PROPOSED ROAD UPGRADE PLAN

For the cleanup of the FOX-C
Intermediate DEW Line Site

Submitted To: Public Works and Government Services Canada
Real Property Services
Architectural & Engineering Services
Environmental Services
Western Region

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General Information

There is a former Intermediate DEW Line Site located at Ekalugad Fjord, Nunavut with the designation FOX-C. The site has been abandoned since 1963, and since that time the condition of the roads on the site have greatly deteriorated. The remediation project at Ekalugad Fjord is planned to occur during the summer of 2006 and 2007. This document will outline the proposed plan to repair and upgrade the roads for use by the remediation project during these two seasons.

Proposed Route

The road will follow the same route that was used when the station was active. The only difference will be where the road has washed out next to the river above the lake. At this location the road will be rerouted to the northeast of the original road location. This will allow for a minimum impact of the road on the site. Figure 1 presents the proposed location of the road (presented at the end of the document).

Watercourse and Drainage Path Crossings

Location of Crossings

Culverts will be installed at all locations along the road where there is a crossing over a watercourse or drainage path. The waters where culverts are to be installed were confirmed to be non-fish bearing verbally by Linden Kivi of the Department of Fisheries and Oceans during a site inspection last summer. Wherever possible the culverts shall be located on a straight reach of the watercourse. Locations where culverts are to be installed are also shown in Figure 1.

Installation of Culverts

Culverts will be installed by placing the culvert in a straight reach at the base of the watercourse or drainage path. Large rocks will be removed that would prevent the culverts from lying flat on the bottom of the watercourse or drainage path. Any impacts to potential fisheries downstream of the temporary culvert will be minimized as much as possible. No excavation will be carried out unless it is absolutely necessary. There will be no disturbance of the natural banks of the watercourse or drainage path. The size and number of culverts to be installed at the locations shown in Figure 1 are detailed in Table 1. Public Works and Government Services Canada is verifying the sizing of the proposed culverts with a qualified hydrogeologist.

Table 1: Proposed Culverts to be Installed

Locations Start at Beach and end at the Upper Site		
Culvert 1	12' L x 12" Ø	To be installed between Beach and POL Tanks
		Only to be installed if needed
Culvert 2	12' L x 24" Ø	After Camp Pad - Removed at end of 2005 season
		To be installed & backfilled
Beach Road Crossing 1	12' L x 24" Ø	Removed at end of 2005 season
		To be installed & backfilled
Beach Road Crossing 2	12' L x 24" Ø	Removed at end of 2005 season
		To be installed & backfilled
Beach Road Crossing 3	None Required	Repaired during 2005 season
		Ditching still to be done
		Other minor repair work expected
No work done on the road past this point		
Beach Road Crossing 4	44' L x 48" Ø	To be installed during the 2006 season
Road Failure	30' L x 24" Ø	
	30' L x 24" Ø	
Beach Road Washout	24' L x 16" Ø	
River Crossing 1	24' L x 36" Ø	
	50' L x 36" Ø	
	2 High Boy Trailers*	
Washout 1	40' L x 48" Ø	
Washout 2	40' L x 48" Ø	
Washout 3	30' L x 36" Ø	
Washout 4	30' L x 36" Ø	
Washout 5	30' L x 24" Ø	
River Crossing 2	40' L x 48" Ø	
	30' L x 24" Ø	

* High Boy Trailers are 45 feet long and will be used between stream banks as a bridge (to be removed every season)

Filling of Crossings

After the culvert has been placed the crossing will be backfilled with granular material and compacted using a drum compactor to stabilise the fill. The crossing will be brought up to grade with the existing terrain on either side of the crossing to minimise the approach grades. A typical culvert installation is shown in Figure 2 (presented at the end of the document). Granular material will be taken from identified borrow areas and not from stream banks.

Timing of Installation of Culverts

Culverts will only be installed after the freshet when the flow has slowed to the point that the culverts can be installed without impeding the flow of water. Any culverts that have been installed prior to the runoff starting will be removed when the flow rates increase, if it is found that the crossings are impeding the flow of water. Installation of the culverts will also be completed prior to August 7th when char begin to migrate into the freshwater lake, reducing the impact on the fish.

