



February 24, 2022

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

RE: Monthly Ambient Air Monitoring Report
January 2022
Clean Harbors Canada, Inc. Approval 10348-03-00

To whom it may concern:

Clean Harbors Canada, Inc. (Clean Harbors) is presenting this Monthly Ambient Air Monitoring Report, which was prepared by GHD (Consultant), for the reporting period of January 2022, to Alberta Environment and Parks (AEP). 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 Environmental Protection and Enhancement Act (EPEA) Approval, Approval No. 10348-03-00 (Approval). As part of the Approval requirements, the Facility submitted a proposal for a New Ambient Air Monitoring Program, which was subsequently approved on June 24, 2009 by the AEP (formally AENV). Operating under the Approval and the approved proposal, Clean Harbors operates two ambient air monitoring stations: AEP Station ID 00010348-I-1 and AEP Station ID 00010348-C-1.

For the January 2022 monthly reporting period, Clean Harbors reported a non-compliance event to the AEP for AEP Station ID 00010348-C-1 on January 12, 2022 (Reference No. 386952). Due to an instrument failure at the meteorological station, the total up time for the month of January was under the minimum 90% required under Chapter 6, Section 4.1.3 of the AMD. Once aware of the missing wind data, Clean Harbors notified the AEP of the non-compliance event. Clean Harbors investigated the issue and have experienced no further issues with the instrument.

Included in this report are the following:

- Summary of the ambient air monitoring program for January 2022
- Summary of AMD Electronic Transfer System submittals
- Results for Particulate Matter ≤ 10 microns (PM₁₀) reported in ug/m³
- Results for water-soluble cations; metal or anions if the PM₁₀ results were >50 ug/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.

A handwritten signature in blue ink that reads "Stan Yuha".

Stan Yuha

Facility Manager
Ryley Facility



Alberta Environment and Parks (AEP)
Monthly Ambient Air Monitoring Report
January 2022
Report Completed on February 24, 2022

Clean Harbors Environmental Services Inc.
Approval Number: 10348-03-00
Ryley Facility, Alberta

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- Appendix A Meteorological Station Calibration Report
- Appendix B Sampling Field Sheets
- Appendix C Wind Class Frequency Distribution Graphs and Wind Rose
- Appendix D Chain of Custody Forms and Laboratory Analytical Reports

1. Introduction

The Facility operates two ambient air monitoring stations to assess ambient air quality at and around the Facility. One intermittent monitoring station, known as the Ryley Lift Station (AEP Station ID 00010348-I-1), is located on Secondary Road 854, approximately 350 metres southeast of the Facility. At this location, samples are collected and analyzed for the following: particulate matter less than or equal to 10 micrometers (μm) in diameter (PM_{10}), volatile organic compounds (VOCs), and total non-methane organic compounds (TNMOC). Additionally, PM_{10} samples that exceed 50 micrograms per cubic metre ($50 \mu\text{g}/\text{m}^3$) are analyzed for a target list of metals, anions, and cations. Sampling is conducted every 12 days as required by the Facility's Approval.

The second station, located at the Facility (AEP Station ID 00010348-C-1), is a continuous meteorological station that collects wind speed and wind direction data.

All sampling and monitoring is conducted in accordance with the Facility's Approval 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.

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
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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
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Name: Mr. Pooya Shariaty
Title: Senior Air Quality Specialist
Company: GHD Limited
Responsibilities: Senior QA/QC
Address: 3445-114th Ave. SE, Suite 103 Calgary, AB
Phone: 403-271-2000
Email: Pooya.shariaty@ghd.com

Name: Mr. Trevor Lewis
 Title: Project Manager
 Company: GHD Limited
 Responsibilities: Maintenance/Calibration Services/Report Preparer/ETS Submitter
 Address: 3445-114th Ave. SE, Suite 103 Calgary, AB
 Phone: 587-991-2378
 Email: trevor.lewis@ghd.com

Company: Innotech
 Responsibilities: Laboratory Analytical Services
 Address: PO Bag 4000, Vegreville, Alberta
 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 January 2022.

<i>Activity</i>	<i>Completed (Y/N)</i>	<i>Date(s)</i>
Wind Speed/Direction Sensor Calibration	N	May 28, 2021 ⁽¹⁾
Changes to the Wind Speed/Direction Sensor	N	-
PM ₁₀ Sampling Station Calibration	N	-
Changes to the PM ₁₀ Sampling Station	N	-
PM ₁₀ Samples Collected	Y	January 11, 2022 January 23, 2022
VOC and TNMOC Samples Collected	Y	January 11, 2022 January 23, 2022
Metal Analysis Conducted	N	-
Maintenance Activities	Y	January 11, 2022 January 23, 2022
Dust Suppression Activities	N	-
<p>Note: (1) The wind speed/direction sensor was replaced on May 28, 2021 after a malfunction with the previous sensor. The installed sensor was checked for calibration on August 28, 2020 and was shown to be within the allowable tolerances and was then stored, prior to installation this year.</p>		

3. Summary of Electronic Transfer System (ETS) Submittals

In addition to the January 2022 monthly report, the following summarized items were submitted to the ETS:

3.1 AMD Approval Contravention Form

An AMD Approval contravention form (AMD1), for AEP Reference No. 386952, was submitted to the AEP via the ETS portal. The contravention form was completed due to the meteorological station experiencing an instrument failure between December 14, 2022 and January 10, 2022, resulting in a uptime less than the 90% required under Chapter 6, Section 4.1.3 of the AMD.

3.2 AMD XML Schema

An XML formatted Schema file was submitted to the AEP via the ETS portal. The XML Schema file contains the results from AEP Station ID 00010348-I-1 and AEP Station ID 00010348-C-1.

3.3 Ambient Air Monitoring Program Laboratory Reports

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

3.4 Ambient Air Monitoring Program Calibration Reports

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

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

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

The meteorological station was taken down and calibrated on May 28, 2021. The station was shown to be within all allowable tolerances, as required by the manufacturer. Provided in Appendix A is the calibration report and record of installation.

There were no changes to the meteorological station during January 2022.

4.2 PM₁₀ Sampling Station (AEP Station ID 00010348-I-1)

Maintenance activities for the Partisol Federal Reference Method PM₁₀ Sampler included inlet cleaning and leak checks that were conducted before each sampling event in January 2022. The pre-sampling maintenance activities are recorded in the field sampling sheets provided in Appendix B.

5. Ambient Air Monitoring Results

The following section presents the results from the ambient air monitoring program for AEP Station ID 00010348-C-1 and AEP Station ID 00010348-I-1 conducted in January 2022. Where applicable, comparisons were made to Alberta Ambient Air Quality Objectives (AAAQO) for parameters that had 24-hour average objectives. These parameters include o,m,p-xylene, hexane, and toluene. For all other parameters, AAAQO have not been established or the limits have averaging periods other than 24-hours.

5.1 Meteorological Data for Wind Speed and Direction (AEP Station ID 00010348-C-1)

In accordance with the Approval and the AMD, the Facility is required to collect wind speed and directional data continuously when operations are occurring on site. Table 1 presents the hourly and 24-hour average wind speeds for January 2022. Table 2 presents the hourly and 24-hour average wind direction data (degrees from north) for January 2022. Table 3 presents the Wind Class Frequency Distribution for January 2022. Appendix C provides a graphical representation of the Wind Class Frequency Distribution and the Wind Roses based on Tables 1, 2 and 3.

5.1.1 Data Verification and Validation and Uptime

Based on the verification and validation process conducted for the meteorological data that was collected in January 2022, it was determined that 69.6 percent of the data is valid, which represents 69.6 percent uptime of the meteorological station. The missing wind data was due to an instrument malfunction regarding the anemometer at meteorological station at the Facility. The anemometer translator did not record the correct the wind direction and was stuck on 357 degrees from December 14th until January 10th. The Facility confirmed the anemometer itself was working normally and reset the translator by unplugging it and plugging it back in. After the reset, the translator started working normally. This is below the 90 percent uptime limit required for compliance, as per the Approval. Clean Harbors submitted a 7-day reference letter to the AEP on January 12, 2022 (reference number #386952) upon learning about the contravention.

5.2 PM₁₀ Concentrations (AEP Station ID 00010348-I-1)

Table 4 presents the results of the sampling conducted for PM₁₀. Appendix B provides the field sheets completed for each sampling event. Appendix D provides the chain of custody forms and laboratory analytical reports.

