Baffinland Iron Mines Corporation
Mary River Project

Dust Management Protocol for the Mary River Project Roads

Revision No.:	A	**Procedure Number:**	
Revision Date:	July 31, 2013	**Date Reviewed:**	July 31, 2013
Date Revision Effective:	August 1, 2013		

1. Introduction

Under Baffinland Iron Mines Corporation (Baffinland) project approvals from the Nunavut Impact Review Board (NIRB), Baffinland has committed to "developing and implementing mitigation measures which control fugitive dust emissions" (NIRB, Final Hearing Report Terms and Conditions, Dec 28, 2012, Appendix A, #2). The objective of this Dust Management Protocol for the Mary River Project roads is to establish the operational requirements that will be implemented on the Mary River Project (the Project) to meet this commitment and the commitments established in the Mary River Project Health, Safety and Environment Policy (2013) to achieve a safe, health and environmentally responsible workplace.

Dust is an inevitable problem on all project roads and the control of dust must be a fundamental part of any environmental management plan. Dust on project roads is formed when fine particles become entrained in the atmosphere by the turbulent action of wind or by the mechanical disturbance of fine materials. Dust is a concern from safety, health, environment and operational standpoint. It can lead to:

- decreased visibility along project roads leading to increased risks of vehicle accidents.
- potentially adverse health effects for people who inhale airborne particles (especially a concern for people with prior respiratory issues).
- potentially adverse environmental effects including limiting photosynthesis levels on plants due to dust deposition and introducing contaminates to water ways.
- premature wear on engines and motor vehicles from increased inhalation of fine particles into engines on roadways.

To help mitigate the concerns, the Mary River Project will employ the following protocol to manage dust on project roads.

2. Dust Suppression Protocol

2.1 Determining When Dust Suppression is Required

Dust suppression methods may only be used on Mary River Project Site Roads when 'significant' dust generation is occurring. The determination if dust generation is significant is at the professional opinion and discretion of the Senior Construction Representative on-site with consultation with the Baffinland Environmental Department Representative on-site.

As a guideline, dust that is visibly being carried as a cloud off the roadway should be considered significant.

2.2 Primary Dust Suppression – Water

The wetting of road surfaces with water will be the primary method to mitigate dust concerns on the Mary River Project roads. If *significant* dust generation is occurring the following conditions shall be adhered to for the wetting of road surfaces with water:

- Water shall be collected only from approved sources as directed by the on-site Baffinland Environmental representative to ensure that the quality of water being used for dust suppression meets all water quality requirements for discharge under the Projects water use licenses and land use permits.
- Contaminated water shall not to be used for dust suppression.
- Water shall be applied to roads using on-site water trucks using a spray bar arrangement.
- The rate of water application should be enough to suppress dust but not sufficient to allow water to puddle or pool on the road surface.
- The frequency or rate of water application will vary depending upon the prevailing site conditions and shall be determined by the Senior Construction representative on-site with consultation with the Baffinland Environmental Department representative on-site.
- Only trained operators assigned and trained on the water truck operation shall be used to apply water on Mary River Project site roads to suppress dust on a as required basis.
- On a daily basis water volume and source used for dust suppression shall be tracked by and reported to the Baffinland Environmental Department representative on-site.

2.3 Secondary Dust Suppression – Calcium Chloride (CaCl)

The Government of the Nunavut, Environmental Protection Service, Department of Sustainable Development has a guideline, Environmental Guideline for Dust Suppression (as shown in Attachment A), that sets out requirements to be followed when using chemical dust suppressants in Nunavut. Currently there are three (3) approved dust suppressants in Nunavut: calcium chloride, Bunker C and DL10. The Mary River Project has restricted the list of approved chemical dust suppressants on project roads to calcium chloride (CaCl) only. 'Calcium Chloride' by Sel Warwick Inc. of Victoriaville, Québec is offered as an example of a commercially manufactured CaCl that can be used on Mary River Project Roads (see Attachment B for MSDS Sheet).

Calcium Chloride may be applied as a dust suppressant on Mary River Project roads if measures are needed to mitigate the safety, health, environmental and/or operational

concerns arising from dust generation on Project roads *and* if primary dust suppressant is deemed to be ineffective due to operational restrictions (e.g. equipment/operator availability), weather conditions or safety reasons.

It is at the discretion of the Senior Construction representative on-site with consultation with the Baffinland Environmental Department representative on-site if the use of CaCl as a dust suppressant is necessary.

If 'significant' dust generation is occurring and secondary dust suppression is deemed required, the following conditions shall be adhered to for the application of CaCl on Mary River Project roads. CaCl shall be applied to in a granular or brine solution.

2.3.1 Application Timing

- If possible, work should be applied to a lightly wetted road or scheduled after a light rainfall, when unpaved road surfaces and accumulated aggregate are damp and better able to absorb control measures.
- While damp surfaces are desirable, working in rain or on overly wet/saturated roadbeds shall be avoided as CaCl is more easily transported in runoff to roadside soils and nearby watercourses.

2.3.2 Granular Application

- As a guideline, 0.5 kg of CaCl shall be applied for every square meter of road area (or 1 lbs/yd)
- If possible, granular CaCl shall be applied using a spinning disk vehicle mounted system. If a vehicle mounted system is not available, CaCl shall be applied in accordance with all other requirements evenly across project roads manually.
- Granular CaCl shall be applied to a pre-wetted surface (or after a light rainfall) however, avoid applying CaCl to overly wet or saturated roadbeds where there is a high potential for chemical transportation.
- Ensure the application of granular CaCl is limited to the travelled road surface.
- Be cautious applying granular CaCl to road surfaces near watercourses or over watercourse crossings.
- Only a trained personnel shall be used to apply granular CaCl on Mary River Project Site Roads to suppress dust on a as required basis.
- Have a spill response plan in place and a functional spill kit on each applicator and/or in application area.
- On a daily basis volume of granular CaCl shall be tracked and reported to the Baffinland Environmental Department representative on-site.
- Ensure all equipment used on site is well maintained and free of fluid leaks.

2.3.3 Brine Production

- Water for brine solution shall be collected only from approved sources as directed by the on-site Baffinland Environmental representative to ensure that the quality of water being

used for dust suppression meets all water quality requirements for discharge under the mine's water use licenses and land use permits.

- Contaminated water shall not to be used for CaCl brine solution production.
- On a daily basis water volume and source used for brine production shall be tracked by and reported to the Baffinland Environmental Department representative on-site.

2.3.4 Brine Application

- CaCl brine solution shall be applied to roads using on-site water truck using spray bar arrangement.
- The rate of CaCl brine application should be enough to suppress dust but not sufficient to allow water to puddle or pool on the road surface.
- Ensure the application of CaCl brine is limited to the travelled road surface.
- Be cautious applying CaCl brine to road surfaces near watercourses or over watercourse crossings.
- The frequency or rate of CaCl brine application will vary depending upon the prevailing site conditions and shall be determined by the Senior Construction representative on-site with consultation with the Baffinland Environmental Department representative on-site
- Only a trained operator(s) assigned and trained on the water truck operation shall be used to apply water on Mary River Project Site Roads to suppress dust on a as required basis.
- Have a spill response plan in place and a functional spill kit on each applicator and/or in application area.
- On a daily basis brine volume used for dust suppression shall be tracked by and reported to the Baffinland Environmental Department representative on-site.
- Ensure all equipment used on site is well maintained and free of fluid leaks.

2.3.5 Storage

- CaCl shall be stored in accordance with applicable regulations and shall be handled with care.
- Transfer and loading of CaCl shall occur at designated sites away from watercourses.
- Care shall be taken to avoid spilling chemicals during transfer and loading.
- Equipment and tools shall be cleaned in a designated area, if possible. Any wash water generated by cleaning tools and equipment shall be managed in a manner that will prevent its direct release to watercourses.
- Ensure all equipment used on site is well maintained and free of fluid leaks.

