APPENDIX 29-4. DUST MANAGEMENT PLAN

AGNICO EAGLE

MELIADINE GOLD MINE

Dust Management Plan

MARCH 2025

VERSION 8

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ᐊᒡᓃᑯ ᐃᒍ ᐅᔭᕋᒃᑕᕆᐊᓕᕆᔫᒃᑯᑦ (ᐊᒡᓃᑯᒃᑯᑦ) ᐊᑐᕐᓂᐊᖅᑐᑦ ᐱᐅᓖᓂᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐊᑐᖅᑕᐅᖃᑦᑕᖅᑐᓂᒃ ᐳᔪᖄᓕᐅᓗᐊᖏᑎᑦᑎᓂᕐᒧᑦ ᐊᓂᖅᓵᖅᑐᖅᑕᑉᑎᖕᓄᐊᖅᑐᓂᒃ ᐱᔪᓂᒃ ᐅᔭᕋᒃᑕᕆᐊᕐᒥᑦ, ᐃᑎᕙᐊᓂᑦ, ᐊᒻᒪᓗ ᐊᐅᕝᕙᑕᐅᔪᓗᒃᑖᓂᑦ, ᐊᒻᒪᓗ ᐅᓯᑲᑦᑕᖕᓂᕐᒧᑦ ᐊᕝᕙᑎᓂᑦ. ᐃᓚᐅᔪᑦ ᐃᓕᑕᕆᓗᒋᑦ ᐱᔾᔪᑕᐅᓗᐊᖅᑐᑦ ᐳᔪᖄᖕᒧᑦ, ᐊᑐᕐᓗᑎᒃ ᐳᔪᖄᖃᓗᐊᖅᑕᐃᓕᓂᕐᒧᑦ ᐱᓕᕆᐊᓂᒃ, ᖃᐅᔨᓴᐃᓃᑦ ᓈᒻᒪᖖᒋᑦᑐᓄᑦ ᓇᓃᓐᓂᐅᔪᓄᑦ ᐳᔪᖄᖕᒥᑦ, ᐊᒻᒪᓗ ᑎᑎᕋᐅᓯᕆᓗᒋᑦ ᖃᐅᔨᒋᐊᖃᑦᑕᕐᓂᐅᔪᑦ ᑎᑎᕋᐅᓯᕆᓂᐊᕐᓗᒋᑦ ᐊᒡᓃᑯᒃᑯᑦ ᐱᐊᓂᑦᑎᐊᕐᓂᖕᒐᑦ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐊᒻᒪᓗ ᒥᒃᓵᒋᐊᕐᓂᕐᒧᑦ ᐳᔪᖄᒃ ᑕᓯᕐᔪᐊᕐᒥᑦ. ᐳᔪᖄᖖᒥᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐸᕐᓇᐅᑎ ᑕᐅᑐᒐᖃᓗᐊᖅᑐᖅ ᐳᔪᖄᓕᐅᖅᑐᑦ ᐊᕝᕗᑎᓂᒃ ᐃᓚᖏᓪᓗ ᐅᔭᕋᒃᑕᕆᐊᓕᕆᓂᕐᒥᑦ. ᐳᔪᖄᓕᐅᕐᓂᖅ ᐊᓯᖏᓐᓂᒃ ᐅᔭᕋᒃᑕᕆᐊᓕᕆᓂᕐᒧᑦ, ᓱᕐᓗ ᕿᒪᒃᑎᑦᑐᓄᑦ ᑐᖅᑯᖅᓯᓯᒪᕝᕙᖏᒥᑦ (TSF), ᐱᓕᕆᐊᖑᔪᑦ ᐊᓯᖏᓐᓂᑦ ᐸᕐᓇᐅᑎᓂᑦ, ᐃᓚᐅᑉᓗᑦ ᐅᔭᕋᒃᑕᕆᐊᕐᒥᑦ ᐊᒃᑕᑯᓂᑦ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐸᕐᓇᐅᑎ ᐊᒻᒪᓗ ᕿᒪᒃᑎᑦᑐᓄᑦ ᑐᖅᑯᖅᓯᓯᒪᕝᕙᐅᑉ ᐃᓂᖓᓄᑦ ᐸᕐᓇᐅᑎ.

ᐳᔪᖄᓕᐅᕈᓐᓇᖅᑐᖅ ᖃᓄᐃᓕᐅᕐᓂᐅᔪᓂᑦ ᐊᕝᕙᑎ ᐊᑐᖅᑕᐅᑎᓪᓗᒍ, ᐃᑰᑕᐃᑎᓪᓗᒋᑦ, ᖄᖅᑎᕆᑎᓪᓗᒋᑦ, ᓯᖃᓪᓕᑎᕆᑎᓪᓗᒋᑦ, ᓈᑎᕆᑎᓪᓗᒋᑦ, ᐅᓯᓕᖅᑐᐃᑎᓪᓗᒋᑦ, ᐊᒡᔭᖅᑐᐃᑎᓪᓗᒋᑦ, ᐅᓯᖏᔭᐃᑎᓪᓗᒋᑦ, ᑲᑎᑎᕆᑎᓪᓗᒋᑦ, ᐊᒻᒪᓗ ᐊᓄᕆᒧᑦ ᓱᕋᒃᑕᐅᔪᓂᒃ ᐸᓂᖅᑐᓂᒃ, ᑕᑯᒃᓴᐅᔪᓂᑦ ᐅᔭᕋᒃᑕᕐᕕᐅᑉ ᖃᓂᑕᖕᒐᓂᑦ. ᐳᔪᖄᒃ ᑕᐃᒪᐅᓗᐊᖃᑦᑕᖅᑐᑦ ᐅᐱᕐᖔᖅ ᓄᖑᐸᓪᓕᐊᓂᖕᒐᓂᑦ ᐊᒻᒪᓗ ᐊᐅᔮᒃᑯᑦ, ᐅᑭᐊᒃᓵᒃᑯᑦ ᐊᖏᓗᐊᖏᓐᓂᖅᓴᐅᓕᖅᓱᓂ ᐊᒻᒪᓗ ᐅᑭᐅᒃᑯᑦ.