AAAQO are specified for total suspended particulates (TSP) at 100 µg/m³ and PM_{2.5} at 29 µg/m³ (24-hour averaging period). There is currently no AAAQO specified for PM₁₀ for a 24-hour averaging period in Alberta. In accordance with the Facility's Approval, PM₁₀ samples that exceed 50 µg/m³ are analyzed for a target list of metals, anions, and cations.

5.3 Metal Concentrations

All of the PM₁₀ samples collected in January 2022 were below 50 µg/m³ and as such analysis for metals, anions, and cations was not conducted on those samples.

5.4 VOC and TNMOC Concentrations

Table 5 presents the VOC and TNMOC concentrations measured in January 2022. There are three VOC parameters that have corresponding AAAQO with 24-hour averaging periods including o,p,m-xylene, hexane and toluene. There were no exceedances for these parameters in January 2022. 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 Dust Suppression

There was no dust suppression activities conducted during January 2022.

6. Conclusions

The following summarizes the Ambient Air Monitoring Program that was conducted in January 2022.

- 1 The PM₁₀ concentrations measured on January 11 and January 23, 2022 were 8.075 µg/m³ and 1.134 µg/m³ respectively.
- 2 Based on the ambient air monitoring results, 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 January 2022.
- 3 During January 2022, the wind station operated at 69.6 percent uptime. Based on the data verification and validation procedure conducted, this is not in compliance with the minimum 90 percent uptime required by the AMD.

Clean Harbors will continue 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 January 2022 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

Tables

TABLE 1

Average Wind Speed (metres/second)
AEP Station ID 00010348-C-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
January 2022

Ryley Wind Speed Data (m/s) - Month of January 2022																								
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	3.1	2.9	2.1	2.9	1.7	2.0	2.6	3.3	3.5	3.7	3.5	2.4	3.8	3.4	3.3	3.3	4.0	4.0	3.6	4.2	4.2	3.8	3.8	5.1
2	4.4	5.5	2.2	4.6	4.0	1.7	1.9	2.5	3.9	4.5	1.2	1.7	5.2	8.8	9.4	7.7	7.8	7.8	5.4	4.1	5.2	5.3	5.2	4.2
3	6.2	5.3	4.9	3.9	4.3	4.6	5.9	5.7	5.2	4.7	4.9	6.4	6.3	5.2	4.0	3.5	4.6	5.4	5.1	5.8	5.6	6.1	6.0	6.1
4	6.4	6.5	6.3	4.9	5.5	6.6	6.9	7.4	8.1	8.5	7.3	7.6	6.7	5.4	6.1	4.6	3.8	3.8	3.8	4.3	3.8	3.8	3.2	2.6
5	3.1	3.2	3.2	3.1	2.9	3.0	3.4	3.7	3.7	3.5	3.8	3.7	2.8	3.0	2.8	2.3	2.1	1.8	1.2	0.9	0.5	0.4	0.7	1.0
6	1.1	1.0	1.7	1.0	2.2	3.5	3.1	3.0	3.2	3.7	3.6	3.2	2.7	2.9	3.1	3.2	3.0	3.8	3.3	3.0	3.3	3.2	3.1	2.4
7	2.4	3.1	2.6	2.1	2.7	1.7	1.4	2.0	3.3	4.2	3.3	3.2	3.7	5.0	4.6	6.3	7.0	7.6	7.6	7.3	7.4	7.7	8.0	8.7
8	7.1	5.8	6.7	6.7	5.9	5.2	5.1	4.6	4.0	4.3	4.6	4.5	3.8	3.7	3.4	2.9	1.1	0.7	1.4	1.5	1.3	1.1	1.2	1.6
9	2.4	2.7	2.0	2.7	2.7	2.8	2.5	2.0	3.3	3.0	4.1	4.6	4.9	5.3	5.8	6.0	6.5	6.8	6.8	5.4	5.0	5.0	4.3	5.1
10	5.7	5.3	5.9	5.5	4.4	3.7	3.8	3.2	2.8	2.5	3.2	2.3	2.8	2.4	4.0	3.4	5.4	4.2	4.8	4.9	6.6	8.6	5.3	4.6
11	6.0	6.6	6.1	7.0	7.2	6.6	6.7	6.4	6.0	2.8	1.2	2.7	1.8	0.9	0.7	0.2	1.9	3.1	1.9	4.5	6.0	5.3	6.0	5.0
12	4.2	4.8	6.0	5.2	4.2	3.7	4.3	2.6	1.5	3.7	4.0	3.3	4.3	5.4	3.4	4.7	4.8	5.4	5.2	5.4	5.0	5.2	5.6	5.2
13	5.2	3.7	1.1	1.8	2.7	1.9	1.8	1.5	2.4	0.6	1.1	3.7	2.5	2.6	2.8	4.0	4.4	4.3	4.8	4.6	4.1	4.8	6.1	7.4
14	6.8	6.5	6.4	4.2	1.8	3.4	3.5	2.9	4.7	4.5	3.3	3.6	4.0	4.9	5.4	5.3	5.6	5.5	4.2	4.2	2.8	3.5	3.0	3.0
15	4.2	5.3	4.0	2.5	3.7	4.7	3.5	3.0	4.6	5.9	4.6	6.6	5.8	3.9	5.0	6.9	5.8	5.2	4.8	4.7	5.2	5.7	5.7	6.5
16	6.5	8.1	5.7	5.6	5.8	5.6	5.9	5.0	5.0	4.9	5.6	5.3	5.6	5.1	4.2	4.4	3.5	2.3	1.5	2.2	2.4	2.1	3.1	3.7
17	3.3	2.9	2.3	2.1	2.5	3.0	2.7	3.3	5.1	4.1	3.1	0.9	0.3	1.1	1.8	1.1	1.6	4.1	12.8	15.8	16.7	14.1	14.8	14.1
18	13.3	11.9	10.6	10.7	11.0	10.9	9.2	7.5	6.5	5.1	4.5	5.2	5.4	4.8	4.5	3.5	2.7	2.1	2.2	2.1	2.9	2.7	2.3	2.2
19	1.0	0.6	1.8	1.8	2.2	1.7	1.7	2.0	1.3	2.7	4.2	4.7	5.0	5.3	5.6	5.7	5.2	5.2	4.7	5.4	6.3	6.3	5.8	6.2
20	6.4	6.6	6.5	5.7	4.9	4.9	5.5	5.3	5.2	3.9	3.4	3.6	3.5	3.1	2.6	2.7	3.9	7.8	8.2	8.4	12.2	14.3	12.9	11.4
21	12.7	14.4	13.4	13.0	11.0	7.3	8.0	7.3	6.7	7.2	5.2	5.2	4.7	4.2	2.8	1.2	2.4	3.8	4.1	4.9	4.8	4.5	4.9	3.6
22	2.8	4.4	6.2	6.7	7.4	8.2	8.7	5.4	4.8	4.4	4.9	4.0	2.1	0.5	1.5	2.4	3.0	2.5	5.2	5.9	5.4	5.1	6.1	6.6
23	6.6	7.4	6.5	8.1	7.2	7.1	6.0	6.2	7.1	6.9	8.4	9.3	7.1	6.1	5.2	4.7	7.6	7.5	7.1	7.0	6.5	5.9	4.4	4.6
24	3.9	1.7	3.2	3.6	3.5	3.9	4.3	4.3	4.3	4.0	3.0	2.7	2.2	1.9	2.1	2.4	2.5	2.0	1.7	2.3	1.7	2.1	2.4	3.0
25	2.9	3.6	3.8	3.8	4.3	4.6	5.1	5.6	5.0	6.0	6.3	6.2	6.7	5.9	7.2	7.5	7.6	7.8	7.2	6.5	5.4	7.8	9.7	10.2
26	11.9	13.1	12.3	13.4	14.1	11.8	10.7	9.5	8.5	8.6	9.2	7.5	8.4	10.0	10.6	11.1	11.2	10.4	9.3	9.2	11.4	8.4	7.5	7.8
27	6.3	4.7	5.2	4.2	3.1	2.8	3.2	3.1	3.5	3.4	3.4	4.7	4.2	4.1	4.0	3.9	4.9	5.5	4.7	4.7	4.1	4.5	3.9	4.0
28	4.5	5.0	2.5	4.4	3.2	3.7	4.6	6.1	6.5	6.8	6.7	6.6	5.1	3.2	4.1	3.8	4.6	4.5	4.8	5.1	5.1	3.8	3.5	4.7
29	4.9	4.4	4.8	5.2	3.7	4.7	4.6	4.1	3.7	3.1	3.1	3.2	2.9	4.3	4.5	3.3	2.5	2.3	2.4	2.8	2.6	2.6	3.6	4.8
30	4.2	4.2	4.9	4.6	4.6	4.6	4.8	4.8	5.8	5.5	5.6	5.9	5.1	4.9	4.2	3.1	2.7	1.7	2.4	2.8	3.5	4.1	3.6	4.1
31	2.7	2.6	2.6	2.4	3.9	4.6	11.7	17.9	17.7	15.9	14.2	13.8	13.8	13.2	12.6	11.0	10.9	10.0	6.4	5.1	4.3	3.8	4.1	3.8