3. References

The Government of the Nunavut, Environmental Protection Service, Department of Sustainable Development. Environmental Guideline for Dust Suppression. 2002

Agnico Eagle Mines Ltd. – Meadowbank Division. Dust Suppression Protocol for Roads. 2008

Environmental Protection Act - Spill Contingency Planning and Reporting Regulation.

Department of Government Services and Public Works, Yellowknife, NWT, Technical Services Division. Community Dust Control Program -. *Calcium Chloride as a Dust Suppressant* . 1992.

City of Albuquerque, Environmental Health Department, Air Quality Division. Fugitive Dust Control Methods. 2005

Environment Australia, Department of the Environment. Best Practice Environmental Management in Mining: Dust Control. 1998

Water, Air and Climate Change Branch, Environmental Protection Division, BC Ministry of Environment. Road salt and Winter Maintenance for British Columbia Municipalities, Best Management Practices to Protect Water Quality. 1998.

Attachment(s)/Enclosure:

Attachment A - Environmental Guideline for Dust Suppression, Government of Nunavut, Environmental Protection Service, Department of Sustainable Development (January 2002).

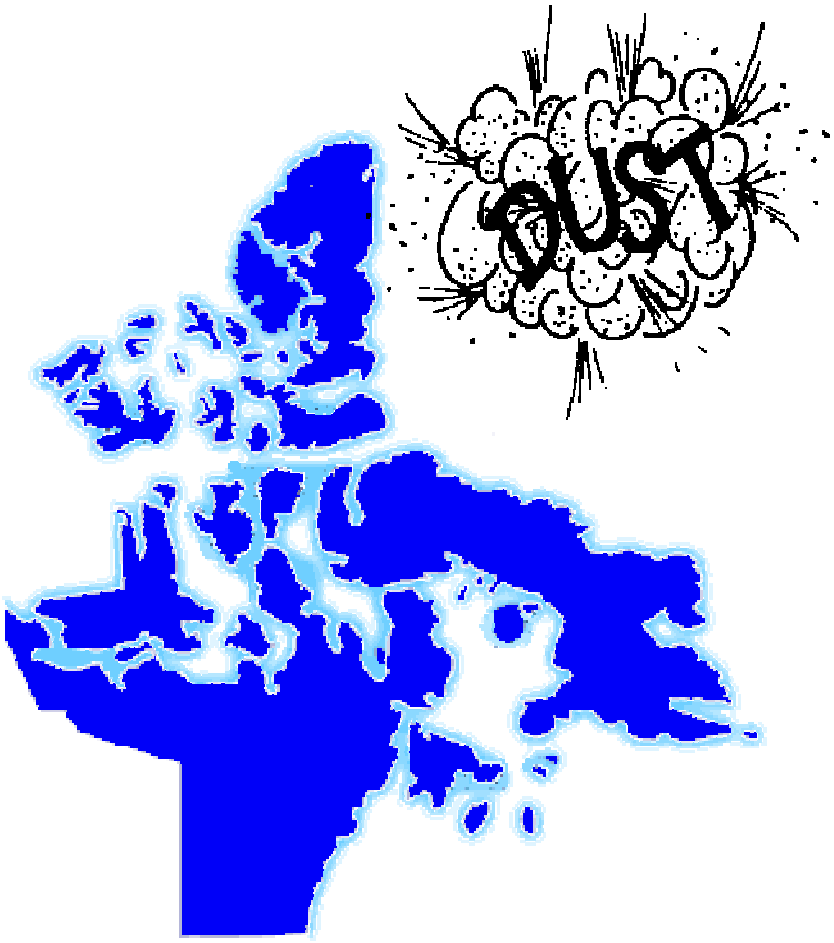
Attachment B – MSDS Sheet ‘Calcium Chloride’ by Sel Warwick Inc. of Victoriaville, Québec

Attachment A

Nunavut Environmental Guideline for Dust Suppression

Government of Nunavut, Environmental Protection Service, Department of Sustainable Development (January 2002).

ENVIRONMENTAL GUIDELINE FOR Dust suppression



Department of Sustainable Development
Environmental Protection Service

Nunavut

GUIDELINE: DUST SUPPRESSION

AS AMENDED BY:

USE OF GUIDELINE

A guideline is not law and is therefore not enforceable. It does however, assist an inspector to determine what action(s) may be required of him. Paragraph 2.2(c) of the Environmental Protection Act allows the Minister to develop co-ordinate and administer guidelines. The Act [subsection 5(1)] makes it an offence to discharge a contaminant into the environment, subject to some exceptions [subsection 5(3)]. When a discharge occurs and it is inconsistent with the guideline, the discharge is considered an unacceptable risk. The inspector may then consider issuing an order or laying an Information.

A guideline allows for some leniency in applying the law. A court would probably be inclined to consider the application of a guideline favorably because the public is aware of the standards they are expected to meet.

This Guideline is not law.
It is prepared by Environmental Protection Service,
Department of Sustainable Development
Government of the Nunavut

January, 2002

Guideline for Dust Suppression

January, 2002

GUIDELINE FOR DUST SUPPRESSION

1 Introduction

The purpose of this guideline is to make you aware of the procedures you must follow before applying a dust suppressant in Nunavut. The Department of Sustainable Development, Environmental Protection Service, (EPS) has currently approved three dust suppressants for use in Nunavut. The publication provides guidance for applying these products and a process for approving other dust suppression products.

Section 2.2 of the *Environmental Protection Act* gives the Minister of Sustainable Development the authority to develop, co-ordinate and administer these guidelines (see appendix A).

1.1 Definitions

Approved Product	A product approved by EPS for dust suppression.
Leachate Test	Leachate Extraction Procedure - Canadian General Standards Board (CGSB) #164-GP-1-MP (or as amended) or equivalent.
PCB	Polychlorinated biphenyl.
Roadway	The traveled surface of a road, from shoulder to shoulder; it does not include the side slopes or ditches.
Set	The point at which the product becomes stable, according to the manufacturer's specifications.
Used Oil	Any oil from an industrial or non-industrial source that has become unsuitable for its intended purpose due to the presence of impurities or the loss of original properties.

1.2 Why are dust suppressants used?

Reasons for using dust suppressants include:

Safety	Untreated roads may lead to more accidents. Accident potential is increased due to loss of visibility.
Health	Dust particles may become a health hazard when they become trapped in the lungs.
Vegetation	Large amounts of dust may induce changes in vegetation due to increased heat absorption and decreased transpiration.

Aquatic Resources	High levels of dustfall into aquatic systems may adversely affect aquatic plants and fish that are not adapted to high levels of sedimentation.
Aesthetics	Dust produces an immediate visual impact that may affect residents who live near dust prone roads.
Road Maintenance Costs	Treated roads can lower road maintenance costs by reducing general loss and blading time.

An Ambient Air Quality Guideline established under the Environmental Protection Act sets standards respecting the maximum desirable levels of dust in ambient air in the NWT/Nunavut. Measured as total suspended particulate (TSP), the standards for dust over 24 hours are 120 micrograms per cubic metre (µg/m^3) and averaged over a year are 60 µg/m3. These standards apply to the whole of the NWT/Nunavut. They define the long term goal for air quality to protect unpolluted parts of the Territories and for the continuing development of control options in polluted areas.

1.3 Roles and Responsibilities

Although the *Environmental Protection Act* does not require permits for the application of dust suppressants in Nunavut, all suppressants must first be approved by EPS. While general conditions are provided for approved dust suppressants, additional conditions may be required on a case by case basis.

