	5.8E+06	NG	NG	9.5E+05	1.2E+06	1.2E+06	3.0E+02	4.8E+03
Residential: coarse-grained: 2.5 m beneath foundation					6.0E+03	1.1E+07	1.0E+07	5.0E+05	NG	1.2E+08	6.5E+06	6.7E+06	6.7E+06	NG	NG	1.1E+06	1.3E+06	1.3E+06	3.3E+02	5.5E+03
Residential: coarse-grained: 3 m beneath foundation					6.6E+03	1.2E+07	1.2E+07	5.6E+05	NG	1.4E+08	7.3E+06	7.6E+06	7.6E+06	NG	NG	1.2E+06	1.5E+06	1.5E+06	3.6E+02	6.1E+03
SV403	0.95	2022-10-05		Residential	<0.50	<0.75	<0.87	<1.8	-	<15	<15	<15	<15	<15	-	<15	<15	<15	<0.41	<5.2
		2023-05-10		Residential	0.41	0.39	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0
		2023-08-28		Residential	0.81	1.69	<0.43	1.5	<5.0	<5.0	<5.0	13.5	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.40	<1.0
		2023-08-28	Dup	Residential	0.57	0.62	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.40	<1.0
		2023-12-06		Residential	<0.32	<0.38	<0.43	<1.3	<5.0	10.5	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0
SV404	1.0	2023-01-24		Residential	<0.64	<0.75	<0.87	<2.2	-	17	<15	<15	<15	<15	-	<15	<15	<15	<0.40	<5.2
		2023-05-05		Residential	<0.32	0.61	<0.43	<1.3	<5.0	<5.0	<5.0	19.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0
		2023-05-05		Residential	1.32	2.5	0.65	2.9	<5.0	9.6	9.7	48.8	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0
		2023-08-28		Residential	<0.32	0.46	<0.43	<1.3	<5.0	<5.0	<5.0	16.8	7.1	-	<5.0	<5.0	<5.0	<5.0	<0.40	<1.0
		2023-12-07		Residential	1.78	<0.38	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	10.7	<5.0	<5.0	<0.4	<1.0
SV500	1.2	2023-01-27		Residential	<0.64	1.85	3	11.4	-	22	71	189	<15	16	-	<15	<15	<15	<0.40	<5.2
SV501	1.2	2023-01-30		Residential	0.89	6.33	5.43	15.6	-	53	130	40	<15	21	-	<15	<15	<15	<0.40	<5.2
		2023-05-11		Residential	0.51	2.01	1.58	4.1	<5.0	<5.0	<5.0	10.6	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0
		2023-09-07		Residential	1.28	0.60	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.40	<1.0
		2023-12-06		Residential	<0.32	<0.38	<0.43	<1.3	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<0.4	<1.0

a - For the full set of depth-specific guidelines, for commercial and residential land use, fine-grained and coarse-grained guidelines, refer to Appendix A, and/or the report entitled *Development of Soil Vapour and Groundwater Quality Guidelines, Prepared by Intrinsik Corp. for Suncor Energy Products Partnership. December 2022.*
The RM&C Plan screening threshold is 90% of the guidelines; see report text for additional details. Guidelines <1 m beneath foundation are based on default attenuation coefficient of 0.01 (AEP 2022b).

NG - No guideline.

"-" - Not analyzed.

Dup - Duplicate Sample.

Italics - Greater than 90% of referenced guidelines (screening threshold).

Underline - Detection limit exceeds guideline.

Shaded Calculated guideline value results in a vapour concentration greater than the maximum possible vapour concentration for that chemical, assuming no NAPL is present. Maximum vapour concentration calculated according to Health Canada (2010) guidance.

mbgs - metres below ground surface (unless otherwise specified)

BOLD - Exceeds referenced guidelines.

Results for all parameters are reported in micrograms per metre cubed (µg/m^3), unless otherwise specified.

Notes: All 2021 and 2022 analytical data was collected by Clifton Engineering Group Inc.

APPENDIX A

SOIL VAPOUR SAMPLING PROCEDURES

APPENDIX A
LEAK TESTING AND SAMPLING PROCEDURES

HEALTH AND SAFETY

Consistent with Parsons' policy and its client's policy, the completed work was carried out consistent with a site-specific health and safety plan. This plan, as a minimum, complied with provincial requirements as well as Parsons and its client's guidelines, whichever were more stringent.

APPROVALS

Prior to doing any site work, approval to proceed was obtained from the client. When monitoring or investigative work was required on public or third-party lands, the necessary approvals were obtained from the municipality or the property owner, respectively, prior to commencing any work.

LEAK TESTING PROCEDURE

Prior to sampling, leak testing is conducted to evaluate the integrity of the monitoring well seal and sampling equipment. The leak testing is conducted a minimum of once per calendar year, and in addition, 10% of soil vapour wells sampled are leak tested during each soil vapour sampling event.

Soil vapour wells are leak tested immediately before sample collection. Leak testing consisted of placing a shroud with two valves (one with a connector that can be attached to the well and the other to the empty space within the shroud) over each well and flooding it with 99.999% Helium via the valve to the open space. The helium canister was connected to the shroud and the valve was opened fully for three seconds allowing the helium to saturate the space.

Using an SKC pump and lung sampler, the pump was connected to the well via tubing connected inside the shroud and run for five minutes at a rate of 70 millilitres (mL) per minute to fill one clean new tedlar bag connected inside the lung sampler. A separate clean new tedlar bag was used for each well.

The pump was turned off and the well was closed. The tedlar bag was then removed from the lung sampler, and the end of the helium detector was inserted inside to take a reading to ensure that less than 5,000 parts per million (ppm) of helium had entered the bag through a leak in the well.

As a check that the helium detector was working, the helium detector end was placed in the shroud containing helium to ensure helium remained in the casing during the test. This was always confirmed; however, no numbers from this were recorded.

APPENDIX A
LEAK TESTING AND SAMPLING PROCEDURES

The shroud was then removed from the casing to release the helium to the atmosphere, and it was unscrewed/detached from the closed well.

As required, the bentonite seals were re-hydrated if leak testing was outside the acceptable range. Soil vapour samples were collected once the pre-sampling leak test indicated that the integrity of the soil vapour monitoring wells was adequate.

SOIL VAPOUR SAMPLING PROCEDURE

Soil vapour sampling and leak testing were completed in accordance with the guidelines outlined in the CCME Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment, Volume 3 (2016).

Soil vapour samples are collected using stainless steel vacuum canisters (1.4 L Summa canisters) provided by Bureau Veritas. The vacuum within each canister is checked prior to mobilization to the field. A shut-in leak test is performed to verify that leakage within the sampling train is within acceptable limits. The sampling train is then only used if the shut-in leak testing is found to be within the acceptable limits. The soil vapour wells were purged for 20 minutes, consistent with historical sampling procedure, using an air sampling pump prior to sampling. Following purging, the well shut-off valve is closed prior to sampling to allow any vacuum to dissipate. For sampling, the canisters are connected to the soil vapour monitoring well with a flow controller wherein the sample is collected directly into the canister over a pre-determined time interval by opening the valve at the wellhead. The sample is collected until the vacuum within the canister is depleted. Collected samples are then shipped to the laboratory utilizing the appropriate chain of custody documentation. A duplicate sample was collected subsequently once every 10 samples.

APPENDIX B

SOIL VAPOUR WELL INTEGRITY INSPECTION, LEAK TESTING, AND SAMPLING RECORD

TABLE B-1

SOIL VAPOUR WELL INTEGRITY INSPECTION AND LEAK TESTING

BH ID	Date of Visual Inspection (yyyy-mm-dd)	Well Condition	Date of Leak Test (yyyy-mm-dd)	Test Results (Helium in % or ppm)[a]	Date of Re-Test (yyyy-mm-dd)	Re-Test Results (Helium in % or ppm)[a]	Leak Test Results
SV32	2023-12-06	Good	-	-	-	-	-
SV321B	2023-12-06	Good	-	-	-	-	-
SV322	2023-12-06	Good	12/6/2023	0 ppm	-	-	Pass
SV323	2023-12-07	Good	-	-	-	-	-
SV323	2023-12-18	Good	-	-	-	-	-
SV401	2023-12-06	Good	-	-	-	-	-
SV402	2023-12-06	Repairs Required - Plugged	-	-	-	-	-
SV403	2023-12-04	Good	2023-12-04	0 ppm	-	-	Pass
SV404	2023-12-07	Good	-	-	-	-	-
SV500	2023-12-07	Could not find	-	-	-	-	-
SV501	2023-12-06	Good	-	-	-	-	-

a - >1% or > 10,000 ppm = fail.

ND - Not detected.

"-" - Not applicable.

Note: Each soil vapour monitoring well sampled must pass a leak test a minimum of once per calendar year.

A minumum of 10% of soil vapour monitoring wells sampled are leak tested during each sampling event.

TABLE B-2

SAMPLING FIELD RECORDS

BH ID	Sampled (Yes/No)	Date (yyyy-mm-dd)	Canister ID	Flow Regulator ID	Time Well Purged Before Sampling (min)	Purging Flow Rate (mL/min)	Start Time (hh:mm)	End Time (hh:mm)	Duration (min)
SV32	Yes	2023-12-06	1465	FX0776	20	84	13:34	13:54	20
SV321B	Yes	2023-12-06	265	FX0528	20	82	12:04	12:26	22
SV322	Yes	2023-12-06	6547	FX0431	20	83	10:47	11:10	23
SV323	Yes	2023-12-18	333	FX0183	20	85	14:12	14:33	21
Dup-01 (SV323)	Yes	2023-12-18	225	FX0782	-	-	13:54	14:11	17
SV401	Yes	2023-12-06	9897	FX1510	20	87	14:25	15:02	37
SV402	No	-	-	-	-	-	-	-	-
SV403	Yes	2023-12-04	10942	FX0315	20	80	15:07	15:28	21
SV404	Yes	2023-12-07	1792	FX0576	20	88	10:56	11:15	19
SV500	No	-	-	-	-	-	-	-	-
SV501	Yes	2023-12-06	10967	FX0706	20	84	15:30	15:55	25

"-" - Not applicable.

NR - Not recorded.

Note: Sampling flow rate set to 70 mL/min.

