MELIADINE GOLD PROJECT

MONITORING PLAN

for the Phase 1 All-weather Access Road between Rankin Inlet and the Meliadine site

November 2011

DOCUMENT CONTROL

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Introduction

The monitoring programs in this Monitoring Plan are proposed to deal with the uncertainties associated with the impact predictions and environmental design features noted in the project description and environmental assessment of the Phase 1 All Weather Access Road (AWAR). In general, monitoring is used to test (verify) impact predictions and determine the effectiveness of environmental design features (mitigation). Monitoring is also used to identify unanticipated effects and implement adaptive management. Typically, monitoring includes one or more of the following categories, which may be applied during the construction, operation and closure of the Phase 1 All Weather Access Road.

1. Compliance inspection: monitoring the activities, procedures, and programs undertaken to confirm the implementation of approved design standards, mitigation, and conditions of approval and company commitments;
2. Environmental monitoring: monitoring to track conditions or issues during the development lifespan, and subsequent implementation of adaptive management; and
3. Follow-up: programs designed to test the accuracy of impact predictions, reduce uncertainty, determine the effectiveness of environmental design features, and provide appropriate feedback to operations for modifying or adopting new mitigation designs, policies, and practices.

Results from these programs can be used to increase the certainty of impact predictions in future environmental assessments. These programs form part of the environmental management system for the AWAR Project. If monitoring or follow-up detects effects that are different from predicted effects, or the need for improved or modified design features, then adaptive management will be implemented. This may include increased monitoring, changes in monitoring plans, or additional mitigation.

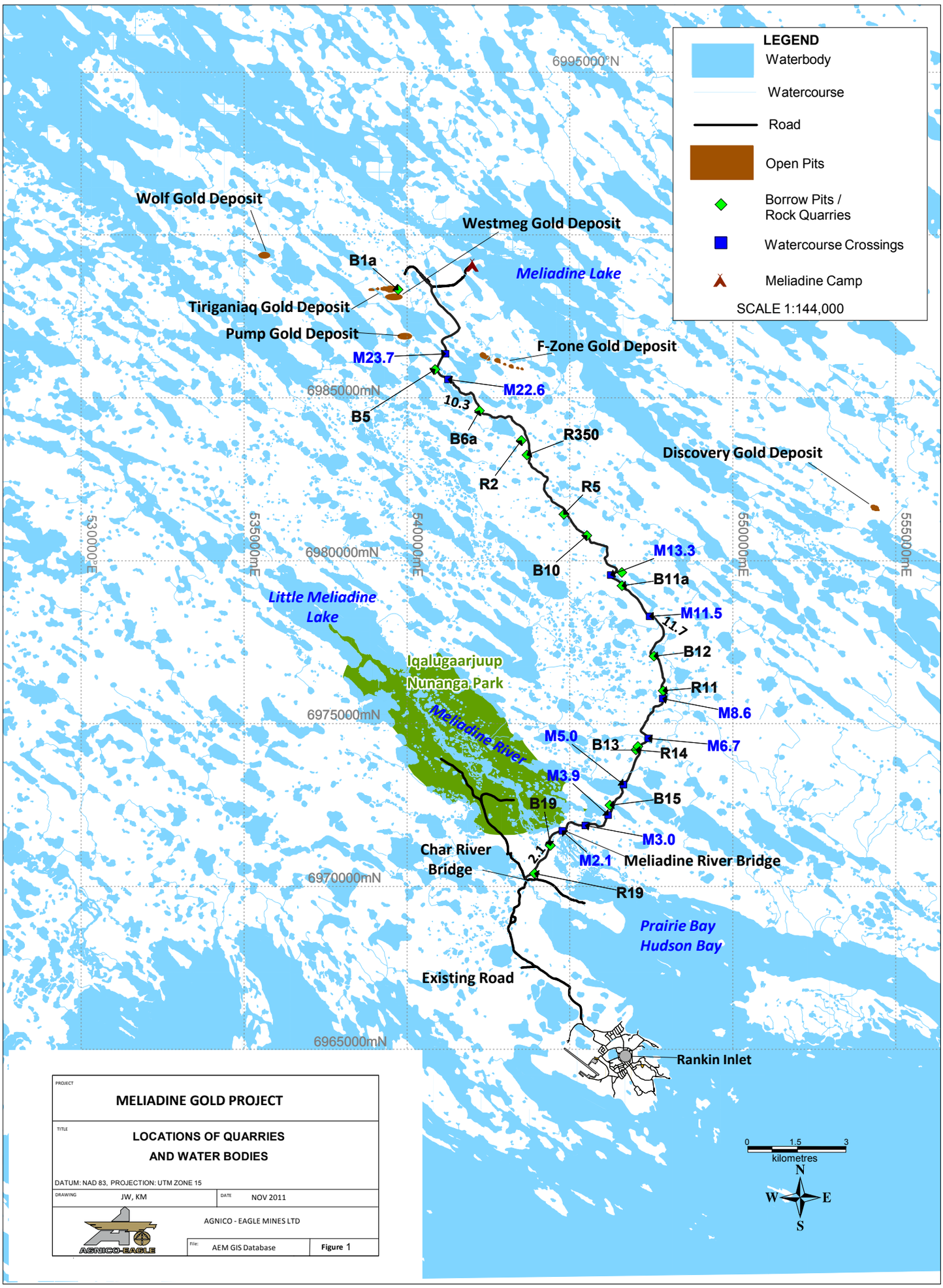
The Monitoring Plan for the All Weather Access Road (AWAR) covers in order wildlife, water quality, hydrology, geochemistry (road fill testing) and permafrost. The Phase 1 AWAR is illustrated on figure 1.

