



Environment and  
Climate Change Canada

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ECCC File: 6100 000 008/002 & 014  
NIRB File: 03MN107 & 16MN056

December 6, 2018

Via email at: [info@nirb.ca](mailto:info@nirb.ca)

Sophia Granchinho  
Manager, Impact Assessment  
Nunavut Impact Review Board  
P.O. Box 1360  
Cambridge Bay, NU X0B 0C0

Dear Sophia Granchinho,

**RE: 03MN107/16MN056 – Agnico Eagle Mines Ltd. – Meadowbank Gold Project and Whale Tail Project – 2017-2018 Annual Monitoring Report ECCC, Responses to NIRB Recommendations**

Environment and Climate Change Canada (ECCC) has reviewed the information provided by the Nunavut Impact Review Board (NIRB) and the recommendations received and is providing the following responses via email. ECCC's specialist advice is provided based on our mandate, in the context of the *Canadian Environmental Protection Act*, the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act*, and the *Species at Risk Act*.

The following comments are provided for the NIRB's consideration:

**NIRB Recommendation 8:**

*The Board requests that Environment and Climate Change Canada review and comment on the information provided by Agnico Eagle in response to the NIRB's 2017 Annual Report related to dust, including whether it agrees with Agnico Eagle's conclusions that alternative dust suppressants at the mine site are not required and that the dust methodology using canisters on the ground along the all-weather access road is more effective compared to other methodologies currently used. Limitations on the effectiveness of the current dust suppression employed for the Meadowbank Project (including the all-weather access road) should also be discussed.*

**Canada**

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## **ECCC Response:**

The response to Recommendation 8 is divided into three parts as follows:

1. Review of Agnico Eagle's conclusions that alternative dust suppressants at the mine site are not required.
2. Review of the dust methodology using canisters on the ground along the all-weather access road (AWAR) as compared to other methodologies currently used.
3. Comments on the limitations of the effectiveness of the current dust suppression employed for the Meadowbank Project (including the AWAR).

### Part 1: Comment on Agnico Eagle's conclusion that alternative dust suppressants at the mine site are not required

#### Documents for reference:

As indicated in the request from NIRB response to Recommendation 8 is based on documents found at the NIRB's online public registry <http://www.nirb.ca/project/124588>

- Agnico Eagle's responses to 2016-2017 Board's Recommendations  
[http://www.nirb.ca/portal/dms/script/dms\\_download.php?fileid=315197&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90](http://www.nirb.ca/portal/dms/script/dms_download.php?fileid=315197&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90)
- 2013 Air Quality and Dustfall Monitoring Report:  
[http://www.nirb.ca/portal/dms/script/dms\\_download.php?fileid=289263&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90](http://www.nirb.ca/portal/dms/script/dms_download.php?fileid=289263&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90)
- 2017 annual report  
[http://www.nirb.ca/portal/dms/script/dms\\_download.php?fileid=317630&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90](http://www.nirb.ca/portal/dms/script/dms_download.php?fileid=317630&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90).
- Appendix G10 – 2017 annual report  
[http://www.nirb.ca/portal/dms/script/dms\\_download.php?fileid=317683&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90](http://www.nirb.ca/portal/dms/script/dms_download.php?fileid=317683&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90)

AEM's response references the 2013 Air Quality and Dustfall Monitoring Report and states that based on findings of this report that "these methods are successfully maintaining dust within acceptable regulatory limits." However, the response goes on to reference data that is from 2016.

PDF page 16 of the 2013 monitoring report states that "AEM did use CaCl<sub>2</sub> and water as a dust suppressant at the mine site itself".

In the 2017 annual report, Appendix G10 summarizes the particulate and dustfall data from all years up to 2017. ECCC review of this data indicates that there are times during the year which dustfall and Total Suspended Particulates (TSP) at DF-1 and DF-2 (on the mine site) are above objectives. The frequency of these is low, however it is not clear from the 2017 annual report what type of dust suppression is being used at the mine site.