The responsible party, being the landowner, road authority or municipal authority, must make provisions to notify the public and contact the Department of Sustainable Development before applying suppressants. The responsible party must also verify that the products are approved for use and properly applied by the applicator. If the product migrates from the roadway and is deemed to violate the *Environmental Protection Act*, the person(s) responsible must be prepared to take appropriate remedial measures.

Applicators are also accountable for their actions. Applicators are responsible for ensuring that the product is approved for use in Nunavut, is correctly applied to the designated area and does not migrate off the site. Applicators, manufacturers and retailers must provide information about new products to EPS for approval before their use in Nunavut (Section 3).

> ***It is important to remember that the responsible party (the landowner, road authority or municipal authority) is liable for any activity they authorize. Contamination of the environment and subsequent remediation of the site is ultimately their responsibility. (See Appendix A)***

2 General Dust Suppression Guidelines

There are many aspects to consider before you apply a dust suppressant in Nunavut. The following are general guidelines to be followed:

2.1 Notification for use of Approved Products

The following parties must be notified:

Property Owner	Any application of a dust suppressant should be conducted according to an agreement between the applicator and the responsible road authority or property owner. A written agreement is recommended.
Department of Sustainable Development	Before any application, provide the local Environmental Protection Officer with the following information: the location of the site, the product(s) used and a timetable for the work.
Public	Notify the affected public before any application. This can be through signs, public notices or media announcements.

2.2 Approved Products

Calcium chloride, Bunker C and DL 10 are currently the only approved dust suppressants in Nunavut. Appendix B contains a list of approved products and information regarding the application of these products.

Other products cannot be used in Nunavut until they have been approved by EPS.

> ***Used oil must not be used as a dust suppression/road stabilizing product or added to other dust suppression products.***

2.3 Application Procedures

Directions	Follow the manufacturer's specifications or other tested and approved procedures.
Roadway	The application shall be limited to the roadway, driveway or parking lot.
Rate	Carefully monitor the application rate to ensure adequate coverage without pooling or runoff of products. The amount of dust suppressant applied should not exceed the minimum amount required to effectively suppress dust.
Incorporation	Products must be bladed or incorporated into the road immediately upon application, to ensure the product does not migrate off the roadway.
Migration	The material must not migrate or run off the traveled portion of the roadway.

2.4 Environmental Concerns

2.4.1 General

Contaminants	Dust suppressants must conform with the manufacturer's specifications and must not contain concentrations of contaminants that would not normally be found in the suppressant.
PCB Concentration	Materials that contain more than 2 parts per million (ppm) of PCB are considered unacceptable and shall not be applied as a dust suppressant.

2.4.2 Water

Proximity to Water	Ensure that dust suppressants do not enter and contaminate waterbodies, including surface and groundwater. Do not allow the product to leave the roadway.
Sensitive Environments	Application rates near sensitive environments, e.g. marshes, must be closely monitored. Remember**,** environmental restoration is the responsibility of the landowner, road authority or municipal authority.
Flooding	Do not apply products to areas of roads that are subject to flooding.
Imminent Precipitation	Do not apply products if precipitation is occurring, or forecast to occur before the product sets or cures.

2.5 Spill Contingency Plan

Provide EPS with a contingency plan, if required by the *Spill Contingency Planning and Reporting Regulations*, under the *Environmental Protection Act*.

Be prepared to respond to spills, including any product that migrates off the roadway.

3 New Products

Products that have not been approved by EPS must undergo an assessment before being approved for use as a dust suppressant. The following information is required before such an assessment can be done:

Manufacturer's Information	Manufacturer's specifications and application procedures.
Laboratory Analysis	All new products must be characterized by an accredited laboratory.
Material Safety Data Sheets	Complete workplace hazardous material information system data sheets (W.H.M.I.S.).

(M.S.D.S.)	(W.H.M.I.S.).
Toxicity Tests	Toxicity tests should be provided for LC-50 and LD-50.
Leachate Tests	See section 3.1
Other requirements	Provide a proposed schedule of field tests to confirm product efficiency and appropriate application rates. Provide any other materials, tests or analysis carried out on the substance. Provide copies of approvals from other jurisdictions. Laboratory or testing costs are the responsibility of the person(s) applying for approval.

3.1 Leachate Toxicity Testing

New, non-approved dust suppressant products may be required to undergo the leachate extraction procedure to determine toxicity of the polymerized product. Testing should be carried out on a sample consisting of the polymerized material, at the standard application rate, and a representative sample of road material. Such a leachate toxicity test can be undertaken by a variety of reputable commercial laboratories. Leachate extraction procedure CGBS #164-GP-1-MP, or an acceptable equivalent, must be used. (See appendix C).

4 Conclusion

This is a brief introduction to dust suppressant application in Nunavut.

If you would like more information please contact:

Environmental Protection Service
Department of Sustainable Development
P.O. Box 1000, Station 1195
Iqaluit, Nunavut, X0A 0H0
Phone: (867) 975-5900; Fax: (867) 975-5990

Remember that this document is to inform you of the procedures you must follow before applying dust suppressants in Nunavut. If you have any questions or comments, contact the Environmental Protection Service before beginning a dust control program.

5 Bibliography

Community Dust Control Program - Technical Services Division. *Calcium Chloride as a Dust Suppressant.* Department of Government Services and Public Works, Yellowknife, NWT, (1992).

Environmental Protection Act - Spill Contingency Planning and Reporting Regulation.

Gazette officielle due Quebec. *Environmental Quality Act - Hazardous Waste Regulation -* Schedules III and IV, Quebec: Editeur officiel du Quebec, (1988).

Government of British Columbia, *British Columbia Waste Management Act - Special Waste Regulation*, Schedule 4, Queen's Printer of British Columbia, (1988).

Government of Ontario, *Regulation 347* (formerly Reg. 309) - Schedule 4, Toronto, Ontario: Queen's Printer of Ontario, (1980).

Green, L. *Public Awareness Information for Dust Control on NWT Highways*, Yellowknife NWT: Department of Transportation, (1992).

Hall, K. *Road Oiling with Bunker C*, Yellowknife, NWT: Environmental Protection Service, Renewable Resources Department, (1993).

RTAC ARTC *Guidelines for Cost Effective Use and Application of Dust Palliatives*, (1987)

Ontario Ministry of the Environment, *Draft Guidelines for the Application of Product Dust Suppressant Materials*, Toronto, Ontario: Ontario Ministry of the Environment, (1992).

Secretary of Canadian General Standards Board (CGSB). *Leachate Extraction Procedure 164-GP-IMP,* Ottawa, Ontario: CGSB, (1987).

Techman Engineering Ltd. *Road Dust Suppression in Northern and Western Canada - Manual or Recommended Procedures,* Calgary, Alberta: Environment Canada, (1982).

Thompson, N. *Use of Entac Dust Suppressant,* Yellowknife, NWT: Environmental Protection Service, Renewable Resources Department (1990).

APPENDIX A

Environmental Protection Act

The following information is a subset of the *Environmental Protection Act.* The complete Act is available for viewing at any office of the Department of Sustainable Development.

1. In this Act;

"Contaminant" means any noise, heat, vibration or substance and includes such other substances as the Minister may prescribe that, where discharged into the environment,

(a) endangers the health, safety or welfare of persons;
(b) interferes or is likely to interfere with normal enjoyment of life or property
(c) endangers the health of animal life, or
(d) causes or is likely to cause damage to plant life or to property;

"Discharge" includes, but not so as to limit the meaning, any pumping, pouring, throwing, dumping, emitting, burning, spraying, spreading, leaking, spilling or escaping;

"Environment" means the components of the Earth and includes:

(a) air, land and water;
(b) all layers of the atmosphere;
(c) all organic and inorganic matter and living organisms, and
(d) the interacting natural systems that include components referred to in paragraph (a) to (c).