TABLE 2

**Average Wind Direction (degrees from North)
 AEP Station ID 00010348-C-1
 Clean Harbors Canada, Inc.
 Monthly Ambient Air Monitoring Report
 January 2022**

Ryley Wind Direction Data (degrees, blowing from) - Month of January 2022																								
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)	171	151	183	171	170	214	225	231	246	249	279	300	290	239
11	234	225	230	232	228	225	223	220	226	233	224	235	289	10	313	59	235	211	215	209	221	228	221	220
12	217	221	215	215	212	241	256	276	224	219	223	274	286	298	282	244	243	225	231	238	241	233	228	226
13	222	218	162	140	151	152	141	94	27	38	300	350	342	317	311	326	308	293	287	280	279	285	314	327
14	333	328	323	311	300	257	254	223	218	223	203	184	180	166	174	163	164	167	166	170	184	171	185	187
15	219	231	226	268	261	241	251	229	238	224	236	232	243	269	283	293	283	277	269	271	269	263	266	280
16	279	285	280	276	255	271	285	281	250	235	227	222	221	221	224	226	222	218	165	107	133	133	150	152
17	152	163	156	153	182	190	173	214	221	227	231	311	161	45	359	31	345	332	333	331	334	323	318	321
18	323	326	328	324	323	324	328	324	313	305	306	315	329	332	338	337	332	322	314	281	274	269	251	231
19	239	219	177	166	181	172	160	137	149	142	146	149	153	152	147	144	146	146	145	144	151	153	152	151
20	154	151	150	154	155	157	160	160	157	172	170	167	164	185	210	197	230	291	290	290	298	296	298	308
21	310	314	314	313	320	334	336	332	340	338	342	351	357	14	22	39	105	115	121	128	140	146	150	165
22	184	224	232	243	279	301	316	331	16	359	351	348	7	238	182	181	160	172	229	233	247	236	233	239
23	275	279	276	288	286	285	280	277	286	300	318	333	325	317	311	329	315	309	306	306	309	310	309	309
24	306	326	95	101	90	97	98	92	84	80	83	69	81	51	60	53	55	57	71	93	115	124	129	143
25	151	167	166	165	163	165	155	153	162	175	188	197	208	208	218	218	225	232	229	246	249	283	289	289
26	298	299	297	309	313	310	305	306	299	310	307	307	301	301	308	312	306	309	317	310	317	324	322	318
27	324	302	308	305	290	270	243	218	215	204	187	193	198	192	187	214	229	243	248	257	265	250	255	257
28	240	224	224	219	192	186	195	219	223	226	226	224	226	247	278	268	271	250	280	273	273	283	257	247
29	248	247	242	242	267	244	237	235	247	236	245	216	207	215	212	198	196	167	140	162	188	181	222	222
30	239	240	245	258	256	257	260	237	232	241	228	224	222	223	224	218	198	151	148	129	130	131	114	114
31	122	111	106	301	325	314	324	325	327	329	330	327	324	326	325	321	320	321	322	323	321	326	326	321

Notes:
 (X) - Equipment Malfunction; anemometer translation error.

TABLE 3

Wind Frequency Distribution
AEP Station ID 00010348-C-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
January 2022

Frequency Distribution Report: Ryley, Alberta - January 2022									
Direction	Angle	Wind Speed (m/s) and Number of Occurrences						%	Total Occurrences by Direction
		< 0.5	0.5 to < 1.5	1.5 to < 2.5	2.5 to < 3.5	3.5 to < 4.5	>= 4.5		
North	> 337.5 - 22.5	0	1	3	2	4	8	2.4%	18
Northeast	> 22.5 - 67.5	1	4	5	1	0	0	1.5%	11
East	> 67.5 - 112.5	0	0	6	5	7	0	2.4%	18
Southeast	> 112.5 - 157.5	0	1	15	8	8	26	7.8%	58
South	> 157.5 - 202.5	1	1	10	23	18	14	9.0%	67
Southwest	> 202.5 - 247.5	0	4	5	20	25	86	18.8%	140
West	> 247.5 - 292.5	0	0	3	9	16	54	11.0%	82
Northwest	> 292.5 - 337.5	0	3	5	3	14	99	16.7%	124
Missing/Invalid Hours								30.4%	226
Total Occurrences by Speed		2	14	52	71	92	287		744
Occurrences by %		0.3%	1.9%	7.0%	9.5%	12.4%	38.6%	100.00%	

TABLE 4

Particulate Matter PM₁₀ Results
AEP Station ID 00010348-I-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
January 2022

Filter ID	P7086429	P7086430
Test ID	787	788
Sample Start Date/Time	22/1/11 00:00:00	22/1/23 00:00:00
Sample End Date/Time	22/1/12 00:00:00	22/1/24 00:00:00
Sampling Time (hours)	24	24
Flow Rate (l/min)	16.7	16.7
Volume (m³)	23.9	23.8
PM₁₀ Mass (mg)	0.193	0.027
PM₁₀ Concentration (ug/m³)	8.075	1.134
Sampler Name	2000 FRM-AE / 200FB209860905	2000 FRM-AE / 200FB209860905

TABLE 5

VOC and TNMOC Analytical Results
AEP Station ID 00010348-I-1
Clean Harbors Canada, Inc.
Monthly Ambient Air Monitoring Report
January 2022

Parameter	Units	Date	11-Jan-22	23-Jan-22
		Sample ID AAAQO ⁽¹⁾	787	788
1,2,3-Trimethylbenzene	ppbv	-	< 0.09	< 0.08
1,2,4-Trimethylbenzene	ppbv	-	< 0.05	< 0.05
1,3,5-Trimethylbenzene	ppbv	-	< 0.05	< 0.05
1-Butene/Isobutylene	ppbv	-	0.37	0.16
1-Hexene/2-Methyl-1-pentene	ppbv	-	0.19	< 0.12
1-Pentene	ppbv	-	0.29	< 0.05
2,2,4-Trimethylpentane	ppbv	-	0.15	0.11
2,2-Dimethylbutane	ppbv	-	0.13	0.16
2,3,4-Trimethylpentane	ppbv	-	< 0.03	< 0.03
2,3-Dimethylbutane	ppbv	-	< 0.16	< 0.15
2,3-Dimethylpentane	ppbv	-	0.15	< 0.03
2,4-Dimethylpentane	ppbv	-	0.12	< 0.05
2-Methylheptane	ppbv	-	< 0.03	< 0.03
2-Methylhexane	ppbv	-	0.18	< 0.05
2-Methylpentane	ppbv	-	0.30	0.16
3-Methylheptane	ppbv	-	0.17	< 0.05
3-Methylhexane	ppbv	-	0.21	< 0.03
3-Methylpentane	ppbv	-	0.48	0.14
Benzene	ppbv	-	0.34	0.27
cis-2-Butene	ppbv	-	0.10	< 0.05
cis-2-Pentene	ppbv	-	< 0.03	< 0.03
Cyclohexane	ppbv	-	0.42	0.30
Cyclopentane	ppbv	-	0.14	0.12
Ethylbenzene	ppbv	-	1.19	0.30
Isobutane	ppbv	-	1.82	1.15
Isopentane	ppbv	-	1.26	0.71
Isoprene	ppbv	-	< 0.03	< 0.03
Isopropylbenzene	ppbv	-	< 0.07	< 0.07
m,p-Xylene	ppbv	161	4.49	0.39
m-Diethylbenzene	ppbv	-	< 0.03	< 0.03
m-Ethyltoluene	ppbv	-	< 0.05	< 0.05
Methylcyclohexane	ppbv	-	0.22	0.17
Methylcyclopentane	ppbv	-	0.39	0.15
n-Butane	ppbv	-	3.33	1.39
n-Decane	ppbv	-	< 0.10	< 0.10
n-Dodecane	ppbv	-	< 0.5	< 0.5
n-Heptane	ppbv	-	0.36	0.28
n-Hexane	ppbv	1990	1.54	0.25
n-Nonane	ppbv	-	< 0.07	< 0.07
n-Octane	ppbv	-	0.23	< 0.03
n-Pentane	ppbv	-	0.93	0.57
n-Propylbenzene	ppbv	-	0.17	< 0.10
n-Undecane	ppbv	-	< 0.9	< 0.8
o-Ethyltoluene	ppbv	-	< 0.03	< 0.03
o-Xylene	ppbv	161	1.03	0.25
p-Diethylbenzene	ppbv	-	< 0.03	< 0.03
p-Ethyltoluene	ppbv	-	< 0.07	< 0.07
Styrene	ppbv	-	0.44	< 0.07
Toluene	ppbv	106	3.70	0.25
trans-2-Butene	ppbv	-	0.08	< 0.05
trans-2-Pentene	ppbv	-	< 0.03	< 0.03
Total Non-Methane Organic Carbon	ppmv	-	< 0.09	< 0.05
Total VOCs ⁽²⁾	ppbv	-	27.270	10.190

