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Waste Discharge Authorization – Air Emissions Permit (PA-110588) – Internet Reporting (August 2024)

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TABLE OF CONTENTS

1. Overview

1.1. Project Background

The LNG Canada liquefied natural gas (LNG) facility (Facility Identification No. 00018315) is located in Kitimat, British Columbia (BC), Canada, in the traditional territory of the Haisla Nation. LNG Canada is a joint venture comprised of Shell Canada Energy (Shell), North Montney LNG Limited Partnership, PetroChina Kitimat LNG Partnership (CNPC), Diamond LNG Canada Partnership (Diamond), and KOGAS Canada LNG Partnership (KOGAS).

A list of acronyms is provided in Appendix A.

1.2. Purpose

On July 15, 2024, the BC Energy Regulator (BCER) issued Waste Discharge Authorization (WDA) discharge permit PA-110588 to LNG Canada Development Inc., under the provisions of the BC *Environmental Management* Act, for the discharge of air contaminants to the environment from:

- Four (4) gas turbine engines with waste heat recovery units (WHRU) (Section 2.1 of PA-110588).
- Two (2) acid gas incinerators (AGI) (Section 2.2 of PA-110588).
- One (1) warm/wet flare (Section 2.3 of PA-110588).
- One (1) cold/dry flare (Section 2.4 of PA-110588).
- One (1) storage and loading flare (Section 2.5 of PA-110588).
- One (1) spare flare (Section 2.6 of PA-110588).
- One (1) liquid burner (structure) (Section 2.7 of PA-110588).
- Five (5) emergency power generators (Section 2.8 of PA-110588).
- Two (2) fire water diesel engines (Section 2.9 of PA-110588).
- Vents (Section 2.10 of PA-110588).
- One (1) condensate storage tank vent stack (Section 2.11 of PA-110588).

Permit PA-110588 applies to Phase 1 of the LNG facility, which is the first two liquefaction trains (known as “Train 1” and “Train 2”), with their supporting utility systems.

The purpose of this document is to compile the information required under Section 10.7 of Permit PA-110588 (Internet Reporting) for August 2024.

1.3. LNG Facility Status

On the afternoon of August 31, 2024, fuel gas was introduced into Unit 1000 (Inlet Facilities) for the first time from the Coastal Gas Link pipeline, commencing the pressurization of piping and the startup fuel gas heater. The introduction of fuel gas into the fuel gas headers down to the flare area, and the first supply of fuel gas to the pilot on the warm wet flare occurred on September 1, 2024. Therefore, there was no discharge from the authorized works in August 2024.

Under Permit PA-110588, the “Commissioning” phase is defined as “*that period of time when Discharge from the authorized works commences and ending when the first cargo is shipped from LNG Train 1.”* Operations is the period of time which follows Commissioning. Therefore, “Commissioning”, under PA-110588, commenced on September 1, 2024. Regardless, the reporting elements required for “Commissioning” are contained within this monthly report for August 2024.

2. Ambient Air Quality Reading (Condition 7.3)

2.1. Permit Condition

The Permittee shall notify the BCER, as soon as practicable and no more than 24 hours following an ambient measurement above the NO2 or SO2 BCAAQO metric recorded at any of the Riverlodge, Whitesail, and Kitamaat Village ambient air quality monitoring stations in the Kitimat Valley. The Permittee shall submit a written report prepared or reviewed by a Qualified Professional within 7 working days of an ambient measurement above the NO2 or SO2 BCAAQO metric describing activities at the facility, and any known contributing factors from authorized works affecting the NO2 or SO2 measurement(s), and any changes to the facility operations that may be appropriate to avoid future ambient measurements above the NO2 or SO2 BCAAQO metric.

2.2. Data and Assessment

The publicly available data for NO_2 and SO_2 at the three continuous ambient air quality monitoring stations are provided in graphs in Appendix B; the graphs also contain the applicable BCAAQO.

There were no ambient air quality concentrations of NO_2 and SO_2 measured in excess of the BCAAQO metrics in the reporting period.

3. CEMS Reporting (Condition 10.2.3)

3.1. Permit Condition

Under Condition 10.2.3, during Operations, after the completion of the initial CEMS performance evaluation, the Permittee shall provide a summary of CEMS data collected during the month.

3.2. Data and Assessment

As Operations has not yet commenced, there is no CEMS reporting for this month.

