APPENDIX A

Operations & Maintenance Manual for the Phase 1 All-Weather Access Road

September 29, 2011

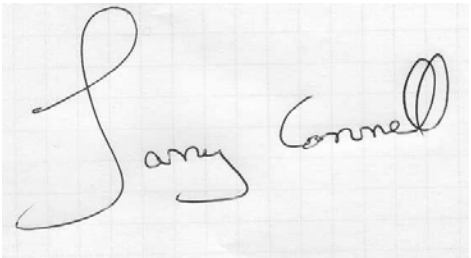
Kelli Gillard
Nunavut Impact Review Board
P.O. Box 1360
Cambridge Bay, NU
X0B 0C0

RE: **Meliadine Exploration Project**
Operations and Maintenance Manual for the Phase 1 All Weather Access Road
(Transportation Management Plan)

Dear Ms. Gillard,

Please note that enclosed Operations and Maintenance Manual for the Phase 1 All Weather Access Road (Transportation Management Plan) has been prepared by Agnico Eagle Mines Limited (AEM). It is appended as part of a document that was jointly prepared by both AEM and Golder Associates, who are working on behalf of AEM on this project. AEM has reviewed all of the statements, conclusions, predictions, recommendations and commitments that have been made in this document. The NIRB, along with all other parties should take it that all statements, predictions, recommendations and commitments made within this document have been approved by AEM and should be taken as commitments made by AEM for this specific Phase 1 AWAR project.

Yours sincerely,
Agnico Eagle Mines Limited



Larry Connell, P. Eng.
Corporate Director of Sustainable Development

cc:

Nunavut Planning Commission
Nunavut Water Board

Kivalliq Inuit Association
Aboriginal Affairs and Northern Development Canada – Iqaluit
Environment Canada
Fisheries and Oceans Canada
Transport Canada
Government of Nunavut

Meliadine Exploration Project

Operations & Maintenance Manual for the Phase 1 All-Weather Access Road

(Transportation Management Plan)

September 2011

Meliadine Exploration Project
Operations & Maintenance Manual for the Phase 1 All-Weather Access Road
Executive Summary

This document is pertaining to the all-weather access road (AWAR) which will be constructed for the Meliadine Gold Project owned by Agnico-Eagle Mines Limited (AEM). The Meliadine Gold Project is located approximately 25 kilometres (km) northwest of the Municipality of Rankin Inlet, Nunavut.

The Phase 1 AWAR will be a private road constructed primarily on Inuit Owned Land leased by AEM from the Kivalliq Inuit Association (KIA) (there are short sections of this road constructed on Commissioner's land and on Crown Land that will also be leased by AEM). Consequently AEM has sole responsibility for the construction and ongoing inspection and maintenance of all of the components of this road, including the road bed, bridges, culverts, and the borrow/quarry sites used in the construction of the road. This road will not be part of any Territorial highway system. This document is intended to serve as a manual to provide the planned operating and maintenance procedures that will be employed by AEM and its contractors for the AWAR.

Road design and construction

The road will be constructed, inspected, and maintained by AEM with its primary purpose being to support advanced exploration and development activity at the Meliadine West exploration site. The road will be a nominal single lane road with a running surface width of 6.5 metres (m) with 30 m long pull-offs (15 m long pull-off plus two 7.5 m long tapered at 15^{o} entry and exit zones) set at intervals of approximately every 350 m which expand the running surface to 9.5 m, allowing traffic to pass.

The construction of the road follows generally accepted good engineering practices for building roads in permafrost areas of the Northwest Territories and Nunavut.

Road inspection and maintenance

Inspection precedes maintenance. AEM recognizes that a good inspection program will lead to the early identification of areas of the road where improvements are necessary. The early resolution of any deficiencies will result in less ongoing maintenance and repair of the driving surface.

The road supervisor will conduct periodic inspections (minimum of weekly) of the road to ensure that the road is maintained for safe travel of personnel, equipment, and supplies. These inspections will be recorded and any deficiency recorded and followed up by a corrective plan. These periodic inspections will include an inspection of the bridge abutments and a visual observation of the road surface to assess the status of road foundation.

Traffic management

The Phase 1 AWAR will be operated as a private road with access controlled by a gate to be sited at the southern end of the road, just after the turnoff onto the Phase 1 AWAR (junction with existing municipal road just after the Char River Bridge). The gate will be staffed by AEM on a 24/7 basis when weather permits (for personnel safety the gate will not be staffed during winter blizzard conditions in which case the road will be closed to all traffic). The gate will only control traffic turning onto the Phase 1 AWAR and will have no effect or control over traffic driving on the existing municipal road that continues on past the Char River. Responsibility for traffic management on the Meliadine Phase 1 AWAR is the sole responsibility of AEM.

Wildlife management

Wildlife is expected occasionally to be observed on or immediately along the side of the access road. Caribou and other wildlife will have the right-of-way at all times. In case of problems (e.g., aggregations of caribou), the environmental personnel on-site will be in charge of managing the situation and with the collaboration of the security department will advise road users by patrolling the road. The project personnel will be notified by dispatch radio if any wildlife is observed on the road.

Environmental monitoring program

Once the road is operational, AEM will implement a monitoring program to record on a systematic basis the prevalence of wildlife seen along the Meliadine Phase 1 AWAR. The program will be developed with the input of the local HTO and with the KIA. The program will focus on caribou, muskox, bear, wolves, migratory birds, and raptors.

The program as envisioned will consist of a periodic ground survey of wildlife observed along the road. At the current time AEM is thinking that the minimum frequency would be weekly. The survey would log type of wildlife observed, estimate of numbers and nearest kilometer marking along the road. The data would be aggregated and presented in an annual report. AEM will explore sub-contracting this program to the local HTO in Rankin Inlet.

Management of hazards and emergency response

An AEM trained site-based emergency response and spill clean-up team will be available on-site with appropriate equipment to respond to all spills and road accidents. Spill response will be implemented by environmental staff who will advise, document, and report on initial response and clean-up actions. The existing Meliadine Gold Project Fuel Management and Spill Contingency Plan for Water Licences 2BE-MEP0813 and 2BB-MEL0914, November 2010 will be updated to include the all-weather road.

Operational parameters

In general, the operational parameters for the road are summarized as follows:

- wildlife has the right-of-way;
- all vehicles (except ATV's) are to be insured and licensed in accordance with licensing rules that apply on municipal and territorial roads in Nunavut;
- all drivers must be licensed and operate in accordance with the same rules that apply on municipal and territorial roads in Nunavut;
- any driver suspected of being impaired will be denied access to the road;
- hunting and fishing restrictions will be as per HTO's stipulations; and
- all spills of any materials will be reported and cleaned up, as set out in the spill contingency plans. The haulage fleet will be required to have appropriate spill containment and clean-up equipment on hand or available on demand.

These procedures were developed using experience from AEM's operation of the Meadowbank AWAR linking the Hamlet of Baker Lake to the Meadowbank mine.

This document provides a standard procedure for implementing the AWAR safety briefing to Rankin Inlet residents who require road access. These safety rules will be reviewed at least annually to determine what worked and what didn't work and will be amended in an adaptive fashion to learn from experience. Such amendments are to be implemented in consultation with the Municipality of Rankin Inlet and the Kivalliq Inuit Association.

ᑕᓯᕐᔪᐊᕐᒥ ᐅᔭᕋᒃᑕᕐᕕᐅᑉ ᐱᕙᓕᐊᓂᖓ
ᐅᑭᐅᓗᒃᑕᒥ ᐊᑐᕈᓇᖅᑐᖅ ᐊᑉᖁᑦ, ᐊᑐᒐᐅᓂᖓᓄᑦ ᐸᕐᓇᒍᑕᐅᓯᒪᔪᑦ 1
ᐊᐅᓚᑦᓯᔨᑦ ᐱᓕᕆᐊᕆᓯᔭᖏᑦ

ᑕᒻᓇ ᑎᑎᕋᒃᓯᒪᔪᖅ ᐸᕐᓇᒍᑕᐅᓯᒪᔪᖅ, ᐅᑭᐅᓗᒃᑕᒥ ᐊᑉᖁᑦ ᐊᑐᕈᓇᖅᑐᖅᓴᓴᓇᔭᐅᓂᐊᕐᓂᖓ. ᑕᒻᓇ ᓇᒥᓂᕆᔭᐅᔪᖅ ᐅᔭᕋᒃᑕᕆᐊᓂᑦ ᐊᒡᓂᑯ ᐃᑯ, ᓴᓇᔭᐅᓂᐊᖅᑐᖅ ᐅᔭᕋᒃᑕᕐᕕᒃᒧᑦ ᑕᓯᕐᔪᐊᕐᒧᑦ. ᐅᔭᕋᒃᑕᕐᕕᐅᓂᐊᖅᑐᖅ ᑕᓯᕐᔪᐊᕐᒥ, ᑲᖏᖅᖠᓂᐅᑉ ᓴᓂᐊᓂ ᐅᖓᓯᒃᑎᒋᔪᖅ 25 ᑭᓚᒥᑐᑦ, ᓄᓇᕗᒥ.

ᓯᕗᓕᒃᒥᒃ ᓴᓇᔭᐅᕙᓕᐊᓂᖓᓄᑦ, ᐅᑭᐅᓗᒃᑕᒥ ᐊᑐᕈᓇᖅᑐᖅ ᐊᑉᖁᑦ, ᐃᓄᐃᑦ ᓇᒥᓂᕆᔭᖓᓂ ᓄᓇᒥᑐᖅ, ᑭᕙᓕᕐᒥ ᐃᓄᐃᑦ ᑲᑐᔨᖃᑎᒋᑦ ᑲᒪᔭᖓᒃ. ᐃᓚᖓᑦ ᓄᓇ ᓇᒥᓂᕆᔭᐅᔪᖅ ᑲᒥᓯᓇᐅᑉ ᐊᒪᓗ ᐃᓚᖓᑦ ᓇᒥᓂᕆᔭᐅᔪᖅ ᑲᕙᒪᑐᖃᑯᓂᒃ. ᑕᑯᐊ ᓄᓇ ᐊᑐᖅᑐᐊᖅᑕᐅᓂᐊᕐᑐᑦ ᐊᒡᓂᑯ ᐃᑯ ᐅᔭᕋᒃᑕᕆᐊᓂᑦ. ᐊᒡᓂᑯ ᐃᑯ ᐅᔭᕋᒃᑕᕆᐊᑦ ᓴᓇᓂᐊᖅᑕᖓᑦ, ᖃᐅᔨᓴᖅᐸᓗᒍᓗ, ᐊᕿᒋᐊᖅᑐᓗᒍᓗ ᑲᒪᒋᓂᐊᖅᑕᖓᑦ. ᐊᑉᖁ ᐊᕿᒋᐊᖅᑕᕐᓗᒍ, ᑯᒐᕐᓂᓗ ᐃᑲᕐᕕᑦ ᐊᕿᒋᐊᖅᑕᕐᓗᒋᑦ, ᓱᐸᓗᓕᑦᓗ, ᐊᑐᕐᓗᑎᒃᓗ ᓯᐅᕋᒃᑕᕐᕕᒃᓂᒃ ᓴᓇᑎᓗᒋᑦ ᐊᑉᖁᒥᒃ. ᑕᒻᓇ ᐊᑉᖁᑦ ᐃᓚᐅᖃᑕᐅᓂᐊᖏᑐᖅ ᓄᓇᕗᑦ ᑲᕙᒪᑯᖏᓂᑦ ᐊᖁᑎᖏᓂᒃ. ᑭᓯᐊᓂᓕ ᑕᒻᓇ ᑎᑎᕋᒃᓯᒪᔪᖅ ᐸᕐᓇᒍᑕᐅᓂᖓᓄᑦ, ᐊᐅᓚᓂᖓᓄᑦ, ᐊᑐᖅᑕᐅᓂᖓᓄᑦᓗ ᐊᕿᓱᕈᑕᐅᔪᖅ, ᐊᒪᓗ ᐊᑉᖁᑦ ᐊᕿᓱᖅᑕᐅᑕᕐᓂᖓᓄᑦ. ᐊᑐᒐᐅᑕᕐᓗᓂᓗ ᐊᕿᓱᒐᐅᑕᕐᓗᓂᓗ ᐊᒡᓂᑯ ᐃᑯ ᐅᔭᕋᒃᑕᕆᐊᓂᑦ, ᐱᓕᕆᑎᑕᖏᑦᑐ ᐊᓯᖏᑦᓂᒃ.

ᐊᑉᖁᑦ ᐊᕿᓯᒪᓂᖓ ᐊᒪᓗ ᓴᓇᔭᐅᓂᖓᓗ

ᐊᑉᖁᑦ ᓴᓇᔭᐅᓂᐊᕐᑐᖅ, ᖃᐅᔨᓴᒐᐅᑕᕐᓗᓂ, ᐊᕿᓱᒐᐅᑕᕐᓗᓂᓗ ᐊᒡᓂᑯ ᐃᑯ ᐅᔭᕋᒃᑕᕆᐊᓂᑦ. ᐊᑐᒐᐅᓗᐊᕐᓗᓂ ᐅᔭᕋᒃᓴᓂᒃ ᕿᓂᖅᑎᓗᒋᑦ ᐊᒪᓗ ᐅᔭᕋᓕᕆᓕᖅᑎᓗᒋᑦ ᑕᓯᕐᔪᐊᕐᒥ. ᐊᑉᖁᑦ ᓯᓕᒃᑎᒋᓂᐊᕐᑐᖅ 6.5 ᒥᑐᒥᒃ ᐊᒪᓗ ᓴᓂᕙᕐᕕᖅᑕᕐᓗᓂ 30 ᒥᑐᑦ ᑕᑭᓂᓕᒃᓂᒃ. ᑕᑯᐊ ᓴᓂᕙᕐᕕᐅᑕᖅᑐᑦ ᐊᑉᖁᑦ ᑭᒡᓕᖓᓂ ᓴᓇᔭᐅᓯᒪᓂᐊᖅᑐᑦ. ᓴᓂᕙᕐᕕᑦ ᐊᑯᑐᑎᒋᓗᑎᒃ 350 ᒥᑐᑦᓂᒃ. ᑕᑯᐊ ᓄᓇᑯᕈᑎᓂᒃ ᓴᓂᕙᕐᕕᑦ ᐊᑉᖁᒥ, ᐊᑐᕐᓂᖃᖅᑐᑦ ᓄᓇᑯᕈᑎᑦ ᓄᓇᓚᐅᕐᓗᑎᒃ ᓴᓇᓂᕙᕐᕕᒃᓄᑦ, ᑕᐃᑯᐊ ᐃᖏᕋᔪᑦ ᓄᓇᑯᕈᑎᑦ ᖃᖏᖅᑕᕐᓂᐊᕐᒪᑕ. ᑕᒻᓇ ᓴᓂᕙᕐᕕᒃ ᐊᑉᖁᒥᒃ ᓯᓕᒃᓕᖅᑎᑲᓂᕐᓗᓂ 9.5 ᒥᑐᒥᒃ. (ᑕᑯᐊ ᐊᑉᖁᒥ ᓴᓂᕙᕐᕕᑦ 15 ᒥᑐᑦ ᑕᑭᑎᒋᔪᑦ) ᑕᒪᓇ ᐊᑉᖁᑦ ᓴᓇᔭᐅᓂᖓ ᒪᓕᒐᕐᓂᒃ ᒪᓕᒃᑐᑦ, ᐊᑉᖁᑎᑦ ᓴᓇᔭᐅᓂᖓᓄᑦ, ᓄᓇᑦᓯᐊᕐᒥᓗ ᓄᓇᕗᒥᓗ ᒪᓕᒐᖁᑎᖏᓂᒃ.