2.2 The Minister may

(a) establish, operate and maintain stations to monitor the quality of the environment in the Territories;
(b) conduct research studies, conferences and training programs relating to contaminants and to the preservation, protection or enhancement of the environment;
(c) develop, co-ordinate and administer policies, standards, guidelines and codes of practice relating to the preservation, protection or enhancement of the environment;

5. **(1)** Subject to subsection (3), no person shall discharge or permit the discharge of a contaminant into the environment.

(2) REPEALED, R.S.N.W.T. 1988, c. 117 (Supp.), s. 8.

(3) Subsection (1) does not apply where the person who discharged the contaminant or permitted the discharge of the contaminant establishes that

(a) the discharge is authorized by this Act or the regulations or by an order issued under this Act or the regulations;
(b) the contaminant has been used solely for domestic purposes and was discharged from within a dwelling-house;

(c) the contaminant was discharged from the exhaust system of a vehicle;
(d) the discharge of the contaminant resulted from the burning of leaves, foliage wood, crops or stubble for domestic or agricultural purposes;
(e) the discharge of the contaminant resulted from burning for land clearing or land grading;
(f) the discharge of the contaminant resulted from a fire set by a public official for habitat management of silviculture purposes;
(g) the contaminant was discharged for the purposes of combating a forest fire;
(h) the contaminant is a soil particle or grit discharged in the course of agriculture or horticulture; or
(i) the contaminant is a pesticide classified and labeled as Adomestic≅ under the *Pest Control Products Regulations* (Canada)

(4) The exceptions set out in subsection (3) do not apply where a person discharges a contaminant that the inspector has reasonable grounds to believe is not usually associated with a discharge from the excepted activity. R.S.N.W.T. 1988, c. 75 (Supp.), s. 5; c. 117 (Supp.), s. 8.

5.1 Where a discharge of a contaminant into the environment in contravention of this Act or the regulations or the provisions of a permit or license issued under the Act or the regulations occurs or a reasonable likelihood of such a discharge exists, every person causing or contributing to the discharge or increasing the likelihood of such a discharge, and the owner or the person charge, management or control of the contaminant before its discharge or likely discharge, shall immediately:

(a) subject to any regulations, report the discharge or likely discharge to the person or office designated by the regulations;
(b) take all reasonable measures consistent with public safety to stop the discharge, repair any damage caused by the discharge and prevent or eliminate any danger to life, health, property or the environment that results or may be reasonably expected to result from the discharge or likely discharge; and
(c) make a reasonable effort to notify every member of the public who may be adversely affected by the discharge or likely discharge. R.S.N.W.T. 1988, c. 75 (Supp.), s. 5: c. 117 (Supp.), s. 9.

6. (1) Where an inspector believes on reasonable grounds that a discharge of a contaminant in contravention of this Act or the regulations or a provision of a permit or license issued under this Act or the regulations has occurred or is occurring, the inspector may issue an order requiring any person causing or contributing to the discharge or the owner or person in charge, management or control of the contaminant to stop the discharge by the date named in the order.

7. (1) Notwithstanding section 6, where a person discharges or permits the discharge of a contaminant into the environment, an inspector may order that person to repair or remedy any injury or damage to the environment that results from the discharge.

APPENDIX B

Approved Dust Suppression Products and Application Information

Application of Bunker C

Bunker C is the heaviest viscosity oil that refineries produce, with an asphalt content varying between 7 and 25%.

Purity	Bunker C must not contain contaminants not normally found within the virgin products, i.e. tank bottom sludge, other fuels or oils, used oil, PCBs or solvents.
Blading	It must be bladed or otherwise incorporated into the road immediately upon application.
Containment	Bunker C must not be applied to sections of the road that are subject to flooding. Do not allow the product to enter waterbodies. The product contains hydrocarbons that are potentially toxic.
General Guidelines	Follow all other general guidelines listed in section 2.

Application of Calcium Chloride

This is a commonly used product in the NWT/Nunavut. It is available in granular and liquid form. Because it is hygroscopic and deliquescent, it draws moisture from the air and will control dust if applied frequently enough.

Road surface conditions and traffic volume dictate the amount, timing and frequency of calcium chloride application. With normal application procedures and concentrations, it is generally non-toxic with rapid dissolution in the environment. However, calcium chloride can wash away in heavy rain. For more information read: *Calcium Chloride as a Dust Suppressant,* (see section 5).

Toxicity to plants	Calcium chloride is toxic to some plants. Keep the product on the roadway.
Application Rate	Apply minimum amounts as it can cause roads to become slippery.
Applicator Competence	Ensure application personnel are informed of corrosive nature of the product (can be harmful to eyes and skin with direct contact).
General Guidelines	Follow all other general dust suppressant guidelines listed in section 2.

APPENDIX B (cont'd)

Application of DL 10

DL 10 is an asphalt product that is mixed with water and a soap solution. DL 10 should be applied to one side of the road at a time, and then allowed to set for approximately three hours. Braking may be difficult on freshly treated road, so a pilot car may be necessary to direct traffic during the application. Vehicles should travel no faster than 20 km/hr through areas where the application has not set.

Fresh DL 10 can be washed off using soap and water. If it is allowed to dry, a solvent may be required.

General Guidelines	Follow all general dust suppressant guidelines listed in Section 2.

APPENDIX C

Leachate Extraction Procedure Test and Equivalents:

(See reference section for complete documentation).

The Environmental Protection Service may require new products to undergo the following test:

- CGSB #164-GP-1-MP *Leachate Extraction Procedure* Canadian General Standards Board (or as amended).

Or one of these equivalent tests:

- Schedules III and IV - *Environmental Quality Act - Hazardous Waste Regulation* - Gazette officielle du Quebec.
- Schedule 4 - *British Columbia Waste Management Act - Special Waste Regulation,* Government of British Columbia.
- Schedule 4 - *Regulation 347* (formerly Regulation 309), Government of Ontario.

If you would like to be placed on a mailing list to receive guideline amendments or for public consultation on Environmental Protection Service legislation please fill this out and mail or fax to:

Environmental Protection Service
Department of Sustainable Development
P.O. Box 1000, Station 1195
Iqaluit, Nunavut, X0A 0H0
Fax: (867) 979-5990

Users of this guide are encouraged to report any errors, misspellings, etc. contained within, to EPS at the above address.

Mailing List for Environmental Protection Service Information

Name: _____

Title: _____

Address : _____

_____

Phone / Fax Number: _____

Attachment B
MSDS Sheet ‘Calcium Chloride’

Sel Warwick Inc. of Victoriaville, Québec

5, Boutet Street
Victoriaville, Qc
G6P 8T6

This product is distributed by
Canada Colors and Chemicals Limited
General Inquiry: (905) 459-1232
24 Hour Emergency: (416) 444-2112
CCC: Product Code: 279213
CCC: Product Name: CALCIUM CHLORIDE FLAKE 77% -SW ML

FLAKE CALCIUM CHLORIDE

Material Safety Data Sheet

A. PRODUCT INFORMATION

TRADE NAME (PRODUCT IDENTIFIER): Flake Calcium Chloride Powdered Calcium Chloride	**CLASSIFICATION & SYMBOL** :  Class D2B	
CHEMICAL NAME AND/OR SYNONYM: Calcium Chloride Dihydrate	**FORMULA :** $CaCl_2$ 2 H_2O	**CAS NO**: 10043-52-4

BNQ Standard 2410-300 / 2009 Certificat # 1156

Canadian Standard CAN-CGSB-15.1-92

PRODUCT USE :
De-icer, Dust control, mud drilling lubricant, Freeze-proofing of ores and aggregates, thawing agent, concrete conditioner. Food Grade Calcium category is used as additive, refrigerants and heat exchange agent.