4. Flaring Activity Reporting (Condition 10.2.4)

4.1. Permit Condition

Under Condition 10.2.4, a summary of all flaring activity carried out during the month is to be included in the monthly report. The monthly report shall include the following information:

a. identification of the flare source;

b. description of the type of process gas sent to flare;

c. the volume of gas sent to the flare during each event;

d. the reason for the flaring event;

e. any external notifications sent out, if applicable;

f. the (i) daily and (ii) monthly volume of gas being flared for each source; and

g. the (i) daily and (ii) monthly contaminant emission totals for each source, parameters include NO_x, CO, $PM_{2.5}$, SO_x, VOCs, and HC-T.

h. the quantification method (under Section 9) and representative calculations

4.2. Data and Assessment

The first planned flaring event notification was uploaded to eSubmission on August 28, 2024, for the introduction of fuel gas into the LNG facility and associated use of the flare pilots on fuel gas (submission #20241085). The notification identified an estimated start date of August 29, 2024. Notifications were also emailed to Haisla Nation, District of Kitimat and Regional District of Kitimat-Stikine on August 28, 2024; and information published on lngcanada.ca and LNG Canada's Facebook page https://www.facebook.com/LNGCanada.

The actual first planned flaring event commenced on September 1, 2024; therefore, there were no flaring activities to report for August 2024.

5. Ambient Air Monitoring Evaluation (Commissioning Only) (Condition 10.2.7)

5.1. Permit Condition

Under Condition 10.2.7, the following information for nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and $PM_{2.5}$ from three continuous ambient air quality monitoring stations (Kitamaat Village (Kitimat Haisla Village) (Site 1); Kitimat Riverlodge (Site 2) and Kitimat Whitesail) are to be included in the monthly report during Commissioning where information is publicly available:

a. a comparison of the measured ambient air concentrations at each ambient air monitoring stations to the applicable numerical metrics of the BC ambient air quality objectives (BCAAQO);

b. (i) a description of any measured ambient air concentrations in excess of the numerical metrics of the BCAAQO, if applicable, (ii) a description of any known contributing factors from authorized works, and (iii) a description of action (if any) taken by the Permittee.

The monthly report shall also include the time series plot of the hourly average ambient air concentration of ozone (O_3) data from these stations.

5.2. Data and Assessment

Data from continuous ambient air quality monitoring stations in Kitimat are publically available via the BC Ministry of Environment and Climate Change Strategy, at: Latest Air Monitoring Data Map - BC Air Quality - Province of British Columbia (gov.bc.ca).

The publicly available data for NO_2, SO_2 and $PM_{2.5}$ at the three continuous ambient air quality monitoring stations are provided in graphs in Appendix B; the graphs also contain the applicable BCAAQO. The time series plot for the hourly average ambient air concentration of O_3 is also provided in Appendix B.

There were no ambient air quality concentrations of NO_2 and SO_2 measured in excess of the BCAAQO metrics in the reporting period. There were elevated $PM_{2.5}$ (24-hour running average) measurements on August 17, 2024, at all three continuous ambient air quality stations, due to elevated $PM_{2.5}$ (1-hour) measurements commencing from early evening on August 16, 2024. These emissions are not attributable to the authorized emissions from the LNG facility under Permit PA-110588, given the discharge had not commenced in this period.

6. Facility SO_2 Emission Limit (Condition 10.2.8)

6.1. Permit Condition

Under Condition 10.2.8, for all authorized sources in Sections 2.1 to 2.7, for each day of the month, the maximum hourly cumulative SO_2 discharge rate is to be provided in the monthly report, including the percentage breakdown of the sources contributing to the maximum discharge rate of each day.

6.2. Data and Assessment

As there was no fuel gas combusted in August 2024; there were no associated SO_2 emissions in this reporting period.

7. References

- BC Ministry of Environment and Climate Change Strategy, Latest Air Monitoring Data Map - BC Air Quality - Province of British Columbia (gov.bc.ca), accessed September 4, 2024.