ᐊᑉᖁᑦ ᖃᐅᔨᓴᖅᑕᐅᑕᕐᓂᖓ ᐊᒪᓗ ᐊᕿᓱᖅᑕᐅᑕᕐᓂᖓ

ᐊᑉᖁᑦ ᐊᕿᓱᒐᐅᖃᕐᑎᓇᒍ ᖃᐅᔨᓴᖅᑕᐅᔭᕆᐊᖃᖅᑐᖅ. ᐊᒡᓂᑯ ᐃᑯ ᐅᔭᕋᒃᑕᕆᐊᑦ ᐱᓕᕆᔨᖏᑦ ᑐᑭᓯᔪᑦ ᐊᑉᖁᑦ ᐊᕿᓱᒐᐅᖃᑎᓇᒍ ᖃᐅᔨᓴᒐᐅᑦᓯᐊᕆᐊᖃᕐᒪᑦ. ᐊᑉᖁᑦ ᖃᐅᔨᓴᒐᐅᑕᕈᒥ ᐊᕿᒋᐊᕐᓂᖓ ᐱᓕᕆᐊᕆᑦᓯᐊᕐᓂᖅᓴᐅᓇᔭᕐᒪᑦ. ᐊᑉᖁᒥᒃ ᑲᒪᔨ ᓴᓇᑕᐃᓕ ᐊᑯᓂᖓᓂ, ᖃᐅᔨᓴᖅᑕᕐᓗᓂ ᐱᓕᕆᓂᐊᖅᑐᖅ. ᖃᐅᔨᓴᒐᐅᓂᖓ ᐃᓗᐊᕐᓂᐊᖅᑐᖅ, ᐱᓕᕆᔨᑦ ᐱᓕᕆᑦᓯᐊᕐᓂᐊᕐᒪᑕ, ᐱᖁᑎᕐᔪᐊᑦᓗ ᐊᔭᖅᑐᒐᐅᔪᑦ ᑭᖑᕙᖅᑕᕐᓂᐊᖏᒪᑕ ᐊᒪᓗ ᐊᓯᖏᑦ ᐅᔭᕋᒃᑕᕆᐊᕐᕕᒃᒧᑦ ᐊᔭᖅᑐᒐᐅᔪᑦ ᑭᖑᕙᒃᑕᕐᓂᐊᖏᒪᑕ. ᐊᑉᖁᑦ ᖃᐅᔨᓴᒐᐅᑎᓗᒍ ᑕᒪᑯᐊ ᖃᐅᔨᓴᕐᓂᑯᑦ ᑎᑎᕋᒃᑕᐅᑕᕐᓂᐊᕐᑐᑦ, ᐱᓕᕆᐊᕆᐊᕆᔭᐅᓚᒃᓯᓇᕐᓗᑎᒃᓗ. ᐊᑉᖁᑦ ᖃᐅᔨᓴᒐᐅᓕᕋᖓᑦ ᖃᖓ, ᐃᑲᕐᕕᑦ, ᓱᐸᓗᓕᑦ, ᑕᒪᑯᐊ ᖃᐅᔨᓴᖅᑕᐅᑕᕐᓂᐊᖅᑐᑦ.

ᐊᑉᖁᑦ ᐊᑐᕐᓂᖓ

ᐊᑉᖁᑦ ᐅᑭᐅᓗᒃᑕᒥ ᐊᑐᕈᓇᖅᑐᖅ ᓯᕗᓕᕐᒥᒃ ᐸᕐᓇᓂᖓᓄᑦ ᑎᑎᕋᒃᓯᓚᔪᖅ ᑕᒻᓇ ᓇᒥᓂᕆᔭᐅᔪᖅ ᐊᒡᓂᑯ ᐃᑯ ᐅᔭᕋᒃᑕᕆᐊᓂᑦ. ᐊᑉᖁᑦ ᔨ ᐅᑯᐊᓂ ᐊᕙᓗᖅᕐᓂᐊᖅᑐᖅ ᐊᑐᕐᓂᐊᖅᑐᑦ ᖃᐅᓴᐅᑕᕐᓂᐊᕐᒪᑕ, ᑕᒻᓇ ᕼᐊᒻᓚᑯᑦ ᐊᑉᖁᑎᖓᓂᑦ ᐱᒋᐊᕐᓗᓂ. ᐊᑉᖁᒥ ᐊᕙᓗ ᐃᓂᖓ, ᓯᕗᓕᖅ ᐃᑲᕐᕕᒃ ᖃᖏᕐᓗᒍ ᓴᓂᐊᓂᓂᐊᕐᑐᖅ. ᑕᒻᓇ ᐊᑉᖁᒥ ᐊᕙᓗ ᐅᔭᕋᒃᑕᕆᐊᑦ ᐱᓕᕆᔨᖓᓂᒃ ᐃᓄᖅᐃᓇᕐᓂᐊᖅᑐᖅ ᐅᑉᓗᑕᒪᑦ, ᐃᑲᕋᓗ 24ᓂᒃ. ᑭᓯᐊᓂ ᐅᑭᐅᒥ ᓯᓚ ᐱᖅᓯᓕᕋᖓᑦ ᐅᑯᐊᖅᓯᑕᕐᓂᐊᖅᑐᖅ. ᓄᓇᑯᕈᑎᓗᒃᑕᑦ ᐅᔭᕋᒃᑕᕐᕕᒃᒧᐊᖅᑐᑦ ᑕᓯᕐᔪᐊᕐᒥ, ᖃᐅᔨᓴᒐᐅᑕᕐᓂᐊᖅᑐᑦ ᐊᕙᓗᒥ ᐱᓕᕆᔨᓂᑦ. ᑕᐃᑯᐊ ᐊᑉᖁᑎᑦ ᕼᐊᒻᓚᑯᑦ ᓇᒥᓂᖏᑦ ᑲᒪᒋᔭᐅᒪᑕ ᕼᐊᒻᓚᑯᓂᑦ. ᐊᑉᖁᑦ ᐅᔭᕋᒃᑕᕐᕕᒃᒧᐊᖅᑐᖅ ᑕᓯᕐᔪᐊᕐᒧᑦ, ᑲᒪᒋᔭᐅᓂᐊᖅᑐᖅ, ᐊᒡᓂᑯ ᐃᑯ ᐅᔭᕋᒃᑕᕆᐊᓂᑦ.

ᓂᕐᔪᑎᑦ ᑲᒪᒋᔭᐅᓂᖕᒋᑦ

ᓂᕐᔪᑎᑦ ᐊᑉᕐᑯᒥᓗ ᓴᓂᐊᓂᓗ ᑕᑯᔭᐅᑕᖅᓯᓇᕆᐊᕐᑲᕐᒪᑕ ᑲᒪᒋᔭᐅᓂᐊᕐᒥᔪᑦ. ᑐᒃᑐᑦ ᐊᓯᖕᒋᑦᓗ ᓂᕐᔪᑎᑦ ᓯᕗᓕᐅᑎᑕᐅᑕᕐᓂᐊᖅᑐᑦ ᐊᑉᕐᑯᒥ. ᓂᕐᔪᑎᑦ ᐊᑉᕐᑯᑎᑯᑦ ᑭᐱᓯᓂᐊᖅᑐᔭᕋᖕᒐᒥᒃ ᓯᕗᓕᐅᑎᑕᐅᑕᕐᓂᐊᖅᑐᑦ. ᑐᒃᑐᑦ ᐊᒥᕋᐅᔭᕋᖕᒐᒥᒃ, ᐊᒥᓱᓗᐊᓕᕋᖕᒐᑕᓗ ᓂᕐᔪᑎᑦ, ᐊᑉᕐᑯᑦ ᓴᓂᐊᓂ, ᐊᕙᑎᓕᕆᔩᑦ ᐅᔭᕋᒃᑕᕆᐊᑦ ᐱᓕᕆᔩᖕᒋᑦ ᑕᑯᓂᖕᒐ ᑲᒪᒋᔭᕐᑲᖅᑕᕐᓂᐊᖅᑐᑦ, ᐊᓯᖕᒋᑦ ᐱᓕᕆᔩᑦ ᐱᓕᕆᕐᑲᑎᒥᓗᒋᑦ. ᐅᔭᕋᒃᑕᕆᐊᑦᓗ ᐳᕐᑭᖅᑕᓕᖕᒋᑦ ᐱᓕᕆᕐᑲᑎᒋᔭᐅᓗᑎᒃ. ᓂᕐᔪᑎᑦᓗ ᓇᓂᑐᐃᓇᖅ ᐊᑉᕐᑯᒥ ᑕᑯᔭᐅᔪᑦ, ᐅᕐᑲᐅᓯᐅᑕᕐᓂᐊᖅᑐᑦ ᓄᓇᑯᕈᒥ ᐅᕐᑲᓗᑎᑎᒍᑦ. ᓂᕐᔪᑎᓗᒃᑕᑦ ᐱᓕᕐᑭᔩᓂᑦ ᑲᒪᒋᔭᐅᑕᕐᓂᐊᕐᑐᑦ.

ᐊᕙᑎᓕᕆᔩᑦ ᐱᓕᕆᐊᖕᒋᑦ

ᐊᑉᕐᑯᑦ ᓴᓇᔭᐅᒐᓂᒃᐸᑦ, ᐊᒡᓂᑯ ᐃᑯ ᐅᔭᕋᒃᑕᕆᐊᑦ ᐊᕙᑎᓕᕆᔩᖕᒋᑦ ᓂᕐᔪᑎᑦ ᕐᑲᓄᖅ ᑲᒪᒋᔭᐅᑕᕐᓂᐊᕐᒪᖕᒐᑕ ᐸᕐᓇᒃᐸᓕᐊᓂᐊᕐᑐᑦ, ᐱᓕᕆᕐᑲᑎᕐᑲᓗᑎᒃ ᑲᖕᒋᖅᓕᓂᕐᒥ ᐊᖕᒍᓇᓱᒃᑎᑦ ᑲᑎᒪᔩᖕᒋᓂᒃ. ᑭᕙᓕᕐᒥ ᐃᓄᐃᑦ ᑲᑐᔩᕐᑲᑎᒋᑦ ᐱᓕᕆᕐᑲᑎᒋᔭᐅᓂᐊᕐᒥᔪᑦ, ᑕᒪᓇ ᐸᕐᓇᒍᑕᐅᑎᓗᒍ. ᓂᕐᔪᑎᑦ ᑲᒪᒋᔭᐅᓂᖕᒋᑦ ᐸᕐᓇᒍᑕᐅᑎᓗᒋᑦ, ᐅᑯᐊ ᐃᓱᒪᒋᔭᐅᓗᐊᕐᑐᑦ, ᑐᒃᑐᑦ, ᐅᒥᒪᑦ, ᐊᒃᓚᑦ, ᐊᒪᕐᑯᑦ, ᑎᖕᒥᐊᓗᒃᑕᑦ, ᐊᒪᓗ ᑭᒡᒐᕕᑦ, ᐊᓯᖕᒋᑦᓗ ᓂᕐᔪᑎᑦ.
ᐊᑉᕐᑯᑦ ᕐᑲᐅᔨᓴᒐᐅᑕᕐᓂᐊᖅᑐᖅ ᓂᕐᔪᑎᕐᑲᕐᒪᖕᒐᑦ, ᓴᓇᑕᐃᓕ ᐊᑯᓂᖕᒐᓂ, ᑕᒪᑯᐊ ᓂᕐᔪᑎᑦ ᐊᑉᕐᑯᑦ ᓴᓂᐊᓂ ᑕᑯᔭᐅᔪᑦ, ᑕᒪᕐᒥᒃ ᑎᑎᕋᒃᑕᐅᑕᕐᓂᐊᖅᑐᑦ ᕐᑲᐅᔨᓴᕐᑎᓗᒋᑦ. ᔪᓇᑦ ᓂᕐᔪᑎᑦ ᑕᑯᔭᐅᒪᖕᒐᑕ, ᕐᑲᑉᓯᐅᒪᖕᒐᑕ, ᕐᑲᓄᕐᓗ ᐊᑉᕐᑯᒥᑦ ᐅᖕᒐᓯᒃᑎᒋᒪᖕᒐᑕ, ᑕᒪᑯᐊ ᐊᓯᖕᒋᑦᓗ ᑎᑎᕋᒃᑕᐅᑕᕐᓂᐊᕐᑐᑦ. ᑕᒪᑯᐊ ᕐᑲᐅᔨᓴᕐᓂᑯᑦ ᕐᑲᑎᖅᓱᓕᐅᓗᑎᒃ, ᐅᕐᑲᐅᓯᐅᑕᕐᓂᐊᖅᑐᑦ ᐃᓱᒪᓕᐅᕈᑕᐅᓗᑎᒃ, ᐊᒪᓗ ᐅᕐᑲᐅᓯᐅᓗᑎᒃ, ᐅᑭᐅᑕᒪᒥ ᑲᑎᒪᓕᕋᖕᒐᑕ. ᑕᒪᓇᓗ ᓂᕐᔪᑎᓂᒃ ᕐᑲᐅᔨᓴᕐᓂᖅ, ᐱᓕᕆᐊᖕᒍᒥᓇᕆᐊᓕᒃ ᑲᖕᒋᖅᓕᓂᕐᒥ ᐊᖕᒍᓇᓱᒃᑎᑦ ᑲᑎᒪᔩᖕᒋᓂᑦ, ᑭᓯᐊᓂ ᑕᒪᓇ ᐸᕐᓇᒍᑕᐅᓂᐊᕐᑐᖅ.