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.

Wildlife is expected occasionally to be observed on or immediately along the side of the AWAR. 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 or near the road. The protocol to use when wildlife is on or near the road is presented in appendix 1.



PROJECT
MELIADINE GOLD PROJECT

TITLE
LOCATIONS OF QUARRIES AND WATER BODIES

DATUM: NAD 83, PROJECTION: UTM ZONE 15

DRAWING	DATE
JW, KM	NOV 2011

AGNICO - EAGLE MINES LTD

File: AEM GIS Database

Figure 1

All wildlife observations will be recorded on a wildlife monitoring form. An example of such a form can be found in appendix 2.

2. Water Quality Monitoring Program

The AWAR between Rankin Inlet and the Meliadine Site could impact water quality as described in the project description and environmental assessment. 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 eight water crossings using culverts and these would offer the highest likelihood of metal leaching. Three water crossings will have clear span bridges with all ancillary infrastructure above the ordinary high water mark. These are not expected to impact on receiving waters. However, all 11 water crossings will initially be monitored to measure the impact of the road on receiving waters.

For the first year after construction of the road, at the end of the freshet season, a full round of water quality sampling will be conducted along the AWAR. This shall include:

- Any significant water seeps and/or water ponded in contact with the road. The sample locations will be chosen to represent areas where standing water is in regular contact with the road fill. Other criteria for selecting a sampling location include areas of evident rock staining (rust colour particularly) and areas where an accidental spill has previously occurred;
- Any significant seeps originating from the borrow pits or rock quarries will be sampled if the water is likely to reach receiving waters. (Standing water will not be collected as it poses little risk to the receiving environment); and
- Upstream and downstream from the 11 major road stream crossings in order to confirm there are no water quality issues resulting from these crossings or the adjacent road fill.

The monitoring program will be scaled back after the second year of sampling only if there are no water quality concerns with any of the sampling locations[1] no longer to be sampled. Areas having elevated levels of trace metals or TSS will continue to be sampled as will Meliadine River(M2.1), M3.0, M5.0 and M23.6. These are being continued as they represent the largest drainage basins and are of most environmental significance. 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 located at the underground exploration ramp, and upstream of the future F Zone gold deposit.

The area of the drainage basins is as follows:

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

The final decision on the monitoring program after year 1 will be reviewed by the NWB, KIA and AEM to determine if less sampling can be carried out in subsequent years.

[1] Borrow pits and rock quarries will not be sampled should raptors be nesting in them.

Samples from water crossings, flow from the borrow pits /rock quarries, standing water against the road will be collected in clean laboratory-supplied containers and preserved as directed by the analytical laboratory. The samples will be returned to an accredited commercial analytical laboratory for the analysis of the parameters specified on the chain-of-custody forms. Quality assurance and quality control measures outlined in the QA/QA Plan[2] for the Meliadine Gold Project will be followed. Generalized quality control is presented in table 1. The standard operating procedure for collecting environmental water samples as outlined in appendix 3 will be followed.