ᐊᖏᓗᐊᖏᑦᑎᐊᖅᑎᑦᑎᓂᕐᒨᖓᔪᑦ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐳᔪᖄᖏᒥᑦ ᐃᓚᐅᔪᑦ ᐊᐅᓛᖅᑎᑦᑎᓂᕐᒧᑦ ᒪᓕᒃᑕᐅᔪᒃᓴᐃᑦ. ᐊᐅᓛᖅᑎᑦᑎᓂᕐᒧᑦ ᐊᑐᖅᑕᐅᖃᑦᑕᖅᑐᑦ, ᓱᕐᓗ ᑭᒡᓕᖅᑲᖅᑎᑦᑎᓂᖅ ᓇᕿᖅᓴᕆᐊᖅᑲᕐᓂᕐᒧᑦ ᐊᒻᒪᓗ ᐊᕝᕙᒍᓯᐅᕆᓃᑦ, ᐃᑲᔪᐃᖃᑦᑕᖅᑐᑦ ᐳᔪᖄᖃᓗᐊᖏᑎᑦᑎᓂᕐᒧᑦ. ᐃᒪᖅ ᐊᒻᒪᓗ, ᐱᔭᕆᐊᖃᖅᐸᑦ ᐳᔪᖄᖃᓗᐊᖅᑕᐃᓕᔾᔪᑏᑦ ᓱᕐᓗ Calcium Chloride, ᐅᕙᔫᓃᑦ ᐊᓯᖓ ᓈᒻᒪᒋᔭᐅᔪᖅ ᐊᑐᖅᑕᐅᔪᓐᓇᖅᑐᖅ, ᐊᑐᖅᑕᐅᓂᐊᖅᑐᖅ ᐳᔪᖄᖃᓗᐊᖅᑕᐃᓕᑎᑦᑎᓂᕐᒧᑦ ᐊᕝᕙᑎᓂᑦ ᐊᓯᖏᓐᓂᒡᓗ ᐅᔭᕋᒃᑕᕆᐊᑉ ᖃᓂᑕᖕᒐᓂᑦ ᐊᓂᖅᓵᖅᑐᖅᑕᑉᑎᖕᓄᐊᖅᑐᖅ ᐳᔪᖄᖅ ᐅᓗᕆᐊᓇᖅᓯᒃᐸᑦ ᐅᕙᔫᓃᑦ ᐊᒃᑐᖅᓯᓗᓂ ᐃᒃᐱᒋᓴᕋᐃᓐᓂᖅᖅᑐᓄᑦ ᓄᓇᒥᑦ. ᐃᑎᕙᐊᓂᑦ ᐊᕝᕙᑎ ᐊᑐᖅᓵᙱᑦᑐᖅ ᐳᔪᖄᖃᓗᐊᖅᑕᐃᓕᔾᔪᑎᓂᒃ. ᐃᒪᖅ ᑭᓯᒥ ᐊᑐᖅᑕᐅᖃᑦᑕᕐᓂᐊᖅᑐᖅ ᐃᓚᖓᓂᑦ ᐊᕝᕙᑎᐅᑉ. ᐳᔪᖄᖃᓗᐊᖅᑕᐃᓕᑎᑦᑎᓂᕐᒨᖓᔪᑦ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᑦ ᓴᓇᕚᓪᓕᐊᓂᕐᒥᑦ, ᐊᐅᓪᓚᖅᑎᑦᑎᓂᕐᒥᑦ, ᐊᒻᒪᓗ ᐅᒃᑯᐊᖅᐸᓪᓕᐊᓂᕐᒥᑦ.

AGNICO EAGLE

EXECUTIVE SUMMARY

Agnico Eagle Mines Limited (Agnico Eagle) uses best management practices to minimise dust generation from becoming airborne at the Mine site, Itivia, and all access, service, and haul roads. This includes identification of major sources of dust, implementation of dust mitigation measures, inspections for unacceptable levels of dust, and recording dust monitoring data to document Agnico Eagle's success in controlling and reducing dust at the Meliadine Mine. The Dust Management Plan focuses primarily on dust generated from roads, mine waste management and ore storage.

Dust could potentially be generated by such activities as road use, drilling, blasting, crushing, conveying, loading, hauling, unloading, stockpiling, and by wind erosion of dry, exposed mine areas. Dust emissions will be prevalent during late spring and summer, while being reduced in fall and winter.

Mitigation measures to control dust include mine design and operational procedures. Operational practices, such as speed limits and road maintenance, will assist in reducing dust. Water and, if necessary, chemical dust suppressants such as Calcium Chloride ($CaCl_2$), or another acceptable chemical, will be used to control and reduce dust on roads and other mine areas when airborne dust becomes a safety hazard or impacts on sensitive natural areas.

