P.O. BOX 119
GJOA HAVEN, NU X0B 1J0
TEL: (867) 360-6338
FAX: (867) 360-6369
KATIMAYINGI

NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN

Supplemental Technical Information Required for Water Crossings (linear/bridge/culverts)

1. Waterbody name (English and Inuktitut) and location (Lat & Long)

   The ephemeral streams do not have any names and are identified only by the letter M and followed by the distance from the start of the south end of the road. M2.1 is the Meliadine River, which is a navigable water.

	NAT 83		UTM Zone 15V	
Location	Lat	Long	Easting (m)	Northing (m)
M2.1	62° 52' 21.8"	92° 07' 10.4"	544790	6971714
M3.0	62° 52' 26.6"	92° 06' 16.6"	545548	6971874
M3.9	62° 52' 36.2"	92° 05' 32.5"	546167	6972178
M5.0	62° 53' 06.5"	92° 04' 58.5"	546634	6973123
M6.7	62° 53' 50.4"	92° 04' 04.3"	547380	6974493
M8.6	62° 54' 36.1"	92° 03' 25.3"	547909	6975915
M11.5	62° 55' 53.8"	92° 03' 55.7"	547445	6978314
M13.3	62° 56' 34.0"	92° 05' 16.6"	546287	6979542
M22.6	62° 59' 51.2"	92° 11' 08.8"	541245	6985577
M23.6	63° 00' 16.6"	92° 11' 12.2"	541188	6986363

2. Site photo, site map or air photo detailing location

   Refer to figure 3.1-1 in the Project Description for the Phase 1 All-weather Access Road (AWAR) and also the attached figure 2-2showing the water crossings, quarries and alignment.

3. Other Agencies contacted to date

   The agencies contacted to date include;
   - **Fisheries and Oceans Canada**
     - **Six of eight ephemeral streams are fish habitat and water will be conveyed from one side of the AWAR to the other using culverts**
   - **Transport Canada – Navigable Waters**
     - **The Meliadine River is navigable water.**
   - **Kivalliq Inuit Association**
     - **A large part of the Phase 1 AWAR will be on Inuit Owned Land**

    - **Quarries will be developed along the Phase 1 AWAR right-of-way**
- **Culture, Language, Elders and Youth**
    - **Archaeological sites within the Phase 1 AWAR right-of-way had to be mitigated**
- **Hamlet of Rankin Inlet**
    - **Part of the AWAR will be on municipal land**
- **Community and Government Affairs**
    - **Community and Government Services will prepare the easement lease documents and the quarry permits**
- **Aboriginal Affairs and Northern Development Canada**
    - **Approximately 200 metres of the AWAR north of the Meliadine River (M2.1) is on federal land. An easement lease is required.**

4. Need for the project and alternatives considered

   Refer to Section 2 in the Project Description for the Phase 1 AWAR

5. General condition of the site (s) **Refer to section 5 and Appendix C in the Project Description for the Phase 1 AWAR.**
    i. Slope of banks
    ii. Description of substrate
    iii. Vegetation (on banks, in-stream, to be removed)
    iv. Expected flow rates during time of construction
    v. Channel meander pattern
6. Existing Habitat **Refer to section 5 in the Project Description for the Phase 1 AWAR.**
    i. Fish Community (species/common names) at and near the site
    ii. Use of impacted are as spawning, nursery, rearing, food supply or migration route
    iii. Presence of sensitive habitat
    iv. Assessment of impact to fish and fish habitat

   DFO, in a letter of 29 April 2011, indicated that no fisheries authorization was required for the Phase 1 All-weather Access Road and advised AEM that no habitat compensation is required for any of the proposed Phase 1 AWAR stream or river crossings. They did however state that AEM had to abide by the applicable Operational Statements for Nunavut.

7. Construction Details
    i. In water work timing restriction for fishery

       Road construction work will begin in March 2012 and continue until September 2012. There will not be any in-water work between May 15 – July 30.

    ii. Proposed start date and completion date

       The proposed start date is March 1 2012 and the completion date September 2012.

    iii. Type of crossing,

The Char and Meliadine Rivers, and M5.0 will have single span bridges with abutments and any ancillary components above the ordinary high water mark. The Meliadine Bridge will be 3 metres above the ordinary high water mark to meet navigable waters requirements.