Based on the dustfall and TSP data from the 2017 annual report, it appears that there are times at which the dustfall measurements are above the predictions in the Final Environmental Impact Statement (FEIS). Dustfall and TSP measurements are also above the Alberta guideline for dustfall and GN guideline for TSP as referenced by AEM in the 2017 report. Table 12.7 of the 2017 annual report suggests that at both DF-1 and DF-2 there are samples that are greater than the FEIS predictions. Section 12.4.1 provides an explanation for these exceedances, however it should be noted that comparison to the FEIS predictions is part of the terms and conditions

It is important to note that mine site dust predictions in the FEIS, do not assume mitigations such as road watering will be used. If no road watering was assumed in the FEIS dust predictions but monitoring results with road watering were still at times above the predictions and Alberta Dustfall and GN TSP guideline guidelines it is expected that the FEIS has potentially underestimated the amount of dust produced on the mine site.

ECCC is not able to comment on whether chemical dust suppressants should be used at the mine site since the 2013 annual report indicates they were, the 2018 NIRB site visit indicates they were not, and the 2017 annual report does not describe the dust suppression methods in the mine area.

## Part 2: Review of dust collection methodology

### Documents for reference:

As indicated in the request from NIRB response to Recommendation 8 is based on documents found at the NIRB's online public registry <http://www.nirb.ca/project/124588>:

- Agnico Eagle's responses to 2016-2017 Board's Recommendations  
[http://www.nirb.ca/portal/dms/script/dms\\_download.php?fileid=315197&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90](http://www.nirb.ca/portal/dms/script/dms_download.php?fileid=315197&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90)

## Part 2 – Other Documents for Reference

1. Standard test method for collection and measurement of dustfall (settleable particulate matter). PDF attached with this response (ASTM 2017).
2. Ontario's manual for air quality monitoring:  
<https://dr6j45jk9xcmk.cloudfront.net/documents/1466/3-7-32-manual-for-air-quality-monitoring-en.pdf>
3. US EPA Quality Assurance Handbook for Air Pollution Measurement Systems Volume II: Ambient Air Quality Monitoring Program:  
<https://nepis.epa.gov/Exe/ZyPDF.cgi/P100FUYK.PDF?Dockey=P100FUYK.PDF>

ECCC notes there are various standards that outline how to monitor dustfall. In the list above ECCC has provided three documents for reference that outline examples of how to collect dustfall data and how dustfall data should be treated.

The standard test method for collection and measurement of dustfall document (ASTM 2017) contains a description of how dustfall samplers are to be set up and how the data should be used. ECCC recommends that this is a good standard to follow when designing a dustfall monitoring plan. Similarly, Ontario and the US EPA documents referenced above outline similar techniques for the development and implementation of a dustfall monitoring program.

Specific to the NIRB's request, the installation of canisters at ground level and not on 1.5-2m poles is not a common practice. Placing canisters on the ground have limitations to data quality, such as the influence of downwash or ground dust. The US EPA guidance states that the "sample intake should either be elevated above the level of the maximum ground turbulence effect". Similarly Section 7.2 of the standard test method (ASTM 2017) states that the "stand for the container, which will hold the top of the container at a height of 2 m above the ground" and "there is a wide variability in the concentration of particles subject to settling at heights of less than 2 m".

During the review of the proposed dust monitoring plans for the following projects, ECCC has found that the dustfall canisters are placed above the ground on poles:

- Back River Project 12MN036
- Mary River (Baffinland) 08MN053
- Hope Bay Phase 2 12MN001
- Meliadine (Agnico Eagle) 11MN034

Generally, for dustfall data to be comparable to other sites as well as any dustfall objective, the methods for collecting the dustfall samples should be consistent and follow relevant dustfall monitoring quality assurance guidance such as those provided above. ECCC is not aware of specific documentation that indicates ground level sampling of dust will produce erroneous results. However, as stated above there is a wide variability in the concentration of particles subject to settling at low heights and the effects of wind and snow on the sample at ground level will have an impact on the data. Therefore, to remove the possible biases in data and to be able to compare to dustfall objectives, ECCC recommends that sampling methods are consistent with the standards listed above and consistent across all sites.