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DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	April 2014			Version 1 of the Dust Management Plan	John Witteman, Env. Consultant, Agnico Eagle
2	April 2015	7.2	11	Update plan for Water Licence application - Added EK-35 and DUST-STOP to chemical dust suppressants approved for use in Nunavut	John Witteman, Env. Consultant, Agnico Eagle
3	April 2017			General review of the plan	Environment Department, Agnico Eagle Mines
4	March 2018			Minor modifications	Environment Department, Agnico Eagle Mines
5	March 2019			General update of the document to reflect going into production	Terry Ternes, Sean Arruda, Environment Department, Agnico Eagle Mines
		5	7	Saline water trucked to Itivia	
		6.2	8	Removed sentence indicating transport on bypass road would be maximized in late summer and fall.	
		7	9-14	Calcium Chloride as dust suppressant	
6		Exec. Summary, 6.2, 7.3	2, 8,13	Use of calcium chloride for bypass road.	Terry Ternes, Environment Department, Agnico Eagle Mines
		8	14	Update Table C.2, additional mitigation strategy	
7	January 2024	1	1	Submitted to NWB as part of the Meliadine Mine Water Licence Amendment	Permitting Department
8	March 2025	2	2	General update	Environment Department
		5	5-9	Updated to include mine waste and ore dust sources	
		6	10-14	Updated to include additional suppression measures	
		7	16	Update Table C.2	

SECTION 1 • INTRODUCTION

The environmental assessment of the Meliadine Gold Mine (the Mine), resulting in the issuance of Project Certificate No.006 in 2015, included approval of a multi-phase approach to development, including mining of Tiriganiaq deposit using open pit and underground mining methods and mining of the Pump, F Zone, Discovery and Wesmeg deposits using open pit methods.

The Mine is subject to the terms and conditions of both the amended Project Certificate 006 issued by the Nunavut Impact Review Board (NIRB) in accordance with the Nunavut Land Claims Agreement Article 12.5.12 on March 2, 2022 (NIRB, 2022) and the Amended Water Licence No. 2AM-MEL1631 (the Licence), issued by the Nunavut Water Board (NWB) on October 25, 2024 and approved by the Minister of Northern Affairs on November 22, 2024 (NWB, 2024).

The Dust Management Plan (the Plan) is a framework for the management and control of dust (airborne particulate matter) arising from mine activities (including road use, mine waste management, ore storage). Best management practices are identified to minimize and reduce the impact of dust on the natural and human environment.

The Plan identifies the sources of dust along with measures for their control during operation and closure.

SECTION 2 • CLIMATE

The Mine is located in the low Arctic eco-climate characterized by long cold winters and short cool summers, relatively high wind speeds, and frost-free period can be as short as 90 days and have prolonged periods with no precipitation.

Dust generation can be a problem at the Mine, particularly during the transition seasons of fall to winter and winter to spring. During these periods, fluctuating temperatures and freeze-thaw cycles can contribute to dust mobilization. As temperatures drop in the fall, moisture freezes, reducing its ability to bind dust particles. Subsequent freeze-drying and sublimation processes can loosen and mobilize particles. While snow cover can minimize dust during the peak of winter, exposed areas and wind-swept surfaces can still generate dust. In the late spring and summer, and under the right conditions, dust generation could present an issue at the Mine and along its roads. In late spring, when temperatures remain below freezing, sublimation tends to cause mine surfaces, including roads, to be dry leading to a potential for dust generation. In summer, when evaporation is high and with little rain, roads and mine surfaces can be dry. The combination of low precipitation and drying winds promote dust generation from developed areas where work is underway and where vehicle traffic is present, especially if mitigation measures are not employed.

SECTION 3 • RELATED DOCUMENTS

3.1 Environment Management and Protection Plan

The Environmental Management and Protection Plan (EMPP) provides Agnico Eagle with overarching direction to environmental and socio-economic management for the Mine throughout its life (i.e., across all Mine phases). It is a site-specific plan that describes the systematic means by which Agnico Eagle will consistently manage and control potentially adverse impacts and enhance potential project benefits identified through the Environmental Assessment process and the subsequent licensing and permitting of the Mine.

3.2 Air Quality Monitoring Plan

In the Air Quality Monitoring Plan, dust monitoring is expected to occur throughout all phases of the mine, during all seasons, at various locations on the mine site, along the All-weather Access Road (AWAR), the Rankin Inlet Bypass Road, and at the Rankin Inlet Itivia land-based facilities area (Itivia). The principal monitoring means are to be particulate fallout measurements.

The Air Quality Monitoring Plan outlines how dust monitoring data helps in verifying if the actual effects from air emissions are less than those predicted in the Final Environmental Impact Statement (FEIS) and associated Addendums. The data collected provides feedback for continuous improvement in dust mitigation measures. If the dust monitored indicates more dust than expected, adaptive management will be used to understand the reason for the elevated levels and recommend mitigation measures to reduce it. These adaptive management strategies are contained within this document and the Air Quality Monitoring Plan.

SECTION 4 • ENVIRONMENTAL, SAFETY AND OPERATIONAL EFFECTS OF DUST

The Mine is anticipated to generate dust representative of local overburden and rock type. There should not be enrichment of any metal in the dust. Agnico Eagle will use all reasonable and practicable measures to minimise dust generated from the Mine.