MANUFACTURER/IMPORTER: Sel Warwick Inc. 5, Boutet Street Victoriaville, Qc, G6P 8T6	**SUPPLIER/DISTRIBUTOR**: **TETRA Technologies Inc** **369, Feed Mill Road** **Eldorado, AZ 71730** **USA**
EMERGENCY TELEPHONE NO: 819-758-5229	

B. PREPARATION INFORMATION

PREPARED BY : Sel Warwick Inc. 5, Boutet Street, Victoriaville Telephone : 819-758-5229	**PREVIOUS ISSUE DATE** : December 2010
	CURRENT ISSUE DATE: June 2012

C. TOXICOLOGICAL PROPERTIES

INHALATION:
Dust or mist inhalation may irritate nose, throat and lungs

INGESTION :
Low in toxicity. May irritate gastrointestinal tract and cause nausea and vomiting

SKIN :
May cause skin irritation. Prolonged contact when moisture is present may result in superficial burns. Contact with abraded skin or cuts can cause severe necrosis

EYES:
May irritate or burn eyes

ACUTE TOXICITY: Moderate toxic LD_{50} (oral-rat) 1000 mg/kg LD_{50} (oral-mouse) 1940 mg/kg	**EXPOSURE LIMITS**: Ontario Ministry of Labour Time-Weighted Average Exposure Value (TWAEV) for Nuisance Particulate 10 mg/m^3
CHRONIC TOXICITY : Not applicable	
OTHER :	**BIOLOGICAL EXPOSURE INDICES (BEI)** : Not applicable

D. PHYSICAL DATA

MATERIAL IS AT NORMAL CONDITIONS: **Liquid** ☐ **Solid** ☒ **Gas** ☐	**APPEARANCE AND COLOR :** Small White Flakes Very hygroscopic	**ODOR THRESHOLD** : Odorless
BOILING POINT : Not available **FREEZING POINT** : ^{0}C **(MELTING POINT)** : 176^{0}C	**SPECIFIC GRAVITY :** g/cc **(H_2O =1)** Not available	**VAPOR DENSITY:** **(AIR=1)** Not applicable
SOLUBILITY IN WATER : 97.7 g/100 ml @ 0^{o}C 326 g / 100 ml @ 60^{o}C	**PH** Neutral to slightly Alkaline	**VAPOR PRESSURE:** **(mm Hg @ 20^{o}C)** Not applicable **(PSIG)**
EVAPORATION RATE : **(Ether = 1.0)** Not applicable **Slow <0.3 Fast > 3.0** **Medium 0.3 – 3.0**	**% VOLATILES BY VOLUME:** (At 20^{o}C) Not applicable	**MOLECULAR WEIGHT:** 147.02 **COEFFICIENT OF WATER/OIL DISTRIBUTION:** Not available

E. REACTIVITY DATA

STABILITY: Stable	**CONDITIONS TO AVOID :** Not applicable
INCOMPATIBILITY (MATERIALS TO AVOID): Reacts violently with bromine trifluoride (BrF_3), or a mixture of boron trioxide and calcium oxide (B_2O_3 + CaO). Sulfuric acid : yields hydrogen chloride gas, which is corrosive, irritating and reactive. Water-reactive materials, such as sodium : causes an exothermic reaction. Methyl vinyl ether : starts runaway polymerization reaction. Zinc as in galvanized iron : yields hydrogen gas with solutions, which may explode under these conditions.	
HAZARDOUS DECOMPOSITION PRODUCTS: Fumes of Chlorides (Cl) are given off at temperature above 1600 ^{o}C	
HAZARDOUS POLYMERIZATION : Will not occur ☐	**OTHER PRECAUTIONS:** Will undergo violent polymerization with methyl vinyl ether. The anhydrous, monohydrate, dihydrate and tetrahydrate forms of calcium chloride, when dissolved in water, produce considerable amounts of heat.

F. FIRE OR EXPLOSION HAZARD

CONDITIONS OF FLAMMABILITY : Not applicable	**FLASH POINT:** Not applicable **METHOD**
HAZARDOUS COMBUSTION PRODUCTS: None	
% BY VOL. IN AIR **UPPER FLAMMABLE LIMIT** : N/A **LOWER FLAMMABLE LIMIT:** N/A **AUTOIGNITION TEMPERATURE** : ^{o}C	**EXPLOSION HAZARDS** : See Section E incompatibility
SENSITIVITY TO MECHANICAL IMPACT : Not applicable	
SENSITIVITY TO STATIC DISCHARGE: Not applicable	
FIRE EXTINGUISHING PROCEDURES: Use extinguisher media appropriate for surrounding fire. For fire fighting wear NIOSH-approved self- contained breathing apparatus.	

G. HAZARDOUS INGREDIENTS (MIXTURES ONLY)

MATERIAL OR COMPONENTS/C.A.S. #	CONCENTRATION	HAZARD DATA
Not applicable		

H. PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT：

RESPIRATORY PROTECTION：
For dusty or misty conditions, wear NIOSH approved dust or mist respirator

EYES AND FACE:
For dusty or misty conditions, or when handling solutions where there is reasonable probability of eye contact, wear chemical safety goggles and hard hat. Under these conditions, do not wear contact lenses.

HANDS, ARMS AND BODY：
As a minimum, wear long-sleeve shirt, trousers, rubber boots and gloves for routine product use. Cotton gloves permitted for dry product, impervious gloves when using solutions.

STORAGE：
Cool, dry area. Prolonged storage may cause product to cake and become wet from atmospheric moisture.

NORMAL HANDLING:
Avoid contact with eyes, skin or clothing. Avoid breathing dust. Use good personal hygiene and housekeeping

ENGINEERING CONTROLS:

Ventilation:Provide general and/or local exhaust ventilation to maintain dust or fume levels below exposure limits.

Eye wash facility should be provided in storage and general work area.

ENVIRONMENTAL:

DEGRADABILITY: Not applicable	**AQUATIC TOXICITY:** Harmful to aquatic life at concentrations greater than 500 ppm. $CaCl_2$ does not bioaccumulate $TL_m96 > 1000$ mg/1

SPILL OR LEAK (Always wear personal protective equipment):
Shovel up dry chemical and place in metal drum with cover. Cautiously spray residue with plenty of water. Keep contaminated water from entering sewers and water courses.

WASTE DISPOSAL:
Consistent with the requirements of local waste disposal authorities.

I. FIRST AID MEASURES

INHALATION:
Promptly remove to fresh air. Get medical attention.

INGESTION:
If conscious, immediately give 2 to 4 glasses of water, and induce vomiting under medical supervision.

SKIN:
Remove contaminated clothing. Wash with plenty of soap and running water. Get medical attention if irritation persists.

EYES:
Flush eyes promptly with plenty of running water, continuing for at least 15 minutes. Get medical attention.

Baffinland Iron Mines Corporation

Tote Road Travel Procedure

BAF-PH1-810-PRO-0002

Rev 2

Prepared By: Shawn Parry
Department: Operations
Title: Ore Handling Superintendent
Date: March 17, 2016
Signature:

Approved By: Bikash Paul
Department: Operations
Title: General Manager
Date: March 17, 2016
Signature:

DOCUMENT REVISION RECORD

Issue Date MM/DD/YY	Revision	Prepared By	Approved By	Issue Purpose
06/05/13	0	G.C	S.P	Use
01/06/15	1	L.H.	T.W.	Use
03/15/16	2	SP	BP	Use

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1 PURPOSE

The Mary River Project's roads are in excess of 100 KM in length and travel through hills with elevations exceeding 500 meters. Arctic weather along these roads can change quickly over short periods of time and distance. Weather conditions at camp are not a reliable indicator of weather conditions on the tote road.