ᐅᓗᕆᓇᕈᓇᖅᑐᑦᓗ ᑐᐊᕕᓇᕈᓇᖅᑐᑦᓗ ᐊᐅᓚᓂᖕᒋᑦ

ᐅᔭᕋᒃᑕᕆᐊᕐᕕᒃᒥ ᑕᓯᕐᔪᐊᕐᒥ, ᑐᐊᕕᕐᓇᖅᑐᕐᑲᕐᓂᕐᒧᑦ ᐱᓕᕆᔨᕐᑲᕐᓂᐊᖅᑐᑦ. ᑕᑯᐊ ᐱᓕᕆᐊᕐᑲᕋᔭᖅᑐᑦ ᓄᓇᒥ ᓇᓂᑐᐃᓇᖅ ᐅᓗᕆᐊᓇᖅᑐᓂᒃ ᑯᕕᔪᕐᑲᖅᐸᑦ, ᐊᒪᓗ ᓱᓇᑐᐃᓇᕐᓂᒃ ᑐᐊᕕᓇᖅᑐᕐᑲᖅᐸᑦ, ᑕᒪᑯᐊ ᐱᓕᕆᐊᕆᔭᐅᓗᑎᒃ ᑲᒪᒋᔭᐅᓇᔭᖅᑐᑦ. ᓄᓇᒥ ᓇᓂᑐᐃᓇᕐᓂᒃ ᑯᕕᔪᕐᑲᖅᐸᑦ, ᐅᔭᕋᒃᑕᕆᐊᑦ ᐊᕙᑎᓕᕆᔩᖕᒋᑦ, ᑕᒪᑯᓂᖕᒐ ᑲᒪᒋᔭᕐᑲᕋᔭᖅᑐᑦ. ᑯᕕᔪᑦ ᓱᓇᑐᐃᓇᐃᑦ ᓄᓇᒧᑦ ᓴᓗᒪᖅᓴᖅᑕᐅᓗᑎᒃ, ᐊᒪᓗ ᐱᓕᕆᐊᕆᔭᐅᔪᑦ ᑎᑎᕋᒃᑕᐅᑕᕐᓗᑎᒃ ᑲᒪᒋᔭᐅᑕᕐᓂᐊᖅᑐᑦ. ᐅᔭᕋᒃᑕᕆᐊᕕᐅᑉ ᑕᓯᕐᔪᐊᕐᒥ ᓚᐃᓴᖕᒐ ᐊᒪᓗ ᓄᓇᒧᑦ ᑯᕕᔪᕐᑲᖅᐸᑦ ᐸᕐᓇᒍᑕᐅᓯᒪᔪᑦ, ᐊᕐᑭᒋᐊᖅᑕᐅᑕᕐᓂᐊᕐᑐᑦ ᐃᓗᐊᕐᓂᖅᓴᒥᒃ. ᐅᔭᕋᒃᑕᕆᐊᕐᓂᕐᒧᑦ ᑕᓯᕐᔪᐊᕐᒥ ᓇᐃᓴᑦ ᓇᓴᐅᑎᓕᒃ ᐃᒪᓕᕆᓂᕐᒧᑦ 2BE-MEP0813 ᐊᒪᓗ 2BB-MEL0914, ᑕᒻᓇ ᓄᕕᐱᕆᒥ 2010ᒥ ᐊᖕᒋᒐᐅᓚᐅᖅᑐᖅ. ᑕᒪᑯᐊ ᐱᓕᕆᐊᑦ ᐊᕐᑭᒋᐊᖅᑕᕐᓂᐊᖅᑐᑦ, ᐊᒪᓗ ᐊᑉᕐᑯᓕᐅᕐᑎᓗᒋᑦ ᐱᓕᕆᐊᖕᒍᔪᑦ ᐊᕐᑭᒋᐊᕐᑕᕐᓂᐊᖅᑐᑦ.

ᐊᑉᕐᑯᑎᐅᑉ ᐊᑐᒐᐅᓂᖕᒐ

ᑕᓯᕐᔪᐊᕐᒧᐊᕐᑐᖅ ᑲᖕᒋᖅᓕᓂᕐᒥᑦ ᐅᑉᕐᑯᑦ ᐅᑯᓄᖕᒐ ᐊᑐᒐᐅᒐᐅᓂᕐᑲᓗᐊᓂᐊᕐᑐᖅ:

- ᓂᕐᔪᑎᓗᒃᑕᑦ ᐊᑉᕐᑯᒥ ᓯᕗᓕᐅᑎᑕᐅᑕᕐᓂᐊᖅᑐᑦ,
- ᓄᓇᑯᕈᑎᓗᒃᑕᑦ (Hᐊᓐᑕᑦ ᐃᓚᐅᖕᒥᓗᑎᒃ) ᓚᐃᓴᕐᑲᓇᐊᕐᑲᖅᑐᑦ, Hᐊᒻᓚᑯᓂᑦ, ᓄᓇᕗᑦᓗ ᑲᕙᒪᑯᖕᒥᓂᑦ ᐅᕙᓗᓂᑦ ᓇᐃᓴᓂᒃ ᑐᓂᐅᕐᑲᐸᒃᑐᓂᑦ, ᓄᓇᕗᒥ,
- ᓄᓇᑯᕈᑎᓂᒃ ᐸᐳᕈᒃᓯᖅᐸᒃᑐᑦ ᓇᐃᓴᕐᑲᓇᐊᕐᑲᖅᑐᑦ ᐸᐱᕈᒃᓯᕐᓂᕐᒧᑦ, ᓚᐃᓴᑕᕐᕕᐅᕙᒃᑐᓂᑦ. ᑕᒪᑯᐊ ᐊᑉᕐᑯᑎᓗᒃᑕᑦ ᓄᓇᕗᒥ ᐊᑐᒐᐅᓂᖕᒐᓄᑦ ᓚᐃᓴᕐᑲᖅᑐᓄᑦ ᐊᑐᒐᐅᔭᕆᐊᕐᑲᕐᒪᑕ.
- ᑭᑐᒥᐊᑦ ᐃᒥᖅᓯᒪᔪᓗᓂᑦ ᐊᖕᒐᔭᖅᑐᓗᓂᑦ, ᐊᕐᕐᑯᑎᑯᑕᕐᓂᐊᖕᒋᑐᑦ,
- ᐊᖕᒍᓇᓱᒃᑕᕐᓂᕐᒧᑦ ᐊᑉᕐᑯᒥ ᐊᑐᕐᓂᖕᒐ, ᐊᕐᑭᒃᑕᐅᓂᐊᕐᑐᖅ ᑲᖕᒋᖅᓕᓂᕐᒥ ᐊᖕᒍᓇᓱᒃᑎᑦ ᑎᑎᕋᕕᖕᒐ ᐱᓕᕆᕐᑲᑎᒋᔭᐅᓗᑎᒃ.
- ᓱᓇᒥᐊᑦ ᐊᑉᕐᑯᒥ ᑯᕕᔪᑦ ᕐᑲᐅᔨᓴᐅᓗᑎᒃ ᓴᓗᒪᖅᓴᖅᑕᐅᑕᕐᓂᐊᖅᑐᑦ. ᓄᓇᒥ ᑯᕕᓂᕐᒧᑦ ᐸᕐᓇᒍᑕᐅᓯᒪᔪᓄᑦ ᐊᑐᕐᓗᒋᑦ, ᑲᒪᒋᔭᐅᑕᕐᓂᐊᖅᑐᑦ. ᓄᓇᑯᕈᑎᕐᔪᐊᑦ ᑯᕕᔪᕐᑲᖅᐸᑦ ᓴᓗᒪᖅᓴᐃᔪᑎᓂᒃ ᓇᒃᓴᖅᑕᕐᓂᐊᖅᑐᑦ. ᓴᓗᒪᖅᓴᐃᒍᒃᓇᖅᑐᑦᓗ ᐱᓕᕆᔨᑦ ᐊᕐᑭᓯᒪᑕᕐᓂᐊᖅᑐᑦ.

ᑕᒪᑯᐊ ᐸᕐᓇᒍᑕᐅᓯᒪᔪᑦ ᒪᓕᒃᑐᑦ ᐊᕐᑭᓯᒪᓂᖕᒋᑦ, ᐊᐳᖅᑎᓐᓇᖅᑐᒥ ᐅᔭᕋᒃᑕᕐᕕᒃᒥ. ᕐᑲᒪᓂᑐᐊᕐᒥᑦ ᐊᐳᖅᑎᓐᓇᖅᑐᒧᑦ ᐊᑉᕐᑯᒥ ᐸᕐᓇᒍᑕᐅᓯᒪᔪᑦ, ᑕᐃᒪᓇ ᑕᑯᐊ ᐊᑐᕐᓂᐊᖅᑐᑦ ᑕᓯᕐᔪᐊᕐᒥ.

ᑕᒪᑯᐊ ᐊᑉᕐᑯᒧᑦ ᐸᕐᓇᒍᑕᐅᓯᒪᔪᑦ ᑎᑎᕋᒃᓯᔪᑦ, ᐊᒪᓗ ᐅᑭᐅᓗᒃᑕᒥ ᐊᑉᕐᑯᑦ ᐊᑐᕐᓂᖕᒐᓄᑦ ᒪᓕᒐᒃᓴᐃᑦ ᐊᑐᕐᓂᐊᕐᑐᑦ ᑲᖕᒋᖅᓕᓂᕐᒥ. ᐃᓄᐃᑦ ᐊᑉᕐᑯᒥᒃ, ᑲᖕᒋᖅᓕᓂᕐᒥ ᐊᑐᕈᒪᔪᑦ ᑕᒪᑯᓂᖕᒐ ᐸᕐᓇᒍᑕᐅᓯᒪᔪᓂᒃ ᒪᓕᒋᐊᕐᑲᖅᑐᑦ. ᑕᒪᑯᐊᓗ ᐊᑉᕐᑯᑦ ᒪᓕᒐᐃ ᐊᕐᑭᒋᐊᖅᑕᕐᓂᐊᖅᑐᑦ ᐅᑭᐅᑕᒪᑦ, ᓇᒪᑦᓯᐊᖅᑐᒥᒃ ᐃᖕᒋᕋᓂᐊᕐᒪᑦ. ᑕᒪᑯᐊ ᐊᕐᑭᒋᐊᓂᖕᒋᑦ ᐱᓕᕆᐊᕆᔭᐅᑎᓗᒋᑦ, ᑲᖕᒋᖅᓕᓂᕐᒥ Hᐊᒻᓚᑯᑦ ᐊᒪᓗ ᑭᕙᓕᕐᒥ ᐃᓄᐃᑦ ᑲᑐᔩᕐᑲᑎᒋᑦ ᐱᓕᕆᕐᑲᑎᒋᔭᐅᓂᐊᕐᑐᑦ.

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Municipality of Rankin Inlet

Rankin Inlet Hunter and Trapper's Organization

Meliadine Health & Safety Committee

Government of Nunavut – Department of Environment

Indian and Northern Affairs Canada – Water Resources and Land Administration

Kivalliq Inuit Association

Nunavut Impact Review Board

Nunavut Water Board

Health & Safety Coordinator

Environmental Coordinator

Road Supervisor

General Manager

AWAR Dispatch & Gatehouse

M&T Nuna Services in Rankin Inlet

1.0 INTRODUCTION

The Meliadine Gold Project is located approximately 25 kilometres (km) northwest of the Municipality of Rankin Inlet, Nunavut. Agnico-Eagle Mines Ltd. (AEM) is planning to construct a gravel surfaced road to provide all-weather access between Rankin Inlet and the Meliadine Project site. The all-weather access road (AWAR) will be constructed in two phases to accommodate the environmental assessment and permitting process:

Phase 1 – Advanced Exploration Phase

> The Phase 1 AWAR will involve the construction of a 23.8 km long by 6.5 metres (m) wide road between the Char River bridge turn-off and the Meliadine West exploration project site with access controlled by a single manned gate located just after the Char River bridge turn-off. The Phase 1 AWAR will allow AEM to safely and efficiently support advanced exploration of the Meliadine West deposits through the feasibility and environmental assessment phase of the Meliadine Gold Project. The Phase 1 AWAR will be decommissioned and reclaimed by AEM if the Project fails to pass either the Feasibility stage or Environmental Assessment Phase.

Phase 2 – Mine Construction and Operations Phase

> The Phase 2 AWAR will involve the construction of a 23.8 km long by 8.0 m wide road between the Char River bridge turn-off and the Meliadine West Project site, with a 9.4 km long by 8.0 m wide spur road to the Meliadine East Project site. The Phase 2 AWAR will allow AEM to safely and efficiently support construction, operation, and ultimately decommissioning of the Meliadine Gold Mine. The Phase 2 AWAR would only proceed to permitting once the project successfully passes the Feasibility stage and Environmental Assessment Phase. The Phase 2 AWAR is expected to allow open public access to Meliadine Lake with access to both the Meliadine East and West Project sites controlled by gates.

This road will be a private road constructed primarily on Inuit Owned Land leased by AEM from the Kivalliq Inuit Association (KIA) (there are short sections of this road constructed on Commissioner's land and on Crown Land that will also be leased by AEM). Consequently AEM has sole responsibility for the construction and ongoing inspection and maintenance of all of the components of this road, including the road bed, the bridges, the culverts, and the borrow/quarry sites used in the construction of the road. This road will not be part of any Territorial highway system.

This manual provides the planned operating and maintenance procedures that will be employed by AEM and its contractors for the Phase 1 AWAR. These procedures were developed using experience from AEM's operation of the Meadowbank AWAR linking the Hamlet of Baker Lake to the Meadowbank mine. The objective is to ensure that the movement of equipment, supplies, and personnel from Rankin Inlet to the Meliadine West Exploration Camp is done in

such a way as to ensure the safety of all road users, while minimizing the potential for incidents or malfunctions. Operating procedures included address road maintenance, road inspection, traffic management, wildlife management, emergency response, and environmental monitoring. In addition, the manual summarizes the information on road design and construction. It will be updated on an annual basis at a minimum or more often as change in circumstances require.

This manual will be used as a reference for road inspection, road maintenance, personnel training and information sessions to be held with road users.

2.0 ROAD DESIGN AND CONSTRUCTION

The Phase 1 Meliadine AWAR will be a private road constructed primarily on Inuit Owned Lands leased by AEM from the KIA. The road will be constructed, inspected, and maintained by AEM with its primary purpose being to support advanced exploration and development activity at the Meliadine West exploration site. The road will be a nominal single lane road with a running surface width of 6.5 m with 30 m long pull-offs (15 m long pull-off plus two 7.5 m long tapered at 15^{o} entry and exit zones) set at intervals of approximately every 350 which expand the running surface to 9.5 m, allowing traffic to pass.

2.1 SPECIFICATIONS FOR ROAD DESIGN

The geometric design of the road is based on the criteria included in the Transport Association of Canada Geometric Design Guide for Canadian Roads (TAC 2007[1]). The construction of the road follows generally accepted good engineering practices for building roads in permafrost areas of the Northwest Territories (NWT) and Nunavut. The road design is detailed in the Golder report "All Weather Access Road, Meliadine Gold Project, Feasibility Level Design, January 2011"[2]. It should be read in its entirety for a complete description of the road design.