4.1 Environmental Concern

Physical and chemical stresses on the tundra environment are commonly associated with unpaved roads. Dust generated by vehicle traffic along the roads and other mine surfaces is carried by the prevailing wind onto the surrounding tundra where it is deposited onto the vegetation and waterbodies.

Chemically inert dust can have negative effects on sensitive receptors such as vegetation. It can accumulate on leaf surfaces and negatively affect leaf physiology. Dust has a shading effect, which reduces the amount of photosynthesis and increases the leaf temperature through incident solar radiation being absorbed by the dust, thus increasing the transpiration rate (Agnico Eagle 2008). Adverse impacts might occur on the wildlife that depend upon the vegetation as a food source. Dust can eventually wash into the local waterbodies adding suspended solids to the water, which can adversely affect water quality and possibly the health of aquatic species.

4.2 Safety Concern

Dust generated by vehicle traffic along roads and other mine surfaces is typically fine, inorganic particulate matter. It reduces visibility along roads, thereby increasing the risk of vehicle accidents. Inhalation of fine particulate matter can potentially cause adverse health effects, especially in persons with pre-existing respiratory problems.

4.3 Operational Cost Concern

Excessive dust when drawn into a vehicle’s engine can result in rapid clogging of vehicle air filters, diminishing engine performance and increasing maintenance costs. While the engines are equipped with air filters, the finer sized particulate matter can pass through these filters, getting into the engine where it can cause premature scouring and wear on the pistons and other moving components, thereby leading to a need for more frequent maintenance and shortening the life of the engine.

SECTION 5 • SOURCES OF DUST

Dust generation at the Meliadine Mine will often be related to road traffic on unpaved roads, construction activities, open pit mining and stockpiling, and placement of waste material on the Waste Rock Storage Facilities (WRSFs) and the Tailings Storage Facility (TSF). Dust emissions will vary and is dependent on Mine activities and meteorological conditions. Dust emissions from the roadways are anticipated to be greatest during the summer months, when traffic along the AWAR will be at its peak (e.g., annual sealift transport campaigns from Itivia to the Mine).

The most significant sources of dust during construction, operations, and closure include the following:

- Preparation of ground surface for construction through stripping, excavating, covering, and/or stockpiling;
- Wind erosion of exposed mine surfaces – e.g., roads, ore stockpiles, WRSFs and TSF;
- Vehicle traffic on unpaved roads and other mine surfaces – haul, service and access roads, pit ramps, other vehicle travel areas (e.g., waste rock storage facilities, storage pads, laydown pads, parking lots);
- Material handling and transfer – loading, hauling, unloading, crushing, conveying;
- Open pit mining activities – drilling, blasting; and
- Closure activities such as covering the tailings, decommissioning of other mine areas, and scarification of roads.

Dust from buildings where people are working such as the mill, maintenance shop and warehouse is expected to be minimal due to the use of bag houses or equivalent means to control dust.

5.1. Dust Associated with Access, Service and Haul Roads

Agnico Eagle committed to apply active controls on the AWAR surface to reduce dust. These controls could include actions such as using water or applying chemical dust suppressants such as $CaCl_2$. Although literature does not provide a control efficiency for regular maintenance of the road surfaces, the commitment by Agnico Eagle to maintain the road surface is expected to have benefits with respect to the amount of dust generated (Agnico Eagle 2011b).

The nature of the road surface and the size distribution of the material, in particular the percentage content of silt and fine sand (2 µm to 75 µm), directly influences the potential to generate dust (Thompson and Visser 2001). The greatest sources of dust on a mine site are the disturbance of granular surfaces, and this normally occurs when materials are handled or when vehicles pass over an unpaved surface[1]. Of the two, by far the largest source of dust is vehicle traffic on unpaved roads; this has been estimated to reach 70 percent in some instances (Cecala 2012). The mechanical grinding of surface materials on the road and their breakdown under the weight of vehicle wheels creates dust, while the air turbulence created by the

[1] Volume 5 of the Final Environmental Impact Statement Atmospheric, Environment and Impact Assessment, section 1.4 Emissions Estimation provides details on how dust emissions can be calculated for various mine sources (*Golder Associate 2013*).

vehicle causes dust to become airborne. The amount of dust generated along a road is dependent on the dryness of the road surface, the percentage of silt on the road surface, the number of vehicles, weight and vehicle speed, weather conditions[2], and maintenance of the driving surface.

The composition of the road surface will be analysed to determine what dust suppression measures will work best. Different types of road surfaces dictate different approaches to dust control. Kissel (2003) makes the following recommendations based on the particle size distribution of material on the road surface:

- *Gravel with few fines.* In gravel road surfaces with not enough fines, only watering will be effective. Chemical dust suppressants can neither compact the surface (because of the poor size gradation) nor form a new surface, and water-soluble suppressants will thus leach.
- *Sand.* In compact sandy soils, bitumens, which are not water-soluble, are the most effective dust suppressant. Water-soluble suppressants such as salts, lignins, and acrylics will leach from the upper road surface. However, in loose, medium, and fine sands, bearing capacity will not be adequate for the bitumen to maintain a new surface.
- *Good size gradation.* In road surfaces with a good surface particle gradation, all chemical suppressant types offer potential for equally effective control.
- *Silt.* In road surfaces with too much silt (greater than about 20 to 25%), no dust suppression program is effective, and the road should be rebuilt. In high-silt locations, chemical suppressants can make the road slippery, and there is an inability to compact the surface or maintain a new road surface because of poor bearing capacity. Further, rutting under wet conditions requires that the road be graded, which destroys chemical dust suppressant effectiveness. If the road cannot be rebuilt, watering is the best option.

