October 31, 2023

Alberta Environment and Protected Areas (AEPA)
Monitoring Branch
11th Floor Oxbridge Place
9820-106 Street
Edmonton, Alberta
T5K 2J6

RE: Monthly Ambient Air Monitoring Report
September 2023
Clean Harbors Canada, Inc. Approval 10348-03-01

To whom it may concern:

Clean Harbors Canada, Inc. (Clean Harbors) is presenting this Monthly Ambient Air Monitoring Report, which was prepared by GHD Limited (Consultant), for the reporting period of September 2023, to Alberta Environment and Protected Areas (AEPA). The Clean Harbors Ryley Industrial Waste Management Facility (Facility) is located in SE 09-050-17 W4M near Ryley, Alberta.

This ambient air monitoring program is conducted in accordance with the requirements outlined in the facility's amended Environmental Protection and Enhancement Act (EPEA) Approval, Approval No. 10348-03-01 (Approval). Clean Harbors' original Ambient Air Monitoring Program for Approval No. 10348-03-00 was initially approved on June 24, 2009. As part of the amended Approval requirements, the Facility submitted an Enhanced Ambient Air Quality Monitoring Program to AEPA (formerly AEP) on September 14, 2022 (no formal approval has been provided by AEPA). Operating under the Approval and the submitted program, Clean Harbors operates the following ambient air monitoring stations:

- Wind
  - Facility Meteorological Station – AEPA Station ID 00010348-C-1
  - Facility Site Station – AEPA Station ID 00010348-C-2
  - Ryley School Station – AEPA Station ID 00010348-C-3
- TSP
  - Facility Site Station – AEPA Station ID 00010348-I-2
  - Ryley School Station – AEPA Station ID 00010348-I-3
  - Highway 854 Lift Station – AEPA Station ID 00010348-I-1
- PM_{10}
  - Highway 854 Lift Station – AEPA Station ID 00010348-I-1

Included in this report are the following:

- Summary of the ambient air monitoring program for September 2023
- Summary of AMD Electronic Transfer System submittals
- Results for Total Suspended Particulate Matter (TSP) reported in µg/m3
- Results for Particulate Matter < 10 microns (PM10) reported in µg/m3
- Results for metals if the TSP or PM10 results were >50 µg/m3
- Results for Total Non-Methane Organic Compounds (TNMOC) and Volatile Organic Compounds (VOC)
- Wind frequency distribution tables, wind rose and monthly uptime

Should there be any questions and comments regarding this report, please do not hesitate to contact the undersigned.

Yours truly,

CLEAN HARBORS CANADA INC.

Stan Yuha

Facility Manager
Ryley Facility

Alberta Environment and Protected Areas (AEPA)
Monthly Ambient Air Monitoring Report
September 2023
Report Completed on October 31, 2023

Clean Harbors Environmental Services Inc.

Approval Number: 10348-03-01

Ryley Facility, Alberta

CLEAN HARBORS CANADA, INC.
P.O. Box 390, Ryley, Alberta T0B 4A0 Telephone (780) 663-3828

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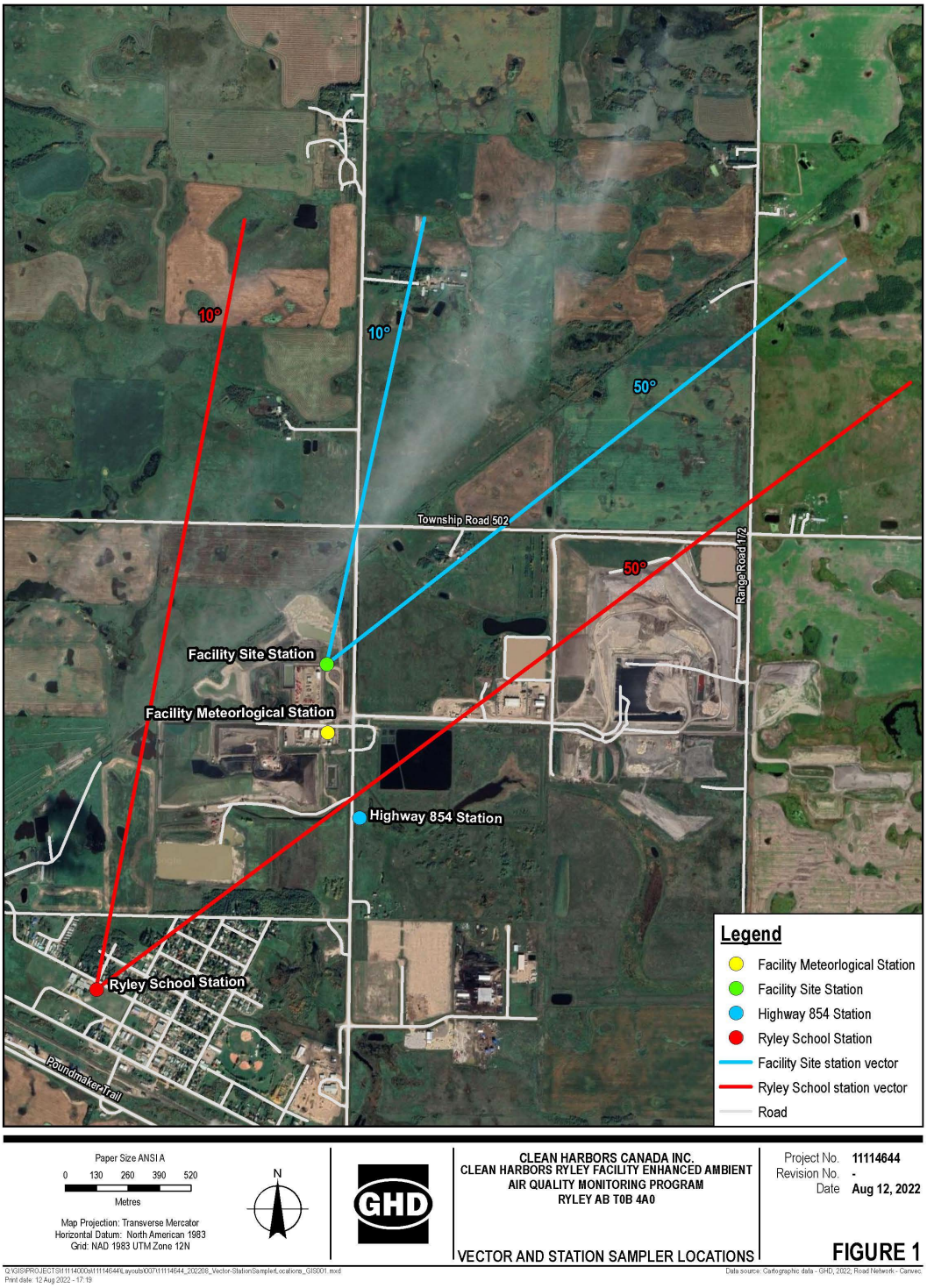
1. Introduction

The Facility operates the following ambient air monitoring stations to assess ambient air quality at and around the Facility as shown in Figure 1.



1. Upwind intermittent ambient air quality monitoring station, known as the Facility Site Station (AEPA Station ID 00010348-I-2), located at 50114 Range Road 173, Ryley, Alberta (53°18'13.11"N and 112°25'5.81"W). At this location, a Tisch TE-5170V VFC High Volume TSP Sampler (TSP Hi-Vol Sampler) is located against the Facility perimeter fence, north of the vehicle staging road.
2. Downwind intermittent ambient air quality monitoring station, known as the Ryley School Station (AEPA Station ID 00010348-I-3), located at 5211 52 Avenue, Ryley, Alberta (53°17'28.99"N and 112°25'55.81"W). At this location, a TSP Hi-Vol Sampler is located on the roof of the Ryley School.

For these two locations, samples are collected and analyzed for the following: total suspended particulate matter (TSP) (typically with diameter less than 35 microns (µm)). Additionally, TSP samples that exceed 50 micrograms per cubic meter (50 µg/m^3) are analyzed for a target list of metals. The samplers are programmed to run for approximately 24-hours. All samples are collected for a total of 24-hours by intermittent sampling when the wind speed is greater than 5 km/hr and wind direction is blowing from the northeast towards the southwest.

3. Intermittent monitoring station, known as the Highway 854 Lift Station (AEPA Station ID 00010348-I-1), located on Secondary Road 854, approximately 350 metres southeast of the Facility (Latitude: 53°17'52.66"N, Longitude: 112°24'57.87"W). At this location, a TSP Hi-Vol Sampler and a Partisol FRM 2000 PM_{10} Sampler (PM_{10} Sampler) will be located on the roof of the lift station. Samples are collected and analyzed for the following: TSP, particulate matter less than or equal to 10 µm in diameter (PM_{10}), volatile organic compounds (VOCs), and total non-methane organic compounds (TNMOC). Additionally, TSP or PM_{10} samples that exceed 50 µg/m^3 are analyzed for a target list of metals. Sampling is conducted once every 6-days for a 24-hour sampling period (midnight to midnight) as required by the Facility's Approval. The 6-day sampling frequency will be in alignment with the Government of Canada, National Air Pollution Surveillance Program (National Air Pollution Surveillance Program – Canada.ca). To correlate PM_{10} data with TSP data, Clean Harbors will continue PM_{10} sampling at the station for a two-year period.

4. Continuous meteorological stations that collect wind speed and wind direction data are also located at the Facility Meteorological Station (AEPA Station ID 00010348-C-1), Upwind Facility Site Station (AEPA Station ID 00010348-C-2), and Downwind Ryley School Station (AEPA Station ID 00010348-C-3). The anemometer equipment used to measure this data includes three R. M. Young 05305-10A Wind Monitor-Aqs.

All sampling and monitoring is conducted in accordance with the Facility's amended Approval (Approval No. 10348-03-01) and the Alberta Air Monitoring Directive, 2016 (AMD).

1.1 Contact Information

As required by AMD Chapter 9, Section 2, contact information is provided for the following Facility personnel and Contractors that assisted with the performance of the Facility's Air Monitoring Program.

Contact Information	
Name	**Mr. Stan Yuha**
Title	Plant Manager
Company	Clean Harbors
Responsibilities	Report Certifier/ETS Submitter
Address	PO Box 390, Ryley, AB T0B 4A0
Phone	780-663-2509
Email	yuha.stan@cleanharbors.com
Name	**Mr. Todd Webb**
Title	Laboratory Chemist
Company	Clean Harbors
Responsibilities	Station Field Operator and Field Sampler
Address	PO Box 390, Ryley, AB T0B 4A0
Phone	780-663-2513
Email	webb.todd@cleanharbors.com
Name	**Mr. Pooya Shariaty**
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Company	GHD Limited
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Phone	403-538-7479
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Name	**Ms. Stepheney Davey**
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Phone	780-632-8211
Email	EAS.Results@albertainnovates.ca

2. Summary of Ambient Air Monitoring Activities

The following ambient air monitoring activities were conducted during the month of September 2023.

Activity	*Completed (Y/N)*	*Date(s)*
Wind – Facility Meteorological Station		
Wind Speed/Direction Sensor Calibration	N	June 30, 2023(1)
Changes to the Wind Speed/Direction Sensor	N	-
Wind – Facility Site Station		
Wind Speed/Direction Sensor Calibration	N	Anemometer Error(2)
Changes to the Wind Speed/Direction Sensor	N	-
Wind – Ryley School Station		
Wind Speed/Direction Sensor Calibration	Y	September 28, 2023
Changes to the Wind Speed/Direction Sensor	N	-
TSP – Facility Site Station		
TSP Hi-Vol Sampler Calibration	Y	October 19, 2023
Changes to the TSP Hi-Vol Sampler	N	-
TSP Samples Collected	Y	September 1 – October 1, 2023
TSP Metal Analysis Conducted	Y	September 1 – October 1, 2023
TSP Sampler Maintenance Activities	Y	September 1, 2023 September 28, 2023 October 19, 2023
TSP – Ryley School Station		
TSP Hi-Vol Sampler Calibration	Y	September 28, 2023
Changes to the TSP Hi-Vol Sampler	N	-
TSP Samples Collected	Y	September 1 – October 1, 2023
TSP Metal Analysis Conducted	Y	September 1 – October 1, 2023
TSP Sampler Maintenance Activities	Y	September 1, 2023 September 28, 2023
TSP, PM_{10}, VOC and TNMOC – Highway 854 Lift Station		
TSP Hi-Vol Sampler Calibration	Y	October 19, 2023
PM_{10} Sampler Calibration	Y	September 28, 2023
Changes to the TSP Hi-Vol Sampler	N	-
Changes to the PM_{10} Sampling Station	N	-
TSP Samples Collected	Y	September 3, 2023 September 9, 2023 September 15, 2023 September 21, 2023

Activity	*Completed (Y/N)*	*Date(s)*
		September 27, 2023
PM_{10} Samples Collected	Y	September 3, 2023 September 9, 2023 September 15, 2023 September 21, 2023 September 27, 2023
VOC and TNMOC Samples Collected	Y	September 3, 2023 September 9, 2023 September 15, 2023 September 21, 2023 September 27, 2023
TSP Metal Analysis Conducted	Y	September 3, 2023 September 9, 2023 September 15, 2023 September 27, 2023
PM_{10} Metal Analysis Conducted	Y	September 3, 2023 September 9, 2023 September 15, 2023 September 27, 2023
TSP Sampler Maintenance Activities	Y	September 3, 2023 September 9, 2023 September 15, 2023 September 21, 2023 September 27, 2023 September 28, 2023 October 19, 2023
PM_{10} Sampler Maintenance Activities	Y	September 3, 2023 September 9, 2023 September 15, 2023 September 21, 2023 September 27, 2023 September 28, 2023
Other		
Dust Suppression Activities	N	-

Note: (1) The wind speed/direction sensor on the Facility Site Meteorological Station was checked for calibration on June 30, 2023 and was shown to be within the allowable tolerances and was then re-installed after calibration.

(2) Instrument is not currently reporting due to anemometer program corruption. The instrument was calibrated prior to install in the Fall of 2014 for voluntary reporting.

3. Summary of Electronic Transfer System (ETS) Submittals

In addition to the September 2023 monthly report, the following summarized items were submitted to the ETS:

3.1 AMD XML Schema

An XML formatted Schema file was submitted to the AEPA via the ETS portal. The XML Schema file contains the results from:

- Wind
  - Facility Meteorological Station – AEPA Station ID 00010348-C-1.
  - Facility Site Station – AEPA Station ID 00010348-C-2.
  - Ryley School Station – AEPA Station ID 00010348-C-3.
- TSP
  - Facility Site Station – AEPA Station ID 00010348-I-2.
  - Ryley School Station – AEPA Station ID 00010348-I-3.
  - Highway 854 Lift Station – AEPA Station ID 00010348-I-1.
- PM_{10}
  - Highway 854 Lift Station – AEPA Station ID 00010348-I-1.

3.2 Ambient Air Monitoring Program Laboratory Reports

One laboratory report in PDF file format was submitted to the AEPA via the ETS portal. The PDF file contains the results from AEPA Station ID 00010348-I-1, AEPA Station ID 00010348-I-2, and AEPA Station ID 00010348-I-3.

3.3 Ambient Air Monitoring Program Calibration Reports

One calibration report in PDF file format was submitted to the AEPA via the ETS portal. The PDF file contains the results from AEPA Station ID 00010348-C-1.

4. Calibration and Operation & Maintenance (O&M) Activities

4.1 Facility Meteorological Station for Wind Speed and Direction (AEPA Station ID 00010348-C-1)

The Facility Meteorological Station was taken down and calibrated on June 30, 2023. The station was shown to be within all allowable tolerances, as required by the manufacturer, and was then re-installed after calibration. Provided in Appendix A is the calibration report and record of installation.

4.2 Facility Site Station for Wind Speed and Direction (AEPA Station ID 00010348-C-2)

The Facility Site Station was last calibrated upon installation. When installed, the station was shown to be within all allowable tolerances, as required by the manufacturer.

During May 2023, Clean Harbors chose to swap the Ryley School Station (AEPA Station ID 00010348-C-3) anemometer with the Facility Site Station (AEPA Station ID 00010348-C-2) anemometer due to AEPA Station ID 00010348-C-3 anemometer program corruption. Per Approval No. 10348-03-01, Clean Harbors is only required to report "a minimum of one (1) meteorological station in each of the Ryley School and Facility Site intermittent ambient air quality monitoring stations" thus, reporting from Station ID 00010348-C-2 is not required as Clean Harbors reports from the Facility Meteorological Station (Station ID 00010348-C-1).

4.3 Ryley School Station for Wind Speed and Direction (AEPA Station ID 00010348-C-3)

The Ryley School Station was taken down and calibrated on June 30, 2023. The station was shown to be within all allowable tolerances, as required by the manufacturer, and was then re-installed after calibration. Provided in Appendix A is the calibration report.

4.4 Facility Site Station TSP Hi-Vol Sampler (AEPA Station ID 00010348-I-2)

The sampling activities for the Tisch TE-5170V VFC High Volume TSP Sampler (TSP Hi-Vol Sampler) are recorded in the field sampling sheets provided in Appendix B.

On a quarterly basis, performance audits are completed on the TSP Hi-Vol Sampler. A quarterly audit was performed on October 19, 2023. It is noted that this audit could not be performed on September 28, 2023 due to an electrical cord issue which was fixed prior to the audit on October 19, 2023.

4.5 Ryley School Station TSP Hi-Vol Sampler (AEPA Station ID 00010348-I-3)

The sampling activities for the TSP Hi-Vol Sampler are recorded in the field sampling sheets provided in Appendix B.

On a quarterly basis, performance audits are completed on the TSP Hi-Vol Sampler. A quarterly audit was performed on September 28, 2023.

4.6 Highway 854 Lift Station TSP Hi-Vol Sampler (AEPA Station ID 00010348-I-1)

The sampling activities for the TSP Hi-Vol Sampler are recorded in the field sampling sheets provided in Appendix B.

On a quarterly basis, performance audits are completed on the TSP Hi-Vol Sampler. A quarterly audit was performed on October 19, 2023. It is noted that this an audit was initially performed on September 28, 2023 and a minor leak was identified. Following this, all parts were tightened and checked by Clean Harbors. Another leak check and audit was performed on October 19, 2023 and it was confirmed the leak was no longer present.

4.7 Highway 854 Lift Station PM_{10} Sampler (AEPA Station ID 00010348-I-1)

Maintenance activities for the Thermo Scientific™ Partisol 2000i-Federal Reference Method (FRM) PM_{10} Sampler included inlet cleaning and leak checks that were conducted before each sampling event in September 2023. The pre-sampling maintenance activities are recorded in the field sampling sheets provided in Appendix B.

On a quarterly basis, performance audits are completed on the TSP Hi-Vol Sampler. A quarterly audit was performed on September 28, 2023.

5. Ambient Air Monitoring Results

The following section presents the results from the ambient air monitoring program for the Facility Meteorological Station (AEPA Station ID 00010348-C-1), Facility Site Station (AEPA Station ID 00010348-C-2), Ryley School Station (AEPA Station ID 00010348-C-3), Highway 854 Lift Station (AEPA Station ID 00010348-I-1), Facility Site Station (AEPA Station ID 00010348-I-2), and Ryley School Station (AEPA Station ID 00010348-I-3) conducted in June 2023. Where applicable, comparisons were made to Alberta Ambient Air Quality Objectives (AAAQO) for parameters that had 24-hour average objectives. These parameters are TSP and some of the VOCs including o,m,p-xylene, hexane, and toluene. For the parameter objectives with averaging periods other than 24-hours, Section 7.1.2 of the Air Quality Model Guideline was used to covert the measured values to the corresponding AAAQO averaging periods prior to comparison. For all other parameters, AAAQO have not been established.

5.1 Meteorological Data for Wind Speed and Direction

In accordance with the Approval and the AMD, the Facility is required to collect wind speed and directional data continuously for the Facility Meteorological Station, Facility Site Station, and Ryley School Station. Tables 1 - 3 present the hourly and 24-hour average wind speeds, Tables 4 - 6 present the hourly and 24-hour most frequent wind direction data (degrees from north), and Tables 7 - 9 present the Wind Class Frequency Distribution for September 2023 from the Facility Meteorological Station, Facility Site Station, and Ryley School Station, respectively. Appendix C

provides graphical representations of the Wind Class Frequency Distribution and the Wind Roses based on Tables 1 – 9.

5.1.1 Facility Meteorological Station Data Verification and Validation and Uptime (AEPA Station ID 00010348-C-1)

Based on the verification and validation process conducted for the meteorological data that was collected in September 2023, it was determined that 100% of the data is valid, which represents 100% uptime of the meteorological station. This is above the 90% uptime limit required for compliance, as per the Approval.

5.1.2 Facility Site Station Data Verification and Validation and Uptime (AEPA Station ID 00010348-C-2)

As noted above, Clean Harbors chose to swap the Ryley School Station (AEPA Station ID 00010348-C-3) anemometer with the Facility Site Station (AEPA Station ID 00010348-C-2) anemometer due to AEPA Station ID 00010348-C-3 anemometer program corruption. Per Approval No. 10348-03-01, Clean Harbors is only required to report "a minimum of one (1) meteorological station in each of the Ryley School and Facility Site intermittent ambient air quality monitoring stations" thus, reporting from Station ID 00010348-C-2 is not required as Clean Harbors reports from the Facility Meteorological Station (Station ID 00010348-C-1).

5.1.3 Ryley School Station Data Verification and Validation and Uptime (AEPA Station ID 00010348-C-3)

Based on the verification and validation process conducted for the meteorological data that was collected in September 2023, it was determined that 100% of the data is valid, which represents 100% uptime of the meteorological station. This is above the 90% uptime limit required for compliance, as per the Approval.

5.2 TSP Concentrations

AAAQO are specified for TSP at 100 µg/m^3 (24-hour averaging period). In accordance with the Facility's Approval, TSP samples that exceed 50 µg/m^3 are analyzed for a target list of metals. Appendix B provides the field sheets completed for each sampling event. Appendix D provides the chain of custody forms and laboratory analytical reports.

5.2.1 Facility Site Station (AEPA Station ID 00010348-I-2)

Table 10 presents the results of the sampling conducted for TSP from the Facility Site Station. The TSP sample collected in September 2023 was shown to have an elevated TSP concentration of 216.443 µg/m^3, which is above the 100 µg/m3 AAAQO threshold. It should be noted that Alberta experienced an unprecedented number of wildfires during this time which led to numerous regional air quality advisories resulting from wildfire smoke. The TSP exceedance for September 2023 is likely a result of the background air quality and not related to the Facility. As such, no contravention form was submitted due to this exceedance.

5.2.2 Ryley School Station (AEPA Station ID 00010348-I-3)

Table 11 presents the results of the sampling conducted for TSP from the Ryley School Station. The TSP sample collected in September 2023 was shown to have an elevated TSP concentration of 129.134 µg/m^3, which is above the 100 µg/m^3 AAAQO threshold. It should be noted that Alberta experienced an unprecedented number of wildfires during this time which led to numerous regional air quality advisories resulting from wildfire smoke. The TSP exceedance for September 2023 is likely a result of the background air quality and not related to the Facility. As such, no contravention form was submitted due to this exceedance.

5.2.3 Highway 854 Lift Station (AEPA Station ID 00010348-I-1)

Table 12 presents the results of the sampling conducted for TSP from the Highway 854 Lift Station. Four out of five samples collected in September 2023 were shown to have elevated TSP concentration above the 100 µg/m^3 AAAQO threshold. It should be noted that Alberta experienced an unprecedented number of wildfires during this time which led to numerous regional air quality advisories resulting from wildfire smoke. The TSP exceedance for September 2023 is likely a result of the background air quality and not related to the Facility. As such, no contravention form was submitted due to this exceedance.

5.3 PM_{10} Concentrations

AAAQO are specified for TSP at 100 µg/m^3 and Particulate Matter $\leq$ 2.5 microns ($PM_{2.5}$) at 29 µg/m^3 (24-hour averaging period). There is currently no AAAQO specified for PM_{10} for a 24-hour averaging period in Alberta. To correlate PM_{10} data with TSP data, Clean Harbors will continue PM_{10} sampling at the station for a two-year period. In accordance with the Facility's Approval, PM_{10} samples that exceed 50 µg/m^3 are analyzed for a target list of metals. Appendix B provides the field sheets completed for each sampling event. Appendix D provides the chain of custody forms and laboratory analytical reports.

5.3.1 Highway 854 Lift Station (AEPA Station ID 00010348-I-1)

Table 13 presents the results of the sampling conducted for PM_{10}.

5.4 VOC and TNMOC Concentrations

There are three VOC parameters that have corresponding AAAQO with 24-hour averaging periods including o,p,m-xylene, hexane and toluene. Appendix B provides the field sheets completed for each sampling event. Appendix D provides the chain of custody forms and laboratory analytical reports.

5.4.1 Highway 854 Lift Station (AEPA Station ID 00010348-I-1)

Table 14 presents the VOC and TNMOC concentrations measured in September 2023. There were no exceedances for the parameters with AAAQO in September 2023.

5.5 Metal Concentrations

In accordance with the Facility's Approval, if collected TSP or PM_{10} samples show exceedances over 50 µg/m^3 after gravimetric analysis, a subsequent filter particulate analysis is done using inductively coupled plasma mass spectroscopy (ICP-MS) for 21 trace elements. There are four parameters that have corresponding AAAQO with 1 hour averaging periods including arsenic, chromium, lead, and nickel. The sample results were converted to a 1-hour averaging period for comparison with the sample AAAQO. If metal analysis was conducted, Appendix B provides the field sheets completed for each sampling event. Appendix D provides the chain of custody forms and laboratory analytical reports.

5.5.1 Facility Site Station (AEPA Station ID 00010348-I-2)

The TSP sample collected in September 2023 was above 50 µg/m^3 and as such, analysis for metals was conducted on the sample. Facility Test #106 (HV-23-02-11) was shown to have an elevated TSP concentration of 216.443 µg/m^3, which is over the 50 µg/m^3 threshold. This sample was sent for additional analysis and the results for this test can be found in Table 15 of this report. There were no exceedances for the parameters with AAAQO in September 2023.

5.5.2 Ryley School Station (AEPA Station ID 00010348-I-3)

The TSP sample collected in September 2023 was above 50 µg/m^3 and as such, analysis for metals was conducted on the sample. School Test #106 (HV-23-02-12) was shown to have an elevated TSP concentration of 129.134 µg/m^3, which is over the 50 µg/m^3 threshold. This sample was sent for additional analysis and the results for this test can be found in Table 16 of this report. There were no exceedances for the parameters with AAAQO in September 2023.

5.5.3 Highway 854 Lift Station (AEPA Station ID 00010348-I-1)

TSP

Four of the TSP samples collected in September 2023 were above 50 µg/m^3 and as such, analysis for metals was conducted on the samples. Facility Test #860 (HVF-23-06-03), Facility Test #861 (HVF-23-06-15), Facility Test #862 (HVF-23-06-12), and Facility Test #864 (HVF-23-06-14) were shown to have elevated TSP concentrations of 199.913 µg/m^3,156.081 µg/m^3, 177.936 µg/m^3, and 216.352 µg/m^3, respectively, which are over the 50 µg/m^3 threshold. These samples were sent for additional analysis and the results for Test #860, Test #861, Test #862, and Test #864 can be found in Table 17 of this report. There were no exceedances for the parameters with AAAQO in September 2023.

PM_{10}

Three of the PM_{10} samples collected in September 2023 were above 50 µg/m^3 and as such, analysis for metals was conducted on the samples. Facility Test #860 (C9700138), Facility Test #862 (AT79034) and Facility Test #864 (AT79033) were shown to have elevated PM_{10} concentrations of 165.596 µg/m^3, 52.174 µg/m^3 and 66.376 µg/m^3, respectively, which are over the 50 µg/m^3 threshold. These samples were sent for additional analysis. The PM_{10} concentration measured for Facility Test #861 (AT79027) was under the 50 µg/m^3 threshold, 48.261 µg/m^3; however, as the TSP concentration for this sample was above the 50 µg/m^3 threshold (as noted

above), the corresponding PM_{10} sample was sent for additional analysis. The results for Test #860, Test #861, Test #862, and Test #864 can be found in Table 18 of this report. There were no exceedances for the parameters with AAAQO in September 2023.

The remainder of the TSP and PM_{10} samples collected in September 2023 were below 50 µg/m^3 and as such analysis for metals was not conducted on those samples.

5.6 Dust Suppression

There were no dust suppression activities, which include using leachate spread on the surface of the active landfill, conducted during September 2023.

6. Conclusions

The following summarizes the Ambient Air Monitoring Program that was conducted in September 2023.

1. During September 2023, the Facility Meteorological Station (AEPA Station ID 00010348-C-1) operated at 100% uptime. Based on the data verification and validation procedure conducted, this is in compliance with the minimum 90% uptime required by the AMD.
2. During September 2023, the continuous Facility Site wind Station was not operational. Per the approval, reporting from Station ID 00010348-C-2 is not required as Clean Harbors reports from the Facility Meteorological Station.
3. During September 2023, the continuous Ryley School wind Station operated at 100% uptime. Based on the data verification and validation procedure conducted, this is in compliance with the minimum 90% uptime required by the AMD.
4. The TSP concentration measured at the intermittent Facility Site Station from September 1, 2023 to October 1, 2023 was 216.443 µg/m^3.
5. The TSP concentration measured at the intermittent Ryley School Station from September 1, 2023 to October 1, 2023 was 129.134 µg/m^3. The AAAQO exceedance for this month is likely a result of the background air quality due to wildfire smoke and not related to the Facility.
6. The TSP concentrations measured at the intermittent Highway 854 Lift Station (AEPA Station ID 00010348-I-1) on September 3, September 9, September 15, September 21, and September 27 were 199.913 µg/m^3, 156.081 µg/m^3, 177.936 µg/m^3, 40.953 µg/m^3, and 216.352 µg/m^3, respectively.
7. The PM_{10} concentrations measured at the intermittent Highway 854 Lift Station (AEPA Station ID 00010348-I-1) on September 3, September 9, September 15, September 21, and September 27 were 165.596 µg/m^3, 48.261 µg/m^3, 52.174 µg/m^3, 22.137 µg/m^3, and 66.376 µg/m^3, respectively.
8. Based on the VOC and TMNOC results measured at the intermittent Highway 854 Lift Station (AEPA Station ID 00010348-I-1), no exceedances were detected for parameters with applicable AAAQO, which included o,m,p-xylene, hexane and toluene. There are no applicable AAAQO for other parameters that were monitored in September 2023.
9. The TSP concentration measured for Facility Test #106 (HV-23-02-11), conducted from September 1, 2023 to October 1, 2023, was above the 50 µg/m^3 threshold outlined in the Facility's approval. Because of the elevated TSP concentration, this sample was sent for additional analysis of metals. The results of this test showed that all parameters were below any applicable AAAQO (arsenic, chromium, lead, and nickel).

10. The TSP concentration measured for School Test #102 (HV-23-02-12), conducted from September 1, 2023 to October 1, 2023, was above the 50 µg/m^3 threshold outlined in the Facility's approval. Because of the elevated TSP concentration, this sample was sent for additional analysis of metals. The results of this test showed that all parameters were below any applicable AAAQO (arsenic, chromium, lead, and nickel).
11. The TSP concentrations measured for Facility Test #860 (HVF-23-06-03), Facility Test #861 (HVF-23-06-15), Facility Test #862 (HVF-23-06-12), and Facility Test #864 (HVF-23-06-14) were over the 50 µg/m^3 threshold outlined in the Facility's approval. Because of the elevated TSP concentration, these samples were sent for additional analysis of metals. The results of these tests showed that all parameters for Test #860, Test #861, Test #862, and Test #864 were below any applicable AAAQO (arsenic, chromium, lead, and nickel).
12. The PM_{10} concentrations measured for Facility Test #860 (C9700138), Facility Test #862 (AT79034) and Facility Test #864 (AT79033) were over the 50 µg/m^3 threshold outlined in the Facility's approval. Because of the elevated PM_{10} concentration, these samples were sent for additional analysis of metals. The PM_{10} concentration for Facility Test #861 (AT79027) was below the 50 µg/m^3 threshold; however, as the TSP concentration for this sample was above the 50 µg/m^3 threshold, the corresponding PM_{10} samples were sent for additional analysis. The results of these tests showed that all parameters for Test #860, Test #861, Test #862, and Test #864 were below any applicable AAAQO (arsenic, chromium, lead, and nickel).

Clean Harbors will continue to perform their Facility's Ambient Air Monitoring Program in accordance with their Approval and the AMD and evaluate the data to determine impacts on the ambient air quality.

7. Certification

Per the requirements of AMD, Chapter 9, Section 2.3, the following certification is provided for the September 2023 Ambient Air Monitoring Report.

"I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements."

