



Cape Christian, August 31<sup>st</sup>, 2009

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**RE: Mitigation Plan to Restore all Impacted Grounds and Waters on the “Old Roadway” – Road between Clyde River and Cape Christian**

Mr. Keim,

As requested by the Inspector’s Direction that we received on August 24<sup>th</sup>, you will find below the mitigation plan developed to restore any impacts to grounds and waters on the old roadway from Clyde River to Cape Christian.

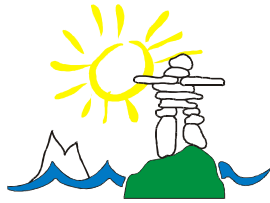
#### **Identification of Impacted Sites and Proposed Restoration Methods**

The **first** impacted area is located 2.7 km from the Cape Christian camp. The area is a detour made around a wet area as shown in picture 1.



**Picture 1: Area 1 to be restored (2.7 km from the camp)**

The restoration measures proposed to be implemented are:



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- Wet area of the old roadway will be backfilled and brought to grade;
- The detour will be dewatered by pumping into the tundra 30 m away from any water course;
- The detour will be filled to grade, landscaped and crowned;
- The detour will be blocked by rocks, to match adjacent terrain.

The **second** impacted area is located 2.9 km from the Cape Christian camp. It is also a detour made around a wet area (see picture 2).



**Picture 2: Area 2 to be restored (2.9 km from the camp)**

This area comprises 3 road paths that all require mitigation. The measures to be implemented are:

- The left area that will be used as the road will need to be backfilled, graded and compacted;
- The 2 bypass paths (to the right) will be reggraded, crowned;
- Drainage will be promoted away from the area;
- The unused path will be blocked with rocks, to match the adjacent terrain.

The **third** impacted area is located between 3.1 and 3.8 km from the Cape Christian camp. This is a section of the old road that is not anymore planned to be used. As shown on the map (see attached), that section of the road path was re-routed to avoid very wet areas. The next 6 pictures show the impacted areas within that section of the old road.



**Picture 3: Area 3 to be restored (3.1 to 3.8 km from the camp)**



**Picture 4: Area 3 to be restored (3.1 to 3.8 km from the camp)**



**Picture 5: Area 3 to be restored (3.1 to 3.8 km from the camp)**



**Picture 6: Area 3 to be restored (3.1 to 3.8 km from the camp)**



**Picture 7: Area 3 to be restored (3.1 to 3.8 km from the camp)**



**Picture 8: Area 3 to be restored (3.1 to 3.8 km from the camp)**

The mitigation measures for that section of the road will include:

- All pounded water will be pumped out and drained into the tundra at least 30 meters from any water course;



- Drainage ditches will be backfilled;
- The road will be backfilled to grade and crowned using stockpiled material beside the road or additional fill that will be hauled if needed;
- All rutted area will be graded to match the surrounding terrain;
- The entrances of that road section will be blocked by rocks to ensure damages are not done from further vehicles and equipment.

The **forth** impacted area is located at 4.4 km from the camp. This is again a detour area from the old road that was made to avoid a very wet spot. The area can be viewed through picture #9.



**Picture 9: Area 4 to be restored (4.4 km from the camp)**

The mitigation plan for the impacted area #4 will consists in:

- The right hand side that will be used for the road will need to be backfilled above grade;
- The left hand side back-bladed and sloped for drainage;
- Fill will be added as needed to ensure the area matches the surrounding terrain.

The **fifth** impacted area is located at the crossing where the new re-routed road is starting and splits from the old roadway. This area is located at 4.6 km from the Cape Christian site. Picture 10 shows the area that will need to be restored.





**Picture 10: Area 5 to be restored (4.6 km from the camp)**

The mitigation plan for that impacted area will consist in:

- All ponded water will be pumped out and drained into the tundra at least 30 meters from any water course;
- The old road will be backfilled to grade and crowned using stockpiled material beside the road or additional fill that will be hauled if needed;
- The entrances of that road section will be blocked by rocks to ensure damages are not done from further vehicles and equipment.