APPENDIX C

GUIDELINE SUMMARY

TABLE C-1

SUMMARY OF SOIL VAPOUR GUIDELINES

Reference	Land Use	Grain Size	Depth (cm)	Benzene	Toluene	Ethylbenzene	Xylenes	1,2-DCA	Naphthalene	F1 Aliphatic C6-C8	F1 Aliphatic >C8-C10	F1 Aromatic >C8-C10	F2 Aliphatic >C10-C12	F2 Aromatic >C10-C12	F2 Aliphatic >C12-C16	F2 Aromatic >C12-C16
Intrinsik, 2022, Table 6.1	Residential	Fine	<100(1)	6.3E+01	1.1E+05	1.0E+05	4.9E+03	3.8E+01	4.5E+02	9.2E+05	4.8E+04	8.1E+03	5.0E+04	1.0E+04	5.0E+04	1.0E+04
			100	3.0E+04	5.5E+07	4.9E+07	2.4E+06	1.8E+03	2.3E+04	4.7E+08	2.5E+07	4.2E+06	2.6E+07	5.1E+06	2.6E+07	5.1E+06
			150	3.2E+04	5.7E+07	5.1E+07	2.5E+06	1.9E+03	2.4E+04	5.0E+08	2.6E+07	4.5E+06	2.7E+07	5.5E+06	2.7E+07	5.5E+06
			200	3.3E+04	5.9E+07	5.3E+07	2.6E+06	1.9E+03	2.5E+04	5.3E+08	2.8E+07	4.7E+06	2.9E+07	5.8E+06	2.9E+07	5.8E+06
			250	3.4E+04	6.1E+07	5.6E+07	2.7E+06	2.0E+03	2.7E+04	5.6E+08	2.9E+07	5.0E+06	3.1E+07	6.1E+06	3.1E+07	6.1E+06
			300	3.5E+04	6.3E+07	5.8E+07	2.8E+06	2.0E+03	2.8E+04	5.9E+08	3.1E+07	5.3E+06	3.2E+07	6.5E+06	3.2E+07	6.5E+06
			350	3.6E+04	6.5E+07	6.0E+07	2.9E+06	2.1E+03	2.9E+04	6.2E+08	3.3E+07	5.5E+06	3.4E+07	6.8E+06	3.4E+07	6.8E+06
			400	3.7E+04	6.8E+07	6.2E+07	3.0E+06	2.2E+03	3.0E+04	6.5E+08	3.4E+07	5.8E+06	3.6E+07	7.1E+06	3.6E+07	7.1E+06
			450	3.9E+04	7.0E+07	6.4E+07	3.1E+06	2.2E+03	3.2E+04	6.8E+08	3.6E+07	6.1E+06	3.7E+07	7.4E+06	3.7E+07	7.4E+06
			500	4.0E+04	7.2E+07	6.7E+07	3.2E+06	2.3E+03	3.3E+04	7.1E+08	3.7E+07	6.3E+06	3.9E+07	7.8E+06	3.9E+07	7.8E+06
			550	4.1E+04	7.4E+07	6.9E+07	3.3E+06	2.3E+03	3.4E+04	7.4E+08	3.9E+07	6.6E+06	4.1E+07	8.1E+06	4.1E+07	8.1E+06
			600	4.2E+04	7.6E+07	7.1E+07	3.4E+06	2.4E+03	3.5E+04	7.7E+08	4.1E+07	6.9E+06	4.2E+07	8.4E+06	4.2E+07	8.4E+06
Intrinsik, 2022, Table 6.2	Residential	Coarse	<100(1)	6.3E+01	1.1E+05	1.0E+05	4.9E+03	3.8E+01	4.5E+02	9.2E+05	4.8E+04	8.1E+03	5.0E+04	1.0E+04	5.0E+04	1.0E+04
			100	4.1E+03	7.4E+06	6.8E+06	3.3E+05	2.3E+02	3.4E+03	7.4E+07	3.9E+06	6.6E+05	4.0E+06	8.1E+05	4.0E+06	8.1E+05
			150	4.7E+03	8.5E+06	8.0E+06	3.9E+05	2.7E+02	4.1E+03	9.0E+07	4.7E+06	8.0E+05	4.9E+06	9.9E+05	4.9E+06	9.9E+05
			200	5.3E+03	9.7E+06	9.2E+06	4.5E+05	3.0E+02	4.8E+03	1.1E+08	5.6E+06	9.5E+05	5.8E+06	1.2E+06	5.8E+06	1.2E+06
			250	6.0E+03	1.1E+07	1.0E+07	5.0E+05	3.3E+02	5.5E+03	1.2E+08	6.5E+06	1.1E+06	6.7E+06	1.3E+06	6.7E+06	1.3E+06
			300	6.6E+03	1.2E+07	1.2E+07	5.6E+05	3.6E+02	6.1E+03	1.4E+08	7.3E+06	1.2E+06	7.6E+06	1.5E+06	7.6E+06	1.5E+06
			350	7.2E+03	1.3E+07	1.3E+07	6.1E+05	4.0E+02	6.8E+03	1.6E+08	8.2E+06	1.4E+06	8.5E+06	1.7E+06	8.5E+06	1.7E+06
			400	7.9E+03	1.4E+07	1.4E+07	6.7E+05	4.3E+02	7.5E+03	1.7E+08	9.0E+06	1.5E+06	9.4E+06	1.9E+06	9.4E+06	1.9E+06
			450	8.5E+03	1.5E+07	1.5E+07	7.3E+05	4.6E+02	8.2E+03	1.9E+08	9.9E+06	1.7E+06	1.0E+07	2.1E+06	1.0E+07	2.1E+06
			500	9.2E+03	1.7E+07	1.6E+07	7.8E+05	4.9E+02	8.9E+03	2.0E+08	1.1E+07	1.8E+06	1.1E+07	2.2E+06	1.1E+07	2.2E+06
			550	9.8E+03	1.8E+07	1.8E+07	8.4E+05	5.3E+02	9.6E+03	2.2E+08	1.2E+07	2.0E+06	1.2E+07	2.4E+06	1.2E+07	2.4E+06
			600	1.0E+04	1.9E+07	1.9E+07	9.0E+05	5.6E+02	1.0E+04	2.4E+08	1.2E+07	2.1E+06	1.3E+07	2.6E+06	1.3E+07	2.6E+06
Intrinsik, 2022, Table 6.3	Commercial	Fine	<100(1)	2.3E+02	4.1E+05	3.6E+05	1.8E+04	1.4E+02	1.6E+03	3.3E+06	1.7E+05	3.0E+04	1.8E+05	3.6E+04	1.8E+05	3.6E+04
			100	3.2E+05	5.7E+08	5.2E+08	2.5E+07	1.8E+04	2.4E+05	5.1E+09	2.7E+08	4.5E+07	2.8E+08	5.5E+07	2.8E+08	5.5E+07
			150	3.3E+05	5.9E+08	5.4E+08	2.6E+07	1.9E+04	2.6E+05	5.4E+09	2.8E+08	4.8E+07	2.9E+08	5.9E+07	2.9E+08	5.9E+07
			200	3.4E+05	6.1E+08	5.6E+08	2.7E+07	2.0E+04	2.7E+05	5.7E+09	3.0E+08	5.0E+07	3.1E+08	6.2E+07	3.1E+08	6.2E+07
			250	3.5E+05	6.4E+08	5.8E+08	2.8E+07	2.0E+04	2.8E+05	5.9E+09	3.1E+08	5.3E+07	3.2E+08	6.5E+07	3.2E+08	6.5E+07
			300	3.6E+05	6.6E+08	6.1E+08	2.9E+07	2.1E+04	2.9E+05	6.2E+09	3.3E+08	5.5E+07	3.4E+08	6.8E+07	3.4E+08	6.8E+07
			350	3.7E+05	6.8E+08	6.3E+08	3.1E+07	2.1E+04	3.1E+05	6.5E+09	3.4E+08	5.8E+07	3.6E+08	7.1E+07	3.6E+08	7.1E+07
			400	3.9E+05	7.0E+08	6.5E+08	3.2E+07	2.2E+04	3.2E+05	6.8E+09	3.6E+08	6.1E+07	3.7E+08	7.5E+07	3.7E+08	7.5E+07
			450	4.0E+05	7.2E+08	6.7E+08	3.3E+07	2.3E+04	3.3E+05	7.1E+09	3.7E+08	6.3E+07	3.9E+08	7.8E+07	3.9E+08	7.8E+07
			500	4.1E+05	7.4E+08	6.9E+08	3.4E+07	2.3E+04	3.4E+05	7.4E+09	3.9E+08	6.6E+07	4.1E+08	8.1E+07	4.1E+08	8.1E+07
			550	4.2E+05	7.6E+08	7.1E+08	3.5E+07	2.4E+04	3.6E+05	7.7E+09	4.1E+08	6.9E+07	4.2E+08	8.4E+07	4.2E+08	8.4E+07
			600	4.3E+05	7.8E+08	7.3E+08	3.6E+07	2.4E+04	3.7E+05	8.0E+09	4.2E+08	7.1E+07	4.4E+08	8.8E+07	4.4E+08	8.8E+07
Intrinsik, 2022, Table 6.4	Commercial	Coarse	<100(1)	2.3E+02	4.1E+05	3.6E+05	1.8E+04	1.4E+02	1.6E+02	3.3E+06	1.7E+05	3.0E+04	1.8E+05	3.6E+04	1.8E+05	3.6E+04
			100	4.3E+04	7.8E+07	7.2E+07	3.5E+06	2.5E+03	3.6E+04	7.7E+08	4.0E+07	6.8E+06	4.2E+07	8.4E+06	4.2E+07	8.4E+06
			150	4.9E+04	8.9E+07	8.4E+07	4.1E+06	2.8E+03	4.2E+04	9.3E+08	4.9E+07	8.3E+06	5.1E+07	1.0E+07	5.1E+07	1.0E+07
			200	5.6E+04	1.0E+08	9.5E+07	4.6E+06	3.1E+03	4.9E+04	1.1E+09	5.7E+07	9.7E+06	6.0E+07	1.2E+07	6.0E+07	1.2E+07
			250	6.2E+04	1.1E+08	1.1E+08	5.2E+06	3.4E+03	5.6E+04	1.3E+09	6.6E+07	1.1E+07	6.8E+07	1.4E+07	6.8E+07	1.4E+07
			300	6.8E+04	1.2E+08	1.2E+08	5.7E+06	3.8E+03	6.3E+04	1.4E+09	7.4E+07	1.3E+07	7.7E+07	1.5E+07	7.7E+07	1.5E+07
			350	7.4E+04	1.3E+08	1.3E+08	6.3E+06	4.1E+03	6.9E+04	1.6E+09	8.3E+07	1.4E+07	8.6E+07	1.7E+07	8.6E+07	1.7E+07
			400	8.1E+04	1.5E+08	1.4E+08	6.8E+06	4.4E+03	7.6E+04	1.7E+09	9.1E+07	1.5E+07	9.5E+07	1.9E+07	9.5E+07	1.9E+07
			450	8.7E+04	1.6E+08	1.5E+08	7.4E+06	4.7E+03	8.3E+04	1.9E+09	9.9E+07	1.7E+07	1.0E+08	2.1E+07	1.0E+08	2.1E+07
			500	9.3E+04	1.7E+08	1.7E+08	7.9E+06	5.0E+03	8.9E+04	2.1E+09	1.1E+08	1.8E+07	1.1E+08	2.2E+07	1.1E+08	2.2E+07
			550	9.9E+04	1.8E+08	1.8E+08	8.5E+06	5.4E+03	9.6E+04	2.2E+09	1.2E+08	2.0E+07	1.2E+08	2.4E+07	1.2E+08	2.4E+07
			600	1.1E+05	1.9E+08	1.9E+08	9.0E+06	5.7E+03	1.0E+05	2.4E+09	1.2E+08	2.1E+07	1.3E+08	2.6E+07	1.3E+08	2.6E+07
Intrinsik, 2016, Table 8.1	Residential	Fine	<100(2)	3.0E+02	1.9E+05	5.0E+04	8.9E+03	4.0E+01	1.0E+02	9.2E+05	4.8E+04	8.1E+03	5.0E+04	1.0E+04	5.0E+04	1.0E+04
			100	1.5E+05	9.1E+07	2.4E+07	4.4E+06	1.8E+03	5.2E+03	NGR	2.5E+07	4.2E+06	NGR	NGR	NGR	NGR
			150	1.5E+05	9.5E+07	2.6E+07	4.6E+06	1.9E+03	5.5E+03	NGR	2.6E+07	4.5E+06	NGR	NGR	NGR	NGR
			200	1.6E+05	9.8E+07	2.7E+07	4.7E+06	1.9E+03	5.7E+03	NGR	2.8E+07	4.7E+06	NGR	NGR	NGR	NGR
			250	1.6E+05	1.0E+08	2.8E+07	4.9E+06	2.0E+03	6.0E+03	NGR	2.9E+07	5.0E+06	NGR	NGR	NGR	NGR
			300	1.7E+05	1.1E+08	2.9E+07	5.1E+06	2.0E+03	6.3E+03	NGR	3.1E+07	5.3E+06	NGR	NGR	NGR	NGR
			350	1.8E+05	1.1E+08	3.0E+07	5.3E+06	2.1E+03	6.6E+03	NGR	3.3E+07	5.5E+06	NGR	NGR	NGR	NGR
			400	1.8E+05	1.1E+08	3.1E+07	5.5E+06	2.2E+03	6.9E+03	NGR	3.4E+07	5.8E+06	NGR	NGR	NGR	NGR
			450	1.9E+05	1.2E+08	3.2E+07	5.7E+06	2.2E+03	7.2E+03	NGR	NGR	6.1E+06	NGR	NGR	NGR	NGR
			500	1.9E+05	1.2E+08	3.3E+07	5.9E+06	2.3E+03	7.5E+03	NGR	NGR	6.3E+06	NGR	NGR	NGR	NGR
			550	2.0E+05	1.2E+08	3.4E+07	6.1E+06	2.3E+03	7.7E+03	NGR	NGR	6.6E+06	NGR	NGR	NGR	NGR
			600	2.0E+05	1.3E+08	3.5E+07	6.2E+06	2.4E+03	8.0E+03	NGR	NGR	6.9E+06	NGR	NGR	NGR	NGR