Stan Yuha

Plant Manager/Report Certifier

END OF REPORT

Tables

TABLE 1

Average Wind Speed (metres/second)
AEPA Station ID 00010348-C-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Ryley Wind Speed Data (m/s) - Month of September 2023																								
Day/Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	4.0	3.6	4.1	3.4	3.9	3.5	3.5	3.5	3.1	3.4	3.8	3.9	4.1	4.5	4.7	5.3	5.6	5.6	4.5	2.8	2.7	3.6	3.8	4.3
2	5.4	5.5	5.0	5.8	5.8	5.3	5.7	4.6	4.0	5.1	6.0	6.9	6.3	8.2	7.7	8.1	7.8	4.7	3.3	2.0	1.4	2.4	2.5	1.2
3	0.8	1.3	1.5	1.8	2.9	4.7	3.6	3.8	3.0	4.0	2.7	5.4	5.6	5.9	4.7	5.5	7.2	6.0	4.5	2.9	2.5	2.1	2.1	2.7
4	3.0	3.1	3.0	2.4	2.9	3.8	5.0	5.5	5.9	5.6	5.0	4.7	5.3	5.2	5.1	4.2	4.1	4.1	2.8	2.4	1.9	1.2	1.4	1.9
5	2.2	2.4	2.4	2.6	2.8	3.0	3.2	3.7	5.1	6.0	6.7	7.9	8.0	7.9	7.6	7.6	7.5	6.5	6.3	5.0	4.5	2.3	4.0	4.5
6	3.2	3.0	3.8	3.8	4.0	4.0	3.8	4.2	2.9	2.0	1.4	1.5	1.5	1.8	1.6	1.5	1.4	1.6	1.5	1.4	1.5	1.5	1.8	1.8
7	2.2	1.4	3.0	2.2	3.0	2.4	3.1	3.8	3.3	2.4	2.6	2.3	3.4	4.8	5.6	5.8	5.9	5.1	3.0	1.9	2.7	3.0	3.7	4.0
8	2.6	3.4	2.7	3.6	2.1	1.8	1.2	0.9	0.6	1.0	0.9	1.2	1.5	1.5	1.6	1.3	1.8	1.4	1.4	1.8	1.8	1.6	1.3	0.9
9	1.7	1.7	1.4	0.3	0.6	1.7	3.0	2.7	3.2	2.1	0.8	0.9	1.1	1.5	1.5	2.0	2.9	2.7	2.0	1.3	1.4	1.8	2.5	2.6
10	2.3	2.5	1.6	1.2	1.3	1.6	1.7	1.8	1.9	2.4	3.3	4.8	6.4	6.1	6.9	6.8	6.5	6.4	5.9	4.1	3.5	3.2	3.4	2.8
11	4.0	4.5	4.2	4.3	4.5	5.0	4.5	4.9	6.1	5.9	7.1	8.7	10.1	8.9	8.0	6.8	5.8	6.1	3.9	3.0	3.0	3.9	4.5	4.4
12	4.7	4.3	3.1	2.3	2.8	2.5	1.5	2.7	3.6	3.5	4.5	5.6	4.2	3.5	3.8	4.6	4.4	3.7	2.7	1.1	1.0	2.1	1.1	1.7
13	1.7	0.8	1.4	3.9	3.3	3.0	2.9	4.0	5.1	3.8	4.0	2.9	2.5	3.8	3.4	3.8	3.9	5.2	6.1	3.2	3.7	4.9	5.1	5.6
14	4.6	6.2	6.9	6.8	7.0	6.4	5.8	5.9	5.8	7.3	8.0	8.5	8.6	9.2	8.2	7.3	7.2	6.3	4.5	2.6	3.3	4.2	2.8	0.8
15	0.8	1.4	1.8	3.4	2.3	2.0	2.0	2.1	3.5	4.1	3.9	4.8	5.4	5.6	6.5	6.8	6.8	6.7	5.5	4.0	4.0	4.4	5.1	5.5
16	5.3	5.8	4.7	3.7	3.0	1.8	1.5	1.6	2.2	3.5	3.5	2.8	3.6	3.8	3.5	2.6	2.4	2.6	2.0	1.2	2.1	2.4	3.0	2.8
17	3.1	3.0	3.2	2.3	3.2	3.5	3.1	1.8	0.9	2.5	3.0	5.1	5.0	5.9	6.4	5.1	5.2	3.9	2.8	2.6	1.8	2.0	1.9	1.7
18	4.7	4.8	2.2	1.7	2.1	2.6	2.3	2.0	1.3	7.2	10.9	12.0	12.6	10.2	8.0	9.0	5.8	6.9	6.0	2.4	2.3	4.0	4.4	5.9
19	4.6	3.8	3.6	4.7	4.2	4.6	6.9	6.4	5.4	4.4	4.3	3.4	3.1	3.1	3.3	2.1	3.7	2.1	1.9	2.1	1.9	3.1	3.1	3.0
20	3.1	2.6	1.8	1.2	2.6	2.7	3.8	4.3	4.3	4.0	5.1	6.2	5.9	3.8	3.6	3.7	4.4	4.5	3.4	3.9	3.4	3.0	3.3	2.8
21	3.3	3.5	3.9	3.9	2.7	2.9	3.4	3.4	1.6	1.1	1.4	3.1	3.5	3.6	4.0	4.0	3.8	4.0	2.9	2.1	2.4	2.8	2.9	2.5
22	3.0	2.9	2.5	2.8	3.2	3.5	3.3	3.3	4.5	3.9	4.7	5.6	7.1	6.8	7.2	7.4	7.3	6.8	5.0	3.8	3.7	3.8	3.6	4.6
23	4.2	4.9	4.1	5.9	6.0	4.7	4.9	5.8	6.8	6.4	7.2	8.3	9.8	9.8	10.1	9.9	8.7	8.1	6.5	5.6	5.5	5.3	5.9	7.1
24	6.7	5.4	4.4	3.5	2.5	3.6	4.4	3.9	2.5	2.4	1.7	2.0	4.2	4.4	5.4	4.6	3.2	1.2	1.3	1.2	0.7	0.1	0.9	0.8
25	0.5	0.1	0.8	0.3	0.7	0.7	0.3	0.9	2.3	3.8	5.1	6.2	7.5	8.7	8.6	8.7	8.2	5.7	5.2	4.3	4.2	4.0	4.7	5.6
26	4.9	5.2	3.4	2.5	2.7	4.2	3.1	3.7	3.5	3.2	3.7	3.2	2.6	1.9	2.8	2.7	2.5	3.5	3.2	2.9	2.4	3.4	4.4	4.7
27	4.3	5.0	1.5	1.5	5.6	5.1	3.5	2.8	3.4	3.2	3.0	3.4	3.2	3.3	3.3	4.1	3.8	3.4	3.0	2.1	1.6	2.6	2.2	2.3
28	1.9	0.9	0.9	3.4	3.5	3.3	3.1	3.2	2.8	2.0	0.9	1.7	1.2	1.9	1.2	1.7	2.9	2.1	4.3	3.4	3.5	3.2	2.3	1.2
29	0.7	1.9	2.3	2.9	3.2	3.3	1.0	1.2	2.5	3.5	3.6	3.0	2.8	3.2	4.0	4.4	5.6	5.3	4.2	2.4	1.5	1.3	2.1	2.5
30	2.8	3.0	3.3	2.3	2.2	1.9	2.0	1.7	0.9	1.0	1.3	3.0	4.0	4.5	4.2	3.0	2.9	2.6	1.7	1.9	1.6	1.2	1.3	1.2

TABLE 2

Average Wind Speed (metres/second)
AEPA Station ID 00010348-C-2
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Ryley Wind Speed Data (m/s) - Month of September 2023																							
Day/Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
2	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
3	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
4	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
5	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
6	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
7	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
8	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
9	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
10	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
11	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
12	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
13	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
14	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
15	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
16	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
17	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
18	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
19	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
20	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
21	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
22	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
23	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
24	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
25	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
26	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
27	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
28	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
29	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
30	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)

Notes:
- (X) - Equipment Malfunction

TABLE 3

Average Wind Speed (metres/second)
AEPA Station ID 00010348-C-3
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Ryley Wind Speed Data (m/s) - Month of September 2023																							
Day/Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	1.2	1.8	2.0	1.2	1.5	2.0	0.9	0.9	1.5	2.1	2.2	2.1	1.7	1.4	1.8	1.7	2.7	2.5	2.9	2.3	2.7	3.3	3.3	2.8
2	1.5	0.6	0.2	0.1	0.3	1.8	3.9	2.6	1.1	3.0	3.7	3.5	3.8	5.0	4.6	5.1	4.7	2.5	1.0	0.5	0.1	1.1	1.2	0.3
3	0.3	0.4	0.7	0.9	2.5	4.0	2.8	3.5	3.1	3.4	1.7	2.6	2.7	2.7	2.8	3.5	4.1	3.2	2.2	1.0	0.7	0.7	0.6	1.2
4	0.6	0.5	0.1	0.9	1.1	1.7	1.8	1.9	2.8	2.9	1.8	2.0	2.4	3.0	3.0	2.4	2.3	1.8	1.2	0.7	0.4	0.2	0.8	1.0
5	1.5	2.3	1.9	1.8	2.5	2.4	2.9	3.7	4.8	4.7	5.7	6.3	7.1	6.4	5.7	5.9	5.4	4.8	4.8	3.3	3.2	1.1	1.8	2.4
6	1.5	1.0	1.2	1.6	1.1	1.0	0.3	0.2	0.7	0.8	0.9	1.1	0.9	1.1	1.2	1.1	0.9	1.6	1.1	0.5	0.6	0.6	0.8	1.1
7	1.0	0.9	1.4	0.3	1.1	1.0	1.1	0.3	1.2	1.7	2.0	1.3	1.7	2.7	2.6	4.0	3.5	3.0	1.6	0.2	0.1	0.2	1.0	1.5
8	0.4	0.7	0.4	0.7	0.9	0.9	0.5	0.5	0.4	0.8	0.6	1.0	1.2	1.7	1.7	1.6	1.2	1.5	1.0	0.8	0.6	0.5	0.5	0.4
9	0.8	1.1	0.6	0.3	0.4	0.2	0.5	0.9	0.6	0.9	0.8	0.6	0.9	1.1	1.4	1.5	1.7	1.3	1.1	0.4	0.2	0.7	1.3	1.9
10	2.0	2.6	1.4	1.2	0.8	1.0	0.9	1.4	1.4	2.6	3.6	4.9	5.9	6.0	6.2	6.1	5.8	5.7	5.0	3.6	2.5	2.3	2.9	3.2
11	4.2	4.1	4.1	4.3	4.6	4.5	3.9	5.1	5.2	5.3	6.5	8.6	8.9	7.6	6.4	5.6	5.1	4.9	3.0	2.2	2.2	3.5	3.4	3.1
12	3.5	3.5	2.3	1.4	2.2	0.9	0.2	1.8	2.2	1.5	2.5	3.2	2.5	2.2	2.4	2.9	2.5	2.9	1.5	0.0	0.1	0.2	0.1	0.2
13	0.1	0.3	0.3	1.0	0.6	0.5	0.3	2.1	3.0	1.7	2.3	1.5	1.5	2.4	2.1	1.8	2.0	0.8	2.8	1.4	0.7	1.0	0.8	0.9
14	1.0	0.4	0.4	0.4	0.5	0.6	1.1	1.6	2.7	4.5	4.6	4.7	5.9	5.5	4.7	5.0	4.2	3.7	2.4	0.8	0.1	0.2	0.2	0.3
15	0.1	0.5	0.8	0.7	1.3	1.7	1.8	1.6	2.6	3.3	4.0	4.1	5.0	5.0	5.8	6.1	5.8	5.6	4.6	3.2	3.3	3.7	5.4	5.7
16	4.8	4.9	4.1	2.7	1.9	1.2	0.5	0.5	1.3	1.9	1.5	2.0	2.3	2.3	2.1	1.5	1.4	1.1	0.7	0.0	0.8	1.3	1.9	1.7
17	2.0	2.7	2.7	1.3	2.8	2.4	1.9	0.9	0.8	0.7	1.8	3.2	3.2	3.6	3.5	2.7	2.9	2.2	1.6	1.0	0.0	0.4	0.3	0.4
18	0.4	0.5	0.5	0.8	1.4	1.5	1.9	1.4	1.2	4.6	7.0	6.1	7.4	6.2	5.1	5.1	3.7	4.0	3.1	1.4	0.6	1.5	1.2	0.3
19	1.3	0.8	0.1	0.4	0.1	0.4	0.7	0.7	0.4	0.6	1.3	1.4	1.6	1.3	1.1	1.3	3.2	1.9	1.5	1.5	1.7	1.2	2.6	1.7
20	2.1	1.3	0.6	0.7	0.8	0.8	0.8	1.9	2.5	2.7	3.3	3.3	2.9	1.9	2.0	2.1	2.6	2.3	0.4	0.8	1.1	1.2	1.8	0.5
21	1.1	1.4	0.7	0.3	0.3	0.7	0.4	0.5	0.5	0.6	1.3	2.9	2.8	2.4	3.1	3.7	3.2	2.8	2.0	1.3	2.1	2.0	2.0	2.1
22	2.7	2.9	3.0	3.0	2.6	2.8	2.9	3.1	3.6	4.0	4.7	5.4	5.9	6.3	5.9	6.5	5.9	5.7	3.8	2.5	2.2	2.7	3.2	3.7
23	4.0	4.1	3.7	4.6	5.0	3.9	4.5	4.8	5.7	5.6	6.5	7.3	8.5	8.5	8.5	9.1	7.5	6.9	5.2	3.8	3.9	3.8	5.1	6.1
24	5.9	4.6	3.1	2.3	2.1	1.9	0.8	1.0	0.1	1.1	1.0	1.1	2.0	2.2	2.5	2.3	1.4	0.5	0.6	0.4	0.3	0.1	0.5	0.5
25	0.2	0.2	0.4	0.2	0.2	0.4	0.1	0.2	2.1	3.1	4.3	5.6	6.1	6.6	6.7	7.2	6.0	4.2	3.9	3.1	3.4	3.6	3.8	4.9
26	4.3	4.5	3.1	2.3	2.6	4.1	3.2	3.9	3.2	2.4	3.1	1.6	2.3	1.6	0.6	1.4	1.7	2.0	1.7	1.5	0.1	0.2	0.3	0.2
27	0.3	0.2	0.3	0.5	0.3	0.2	0.3	0.6	2.4	1.8	1.9	2.3	2.0	2.4	2.0	2.0	2.1	1.9	1.4	0.8	0.3	1.1	0.3	0.5
28	0.2	0.4	0.6	1.4	1.1	1.1	1.3	1.3	1.2	1.2	0.7	1.2	0.9	1.0	1.1	0.8	1.1	0.7	1.2	1.5	0.6	1.0	0.5	0.4
29	0.4	0.8	1.3	0.5	1.3	0.7	0.2	0.6	1.6	1.7	1.4	1.5	1.2	1.4	1.7	1.6	2.3	1.9	1.3	0.6	0.5	0.4	0.9	1.0
30	1.2	1.0	0.7	0.7	0.8	0.7	1.0	0.4	0.4	0.6	0.6	2.1	3.2	3.4	3.6	1.7	1.0	1.2	0.6	0.8	0.6	0.2	0.7	0.2

TABLE 4

Average Wind Direction (degrees from North)
AEPA Station ID 00010348-C-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Ryley Wind Direction Data (degrees, blowing from) - Month of September 2023																								
Day/Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	262	266	275	264	260	270	258	253	257	275	260	261	243	230	226	203	188	189	186	180	178	178	177	185
2	193	194	209	213	215	254	291	286	252	274	288	287	272	295	295	289	287	290	320	327	247	10	38	132
3	220	167	142	152	139	130	130	124	108	110	76	307	333	224	256	298	302	304	304	310	307	293	256	257
4	260	257	220	245	268	298	317	317	313	309	318	321	313	307	303	307	302	314	307	324	234	30	73	109
5	121	121	122	131	131	113	119	112	115	114	117	110	103	109	91	96	97	88	87	83	96	185	230	52
6	244	248	236	267	246	247	226	212	219	242	227	204	219	212	196	225	224	208	157	89	113	90	121	164
7	246	198	164	201	231	260	251	227	246	285	274	273	268	274	257	261	257	273	272	243	206	202	194	189
8	205	188	191	193	190	183	160	167	117	176	192	149	150	158	139	82	35	103	79	44	70	88	127	151
9	206	99	159	173	299	223	193	190	200	247	237	249	118	101	183	246	308	323	334	9	42	77	108	122
10	122	128	135	134	119	99	104	108	117	130	140	144	146	133	142	143	144	135	124	121	122	122	122	124
11	128	124	108	113	113	112	116	117	122	131	134	131	135	133	138	146	132	124	115	99	97	107	108	102
12	101	110	111	113	105	213	230	275	295	298	284	300	301	299	289	282	296	294	305	286	264	223	249	250
13	255	246	190	192	195	216	234	258	281	289	294	285	247	281	273	257	269	218	254	274	233	231	242	240
14	240	216	208	208	208	216	226	230	250	269	273	278	284	284	290	284	283	289	277	253	229	224	223	162
15	130	120	145	186	179	183	182	162	165	171	171	158	139	149	140	134	135	129	123	120	119	115	117	119
16	120	117	126	126	124	117	153	254	276	301	327	304	299	300	320	177	47	45	59	85	89	88	100	113
17	108	117	120	140	123	108	127	170	186	215	256	262	276	290	300	288	306	288	275	265	263	263	261	215
18	195	196	174	161	153	155	132	120	229	266	302	308	300	292	287	279	276	263	266	286	207	186	187	201
19	251	250	224	223	213	218	193	193	200	216	225	246	258	227	230	197	180	151	118	147	162	182	158	155
20	98	76	27	252	301	323	312	311	299	291	292	294	304	294	282	282	291	283	228	226	248	263	269	256
21	262	264	258	246	239	265	259	240	185	225	195	160	172	179	166	171	173	174	175	161	142	147	145	130
22	138	142	135	125	140	125	117	128	127	117	116	118	123	122	124	128	122	117	115	108	111	109	110	109
23	117	107	112	103	112	110	116	122	126	121	126	113	101	101	107	104	97	96	103	100	99	98	96	95
24	105	117	120	133	154	177	192	193	218	256	263	276	308	305	300	294	306	291	320	338	235	264	237	225
25	242	270	277	176	132	181	124	70	81	83	85	101	86	79	85	94	100	90	86	90	94	93	91	96
26	105	104	111	119	111	115	110	116	124	111	127	162	150	174	211	263	296	290	283	267	245	241	205	205
27	216	205	193	150	192	211	222	226	288	295	273	252	277	250	254	300	290	286	283	281	279	262	262	262
28	266	173	230	261	262	269	268	272	268	266	221	187	155	286	267	249	201	116	195	189	208	243	194	188
29	201	193	171	202	263	259	200	233	273	309	329	318	312	335	325	325	329	338	341	344	319	289	279	270
30	275	267	270	273	277	283	283	297	282	296	138	46	48	50	57	46	30	35	32	25	39	46	334	228

TABLE 5

Average Wind Direction (degrees from North)
AEPA Station ID 00010348-C-2
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Ryley Wind Direction Data (degrees, blowing from) - Month of September 2023																								
Day/Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
2	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
3	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
4	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
5	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
6	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
7	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
8	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
9	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
10	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
11	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
12	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
13	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
14	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
15	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
16	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
17	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
18	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
19	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
20	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
21	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
22	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
23	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
24	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
25	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
26	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
27	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
28	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
29	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
30	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)

Notes:
- (X) - Equipment Malfunction

TABLE 6

Most Frequent Wind Direction (degrees from North)
AEPA Station ID 00010348-C-3
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Ryley Wind Direction Data (degrees, blowing from) - Month of September 2023																								
Day/Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	263	270	272	264	266	274	263	259	267	276	272	271	254	250	227	226	214	207	204	194	195	190	195	206
2	231	231	232	221	237	267	285	284	260	277	284	279	277	288	288	284	291	300	291	264	173	169	82	194
3	289	147	152	175	132	129	137	127	126	118	114	306	280	173	301	299	300	303	304	313	310	281	259	269
4	254	261	248	272	268	300	313	318	304	302	326	336	317	308	300	303	306	313	310	291	262	95	84	114
5	124	119	121	127	128	118	118	120	119	118	123	119	118	121	112	113	113	105	103	101	116	222	215	87
6	266	250	267	265	266	265	235	260	246	260	241	205	234	221	189	249	233	177	144	111	97	88	158	150
7	272	179	174	192	251	277	265	241	265	286	284	276	266	274	268	281	277	285	279	221	167	184	189	199
8	205	179	217	198	205	179	144	187	144	191	248	149	132	116	99	74	39	118	88	69	81	85	174	190
9	190	115	197	270	289	209	210	195	242	275	223	179	157	151	194	248	269	306	172	112	97	93	111	119
10	124	125	123	115	79	99	100	112	113	141	137	150	148	140	149	143	149	138	125	121	123	117	121	123
11	131	129	114	114	115	116	116	118	123	128	131	132	137	138	145	152	137	127	114	106	102	112	114	110
12	111	112	115	121	109	236	251	277	294	305	294	300	304	299	299	297	301	286	293	269	243	246	241	235
13	227	213	220	205	227	271	247	273	288	291	296	280	268	285	283	268	275	240	278	272	262	260	258	262
14	261	242	240	247	251	255	253	255	264	276	275	275	282	284	292	289	295	297	290	262	234	262	245	194
15	173	110	155	232	177	185	181	156	174	186	187	159	145	152	148	134	134	133	125	120	118	119	129	129
16	125	124	126	137	132	122	159	248	284	301	315	304	301	303	273	120	81	49	71	88	91	92	102	114
17	111	121	123	151	120	109	131	207	203	258	270	274	290	296	305	297	304	296	282	255	237	233	241	210
18	260	207	171	141	137	150	126	135	222	278	293	301	296	290	288	292	292	278	280	265	195	201	216	250
19	257	249	225	254	248	222	231	240	236	241	251	265	269	241	217	241	171	140	123	143	162	214	149	162
20	98	92	127	329	305	323	328	309	299	290	293	295	300	294	281	290	297	288	250	257	261	266	274	227
21	265	262	258	269	271	257	260	246	213	233	197	168	184	201	183	168	182	189	187	152	134	141	141	123
22	129	134	132	131	142	126	125	137	130	130	128	129	137	133	131	132	135	124	120	112	114	116	117	117
23	126	119	119	115	120	117	120	125	127	125	131	126	125	121	127	125	121	120	119	115	114	112	115	117
24	128	132	120	122	162	187	224	215	219	264	274	293	303	316	309	302	304	254	240	278	214	205	224	227
25	221	188	233	223	180	250	155	72	93	104	112	114	109	106	112	115	118	105	106	109	107	111	110	118
26	123	123	123	141	137	130	135	144	148	135	131	185	166	193	235	279	296	300	291	272	224	251	247	262
27	239	238	226	206	241	217	258	257	295	296	277	272	289	288	290	299	301	301	293	292	277	254	250	248
28	217	168	211	258	255	266	264	269	265	280	170	138	218	299	251	255	229	211	225	214	239	261	205	171
29	155	220	178	240	265	246	229	232	283	313	270	256	330	337	324	323	335	326	323	330	305	280	264	270
30	273	256	257	276	282	263	275	303	207	263	168	79	86	80	85	53	54	43	26	28	57	215	332	255

TABLE 7

Wind Frequency Distribution
AEPA Station ID 00010348-C-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Frequency Distribution Report: Ryley, Alberta - September 2023										
Direction	Angle	Wind Speed (m/s) and Number of Occurences (minutes)							%	Total Occurrences by Direction
		< 0.5	0.5 to < 2.1	2.1 to < 3.6	3.6 to < 5.7	5.7 to < 8.8	8.8 to < 11.1	>= 11.1		
North	> 337.5 - 22.5	107	783	268	151	48	1	0	3.1%	1358
Northeast	> 22.5 - 67.5	90	622	487	204	29	2	0	3.3%	1434
East	> 67.5 - 112.5	91	1123	1326	1909	1237	361	60	14.1%	6107
Southeast	> 112.5 - 157.5	115	1443	2580	2361	1583	214	58	19.3%	8354
South	> 157.5 - 202.5	134	1222	1976	1692	505	6	0	12.8%	5535
Southwest	> 202.5 - 247.5	150	945	1380	1781	621	1	0	11.3%	4878
West	> 247.5 - 292.5	259	1777	3907	2566	1069	238	36	22.8%	9852
Northwest	> 292.5 - 337.5	136	947	1404	1991	919	155	130	13.2%	5682
Missing/Invalid Minutes									0.000%	0
Total Occurences by Speed		1082	8862	13328	12655	6011	978	284		**43200**
Occurences by %		2.5%	20.5%	30.9%	29.3%	13.9%	2.3%	0.7%	**100.000%**	

TABLE 8

Wind Frequency Distribution
AEPA Station ID 00010348-C-2
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Frequency Distribution Report: Ryley, Alberta - September 2023										
		Wind Speed (m/s) and Number of Occurences (minutes)								Total Occurrences
Direction	Angle	< 0.5	0.5 to < 2.1	2.1 to < 3.6	3.6 to < 5.7	5.7 to < 8.8	8.8 to < 11.1	>= 11.1	%	by Direction
North	> 337.5 - 22.5	0	0	0	0	0	0	0	0.0%	0
Northeast	> 22.5 - 67.5	0	0	0	0	0	0	0	0.0%	0
East	> 67.5 - 112.5	0	0	0	0	0	0	0	0.0%	0
Southeast	> 112.5 - 157.5	0	0	0	0	0	0	0	0.0%	0
South	> 157.5 - 202.5	0	0	0	0	0	0	0	0.0%	0
Southwest	> 202.5 - 247.5	0	0	0	0	0	0	0	0.0%	0
West	> 247.5 - 292.5	0	0	0	0	0	0	0	0.0%	0
Northwest	> 292.5 - 337.5	0	0	0	0	0	0	0	0.0%	0
Missing/Invalid Hours									**100%**	43200
Total Occurences by Speed		0	0	0	0	0	0	0		**43200**
Occurences by %		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.00%**	

TABLE 9

Wind Frequency Distribution
AEPA Station ID 00010348-C-3
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Frequency Distribution Report: Ryley, Alberta - September 2023										
Direction	Angle	Wind Speed (m/s) and Number of Occurences (minutes)							%	Total Occurrences by Direction
		< 0.5	0.5 to < 2.1	2.1 to < 3.6	3.6 to < 5.7	5.7 to < 8.8	8.8 to < 11.1	>= 11.1		
North	> 337.5 - 22.5	728	1474	286	53	1	0	0	5.9%	2542
Northeast	> 22.5 - 67.5	358	474	53	2	0	0	0	2.1%	887
East	> 67.5 - 112.5	380	1484	980	705	230	18	1	8.8%	3798
Southeast	> 112.5 - 157.5	495	2242	3077	3102	1775	239	38	25.4%	10968
South	> 157.5 - 202.5	721	1756	802	464	109	5	0	8.9%	3857
Southwest	> 202.5 - 247.5	1820	1627	208	74	4	0	0	8.6%	3733
West	> 247.5 - 292.5	1970	6325	1833	959	294	21	3	26.4%	11405
Northwest	> 292.5 - 337.5	804	2656	1787	603	146	11	3	13.9%	6010
Missing/Invalid Minutes									0.0%	0
Total Occurences by Speed		7276	18038	9026	5962	2559	294	45		**43200**
Occurences by %		16.8%	41.8%	20.9%	13.8%	5.9%	0.7%	0.1%	**100.00%**	

TABLE 10

Total Suspended Particulate (TSP) Matter Results
AEPA Station ID 00010348-I-2
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Filter ID	HV-23-02-11
Test ID	Facility Test # 106
Sample Start Date/Time	23/09/01 15:00:00
Sample End Date/Time	23/10/01 12:00:00
Sampling Time (hours)	24.68
Flow Rate (m^3/min)	1.304
Volume (m^3)	1931.22
TSP Mass (mg)	418
TSP Concentration (ug/m^3)	216.443
Sampler Name	TE-5170V / P8580 TSP VFC

TABLE 11

Total Suspended Particulate (TSP) Matter Results
AEPA Station ID 00010348-I-3
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Filter ID	HV-23-02-12
Test ID	School Test # 106
Sample Start Date/Time	23/09/01 15:00:00
Sample End Date/Time	23/10/01 12:00:00
Sampling Time (hours)	24.72
Flow Rate (m^3/min)	1.295
Volume (m^3)	1920.485
TSP Mass (mg)	248
TSP Concentration (ug/m^3)	129.134
Sampler Name	TE-5170V / P8581 TSP VFC

TABLE 12

Total Suspended Particulate (TSP) Matter Results
AEPA Station ID 00010348-I-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Filter ID	HVF-23-06-03	HVF-23-06-15	HVF-23-06-12	HVF-23-06-13	HVF-23-06-14
Test ID	860	861	862	863	864
Sample Start Date/Time	23/09/03 00:00:00	23/09/09 00:00:00	23/09/15 00:00:00	23/09/21 00:00:00	23/09/27 00:00:00
Sample End Date/Time	23/09/04 00:00:00	23/09/10 00:00:00	23/09/16 00:00:00	23/09/22 00:00:00	23/09/28 00:00:00
Sampling Time (hours)	24.14	23.62	24.46	24.58	24.14
Flow Rate (m^3/min)	1.302	1.302	1.302	1.302	1.302
Volume (m^3)	1885.82	1845.20	1910.80	1902.19	1885.82
TSP Mass (mg)	377	288	340	77.9	408
TSP Concentration (ug/m^3)	199.913	156.081	177.936	40.953	216.352
Sampler Name	TE-5170V / P11162 TSP VFC	TE-5170V / P11162 TSP VFC	TE-5170V / P11162 TSP VFC	TE-5170V / P11162 TSP VFC	TE-5170V / P11162 TSP VFC

TABLE 13

Particulate Matter PM_{10} Results
AEPA Station ID 00010348-I-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Filter ID	C9700138	AT79027	AT79034	AT79032	AT79033
Test ID	860	861	862	863	864
Sample Start Date/Time	23/09/03 00:00:00	23/09/09 00:00:00	23/09/15 00:00:00	23/09/21 00:00:00	23/09/27 00:00:00
Sample End Date/Time	23/09/04 00:00:00	23/09/10 00:00:00	23/09/16 00:00:00	23/09/22 00:00:00	23/09/28 00:00:00
Sampling Time (hours)	23.01	24	24	24	24
Flow Rate (l/min)	16.7	16.7	16.7	16.7	16.7
Volume (m^3)	21.8	23	23	23.4	22.9
PM_{10} Mass (mg)	3.61	1.11	1.2	0.518	1.52
PM_{10} Concentration (ug/m^3)	165.596	48.261	52.174	22.137	66.376
Sampler Name	2000 FRM-AE / 200FB209860905	2000 FRM-AE / 200FB209860905	2000 FRM-AE / 200FB209860905	2000 FRM-AE / 200FB209860905	2000 FRM-AE / 200FB209860905

Notes: For Test ID 860, the run status was “X” which was due to a flow cutoff error. The sample time was 23.01 hours due to flow shutoff near the end of the sampling period (flowrate dropped to 0 in last hour of sample).

TABLE 14

VOC and TNMOC Analytical Results
AEPA Station ID 00010348-I-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Parameter	Units	Date / Sample ID / AAAQO[1]	3-Sep-23 860	9-Sep-23 861	15-Sep-23 862	21-Sep-23 863	27-Sep-23 864
Total Non-Methane Organic Carbon	ppmv	-	< 0.08	< 0.08	< 0.11	< 0.12	< 0.07
1,2,3-Trimethylbenzene	ppbv	-	< 0.08	0.11	< 0.11	< 0.08	< 0.07
1,2,4-Trimethylbenzene	ppbv	-	< 0.05	< 0.05	< 0.06	< 0.05	0.1
1,3,5-Trimethylbenzene	ppbv	-	< 0.05	< 0.05	< 0.06	< 0.05	< 0.04
1-Butene/Isobutylene	ppbv	-	0.26	< 0.10	< 0.13	< 0.09	< 0.09
1-Hexene/2-Methyl-1-pentene	ppbv	-	< 0.12	< 0.12	< 0.15	< 0.11	< 0.10
1-Pentene	ppbv	-	0.08	0.07	< 0.06	< 0.05	< 0.04
2,2,4-Trimethylpentane	ppbv	-	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
2,2-Dimethylbutane	ppbv	-	< 0.03	< 0.03	< 0.04	< 0.03	0.04
2,3,4-Trimethylpentane	ppbv	-	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
2,3-Dimethylbutane	ppbv	-	< 0.15	< 0.15	< 0.19	< 0.14	< 0.13
2,3-Dimethylpentane	ppbv	-	< 0.03	< 0.03	< 0.04	< 0.03	0.04
2,4-Dimethylpentane	ppbv	-	< 0.05	< 0.05	< 0.06	< 0.05	< 0.04
2-Methylheptane	ppbv	-	< 0.03	< 0.03	< 0.04	< 0.03	0.06
2-Methylhexane	ppbv	-	< 0.05	< 0.05	< 0.06	< 0.05	0.09
2-Methylpentane	ppbv	-	0.09	0.38	0.05	< 0.03	0.61
3-Methylheptane	ppbv	-	< 0.05	< 0.05	< 0.06	< 0.05	< 0.04
3-Methylhexane	ppbv	-	< 0.03	0.05	< 0.04	< 0.03	0.12
3-Methylpentane	ppbv	-	0.06	0.98	0.21	0.08	0.3
Benzene	ppbv	-	1.46	0.09	< 0.06	< 0.05	0.19
cis-2-Butene	ppbv	-	< 0.05	< 0.05	< 0.06	< 0.05	< 0.04
cis-2-Pentene	ppbv	-	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Cyclohexane	ppbv	-	< 0.07	< 0.07	< 0.08	< 0.06	0.13
Cyclopentane	ppbv	-	< 0.03	0.07	< 0.04	< 0.03	0.09
Ethylbenzene	ppbv	-	< 0.05	0.07	< 0.06	< 0.05	0.13
Isobutane	ppbv	-	0.4	0.57	< 0.06	0.19	0.28
Isopentane	ppbv	-	0.65	0.42	0.16	0.38	0.97
Isoprene	ppbv	-	0.34	0.09	< 0.04	< 0.03	< 0.03
Isopropylbenzene	ppbv	-	< 0.07	< 0.07	< 0.08	< 0.06	< 0.06
m,p-Xylene	ppbv	161	0.08	0.15	< 0.08	< 0.06	0.19
m-Diethylbenzene	ppbv	-	0.09	0.12	< 0.04	< 0.03	< 0.03
m-Ethyltoluene	ppbv	-	< 0.05	0.09	< 0.06	< 0.05	< 0.04
Methylcyclohexane	ppbv	-	< 0.03	0.04	< 0.04	< 0.03	0.22
Methylcyclopentane	ppbv	-	0.08	0.70	0.11	0.09	0.24
n-Butane	ppbv	-	0.89	5.18	0.32	0.66	1.33
n-Decane	ppbv	-	< 0.10	< 0.10	< 0.13	< 0.09	< 0.09
n-Dodecane	ppbv	-	< 0.5	< 0.5	< 0.6	< 0.5	< 0.4
n-Heptane	ppbv	-	< 0.07	< 0.07	< 0.08	< 0.06	0.17
n-Hexane	ppbv	1990	0.2	3.75	0.66	0.32	0.52
n-Nonane	ppbv	-	< 0.07	< 0.07	< 0.08	< 0.06	0.07
n-Octane	ppbv	-	< 0.03	0.04	< 0.04	< 0.03	0.1
n-Pentane	ppbv	-	0.53	0.31	0.11	0.24	0.92
n-Propylbenzene	ppbv	-	< 0.10	< 0.10	< 0.13	< 0.09	< 0.09
n-Undecane	ppbv	-	< 0.8	< 0.8	< 1.1	< 0.8	< 0.7
o-Ethyltoluene	ppbv	-	< 0.03	0.08	< 0.04	< 0.03	< 0.03
o-Xylene	ppbv	161	< 0.05	0.05	< 0.06	< 0.05	< 0.04
p-Diethylbenzene	ppbv	-	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
p-Ethyltoluene	ppbv	-	< 0.07	< 0.07	< 0.08	< 0.06	0.07
Styrene	ppbv	-	< 0.07	< 0.07	< 0.08	< 0.06	< 0.06
Toluene	ppbv	106	0.46	0.21	< 0.06	< 0.05	0.4
trans-2-Butene	ppbv	-	< 0.05	< 0.05	< 0.06	< 0.05	< 0.04
trans-2-Pentene	ppbv	-	< 0.03	< 0.03	< 0.04	< 0.03	< 0.03
Total VOCs [2]	ppbv	-	8.830	16.500	6.160	5.410	9.730

Notes:
(1) Alberta Ambient Air Quality Objectives for a 24 hour averaging period.
(2) Total VOCs are calculated under the assumption that values under the detection limit are equal to the detection limit, as per the AMD.