The eight ephemeral streams will be crossed using culverts.

iv. Method of installation

The Char and Meliadine bridges would see the abutments constructed first followed by the girders being lifted or slid into place. This will all happen before spring break-up for the Char and Meliadine Rivers. For M5.0, the abutments and bridge will be constructed between July and September. Refer to the attached Phase 1 construction schedule.

The culverts would be installed as the road progresses. The stream bed would be excavated to a depth of 300 mm and the culvert installed. This will allow fish migration through the culvert. Other culverts installed at the same locations will be offset and higher up in the road bed. Bedding material will be placed around the culverts.

For more detail refer to the report, "All Weather Access Road, Meliadine Gold Project, Feasibility Level Design" found on the CD attached to the Project Description for the Phase 1 AWAR.

v. Dimensions of pipe or structure

Culverts with nominal sizes of 0.7 m, 1.0 m, and 1.3 m (internal diameter) would be used to pass the design flow. The length of the culverts varies from 15.3 to 18.3 metres depending on where it is located.

vi. Machinery to be used.

Conventional road building equipment will be used. This includes but is not limited to dump trucks, dozers, back hoes, drills, loaders, pick-up trucks and vans.

vii. Construction sequence (timing restriction may need to be taken into account)

Refer to the attached construction schedule. The restriction on in-water work is built into the schedule.

viii. Sedimentation and erosion control measures

Sediment and erosion control measures will be implemented prior to the start of work and maintained during the work phase, to prevent entry of sediment into the water or the movement of re-suspended sediment into the stream crossings.

Sediment and erosion control measure will be left in place until all disturbed areas have been stabilized.

ix. Monitoring during construction

Sediment control structures will be monitored following break-up by Meliadine site environmental staff. If high TSS is noticed downstream of a culvert or bridge, corrective action would be taken.

x. Other mitigation measures

Machinery used near stream crossings will arrive on-site in a clean condition and be maintained free of fluid leaks to keep contaminants out of the water.

Refer to the Project Description for the Phase 1 AWAR. The document provides an assessment of the predicted environmental and socio-economic effects associated with the Phase 1 AWAR and provides mitigation measures that will be applied to mitigate, where possible, adverse effects and to enhance where possible positive effects.

xi. Assessment of impact to fish and fish habitat

DFO, in a letter of 29 April 2011, indicated that no fisheries authorization was required for the Phase 1 All-weather Access Road and advised AEM that no habitat compensation is required for any of the proposed Phase 1 AWAR stream or river crossings. They did however state that AEM had to abide by the applicable Operational Statements for Nunavut.

Refer to the attached letter.

Also refer to section 5.2 in the Project Description for the Phase 1 AWAR

xii. Bank stabilization (size range of material)

The rip-rap for bank stabilization will only be coarse rock that is at least 300 mm or larger.

xiii. Cumulative impacts to area

Refer to sections 5.2.5 and 5.3.6.5 in the Project Description for the Phase 1 AWAR.

xiv. Contingency plan

The existing exploration project Fuel Management and Spill Contingency Plan for Water Licences 2BE-MEP0813 and 2BBMEL0914 (November 2010) will be updated to include the all-weather road.

xv. Revegetation proposed

All disturbed areas are to be physically stabilized as soon as possible following construction and to the greatest extent possible re-vegetated with native species from the area, assuming that an appropriate source of vegetation can be found (seed or transplants).

xvi. Proposed post-construction monitoring (photos taken of the site before construction, during construction and after construction; photographs should be taken form the same reference point for easy comparison)

Refer to the preconstruction photos in the Project Description for the Phase 1 AWAR, Appendix C.
AEM commits to take photos of the water crossings during and after construction and submit them to the NWB as part of its annual report for the road.