Optimally designed and maintained roads offer the best means of controlling dust but it does not remove the potential for dust generation completely. The potential for dust generation decreases significantly when road design and maintenance are combined with the application of water and/or chemical dust suppressants such as $CaCl_2$.

5.2 Dust Associated with Mine Waste Management

The possible sources of dust related to the waste rock, overburden, and filtered tailings management during construction, operation, and closure include:

- Site preparation prior to placement of waste materials i.e., stripping, excavation and/or placement of foundation pad;
- Wind erosion of fine particles from the WRSFs and TSF surface;

[2]Humidity, frequency of days with rain, mean daily evaporation rates, and the prevailing wind speed and direction. Wind erosion contributes to road dust emissions, especially when strong winds combined with vehicle traffic moves the dust generated far afield.

- Vehicle traffic dislodging fine particles from the surface of WRSFs and TSF, and associated service and haul roads to WRSFs and TSF;
- Waste rock, overburden, and filtered tailings handling and transfer - loading, hauling, unloading, placement and compaction; and
- Placement of closure and capping layers.

Dust suppression measures, which are typical of the current mine practices (i.e., Meadowbank Complex) and consistent with best management practices, will be considered through design, operation and closure phases to control the dust.

Dust is expected to be a minor issue during the operation of the WRSFs as the waste rock produced at the mine generally comprises large pieces of rock that is not be susceptible to wind erosion. Although overburden contains material that is fine-grained and thus more susceptible to wind erosion, the plan is to store the majority of the overburden materials within the core of the WRSFs. Dust from the overburden materials is therefore not expected to be a concern.

The surface compaction of the filtered tailings lifts and limiting traffic over the compacted surface will significantly reduce the potential for wind erosion of the tailings surface. Dust related to TSF operation during the winter season will be further managed by limiting the exposed surface area of the tailings. Other control measures considered in the design of TSF to minimize dust generation include:

- Placement of waste rock cover over the final perimeter tailings slope surface as soon as possible. Safety berms around the perimeter of the waste rock slopes are expected to both trap dust from leaving the TSF and cut exposure of the tailings surface to wind erosion;
- TSF will be operated by cells to limit the tailings surface area exposed to wind and facilitate progressive closure;
- Consideration of prevailing north-northwest wind direction by development of the southern portion of Cell 1 first and progression northward;
- Tailings surface will be covered progressively once it reaches the design elevation;
- Flat side slope of 4(H):1(V) for the TSF was adopted to minimize the erosion potential and maintain overall stability of the tailings stack;
- Using snow, thin ice surface, or other materials to cover inactive surface of TSF to reduce exposed tailings surface area; and
- Potential usage of approved chemical dust suppressant.

Dust generated from vehicles travelling on the surface of the associated access roads will be controlled principally by spraying water on the traffic area, and potentially by applying an approved chemical dust suppressant to the area which will be carried out regularly by mine services during dry periods in the summer. Watering the haul and access roads is only possible when temperatures are above freezing. When the temperature is below freezing, dust suppression using water or chemicals will pose a safety hazard for travel; therefore, reducing the speed limit will be the principal way of controlling dust during these periods.

Other control measures considered in design and operation related to dust generation by vehicles travelling include:

- Roads will be designed as narrow and short as possible while maintaining safe construction and operation practices;
- Coarse size rock will be used as much as possible for road construction;
- Roads will be regularly graded to mix the fines found on the road surface with coarser material located deeper in the roadbed; and
- As required, roads and travel areas will be topped with additional aggregate.

Dust from material handling is not expected to be problematic on site. Long end dumps, which can generate significant amounts of dust, will not occur since waste rock, overburden and filtered tailings will be dumped in lifts and spread with a dozer. Where possible, multiple handlings of materials that have the potential to generate dust will be avoided. However, should dust related to material handling occur on site, specific control measures will be evaluated and applied, as required.

At closure, the TSF will be fully covered to prevent further wind erosion of the tailings. The proposed closure cover includes a layer of 0.5 m thick overburden followed by a layer of 2.5 m thick waste rock on the top of the facility. The TSF closure slopes cover includes a 4.0 m to 4.5 m thick waste rock layer depending on the elevation. The overburden will be surrounded by waste rock in the WRSFs; therefore, dusting is not expected to be an issue. The need for dust control at closure will be further evaluated during closure activities.

5.3 Dust Associated with Ore Storage

The potential sources of dust related to ore management during construction, operation and closure include:

- Site preparation prior to placement of waste materials i.e., stripping, excavation and/or placement of storage pad;
- Vehicle traffic dislodging fine particles from the surface of the storage pad and associated haul roads;
- Ore handling and transfer - loading, hauling, unloading and placement; and
- Ore sorting, screening and crushing.

Dust suppression measures, which are typical of the current mine practices (i.e. Meadowbank Complex) and consistent with the best management practices, will be considered through design, operation and closure phases to control the dust.

Minimal site preparation was required for the storage pad during construction. Dust from this source was not observed to be problematic.

Dust generated from vehicles travelling on the surface of the associated access roads will be controlled principally by spraying water on the traffic area, and potentially by applying an approved chemical dust suppressant to the area which will be carried out regularly by mine services during dry periods in the summer. Watering the haul and access roads is only possible when temperatures are above freezing. When the temperature is below freezing, dust suppression using water or chemical will pose a safety hazard for travel; therefore, reducing the speed limit will be the principal way of controlling dust during these periods.