TABLE 15

TSP Metals Analytical Results
AEPA Station ID 00010348-I-2
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Parameter	Date / Sample ID / Lab Results [1]		1-Sep-23 / HV-23-02-11 / (ug/m^3)[2]	AAAQO[2] (ug/m^3)
Antimony	190	ng/Filter	2.41E-04	-
Arsenic	2260	ng/Filter	2.86E-03	0.10
Barium	< 300	ng/Filter	3.80E-04	-
Beryllium	168	ng/Filter	2.13E-04	-
Boron	2640000	ng/Filter	3.34E+00	-
Cadmium	971	ng/Filter	1.23E-03	-
Chromium	7260	ng/Filter	9.20E-03	1.0
Cobalt	2060	ng/Filter	2.61E-03	-
Copper	22000	ng/Filter	2.79E-02	-
Iron	4470000	ng/Filter	5.66E+00	-
Lead	15900	ng/Filter	2.01E-02	1.5
Manganese	114000	ng/Filter	1.44E-01	2
Mercury	< 0.70	ng/Filter	8.87E-07	-
Nickel	10900	ng/Filter	1.38E-02	6
Selenium	1720	ng/Filter	2.18E-03	-
Silver	44.9	ng/Filter	5.69E-05	-
Thallium	32.1	ng/Filter	4.07E-05	-
Tin	< 0.20	ng/Filter	2.53E-07	-
Uranium	414	ng/Filter	5.25E-04	-
Vanadium	10800	ng/Filter	1.37E-02	-
Zinc	< 1000	ng/Filter	1.27E-03	-

Sampling Time (hours)	24.68
Flow Rate (m3/min)	1.304
Volume Sampled (m^3)	1931.22

Notes:

(1) These results are from a 24.68 hour averaging period that took place on September 1 to October 1, 2023

(2) Measured data have been converted from the measured 24.68 hour avering period to a 1 hour averaging period based on Alberta's Air Quality Model Guideline Section 7.1.2.

TABLE 16

TSP Metals Analytical Results
AEPA Station ID 00010348-I-3
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

Parameter	Date / Sample ID	Lab Results [1]		(ug/m^3)[2]	AAAQO[2] (ug/m^3)
		1-Sep-23 / HV-23-02-12			
Antimony		214	ng/Filter	2.74E-04	-
Arsenic		1,610	ng/Filter	2.06E-03	0.10
Barium		< 300	ng/Filter	3.83E-04	-
Beryllium		91	ng/Filter	1.16E-04	-
Boron		3,860,000	ng/Filter	4.93E+00	-
Cadmium		463	ng/Filter	5.92E-04	-
Chromium		4,360	ng/Filter	5.57E-03	1.0
Cobalt		844	ng/Filter	1.08E-03	-
Copper		293,000	ng/Filter	3.75E-01	-
Iron		2,500,000	ng/Filter	3.20E+00	-
Lead		2,030	ng/Filter	2.59E-03	1.5
Manganese		107,000	ng/Filter	1.37E-01	2
Mercury		< 0.70	ng/Filter	8.95E-07	-
Nickel		3,470	ng/Filter	4.44E-03	6
Selenium		1,350	ng/Filter	1.73E-03	-
Silver		174	ng/Filter	2.22E-04	-
Thallium		24	ng/Filter	3.03E-05	-
Tin		< 0.20	ng/Filter	2.56E-07	-
Uranium		90	ng/Filter	1.15E-04	-
Vanadium		3,890	ng/Filter	4.97E-03	-
Zinc		< 1000	ng/Filter	1.28E-03	-
Sampling Time (hours)		24.72			
Flow Rate (m3/min)		1.295			
Volume Sampled (m^3)		1920.49			

Notes:

(1) These results are from a 24.72 hour averaging period that took place on September 1 to October 1, 2023

(2) Measured data have been converted from the measured 24.72 hour avering period to a 1 hour averaging period based on Alberta's Air Quality Model Guideline Section 7.1.2.

TABLE 17

TSP Metals Analytical Results
EPA Station ID 00010348-I-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

	Date	3-Sep-23		Date	9-Sep-23		Date	15-Sep-23		Date	27-Sep-23		
	Sample ID	860		Sample ID	861		Sample ID	862		Sample ID	864		
Parameter	**Lab Results (1)**		**(ug/m^3)(3)**	**Lab Results (1)**		**(ug/m^3)(3)**	**Lab Results (1)**		**(ug/m^3)(3)**	**Lab Results (1)**		**(ug/m^3)(3)**	**AAAQO(3) (ug/m^3)**
Antimony	661	ng/Filter	8.55E-04	424	ng/Filter	5.57E-04	406	ng/Filter	5.20E-04	635	ng/Filter	8.21E-04	-
Arsenic	2980	ng/Filter	3.85E-03	3130	ng/Filter	4.11E-03	4190	ng/Filter	5.37E-03	5780	ng/Filter	7.50E-03	0.10
Barium	< 300	ng/Filter	3.88E-04	< 300	ng/Filter	3.94E-04	< 300	ng/Filter	3.84E-04	< 300	ng/Filter	3.89E-04	-
Beryllium	73.0	ng/Filter	9.44E-05	231	ng/Filter	3.03E-04	220	ng/Filter	2.82E-04	478	ng/Filter	6.20E-04	-
Boron	< 600	ng/Filter	7.76E-04	< 600	ng/Filter	7.88E-04	1370000	ng/Filter	1.75E+00	2080000	ng/Filter	2.70E+00	-
Cadmium	1450	ng/Filter	1.88E-03	455	ng/Filter	5.98E-04	563	ng/Filter	7.21E-04	949	ng/Filter	1.23E-03	-
Chromium	14300	ng/Filter	1.85E-02	20300	ng/Filter	2.67E-02	18900	ng/Filter	2.42E-02	29300	ng/Filter	3.80E-02	1.0
Cobalt	1780	ng/Filter	2.30E-03	3230	ng/Filter	4.24E-03	3190	ng/Filter	4.09E-03	5770	ng/Filter	7.49E-03	-
Copper	393000	ng/Filter	5.08E-01	545000	ng/Filter	7.16E-01	570000	ng/Filter	7.30E-01	511000	ng/Filter	6.63E-01	-
Iron	3660000	ng/Filter	4.73E+00	7890000	ng/Filter	1.04E+01	7450000	ng/Filter	9.54E+00	12400000	ng/Filter	1.61E+01	-
Lead	17600	ng/Filter	2.28E-02	16900	ng/Filter	2.22E-02	18900	ng/Filter	2.42E-02	24100	ng/Filter	3.13E-02	1.5
Manganese	209000	ng/Filter	2.70E-01	237000	ng/Filter	3.11E-01	269000	ng/Filter	3.45E-01	373000	ng/Filter	4.84E-01	2
Mercury	20.4	ng/Filter	2.64E-05	21.3	ng/Filter	2.80E-05	18.3	ng/Filter	2.34E-05	19.4	ng/Filter	2.52E-05	-
Nickel	11400	ng/Filter	1.47E-02	14600	ng/Filter	1.92E-02	24900	ng/Filter	3.19E-02	29200	ng/Filter	3.79E-02	6
Selenium	160	ng/Filter	2.07E-04	2270	ng/Filter	2.98E-03	1470	ng/Filter	1.88E-03	3300	ng/Filter	4.28E-03	-
Silver	421	ng/Filter	5.44E-04	344	ng/Filter	4.52E-04	372	ng/Filter	4.77E-04	381	ng/Filter	4.95E-04	-
Thallium	68.5	ng/Filter	8.86E-05	59.1	ng/Filter	7.76E-05	54.4	ng/Filter	6.97E-05	111	ng/Filter	1.44E-04	-
Tin	72.8	ng/Filter	9.41E-05	< 0.20	ng/Filter	2.63E-07	< 0.20	ng/Filter	2.56E-07	< 0.20	ng/Filter	2.60E-07	-
Uranium	703	ng/Filter	9.09E-04	2620	ng/Filter	3.44E-03	1680	ng/Filter	2.15E-03	8350	ng/Filter	1.08E-02	-
Vanadium	8510	ng/Filter	1.10E-02	19000	ng/Filter	2.50E-02	15400	ng/Filter	1.97E-02	37400	ng/Filter	4.85E-02	-
Zinc	< 1000	ng/Filter	1.29E-03	< 1000	ng/Filter	1.31E-03	< 1000	ng/Filter	1.28E-03	< 1000	ng/Filter	1.30E-03	-
Sampling Time (hours)	24.14			23.62			24.46			24.14			
Flow Rate (l/min)	1.302			1.302			1.302			1.302			
Volume Sampled (m^3)	1885.82			1845.20			1910.80			1885.82			

Notes:

(1) These results are from an approximately 24 hour averaging period that took place on September 3, September 9, September 15 and September 27, 2023.

(2) Measured data have been converted from the measured approximately 24 hour avering period to a 1 hour averaging period based on Alberta's Air Quality Model Guideline Section 7.1.2.

TABLE 18

PM10 Metals Analytical Results
EPA Station ID 00010348-I-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
September 2023

	Date	3-Sep-23		Date	9-Sep-23		Date	15-Sep-23		Date	27-Sep-23		
	Sample ID	860		Sample ID	861		Sample ID	862		Sample ID	864		
Parameter	**Lab Results [1]**		**(ug/m^3)[2]**	**Lab Results [1]**		**(ug/m^3)[2]**	**Lab Results [1]**		**(ug/m^3)[2]**	**Lab Results [1]**		**(ug/m^3)[2]**	**AAAQO[2] (ug/m^3)**
Antimony	28.2	ng/Filter	3.11E-03	6.62	ng/Filter	7.01E-04	6.05	ng/Filter	6.40E-04	8.82	ng/Filter	9.38E-04	-
Arsenic	17.0	ng/Filter	1.88E-03	16.8	ng/Filter	1.78E-03	11.7	ng/Filter	1.24E-03	28.1	ng/Filter	2.99E-03	0.10
Barium	493	ng/Filter	5.44E-02	596	ng/Filter	6.31E-02	543	ng/Filter	5.75E-02	910	ng/Filter	9.68E-02	-
Beryllium	0.61	ng/Filter	6.73E-05	1.37	ng/Filter	1.45E-04	1.06	ng/Filter	1.12E-04	2.27	ng/Filter	2.41E-04	-
Boron	509	ng/Filter	5.62E-02	176	ng/Filter	1.86E-02	210	ng/Filter	2.22E-02	161	ng/Filter	1.71E-02	-
Cadmium	18.9	ng/Filter	2.09E-03	1.65	ng/Filter	1.75E-04	1.75	ng/Filter	1.85E-04	3.39	ng/Filter	3.60E-04	-
Chromium	41	ng/Filter	4.53E-03	47	ng/Filter	4.98E-03	17	ng/Filter	1.80E-03	122	ng/Filter	1.30E-02	1.0
Cobalt	8.81	ng/Filter	9.72E-04	12.8	ng/Filter	1.36E-03	9.11	ng/Filter	9.64E-04	25.3	ng/Filter	2.69E-03	-
Copper	369	ng/Filter	4.07E-02	511	ng/Filter	5.41E-02	319	ng/Filter	3.38E-02	526	ng/Filter	5.59E-02	-
Iron	20200	ng/Filter	2.23E+00	39000	ng/Filter	4.13E+00	32400	ng/Filter	3.43E+00	56200	ng/Filter	5.98E+00	-
Lead	72.4	ng/Filter	7.99E-03	63.5	ng/Filter	6.72E-03	25.4	ng/Filter	2.69E-03	106	ng/Filter	1.13E-02	1.5
Manganese	1380	ng/Filter	1.52E-01	1100	ng/Filter	1.16E-01	960	ng/Filter	1.02E-01	1560	ng/Filter	1.66E-01	2
Mercury	0.46	ng/Filter	5.08E-05	0.17	ng/Filter	1.80E-05	0.21	ng/Filter	2.22E-05	0.17	ng/Filter	1.81E-05	-
Nickel	65.4	ng/Filter	7.22E-03	46.9	ng/Filter	4.96E-03	30.0	ng/Filter	3.18E-03	112	ng/Filter	1.19E-02	6
Selenium	13.1	ng/Filter	1.45E-03	17.7	ng/Filter	1.87E-03	8.2	ng/Filter	8.68E-04	18.0	ng/Filter	1.91E-03	-
Silver	2.61	ng/Filter	2.88E-04	0.59	ng/Filter	6.25E-05	0.43	ng/Filter	4.55E-05	0.93	ng/Filter	9.89E-05	-
Thallium	1.00	ng/Filter	1.10E-04	0.53	ng/Filter	5.61E-05	0.48	ng/Filter	5.08E-05	0.90	ng/Filter	9.57E-05	-
Tin	3.18	ng/Filter	3.51E-04	3.23	ng/Filter	3.42E-04	2.57	ng/Filter	2.72E-04	5.74	ng/Filter	6.10E-04	-
Uranium	2.28	ng/Filter	2.52E-04	11.0	ng/Filter	1.16E-03	3.95	ng/Filter	4.18E-04	40.2	ng/Filter	4.27E-03	-
Vanadium	45.3	ng/Filter	5.00E-03	98.9	ng/Filter	1.05E-02	65.9	ng/Filter	6.98E-03	192	ng/Filter	2.04E-02	-
Zinc	1710	ng/Filter	1.89E-01	718	ng/Filter	7.60E-02	309	ng/Filter	3.27E-02	1470	ng/Filter	1.56E-01	-
Sampling Time (hours)	23.01			24			24			24			
Flow Rate (l/min)	16.7			16.7			16.7			16.7			
Volume Sampled (m^3)	21.8			23			23			22.9			

Notes:

(1) These results are from an approximately 24 hour averaging period that took place on September 3, September 9, September 15 and September 27, 2023.

(2) Measured data have been converted from the measured approximately 24 hour avering period to a 1 hour averaging period based on Alberta's Air Quality Model Guideline Section 7.1.2.

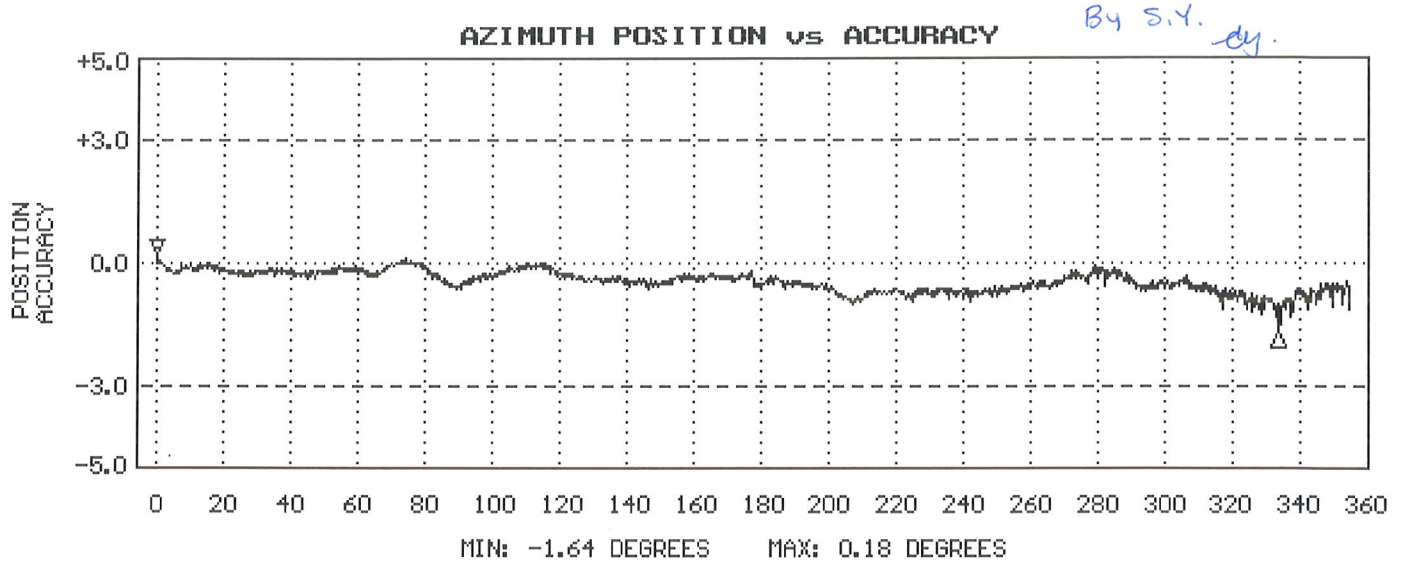
Appendix A
Meteorological Station Calibration Report

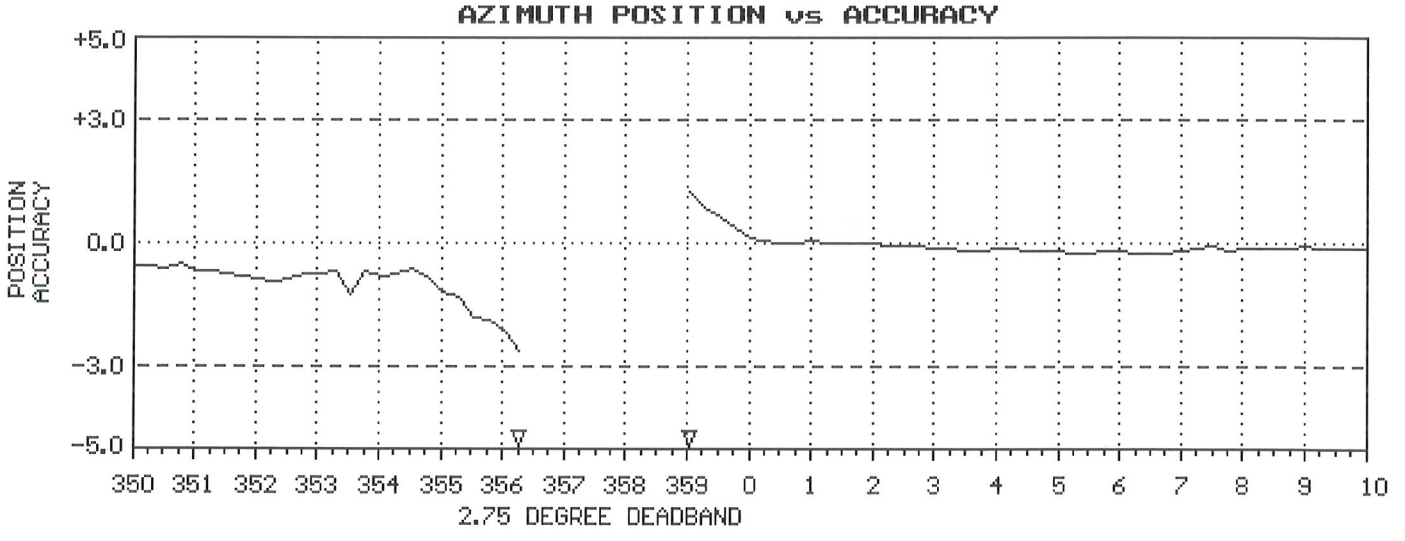
R. M. YOUNG COMPANY WIND SENSOR CALIBRATION CERTIFICATE

SENSOR: 05305-10A WIND MONITOR-AQ
SENSOR SERIAL NUMBER: WM149768
BEARINGS: SHIELDED/OIL LUBE
DATE: AUG 3 2016
WIND SPEED THRESHOLD TEST: PASS
LOW WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
HIGH WIND SPEED AMPLITUDE/FREQUENCY TEST: PASS
VANE TORQUE TEST: PASS
SPECIAL NOTES:
SPECIAL NOTES:

Insp. By

Installed Nov. 8/16
By S.Y. dy.





NOTE: Azimuth Position vs Accuracy graphs are accurate to within 0.5 degrees. The accuracy shown in the potentiometer deadband region between 355 and 0 degrees is the result of no resistance change while position changes. The gap represents the actual deadband (open circuit).

GHD Wind Calibration Form

Site and Instrument Information

Site		Wind Monitor	
Location:	Facility	**Make:**	RM Young
Calibration Date:	Jun 30, 2023	**Model:**	05305
Tech.:	P. Shariaty & S. Davey	**Serial #:**	149768
Instrument:	Continuous Wind Monitor	**Calibration due:**	Annually
Time:	1:05 PM - 1:20 PM	**Temperature:**	25°C

Pre-Calibration Inspection	Y/N
Is the wind direction < +/- 10° from compass observation?	N
Is siting aligned?	Y
Does the propeller rotate 360° with no friction?	Y
Does the vane rotate 360° with no friction?	Y

Calibration Information

Direction (degrees °)			Anemometer Speed (m/s)		
Test Angle (°)	Recorded Angle (°)	Within +/- 5°? (Y/N)	Test Speed (m/s)	Recorded Speed (m/s)	Within +/- 3 (m/s)? (Y/N)
0	0	Y	26.1	26.0	Y
30	29	Y	24.6	24.5	Y
60	59	Y	23.0	22.9	Y
180	178	Y	20.5	20.4	Y
			18.9	18.9	Y
			41.0	40.8	Y

Comments	Conversion Factors	
	m/s	RPM
Wind monitor (SN:149768) was removed from tower, inspected and the calibration was checked on June 30, 2023. Mechanical bearings and shaft alignment were inspected. Bearings were cleaned of any dust buildup. Alignment was in good condition. Wind direction calibration adjustment was required based on the pre-calibration inspection. Other than cleaning and direction calibration, no additional maintenance was required. It is recommended that the instrument be cleaned biannually and bearings checked and replaced (if required) at the next calibration interval. After calibration check, wind monitor was re-installed and sited back to original position.	26.112	5100.0
	24.576	4800.0
	23.040	4500.0
	20.480	4000.0
	18.944	3700.0
	40.960	8000.0
Calibration Adjustment Required?: Yes		

GHD Wind Calibration Form

Site and Instrument Information

Site		Wind Monitor	
Location:	Ryley School	**Make:**	RM Young
Calibration Date:	Jun 30, 2023	**Model:**	05305
Tech.:	P. Shariaty & S. Davey	**Serial #:**	183487
Instrument:	Continuous Wind Monitor	**Calibration due:**	Annually
Time:	10:00 AM - 11:20 AM	**Temperature:**	22°C

Pre-Calibration Inspection	Y/N
Is the wind direction < +/- 10° from compass observation?	N
Is siting aligned?	Y
Does the propeller rotate 360° with no friction?	Y
Does the vane rotate 360° with no friction?	Y

Calibration Information

Direction (degrees °)			Anemometer Speed (m/s)		
Test Angle (°)	Recorded Angle (°)	Within +/- 5°? (Y/N)	Test Speed (m/s)	Recorded Speed (m/s)	Within +/- 3 (m/s)? (Y/N)
0	1	Y	26.112	26.0	Y
30	29	Y	24.576	24.5	Y
330	332	Y	23.040	22.9	Y
60	57	Y	20.480	20.4	Y
90	86	Y	18.944	18.9	Y
0	1	Y	40.960	40.8	Y
180	176	Y			
260	256	Y			

Comments	Conversion Factors	
	m/s	RPM
Wind monitor (SN:183487) was removed from tower, inspected and the calibration was checked on June 30, 2023. Mechanical bearings and shaft alignment were inspected. Bearings were cleaned of any dust buildup. Alignment was in good condition. Wind direction calibration adjustment was required based on the pre-calibration inspection. Other than cleaning and direction calibration, no additional maintenance was required. It is recommended that the instrument be cleaned biannually and bearings checked and replaced (if required) at the next calibration interval. After the calibration check, the wind monitor was re-installed and sited back to the original position.	26.112	5100.0
	24.576	4800.0
	23.040	4500.0
	20.480	4000.0
	18.944	3700.0
	40.960	8000.0
Calibration Adjustment Required?: Yes		

Appendix B
Sampling Field Sheets

FIELD SHEET			
PM_{10} (Partisol Monitoring Unit)			
CLEAN HARBORS CANADA INC			
RYLEY, ALBERTA			
A) GENERAL INFORMATION			
Filter ID:	C9700138		
PO Number:	235911		
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905		
Test number :	Particulate Test 860		
Sample Date:	23/09/03		yy/mm/dd
Shipping Date to Laboratory:	23/09/07		
PM10 Analysis Trigger Weight (mg):	1.09		weight which PM10 conc. > 50 µg/m^3
B) SAMPLING INFORMATION			
SAMPLE START			
Sampling Start Date:	23/09/03		
Sampling Start Time:	00:00		
Current Instrument Date:	23/08/30		
Current Instrument Time:	16:21		
Ambient Temperature °C:	27.3		
Barometric Pressure (mm Hg):	693		
Leak Check:	Pass		(Pass/Fail)
Clean PM10 Inlet:	Yes		(Yes/No)
Weather Conditions Sampling date :	Cloudy		
Weather Conditions set up:	Partly Sunny		
SAMPLE RETRIEVAL			
Sampled by	T. Webb		
Sampling End Date:	23/09/04		
Sampling End Time:	00:00		
Current Instrument Date:	23/09/06		
Current Instrument Time:	8:41		
Run Status:	X		(Ensure Run Status is OK)
Total Sampling Time (Hours):	23.01		
Volume Sampled (m^3):	21.8		
Average Flow Rate (L/min):	16.7 L/min		
AmbT °C :	10.2		
Barometric Pressure (mm Hg) :	700		
Sample Filter Temperature °C :	8.8		
Flow Rate Coefficient of Variation (%CV):	1.7		
Weather Conditions :	Cloudy, Fog		
Leak Check:	Pass		(Pass/Fail)
FIELD BLANK			(Once every quarter)
Was a field blank collected	Yes		(Yes/No)
Filter ID:	AT79028		
Filter Batch Number:			
Current Instrument Date:	23/09/06		
Current Instrument Time:	8:55		
C) OBSERVATIONS			
Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?	No		
Describe facility operations that may affect sampling event:			
Comments:	"X" error code - "Flow Cutoff – The measured sample flow rate deviates by more than 10% from its set point for mo		
	Sample time was 23.01 hrs due to flow shutoff near end of sample - flowrate dropped to 0 in last hour of sample		
	PM10 filter brown, very dirty		

FIELD SHEET
VOLATILE ORGANIC COMPOUNDS
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

A) GENERAL INFORMATION

Sample Identification Number:	Organic Test 860	
Sample Canister Location:	Ryley Lift Station -Shed	
Sampled by	T.Webb	
Sampler Name:	Test 860	
Sample Date:	23/09/03	yy/mm/dd
Shipping Date to Laboratory:	23/09/07	
Canister Type (ie. 1 Litre/6 Litre/Other):	6L	
Canister Serial No.:	32272	
Flow Controller Serial No.:	H/L578699/A0334390-5	

B) SAMPLE SET UP

	Set up Conditions	Sample Retrieval
Date:	23/08/30	23/09/06
Ambient Temperature °C (inside shed):	32.3	10.3
Barometric Pressure (mm Hg):	693	700
Canister Pressure Gauge Reading (- Inches Hg):	(-)27.1	(-)4
Sample Time:	24	24

C) OBSERVATIONS

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?	No
Describe general weather conditions during sampling event:	Cloudy
Describe facility operations that may affect sampling event:	None
Comments:	

CLEAN HARBORS CANADA INC
TSP (High Volume Monitoring Unit)
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

1. SAMPLING INFORMATION

Sample ID	Test #860				
Lab Filter ID	HVF-23-06-03				
Start Sampling	9 mm	3 dd	0 hr	2023	
Stop Sampling	9 mm	4 dd	0 hr	2023	
Timer Initial:	970.62				
Timer Final:	994.76				
	24.14				
Total Sampling Time	24 hr		8 min		1448 min
Average Flow Rate		cfm			
Actual m3/min	1.302				
Air Volume	1885.8	cubic metres			
Net TSP Weight		g			
TSP Concentration		mg/m3			
TSP Analysis Trigger Weight	94.3	mg	weight which TSP conc. > 50 µg/m^3		

3. OBSERVATIONS

Comments:

Instrument Last Calibrated:	30-Jun-23

3. GUIDELINES

- Faceplate must be handtight.
- Flow rate must be ±10 percent of established flow rate.
- Faceplate gasket must be in good condition.
- Rotameter must be free of foreign material.
- Rotameter operation must be stable.
- Sampler motor brushes must be changed every 400 hours of operation.
- TSP analysis triggers when concentration >0.05mg/m3

Sample was collected in accordance with the above guidelines.

Sampler's Signature: _____

Comments: _____

_____

FIELD SHEET			
PM_{10} (Partisol Monitoring Unit)			
CLEAN HARBORS CANADA INC			
RYLEY, ALBERTA			
A) GENERAL INFORMATION			
Filter ID:	AT79027		
PO Number:	235911		
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905		
Test number :	Particulate Test 861		
Sample Date:	23/09/09	yy/mm/dd	
Shipping Date to Laboratory:	23/09/12		
PM10 Analysis Trigger Weight (mg):	1.15	weight which PM10 conc. > 50 µg/m^3	
B) SAMPLING INFORMATION			
SAMPLE START			
Sampling Start Date:	23/09/09		
Sampling Start Time:	00:00		
Current Instrument Date:	23/09/07		
Current Instrument Time:	12:34		
Ambient Temperature °C:	19.9		
Barometric Pressure (mm Hg):	701		
Leak Check:	Pass	(Pass/Fail)	
Clean PM10 Inlet:	Yes	(Yes/No)	
Weather Conditions Sampling date :	Passing clouds		
Weather Conditions set up:	Passing clouds		
SAMPLE RETRIEVAL			
Sampled by	T. Webb		
Sampling End Date:	23/09/10		
Sampling End Time:	00:00		
Current Instrument Date:	23/09/11		
Current Instrument Time:	8:41		
Run Status:	Ok	(Ensure Run Status is OK)	
Total Sampling Time (Hours):	24		
Volume Sampled (m^3):	23		
Average Flow Rate (L/min):	16.7 L/min		
AmbT °C :	17.0		
Barometric Pressure (mm Hg) :	704		
Sample Filter Temperature °C :	15.3		
Flow Rate Coefficient of Variation (%CV):	0.1		
Weather Conditions :	Sunny		
Leak Check:	Pass	(Pass/Fail)	
FIELD BLANK		(Once every quarter)	
Was a field blank collected	No	(Yes/No)	
Filter ID:			
Filter Batch Number:			
Current Instrument Date:			
Current Instrument Time:			
C) OBSERVATIONS			
Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?	No		
Describe facility operations that may affect sampling event:			
Comments:			

FIELD SHEET
VOLATILE ORGANIC COMPOUNDS
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

A) GENERAL INFORMATION

Sample Identification Number:	Organic Test 861	
Sample Canister Location:	Ryley Lift Station -Shed	
Sampled by	T.Webb	
Sampler Name:	Test 861	
Sample Date:	23/09/09	yy/mm/dd
Shipping Date to Laboratory:	23/09/12	
Canister Type (ie. 1 Litre/6 Litre/Other):	6L	
Canister Serial No.:	32204	
Flow Controller Serial No.:	H/L578699/A0334390-5	

B) SAMPLE SET UP

	Set up Conditions	Sample Retrieval
Date:	23/09/07	23/09/11
Ambient Temperature °C (inside shed):	10.3	15.1
Barometric Pressure (mm Hg):	701	704
Canister Pressure Gauge Reading (- Inches Hg):	(-)27.1	(-)5
Sample Time:	24	24

C) OBSERVATIONS

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event? No

Describe general weather conditions during sampling event: Passing clouds

Describe facility operations that may affect sampling event: None

Comments:

CLEAN HARBORS CANADA INC
TSP (High Volume Monitoring Unit)
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

1. SAMPLING INFORMATION

Sample ID	Test #861				
Lab Filter ID	HVF-23-06-15				
Start Sampling	9	9	0	2023	
	mm	dd	hr		
Stop Sampling	9	10	0	2023	
	mm	dd	hr		
Timer Initial:	994.76				
Timer Final:	1018.38				
	23.62				
Total Sampling Time	23 hr		37 min		1417 min
Average Flow Rate	cfm				
Actual m3/min	1.302				
Air Volume	1845.2 cubic metres				
Net TSP Weight	g				
TSP Concentration	mg/m3				
TSP Analysis Trigger Weight	92.3 mg		weight which TSP conc. > 50 µg/m^3		

3. OBSERVATIONS

Comments:

Instrument Last Calibrated: 30-Jun-23

3. GUIDELINES

- Faceplate must be handtight.
- Flow rate must be ±10 percent of established flow rate.
- Faceplate gasket must be in good condition.
- Rotameter must be free of foreign material.
- Rotameter operation must be stable.
- Sampler motor brushes must be changed every 400 hours of operation.
- TSP analysis triggers when concentration >0.05mg/m3

Sample was collected in accordance with the above guidelines.

Sampler's Signature: _____

Comments: _____

CLEAN HARBORS CANADA INC
TSP (High Volume Monitoring Unit)
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

1. SAMPLING INFORMATION

Sample ID	Test #862				
Lab Filter ID	HVF-23-06-12				
Start Sampling	9	15	0	2023	
	mm	dd	hr		
Stop Sampling	9	16	0	2023	
	mm	dd	hr		
Timer Initial:	1018.38				
Timer Final:	1042.84				
	24.46				
Total Sampling Time	24	hr	28	min	1468 min
Average Flow Rate		cfm			
Actual m3/min	1.302				
Air Volume	1910.8	cubic metres			
Net TSP Weight		g			
TSP Concentration		mg/m3			
TSP Analysis Trigger Weight	95.5	mg	weight which TSP conc. > 50 µg/m^3		

3. OBSERVATIONS

Comments:

Instrument Last Calibrated: 30-Jun-23

3. GUIDELINES

- Faceplate must be handtight.
- Flow rate must be ±10 percent of established flow rate.
- Faceplate gasket must be in good condition.
- Rotameter must be free of foreign material.
- Rotameter operation must be stable.
- Sampler motor brushes must be changed every 400 hours of operation.
- TSP analysis triggers when concentration >0.05mg/m3

Sample was collected in accordance with the above guidelines.

Sampler's Signature: _____

Comments: _____

FIELD SHEET				
PM_{10} (Partisol Monitoring Unit)				
CLEAN HARBORS CANADA INC				
RYLEY, ALBERTA				
A) GENERAL INFORMATION				
Filter ID:	AT79034			
PO Number:	235911			
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905			
Test number :	Particulate Test 862			
Sample Date:	23/09/15		yy/mm/dd	
Shipping Date to Laboratory:	23/09/21			
PM10 Analysis Trigger Weight (mg):	1.15		weight which PM10 conc. > 50 µg/m^3	
B) SAMPLING INFORMATION				
SAMPLE START				
Sampling Start Date:	23/09/15			
Sampling Start Time:	00:00			
Current Instrument Date:	23/09/11			
Current Instrument Time:	8:50			
Ambient Temperature °C:	17.5			
Barometric Pressure (mm Hg):	704			
Leak Check:	Pass		(Pass/Fail)	
Clean PM10 Inlet:	Yes		(Yes/No)	
Weather Conditions Sampling date :	Partly Sunny			
Weather Conditions set up:	Partly Sunny			
SAMPLE RETRIEVAL				
Sampled by	T. Webb			
Sampling End Date:	23/09/16			
Sampling End Time:	00:00			
Current Instrument Date:	23/09/20			
Current Instrument Time:	12:43			
Run Status:	Ok		(Ensure Run Status is OK)	
Total Sampling Time (Hours):	24			
Volume Sampled (m^3):	23			
Average Flow Rate (L/min):	16.7 L/min			
AmbT °C :	12.6			
Barometric Pressure (mm Hg) :	703			
Sample Filter Temperature °C :	11.3			
Flow Rate Coefficient of Variation (%CV):	0			
Weather Conditions :	overcast, light rain			
Leak Check:	Pass		(Pass/Fail)	
FIELD BLANK			(Once every quarter)	
Was a field blank collected	No		(Yes/No)	
Filter ID:				
Filter Batch Number:				
Current Instrument Date:				
Current Instrument Time:				
C) OBSERVATIONS				
Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?	No			
Describe facility operations that may affect sampling event:				
Comments:				

FIELD SHEET
VOLATILE ORGANIC COMPOUNDS
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

A) GENERAL INFORMATION

Sample Identification Number:	Organic Test 862	
Sample Canister Location:	Ryley Lift Station -Shed	
Sampled by	T.Webb	
Sampler Name:	Test 862	
Sample Date:	23/09/15	yy/mm/dd
Shipping Date to Laboratory:	23/09/21	
Canister Type (ie. 1 Litre/6 Litre/Other):	6L	
Canister Serial No.:	28913	
Flow Controller Serial No.:	H/L578699/A0334390-5	

B) SAMPLE SET UP

	Set up Conditions	Sample Retrieval
Date:	23/09/11	23/09/20
Ambient Temperature °C (inside shed):	15.1	13.7
Barometric Pressure (mm Hg):	704	703
Canister Pressure Gauge Reading (- Inches Hg):	(-)27.1	(-)6
Sample Time:	24	24

C) OBSERVATIONS

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?	No
Describe general weather conditions during sampling event:	partly Sunny
Describe facility operations that may affect sampling event:	None
Comments:	

CLEAN HARBORS CANADA INC
TSP (High Volume Monitoring Unit)
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

1. SAMPLING INFORMATION

Sample ID	Test #863			
Lab Filter ID	HVF-23-06-13			
Start Sampling	9 mm	21 dd	0 hr	2023
Stop Sampling	9 mm	22 dd	0 hr	2023
Timer Initial:	1042.84			
Timer Final:	1067.42			
	24.58			

Total Sampling Time	24	hr	35	min	1475
Average Flow Rate		cfm			
Actual m3/min	1.302				
Air Volume	1920.2	cubic metres			
Net TSP Weight		g			
TSP Concentration		mg/m3			
TSP Analysis Trigger Weight	96.0	mg	weight which TSP conc. > 50 µg/m^3		

3. OBSERVATIONS

Comments:

Instrument Last Calibrated: 30-Jun-23

3. GUIDELINES

- Faceplate must be handtight.
- Flow rate must be ±10 percent of established flow rate.
- Faceplate gasket must be in good condition.
- Rotameter must be free of foreign material.
- Rotameter operation must be stable.
- Sampler motor brushes must be changed every 400 hours of operation.
- TSP analysis triggers when concentration >0.05mg/m3

Sample was collected in accordance with the above guidelines.