8. Bridge **Refer to section 3.1.3 in the Project Description for the Phase 1 AWAR.**

i. Bridge dimensions and type

The bridges will be 2 lanes wide. They will be single span with the abutments and any ancillary structures located above the normal high water mark.

ii. Any structures (abutments, pilings, piers) that will be placed in the water, on a temporary or permanent basis

Abutments will be located above the high water mark on both sides of the rivers/stream and these will hold the steel girders for the bridge. Refer to section 3.1.3 and figures 3.1-5 and 3.1-6 in the Project Description for the Phase 1 AWAR.

iii. Anticipated changes to the existing channel/shoreline morphology as a result of the proposed works

There will not be any changes to the existing channel /shoreline morphology excepting that the rip-rap protecting the abutments will be partially under water during times of very high water. During ordinary high water, the rip-rap will be above the water line.

iv. Activities or structures that may cause a temporary or permanent barrier to movement of fish or flow of water

There will not be any activities that may cause a temporary or permanent barrier to movement of fish or water flow.

v. Coffer dams, dewatering, temporary watercourse diversions, excavation and temporary crossings

There will not be any coffer dams or any watercourse diversions in building the Char and M5.0 bridges. For the Meliadine River an ice bridge will be built across the river for the installation of the abutments and the steel girders. The ice bridge will be breeched prior to break-up.

vi. Total area of impact (m^2)

The total area of impact is the width of the abutments and the associated rip-rap in front of and to the sides of the abutment as shown on plan view of the Meliadine Bridge in figure 3.1-5 in the Project Description for the Phase 1 AWAR.

Char River < 140 m^2
Meliadine River <170 m^2
M5.0 <90 m^2

vii. Stabilization method and materials used at bridge abutments(include details of material size range)

Rip-rap exceeding 300 mm in size will be used to stabilize the abutments in front and to the sides. Refer to point ii above.

9. Culvert Installation **Refer to the Project Description for the Phase 1 AWAR**

i. Culvert dimensions (height and width or diameter, length)

The sizing of the culvert crossings was based on an estimated peak flow at each crossing. The peak flows for each crossing were based on the 1:25 year 24 hour rainfall (52.3 mm) derived using rainfall data from Chesterfield Inlet, which is 80 km north of the Meliadine site. Culverts with nominal sizes of 0.7 m, 1.0 m, and 1.3 m (internal diameter) would be used to pass the design flow. The length of the culverts varies from 15.3 to 18.3 depending on where they are located.

For more information refer to the report, "All Weather Access Road, Meliadine Gold Project, Feasibility Level Design" found on the CD attached to the Project Description for the Phase 1 AWAR.

ii. Culvert type/material

Culverts will be full-rounded corrugated steel pipe.

iii. Impact to fisheries ability to migrate through the culvert

More than one culvert will be installed at each water crossing and they will have an "offset stacked" configuration with the lowest culvert embedded approximately 300 mm into the watercourse to provide low water fish passage.

iv. Need to realign the channel?

Channels will not be realigned.

v. Open bottom or natural substrate inside?