Removal of Culverts

Culverts will be removed from the watercourses and drainage paths at the end of each field season. However, as per DFO instructions, no work will occur within waterways between August 7th and September 7th as an environmental protection measure during fish migration. This work will be completed prior to the end of September when the spawning season for the arctic char beings. The fill from the crossings will be piled next to the road for use the next season (fill will not be stockpiled on ice or snow). The culverts will also be placed next to the road. At the end of the projects, the culverts will be removed, and the fill will be used to recontour borrow pits or other uses as needed.

Installation Procedure for the Culverts

The installation of the culverts in 2006 will start with the culverts that were removed in 2005. Then equipment will proceed to Borrow Area #3 and material from the Borrow will be used to construct Beach Road Crossing #4. Then the equipment will proceed to Borrow Area #2 and material from this Borrow Area (which is better suited for road repairs) will be used to upgrade the crossings already completed, for new crossings on the beach road and the road to the second river crossing, and road upgrades.

In 2007 the fill piled at the side of the road will be used to construct the crossings. Extra fill will be added as needed.

CONTINGENCY PLANS

The existing ground surface around the watercourses, and drainage paths will not be disturbed. According to information provided by PWGSC (following a site investigation in 2004) the river that flows from the lake to the ocean is only used as a migratory channel by the arctic char, and is not suitable as fish habitat. There is no discussion on wether the tributaries that flow into the river below the lake are fish nearing or not. During the site investigation the DFO representative confirmed verbally that the crossings used by the road are not over fish bearing waters (too steep of grade with fast flowing waters). This does not mean however, that the waters below the crossings are not fish bearing. If it is found during the installation of the culverts, or normal operations, that excessive sediment is being created in the watercourse then environmental protection measures such as filter cloth, which is available on-site, will be employed to prevent sediment from flowing downstream.

If at any time during the season any of the watercourses are found to be running at such a flow rate that the culverts are not able to maintain the flow, they will be removed until such a time as the flow rate diminishes to a point where they can be safely installed again.

OTHER ROAD REPAIRS AND UPGRADES

The road surface will also be upgraded with additional fill where needed. In 2005 a section of the beach road was found to not be able to support the load of the equipment operating on it. This section of the road will have a geotextile installed to increase it's bearing capacity. It will then have a layer of fill added overtop. Rock from Borrow Area 7 will also be needed to stabilise the road surface. Ideally this material would be acquired prior to the runoff from the snow melt so that the permafrost under the road surface can be protected as much as possible. The geotextile will be removed at the end of the project in 2007.

The current road is large enough for only one vehicle to pass at a time. To allow two way traffic pull-outs will be constructed at regular intervals along the road to allow for passing of oncoming traffic. The pullouts will be placed as much as possible in already disturbed areas, or areas already designated as borrow areas, to reduce the impact on the environment.

To attempt to drain the water in the sub-surface of the road material ditches will be dug along either side of the road. The ditches will have shallow side slopes and will be no deeper than 1 foot, however, exact dimensions will be determined onsite. The ditches will drain into existing watercourses. The ditches will be filled in at the end of the project.

EQUIPMENT TO BE USED

An excavator will be used to place the culverts in the crossings. The crossings will be filled by dumping the fill into the crossing with a dump truck. A bulldozer will be used to smooth out the dumped material and provide a primary compaction. A rotary vibrating drum compactor will be used to harden the road surface. The ditches will be dug using an excavator. The make and model of the equipment to be used is presented in table 2 below:

Table 2: List of Equipment to be Used for Road Repairs

Description	Make	Model
Bulldozer	Caterpillar	D6XR (angle blade & wide track)
Excavator	Caterpillar	322 BL or 320 CL
Compactor	Caterpillar	563
Dump Truck	Caterpillar	D250
	Mack	Tandem rear axle
	GMC	Tandem rear axle