Sampler's Signature: _____

Comments: _____

FIELD SHEET			
PM_{10} (Partisol Monitoring Unit)			
CLEAN HARBORS CANADA INC			
RYLEY, ALBERTA			
A) GENERAL INFORMATION			
Filter ID:	AT79032		
PO Number:	235911		
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905		
Test number :	Particulate Test 863		
Sample Date:	23/09/21	yy/mm/dd	
Shipping Date to Laboratory:	23/09/25		
PM10 Analysis Trigger Weight (mg):	1.17	weight which PM10 conc. > 50 µg/m^3	
B) SAMPLING INFORMATION			
SAMPLE START			
Sampling Start Date:	23/09/21		
Sampling Start Time:	00:00		
Current Instrument Date:	23/09/20		
Current Instrument Time:	12:52		
Ambient Temperature °C:	13.1		
Barometric Pressure (mm Hg):	703		
Leak Check:	Pass	(Pass/Fail)	
Clean PM10 Inlet:	Yes	(Yes/No)	
Weather Conditions Sampling date :	Partly Sunny		
Weather Conditions set up:	Scattered Showers		
SAMPLE RETRIEVAL			
Sampled by	T. Webb		
Sampling End Date:	23/09/22		
Sampling End Time:	00:00		
Current Instrument Date:	23/09/22		
Current Instrument Time:	13:43		
Run Status:	Ok	(Ensure Run Status is OK)	
Total Sampling Time (Hours):	24		
Volume Sampled (m^3):	23.4		
Average Flow Rate (L/min):	16.7 L/min		
AmbT °C :	22.4		
Barometric Pressure (mm Hg) :	703		
Sample Filter Temperature °C :	22.0		
Flow Rate Coefficient of Variation (%CV):	0.1		
Weather Conditions :	Mostly Sunny		
Leak Check:	Pass	(Pass/Fail)	
FIELD BLANK		(Once every quarter)	
Was a field blank collected	No	(Yes/No)	
Filter ID:			
Filter Batch Number:			
Current Instrument Date:			
Current Instrument Time:			
C) OBSERVATIONS			
Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?	No		
Describe facility operations that may affect sampling event:			
Comments:			

FIELD SHEET
VOLATILE ORGANIC COMPOUNDS
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

A) GENERAL INFORMATION

Sample Identification Number:	Organic Test 863	
Sample Canister Location:	Ryley Lift Station -Shed	
Sampled by	T.Webb	
Sampler Name:	Test 863	
Sample Date:	23/09/21	yy/mm/dd
Shipping Date to Laboratory:	23/09/25	
Canister Type (ie. 1 Litre/6 Litre/Other):	6L	
Canister Serial No.:	29015	
Flow Controller Serial No.:	H/L578699/A0334390-5	

B) SAMPLE SET UP

	Set up Conditions	Sample Retrieval
Date:	23/09/20	23/09/22
Ambient Temperature °C (inside shed):	13.7	28.8
Barometric Pressure (mm Hg):	703	702
Canister Pressure Gauge Reading (- Inches Hg):	(-)27.1	(-)4
Sample Time:	24	24

C) OBSERVATIONS

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?	No
Describe general weather conditions during sampling event:	partly Sunny
Describe facility operations that may affect sampling event:	None
Comments:	

CLEAN HARBORS CANADA INC
TSP (High Volume Monitoring Unit)
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

1. SAMPLING INFORMATION

Sample ID	Test #864			
Lab Filter ID	HVF-23-06-14			
Start Sampling	9	21	0	2023
	mm	dd	hr	
Stop Sampling	9	22	0	2023
	mm	dd	hr	
Timer Initial:	1067.42			
Timer Final:	1091.56			
	24.14			

Total Sampling Time	24	hr	8	min	1448
Average Flow Rate		cfm			
Actual m3/min	1.302				
Air Volume	1885.8	cubic metres			
Net TSP Weight		g			
TSP Concentration		mg/m3			
TSP Analysis Trigger Weight	94.3	mg	weight which TSP conc. > 50 µg/m^3		

3. OBSERVATIONS

Comments:

Instrument Last Calibrated: 30-Jun-23

3. GUIDELINES

- Faceplate must be handtight.
- Flow rate must be ±10 percent of established flow rate.
- Faceplate gasket must be in good condition.
- Rotameter must be free of foreign material.
- Rotameter operation must be stable.
- Sampler motor brushes must be changed every 400 hours of operation.
- TSP analysis triggers when concentration >0.05mg/m3

Sample was collected in accordance with the above guidelines.

Sampler's Signature: _____

Comments: _____

FIELD SHEET				
PM_{10} (Partisol Monitoring Unit)				
CLEAN HARBORS CANADA INC				
RYLEY, ALBERTA				
A) GENERAL INFORMATION				
Filter ID:	AT79033			
PO Number:	235911			
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905			
Test number :	Particulate Test 864			
Sample Date:	23/09/27		yy/mm/dd	
Shipping Date to Laboratory:	23/09/28			
PM10 Analysis Trigger Weight (mg):	1.15		weight which PM10 conc. > 50 µg/m^3	
B) SAMPLING INFORMATION				
SAMPLE START				
Sampling Start Date:	23/09/27			
Sampling Start Time:	00:00			
Current Instrument Date:	23/09/22			
Current Instrument Time:	13:53			
Ambient Temperature °C:	22.9			
Barometric Pressure (mm Hg):	702			
Leak Check:	Pass		(Pass/Fail)	
Clean PM10 Inlet:	Yes		(Yes/No)	
Weather Conditions Sampling date :	Mostly Sunny			
Weather Conditions set up:	Partly Sunny			
SAMPLE RETRIEVAL				
Sampled by	T. Webb			
Sampling End Date:	23/09/28			
Sampling End Time:	00:00			
Current Instrument Date:	23/09/28			
Current Instrument Time:	7:30			
Run Status:	Ok		(Ensure Run Status is OK)	
Total Sampling Time (Hours):	24			
Volume Sampled (m^3):	22.9			
Average Flow Rate (L/min):	16.7 L/min			
AmbT °C :	6.7			
Barometric Pressure (mm Hg) :	697			
Sample Filter Temperature °C :	6.4			
Flow Rate Coefficient of Variation (%CV):	0			
Weather Conditions :	Mostly Sunny			
Leak Check:	Pass		(Pass/Fail)	
FIELD BLANK			(Once every quarter)	
Was a field blank collected	No		(Yes/No)	
Filter ID:				
Filter Batch Number:				
Current Instrument Date:				
Current Instrument Time:				
C) OBSERVATIONS				
Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?	No			
Describe facility operations that may affect sampling event:				
Comments:				

FIELD SHEET
VOLATILE ORGANIC COMPOUNDS
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

A) GENERAL INFORMATION

Sample Identification Number:	Organic Test 864	
Sample Canister Location:	Ryley Lift Station -Shed	
Sampled by	T.Webb	
Sampler Name:	Test 864	
Sample Date:	23/09/27	yy/mm/dd
Shipping Date to Laboratory:	23/09/28	
Canister Type (ie. 1 Litre/6 Litre/Other):	6L	
Canister Serial No.:	32267	
Flow Controller Serial No.:	H/L578699/A0334390-5	

B) SAMPLE SET UP

	Set up Conditions	Sample Retrieval
Date:	23/09/22	23/09/28
Ambient Temperature °C (inside shed):	28.8	5.9
Barometric Pressure (mm Hg):	702	697
Canister Pressure Gauge Reading (- Inches Hg):	(-)27.1	(-)5
Sample Time:	24	24

C) OBSERVATIONS

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event? No

Describe general weather conditions during sampling event: Mostly Sunny

Describe facility operations that may affect sampling event: None

Comments:

FIELD SHEET
TSP (High Volume Monitoring Unit)
CLEAN HARBORS CANADA INC
RYLEY, ALBERTA

1. SAMPLING INFORMATION

Sample ID	Facility Test # 106				
Lab Filter ID	HV-23-02-11				
Start Sampling	9	1	15	2023	
	mm	dd	hr		
Stop Sampling	10	1	12	2023	
	mm	dd	hr		
Timer Initial:	3176.53				
Timer Final:	3201.22				
Total Sampling Time	24 hr	41 min	1481		
Average Flow Rate	cfm				
Actual m3/min	1.304				
Air Volume	1931.2 cubic metres				
Net TSP Weight	g				
TSP Concentration	mg/m3				

2. SAMPLING INFORMATION

Sample ID	School Test # 106				
Lab Filter ID	HV-23-02-12				
Start Sampling	9	1	15	2023	
	mm	dd	hr		
Stop Sampling	10	1	12	2023	
	mm	dd	hr		
Timer Initial:	2576.92				
Timer Final:	2601.71				
Total Sampling Time	24 hr	43 min	1483	min	
Average Flow Rate	cfm				
Actual m3/min	1.295				
Air Volume	1920.5 cubic metres				
Net TSP Weight	g				
TSP Concentration	mg/m3				

3. OBSERVATIONS

Comments:

Instrument Last Calibrated: 28-Sep-23

3. GUIDELINES

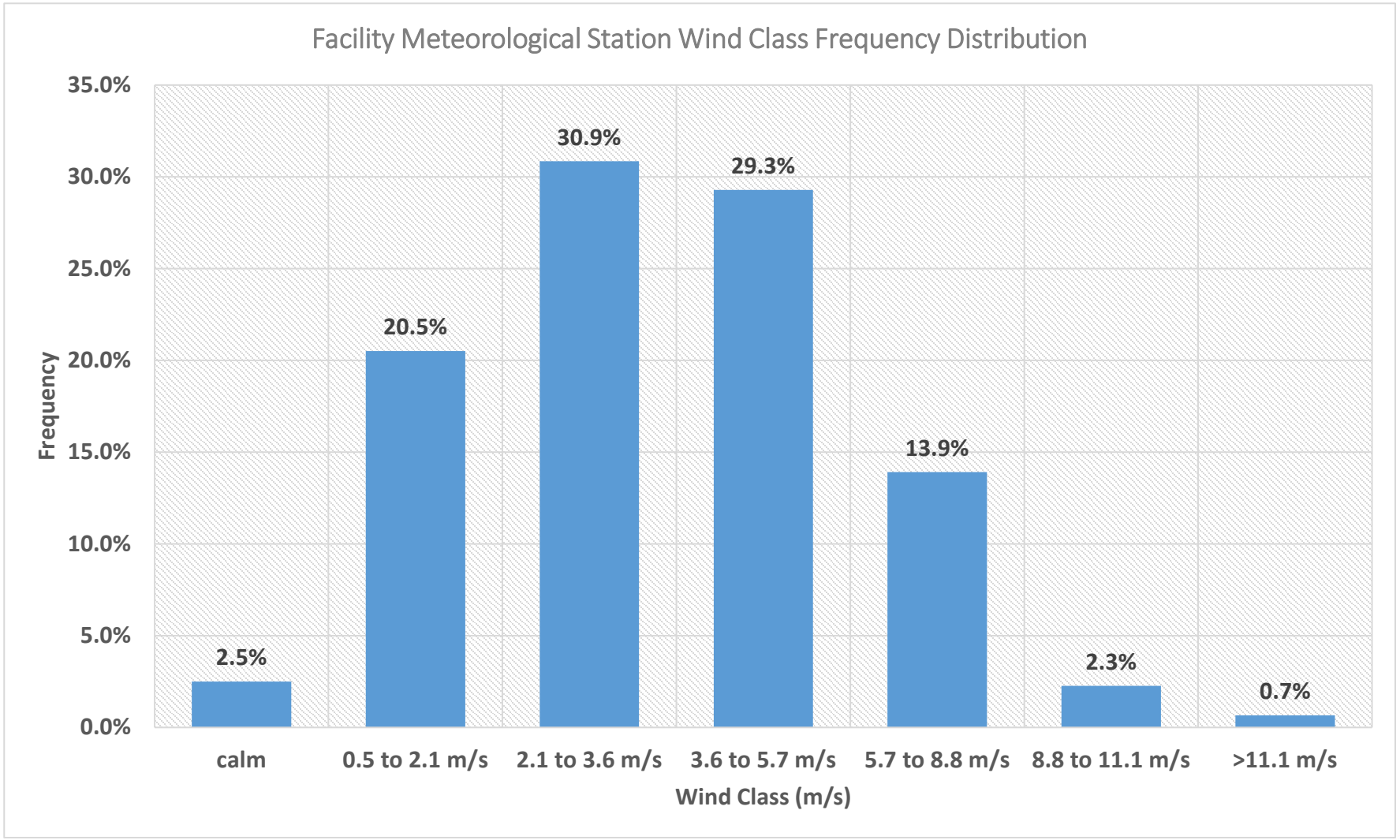
- Faceplate must be handtight.
- Flow rate must be ±10 percent of established flow rate.
- Faceplate gasket must be in good condition.
- Rotameter must be free of foreign material.
- Rotameter operation must be stable.
- Sampler motor brushes must be changed every 400 hours of operation.

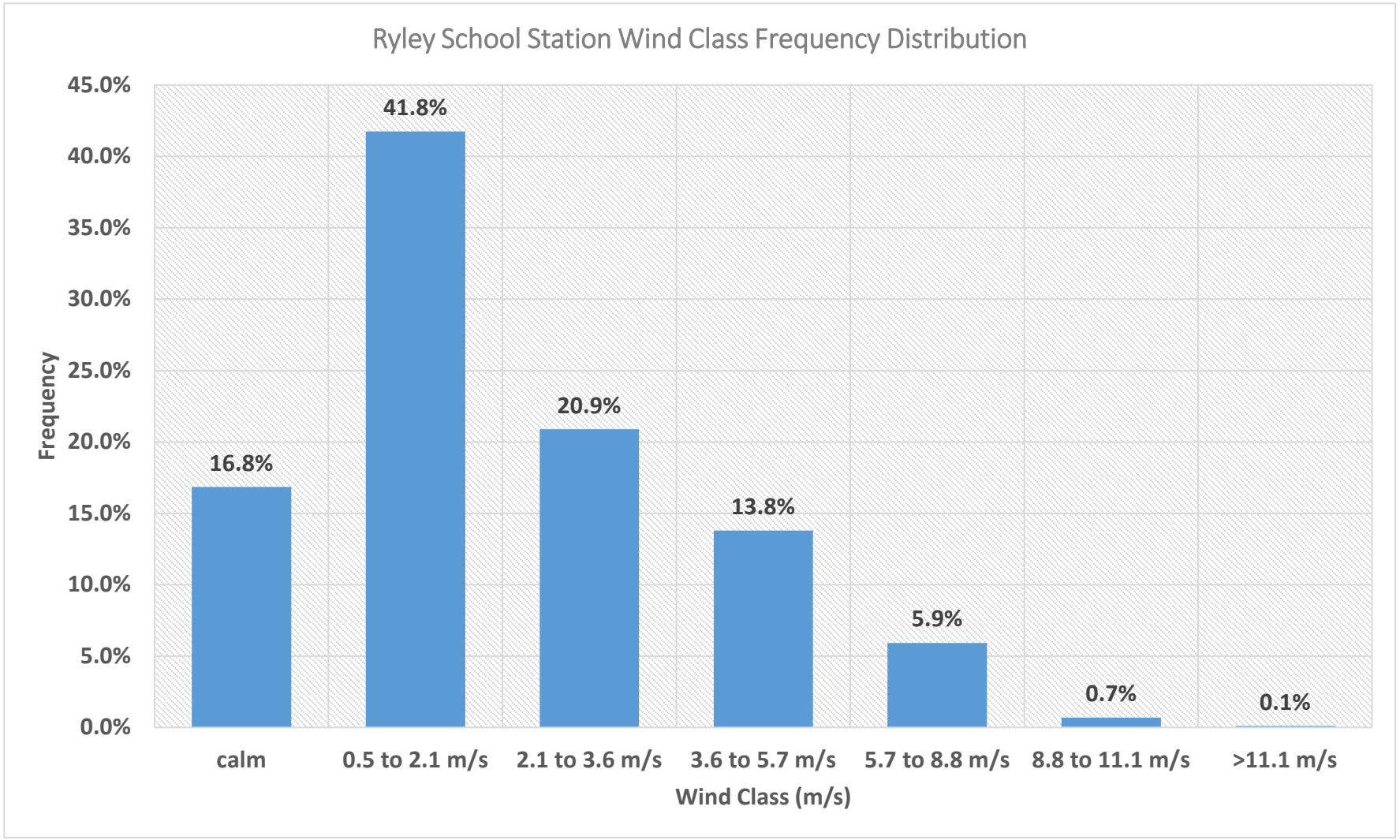
Sample was collected in accordance with the above guidelines.

Sampler's Signature: 

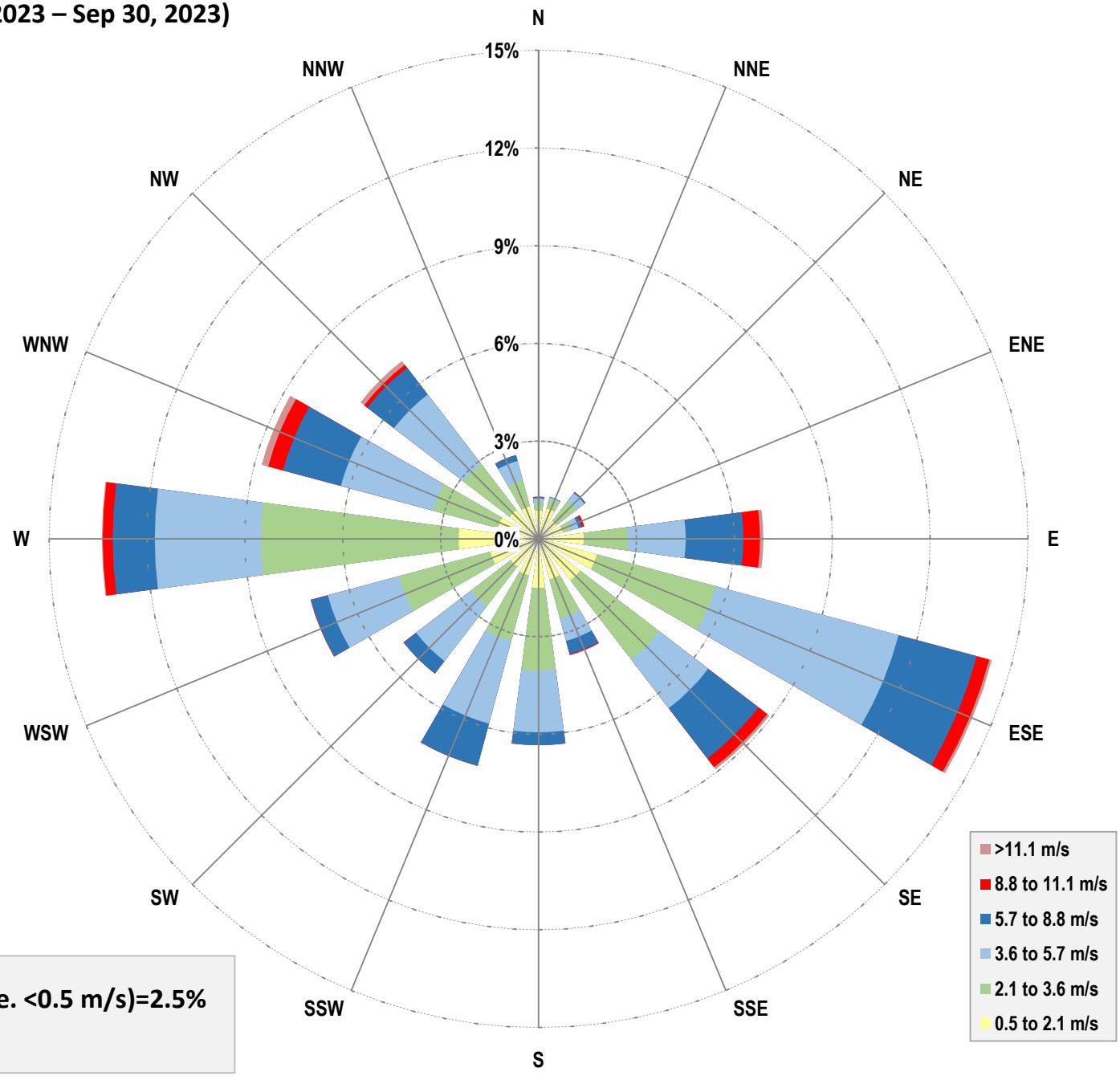
Comments:

Appendix C
Wind Class Frequency Distribution Graphs and Wind Rose


Facility Meteorological Station Wind Class Frequency Distribution
35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
Frequency
2.5%
20.5%
30.9%
29.3%
13.9%
2.3%
0.7%
calm
0.5 to 2.1 m/s
2.1 to 3.6 m/s
3.6 to 5.7 m/s
5.7 to 8.8 m/s
8.8 to 11.1 m/s
>11.1 m/s
Wind Class (m/s)

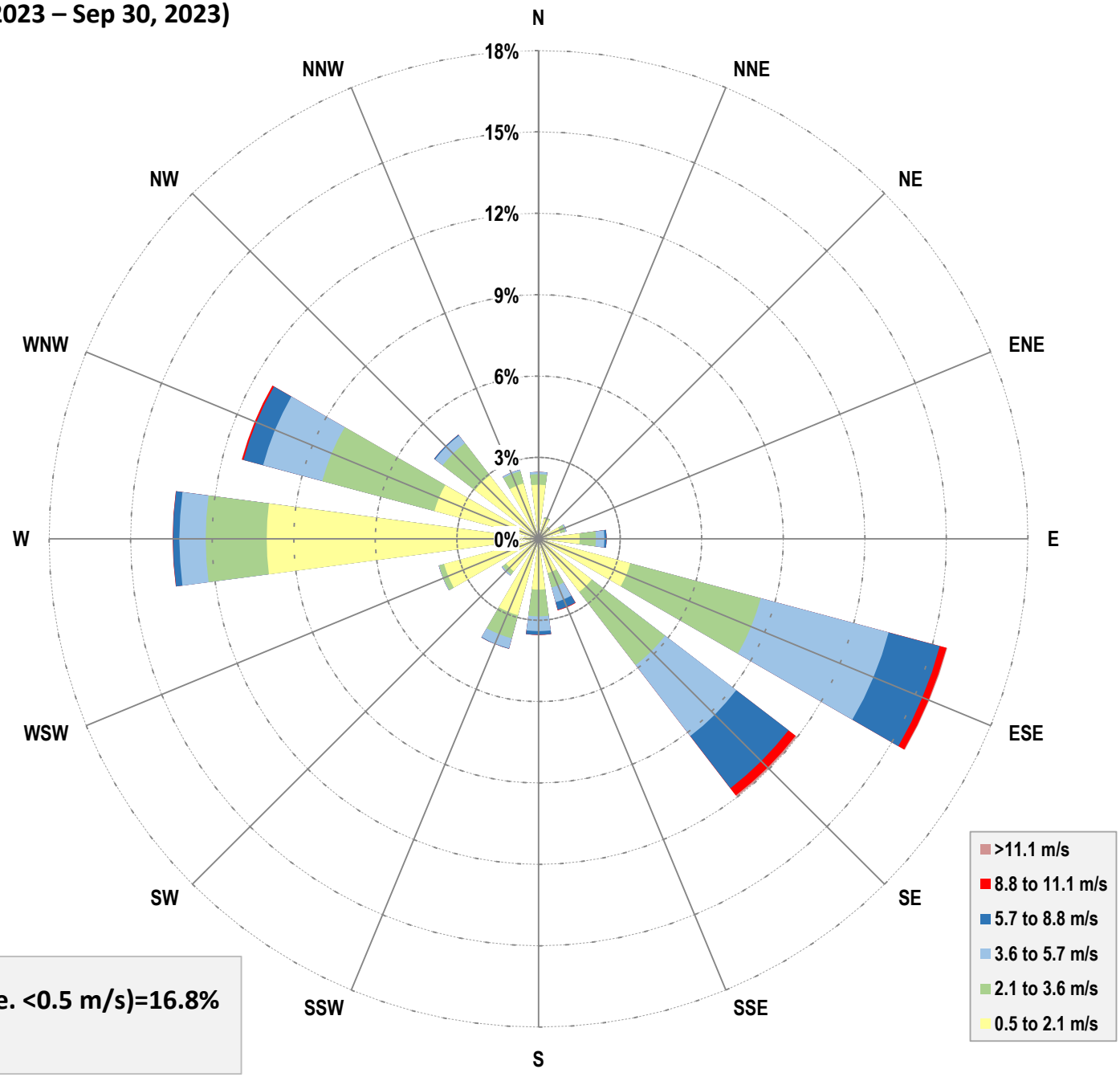

Ryley School Station Wind Class Frequency Distribution
45.0%
40.0%
35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
Frequency
16.8%
41.8%
20.9%
13.8%
5.9%
0.7%
0.1%
calm
0.5 to 2.1 m/s
2.1 to 3.6 m/s
3.6 to 5.7 m/s
5.7 to 8.8 m/s
8.8 to 11.1 m/s
>11.1 m/s
Wind Class (m/s)

Clean Harbors Facility Meteorological Station
(Sep 1, 2023 – Sep 30, 2023)



calms (i.e. <0.5 m/s)=2.5%

Clean Harbors Ryley School Station
(Sep 1, 2023 – Sep 30, 2023)



calms (i.e. <0.5 m/s)=16.8%

Appendix D
Chain of Custody Forms and Laboratory Analytical Reports

InnoTech ALBERTA
PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Todd Webb
Clean Harbors Environmental
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

INVOICE: Stephanie Dennis
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

CLIENT SAMPLE ID: Ryley Facility Test # 106, HVF-23-02-11
Matrix: Air Filter
CANISTER ID:
PRIORITY: Normal
DESCRIPTION: Filter #: HVF-23-02-11
DATE SAMPLED: 01-Sep-23
DATE RECEIVED: 06-Oct-23
REPORT CREATED: 25-Oct-23
REPORT NUMBER: 23100042
VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100042-001	Antimony		190	ng/Filter	0.30	AC-021	20-Oct-23
23100042-001	Arsenic		2260	ng/Filter	0.30	AC-021	20-Oct-23
23100042-001	Barium	K, T, U	< 300	ng/Filter	300	AC-021	20-Oct-23
23100042-001	Beryllium		168	ng/Filter	0.60	AC-021	20-Oct-23
23100042-001	Boron		2640000	ng/Filter	600	AC-021	20-Oct-23
23100042-001	Cadmium		971	ng/Filter	0.80	AC-021	20-Oct-23
23100042-001	Chromium		7260	ng/Filter	20	AC-021	20-Oct-23
23100042-001	Cobalt		2060	ng/Filter	0.50	AC-021	20-Oct-23
23100042-001	Copper		22000	ng/Filter	20	AC-021	20-Oct-23
23100042-001	Iron		4470000	ng/Filter	80	AC-021	20-Oct-23
23100042-001	Lead		15900	ng/Filter	0.70	AC-021	20-Oct-23
23100042-001	Manganese		114000	ng/Filter	1.0	AC-021	20-Oct-23
23100042-001	Mercury	K, T, U	< 0.70	ng/Filter	0.70	AC-021	20-Oct-23
23100042-001	Nickel		10900	ng/Filter	5.0	AC-021	20-Oct-23
23100042-001	Selenium		1720	ng/Filter	4.0	AC-021	20-Oct-23
23100042-001	Silver		44.9	ng/Filter	0.50	AC-021	20-Oct-23
23100042-001	Thallium		32.1	ng/Filter	0.20	AC-021	20-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing
Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

InnoTech ALBERTA
PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
Ryley Facility Test # 106, HVF-23-02-11		Air Filter	01-Sep-23

DESCRIPTION: Filter #: HVF-23-02-11

REPORT NUMBER: 23100042 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100042-001	Tin	K, T, U	< 0.20	ng/Filter	0.20	AC-021	20-Oct-23
23100042-001	Uranium		414	ng/Filter	0.200	AC-021	20-Oct-23
23100042-001	Vanadium		10800	ng/Filter	0.40	AC-021	20-Oct-23
23100042-001	Zinc	K, T, U	< 1000	ng/Filter	1000	AC-021	20-Oct-23
23100042-001	Particulate Weight		418	mg	0.1	Research	10-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

InnoTech ALBERTA
PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
Ryley School Test # 106, HVF-23-02-12		Air Filter	01-Sep-23

DESCRIPTION: Filter #: HVF-23-02-12

REPORT NUMBER: 23100042 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100042-002	Antimony		214	ng/Filter	0.30	AC-021	20-Oct-23
23100042-002	Arsenic		1610	ng/Filter	0.30	AC-021	20-Oct-23
23100042-002	Barium	K, T, U	< 300	ng/Filter	300	AC-021	20-Oct-23
23100042-002	Beryllium		90.8	ng/Filter	0.60	AC-021	20-Oct-23
23100042-002	Boron		3860000	ng/Filter	600	AC-021	20-Oct-23
23100042-002	Cadmium		463	ng/Filter	0.80	AC-021	20-Oct-23
23100042-002	Chromium		4360	ng/Filter	20	AC-021	20-Oct-23
23100042-002	Cobalt		844	ng/Filter	0.50	AC-021	20-Oct-23
23100042-002	Copper		293000	ng/Filter	20	AC-021	20-Oct-23
23100042-002	Iron		2500000	ng/Filter	80	AC-021	20-Oct-23
23100042-002	Lead		2030	ng/Filter	0.70	AC-021	20-Oct-23
23100042-002	Manganese		107000	ng/Filter	1.0	AC-021	20-Oct-23
23100042-002	Mercury	K, T, U	< 0.70	ng/Filter	0.70	AC-021	20-Oct-23
23100042-002	Nickel		3470	ng/Filter	5.0	AC-021	20-Oct-23
23100042-002	Selenium		1350	ng/Filter	4.0	AC-021	20-Oct-23
23100042-002	Silver		174	ng/Filter	0.50	AC-021	20-Oct-23
23100042-002	Thallium		23.7	ng/Filter	0.20	AC-021	20-Oct-23
23100042-002	Tin	K, T, U	< 0.20	ng/Filter	0.20	AC-021	20-Oct-23
23100042-002	Uranium		89.9	ng/Filter	0.200	AC-021	20-Oct-23
23100042-002	Vanadium		3890	ng/Filter	0.40	AC-021	20-Oct-23
23100042-002	Zinc	K, T, U	< 1000	ng/Filter	1000	AC-021	20-Oct-23
23100042-002	Particulate Weight		248	mg	0.1	Research	10-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

Revision History

Order ID	Ver	Date	Reason
23100042	01	25-Oct-23	Report created

Methods

Method	Description
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
Research	Research method

List of Analytical Method IDs within InnoTech's ISO/IEC 17025:2017 CALA Scope of Accreditation

Method ID	Description
AC-013	Mercury in Waters by Cold Vapor Atomic Fluorescence Detection (CVAFS)
AC-020	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-026	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-035	Analysis of Glyphosate, Aminomethylphosphonic Acid and Glufosinate in Water
AC-038	Trace Metal Analysis of Water Samples by ICP-MS
AC-048	Specific Conductance (Conductivity Meter Method)
AC-049	pH (Meter Method)
AC-054	Alkalinity Total and Phenolphthalein
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
AC-060	Trace Metal Analysis of Soil Sediment and Industrial Waste Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-061	Trace Metal Analysis for Biological Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-065	Analysis of Naphthenic Acids in Water by HPLC-Orbitrap-MS analysis
AC-074	Pesticides in Water
AC-079	Alkylated PAH in Soil and Sediment
AC-080	Alkylated PAH in Water (SPE Extraction)
NA-006	Determination of BTEX, F1 Hydrocarbons and F2, F3 and F4 Hydrocarbons in Water
NA-024	Analysis of Reduced Sulfur Compounds in Air

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
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Qualifiers

Data Qualifier	Translation
B	Blank contamination; Analyte detected above the method reporting limit in an associated blank
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J1	Reported value is estimated; Surrogate recoveries limits were exceeded
J2	Reported value is estimated; No known QC criteria for this component
J3	Reported value is estimated; The value failed to meet QC criteria for either precision or accuracy
J4	Reported value is estimated; The sample matrix interfered with the analysis
K	Off-scale low. Actual value is known to be less than the value given
L	Off-scale high. Actual value is known to be greater than value given
N	Non-target analyte; Tentatively identified compound (using mass spectroscopy)
Q	Sample held beyond the accepted holding time
R	Rejected data; Not suitable for the projects intended use
T	Value reported is less than the laboratory method detection limit
U	Compound was analyzed for but not detected
V	Analyte was detected in both the sample and the associated method blank

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

Order Comments

23100042

Re: QT140005. Report also to Stan Yuha.