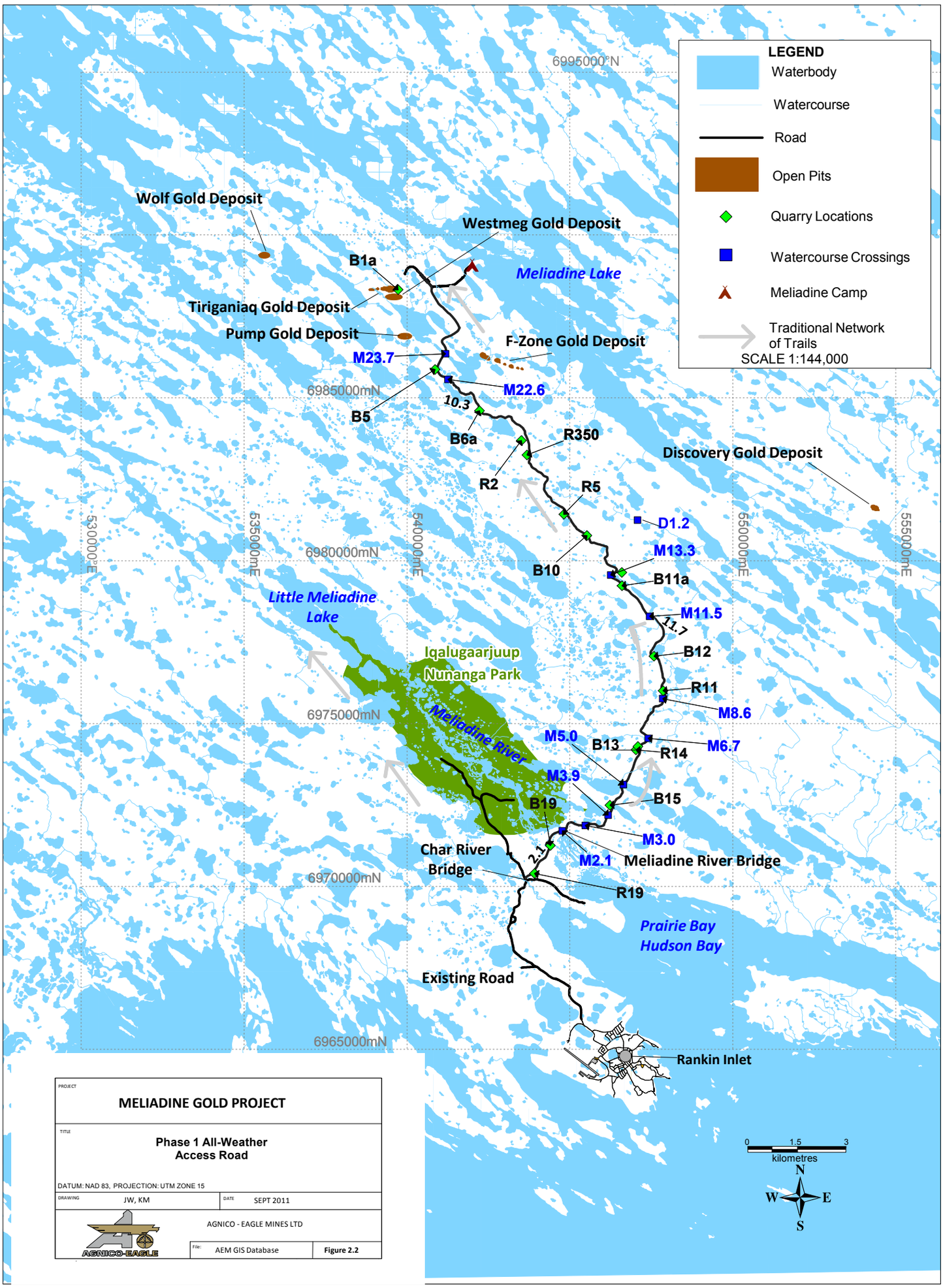
It is not planned to put a natural substrate in the bottom of the culverts as it might impede flow (boulders or gravel) or be eroded (fine organic material). At most water crossings the substrate is a final organic material that is highly prone to erosion so it would not be wise to put this material in the culvert. Furthermore, it does not provide habitat to most fish, excepting stickleback and slimy sculpins.

vi. Slope of culvert

Culverts would be installed to match the slope of the stream at the location. In many cases this would be a horizontal position with only the slightest slope to the downstream side.

vii. Installation of baffles, rock weirs or other structures

Baffles, rock weirs or other structures will not be installed.



PROJECT

MELIADINE GOLD PROJECT

TITLE

Phase 1 All-Weather Access Road

DATUM: NAD 83, PROJECTION: UTM ZONE 15

DRAWING	JW, KM	DATE	SEPT 2011

AGNICO - EAGLE MINES LTD

File: AEM GIS Database

Figure 2.2

8. Comment Form Distribution

Submit by Email | Print Form

COMMENT FORM FOR NIRB SCREENINGS

The Nunavut Impact Review Board (NIRB) has a mandate to protect the integrity of the ecosystem for the existing and future residents of Nunavut. To assess the environmental and socio-economic impacts of the project proposal, NIRB would like to hear your concerns, comments and suggestions about the following project proposal application:

