Woodfibre LNG Air Quality Monitoring Station Report for October 2024

December 3, 2024

Prepared for:
Woodfibre LNG General Partner Inc.

Prepared by:
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Stantec

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Approved by: Adriana MacLeod Digitally signed by Adriana MacLeod Date: 2024.12.04 09:39:14 -08'00'

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Adriana MacLeod, B.Sc.

Printed Name

Executive Summary

This report provides a summary of the ambient air quality monitoring data for October 2024 that has been collected in fulfilment of the requirements established in the Floatel Air Quality Management and Monitoring Plan (Rev 6, July 5, 2024) (Woodfibre LNG, 2024). Table E.1 below presents the monthly averages, ranges, and maximum values for key air contaminants, along with additional information on any air quality exceedances and complaints received during this period. Please note that the September/October SO_2 and VOC passive sample data were unavailable at the time of reporting due to shipping, receiving, and logistical issues. This report provides an overview of air quality conditions and any regulatory compliance actions taken in October 2024.

Table E.1 October 2024 Air Quality Monitoring Station Summary

Air Contaminant	Units	Monthly Average	Monthly Range (Min - Max)
$PM_{2.5}$ (24-hour average)	µg/m³	10	8 - 17
PM_{10} (24-hour average)	µg/m³	18	10 - 72
TSP (24-hour average)	µg/m³	37	19 - 134
NO_2 (24-hour average)	Ppb	3.6	1.2 - 8.0
NO_2 (1-hour average)	Ppb	3.4	0.0 - 21.3
Number of Air Quality Exceedances Recorded		1	
Number of Complaints Received		None	

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Acronyms / Abbreviations

AGAT	AGAT Laboratories
AQMS	Air Quality Monitoring Station
AQO	British Columbia Air Quality Objective(s)
BC	British Columbia
BC ENV	British Columbia Ministry of Environment and Climate Change Strategy
CAAQS	Canadian Ambient Air Quality Standard(s)
CCME	Canadian Council of Ministers of the Environment
EAO	British Columbia Environmental Assessment Office
Floatel	The marine-based work camp, associated facilities and mooring infrastructure dedicated to house approximately 650 Workers during the Construction and Operations of the Project
FAQMMP	Floatel Air Quality Monitoring and Mitigation Plan
NO_2	Nitrogen Dioxide
PM	Particulate Matter
$PM_{2.5}$	Fine Particulate Matter (less than 2.5 microns (µm) in aerodynamic diameter)
PM_{10}	Particulate Matter (less than 10 microns (µm) in aerodynamic diameter)
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
TSP	Total Suspended Particulate
VOC	Volatile Organic Compounds
Woodfibre LNG	Woodfibre LNG General Partner Inc.

1 Introduction

Woodfibre LNG General Partner Inc. (Woodfibre LNG) is developing the Woodfibre Liquefied Natural Gas Project (the Project) at the former Woodfibre Pulp Mill site, approximately seven kilometres southwest of Skwxwú7mesh (Squamish), British Columbia (BC). To support onsite air quality monitoring, Stantec Consulting Ltd. ("Stantec") prepared the Floatel Air Quality Monitoring and Mitigation Plan (FAQMMP; Rev 6, July 5, 2024) on behalf of Woodfibre LNG (Woodfibre LNG, 2024). The FAQMMP was developed to address regulatory compliance conditions issued by the Environmental Assessment Office (EAO) on November 1, 2023, as part of Amendment #3 (EAO, 2023), including Condition 30, which pertains specifically to Floatel air quality monitoring. The monitoring is intended to demonstrate compliance with air quality standards and assists Woodfibre LNG in determining whether mitigation during the Project's construction phase is required. Further details regarding the purpose, duration, and compliance framework are available in the FAQMMP Rev 6 July 5, 2024 (Woodfibre LNG, 2024). Woodfibre LNG contracts AGAT Laboratories (AGAT) to provide an air quality monitoring station (AQMS) rental, including installation, operation and quarterly maintenance and calibration services. The AQMS continuously measures $PM_{2.5}$, PM_{10}, TSP, and NO_2 concentrations, along with passive sampling and analysis for SO_2 and VOCs. Stantec performs data processing, quality assurance, and quality control (QA/QC) of the air quality monitoring equipment, and the data presented in this monthly report is based on a Level 0 data validation as described by the British Columbia Field Sampling Manual – Part B (BC ENV, 2020).

This October 2024 monthly air quality report provides data on air quality and weather conditions monitored at the Woodfibre LNG Project site close to the Floatel. The monitoring and reporting supports regulatory compliance. These monthly reports track air quality trends, address potential issues, and help the Project meet project-specific and regulatory requirements.

2 Key Components Assessed

Two key sets of measurements are reported: a) meteorological data, including ambient temperature, wind speed and direction, and total rainfall, and b) ambient concentrations of air contaminants, measured at both AQMS and the Aeroqual stations.

2.1 Meteorology

Meteorology data supporting the Woodfibre LNG AQMS are acquired from the nearby WLNG Meteorology Station. This meteorology data supports the long-term ambient air quality monitoring collected at the site. The meteorology variables measured at the station are listed in Table 2.1. While the table includes all measured parameters, this report explicitly presents data for wind, air temperature, and rainfall only, excluding pressure and relative humidity.

Table 2.1 Parameters Measured at the WLNG Meteorological Station

Parameter	Units
Wind Speed	m/s
Wind Direction	Degrees
Air Temperature	°C
Rainfall	Mm
Barometric Pressure	hPa
Relative Humidity	%

2.2 Air Contaminants of Interest

The air contaminants being measured are described below according to the type of monitoring.

2.2.1 Continuous Sampling

- Particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$)
- Particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10})
- Total suspended particulate (TSP)
- Nitrogen dioxide (NO_2)

2.2.2 Passive Sampling

- Sulfur dioxide (SO_2)
- Volatile organic compounds (VOCs)

2.3 Air Quality Criteria

The air contaminants monitored at the AQMS, along with their corresponding Canadian Ambient Air Quality Standards (CAAQS) (CCME, 2024) and British Columbia Air Quality Objectives (BCAQO) (BC ENV, 2021) regulatory criteria, are presented in Table 2.2 and Table 2.3, respectively.

Table 2.2 Summary of Current and 2025 Canadian Ambient Air Quality Standards for the Contaminants of Potential Concern (CCME, 2024)

Substance	Averaging Period	Concentration [a]			
		($\mu g/m^3$) [b,c]		(ppbv) [d]	
		2020	2025	2020	2025
Nitrogen Dioxide (NO_2)	1-hour [e]	113	79	60	42
	Annual [f]	32	23	17.0	12.0
Sulphur Dioxide (SO_2)	1-hour [g]	183	170	70	65
	Annual [h]	13	10.4	5.0	4.0
Fine Particulate Matter ($PM_{2.5}$)	24-hour [i]	27	— [j]	—	—
	Annual [k]	8.8	— [j]	—	—

Notes:

[a] Canadian Ambient Air Quality Standards (CCME, 2024) for 2020 and 2025.
[b] $\mu g/m^3$ is the mass of the substance in micrograms per cubic meter of air.
[c] Standard conditions of 25°C and 101.325 kPa are used to convert from $\mu g/m^3$ to ppbv.
[d] ppbv is the volume of the substance (parts) per billion volumes of air.
[e] The 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentration.
[f] The average over a single calendar year of all 1-hour average concentrations.
[g] The 3-year average of the annual 99th percentile of the daily maximum 1-hour average concentrations.
[h] The average over a single calendar year of all 1-hour average concentrations.
[i] The 3-year average of the annual 98th percentile of the daily 24-hour average concentrations.
[j] Currently under review by the CCME
[k] The 3-year average of the annual average of the daily 24-hour average concentrations.

Table 2.3 British Columbia Ambient Air Quality Objectives (BC ENV, 2021)

Substance	Averaging Period	Air Quality Objective [a]	
		µg/m^3 [b,c]	ppbv [d]
Nitrogen Dioxide (NO_2)	1-hour [e]	113	60
	Annual [f]	32	17
Sulphur Dioxide (SO_2)	1-hour [g]	183	70
	Annual [h]	13	5
Fine Particulate Matter ($PM_{2.5}$)	24-hour [i]	25	—
	Annual [j]	8.0	—
Coarse Particulate Matter (PM_{10})	24-hour	50	—
Total Suspended Particulate (TSP)	24-hour	120	—
	Annual [k]	60	—

Notes:

[a] British Columbia Air Quality Objectives (BC ENV, 2021).
[b] µg/m^3 is the mass of the substance in micrograms per cubic meter of air.
[c] Standard conditions of 25°C and 101.325 kPa are used to convert from µg/m^3 to ppbv.
[d] ppbv is the volume of the substance (parts) per billion volumes of air.
[e] Achievement based on annual 98th percentile of daily 1-hour average maximum (D1HM), averaged over three consecutive years.
[f] Achievement based on annual average of 1-hour average concentrations over one year.
[g] Achievement based on annual 99th percentile of daily 1-hour average maximum (D1HM), averaged over three consecutive years.
[h] Achievement based on annual average of 1-hour concentrations over one year.
[i] Achievement based on annual 98th percentile of daily average, averaged over one year.
[j] Achievement based on annual average, averaged over one year.
[k] Based on geometric mean.

3 Instrument Summary

Woodfibre LNG contracts AGAT for the rental, operation and quarterly servicing of the AQMS. The station is currently being operated by AGAT to measure the ambient concentrations of the air contaminants mentioned above. The next quarterly calibration is scheduled for November 26–28, 2024. However, the Aeroqual AQS1 air sampler was rented from Pine Environmental and operated by Stantec between July 3 and October 24, 2024, when a Stantec Air Quality Engineer removed it.

The passive sampling of SO_2 and VOCs uses AGAT's Passive Sampler system. WLNG personnel exchange the monthly samples and submit them to AGAT for laboratory analysis.

Table 3.1 Summary of Instrumentation used at the WLNG Air Quality Monitoring Station

Parameter	Instrumentation
$PM_{2.5}$, PM_{10}, and TSP	Met One Instruments BAM 1020 Beta Attenuation Mass Monitors
NO_2	Thermo Fisher Scientific – Model 42i (NO-NO_2-NO_x) Analyzer
$PM_{2.5}$, PM_{10}, and TSP, and NO_2	Aeroqual AQS1 Air Quality Monitor
SO_2 and total VOCs	AGAT's Passive Sampler system

3.1 Continuous Monitoring of PM and NO_2

Particulate matter ($PM_{2.5}$, PM_{10}, and TSP) was continuously monitored following the Standard Operating Procedure for the Continuous Measurements of Ambient PM Using a Beta Attenuation Monitor (Reference No: SOP-05a). The NO_2 concentrations were continuously monitored following the Standard Operating Procedure for the Continuous Measurement of Ambient NOx (Reference No: SOP-03) in Part B1 of the British Columbia Field Sampling Manual (BC ENV, 2020).

3.2 Passive Monitoring of SO_2 and VOC

The SO_2 and VOC ambient concentrations were monitored following the Standard Operating Procedure for the Passive/Diffusive Method of Air Sample Collection (Reference No: SOP-07) in Part B1 of the British Columbia Field Sampling Manual (BC ENV, 2020).

4 Ambient Air Quality Monitoring Results

The measured data presented for passive and continuous monitoring include; a) ambient air quality data collected at the AQMS and Aeroqual, and b) meteorology data acquired from the Woodfibre LNG Meteorology Station. The daily air quality and meteorological data are included in Appendix B, Table B.1 and Table B.2.

4.1 Continuous Monitoring of PM and NO_2

A summary of the hourly ambient air monitoring results for $PM_{2.5}$, PM_{10}, TSP, and NO_2 for October 2024 is presented in Figure A.1 to Figure A.5, along with the corresponding regulatory criteria and comparisons with Langdale (BC ENV, 2024a) and Squamish (BC ENV, 2024b) regional air quality monitoring stations. Langdale and Squamish were selected as reference points due to their relative proximity to the WLNG construction site and the availability of relevant air quality data. BC ENV air quality monitoring station at Langdale Elementary provides measurements for $PM_{2.5}$, PM_{10}, NO_2, and SO_2, while Squamish Elementary monitors $PM_{2.5}$, NO_2, and SO_2. There are no BC ENV air quality monitoring stations that measure TSP and VOCs. The hourly air quality objective threshold for NO_2 is based on the 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentration (CCME 2024; BC ENV 2021).

During October 2024, the hourly $PM_{2.5}$ concentrations ranged from 1 to 40 µg/m³, the hourly PM_{10} concentrations ranged from 3 to 284 µg/m³, the hourly TSP concentrations ranged from 10 to 560 µg/m³, and the hourly NO_2 concentrations ranged from 0 to 21.3 ppb. The hourly results for the NO_2 monitoring during this period were less than the BCAQO threshold value of 60 ppb.

Similarly, a summary of the daily (24-hour average) ambient air quality monitoring results for $PM_{2.5}$, PM_{10}, TSP, and NO_2 for October 2024 is presented Table E.1 and in Figure A.6 to Figure A.10, with corresponding regulatory criteria and comparisons with Langdale and Squamish regional air quality monitoring stations. The 24-hour regulatory standards for PM_{10} and TSP monitoring are 50 µg/m³ and 120 µg/m³, respectively. The 24-hour BCAQO threshold value for $PM_{2.5}$ is 25 µg/m³, based on the 3-year average of the annual 98th percentile of the daily 24-hour average concentrations (CCME 2024; BC ENV, 2021).

During October 2024, 24-hour average concentrations of $PM_{2.5}$ ranged from 8 to 17 µg/m³, 24-hour average concentrations of PM_{10} ranged from 10 to 72 µg/m³, 24-hour average concentrations of TSP ranged from 19 to 134 µg/m³, and 24-hour average concentrations of NO_2 ranged from 1.2 to 8.0 ppb.

The 24-hour average $PM_{2.5}$ and PM_{10} concentrations recorded at the WLNG AQMS site were generally higher than those observed at the regional air quality monitoring stations in Langdale and Squamish, which is expected given the proximity of the AQMS site to active construction activities. In contrast, NO_2 concentrations were similar to those at the regional air quality monitoring stations, indicating minimal impact from site-specific emissions on ambient NO_2 concentrations.

