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June 03, 2024

Leah Klaassen
Impact Assessment Officer
Nunavut Impact Review Board
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Cambridge Bay, NU X0B 0C0

Sent by email to: info@nirb.ca

Subject: Health Canada's response to the Comment Request for Agnico Eagle Mines Limited's Meliadine Project 2023 Annual Monitoring Report

Dear Leah Klaassen:

Thank you for your letter dated April 19, 2024, requesting comments on the Meliadine Project 2023 Annual Monitoring Report provided by Agnico Eagle Mines Limited.

Health Canada (HC) participates in environmental assessments as a federal authority under the *Nunavut Planning and Project Assessment Act*, S.C. 2013, c. 14 (*NuPPAA*). HC makes available specialist or expert information or knowledge in its possession to review panels and responsible authorities, among others.

The objective and scope of HC's review was to verify that potential health risks of the project are properly identified and to support Responsible Authorities to prevent, reduce, and mitigate the potential health impacts of project activities.

HC has reviewed the 2023 Annual Monitoring Report and has provided its comments in the attachment. These pertain to the Proponent's Aquatic Ecosystem Monitoring Program, Air Quality Monitoring, Noise Monitoring, and Terrestrial Environment Management and Monitoring Plan reports.

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Should you have any questions concerning HC's response, please contact Paul Partridge at paul.partridge@hc-sc.gc.ca.

Sincerely,

David Kitchen
Regional Manager, MB/SK/NU Region, EHP
ROEB, Health Canada

cc: Heather Jones-Otazo, A/Manager, Environmental Assessment and Contaminated Sites (EACS) Division, Healthy Environments and Consumer Safety Branch (HECSB), Health Canada
Paul Partridge, Impact Assessment Specialist, EHP, ROEB, Health Canada
Wendy Wilson, Senior Environmental Health Specialist, EACS, HECSB, Health Canada
Julie Anderson, Environmental Assessment Coordinator, EACS, HECSB, Health Canada

Meliadine Project 2023 Annual Monitoring Report

Health Canada Comments

Comment Number:	HC-01
Subject/Topic:	Screening criteria for Drinking Water Quality.
References:	<p>2023 Annual Monitoring Report, Appendix 17: Aquatic Effects Monitoring Program (2023 Annual Report)</p> <ul style="list-style-type: none"> • Acronyms & Glossary of Terms, PDF pg. 17 – 20. • Section 4.3.2: Data Analysis - Water Quality Screening Assessment, PDF pg. 99. • Table 4-4: Lake B7 Water Quality Screening Assessment, 2023, PDF pg. 112. <p>Guidelines for Canadian Drinking Water Quality (GCDWQ) https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html</p>
Comment:	<p>The suitability of the Aquatic Ecosystem Monitoring Program’s (AEMP) Benchmark and Action Levels as screening criteria for drinking water quality is unclear.</p> <p>The 2023 Annual Monitoring Report (Appendix 17, PDF pg. 17) indicates that “<i>the <u>AEMP Benchmarks</u> are screening guidelines that are protective of aquatic life and human drinking water quality for the project</i>”; and, “<i>the <u>AEMP Action Level</u> is an early warning trigger equal to 75% of the AEMP Benchmark.</i>” The report also indicates that “<i>in the context of the AEMP, water is considered safe for drinking if measured concentrations of parameters are below guidelines published by Health Canada</i>” (Appendix 17, PDF pg. 19).</p> <p>While HC does not recommend drinking untreated surface water, the GCDWQ can be an effective screening tool for identifying potential health risks. HC supports use of the GCDWQ as the basis for provincial and territorial drinking and recreational water quality requirements for the protection of human health. The GCDWQ were established by HC in collaboration with the Federal-Provincial-Territorial Committee on Drinking Water and other federal government departments. The guidelines are based on a comprehensive review of the known health effects associated with each contaminant, exposure levels, and availability of treatment and analytical technologies. While several of the AEMP Benchmarks and Action Levels appear to be below the GCDWQ values (and therefore,</p>