Project Proposal Title: AEM Meliadine All-Weather Road

Proponent: Agnico-Eagle Mines Limited

Location: North-west of Rankin Inlet

Comments Due By: April 28, 2011 **NIRB #:** 11RN017

Indicate your concerns about the project proposal below:

- ☐ no concerns
- ☐ water quality
- ☐ terrain
- ☐ air quality
- ☐ wildlife and their habitat
- ☐ marine mammals and their habitat
- ☐ birds and their habitat
- ☒ fish and their habitat
- ☐ heritage resources in area
- ☐ traditional uses of land
- ☐ Inuit harvesting activities
- ☐ community involvement and consultation
- ☐ local development in the area
- ☐ tourism in the area
- ☐ human health issues
- ☐ other: _____

Please describe the concerns indicated above:

Impacts to fish and fish habitat resulting from the installation of the culverts and bridges.

Do you have any suggestions or recommendations for this application?

Recommended mitigations measures are included in the attached letter.

Do you support the project proposal? Yes ☒ **No** ☐ **Any additional comments?**

Name of person commenting: Georgina Williston **of**

Position: Fish Habitat Biologist **Organization:** Fisheries and Oceans Canada

Signature: Georgina Williston **Date:** April 28,2011

Fisheries and Oceans Canada
Pêches et Océans Canada
Eastern Arctic Area
P.O. Box 358
Iqaluit, NU X0A 0H0
Phone: (867) 979-8000
Fax : (867) 979-8039

April 29, 2011

Your file *Votre référence*
NIRB File No. :11RN017

Our file *Notre référence*
09-HCAA-CA7-00002

Tannis Bolt
Nunavut Impact Review Board
P. O. Box 2379
Cambridge Bay, Nunavut
X0A0C0

Dear Ms. Bolt:

Subject: Part 4 Screening for Agnico-Eagle Mines Ltd. All-Weather Road.

Fisheries and Oceans Canada (DFO) appreciates the opportunity to participate in the Part 4 Screening process for the above mentioned project proposal as requested by you on April 7, 2011. To expedite future correspondence or inquiries, please refer to the referral title and file numbers when you contact us.

DFO File No.: 09-HCAA-CA7-00002
Title: All-Weather Road, Meliadine Gold Project, Kivalliq Region, Nunavut

The proposal has been reviewed to determine whether it is likely to result in impacts to fish and fish habitat which are prohibited by the habitat protection provisions of the *Fisheries Act* or those prohibitions of the *Species at Risk Act* that apply to aquatic species.*

Our review consisted of:

- Notice of Part 4 Screening for Agnico-Eagle Mines Ltd.'s All-Weather Road, project proposal sent on April 7, 2011.
- Agnico-Eagle Mines Limited, Project Description, All Weather Road in Support of the Underground Program – Rankin Inlet to the Meliadine Site.
- Fish Habitat Loss and Compensation Options for the All-Weather Access Road to the Meliadine Gold Project. December 2010, Prepared by Golder Associates, Edmonton Alberta.

*Those sections most relevant to the review of development proposals include 20, 22, 32 and 35 of the *Fisheries Act* and sections 32, 33 and 58 of the *Species at Risk Act*. For more information please visit www.dfo-mpo.gc.ca.

We understand that the proponent plans to:

- Replace the existing bridge at the Char River with a new Clear Span bridge.
- Install 2 new clear span bridges at the Meliadine River and Site M5.0.
- Install culverts at the following 9 crossings; M3.0, M3.9, M6.7, M8.6, M11.5, M13.3, M22.6, M23.7 and D1.2.
- Culverts will be embedded and sized appropriately at each of the above crossings to facilitate fish passage.

DFO has produced an Operational Statement titled "Clear Span Bridges" which can be found at the following website: http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/provinces-territories-territoires/nu/os-eo24-eng.htm. This operational statement covers activities and mitigation measures associated with the installation of the three proposed clear span bridge structures.