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.

Appendix A

Meteorological Station Calibration Report

R. M. YOUNG COMPANY WIND SENSOR CALIBRATION CERTIFICATE

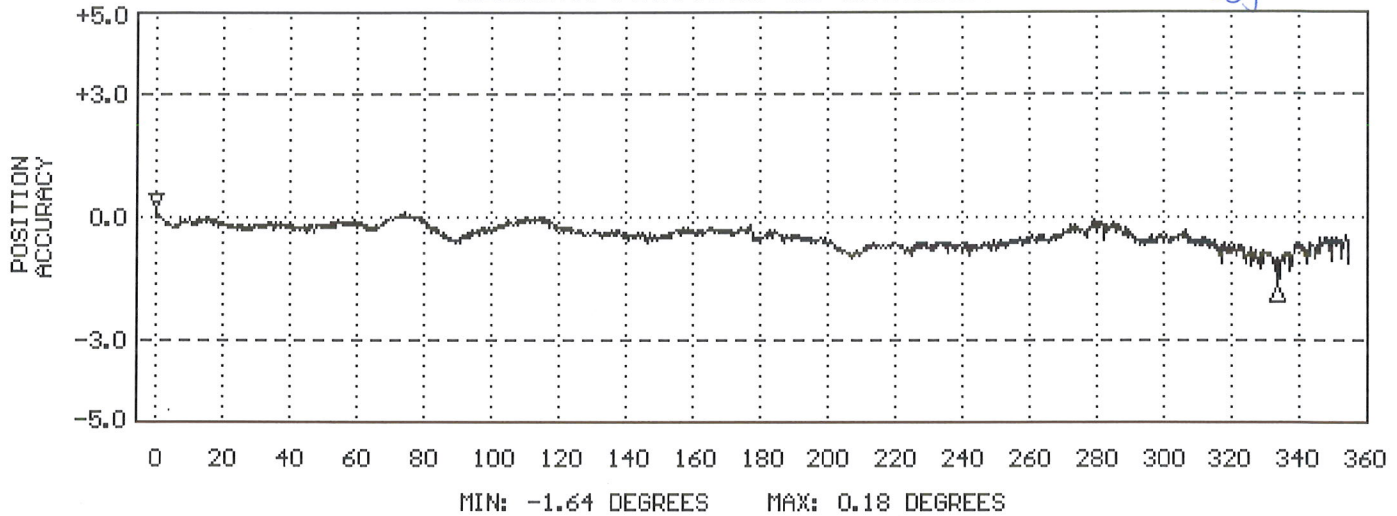
SENSOR: 05305-10A WIND MONITOR-AQ
SENSOR SERIAL NUMBER: WM149768
BEARINGS: SHIELDED/OIL LUBE
DATE: AUG 3 2016

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:

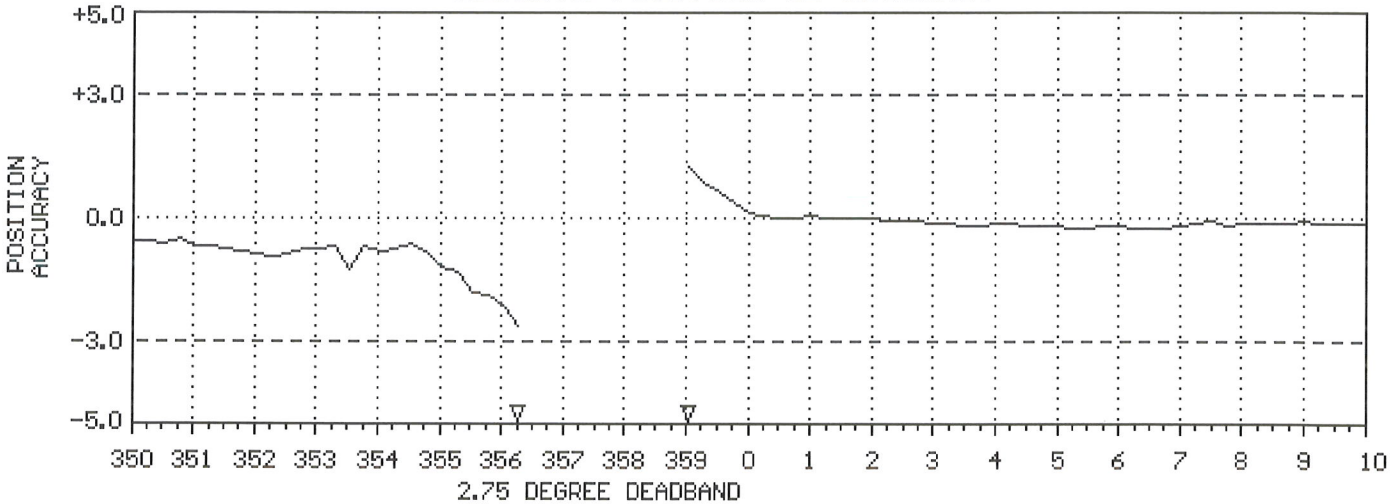
[Signature]
Insp. By

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

AZIMUTH POSITION vs ACCURACY



AZIMUTH POSITION vs ACCURACY



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:	Aug 28, 2020		Model:	05305	
Tech.:	T.Lewis		Serial #:	151040	
Instrument:	Continuous Wind Monitor		Calibration due:	Annually	
Time:	10:15 AM - 1:00 PM		Temperature:	19°C	
Pre-Calibration Inspection			Y/N		
Is the wind direction < +/- 10° from compass observation?			Y		
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)
40	37	Y	9.7	9.7	Y
70	67	Y	9.2	9.2	Y
100	97	Y	7.7	7.6	Y
190	188	Y	5.6	5.6	Y
270	267	Y	4.1	4.1	Y
355	351	Y	2.6	2.5	Y
90	87	Y	1.0	1.0	Y
Comments			Conversion Factors		
Wind monitor (SN:151040) was removed from tower, inspected and calibration checked on August 28, 2020. Mechanical bearings and shaft alignment were inspected. Both bearings and alignment are in good condition with appropriate play. No additional maintenance is required. The wind monitor was installed on May 28, 2021.			m/s	RPM	
			19.460	3800	
			15.360	3000	
			12.800	2500	
			9.216	1800	
			7.680	1500	
			5.632	1100	
			4.096	800	
Calibration Adjustment Required?: No			2.560	500	
			1.024	200	

Appendix B

Sampling Field Sheets

**FIELD SHEET
VOLATILE ORGANIC COMPOUNDS
CLEAN HARBORS CANADA INC
RILEY, ALBERTA**

A) GENERAL INFORMATION

Sample Identification Number: Organic Test 787
 Sample Canister Location: Ryley Lift Station -Shed
 Sampled by: T. Webb
 Sampler Name: Test 787
 Sample Date: 22/01/11 yy/mm/dd
 Shipping Date to Laboratory: 22/01/13
 Canister Type (ie. 1 Litre/6 Litre/Other): 6L
 Canister Serial No.: 29002
 Flow Controller Serial No.: H/L578699/A0334390-5