- Over the course of a year a driver on the tote road can experience a number of hazards including:
- Snow storms and whiteouts conditions that can reduce and even eliminate visibility.
- Drifting snow that could impede or in some cases prevent vehicle movement.
- Steep hills can be a challenge, especially in winter conditions
- Sharp corners limit visibility and vehicle manoeuvrability.
- Roadway washouts can occur at any time during the warm weather – but are common during freshet.
- Remote driving conditions on roads with infrequent vehicle use.
- Reduced ability to rescue stranded workers in vehicles.
- Construction

These hazards require that specific controls be implemented to reduce the risk of workers being stranded on a road and will ensure that all workers are prepared to safely wait out a storm or emergency if they are stranded. This safe work procedure details the controls that are to be followed for all workers traveling on the Tote Road at all times of the year.

2 SCOPE

This procedure applies to the tote road running between the Mary River and Milne Inlet sites.

3 RESPONSIBILITES

3.1 ORE HAULAGE SUPERINTENDENT

Mary River and Milne Inlet Ore Haulage Superintendents have the lead responsibility for managing traffic on the tote road including;

- Monitoring weather forecasts and conditions
- Identify problem areas on the tote road that may impact driver safety and take appropriate action
- Problem area's on the tote road may include,
    - white out condition
    - road wash-out
    - vehicle breakdown

- narrow sections of road
- construction zones

All person's travelling the tote road must check in with the Security Office or Dispatch at both Mary River and Milne Inlet. All personnel must be accounted for when travelling the Tote Road.

3.2 BAFFINLAND SUPERVISOR/ CONTRACTOR SUPERVISOR

All Supervisors are responsible for the following:

- Ensure that any worker assigned to drive a vehicle on the tote road is trained and qualified regarding tote road safety and driving communication protocols
- Ensure that any light vehicles or work equipment travelling the tote road in winter months, or in periods of severe weather conditions are equipped with an emergency survival kit
- Ensure that any workers traveling the tote road have all the required safety equipment, and are following all PPE requirements and procedural controls identified in this SOP
- Ensure their crews will comply with the process for recording when vehicles enter and depart the tote road
- Ensure weather conditions are suitable for the travel or work activity required by following the tote road Conditions report issued from Dispatch.

3.3 EMPLOYEE

All personnel using the tote road are responsible to comply with the requirements of this procedure.

4 DEFINITIONS

Port Site Camp Boundary: The Port Site camp boundary is defined and bounded by the ocean to the North, the Port Site Camp to the East, ore stockpile to the West and Port Site Weatherhaven to the South.

Mine Site Camp Boundary: The Mine Site camp boundary is defined and bounded by the airstrip to the North, the East end of the runway to the East, the most southerly building of the Mary River camp to the South and the West end of the runway to the West.

Whiteout: The declaration of a white condition must include identification of the area impacted.

A white out is declared when deteriorating weather conditions pose a safety risk for workers. The initial risk is associated with vehicles and workers safely reaching a camp or emergency shelter. White out conditions include wind and blowing snow that can result in significantly reduced visibility and drifting snow. These conditions may offer serious or life threatening safety hazards for pedestrian and vehicle travel.

5 SEVERE WEATHER

5.1 EMERGENCY SURVIVAL KIT

The emergency survival kit is a pack containing survival material to assist a worker stranded in a vehicle on the tote road.

Every vehicle shall be equipped with a sealed “basic first-aid kit” for use in case of an injury while workers are stranded on the tote road.

Survival kits are for use in emergency situations only. In the event an emergency survival kit has been opened, it must be returned to your supervisor or warehouse for replacement.

Due to the harsh conditions of the Arctic and reliance on emergency survival equipment for life safety, tampering with a survival kit can result in discipline including discharge or removal from site.

5.2 WEATHER CHECK

Prior to departure onto the tote road, check the Tote Road Conditions report issued by Dispatch This memo can be obtained from security at both Mary River and Milne Inlet.

5.3 WINTER ROAD TRAVEL- SEPTEMBER 15TH TO MAY 30TH

Workers travelling or working on the Tote Road in winter months or in periods of severe weather conditions must have a winter survival kit for each worker in the truck and a first aid kit.

Wearing or transporting adequate winter gear is mandatory when working or traveling on the tote road during this period “winter months”.

Winter gear is the responsibility of workers and should include: a heavy winter parka, insulated pants or coveralls, insulated work boots, arctic gloves or mitts, face protection, toque or other winter headgear all suitable to keep warm if stranded in a vehicle or at an emergency shelter.

5.4 SUMMER ROAD TRAVEL- JUNE 1ST TO SEPTEMBER 14TH

Sudden Arctic storms can occur at any time of the year. Carrying additional clothing is the workers responsibility. Additional clothing should include, as a minimum, a heavy sweater or fleece jacket, a wind breaker or Gore-Tex jacket, bib overalls, toques, mitts or gloves. Dress appropriately. This may seem obvious but it is easy to misjudge the temperature.

5.5 Fuel and Tires

Vehicles traveling between both sites must have full tank of fuel prior to leaving either camp. The exception to this rule will be the ore haul trucks.

Small fleet vehicles equipped with a tidy tank must have those tanks filled prior to leaving either site.

Ensure spare tire and jack are available on light vehicles. Due to the condition of the road and vehicle loads, the frequency of tire failures on the tote road is higher than on public highways.

Perform a thorough vehicle circle check, including windshield washer fluid before leaving and upon returning.

5.6 Emergency Shelters

Emergency shelters are currently maintained along the tote road. They are located at KM32, and KM68.

6 RULES OF THE ROAD

All personnel using the Tote Road are responsible for understanding this Safe Operating Procedure and are required to adhere to the following Rules of the Road:

6.1 Speed Restrictions

- Drivers are required to obey all traffic signs.
- Speed limits will be clearly posted through signage along the tote road.
- The driver is responsible to maintain their vehicle under control at all times.
- Tote road conditions may require the driver to operate their vehicle at less than the posted speed for a number of safety related reasons including, but not limited to, limited visibility due to weather or poor road conditions including washboard, ruts, soft spots and washouts.
- Sharp turns in the road and steep grades on the hill also pose safety concerns and the driver of the vehicle is responsible to reduce speed in order to maintain safe operation of the vehicle.
- If the road is impassable, the driver is responsible to stop and report the dangerous condition by radio to the Ore Haulage supervisor or Dispatch. The driver should stay at that location and communicate the hazard to vehicles in the area until all vehicles on the Tote Road are notified.
- All trucks must slow to 10KM/h when travelling through standing water on the road.
- If the vehicle is immobilized as the result of a simple mechanical failure, spin out, accident or off road incident the driver must immediately communicate their situation to the Ore Handling Supervisor or Dispatch. Based on the situation, an appropriate plan will be developed and communicated. Place hazard warning triangles in front and behind the immobilized vehicle to warn other traffic.

- The Ore Haulage Supervisor or Dispatch is responsible to instruct all vehicles on the tote road to stop or return to base in the event of a road blockage.

6.2 Vehicle Spacing and Right of Way Protocols

- Drivers must maintain a minimum of ½ kilometre spacing between vehicles travelling in the same direction depending on road and visibility conditions. This spacing may have to increase if the visibility is lowered.
- The right-of-way protocol is listed below:
- Emergency vehicles responding to an emergency.
- Loaded explosives truck
- The loaded fuel tanker heading south.
- Loaded ore haul truck
- Empty ore haul truck
- Empty fuel tanker
- Freight haulage and equipment floats and other maintenance support equipment.
- Light vehicles including passenger and small work trucks must yield to all transport vehicles. The light vehicle must stop safety at the side of the road and let the loaded vehicle pass unless signage is posted allowing two way traffic.
- When meeting on the tote road, communication protocols must be followed. (Section 6.4)
- Passing another vehicle headed in the same direction is not allowed on the tote road until clear communication is established and permission is given to do so if it is safe to do so.