Both PM monitoring instruments (Aeroqual and the three Met One BAM 1020 units at the AQMS) showed similar trends for hourly and 24-hour average concentrations; however, the readings from the AQMS (BAM 1020 units) were consistently higher. Conversely, NO_2 concentrations were consistently higher when monitored using the Aeroqual instrument than the Thermo Scientific Model 42i gas analyzer at the AQMS. Given that the BAM 1020 and the Model 42i gas analyzer are U.S. EPA Designated Reference and Equivalent Methods, the hourly and daily PM and NO_2 concentrations measured by these instruments are considered more reliable than those recorded by the Aeroqual.

A summary of the 24-hour average $PM_{2.5}$, PM_{10}, TSP and NO_2 concentrations in October 2024 is presented in Appendix B, Table B.1. The results for $PM_{2.5}$ were less than the BCAQO threshold value of 25 µg/m³ throughout October 2024, and no exceedances were recorded. However, one air quality exceedance for PM_{10} and TSP was recorded on October 25, 2024, with concentrations of 71.8 µg/m³ and 133.8 µg/m³, respectively, exceeding the BCAQO threshold values of 50 µg/m³ for PM_{10} and 120 µg/m³ for TSP. It was concluded, based on air quality and meteorological investigations, that these PM_{10} and TSP exceedances are primarily attributable to construction project-related sources (see further details in the Air Quality Exceedance Report; Appendix C). No complaints were received from the Floatel residents during October that required further investigation or mitigation actions. The weekly AQMS reports are presented in Appendix D.

4.2 Passive Monitoring of SO_2 and VOC

Passive samples for SO_2 and total VOCs were first installed on September 1, 2024; however, due to shipping, receiving, and logistical issues, the samples could not be swapped or submitted to AGAT for analysis until November 7, 2024. The SO_2 and VOC passive sampling results will be included in the November monthly report.

4.3 Meteorology

A summary of the meteorology conditions in October 2024 is presented in Appendix B, Table B.2. Daily average and maximum wind speeds are shown in Figure A.11. The highest hourly wind speed was recorded on October 27, 2024, at 14:00 (10.2 m/s), and the highest 24-hour average wind speed occurred on October 25 (2.1 m/s). Figure A.12 presents a wind rose illustrating wind direction and speed for October 2024 at the WLNG Meteorological Station. Additionally, Figure A.13 includes four wind roses capturing specific time intervals: between 3:00 and 8:00 hours, 9:00 and 12:00 hours, 13:00 and 19:00 hours, and 20:00 and 02:00 hours throughout October 2024.

The daily ambient temperature data is presented in Figure A.14. The maximum hourly temperature of 19.7°C was recorded on October 12, 2024, at 14:00, while the minimum hourly temperature of 4.7°C occurred on October 24, 2024, at 07:00. The monthly average temperature for October 2024 was 10.1°C

The daily and total monthly rainfall data, presented in Figure A.15 and Appendix B, Table B.2, show that the highest single-day rainfall of 74.2 mm occurred on October 19, 2024. The total rainfall for October 2024 was 385.8 mm.

5 Summary of Ambient Air Quality Monitoring Results

The ambient air quality monitoring results for October 2024 indicate that $PM_{2.5}$ concentrations remained less than the BC Air Quality Objective threshold value, with one exceedance recorded for PM_{10} and TSP on October 25, 2024. These exceedances were primarily attributable to construction project-related sources (Air Quality Exceedance Report; Appendix C). The measured nitrogen dioxide (NO_2) concentrations were less than the regulatory limits. The meteorology data, including wind speed, temperature, and rainfall, supported accurate interpretation of air quality trends. The highest daily average wind speed coincided with the PM_{10} and TSP exceedance on October 25, 2024. No complaints from the Floatel residents were received that required further investigation or mitigation during October 2024.

6 References

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Appendices

Appendix A Figures

Figure A.1 Hourly PM Concentrations Recorded at AQMS for October 2024

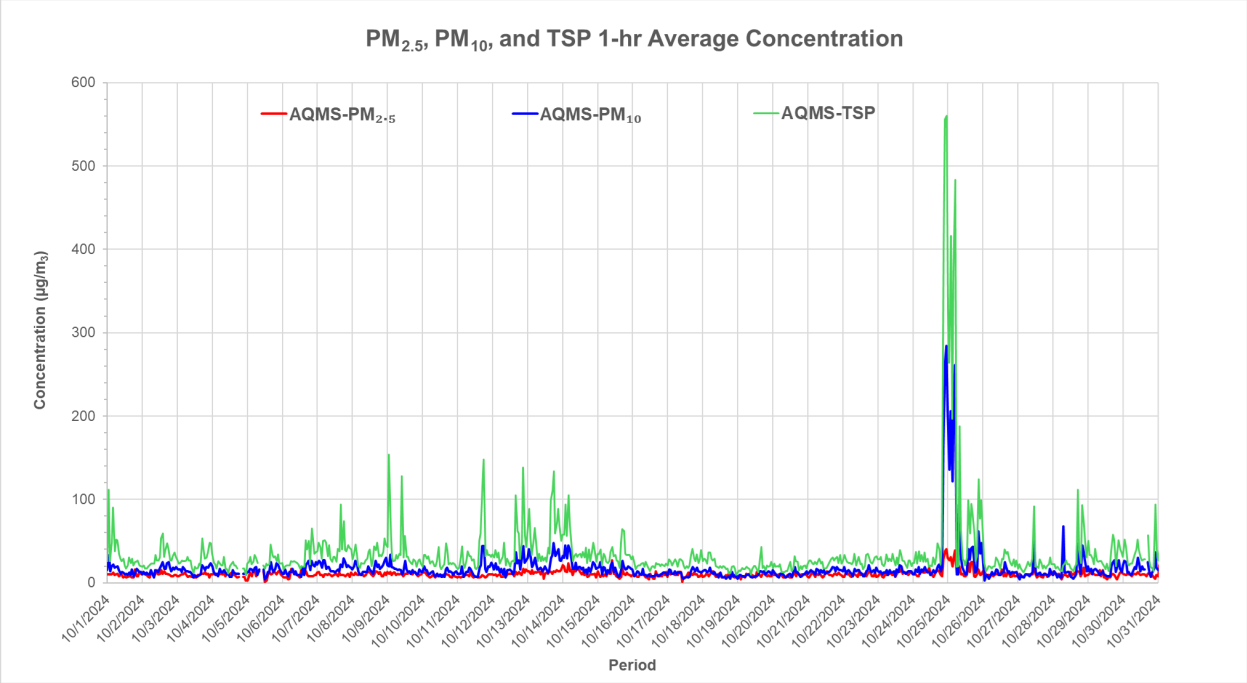


Figure A.2 Hourly $PM_{2.5}$ Concentrations Recorded at the AQMS, Aeroqual and at Langdale and Squamish Regional Air Quality Stations for October 2024

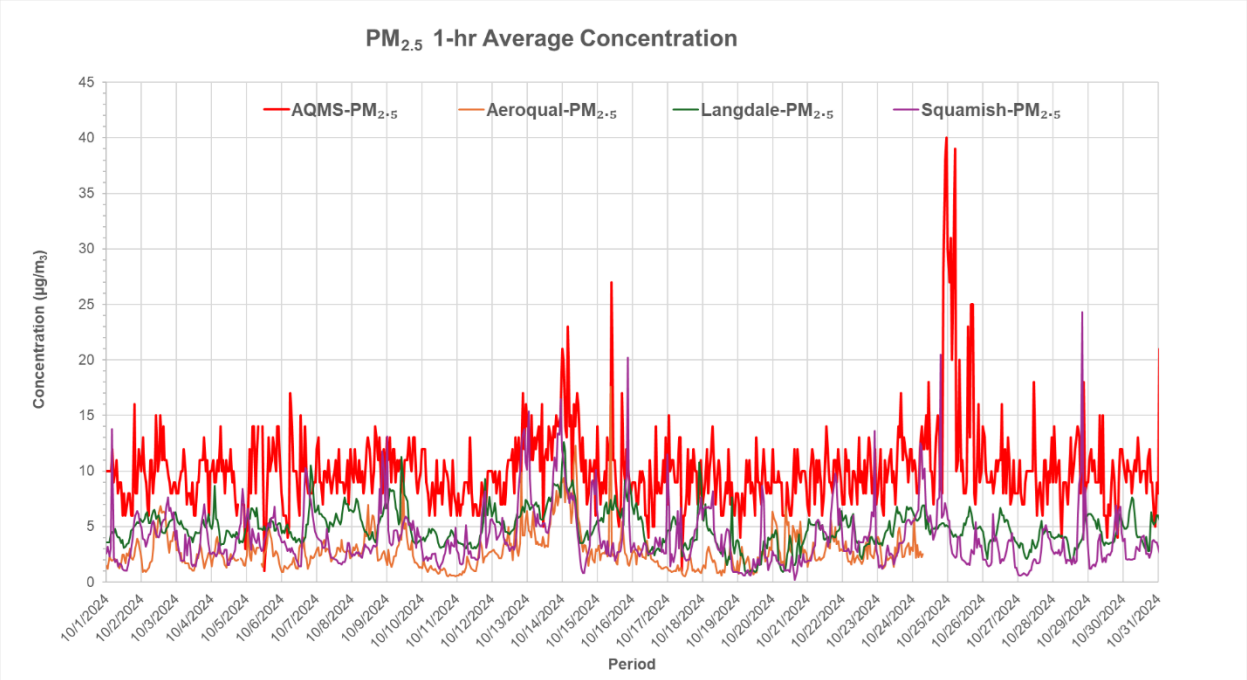


Figure A.3 Hourly PM_{10} Concentrations Recorded at the AQMS, Aeroqual and at Langdale Regional Air Quality Station for October 2024

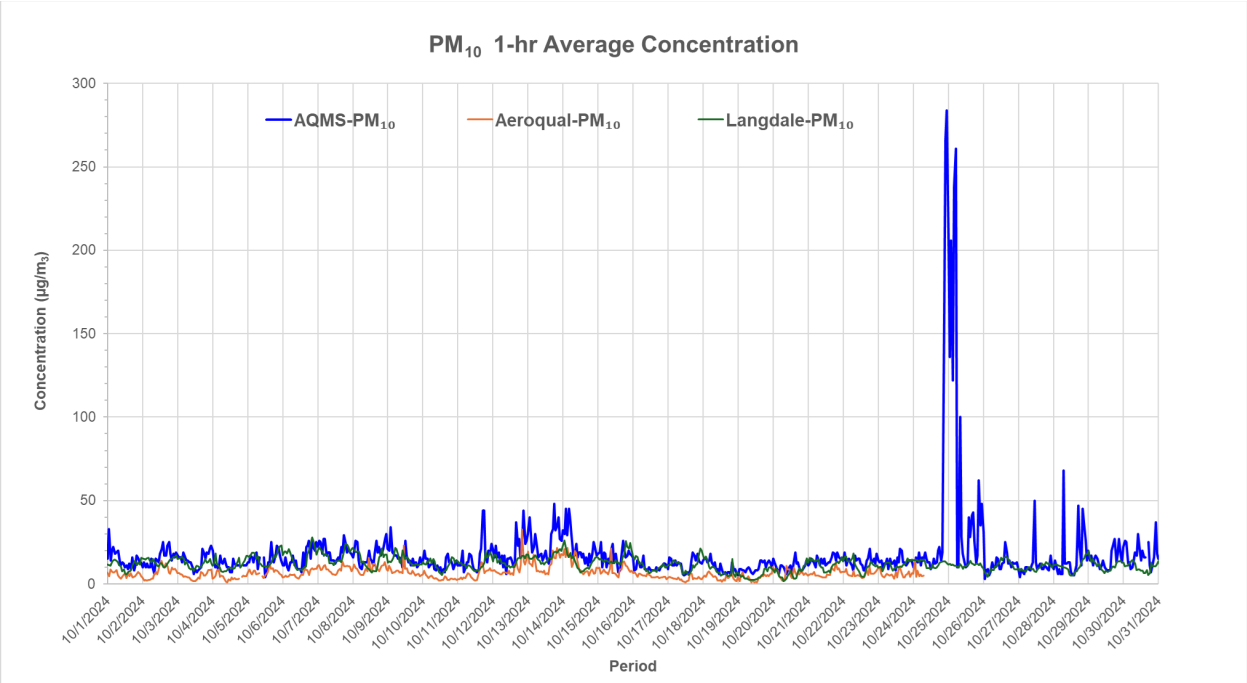


Figure A.4 Hourly TSP Concentrations Recorded at the AQMS and the Aeroqual for October 2024

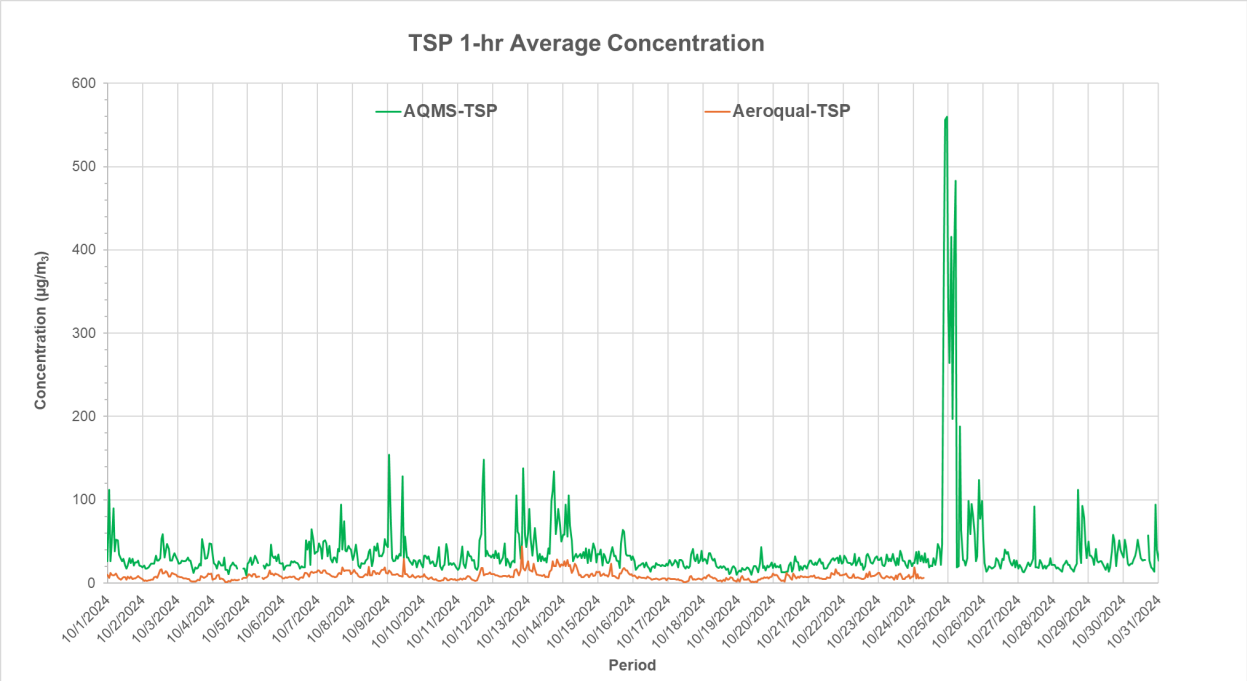


Figure A.5 Hourly NO_2 Concentrations Recorded Onsite at the AQMS, Aeroqual and at the Langdale and Squamish Regional Air Quality Stations for October 2024