Other control measures considered in design and operation related to dust generation by vehicles travelling include:

- Road will be designed as narrow and short as possible while maintaining safe construction and operation practices;
- Coarse size rock will be used as much as possible for road construction;
- Roads will be regularly graded to mix the fines found on the road surface with coarser material located deeper in the roadbed; and
- As required, roads and travel areas will be topped with additional aggregate.

Dust is expected to be a minor issue during construction of the ore stockpiles. The ore stockpiles will be located at suitable locations and with minimal heights and suitable side slopes to minimize the wind erosion effects. Water and/or approved chemical dust suppressions will be sprayed on ore stockpiles, if required.

The crusher plant has been designed to follow best management practices by having the dump station and rock hammer enclosed to minimize the dust generation. The conveyor from the crusher to the process plant is a covered belt system in which the dust can be easily controlled. The covered conveyor system will be equipped with dust collectors and will be maintained regularly during mine operation. The conveyor loads will be kept within designated load limits to minimize the dust generation during operation. Dust collected during operation will be recycled through the mill.

SECTION 6 • FUGITIVE DUST MANAGEMENT

Dust suppression measures, which are considered to be typical of current mine practices and consistent with best management practices, are expected to achieve desired results through design, operations, and closure.

6.1 Design-Based Dust Suppression Measures

In assessing dust emissions associated with the Mine, consideration was given to those mitigation measures that were considered integral in the mine design. Design-based means of dust suppression include:

- The mine site is compact thereby reducing the area where dust generation can occur;
- Roads were designed to be well-graded and as narrow and short as possible, while maintaining safe construction and operation practices. This reduces the surface area of roads and the potential to generate dust;
- To minimize dust during construction and operations, coarse sized rock is be used as much as possible in building roads, pads, and laydown areas;
- If possible, construction will largely occur during the winter when the generation of dust is at its lowest;
- Minimizing the extent of exposed soils surface by strategically locating stockpiles and other areas prone to dust;
- Sheds, enclosures, covers, and/or bag houses will be used on most crushing and processing equipment to limit dust emissions; and
- Most outside conveyer belts will have covers and will maintain minimum drop heights to the stockpiles.

6.2 Operation-Based Dust Suppression Measures

Best management practices will be used to control and suppress dust emissions from the Mine. Dust suppression during operations include:

6.2.1 Roads and Traffic Management

- Roads will be regularly graded to mix excessive silt found on the road surface with the coarser materials located deeper in the roadbed. This will reduce the percentage of silt in the road surface with the benefit of reducing related dust;
- As needed, roads and travel areas will be topped with aggregate and stabilized, which will minimize erosion and dust emissions;
- The maximum speed limit on the AWAR will be 50 km/hr but will be lower where required for safety reasons (e.g., approaches to bridges, intersections, etc.);
- The number of mine vehicles on the AWAR will be minimized (e.g., vans and buses are to be used to transport employees to and from the Rankin Inlet airport);

- Maximize the transport of materials from Itivia to the mine site in late summer when rain events are more common, and in the fall when the road surface is frozen and less susceptible to dust generation;
- Communication with Rankin hamlet will occur every year to ensure the entire length of the AWAR is treated with dust suppression; and
- Discussions with the Hamlet have indicated that they approve the use of chemical use of dust suppressants if required on the Bypass Road.

6.2.2 Construction and Operations

- Overburden stripped from open pit development may be prone to wind erosion, and will be stored within the core of the waste rock storage facilities;
- During landfill activities such as topping and capping, visual monitoring will occur and if necessary, water will be applied;
- Topping and capping of dormant areas of the TSF as required;
- Where appropriate, larger sized aggregate will be used on the road surface to replace material lost due to wind and water erosion;
- Should further rock crushing occur in the quarries along the access roads, the crushers location will be best shielded from the prevailing wind, preferably behind a high wall in the quarry so as to reduce the quantity of wind-blown dust, and to have as much dust as possible fall within the bounds of the quarry;
- Avoid multiple handling of materials that have the potential to generate dust, where possible;
- Stockpiles will be of a suitable height, width and slope to minimise wind effects; and
- Conveyor loads will be kept within designated load limits, and conveyor covers used, where practical.

6.2.3 Suppression and Abatement

- Wind fencing and wind breaks will be used in select areas to reduce wind speeds. Areas will be selected and adjusted based on the prevailing winds;
- Reclaim water (from CPs), $CaCl_2$, or an equivalent approved dust suppressant, will be applied to roadways as needed to reduce airborne dust and improve visibility on access, service, haul roads, pit ramps and other travel areas. Reclaim water will only be used within the mining footprint area, where runoff is captured by the contact water management facilities; and
- Dust suppressants (water and chemical) will be trialed and applied on the TSF based on evaluation their performance and potential impacts to the short and long-term chemical a physical stability.

6.2.4 Planning, Monitoring and Maintenance

- Activities that are prone to dust generation will be planned to avoid high wind events to the most practical extent;

- Contractor based activities that have the highest potential for dust generation are required to submit detailed work plans that indicate dust mitigating practices and procedures. This may include the modification of activities to reduce the dust created by their activities;
- Daily and weekly dust inspections will occur in key areas that are prone to dust generation;
- Regular review and analysis of dust monitoring data to identify trends and adjust control measures as needed;
- Regular inspections and timely repairs to roads to minimize the silt loading on the road surface; and
- Employees and contractors will be encouraged to report excessive dust to their supervisor.