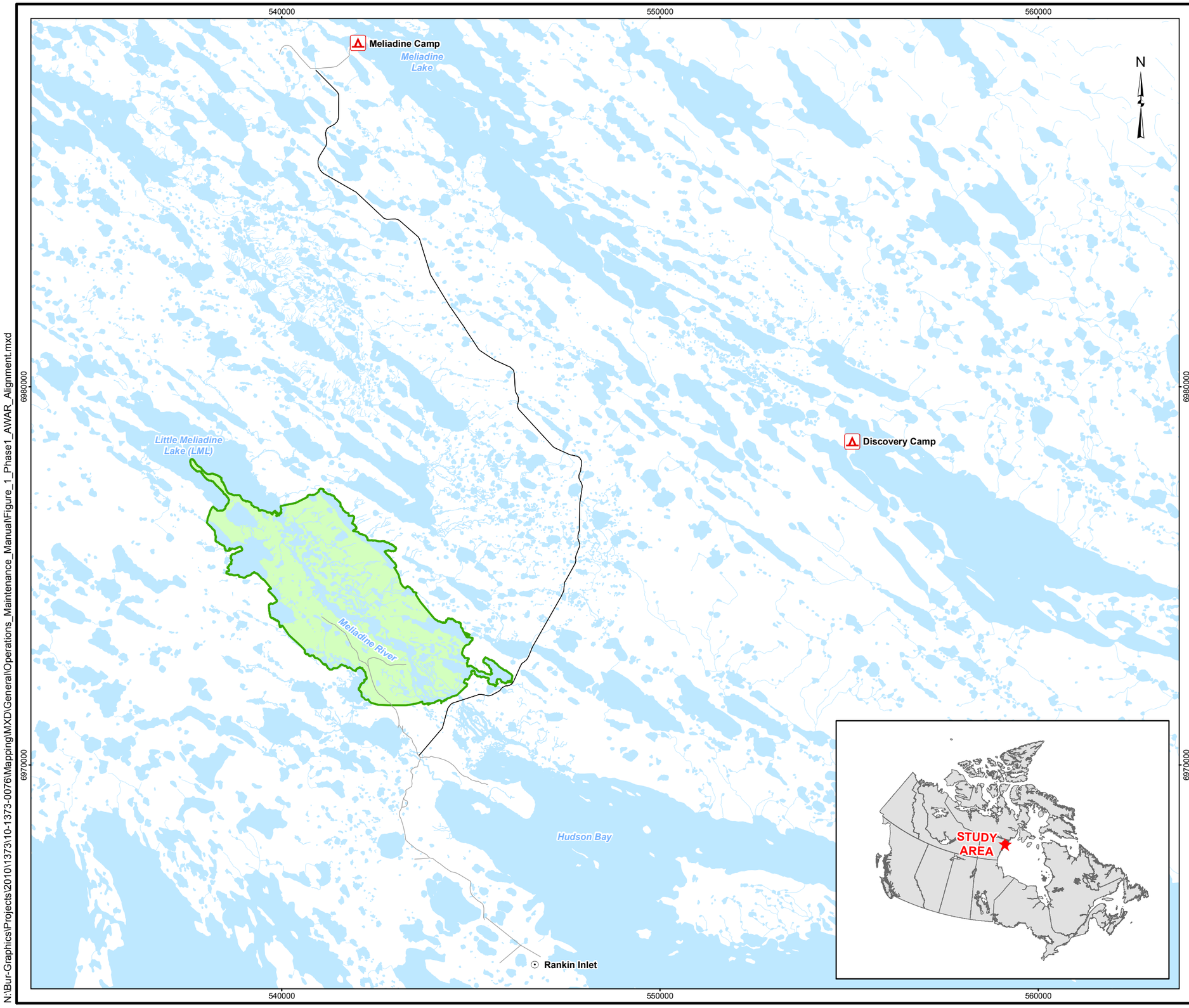
2.1.1 Routing of the Road

The routing of the Phase 1 AWAR road from Rankin Inlet to the Meliadine West Exploration Camp was selected to minimize possible effects on the environment, minimize the number of water crossings, and facilitate maintenance of the road particularly during winter. The selection of the route was based on a number of considerations, including the overall length of the road, the route's proximity to satellite ore bodies, a desire to minimize the number of stream crossings, the availability of quarries along the route, geomorphology, avoidance of archaeological sites, avoidance of the Iqaluqaarjuup Nunanga territorial park, and the goal of remaining on the height of land to allow for drainage in the summer and for wind to clear snow in the winter.

The Phase 1 road routing is shown in Figure 1.

The proposed AWAR will start from the existing municipal road that provides access to the Iqaluqaarjuup Nunanga Territorial Park, just after it crosses the Char River. From there the road continues to the Meliadine River, east of the park. The road will not enter the park. After crossing the Meliadine River, the road will cross an area of low topography before climbing to the height of land and following the existing all-terrain vehicle trail to the Meliadine site.

[1] Transport Association of Canada Geometric Design Guide for Canadian Roads 2007
[2] Golder Report entitled "All Weather Access Road, Meliadine Gold Project, Feasibility Level Design", dated January 2011, Report number 09-1426-0015/4700 – 085 Rev. 1.



LEGEND

- Camp
- Phase 1 AWAR Road Alignment
- Road - Existing
- Territorial Park
- Watercourse
- Waterbody

REFERENCE

Base data obtained from Agnico-Eagle Mines Ltd (AEM).
Datum: NAD 83 Projection: UTM Zone 15

2 0 2
SCALE 1:100,000 KILOMETRES

PROJECT

AGNICO-EAGLE MINES LTD.
MELIADINE GOLD PROJECT
NUNAVUT

TITLE

PHASE 1 AWAR LOCATION AND ALIGNMENT

Golder Associates
Greater Vancouver Office, B.C.

PROJECT NO. 10-1373-0076			FILE No.		
DESIGN	JG	22 Aug. 2011	SCALE AS SHOWN	REV.	0
GIS	CDB	22 Aug. 2011	FIGURE: 1		
CHECK	JG	08 Sep. 2011			
REVIEW	GRA	20 Sep. 2011			

N:\Bur-Graphics\Projects\2010\1373\10-1373-0076\Mapping\MXD\General\Operations_Maintenance_Manual\Figure_1_Phase1_AWAR_Alignment.mxd

2.1.2 Road Construction Material

The road will be constructed from glacial-fluvial material and quarry rock.

The minimum thickness, or depth, of the road will vary from 1.0 to 1.3 m, depending on whether the underlying soil is thaw-stable (1.0 m) or thaw-susceptible (1.3 m). Two types of structural fill are proposed for construction. The first is 75 millimetres in particle size or smaller, and is known as Type 1 fill. This material will be used as a top dressing for the road and will form the running surface. Type 2 fill is coarse run-of-quarry rock, and will form the base of the road.

All proposed rock and granular quarry/borrow sources used for road construction have been tested and verified as being non- acid generating and with low metal leaching potential.

2.1.3 Road Configuration and Design

The Phase 1 AWAR will be a nominal single lane road with a running surface of 6.5 m in width. There will be passing turnouts of 30 m in length set at intervals of approximately every 350 m distance along the road (actual distance between passing turnouts will be 400m +/- 50m to be optimized with the topography for safety purposes). The nominal running surface at each passing turnout will be 9.5 m in width. The minimum road depth will be 1.0 m for areas over non-thaw susceptible soil (well-drained soil over bedrock) and 1.3 m for areas over thaw susceptible soil (poorly drained, ice-rich, organic or bog over bedrock)[3]. In both cases the side slope of the road would be 2.5H:1V. Thus the nominal base width of the road will be 13.0 m wide, increasing to 16.0 m wide at each passing turnout.

Figure 2 shows a typical road cross-section for the road to be constructed over areas of thaw susceptible soil. Figure 3 shows a typical cross-section for the road at a passing turnout to be constructed over areas of thaw susceptible soil.

[3] Golder Report entitled “All Weather Access Road, Meliadine Gold Project, Feasibility Level Design”, dated January 2011, Report number 09-1426-0015/4700 – 085 Rev. 1. Section 4.2

Figure 2: Typical road cross-section for thaw susceptible soil

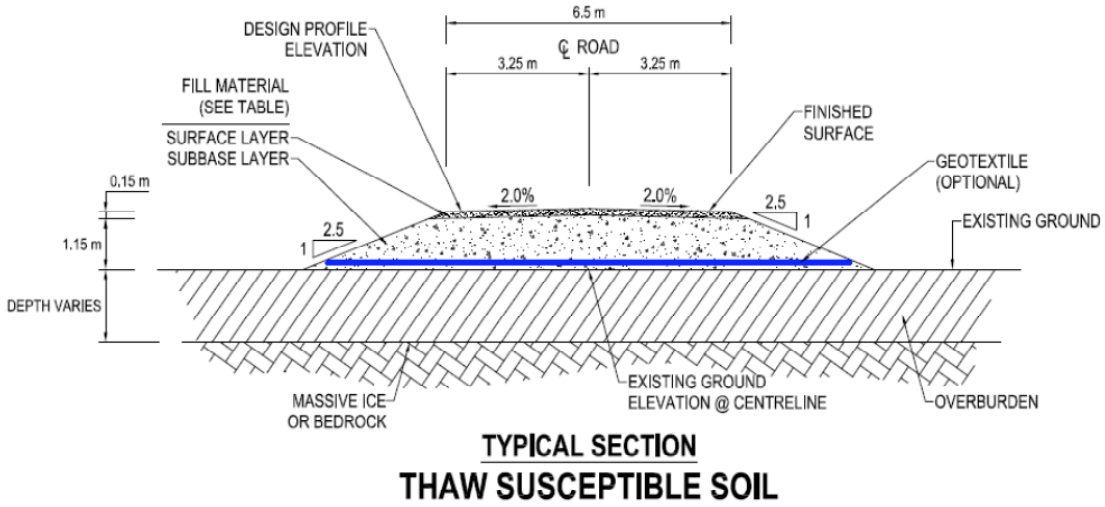
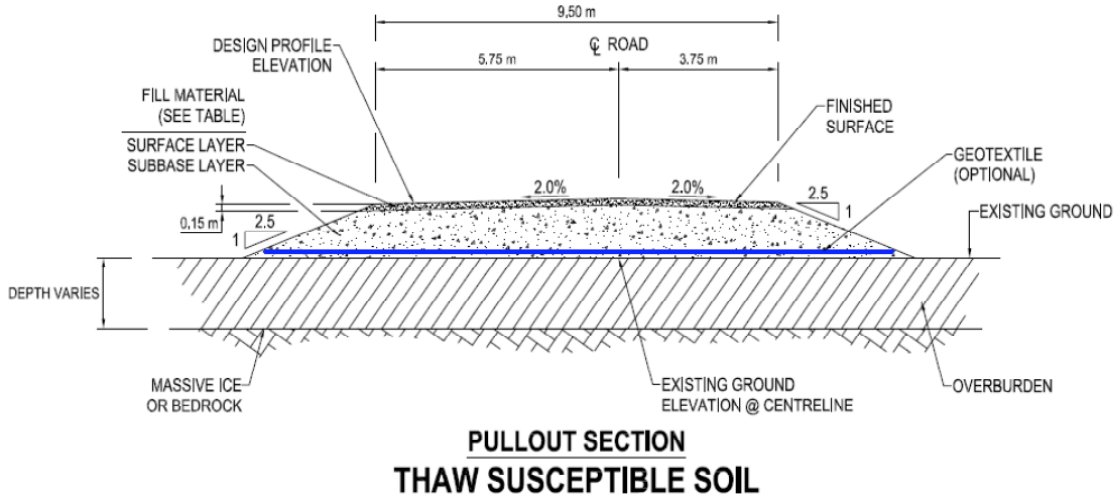


Figure 3: Typical road cross-section at a passing turnout for areas over thaw susceptible soil



The main road design criteria are shown in Table 1.

TABLE 1: Phase 1 Road design criteria

Design Element	Criteria
Rock Fill/Glacial-fluvial sand/gravel	Low to no acid generating potential and low metal leaching potential
Length or road to camp	23.8 km
Travel surface width	6.5 m (Phase 1 – to be expanded to 8.0 m for Phase 2) – nominal single lane road for Phase 1 AWAR).
Maximum slope gradient	8% (TAC 2007 p. 2.1.3.2)
Maximum speed	50 km/h
Widest vehicle on road	2.4 m (B-train tractor trailer unit of 2.4 m wide by 25 m long) – in some circumstances there will be wider loads that extend beyond the sides of the vehicle. These will be handled as oversized loads with special travel arrangements
Longest vehicle on road	25.0 m (TAC 2007)[4]
Travel surface	Crushed material or equivalent less than 75 mm in diameter (Type 1 Fill)
Minimum stopping distance	110 m (based on trucks with conventional braking systems, TAC 2007. 1.2.5.4.)
Super-elevation	None
Minimum cross fall	2%
Minimum radius of curvature	165 m (based on 50 km/h maximum design speed and 0.12 coefficient of friction between road surface and vehicle tire, TAC 2007 p. 2.1.2.7
Minimum Sag Curve “K” value	12 (based on stopping distance, TAC 2007 p.2.1.3.8)
Minimum Crest Curve “K” Value	9 (based on stopping distance, TAC 2007 p. 2.1.3.5)
Minimum pull-out frequency	+400m +/- 50m to be optimized with the topography for safety purposes
Pullout dimensions	30 m length (15 m full width + two 7.5 m length tapered at 15^{o} entry and exit aprons) (including tapered entrance and exits)(turnouts will increase running surface from 6.5 m to 9.5 m)
Offset from archaeological site	30 m (Nunavut Archaeological and Paleontological sites Regulations (2003)
Road alignment at water crossings	Perpendicular to watercourse. 2 bridges + 8 culverted stream crossings
Drainage culvert or French Drain Frequency (for planning purposes, actual number to be determined in the field)	Every 50 m for low ground; likely will not be required on high ground
Road Section Construction Method (Cuts and Fills)	Fill (no cuts to avoid permafrost disturbance)

[4] Transport Association of Canada Geometric Design Guide for Canadian Roads 2007

2.1.4 Road Signage

AEM will post appropriate road signs along the road in both English and Inuktitut. Typically signs will advise drivers of the posted speed limit of 50 kilometres per hour (km/hr), of approaching bridges, of approaching curves, and/or areas of lower visibility (blind hills or obstructed curves).

English and Inuktitut signs will be posted at the southern and northern ends of the road and at an appropriate mid-point to advise any public travelling by skidoo or ATV along the road that they are entering an area that may be potentially hazardous due to the presence of heavy truck traffic on the road. This to recognize that despite the gatehouse at the southern end of the road, snowmobiles and ATVs can enter and leave the road from any point along the road. Signs will also be posted at the northern end of the road to advise the public that they are approaching the Meliadine exploration site and that this is an area of heavy industrial activity that is potentially hazardous due to heavy traffic.

Speed limit signs (50 km/hr) will be posted at intervals of approximately every 5 km along the road. Reflective flags will be installed along the one side of the road to help drivers identify the road shoulder during blizzard or white out conditions. Typically these flags will be back in colour to help them stand out in white-out conditions and are nominally set at intervals of 100 to 200 m apart. Kilometre markers will be posted at intervals of at least 1 km along the road.