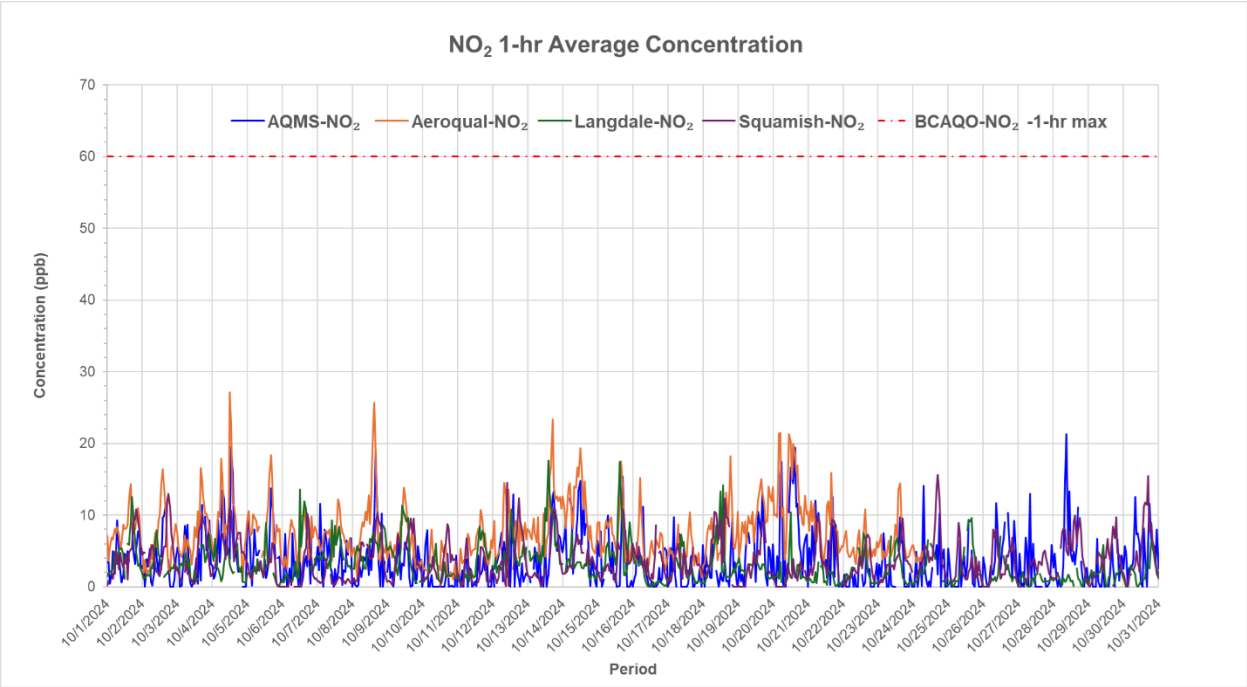


Figure A.6 24-Hour Average PM Concentrations Recorded at the AQMS for October 2024

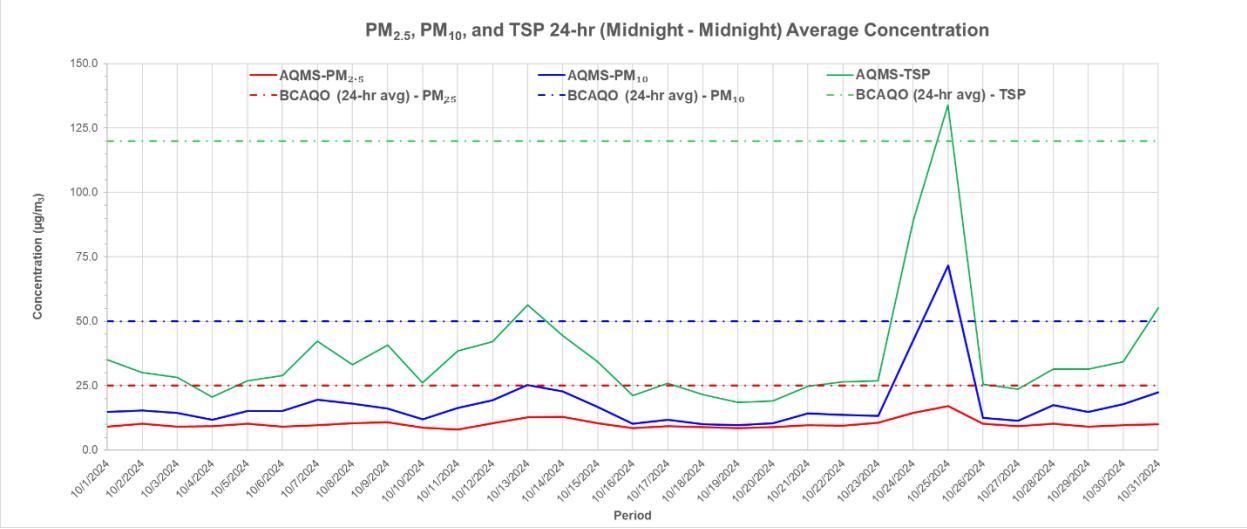


Figure A.7 24-Hour Average $PM_{2.5}$ Concentrations Recorded at the AQMS, Aeroqual and at the Langdale and Squamish Regional Air Quality Stations for October 2024

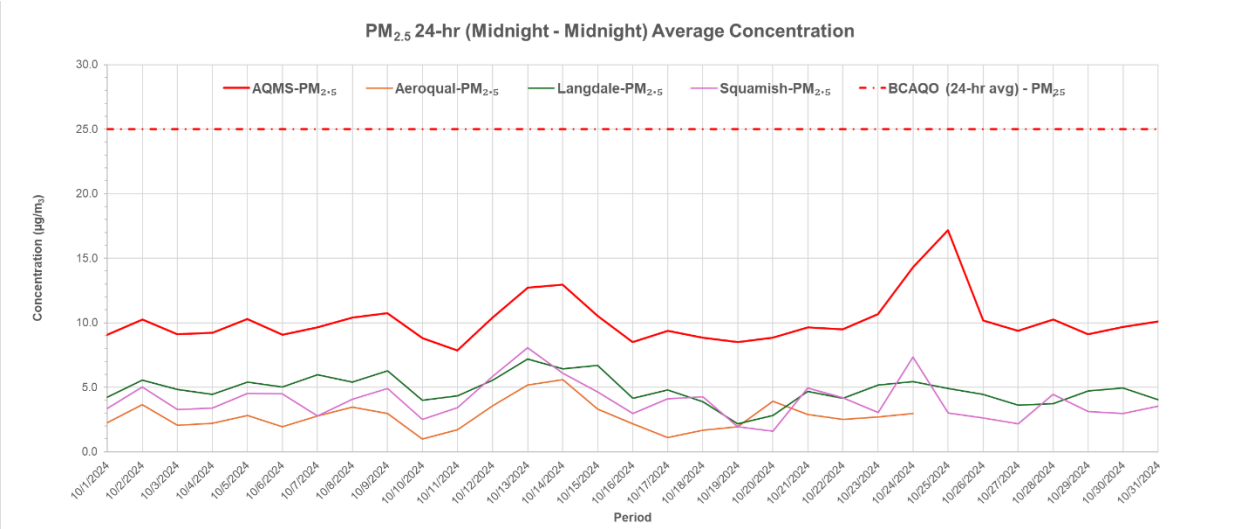


Figure A.8 24-Hour Average PM_{10} Concentrations Recorded at the AQMS, Aeroqual and at the Langdale Regional Air Quality Station for October 2024

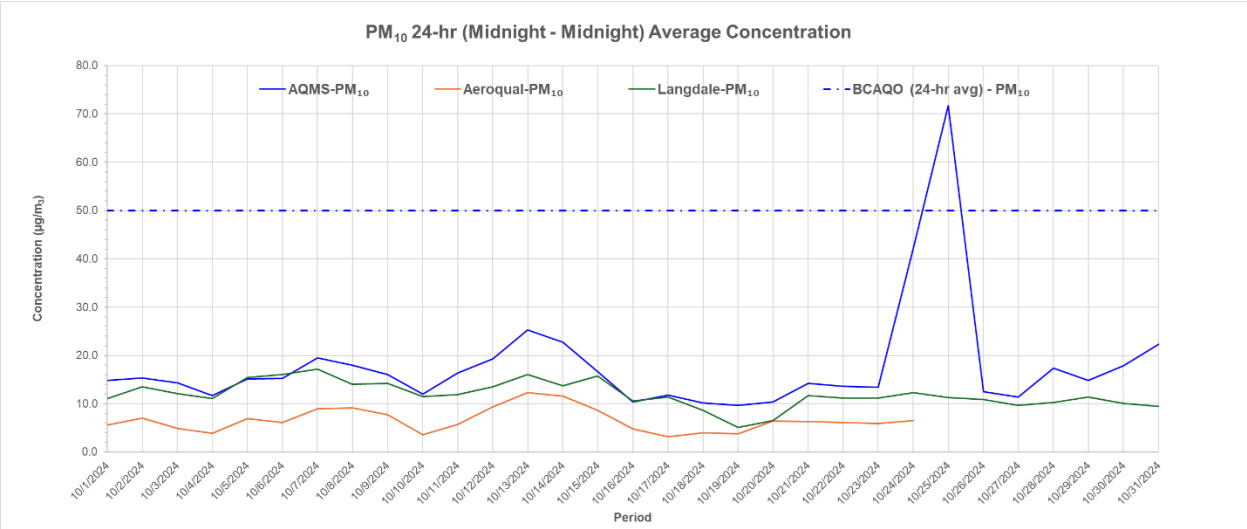


Figure A.9 24-Hour Average TSP Concentrations Recorded at the AQMS and Aeroqual for October 2024

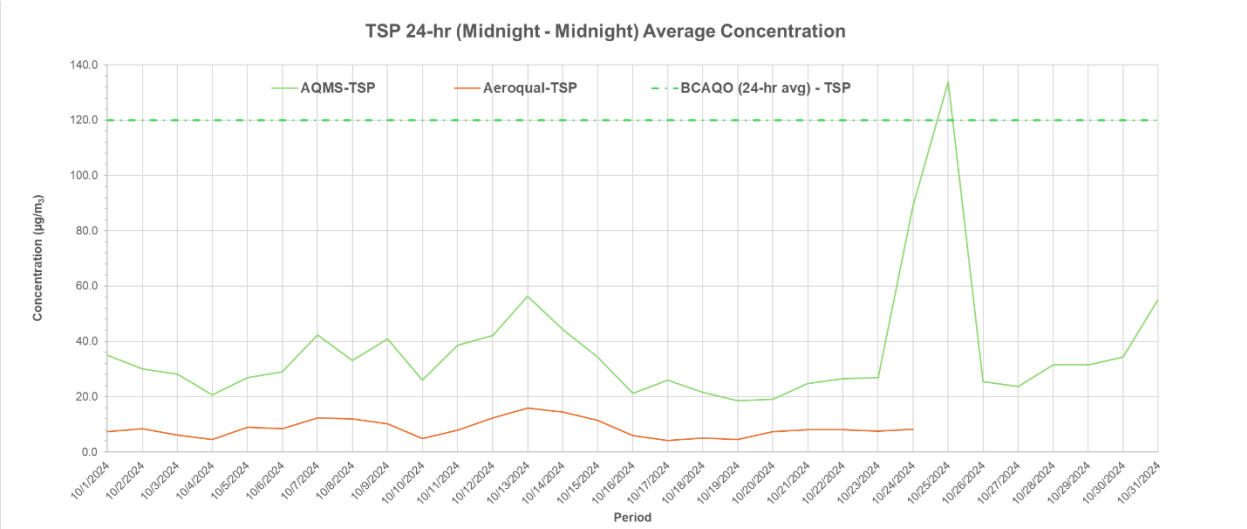


Figure A.10 24-Hour Average NO_2 Concentrations Recorded at the AQMS, Aeroqual and at the Langdale and Squamish Regional Air Quality Stations

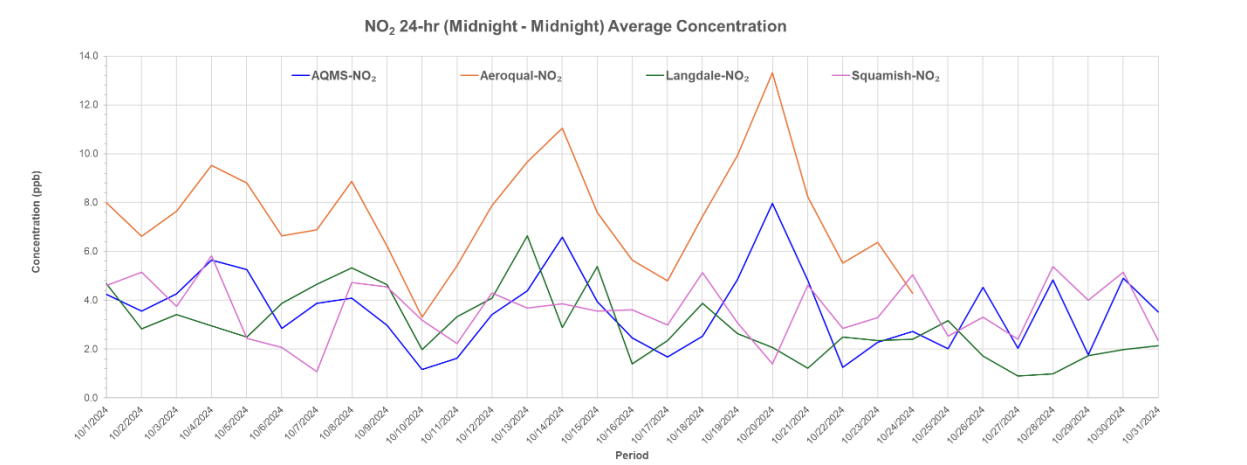


Figure A.11 Daily Average and Maximum Wind Speed Recorded at the Woodfibre LNG Meteorology Station for October 2024