Table 1. Generalised Quality Control Measures

General quality control guidelines of a field sampling program are as follows:

- *all personnel involved in field procedures should have appropriate education and training;*
- *sampling methods should be consistently applied among sites throughout the study;*
- *samples should be collected according to SOPs that should be available to personnel at all times during the field program;*
- *sampling equipment should be appropriate for the habitat being studied, properly cleaned, and accompanied by the appropriate documentation (i.e., manual, calibration and maintenance schedule);*
- *all samples should be properly labelled as to date, location, type, number and collector;*
- *samples should be in the proper container with the appropriate preservative or fixative if necessary;*
- *field technicians should maintain detailed field notes using indelible ink and waterproof notebooks;*
- *personnel should use chain-of-custody/sample submission forms and custody seals for contaminant samples;*
- *personnel should follow appropriate shipping and storage methods; and*
- *standardised field collection forms should be used during the field program.*

The parameters to be analysed in all samples are presented in table 2 with particular attention paid to total suspended solids and total trace metals.

Table 2. Parameters for Analysis

Physical Parameters: pH (field and laboratory), temperature (field), alkalinity, bicarbonate, carbonate, electrical conductivity, hardness, hydroxide, ion balance, oil & grease, total dissolved solids, total suspended sediments, turbidity

Nutrients: NH_4, NO_3, NO_2, PO_4

Major Ions: Ca, Cl, Mg, K, Na, SO_4

Trace Metals: Al, Sb, As, Ba, Be, B, Cd, Cr, Cu, Fe, Pb, Li, Mn, Hg, Mo, Ni, Se, Ag, Sr, Sn, Ti, U, V, Zn

[2] Refer to the NWB ftp site for the Quality Assurance / Quality Control Plan for the Meliadine Gold Project, October 2009 under water licence 2BB-MEL0914

3. Hydrology Monitoring Program

Each crossing location was assessed during a preliminary study based on crossing descriptions and photographs in the Meliadine Gold Project Aquatics Baseline Synthesis Report[3] to determine its potential for classification as navigable waters based on the *Navigable Waters Protection Act* (NWPA) administered by Transport Canada. For crossings of non-navigable waters, culverts were recommended as the preferred crossing method.

The sizing of the culverts and bridges was based on an estimated peak flow at each crossing. Due to a lack of site-specific hydrometric data for the study area, the peak flow for each ephemeral crossing was estimated based on the 1:25 year 24-hour rainfall (52.3 millimetres [mm]); this was derived using rainfall data from Chesterfield Inlet (MSC Station Number 2300707), approximately 80 km north of the Meliadine Exploration site, which has a longer period of record than Rankin Inlet A (MSC Station 2303401) located approximately 26 km south of the Meliadine Exploration site. Corresponding water levels were derived using a 1-day flow model based on the channel cross-sections and peak flows. For the Meliadine River, the peak flow was estimated by extending the record of peak discharges from the crossing location by comparison with data from the regional Water Survey of Canada hydrometric stations 06NC001 Diana River near Rankin Inlet and 06NB002 Ferguson River below O'Neil Lake. The corresponding high water level was derived based on the peak flow and a 1-day flow model calibrated to water depths measured at the crossing location. The 1:25 year rainfall event was selected as the design criterion because of the proposed use of the road for 2 years under Phase 1 for the exploration and bulk sampling program, and, if Phase 2 is approved, the road would be used for 10 years for the construction and operation of the proposed mine, and because of the general absence of additional public infrastructure in the vicinity of the road.

The watercourse crossing visual inspection and maintenance program is designed to identify issues relating to watercourse crossings structural integrity and hydraulic function. It has three main objectives:

- 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.

If more freshet water is evidenced than expected, the hydrology of the basin will be surveyed once again to ensure the proper culvert design was used for the size of the drainage basin.

[3] Golder (Golder Associates Ltd.). 2009. Aquatics Baseline Synthesis Report; Meliadine Gold Project. Submitted to Compalex Minerals Corporation. November 2009. Report 09-1371-0010-4000.

4. Road Fill Testing[4]

There will be five rock quarries and eight borrow pits used in construction the AWAR. Rock and aggregate will be used directly after blasting for road building over the 6 month building period. Once the base of the road is completed, it will be topped with crushed rock and till to establish the driving surface

The AWAR Project design includes the use rock and till materials, from identified quarry locations along the road, to be used for installation of culverts and bridges. All identified road building material comes from quarries and not from existing watercourses; no rock and construction material will be gathered from below the high water mark of any watercourse. Initial testing, using static methods to assess the chemical composition of the potential road building material, its potential to generate acid rock draining (ARD), and its potential to leach metals to the receiving environment upon exposure to ambient conditions was completed in 2010. The quarry locations identified for the AWAR show no potential to generate acid drainage. The low ARD potential stems from the low sulphide content and high buffering capacity in the same material. Sulphide sulphur content ranges from <0.01 to 0.17% (in rock) and 0.07% (in till), and total sulphur ranges from <0.005 to 0.34% (in rock) and0.09% (in till). Based on the low sulphide sulphur content, samples are classified as non-acid generating.