Appendix A Abbreviations

AGI	Acid Gas Incinerator
BC	British Columbia
BCAAQO	BC Ambient Air Quality Objectives
BCER	BC Energy Regulator
CEMS	Continuous Emissions Monitoring System
CO	Carbon monoxide
EPC	Engineering, Procurement, and Construction
HC-T	Total hydrocarbons
IPP	Initial Performance Period
JFJV	JGC Fluor BC LNG Joint Venture
LNG	Liquefied Natural Gas
LNG Canada	LNG Canada Development Inc.
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
O_3	Ozone
$PM_{2.5}$	Fine particulate matter (aerodynamic diameter smaller than 2.5 micrometers)
ppb	Parts per billion
SO_x	Oxides of sulphur
SO_2	Sulphur Dioxide
VOC	Volatile Organic Compound
WDA	Waste Discharge Authorization
WHRU	Waste Heat Recovery Unit
$\mu g/m^3$	micrograms per cubic meter

Appendix B Ambient Air Quality Evaluation (Condition 10.2.7)

Nitrogen Dioxide (NO_2)

The publicly available data of 1-hour NO_2 from the three continuous ambient air quality monitoring stations is illustrated in Figure B-1. The BCAAQO for 1-hour NO_2 is 60 parts per billion (ppb) (equates to 113 µg/m^3), calculated by the 98th percentile of daily 1-hour maximum over three years; this metric is also illustrated in Figure B-1.

There is a BCAAQO for annual NO_2 (17 ppb, based on the annual average of the 1-hour concentrations) however this information is not published for each monitoring station therefore is not provided herein.

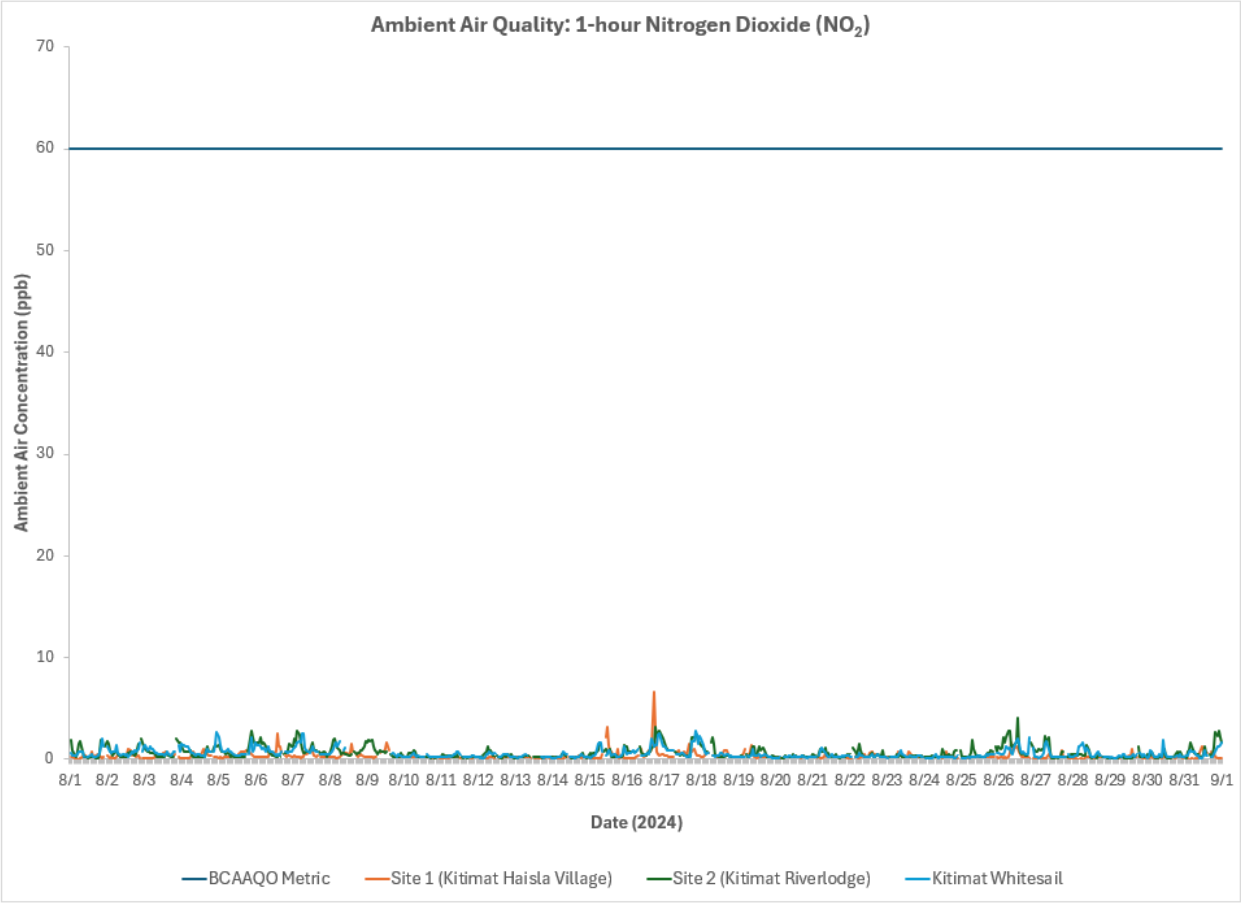

Figure B-1: Ambient Air Quality - 1-hour Nitrogen Dioxide (NO_2)