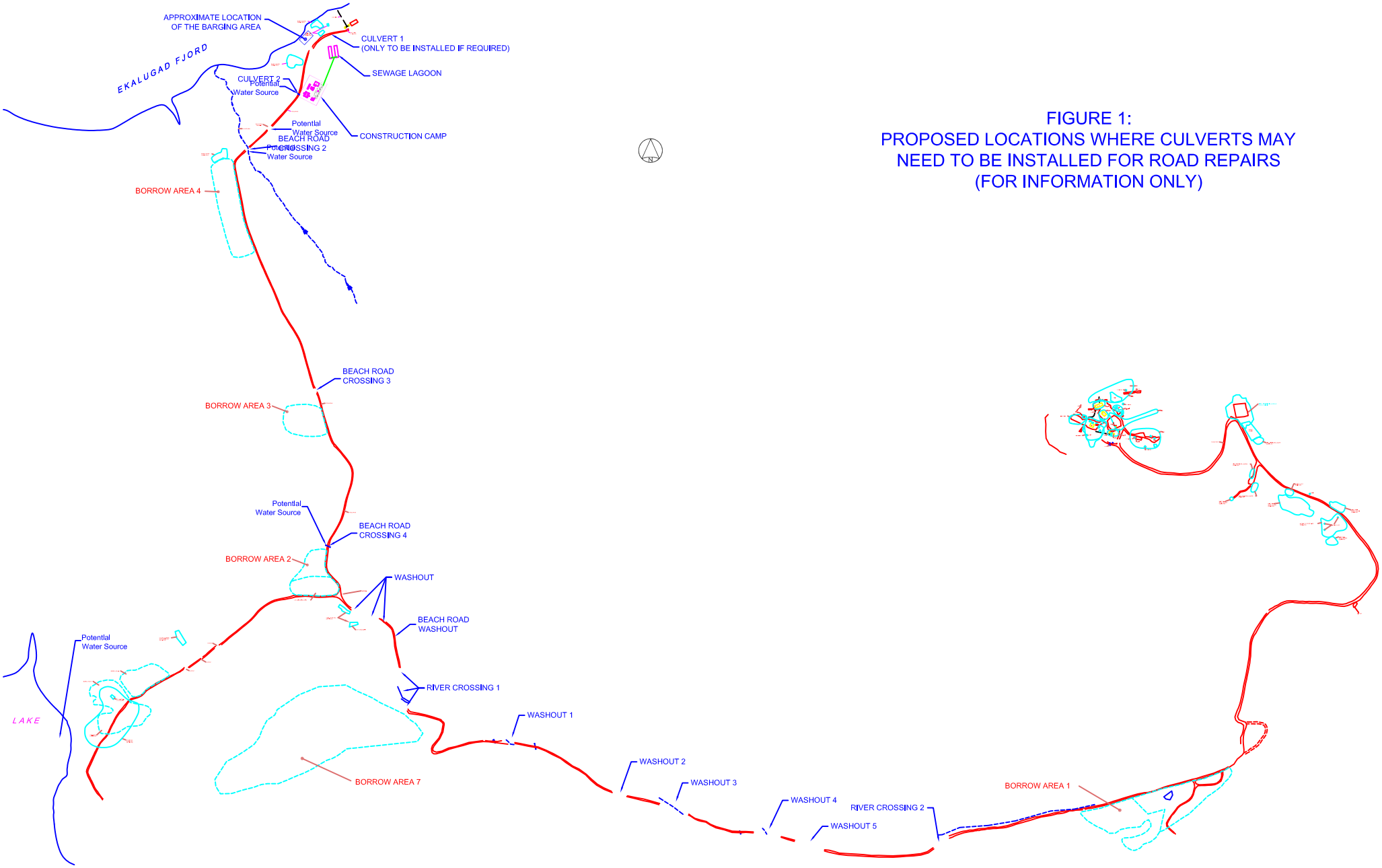

FIGURE 1:
PROPOSED LOCATIONS WHERE CULVERTS MAY NEED TO BE INSTALLED FOR ROAD REPAIRS
(FOR INFORMATION ONLY)

FIGURE 2:

CULVERT INSTALLATION DETAILS

(FOR INFORMATION PURPOSES ONLY, NOT FOR CONSTRUCTION)