B) SAMPLE SET UP

	Set up Conditions	Sample Retrieval
Date:	22/01/10	22/01/12
Ambient Temperature °C (inside shed):	15.4	17.2
Barometric Pressure (mm Hg):	697	696
Canister Pressure Gauge Reading (- Inches Hg):	(-)27.1	(-)7
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 cloudy

Describe facility operations that may affect sampling event:

None

Comments:

FIELD SHEET			
PM ₁₀ (Partisol Monitoring Unit)			
CLEAN HARBORS CANADA INC			
RYLEY, ALBERTA			
A) GENERAL INFORMATION			
Filter ID:	P7086429		
PO Number:	222179		
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905		
Test number :	Particulate Test 787		
Sample Date:	22/01/11		yy/mm/dd
Shipping Date to Laboratory:	22/01/13		
B) SAMPLING INFORMATION			
SAMPLE START			
Sampling Start Date:	22/01/11		
Sampling Start Time:	00:00		
Current Instrument Date:	22/01/10		
Current Instrument Time:	14:18		
Ambient Temperature °C:	-5.0		
Barometric Pressure (mm Hg):	697		
Leak Check:	Pass		(Pass/Fail)
Clean PM10 Inlet:	Yes		(Yes/No)
Weather Conditions Sampling date :	mostly cloudy		
Weather Conditions set up:	mostly cloudy		
SAMPLE RETRIEVAL			
Sampled by	T. Webb		
Sampling End Date:	22/01/12		
Sampling End Time:	00:00		
Current Instrument Date:	22/01/12		
Current Instrument Time:	8:09		
Run Status:	OK		(Ensure Run Status is OK)
Total Sampling Time (Hours):	24		
Volume Sampled (m ³):	23.9		
Average Flow Rate (L/min):	16.7 L/min		
AmbT °C :	-0.6		
Barometric Pressure (mm Hg) :	696		
Sample Filter Temperature °C :	0.5		
Flow Rate Coefficient of Variation (%CV):	0.2		
Weather Conditions :	mostly cloudy		
Leak Check:	Pass		(Pass/Fail)
FIELD BLANK			
Was a field blank collected	No		(Once every quarter) (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:	None		
Comments:			

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

A) GENERAL INFORMATION

Sample Identification Number: Organic Test 788
 Sample Canister Location: Ryley Lift Station -Shed
 Sampled by: T. Webb
 Sampler Name: Test 788
 Sample Date: 22/01/23 yy/mm/dd
 Shipping Date to Laboratory: 22/01/25
 Canister Type (ie. 1 Litre/6 Litre/Other): 6L
 Canister Serial No.: 29038
 Flow Controller Serial No.: H/L578699/A0334390-5

B) SAMPLE SET UP

	Set up Conditions	Sample Retrieval
Date:	22/01/20	22/01/24
Ambient Temperature °C (inside shed):	14.0	11.3
Barometric Pressure (mm Hg):	690	704
Canister Pressure Gauge Reading (- Inches Hg):	(-)27.0	(-)7
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: light rain and snow

Describe facility operations that may affect sampling event: None

Comments: _____

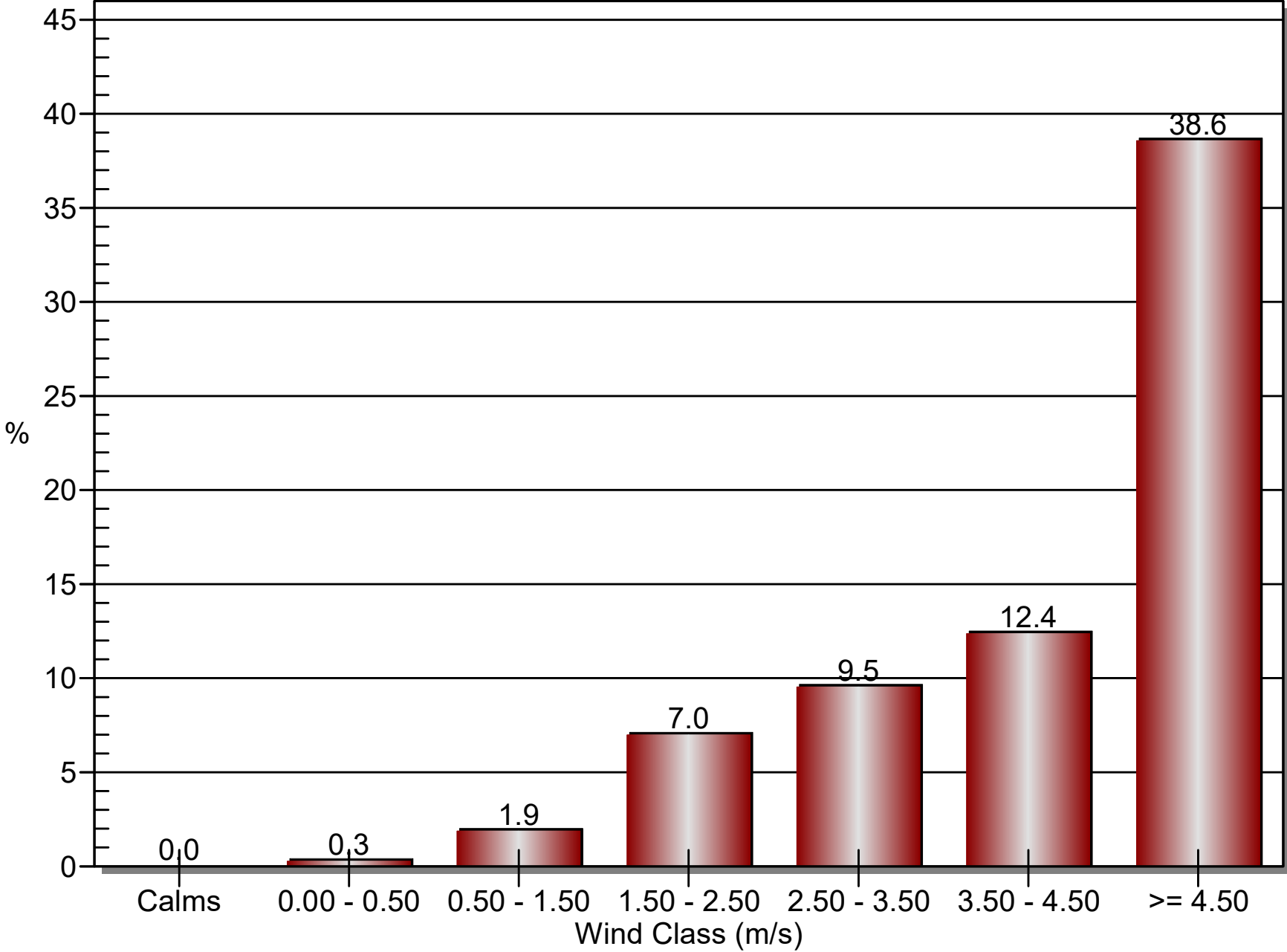
FIELD SHEET			
PM ₁₀ (Partisol Monitoring Unit)			
CLEAN HARBORS CANADA INC			
RYLEY, ALBERTA			
A) GENERAL INFORMATION			
Filter ID:	P7086430		
PO Number:	222179		
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905		
Test number :	Particulate Test 788		
Sample Date:	22/01/23		yy/mm/dd
Shipping Date to Laboratory:	22/01/25		
B) SAMPLING INFORMATION			
SAMPLE START			
Sampling Start Date:	22/01/23		
Sampling Start Time:	00:00		
Current Instrument Date:	22/01/20		
Current Instrument Time:	12:56		
Ambient Temperature °C:	-4.0		
Barometric Pressure (mm Hg):	690		
Leak Check:	Pass		(Pass/Fail)
Clean PM10 Inlet:	Yes		(Yes/No)
Weather Conditions Sampling date :	light rain and snow		
Weather Conditions set up:	mostly cloudy		
SAMPLE RETRIEVAL			
Sampled by	T. Webb		
Sampling End Date:	22/01/24		
Sampling End Time:	00:00		
Current Instrument Date:	22/01/24		
Current Instrument Time:	8:05		
Run Status:	OK		(Ensure Run Status is OK)
Total Sampling Time (Hours):	24		
Volume Sampled (m ³):	23.8		
Average Flow Rate (L/min):	16.7 L/min		
AmbT °C :	-8.4		
Barometric Pressure (mm Hg) :	704		
Sample Filter Temperature °C :	-6.8		
Flow Rate Coefficient of Variation (%CV):	0.1		
Weather Conditions :	cloudy		
Leak Check:	Pass		(Pass/Fail)
FIELD BLANK			
Was a field blank collected	No		(Once every quarter) (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:	None		
Comments:			