Part 3: Comments on the limitations of the effectiveness of the current dust suppression employed for the Meadowbank Project (including the all-weather access road)

Documents for reference:

As indicated in the request from NIRB response to Recommendation 8 is based on documents found at the NIRB's online public registry <http://www.nirb.ca/project/124588>

Part 3 - Documents for reference:

- Agnico Eagle's responses to 2016-2017 Board's Recommendations  
[http://www.nirb.ca/portal/dms/script/dms\\_download.php?fileid=315197&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90](http://www.nirb.ca/portal/dms/script/dms_download.php?fileid=315197&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90)
- 2017 annual report  
[http://www.nirb.ca/portal/dms/script/dms\\_download.php?fileid=317630&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90](http://www.nirb.ca/portal/dms/script/dms_download.php?fileid=317630&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90).
- Appendix G11 -  
[http://www.nirb.ca/portal/dms/script/dms\\_download.php?fileid=317684&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90](http://www.nirb.ca/portal/dms/script/dms_download.php?fileid=317684&applicationid=124588&sessionid=1j40n6hgjmicgsge9kqm9bea90)

ECCC has reviewed AEM's 2017 All-Weather Access Road (AWAR) Dust Monitoring Report and the 2017 Annual Report. In the AWAR Report, Agnico Eagle demonstrated a reduction in measured dustfall using the TETRA Flake dust suppressant product. While there were problems with the study's sampling method, specifically the ground level placement of dustfall canisters as detailed previously, the chosen dust suppressant was shown to be effective at reducing dust levels. Sections of haul road that were treated with dust suppressant generated less airborne dust than untreated sections. ECCC has found reference to a 2016 pilot study where Agnico Eagle investigated lower speed limits to reduce dust, however these results were not discussed in the 2017 annual report.

The effectiveness of dust suppression is limited to areas in which TETRA Flake is applied. In the study, these were specific areas of concern that were identified by the Baker Lake Hunter's and Trapper's Organization. As such, areas along the majority (>90%) of the 110 km AWAR were still subjected to relatively higher dust emissions compared to treated areas. In addition, the study demonstrated that the dust suppression was effective over a 1-2 month time period. Further assessment by Agnico Eagle is needed to determine whether additional dust suppressant applications are needed for the summer months.

ECCC's analysis of the dust suppression at the mine site is discussed in Part 1 of the response above. Based on information in the 2017 annual report, the dustfall data indicates that there are times in which the Alberta residential dustfall objectives are exceeded, however infrequent, they are exceeded at sites near the mine site. Furthermore, measured TSP data indicates that there are times in which the GN TSP Guideline is also exceeded, however infrequent, they are exceeded at sites near the mine site.

#### **NIRB Recommendation 9:**

*The Board requests that Environment and Climate Change Canada confirm whether it agrees with Agnico Eagle's conclusion that based on the dust monitoring results to date along the all-weather access road, it is unlikely that Final Environmental Impact Statement predictions are being exceeded and that impacts to valued ecosystemic components (vegetation community productivity and wildlife) from dust dispersion are not occurring beyond the smallest assumed zone of influence (100 metres).*

**ECCC Response:**

ECCC notes that Agnico Eagle did not make predictions specifically for the dustfall metric along the AWAR in the Final Environmental Impact Statement for the Whale Tail Project, or for the 2005 Meadowbank Air Quality Impact Assessment. Rather, results of the previous dustfall monitoring of the Meadowbank Haul Road from 2015 as well as predicted dustfall for the Whale Tail Haul Road were included in the Whale Tail FEIS. While the usage of the AWAR differs from that of the haul roads, the results of this recent study are generally consistent with those earlier findings.