The sites chosen for potential quarry and borrow sites along the road alignment were also tested for metal leaching. The results indicated no acid rock drainage and low metal leaching. Water leach tests yielded chemical concentrations that were less than the Metal Mining Effluent Regulations guidelines and were less than the CWQG for the protection of aquatic life for most parameters except for arsenic, aluminum, copper, and pH. Results from the laboratory testing serve to highlight chemicals of environmental interest and are not necessarily indicative of actual drainage quality because this will depend on the exposure of the materials to ambient conditions, particularly to water and snow melt.

Visual examinations of the quarry material for sulphur species and additional testing for acid rock drainage/metal leaching from each quarry and borrow will be conducted during construction. All material used at the watercourse crossings will be non-acid generating; however, this will be verified through testing of the rock fill material and through monitoring of water quality in the watercourse or in standing water during and after construction.

The additional samples collected from each borrow pit / rock quarry will be dependent on the quantity of material to be extracted. For every 10,000 m^3 of material removed from a borrow pit or rock quarry a sample will be collected for static testing. The results will be presented in a report three months following receipt of the analytical results.

5. Permafrost Monitoring

The AWAR is to be largely built over the winter period with the driving surface completed by August 2012. By building the AWAR during winter, the permafrost will aggrade into the road bed with the original ground remaining frozen year round.

[4] Please refer to Golder Associates Geochemical Assessment of Potential Road Construction Material, Meliadine Golder Project, Nunavut, December 2010. This report is on the NWB's ftp site.

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 would be repaired using granular material and/or crushed rock. AEM will maintain stockpiles of such material in select borrow/quarry areas along the road and these will be used to ensure that the minimum road fill thickness is maintained to preserve the subgrade soil in a frozen state and so that the surface remains drivable.

Appendix 1.

Protocol for Animals

on or immediately adjacent to

the AWAR

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

1. Vehicular traffic speeds on the access road will be limited to 50 km/hr.
2. 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
3. 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.
4. Caribou and other wildlife will be given right-of-way on the road. Vehicles must stop until the animal is off the road.
5. Locations of large aggregations of animals must be reported to the road supervisor who will inform all potentially affected employees, contractors and the environmental representative.
6. 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.
7. 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.
8. 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 will be removed from the road and incinerated to avoid attracting scavengers such as Arctic Fox, Wolves, Grizzly Bear, and/or Wolverine.

Appendix 2.

Technical Procedures

for

Wildlife Monitoring

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OBJECTIVE

The objective is to determine if wildlife (particularly caribou, foxes, wolves, wolverines, bears, and birds) are distributed along the project footprint (e.g., road, quarries and borrow pits).

FIELD PROCEDURES

Wildlife sign monitoring surveys should be performed on a weekly basis or every two weeks. Using an ATV vehicle, environmental staff and/or contractors will travel the AWAR at a slow speed and stop periodically to search for birds (ptarmigans, raptors and waterfowl) in the distance. Consecutive surveys should be alternated between morning and afternoon. Borrow pits and rock quarries will be surveyed using a systematic meander survey on foot of the outside perimeter of each site. **If raptors are nesting in the quarries or borrow pits, they will not be approached for any water sampling or wildlife surveys.**

Observations of all wildlife or wildlife sign will be recorded. Data recorded will include species, location of group and the number of animals. If applicable, any wildlife sign, the species that left the sign, an estimation of the number of individuals that were in the area and any reports from staff of animals in the area being surveyed should also be recorded on the data sheets. Photos may also be taken. A new sheet should be used for each location.

Wildlife reports from staff, contractors and/or private individuals travelling the road will be recorded on the wildlife observation form.

If surveys detected no sign of wildlife, then a "0" should be entered on the data sheet and in the database for that date

EQUIPMENT AND MATERIALS

- Data sheets;
- Digital camera;
- Binoculars;
- GPS units; and,
- Classification codes for group composition (e.g., caribou groups – bulls, nursery groups), behaviour (running, bedded, feeding, walking) and habitat (vegetation codes).

SAFETY CONCERNS AND PRECAUTIONS

- Animal encounters - Watch bear safety video, have bear deterrent, do not approach any known den areas, talk loudly before cresting a hill, etc.;
- Working along the AWAR - watch for traffic.