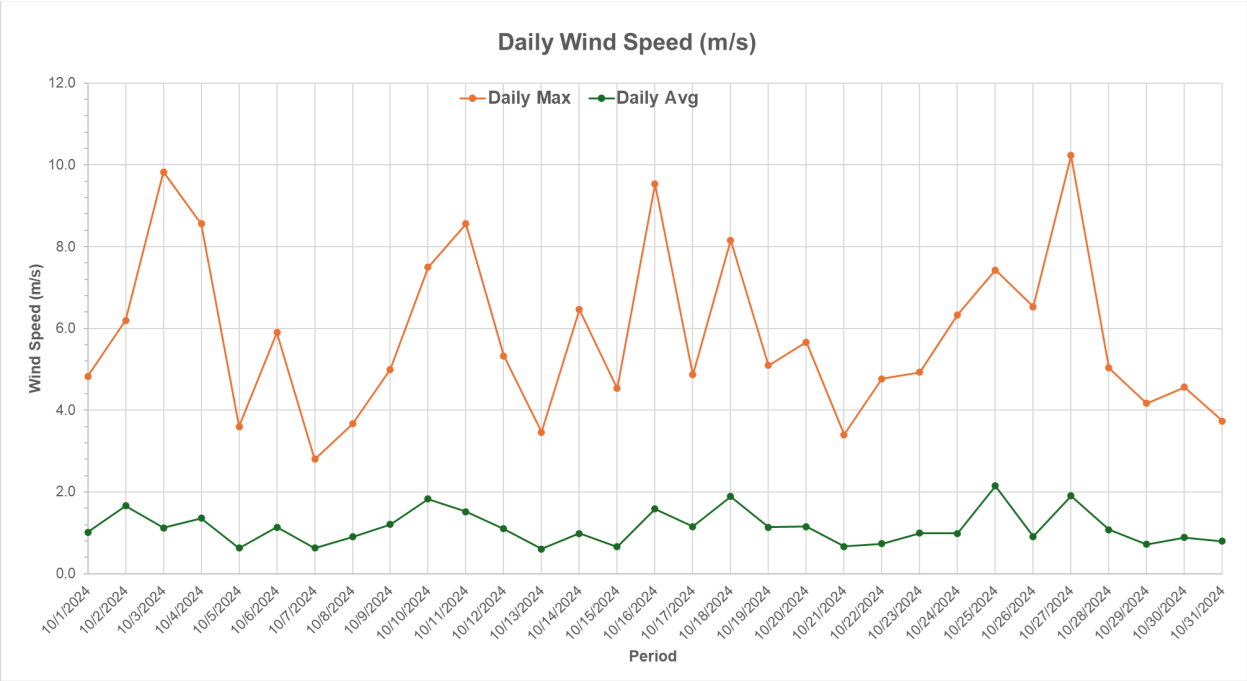


Figure A.12 Windrose for Woodfibre LNG Meteorology Station for October 2024

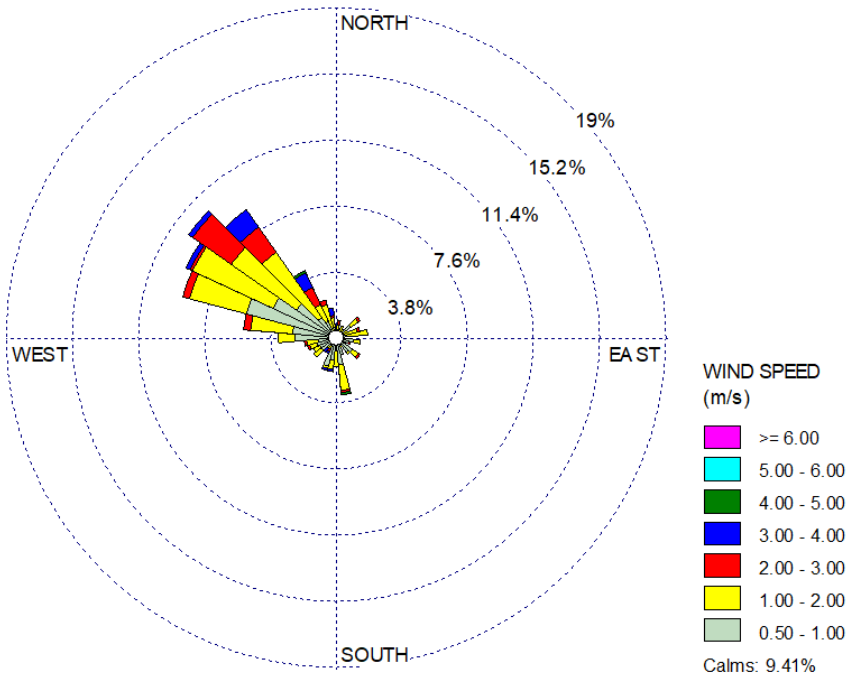


Figure A.13 Windrose for Woodfibre LNG Meteorology Station for Time Periods Hours 3 - 8, 9 - 12, 13 - 19, and 20 - 2 for October 2024

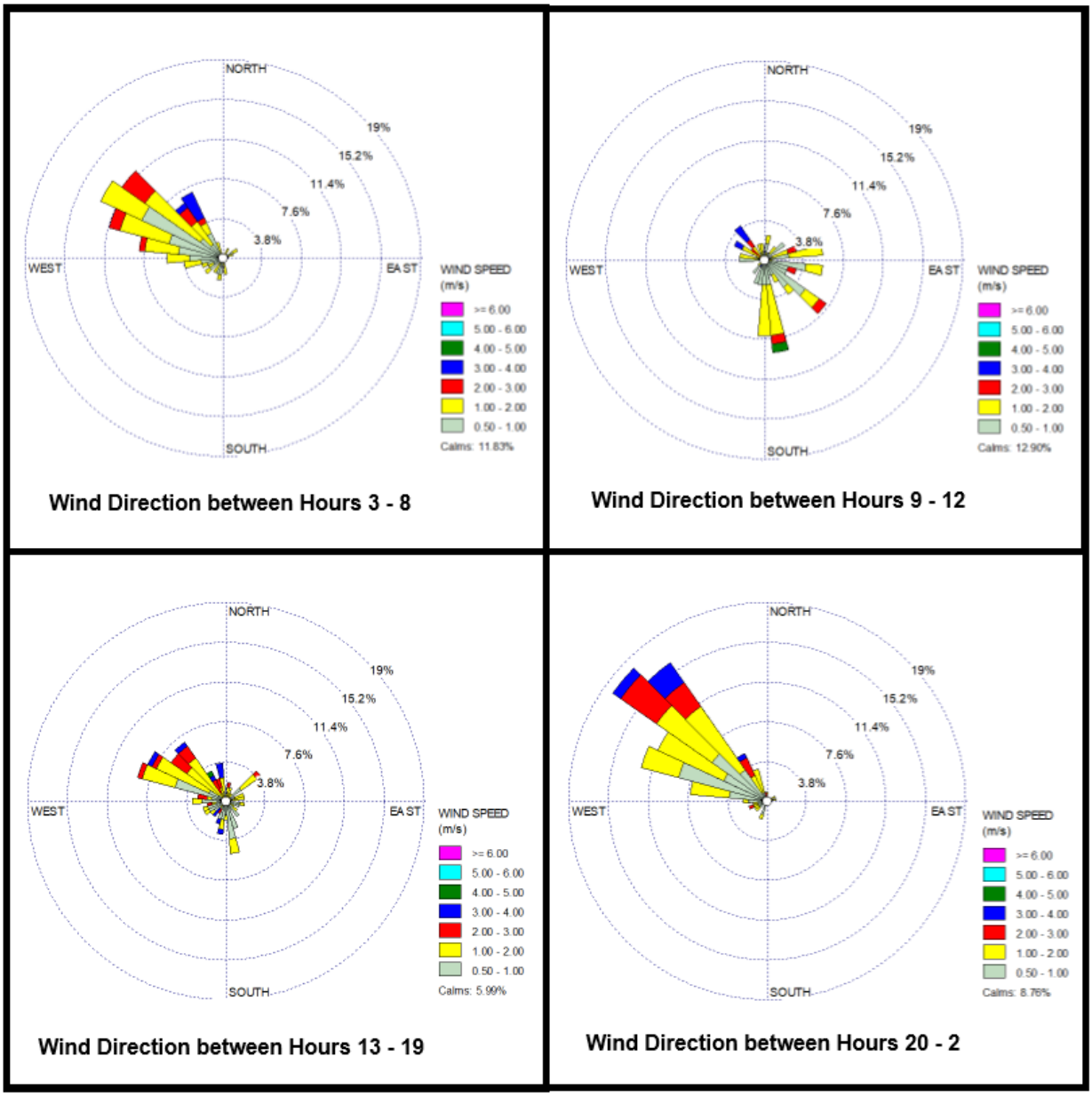


Figure A.14 Daily Average, Minimum, and Maximum Air Temperature Recorded at the Woodfibre LNG Meteorology Station for October 2024

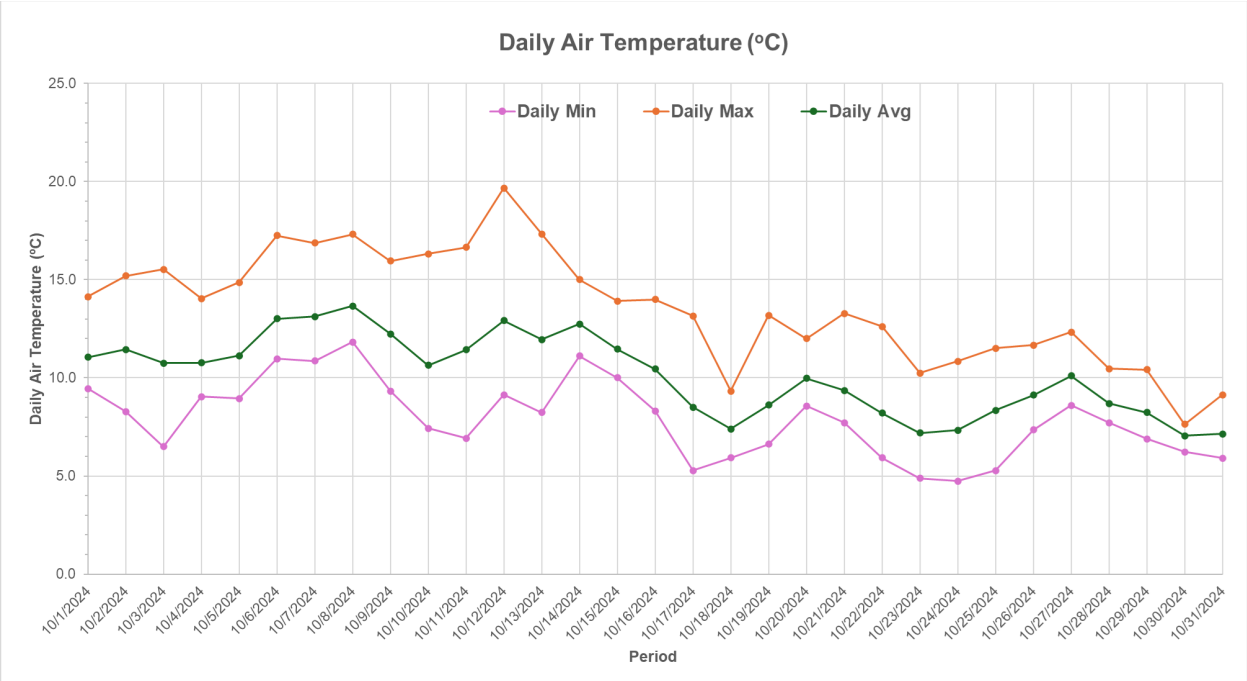
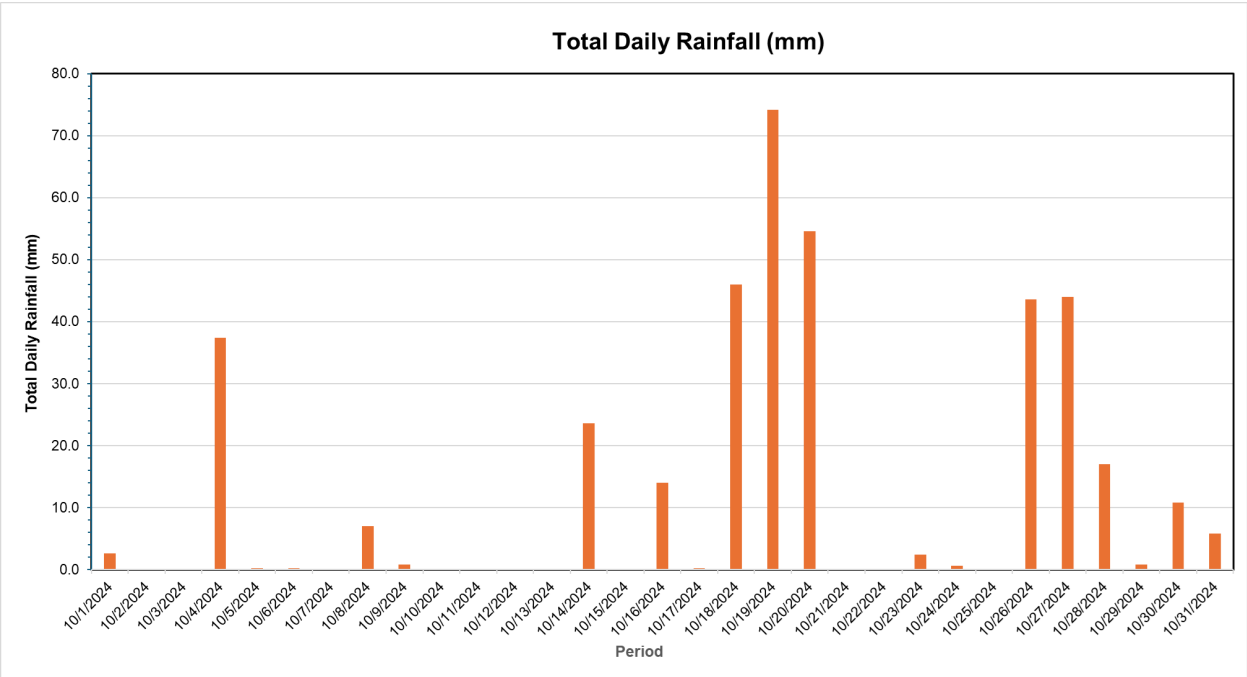