The **sixth** area is located at 4.8 km from the camp area. It is a location where a culvert (#3) was initially planned to be installed. Silt fences are installed in the area to prevent the entry of any sediment. Picture 11 shows the impacted area. The mitigation plan will include:

- Dewater, backfill and crown low areas;
- Open the channel between the lake on the left and the river on the right at the location where culvert number 3 was supposed to be installed originally;
- On a 10 feet section wide within that channel, place rip-rap material in the bed to minimize any impact should the path be used again in the future by ATVs;
- After the channel is built, remove the silt fences to allow for fish passage.



Picture 11: Area 6 to be restored (4.8 km from the camp)

The **seventh** area is located between the 5.0 and 5.1 km from the camp where there are 2 impacted areas with pounding water. Pictures 12 and 13 show the locations and the areas which will need mitigation.



Picture 12: Area 7 to be restored (5 km from the camp)





**Picture 13: Area 7 to be restored (5.1 km from the camp)**

The proposed mitigation measures to be implemented in this area are:

- Dewater and drain into the tundra at least 30 meters from any water course;
- Rutting on the side will be back-bladed;
- All stockpiled gravel material will be used for backfill and/or levelled;
- Backfill and crown as required matching the surrounding terrain.

The **eighth** impacted area is located 5.2 km from the camp. It is a portion of the old roadway that sank in and was by-passed on the side. Picture 14 shows the area.

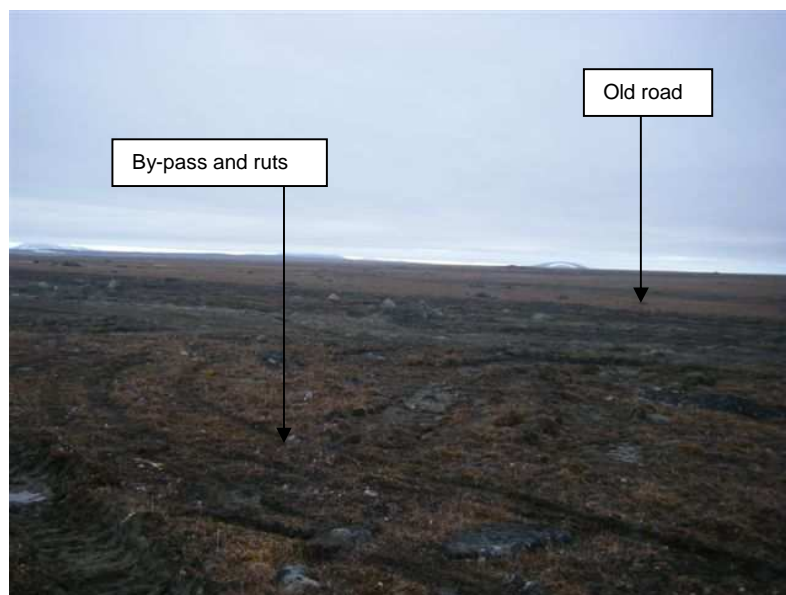
The mitigating measures to be implemented include:

- Dewater and drain into the tundra at least 30 meters from any water course;
- Left side path to be back-bladed and scarified to promote growth;
- Ditches to be backfilled and covered with rocks;
- Backfill the old roadway and crown as required matching the surrounding terrain.

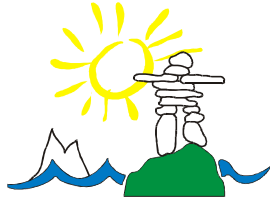


**Picture 14: Area 8 to be restored (5.2 km from the camp)**

The **ninth** impacted area is located on the old roadway at 5.5 km from the Cape Christian camp site. Damages were made by attempting a by-pass to the old road that became too wet as shown on picture 15.



**Picture 15: Area 9 to be restored (5.5 km from the camp)**



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The mitigation measures to be implemented will be:

- The by-pass area will be back-bladed and levelled to match the surrounding area;
- The old road will be dewatered, backfilled and crowned.

The **tenth** impacted areas are located between 5.7 and 6.1 km from the camp in three small distinct locations having similar impacts (ruts, pounded water). Pictures 16 to 18 show these locations.