AWAR WILDLIFE MONITORING
WILDLIFE SIGN MONITORING

Date:_____ **Time:**_____ **Observers:**_____ **Temperature:** _____

% Snow Cover (if applicable):__ **Days Since Last Snow:**_ **Visibility (est distance):**

Cloud Cover:_____ **Wind Speed (Beaufort):**_____

Beaufort scale: **0 – calm**; **1 – light air**, smoke indicates wind direction; **2 – light breeze**, felt on face; **3 – gentle breeze**, vegetation in constant motion; **4 – moderate breeze**, dust and loose leaves raised up; **5 – fresh breeze**, small trees/shrubs begin to sway; **>5 – strong breeze**, winds are >25 mph.

Wildlife Observations

Waypoint Number	UTM Coordinates (Grid Zone, Northing, Easting)	Species	Observation Type (Sighting or Sign and list sign	Estimated # Individuals	Comments on Observation/Behaviour

Places to visit include: Roads, borrow pits / rock quarries, water crossings
Wildlife Sign: (tracks, scat, digs, dens, bed, feeding craters, etc.)

Additional Comments/Reports from Staff

_____
_____
_____
_____
_____

Appendix 3.

Standard Operating Procedure

for

Collecting Environmental Water Samples

Standard Operating Procedure for Collecting Environmental Water Samples.

1. Principle

This Standard Operating Procedure provides guidance on the collection of environmental water samples along the AWAR.

2. Materials

The person collecting the samples will require the following to collect samples:

- A map showing the sample locations and the GPS coordinates,
- A Chain of Custody form to record the sample location, date and time of sample collection,
- A worksheet to record field data, climate at the time, and any observations relevant to the environmental conditions at the time of collection.

The materials required include:

- A cooler to hold the samples,
- Ice packs to keep the samples cool,
- pH and temperature meter,
- A beaker or wide mouth sample bottle to measure pH and temperature in the field,
- the proper sample bottles for the parameters being analysed.
- Disposable latex gloves,
- A GPS,
- A radio for emergencies.

3. Procedure

Before going into the field to collect the samples:

- Do a two point calibration on the pH meter using 2 buffer solutions,
- Label all the sample bottles using a water proof marker for all locations excepting the time of collection. This can be written on the bottle in the field or directly afterwards when back in camp,
- Take sufficient ampoules of preservatives into the field for all samples. Each sample needing preservation gets a different preservative. The ampoules are colour coded to match the colour coding on the bottles,
- Check the GPS to ensure it is working,
- Take sufficient disposal latex gloves into the field, one set for each sample location. These should be placed in a new Ziploc locked bag or the like so they do not get contaminated,
- Put two ice packs in the cooler along with the labelled, empty bottles.

Collecting the samples:

- Check the GPS against the field sheet to ensure you are at the correct sampling location,
- Rinse the beaker used for pH and temperature measurements three times,
- Fill the beaker with water and immerse the pH/temperature probe
- Record the temperature immediately,
- Stir the pH probe in the beaker without touching the sides if possible until the readings stabilize. This may take some time seeing the water is normally cold,
- Check to see that the correct bottles are assembled for the sampling location,
- Put on a set of clean, disposable latex gloves,
- Rinse the sample bottle 3 times before collecting the sample. Dispose of the rinse water away from where the sample is to be collected, preferably on land or downstream,
- After collecting the sample, leave enough head space in the bottle to add the preservative,
- **ENSURE THE RIGHT PERSERVATIVE IS USED FOR THE SAMPLE COLLECTED,**
- Upon adding the preservative, tighten the cap and invert the bottle three or four times to cause thorough mixing of the sample water and preservative,
- Samples bottles for faecal coliforms, oil and grease and PAHs should **not** be rinsed before taking the sample,
- Place the sample bottles in the cooler right side up for transport,
- It is best to collect samples for time sensitive parameters the morning the cooler is to be sent to the laboratory.

4. Reporting

- Complete the chain of custody form recording the field pH, temperature, date and time, location, name of technician on the form,
- Keep the yellow copy for camp records. Put the remaining copies in a Ziploc bag and place it in the cooler,
- Check the freezer packs to ensure they are frozen. That way they will keep the samples cool until they arrive at the laboratory,
- Securely seal the cooler,
- Contact M&T Enterprises and tell them that a cooler with environmental samples is coming. Emphasize the samples have to be on the next plane to the laboratory,
- Get the waybill number from M&T and transmit it to the laboratory contact telling them what plane the cooler will be on. They will meet the plane and take the cooler to the laboratory.