(1) - Based on default attenuation coefficient of 0.01 (AEP 2022b).

Notes: Highlighted value indicates calculated guideline value results in a vapour concentration greater than the maximum possible vapour concentration for that chemical, assuming no NAPL is present.
Maximum vapour concentration calculated according to Health Canada (2010) guidance.

TABLE C-1

SUMMARY OF SOIL VAPOUR GUIDELINES

Reference	Land Use	Grain Size	Depth (cm)	Benzene	Toluene	Ethylbenzene	Xylenes	1,2-DCA	Naphthalene	F1 Aliphatic C6-C8	F1 Aliphatic >C8-C10	F1 Aromatic >C8-C10	F2 Aliphatic >C10-C12	F2 Aromatic >C10-C12	F2 Aliphatic >C12-C16	F2 Aromatic >C12-C16
Intrinsik, 2016, Table 8.2	Residential	Coarse	<100(2)	3.0E+02	1.9E+05	5.0E+04	8.9E+03	4.0E+01	1.0E+02	9.2E+05	4.8E+04	8.1E+03	5.0E+04	1.0E+04	5.0E+04	1.0E+04
			100	2.0E+04	1.2E+07	3.4E+06	6.0E+05	2.3E+02	7.7E+02	7.4E+07	3.9E+06	6.6E+05	4.0E+06	8.1E+05	NGR	NGR
			150	2.3E+04	1.4E+07	4.0E+06	7.1E+05	2.7E+02	9.3E+02	9.0E+07	4.7E+06	8.0E+05	NGR	9.9E+05	NGR	NGR
			200	2.6E+04	1.6E+07	4.6E+06	8.1E+05	3.0E+02	1.1E+03	1.1E+08	5.6E+06	9.5E+05	NGR	1.2E+06	NGR	NGR
			250	2.9E+04	1.8E+07	5.2E+06	9.1E+05	3.3E+02	1.2E+03	1.2E+08	6.5E+06	1.1E+06	NGR	1.3E+06	NGR	NGR
			300	3.2E+04	2.0E+07	5.8E+06	1.0E+06	3.6E+02	1.4E+03	1.4E+08	7.3E+06	1.2E+06	NGR	1.5E+06	NGR	NGR
			350	3.5E+04	2.2E+07	6.4E+06	1.1E+06	4.0E+02	1.5E+03	1.6E+08	8.2E+06	1.4E+06	NGR	1.7E+06	NGR	NGR
			400	3.8E+04	2.4E+07	7.0E+06	1.2E+06	4.3E+02	1.7E+03	1.7E+08	9.0E+06	1.5E+06	NGR	1.9E+06	NGR	NGR
			450	4.1E+04	2.6E+07	7.5E+06	1.3E+06	4.6E+02	1.9E+03	1.9E+08	9.9E+06	1.7E+06	NGR	2.1E+06	NGR	NGR
			500	4.4E+04	2.8E+07	8.1E+06	1.4E+06	4.9E+02	2.0E+03	2.0E+08	1.1E+07	1.8E+06	NGR	2.2E+06	NGR	NGR
			550	4.7E+04	3.0E+07	8.7E+06	1.5E+06	5.3E+02	2.2E+03	2.2E+08	1.2E+07	2.0E+06	NGR	2.4E+06	NGR	NGR
			600	5.1E+04	3.2E+07	9.3E+06	1.6E+06	5.6E+02	2.3E+03	2.4E+08	1.2E+07	2.1E+06	NGR	2.6E+06	NGR	NGR
Intrinsik, 2016, Table 8.3	Commercial	Fine	<100(2)	1.1E+03	6.8E+05	1.8E+05	3.2E+04	1.5E+02	3.7E+02	3.3E+06	1.7E+05	3.0E+04	1.8E+05	3.6E+04	1.8E+05	3.6E+04
			100	1.5E+06	NGR	NGR	4.6E+07	1.8E+04	5.5E+04	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			150	1.6E+06	NGR	NGR	4.8E+07	1.9E+04	5.8E+04	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			200	1.6E+06	NGR	NGR	5.0E+07	2.0E+04	6.1E+04	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			250	1.7E+06	NGR	NGR	NGR	2.0E+04	6.4E+04	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			300	1.8E+06	NGR	NGR	NGR	2.1E+04	6.7E+04	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			350	1.8E+06	NGR	NGR	NGR	2.1E+04	6.9E+04	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			400	1.9E+06	NGR	NGR	NGR	2.2E+04	7.2E+04	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			450	1.9E+06	NGR	NGR	NGR	2.3E+04	7.5E+04	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			500	2.0E+06	NGR	NGR	NGR	2.3E+04	7.8E+04	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			550	2.0E+06	NGR	NGR	NGR	2.4E+04	8.1E+04	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			600	2.1E+06	NGR	NGR	NGR	2.4E+04	8.3E+04	NGR	NGR	NGR	NGR	NGR	NGR	NGR
Intrinsik, 2016, Table 8.4	Commercial	Coarse	<100(2)	1.1E+03	6.8E+05	1.8E+05	3.2E+04	1.5E+02	3.7E+02	3.3E+06	1.7E+05	3.0E+04	1.8E+05	3.6E+04	1.8E+05	3.6E+04
			100	2.1E+05	1.3E+08	3.6E+07	6.4E+06	2.5E+03	8.1E+03	NGR	NGR	6.8E+06	NGR	NGR	NGR	NGR
			150	2.4E+05	NGR	4.2E+07	7.4E+06	2.8E+03	9.6E+03	NGR	NGR	8.3E+06	NGR	NGR	NGR	NGR
			200	2.7E+05	NGR	4.8E+07	8.4E+06	3.1E+03	1.1E+04	NGR	NGR	9.7E+06	NGR	NGR	NGR	NGR
			250	3.0E+05	NGR	5.3E+07	9.4E+06	3.4E+03	1.3E+04	NGR	NGR	1.1E+07	NGR	NGR	NGR	NGR
			300	3.3E+05	NGR	NGR	1.0E+07	3.8E+03	1.4E+04	NGR	NGR	1.3E+07	NGR	NGR	NGR	NGR
			350	3.6E+05	NGR	NGR	1.1E+07	4.1E+03	1.6E+04	NGR	NGR	1.4E+07	NGR	NGR	NGR	NGR
			400	3.9E+05	NGR	NGR	1.2E+07	4.4E+03	1.7E+04	NGR	NGR	1.5E+07	NGR	NGR	NGR	NGR
			450	4.2E+05	NGR	NGR	1.3E+07	4.7E+03	1.9E+04	NGR	NGR	1.7E+07	NGR	NGR	NGR	NGR
			500	4.5E+05	NGR	NGR	1.4E+07	5.0E+03	2.0E+04	NGR	NGR	1.8E+07	NGR	NGR	NGR	NGR
			550	4.8E+05	NGR	NGR	1.5E+07	5.4E+03	2.2E+04	NGR	NGR	2.0E+07	NGR	NGR	NGR	NGR
			600	5.1E+05	NGR	NGR	1.6E+07	5.7E+03	2.3E+04	NGR	NGR	2.1E+07	NGR	NGR	NGR	NGR
Intrinsik, 2016, Table 8.5	Outdoor	Fine	100	8.1E+06	NGR	NGR	NGR	8.6E+04	4.1E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			150	1.2E+07	NGR	NGR	NGR	1.3E+05	6.2E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			200	1.6E+07	NGR	NGR	NGR	1.7E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			250	2.0E+07	NGR	NGR	NGR	2.1E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			300	2.4E+07	NGR	NGR	NGR	2.6E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			350	2.8E+07	NGR	NGR	NGR	3.0E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			400	3.3E+07	NGR	NGR	NGR	3.4E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			450	3.7E+07	NGR	NGR	NGR	3.9E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			500	4.1E+07	NGR	NGR	NGR	4.3E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			550	4.5E+07	NGR	NGR	NGR	4.7E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			600	4.9E+07	NGR	NGR	NGR	5.1E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
Intrinsik, 2016, Table 8.6	Outdoor	Coarse	100	4.4E+06	NGR	NGR	NGR	4.7E+04	2.2E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			150	6.6E+06	NGR	NGR	NGR	7.0E+04	3.4E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			200	8.9E+06	NGR	NGR	NGR	9.3E+04	4.5E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			250	1.1E+07	NGR	NGR	NGR	1.2E+05	5.6E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			300	1.3E+07	NGR	NGR	NGR	1.4E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			350	1.5E+07	NGR	NGR	NGR	1.6E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			400	1.8E+07	NGR	NGR	NGR	1.9E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			450	2.0E+07	NGR	NGR	NGR	2.1E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			500	2.2E+07	NGR	NGR	NGR	2.3E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			550	2.4E+07	NGR	NGR	NGR	2.6E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
			600	2.7E+07	NGR	NGR	NGR	2.8E+05	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR

(2) - Based on default attenuation coefficient of 0.01 (AEP 2016b).