**Picture 16: Area 10 to be restored (5.7 km from the camp)**



**Picture 17: Area 10 to be restored (5.9 km from the camp)**



**Picture 18: Area 10 to be restored (6.1 km from the camp)**

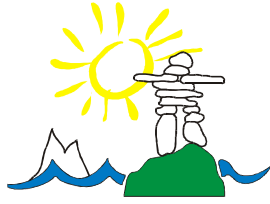
The mitigating measures to be implemented include:

- Dewater and drain into the tundra at least 30 meters from any water course;
- Backfill the old roadway and crown as required matching the surrounding terrain.

The **eleventh** impacted area is located 6.2 km from the camp. The old road has sunk in and by-passes were used on both sides to the damaged section. Picture 19 shows the location.



**Picture 19: Area 11 to be restored (6.1 km from the camp)**



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The mitigation measures to restore the impacted area number 11 are:

- The old road will be dewatered, backfilled and crowned to the matching grades;
- The material from the right sided by-pass will be used to backfill the old road. The ground will then be scarified;
- The left sided by-pass will be dewatered, backfilled and crowned.

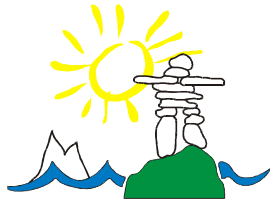
The twelfth impacted area consists in a ditch that was constructed earlier to drain the old roadway. The area is located 6.3 km from the camp. The ditch as shown in pictures 20 and 21 drains into the tundra that is sloped toward a lake.



**Picture 20: Area 12 to be restored (6.3 km from the camp)**



**Picture 21: Area 12 - view of the lake from the end of the ditch**



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The mitigation measures to restore that area include:

- Install a silt fence at the end of the ditch;
- Backfill the ditch with stockpiled material and cover with rock;

The **thirteenth** impacted area along the old roadway is located at 6.6 km from the Cape Christian camp. The area consists in a relatively small muddy section that has rutting. Picture 22 shows the area.



**Picture 22: Area 13 to be restored (6.6 km from the camp)**

Similar to a few other locations, the mitigating measures to be implemented include:

- Dewater and drain into the tundra at least 30 meters from any water course;
- Backfill the old roadway and crown as required matching the surrounding terrain.

The **fourteenth** impacted area consists in a by-pass on the left side of the road to avoid a muddy section of the road filled with pounded water. This area is located 7.0 km away from the Cape Christian camp. Picture 23 shows a view of the area.

The mitigation measures to be implemented will require:

- Dewatering and draining pounded water onto the old roadway into the tundra at least 30 meters from any water course;
- Backfilling the old roadway and grading as required to match the surrounding terrain;
- Back-blade the left-side by-pass and backfilling as required.



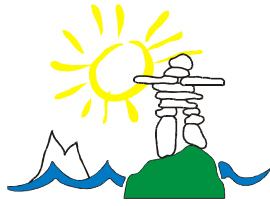


**Picture 23: Area 14 to be restored (7.0 km from the camp)**

The **fifteenth** impacted area is located at 7.2 km from the camp, just after the old above ground storage tank. Again, several by-passes to the old roadway were made avoiding a very wet spot. Picture 24 shows the area.



**Picture 24: Area 15 to be restored (7.2 km from the camp)**



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Mitigation measures for area 15 include:

- Dewatering and draining pounded water onto the old roadway into the tundra at least 30 meters from any water course;
- Backfilling the old roadway and grading as required to match the surrounding terrain;
- Back-blade the by-passes and backfilling as required.

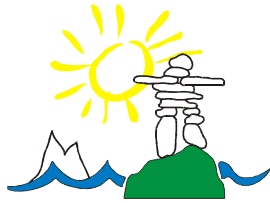
The sixteenth impacted area consists in two short locations that have similar damages: ruts from the passage of vehicles in a soft and wet area. The two sections are located at 7.7 km and 7.9 km from the camp. Pictures 25 and 26 show these locations.