6.3 Closure-Based Dust Suppression Measures

Closure will include the following dust suppression measures:

- The TSF will be covered progressively, with an engineered cover, thereby isolating it from the environment and preventing dust generation;
- Other exposed mine areas subject to wind erosion will also be covered with waste rock;
- Open pits will be flooded;
- All roads not deemed to remain in place through closure consultations will be scarified, bridges and culverts may be removed as required, thereby making the roads impassable to vehicles and their associated dust generation. Scarification will also allow plants to establish on the former roads and, in doing so, prevent wind and water erosion; and
  During operations, obsolete roads will be closed and scarified.

More information on closure and reclamation activities can be found in the Interim Closure and Reclamation Plan.

6.4 Dust Suppression Using Water

Water remains the most readily available means of controlling dust in Nunavut. It is common at mine sites worldwide to apply water through fantail sprayers or spray bars attached to a haul truck or equivalent fitted with a large tank. Agnico Eagle recognises that water is only a temporary measure, and reapplications are necessary to achieve the desired dust control efficiency[3]. The control efficiency of water applications is dependent on the amount of water applied, the time between re-applications, penetration depth of the water into the desired surface, the traffic volume, prevailing weather conditions, and the state of the surface (e.g., excessive fines over coarse material). All these variables need to be considered before selecting water to control dust from roads and other areas of the Mine. If water is selected to suppress dust, Agnico Eagle will use it with a greater frequency near critical areas. The use of reclaim water over freshwater sources will be prioritized within the mining footprint area, where runoff is captured by the contact water management facilities. In areas outside of the Mine's contact water

[3] Regular light watering is more effective than infrequent heavy watering (Thompson and Visser 2007).

management facilities (e.g., along the AWAR), freshwater will be used in accordance with the Water Licence.

Watering the roads is only possible during frost-free days. In late spring, significant sublimation can be expected when the temperatures remain below freezing, which can lead to dry roads and significant dust potential. If water is applied while the temperature is below freezing, it will turn to ice on the road and pose a safety hazard for travel. Dust suppression using water or chemicals on the road will be limited to the above freezing temperatures.

Watering the TSF surface is a possible option at anytime of year. Ice application can be an effective dust suppression method, particularly during the winter months for inactive portions of the TSF. Water can be applied to create a thin layer of ice over exposed surfaces, minimizing wind erosion. However, frequent reapplication may be necessary due to sublimation and melting. In inactive portions of the TSF (dormant cells), ice layers can be maintained throughout the winter.

6.5 Chemical Dust Suppression

Chemical dust suppressants offer advantages over water under the right conditions. They tend to have the benefit of a reduced treatment frequency over water. However, use of chemical suppressants under all conditions does not necessarily lead to improved dust suppression over that of water. Presently, only fresh water, seawater, DL10, $CaCl_2$, EK-35 and DUST-STOP are approved for use on roadways in Nunavut. Other chemical dust suppressants can be approved for use in Nunavut following their assessment by the Government of Nunavut's Environmental Protection Service.

Numerous types of chemical suppressants are available; broad categories that encompass those approved for use in Nunavut are as follows:

- Wetting agents are designed to increase the ability of water to adhere to and spread over the dust particle. This increases the bulk density of the particle and leads to agglomeration. $CaCl_2$ is one such wetting agent.
- Binders hold particulates together and can provide long-term dust suppression on roads. DL10, EK-35, and DUST-STOP are examples of binders approved for use in Nunavut (*GN 2014*).
- Crusting agents work best on inactive storage piles. They are reasonably long lasting, rain resistant, and wind proof. None are approved for use in Nunavut.

Table C.1 provides a comparison of the advantages and disadvantages of using water, wetting agents, and binders for dust suppression.

Analysis of the road surface is considered when the decision on whether to use chemical dust suppressants, such as $CaCl_2$, is made. Agnico Eagle's use of $CaCl_2$ is kept to a minimum to prevent damage to vegetation adjacent to the road and to mitigate the risk of creating an attractant to wildlife (salt lick effect). It is used selectively where it's more effective than water alone, and where it doesn't adversely affect the environment immediately next to the road.

Agnico Eagle is continuing to assess alternatives for dust suppressant. Agnico Eagle will continue to use $CaCl_2$ as the primary dust suppressant as this product is considered to work best at the Mine. If another non-approved product is considered as an alternative, Agnico Eagle will discuss with the proper authorities for approval.

Table C.1. Comparison of Dust Suppressants

Dust Suppressant	Advantages	Disadvantages
Water	- no environmental impacts - readily available	- short term dust suppression, requires frequent re-application - works better than chemical dust suppressants on roads having greater than 20 – 25 % silt on the driving service or having a majority of sand - can cause water erosion if too much is applied
$CaCl_2$	- effective in climatic areas when relative humidity greater than 30% - less frequent applications required than water	- possible impact on water and aquatic species when washed from the road and into the environment - soil salinization and impact on plant life; attractant for wildlife - not effective when road surface has greater than 20 – 25 % silt or has a majority of sand on the driving surface
Oil based binders (DL10)	- effective and long lasting	- may have adverse impacts on vegetation, soil, water and aquatic life
Organic binders (EK-35, DUST-STOP)	- effective and applied directly to road or tailings surfaces - Less frequent applications than water	- significantly more expensive to use than water - limited effectiveness if road has greater than 20 to 25 % silt on the driving surface, it is better to use water under this condition -Requires specialized equipment

Adapted from Alberta Environment 2012

6.6 Planned Dust Suppression

During the peak season where dust suppression is required, Agnico Eagle will complete daily inspections on the road. $CaCl_2$ is applied to the entire length of the AWAR. When the roads have been inspected and areas which produce unusual amounts of dust addition are observed, additional $CaCl_2$ or water may be applied to these areas. In 2019, discussions with the Hamlet of Rankin Inlet indicated that they agreed that $CaCl_2$ could be used on the Rankin Inlet Bypass Road.