NGR - No guideline required, as calculated guideline value results in a vapour concentration greater than the maximum possible vapour concentration for that chemical, assuming no NAPL is present.

Notes: Maximum vapour concentration calculated according to Health Canada (2010) guidance.

APPENDIX D

QUALITY ASSURANCE AND QUALITY CONTROL

APPENDIX D
QUALITY ASSURANCE AND QUALITY CONTROL (QAQC)

A QAQC program was implemented to reduce and quantify potential issues introduced during sample collection, handling, shipping, and analysis. The program included, but was not limited to, using dedicated sampling equipment, using sample specific identification and labelling procedures, and using chain of custody records.

Laboratory QAQC

The results of the laboratory QAQC analysis are presented with the laboratory certificates of analysis. The analysis included method blanks, matrix duplicates, matrix spikes, and laboratory control samples.

Field QAQC

For each sampling event, a field duplicate is taken every 10 samples submitted to Bureau Veritas.

For the field duplicate samples, evaluations of the QAQC results were determined by calculating the relative percent difference (RPD) between the field duplicate and original sample results, and comparison of the RPD to designated alert limits.

$$RPD = \left| \frac{(x_1 - x_2)}{\left(\frac{(x_1 + x_2)}{2}\right)} \right| \times 100$$

The designated field duplicate RPD alert limits are presented in Table E-1. Consistent with laboratory practices and to permit reliable calculations, an RPD is only calculated when the original and duplicate sample concentrations are at least five times the reportable detection limit.

DATA QUALITY REVIEW CHECKLIST

Consultant: *Parsons Inc.* Sampling Date: *2023-12-06 to 2023-12-07*

Location: *1620 14th Avenue NW, Calgary, AB* Laboratory : *Bureau Veritas, Calgary, AB*

Consultant Project Number: *10-12832* Sample Submission Number: *C3BA243*

Are All Laboratory QC Samples Within Acceptance Criteria (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Surrogate Recovery	*X*			*All lab QC met acceptance criteria.*
Method Blank Concentration	*X*			
Matrix Duplicate RPD			*X*	
Matrix Spike Recovery			*X*	
Other Quality Control Data	*X*			

Are All Field QC Samples Within Alert Limits (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Field Blank Concentration			*X*	*No field QC samples were submitted.*
Trip Blank Concentration			*X*	
Field Duplicate RPD			*X*	

Has CoA been signed off (Yes/No)?:	*Yes*
Has lab warranted all tests were in statistical control in CoA (Yes/No)?:	*Yes*
Has lab warranted all tests were analyzed following SOP's in CoA (Yes, No or N/A)?:	*Yes*
Were all samples analyzed within hold times (Yes/No)?:	*Yes*
Is Chain of Custody completed and signed (Yes/No)?:	*Yes*
Were sample temperatures acceptable when they reached lab (Yes/No)?:	*NA*

Is data considered to be reliable (Yes/No)?: *Yes*

If answer is "No", describe and provide rationale:

Performed by (Print): *Andres Montanez*

Reviewed by (Print): *Michelle Patterson*

Reviewed date: *2024-01-10*

Reviewed by (Signature): 

Your P.O. #: 478621.17113
Your Project #: 10-12832
Site#: OUTLET#9445
Site Location: 1620 14TH AVENUE NW,CALGARY,AB
Your C.O.C. #: NA

Attention: Michelle Patterson

Parsons Inc.
318 - 11th Ave SE
Suite 200
Calgary, AB
CANADA T2G 0Y2

Report Date: 2023/12/21
Report #: R7965321
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C3BA243
Received: 2023/12/08, 08:45

Sample Matrix: Air
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX Fractionation in Air (TO-15mod)	5	N/A	2023/12/18	BRL SOP-00304	EPA TO-15 m
Canister Pressure (TO-15)	5	N/A	2023/12/18	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (ug/m3)	5	N/A	2023/12/19	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (TO-15) (1)	5	N/A	2023/12/18	BRL SOP-00304	EPA TO-15 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCCFP, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
(1) Air sampling canisters have been cleaned in accordance with U.S. EPA Method TO15. At the end of the cleaning, evacuation, and pressurization cycles, one canister was selected and was pressurized with Zero Air. This canister was then analyzed via TO15 on a GC/MS. The canister must have been found to contain <0.2 ppbv concentration of all target analytes in order for the batch to have been considered clean. Each canister also underwent a leak check prior to shipment.

Please Note: SUMMA® canister samples will be retained by Bureau Veritas for a period of 5 calendar days or as contractually agreed from the date of this report, after which time they will be cleaned for reuse. If you require a longer sample storage period, please contact your service representative.

Your P.O. #: 478621.17113
Your Project #: 10-12832
Site#: OUTLET#9445
Site Location: 1620 14TH AVENUE NW,CALGARY,AB
Your C.O.C. #: NA

Attention: Michelle Patterson

Parsons Inc.
318 - 11th Ave SE
Suite 200
Calgary, AB
CANADA T2G 0Y2

Report Date: 2023/12/21
Report #: R7965321
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C3BA243
Received: 2023/12/08, 08:45

Encryption Key

Cristina (Maria) Bacchus
Project Manager
21 Dec 2023 16:19:48

Please direct all questions regarding this Certificate of Analysis to:
Cristina (Maria) Bacchus, Project Manager
Email: maria.bacchus@bureauveritas.com
Phone# (905)817-5763

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BA243
Report Date: 2023/12/21

Parsons Inc.
Client Project #: 10-12832
Site Location: 1620 14TH AVENUE NW,CALGARY,AB
Your P.O. #: 478621.17113
Sampler Initials: GC

RESULTS OF ANALYSES OF AIR

Bureau Veritas ID		XVK738	XVK739	XVK740	XVK741	XVK742	
Sampling Date		2023/12/06	2023/12/06	2023/12/06	2023/12/06	2023/12/07	
COC Number		NA	NA	NA	NA	NA	
	UNITS	**SV32/1465**	**SV401/9897**	**SV403/10942**	**SV501/10967**	**SV404/1792**	**QC Batch**
Pressure on Receipt	psig	(-2.9)	(-3.0)	(-2.7)	(-2.1)	(-2.1)	9119021
QC Batch = Quality Control Batch							

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BA243
Report Date: 2023/12/21

Parsons Inc.
Client Project #: 10-12832
Site Location: 1620 14TH AVENUE NW,CALGARY,AB
Your P.O. #: 478621.17113
Sampler Initials: GC

CALCULATED VOLATILE ORGANICS (AIR)

Bureau Veritas ID		XVK738	XVK739	XVK740	XVK741	XVK742		
Sampling Date		2023/12/06	2023/12/06	2023/12/06	2023/12/06	2023/12/07		
COC Number		NA	NA	NA	NA	NA		
	UNITS	**SV32/1465**	**SV401/9897**	**SV403/10942**	**SV501/10967**	**SV404/1792**	**RDL**	**QC Batch**
1,2-Dichloroethane	ug/m3	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	9104070
Benzene	ug/m3	1.15	0.56	<0.32	<0.32	1.78	0.32	9104070
Toluene	ug/m3	0.64	1.01	<0.38	<0.38	<0.38	0.38	9104070
Ethylbenzene	ug/m3	6.88	0.86	<0.43	<0.43	<0.43	0.43	9104070
p+m-Xylene	ug/m3	26.6	2.58	<0.87	<0.87	<0.87	0.87	9104070
o-Xylene	ug/m3	6.40	0.77	<0.43	<0.43	<0.43	0.43	9104070
Naphthalene	ug/m3	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	9104070
Total Xylenes	ug/m3	33.0	3.4	<1.3	<1.3	<1.3	1.3	9104070

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BA243
Report Date: 2023/12/21

Parsons Inc.
Client Project #: 10-12832
Site Location: 1620 14TH AVENUE NW,CALGARY,AB
Your P.O. #: 478621.17113
Sampler Initials: GC

VOLATILE ORGANIC HYDROCARBONS BY GC/MS (AIR)

Bureau Veritas ID		XVK738	XVK739	XVK740	XVK741	XVK742		
Sampling Date		2023/12/06	2023/12/06	2023/12/06	2023/12/06	2023/12/07		
COC Number		NA	NA	NA	NA	NA		
	UNITS	**SV32/1465**	**SV401/9897**	**SV403/10942**	**SV501/10967**	**SV404/1792**	**RDL**	**QC Batch**
Aliphatic >C5-C6	ug/m3	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	9124789
Aliphatic >C6-C8	ug/m3	<5.0	<5.0	10.5	<5.0	<5.0	5.0	9124789
Aliphatic >C8-C10	ug/m3	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	9124789
Aliphatic >C10-C12	ug/m3	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	9124789
Aliphatic >C12-C16	ug/m3	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	9124789
Aromatic >C7-C8 (TEX Excluded)	ug/m3	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	9124789
Aromatic >C8-C10	ug/m3	16.9	<5.0	<5.0	<5.0	10.7	5.0	9124789
Aromatic >C10-C12	ug/m3	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	9124789
Aromatic >C12-C16	ug/m3	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	9124789

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BA243
Report Date: 2023/12/21

Parsons Inc.
Client Project #: 10-12832
Site Location: 1620 14TH AVENUE NW,CALGARY,AB
Your P.O. #: 478621.17113
Sampler Initials: GC

VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		XVK738			XVK739				
Sampling Date		2023/12/06			2023/12/06				
COC Number		NA			NA				
	UNITS	**SV32/1465**	**ug/m3**	**DL (ug/m3)**	**SV401/9897**	**RDL**	**ug/m3**	**DL (ug/m3)**	**QC Batch**
1,2-Dichloroethane	ppbv	<0.10	<0.405	0.405	<0.10	0.10	<0.405	0.405	9119023
Benzene	ppbv	0.36	1.15	0.319	0.17	0.10	0.555	0.319	9119023
Toluene	ppbv	0.17	0.639	0.377	0.27	0.10	1.01	0.377	9119023
Ethylbenzene	ppbv	1.58	6.88	0.434	0.20	0.10	0.858	0.434	9119023
p+m-Xylene	ppbv	6.13	26.6	0.868	0.60	0.20	2.58	0.868	9119023
o-Xylene	ppbv	1.47	6.40	0.434	0.18	0.10	0.768	0.434	9119023
Naphthalene	ppbv	<0.20	<1.05	1.05	<0.20	0.20	<1.05	1.05	9119023
Total Xylenes	ppbv	7.60	33.0	1.30	0.77	0.30	3.35	1.30	9119023
Surrogate Recovery (%)									
Bromochloromethane	%	86	N/A	N/A	92		N/A	N/A	9119023
D5-Chlorobenzene	%	83	N/A	N/A	85		N/A	N/A	9119023
Difluorobenzene	%	86	N/A	N/A	91		N/A	N/A	9119023

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Bureau Veritas ID		XVK740			XVK741				
Sampling Date		2023/12/06			2023/12/06				
COC Number		NA			NA				
	UNITS	**SV403/10942**	**ug/m3**	**DL (ug/m3)**	**SV501/10967**	**RDL**	**ug/m3**	**DL (ug/m3)**	**QC Batch**
1,2-Dichloroethane	ppbv	<0.10	<0.405	0.405	<0.10	0.10	<0.405	0.405	9119023
Benzene	ppbv	<0.10	<0.319	0.319	<0.10	0.10	<0.319	0.319	9119023
Toluene	ppbv	<0.10	<0.377	0.377	<0.10	0.10	<0.377	0.377	9119023
Ethylbenzene	ppbv	<0.10	<0.434	0.434	<0.10	0.10	<0.434	0.434	9119023
p+m-Xylene	ppbv	<0.20	<0.868	0.868	<0.20	0.20	<0.868	0.868	9119023
o-Xylene	ppbv	<0.10	<0.434	0.434	<0.10	0.10	<0.434	0.434	9119023
Naphthalene	ppbv	<0.20	<1.05	1.05	<0.20	0.20	<1.05	1.05	9119023
Total Xylenes	ppbv	<0.30	<1.30	1.30	<0.30	0.30	<1.30	1.30	9119023
Surrogate Recovery (%)									
Bromochloromethane	%	93	N/A	N/A	92		N/A	N/A	9119023
D5-Chlorobenzene	%	88	N/A	N/A	91		N/A	N/A	9119023
Difluorobenzene	%	93	N/A	N/A	92		N/A	N/A	9119023

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BA243
Report Date: 2023/12/21

Parsons Inc.
Client Project #: 10-12832
Site Location: 1620 14TH AVENUE NW,CALGARY,AB
Your P.O. #: 478621.17113
Sampler Initials: GC

VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		XVK742				
Sampling Date		2023/12/07				
COC Number		NA				
	UNITS	**SV404/1792**	**RDL**	**ug/m3**	**DL (ug/m3)**	**QC Batch**
1,2-Dichloroethane	ppbv	<0.10	0.10	<0.405	0.405	9119023
Benzene	ppbv	0.56	0.10	1.78	0.319	9119023
Toluene	ppbv	<0.10	0.10	<0.377	0.377	9119023
Ethylbenzene	ppbv	<0.10	0.10	<0.434	0.434	9119023
p+m-Xylene	ppbv	<0.20	0.20	<0.868	0.868	9119023
o-Xylene	ppbv	<0.10	0.10	<0.434	0.434	9119023
Naphthalene	ppbv	<0.20	0.20	<1.05	1.05	9119023
Total Xylenes	ppbv	<0.30	0.30	<1.30	1.30	9119023
Surrogate Recovery (%)						
Bromochloromethane	%	90		N/A	N/A	9119023
D5-Chlorobenzene	%	86		N/A	N/A	9119023
Difluorobenzene	%	90		N/A	N/A	9119023

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BA243
Report Date: 2023/12/21

Parsons Inc.
Client Project #: 10-12832
Site Location: 1620 14TH AVENUE NW,CALGARY,AB
Your P.O. #: 478621.17113
Sampler Initials: GC

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9119023	DM2	Spiked Blank	Bromochloromethane	2023/12/18		117	%	60 - 140
			D5-Chlorobenzene	2023/12/18		115	%	60 - 140
			Difluorobenzene	2023/12/18		119	%	60 - 140
			1,2-Dichloroethane	2023/12/18		95	%	70 - 130
			Benzene	2023/12/18		102	%	70 - 130
			Toluene	2023/12/18		101	%	70 - 130
			Ethylbenzene	2023/12/18		103	%	70 - 130
			p+m-Xylene	2023/12/18		105	%	70 - 130
			o-Xylene	2023/12/18		100	%	70 - 130
			Naphthalene	2023/12/18		116	%	70 - 130
			Total Xylenes	2023/12/18		104	%	70 - 130
9119023	DM2	Method Blank	Bromochloromethane	2023/12/18		98	%	60 - 140
			D5-Chlorobenzene	2023/12/18		92	%	60 - 140
			Difluorobenzene	2023/12/18		99	%	60 - 140
			1,2-Dichloroethane	2023/12/18	<0.10		ppbv	
			Benzene	2023/12/18	<0.10		ppbv	
			Toluene	2023/12/18	<0.10		ppbv	
			Ethylbenzene	2023/12/18	<0.10		ppbv	
			p+m-Xylene	2023/12/18	<0.20		ppbv	
			o-Xylene	2023/12/18	<0.10		ppbv	
			Naphthalene	2023/12/18	<0.20		ppbv	
			Total Xylenes	2023/12/18	<0.30		ppbv	
9124789	DM2	Method Blank	Aliphatic >C5-C6	2023/12/18	<5.0		ug/m3	
			Aliphatic >C6-C8	2023/12/18	<5.0		ug/m3	
			Aliphatic >C8-C10	2023/12/18	<5.0		ug/m3	
			Aliphatic >C10-C12	2023/12/18	<5.0		ug/m3	
			Aliphatic >C12-C16	2023/12/18	<5.0		ug/m3	
			Aromatic >C7-C8 (TEX Excluded)	2023/12/18	<5.0		ug/m3	
			Aromatic >C8-C10	2023/12/18	<5.0		ug/m3	
			Aromatic >C10-C12	2023/12/18	<5.0		ug/m3	
			Aromatic >C12-C16	2023/12/18	<5.0		ug/m3	

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

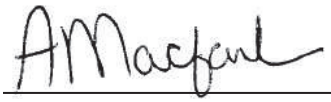
Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BA243
Report Date: 2023/12/21

Parsons Inc.
Client Project #: 10-12832
Site Location: 1620 14TH AVENUE NW,CALGARY,AB
Your P.O. #: 478621.17113
Sampler Initials: GC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Anke Macfarlane, Laboratory Manager, VOC

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

BUREAU VERITAS

6740 Campobello Rd
Mississauga Ontario ,L5N 2L8
www.bvna.com

Toll Free: 1-800-668-0639
Phone: (905) 817-5700
Fax: (905) 817-5777

08-Dec-23 08:45
Cristina (Maria) Bacchus
C3BA243
WKK AIR-001

CAM FCD-01302 /5

Canister

Page 1 of 1

INVOICE INFORMATION		REPORT INFORMATION	
Company Name:	Parsons	Company Name:	Parsons
Contact Name	Accounts Payable	Project Manager:	Michelle Patterson/Rebecca Neufeld
Address:	2751 John Street, Markham, ON L3R 2Y8	Address:	510, 214-11 AVE SW, Calgary AB, T2R 0K1
E-mail:	ParsonsincaAP.Parsons.com	E-mail:	rebecca.neufeld@parsons.com
Ph:	905 944 8877	Ph:	403 294 4215
Sampled by:	Gavin Clarke		

ANALYSIS REQUESTED

Field Sample ID	Canister Serial #	Flow Regulator Serial #	Collection Date	START VACUUM (inches of Hg)	END VACUUM (inches of Hg)	SOIL VAPOUR	AMBIENT/INDOOR AIR	AMBIENT/COMMERCIAL/INDUSTR	SUB-SLAB GAS	FULL LIST OF VOCs (reference	BTEX/Aromatic/Aliphatic Hydrocarb Fractions	BTEX/F1 (C6-C10) and F2 (C10-C	Selected VOC's - please specify	Other	1,2 Dichloroethane	Naphthalene		CANISTERS NOT USED
SV 32	1465	FX0776	23/12/06	-25.5	-3	X					X				X	X		
SV 401	9897	FX1510	23/12/06	-26	-3.5	X					X				X	X		
SV 403	10942	FX0315	23/12/06	-26	-4.0	X					X				X	X		
SV 501	10967	FX0706	23/12/06	-25.5	-4.0	X					X				X	X		
SV 404	1792	FX0576	23/12/07	-25.5	-3.0	X					X				X	X		
	9859			-17.0														X
	358			-23.0														X

TAT Requirement		PROJECT INFORMATION	REPORTING REQUIREMENTS		
STD 10 Business day	☑	Project #: 10-12832; outlet# 9445	EDD		☐
Rush 5 Business day *	☐	Name: 1620 14th Avenue NW, Calgary, AB	Regulations	ON 153	☐
Rush 2 Business day *	☐	PO #: 478621.17113		ON 419	☐
Rush Other *	☐	Bureau Veritas Quote #:		BC CSR	☐
		Bureau Veritas Contact:	x	Other AB Tier 1 Residential	
* need approval from Bureau Veritas		Task Order/Line Item			

Notes

1) please indicate on chain of custody if your samples are soil vapour or ambient air

2) please list all canisters on the chain of custody even if unused

PROJECT SPECIFIC COMMENTS

Activity Code: MV

Client Signature:	Gavin Clarke
Date/Time:	23/12/07 15:00
Received by:	Gavin Parmindeep Kaur Kular
Date/Time:	2023/12/08 8:45