Sulphur Dioxide (SO_2)

The publicaly available data of 1-hour SO_2 from the three continuous ambient air quality monitoring stations is illustrated in Figure B-2. BC adopted the 2020 Canadian Ambient Air Quality Standard (CAAQS) as the BCAAQO for 1-hour SO_2, which is 70 parts per billion (ppb) (equates to 183 µg/m^3), calculated by the annual 99th percentile of daily 1-hour averaged over three consecutive years; this metric is also illustrated in Figure B-2.

There is a BCAAQO for annual SO_2 (5 ppb, based on the annual average of the 1-hour concentrations) however this information is not published for each monitoring station therefore is not provided herein.

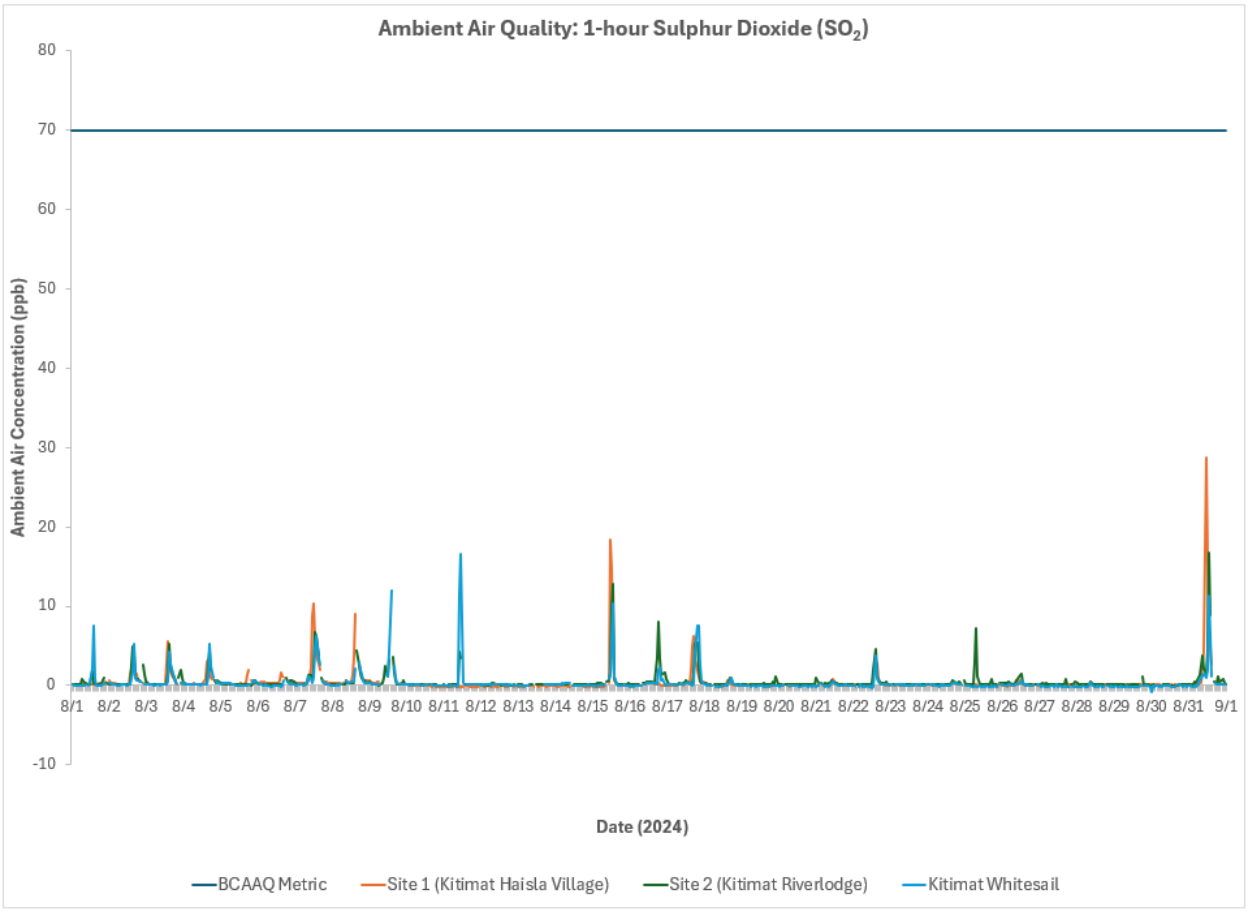

Figure B-2: Ambient Air Quality - 1-hour Sulphur Dioxide (SO_2)