FIELD SHEET			
PM ₁₀ (Partisol Monitoring Unit)			
CLEAN HARBORS CANADA INC			
RYLEY, ALBERTA			
A) GENERAL INFORMATION			
Filter ID:	P7086430		
PO Number:	222179		
Partisol Sampler ID/Serial Number:	2000 FRM-AE / 200FB209860905		
Test number :	Particulate Test 788		
Sample Date:	22/01/23		yy/mm/dd
Shipping Date to Laboratory:	22/01/25		
B) SAMPLING INFORMATION			
SAMPLE START			
Sampling Start Date:	22/01/23		
Sampling Start Time:	00:00		
Current Instrument Date:	22/01/20		
Current Instrument Time:	12:56		
Ambient Temperature °C:	-4.0		
Barometric Pressure (mm Hg):	690		
Leak Check:	Pass		(Pass/Fail)
Clean PM10 Inlet:	Yes		(Yes/No)
Weather Conditions Sampling date :	light rain and snow		
Weather Conditions set up:	mostly cloudy		
SAMPLE RETRIEVAL			
Sampled by	T. Webb		
Sampling End Date:	22/01/24		
Sampling End Time:	00:00		
Current Instrument Date:	22/01/24		
Current Instrument Time:	8:05		
Run Status:	OK		(Ensure Run Status is OK)
Total Sampling Time (Hours):	24		
Volume Sampled (m ³):	23.8		
Average Flow Rate (L/min):	16.7 L/min		
AmbT °C :	-8.4		
Barometric Pressure (mm Hg) :	704		
Sample Filter Temperature °C :	-6.8		
Flow Rate Coefficient of Variation (%CV):	0.1		
Weather Conditions :	cloudy		
Leak Check:	Pass		(Pass/Fail)
FIELD BLANK			
Was a field blank collected	No		(Once every quarter) (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:	None		
Comments:			

Appendix C

Wind Class Frequency Distribution Graphs and Wind Rose

Wind Class Frequency Distribution

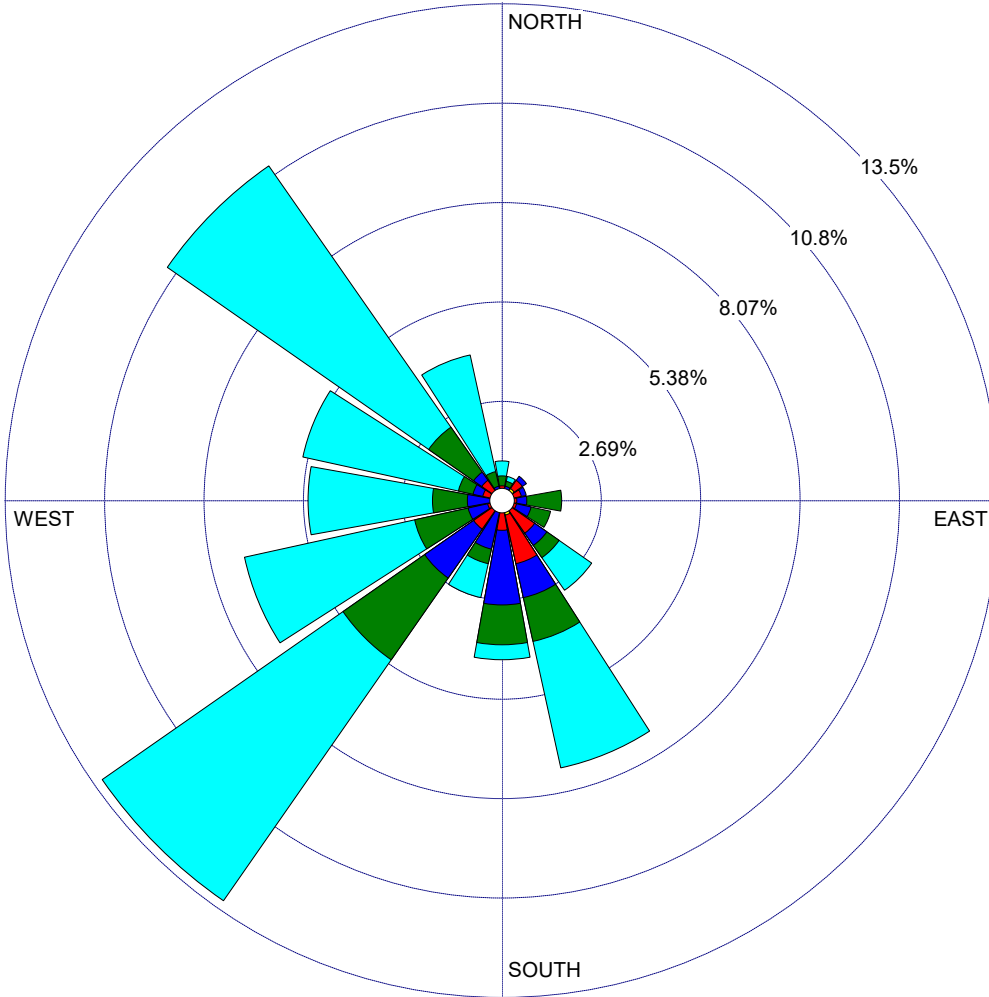


WIND ROSE PLOT:

**Wind Rose Plot - Ryley, AB
January 2022**

DISPLAY:

**Wind Speed
Direction (blowing from)**



WIND SPEED
(m/s)

- >= 4.50
- 3.50 - 4.50
- 2.50 - 3.50
- 1.50 - 2.50
- 0.50 - 1.50
- 0.00 - 0.50

Calms: 0.00%

COMMENTS:

DATA PERIOD:

**Start Date: 1/1/2022 - 00:00
End Date: 1/31/2022 - 23:00**

COMPANY NAME:

Clean Harbors

MODELER:

GHD

CALM WINDS:

0.00%

TOTAL COUNT:

518 hrs.

AVG. WIND SPEED:

5.23 m/s

DATE:

2/22/2022

PROJECT NO.:

11114644-007-02



Appendix D

Chain of Custody Forms and Laboratory Analytical Reports



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Todd Webb Clean Harbors Environmental PO Box 390 2 km N of Hwy 14 on Sec Road 854 50114 RR 173 Ryley AB TOB 4A0</p> <p>INVOICE: Robbi Gooding PO Box 390 2 km N of Hwy 14 on Sec Road 854 50114 RR 173 Ryley AB TOB 4A0</p>	<p style="text-align: center;">CLIENT SAMPLE ID Filter # P7086429, PM10 Test #: 787</p> <p>CANISTER ID:</p> <p>PRIORITY: Normal</p> <p>DESCRIPTION: PM10 Filter</p> <p>DATE SAMPLED: 11-Jan-22 0:00</p> <p>REPORT CREATED: 26-Jan-22</p>	<p style="text-align: center;">Matrix Air Filter</p> <p>DATE RECEIVED: 14-Jan-22</p> <p>REPORT NUMBER: 22010078</p> <p>VERSION: Version 01</p>
--	---	---

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22010078-002	Particulate Weight		0.193 mg	0.004	AC-029	17-Jan-22