Figure A.15 Daily Rainfall Recorded at the Woodfibre LNG Meteorology Station for October 2024



Appendix B Data Tables

Table B.1 Daily $PM_{2.5}$, PM_{10}, TSP, and NO_2 Concentrations Recorded at the AQMS and the Aeroqual for October 2024

Date	AQMS (24-hr Average)				AQMS (1-hr Max)	Aeroqual (24-hr Average)				Aeroqual (1-hr Max)
	$PM_{2.5}$	PM_{10}	TSP	NO_2	NO_2	$PM_{2.5}$	PM_{10}	TSP	NO_2	NO_2
	µg/m³	µg/m³	µg/m³	ppb	ppb	µg/m³	µg/m³	µg/m³	ppb	ppb
10/1/2024	9	15	35	4.2	9.3	2.2	5.6	7.4	8.0	14.3
10/2/2024	10	15	30	3.5	11.3	3.6	7.0	8.4	6.6	16.4
10/3/2024	9	14	28	4.3	11.4	2.1	4.9	6.2	7.6	16.6
10/4/2024	9	12	21	5.6	19.5	2.2	3.9	4.6	9.5	27.1
10/5/2024	10	15	27	5.3	13.7	2.8	7.0	9.0	8.8	18.4
10/6/2024	9	15	29	2.8	8.8	2.0	6.1	8.4	6.6	11.4
10/7/2024	10	20	42	3.9	11.6	2.8	9.0	12.3	6.9	12.2
10/8/2024	10	18	33	4.1	19.2	3.5	9.1	12.0	8.9	25.7
10/9/2024	11	16	41	3.0	6.2	3.0	7.7	10.2	6.2	13.8
10/10/2024	9	12	26	1.2	7.9	1.0	3.6	5.0	3.3	8.0
10/11/2024	8	16	39	1.6	4.8	1.7	5.7	7.9	5.4	10.7
10/12/2024	10	19	42	3.4	12.9	3.6	9.3	12.3	7.9	14.5
10/13/2024	13	25	56	4.4	13.3	5.2	12.3	15.9	9.7	23.4
10/14/2024	13	23	44	6.6	14.8	5.6	11.6	14.5	11.0	19.3
10/15/2024	11	17	34	3.9	15.4	3.3	8.6	11.4	7.6	17.5
10/16/2024	9	10	21	2.4	11.2	2.2	4.8	5.9	5.6	15.2
10/17/2024	9	12	26	1.7	9.7	1.1	3.2	4.2	4.8	10.4
10/18/2024	9	10	22	2.5	9.6	1.7	3.9	5.0	7.4	18.2
10/19/2024	9	10	19	4.8	13.2	1.9	3.8	4.5	9.9	15.0
10/20/2024	9	10	19	8.0	19.4	3.9	6.4	7.3	13.3	21.5
10/21/2024	10	14	25	4.8	12.5	2.9	6.4	8.1	8.2	15.9
10/22/2024	10	14	26	1.2	5.8	2.5	6.2	8.0	5.5	10.8
10/23/2024	11	13	27	2.3	9.7	2.7	5.9	7.5	6.4	14.4
10/24/2024	14	42	89	2.7	14.1	3.0	6.5	8.3	4.3	5.8
10/25/2024	17	72	134	2.0	9.0	–	–	–	–	–
10/26/2024	10	13	26	4.5	11.7	–	–	–	–	–
10/27/2024	9	11	24	2.0	13.0	–	–	–	–	–

Date	AQMS (24-hr Average)				AQMS (1-hr Max)	Aeroqual (24-hr Average)				Aeroqual (1-hr Max)
	$PM_{2.5}$	PM_{10}	TSP	NO_2	NO_2	$PM_{2.5}$	PM_{10}	TSP	NO_2	NO_2
	µg/m³	µg/m³	µg/m³	ppb	ppb	µg/m³	µg/m³	µg/m³	ppb	ppb
10/28/2024	10	17	32	4.8	21.3	–	–	–	–	–
10/29/2024	9	15	32	1.8	6.7	–	–	–	–	–
10/30/2024	10	18	34	4.9	12.5	–	–	–	–	–
10/31/2024	10	22	55	3.5	9.8	–	–	–	–	–

Table B.2 Daily Wind Speed, Air Temperature, and Rainfall Recorded at the Woodfibre LNG Meteorology Station for October 2024

Date	Daily Wind Speed (m/s)		Daily Air Temperature (°C)			Daily Total Rainfall (mm)
	Max	Avg	Min	Max	Avg	
10/1/2024	4.8	1.0	9.5	14.1	11.0	2.6
10/2/2024	6.2	1.7	8.3	15.2	11.5	0.0
10/3/2024	9.8	1.1	6.5	15.5	10.8	0.0
10/4/2024	8.6	1.4	9.1	14.0	10.8	37.4
10/5/2024	3.6	0.6	8.9	14.9	11.1	0.2
10/6/2024	5.9	1.1	11.0	17.3	13.0	0.2
10/7/2024	2.8	0.6	10.9	16.9	13.1	0.0
10/8/2024	3.7	0.9	11.8	17.3	13.7	7.0
10/9/2024	5.0	1.2	9.3	16.0	12.2	0.8
10/10/2024	7.5	1.8	7.4	16.3	10.6	0.0
10/11/2024	8.6	1.5	6.9	16.7	11.4	0.0
10/12/2024	5.3	1.1	9.1	19.7	12.9	0.0
10/13/2024	3.5	0.6	8.2	17.3	12.0	0.0
10/14/2024	6.5	1.0	11.1	15.0	12.7	23.6
10/15/2024	4.5	0.7	10.0	13.9	11.5	0.0
10/16/2024	9.5	1.6	8.3	14.0	10.4	14.0
10/17/2024	4.9	1.1	5.3	13.2	8.5	0.2
10/18/2024	8.2	1.9	5.9	9.3	7.4	46.0
10/19/2024	5.1	1.1	6.6	13.2	8.6	74.2

Date	Daily Wind Speed (m/s)		Daily Air Temperature (°C)			Daily Total Rainfall (mm)
	Max	Avg	Min	Max	Avg	
10/20/2024	5.7	1.2	8.6	12.0	10	54.6
10/21/2024	3.4	0.7	7.7	13.3	9.4	0.0
10/22/2024	4.8	0.7	5.9	12.6	8.2	0.0
10/23/2024	4.9	1.0	4.9	10.3	7.2	2.4
10/24/2024	6.3	1.0	4.7	10.8	7.3	0.6
10/25/2024	7.4	2.1	5.3	11.5	8.3	0.0
10/26/2024	6.5	0.9	7.3	11.7	9.1	43.6
10/27/2024	10.2	1.9	8.6	12.3	10.1	44.0
10/28/2024	5.0	1.1	7.7	10.5	8.7	17.0
10/29/2024	4.2	0.7	6.9	10.4	8.2	0.8
10/30/2024	4.6	0.9	6.2	7.6	7.0	10.8
10/31/2024	3.7	0.8	5.9	9.1	7.1	5.8

Appendix C Air Quality Exceedance Report

Stantec

Memo

To:	Ross McCann (Regulatory Project Specialist), Ryan Schucroft (Environmental Site Lead), Jackie Boruch (Environmental Site Lead), Ian McAllister (Compliance Manager) Woodfibre LNG General Partner Inc.	From:	Dr. Kashif Choudhry, Senior Atmospheric Engineer Stantec Consulting Ltd.
Project/File:	123222160 12.2024.300	Date:	November 5, 2024

Reference: WLNG Air Quality Exceedance Report for PM_{10} and TSP – October 25, 2024

Executive Summary

This report investigates the exceedance of the 24-hour British Columbia Ambient Air Quality Objectives (BCAQO) for PM_{10} and TSP, which have a threshold of 50 µg/m³ and 120 µg/m³, respectively. PM_{10} and TSP concentrations, recorded at Woodfibre LNG (WLNG) Air Quality Monitoring Stations (AQMS) using Met One Instrument BAM 1020s, reached a 24-hour average of 71.8 µg/m³ and 133.8 µg/m³ respectively, with elevated hourly concentrations noted from 0:00 to 8:00 PDT. Wind conditions, regional PM_{10} data, and onsite work activities were analyzed to determine the likely sources of the air quality exceedances, which were attributed to project-related activities. Based on the locations of the emission sources and the wind direction during the period of elevated concentrations, it is determined that emissions from the construction rock_crushing and ditching activities at the site caused the elevated concentrations, however on-site staff observations confirmed that the dust plume did not travel towards the Floatel.

1 Introduction

This report assesses the PM_{10} and TSP exceedances observed on October 25, 2024, at the WLNG AQMS examines the environmental and project-related factors contributing to elevated concentrations. This analysis considers local meteorological data, onsite activities, and regional air quality data comparisons to identify the potential sources of the elevated PM_{10} concentrations. The regional ambient air quality monitoring stations (Langdale Elementary and Squamish Elementary) provide information for PM_{10} concentrations, but do not provide information on ambient TSP concentrations.

2 Data Collection and Methodology

- **Guideline Criteria Exceeded:**
  - 24-hour BC Air Quality Objective for PM_{10}: 50 µg/m³
  - 24-hour BC Air Quality Objective for TSP: 120 µg/m³
- **Actual Reading recorded at WLNG AQMS using Met One Instrument BAM 1020s:**
  - PM_{10} (24-hr average): 71.8 µg/m³
  - TSP (24-hr average): 133.8 µg/m³

  Elevated PM_{10} and TSP hourly concentrations were recorded from 0:00 to 8:00 hours and again at 21:00 hours.

- **Climatic Conditions:**
  - Wind Speed: 24-hour average of 2.1 m/s; range of 0.5 – 3.6 m/s
  - Wind Direction: Predominantly from the northwest
  - Total Precipitation (24-hours): 0 mm

Data collection included hourly PM_{10} and TSP readings from WLNG AQMS, hourly wind speed and wind direction measurements from WLNG meteorological station, and regional PM_{10} data from the British Columbia Ministry of Environment (BC MOE) Langdale Elementary air quality monitoring station. The Squamish air quality monitoring station operated under BC MOE does not provide data on ambient levels of PM_{10} and TSP. A North American smoke forecast from firesmoke.ca was also reviewed to assess the potential impacts of wildfire smoke. Onsite activity logs provided insight into dust-generating activities that may have influenced the local ambient air quality.

3 Air Quality Exceedance Investigation

The observed PM_{10} and TSP air quality exceedances were compared to regional air quality and local weather stations. Figure 1 shows that PM_{10} and TSP concentrations recorded at the WLNG air quality station on October 25, 2024, did not correlate well with wind speed. The maximum hourly average wind speed measured at the onsite Meteorological Station was 3.6 m/s, blowing predominantly from the northwest (Figure 2). Figure 3 compares the PM_{10} concentrations recorded at the WLNG AQMS to the regional Langdale Elementary air quality station operated by BC MOE. PM_{10} levels at the WLNG site were significantly higher than those recorded at the Langdale Elementary regional air quality station, particularly between 0:00 and 5:00 hours. Figure 3 also shows that PM_{10} concentrations at the WLNG site were, at times, more than forty-eight times higher than the Langdale Elementary regional air quality station on October 25, 2024. WLNG informed Stantec of various dust-generating activities occurring adjacent to the construction road, less than 100 meters north and approximately 100 to 200 meters northwest of the AQMS station, on October 25, 2024. Activities included rock crushing and ditching work to the north and northwest of the AQMS (see Figure 4 for a summary of the onsite work activities across the construction site), contributing to the observed PM_{10} exceedance at the AQMS. Figure 2 presents a wind rose showing the predominant wind direction during October 25, 2024, indicating wind patterns that likely dispersed particulates (fugitive dust) from the northwest. This aligns with dust-generating activities reported near the AQMS. The North American smoke forecast at firesmoke.ca does not indicate that wildfire smoke affected air quality at the WLNG Site on October 25, 2024. Observations made onsite by the Stantec Air Quality Engineer until the afternoon, along with confirmation from site staff present all day, noted no visual indication of dust travelling toward the Floatel from any direction (east, north, south, or west). Given the locations of the emission sources and prevailing wind direction during the elevated concentration period, it appears unlikely that the dust plume moved toward the Floatel from any direction.

Reference: WLNG Air Quality Exceedance Report for PM10 and TSP – October 25, 2024

4 Conclusion

In conclusion, the PM_{10} and TSP air quality exceedances, recorded at the WLNG site on October 25, 2024, can be attributed to dust-generating project-related construction activities (e.g., rock crushing and ditching) near the monitoring station. Predominant winds from the northwest quadrant likely contributed to the increased PM_{10} and TSP concentrations observed during this period. Therefore, these PM_{10} and TSP exceedances are primarily attributable to the construction project-related sources.

Regards,

Stantec Consulting Ltd.