Fine Particulate Matter ($PM_{2.5}$)

The publicaly available data of 24-hour running average for $PM_{2.5}$ from the three continuous ambient air quality monitoring stations is illustrated in Figure B-3. The BCAAQO for 24-hour $PM_{2.5}$ is 25 µg/m^3, calculated by the 98th percentile of daily average, over one year; this metric is also illustrated in Figure B-3.

There is a BCAAQO for annual $PM_{2.5}$ (8 µg/m^3 based on the annual average, over one year) however this information is not published for each monitoring station therefore is not provided herein.

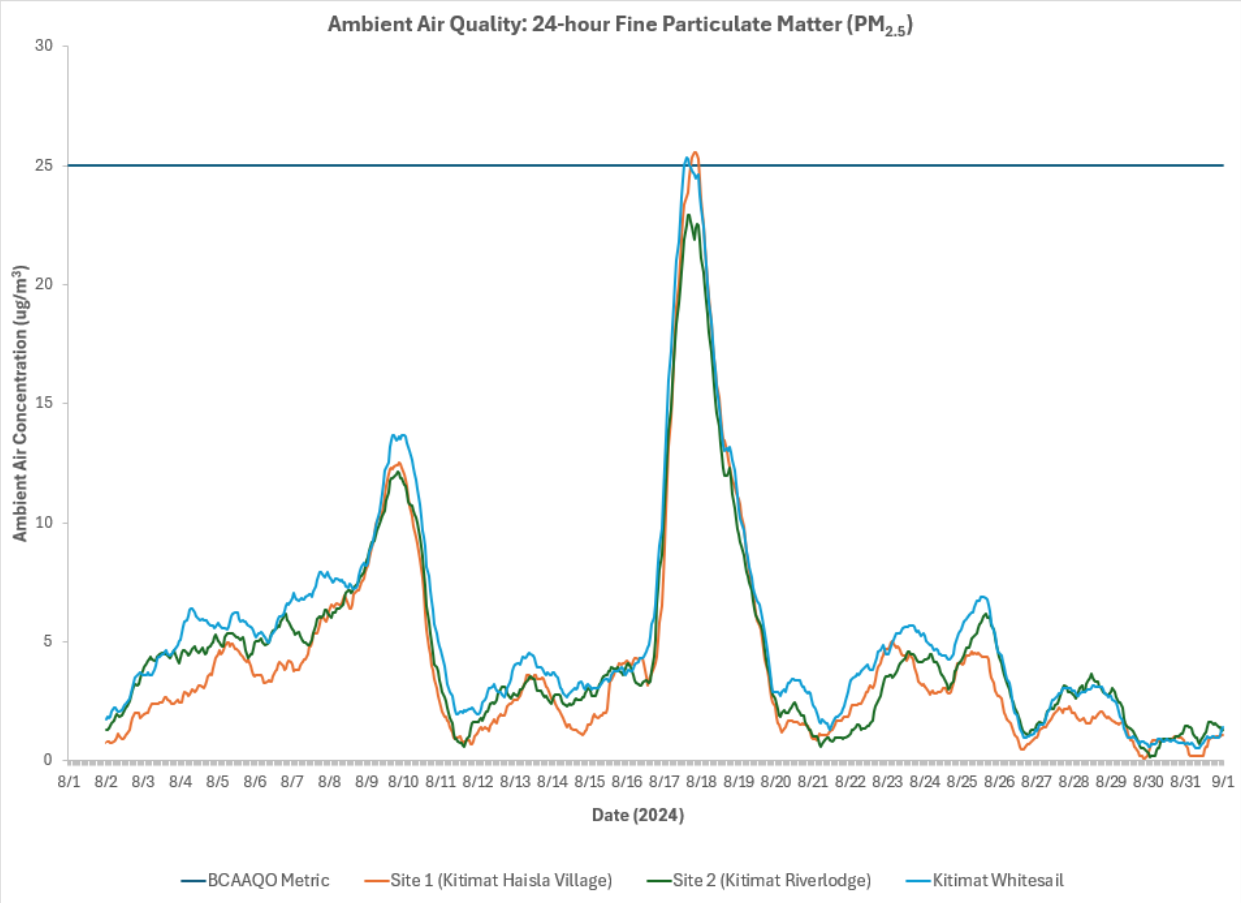

Figure B-3: Ambient Air Quality - 24-hour Fine Particulate Matter ($PM_{2.5}$)

Ozone (O_3)

The publicaly available data of 1-hour O_3 from the three continuous ambient air quality monitoring stations is illustrated in Figure B-4.