To reduce potential impacts to fish and fish habitat we are recommending the following mitigation measures be included into your plans:

- To protect fish spawning and nursery periods of local fish population, no in-water work should take place from May 1 to July 15.
- Sediment and erosion control measures should be implemented prior to work and maintained during the work phase, to prevent entry of sediment into the water or the movement of re-suspended sediment into the river.
- Sediment and erosion controls measures should be left in place until all disturbed areas have been stabilized.
- All disturbed areas should be stabilized and re-vegetated as required upon completion of work.
- Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks
- Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent deleterious substances from entering the water.
- An emergency spill kit should be kept on site in case of fluid leaks or spills from machinery

Provided that the plans are implemented as described DFO has concluded that he proposal is not likely to result in impacts to fish and fish habitat.

The proponent will not need to obtain a formal approval from DFO in order to proceed with the proposal.

If the plans have changed or if the description of the proposal is incomplete the proponent should contact this office to determine if the advice in this letter still applies.

I trust the information provided will be of assistance in the Nunavut Impact Review Board's review of Agnico-Eagle Mines Ltd. All-Weather Road. If you or the proponent have any questions concerning the above, or if my understanding of the proposal is either incorrect, incomplete, or if there are changes to the proposed work,contact the undersigned at (613) 925-2865ext. 131, by fax at (613) 925-2245, or by email at Georgina.Williston@dfo-mpo.gc.ca.

Yours sincerely,

Georgina Williston

Georgina Williston
Habitat Management Biologist

Derrick Moggy: Fisheries and Oceans Canada
John Witteman: Agnico- Eagle Mines Ltd.

AGNICO-EAGLE MINES LTD
Meliadine Project
All Weather Project Access Road - PHASE 1

REVISION: 01
September 2011

ID	Nom de la tâche	Start	Finish
1	**MELIADINE PROJECT - AWR Phase 1**	**Wed 10-09-01**	**Thu 12-09-27**
2			
3			
4	**100 OFF-SITE INFRASTRUCTURE**	**Wed 10-09-01**	**Thu 12-09-27**
5			
6	**105 All Weather Road - Rankin to Meliadine**	**Wed 10-09-01**	**Thu 12-09-27**
7	Preliminaire road design - Golder	Thu 10-11-25	Fri 10-11-26
8	Advance road design - Ass. Eng.	Wed 10-10-27	Fri 11-01-21
9	Geotechnical Report Main Bridges - Golder	Mon 10-09-06	Fri 10-11-26
10	Preliminairy Bridge Design - Stavibel	Wed 10-11-24	Tue 11-01-25
11	Bidding Process - Main bridges (3)	Tue 11-01-25	Fri 11-03-18
12	Main Bridges (3) - Eng. / Fab. / Delivery	Mon 11-03-21	Fri 11-08-26
13			
14	Road Misc. Supplies - Purchase & Delivery	Mon 11-04-25	Fri 11-08-19
15			
16	**Winter Road to access bridges construction sites**	Mon 12-01-16	Fri 12-03-02
17			
18	Char River Bridge - Abutment Const.	Mon 12-03-05	Fri 12-04-27
19	Char River Bridge - Construction	Mon 12-04-30	Fri 12-05-25
20	Char River Bridge - Bridge open for road construction	Mon 12-06-04	Mon 12-06-04
21	Char River Bridge - Completion of Bridge Abutment	Mon 12-06-25	Mon 12-07-02
22			
23	Meliadine River Bridge - Abutments Const.	Mon 12-03-05	Fri 12-05-18
24	Meliadine River Bridge - Construction	Mon 12-05-14	Fri 12-06-15
25	Meliadine River Bridge - Bridge open for road construction	Fri 12-06-15	Fri 12-06-15
26	Meliadine River Bridge - Completion of Bridge Abutment	Mon 12-07-02	Tue 12-07-10
27			
28	Bridge M0.5 Location - Abutment and Construction	Mon 12-07-30	Fri 12-09-07
29	(Note: will not slow down AWR const if done 2012)	Wed 10-09-01	Wed 10-09-01
30			
31	Meliadine AW Road - Request for Proposal	Mon 11-04-18	Fri 11-05-27
32			
33	Meliadine AW Road - Const. Km 0 to 1.9	Mon 12-03-05	Fri 12-04-20
34	Meliadine AW Road - Const. Km 2.0 to Km 25	Mon 12-03-05	Thu 12-09-27
35	Meliadine AW Road Opened to AEM Traffic ONLY	Sat 12-09-15	Sat 12-09-15