	<p>more stringent), the AEMP Benchmark and Action Level for arsenic is greater than the GCDWQ value. Specifically, the AEMP Action Level for arsenic (18.8 µg/L) reported in the 2023 AEMP Report (Appendix 17, PDF pg. 7; Table 4-4, PDF pg. 112) was above GCDWQ (10 µg/L), so it is unclear how use of the AEMP Benchmark or Action Level would be considered protective of human drinking water quality (Appendix 17, PDF pg. 99).</p> <p>Recognizing that the annual monitoring report offers an opportunity for proactive risk communication, HC encourages efforts to improve accessibility and transparency of data presented in annual monitoring reports. To avoid potential confusion about the safety of water for human consumption, it is important to communicate how the AEMP Benchmarks and Action Levels are meant to be protective of human drinking water quality.</p>
Conclusion/Request:	<ol style="list-style-type: none"> 1. HC recommends providing a rationale to support use of AEMP Benchmarks and Actions Levels as guidelines considered protective of human health for substances with AEMP Benchmarks and/or Action Levels above the GCDWQ (e.g., arsenic).

Comment Number:	HC-02
Subject/Topic:	Elevated concentrations of arsenic levels in soil, vegetation, snow and surface water samples.
References:	<p>2023 Annual Monitoring Report</p> <ul style="list-style-type: none"> • Section 7.10.2: Monitoring Results 2017 – 2022 (PDF pg. 106 - 109). • Appendix 17: Aquatic Effects Monitoring Program (2023 Annual Report) <ul style="list-style-type: none"> ○ Plain Language Summary, Peninsula Lakes Water Quality (PDF pg. 7) ○ Section 2.1 - Findings from the 2023 Effluent Quality and Snow Chemistry Program (PDF pg. 30) ○ Figure 20 – AEMP Sampling Locations (PDF pg. 71) ○ Section 4.4.2 – Temporal Trends in the Peninsula Lakes (PDF pg. 105-106) ○ Section 4.5 – Conclusions (PDF pg. 107) • Appendix 23: 2023 Air Quality Monitoring Report <ul style="list-style-type: none"> ○ Executive Summary (PDF pg. 3) <p>Health Canada’s comments on the 2022 Annual Monitoring Report (NIRB Registry ID – 345483)</p>

	<p>2022 Annual Monitoring Report, Appendix 27: 2022 Terrestrial Environment Monitoring and Mitigation Program (TEMMP) Annual Report, Section 6.2: Soil and Vegetation Results (PDF pg. 37)</p>
<p>Comment:</p>	<p>Enhanced arsenic monitoring in soil and other environmental media is recommended to better understand the causes of observed arsenic levels, the spatial extent of elevated arsenic levels, and potential project-related effects.</p> <p>Monitoring arsenic and trend analyses during the life of the project are important to confirm that concentrations are not increasing over time, particularly in locations already elevated under baseline conditions.</p> <p>As stated in HC’s comments on the 2022 Annual Monitoring Report (NIRB Registry ID – 345483), arsenic in soil and surface water under current mine site conditions may warrant further monitoring. Arsenic results from the 2023 Annual Monitoring Report suggest a similar conclusion. Specifically, the report (PDF pg. 109) indicates that additional years of sampling, and sampling over a larger area would be required to determine if arsenic in soils is increasing, the spatial extent of naturally elevated arsenic, and any project-related effects. Agnico Eagle’s plans to undertake additional soil sampling in 2024 are noted.</p> <p>To the furthest extent possible, HC encourages alignment of additional soil sampling with any additional planned analysis of geological maps, dustfall sampling, and wider metal sampling to determine possible cause(s) of observed exceedances (as indicated in the 2023 Annual Monitoring Report, PDF pg. 109), particularly where observations from the 2022 TEMMP Annual Report (PDF pg. 37) overlap with other monitoring plans and programs (e.g., the Air Quality Monitoring Plan [AQMP] and the AEMP), such as off-site migration of dust west and south of the mine site (Appendix 17, PDF pg. 7, 30 & 105-107; and, Appendix 23, PDF pg.3).</p> <p>As part of plans to refine existing monitoring for metals, including arsenic, HC recommends the AQMP include collection of data necessary to validate predicted dustfall and metals accumulation in soil (and associated potential risks to human receptors) for the different project phases, and consideration of cumulative effects.</p> <p>Proactive engagement with Inuit and Indigenous communities is recommended to ensure that the locations of monitoring stations remain protective of potential exposures to human receptors (e.g., the</p>