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

Sample Comments

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

Result Comments

Note:

1. Results relate only to items tested and apply to the sample as received.

2. This report shall not be reproduced, except in full, without the explicit approval of the laboratory.

InnoTech ALBERTA
PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Todd Webb
Clean Harbors Environmental
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

INVOICE: Stephanie Dennis
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

CLIENT SAMPLE ID: HI-VOL Test Number: 860 - Filter # HVF-23-06-03

Matrix: Air Filter

CANISTER ID:

PRIORITY: Normal

DESCRIPTION: HI-VOL Filter

DATE SAMPLED: 03-Sep-23 0:00

DATE RECEIVED: 08-Sep-23

REPORT CREATED: 25-Oct-23

REPORT NUMBER: 23090099

VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090099-003	Antimony		661	ng/Filter	0.30	AC-021	20-Oct-23
23090099-003	Arsenic		2980	ng/Filter	0.30	AC-021	20-Oct-23
23090099-003	Barium	K, T, U	< 300	ng/Filter	300	AC-021	20-Oct-23
23090099-003	Beryllium		73.0	ng/Filter	0.60	AC-021	20-Oct-23
23090099-003	Boron	K, T, U	< 600	ng/Filter	600	AC-021	20-Oct-23
23090099-003	Cadmium		1450	ng/Filter	0.80	AC-021	20-Oct-23
23090099-003	Chromium		14300	ng/Filter	20	AC-021	20-Oct-23
23090099-003	Cobalt		1780	ng/Filter	0.50	AC-021	20-Oct-23
23090099-003	Copper		393000	ng/Filter	20	AC-021	20-Oct-23
23090099-003	Iron		3660000	ng/Filter	80	AC-021	20-Oct-23
23090099-003	Lead		17600	ng/Filter	0.70	AC-021	20-Oct-23
23090099-003	Manganese		209000	ng/Filter	1.0	AC-021	20-Oct-23
23090099-003	Mercury		20.4	ng/Filter	0.70	AC-021	20-Oct-23
23090099-003	Nickel		11400	ng/Filter	5.0	AC-021	20-Oct-23
23090099-003	Selenium		160	ng/Filter	4.0	AC-021	20-Oct-23
23090099-003	Silver		421	ng/Filter	0.50	AC-021	20-Oct-23
23090099-003	Thallium		68.5	ng/Filter	0.20	AC-021	20-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing
Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
HI-VOL Test Number: 860 - Filter # HVF-23-06-03		Air Filter	03-Sep-23 0:00

DESCRIPTION: HI-VOL Filter

REPORT NUMBER: 23090099 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090099-003	Tin		72.8	ng/Filter	0.20	AC-021	20-Oct-23
23090099-003	Uranium		703	ng/Filter	0.200	AC-021	20-Oct-23
23090099-003	Vanadium		8510	ng/Filter	0.40	AC-021	20-Oct-23
23090099-003	Zinc	K, T, U	< 1000	ng/Filter	1000	AC-021	20-Oct-23
23090099-003	Particulate Weight		377	mg	0.1	Research	12-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
PM10 Quarter 3 Field Blank - Filter # AT79028		Air Filter	06-Sep-23 8:55

DESCRIPTION:

REPORT NUMBER: 23090099 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090099-004	Antimony	K, T, U	< 0.03	ng/Filter	0.03	AC-021	19-Oct-23
23090099-004	Arsenic	K, T, U	< 0.03	ng/Filter	0.03	AC-021	19-Oct-23
23090099-004	Barium	K, T, U	< 0.3	ng/Filter	0.3	AC-021	19-Oct-23
23090099-004	Beryllium	K, T, U	< 0.06	ng/Filter	0.06	AC-021	19-Oct-23
23090099-004	Boron	I	3.4	ng/Filter	0.6	AC-021	19-Oct-23
23090099-004	Cadmium	K, T, U	< 0.08	ng/Filter	0.08	AC-021	19-Oct-23
23090099-004	Chromium	K, T, U	< 2	ng/Filter	2	AC-021	19-Oct-23
23090099-004	Cobalt	K, T, U	< 0.05	ng/Filter	0.05	AC-021	19-Oct-23
23090099-004	Copper	K, T, U	< 2	ng/Filter	2	AC-021	19-Oct-23
23090099-004	Iron	K, T, U	< 8	ng/Filter	8	AC-021	19-Oct-23
23090099-004	Lead	K, T, U	< 0.07	ng/Filter	0.07	AC-021	19-Oct-23
23090099-004	Manganese	I	0.8	ng/Filter	0.1	AC-021	19-Oct-23
23090099-004	Mercury	K, T, U	< 0.07	ng/Filter	0.07	AC-021	19-Oct-23
23090099-004	Nickel	K, T, U	< 0.5	ng/Filter	0.5	AC-021	19-Oct-23
23090099-004	Selenium	I	0.8	ng/Filter	0.4	AC-021	19-Oct-23
23090099-004	Silver	K, T, U	< 0.05	ng/Filter	0.05	AC-021	19-Oct-23
23090099-004	Thallium	K, T, U	< 0.02	ng/Filter	0.02	AC-021	19-Oct-23
23090099-004	Tin	K, T, U	< 0.02	ng/Filter	0.02	AC-021	19-Oct-23
23090099-004	Uranium	K, T, U	< 0.020	ng/Filter	0.020	AC-021	19-Oct-23
23090099-004	Vanadium	K, T, U	< 0.04	ng/Filter	0.04	AC-021	19-Oct-23
23090099-004	Zinc	K, T, U	< 1	ng/Filter	1	AC-021	19-Oct-23
23090099-004	Particulate Weight	K, T, U	< 0.004	mg	0.004	AC-029	14-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
PM10 Test Number: 860 - Filter # C9700138		Air Filter	03-Sep-23 0:00

DESCRIPTION: PM10 Filter

REPORT NUMBER: 23090099 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090099-002	Antimony		28.2	ng/Filter	0.03	AC-021	19-Oct-23
23090099-002	Arsenic		17.0	ng/Filter	0.03	AC-021	19-Oct-23
23090099-002	Barium		493	ng/Filter	0.3	AC-021	19-Oct-23
23090099-002	Beryllium		0.61	ng/Filter	0.06	AC-021	19-Oct-23
23090099-002	Boron		509	ng/Filter	0.6	AC-021	19-Oct-23
23090099-002	Cadmium		18.9	ng/Filter	0.08	AC-021	19-Oct-23
23090099-002	Chromium		41	ng/Filter	2	AC-021	19-Oct-23
23090099-002	Cobalt		8.81	ng/Filter	0.05	AC-021	19-Oct-23
23090099-002	Copper		369	ng/Filter	2	AC-021	19-Oct-23
23090099-002	Iron		20200	ng/Filter	8	AC-021	19-Oct-23
23090099-002	Lead		72.4	ng/Filter	0.07	AC-021	19-Oct-23
23090099-002	Manganese		1380	ng/Filter	0.1	AC-021	19-Oct-23
23090099-002	Mercury		0.46	ng/Filter	0.07	AC-021	19-Oct-23
23090099-002	Nickel		65.4	ng/Filter	0.5	AC-021	19-Oct-23
23090099-002	Selenium		13.1	ng/Filter	0.4	AC-021	19-Oct-23
23090099-002	Silver		2.61	ng/Filter	0.05	AC-021	19-Oct-23
23090099-002	Thallium		1.00	ng/Filter	0.02	AC-021	19-Oct-23
23090099-002	Tin		3.18	ng/Filter	0.02	AC-021	19-Oct-23
23090099-002	Uranium		2.28	ng/Filter	0.020	AC-021	19-Oct-23
23090099-002	Vanadium		45.3	ng/Filter	0.04	AC-021	19-Oct-23
23090099-002	Zinc		1710	ng/Filter	1	AC-021	19-Oct-23
23090099-002	Particulate Weight		3.61	mg	0.004	AC-029	14-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test Number: 860	32272	Ambient Air	03-Sep-23 0:00

DESCRIPTION:

REPORT NUMBER: 23090099 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090099-001	Total Non-Methane Organic Carbon	K, T, U	< 0.08	ppmv	0.08	NA-028	08-Sep-23
23090099-001	1,2,3-Trimethylbenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	10-Sep-23
23090099-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Sep-23
23090099-001	1,3,5-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Sep-23
23090099-001	1-Butene/Isobutylene	I	0.26	ppbv	0.10	AC-058	10-Sep-23
23090099-001	1-Hexene/2-Methyl-1-pentene	K, T, U	< 0.12	ppbv	0.12	AC-058	10-Sep-23
23090099-001	1-Pentene	I	0.08	ppbv	0.05	AC-058	10-Sep-23
23090099-001	2,2,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23
23090099-001	2,2-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23
23090099-001	2,3,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23
23090099-001	2,3-Dimethylbutane	K, T, U	< 0.15	ppbv	0.15	AC-058	10-Sep-23
23090099-001	2,3-Dimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23
23090099-001	2,4-Dimethylpentane	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Sep-23
23090099-001	2-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23
23090099-001	2-Methylhexane	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Sep-23
23090099-001	2-Methylpentane	I	0.09	ppbv	0.03	AC-058	10-Sep-23
23090099-001	3-Methylheptane	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Sep-23
23090099-001	3-Methylhexane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23
23090099-001	3-Methylpentane	I	0.06	ppbv	0.03	AC-058	10-Sep-23
23090099-001	Benzene		1.46	ppbv	0.05	AC-058	10-Sep-23
23090099-001	cis-2-Butene	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Sep-23
23090099-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23
23090099-001	Cyclohexane	K, T, U	< 0.07	ppbv	0.07	AC-058	10-Sep-23
23090099-001	Cyclopentane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23
23090099-001	Ethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test Number: 860	32272	Ambient Air	03-Sep-23 0:00

DESCRIPTION:

REPORT NUMBER: 23090099 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090099-001	Isobutane		0.40	ppbv	0.05	AC-058	10-Sep-23
23090099-001	Isopentane		0.65	ppbv	0.07	AC-058	10-Sep-23
23090099-001	Isoprene		0.34	ppbv	0.03	AC-058	10-Sep-23
23090099-001	Isopropylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	10-Sep-23
23090099-001	m,p-Xylene	I	0.08	ppbv	0.07	AC-058	10-Sep-23
23090099-001	m-Diethylbenzene	I	0.09	ppbv	0.03	AC-058	10-Sep-23
23090099-001	m-Ethyltoluene	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Sep-23
23090099-001	Methylcyclohexane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23
23090099-001	Methylcyclopentane	I	0.08	ppbv	0.08	AC-058	10-Sep-23
23090099-001	n-Butane		0.89	ppbv	0.03	AC-058	10-Sep-23
23090099-001	n-Decane	K, T, U	< 0.10	ppbv	0.10	AC-058	10-Sep-23
23090099-001	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	10-Sep-23
23090099-001	n-Heptane	K, T, U	< 0.07	ppbv	0.07	AC-058	10-Sep-23
23090099-001	n-Hexane	I	0.20	ppbv	0.05	AC-058	10-Sep-23
23090099-001	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23
23090099-001	n-Pentane		0.53	ppbv	0.07	AC-058	10-Sep-23
23090099-001	n-Propylbenzene	K, T, U	< 0.10	ppbv	0.10	AC-058	10-Sep-23
23090099-001	n-Undecane	K, T, U	< 0.8	ppbv	0.8	AC-058	10-Sep-23
23090099-001	n-Nonane	K, T, U	< 0.07	ppbv	0.07	AC-058	10-Sep-23
23090099-001	o-Ethyltoluene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23
23090099-001	o-Xylene	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Sep-23
23090099-001	p-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23
23090099-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	10-Sep-23
23090099-001	Styrene	K, T, U	< 0.07	ppbv	0.07	AC-058	10-Sep-23
23090099-001	Toluene		0.46	ppbv	0.05	AC-058	10-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test Number: 860	32272	Ambient Air	03-Sep-23 0:00

DESCRIPTION:

REPORT NUMBER: 23090099 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090099-001	trans-2-Butene	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Sep-23
23090099-001	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

Revision History

Order ID	Ver	Date	Reason
23090099	01	25-Oct-23	Report created

Methods

Method	Description
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
NA-028	Determination of Total Non-methane Hydrocarbons and Total Hydrocarbons in Ambient Air by Gas Chromatography Flame Ionization Detector
Research	Research method

List of Analytical Method IDs within InnoTech's ISO/IEC 17025:2017 CALA Scope of Accreditation

Method ID	Description
AC-013	Mercury in Waters by Cold Vapor Atomic Fluorescence Detection (CVAFS)
AC-020	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-026	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-035	Analysis of Glyphosate, Aminomethylphosphonic Acid and Glufosinate in Water
AC-038	Trace Metal Analysis of Water Samples by ICP-MS
AC-048	Specific Conductance (Conductivity Meter Method)
AC-049	pH (Meter Method)
AC-054	Alkalinity Total and Phenolphthalein
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
AC-060	Trace Metal Analysis of Soil Sediment and Industrial Waste Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-061	Trace Metal Analysis for Biological Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-065	Analysis of Naphthenic Acids in Water by HPLC-Orbitrap-MS analysis
AC-074	Pesticides in Water
AC-079	Alkylated PAH in Soil and Sediment
AC-080	Alkylated PAH in Water (SPE Extraction)
NA-006	Determination of BTEX, F1 Hydrocarbons and F2, F3 and F4 Hydrocarbons in Water
NA-024	Analysis of Reduced Sulfur Compounds in Air

Qualifiers

Data Qualifier	Translation
B	Blank contamination; Analyte detected above the method reporting limit in an associated blank
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J1	Reported value is estimated; Surrogate recoveries limits were exceeded
J2	Reported value is estimated; No known QC criteria for this component
J3	Reported value is estimated; The value failed to meet QC criteria for either precision or accuracy
J4	Reported value is estimated; The sample matrix interfered with the analysis
K	Off-scale low. Actual value is known to be less than the value given
L	Off-scale high. Actual value is known to be greater than value given
N	Non-target analyte; Tentatively identified compound (using mass spectroscopy)
Q	Sample held beyond the accepted holding time
R	Rejected data; Not suitable for the projects intended use
T	Value reported is less than the laboratory method detection limit
U	Compound was analyzed for but not detected
V	Analyte was detected in both the sample and the associated method blank

Order Comments

23090099

Project ID: Test 860. Send results to yuha.stan@cleanharbors.com

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Sample Comments

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Result Comments

Note:

1. Results relate only to items tested and apply to the sample as received.

2. This report shall not be reproduced, except in full, without the explicit approval of the laboratory.

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Todd Webb
Clean Harbors Environmental
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

INVOICE: Stephanie Dennis
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

CLIENT SAMPLE ID: HI-VOL Test Number: 861, HVF-23-06-15
Matrix: Air Filter
CANISTER ID:
PRIORITY: Normal
DESCRIPTION: HI-VOL Filter
DATE SAMPLED: 09-Sep-23 0:00
DATE RECEIVED: 13-Sep-23
REPORT CREATED: 25-Oct-23
REPORT NUMBER: 23090143
VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090143-003	Antimony		424	ng/Filter	0.30	AC-021	20-Oct-23
23090143-003	Arsenic		3130	ng/Filter	0.30	AC-021	20-Oct-23
23090143-003	Barium	K, T, U	< 300	ng/Filter	300	AC-021	20-Oct-23
23090143-003	Beryllium		231	ng/Filter	0.60	AC-021	20-Oct-23
23090143-003	Boron	K, T, U	< 600	ng/Filter	600	AC-021	20-Oct-23
23090143-003	Cadmium		455	ng/Filter	0.80	AC-021	20-Oct-23
23090143-003	Chromium		20300	ng/Filter	20	AC-021	20-Oct-23
23090143-003	Cobalt		3230	ng/Filter	0.50	AC-021	20-Oct-23
23090143-003	Copper		545000	ng/Filter	20	AC-021	20-Oct-23
23090143-003	Iron		7890000	ng/Filter	80	AC-021	20-Oct-23
23090143-003	Lead		16900	ng/Filter	0.70	AC-021	20-Oct-23
23090143-003	Manganese		237000	ng/Filter	1.0	AC-021	20-Oct-23
23090143-003	Mercury		21.3	ng/Filter	0.70	AC-021	20-Oct-23
23090143-003	Nickel		14600	ng/Filter	5.0	AC-021	20-Oct-23
23090143-003	Selenium		2270	ng/Filter	4.0	AC-021	20-Oct-23
23090143-003	Silver		344	ng/Filter	0.50	AC-021	20-Oct-23
23090143-003	Thallium		59.1	ng/Filter	0.20	AC-021	20-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing
Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
HI-VOL Test Number: 861, HVF-23-06-15		Air Filter	09-Sep-23 0:00

DESCRIPTION: HI-VOL Filter

REPORT NUMBER: 23090143 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090143-003	Tin	K, T, U	< 0.20	ng/Filter	0.20	AC-021	20-Oct-23
23090143-003	Uranium		2620	ng/Filter	0.200	AC-021	20-Oct-23
23090143-003	Vanadium		19000	ng/Filter	0.40	AC-021	20-Oct-23
23090143-003	Zinc	K, T, U	< 1000	ng/Filter	1000	AC-021	20-Oct-23
23090143-003	Particulate Weight		288	mg	0.1	Research	18-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
PM10 Test Number: 861 Flt # AT79027		Air Filter	09-Sep-23 0:00

DESCRIPTION: PM10 Filter

REPORT NUMBER: 23090143 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090143-002	Antimony		6.62	ng/Filter	0.03	AC-021	19-Oct-23
23090143-002	Arsenic		16.8	ng/Filter	0.03	AC-021	19-Oct-23
23090143-002	Barium		596	ng/Filter	0.3	AC-021	19-Oct-23
23090143-002	Beryllium		1.37	ng/Filter	0.06	AC-021	19-Oct-23
23090143-002	Boron		176	ng/Filter	0.6	AC-021	19-Oct-23
23090143-002	Cadmium		1.65	ng/Filter	0.08	AC-021	19-Oct-23
23090143-002	Chromium		47	ng/Filter	2	AC-021	19-Oct-23
23090143-002	Cobalt		12.8	ng/Filter	0.05	AC-021	19-Oct-23
23090143-002	Copper		511	ng/Filter	2	AC-021	19-Oct-23
23090143-002	Iron		39000	ng/Filter	8	AC-021	19-Oct-23
23090143-002	Lead		63.5	ng/Filter	0.07	AC-021	19-Oct-23
23090143-002	Manganese		1100	ng/Filter	0.1	AC-021	19-Oct-23
23090143-002	Mercury	I	0.17	ng/Filter	0.07	AC-021	19-Oct-23
23090143-002	Nickel		46.9	ng/Filter	0.5	AC-021	19-Oct-23
23090143-002	Selenium		17.7	ng/Filter	0.4	AC-021	19-Oct-23
23090143-002	Silver		0.59	ng/Filter	0.05	AC-021	19-Oct-23
23090143-002	Thallium		0.53	ng/Filter	0.02	AC-021	19-Oct-23
23090143-002	Tin		3.23	ng/Filter	0.02	AC-021	19-Oct-23
23090143-002	Uranium		11.0	ng/Filter	0.020	AC-021	19-Oct-23
23090143-002	Vanadium		98.9	ng/Filter	0.04	AC-021	19-Oct-23
23090143-002	Zinc		718	ng/Filter	1	AC-021	19-Oct-23
23090143-002	Particulate Weight		1.11	mg	0.004	AC-029	22-Sep-23

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test # 861	32204	Ambient Air	09-Sep-23 0:00

DESCRIPTION: Canister

REPORT NUMBER: 23090143 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090143-001	Total Non-Methane Organic Carbon	K, T, U	< 0.08	ppmv	0.08	NA-028	14-Sep-23
23090143-001	1,2,3-Trimethylbenzene	I	0.11	ppbv	0.08	AC-058	15-Sep-23
23090143-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Sep-23
23090143-001	1,3,5-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Sep-23
23090143-001	1-Butene/Isobutylene	K, T, U	< 0.10	ppbv	0.10	AC-058	15-Sep-23
23090143-001	1-Hexene/2-Methyl-1-pentene	K, T, U	< 0.12	ppbv	0.12	AC-058	15-Sep-23
23090143-001	1-Pentene	I	0.07	ppbv	0.05	AC-058	15-Sep-23
23090143-001	2,2,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Sep-23
23090143-001	2,2-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Sep-23
23090143-001	2,3,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Sep-23
23090143-001	2,3-Dimethylbutane	K, T, U	< 0.15	ppbv	0.15	AC-058	15-Sep-23
23090143-001	2,3-Dimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Sep-23
23090143-001	2,4-Dimethylpentane	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Sep-23
23090143-001	2-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Sep-23
23090143-001	2-Methylhexane	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Sep-23
23090143-001	2-Methylpentane		0.38	ppbv	0.03	AC-058	15-Sep-23
23090143-001	3-Methylheptane	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Sep-23
23090143-001	3-Methylhexane	I	0.05	ppbv	0.03	AC-058	15-Sep-23
23090143-001	3-Methylpentane		0.98	ppbv	0.03	AC-058	15-Sep-23
23090143-001	Benzene	I	0.09	ppbv	0.05	AC-058	15-Sep-23
23090143-001	cis-2-Butene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Sep-23
23090143-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Sep-23
23090143-001	Cyclohexane	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Sep-23
23090143-001	Cyclopentane	I	0.07	ppbv	0.03	AC-058	15-Sep-23
23090143-001	Ethylbenzene	I	0.07	ppbv	0.05	AC-058	15-Sep-23

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test # 861	32204	Ambient Air	09-Sep-23 0:00

DESCRIPTION: Canister

REPORT NUMBER: 23090143 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090143-001	Isobutane		0.57	ppbv	0.05	AC-058	15-Sep-23
23090143-001	Isopentane		0.42	ppbv	0.07	AC-058	15-Sep-23
23090143-001	Isoprene	I	0.09	ppbv	0.03	AC-058	15-Sep-23
23090143-001	Isopropylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Sep-23
23090143-001	m,p-Xylene	I	0.15	ppbv	0.07	AC-058	15-Sep-23
23090143-001	m-Diethylbenzene	I	0.12	ppbv	0.03	AC-058	15-Sep-23
23090143-001	m-Ethyltoluene	I	0.09	ppbv	0.05	AC-058	15-Sep-23
23090143-001	Methylcyclohexane	I	0.04	ppbv	0.03	AC-058	15-Sep-23
23090143-001	Methylcyclopentane		0.70	ppbv	0.08	AC-058	15-Sep-23
23090143-001	n-Butane		5.18	ppbv	0.03	AC-058	15-Sep-23
23090143-001	n-Decane	K, T, U	< 0.10	ppbv	0.10	AC-058	15-Sep-23
23090143-001	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	15-Sep-23
23090143-001	n-Heptane	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Sep-23
23090143-001	n-Hexane		3.75	ppbv	0.05	AC-058	15-Sep-23
23090143-001	n-Octane	I	0.04	ppbv	0.03	AC-058	15-Sep-23
23090143-001	n-Pentane		0.31	ppbv	0.07	AC-058	15-Sep-23
23090143-001	n-Propylbenzene	K, T, U	< 0.10	ppbv	0.10	AC-058	15-Sep-23
23090143-001	n-Undecane	K, T, U	< 0.8	ppbv	0.8	AC-058	15-Sep-23
23090143-001	n-Nonane	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Sep-23
23090143-001	o-Ethyltoluene	I	0.08	ppbv	0.03	AC-058	15-Sep-23
23090143-001	o-Xylene	I	0.05	ppbv	0.05	AC-058	15-Sep-23
23090143-001	p-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Sep-23
23090143-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Sep-23
23090143-001	Styrene	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Sep-23
23090143-001	Toluene	I	0.21	ppbv	0.05	AC-058	15-Sep-23

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test # 861	32204	Ambient Air	09-Sep-23 0:00

DESCRIPTION: Canister

REPORT NUMBER: 23090143 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090143-001	trans-2-Butene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Sep-23
23090143-001	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Sep-23

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Date: October 25, 2023

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Revision History

Order ID	Ver	Date	Reason
23090143	01	25-Oct-23	Report created

Methods

Method	Description
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
NA-028	Determination of Total Non-methane Hydrocarbons and Total Hydrocarbons in Ambient Air by Gas Chromatography Flame Ionization Detector
Research	Research method

List of Analytical Method IDs within InnoTech's ISO/IEC 17025:2017 CALA Scope of Accreditation

Method ID	Description
AC-013	Mercury in Waters by Cold Vapor Atomic Fluorescence Detection (CVAFS)
AC-020	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-026	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-035	Analysis of Glyphosate, Aminomethylphosphonic Acid and Glufosinate in Water
AC-038	Trace Metal Analysis of Water Samples by ICP-MS
AC-048	Specific Conductance (Conductivity Meter Method)
AC-049	pH (Meter Method)
AC-054	Alkalinity Total and Phenolphthalein
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
AC-060	Trace Metal Analysis of Soil Sediment and Industrial Waste Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-061	Trace Metal Analysis for Biological Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-065	Analysis of Naphthenic Acids in Water by HPLC-Orbitrap-MS analysis
AC-074	Pesticides in Water
AC-079	Alkylated PAH in Soil and Sediment
AC-080	Alkylated PAH in Water (SPE Extraction)
NA-006	Determination of BTEX, F1 Hydrocarbons and F2, F3 and F4 Hydrocarbons in Water
NA-024	Analysis of Reduced Sulfur Compounds in Air

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Qualifiers

Data Qualifier	Translation
B	Blank contamination; Analyte detected above the method reporting limit in an associated blank
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J1	Reported value is estimated; Surrogate recoveries limits were exceeded
J2	Reported value is estimated; No known QC criteria for this component
J3	Reported value is estimated; The value failed to meet QC criteria for either precision or accuracy
J4	Reported value is estimated; The sample matrix interfered with the analysis
K	Off-scale low. Actual value is known to be less than the value given
L	Off-scale high. Actual value is known to be greater than value given
N	Non-target analyte; Tentatively identified compound (using mass spectroscopy)
Q	Sample held beyond the accepted holding time
R	Rejected data; Not suitable for the projects intended use
T	Value reported is less than the laboratory method detection limit
U	Compound was analyzed for but not detected
V	Analyte was detected in both the sample and the associated method blank

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Order Comments

23090143

Project ID: Test 861. Results aslo to Stan Yuha.

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Sample Comments

Result Comments

Note:

1. Results relate only to items tested and apply to the sample as received.

2. This report shall not be reproduced, except in full, without the explicit approval of the laboratory.

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Todd Webb
Clean Harbors Environmental
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

INVOICE: Stephanie Dennis
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

CLIENT SAMPLE ID: HI-VOL Test Number: 862, Flt# HVF-23-06-12

Matrix: Air Filter

CANISTER ID:

PRIORITY: Normal

DESCRIPTION:

DATE SAMPLED: 15-Sep-23 0:00

DATE RECEIVED: 25-Sep-23

REPORT CREATED: 25-Oct-23

REPORT NUMBER: 23090283

VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090283-003	Antimony		406	ng/Filter	0.30	AC-021	20-Oct-23
23090283-003	Arsenic		4190	ng/Filter	0.30	AC-021	20-Oct-23
23090283-003	Barium	K, T, U	< 300	ng/Filter	300	AC-021	20-Oct-23
23090283-003	Beryllium		220	ng/Filter	0.60	AC-021	20-Oct-23
23090283-003	Boron		1370000	ng/Filter	600	AC-021	20-Oct-23
23090283-003	Cadmium		563	ng/Filter	0.80	AC-021	20-Oct-23
23090283-003	Chromium		18900	ng/Filter	20	AC-021	20-Oct-23
23090283-003	Cobalt		3190	ng/Filter	0.50	AC-021	20-Oct-23
23090283-003	Copper		570000	ng/Filter	20	AC-021	20-Oct-23
23090283-003	Iron		7450000	ng/Filter	80	AC-021	20-Oct-23
23090283-003	Lead		18900	ng/Filter	0.70	AC-021	20-Oct-23
23090283-003	Manganese		269000	ng/Filter	1.0	AC-021	20-Oct-23
23090283-003	Mercury		18.3	ng/Filter	0.70	AC-021	20-Oct-23
23090283-003	Nickel		24900	ng/Filter	5.0	AC-021	20-Oct-23
23090283-003	Selenium		1470	ng/Filter	4.0	AC-021	20-Oct-23
23090283-003	Silver		372	ng/Filter	0.50	AC-021	20-Oct-23
23090283-003	Thallium		54.4	ng/Filter	0.20	AC-021	20-Oct-23

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
HI-VOL Test Number: 862, Flt# HVF-23-06-12		Air Filter	15-Sep-23 0:00

DESCRIPTION:

REPORT NUMBER: 23090283 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090283-003	Tin	K, T, U	< 0.20	ng/Filter	0.20	AC-021	20-Oct-23
23090283-003	Uranium		1680	ng/Filter	0.200	AC-021	20-Oct-23
23090283-003	Vanadium		15400	ng/Filter	0.40	AC-021	20-Oct-23
23090283-003	Zinc	K, T, U	< 1000	ng/Filter	1000	AC-021	20-Oct-23
23090283-003	Particulate Weight		340	mg	0.1	Research	03-Oct-23

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
PM10 Test Number: 862, Flt# AT79034		Air Filter	15-Sep-23 0:00

DESCRIPTION:

REPORT NUMBER: 23090283 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090283-002	Antimony		6.05	ng/Filter	0.03	AC-021	19-Oct-23
23090283-002	Arsenic		11.7	ng/Filter	0.03	AC-021	19-Oct-23
23090283-002	Barium		543	ng/Filter	0.3	AC-021	19-Oct-23
23090283-002	Beryllium		1.06	ng/Filter	0.06	AC-021	19-Oct-23
23090283-002	Boron		210	ng/Filter	0.6	AC-021	19-Oct-23
23090283-002	Cadmium		1.75	ng/Filter	0.08	AC-021	19-Oct-23
23090283-002	Chromium		17	ng/Filter	2	AC-021	19-Oct-23
23090283-002	Cobalt		9.11	ng/Filter	0.05	AC-021	19-Oct-23
23090283-002	Copper		319	ng/Filter	2	AC-021	19-Oct-23
23090283-002	Iron		32400	ng/Filter	8	AC-021	19-Oct-23
23090283-002	Lead		25.4	ng/Filter	0.07	AC-021	19-Oct-23
23090283-002	Manganese		960	ng/Filter	0.1	AC-021	19-Oct-23
23090283-002	Mercury	I	0.21	ng/Filter	0.07	AC-021	19-Oct-23
23090283-002	Nickel		30.0	ng/Filter	0.5	AC-021	19-Oct-23
23090283-002	Selenium		8.2	ng/Filter	0.4	AC-021	19-Oct-23
23090283-002	Silver		0.43	ng/Filter	0.05	AC-021	19-Oct-23
23090283-002	Thallium		0.48	ng/Filter	0.02	AC-021	19-Oct-23
23090283-002	Tin		2.57	ng/Filter	0.02	AC-021	19-Oct-23
23090283-002	Uranium		3.95	ng/Filter	0.020	AC-021	19-Oct-23
23090283-002	Vanadium		65.9	ng/Filter	0.04	AC-021	19-Oct-23
23090283-002	Zinc		309	ng/Filter	1	AC-021	19-Oct-23
23090283-002	Particulate Weight		1.20	mg	0.004	AC-029	26-Sep-23

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test Number: 862	28913	Ambient Air	15-Sep-23 0:00

DESCRIPTION:

REPORT NUMBER: 23090283 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090283-001	Total Non-Methane Organic Carbon	K, T, U	< 0.11	ppmv	0.11	NA-028	26-Sep-23
23090283-001	1,2,3-Trimethylbenzene	K, T, U	< 0.11	ppbv	0.11	AC-058	29-Sep-23
23090283-001	1,2,4-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090283-001	1,3,5-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090283-001	1-Butene/Isobutylene	K, T, U	< 0.13	ppbv	0.13	AC-058	29-Sep-23
23090283-001	1-Hexene/2-Methyl-1-pentene	K, T, U	< 0.15	ppbv	0.15	AC-058	29-Sep-23
23090283-001	1-Pentene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090283-001	2,2,4-Trimethylpentane	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	2,2-Dimethylbutane	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	2,3,4-Trimethylpentane	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	2,3-Dimethylbutane	K, T, U	< 0.19	ppbv	0.19	AC-058	29-Sep-23
23090283-001	2,3-Dimethylpentane	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	2,4-Dimethylpentane	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090283-001	2-Methylheptane	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	2-Methylhexane	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090283-001	2-Methylpentane	I	0.05	ppbv	0.04	AC-058	29-Sep-23
23090283-001	3-Methylheptane	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090283-001	3-Methylhexane	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	3-Methylpentane	I	0.21	ppbv	0.04	AC-058	29-Sep-23
23090283-001	Benzene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090283-001	cis-2-Butene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090283-001	cis-2-Pentene	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	Cyclohexane	K, T, U	< 0.08	ppbv	0.08	AC-058	29-Sep-23
23090283-001	Cyclopentane	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	Ethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test Number: 862	28913	Ambient Air	15-Sep-23 0:00

DESCRIPTION:

REPORT NUMBER: 23090283 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090283-001	Isobutane	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090283-001	Isopentane	I	0.16	ppbv	0.08	AC-058	29-Sep-23
23090283-001	Isoprene	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	Isopropylbenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	29-Sep-23
23090283-001	m,p-Xylene	K, T, U	< 0.08	ppbv	0.08	AC-058	29-Sep-23
23090283-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	m-Ethyltoluene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090283-001	Methylcyclohexane	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	Methylcyclopentane	I	0.11	ppbv	0.11	AC-058	29-Sep-23
23090283-001	n-Butane		0.32	ppbv	0.04	AC-058	29-Sep-23
23090283-001	n-Decane	K, T, U	< 0.13	ppbv	0.13	AC-058	29-Sep-23
23090283-001	n-Dodecane	K, T, U	< 0.6	ppbv	0.6	AC-058	29-Sep-23
23090283-001	n-Heptane	K, T, U	< 0.08	ppbv	0.08	AC-058	29-Sep-23
23090283-001	n-Hexane		0.66	ppbv	0.06	AC-058	29-Sep-23
23090283-001	n-Octane	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	n-Pentane	I	0.11	ppbv	0.08	AC-058	29-Sep-23
23090283-001	n-Propylbenzene	K, T, U	< 0.13	ppbv	0.13	AC-058	29-Sep-23
23090283-001	n-Undecane	K, T, U	< 1.1	ppbv	1.1	AC-058	29-Sep-23
23090283-001	n-Nonane	K, T, U	< 0.08	ppbv	0.08	AC-058	29-Sep-23
23090283-001	o-Ethyltoluene	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	o-Xylene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090283-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23
23090283-001	p-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	29-Sep-23
23090283-001	Styrene	K, T, U	< 0.08	ppbv	0.08	AC-058	29-Sep-23
23090283-001	Toluene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test Number: 862	28913	Ambient Air	15-Sep-23 0:00

DESCRIPTION:

REPORT NUMBER: 23090283 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090283-001	trans-2-Butene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090283-001	trans-2-Pentene	K, T, U	< 0.04	ppbv	0.04	AC-058	29-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

Revision History

Order ID	Ver	Date	Reason
23090283	01	25-Oct-23	Report created

Methods

Method	Description
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
NA-028	Determination of Total Non-methane Hydrocarbons and Total Hydrocarbons in Ambient Air by Gas Chromatography Flame Ionization Detector
Research	Research method

List of Analytical Method IDs within InnoTech's ISO/IEC 17025:2017 CALA Scope of Accreditation

Method ID	Description
AC-013	Mercury in Waters by Cold Vapor Atomic Fluorescence Detection (CVAFS)
AC-020	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-026	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-035	Analysis of Glyphosate, Aminomethylphosphonic Acid and Glufosinate in Water
AC-038	Trace Metal Analysis of Water Samples by ICP-MS
AC-048	Specific Conductance (Conductivity Meter Method)
AC-049	pH (Meter Method)
AC-054	Alkalinity Total and Phenolphthalein
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
AC-060	Trace Metal Analysis of Soil Sediment and Industrial Waste Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-061	Trace Metal Analysis for Biological Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-065	Analysis of Naphthenic Acids in Water by HPLC-Orbitrap-MS analysis
AC-074	Pesticides in Water
AC-079	Alkylated PAH in Soil and Sediment
AC-080	Alkylated PAH in Water (SPE Extraction)
NA-006	Determination of BTEX, F1 Hydrocarbons and F2, F3 and F4 Hydrocarbons in Water
NA-024	Analysis of Reduced Sulfur Compounds in Air