Report certified by: Rebecca Dasilva, Account Coordinator

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: January 26, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID VOCs and TNMOC Test #: 787	CANISTER ID 29002	Matrix Ambient Air	DATE SAMPLED 11-Jan-22 0:00
DESCRIPTION: Canister			
REPORT NUMBER: 22010078	REPORT CREATED: 26-Jan-22		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22010078-001	Total Non-Methane Organic Carbon	K, T, U	< 0.09	ppmv	0.09	NA-028	14-Jan-22
22010078-001	1,2,3-Trimethylbenzene	K, T, U	< 0.09	ppbv	0.09	AC-058	18-Jan-22
22010078-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Jan-22
22010078-001	1,3,5-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Jan-22
22010078-001	1-Butene/Isobutylene		0.37	ppbv	0.10	AC-058	18-Jan-22
22010078-001	1-Hexene/2-Methyl-1-pentene	I	0.19	ppbv	0.12	AC-058	18-Jan-22
22010078-001	1-Pentene		0.29	ppbv	0.05	AC-058	18-Jan-22
22010078-001	2,2,4-Trimethylpentane	I	0.15	ppbv	0.03	AC-058	18-Jan-22
22010078-001	2,2-Dimethylbutane	I	0.13	ppbv	0.03	AC-058	18-Jan-22
22010078-001	2,3,4-Trimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Jan-22
22010078-001	2,3-Dimethylbutane	K, T, U	< 0.16	ppbv	0.16	AC-058	18-Jan-22
22010078-001	2,3-Dimethylpentane	I	0.15	ppbv	0.03	AC-058	18-Jan-22
22010078-001	2,4-Dimethylpentane	I	0.12	ppbv	0.05	AC-058	18-Jan-22
22010078-001	2-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Jan-22
22010078-001	2-Methylhexane		0.18	ppbv	0.05	AC-058	18-Jan-22
22010078-001	2-Methylpentane		0.30	ppbv	0.03	AC-058	18-Jan-22
22010078-001	3-Methylheptane	I	0.17	ppbv	0.05	AC-058	18-Jan-22
22010078-001	3-Methylhexane		0.21	ppbv	0.03	AC-058	18-Jan-22
22010078-001	3-Methylpentane		0.48	ppbv	0.03	AC-058	18-Jan-22
22010078-001	Benzene	I	0.34	ppbv	0.05	AC-058	18-Jan-22
22010078-001	cis-2-Butene	I	0.10	ppbv	0.05	AC-058	18-Jan-22
22010078-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Jan-22
22010078-001	Cyclohexane		0.42	ppbv	0.07	AC-058	18-Jan-22
22010078-001	Cyclopentane	I	0.14	ppbv	0.03	AC-058	18-Jan-22
22010078-001	Ethylbenzene		1.19	ppbv	0.05	AC-058	18-Jan-22

Report certified by: Rebecca Dasilva, Account Coordinator

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: January 26, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID VOCs and TNMOC Test #: 787	CANISTER ID 29002	Matrix Ambient Air	DATE SAMPLED 11-Jan-22 0:00
DESCRIPTION: Canister			
REPORT NUMBER: 22010078	REPORT CREATED: 26-Jan-22		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
22010078-001	Isobutane		1.82	ppbv	0.05	AC-058	18-Jan-22
22010078-001	Isopentane		1.26	ppbv	0.07	AC-058	18-Jan-22
22010078-001	Isoprene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Jan-22
22010078-001	Isopropylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Jan-22
22010078-001	m,p-Xylene		4.49	ppbv	0.07	AC-058	18-Jan-22
22010078-001	m-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Jan-22
22010078-001	m-Ethyltoluene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Jan-22
22010078-001	Methylcyclohexane		0.22	ppbv	0.03	AC-058	18-Jan-22
22010078-001	Methylcyclopentane		0.39	ppbv	0.09	AC-058	18-Jan-22
22010078-001	n-Butane		3.33	ppbv	0.03	AC-058	18-Jan-22
22010078-001	n-Decane	K, T, U	< 0.10	ppbv	0.10	AC-058	18-Jan-22
22010078-001	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Jan-22
22010078-001	n-Heptane		0.36	ppbv	0.07	AC-058	18-Jan-22
22010078-001	n-Hexane		1.54	ppbv	0.05	AC-058	18-Jan-22
22010078-001	n-Octane		0.23	ppbv	0.03	AC-058	18-Jan-22
22010078-001	n-Pentane		0.93	ppbv	0.07	AC-058	18-Jan-22
22010078-001	n-Propylbenzene	I	0.17	ppbv	0.10	AC-058	18-Jan-22
22010078-001	n-Undecane	K, T, U	< 0.9	ppbv	0.9	AC-058	18-Jan-22
22010078-001	n-Nonane	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Jan-22
22010078-001	o-Ethyltoluene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Jan-22
22010078-001	o-Xylene		1.03	ppbv	0.05	AC-058	18-Jan-22
22010078-001	p-Diethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	18-Jan-22
22010078-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Jan-22
22010078-001	Styrene		0.44	ppbv	0.07	AC-058	18-Jan-22
22010078-001	Toluene		3.70	ppbv	0.05	AC-058	18-Jan-22

Report certified by: Rebecca Dasilva, Account Coordinator

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: January 26, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID VOCs and TNMOC Test #: 787	CANISTER ID 29002	Matrix Ambient Air	DATE SAMPLED 11-Jan-22 0:00
DESCRIPTION: Canister			
REPORT NUMBER: 22010078	REPORT CREATED: 26-Jan-22		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22010078-001	trans-2-Butene	I	0.08 ppbv	0.05	AC-058	18-Jan-22
22010078-001	trans-2-Pentene	K, T, U	< 0.03 ppbv	0.03	AC-058	18-Jan-22

Report certified by: Rebecca Dasilva, Account Coordinator

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: January 26, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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Revision History

Order ID	Ver	Date	Reason
22010078	01	26-Jan-22	Report created



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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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

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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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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Order Comments

22010078

Report to Stan Yuha. Project ID: Test 787



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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Sample Comments



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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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

<p>RESULTS: Todd Webb Clean Harbors Environmental PO Box 390 2 km N of Hwy 14 on Sec Road 854 50114 RR 173 Ryley AB TOB 4A0</p> <p>INVOICE: Robbi Gooding PO Box 390 2 km N of Hwy 14 on Sec Road 854 50114 RR 173 Ryley AB TOB 4A0</p>	<p style="text-align: center;">CLIENT SAMPLE ID PM10 Test # 788 - Filter # P7086430</p> <p>MATRIX: Air Filter</p> <p>CANISTER ID:</p> <p>PRIORITY: Normal</p> <p>DESCRIPTION: PM 10 Filter</p> <p>DATE SAMPLED: 23-Jan-22 0:00</p> <p>REPORT CREATED: 23-Feb-22</p>	<p>DATE RECEIVED: 25-Jan-22</p> <p>REPORT NUMBER: 22010158</p> <p>VERSION: Version 01</p>
--	---	--

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22010158-002	Particulate Weight		0.027 mg	0.004	AC-029	28-Jan-22

CLIENT SAMPLE ID VOCs and TNMOC Test #: 788	CANISTER ID 29038	Matrix Ambient Air	DATE SAMPLED 23-Jan-22 0:00
DESCRIPTION: Canister			
REPORT NUMBER: 22010158	REPORT CREATED: 23-Feb-22		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22010158-001	Total Non-Methane Organic Carbon	K, T, U	< 0.05 ppmv	0.05	NA-028	26-Jan-22
22010158-001	1,2,3-Trimethylbenzene	K, T, U	< 0.08 ppbv	0.08	AC-058	26-Jan-22
22010158-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	26-Jan-22
22010158-001	1,3,5-Trimethylbenzene	K, T, U	< 0.05 ppbv	0.05	AC-058	26-Jan-22
22010158-001	1-Butene/Isobutylene	I	0.16 ppbv	0.10	AC-058	26-Jan-22
22010158-001	1-Hexene/2-Methyl-1-pentene	K, T, U	< 0.12 ppbv	0.12	AC-058	26-Jan-22
22010158-001	1-Pentene	K, T, U	< 0.05 ppbv	0.05	AC-058	26-Jan-22
22010158-001	2,2,4-Trimethylpentane	I	0.11 ppbv	0.03	AC-058	26-Jan-22
22010158-001	2,2-Dimethylbutane	I	0.16 ppbv	0.03	AC-058	26-Jan-22
22010158-001	2,3,4-Trimethylpentane	K, T, U	< 0.03 ppbv	0.03	AC-058	26-Jan-22
22010158-001	2,3-Dimethylbutane	K, T, U	< 0.15 ppbv	0.15	AC-058	26-Jan-22
22010158-001	2,3-Dimethylpentane	K, T, U	< 0.03 ppbv	0.03	AC-058	26-Jan-22
22010158-001	2,4-Dimethylpentane	K, T, U	< 0.05 ppbv	0.05	AC-058	26-Jan-22
22010158-001	2-Methylheptane	K, T, U	< 0.03 ppbv	0.03	AC-058	26-Jan-22
22010158-001	2-Methylhexane	K, T, U	< 0.05 ppbv	0.05	AC-058	26-Jan-22
22010158-001	2-Methylpentane	I	0.16 ppbv	0.03	AC-058	26-Jan-22
22010158-001	3-Methylheptane	K, T, U	< 0.05 ppbv	0.05	AC-058	26-Jan-22
22010158-001	3-Methylhexane	K, T, U	< 0.03 ppbv	0.03	AC-058	26-Jan-22
22010158-001	3-Methylpentane	I	0.14 ppbv	0.03	AC-058	26-Jan-22
22010158-001	Benzene	I	0.27 ppbv	0.05	AC-058	26-Jan-22
22010158-001	cis-2-Butene	K, T, U	< 0.05 ppbv	0.05	AC-058	26-Jan-22
22010158-001	cis-2-Pentene	K, T, U	< 0.03 ppbv	0.03	AC-058	26-Jan-22
22010158-001	Cyclohexane	I	0.30 ppbv	0.07	AC-058	26-Jan-22
22010158-001	Cyclopentane	I	0.12 ppbv	0.03	AC-058	26-Jan-22
22010158-001	Ethylbenzene	I	0.30 ppbv	0.05	AC-058	26-Jan-22