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Attachments: A: Figures

Reference: WLNG Air Quality Exceedance Report for PM10 and TSP – October 25, 2024

Attachment A Figures

Reference: WLNG Air Quality Exceedance Report for PM10 and TSP – October 25, 2024

Figure 1 PM_{10} and TSP concentrations and wind speed at the WLNG site on October 25, 2024

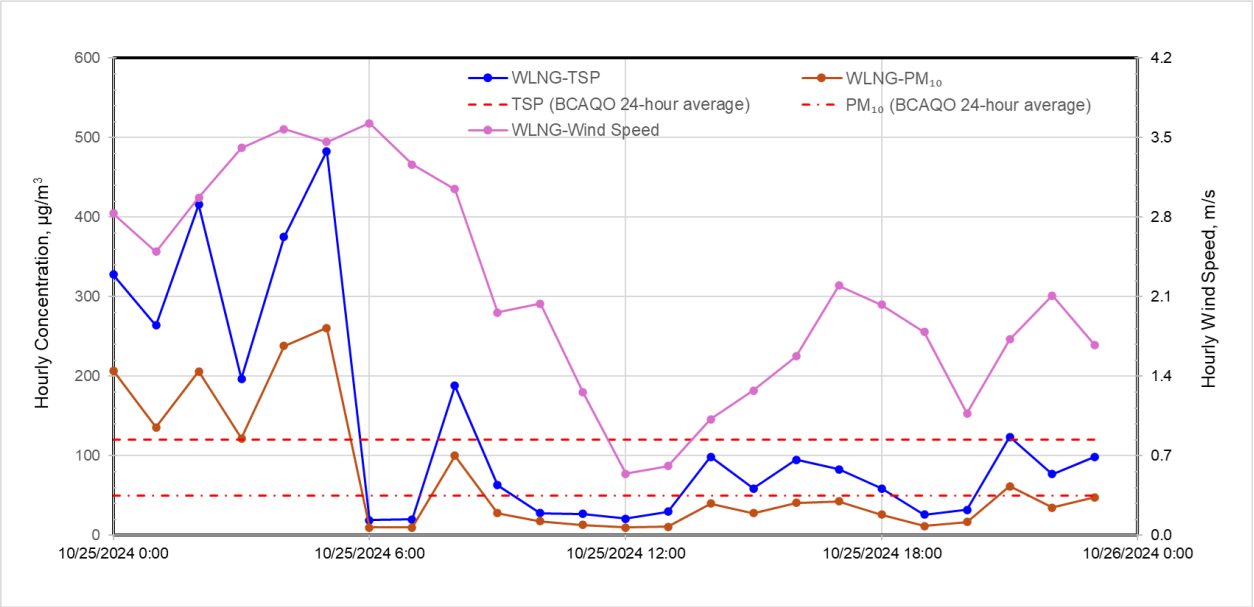
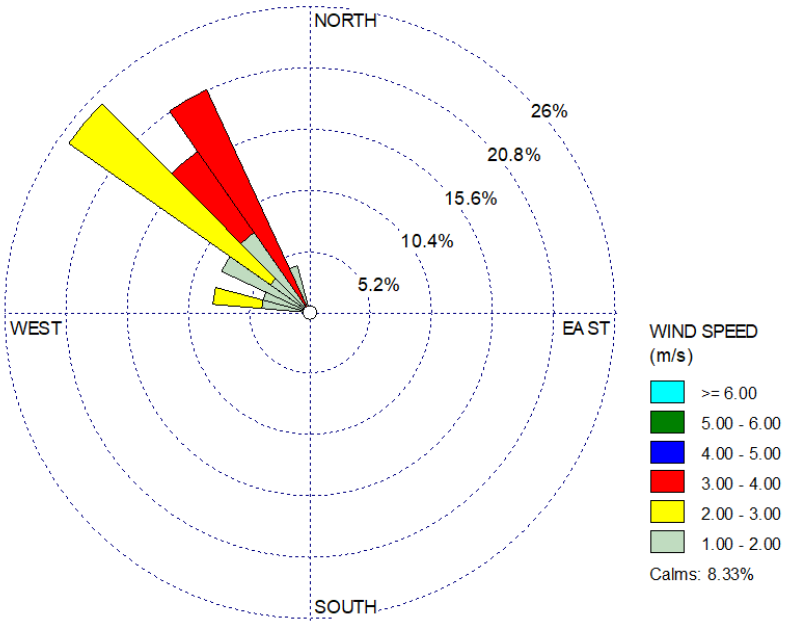
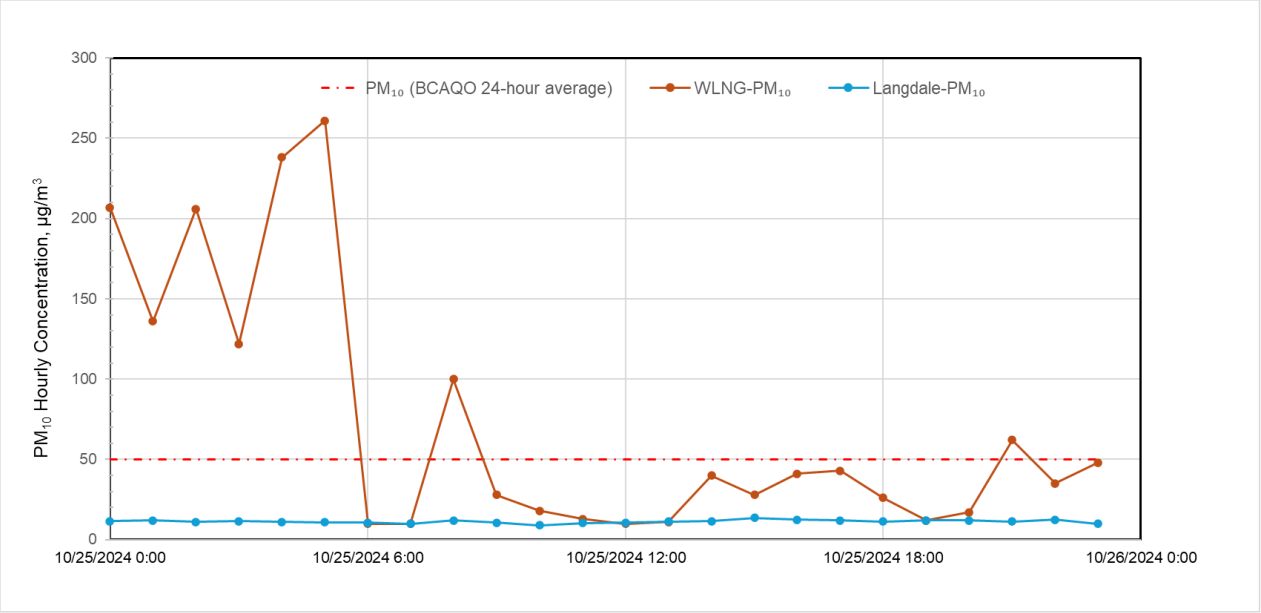


Figure 2 Windrose for the WLNG Meteorological Station, October 25, 2024



Reference: WLNG Air Quality Exceedance Report for PM10 and TSP – October 25, 2024

Figure 3 PM_{10} concentrations at the WLNG site and the Langdale Elementary Regional BC MOE Station on October 25, 2024.

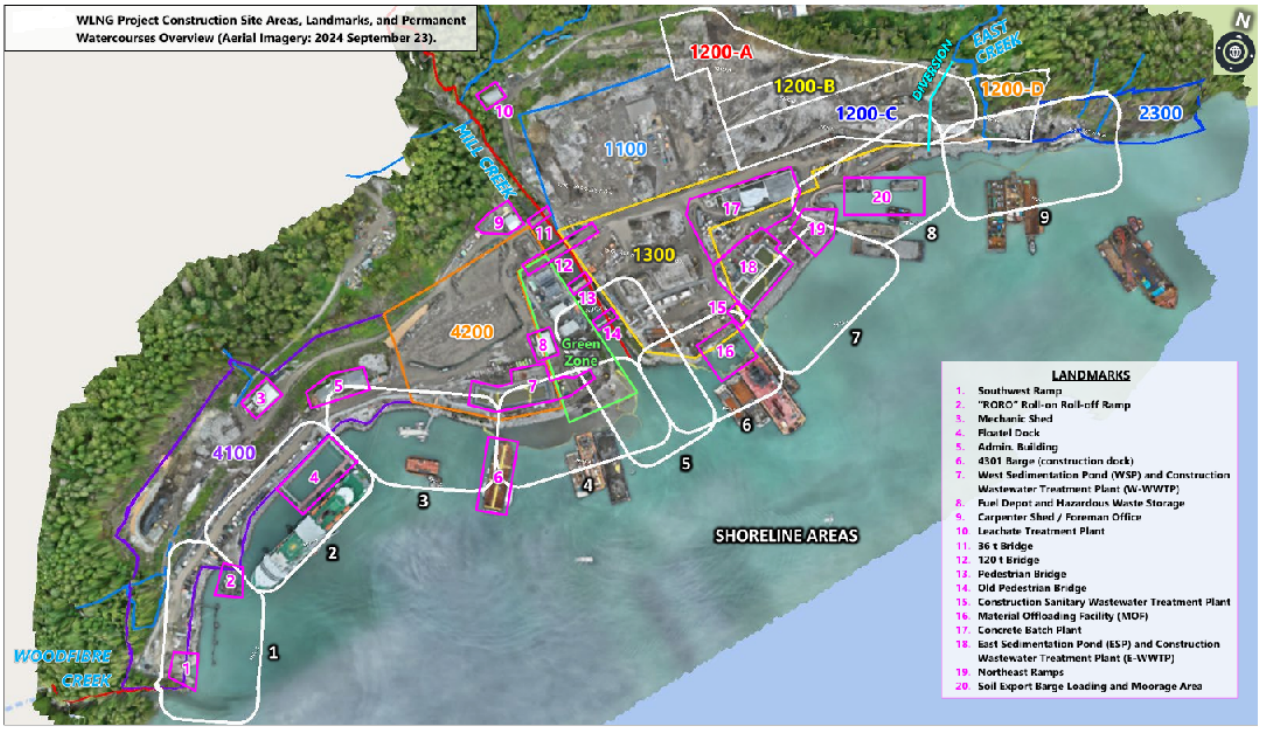


Reference: WLNG Air Quality Exceedance Report for PM10 and TSP – October 25, 2024

Figure 4 Details of the WLNG Onsite Daily Work (Construction) Activities for October 25, 2024.

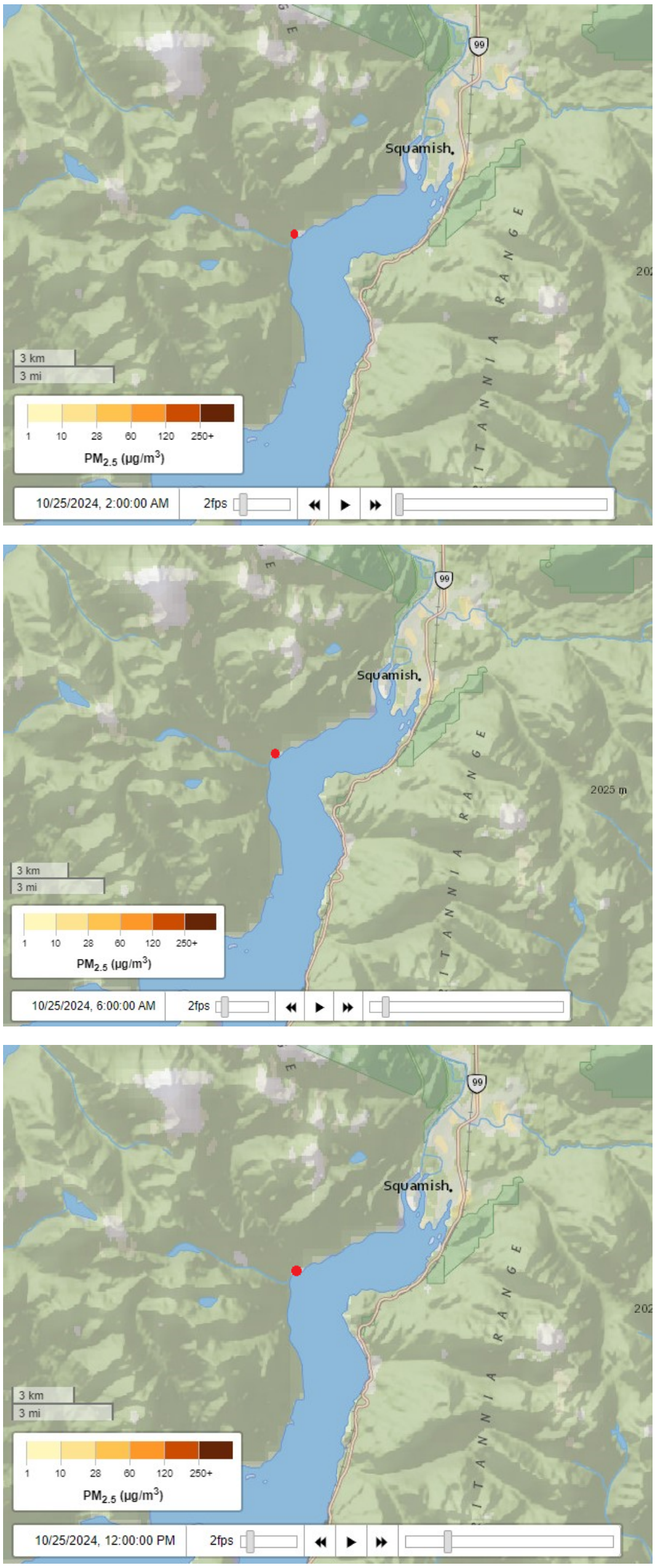
On-site Work Activities

- 1200d – backfill and rock splitting
- 1200b/c - continue drilling for blasting. Continue rock removal. Oversized rocks to be placed at 1100 for Norland to hammer down. Smaller rocks hauled to 4200 for Kode to crush.
- 1200a - blast at 4 pm. 145 kg.
- 4200 - Kode got their crusher repaired and setup at 4200. They commenced crushing last night. Commence fusing water lines and laying pipe near west pond.
- 4100 - continue ditching rework.
- 1100 - continue drilling, rock anchor install, grouting and testing. Continue hammering oversized rocks.
- 2100 – Vibro and impact piling
- Area 6 - place 1000kg rock in east corner of MOF.
- Area 7 - trans loading 50kg/100kg rock.
- Area 8 - continue placing 50kg rock.
- East Creek - placing more backfill.



Reference: WLNG Air Quality Exceedance Report for PM10 and TSP – October 25, 2024

Figure 5 **Smoke modelling output (forecast for 2:00 am, 6:00 am, and 12:00 pm) for October 25, 2024. The timestamps in the figure are based on Saskatchewan time, which observes Central Standard Time (CST) year-round, with no Daylight-Saving Time (DST) adjustment. The WLNG site (red dot) is near the center of the image.**



Appendix D Weekly AQMS Reports

WLNG AQMS - Weekly Reporting

Reporting Period

This AQMS Weekly report covers the period from September 30 to October 06, 2024.