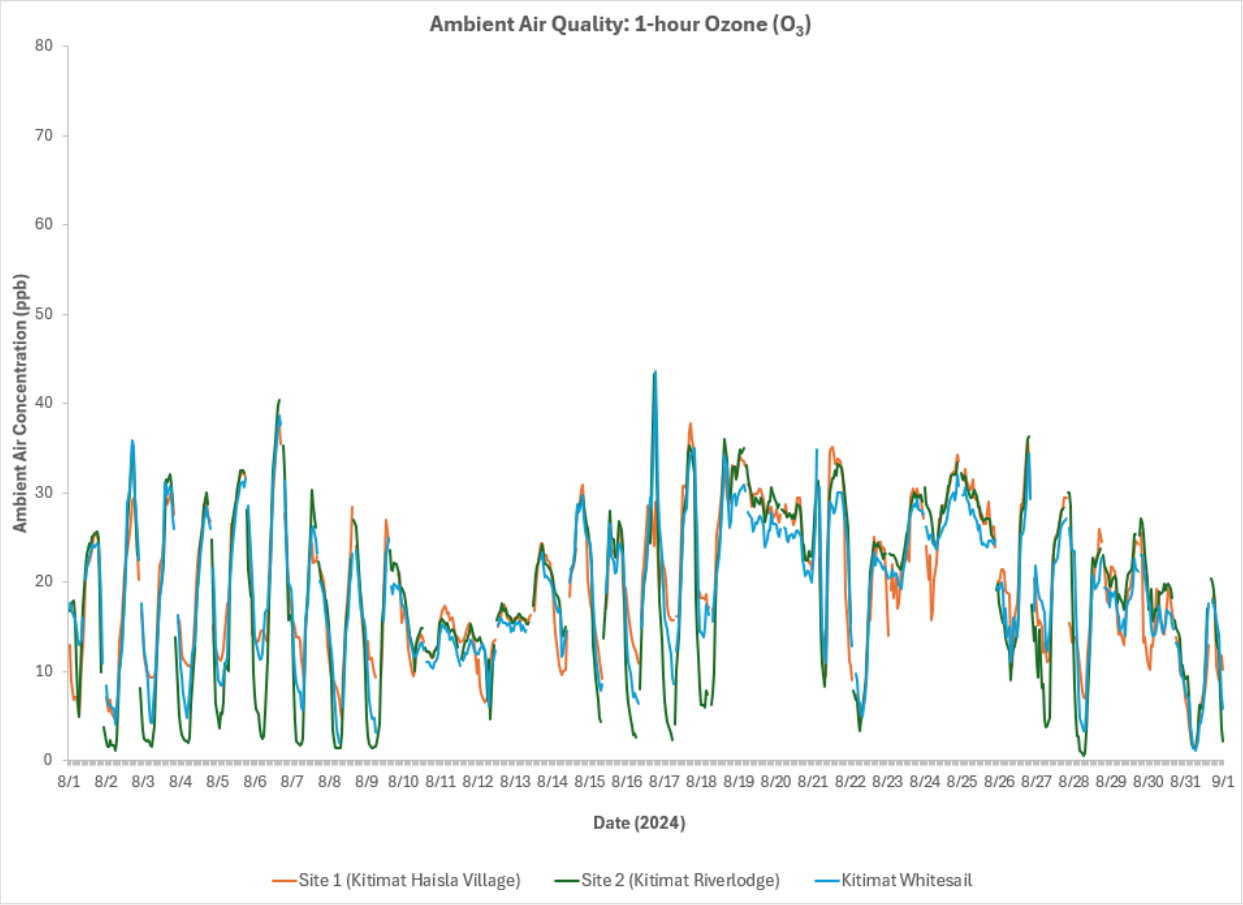

Figure B-4: Ambient Air Quality - 1-hour Ozone (O_3)