It should be emphasized that dustfall monitoring, while being relatively inexpensive and simple to deploy, is generally considered to be a basic monitoring method for assessing air quality impacts to the environment. Dustfall measurements below the Alberta dustfall standards do not, by themselves, indicate the absence of harm to ecosystem components. Dustfall measurements are broadly useful for limiting the amount of nuisance dust accumulation, and are a rough indicator of relative dust emissions on site.

To fully assess the impacts of airborne dust on the environment, monitoring methods that measure concentrations of PM<sub>2.5</sub>, PM<sub>10</sub>, and/or Total Suspended Particulate are needed. The Whale Tail Atmospheric Environment assessment in the FEIS does make predictions of PM<sub>2.5</sub>, PM<sub>10</sub>, or TSP along the AWAR, but as stated above does not make predictions of dustfall along the AWAR. Air quality monitoring methods that measure PM<sub>2.5</sub>, PM<sub>10</sub>, and/or TSP, continuously with a powered instrument (similar to those found on the mine site), are needed to determine whether the AWAR FEIS predictions are being exceeded. Dustfall monitoring along the AWAR alone is not adequate.

**NIRB Recommendation 2:**

*The Board requests that Environment and Climate Change Canada review the Air Quality and Dustfall Management Plan submitted by Agnico Eagle in June 2018 and provide feedback regarding whether the plan meets the requirements under Terms and Conditions #1 and #2 of Project Certificate No. 008.*

Reference:

Condition #1 and #2 of Project Certificate No. 008:

Condition 1:

The Proponent shall:

- a) Develop and implement an Air Quality Monitoring and Management Plan that includes clear objectives and that specifies air quality monitoring thresholds that will trigger adaptive management responses and actions;
- b) In the implementation of the Plan, the Proponent shall demonstrate through active and passive monitoring of dustfall, for criteria air contaminant concentrations, incinerator stack testing, and vegetation, soil and snow

chemistry sampling that dustfall and emissions of carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), sulphur dioxide (SO<sub>2</sub>), suspended particulate matter, mercury, dioxins and furans, and other chemicals remain within predicted levels and, where applicable, within levels or limits established by all applicable guidelines and regulations;

- c) If exceedances occur, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures; and
- d) The Proponent shall also develop, implement, and report on the quality assurance and quality control protocols used to ensure data reliability and proper functioning of equipment.

The Plan should be submitted to the Nunavut Impact Review Board (NIRB) 30 days prior to commencement of construction, and the Proponent shall report on its development and implementation of this Plan and associated monitoring results annually to the NIRB.

Commentary: It is expected that in the reporting of monitoring results, the Proponent will clearly identify: parameters that are being evaluated and compared to predicted levels set out in the Environmental Impact Statement; and parameters that are being evaluated and compared to levels or limits established by applicable guidelines and regulations.

#### Condition 2:

Prior to commencing construction activities the Proponent shall update the existing Dust Management and Monitoring Plan for the Meadowbank Mine site to address and/or include the following additional items:

- Align plan requirements with commitments made in the Final Environmental Impact Statement and during the Final Hearing to monitor dust along the existing all-weather access road, the Amaruq haul road and any other roads and trails associated with the Project.
- Verify commitments to the utilization of dust suppressants along the all-weather access road, the Amaruq haul road and any other roads and trails associated with the Project, including a description of the type of suppressant to be utilized and the frequency and timing of applications to be made throughout the various seasons of road use.
- Outline the specific triggers, thresholds, and adaptive management measures that will apply if monitoring indicates that dust deposition is higher than predicted.

The Proponent shall report annually to the Nunavut Impact Review Board with a summary of its dust management activities.

ECCC comments on Air Quality and Dustfall Management Plan (submitted by Agnico Eagle in June 2018):

#### Documents for reference:

As indicated in the request from NIRB response to Recommendation 2 is based on documents found at the NIRB's online public registry <http://www.nirb.ca/project/124683>.