Objective

This report aims to summarize air quality monitoring data for the week of September 30 - October 06, 2024. This report includes an analysis of pollutants such as $PM_{2.5}$, PM_{10}, TSP, and NO_2, highlighting any significant dust events, alerts from the Air Quality Monitoring System (AQMS), and changes to the monitoring network and mitigation measures. Additionally, the report aims to document the results of any investigations into alerts or equipment failures, detailing actions taken or plans for resolution to ensure compliance with environmental standards and support ongoing air quality management efforts.

Summary of Onsite Air Quality and Meteorological Data Collected

This section presents four summary tables summarizing the air quality and meteorological monitoring data. The presented data is based on Level 0 verification, indicating that it has undergone preliminary checks for completeness and accuracy.

Table 1: Summary of Daily Results for the Past 7 Days

Date	$PM_{2.5}$ (µg/m³)			PM_{10} (µg/m³)			TSP (µg/m³)			NO_2 (ppb)		
	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg
30-Sep	5	15	8.5	6	37	15.7	14	87	36.3	0	11.6	3.9
01-Oct	6	16	9.1	8	33	14.8	17	112	35.5	0.4	9.3	4.2
02-Oct	6	15	10.3	6	25	15.4	17	59	29.7	0	11.3	3.5
03- Oct	6	13	9.1	6	23	14.4	12	53	27.5	0	11.4	5.1
04- Oct	3	14	8.9	8	20	12.4	17	47	23.6	0	15.8	6.5
05- Oct	1	14	10.3	4	25	15.1	9	46	26.0	0.2	13.7	5.3
06- Oct	4	17	9.1	7	26	15.2	16	65	28.5	0	8.8	2.8

Note: The British Columbia Air Quality Objectives (AQO) are:

- $PM_{2.5}$: 25 µg/m³ - Achievement based on annual 98th percentile of daily average, averaged over one year.
- PM_{10}: 50 µg/m³ - Achievement based on the daily (24-hr) average.
- TSP: 120 µg/m³ - Achievement based on the daily (24-hr) average.
- NO_2: 60 ppb - Achievement based on annual 98th percentile of daily 1-hour average maximum (D1HM), averaged over three consecutive years.

Bold Italic numbers indicates that the 24-hour average for PM or one or more 1-hour maximum values for NO_2 exceed the respective threshold values.

Table 2: Weekly Averages Summary – $PM_{2.5}$, PM_{10}, TSP and NO_2

Pollutant	units	1-hr Min	1-hr Max	Weekly average	Trigger Limits (2/3 of the AQO)	Time Above Trigger Limit (Days)	Time Above AQO (Days)
$PM_{2.5}$	µg/m³	1	17	9.3	16.7 (24-hr avg)	0	0
PM_{10}	µg/m³	4	37	14.7	33.3 (24-hr avg)	0	0
TSP	µg/m³	9	112	29.6	80 (24-hr avg)	0	0
NO_2	ppb	0	15.8	4.5	40 (1-hr avg max)	0	0

Table 3: Summary of Meteorological Station Results

Date	Wind Speed (m/s)		Ambient Temperature (ºC)			Total Rainfall (mm)
	Max	24-hr Avg	Min	Max	24-hr Avg	
30-Sep	5.0	0.9	5.7	14.5	9.9	0
01-Oct	4.8	1.0	9.5	14.1	11.0	2.6
02- Oct	6.2	1.7	8.3	15.2	11.5	0
03- Oct	9.8	1.1	6.5	15.5	10.8	0
04- Oct	8.6	1.4	9.1	14.0	10.8	37.4
05- Oct	3.6	0.6	8.9	14.9	11.1	0.2
06- Oct	5.9	1.1	10.9	17.3	13.0	0.2

Table 4: Passive SO_2 and VOC Sampling

Date	Sampled Swapped (Yes/No)	Chain of Custody (COC) Submitted (Yes/No)	Sample Submitted to AGAT Lab (Yes/No)	Lab Results Received (Yes/No)	Lab Results Summary or Comments
30-Sep to 06-Oct	No	No	No	No	No sample swap or lab analysis was performed during this period.

Note: This table mostly contains "No" entries because SO_2 and VOC passive samples are swapped on a monthly basis, and this reporting period may not coincide with the sampling schedule. Passive samples were installed on September 1, 2024.

On-Site Dust Observation Report and Work Activities Details

Dust Observation Report Summary:

No dust observation report was received for this period, as the template is still being prepared for the client to provide this information.

Work Activities Details:

Daily Construction Reports for September 30 and October 1 are not available to Stantec Consulting for this reporting period. According to the Daily Construction Reports, between October 2 and 6, construction activities included ongoing drilling and blasting in areas 1100 and 1200, rock breaking, and hauling and loading blast rock to Kode Crushing. Additional tasks involved stockpile management, site cleanup, and containment work by the environmental team.

Summary of Daily Reports and Action Taken

Category	Details	Action Taken	Resolution Status / Anticipated Completion Date
AQ Exceedances Report	No AQ exceedances recorded for this period.	No Action required.	Not Applicable.
AQ Complaints	No AQ complaints received during this period.	No Action required.	Not Applicable.
Alerts from the AQMS	No alarms or instrument break-down was reported from AGAT during this period.	No Action required.	Not Applicable.
Changes to the Monitoring Network	No changes to the monitoring network during this period.	Not Applicable.	Not Applicable.
Changes to Mitigation Measures	No changes to mitigation measures during this period.	Not Applicable.	Not Applicable.

In summary, all instruments operated as intended, successfully collecting air quality data throughout the reporting period. No air quality exceedances of the British Columbia Air Quality Objectives were recorded, and no further investigation was required.

WLNG AQMS - Weekly Reporting

Reporting Period

This AQMS Weekly report covers the period from October 7 to October 13, 2024.

Objective

This report aims to summarize air quality monitoring data for the week of October 7 - October 13, 2024. This report includes an analysis of pollutants such as $PM_{2.5}$, PM_{10}, TSP, and NO_2, highlighting any significant dust events, alerts from the Air Quality Monitoring System (AQMS), and changes to the monitoring network and mitigation measures. Additionally, the report aims to document the results of any investigations into alerts or equipment failures, detailing actions taken or plans for resolution to ensure compliance with environmental standards and support ongoing air quality management efforts.

Summary of Onsite Air Quality and Meteorological Data Collected

This section presents four summary tables summarizing the air quality and meteorological monitoring data. The presented data is based on Level 0 verification, indicating that it has undergone preliminary checks for completeness and accuracy.

Table 1: Summary of Daily Results for the Past 7 Days

Date	$PM_{2.5}$ (µg/m³)			PM_{10} (µg/m³)			TSP (µg/m³)			NO_2 (ppb)		
	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg
07-Oct	7	13	9.6	12	29	19.5	25	94	42.2	0	11.6	3.9
08- Oct	8	14	10.4	9	30	18.0	18	53	32.9	0	19.2	4.1
09- Oct	8	13	10.8	10	34	16.1	19	154	41.8	0	6.2	3.0
10- Oct	6	12	8.7	7	20	11.8	16	47	26.4	0	7.9	1.2
11- Oct	6	13	7.9	7	44	16.4	16	148	38.0	0	4.8	1.6
12- Oct	7	17	10.4	6	44	19.3	19	138	41.6	0	12.9	3.4
13- Oct	5	16	12.7	12	48	25.3	25	134	56.1	0	13.3	4.4

Note: The British Columbia Air Quality Objectives (AQO) are:

- $PM_{2.5}$: 25 µg/m³ - Achievement based on annual 98th percentile of daily average, averaged over one year.
- PM_{10}: 50 µg/m³ - Achievement based on the daily (24-hr) average.
- TSP: 120 µg/m³ - Achievement based on the daily (24-hr) average.
- NO_2: 60 ppb - Achievement based on annual 98th percentile of daily 1-hour average maximum (D1HM), averaged over three consecutive years.

Bold Italic numbers indicates that the 24-hour average for PM or one or more 1-hour maximum values for NO_2 exceed the respective threshold values.

Table 2: Weekly Averages Summary – $PM_{2.5}$, PM_{10}, TSP and NO_2

Pollutant	units	1-hr Min	1-hr Max	Weekly average	Trigger Limits (2/3 of the AQO)	Time Above Trigger Limit (Days)	Time Above AQO (Days)
$PM_{2.5}$	µg/m³	5	17	10.1	16.7 (24-hr avg)	0	0
PM_{10}	µg/m³	6	48	18.1	33.3 (24-hr avg)	0	0
TSP	µg/m³	16	154	39.9	80 (24-hr avg)	0	0
NO_2	ppb	0	19.2	3.1	40 (1-hr avg max)	0	0

Table 3: Summary of Meteorological Station Results

Date	Wind Speed (m/s)		Ambient Temperature (ºC)			Total Rainfall (mm)
	Max	24-hr Avg	Min	Max	24-hr Avg	
07-Oct	2.8	0.6	10.9	16.9	13.1	0.0
08- Oct	3.7	0.9	11.8	17.3	13.7	7.0
09- Oct	5.0	1.2	9.3	16.0	12.2	0.8
10- Oct	7.5	1.8	7.4	16.3	10.6	0.0
11- Oct	8.6	1.5	6.9	16.7	11.4	0
12- Oct	5.3	1.1	9.1	19.7	12.9	0
13- Oct	3.5	0.6	8.2	17.3	11.9	0

Table 4: Passive SO_2 and VOC Sampling

Date	Sampled Swapped (Yes/No)	Chain of Custody (COC) Submitted (Yes/No)	Sample Submitted to AGAT Lab (Yes/No)	Lab Results Received (Yes/No)	Lab Results Summary or Comments
07-Oct to 13-Oct	No	No	No	No	No sample swap or lab analysis was performed during this period.

Note: This table mostly contains "No" entries because SO_2 and VOC passive samples are swapped on a monthly basis, and this reporting period may not coincide with the sampling schedule. Passive samples were installed on September 1, 2024.

On-Site Dust Observation Report and Work Activities Details

Dust Observation Report Summary:

No dust observation report was received for this period, as the template is still being prepared for the client to provide this information.

Work Activities Details:

According to the Daily Construction Reports, between October 7 and 13, construction activities included ongoing drilling and blasting in areas 1100 and 1200, rock breaking, and hauling and loading of blast rock to Kode Crushing. Additional tasks involved stockpile management, site cleanup, and containment work by the environmental team.

Summary of Daily Reports and Action Taken

Category	Details	Action Taken	Resolution Status / Anticipated Completion Date
AQ Exceedances Report	No AQ exceedances recorded for this period.	No Action required.	Not Applicable.
AQ Complaints	No AQ complaints received during this period.	No Action required.	Not Applicable.
Alerts from the AQMS	No alarms or instrument break-down was reported from AGAT during this period.	No Action required.	Not Applicable.
Changes to the Monitoring Network	No changes to the monitoring network during this period.	Not Applicable.	Not Applicable.
Changes to Mitigation Measures	No changes to mitigation measures during this period.	Not Applicable.	Not Applicable.

In summary, all instruments operated as intended, successfully collecting air quality data throughout the reporting period. No air quality exceedances of the British Columbia Air Quality Objectives were recorded, and no further investigation was required.

WLNG AQMS - Weekly Reporting

Reporting Period
This AQMS Weekly report covers the period from October 14 to October 20, 2024.

Objective

This report summarizes the air quality monitoring data for the week of October 14 - October 20, 2024. This report includes an analysis of pollutants such as $PM_{2.5}$, PM_{10}, TSP, and NO_2, highlighting any significant dust events, alerts from the Air Quality Monitoring System (AQMS), and changes to the monitoring network and mitigation measures. Additionally, the report documents the results of any investigations into alerts or equipment failures, detailing actions taken or plans for resolution to ensure compliance with environmental standards and support the ongoing air quality management efforts.

Summary of Onsite Air Quality and Meteorological Data Collected

This section presents four summary tables summarizing the air quality and meteorological monitoring data. The data is based on Level 0 verification, indicating that it has undergone preliminary checks for completeness and accuracy.

Table 1: Summary of Daily Results for the Past 7 Days

Date	$PM_{2.5}$ (µg/m³)			PM_{10} (µg/m³)			TSP (µg/m³)			NO_2 (ppb)		
	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg
14-Oct	6	23	13.0	11	45	22.8	24	105	44.3	0.0	14.8	6.6
15-Oct	5	27	10.5	7	26	16.7	18	64	34.3	0.0	15.4	3.9
16-Oct	4	14	8.5	8	17	10.3	14	32	21.2	0.0	11.2	2.4
17-Oct	1	15	9.4	5	19	11.8	17	41	26.0	0.0	9.7	1.7
18-Oct	6	14	8.8	5	18	10.1	10	36	21.6	0.0	9.6	2.5
19-Oct	4	13	8.5	5	14	9.7	10	43	18.6	0.0	13.2	4.8
20-Oct	6	12	8.8	6	19	10.4	13	32	19.0	0.0	19.4	8.0

Note: The British Columbia Air Quality Objectives (AQO) are:

- $PM_{2.5}$: 25 µg/m³ - Achievement based on annual 98th percentile of daily average, averaged over one year.
- PM_{10}: 50 µg/m³ - Achievement based on the daily (24-hr) average.
- TSP: 120 µg/m³ - Achievement based on the daily (24-hr) average.
- NO_2: 60 ppb - Achievement based on annual 98th percentile of daily 1-hour average maximum (D1HM), averaged over three consecutive years.

Bold Italic numbers indicates that the 24-hour average for PM or one or more 1-hour maximum values for NO_2 exceed the respective threshold values.