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Qualifiers

Data Qualifier	Translation
B	Blank contamination; Analyte detected above the method reporting limit in an associated blank
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J1	Reported value is estimated; Surrogate recoveries limits were exceeded
J2	Reported value is estimated; No known QC criteria for this component
J3	Reported value is estimated; The value failed to meet QC criteria for either precision or accuracy
J4	Reported value is estimated; The sample matrix interfered with the analysis
K	Off-scale low. Actual value is known to be less than the value given
L	Off-scale high. Actual value is known to be greater than value given
N	Non-target analyte; Tentatively identified compound (using mass spectroscopy)
Q	Sample held beyond the accepted holding time
R	Rejected data; Not suitable for the projects intended use
T	Value reported is less than the laboratory method detection limit
U	Compound was analyzed for but not detected
V	Analyte was detected in both the sample and the associated method blank

Order Comments

23090283

Project ID: Test 862. Report also to yuha.stan@cleanharbors.com

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Sample Comments

Result Comments

Note:

1. Results relate only to items tested and apply to the sample as received.

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Todd Webb
Clean Harbors Environmental
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

INVOICE: Stephanie Dennis
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

CLIENT SAMPLE ID: HiVol Test #: 863, Flt#: HVF-23-06-13

Matrix: Air Filter

CANISTER ID:

PRIORITY: Normal

DESCRIPTION: HiVol Filter

DATE SAMPLED: 21-Sep-23 0:00

DATE RECEIVED: 27-Sep-23

REPORT CREATED: 25-Oct-23

REPORT NUMBER: 23090310

VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090310-003	Particulate Weight		77.9	mg	0.1	Research	02-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing
Date: October 25, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
PM10 Test #: 863, Flt# AT79032		Air Filter	21-Sep-23 0:00

DESCRIPTION: PM10 Filter

REPORT NUMBER: 23090310 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090310-002	Particulate Weight		0.518	mg	0.004	AC-029	29-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test #: 863	29015	Ambient Air	21-Sep-23 0:00

DESCRIPTION: Canister

REPORT NUMBER: 23090310 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090310-001	Total Non-Methane Organic Carbon	K, T, U	< 0.12	ppmv	0.12	NA-028	28-Sep-23
23090310-001	1,2,3-Trimethylbenzene	K, T, U	< 0.08	ppbv	0.08	AC-058	29-Sep-23
23090310-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23
23090310-001	1,3,5-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23
23090310-001	1-Butene/Isobutylene	K, T, U	< 0.09	ppbv	0.09	AC-058	29-Sep-23
23090310-001	1-Hexene/2-Methyl-1-pentene	K, T, U	< 0.11	ppbv	0.11	AC-058	29-Sep-23
23090310-001	1-Pentene	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23
23090310-001	2,2,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	2,2-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	2,3,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	2,3-Dimethylbutane	K, T, U	< 0.14	ppbv	0.14	AC-058	29-Sep-23
23090310-001	2,3-Dimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	2,4-Dimethylpentane	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23
23090310-001	2-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	2-Methylhexane	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23
23090310-001	2-Methylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	3-Methylheptane	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23
23090310-001	3-Methylhexane	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	3-Methylpentane	I	0.08	ppbv	0.03	AC-058	29-Sep-23
23090310-001	Benzene	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23
23090310-001	cis-2-Butene	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23
23090310-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	Cyclohexane	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090310-001	Cyclopentane	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	Ethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test #: 863	29015	Ambient Air	21-Sep-23 0:00

DESCRIPTION: Canister

REPORT NUMBER: 23090310 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090310-001	Isobutane		0.19	ppbv	0.05	AC-058	29-Sep-23
23090310-001	Isopentane		0.38	ppbv	0.06	AC-058	29-Sep-23
23090310-001	Isoprene	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	Isopropylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090310-001	m,p-Xylene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090310-001	m-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	m-Ethyltoluene	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23
23090310-001	Methylcyclohexane	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	Methylcyclopentane	I	0.09	ppbv	0.08	AC-058	29-Sep-23
23090310-001	n-Butane		0.66	ppbv	0.03	AC-058	29-Sep-23
23090310-001	n-Decane	K, T, U	< 0.09	ppbv	0.09	AC-058	29-Sep-23
23090310-001	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	29-Sep-23
23090310-001	n-Heptane	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090310-001	n-Hexane		0.32	ppbv	0.05	AC-058	29-Sep-23
23090310-001	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	n-Pentane		0.24	ppbv	0.06	AC-058	29-Sep-23
23090310-001	n-Propylbenzene	K, T, U	< 0.09	ppbv	0.09	AC-058	29-Sep-23
23090310-001	n-Undecane	K, T, U	< 0.8	ppbv	0.8	AC-058	29-Sep-23
23090310-001	n-Nonane	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090310-001	o-Ethyltoluene	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	o-Xylene	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23
23090310-001	p-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23
23090310-001	p-Ethyltoluene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090310-001	Styrene	K, T, U	< 0.06	ppbv	0.06	AC-058	29-Sep-23
23090310-001	Toluene	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test #: 863	29015	Ambient Air	21-Sep-23 0:00

DESCRIPTION: Canister

REPORT NUMBER: 23090310 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090310-001	trans-2-Butene	K, T, U	< 0.05	ppbv	0.05	AC-058	29-Sep-23
23090310-001	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	29-Sep-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

Revision History

Order ID	Ver	Date	Reason
23090310	01	25-Oct-23	Report created

Methods

Method	Description
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
NA-028	Determination of Total Non-methane Hydrocarbons and Total Hydrocarbons in Ambient Air by Gas Chromatography Flame Ionization Detector
Research	Research method

List of Analytical Method IDs within InnoTech's ISO/IEC 17025:2017 CALA Scope of Accreditation

Method ID	Description
AC-013	Mercury in Waters by Cold Vapor Atomic Fluorescence Detection (CVAFS)
AC-020	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-026	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-035	Analysis of Glyphosate, Aminomethylphosphonic Acid and Glufosinate in Water
AC-038	Trace Metal Analysis of Water Samples by ICP-MS
AC-048	Specific Conductance (Conductivity Meter Method)
AC-049	pH (Meter Method)
AC-054	Alkalinity Total and Phenolphthalein
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
AC-060	Trace Metal Analysis of Soil Sediment and Industrial Waste Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-061	Trace Metal Analysis for Biological Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-065	Analysis of Naphthenic Acids in Water by HPLC-Orbitrap-MS analysis
AC-074	Pesticides in Water
AC-079	Alkylated PAH in Soil and Sediment
AC-080	Alkylated PAH in Water (SPE Extraction)
NA-006	Determination of BTEX, F1 Hydrocarbons and F2, F3 and F4 Hydrocarbons in Water
NA-024	Analysis of Reduced Sulfur Compounds in Air

Qualifiers

Data Qualifier	Translation
B	Blank contamination; Analyte detected above the method reporting limit in an associated blank
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J1	Reported value is estimated; Surrogate recoveries limits were exceeded
J2	Reported value is estimated; No known QC criteria for this component
J3	Reported value is estimated; The value failed to meet QC criteria for either precision or accuracy
J4	Reported value is estimated; The sample matrix interfered with the analysis
K	Off-scale low. Actual value is known to be less than the value given
L	Off-scale high. Actual value is known to be greater than value given
N	Non-target analyte; Tentatively identified compound (using mass spectroscopy)
Q	Sample held beyond the accepted holding time
R	Rejected data; Not suitable for the projects intended use
T	Value reported is less than the laboratory method detection limit
U	Compound was analyzed for but not detected
V	Analyte was detected in both the sample and the associated method blank

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Order Comments

23090310

Project ID: Test # 863. Report also to Stan Yuha.

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Sample Comments

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Result Comments

Note:

1. Results relate only to items tested and apply to the sample as received.

2. This report shall not be reproduced, except in full, without the explicit approval of the laboratory.

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Todd Webb
Clean Harbors Environmental
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

INVOICE: Stephanie Dennis
PO Box 390
2 km N of Hwy 14 on Sec Road 854 50114 RR 173
Ryley
AB T0B 4A0

CLIENT SAMPLE ID: AT79033 - PM10 Test Number: 864
Matrix: Air Filter
CANISTER ID:
PRIORITY: Normal
DESCRIPTION: PM10 filter
DATE SAMPLED: 27-Sep-23 0:00
DATE RECEIVED: 03-Oct-23
REPORT CREATED: 25-Oct-23
REPORT NUMBER: 23100008
VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100008-002	Antimony		8.82	ng/Filter	0.03	AC-021	19-Oct-23
23100008-002	Arsenic		28.1	ng/Filter	0.03	AC-021	19-Oct-23
23100008-002	Barium		910	ng/Filter	0.3	AC-021	19-Oct-23
23100008-002	Beryllium		2.27	ng/Filter	0.06	AC-021	19-Oct-23
23100008-002	Boron		161	ng/Filter	0.6	AC-021	19-Oct-23
23100008-002	Cadmium		3.39	ng/Filter	0.08	AC-021	19-Oct-23
23100008-002	Chromium		122	ng/Filter	2	AC-021	19-Oct-23
23100008-002	Cobalt		25.3	ng/Filter	0.05	AC-021	19-Oct-23
23100008-002	Copper		526	ng/Filter	2	AC-021	19-Oct-23
23100008-002	Iron		56200	ng/Filter	8	AC-021	19-Oct-23
23100008-002	Lead		106	ng/Filter	0.70	AC-021	19-Oct-23
23100008-002	Manganese		1560	ng/Filter	0.1	AC-021	19-Oct-23
23100008-002	Mercury	I	0.17	ng/Filter	0.07	AC-021	19-Oct-23
23100008-002	Nickel		112	ng/Filter	0.5	AC-021	19-Oct-23
23100008-002	Selenium		18.0	ng/Filter	0.4	AC-021	19-Oct-23
23100008-002	Silver		0.93	ng/Filter	0.05	AC-021	19-Oct-23
23100008-002	Thallium		0.90	ng/Filter	0.02	AC-021	19-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing
Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

InnoTech ALBERTA
PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
AT79033 - PM10 Test Number: 864		Air Filter	27-Sep-23 0:00

DESCRIPTION: PM10 filter

REPORT NUMBER: 23100008 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100008-002	Tin		5.74	ng/Filter	0.02	AC-021	19-Oct-23
23100008-002	Uranium		40.2	ng/Filter	0.020	AC-021	19-Oct-23
23100008-002	Vanadium		192	ng/Filter	0.04	AC-021	19-Oct-23
23100008-002	Zinc		1470	ng/Filter	1	AC-021	19-Oct-23
23100008-002	Particulate Weight		1.52	mg	0.004	AC-029	04-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
HVF-23-06-14 - HI-VOL Test Number: 864		Air Filter	27-Sep-23 0:00

DESCRIPTION:

REPORT NUMBER: 23100008 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100008-003	Antimony		635	ng/Filter	0.30	AC-021	20-Oct-23
23100008-003	Arsenic		5780	ng/Filter	0.30	AC-021	20-Oct-23
23100008-003	Barium	K, T, U	< 300	ng/Filter	300	AC-021	20-Oct-23
23100008-003	Beryllium		478	ng/Filter	0.60	AC-021	20-Oct-23
23100008-003	Boron		2080000	ng/Filter	600	AC-021	20-Oct-23
23100008-003	Cadmium		949	ng/Filter	0.80	AC-021	20-Oct-23
23100008-003	Chromium		29300	ng/Filter	20	AC-021	20-Oct-23
23100008-003	Cobalt		5770	ng/Filter	0.50	AC-021	20-Oct-23
23100008-003	Copper		511000	ng/Filter	20	AC-021	20-Oct-23
23100008-003	Iron		12400000	ng/Filter	80	AC-021	20-Oct-23
23100008-003	Lead		24100	ng/Filter	0.70	AC-021	20-Oct-23
23100008-003	Manganese		373000	ng/Filter	1.0	AC-021	20-Oct-23
23100008-003	Mercury		19.4	ng/Filter	0.70	AC-021	20-Oct-23
23100008-003	Nickel		29200	ng/Filter	5.0	AC-021	20-Oct-23
23100008-003	Selenium		3300	ng/Filter	4.0	AC-021	20-Oct-23
23100008-003	Silver		381	ng/Filter	0.50	AC-021	20-Oct-23
23100008-003	Thallium		111	ng/Filter	0.20	AC-021	20-Oct-23
23100008-003	Tin	K, T, U	< 0.20	ng/Filter	0.20	AC-021	20-Oct-23
23100008-003	Uranium		8350	ng/Filter	0.200	AC-021	20-Oct-23
23100008-003	Vanadium		37400	ng/Filter	0.40	AC-021	20-Oct-23
23100008-003	Zinc	K, T, U	< 1000	ng/Filter	1000	AC-021	20-Oct-23
23100008-003	Particulate Weight		408	mg	0.1	Research	10-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

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Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test Number: 864	32267	Ambient Air	27-Sep-23 0:00

DESCRIPTION:

REPORT NUMBER: 23100008 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100008-001	Total Non-Methane Organic Carbon	K, T, U	< 0.07	ppmv	0.07	NA-028	04-Oct-23
23100008-001	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	08-Oct-23
23100008-001	1,2,4-Trimethylbenzene	I	0.10	ppbv	0.04	AC-058	08-Oct-23
23100008-001	1,3,5-Trimethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-Oct-23
23100008-001	1-Butene/Isobutylene	K, T, U	< 0.09	ppbv	0.09	AC-058	08-Oct-23
23100008-001	1-Hexene/2-Methyl-1-pentene	K, T, U	< 0.10	ppbv	0.10	AC-058	08-Oct-23
23100008-001	1-Pentene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-Oct-23
23100008-001	2,2,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	08-Oct-23
23100008-001	2,2-Dimethylbutane	I	0.04	ppbv	0.03	AC-058	08-Oct-23
23100008-001	2,3,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	08-Oct-23
23100008-001	2,3-Dimethylbutane	K, T, U	< 0.13	ppbv	0.13	AC-058	08-Oct-23
23100008-001	2,3-Dimethylpentane	I	0.04	ppbv	0.03	AC-058	08-Oct-23
23100008-001	2,4-Dimethylpentane	K, T, U	< 0.04	ppbv	0.04	AC-058	08-Oct-23
23100008-001	2-Methylheptane	I	0.06	ppbv	0.03	AC-058	08-Oct-23
23100008-001	2-Methylhexane	I	0.09	ppbv	0.04	AC-058	08-Oct-23
23100008-001	2-Methylpentane		0.61	ppbv	0.03	AC-058	08-Oct-23
23100008-001	3-Methylheptane	K, T, U	< 0.04	ppbv	0.04	AC-058	08-Oct-23
23100008-001	3-Methylhexane	I	0.12	ppbv	0.03	AC-058	08-Oct-23
23100008-001	3-Methylpentane		0.30	ppbv	0.03	AC-058	08-Oct-23
23100008-001	Benzene	I	0.19	ppbv	0.04	AC-058	08-Oct-23
23100008-001	cis-2-Butene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-Oct-23
23100008-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	08-Oct-23
23100008-001	Cyclohexane	I	0.13	ppbv	0.06	AC-058	08-Oct-23
23100008-001	Cyclopentane	I	0.09	ppbv	0.03	AC-058	08-Oct-23
23100008-001	Ethylbenzene	I	0.13	ppbv	0.04	AC-058	08-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

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PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test Number: 864	32267	Ambient Air	27-Sep-23 0:00

DESCRIPTION:

REPORT NUMBER: 23100008 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100008-001	Isobutane		0.28	ppbv	0.04	AC-058	08-Oct-23
23100008-001	Isopentane		0.97	ppbv	0.06	AC-058	08-Oct-23
23100008-001	Isoprene	K, T, U	< 0.03	ppbv	0.03	AC-058	08-Oct-23
23100008-001	Isopropylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	08-Oct-23
23100008-001	m,p-Xylene	I	0.19	ppbv	0.06	AC-058	08-Oct-23
23100008-001	m-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	08-Oct-23
23100008-001	m-Ethyltoluene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-Oct-23
23100008-001	Methylcyclohexane		0.22	ppbv	0.03	AC-058	08-Oct-23
23100008-001	Methylcyclopentane		0.24	ppbv	0.07	AC-058	08-Oct-23
23100008-001	n-Butane		1.33	ppbv	0.03	AC-058	08-Oct-23
23100008-001	n-Decane	K, T, U	< 0.09	ppbv	0.09	AC-058	08-Oct-23
23100008-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	08-Oct-23
23100008-001	n-Heptane	I	0.17	ppbv	0.06	AC-058	08-Oct-23
23100008-001	n-Hexane		0.52	ppbv	0.04	AC-058	08-Oct-23
23100008-001	n-Octane	I	0.10	ppbv	0.03	AC-058	08-Oct-23
23100008-001	n-Pentane		0.92	ppbv	0.06	AC-058	08-Oct-23
23100008-001	n-Propylbenzene	K, T, U	< 0.09	ppbv	0.09	AC-058	08-Oct-23
23100008-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	08-Oct-23
23100008-001	n-Nonane	I	0.07	ppbv	0.06	AC-058	08-Oct-23
23100008-001	o-Ethyltoluene	K, T, U	< 0.03	ppbv	0.03	AC-058	08-Oct-23
23100008-001	o-Xylene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-Oct-23
23100008-001	p-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	08-Oct-23
23100008-001	p-Ethyltoluene	I	0.07	ppbv	0.06	AC-058	08-Oct-23
23100008-001	Styrene	K, T, U	< 0.06	ppbv	0.06	AC-058	08-Oct-23
23100008-001	Toluene		0.40	ppbv	0.04	AC-058	08-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
VOCs and TNMOC Test Number: 864	32267	Ambient Air	27-Sep-23 0:00

DESCRIPTION:

REPORT NUMBER: 23100008 **REPORT CREATED:** 25-Oct-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100008-001	trans-2-Butene	K, T, U	< 0.04	ppbv	0.04	AC-058	08-Oct-23
23100008-001	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	08-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: October 25, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

Revision History

Order ID	Ver	Date	Reason
23100008	01	25-Oct-23	Report created

Methods

Method	Description
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
NA-028	Determination of Total Non-methane Hydrocarbons and Total Hydrocarbons in Ambient Air by Gas Chromatography Flame Ionization Detector
Research	Research method

List of Analytical Method IDs within InnoTech's ISO/IEC 17025:2017 CALA Scope of Accreditation

Method ID	Description
AC-013	Mercury in Waters by Cold Vapor Atomic Fluorescence Detection (CVAFS)
AC-020	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-026	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-035	Analysis of Glyphosate, Aminomethylphosphonic Acid and Glufosinate in Water
AC-038	Trace Metal Analysis of Water Samples by ICP-MS
AC-048	Specific Conductance (Conductivity Meter Method)
AC-049	pH (Meter Method)
AC-054	Alkalinity Total and Phenolphthalein
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
AC-060	Trace Metal Analysis of Soil Sediment and Industrial Waste Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-061	Trace Metal Analysis for Biological Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-065	Analysis of Naphthenic Acids in Water by HPLC-Orbitrap-MS analysis
AC-074	Pesticides in Water
AC-079	Alkylated PAH in Soil and Sediment
AC-080	Alkylated PAH in Water (SPE Extraction)
NA-006	Determination of BTEX, F1 Hydrocarbons and F2, F3 and F4 Hydrocarbons in Water
NA-024	Analysis of Reduced Sulfur Compounds in Air

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

Qualifiers

Data Qualifier	Translation
B	Blank contamination; Analyte detected above the method reporting limit in an associated blank
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J1	Reported value is estimated; Surrogate recoveries limits were exceeded
J2	Reported value is estimated; No known QC criteria for this component
J3	Reported value is estimated; The value failed to meet QC criteria for either precision or accuracy
J4	Reported value is estimated; The sample matrix interfered with the analysis
K	Off-scale low. Actual value is known to be less than the value given
L	Off-scale high. Actual value is known to be greater than value given
N	Non-target analyte; Tentatively identified compound (using mass spectroscopy)
Q	Sample held beyond the accepted holding time
R	Rejected data; Not suitable for the projects intended use
T	Value reported is less than the laboratory method detection limit
U	Compound was analyzed for but not detected
V	Analyte was detected in both the sample and the associated method blank

Order Comments

23100008

Project ID: Test 864. Send results to Stan Yuha

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

Sample Comments

Result Comments

Note:

1. Results relate only to items tested and apply to the sample as received.

2. This report shall not be reproduced, except in full, without the explicit approval of the laboratory.

Sample ID: 23100042-001 Priority: Normal

San

PO Customer ID: Clean Harbours

Veg Cust Samp ID: Ryley Facility Test # 106, HVF-23-02-11

Phon [illegible] Fax: (780) 632-8620

Shipping: Highway 16 A & 75 St

ANALYSIS REQUEST FORM

Project Code:

Client Code:

Invoice Code:

Date Rec'd (D/M/Y):

Rec'd By:

RECEIVED OCT 06 2023

FOR AITF USE ONLY

Client details:

Contact:

Company:

Project ID:

Address:

Telephone:

Email:

CleanHarbors

Jorge A. Mendoza
Laboratory Manager

Clean Harbors
Environmental Services
Box 390 , 2 Km North of Hwy 14
on Sec. Road 854
Ryley, AB T0B 4A0
www.cleanharbors.com

780.663.3828 Ext. 235
Home Office 780.663.2342
Mobile 780.934.2342
Fax 780.663.3539
Direct Line 780.663.2513
mendoza.jorge@cleanharbors.com

"People & Technology Creating a Safer, Cleaner Environment"

Special Instructions/Comments:

RUSH (Surcharge): ☐

PO # 236612

Quote ID: QT140005

AITF Contact: _____ **Email:** _____

Tel: _____

	Sample ID	Sample Source Description	Date/Time Sampled From/To: Date (dd/mm/yy)	Date/Time Sampled From/To: Time (24 Hr)	Analysis Requested
1	Ryley Facility Test # 106	Filter Number # HV-23-02-11	1/09/23 1/10/23	 24.69 hrs	Particulate weight ICP-MS analysis
2	Ryley School Test # 106	Filter Number # HV-23-02-12	1/09/23 1/10/23	 24.79 hrs	Particulate weight ICP-MS analysis

Sample ID: 23090099-001 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test Number: 860

CHAIN OF CUSTODY FORM

Environmental Analytical Services
Highway 16A & 75 Street
Vegreville, AB T9C 1T4

Phone: 780-632-8403
Email: EAS.Reception@innotechalberta.ca
www.innotechalberta.ca

Client Reporting Information		Client Billing Information		Turnaround Time
Company:	Clean Harbors Canada, Inc	Contact:	Stephanie Dennis	X Normal (10 business days)
Address:	PO Box 390, 50114 Range Road 173, Ryley, AB T0B 4A0	Phone:	780-663-3828	Rush
Contact:	Todd Webb or Stan Yuha	Email:	Dennis.Stephanie@cleanharbors.com	Note: Rush service not available for all tests. Confirm rush requests with InnoTech Alberta.
Phone:	780-663-2513 or 780-663-3828	Project ID:	Test 860	
Email:	Webb.Todd@cleanharbors.com, Yuha.Stan@cleanharbors.com	PO #:	0000235911	

Special Instructions/Comments:

***If either PM10 or HI-VOL filter exceeds its trigger weight, then both filters are analyzed for metals**

If neither filter exceeds its trigger weight, neither filter is analyzed for metals

If metals analysis is required, please report on the same report as filter weights and VOCs/TNMOC

Trigger Weight for Analysis (PM10): 1.09 mg

Trigger Weight for Analysis (HI-VOL): 94.3 mg

Date Received – Lab Use Only

RECEIVED
SEP 08 2023

Lab Sample No.	Client Sample ID	Sample Source/ Description	Canister Number/ Sampler ID	Date Sampled (dd/mm/yy) From / To	Time Sampled (24 hour) From / To	Analysis Requested
	VOCs and TNMOC Test Number: 860	Canister	32272	03/09/23	00:00	VOC PAMS & TNMOC
				04/09/23	00:00	
	PM10 Test Number: 860	PM10 filter	C9700138	03/09/23	00:00	FLT Particulate Weight (& metals if over trigger weight)*
				04/09/23	00:00	
	HI-VOL Test Number: 860	HI-VOL Filter	HVF-23-06-03	03/09/23	00:00	Particulate Weight (& metals if over trigger weight)*
				04/09/23	00:00	
					Total: 24.14 hrs	
	PM10 Quarter 3 Field Blank	PM10 Filter	AT79028	06/09/23	8:55	FLT Particulate Weight

Client Authorization: _____ Laboratory Personnel: _____

(Signature) *(Signature)*

This "Chain of Custody" form is subject to InnoTech Alberta standard terms and conditions.

Sample ID: 23090099-002 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: PM10 Test Number: 860 - Filter # C9700

Filter Shipping Record

RECE
SEP 08 202

Sent To: Clean Harbors
PO Box 390
Ryley, AB T0B 4A0
(1/2 mile north, Hwy 854)
Todd Webb
780-663-2513

Date: June 28/23

Project: Clean Harbors

Prepared by:

Filter Size	# of Filters in Cassettes	Filter IDs
47 mm	1	C9700138 Test 860

Returns: coolers, large and small containers may be shipped to: Innotech, PO Bag 4000, HWY 16A & 75th Street, Vegreville, AB T9C 1T4

Sample ID: 23090099-004 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: PM10 Quarter 3 Field Blank - Filter # AT

RECEIVED
SEP 08 2023

Filter Shipping Record

Sent To: Clean Harbors
PO Box 390
Ryley, AB T0B 4A0
(1/2 mile north, Hwy 854)
Todd Webb
780-663-2513

Date: August 2/23

Project: Clean Harbors

Prepared by: SMulenka.

Filter Size	# of Filters in Cassettes	Filter IDs
47 mm	1	AT79028 Qtr 3 Field Blank

Returns: coolers, large and small containers may be shipped to: Innotech, PO Bag 4000, HWY 16A & 75th Street, Vegreville, AB T9C 1T4

InnoTech ALBERTA

Canister ID: 32272

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: ISR on: JUN 0 8 2023

Evacuated: JUL 1 2 2023 Recertified: _____

(Use within: 3 months from evacuation or recertification date)

Laboratory Contact Number: 780-632-8403

Sample ID: Test 860

Sampled By: T. Webb

Starting Vacuum:	End Vacuum:
-27.1 "Hg	-4 -6 "Hg/psig

Sample ID: 23090099-003 **Priority:** Normal

Customer ID: Clean Harbours

Cust Samp ID: HI-VOL Test Number: 860 - Filter # HVF

{00004084;2}

TERMS AND CONDITIONS

The attached document entitled "**Chain of Custody Form**" is subject to the following Terms and Conditions, unless otherwise specified on the Quotation. InnoTech Alberta's commencement of the Services shall be deemed acceptance of the terms and conditions by the Client.

1.Any proposal contained herein is prepared for the consideration of the Client only. Its contents may not be used or disclosed to any other party without prior written consent of the INNOTECH ALBERTA INC. (hereinafter referred to as "InnoTech Alberta").

2.InnoTech Alberta will perform the Services in accordance with normal professional standards.

3.The delivery time for performance of the Services (as set out on the front page of this Quotation) is approximate and may be changed by InnoTech Alberta giving written notice to the Client.

4.InnoTech Alberta will exercise due care and proficiency in testing items submitted by a Client. InnoTech Alberta shall not, however, be liable to the Client for any damage or loss caused to the item being tested or for any damage, loss or expense caused by any delay in carrying out the test, including any damage, loss or expense resulting from InnoTech Alberta's negligence. InnoTech Alberta shall not be responsible for any damage, which is a natural or necessary result of any testing procedure.

5.For the purposes of this Quotation, Intellectual Property means all information, data, artistic and literary works, concepts, designs, processes, software, algorithms and inventions, including, without limitation, those that could be the subject of patent, copyright, industrial design, trade secret or other forms of protection. Intellectual Property which was owned by either InnoTech Alberta or the Client prior to the signing of this Agreement remains the property of that party. Nothing in this Agreement shall operate as a license, permission or grant of any other rights to either InnoTech Alberta's or the Client's Intellectual Property.

6.All data, reports and other information relating to the Services shall be treated by InnoTech Alberta as the confidential property of the Client, and InnoTech Alberta will use reasonable efforts to ensure that its employees, contractors and agents will not disclose the same to any other person, firm or corporation during the term of this Agreement and for a period of five (5) years after the date of termination of the Agreement. The obligation of confidentiality set out herein shall not apply to any information that was in InnoTech Alberta's possession prior to receipt from the Client or which is or becomes part of the public domain through no act or failure on the part of InnoTech Alberta. The obligation of confidentiality set out in this Section shall not prevent the disclosure of information to any level of government having jurisdiction to make lawful demand therefor, or required to be disclosed by any applicable law. Any records required to be maintained by InnoTech Alberta pursuant to this Agreement are subject to the protection and access provisions of the Freedom of Information and Protection of Privacy Act (Alberta).

7.The reported results of any InnoTech Alberta tests or evaluations performed on samples or items provided by the Client shall be interpreted as being specific to the sample or item tested. InnoTech Alberta makes no representation that any similar or related untested samples or items would produce the same results.

8.The Client shall not use InnoTech Alberta's name in any advertising material, sale offer, news releases, public statements or announcements, whether written or oral relating to the Services or the results thereof, without the prior written consent of InnoTech Alberta.

9.Records, test data, reports and samples, except where shipped to the Client after completion of the work shall be retained by InnoTech Alberta according to InnoTech Alberta's approved Records Retention and Disposition Schedule.

10.Prices quoted are in Canadian Dollars unless otherwise stated in writing and are exclusive of any provincial, municipal, sales, use or goods and services tax.

11.Prices quoted do not include shipping, insurance or cost of consumables. The Client shall be responsible for all costs incurred by InnoTech Alberta in collecting any item for testing and returning the item to the Client after testing and shall be responsible for all necessary incidental costs incurred by InnoTech Alberta in providing the Services. InnoTech Alberta will not be responsible for any damage or loss to items during shipping and it is the responsibility of the Client to arrange and pay for any insurance it deems necessary.

12.Any test samples or other materials supplied by the Client to InnoTech Alberta may, at InnoTech Alberta's option, be returned by InnoTech Alberta to the Client. The Client shall:

(a)be responsible for all costs associated with the handling, transportation and disposal of such materials;

(b)reimburse InnoTech Alberta for any costs incurred by InnoTech Alberta associated with the handling, transportation and disposal of such materials; and

(c)indemnify and hold InnoTech Alberta harmless from any and all claims, damages or actions associated with the handling, transportation and disposal of such materials.

13.The Client shall pay all invoices rendered by InnoTech Alberta to the Client within thirty (30) days from the date of invoice, without deduction or set-off.

14.If the Client fails to pay any amount under this Agreement, such unpaid amount shall bear interest at a rate per month equal to one (1%) percent (or 12.6825% per annum) with interest on overdue interest at the same rate.

15.InnoTech Alberta makes no representation, warranties or conditions, either expressed or implied, statutory or otherwise and does not warrant the quality, state, merchantability or fitness for any purpose of any goods or products to be delivered pursuant to this Agreement. The Client accepts the results of these Services or items tested as is, and acknowledges that any use or interpretation of the information contained is at the Client's own risk.

16.In no event shall InnoTech Alberta be liable for any indirect or consequential damage or loss suffered by the Client, including loss of anticipated profits.

17.The Client shall indemnify and hold harmless InnoTech Alberta from any and all claims, demands, actions and costs (including legal costs on a solicitor-client basis) that may arise out of:
(a)any dangerous defect or content in the item being tested, whether apparent or not, which dangerous defect or content was not disclosed in writing to InnoTech Alberta by the Client at the time the item was submitted for testing;
(b)differences between those items actually tested and items previously or subsequently produced which are purported to be identical to the item tested; or
(c)any use of the tested item or any item incorporating the tested item, whether by the Client or a third party following its return to the Client.
The hold harmless shall survive this Agreement.

18.The Client shall, at its own expense and without limiting its liabilities herein, be responsible for insuring its operation in an amount not less than $2,000,000 inclusive per occurrence, insuring against bodily injury, and property damage including loss of use thereof. Further, the Client is responsible for insuring all owned property directly or indirectly related to this Agreement and InnoTech Alberta shall have no liability for any loss or damage to such property. 19.InnoTech Alberta shall maintain the following insurance: (i) commercial general liability insurance (including cross liability, severability of interests, non-owned automobile liability) in the amount of two million dollars ($2,000,000.00) per occurrence, and; (ii) professional liability and errors and omissions insurance in the amount of one million dollars ($1,000,000.00) per claim, and two million dollars ($2,000,000.00) in the aggregate. In addition, InnoTech Alberta shall maintain all workers' compensation coverage required by applicable laws. Notwithstanding the foregoing, InnoTech Alberta reserves the right to supplement or add insurance coverage from time to time as may be required in its sole discretion. InnoTech Alberta may provide certificates of insurance for coverages outlined in (i) and (ii) above.

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Sample ID: 23090099-001 **Priority:** Normal

Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test Number: 860

Sample ID: 23090143-001 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test

HAIN OF CUSTODY FORM

Environmental Analytical Services
Highway 16A & 75 Street
Vegreville, AB T9C 1T4

Phone: 780-632-8403
Email: EAS.Reception@innotechalberta.ca
www.innotechalberta.ca

Client Reporting Information		Client Billing Information		Turnaround Time
Company:	Clean Harbors Canada, Inc	Contact:	Stephanie Dennis	X Normal (10 business days)
Address:	PO Box 390, 50114 Range Road 173, Ryley, AB T0B 4A0	Phone:	780-663-3828	Rush
Contact:	Todd Webb or Stan Yuha	Email:	Dennis.Stephanie@cleanharbors.com	Note: Rush service not available for all tests. Confirm rush requests with InnoTech Alberta.
Phone:	780-663-2513 or 780-663-3828	Project ID:	Test 861	
Email:	Webb.Todd@cleanharbors.com, Yuha.Stan@cleanharbors.com	PO #:	0000235911	

Special Instructions/Comments:

***If either PM10 or HI-VOL filter exceeds its trigger weight, then both filters are analyzed for metals**
If neither filter exceeds its trigger weight, neither filter is analyzed for metals
If metals analysis is required, please report on the same report as filter weights and VOCs/TNMOC
Trigger Weight for Analysis (PM10): 1.15 mg
Trigger Weight for Analysis (HI-VOL): 92.3 mg

Date Received – Lab Use Only

RECEIVED
SEP 13 2023

Lab Sample No.	Client Sample ID	Sample Source/ Description	Canister Number/ Sampler ID	Date Sampled (dd/mm/yy) From / To	Time Sampled (24 hour) From / To	Analysis Requested
	VOCs and TNMOC Test Number: 861	Canister	32204	09/09/23	00:00	VOC PAMS & TNMOC
				10/09/23	00:00	
	PM10 Test Number: 861	PM10 filter	AT79027	09/09/23	00:00	FLT Particulate Weight (& metals if over trigger weight)*
				10/09/23	00:00	
	HI-VOL Test Number: 861	HI-VOL Filter	HVF-23-06-15	09/09/23	00:00	Particulate Weight (& metals if over trigger weight)*
				10/09/23	00:00	
					Total: 23.62 hrs	

Client Authorization: _____ Laboratory Personnel: _____

(Signature) *(Signature)*

This "Chain of Custody" form is subject to InnoTech Alberta standard terms and conditions.