PLEASE RETURN ALL UNUSED EQUIPMENT

DATA QUALITY REVIEW CHECKLIST

Consultant: *Parsons Inc.* Sampling Date: *12/6/2023*

Location: *1620 14th Avenue NW, Calgary, AB* Laboratory : *Bureau Veritas, Calgary, AB*

Consultant Project Number: *10-12832* Sample Submission Number: *C3BA188*

Are All Laboratory QC Samples Within Acceptance Criteria (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Surrogate Recovery	*X*			*All lab QC met acceptance criteria.*
Method Blank Concentration	*X*			
Matrix Duplicate RPD	*X*			
Matrix Spike Recovery			*X*	
Other Quality Control Data	*X*			

Are All Field QC Samples Within Alert Limits (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Field Blank Concentration			*X*	*No field QC samples were submitted.*
Trip Blank Concentration			*X*	
Field Duplicate RPD			*X*	

Has CoA been signed off (Yes/No)?:	*Yes*
Has lab warranted all tests were in statistical control in CoA (Yes/No)?:	*Yes*
Has lab warranted all tests were analyzed following SOP's in CoA (Yes, No or N/A)?:	*Yes*
Were all samples analyzed within hold times (Yes/No)?:	*Yes*
Is Chain of Custody completed and signed (Yes/No)?:	*Yes*
Were sample temperatures acceptable when they reached lab (Yes/No)?:	*NA*

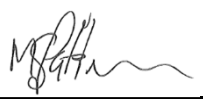
Is data considered to be reliable (Yes/No)?: *Yes*

If answer is "No", describe and provide rationale:

Performed by (Print): *Andres Montanez*

Reviewed by (Print): *Michelle Patterson*

Reviewed date: *10-Jan-24*

Reviewed by (Signature): 

Your P.O. #: 478621.17113;OUTLET#
Your Project #: 10-12832
Site Location: 162014TH AVENUE NW,CALGARY,AB
Your C.O.C. #: NA

Attention: Michelle Patterson

Parsons Inc.
318 - 11th Ave SE
Suite 200
Calgary, AB
CANADA T2G 0Y2

Report Date: 2023/12/22
Report #: R7966606
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C3BA188
Received: 2023/12/08, 08:45

Sample Matrix: Air
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX Fractionation in Air (TO-15mod)	2	N/A	2023/12/19	BRL SOP-00304	EPA TO-15 m
Canister Pressure (TO-15)	2	N/A	2023/12/19	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (ug/m3)	2	N/A	2023/12/20	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (TO-15) (1)	2	N/A	2023/12/19	BRL SOP-00304	EPA TO-15 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCCFP, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
(1) Air sampling canisters have been cleaned in accordance with U.S. EPA Method TO15. At the end of the cleaning, evacuation, and pressurization cycles, one canister was selected and was pressurized with Zero Air. This canister was then analyzed via TO15 on a GC/MS. The canister must have been found to contain <0.2 ppbv concentration of all target analytes in order for the batch to have been considered clean. Each canister also underwent a leak check prior to shipment.

Please Note: SUMMA® canister samples will be retained by Bureau Veritas for a period of 5 calendar days or as contractually agreed from the date of this report, after which time they will be cleaned for reuse. If you require a longer sample storage period, please contact your service representative.

Your P.O. #: 478621.17113;OUTLET#
Your Project #: 10-12832
Site Location: 162014TH AVENUE NW,CALGARY,AB
Your C.O.C. #: NA

Attention: Michelle Patterson

Parsons Inc.
318 - 11th Ave SE
Suite 200
Calgary, AB
CANADA T2G 0Y2

Report Date: 2023/12/22
Report #: R7966606
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C3BA188
Received: 2023/12/08, 08:45

Encryption Key

Cristina (Maria) Bacchus
Project Manager
22 Dec 2023 11:45:23

Please direct all questions regarding this Certificate of Analysis to:
Cristina (Maria) Bacchus, Project Manager
Email: maria.bacchus@bureauveritas.com
Phone# (905)817-5763

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C3BA188
Report Date: 2023/12/22

Parsons Inc.
Client Project #: 10-12832
Site Location: 162014TH AVENUE NW,CALGARY,AB
Your P.O. #: 478621.17113;OUTLET#
Sampler Initials: GC

RESULTS OF ANALYSES OF AIR

Bureau Veritas ID		XVK352	XVK353	
Sampling Date		2023/12/06	2023/12/06	
COC Number		NA	NA	
	UNITS	**SV322/6547**	**SV321 B/00265**	**QC Batch**
Pressure on Receipt	psig	(-2.5)	(-2.7)	9121668
QC Batch = Quality Control Batch				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BA188
Report Date: 2023/12/22

Parsons Inc.
Client Project #: 10-12832
Site Location: 162014TH AVENUE NW,CALGARY,AB
Your P.O. #: 478621.17113;OUTLET#
Sampler Initials: GC

CALCULATED VOLATILE ORGANICS (AIR)

Bureau Veritas ID		XVK352	XVK352	XVK353		
Sampling Date		2023/12/06	2023/12/06	2023/12/06		
COC Number		NA	NA	NA		
	UNITS	**SV322/6547**	**SV322/6547 Lab-Dup**	**SV321 B/00265**	**RDL**	**QC Batch**
1,2-Dichloroethane	ug/m3	<0.40	<0.40	<0.40	0.40	9104070
Benzene	ug/m3	0.51	0.52	5.45	0.32	9104070
Toluene	ug/m3	<0.38	0.40	<0.38	0.38	9104070
Ethylbenzene	ug/m3	<0.43	<0.43	<0.43	0.43	9104070
p+m-Xylene	ug/m3	<0.87	<0.87	<0.87	0.87	9104070
o-Xylene	ug/m3	<0.43	<0.43	<0.43	0.43	9104070
Naphthalene	ug/m3	<1.0	<1.0	<1.0	1.0	9104070
Total Xylenes	ug/m3	<1.3	<1.3	<1.3	1.3	9104070

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

VOLATILE ORGANIC HYDROCARBONS BY GC/MS (AIR)

Bureau Veritas ID		XVK352	XVK352	XVK353		
Sampling Date		2023/12/06	2023/12/06	2023/12/06		
COC Number		NA	NA	NA		
	UNITS	**SV322/6547**	**SV322/6547 Lab-Dup**	**SV321 B/00265**	**RDL**	**QC Batch**
Aliphatic >C5-C6	ug/m3	<5.0	<5.0	<5.0	5.0	9126598
Aliphatic >C6-C8	ug/m3	<5.0	<5.0	<5.0	5.0	9126598
Aliphatic >C8-C10	ug/m3	<5.0	<5.0	<5.0	5.0	9126598
Aliphatic >C10-C12	ug/m3	<5.0	<5.0	<5.0	5.0	9126598
Aliphatic >C12-C16	ug/m3	<5.0	<5.0	<5.0	5.0	9126598
Aromatic >C7-C8 (TEX Excluded)	ug/m3	<5.0	<5.0	<5.0	5.0	9126598
Aromatic >C8-C10	ug/m3	<5.0	<5.0	16.6	5.0	9126598
Aromatic >C10-C12	ug/m3	<5.0	<5.0	<5.0	5.0	9126598
Aromatic >C12-C16	ug/m3	<5.0	<5.0	<5.0	5.0	9126598

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		XVK352			XVK352				
Sampling Date		2023/12/06			2023/12/06				
COC Number		NA			NA				
	UNITS	**SV322/6547**	**ug/m3**	**DL (ug/m3)**	**SV322/6547 Lab-Dup**	**RDL**	**ug/m3**	**DL (ug/m3)**	**QC Batch**
1,2-Dichloroethane	ppbv	<0.10	<0.405	0.405	<0.10	0.10	<0.405	0.405	9121672
Benzene	ppbv	0.16	0.506	0.319	0.16	0.10	0.523	0.319	9121672
Toluene	ppbv	<0.10	<0.377	0.377	0.11	0.10	0.401	0.377	9121672
Ethylbenzene	ppbv	<0.10	<0.434	0.434	<0.10	0.10	<0.434	0.434	9121672
p+m-Xylene	ppbv	<0.20	<0.868	0.868	<0.20	0.20	<0.868	0.868	9121672
o-Xylene	ppbv	<0.10	<0.434	0.434	<0.10	0.10	<0.434	0.434	9121672
Naphthalene	ppbv	<0.20	<1.05	1.05	<0.20	0.20	<1.05	1.05	9121672
Total Xylenes	ppbv	<0.30	<1.30	1.30	<0.30	0.30	<1.30	1.30	9121672
Surrogate Recovery (%)									
Bromochloromethane	%	87	N/A	N/A	89		N/A	N/A	9121672
D5-Chlorobenzene	%	82	N/A	N/A	82		N/A	N/A	9121672
Difluorobenzene	%	85	N/A	N/A	88		N/A	N/A	9121672

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas ID		XVK353				
Sampling Date		2023/12/06				
COC Number		NA				
	UNITS	**SV321 B/00265**	**RDL**	**ug/m3**	**DL (ug/m3)**	**QC Batch**
1,2-Dichloroethane	ppbv	<0.10	0.10	<0.405	0.405	9121672
Benzene	ppbv	1.70	0.10	5.45	0.319	9121672
Toluene	ppbv	<0.10	0.10	<0.377	0.377	9121672
Ethylbenzene	ppbv	<0.10	0.10	<0.434	0.434	9121672
p+m-Xylene	ppbv	<0.20	0.20	<0.868	0.868	9121672
o-Xylene	ppbv	<0.10	0.10	<0.434	0.434	9121672
Naphthalene	ppbv	<0.20	0.20	<1.05	1.05	9121672
Total Xylenes	ppbv	<0.30	0.30	<1.30	1.30	9121672
Surrogate Recovery (%)						
Bromochloromethane	%	86		N/A	N/A	9121672
D5-Chlorobenzene	%	81		N/A	N/A	9121672
Difluorobenzene	%	85		N/A	N/A	9121672

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

GENERAL COMMENTS

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BA188
Report Date: 2023/12/22

Parsons Inc.
Client Project #: 10-12832
Site Location: 162014TH AVENUE NW,CALGARY,AB
Your P.O. #: 478621.17113;OUTLET#
Sampler Initials: GC