	workers' camp and hunter/trapper cabins), including traditional land users, and can be used to inform additional mitigation and management approaches. This approach would improve relevance of the monitoring data and help inform potential community outreach initiatives.
Conclusion/Request:	<ol style="list-style-type: none"> 1. Annual monitoring reports demonstrate increasing arsenic concentrations that exceed health-based guidelines. HC supports the continued monitoring of arsenic.. 2. As part of discussions to refine existing monitoring for metals, including arsenic, it is recommended to: <ol style="list-style-type: none"> a. Evaluate the hypotheses for the cause(s) of observed exceedances, review sampling methods to test these hypotheses, explore the best options for supplementary monitoring of soil as well as other environmental media; and, b. As part of the Air Quality Management Plan, include collection of data necessary to validate predicted dustfall and metals accumulation in soil (and associated potential risks to human receptors) for the different project phases, including an analysis of cumulative effects. 3. Proactive engagement with Inuit and Indigenous communities is recommended to ensure that the locations of monitoring stations remain protective of potential exposures to human receptors, including traditional land users.

Comment Number:	HC-03
Subject/Topic:	Metals Analysis of Total Suspended Particulates (TSP) - Arsenic
References:	<p>2023 Annual Monitoring Report</p> <ul style="list-style-type: none"> • Appendix 23: 2023 Air Quality Monitoring Report <ul style="list-style-type: none"> ○ Figure 1: Air Quality Monitoring Locations (PDF pg., 15) ○ Section 2.2.1.2: Regulatory Guidelines and FEIS Predictions (PDF pg. 22-23) ○ Section 3.1.3: Metals (PDF pg. 31) • Appendix 36: NIRB Project Certificate Tracking Table (PDF pg. 2) <p>Final Environmental Impact Statement (FEIS) 2014</p>

	<ul style="list-style-type: none"> • Volume 10.0: Environmental and Human Health Risk Assessment, Figure 10.2-4 – Human Health Receptor Locations, (PDF pg. 101) • Appendix 10.2-A: Air Quality – Acute (PDF pg. 262 – 312) • Appendix 10.2-B: Air Quality - Chronic (PDF pg. 313 – 401)
Comment:	<p>The addition of analysis for arsenic in Total Suspended Particulate (TSP) samples to the Project’s Air Quality Monitoring Plan (AQMP) is recommended.</p> <p>As part of the Project’s AQMP, samples for analysis of particulate-bound metals are collected from two monitoring locations (DF-5 and DF-7) that correspond to the nearest human receptor sites to the Meliadine Mine (the workers’ camp and Receptor 1 cabin site), respectively; as shown in Appendix 23 and the 2014 FEIS.</p> <p>Under the current AQMP, analysis of metals in TSP are limited to cadmium and iron for comparison to the health-based screening value and maximum model predictions from the 2014 FEIS.</p> <p>Given recent observations of elevated arsenic levels from soil and surface water monitoring (as discussed in HC-02), which has been associated with off-site dust migration from the mine site, HC recommends sampling of arsenic concentrations in TSP to validate model predictions from the 2014 FEIS (Appendices 10.2-A and 10.2-B). The inclusion of arsenic in this monitoring could help refine future monitoring to better understand the spatial extent of elevated arsenic levels and ensure that the locations of monitoring stations remain protective of exposure to human receptors, including traditional land users.</p>
Conclusion/Request:	<ol style="list-style-type: none"> 1. Measurement of arsenic in TSP as part of the Project’s AQMP to validate model predictions from the 2014 EIS is recommended.