A list of road signage is presented in Table 2.

TABLE 2: Road Signage

Element	Location
Safety precautions and users advice	At the southern and northern ends of the road and at an appropriate mid-point along the road.
Blind hill	200 m ahead of the beginning of a blind hill
Speed limit	Nominally at 5 kilometre intervals
Curve	200 m ahead of a curve
Bridge announcement	200 m ahead of a bridge
Bridge side sign	On each side of the bridge
Flexible delineators (flags)	Nominally at 100 to 200 m intervals
Kilometres markers	Nominally at 1 kilometre intervals

2.2 SPECIFICATIONS FOR BRIDGE AND CULVERTS DESIGN

For the Phase 1 AWAR there will be a total of 10 water crossings along the road route. Two of these crossings are achieved using clear span bridges (the Meliadine River at KM 2.3 and an unnamed stream at KM 5.0). The other stream crossings are achieved using culverts. A list of the 10 crossings and their hydraulic characteristics is shown in Table 3. Their locations are shown in Figure 4.

In addition to the above AEM will be constructing a new bridge across the Char River, immediately adjacent to the existing Char River Bridge. The existing bridge is not on the proposed Phase 1 AWAR but is located on the existing Municipal owned and operated road to the Iqaluqaarjuup Nunanga Territorial Park and to the municipality's existing granular quarry source. This new bridge will be constructed by AEM at AEM's expense to accommodate the heavier and wider loads that will be transported to the Meliadine exploration site.

TABLE 3: Locations and Hydraulic Characteristics of Water Crossings (NAT 83)

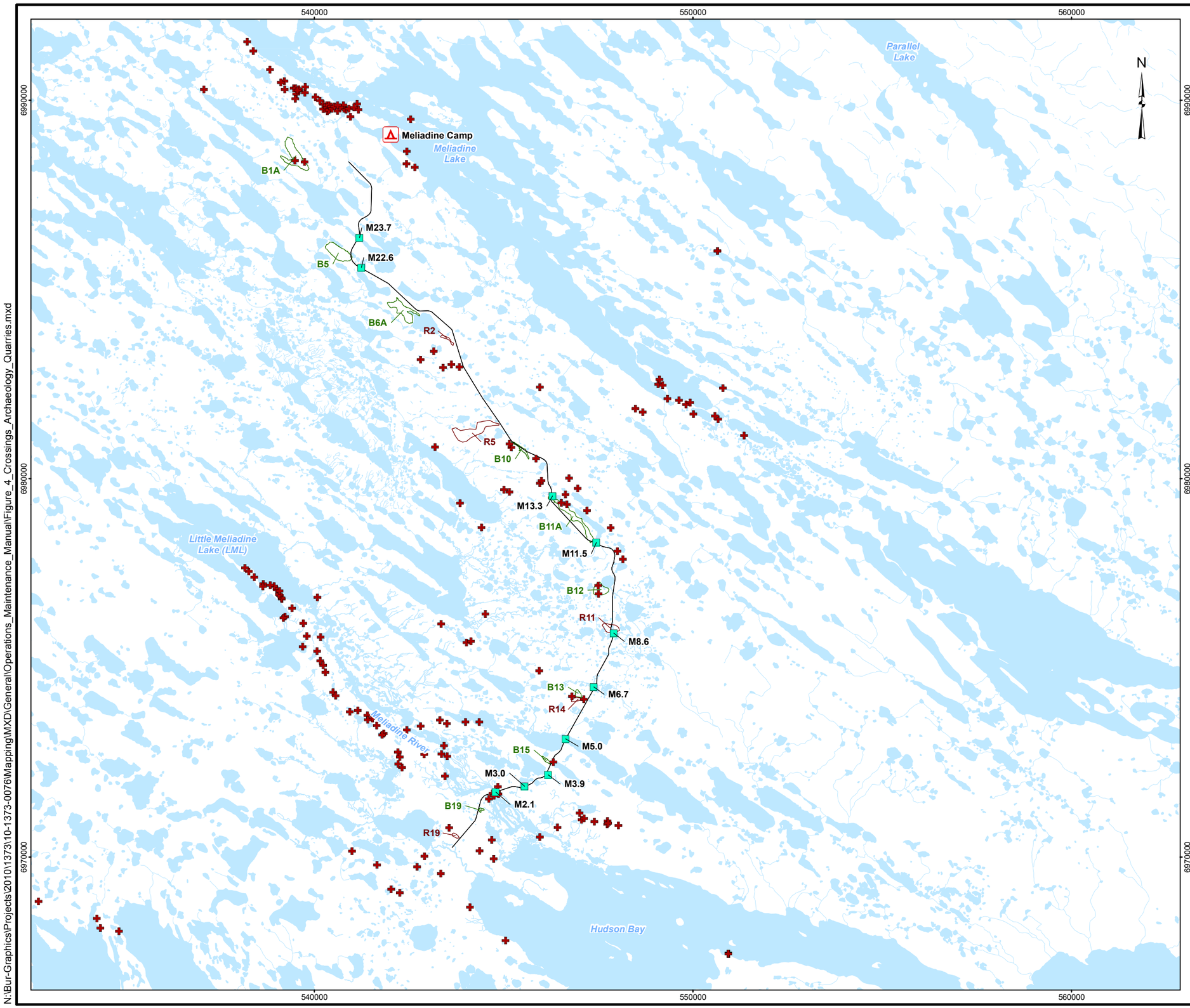
Location	Latitude	Longitude	Drainage Area (km^2)	Design[1] Discharge (m^3/s)	Bankfull Width (m)	Bankfull Depth (m)	Design Depth (m)
Char River[2]	62° 51′ 31.8″	93° 51′ 27.9″	69	NA	NA	NA	NA
Meliadine River	62° 52' 21.8"	9° 07' 10.4"	796	81	60	1.2	1.58
M3.0	62° 52' 26.6"	92° 06' 16.6"	2.77	1.5	2.5	0.12	0.24
M3.9	62° 52' 36.2"	92° 05' 32.5"	1.82	4.7	2.5	0.1	0.62
M5.0	62° 53' 06.5"	92° 04' 58.5"	11.02	9.1	10	0.2	0.81
M6.7	62° 53' 50.4"	92° 04' 04.3"	0.82	3.1	1	0.05	0.24
M8.6	62° 54' 36.1"	92° 03' 25.3"	1.4	4	3.9	0.16	0.57
M11.5	62° 55' 53.8"	92° 03' 55.7"	1.38	1.2	1.5	0.26	0.41
M13.3	62° 56' 34.0"	92° 05' 16.6"	0.16	0.4	3.75	0.2	0.27
M22.6	62° 59' 51.2"	92° 11' 08.8"	0.97	0.5	0.9	0.13	0.21
M23.6	63° 00' 16.6"	92° 11' 12.2"	3.62	0.5	3.2	0.25	0.31

[1] 1:25 year flood

[2] The Char River Bridge will not be on the proposed Phase 1 AWAR. It will be on the existing municipal road leading to the Territorial Park.

Based on assessments carried out for AEM by a hydrologist from Golder Associates, AEM believes that 8 of the 10 stream crossings along the proposed Phase 1 AWAR will not be considered as being navigable under the *Navigable Waters Protection Act. The one* exception is the Meliadine River crossing which will be crossed with a clear-span bridge set to avoid any interference with boats navigated on this river. (Transport Canada has subsequently confirmed to AEM that the unnamed stream crossing at KM 5.0, as well as all of the other eight stream crossings along the proposed Phase 1 AWAR are not navigable under the *Navigable Waters Protection Act*).

Similarly Golder Associates (on behalf of AEM) have carried out fish habitat surveys at each of these crossings. We believe that all of these stream crossing should be considered Fisheries Habitat (Criteria: Fish or fish habitat observed) under the *Fisheries Act*, with the exception of the stream crossing at KM 3.9, 6.7, and 8.6. Fisheries and Oceans Canada (DFO) have subsequently advised AEM that no habitat compensation is required for any of the proposed Phase 1 AWAR stream or river crossings; however AEM will have to conform with all applicable DFO Operational Statements for protecting fish and fish habitat in constructing and operating these crossings.



LEGEND

- Camp
- Ephemeral Water Crossing
- Archaeological Site
- Phase 1 AWAR Road Alignment
- Borrow Area
- Rock Quarry
- Watercourse
- Waterbody

NOTE

The Government of Nunavut makes no guarantees, representations or warranties respecting the Nunavut Archaeological Sites Database (including the Database Subset), express or implied, arising by law or otherwise, including but not limited to, the effectiveness, completeness, accuracy or fitness for any particular purpose of the Nunavut Archaeological Sites Database.

REFERENCE

Base data obtained from Agnico-Eagle Mines Ltd (AEM). Archaeological Site Data obtained from the Culture, and Heritage Division; ' Government of Nunavut, Department of Culture, Language, Elders and Youth.
Datum: NAD 83 Projection: UTM Zone 15

2 0 2
SCALE 1:100,000 KILOMETRES

PROJECT
AGNICO-EAGLE MINES LTD.
MELIADINE GOLD PROJECT
NUNAVUT

TITLE
LOCATION OF WATER CROSSINGS, ARCHAEOLOGICAL SITES, AND POTENTIAL QUARRIES (PHASE 1 AWAR ALIGNMENT)

Golder Associates
Greater Vancouver Office, B.C.

PROJECT NO. 10-1373-0076			FILE No.	
DESIGN	JG	22 Aug. 2011	SCALE AS SHOWN	REV. 0
GIS	CDB	22 Aug. 2011		
CHECK	JG	08 Sep. 2011		
REVIEW	GRA	20 Sep. 2011		

FIGURE: 4

N:\Bur-Graphics\Projects\2010\1373\10-1373-0076\Mapping\MXD\General\Operations_Maintenance_Manual\Figure_4_Crossings_Archaeology_Quarries.mxd

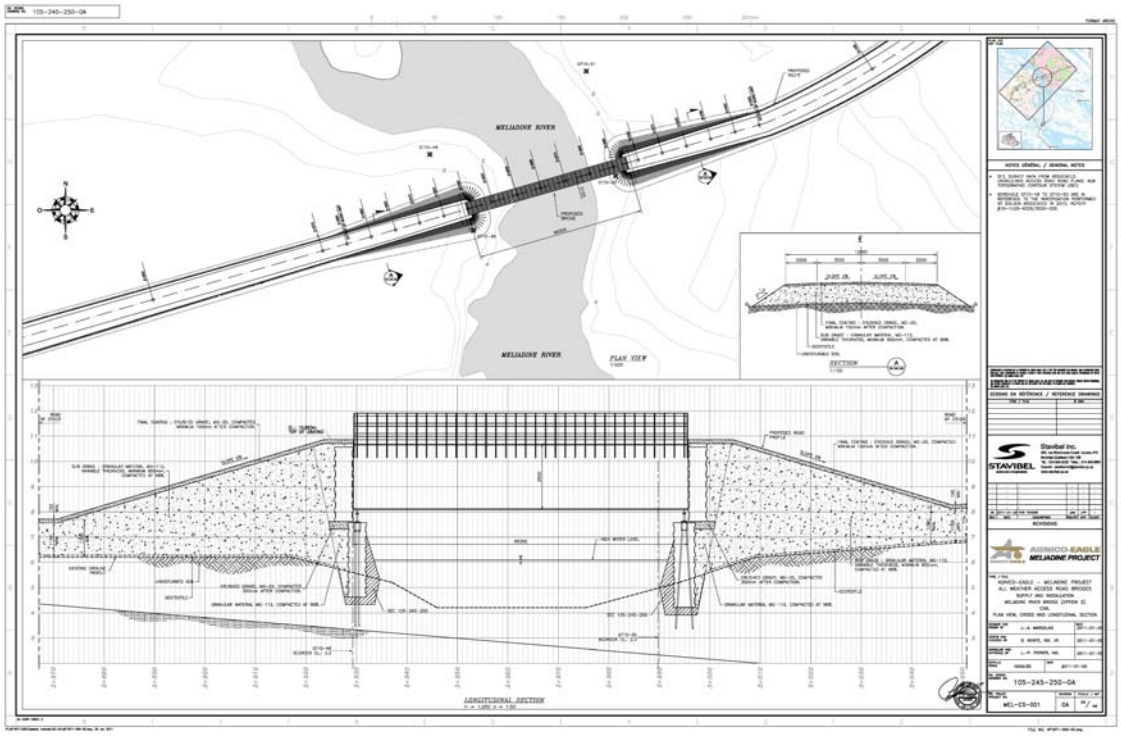
A total of three bridges will be built. All three bridges will be single steel prefabricated bridges with span lengths of 29.5 m (new Char River Bridge), 66.3 m (Meliadine River Bridge), and 23.5 m (no name stream bridge M5.0).

The design for the three (3) bridges is based on the Canadian Highway Code where the design is CSA, S6-06, CL-625, specifically:

> For a design stress load based on two 25 m long vehicles of GVW (gross vehicle weight) of 62,500 kg, both considered travelling simultaneously on a bridge.
>
> The loading is factored by 40% dynamic allowance and another 60% safety factor.
>
> The ultimate bridge design load capacity is around 280,000 kg.

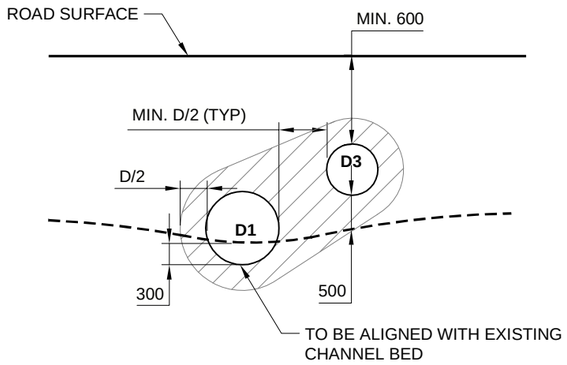
Figure 5 shows the Meliadine River bridge design. The abutments will be located above the ordinary high-water mark, thereby avoiding any impingement on the river. The bridge decks for the bridges will be launched from one side or installed using a mobile crane.