{00004084;2}

TERMS AND CONDITIONS

The attached document entitled "**Chain of Custody Form**" is subject to the following Terms and Conditions, unless otherwise specified on the Quotation. InnoTech Alberta's commencement of the Services shall be deemed acceptance of the terms and conditions by the Client.

1.Any proposal contained herein is prepared for the consideration of the Client only. Its contents may not be used or disclosed to any other party without prior written consent of the INNOTECH ALBERTA INC. (hereinafter referred to as "InnoTech Alberta").

2.InnoTech Alberta will perform the Services in accordance with normal professional standards.

3.The delivery time for performance of the Services (as set out on the front page of this Quotation) is approximate and may be changed by InnoTech Alberta giving written notice to the Client.

4.InnoTech Alberta will exercise due care and proficiency in testing items submitted by a Client. InnoTech Alberta shall not, however, be liable to the Client for any damage or loss caused to the item being tested or for any damage, loss or expense caused by any delay in carrying out the test, including any damage, loss or expense resulting from InnoTech Alberta's negligence. InnoTech Alberta shall not be responsible for any damage, which is a natural or necessary result of any testing procedure.

5.For the purposes of this Quotation, Intellectual Property means all information, data, artistic and literary works, concepts, designs, processes, software, algorithms and inventions, including, without limitation, those that could be the subject of patent, copyright, industrial design, trade secret or other forms of protection. Intellectual Property which was owned by either InnoTech Alberta or the Client prior to the signing of this Agreement remains the property of that party. Nothing in this Agreement shall operate as a license, permission or grant of any other rights to either InnoTech Alberta's or the Client's Intellectual Property.

6.All data, reports and other information relating to the Services shall be treated by InnoTech Alberta as the confidential property of the Client, and InnoTech Alberta will use reasonable efforts to ensure that its employees, contractors and agents will not disclose the same to any other person, firm or corporation during the term of this Agreement and for a period of five (5) years after the date of termination of the Agreement. The obligation of confidentiality set out herein shall not apply to any information that was in InnoTech Alberta's possession prior to receipt from the Client or which is or becomes part of the public domain through no act or failure on the part of InnoTech Alberta. The obligation of confidentiality set out in this Section shall not prevent the disclosure of information to any level of government having jurisdiction to make lawful demand therefor, or required to be disclosed by any applicable law. Any records required to be maintained by InnoTech Alberta pursuant to this Agreement are subject to the protection and access provisions of the Freedom of Information and Protection of Privacy Act (Alberta).

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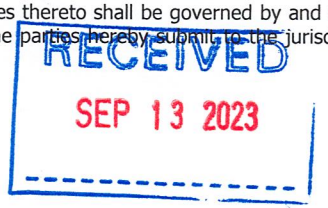
Sample ID: 23090143-001 **Priority:** Normal

Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test



Sample ID: 23090143-001 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test

Filter Shipping Record

Sent To: Clean Harbors
PO Box 390
Ryley, AB T0B 4A0
(1/2 mile north, Hwy 854)
Todd Webb
780-663-2513

Date: August 2/23

Project: Clean Harbors

Prepared by: S Mulenka

Filter Size	# of Filters in Cassettes	Filter IDs
47 mm	1	AT79027 Test 861

Returns: coolers, large and small containers may be shipped to: Innotech, PO Bag 4000, HWY 16A & 75th Street, Vegreville, AB T9C 1T4

Sample ID: 23090143-001 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test

InnoTech ALBERTA

Canister ID: 32204

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: ISQ on: JUL 2 8 2023

Evacuated: AUG 1 4 2023 Recertified: _____

(Use within: 3 months from evacuation or recertification date)

Laboratory Contact Number: 780-632-8403

Sample ID: Test 861

Sampled By: T. Webb

Starting Vacuum:	End Vacuum: MW
-27.1 "Hg	~~-5~~ -6 "Hg/psig

InnoTech ALBERTA
A SUBSIDIARY OF ALBERTA INNOVATES

Sample ID: 23090283-001 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test Number: 862

Environmental Analytical Services
Highway 16A & 75 Street
Vegreville, AB T9C 1T4

Phone: 780-632-8403
Email: EAS.Reception@innotechalberta.ca
www.innotechalberta.ca

Client Reporting Information

Company:	Clean Harbors Canada, Inc
Address:	PO Box 390, 50114 Range Road 173, Ryley, AB T0B 4A0
Contact:	Todd Webb or Stan Yuha
Phone:	780-663-2513 or 780-663-3828
Email:	Webb.Todd@cleanharbors.com, Yuha.Stan@cleanharbors.com

Client Billing Information

Contact:	Stephanie Dennis
Phone:	780-663-3828
Email:	Dennis.Stephanie@cleanharbors.com
Project ID:	Test 862
PO #:	0000235911

Turnaround Time

X Normal (10 business days)

Rush

Note: Rush service not available for all tests.
Confirm rush requests with InnoTech Alberta.

Special Instructions/Comments:

***If either PM10 or HI-VOL filter exceeds its trigger weight, then both filters are analyzed for metals**
If neither filter exceeds its trigger weight, neither filter is analyzed for metals
If metals analysis is required, please report on the same report as filter weights and VOCs/TNMOC
Trigger Weight for Analysis (PM10): 1.15 mg
Trigger Weight for Analysis (HI-VOL): 95.5 mg

Date Received – Lab Use Only

RECEIVED
SEP 25 2023

Lab Sample No.	Client Sample ID	Sample Source/ Description	Canister Number/ Sampler ID	Date Sampled (dd/mm/yy) From / To	Time Sampled (24 hour) From / To	Analysis Requested
	VOCs and TNMOC Test Number: 862	Canister	28913	15/09/23	00:00	VOC PAMS & TNMOC
				16/09/23	00:00	
	PM10 Test Number: 862	PM10 filter	AT79034	15/09/23	00:00	FLT Particulate Weight (& metals if over trigger weight)*
				16/09/23	00:00	
	HI-VOL Test Number: 862	HI-VOL Filter	HVF-23-06-12	15/09/23	00:00	Particulate Weight (& metals if over trigger weight)*
				16/09/23	00:00	
					Total: 24.46 hrs	

Client Authorization: _____ Laboratory Personnel: _____
(Signature) *(Signature)*

This "Chain of Custody" form is subject to InnoTech Alberta standard terms and conditions.

Sample ID: 23090283-001 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test Number: 862

Filter Shipping Record

RECEIVED
SEP 25 2023

Sent To: Clean Harbors
PO Box 390
Ryley, AB T0B 4A0
(1/2 mile north, Hwy 854)
Todd Webb
780-663-2513

Date: August 2/23

Project: Clean Harbors

Prepared by:

Filter Size	# of Filters in Cassettes	Filter IDs
47 mm	1	AT79034 Test 862

Returns: coolers, large and small containers may be shipped to: Innotech, PO Bag 4000, HWY 16A & 75th Street, Vegreville, AB T9C 1T4

{00004084:2}

TERMS AND CONDITIONS

The attached document entitled "**Chain of Custody Form**" is subject to the following Terms and Conditions, unless otherwise specified on the Quotation. InnoTech Alberta's commencement of the Services shall be deemed acceptance of the terms and conditions by the Client.

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5.For the purposes of this Quotation, Intellectual Property means all information, data, artistic and literary works, concepts, designs, processes, software, algorithms and inventions, including, without limitation, those that could be the subject of patent, copyright, industrial design, trade secret or other forms of protection. Intellectual Property which was owned by either InnoTech Alberta or the Client prior to the signing of this Agreement remains the property of that party. Nothing in this Agreement shall operate as a license, permission or grant of any other rights to either InnoTech Alberta's or the Client's Intellectual Property.

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Sample ID: 23090283-001 **Priority:** Normal

Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test Number: 862

RECEIVED
SEP 25 2023

Sample ID: 23090283-001 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test Number: 862

InnoTech ALBERTA

Canister ID: 28913

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: ISQ on: JUL 27 2023

Evacuated: AUG 08 2023 Recertified: _____

(Use within: 3 months from evacuation or recertification date)

Laboratory Contact Number: 780-632-8403

Sample ID: Test 862

Sampled By: T. Webb

Starting Vacuum:	End Vacuum:
-27.1 "Hg	-6 "Hg/psig

InnoTech ALBERTA
A SUBSIDIARY OF ALBERTA INNOVATES

Sample ID: 23090310-001 **Priority:** Normal

Environmental Analytical Services
Highway 16A & 75 Street
Vegreville, AB T9C 1T4

Phone: 780-632-8403
Email: EAS.Reception@innotechalberta.ca
www.innotechalberta.ca

Customer ID: Clean Harbours

Client Reporting Informat **Cust Samp ID:** VOCs and TNMOC Test #: 863 **nation**

Company:	Clean Harbors Canada, Inc	Contact:	Stephanie Dennis
Address:	PO Box 390, 50114 Range Road 173, Ryley, AB T0B 4A0	Phone:	780-663-3828
Contact:	Todd Webb or Stan Yuha	Email:	Dennis.Stephanie@cleanharbors.com
Phone:	780-663-2513 or 780-663-3828	Project ID:	Test 863
Email:	Webb.Todd@cleanharbors.com, Yuha.Stan@cleanharbors.com	PO #:	0000235911

Turnaround Time

X Normal (10 business days)

Rush

Note: Rush service not available for all tests.
Confirm rush requests with InnoTech Alberta.

Special Instructions/Comments:

***If either PM10 or HI-VOL filter exceeds its trigger weight, then both filters are analyzed for metals**

If neither filter exceeds its trigger weight, neither filter is analyzed for metals

If metals analysis is required, please report on the same report as filter weights and VOCs/TNMOC

Trigger Weight for Analysis (PM10): 1.17 mg

Trigger Weight for Analysis (HI-VOL): 96.0 mg

Date Received – Lab Use Only

RECEIVED
SEP 27 2023

Lab Sample No.	Client Sample ID	Sample Source/ Description	Canister Number/ Sampler ID	Date Sampled (dd/mm/yy) From / To	Time Sampled (24 hour) From / To	Analysis Requested
1	VOCs and TNMOC Test Number: 863	Canister	29015	21/09/23	00:00	VOC PAMS & TNMOC
				22/09/23	00:00	
2	PM10 Test Number: 863	PM10 filter	AT79032	21/09/23	00:00	FLT Particulate Weight (& metals if over trigger weight)*
				22/09/23	00:00	
3	HI-VOL Test Number: 863	HI-VOL Filter	HVF-23-06-13	21/09/23	00:00	Particulate Weight (& metals if over trigger weight)*
				22/09/23	00:00	
					Total: 24.58 hrs	

Client Authorization: _____ Laboratory Personnel: _____

(Signature) *(Signature)*

This "Chain of Custody" form is subject to InnoTech Alberta standard terms and conditions.

InnoTech ALBERTA

Canister ID: 29015

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: ISQ on: JUL 28 2023

Evacuated: AUG 08 2023 Recertified: _____

(Use within: 3 months from evacuation or recertification date)

Laboratory Contact Number: 780-632-8403

Sample ID: Test 863

Sampled By: T. Webb

Starting Vacuum: -27.1 "Hg

End Vacuum: JWP. -4 "Hg/psig

Sample ID: 23090310-001 **Priority:** Normal

Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test #: 863

Sample ID: 23090310-001 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test #: 863

Filter Shipping Record

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SEP 27 2023

Sent To: Clean Harbors
PO Box 390
Ryley, AB T0B 4A0
(1/2 mile north, Hwy 854)
Todd Webb
780-663-2513

Date: August 2/23

Project: Clean Harbors

Prepared by: [signature]

Filter Size	# of Filters in Cassettes	Filter IDs
47 mm	1	AT79032 Test 863

Returns: coolers, large and small containers may be shipped to: Innotech, PO Bag 4000, HWY 16A & 75th Street, Vegreville, AB T9C 1T4

{00004084:2}

TERMS AND CONDITIONS

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5.For the purposes of this Quotation, Intellectual Property means all information, data, artistic and literary works, concepts, designs, processes, software, algorithms and inventions, including, without limitation, those that could be the subject of patent, copyright, industrial design, trade secret or other forms of protection. Intellectual Property which was owned by either InnoTech Alberta or the Client prior to the signing of this Agreement remains the property of that party. Nothing in this Agreement shall operate as a license, permission or grant of any other rights to either InnoTech Alberta's or the Client's Intellectual Property.

6.All data, reports and other information relating to the Services shall be treated by InnoTech Alberta as the confidential property of the Client, and InnoTech Alberta will use reasonable efforts to ensure that its employees, contractors and agents will not disclose the same to any other person, firm or corporation during the term of this Agreement and for a period of five (5) years after the date of termination of the Agreement. The obligation of confidentiality set out herein shall not apply to any information that was in InnoTech Alberta's possession prior to receipt from the Client or which is or becomes part of the public domain through no act or failure on the part of InnoTech Alberta. The obligation of confidentiality set out in this Section shall not prevent the disclosure of information to any level of government having jurisdiction to make lawful demand therefor, or required to be disclosed by any applicable law. Any records required to be maintained by InnoTech Alberta pursuant to this Agreement are subject to the protection and access provisions of the Freedom of Information and Protection of Privacy Act (Alberta).

7.The reported results of any InnoTech Alberta tests or evaluations performed on samples or items provided by the Client shall be interpreted as being specific to the sample or item tested. InnoTech Alberta makes no representation that any similar or related untested samples or items would produce the same results.

8.The Client shall not use InnoTech Alberta's name in any advertising material, sale offer, news releases, public statements or announcements, whether written or oral relating to the Services or the results thereof, without the prior written consent of InnoTech Alberta.

9.Records, test data, reports and samples, except where shipped to the Client after completion of the work shall be retained by InnoTech Alberta according to InnoTech Alberta's approved Records Retention and Disposition Schedule.

10.Prices quoted are in Canadian Dollars unless otherwise stated in writing and are exclusive of any provincial, municipal, sales, use or goods and services tax.

11.Prices quoted do not include shipping, insurance or cost of consumabl
responsible for all costs incurred by InnoTech Alberta in c
the item to the Client after testing and shall be responsib
by InnoTech Alberta in providing the Services. InnoTech Al
or loss to items during shipping and it is the responsibilit
insurance it deems necessary.

Priority: Normal

Sample ID: 23090310-001

Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test #: 863

12.Any test samples or other materials supplied by the Client to InnoTech Alberta may, at InnoTech Alberta's option, be returned by InnoTech Alberta to the Client. The Client shall:

(a)be responsible for all costs associated with the handling, transportation and disposal of such materials;

(b)reimburse InnoTech Alberta for any costs incurred by InnoTech Alberta associated with the handling, transportation and disposal of such materials; and

(c)indemnify and hold InnoTech Alberta harmless from any and all claims, damages or actions associated with the handling, transportation and disposal of such materials.

13.The Client shall pay all invoices rendered by InnoTech Alberta to the Client within thirty (30) days from the date of invoice, without deduction or set-off.

14.If the Client fails to pay any amount under this Agreement, such unpaid amount shall bear interest at a rate per month equal to one (1%) percent (or 12.6825% per annum) with interest on overdue interest at the same rate.

15.InnoTech Alberta makes no representation, warranties or conditions, either expressed or implied, statutory or otherwise and does not warrant the quality, state, merchantability or fitness for any purpose of any goods or products to be delivered pursuant to this Agreement. The Client accepts the results of these Services or items tested as is, and acknowledges that any use or interpretation of the information contained is at the Client's own risk.

16.In no event shall InnoTech Alberta be liable for any indirect or consequential damage or loss suffered by the Client, including loss of anticipated profits.

17.The Client shall indemnify and hold harmless InnoTech Alberta from any and all claims, demands, actions and costs (including legal costs on a solicitor-client basis) that may arise out of:
(a)any dangerous defect or content in the item being tested, whether apparent or not, which dangerous defect or content was not disclosed in writing to InnoTech Alberta by the Client at the time the item was submitted for testing;
(b)differences between those items actually tested and items previously or subsequently produced which are purported to be identical to the item tested; or
(c)any use of the tested item or any item incorporating the tested item, whether by the Client or a third party following its return to the Client.
The hold harmless shall survive this Agreement.

18.The Client shall, at its own expense and without limiting its liabilities herein, be responsible for insuring its operation in an amount not less than $2,000,000 inclusive per occurrence, insuring against bodily injury, and property damage including loss of use thereof. Further, the Client is responsible for insuring all owned property directly or indirectly related to this Agreement and InnoTech Alberta shall have no liability for any loss or damage to such property. 19.InnoTech Alberta shall maintain the following insurance: (i) commercial general liability insurance (including cross liability, severability of interests, non-owned automobile liability) in the amount of two million dollars ($2,000,000.00) per occurrence, and; (ii) professional liability and errors and omissions insurance in the amount of one million dollars ($1,000,000.00) per claim, and two million dollars ($2,000,000.00) in the aggregate. In addition, InnoTech Alberta shall maintain all workers' compensation coverage required by applicable laws. Notwithstanding the foregoing, InnoTech Alberta reserves the right to supplement or add insurance coverage from time to time as may be required in its sole discretion. InnoTech Alberta may provide certificates of insurance for coverages outlined in (i) and (ii) above.

20.The Client agrees to comply with all InnoTech Alberta Safety & Security regulations in effect while on InnoTech Alberta premises.

21.This Agreement represents the entire agreement between the parties and shall supersede all prior agreements relative to this transaction.

22.InnoTech Alberta shall not be liable to the Client for any failure or delay in performance of its obligations caused by circumstances beyond its control, including but not limited to acts of God, strikes, laws imposed after the fact, governmental restrictions, riots, wars, civil disorder, rebellion, , fire, flood, explosion, earthquake or other disasters.

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Quotation and rights and parties thereto shall be governed by and construed according to of the Province of Alberta. The parties hereby submit to the jurisdiction of the Courts of

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SEP 27 2023

Sample ID: 23100008-001 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test Number: 864

IAIN OF CUSTODY FORM

Environmental Analytical Services
Highway 16A & 75 Street
Vegreville, AB T9C 1T4

Phone: 780-632-8403
Email: EAS.Reception@innotechalberta.ca
www.innotechalberta.ca

Company:	Clean Harbors Canada, Inc
Address:	PO Box 390, 50114 Range Road 173, Ryley, AB T0B 4A0
Contact:	Todd Webb or Stan Yuha
Phone:	780-663-2513 or 780-663-3828
Email:	Webb.Todd@cleanharbors.com, Yuha.Stan@cleanharbors.com

Client Billing Information

Contact:	Stephanie Dennis
Phone:	780-663-3828
Email:	Dennis.Stephanie@cleanharbors.com
Project ID:	Test 864
PO #:	0000235911

Turnaround Time

X Normal (10 business days)

Rush

Note: Rush service not available for all tests.
Confirm rush requests with InnoTech Alberta.

Special Instructions/Comments:

***If either PM10 or HI-VOL filter exceeds its trigger weight, then both filters are analyzed for metals**
If neither filter exceeds its trigger weight, neither filter is analyzed for metals
If metals analysis is required, please report on the same report as filter weights and VOCs/TNMOC
Trigger Weight for Analysis (PM10): 1.15 mg
Trigger Weight for Analysis (HI-VOL): 94.3 mg

Date Received – Lab Use Only

RECEIVED
OCT 02 2023
3

Lab Sample No.	Client Sample ID	Sample Source/ Description	Canister Number/ Sampler ID	Date Sampled (dd/mm/yy) From / To	Time Sampled (24 hour) From / To	Analysis Requested
	VOCs and TNMOC Test Number: 864	Canister	32267	27/09/23	00:00	VOC PAMS & TNMOC
				28/09/23	00:00	
	PM10 Test Number: 864	PM10 filter	AT79033	27/09/23	00:00	FLT Particulate Weight (& metals if over trigger weight)*
				28/09/23	00:00	
	HI-VOL Test Number: 864	HI-VOL Filter	HVF-23-06-14	27/09/23	00:00	Particulate Weight (& metals if over trigger weight)*
				28/09/23	00:00	
					Total: 24.14 hrs	

Client Authorization: _____ Laboratory Personnel: _____

(Signature) *(Signature)*

This "Chain of Custody" form is subject to InnoTech Alberta standard terms and conditions.

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3

Filter Shipping Record

Sample ID: 23100008-002 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: PM10 Test Number: 864

Date: August 2/23

Project: Clean Harbors

Prepared by: Amelia

Sent To: Clean Harbors
PO Box 390
Ryley, AB T0B 4A0
(1/2 mile north, Hwy 854)
Todd Webb
780-663-2513

Filter Size	# of Filters in Cassettes	Filter IDs
47 mm	1	AT79033 Test 864

Returns: coolers, large and small containers may be shipped to: Innotech, PO Bag 4000, HWY 16A & 75th Street, Vegreville, AB T9C 1T4

Sample ID: 23100008-001 **Priority:** Normal

Customer ID: Clean Harbours
Cust Samp ID: 32267 - VOCs and TNMOC Test Number:

InnoTech ALBERTA

Canister ID: 32267

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: ISQ on: JUL 27 2023

Evacuated: AUG 14 2023 Recertified: _____

(Use within: 3 months from evacuation or recertification date)

Laboratory Contact Number: 780-632-8403

Sample ID: Test 864

Sampled By: T. Webb

Starting Vacuum:	End Vacuum:
-27.1 "Hg	-5 "Hg/psig

{00004084;2}

TERMS AND CONDITIONS

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11.Prices quoted do not include shipping, insurance or cost of consumables. The Client shall be responsible for all costs incurred by InnoTech Alberta in collecting any item for testing and returning the item to the Client after testing and shall be responsible for all necessary incidental costs incurred by InnoTech Alberta in providing the Services. InnoTech Alberta will not be responsible for any damage or loss to items during shipping and it is the responsibility of the Client to arrange and pay for any insurance it deems necessary.

12.Any test samples or other materials supplied by the Client to InnoTech Alberta may, at InnoTech Alberta's option, be returned by InnoTech Alberta to the Client. The Client shall:

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24.This Quotation and rights and parties thereto shall be governed by and construed according to the laws of the Province of Alberta. The parties hereby submit to the jurisdiction of the Courts of Alberta.

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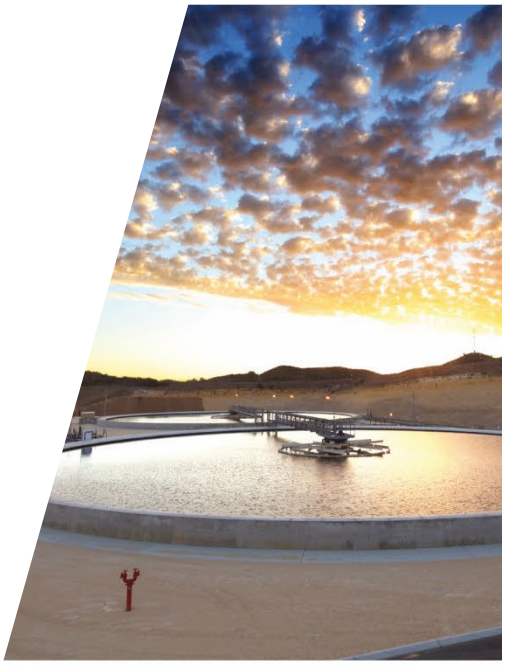
OCT 02 2023
3

Sample ID: 23100008-003 **Priority:** Normal

Customer ID: Clean Harbours

Cust Samp ID: HI-VOL Test Number: 864

Appendix E
September Quarterly Audit



Quarterly Audit Partisol FRM Model 2000

Clean Harbors
50114 Range Rd. 173
Ryley, Alberta T0B 4A0
Quarterly Audit Date: September 28, 2023

Clean Harbors

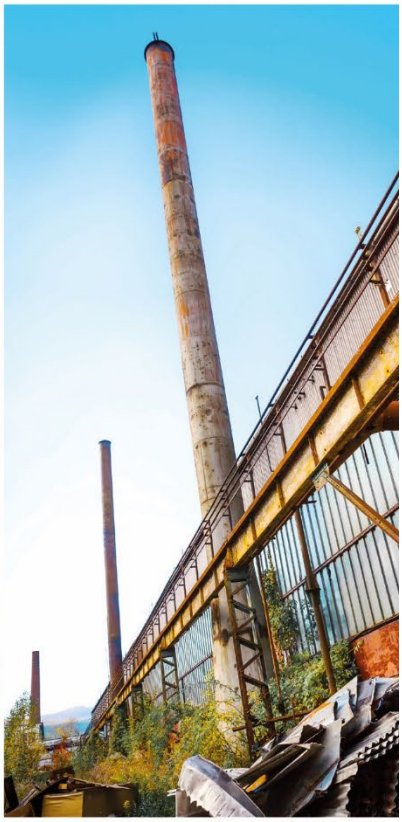


Table of Contents

Table Index

Appendix Index

1. Introduction

GHD Limited (GHD) was retained by Clean Harbors to conduct a Quarterly Audit at 50114 Range Road 173 Ryley, Alberta (Facility) on September 28, 2023. The Quarterly Audit was conducted on the Partisol FRM 2000 Particulate Matter less than 10 microns (PM_{10}) Sampler (Partisol Sampler), located at the Ryley Lift Station, Secondary Road 854, approximately 350 metres southeast of the Facility (53°17'52.66"N and 112°24'57.87"W).

2. Audit Procedure

The Partisol Sampler was audited in accordance with the instrument manual and the Alberta Air Monitoring Directive, 2016 (AMD). Siting location, ambient pressure, ambient temperature, filter temperature, leakage rate and flow rate were audited, as well as overall instrument condition to ensure compliance with the instrument manual and the AMD. Below is a summary of the tasks performed on the Partisol Sampler:

- Siting Location Audit
- Ambient Pressure Audit
- Ambient Temperature Audit
- Filter Temperature Audit
- Leakage Rate Audit
- Flow Rate Audit
- Instrument Condition and Recommendations

GHD verified all of these parameters using calibrated reference instruments. GHD reference instruments either have National Institute of Standards and Technology (NIST) Traceable Certifications, current manufacturer certification, or were verified by a primary standard. The GHD quarterly audit field form can be found in Appendix A. All calibrations and certifications can be found in Appendix B.

3. Audit Results

3.1 Siting Location Audit Results (AEP Station ID 00010348-I-1)

The siting location of the Partisol Sampler meets the requirements of Chapter 3, of the AMD. Table 3.1 of this report compares the AMD Siting Requirements for Intermittent Samplers versus the current Partisol sampler location.

- The current coordinates of the Partisol Sampler are 53°17'52.66"N and 112°24'57.87"W.
- The distance from the nearest roadway is 21 m.

Table 3.1 AMD Requirements vs. Current Partisol Sampler Location

Site Characteristics	AMD Requirements	Current Location	Specification
Sampler Inlet-height above ground (abg)	Minimum 2 m, Maximum 15 m	Meets Requirement	4.63 m abg
Other Requirements	a. Distance from an obstacle greater than 2.5 times the height of the obstacle above the sampler.	Meets Requirement	>2.5 times
	b. At least 2 m from any other samplers or inlets with flow rates greater than 200 litres (L) per minute,	Meets Requirement	None
	Or at least 1 m apart from any other samplers or inlets with flow rates less than or equal of 200 L per minute.	Meets Requirement	None
	c. Unrestricted air flow in three to four wind quadrants.	Meets Requirement	4/4 Unrestricted Quadrants

3.2 Pressure and Temperature Audit Results (AEP Station ID 00010348-I-1)

The pressure and temperature audit results of the Partisol Sampler meet the requirements of Chapter 4, of the AMD. Table 3.2 of this report compares the reference results versus the Partisol Sampler readings.

Table 3.2 Reference Results vs. Partisol Sampler Readings

Parameter	Partisol	Reference	Difference	Limit	Pass/Fail
Ambient Temperature (°C)	19.9	20.1	0.2	±2°C	Pass
Barometric Pressure (mmHg)	697.0	697.56	0.6	±10 mmHg	Pass
Filter Temperature (°C)	20.1	19.9	0.2	±2°C	Pass
Flow (L/min)	16.7	16.7	0.0	±1.0 L/min	Pass

Note: A slight fail was observed based on the flow equation check criteria. However, as shown in Table 3.2, the internal flow check passed during the physical audit. GHD will monitor this closely over the following months and during the next audit.

3.3 Leak Check Results (AEP Station ID 00010348-I-1)

3.3.1 Automatic Leak Check

The Partisol firmware performs leak checks in automatic mode and indicates either a "pass" or "fail" based on a pressure drop threshold of 127 mmHg per minute. The Partisol Sampler passed the requirements outlined in the service manual with a pressure drop of 6 mmHg per minute during the audit.

3.3.2 External Manual Leak Check

GHD also performs an external manual leak check on the Partisol Sampler as part of the quarterly audit. The external manual leak check measures the pressure drop on a vacuum gauge located on the sampler. The pressure drop may not exceed more than 8.5 inHg (216 mmHg) over a 30-second span. The Partisol Sampler passed the requirements of the service manual with a pressure drop of 6 mmHg in a 30-second span.

3.4 Flow Audit (AEP Station ID 00010348-I-1)

The flow audit results of the Partisol Sampler meet the requirements of Chapter 4 of the AMD, refer to Table 3.2.

3.5 Instrument Condition and Recommendations (AEP Station ID 00010348-I-1)

The Partisol Sampler was visually and functionally inspected on the audit day. Audit recommendations and instrument conditions are listed below:

- Liquid crystal display screen is functioning.
- Filter exchange cabinet has been cleaned.
- Ventilation fan filters are clean.
- Filter exchange mechanism is operating normally.
- Filter v-seals are in good condition.
- Ambient temperature and pressure sensor wires in good condition.
- Main power connection wire in good condition.

3.5.1 Recommendations

GHD recommends opening and cleaning PM_{10} sampling inlet prior to next sampling event.

Appendices

Appendix A
Quarterly Audit Form

GHD Quarterly Audit Form

Date	9/28/2023	Weather Cond.:	Partial Cloud
Owner	Clean Harbors	Start Time:	11:20:00 AM
Station Name	Ryley Lift Station	End Time:	11:30:00 AM
Parameter	PM_{10}	Performed By:	A. Penny and P. Shariaty

Partisol FRM Model 2000 Identification		**Sampler Data**	
Make/Model:	R & P Partisol FRM 2000	Temperature:	19.9 °C
Unit ID:	Ryley Lift Station	Pressure:	697 mm Hg
S/N:	200FB209860905	Flow Set Point:	16.7 L/min

GHD Reference Standards

	Flow	Pressure	Temperature	Manometer
Make:	AirMetrics	TSI	Fluke	Dwyer
Model:	FRM	9555-X / 960	1551A Ex	475-0-FM
Serial Number:	FRM1218	9555X1002005	3520009	N/A
Calibration Date:	5/17/2016	12/20/2022	7/4/2023	12/1/2022

Audit Data

	Sampler Data	Reference Data	Difference	Pass/Fail	Units
Ambient Temperature (+/- 2 °C)	19.90	20.10	0.2	Pass	°C
Barometric Pressure (+/- 10 mmHg)	697.00	697.56	0.6	Pass	mmHg
Filter Temperature (+/- 2 °C)	20.10	19.90	0.2	Pass	°C
Flow (+/- 1.0 Litres/min)	16.70	16.70	0.0	Pass	Litres/min

Leak Check

Manual Check (-8.5 inHg)

Initial Pressure	Final Pressure	Pressure Drop	Pass/Fail	Units
345.00	351.00	-6.00	Pass	mmHg

Automatic Check (-127 mmHg)

Leak check was performed in automatic mode, sampler indicated:	6 mmHg/min	Pass	mmHg/min

As Found/As Left	**Yes/No**	**As Found**	**As Left**	**Pass/Fail**
Did the ambient temperature require adjustment?	No	29.7	29.7	Pass
Did the barometric pressure require adjustment?	No	700	700	Pass
Did the filter temperature require adjustment?	No	30.8	30.8	Pass
Did the flow audit require adjustment?	No	16.7	16.7	Pass

Comments

Flow Equation

Set Point (lpm)	Actual Flow *(Qact)* (lpm)	Absolute Difference (lpm)	Pass/Fail (± 1 lpm)			
				Manometer *(DH)*	3.52 "H2O	
				Actual Temp *(Tact)*	293.25 °K	20.1°C
				Actual Pres *(Pact)*	0.930 bar	
16.7	15.3	1.4	Fail	Actual Pres *(Pact)*	27.46 inHg	

FTS Linear Regression Constants

(mflo) = 0.4452

(bflo) = 0.4430

$$Qact = mflo \times \frac{\sqrt{\Delta H \times Tact}}{Pact} + bflo$$

Appendix B
Calibration Certificates

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Calibration Certificate

Customer: *GHD Ltd.*

Certificate: C593374-00-01

Unit Identification

Manufacturer: **Fluke**
Model: **1551A Ex**
Description: **Stik Thermometer**
Serial: **3520009**
Unit ID: **THM-CAL-001**

Calibration Date

Calibration Date: **4-Jul-2023**
Due Date: **4-Jul-2024**

Calibration Conditions

Temperature: **22.8°C**
Humidity: **41.2 %**
Barometric Pressure: **N/A**

General Information

Remark:**N/A**

Standards Used

Unit ID	Manufacturer	Model	Cal Date	Due Date
I-1585	Hart Scientific	1521/5627A	20-Apr-2023	20-Apr-2024
I-1969	Ametek	RTC-157A	27-Feb-2023	27-Feb-2024

The calibration was performed using measurement standards traceable to the National Measurement Institute Standards (NMIS) part of the National Research Council of Canada (NRC) or the National Institute of Standards and Technology (NIST), or to accepted instrinsic standards or measurement, or is derived by ratio type self-calibration techniques. Measurement uncertainties given in this report are based on a coverage factor of k=2 corresponding to a confidence level of approximately 95%

Calibrated by: *L. Fuentebella*

Luke Fuentebella

Approved by:

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Test Results

Procedure: **FLUKE 1551A EX_RTC-157A,Fluke 1523** Rev: **1**

Data Type: **As Found** Results: **Pass**

Test Description	True Value	Reading	Lower Limit	Upper Limit	Test Status	Exp Uncert
TEMPERATURE ACCURACY TEST						
-49.9540 °C		-49.982 °C	-50.004 °C	-49.904 °C	Pass	9.0e-003 °C
-24.9510 °C		-24.999 °C	-25.001 °C	-24.901 °C	Pass	9.0e-003 °C
0.0020 °C		-0.022 °C	-0.048 °C	0.052 °C	Pass	9.0e-003 °C
100.0140 °C		99.993 °C	99.964 °C	100.064 °C	Pass	9.0e-003 °C
154.9970 °C		154.986 °C	154.947 °C	155.047 °C	Pass	9.0e-003 °C

NIST Traceable Transfer Standard Calibration

Calibration Date:	05/17/2016		Orifice #	FRM1218-	By:
Ambient Temp, °K:	295.5		Pri Std #	LFE774300	
Amb Press, Atm:	1.0000		Manometer #	FRM1218	Chk:

Std ΔH (inH_2O)	Manometer ΔH (inH_2O)	Actual Flow (alpm)	Calc Flow (alpm)	Difference* (%diff)
6.67	6.67	20.179	20.209	-0.15
5.86	5.86	18.988	18.970	0.09
5.10	5.10	17.733	17.727	0.03
4.39	4.39	16.490	16.479	0.07
3.73	3.73	15.233	15.224	0.06
3.12	3.12	13.964	13.962	0.02
2.56	2.56	12.683	12.688	-0.04
2.05	2.05	11.390	11.401	-0.10

Manometer ΔH vs Act Flow
Linear Regression Results:

m_{flo} =	**0.4452**
b_{flo} =	**0.4430**
r^2 =	**1.0000**

* all points must be within ± 2%

The MiniFlo calibration is performed with an NIST-traceable standard. Each unit has a unique pair of calibration constants derived from the calibration which are used to calculate the actual air flow rate at all ambient conditions. The unit's calibration should be recertified annually.