Report certified by: Rebecca Dasilva, Account Coordinator

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: February 23, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID VOCs and TNMOC Test #: 788	CANISTER ID 29038	Matrix Ambient Air	DATE SAMPLED 23-Jan-22 0:00
DESCRIPTION: Canister			
REPORT NUMBER: 22010158	REPORT CREATED: 23-Feb-22		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22010158-001	Isobutane		1.15 ppbv	0.05	AC-058	26-Jan-22
22010158-001	Isopentane		0.71 ppbv	0.07	AC-058	26-Jan-22
22010158-001	Isoprene	K, T, U	< 0.03 ppbv	0.03	AC-058	26-Jan-22
22010158-001	Isopropylbenzene	K, T, U	< 0.07 ppbv	0.07	AC-058	26-Jan-22
22010158-001	m,p-Xylene	I	0.39 ppbv	0.07	AC-058	26-Jan-22
22010158-001	m-Diethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	26-Jan-22
22010158-001	m-Ethyltoluene	K, T, U	< 0.05 ppbv	0.05	AC-058	26-Jan-22
22010158-001	Methylcyclohexane		0.17 ppbv	0.03	AC-058	26-Jan-22
22010158-001	Methylcyclopentane	I	0.15 ppbv	0.08	AC-058	26-Jan-22
22010158-001	n-Butane		1.39 ppbv	0.03	AC-058	26-Jan-22
22010158-001	n-Decane	K, T, U	< 0.10 ppbv	0.10	AC-058	26-Jan-22
22010158-001	n-Dodecane	K, T, U	< 0.5 ppbv	0.5	AC-058	26-Jan-22
22010158-001	n-Heptane	I	0.28 ppbv	0.07	AC-058	26-Jan-22
22010158-001	n-Hexane	I	0.25 ppbv	0.05	AC-058	26-Jan-22
22010158-001	n-Octane	K, T, U	< 0.03 ppbv	0.03	AC-058	26-Jan-22
22010158-001	n-Pentane		0.57 ppbv	0.07	AC-058	26-Jan-22
22010158-001	n-Propylbenzene	K, T, U	< 0.10 ppbv	0.10	AC-058	26-Jan-22
22010158-001	n-Undecane	K, T, U	< 0.8 ppbv	0.8	AC-058	26-Jan-22
22010158-001	n-Nonane	K, T, U	< 0.07 ppbv	0.07	AC-058	26-Jan-22
22010158-001	o-Ethyltoluene	K, T, U	< 0.03 ppbv	0.03	AC-058	26-Jan-22
22010158-001	o-Xylene	I	0.25 ppbv	0.05	AC-058	26-Jan-22
22010158-001	p-Diethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	26-Jan-22
22010158-001	p-Ethyltoluene	K, T, U	< 0.07 ppbv	0.07	AC-058	26-Jan-22
22010158-001	Styrene	K, T, U	< 0.07 ppbv	0.07	AC-058	26-Jan-22
22010158-001	Toluene	I	0.25 ppbv	0.05	AC-058	26-Jan-22

Report certified by: Rebecca Dasilva, Account Coordinator

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: February 23, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID VOCs and TNMOC Test #: 788	CANISTER ID 29038	Matrix Ambient Air	DATE SAMPLED 23-Jan-22 0:00
DESCRIPTION: Canister			
REPORT NUMBER: 22010158	REPORT CREATED: 23-Feb-22		VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
22010158-001	trans-2-Butene	K, T, U	< 0.05 ppbv	0.05	AC-058	26-Jan-22
22010158-001	trans-2-Pentene	K, T, U	< 0.03 ppbv	0.03	AC-058	26-Jan-22

Report certified by: Rebecca Dasilva, Account Coordinator

On behalf of: A. Prefontaine, Manager, Chemical Testing

Date: February 23, 2022

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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Revision History

Order ID	Ver	Date	Reason
22010158	01	23-Feb-22	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

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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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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Order Comments

22010158

Send results to Stan Yuha. Test # 788.



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

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Sample Comments



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ENVIRONMENTAL ANALYTICAL SERVICES

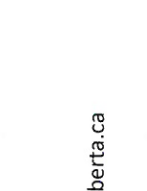
TEST REPORT

Page 10 of 10

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.*



Client Reporting Information
 Company: Clean Harbours 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@cleanharbours.com, Yuha.Stan@cleanharbours.com

Client Billing Information
 Contact: Robbi Gooding
 Phone: 780-663-3828
 Email: Gooding.Robbj@cleanharbours.com
 Project ID: Test 787
 PO #: 222179

Client Rep Billing Information
 Contact: Robbi Gooding
 Phone: 780-663-3828
 Email: Gooding.Robbj@cleanharbours.com
 Project ID: Test 787
 PO #: 222179

Turnaround Time
 Normal (10 business days)
 Rush
 Note: Rush service not available for all tests.
 Confirm rush requests with InnoTech Alberta.

Special Instructions/Comments
 Date Received – Lab Use Only
 RECEIVED
 JAN 14 2022
 JWP

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: 787	Canister	29002	11/01/22	00:00	VOC PAMS & TNMOC
2	PM10 Test Number: 787	PM10 filter	P7086429	12/01/22	00:00	FLT Particulate Weight
				11/01/22	00:00	
				12/01/22	00:00	

Client Authorization: *[Signature]* Laboratory Personnel: _____
 (Signature) (Signature)
 This "Chain of Custody" form is subject to InnoTech Alberta standard terms and conditions.



Canister ID: 29002

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: 1804 on: NOV 23 2021

Evacuated: NOV 24 2021 Recertified: _____

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

Laboratory Contact Number: 780-632-8403

Sample ID: Test 787

Sampled By: T. Webb

Starting Vacuum:

27.1 "Hg

End Vacuum:

-7 "Hg/psig

Sample ID 22010078-001 Priority: Normal



Customer ID: Clean Harbours
Cust Samp ID: VOCs and TNMOC Test #: 787



Customer ID: Clean Harbours

Test Samp ID: VOCs and TNMOC Test #: 788

Client Reporting Information

Company: Clean Harbours 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@cleanharbours.com, Yuha.Stan@cleanharbours.com

Client Billing Information

Contact: Robbi Gooding
Phone: 780-663-3828
Email: Gooding.Robbi@cleanharbours.com
Project ID: Test 788
PO #: 222179

Turnaround Time

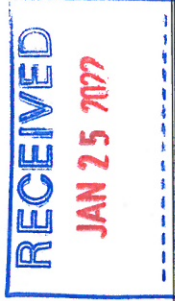
X Normal (10 business days)

Rush

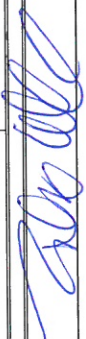
Note: Rush service not available for all tests.
Confirm rush requests with InnoTech Alberta.

Special Instructions/Comments

Date Received – Lab Use Only



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: 788	Canister	29038	23/01/22	00:00	VOC PAMS & TNMOC
2	PM10 Test Number: 788	PM10 filter	P7086430	24/01/22	00:00	FLT Particulate Weight

Client Authorization:  Laboratory Personnel: _____ (Signature)

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



Canister ID: 29038

This cleaned canister meets or exceeds TO-15 Method Specifications

Proofed by: ISQ4 on: NOV 23 2021

Evacuated: NOV 24 2021 Recertified: _____

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

Laboratory Contact Number: 780-632-8403

Sample ID: Test 788

Sampled By: T. Webb

Starting Vacuum:

-27.0 "Hg

End Pressure: -8

-7 

Sample ID: 22010158-001 Priority: Normal



Customer ID: Clean Harbours

Cust Samp ID: VOCs and TNMOC Test #: 788

END OF REPORT