Another chemical suppressant (Dust Stop) was tested to evaluate the performance in terms of dust suppression, but it did not show to be as effective as $CaCl_2$. It is Agnico Eagle's intention to use best management practices concerning dust suppression along all of its roads.

6.7 Maintenance of the Road Surface for Dust Suppression

Agnico Eagle recognizes that inspection precedes maintenance, and a good inspection program will lead to the early identification of areas of the roads where improvements are necessary. The early resolution of any deficiencies will result in less ongoing maintenance and repair of the driving surface (Agnico Eagle 2011a). It will also lead to less dust generation.

The amount of dust generated is a function of the composition of the road surface. If there is a significant percentage of silt size particles on the road surface, one can expect greater dust generation. Likewise, any reduction in the percentage of silt on the road surface leads to an equivalent reduction in dust. Grading roads provides relief from excessive dust by mixing silt sized material on the road surface with coarser road materials found deeper in the roadbed.

Unpaved roads and travel areas are topped with new aggregate and graded on an ongoing basis, with the goal of improving safety, minimizing erosion, and reducing dust emissions. This is required as unpaved road constantly lose surface material through wind and water erosion, and from vehicles throwing material off the road.

SECTION 7 • THRESHOLDS FOR INITIATING DUST SUPPRESSION

Table C.2 outlines the thresholds Agnico Eagle uses at the Mine to initiate mitigation measures.

Dustfall measurements are regularly collected along the roads and other parts of the mine site using passive sampling methods to record the quantity of dust collected over time, and to allow the success of mitigation measures to be quantified. The monitoring data is used to adjust mitigation measures to improve dust management strategy.

Table C.2. Thresholds and Mitigation Measures

Location	Frequency	Indicator	Threshold	Mitigation Measure
Itivia laydown and Oil Handling Facility	routine inspection by Itivia supervisor during summer period.	- deterioration of visibility along road.	- deterioration of visibility. - safety concern. - dust reaching Hamlet.	- use water and/or $CaCl_2$ to control the dust.
AWAR and Rankin Inlet Bypass Road	regular weekly or more frequent inspection by road supervisor during the late spring and summer periods.	- measured dustfall. - deterioration of visibility along road.	- deterioration of visibility. - safety concern. - high dust levels evident near significant waterbodies. - dustfall exceeding 1.58 mg/cm^2/30-day at 500 m from the AWAR for two consecutive months.	- use water and/or $CaCl_2$ in areas requiring attention. - grade the road surface. - add new granular material to the road surface. - temporary reduction in speed limit
Mine site, including travel areas, haul and service roads	regular weekly or more frequent inspection by site services supervisor during the late spring and summer periods.	- measured dustfall. - deterioration of visibility.	- deterioration of visibility. - safety concern. - dust reaching Meliadine Lake.	- use water and/or dust suppressant on exposed surfaces such as parking areas, pads, haul, access and service roads, dry stack tailings. - review mitigation measures in place. - add new granular material to surface, - if applicable, grade the surface. - temporarily lower speed limit on site.
Ramps in the open pits	regular inspection by pit supervisor during summer period.	- deterioration of visibility.	- deterioration of visibility. - safety concern.	- use water as a dust suppressant.
Tailings Storage Facility (TSF)	regular daily visual inspections by TSF operators and weekly drone surveys during dry	- measured dustfall. - visual evidence of windblown dust.	- deterioration of visibility. - safety concern. - high dust levels evident near significant waterbodies.	- application of water or approved dust suppressants to exposed tailings surfaces. - wind fencing or other physical barriers (windbreaks, rock cap).

Location	Frequency	Indicator	Threshold	Mitigation Measure
	periods and high-wind events.			- reduced haul truck speeds during high wind events. - temporary suspension of tailings deposition during high wind events. - regular monitoring of dust suppression effectiveness.

7.1 Roles and Responsibilities

The road supervisor[4] conducts periodic inspections (minimum weekly) of roads to ensure that they are maintained for safe travel of personnel, equipment, and supplies. Any deficiency is recorded and followed up by a corrective plan.

In areas or times identified by the Agnico Eagle road supervisor as being prone to high dust levels, where safe road visibility is impaired, or in areas where dust deposition could impact waterbodies or the Hamlet, the road supervisor will arrange mitigation measures as appropriate. This could involve actions such as grading of the road surface, addition of aggregate to the road surface, watering of the road surface and/or using $CaCl_2$.

Adaptive management will be used when inspections or monitoring shows the generation of dust to be greater than anticipated and that additional mitigation measures are required. As well, if dust is unexpectedly generated where it was not anticipated, adaptive management will be used to understand the source and find ways to reduce or eliminate the same.

[4] The open pit supervisor will do the same for the open pit ramps.

SECTION 8 • REFERENCES

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