The actual flow rate is a function of the pressure drop across the device, the ambient temperature, and the ambient pressure. The relationship of these variables and the unique calibration constants ("m" and "b") for each device is presented in the following equation (Eq.A):

$$Q_{act} = m_{flo} \times \sqrt{\frac{\Delta H \times T_{act}}{P_{act}}} + b_{flo}$$

Q_{act} = actual flowrate, liters per min
ΔH = manometer reading, inches of water
T_{act} = ambient temperature, °K
P_{act} = ambient pressure, atmospheres

CAUTION: The weather service, most airports, etc, reduce the atmospheric pressure to a common reference (sea level). The equation above requires the atmospheric pressure at the location where the MiniFlo is being used.

The equation below may be used to estimate the ambient atmospheric pressure at any elevation if the sea level pressure is known.

$$P_{act} = P_{sea} \times \left(1 - \frac{E}{145300}\right)^{5.25}$$

P_{act} = Ambient Atmospheric Pressure
P_{sea} = Sea Level Atmospheric Pressure
E = Site elevation, feet

Airmetrics
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Springfield, OR 97477
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Calibration Certificate

Customer: *GHD Ltd.*

Certificate: C542161-00-01

Unit Identification

Manufacturer: **Dwyer**
Model: **475-0-FM**
Description: **Digital Manometer**
Serial: **N/A**
Unit ID: **MAN-CAL-001**

Calibration Date

Calibration Date: **1-Dec-2022**
Due Date: **1-Dec-2023**

Calibration Conditions

Temperature: **21.7°C**
Humidity: **15 %**
Barometric Pressure: **N/A**

General Information

Remark:**N/A**

Standards Used

Unit ID	Manufacturer	Model	Cal Date	Due Date
CAL0224	Fluke	750P01	12-Sep-2022	12-Mar-2023

The calibration was performed using measurement standards traceable to the National Measurement Institute Standards (NMIS) part of the National Research Council of Canada (NRC) or the National Institute of Standards and Technology (NIST), or to accepted instrinsic standards or measurement, or is derived by ratio type self-calibration techniques. Measurement uncertainties given in this report are based on a coverage factor of k=2 corresponding to a confidence level of approximately 95%.

Calibrated by: *D. Gano*

Approved by:

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Test Results
Procedure: **Pressure Gauge 10.00 IN.W.C 0.5% FS /750P01** Rev: **1.1**
Data Type: **As Found** Results: **Pass**

Test Description	True Value	Reading	Lower Limit	Upper Limit	Test Status	Exp Uncert
Tolerance used (additive if more than one listed): 0.5% of full scale						
UUT is set to the nominal value, Reading is the actual pressure read by the system instrument.						
1.000 inH2O		1.003 inH2O	0.950 inH2O	1.050 inH2O	Pass	1.6e-002 inH2O
2.000 inH2O		1.983 inH2O	1.950 inH2O	2.050 inH2O	Pass	1.6e-002 inH2O
4.000 inH2O		3.982 inH2O	3.950 inH2O	4.050 inH2O	Pass	1.6e-002 inH2O
6.000 inH2O		5.978 inH2O	5.950 inH2O	6.050 inH2O	Pass	1.6e-002 inH2O
8.000 inH2O		7.969 inH2O	7.950 inH2O	8.050 inH2O	Pass	1.6e-002 inH2O
10.000 inH2O		9.974 inH2O	9.950 inH2O	10.050 inH2O	Pass	1.6e-002 inH2O

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Calibration Certificate

Customer: *GHD LTD*

Certificate: C542157-00-01

Unit Identification

Manufacturer: **TSI**
Model: **9555-X / 960**
Description: **VelociCalc**

Serial: **9555X1002005**
Unit ID: **VEL-CAL-002**

Calibration Date

Calibration Date: **20-Dec-2022**

Due Date: **20-Dec-2023**

Calibration Conditions

Temperature: **22.5°C**
Humidity: **34.8 %**
Barometric Pressure: **103.0kPa**

General Information

Remark:**N/A**

Standards Used

Unit ID	Manufacturer	Model	Cal Date	Due Date
M-012	Airflow Development	83FSL	********** No Calibration Required **********	
M-110	Love Controls	HM3531DLF600	11-Oct-2022	11-Oct-2023
M-115	Rotronic	M22W	10-Jul-2022	10-Jul-2023
M-130	Fluke	1552A	13-May-2022	13-May-2023

The calibration was performed using measurement standards traceable to the National Measurement Institute Standards (NMIS) part of the National Research Council of Canada (NRC) or the National Institute of Standards and Technology (NIST), or to accepted instrinsic standards or measurement, or is derived by ratio type self-calibration techniques. Measurement uncertainties given in this report are based on a coverage factor of k=2 corresponding to a confidence level of approximately 95%.

Calibrated by: ***R. Chaaya***

Approved by:

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Test Results
Procedure: **TSI 9555-P C/W 964 Probe** Rev: **2**
Data Type: **As Found** Results: **Pass**

Test Description	True Value	Reading	Lower Limit	Upper Limit	Test Status	Exp Uncert
TEMPERATURE TEST ACCURACY °C						
0.0 °C		0.1 °C	-0.3 °C	0.3 °C	Pass	1.2e-001 °C
25.0 °C		24.9 °C	24.7 °C	25.3 °C	Pass	1.2e-001 °C
60.0 °C		60.0 °C	59.7 °C	60.3 °C	Pass	1.2e-001 °C
VELOCITY TEST ACCURACY ft/min						
100 ft/min		99 ft/min	97 ft/min	103 ft/min	Pass	5.8e-001 t/min
200 ft/min		201 ft/min	194 ft/min	206 ft/min	Pass	5.8e-001 t/min
300 ft/min		303 ft/min	291 ft/min	309 ft/min	Pass	5.8e-001 t/min
400 ft/min		402 ft/min	388 ft/min	412 ft/min	Pass	5.8e-001 t/min
500 ft/min		496 ft/min	485 ft/min	515 ft/min	Pass	5.8e-001 t/min
750 ft/min		754 ft/min	727 ft/min	773 ft/min	Pass	5.8e-001 t/min
1000 ft/min		993 ft/min	970 ft/min	1030 ft/min	Pass	5.8e-001 t/min
1500 ft/min		1507 ft/min	1455 ft/min	1545 ft/min	Pass	5.8e-001 t/min
2000 ft/min		2018 ft/min	1939 ft/min	2061 ft/min	Pass	5.8e-001 t/min
3000 ft/min		3005 ft/min	2910 ft/min	3090 ft/min	Pass	5.8e-001 t/min
4000 ft/min		3986 ft/min	3880 ft/min	4120 ft/min	Pass	5.8e-001 t/min
5000 ft/min		5011 ft/min	4850 ft/min	5150 ft/min	Pass	5.8e-001 t/min

about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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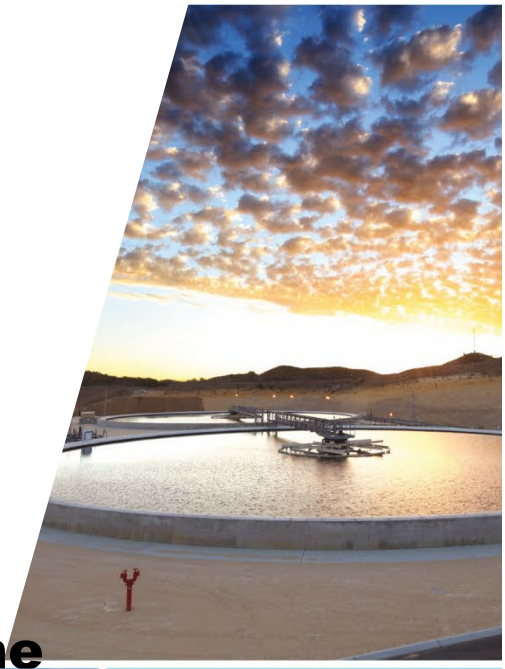
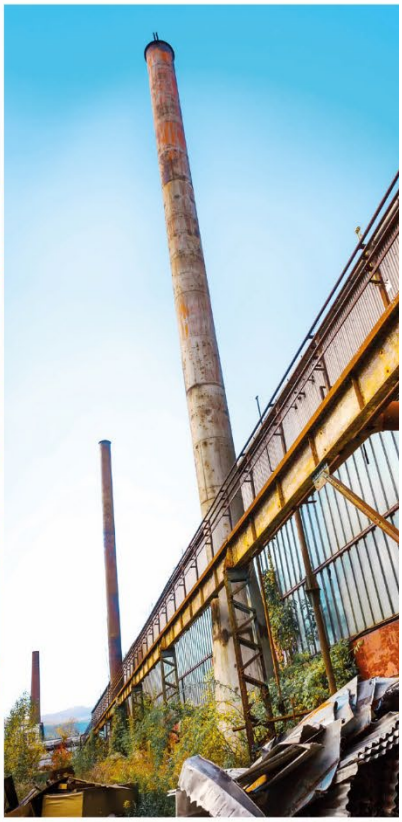


Quarterly Total Suspended Particulate (TSP) High Volume Sampler Calibration

Clean Harbors
50114 Range RD. 173
Ryley, Alberta T0B 4A0
Quarterly Audit Date: September 28, 2023



Clean Harbors

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Appendix Index

1. Introduction

GHD Limited (GHD) was retained by Clean Harbors to conduct a Quarterly Total Suspended Particulate (TSP) High Volume Calibration Audit at 50114 Range Road 173 Ryley, Alberta (Facility), 5211 - 52 Ave, Ryley, Alberta (School), and Secondary Road 854, approximately 350 metres southeast of the Facility (Lift Station) on September 28, 2023. The Quarterly Audit was conducted on three Tisch TSP High Volume Samplers (Hi-Vol Samplers). The Facility Site Station (AEPA Station ID 00010348-I-2) Sampler is located against the Facility perimeter fence, north of the vehicle staging road (53°18'13.11"N and 112°25'5.81"W). The Ryley School Station (AEPA Station ID 00010348-I-3) Sampler is located on the roof of the Ryley School (53°17'28.99"N and 112°25'55.81"W). The Highway 854 Lift Station (AEPA Station ID 00010348-I-1) Sampler is located at the Ryley Lift Station, Secondary Road 854, approximately 350 metres southeast of the Facility (53°17'52.66"N and 112°24'57.87"W).

2. Audit Procedure

The TSP Samplers were audited in accordance with the instrument manual, the Clean Harbors Ryley Enhanced Ambient Air Quality Monitoring Program (AQMP) and the Alberta Air Monitoring Directive, 2016 (AMD). The AQMP requires that the calibration of equipment be completed on a quarterly basis. GHD performed a siting location audit, leak audit, 5-point flow calibration audit and evaluation of instrumentation and provided recommendations.

Below is a summary of the tasks performed on each Sampler:

- Siting Location Audit
- Leak Audit
- 5-Point Flow Rate Audit
- Instrument Condition and Recommendations

GHD verified all of these parameters using calibrated reference instruments. GHD reference instruments either have National Institute of Standards and Technology (NIST) Traceable Certifications, current manufacturer certification, or were verified by a primary standard. The GHD quarterly audit field forms can be found in Appendix A. All calibrations and certifications can be found in Appendix B.

3. Audit Results

3.1 Siting Location Audit Results

The siting locations of the Hi-Vol Samplers meet the requirements of Chapter 3, Page 8, Table 5 of the AMD. Table 3.1 of this report compares the AMD Siting Requirements for Intermittent Samplers versus the Sampler locations.

Facility Site Station

- The current coordinates of the Facility Sampler is 53°18'13.11"N and 112°25'5.81"W.
- The distance from the nearest roadway is ~10 metres (m).

Ryley School Station

- The current coordinates of the School Sampler are 53°17'28.99"N and 112°25'55.81"W.
- The distance from the nearest roadway is ~5 m.

Highway 854 Lift Station

- The current coordinates of the List Station Sampler are 53°17'52.66"N and 112°24'57.87"W.
- The distance from the nearest roadway is ~5 m.

Table 3.1 AMD Requirements vs. Facility Site Station Location

Site Characteristics	AMD Requirements	Current Location	Specification
Sampler Inlet-height above ground (abg)	Minimum 2 m, Maximum 15 m	Meets Requirement	4 m abg
Other Requirements	a. Distance from an obstacle greater than 2.5 times the height of the obstacle above the sampler.	Meets Requirement	>2.5 times
	b. At least 2 m from any other samplers or inlets with flow rates greater than 200 litres (L) per minute.	Meets Requirement	None
	or at least 1 m apart from any other samplers or inlets with flow rates less than or equal of 200 L per minute	Meets Requirement	None
	c. Unrestricted air flow in three to four wind quadrants.	Meets Requirement	Three to four Unrestricted Quadrants

Table 3.2 AMD Requirements vs. Ryley School Station Location

Site Characteristics	AMD Requirements	Current Location	Specification
Sampler Inlet-height above ground (abg)	Minimum 2 m, Maximum 15 m	Meets Requirement	4 m abg
Other Requirements	a. Distance from an obstacle greater than 2.5 times the height of the obstacle above the sampler.	Meets Requirement	>2.5 times
	b. At least 2 m from any other samplers or inlets with flow rates greater than 200 litres (L) per minute.	Meets Requirement	None
	or at least 1 m apart from any other samplers or inlets	Meets Requirement	None

Table 3.2 AMD Requirements vs. Ryley School Station Location

Site Characteristics	AMD Requirements	Current Location	Specification
	with flow rates less than or equal of 200 L per minute		
	c. Unrestricted air flow in three to four wind quadrants.	Meets Requirement	4/4 Unrestricted Quadrants

Table 3.3 AMD Requirements vs. Highway 854 Lift Station Location

Site Characteristics	AMD Requirements	Current Location	Specification
Sampler Inlet-height above ground (abg)	Minimum 2 m, Maximum 15 m	Meets Requirement	4 m abg
Other Requirements	a. Distance from an obstacle greater than 2.5 times the height of the obstacle above the sampler.	Meets Requirement	>2.5 times
	b. At least 2 m from any other samplers or inlets with flow rates greater than 200 litres (L) per minute.	Meets Requirement	None
	or at least 1 m apart from any other samplers or inlets with flow rates less than or equal of 200 L per minute	Meets Requirement	None
	c. Unrestricted air flow in three to four wind quadrants.	Meets Requirement	4/4 Unrestricted Quadrants

3.2 Leak Check Procedure

GHD performed a leak rate pre-inspection of each Sampler by making sure all gaskets were in place and in good condition, all connections are secure and not over tightened and inspected for damaged components. The leak rate audit was conducted by installing the calibrator orifice plate and warming up the sampler to normal operating temperature. The orifice plate holes and pressure tap holes were then covered for 30 seconds. Leakage was determined by listening for a "high-pitched squealing" sound made by escaping air.

3.2.1 Leak Check Results

Facility Site Station

The Facility Site Station Sampler passed the requirements of manufacturer's requirement for Leak Rate Audit.

Ryley School Station

The Ryley School Station Sampler passed the requirements of manufacturer's requirement for Leak Rate Audit.

Highway 854 Lift Station

A minor leak was detected at the Lift Station Sampler (AEPA Station ID 00010348-I-1) during the audit on September 28. Following this all parts were tightened and checked by Clean Harbors. GHD performed another leak check and audit on October 19 and confirmed the Lift Station Sampler passed the requirements of manufacturer's requirement for Leak Rate Audit.

3.3 Flow Audit Results

The 5-point flow audit was completed in accordance with the AQMP, the AMD and procedures outlined in the manufacturer's manual. The Facility Sampler, School Sampler, and Lift Station Sampler field audit forms are provided in Appendix A.

Facility Site Station

The Facility Site Station Sampler passed the 10 percent tolerance at 40 cubic feet per minute (CFM) as specified in the AQMP.

Ryley School Station

The Ryley School Station Sampler passed the 10 percent tolerance at 40 cubic feet per minute (CFM) as specified in the AQMP.

Highway 854 Lift Station

The Lift Station Sampler passed the 10 percent tolerance at 40 cubic feet per minute (CFM) as specified in the AQMP.

3.4 Instrument Condition and Recommendations

The Facility Site Sampler, Ryley School Sampler, and Lift Station Sampler were visually and functionally inspected on the audit day. Audit recommendations are listed below:

- The high volume motors were inspected at both locations, they were in good working condition when GHD arrived on site.
- Sample filter pans were cleaned.
- Pressure tap tubing in fair condition.
- All seals, gaskets and fittings are in good condition (no action required).
- Filter holder and screen in good condition (no action required).
- Main power connection wire in good condition (no action required).

All of Which is Respectfully Submitted,

GHD

Pooya Shariaty, Ph.D, P.Eng.

Appendices

Appendix A
Quarterly Audit Forms

Site and Calibration Information

Site		Calibration Orifice	
Location:	Facility Sampler	**Make:**	Tisch Environmental
Date:	Oct 19, 2023	**Model:**	TE-5028A
Tech.:	S. Davey & A. Penny	**Serial:**	1203
Sampler:	TE-5170V	**Qa Slope (m):**	0.97323
Serial #:	P8580 TSP VFC	**Qa Int (b):**	-0.01459
VFC G-Factor:	0.0909523500	**Calibration due date:**	02/20/24

Ambient Conditions

Temp (deg F):	52.89		
Ta (deg K):	285	**Barometric Press (in Hg):**	27.46
Ta (deg C):	11.6	**Pa (mm Hg):**	697.6

Calibration Information

Run Number	Orifice "H2O	Qa m3/min	Sampler "H2O	Pf mm Hg	Po/Pa	Calculated m3/min	% of Diff
1	3.57	1.255	6.05	11.291	0.984	1.263	0.56
2	3.53	1.248	7.42	13.848	0.980	1.258	0.72
3	3.45	1.234	8.31	15.509	0.978	1.254	1.62
4	3.40	1.225	9.22	17.207	0.975	1.251	2.12
5	3.38	1.222	10.45	19.503	0.972	1.247	2.05

Calculate Total Air Volume Using G-Factor

Enter Average Temperature During Sampling Duration (Deg F)	52.89
Average Temperature During Sampling Duration (Deg K)	284.61
Enter Average Barometric Pressure During Sampling Duration (In Hg)	27.46
Average Barometric Pressure During Sampling (mm Hg)	697.56
Enter Clean Filter Sampler Inches of Water	3.57
Enter Dirty Filter Sampler Inches of Water	3.38
Average Filter Sampler (mm Hg)	6.49
Enter Total Runtime in Hours (xx.xx)	0.22
Po/Pa :	0.991
Calculated Flow Rate (m3/min):	1.272
Total Flow (m3):	16.79

Calculations

Calibrator Flow (Qa) = 1/Slope*(SQRT(H20*(Ta/Pa))-Intercept)

Pressure Ratio (Po/Pa) = 1-Pf/Pa

% Difference = (Look Up Flow-Calibrator Flow)/Calibrator Flow*100

NOTE: Ensure calibration orifice has been certified within 12 months of use

Site and Calibration Information

Site		Calibration Orifice	
Location:	Ryley School Sampler	**Make:**	Tisch Environmental
Date:	Sep 28, 2023	**Model:**	TE-5028A
Tech.:	A. Penny & P. Shariaty	**Serial:**	1203
Sampler:	TE-5170V	**Qa Slope (m):**	0.97323
Serial #:	P8581 TSP VFC	**Qa Int (b):**	-0.01459
VFC G-Factor:	0.0906771980	**Calibration due date:**	02/20/24

Ambient Conditions

Temp (deg F):	57.4		
Ta (deg K):	287	**Barometric Press (in Hg):**	27.43
Ta (deg C):	14.1	**Pa (mm Hg):**	696.8

Calibration Information

Run Number	Orifice "H2O	Qa m3/min	Sampler "H2O	Pf mm Hg	Po/Pa	Calculated m3/min	% of Diff
1	3.40	1.231	5.87	10.955	0.984	1.268	3.01
2	3.42	1.235	6.60	12.317	0.982	1.265	2.43
3	3.41	1.233	7.42	13.848	0.980	1.262	2.35
4	3.35	1.222	8.78	16.386	0.976	1.257	2.86
5	3.27	1.208	10.23	19.092	0.973	1.252	3.64

Calculate Total Air Volume Using G-Factor

Enter Average Temperature During Sampling Duration (Deg F)	57.40
Average Temperature During Sampling Duration (Deg K)	287.11
Enter Average Barometric Pressure During Sampling Duration (In Hg)	27.43
Average Barometric Pressure During Sampling (mm Hg)	696.81
Enter Clean Filter Sampler Inches of Water	3.40
Enter Dirty Filter Sampler Inches of Water	3.27
Average Filter Sampler (mm Hg)	6.22
Enter Total Runtime in Hours (xx.xx)	0.33
Po/Pa :	0.991
Calculated Flow Rate (m3/min):	1.277
Total Flow (m3):	25.28

Calculations

Calibrator Flow (Qa) = 1/Slope*(SQRT(H20*(Ta/Pa))-Intercept)

Pressure Ratio (Po/Pa) = 1-Pf/Pa

% Difference = (Look Up Flow-Calibrator Flow)/Calibrator Flow*100

NOTE: Ensure calibration orifice has been certified within 12 months of use

Site and Calibration Information

Site		Calibration Orifice	
Location:	Lift Station Sampler	**Make:**	Tisch Environmental
Date:	Sep 28, 2023	**Model:**	TE-5028A
Tech.:	A. Penny & P. Shariat	**Serial:**	1203
Sampler:	TE-5170V	**Qa Slope (m):**	0.97323
Serial #:	P11162 TSP VFC	**Qa Int (b):**	-0.01459
VFC G-Factor:	0.0864333900	**Calibration due date:**	02/20/24

Ambient Conditions

Temp (deg F):	72.86		
Ta (deg K):	296	**Barometric Press (in Hg):**	27.61
Ta (deg C):	22.7	**Pa (mm Hg):**	701.3

Calibration Information

Run Number	Orifice "H2O	Qa m3/min	Sampler "H2O	Pf mm Hg	Po/Pa	Calculated m3/min	% of Diff
1	3.44	1.252	5.68	10.600	0.985	1.280	2.24
2	3.41	1.247	6.48	12.093	0.983	1.278	2.49
3	3.34	1.234	7.32	13.661	0.981	1.275	3.24
4	3.26	1.220	8.77	16.367	0.977	1.269	4.10
5	3.18	1.205	10.26	19.148	0.973	1.264	4.90

Calculate Total Air Volume Using G-Factor

Enter Average Temperature During Sampling Duration (Deg F)	72.86
Average Temperature During Sampling Duration (Deg K)	295.70
Enter Average Barometric Pressure During Sampling Duration (In Hg)	27.61
Average Barometric Pressure During Sampling (mm Hg)	701.31
Enter Clean Filter Sampler Inches of Water	3.44
Enter Dirty Filter Sampler Inches of Water	3.18
Average Filter Sampler (mm Hg)	6.18
Enter Total Runtime in Hours (xx.xx)	0.20
Po/Pa :	0.991
Calculated Flow Rate (m3/min):	1.289
Total Flow (m3):	15.47

Calculations

Calibrator Flow (Qa) = 1/Slope*(SQRT(H20*(Ta/Pa))-Intercept)

Pressure Ratio (Po/Pa) = 1-Pf/Pa

% Difference = (Look Up Flow-Calibrator Flow)/Calibrator Flow*100

NOTE: Ensure calibration orifice has been certified within 12 months of use

Site and Calibration Information

Site		Calibration Orifice	
Location:	LiftStation Sampler Oct	**Make:**	Tisch Environmental
Date:	19, 2023	**Model:**	TE-5028A
Tech.:	S. Davey & A. Penny	**Serial:**	1203
Sampler:	TE-5170V	**Qa Slope (m):**	0.97323
Serial #:	P11162 TSP VFC	**Qa Int (b):**	-0.01459
VFC G-Factor:	0.0864333900	**Calibration due date:**	02/20/24

Ambient Conditions

Temp (deg F):	61.05		
Ta (deg K):	289	**Barometric Press (in Hg):**	27.43
Ta (deg C):	16.1	**Pa (mm Hg):**	696.8

Calibration Information

Run Number	Orifice "H2O	Qa m3/min	Sampler "H2O	Pf mm Hg	Po/Pa	Calculated m3/min	% of Diff
1	3.34	1.225	5.71	10.656	0.985	1.267	3.51
2	3.25	1.208	6.34	11.832	0.983	1.265	4.72
3	3.13	1.186	7.12	13.288	0.981	1.262	6.41
4	3.09	1.178	8.62	16.087	0.977	1.257	6.62
5	2.93	1.148	10.27	19.167	0.972	1.251	8.97

Calculate Total Air Volume Using G-Factor

Enter Average Temperature During Sampling Duration (Deg F)	61.05
Average Temperature During Sampling Duration (Deg K)	289.14
Enter Average Barometric Pressure During Sampling Duration (In Hg)	27.43
Average Barometric Pressure During Sampling (mm Hg)	696.72
Enter Clean Filter Sampler Inches of Water	3.34
Enter Dirty Filter Sampler Inches of Water	2.93
Average Filter Sampler (mm Hg)	5.85
Enter Total Runtime in Hours (xx.xx)	0.20
Po/Pa :	0.992
Calculated Flow Rate (m3/min):	1.277
Total Flow (m3):	15.32

Calculations

Calibrator Flow (Qa) = 1/Slope*(SQRT(H20*(Ta/Pa))-Intercept)

Pressure Ratio (Po/Pa) = 1-Pf/Pa

% Difference = (Look Up Flow-Calibrator Flow)/Calibrator Flow*100

NOTE: Ensure calibration orifice has been certified within 12 months of use

Appendix B
Calibration Certificates

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Calibration Certificate

Customer: *GHD Ltd.*

Certificate: C593374-00-01

Unit Identification

Manufacturer: **Fluke**
Model: **1551A Ex**
Description: **Stik Thermometer**
Serial: **3520009**
Unit ID: **THM-CAL-001**

Calibration Date

Calibration Date: **4-Jul-2023**
Due Date: **4-Jul-2024**

Calibration Conditions

Temperature: **22.8°C**
Humidity: **41.2 %**
Barometric Pressure: **N/A**

General Information

Remark:**N/A**

Standards Used

Unit ID	Manufacturer	Model	Cal Date	Due Date
I-1585	Hart Scientific	1521/5627A	20-Apr-2023	20-Apr-2024
I-1969	Ametek	RTC-157A	27-Feb-2023	27-Feb-2024

The calibration was performed using measurement standards traceable to the National Measurement Institute Standards (NMIS) part of the National Research Council of Canada (NRC) or the National Institute of Standards and Technology (NIST), or to accepted instrinsic standards or measurement, or is derived by ratio type self-calibration techniques. Measurement uncertainties given in this report are based on a coverage factor of k=2 corresponding to a confidence level of approximately 95%

Calibrated by: *L. Fuentebella*

Luke Fuentebella

Approved by:

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Test Results

Procedure: **FLUKE 1551A EX_RTC-157A,Fluke 1523** Rev: **1**

Data Type: **As Found** Results: **Pass**

Test Description	True Value	Reading	Lower Limit	Upper Limit	Test Status	Exp Uncert
TEMPERATURE ACCURACY TEST						
-49.9540 °C		-49.982 °C	-50.004 °C	-49.904 °C	Pass	9.0e-003 °C
-24.9510 °C		-24.999 °C	-25.001 °C	-24.901 °C	Pass	9.0e-003 °C
0.0020 °C		-0.022 °C	-0.048 °C	0.052 °C	Pass	9.0e-003 °C
100.0140 °C		99.993 °C	99.964 °C	100.064 °C	Pass	9.0e-003 °C
154.9970 °C		154.986 °C	154.947 °C	155.047 °C	Pass	9.0e-003 °C

TISCH Environmental

RECALIBRATION DUE DATE:
February 20, 2024

Certificate of Calibration

Calibration Certification Information

Cal. Date:	February 20, 2023	**Rootsmeter S/N:** 438320	**Ta:** 294	°K
Operator:	Jim Tisch		**Pa:** 741.17	mm Hg
Calibration Model #:	TE-5028A	**Calibrator S/N:** **1203**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.2300	4.3	1.50
2	3	4	1	0.9590	7.1	2.50
3	5	6	1	0.8670	8.5	3.00
4	7	8	1	0.8040	9.9	3.50
5	9	10	1	0.6110	17.0	6.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9828	0.7990	1.2177	0.9942	0.8083	0.7714
0.9790	1.0209	1.5720	0.9904	1.0328	0.9958
0.9772	1.1271	1.7221	0.9885	1.1402	1.0909
0.9753	1.2130	1.8600	0.9866	1.2272	1.1783
0.9658	1.5807	2.4354	0.9771	1.5991	1.5427
QSTD	**m=**	**1.55422**	**QA**	**m=**	**0.97323**
	b=	**-0.02303**		**b=**	**-0.01459**
	r=	**0.99992**		**r=**	**0.99992**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd=	$1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$	**Qa=**	$1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

Key
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30.

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Calibration Certificate

Customer: *GHD Ltd.*

Certificate: C542161-00-01

Unit Identification

Manufacturer: **Dwyer**
Model: **475-0-FM**
Description: **Digital Manometer**
Serial: **N/A**
Unit ID: **MAN-CAL-001**

Calibration Date

Calibration Date: **1-Dec-2022**
Due Date: **1-Dec-2023**

Calibration Conditions

Temperature: **21.7°C**
Humidity: **15 %**
Barometric Pressure: **N/A**

General Information

Remark:**N/A**

Standards Used

Unit ID	Manufacturer	Model	Cal Date	Due Date
CAL0224	Fluke	750P01	12-Sep-2022	12-Mar-2023

The calibration was performed using measurement standards traceable to the National Measurement Institute Standards (NMIS) part of the National Research Council of Canada (NRC) or the National Institute of Standards and Technology (NIST), or to accepted instrinsic standards or measurement, or is derived by ratio type self-calibration techniques. Measurement uncertainties given in this report are based on a coverage factor of k=2 corresponding to a confidence level of approximately 95%.

Calibrated by: *D. Gano*

Approved by:

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Test Results
Procedure: **Pressure Gauge 10.00 IN.W.C 0.5% FS /750P01** Rev: **1.1**
Data Type: **As Found** Results: **Pass**

Test Description	True Value	Reading	Lower Limit	Upper Limit	Test Status	Exp Uncert
Tolerance used (additive if more than one listed): 0.5% of full scale						
UUT is set to the nominal value, Reading is the actual pressure read by the system instrument.						
1.000 inH2O		1.003 inH2O	0.950 inH2O	1.050 inH2O	Pass	1.6e-002 inH2O
2.000 inH2O		1.983 inH2O	1.950 inH2O	2.050 inH2O	Pass	1.6e-002 inH2O
4.000 inH2O		3.982 inH2O	3.950 inH2O	4.050 inH2O	Pass	1.6e-002 inH2O
6.000 inH2O		5.978 inH2O	5.950 inH2O	6.050 inH2O	Pass	1.6e-002 inH2O
8.000 inH2O		7.969 inH2O	7.950 inH2O	8.050 inH2O	Pass	1.6e-002 inH2O
10.000 inH2O		9.974 inH2O	9.950 inH2O	10.050 inH2O	Pass	1.6e-002 inH2O

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Calibration Certificate

Customer: *GHD LTD*

Certificate: C542157-00-01

Unit Identification

Manufacturer: **TSI**
Model: **9555-X / 960**
Description: **VelociCalc**

Serial: **9555X1002005**
Unit ID: **VEL-CAL-002**

Calibration Date

Calibration Date: **20-Dec-2022**

Due Date: **20-Dec-2023**

Calibration Conditions

Temperature: **22.5°C**
Humidity: **34.8 %**
Barometric Pressure: **103.0kPa**

General Information

Remark:**N/A**

Standards Used

Unit ID	Manufacturer	Model	Cal Date	Due Date
M-012	Airflow Development	83FSL	********** No Calibration Required **********	
M-110	Love Controls	HM3531DLF600	11-Oct-2022	11-Oct-2023
M-115	Rotronic	M22W	10-Jul-2022	10-Jul-2023
M-130	Fluke	1552A	13-May-2022	13-May-2023

The calibration was performed using measurement standards traceable to the National Measurement Institute Standards (NMIS) part of the National Research Council of Canada (NRC) or the National Institute of Standards and Technology (NIST), or to accepted instrinsic standards or measurement, or is derived by ratio type self-calibration techniques. Measurement uncertainties given in this report are based on a coverage factor of k=2 corresponding to a confidence level of approximately 95%.

Calibrated by: ***R. Chaaya***

Approved by:

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Test Results
Procedure: **TSI 9555-P C/W 964 Probe** Rev: **2**
Data Type: **As Found** Results: **Pass**

Test Description	True Value	Reading	Lower Limit	Upper Limit	Test Status	Exp Uncert
TEMPERATURE TEST ACCURACY °C						
0.0 °C		0.1 °C	-0.3 °C	0.3 °C	Pass	1.2e-001 °C
25.0 °C		24.9 °C	24.7 °C	25.3 °C	Pass	1.2e-001 °C
60.0 °C		60.0 °C	59.7 °C	60.3 °C	Pass	1.2e-001 °C
VELOCITY TEST ACCURACY ft/min						
100 ft/min		99 ft/min	97 ft/min	103 ft/min	Pass	5.8e-001 t/min
200 ft/min		201 ft/min	194 ft/min	206 ft/min	Pass	5.8e-001 t/min
300 ft/min		303 ft/min	291 ft/min	309 ft/min	Pass	5.8e-001 t/min
400 ft/min		402 ft/min	388 ft/min	412 ft/min	Pass	5.8e-001 t/min
500 ft/min		496 ft/min	485 ft/min	515 ft/min	Pass	5.8e-001 t/min
750 ft/min		754 ft/min	727 ft/min	773 ft/min	Pass	5.8e-001 t/min
1000 ft/min		993 ft/min	970 ft/min	1030 ft/min	Pass	5.8e-001 t/min
1500 ft/min		1507 ft/min	1455 ft/min	1545 ft/min	Pass	5.8e-001 t/min
2000 ft/min		2018 ft/min	1939 ft/min	2061 ft/min	Pass	5.8e-001 t/min
3000 ft/min		3005 ft/min	2910 ft/min	3090 ft/min	Pass	5.8e-001 t/min
4000 ft/min		3986 ft/min	3880 ft/min	4120 ft/min	Pass	5.8e-001 t/min
5000 ft/min		5011 ft/min	4850 ft/min	5150 ft/min	Pass	5.8e-001 t/min

about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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