6.3 Passing Road Maintenance Equipment

- When you approach road maintenance equipment or vehicles that are working on the road or at roadside, communication must be established. Permission to pass the road maintenance equipment must be received from the operator.
- Stay back 70 meters from a Grader when the blade is down. Do not attempt to pass a grader until the driver stops and signals you to pass
- To pass safely, make sure you communicate with the operator by radio. If you cannot reach the operator by radio, get his/her attention by flashing your lights or honking your horn.
- Never pass until the machine operator clearly signals that it is safe to pass. Do not make the assumption that because someone looked your way that they saw you, wait for a clear radio communication to proceed.
- 25KM per hour max. in road maintenance zones
- If in doubt, DO NOT take chances. Be patient and wait for proper communication with the equipment operator.

6.4 Permission and Radio Communication Protocols

If you plan to drive a vehicle on the tote road, you must,

- Travel with a radio tuned to channel" Analog backup tote road". Once you have reached the mine site or port site, report to security that you have arrived using channel "Analog backup SS Tac"
- If your radio fails stop the next vehicle and have the operator of that equipment radio for both vehicles.
- When using the radio drivers must be timely, courteous and brief.
- The loaded fuel tanker must contact Dispatch 15 minutes prior to departure. The operator of the loaded fuel tanker at designated call markers and every 5 kilometres as "Loaded tanker heading south" with the kilometre location. For example, "Loaded tanker heading south at kilometre 32"
- Ore haulage drivers must contact Dispatch upon arrival and departure of both sites.

6.4.1 Steep hills and blind corners

- Road signs prompting radio communication have been posted along the course of the tote road on either side of steep hills and blind curves. The purpose of these signs is to avoid potential collision between oncoming vehicles on steep hills and blind corners.
- Upon observation of the road sign prompting radio communication , the vehicle driver must make the following radio call,
    - Type of vehicle (i.e. light truck)
    - Located at Kilometre number as stated on the sign
    - Which direction the vehicle is travelling
    - For example, "Light vehicle pick up, kilometre 52, heading south"

6.5 Dangerous Driving and Unsafe Practices

- Operating a vehicle in a dangerous or unsafe manner will result in corrective action by the supervisor. The corrective action will include coaching, discipline or discharge, depending on the seriousness of the offence.
- Dangerous driving and unsafe practices include but are not restricted to the following:
    - Failure to follow tote road driving and communication protocols
    - Operating a vehicle in excess of the posted speed limit
    - Passing another vehicle that is travelling in the same direction without permission
    - Following too closely to a vehicle headed in the same direction
    - Driving a vehicle on the tote road without the required training and permission to drive on the tote road
    - Operating a vehicle in a reckless manner

6.6 Actions to be Taken when Working on the Tote Road

- Call dispatch on **site digital Tote road** to inform them of your location and the work you will be performing.
- Park you vehicle in a safe locations.
- Leave all lights and beacon on and make sure that your lights are not on High beam.
- Place man at work signs (if signs not available 2 road delineators in an X formation) at least 500m from your work area southbound and northbound.
- Dispatch will broadcast to all Tote road users your location and inform all traffic to slow down to 25 KM/HR in the work area.
- Place delineators (cones markers) to define your immediate work areas
- When outside working, monitor road traffic on **Analog backup tote road** to warn traffic of your presence and to be aware of the traffic traveling toward you.
- If you observe a vehicle not slowing down in your work area, report immediately to dispatch the unit #, the time and the type of vehicle.

7 REFERENCES AND RECORDS

- Nunavut General Safety Regulations, R.R.N.W.T. 1990.
- Nunavut Mine Health and Safety Regulations, R-125-95.
- Baffinland Standard Operating Procedure - White out Declaration and Communication Camp, Worksite and Tote Road

Baffinland Iron Mines Corporation

Whiteout and Wind Storm Conditions

BAF-PH1-810-PRO-0001

Rev 3

Prepared By: Tony Noseworthy
Department: Health and Safety
Title: Manager
Date: January 18, 2016
Signature:

Approved By: Bikash Paul
Department: Operations
Title: General Manager
Date: January 18, 2016
Signature:

DOCUMENT REVISION RECORD

Issue Date MM/DD/YY	Revision	Prepared By	Approved By	Issue Purpose
10/23/13	0	HF	MA	Use
11/25/15	1	TN	EM	Use
01/05/16	2	HF	TW	Added guidelines for managing windstorm plus updated document title
01/18/16	3	TN	BP	Use

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1 PURPOSE

Baffinland Iron Mines (BIM) is committed to achieving ZERO Harm in all work areas and the continued Health and Safety of its employees and contractors. This procedure provides guidelines for managing whiteout and wind storm conditions.

2 SCOPE

This procedure applies to all BIM employees and contractors working at Baffinland's work sites.

3 RESPONSIBILITES

3.1 Department Superintendents and Supervisors

Departmental Superintendents and Supervisors are responsible for informing the senior management member on site regarding hazardous conditions, including wind storms and white out conditions. This information will assist management decide the appropriate actions to take to safely manage the situation.

The response to extreme wind or white out conditions may include;

- Communicate to all departments including Security and Ore Haul Dispatch, the specific area impacted by extreme winds or whiteout conditions.
- Ensuring any white out declaration is effectively communicated.
- Blockading access to area of whiteout/shutdown
- Managing log books that record date and time of events, significant decisions and actions
- Managing essential services during the whiteout.
- Declaring the whiteout condition is over and the operation may return to regular operation

3.1.1 Mine Area

The Mine area is under the care and control of the Mine Operations department. The senior Mine Operations management representative, in consultation with other senior management team members on site, is responsible to declare a whiteout in the Mine area.

3.1.2 Mary River and Milne Inlet Campsites

The senior Site Services management representative, in consultation with other senior management team members on site, is responsible to declare a whiteout in the Mine and Port Site camp area under Site Services control.

3.1.3 Tote Road

The senior Ore Haul management representative, in consultation with other senior management team members on site, is responsible to declare a whiteout on the Tote Road.

3.1.4 SECURITY

1) Security is responsible to monitor the weather on a daily basis and communicate this information to the Site Services Superintendent. The Site Services Superintendent relays weather information to management and the employee group.
2) Security is responsible to communicate via all radio channels any whiteout/shutdown declaration.

4 DEFINITIONS

Weather Risk Levels:

Green conditions – Constant wind speeds are below 40 kilometres per hour and visibility is greater than 500 meters. These wind speeds are considered within the normal working range for outdoor activities. Visibility in winter is typically good (exceptions can occur). Follow manufacturers wind speed recommendations for equipment designed to lift/hoist materials. Follow the supervisor's instructions for workers manual outdoor tasks.

Yellow conditions – Constant wind speeds are above 40 kilometres per hour and visibility is greater than 100 meters. Safety precautions must be taken for working outdoors. Visibility in winter is reduced but typically greater than 100 meters (exceptions can occur). Outside crane operations and working in aerial work platforms will not be carried out. Working at heights can only occur after a JHA has been completed. Routine outdoor activity that involves working around dangerous process (i.e – Crusher) must be risk assessed using a Job Hazard Analysis (JHA) or equivalent method and the risk controls applied. Outdoor activity must be done in pairs and risks associated with walking outdoors or other low risk activities must be assessed and recorded on a Field Level Risk Assessment document. Outdoor work may continue for those assigned to work in mobile equipment, provided it is safe to perform the work. The supervisor and superintendent are responsible to determine if the work is safe. Work inside of building which is not affected by wind or visibility can be carried out as normal.

