

REPORT

February 2024 B(a)P Sampling Results Above Measured Level Report

Rain Carbon Canada Inc.

Submitted by:

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1.0 INTRODUCTION

The ambient air monitoring measurements for February 2024 follow the November 12, 2019, Monitoring Plan for B(a)P and Benzene (the Plan) approved by the Ontario Ministry of the Environment, Conservation and Parks (MECP) on November 20, 2019.

As required by the Plan, Rain completed three monitoring events in the month of February 2024 (February 12 and 24) and submitted a monthly summary report to the MECP entitled “February 2024 Ambient Air Monitoring Report” (the AAMR).

As presented in the February 2024 AAMR, there was one B(a)P concentration recorded above the 0.0043 µg/m³ Measured Level threshold which triggered the preparation of this report, as set out in the ECA #7313-8KEN49 Notice No.1 issued November 17, 2022.

This report includes information on the causes and prevention of future concentrations above the Measured Level threshold. Where possible, this report will include the following items as per the ECA #7313-8KEN49 Notice No.1 issued November 17, 2022.

An analysis of what may have caused the B(a)P concentration to be above the Measured Level Threshold.

- Production rate(s) at the time measuring B(a)P concentrations to be above the Measured Level Threshold.
- An assessment of additional equipment, technically feasible methods and operational measures that are available to further minimize the likelihood of measurements above the Measured Level Threshold; and
- A proposed schedule to implement any actions that would minimize the likelihood of measurements above the Measured Level Threshold.

2.0 B(A)P MONITORING

The monitoring program for B(a)P consists of setting up a polyurethane foam (PUF) polyaromatic hydrocarbon (PAH) sampling system at five locations at the Facility, as presented in Figure 1 and also at the exterior to the site HAMN Station 29164. Samples were collected over a 24-hour period. Air quality data acquisition and instrument performance were evaluated by Rotek Environmental Inc. personnel. The laboratory analysis was conducted by Bureau Veritas Laboratories, which is ISO17025 compliant and accredited.

Figure 1: Monitor and Source Locations



The B(a)P measurements ranged from < 0.00029 µg/m³ to **0.02950 µg/m³**.

The MECP included a Measured Level threshold as a trigger to evaluate progress on B(a)P emission reduction. This level set by the MECP is not directly related to the ESDM Report results. One of the B(a)P concentrations measured on February 12, 2024, was above the 0.00430 µg/m³ Measured Level threshold which triggered the preparation of this report, as set out in the ECA Notice No.1 and the measurement was also above the 0.00500 µg/m³ B(a)P Upper Risk Threshold (URT)

Table 1: Summary of February 2024 B(a)P Measurements.

Monitoring Event Date	Measured Concentration [µg/m³]					HAMN STN 29164
	East	North	Old West	South	New West	
February 12	0.00363	0.02950	0.00060	< 0.00031	0.00107	0.00060
February 24	0.00078	0.00046	0.00158	0.00049	0.00043	< 0.00029

Facility Conditions During Monitoring

The Facility was undergoing normal operations during the February 12, 2024, monitoring event. Table 2 summarizes the daily vehicle loading activity at the Facility during the February 12, 2024, monitoring event at the sources previously identified as the main contributors to B(a)P emissions.

Table 2: Summary of Facility Activities on February 12, 2024, Sampling Date

Monitoring Event	Area	Modelling Source ID	Daily Vehicle Loading [US gal]				
			Pitch	Creosote	Naphthalene	LPSB	RT-12
February 12, 2024	Railcar Loading	LS3	17,237	85,501	0	0	0
	Truck Loading	LS2	0	9,151	0	0	0
	Truck Loading	LS4	76,019	0	0	0	0

The daily vehicle loading data is based on information derived from the Systems, Application and Products (SAP) Enterprise Resource Planning software system which tracks the amount of material loaded into trailers and rail cars in kilograms. This data was converted to US gallons, representing the amount of material loaded during the monitoring event (i.e., daily amount loaded). This daily loading data allows for a better representation of Facility conditions during the 24-hour monitoring events.