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9104070	RAE	RPD [XVK352-01]	1,2-Dichloroethane	2023/12/22	NC		%	25
			Benzene	2023/12/22	3.2		%	25
			Toluene	2023/12/22	6.1		%	25
			Ethylbenzene	2023/12/22	NC		%	25
			p+m-Xylene	2023/12/22	NC		%	25
			o-Xylene	2023/12/22	NC		%	25
			Naphthalene	2023/12/22	NC		%	25
			Total Xylenes	2023/12/22	NC		%	25
9121672	DM2	Spiked Blank	Bromochloromethane	2023/12/19		114	%	60 - 140
			D5-Chlorobenzene	2023/12/19		113	%	60 - 140
			Difluorobenzene	2023/12/19		115	%	60 - 140
			1,2-Dichloroethane	2023/12/19		101	%	70 - 130
			Benzene	2023/12/19		107	%	70 - 130
			Toluene	2023/12/19		105	%	70 - 130
			Ethylbenzene	2023/12/19		107	%	70 - 130
			p+m-Xylene	2023/12/19		108	%	70 - 130
			o-Xylene	2023/12/19		103	%	70 - 130
			Naphthalene	2023/12/19		115	%	70 - 130
			Total Xylenes	2023/12/19		107	%	70 - 130
9121672	DM2	Method Blank	Bromochloromethane	2023/12/19		91	%	60 - 140
			D5-Chlorobenzene	2023/12/19		83	%	60 - 140
			Difluorobenzene	2023/12/19		91	%	60 - 140
			1,2-Dichloroethane	2023/12/19	<0.10		ppbv	
			Benzene	2023/12/19	<0.10		ppbv	
			Toluene	2023/12/19	<0.10		ppbv	
			Ethylbenzene	2023/12/19	<0.10		ppbv	
			p+m-Xylene	2023/12/19	<0.20		ppbv	
			o-Xylene	2023/12/19	<0.10		ppbv	
			Naphthalene	2023/12/19	<0.20		ppbv	
			Total Xylenes	2023/12/19	<0.30		ppbv	
9121672	DM2	RPD [XVK352-01]	1,2-Dichloroethane	2023/12/19	NC		%	25
			Benzene	2023/12/19	3.2		%	25
			Toluene	2023/12/19	6.1		%	25
			Ethylbenzene	2023/12/19	NC		%	25
			p+m-Xylene	2023/12/19	NC		%	25
			o-Xylene	2023/12/19	NC		%	25
			Naphthalene	2023/12/19	NC		%	25
			Total Xylenes	2023/12/19	NC		%	25
9126598	DM2	Method Blank	Aliphatic >C5-C6	2023/12/19	<5.0		ug/m3	
			Aliphatic >C6-C8	2023/12/19	<5.0		ug/m3	
			Aliphatic >C8-C10	2023/12/19	<5.0		ug/m3	
			Aliphatic >C10-C12	2023/12/19	<5.0		ug/m3	
			Aliphatic >C12-C16	2023/12/19	<5.0		ug/m3	
			Aromatic >C7-C8 (TEX Excluded)	2023/12/19	<5.0		ug/m3	
			Aromatic >C8-C10	2023/12/19	<5.0		ug/m3	
			Aromatic >C10-C12	2023/12/19	<5.0		ug/m3	
			Aromatic >C12-C16	2023/12/19	<5.0		ug/m3	
9126598	DM2	RPD [XVK352-01]	Aliphatic >C5-C6	2023/12/19	NC		%	25
			Aliphatic >C6-C8	2023/12/19	NC		%	25
			Aliphatic >C8-C10	2023/12/19	NC		%	25

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Aliphatic >C10-C12	2023/12/19	NC		%	25
			Aliphatic >C12-C16	2023/12/19	NC		%	25
			Aromatic >C7-C8 (TEX Excluded)	2023/12/19	NC		%	25
			Aromatic >C8-C10	2023/12/19	NC		%	25
			Aromatic >C10-C12	2023/12/19	NC		%	25
			Aromatic >C12-C16	2023/12/19	NC		%	25

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

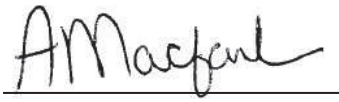
Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BA188
Report Date: 2023/12/22

Parsons Inc.
Client Project #: 10-12832
Site Location: 162014TH AVENUE NW,CALGARY,AB
Your P.O. #: 478621.17113;OUTLET#
Sampler Initials: GC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Anke Macfarlane, Laboratory Manager, VOC

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

BUREAU VERITAS

6740 Campobello Rd
Mississauga Ontario ,L5N 2L8
www.bvna.com

Toll Free: 1-80(
Phone: (905)
Fax: (905)

08-Dec-23 08:45
Cristina (Maria) Bacchus
C3BA188
WKK AIR-001

CAM FCD-01302 /5

Summa™ Canister Page 1 of 1

INVOICE INFORMATION		REPORT INFORMATION	
Company Name:	Parsons	**Company Name:**	Parsons
Contact Name	Accounts Payable	**Project Manager:**	Michelle Patterson/Re Rebecca Neufeld
Address:	2751 John Street, Markham, ON L3R 2Y8	**Address:**	510, 214-11 AVE SW, Calgary AB, T2R 0K1
E-mail:	ParsonsincaAP.Parsons.com	**E-mail:**	rebecca.neufeld@parsons.com
Ph:	905 944 8877	**Ph:**	403 294 4215
Sampled by:	Gavin Clarke		

ANALYSIS REQUESTED

Field Sample ID	Canister Serial #	Flow Regulator Serial #	Collection Date	START VACUUM (inches of H	END VACUUM (inches of Hg)	SOIL VAPOUR	AMBIENT/INDOOR AIR	AMBIENT/COMMERCIAL/INDUSTR	SUB-SLAB GAS	FULL LIST OF VOCs (reference 1	BTEX/Aromatic/Aliphatic Hydrocarbo. Fractions	BTEX/F1 (C6-C10) and F2 (C10-C16)	Selected VOC's - please specify	Other	1,2 Dichloroethane	Naphthalene		CANISTERS NOT USED
SV322	6547	FX0431	23/12/06	-25.5	-4.0	X					X				X	X		
SV321B	00265	FX0528	23/12/06	-26	-3.0	X					X				X	X		

TAT Requirement

- STD 10 Business day ☑
- Rush 5 Business day * ☐
- Rush 2 Business day * ☐
- Rush Other * ☐

* need approval from Bureau Veritas

PROJECT INFORMATION

Project #: 10-12832; outlet# 9445
Name: 1620 14th Avenue NW, Calgary, AB
PO #: 478621.17 113
Bureau Veritas Quote #:
Bureau Veritas Contact:
Task Order/Line Item

REPORTING REQUIREMENTS

EDD ☐
Regulations ON 153 ☐
ON 419 ☐
BC CSR ☐
x Other AB Tier 1 Residential

Notes

1) please indicate on chain of custody if your samples are soil vapour or ambient air
2) please list all canisters on the chain of custody even if unused

PROJECT SPECIFIC COMMENTS

Activity Code: MV

Client Signature: Gavin Clarke
Date/Time: 23/12/07 15:00

Received by: Ravneet Kaur Kuler
Date/Time: 2023/12/08 8:45

PLEASE RETURN ALL UNUSED EQUIPMENT

DATA QUALITY REVIEW CHECKLIST

Consultant: *Parsons Inc.* Sampling Date: *12/18/2023*

Location: *1620 14th Avenue NW, Calgary, AB* Laboratory : *Bueau Veritas, Calgary, AB*

Consultant Project Number: *10-12832* Sample Submission Number: *C3BN555*

Are All Laboratory QC Samples Within Acceptance Criteria (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Surrogate Recovery	*X*			*All lab QC met acceptance criteria.*
Method Blank Concentration	*X*			
Matrix Duplicate RPD	*X*			
Matrix Spike Recovery			*X*	
Other Quality Control Data	*X*			

Are All Field QC Samples Within Alert Limits (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Field Blank Concentration			*X*	*No field QC samples were submitted.*
Trip Blank Concentration			*X*	
Field Duplicate RPD			*X*	

Has CoA been signed off (Yes/No)?:	*Yes*
Has lab warranted all tests were in statistical control in CoA (Yes/No)?:	*Yes*
Has lab warranted all tests were analyzed following SOP's in CoA (Yes, No or N/A)?:	*Yes*
Were all samples analyzed within hold times (Yes/No)?:	*Yes*
Is Chain of Custody completed and signed (Yes/No)?:	*Yes*
Were sample temperatures acceptable when they reached lab (Yes/No)?:	*NA*

Is data considered to be reliable (Yes/No)?: *Yes*

If answer is "No", describe and provide rationale:

Duplicate (DUP-1) was collected but analysis was not completed due to sampling error.

Performed by (Print): *Andres Montanez*

Reviewed by (Print): *Michelle Patterson*

Reviewed date: *2024-01-10*

Reviewed by (Signature): 

Your P.O. #: 478621.17113
Your Project #: 10-12832
Site#: OUTLET#:9445
Site Location: FORMER SEARS SERVICE STN.
Your C.O.C. #: 49963

Attention: Michelle Patterson

Parsons Inc.
318 - 11th Ave SE
Suite 200
Calgary, AB
CANADA T2G 0Y2

Report Date: 2024/01/08
Report #: R7982046
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C3BN555
Received: 2023/12/20, 08:30

Sample Matrix: Air
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX Fractionation in Air (TO-15mod)	1	N/A	2024/01/03	BRL SOP-00304	EPA TO-15 m
Canister Pressure (TO-15)	1	N/A	2024/01/03	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (ug/m3)	1	N/A	2024/01/08	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (TO-15) (1)	1	N/A	2024/01/03	BRL SOP-00304	EPA TO-15 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCCFP, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Air sampling canisters have been cleaned in accordance with U.S. EPA Method TO15. At the end of the cleaning, evacuation, and pressurization cycles, one canister was selected and was pressurized with Zero Air. This canister was then analyzed via TO15 on a GC/MS. The canister must have been found to contain <0.2 ppbv concentration of all target analytes in order for the batch to have been considered clean. Each canister also underwent a leak check prior to shipment.

Please Note: SUMMA® canister samples will be retained by Bureau Veritas for a period of 5 calendar days or as contractually agreed from the date of this report, after which time they will be cleaned for reuse. If you require a longer sample storage period, please contact your service representative.