Comment Number:	HC-04
Subject/Topic:	Mitigation of exhaust emission from non-road vehicles and stationary equipment.
References:	<p>2023 Annual Monitoring Report</p> <ul style="list-style-type: none"> • Appendix 23: 2023 Air Quality Monitoring Report, Section 7.1 – Mitigation (PDF pg. 48)

<p>Comment:</p>	<p>HC supports implementing all economically and technologically feasible mitigation measures to limit emissions of non-threshold air contaminants to the extent possible.</p> <p>The applicable air quality standards, such as the Canadian Ambient Air Quality Standards (CAAQS), should not be considered as “pollute up-to” levels and the Proponent is encouraged to strive for continuous improvement.</p> <p>Efforts to mitigate impacts and improve air quality in their Annual Monitoring Report (Appendix 23, Section 7.1) are noted to include:</p> <ul style="list-style-type: none"> • Management of exhaust emissions from non-road vehicles through the purchase of new equipment that met Tier 4 emission standards in 2023. • Reduction of SO₂ emission from non-road vehicles and stationary equipment through use of ultra-low sulphur fuel (<8 ppm) in 2023.
<p>Conclusion/Request:</p>	<p>1. HC acknowledges Agnico Eagle’s efforts to mitigate the Meliadine Gold Mine’s impact on air quality in 2023 and encourages continuous improvement including the implementation of all economically and technologically feasible mitigation measures to limit emissions of non-threshold air contaminants to the extent possible.</p>

<p>Comment Number:</p>	<p>HC-05</p>
<p>Subject/Topic:</p>	<p>Noise monitoring at locations protective of off-duty workers</p>
<p>References:</p>	<p>2023 Annual Monitoring Report</p> <ul style="list-style-type: none"> • Section 7.7 Noise Monitoring (PDF pg. 91) • Appendix 22: 2023 Noise Monitoring Report. <ul style="list-style-type: none"> ○ Figure 1 – Noise Monitoring Stations for the Meliadine Site (PDF pg. 13) ○ Table 8 – Measured 24-h Leq values for monitoring location NPOR008a (PDF pg. 22) <p>Meliadine Extension Project FEIS Addendum</p> <ul style="list-style-type: none"> • Section 1.1.1 – Scope of Meliadine Extension Components and Activities, Figure 1.1-4 (PDF pg. 14) <p>Health Canada’s comments on the 2022 Annual Monitoring Report (NIRB Registry ID – 345483)</p>

<p>Comment:</p>	<p>Noise monitoring should be considered in locations that are protective of off-duty workers.</p> <p>It is unclear if occupational noise data collected as part of the Meliadine Industrial Sampling Plan referenced in the 2023 Annual Monitoring Report (PDF pg. 91) could be used to characterize noise levels experienced by off-duty workers, particularly at the on-site camp (i.e., accommodations) location (as shown in the 2023 FEIS Addendum, Figure 1.1-4) and monitor for potential adverse noise-related health impacts such as sleep disturbance experienced by off-duty workers.</p> <p>As mentioned in HC’s comments on the 2022 Annual Monitoring Report (NIRB Registry ID – 345483), adverse health impacts on sleep may begin when average sound levels inside sleeping quarters exceed 30 dBA for continuous noise sources, or 45 dBA (max) for discrete noise events (WHO, 1999). The only L_{eq} (nighttime) values (39.9 dBA, 34.9 dBA and 39.4 dBA) reported for 2023 were at station NPOR008, which is located approximately 2 km from the mine lease (Appendix 22, Figure 1, Table 8). Additional noise monitoring stations located closer to the camp accommodations could be considered to characterize noise exposure for the closest human receptors.</p> <p><i>World Health Organization (WHO). 1999. Guidelines for community noise. Geneva: World Health Organization.</i></p>
<p>Conclusion/Request:</p>	<ol style="list-style-type: none"> 1. Consider locating noise monitoring stations where they can monitor future noise levels (particularly night-time levels) experienced inside of dwelling spaces (i.e., sleeping quarters) and inform the need for additional mitigations should measured levels exceed noise guidelines. 2. HC supports the implementation of additional mitigations under the Proponent’s noise abatement plan (Project Certificate Condition 10) should monitoring results indicate potential adverse noise-related health impacts for off-duty workers.