FIGURE 5: MELIADINE RIVER BRIDGE DESIGN

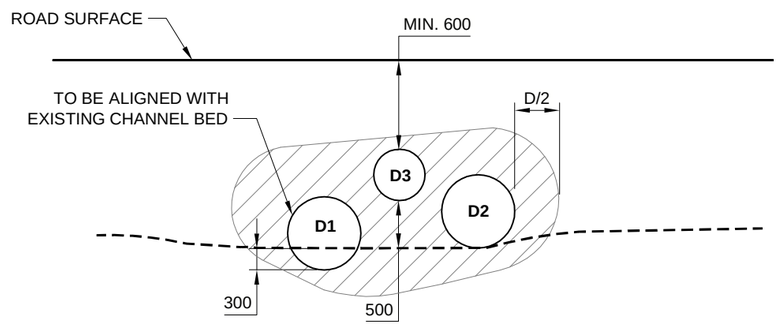


For non-navigable stream crossing locations, it is initially assumed that multiple full-rounded corrugated steel pipe culverts with nominal sizes of 0.7 m, 1.0 m, and 1.3 m (internal diameter) will be used to pass the design flow. A minimum of two culverts placed in an “offset stacked” configuration will be used to enable flow conveyance before complete ice break-up within the watercourse. As part of the “offset stacked” configuration the lowest culvert will be embedded into the watercourse to provide low water fish passage. For each fish bearing crossing, a hydraulic analysis was conducted to confirm that the estimated culvert flow velocities will not exceed 0.8 m/s during the 1:10 year, 3-day event

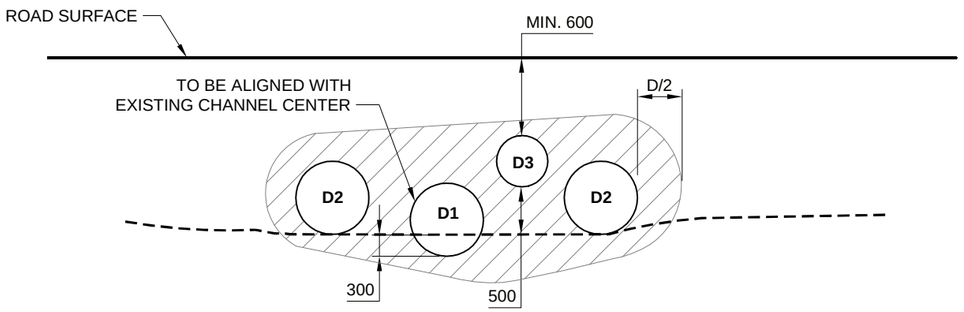
Figure 6 shows the typical designs for the culverts that will be used for these ephemeral stream crossings.



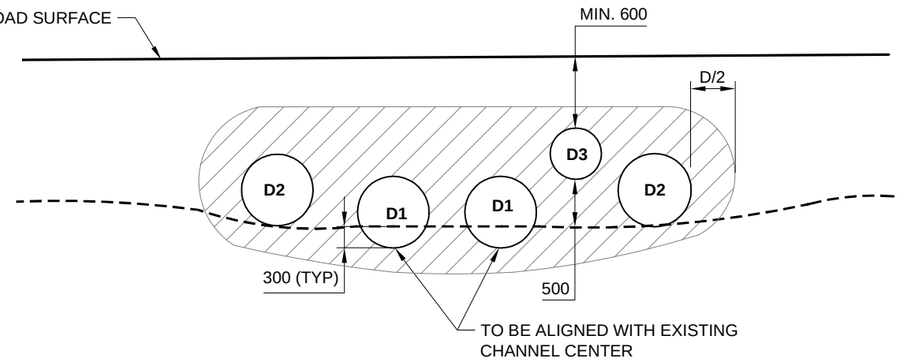
TYPICAL SECTION DESIGN A
NTS



TYPICAL SECTION DESIGN B
NTS



TYPICAL SECTION DESIGN C
NTS



TYPICAL SECTION DESIGN D
NTS

LEGEND

- ROAD SURFACE
- EXISTING GROUND
- WELL COMPACTED TYPE 1 FILL 75mm MINUS

NOTES

1. ALL DIMENSIONS IN mm UNLESS OTHERWISE NOTED.

NOT FOR CONSTRUCTION

PROJECT
AGNICO-EAGLE MINES LIMITED
MELIADINE GOLD PROJECT
NUNAVUT

TITLE
TYPICAL CULVERT DESIGN CROSS SECTIONS

Golder Associates
Greater Vancouver Office, BC

PROJECT No. 09-1426-0015			PHASE No.		4700
DESIGN	MLP	10NOV10	SCALE	AS SHOWN	REV. 1
CADD	SRR	10NOV10			
CHECK	CJC	19JAN11			
REVIEW	JAH	19JAN11			

FIGURE 6

3.0 ROAD INSPECTION AND MAINTENANCE

The Phase 1 AWAR is a private road constructed primarily on Inuit Owned Land leased by AEM from the KIA (there are sections of this road constructed on Commissioner's land (2.1 km) and on Crown Land (about 200 m) that will also leased by AEM). Consequently AEM has sole responsibility for the ongoing inspection and maintenance of all of the components of this road, including the road bed, the bridges, the culverts and the borrow/quarry sites used in the construction of the road.

AEM will apply the experience that it has gained from the ongoing operation of the Meadowbank All-Weather Road, which has now been in operation for three years. This experience will be applied in the planning of the day to day operation, inspection and maintenance of the Meliadine AWAR.

AEM will have a road supervisor who will be responsible for the ongoing road inspection and maintenance of this Phase 1 AWAR. The following is a summary of the procedures that will be applied.

3.1 ROAD SURFACE INSPECTION AND MAINTENANCE

Inspection precedes maintenance. AEM recognizes that a good inspection program will lead to the early identification of areas of the road where improvements are necessary. The early resolution of any deficiencies will result in less ongoing maintenance and repair of the driving surface.

The road and its shoulders will be inspected weekly (at a minimum) during the summer period for evidence of seasonal freeze and thaw adjacent to the toe of the road embankment. Such movements are expected and may lead to longitudinal cracking and thaw settlement especially for portions of the road founded on thaw susceptible (ice rich) soil. When such areas are discovered, the affected area will be repaired using granular material and/or crushed rock. AEM will maintain stockpiles of such material in select borrow/quarry areas along the road.

The road will be inspected for signs of accumulation of ponded water either on the road surface or along the sides of the road. Where noticed, the AEM road supervisor will evaluate and monitor the accumulation to determine why water is accumulating in these areas. Based on these evaluations the road supervisor will take remedial action where and when necessary to correct the cause of such ponding, such as grading of the road surface to remove areas of ponding or installation of additional culverts if the road is causing excessive water ponding.

The quarry and borrow locations along the Phase 1 AWAR will also be inspected weekly (at a minimum) to monitor wall conditions, ponding of water and snow accumulations. Remedial actions will be taken in a reasonable time when problems are noted. These could include remedial actions such as re-shaping of borrow/quarry area walls and/or grading of quarry floors.

The road supervisor will conduct periodic inspections (minimum of weekly) of the road to ensure that the road is maintained for safe travel of personnel, equipment and supplies. These inspections will be recorded and any deficiency recorded and followed up by a corrective plan. These periodic inspections will include an inspection of the bridge abutments and a visual observation of the road surface to assess the status of road foundation.

During the summer period, the road surface will be maintained with gravel being spread as required and regular grading of the road. In the fall, winter and spring time the maintenance will be adjusted according to the weather conditions. Snow clearing along the road will be done to ensure that the road can be operated safely. The manner in which the snow is cleared will also take into account the road configuration to ensure that snow accumulation will not cause any particular problem during the freshet.

Inspection frequency will be increased during the following critical time periods:

- Just prior to spring freshet to ensure that the culverts and stream crossings are in good state to accommodate the rapid spring thaw that is seen in the north;

- During the spring freshet to ensure that the culverts and bridges are not impeding spring freshet and to initiate action when and where required to prevent road wash outs; and

- Just after heavy rainfall events to monitor water accumulation along the road, to ensure that culverts are passing precipitation as planned and to initiate action when and where required to prevent erosion and road wash outs.

The amount of dust generated along the road is dependent on the dryness of the road surface, the number of vehicles, weight and speed, and maintenance of the driving surface. Regular grading of the road combined with the addition of granular material to the driving surface will be needed. This will improve road safety and also reduce the amount of dust. Dust will also be mitigated by maintaining posted speed limits. In areas or times identified by the AEM road supervisor as being prone to high dust levels or areas where safe road visibility is impaired or in areas where dust deposition is impacting fish habitat and/or water quality, the road supervisor will arrange mitigation measures as appropriate. This could involve actions such as grading of the road surface, placement of new coarser topping, and/or watering of the road surface. Use of chemical dust suppressants will be only used as a last resort and only in accordance with the Environmental Guidance for Dust Suppression published by the Government of Nunavut Department of Environment (January 2002) (available online at the following web site: http://env.gov.nu.ca/sites/default/files/Guideline%20Dust%20Suppression.pdf) and appended to this document as Attachment A.

All road users are requested to report any road maintenance problem or hazardous road conditions to the Meliadine gatehouse to be sited at the southern end of the road, at the Meliadine camp or at the Meliadine office in Rankin Inlet.

3.2 WATERCOURSE CROSSINGS INSPECTIONS AND MAINTENANCE

The watercourse crossing inspection and maintenance program has three main components:

(a) a regular inspection program to identify issues relating to watercourse crossings, such as structural integrity and hydraulic function;

(b) an event inspection program to track the impacts of large storm events on watercourse crossings, such as structural integrity and hydraulic function; and

(c) a culvert location inspection program to ensure that culverts have been installed in the right location with respect to the watercourse and that culvert capacity is adequate to ensure that the culvert(s) pass the water under all hydraulic conditions. In most cases there will be multiple culverts installed at different elevations at each stream crossing to ensure that these culverts can adequately pass both normal summer flows as well as spring freshet and heavy rainfall flows.

• ***Regular Crossing Inspection and Maintenance***

During the freshet period, crossings inspections will be performed twice a week (mid-May thru June) and weekly during the remainder of the ice-free period prior to fall freeze-up (July through October).

These inspection activities for each watercourse crossing will consist of:

- Visual inspection of its infrastructure to identify defects, cracks or any other risks to structural integrity. Particular attention will be paid to the inlet and outlet structures of culverts, and to bridge abutments and their foundations, as required.

- Visual inspection to identify sediment or other debris accumulation impeding the free flow of water through the crossings. Maintenance operations will consist of hand removal of accumulated debris and repairing damages as soon as possible.

- Visual inspection of upstream and downstream channel to identify bed erosion or scour around the watercourse crossing structure. Particular attention will be paid to bridge abutments and abutment foundations as they will be vulnerable to scour and erosion, during flooded event. Particular attention will also be paid to potential sources of sediment transport at the crossing. Inspection results will be recorded by AEM to help track change in conditions over time. Maintenance operations will consist of undertaking remediation of any detected problems and repairing damage as soon as possible.

• ***Event Crossing Inspection and Maintenance***

Following heavy or prolonged rainfall storm events, visual inspection of each watercourse crossing will be completed to identify potential risks to the crossing's structural integrity, debris accumulation and whether erosion and scour have occurred. Results will be recorded by AEM to help track changes in condition over time. The remediation of any detected problem and any

necessary damage repairs will be undertaken as soon as possible, under the direction of AEM's road supervisor.

• ***Culvert Location Inspection***

Following their installation, the culvert crossings will be visually inspected to confirm they have been properly executed and installed. These culverts will initially be installed during winter conditions and thus it is possible that a culvert will not be sited correctly to pass all ponding of water through the road. The intent is to check for such conditions during the first snow melt and after rain events so that adjustments can be made accordingly. Additional culverts will be installed, if necessary, should the inspection indicate that the culverts were installed in a location that does not optimally route water flows.

3.3 SNOW CLEARING

Sections of the Meliadine road are expected to experience snow drifts because of strong winds over the winter period. As much as possible this snow will be cleared to the downwind side of the road to limit the wind re-depositing the same snow on the cleared road. Routine spring snow management will include the removal of any snow that accumulates at bridges and culverts so that water at freshet can move freely through the culverts and under bridges. In the case of culverts, snow is removed from both ends but not from the inside.

The report, "Preliminary Snow Drift Assessment of the Meliadine All Weather Road from Rankin Inlet to the Meliadine Site, Nunavut" provides an assessment where snow drifts can be expected. It states:

> "Observations seem to indicate that snow drifts can be expected on the lee of short, steep slopes and along lake shores." and
>
> "Maintenance will be required during operations to manage snow accumulation along the road alignment; however, most of the alignment appears to be located along the windward slopes and ridge crests where there should be a limited tendency for snow to build up."

The design of the road factored in snow accumulation and this is one of the reasons the road is located along the height of land as much as possible and in a northerly alignment.

4.0 TRAFFIC MANAGEMENT

The Phase 1 AWAR will be operated as a privately operated road with access controlled by a gate to be sited at the southern end of the road, just after the turnoff onto the Phase 1 Meliadine AWAR (junction with existing municipal road just after the Char River Bridge). The gate will be staffed by AEM on a 24/7 basis when weather permits (for personnel safety the gate will not be staffed during winter blizzard conditions in which case the road will be closed to all traffic). The gate will only control traffic turning onto the Meliadine AWAR and will have no effect or control over traffic driving on the existing municipal road that continues on past the Char River. Responsibility for traffic management on the Meliadine Phase 1 AWAR is the sole responsibility of AEM.

4.1 MANAGEMENT OF AEM TRAFFIC ON THE ROAD

All of the required fuel and supplies for the advanced exploration and underground development activity at the Meliadine West exploration camp will be transported to the site via the Meliadine Phase 1 AWAR. All drivers transporting these materials will either be AEM employees or employees of contractors directly hired by AEM and must possess a valid driver's license from a Canadian province or territory, for the appropriate class of vehicle, in order for them to be allowed to operate vehicles on the access road.

As a privately operated road, responsibility for “policing” on this road does not come under the RCMP. AEM security personnel along with AEM’s road supervisor will monitor activity on the road through radio contact with both the staff at the gatehouse and with driver’s operating on the road and through periodic patrols of the road. All AEM vehicles that travel routinely on the Meliadine AWAR will be equipped with a radio set to the requisite road frequency. Similarly contractor’s vehicles that travel routinely on the Meliadine AWAR will be equipped with a radio set to the requisite road frequency. Consequently AEM traffic on the road will always have radio contact with the gatehouse, security and other AEM and AEM contractor traffic. This system will be used to report any unusual conditions along the road such as: location of other vehicles, presence of wildlife on the roadway, presence of non-AEM traffic such as ATV’s, snowmobiles or other vehicles, any special road conditions, any special weather conditions, etc.

All northbound AEM and AEM contractor vehicles will be required to stop at the southern gatehouse. The personnel at the gate will record the name of the driver and the names of all passengers who are travelling in the vehicle, the vehicle type and the vehicle ID number, time that the vehicle passes through the gate and ensure that they have all appropriate safety equipment (i.e., such as a functioning radio set to the road frequency, survival kit in winter months). Signage in both English and Inuktitut on the side of the road at the gatehouse will ensure that the driver is reminded of the following basic safety requirements:

- The posted road speed limit is 50 km/h;
- Wildlife on the road has the right-of-way and must not be harassed; and

- Drivers are required to report their location and direction over the radio at periodic intervals such as when approaching bridges, blind hills and curves, and when approaching the Meliadine West exploration camp.

It should be noted that AEM will educate all of its employees and all of its contractor's employees on road safety rules during the safety indoctrination training that occurs when an employee first starts work at the Meliadine site.