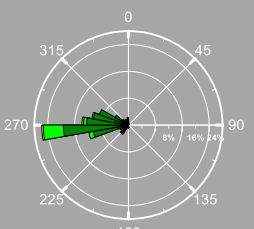
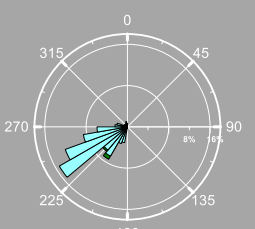
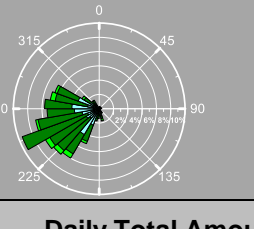
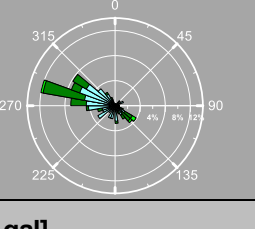
The monitoring and control of loading volumes is part of Standard Operation Procedures (SOPS) for material loading.

3.0 MONITORING RESULTS AND ANALYSIS

At this time, a general correlation between Facility operations and measured concentrations cannot be identified. Although the monitors are located within the Facility's property, their measurements are likely impacted by emissions from other industrial facilities and transportation sources in the vicinity.

Table 3 summarizes the February 12, 2024, monitoring results and wind conditions and facility loading operations. The analysis of the results is presented below Table 3.

Table 3: Summary of Wind Conditions, Facility Operations and Measured B(a)P Concentrations during February 12, 2024

	HAMN Station	Wind Direction & Strength	Overall				
	29102	SW, WSW, (Moderate)	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">29171</div>		 <div style="border: 1px solid black; padding: 2px; display: inline-block;">29102</div>		
	29171	W, WNW (Strong)					
	29180	WNW, W, WSW, SW, (Strong)	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">29180</div>		 <div style="border: 1px solid black; padding: 2px; display: inline-block;">29565</div>		
	29565	W, WNW, NW (Moderate, Strong)					
Facility Operations	Facility Area	Modelling Source ID	Daily Total Amount Loaded [US gal]				
			Pitch	Creosote	Naphthalene	LPSB	RT-12
	Railcar Loading	LS3 (close to Old West and New West Monitors)	17,237	85,501	0	0	0
	Truck Loading	LS2 (close to Old West Monitor)	0	9,151	0	0	0
Truck Loading	LS4 (close to New West Monitor)	76,019	0	0	0	0	
Measured Concentrations [µg/m³]		East Monitor	North Monitor	Old West Monitor / New West Monitor		South Monitor/STN29164	
		0.00363	0.02950	0.00060 / 0.00107		< 0.00031 / 0.00060	

February 12, 2024, monitoring event:

Wind conditions during the February 12, 2024, monitoring event were blowing from a general south westerly direction with moderate to strong winds. This information is summarized in the table below.

Monitoring Event	February 12, 2024
Wind Strength	Moderate Strong
Main Wind Direction	SW, WSW, W, WNW

The loading activities during the February 12, 2024, monitoring event are summarized in the table below.

Monitoring Event	February 12, 2024
Total Volume Loaded from Rail Car Loading LS3 [US gal]	102,738
Total Volume Loaded from Truck Loading LS2 Spot 1 [US gal]	9,151
Total Volume Loaded from Truck Loading LS4 Spot 7 [US gal]	76,019

During the February 12, 2024, monitoring event the railcar loading activity was for 17,237 US gal of pitch and 85,501 US gal of creosote.

The truck loading LS4 (Spot 7) activity was for 76,019 US gal of coal tar pitch. The truck loading LS2 (Spot 1) activity was for 9,151 US gal of creosote.

North Monitor Measurement on Monday February 12, 2024

The **0.02950 µg/m³ B(a)P measurement at the north monitor on the Monday, February 12, 2024, monitoring event** was above the 0.00430 µg/m³ Measured Level threshold and above the 24-hour upper risk threshold (URT) of 0.005 µg/m³ B(a)P.