Table 2: Weekly Averages Summary – $PM_{2.5}$, PM_{10}, TSP and NO_2

Pollutant	units	1-hr Min	1-hr Max	Weekly average	Trigger Limits (2/3 of the AQO)	Time Above Trigger Limit (Days)	Time Above AQO (Days)
$PM_{2.5}$	µg/m³	1	27	9.6	16.7 (24-hr avg)	0	0
PM_{10}	µg/m³	5	45	13.1	33.3 (24-hr avg)	0	0
TSP	µg/m³	10	105	26.4	80 (24-hr avg)	0	0
NO_2	ppb	0	19.4	4.3	40 (1-hr avg max)	0	0

Table 3: Summary of Meteorological Station Results

Date	Wind Speed (m/s)		Ambient Temperature (ºC)			Total Precipitation (mm)
	Max	24-hr Avg	Min	Max	24-hr Avg	
14-Oct	6.5	1.0	11.1	15.0	12.7	23.6
15-Oct	4.5	0.7	10.0	13.9	11.5	0.0
16-Oct	9.5	1.6	8.3	14.0	10.4	14.0
17-Oct	4.9	1.1	5.3	13.2	8.5	0.2
18-Oct	8.2	1.9	5.9	9.3	7.4	46.0
19-Oct	5.1	1.1	6.6	13.2	8.6	74.2
20-Oct	5.7	1.2	8.57	12.0	10.0	54.6

Table 4: Passive SO_2 and VOC Sampling

Date	Sampled Swapped (Yes/No)	Chain of Custody (COC) Submitted (Yes/No)	Sample Submitted to AGAT Lab (Yes/No)	Lab Results Received (Yes/No)	Lab Results Summary or Comments
14-Oct to 20-Oct	No	No	No	No	No sample swap or lab analysis was performed during this period.

Note: This table mostly contains "No" entries because SO_2 and VOC passive samples are swapped on a monthly basis, and this reporting period may not coincide with the sampling schedule. Passive samples were installed on September 1, 2024; however, due to shipping/receiving issues and logistical challenges, the samples were only swapped on November 7, 2024.

On-Site Dust Observation Report and Work Activities Details

Dust Observation Report Summary:

No dust observation report was received for this period, as the template is still being prepared for the client to provide this information.

Work Activities Details:

According to the Daily Construction Reports for October 14, construction activities include ongoing drilling, blasting, and rock breaking in areas 1100 and 1200, vibro and impact piling in Area 1300MOF, erosion control installations, and regrading and stockpile management in Area 4200. Daily Construction Reports for October 15 to 20 are not available.

Summary of Daily Reports and Action Taken

Category	Details	Action Taken	Resolution Status / Anticipated Completion Date
AQ Exceedances Report	No AQ exceedances recorded for this period.	No Action required.	Not Applicable.
AQ Complaints	No AQ complaints received during this period.	No Action required.	Not Applicable.
Alerts from the AQMS	No alarms or instrument break-down was reported from AGAT during this period.	No Action required.	Not Applicable.
Changes to the Monitoring Network	No changes to the monitoring network during this period.	Not Applicable.	Not Applicable.
Changes to Mitigation Measures	No changes to mitigation measures during this period.	Not Applicable.	Not Applicable.

In summary, all instruments operated as intended, successfully collecting air quality data throughout the reporting period. No air quality exceedances of the British Columbia Air Quality Objectives were recorded, and no further investigation was required.

WLNG AQMS - Weekly Reporting

Reporting Period

This AQMS Weekly report covers the period from October 21 to October 27, 2024.

Objective

This report summarizes the air quality monitoring data for the week of October 21 - October 27, 2024. This report includes an analysis of pollutants such as $PM_{2.5}$, PM_{10}, TSP, and NO_2, highlighting any significant dust events, alerts from the Air Quality Monitoring System (AQMS), and changes to the monitoring network and mitigation measures. Additionally, this report documents the results of any investigations into alerts or equipment failures, detailing actions taken or plans for resolution to ensure compliance with environmental standards and support ongoing air quality management efforts.

Summary of Onsite Air Quality and Meteorological Data Collected

This section presents four summary tables summarizing the air quality and meteorological monitoring data. The data is based on a Level 0 verification, indicating that it has undergone preliminary checks for completeness and accuracy.

Table 1: Summary of Daily Results for the Past 7 Days

Date	$PM_{2.5}$ (µg/m³)			PM_{10} (µg/m³)			TSP (µg/m³)			NO_2 (ppb)		
	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg
21-Oct	6	14	9.6	10	19	14.2	17	33	24.8	0.0	12.5	4.8
22-Oct	7	13	9.5	8	21	13.6	16	35	26.5	0.0	5.8	1.2
23-Oct	6	17	10.7	8	21	13.4	18	39	26.8	0.0	9.7	2.3
24-Oct	7	40	14.3	9	284	42.3	19	560	89.0	0.0	14.1	2.7
25-Oct	7	39	17.2	10	261	***71.8***	19	483	***133.8***	0.0	9.0	2.0
26-Oct	7	16	10.2	3	31	12.5	14	53	25.5	0.0	11.7	4.5
27-Oct	6	18	9.4	4	50	11.4	13	92	23.6	0.0	13.0	2.0

Note: The British Columbia Air Quality Objectives (AQO) are:

- $PM_{2.5}$: 25 µg/m³ - Achievement based on annual 98th percentile of daily average, averaged over one year.
- PM_{10}: 50 µg/m³ - Achievement based on the daily (24-hr) average.
- TSP: 120 µg/m³ - Achievement based on the daily (24-hr) average.
- NO_2: 60 ppb - Achievement based on annual 98th percentile of daily 1-hour average maximum (D1HM), averaged over three consecutive years.

Bold Italic numbers indicates that the 24-hour average for PM or one or more 1-hour maximum values for NO_2 exceed the respective threshold values.

Table 2: Weekly Averages Summary – $PM_{2.5}$, PM_{10}, TSP and NO_2

Pollutant	units	1-hr Min	1-hr Max	Weekly average	Trigger Limits (2/3 of the AQO)	Time Above Trigger Limit (Days)	Time Above AQO (Days)
$PM_{2.5}$	µg/m³	6	40	11.6	16.7 (24-hr avg)	1	0
PM_{10}	µg/m³	3	284	25.6	33.3 (24-hr avg)	2	1
TSP	µg/m³	13	560	50.0	80 (24-hr avg)	2	1
NO_2	ppb	0	14.1	2.8	40 (1-hr avg max)	0	0

Table 3: Summary of Meteorological Station Results

Date	Wind Speed (m/s)		Ambient Temperature (ºC)			Total Precipitation (mm)
	Max	24-hr Avg	Min	Max	24-hr Avg	
21-Oct	3.4	0.7	7.7	13.3	9.4	0.0
22-Oct	4.8	0.7	5.9	12.6	8.2	0.0
23-Oct	4.9	1.0	4.9	10.3	7.2	2.4
24-Oct	6.3	1.0	4.7	10.8	7.3	0.6
25-Oct	7.4	2.1	5.3	11.5	8.3	0.0
26-Oct	6.5	0.9	7.3	11.7	9.1	43.6
27-Oct	10.2	1.9	8.6	12.3	10.1	44.0

Table 4: Passive SO_2 and VOC Sampling

Date	Sampled Swapped (Yes/No)	Chain of Custody (COC) Submitted (Yes/No)	Sample Submitted to AGAT Lab (Yes/No)	Lab Results Received (Yes/No)	Lab Results Summary or Comments
21-Oct to 27-Oct	No	No	No	No	No sample swap or lab analysis was performed during this period.

Note: This table mostly contains "No" entries because SO_2 and VOC passive samples are swapped on a monthly basis, and this reporting period may not coincide with the sampling schedule. Passive samples were installed on September 1, 2024; however, due to shipping/receiving issues and logistical challenges, the samples were only swapped on November 7, 2024.

On-Site Dust Observation Report and Work Activities Details

Dust Observation Report Summary:

For this report: No dust observation report was received for this period, as the template is still being prepared for the client to provide this information.

Work Activities Details:

From October 23 to 27, construction activities primarily involved ongoing drilling, blasting, and rock breaking in areas 1100 and 1200, along with vibro and impact piling in Area 1300MOF, Type-D backfilling, and excavation in Area 1200, rock crushing in Area 4200, with similar operations carried out each day; air quality exceedances were recorded on October 25 during these activities. The Daily Construction Reports for October 21 and 22 are not available.

Summary of Daily Reports and Action Taken

Category	Details	Action Taken	Resolution Status / Anticipated Completion Date
AQ Exceedances Report	AQ exceedances were recorded on October 25, 2024. PM_{10} = 71.8 µg/m^3 and TSP = 133.8 µg/m^3, both values were greater than the BC AQO.	AQ exceedance report was prepared.	Completed on November 5, 2024.
AQ Complaints	No AQ complaints received during this period.	No Action required.	Not Applicable.
Alerts from the AQMS	No alarms or instrument break-down was reported from AGAT during this period.	No Action required.	Not Applicable.
Changes to the Monitoring Network	No changes to the monitoring network during this period.	Not Applicable.	Not Applicable.
Changes to Mitigation Measures	No changes to mitigation measures during this period.	Not Applicable.	Not Applicable.

In summary, all instruments operated as intended, successfully collecting air quality data throughout the reporting period. Air quality exceedances of the British Columbia Air Quality Objectives were recorded for PM_{10} and TSP on October 25, 2024, and therefore, an air quality exceedance report was prepared.

WLNG AQMS - Weekly Reporting

Reporting Period

This AQMS Weekly report covers the period from October 28 to November 3, 2024.

Objective

This report summarizes the air quality monitoring data for the week of October 28 – November 3, 2024. This report includes an analysis of pollutants such as $PM_{2.5}$, PM_{10}, TSP, and NO_2, highlighting any significant dust events, alerts from the Air Quality Monitoring System (AQMS), and changes to the monitoring network and mitigation measures. Additionally, the documents the results of any investigations into alerts or equipment failures, detailing actions taken or plans for resolution to ensure compliance with the environmental standards and support ongoing air quality management efforts.

Summary of Onsite Air Quality and Meteorological Data Collected

This section presents four summary tables summarizing the air quality and meteorological monitoring data. The data is based on a Level 0 verification, indicating that it has undergone preliminary checks for completeness and accuracy.

Table 1: Summary of Daily Results for the Past 7 Days

Date	$PM_{2.5}$ (µg/m³)			PM_{10} (µg/m³)			TSP (µg/m³)			NO_2 (ppb)		
	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg	1-hr Min	1-hr Max	24-hr Avg
28-Oct	4	18	10.3	5	68	17.4	14	112	31.5	0.0	21.3	4.8
29-Oct	4	15	9.1	8	27	14.9	14	58	31.5	0.0	6.7	1.8
30-Oct	5	13	9.7	7	37	17.9	14	94	34.3	0.0	12.5	4.9
31-Oct	3	21	10.1	7	123	22.4	18	336	55.3	0.0	9.8	3.5
01-Nov	6	36	12.9	8	206	44.0	19	399	100.2	0.0	6.6	1.5
02-Nov	6	23	10.9	7	149	25.4	17	348	59.1	0.0	4.8	1.6
03-Nov	6	14	10.0	7	28	13.6	18	92	26.6	0.0	10.8	2.7

Note: The British Columbia Air Quality Objectives (AQO) are:

- $PM_{2.5}$: 25 µg/m³ - Achievement based on annual 98th percentile of daily average, averaged over one year.
- PM_{10}: 50 µg/m³ - Achievement based on the daily (24-hr) average.
- TSP: 120 µg/m³ - Achievement based on the daily (24-hr) average.
- NO_2: 60 ppb - Achievement based on annual 98th percentile of daily 1-hour average maximum (D1HM), averaged over three consecutive years.

Bold Italic numbers indicates that the 24-hour average for PM or one or more 1-hour maximum values for NO_2 exceed the respective threshold values.

Table 2: Weekly Averages Summary – $PM_{2.5}$, PM_{10}, TSP and NO_2

Pollutant	units	1-hr Min	1-hr Max	Weekly average	Trigger Limits (2/3 of the AQO)	Time Above Trigger Limit (Days)	Time Above AQO (Days)
$PM_{2.5}$	µg/m³	3	36	10.4	16.7 (24-hr avg)	0	0
PM_{10}	µg/m³	5	206	22.2	33.3 (24-hr avg)	1	0
TSP	µg/m³	14	399	48.4	80 (24-hr avg)	1	0
NO_2	ppb	0	21.3	3.0	40 (1-hr avg max)	0	0

Table 3: Summary of Meteorological Station Results

Date	Wind Speed (m/s)		Ambient Temperature (ºC)			Total Precipitation (mm)
	Max	24-hr Avg	Min	Max	24-hr Avg	
28-Oct	5.0	1.1	7.7	10.5	8.7	17.0
29-Oct	4.2	0.7	6.9	10.4	8.2	0.8
30-Oct	4.6	0.9	6.2	7.6	7.0	10.8
31-Oct	3.7	0.8	5.9	9.1	7.1	5.8
01-Nov	3.6	0.8	6.0	8.4	7.0	9.2
02-Nov	3.8	0.7	5.9	8.8	7.0	1.2
03-Nov	4.3	0.8	6.5	10.2	7.7	1.2

Table 4: Passive SO_2 and VOC Sampling

Date	Sampled Swapped (Yes/No)	Chain of Custody (COC) Submitted (Yes/No)	Sample Submitted to AGAT Lab (Yes/No)	Lab Results Received (Yes/No)	Lab Results Summary or Comments
28-Oct to 03-Nov	No	No	No	No	No sample swap or lab analysis was performed during this period.

Note: This table mostly contains "No" entries because SO_2 and VOC passive samples are swapped on a monthly basis, and this reporting period may not coincide with the sampling schedule. Passive samples were installed on September 1, 2024; however, due to shipping/receiving issues and logistical challenges, the samples were only swapped on November 7, 2024.

On-Site Dust Observation Report and Work Activities Details

Dust Observation Report Summary:

For this report: No dust observation report was received for this period, as the template is still being prepared for the client to provide this information.

Work Activities Details:

According to the Daily Construction Reports from Oct 28 to Nov 3, construction activities include ongoing drilling, blasting, and rock breaking in areas 1100 and 1200, vibro and impact piling in Area 1300MOF, and blasted rock processing, outfall backfilling and debris removal in Area 4200, with similar operations carried out each day.

Summary of Daily Reports and Action Taken

Category	Details	Action Taken	Resolution Status / Anticipated Completion Date
AQ Exceedances Report	No AQ exceedances recorded for this period.	No Action required.	Not Applicable.
AQ Complaints	No AQ complaints received during this period.	No Action required.	Not Applicable.
Alerts from the AQMS	No alarms or instrument break-down was reported from AGAT during this period.	No Action required.	Not Applicable.
Changes to the Monitoring Network	No changes to the monitoring network during this period.	Not Applicable.	Not Applicable.
Changes to Mitigation Measures	No changes to mitigation measures during this period.	Not Applicable.	Not Applicable.

In summary, all instruments operated as intended, successfully collecting air quality data throughout the reporting period. No air quality exceedances of the British Columbia Air Quality Objectives were recorded, and no further investigation was required.