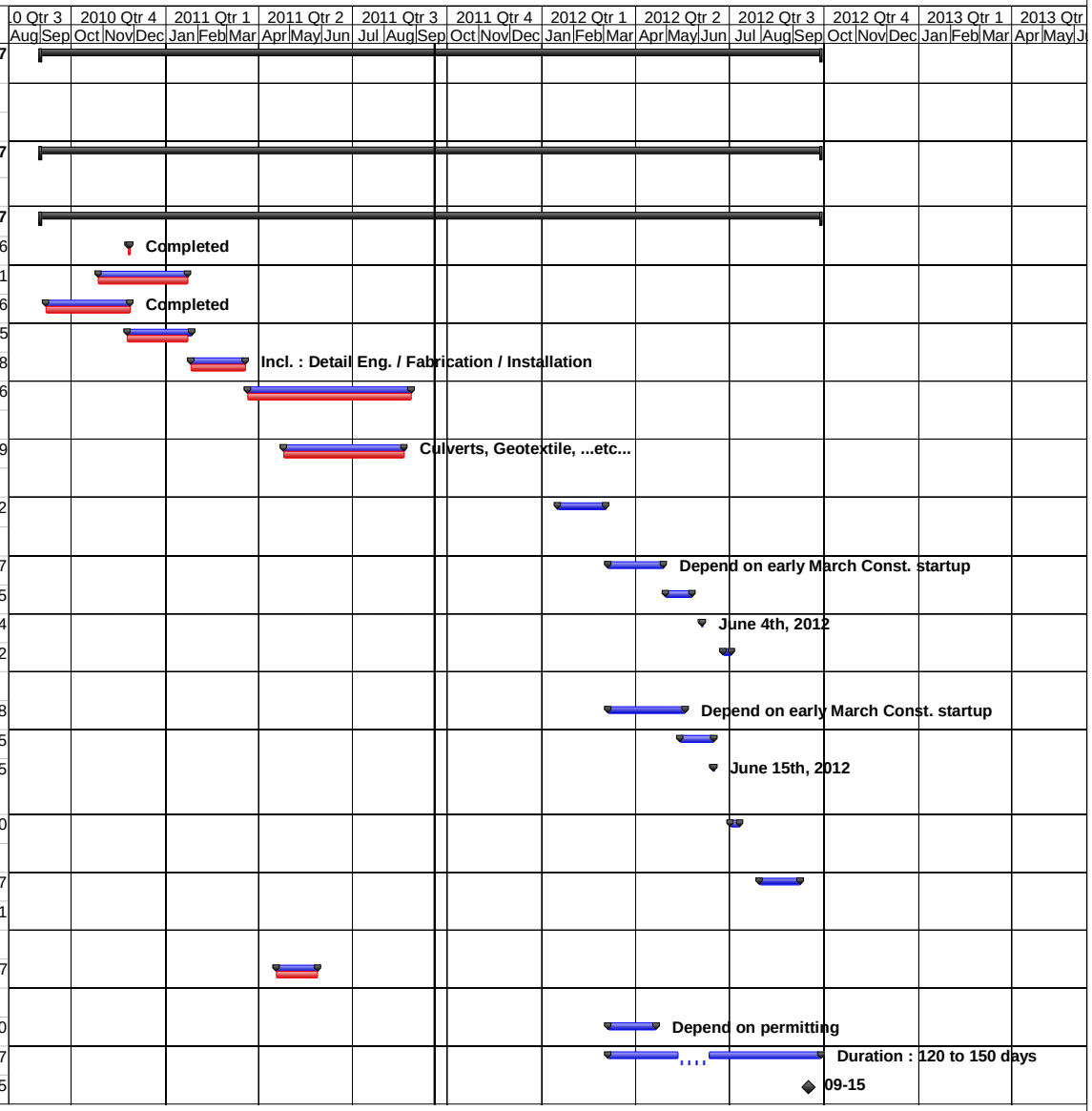


Figure 2-3 Proposed Phase 1 Construction Schedule