At the NIRB online registry link provided above there is a document titled Air Quality Dustfall Monitoring Plan that is categorized under the Management Plan documents. This document was posted in June 2018, matching the date indicated in NIRB's letter to ECCC the link to this document is provided below.

- Air Quality Dustfall Monitoring Plan  
[http://www.nirb.ca/portal/dms/script/dms\\_download.php?fileid=317954&applicationid=124683&sessionid=1j40n6hgjmicgsge9kqm9bea90](http://www.nirb.ca/portal/dms/script/dms_download.php?fileid=317954&applicationid=124683&sessionid=1j40n6hgjmicgsge9kqm9bea90)
- Correspondence between AEM and NIRB (document 320638):  
[http://www.nirb.ca/portal/dms/script/dms\\_download.php?fileid=320638](http://www.nirb.ca/portal/dms/script/dms_download.php?fileid=320638)

#### ECCC Response:

Based on ECCC's review the Air Quality Dustfall Monitoring Plan does not appear to address the requirements of the Term and Condition. This document is a Monitoring Plan, not a Management Plan. The Air Quality Monitoring Plan posted June 2018 is the same plan that was provided May 2016, with the addition of descriptions of the transect dustfall stations along the AWAR and Whale Tail Haul Road (WTHR).

In the correspondence between AEM and the NIRB (document 320638) point number one on pdf page 2 indicates that the "Air Quality and Monitoring and Management Plan" is "covered under the Air Quality and Dustfall Management Plan". Point two on PDF page 2 indicates that the "Dust Management and Monitoring Plan" is "Covered under the Air Quality and Dustfall Management Plan. Dust suppression is also discussed in the Whale Tail Haul Road Management Plan".

ECCC has searched the NIRB registry for documents that match the documents referenced in the correspondence between AEM and the NIRB e.g., Air Quality and Monitoring and Management Plan, Air Quality and Dustfall Management Plan, Dust management and monitoring plan and is unable to locate the documents that have these titles and have content that meet the intent of Condition 1 and 2.

As indicated in NIRB's letter to ECCC, "the first recommendation is being made to track reporting required through the first 6 months of it being in place, which was September 2018". ECCC interprets this statement to mean that the management plan in question should contain updates for 2018. The 2018 Air Quality and Dustfall Monitoring plan which appears to be very similar to the 2016 monitoring plan is an outline for how and where the monitoring will be conducted but not the management of any air quality or dust issues indicated by the data collected by following the monitoring plan. The monitoring plan covers part of the requirements for Term and Condition #1 and #2 however, as indicated above, the following plan components are aspects of a typical management plan and if included would help to satisfy the intent of Term and Condition #1 and #2:

- Clear objectives that specify air quality monitoring thresholds that will trigger adaptive management responses and actions



- A description of measures taken to compare to predictions in the EIS
- A detailed description and plan for the utilization of mitigation measures such as dust suppressants.
- A detailed description of the methodology that is used to determine and verify the effectiveness of the mitigation measures, i.e., dust suppressants
- Monitoring should be compared to all objectives including the CAAQS for PM2.5. The CAAQS would fall under “all applicable guidelines and regulations”
- Procedure for identifying and auctioning a response due to an air quality exceedance
- quality assurance/quality control procedures used to ensure data reliability and proper functioning of equipment

## **Conclusion**

To assist with ease of review ECCC recommends that the Proponent compile all of the air quality and dust monitoring, mitigation, management information, and studies into one document. This document could then be updated based on the data that is collected and presented in the annual report. This way, there would be one report for the whole project, including Whale Tail, Meadowbank, and any further expansions.

Should you require further information, please do not hesitate to contact me at (867) 669-4746 or [Gabriel.Bernard-Lacaille@canada.ca](mailto:Gabriel.Bernard-Lacaille@canada.ca).

Sincerely,

*[original signed by]*

Bradley Summerfield  
Senior Environmental Assessment Coordinator

cc: Georgina Williston, Head, Environmental Assessment North (NT and NU)