Your P.O. #: 478621.17113
Your Project #: 10-12832
Site#: OUTLET#:9445
Site Location: FORMER SEARS SERVICE STN.
Your C.O.C. #: 49963

Attention: Michelle Patterson

Parsons Inc.
318 - 11th Ave SE
Suite 200
Calgary, AB
CANADA T2G 0Y2

Report Date: 2024/01/08
Report #: R7982046
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C3BN555
Received: 2023/12/20, 08:30

Encryption Key

Cristina (Maria) Bacchus
Project Manager
08 Jan 2024 19:21:56

Please direct all questions regarding this Certificate of Analysis to:
Cristina (Maria) Bacchus, Project Manager
Email: maria.bacchus@bureauveritas.com
Phone# (905)817-5763

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C3BN555
Report Date: 2024/01/08

Parsons Inc.
Client Project #: 10-12832
Site Location: FORMER SEARS SERVICE STN.
Your P.O. #: 478621.17113
Sampler Initials: RC

RESULTS OF ANALYSES OF AIR

Bureau Veritas ID		XYG039	
Sampling Date		2023/12/18 14:12	
COC Number		49963	
	UNITS	**SV323/333**	**QC Batch**
Volatile Organics			
Pressure on Receipt	psig	(-3.3)	9144185
QC Batch = Quality Control Batch			

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Parsons Inc.
Client Project #: 10-12832
Site Location: FORMER SEARS SERVICE STN.
Your P.O. #: 478621.17113
Sampler Initials: RC

VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		XYG039		
Sampling Date		2023/12/18 14:12		
COC Number		49963		
	UNITS	**SV323/333**	**RDL**	**QC Batch**
Volatile Organics				
1,2-Dichloroethane	ppbv	<0.10	0.10	9141187
Benzene	ppbv	0.48	0.10	9141187
Toluene	ppbv	0.12	0.10	9141187
Ethylbenzene	ppbv	<0.10	0.10	9141187
p+m-Xylene	ppbv	<0.20	0.20	9141187
o-Xylene	ppbv	<0.10	0.10	9141187
Naphthalene	ppbv	<0.20	0.20	9141187
Total Xylenes	ppbv	<0.30	0.30	9141187
Surrogate Recovery (%)				
Bromochloromethane	%	89		9141187
D5-Chlorobenzene	%	84		9141187
Difluorobenzene	%	88		9141187

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Parsons Inc.
Client Project #: 10-12832
Site Location: FORMER SEARS SERVICE STN.
Your P.O. #: 478621.17113
Sampler Initials: RC

CALCULATED VOLATILE ORGANICS (AIR)

Bureau Veritas ID		XYG039		
Sampling Date		2023/12/18 14:12		
COC Number		49963		
	UNITS	**SV323/333**	**RDL**	**QC Batch**
Calculated Parameters				
1,2-Dichloroethane	ug/m3	<0.40	0.40	9124711
Benzene	ug/m3	1.55	0.32	9124711
Toluene	ug/m3	0.44	0.38	9124711
Ethylbenzene	ug/m3	<0.43	0.43	9124711
p+m-Xylene	ug/m3	<0.87	0.87	9124711
o-Xylene	ug/m3	<0.43	0.43	9124711
Naphthalene	ug/m3	<1.0	1.0	9124711
Total Xylenes	ug/m3	<1.3	1.3	9124711

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BN555
Report Date: 2024/01/08

Parsons Inc.
Client Project #: 10-12832
Site Location: FORMER SEARS SERVICE STN.
Your P.O. #: 478621.17113
Sampler Initials: RC

VOLATILE ORGANIC HYDROCARBONS BY GC/MS (AIR)

Bureau Veritas ID		XYG039		
Sampling Date		2023/12/18 14:12		
COC Number		49963		
	UNITS	**SV323/333**	**RDL**	**QC Batch**
Volatile Organics				
Aliphatic >C5-C6	ug/m3	<5.0	5.0	9148949
Aliphatic >C6-C8	ug/m3	<5.0	5.0	9148949
Aliphatic >C8-C10	ug/m3	<5.0	5.0	9148949
Aliphatic >C10-C12	ug/m3	13.9	5.0	9148949
Aliphatic >C12-C16	ug/m3	<5.0	5.0	9148949
Aromatic >C7-C8 (TEX Excluded)	ug/m3	<5.0	5.0	9148949
Aromatic >C8-C10	ug/m3	<5.0	5.0	9148949
Aromatic >C10-C12	ug/m3	<5.0	5.0	9148949
Aromatic >C12-C16	ug/m3	<5.0	5.0	9148949
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BN555
Report Date: 2024/01/08

Parsons Inc.
Client Project #: 10-12832
Site Location: FORMER SEARS SERVICE STN.
Your P.O. #: 478621.17113
Sampler Initials: RC

GENERAL COMMENTS

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9124711	RAE	RPD	1,2-Dichloroethane	2024/01/05	NC		%	25
			Benzene	2024/01/05	NC		%	25
			Toluene	2024/01/05	NC		%	25
			Ethylbenzene	2024/01/05	NC		%	25
			p+m-Xylene	2024/01/05	NC		%	25
			o-Xylene	2024/01/05	NC		%	25
			Total Xylenes	2024/01/05	NC		%	25
			1,2-Dichloroethane	2024/01/04	0.43		%	25
			Benzene	2024/01/04	0.29		%	25
			Toluene	2024/01/04	0.60		%	25
			Ethylbenzene	2024/01/04	NC		%	25
			p+m-Xylene	2024/01/04	NC		%	25
			o-Xylene	2024/01/04	NC		%	25
			Naphthalene	2024/01/04	NC		%	25
			Total Xylenes	2024/01/04	NC		%	25
			Benzene	2024/01/08	0.86		%	25
			Toluene	2024/01/08	2.7		%	25
			Ethylbenzene	2024/01/08	1.0		%	25
			p+m-Xylene	2024/01/08	3.1		%	25
			o-Xylene	2024/01/08	1.3		%	25
			Total Xylenes	2024/01/08	3.0		%	25
9141187	LSY	Spiked Blank	Bromochloromethane	2024/01/03		102	%	60 - 140
			D5-Chlorobenzene	2024/01/03		102	%	60 - 140
			Difluorobenzene	2024/01/03		102	%	60 - 140
			1,2-Dichloroethane	2024/01/03		99	%	70 - 130
			Benzene	2024/01/03		100	%	70 - 130
			Toluene	2024/01/03		101	%	70 - 130
			Ethylbenzene	2024/01/03		100	%	70 - 130
			p+m-Xylene	2024/01/03		98	%	70 - 130
			o-Xylene	2024/01/03		100	%	70 - 130
			Naphthalene	2024/01/03		132 (1)	%	70 - 130
			Total Xylenes	2024/01/03		99	%	70 - 130
9141187	LSY	Method Blank	Bromochloromethane	2024/01/03		95	%	60 - 140
			D5-Chlorobenzene	2024/01/03		86	%	60 - 140
			Difluorobenzene	2024/01/03		95	%	60 - 140
			1,2-Dichloroethane	2024/01/03	<0.10		ppbv	
			Benzene	2024/01/03	<0.10		ppbv	
			Toluene	2024/01/03	<0.10		ppbv	
			Ethylbenzene	2024/01/03	<0.10		ppbv	
			p+m-Xylene	2024/01/03	<0.20		ppbv	
			o-Xylene	2024/01/03	<0.10		ppbv	
			Naphthalene	2024/01/03	<0.20		ppbv	
			Total Xylenes	2024/01/03	<0.30		ppbv	
9141187	LSY	RPD	Benzene	2024/01/03	0.86		%	25
			Toluene	2024/01/03	2.7		%	25
			Ethylbenzene	2024/01/03	1.0		%	25
			p+m-Xylene	2024/01/03	3.1		%	25
			o-Xylene	2024/01/03	1.3		%	25
			Total Xylenes	2024/01/03	3.0		%	25
9148949	LSY	Method Blank	Aliphatic >C5-C6	2024/01/03	<5.0		ug/m3	

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Aliphatic >C6-C8	2024/01/03	<5.0		ug/m3	
			Aliphatic >C8-C10	2024/01/03	<5.0		ug/m3	
			Aliphatic >C10-C12	2024/01/03	<5.0		ug/m3	
			Aliphatic >C12-C16	2024/01/03	<5.0		ug/m3	
			Aromatic >C7-C8 (TEX Excluded)	2024/01/03	<5.0		ug/m3	
			Aromatic >C8-C10	2024/01/03	<5.0		ug/m3	
			Aromatic >C10-C12	2024/01/03	<5.0		ug/m3	
			Aromatic >C12-C16	2024/01/03	<5.0		ug/m3	

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

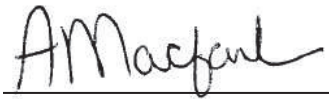
Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C3BN555
Report Date: 2024/01/08

Parsons Inc.
Client Project #: 10-12832
Site Location: FORMER SEARS SERVICE STN.
Your P.O. #: 478621.17113
Sampler Initials: RC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Anke Macfarlane, Laboratory Manager, VOC

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

20-Dec-23 08:30
Cristina (Maria) Bacchus
C3BN555

WKK AIR-001

Calgary: 4000 19th St. NE, T2E 6P8. Toll Free (800)
Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 38
bvna.com

ORD **BV 09885** Page 1 of 1

Invoice Information	Report Information (if differ	Project Information	Turnaround Time (TAT) Required
Company: #11243 PARSONS	Company: PARSONS	Quotation #:	[X] 5 - 7 Days Regular (Most analyses)
Contact Name: Accounts Payable	Contact Name: Michelle Patterson	P.O. #/ AFE#: 478621.1711 3	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 2751 John St Markham, ON, L3R 2Y8	Address: 1620 - 14th Ave NW, Calgary AB	Project #: 10-12832	Rush TAT (Surcharges will be applied): [ ] Same Day [ ] 2 Days [ ] 1 Day [ ] 3-4 Days
Phone: 905-944-9877	Phone: 403-585-9146	Site Location: Former Sears Service Stn.	Date Required:
Email: Parsons Inc AP. Parsons@parsons.com	Email: Michelle.patterson@parsons.com	Sampled #: Dist#: 9445	Rush Confirmation #:
Copies:	Copies: rebecca.neufeld@parsons.com	Sampled By: Robyn Craig	

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Canister Serial #	Flow Regulator	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☐	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals Tot ☐ Diss ☐	Mercury Total ☐ Dissolved ☐	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	Start Vacuum	End Vacuum	BTEX/Aromatics/Aliphatics	1,2-DichloroEthane	Naphthalene					HOLD - DO NOT ANALYZE
1	SV323	323	FX0183	Dec 18/23	14:12	soil gas	1											-25.4		X	X	X					
2	DUP-1	00225	FX0782	Dec 18/23	13:54	"	1											-25.3		X	X	X					
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											

Please indicate Filtered, Preserved or Both (F, P, F/P)

Regulatory Criteria

- [X] AT1
- [ ] CCME
- [ ] Drinking Water CAN / Drinking Water AB
- [ ] D50 (Drilling Waste)
- [ ] Saskatchewan
- [ ] Other:

Special Instructions

Reg TAT understood to be 10 days for air.

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	BV Job #
Robyn Craig	2023/12/19	9:00	ATRAVERSE III	2023/12/19	09:00	

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Bureau Veritas' standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at https://www.bvna.com/coc-forms-and-conditions

Seal - Y

Rec'd Parwandeep Kaur Kullar 2023/12/20 8:30

AB FCD-00331/10