Blue conditions – Constant wind speeds are above 60 kilometres per hour and visibility is less than 100 meters. Outdoor activity that involves working around dangerous process (i.e – Crusher and Shiploader) must be stopped. Outside crane operations, working at heights, working in aerial work platforms will not be carried out. Outdoor visibility in winter is typically reduced to less than 100 meters (exceptions can occur). Roadways in winter are typically closed due to poor visibility. Outdoor activity must be done in pairs and risks associated with walking outdoors or other low risk activities must be assessed and recorded on a Field Level Risk Assessment document. Management may call a Code 1 to deal with the issues presented by the wind. Outdoor work may continue for those assigned to work in mobile equipment, provided it is safe to perform the work. The supervisor and superintendent are responsible to determine if the work is safe. Work inside buildings which is not affected by wind or visibility can be carried out as normal.

Red conditions – Constant wind speeds are 80 kilometres per hour or more or visibility is 10 meters or less. (Whiteout) Management will meet in the Incident Command Centre to determine if a Code 1 call is required to manage the safety issues presented by the extreme wind conditions. Outdoor activity must be limited to maintenance of essential services as determined by senior management and the Emergency Response process. Outside crane operations, working at heights, working in aerial work platforms will not be carried out. Work inside buildings which is not affected by wind or visibility can be carried out as normal.

5 Crisis Management Meeting:

Whenever the conditions reach yellow, blue, or red, the management team of the site affected or both sites if required will meet every two hours to re-evaluate conditions. Each department manager or designate will report on conditions on their area. During nightshift, the nightshift superintendent is to monitor conditions. If conditions change, either improves or deteriorates, the management team is to be reconvened to discuss the changes noted.

The Whiteout and Windstorm Conditions Communication Form BAF-PH1-810-FOR-0021 form is to be used to communicate changes via email and other electronic means that becomes available.

6 EXEMPTIONS

Department personnel involved in maintaining essential services may be deployed during a wind storm or white out conditions provided reasonable and effective measures for their safety have been taken. Responsibility for reasonable and effective measures rests with the department supervisor or superintendent. In the event a Code 1 has been declared, the responsibility rests with the Emergency Management Team Lead (EMTL).

7 WHITE OUT AND WIND STORM BACKGROUND

Arctic weather subjects the Mine, Port and Tote Road to strong wind year around. Winter winds can result in blowing snow with white out conditions. Arctic storms can bring sustained winds that can exceed 100 kilometres per hour. These winds can damage buildings and present a variety of serious hazards to personnel working outdoors.

7.1 Whiteout conditions

White out conditions include wind and blowing snow that can results in visibility of 10 meters or less. These conditions may offer serious safety hazards for pedestrian and vehicle travel.

Whiteout conditions typically occur in a localized area. For example weather conditions may be fine at Mary River and Milne Inlet but poor weather conditions may be experienced at the same time on the tote

road – especially at the higher elevations. It is possible for white out conditions to extend over large areas but the frequency of these occurrences is low.

Management response to white out conditions must also be area specific.

7.2 Whiteout Declaration

The purpose for declaring a "whiteout condition" is to ensure all workers in the area impacted are instructed to return to a safe location, prior to weather conditions deteriorating to an unsafe level. The decision to cease work and return to camp is based on risk.

Once a whiteout is declared, any equipment in the area of the whiteout which will be left in that area due to the weather conditions, must be shut down and shut off following shut down and shut off protocols for that equipment. Position equipment in such a way that it will be accessible for snow removal and/or maintenance.

Once a whiteout is declared, management and supervision must ensure security is contacted and communicates the whiteout condition and area impacted to all effected Baffinland and contract employees. Methods of communication will include direct contact, radio and satellite phone.

Should weather along the Tote Road be too severe to travel safely, workers in the area impacted must be instructed to stop immediately, contact security and communicate their position to the nearest kilometer.

When a whiteout/shutdown has been declared, the following actions will occur in the impacted area:

- All work will stand down and workers return to camp or a safe sheltered location. The only exception is work approved by the area departmental superintendent, in conjunction with the senior management member on site, and that may include snow-clearing / road maintenance work attempting to recover from the whiteout condition. This could include retrieving people stranded on the roadways. A Baffinland non-routine job safety analysis shall be completed with the appropriate personnel before retrieving personal on the roadways including the Tote Road during a white out condition.
- Traffic through the impact area will be closed.

7.3 Whiteout Conditions on Roadway

When whiteout conditions impact roadways, supervisors will direct their workers to drive to the closest camp, emergency shelter, or (if stranded) stop and take shelter in their vehicle in a safe location along the road. Crews returning to camp in multiple vehicles must travel as a convoy.

When whiteout conditions impact the camp and worksite, all workers located inside a camp or worksite building must remain inside that building unless directed otherwise by their supervisor. Walking between camp buildings during a whiteout is a high risk activity.

Tote Road weather can deteriorate while you are on the Tote Road even though it was fine when you left.

7.4 Stranded in Vehicle

Should you become stranded in your vehicle as a result of poor weather, you are to remain in your vehicle, with the following instructions:

- Remain inside or within touch of the vehicle. It is not safe to travel beyond the touch of the vehicle.
- Leave the vehicle engine running with flashing roof lights activated. A light truck fueled with diesel can typically idle for about 2 to 3 days on a full tank of fuel. Diesel trucks are difficult to start if the engine gets cold.
- Routinely check to ensure the exhaust pipe is clear of snow to prevent carbon monoxide poisoning that could result from exhaust backing in to the vehicle.
- Routinely check the engine air filter to ensure windblown snow does not block the air filter and stop the engine.
- Routinely check the vehicle doors will open and do not become blocked with snow.
- Roll the window down one inch to ensure fresh air in the cab of the vehicle. Stay calm and stay in the vehicle. Do not under any circumstances try to walk to safety. The rescue team will come to you.
- Do not consume food and water until it is necessary as you might be stranded for an extended period of time.
- White out conditions can last for two or three days. Remember; never leave the vehicle except to perform the safety checks described in this procedure. White out conditions can cause a person travelling on foot, to quickly become disoriented and easily lose their way.
- Monitor co-workers and observe for signs of frostbite and hypothermia. Don't ignore early signs of cold exposure, they won't go away. Most cases of cold exposure occur in temperatures above zero. If radio contact with camp is available, notify the nearest camp of changes to co-workers or conditions that could deteriorate into an emergency.

7.5 Camp Essential Services

The Site Services Superintendent is required to complete a risk assessment for maintenance of essential services during white out or condition red wind conditions. Adequate safety controls must be put in place prior to executing any attempt at outdoor maintenance or repairs during a white out. The execution of a plan to repair or maintain outdoor essential services equipment during a white out or condition red wind conditions, requires the approval of the operations manager or designate prior to execution.

Essential services include:

- electrical power
- kitchen operation
- water and sewage service
- equipment refuelling requirements

8 WINDSTORMS

1. Wind conditions are location specific. Management response to wind conditions (green, yellow, blue, red) must also be location specific.
2. The department supervisor is responsible to remain aware of weather conditions, including wind speeds.
3. The department supervisor, superintendent and manager are responsible to be aware of and apply the Green, Yellow, Blue and Red work guidelines for wind conditions.
4. Any lifting task involving the use of hoists or cranes must comply with the crane or hoist manufacturer's recommendations for wind speeds.
5. Each department superintendent, supervisor and workers are responsible to maintain housekeeping in their area of responsibility.
6. Wind storms are a normal part of year round Arctic weather. One of the most serious safety concerns during a wind storm is flying debris. The wind can lift and carry objects quickly through the air. These airborne objects are extremely hazardous to personnel. Objects most likely to become airborne are flat shaped and include sheets of plywood and sheets of metal. These objects stored outdoors must be adequately secured from the wind.

9 REFERENCES AND RECORDS

Whiteout and Windstorm Conditions Communication Form BAF-PH1-810-FOR-0021