A similar sign will be installed at the northern end of the road to remind all drivers of the same information when they are heading back towards Rankin Inlet. Drivers leaving the Meliadine West exploration site and entering the Meliadine AWAR heading south towards Rankin Inlet will be required to report by radio to the personnel in the gatehouse. The information that must be provided by radio is as follows:

- The vehicle type and ID number;
- The names of the driver and any passengers; and
- The time of departure from the Meliadine West exploration site.

All AEM drivers using the road are required to monitor and report to the gatehouse by radio any observed unauthorized or unsafe use of the road.

4.2 MANAGEMENT OF NON-AEM TRAFFIC ON THE ROAD

The Phase 1 Meliadine AWAR is a nominal single lane road built to solely support the advanced exploration and underground development activity at the Meliadine West exploration site. AEM intends to widen this road and extend it to access the Meliadine East (Discovery site) with open public access to Meliadine Lake (through a short spur) as Phase 2. Phase 2 is part of the application to develop the Meliadine Gold Project that is currently undergoing a full Part 5 environmental and socio-economic assessment by the Nunavut Impact Review Board (NIRB) under the Nunavut Land Claim Agreement (NLCA). NIRB has made it clear through its prior decisions that it feels that under the NLCA it must conduct a full open public review of the potential environmental and socio-economic impacts related to opening enhanced public access to the area north of Rankin Inlet that will be associated with the Phase 2 Meliadine AWAR. This public review will most likely occur in 2012/2013. Consequently AEM has agreed to control public access over the Phase 1 AWAR pending the public review by NIRB of the Phase 2 AWAR.

AEM will work with the KIA and the Municipality of Rankin Inlet to devise a system for controlling access by non-AEM traffic and will have this in place before construction starts. We will also consult with the local HTO on this issue. Based on our experience in Baker Lake we believe the system should take the following factors into account:

- The road is too narrow to safely allow for uncontrolled public access by any and all vehicles in Rankin Inlet;

- ATV's and snowmobiles can and will access the road from anywhere along the road and can bypass any security controls to be imposed by AEM. Such ATV and snowmobile traffic in this area does and will continue to occur whether the Phase 1 AWAR is there or not and thus we must find ways to safely operate with these vehicles being present;
- There are existing trails that are used by the citizens of Rankin Inlet and surrounding area to access traditional use purposes, hunting, fishing, and recreation in the Meliadine Lake area. There are numerous cabins around Meliadine Lake that are used year round by residents of Rankin Inlet. The construction of the Phase 1 AWAR cannot block or alter the current access that residents of Rankin Inlet have to this area and in fact it would be better to devise systems to enhance safe use of the Phase 1 AWAR by both AEM and non-AEM traffic;
- All Inuit have rights of access to these Inuit Owned Lands and thus the construction of the Phase 1 AWAR cannot block or alter this type of access and in fact it would be better to devise systems to enhance safe use of the Phase 1 AWAR by both AEM and Inuit Beneficiaries; and
- Public safety is key and must be given full consideration. Because of the narrow width of the road it is undesirable to have unlimited access by cars and trucks belonging to the public. We should focus on providing controlled access in a safe manner to those who have a legitimate need to use the road to access cabins, or carry out traditional use. We should focus on preventing spur of the moment, sightseeing or "joy ride" type of access.

AEM suggests that the system used to control public access should be as follows:

- Any member of the public wishing to obtain authorization to use the Meliadine Phase 1 AWAR with a personal vehicle that is larger than a standard ATV or snowmobile will be required to obtain a vehicle pass (referenced to one or two authorized drivers who will be identified on the pass) from the KIA as the primary land owner. The KIA will determine suitable criteria for granting such access. The pass, once issued, will be good for multiple travels by that vehicle provided that the driver is referenced on the pass.
- The vehicle will be required to stop at the gatehouse at the southern end of the road. The AEM personnel at the gate will confirm that the pass is valid for that specific vehicle and driver, will record the name of the driver and any passengers in the vehicle, and the time that the vehicle passed through the gate. The AEM gatehouse personnel will then give the driver a short safety briefing on the rules of the road, provide a written copy of the safety rules to the driver (will be available in both English and Inuktitut) and have the driver confirm his understanding of the rules by signing a release. The AEM gatehouse person will also inform the driver of current road and weather conditions. The rules will point out that violation of the road safety

rules could lead to revocation of future access privileges. If the AEM gatehouse suspects that a driver is intoxicated then access will be denied.

- Safety rules will include:
    - Maximum speed limit on this road is 50 km/h;
    - Use of seat belts by all drivers and passengers is mandatory;
    - No drinking and driving is allowed;
    - Driving under the influence of alcohol or intoxicating drugs is prohibited;
    - Wildlife has right-of-way on the road and no harassment of wildlife is allowed (for caribou this includes not getting out of a vehicle to watch, photograph or approach caribou as such activity causes increased stress and constitutes harassment);
    - All hunting activity must avoid shooting across the road and should respect a safe shooting distance from the road (suggested at 1 km);
    - Hunting is not allowed within 1 km of the Meliadine exploration site;
    - All traffic should give way to oncoming truck traffic (i.e. use the passing turnouts to allow the oncoming truck to safely pass);
    - Vehicles should not park on the travelling surface of the road but should pull off the road at a safe location to park to prevent accidents;
    - No public traffic is allowed within the Meliadine exploration site. This is an industrial work site and thus non-project related vehicles should not go beyond KM 23 without prior special arrangement with AEM. Signs will be posted at KM 23 advising drivers of this rule; and
    - The road is closed to all traffic whenever the gatehouse is not staffed. At that time the gate across the road will be closed. Typically this means that weather is too bad to safely travel on the road or some activity is occurring on the road that makes travel unsafe. No traffic should proceed up the road during these times.

These are the same safety rules that will apply to all users of the road, including AEM employees, AEM contractor employees, and public users of the road. It is worth noting that the Criminal Code of Canada applies to private roads. For example, if an accident were to occur on the road and alcohol was involved, that person could be charged by the RCMP.

AEM will hold public information sessions in Rankin Inlet for users of the road prior to the road opening and on a regular basis thereafter (minimum of twice per year). A copy of the road safety rules will presented at these sessions.

AEM will also hold public information sessions in Chesterfield Inlet for users of the road prior to the road opening and on a regular basis thereafter (minimum of once per year). A copy of

the road safety rules will presented at these sessions. This is required because Chesterfield Inlet have now built approximately 17 km of trail/road south from their community toward Rankin Inlet and now occasionally drive their ATVs/snowmobiles to Rankin Inlet.

AEM will also use other communication tools to get the road access procedures and road safety rules out to the public in Rankin Inlet. These will include Community Radio, Community TV, and postings around town, through the Meliadine project office in Rankin Inlet, and via an AEM project website. The communication will be in both English and Inuktitut.

All non-AEM road users will also be encouraged to monitor and report any observed unsafe use of the road to AEM via the gatehouse.

4.3 OTHER ACCESS CONTROL PROCEDURES

There will be occasions when access to the Phase 1 AWAR needs to be curtailed for short time periods for special reasons, such as bad weather, unsafe road conditions, maintenance activity on the road, heavy project related truck traffic, movement of oversized loads, and presence of large numbers of caribou on or adjacent to the road. Typically these short-term closures will be required to ensure safety.

In communicating such short-term closures AEM will take the following actions:

Weather and Road Conditions:

- AEM will issue a daily road condition bulletin by means of email to a subscriber list, through a project related web site, and through community radio. The bulletin will provide information on current road and weather conditions and of special activity on the road planned for that day;
- AEM (with the consent of the Municipality of Rankin Inlet) will set up and maintain a sign to be sited close to Rankin Inlet on the existing municipal road out to the Char River and the Territorial Park that indicates whether the Meliadine Phase 1 AWAR is “open” or “closed” at that specific point in time;
- AEM will limit access and in certain conditions close the road to all traffic during bad winter weather (blizzard or white out conditions). In the worst weather the gatehouse personnel will be brought into Rankin Inlet and the gate closed and signed accordingly;
- AEM will limit access when the road is not safe as a result of an accident or a road maintenance problem;
- AEM will limit access to the road when large numbers of caribou are crossing the road. This will occur in consultation with the local HTO;
- AEM will work with the KIA and HTO to establish of an appropriate no shooting zone along the road to ensure that project workers and all other road travelers are not inadvertently exposed to risk of accidental shooting; and

- AEM reserves the right to refuse access to individuals who do not respect the rules on safety, speed and the no shooting zone when using the road.

4.4 POLICING OF ROAD SAFETY RULES

As indicated earlier the Phase 1 AWAR is a private road and thus policing does not fall under the RCMP. Responsibility for all operating and maintenance activity on this road solely lies with AEM. AEM will concentrate on raising public awareness and commitment to road safety, and improving communication, cooperation and collaboration among all stakeholders on the safe use of the road.

AEM will use its gatehouse staff, road supervisor, and site security to monitor what is occurring on the road. AEM will also rely on radio contact with all AEM and AEM contractor vehicles on the road to monitor unsafe conditions or activity on the road. AEM do not have any special policing powers. AEM staff cannot issue tickets or use other methods to address unsafe operation. AEM can record unsafe practices, warn the person causing the infraction, and in severe or repeated cases of violation remove all privileges for future access to the road by an offending driver.

AEM will monitor speed limit infractions using two methods:

- Direct observation of drivers seen to be driving too fast; and
- Travel time for a vehicle between when they enter the road and when they leave the road via as recorded by the AEM gatehouse staff (through radio reporting of when AEM and AEM contractor vehicles report to the gatehouse when entering and leaving the road).

AEM will have the right to remove future road access privileges for drivers who repeatedly operate in an unsafe manner and ignore verbal warnings previously given.

Regulatory inspectors can inspect the road and any associated infrastructure at will. AEM will abide with the recommendations and directives provided by the inspectors.

4.5 ESTIMATE OF ROAD TRAFFIC

AEM expects to see the following public road usage pattern during the advanced exploration stage:

• Winter months

- Week days – between 1 and 2 pick-up trucks and 5 to 10 snowmobiles daily when the weather is good, dropping to zero when the weather is bad.
- Weekend days – between 2 and 5 pick-up trucks and 10 to 20 snowmobiles daily when the weather is good, dropping to zero when the weather is bad.

• Summer months

- Week days – between 2 and 5 pickup trucks and 5 to 10 ATV's daily when the weather is good, dropping to zero when the weather is bad.
- Weekend days – between 5 and 10 pickup trucks and 10 to 20 ATV's daily when the weather is good, dropping to zero when the weather is bad.

We estimate that between 25 to 50% of these trips will be incremental to current access, which is by ATVs and snowmobiles.

Road usage by AEM and its contractors is not expected to vary as much as the public traffic between summer and winter. AEM and contractor vehicles expected to use the road will include but not be limited to pick-up trucks, cube vans, buses, fuel trucks, tractor trailers, snowplows and graders.

• Winter months

- Week days – between 8 and 10 pick-up trucks, 2 cube vans, 2 passenger vans, 2 fuel trucks daily, 1 transport truck and zero when the weather is bad. Should the flights not get into Rankin Inlet, the number of passenger van trips will drop in half.
- Weekend days – between 2 to 4 pick-up trucks, 1 cube van and 1 passenger van, 1 transport truck and zero when the weather is bad. Should the flights not get into Rankin Inlet, the number of passenger van trip will drop in half.

• Summer months

- Week days – between 10 and 14 pick-up trucks, 3 cube vans, 2 passenger vans, 2 fuel trucks, 1 transport truck and zero when the weather is bad. Should the flights not get into Rankin Inlet, the number of passenger van trips will drop in half.
- Weekend days – between 4 – 8 pick-up trucks, 1 cube van, 1 passenger van, 1 transport truck and zero when the weather is bad. Should the flights not get into Rankin Inlet, the number of passenger van trips will drop to half.
- During the summer sealift period and for 1 month after the departure of the last barge the following additional truck traffic is expected: 6 to 10 transport trucks per day (round trips) to move freight to the Meliadine site.

4.6 EMERGENCY RESPONSE

As a private road the responsibility for response to any emergency or accident lies solely with AEM. It will be AEM personnel that respond and deal with any emergencies that occur on the road. AEM will have people on site trained in emergency response (firefighting, first aid, mine rescue, spill response, etc.). Where appropriate, AEM in such urgent circumstances will request assistance from other parties in Rankin Inlet**.** However based on our experience with the Meadowbank road, AEM does not believe that this Phase 1 AWAR will result in any increased

demand on local public service providers in Rankin Inlet (fire, police, ambulance, medical, maintenance). In most circumstances the emergency response will be met by AEM personnel.

Emergency response is reactive while prevention lowers the frequency of emergency response. AEM's emphasis will be on the latter while at the same time keeping resources close at hand to respond to emergencies on the road in a timely manner.

Three possible causes of road emergencies are the road, vehicle and people. It is the interplay of these three elements that lead to either safe use of the road or emergency response. AEM is fully responsible for the design, construction and maintenance of the Meliadine Phase 1 AWAR for private and public use. AEM will ensure its vehicles are in good working order before they venture out on the road. As well, AEM will train its employees on road safety and emergency response (first aid, firefighting, emergency response) and by educating and protecting its workers, they will lead by example in road safety. However, AEM can only influence the public in their choice of vehicle and behaviour on the road through education.

AEM will work to develop partnerships with the public, community organizations, and government departments in educating the public on road safety, shaping good driving practices and influencing people's behaviour on the road. Emphasis will be directed to the use of helmets, seat belts, observing the posted speed limits, improving one's visibility by wearing reflective clothing when on a snowmobile or ATV, not drinking and driving, dealing with driver inexperience, etc. AEM will, however, have little influence on the vehicles that will use the road. Vehicles could suffer from poor maintenance, and individuals could also make poor choices such as using an ATV in winter when a snowmobile would be more appropriate.

4.7 ACCIDENTS AND MALFUNCTIONS

There is reasonable probability that accidents and malfunctions will occur on this road. Such unfortunate events can occur no matter how much effort is devoted to preventing them. However, mitigation measures and response plans will be in place that will be applied to reduce the frequency and severity of such events. In the event of such an accident, AEM staff will follow the procedures in place in the Project's Emergency Response Plan. The types of events that may occur are as follows:

- Vehicle collisions that may result in personal injury and spillage of potential harmful materials such as fuel, lubricating fluids, antifreeze, etc;
- Contact between vehicles and wildlife that may result in harm to wildlife, personal injury and spillage of potentially harmful materials, etc.;
- Single vehicle accidents that may result in personal injury and spillage of potentially harmful materials;
- Risk of people getting stuck on the road in bad weather such as in heavy snow or white out conditions, or due to mechanical breakdown;

- Risk of accident due to an intoxicated or impaired driver on the road; and
- Spills of harmful materials onto the land or into water through a vehicle rollover or tipping during bad weather.

Emergency response equipment is to be carried in all AEM vehicles using the road to improve response in the event of an incident or accident. This equipment includes survival gear, emergency first aid equipment, and initial spill response equipment.