We determined that the B(a)P measurement at the north monitor on the **Monday, February 12, 2024, monitoring event** was likely substantially elevated due to the one of the clamps on the north monitor PUF cartridge being difficult to close at the north PAH monitor PUF cartridge installation prior to the **Monday, February 12, 2024, monitoring event** which resulted in a substantial leak on the PUF cartridge due a small gap between the PUF cartridge body and the PUF cartridge top filter.

As a result, the incoming ambient air stream into the PUF cartridge was routed directly into the PUF cartridge body and by-passed the PUF cartridge filter instead of being first routed through the filter. This would likely have resulted in an increased and abnormal sample quantity of B(a)P containing particulate being captured inside the PUF cartridge due to the decreased PUF cartridge system pressure drop.

The north PAH monitor PUF cartridge was therefore repaired before the **Saturday February 24, 2024 MECP monitoring event** and several bent or difficult to close clamps were replaced with new clamps.

The following **Saturday February 24, 2024, MECP monitoring event** north monitor B(a)P measurement result was well under the 0.00430 $\mu\text{g}/\text{m}^3$ Measured Level threshold at 0.00046 $\mu\text{g}/\text{m}^3$ B(a)P.

4. CONCLUSION

This report was prepared to fulfill the requirements of the ECA #7313-8KEN49 Notice No.1 issued November 17, 2022.

Table 6: Conclusions

	Conclusions
<p>Analysis of what may have caused the B(a)P concentration to be above the Measured Level Threshold.</p>	<p>The 0.02950 µg/m³ B(a)P measurement at the north monitor on the February 12, 2024, monitoring event was above the 0.00430 µg/m³ Measured Level threshold and above the 24-hour upper risk threshold (URT) of 0.005 µg/m³ B(a)P.</p> <p>We determined that the B(a)P measurement at the north monitor on the February 12, 2024, monitoring event was likely elevated due to the one of the clamps on the north monitor PUF cartridge being not able to be closed resulting in a small leak on the PUF cartridge due a small gap between the PUF cartridge body and the PUF cartridge top filter.</p> <p>As a result, the incoming ambient air stream into the PUF cartridge was routed directly into the PUF cartridge body and by-passed the PUF cartridge filter instead of being first routed through the filter. This would likely have resulted in an increased and abnormal sample quantity of B(a)P containing particulate being captured inside the PUF cartridge due to the decreased PUF cartridge system pressure drop.</p> <p>The north PAH monitor PUF cartridge was therefore repaired before the Saturday February 24,2024 MECP monitoring event and a number of bent or difficult to close clamps were replaced with new clamps.</p> <p>The Saturday February 24, 2024 MECP monitoring event north monitor B(a)P measurement result was well under the 0.00430 µg/m³ Measured Level threshold at 0.00046 µg/m³ B(a)P.</p> <p>A “green” coal tar pitch railcar loading audit and a “red” truck/trailer loading audit were conducted on the Monday February 12, 2024, monitoring event.</p>
<p>Loading volumes(s) in US gal at the time measuring B(a)P concentrations to be above the Measured Level threshold.</p>	<p>Details on loading volumes (US gal) are presented in Section 2.0 of this report.</p>

<p>Assessment of additional equipment, technically feasible methods and operational measures that are available to further minimize the likelihood of measurements above the Measured Level threshold and the proposed schedule to implement any actions that would minimize the likelihood of measurements above the Measured Level threshold-</p>	<p>Rain will continue conducting vehicle loading audits on each monitoring day to continue assessing the operations of loading equipment and operators' implementation of Standard Operating Procedures.</p> <p>Further audits are required prior to evaluating additional equipment, technically feasible methods and operational measures that are available to further minimize the likelihood of measurements above the Measured Level Threshold.</p>
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Signature Page

A handwritten signature in black ink that reads "R. S. Hart". The letters are cursive and fluidly connected.

Robin S. Hart P.Eng.

Environmental Engineer
Rain Carbon Canada Inc