It is AEM responsibility to respond to all emergencies along the road, including but not limited to:

- Vehicular Accidents – AEM emergency response personnel are tasked with responding to any vehicle accident resulting in personal injury or spillage of harmful material. AEM will initiate extraction and transport to medical assistance at Rankin Inlet's medical center. AEM will initiate spill containment and clean up measures;
- Spills – AEM emergency response personnel are tasked with responding to any spills and will initiate spill containment and clean up; and
- Reporting – AEM will report all reportable scale incidents to the appropriate Government authority (e.g., Mines Inspector, RCMP, Water Board, NU Spill Line, Environment Canada, GN Department of Environment, Fisheries and Oceans Canada, KIA and Rankin Inlet Municipality).

Emergency response personnel and equipment will be available at all times on the Project site to allow for quick action should an accident occur. AEM will have a program to train and maintain personnel on site at all times that can respond and address all emergencies that may occur, ranging from personal injuries, fire, spills of harmful materials, etc. AEM will also have appropriate equipment and material available to equip its emergency response personnel.

The Meliadine West exploration site has an emergency and spill response plan in place. This Plan will be periodically reviewed and updated to learn from past experience. Emergency response personnel will be trained on the procedures and protocols contained in the Emergency and Spill Response Plan.

Based on AEM's experience with the road between Baker Lake and the Meadowbank Gold Mine, AEM understands that accidents can occur but the prevention and proposed mitigation measures along the road, emergency response planning, training, and preparation, will substantially reduce the risk, frequency, and severity of such incidents.

5.0 WILDLIFE MANAGEMENT

Wildlife is expected occasionally to be observed on or immediately along the side of the access road. Caribou and other wildlife will have the right-of-way at all times. In case of problems (ex : aggregations of caribou), the environmental personnel on site will be in charge of managing the situation and with the collaboration of the security department will advise

road users by patrolling the road. The project personnel will be notified by dispatch radio if any wildlife is observed on the road.

The following protocol will be implemented on the road for the protection of wildlife:

- Vehicular traffic speeds on the access road will be limited to 50 km/hr.
- Where small to moderate aggregations of caribou (i.e., 1-50 animals) are observed within 100 m of the road, travel speeds will be reduced to 30 km/hr
- Where large aggregations of caribou (i.e., 50 or more) are observed within 100 m of the road, at the discretion of the road supervisor, vehicle movements may be suspended until animals have moved away from the road.
- Caribou and all wildlife will be given right-of-way on the road. Vehicles must stop until the animal is off the road.
- Locations of large aggregations of animals must be reported to the road supervisor who will inform all potentially affected employees and the environmental representative.
- All incidents between vehicles and wildlife must be reported to the AEM road supervisor and the environmental representative whether they are:
    - near-miss;
    - collision with injury to the wildlife; or
    - accidental death.
- Each incident will be investigated by the road supervisor and the environment department and measures taken to avoid re-occurrence put in place. Disciplinary measures will be taken against any employee if the investigation concludes that the accident is the result of negligence.
- In the case of accidental death of an animal, the AEM Meliadine Project Environmental Coordinator(s) will contact the GN Conservation Officer in Rankin Inlet. The carcass should be removed from the road and incinerated to avoid attracting scavengers such as Arctic Fox, Wolves, Grizzly Bear, and/or Wolverine.

6.0 ENVIRONMENTAL MONITORING PROGRAM

6.1 WILDLIFE MONITORING PROGRAM

Once the road is operational, AEM will implement a monitoring program to record on a systematic basis the prevalence of wildlife seen along the Meliadine Phase 1 AWAR. The program will be developed with the input of the local HTO and with the KIA. The program will focus on caribou, muskox, bear, wolves, migratory birds, and raptors.

The program as envisioned will consist of a periodic ground survey of wildlife observed along the road. At the current time AEM is thinking that the minimum frequency would be weekly. The survey would log type of wildlife observed, estimate of numbers and nearest kilometre marking along the road. The data would be aggregated and presented in an annual report. AEM will explore sub-contracting this program to the local HTO in Rankin Inlet.

6.2 WATER QUALITY MONITORING PROGRAM FOR THE MELIADINE ALL-WEATHER ROAD

The AWAR between Rankin Inlet and the Meliadine Site could impact water quality as described in the Project Description. This would largely occur due to the leaching of trace metals from the road building material and road dust settling on receiving waters.

There are nine water crossings using culverts and these would offer the highest likelihood of metal leaching. The three largest drainage basins will be sampled:

1. M3.0 having a drainage basin of 2.77 km^2;
2. M5.0 having a drainage basin of 11.02 km^2; and
3. M23.6 having a drainage basin of 3.62 km^2.

M3.0 and M5.0 are both near the Meliadine River and are located in the “low lands” before the road climbs to the higher ground. Water here would have a greater probability of being in contact with any road building material for an extended period. M23.6 has the advantages of having historical water quality data collected in the past, being downstream of the waste rock pad, and upstream of the future F Zone gold deposit.

There could also be drainage from some of the various quarries that are to be established. When there is noticeable flow out of a quarry, likely during spring melt, a water sample will be collected before this water enters a receiving water body. Standing water will not be collected as it poses little risk to the receiving environment.

Water samples would be collected on a monthly basis over the open water period, late June to September inclusive. The parameters to be collected are no different from what is presently collected downstream of the waste rock pad. The parameters to be collected include:

- Physical parameters – field pH and water temperature, lab pH, conductivity, major anions and cations, turbidity, TSS
- Nutrients – NH_4, NO_3, NO_2, Kjeldahl N, and PO_4
- Trace metals – complete ICP/MS scan

The results will be attached to the monthly NWB report and compiled for the annual report.

The sampling will continue for 1 year at which point the results will be reviewed by KIA and AEM to determine if more or less sampling should be carried out in coming years.

7.0 MANAGEMENT OF HAZARDS AND EMERGENCY RESPONSE

An AEM trained site-based emergency response and spill clean-up team will be available on site with appropriate equipment to respond to all spills and road accidents. Spill response will be implemented by environmental staff who will advise, document, and report on initial response and clean-up actions. The existing Meliadine Gold Project Fuel Management and Spill Contingency Plan for Water Licences 2BE-MEP0813 and 2BB-MEL0914, November 2010 will be updated to include the all-weather road.

The following actions are to be taken in the event of an accident on the AWAR involving other vehicles (including ATV's) or in the event of an accident involving contact with wildlife such as caribou, musk ox, bear, wolf, etc.;

- Check the condition of people involved in the accident and provide immediate first aid if appropriate;
- Call the Meliadine road dispatch by radio and report the location and nature of the accident and indicate the type of assistance required (medical help, environmental cleanup, fire and/or mechanical help);
- Secure the accident site so that the vehicles do not continue to present a hazard to others. This may involve moving the vehicles to the nearest pull off in the event of a minor accident; or blocking off the road back from the site in both directions in the event of a more serious accident; and
- If safe to do so secure the site to prevent continued spill or leakage of contaminants into the surrounding environment.

Upon receiving the accident call, the road dispatch will initiate the emergency response procedure passing along the information to the emergency response coordinator. The emergency response coordinator will then call out the required emergency response personnel to assist at the accident site.

Once the accident site is secured and all people requiring assistance have been removed to medical care, the emergency coordinator will turn the scene over to the mine's safety personnel so that an appropriate accident investigation can be initiated.

In the event of an incident involving contact with wildlife the Dispatcher will notify the site security personnel and the Environmental representative. Security and the site environmental team will then initiate an appropriate accident investigation. The Environmental Department will ensure that appropriate reporting of such incidents is made on a timely basis to the KIA, the Rankin Inlet HTO, and the GN Department of Environment.

In the event of a serious accident the RCMP will be contacted and advised of the incident. The RCMP will then decide on whether they will become involved or take the lead on any subsequent accident investigation.

8.0 OPERATIONAL PARAMETERS

In general, the operational parameters for the road are summarized below:

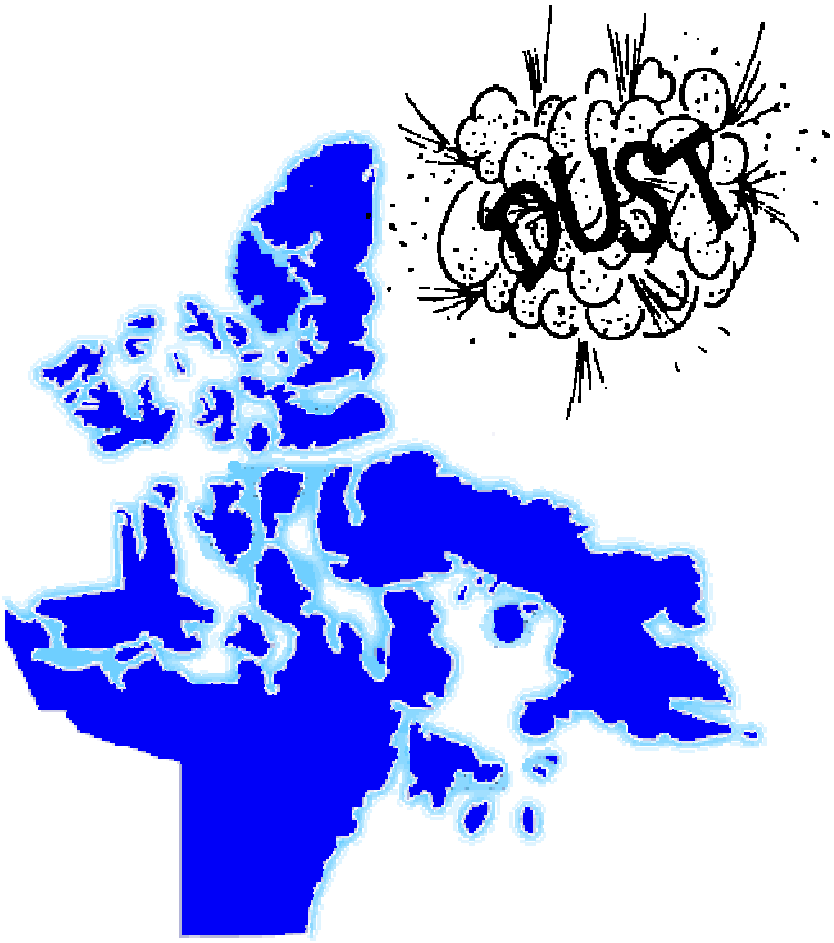
- Wildlife has the right-of-way;
- All vehicles (except ATV's) are to be insured and licensed in accordance with licensing rules that apply on municipal and territorial roads in Nunavut;
- All drivers must be licensed and operate in accordance with the same rules that apply on municipal and territorial roads in Nunavut;
- Any driver suspected of being impaired will be denied access to the road;
- Hunting and fishing restrictions will be as per HTO's stipulations; and
- All spills of any materials will be reported and cleaned up, as set out in the spill contingency plans. The haulage fleet will be required to have appropriate spill containment and clean-up equipment on hand or available on demand.

ATTACHMENT A

Environmental Guidance for Dust Suppression

Published by the
Government of Nunavut Department of Environment
(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

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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

Safety Briefing for Meliadine AWAR Non AEM Road Users

This document provides a standard procedure for implementing the AWAR safety briefing to Rankin Inlet residents who require road access. Delivering the safety briefing in a consistent manner by addressing each point below and recording information about the road users will help ensure that AEM has performed its due diligence in educating each individual on the safety procedures and inherent risks of using this road.

These safety rules will be reviewed at least annually to determine what worked and what didn't work and will be amended in an adaptive fashion to learn from experience. Such amendments are to be implemented in consultation with the Municipality of Rankin Inlet and the Kivalliq Inuit Association.

Safety Briefing Procedure

The AEM gatehouse person will:

1. Fill out the related control log form (attached).
2. Give the resident a printed copy of the Safety Rules and Procedures available in Inuktitut and English.
3. Explain each safety rule and procedure.
4. Explain current road and weather conditions.
5. Explain that any violation of the rules or procedures may result in refusal of future entry.
6. Ask for verbal confirmation that the resident understands the safety rules and procedures and make sure he /she signs and dates our related document.
7. Buggy whip and safety vest will be available for ATV and snowmobile. Explain that it must be returned to AEM upon their return to the gatehouse.

AWAR Record of Non-Mine Use

Date	First name/Last name	Expected return date	Expected time of return	License plate	Security vest #	Buggy whip	Resp. waiver	Explained shooting zone / road access	Phone number	Return date	Return time	Return security vest	Security guard Print name

Safety Rules and Procedures

Safety Rules

- If the Gatehouse is closed, the road is also closed, and access is thus not allowed (safety concern is high). This is likely due to unsafe weather, road conditions or safety reasons.
- Use of the Meliadine AWAR is at your own risk. AEM is not responsible for personal injury or property damage caused by your actions.
- AEM reserves the right to refuse entry to anyone who does not respect these safety rules and procedures.
- AEM reserves the right to restrict public access in periods of heavy mine traffic flow, for example, during the transfer of supplies from Rankin Inlet to Meliadine after the annual sealift.

Procedures For Road Access & Road Safety Rules

1. Report to the Gatehouse to access the road, present your access pass (issued by the Kivalliq Inuit Association office in Rankin Inlet) and provide your name and expected time of return. AEM Dispatch will explain the safety rules and procedures and provide an update on current road and weather conditions.

2. Maximum speed limit on this road is 50 km/hr;

3. Use of seat belts by all drivers and passengers is mandatory;

4. No drinking and driving is allowed;

5. Driving under the influence of alcohol or intoxicating drugs is prohibited;

6. Wildlife has right-of-way on the road and no harassment of wildlife is allowed;

7. All hunting activity must avoid shooting across the road and should respect a safe shooting distance from the road (suggested at 1 km);

8. Hunting is not allowed within 1 km of the Meliadine exploration site;

9. All traffic should give way to oncoming truck traffic, i.e. use the passing turnouts to allow the oncoming truck to safely pass;

10. Vehicles should not park on the travelling surface of the road but should pull off the road at a safe location to park to prevent accidents;

11. No public traffic is allowed within the Meliadine exploration site. This is an industrial work site and thus non-project related vehicles should not go beyond KM 23 without prior special arrangement with AEM. Signs will be posted at KM 23 advising drivers of this rule; and

12. The road is closed to all traffic whenever the gatehouse is not staffed. At that time the gate across the road will be closed. Typically this means that weather is too bad to safely travel on the road or some activity is occurring on the road that makes travel unsafe. No traffic should proceed up the road during these times.

These are the same safety rules that will apply to all users of the road, including AEM employees, AEM contractor employees and public users of the road.

It is worth noting that the Criminal Code of Canada applies to private roads. For example, if an accident were to occur on the road and alcohol was involved, that person could be charged by the RCMP.

I acknowledge that I have been briefed on these safety rules by AEM:

_____	_____	_____
Printed name	Date	Signature