**Picture 25: Area 16 to be restored (7.7 km from the camp)**



**Picture 26: Area 16 to be restored (7.9 km from the camp)**



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The mitigation measures for the above impacted area is similar to what is proposed for other areas

- Dewatering and draining pounded water onto the old roadway and within rutted areas into the tundra at least 30 meters from any water course;
- Backfilling the old roadway and ruts and grading as required to match the surrounding terrain;
- Back-blade the ruts and backfilling as required.

The seventeenth impacted area is where culvert #2 was supposed to be installed as per the initial plan. The impacted area is located 8.1 km from the Cape Christian camp. Picture 26 shows the location of the stream which was found to be fish bearing.



**Picture 27: Area 17 to be restored (8.1 km from the camp)**

This area is not so damaged but in order to restore the old roadway in such a manner to protect waters, the following mitigation measures are to be implemented:

- Install silt fences downstream of the channel prior to any work onto the stream;
- Ensure the stream channel is opened for fish passage where culvert number 2 was supposed to be installed originally;
- On a 10 feet section wide within that channel, place rip-rap material in the bed to minimize any impact should the path be used again in the future by ATVs;
- After the channel is built, remove the silt fences to allow for fish passage.

The eighteenth and last impacted area is located just after the newly constructed bridge, 8.8 km from the Cape Christian bridge. Picture 28 shows the area that will need to be restored.



**Picture 28: Area 18 to be restored (8.8 km from the camp)**

The right side on the road will be repaired and remain. The left side will be back-bladed and landscape to match the surrounding ground

### **Sediment Control Plan**

Sediment control has already been implemented in all crossings for which culverts were installed. Those controls were reported to DFO. In addition, by August 25<sup>th</sup>, silt fences were installed along the old roadway at all areas where water bodies are in the close vicinity of the road path. Pictures of all installations were sent to the Inspector as requested. During the proposed mitigation work as per the above plan, only three impacted areas will require specific attention in terms of potential impact to waters. Those are:

- Impacted area 6
- Impacted area 12
- Impacted area 17

For the impacted area 6, silt fences are already installed at the inlet and the outlet of the stream channel that will need to be opened to allow fish passage. Those silt fences will also remain when rip-rap material will be placed into the bed on a 10 feet wide section, to mitigate any further passage by ATVs should the path be used by residents of Clyde River as it has been the case for many years. The silt fence will be removed once any sediment will have settled after the above mentioned work will be completed.



For the impacted area 12, the potential impact would result from the overflow of pounded water in the ditch that will eventually flow into the downstream lake. In order to prevent any sediment to enter the lake, a silt fence will be installed prior to remediation work and will be maintained in place until it is observed that the water flow condition has ceased over time.

Finally, for the impacted area number 17, a silt fence will be installed downstream before any work into the streambed will be initiated. The flow channel does not appear to be blocked for fish passage at this stage and in stream work will probably be limited in the installation of rip-rap material on a 10 feet wide section perpendicular to the road path. The silt fence will be removed after work once it will be observed that any sediment created has settled.

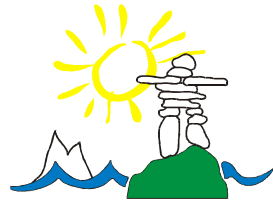
### **Timeline for Implementation**

Qikiqtaaluk is planning to initiate the proposed mitigation work once frozen conditions during night time can create conditions where the passage of Heavy Equipment required to conduct those activities will not generate more damages. Qikiqtaaluk has on site at Cape Christian, 3 excavators, 2 dozers, 3 articulated rock trucks, and two front end loaders that can be made available for the mitigation work starting September 15, 2009. Therefore, it is planned to conduct the majority of the above described work during the two last weeks of September up to the first week of October, where freezing conditions is expected to limit the use of granular fill for backfilling.

Qikiqtaaluk will still be conducting remediation activities during the summer of 2010 at Cape Christian and therefore, the above mentioned equipment with skilled labours for operation will be in place from early July to late September. Therefore, any road mitigation work to restore all impacted grounds and waters on the old roadway that will not be completed this coming fall will be resumed in 2010.

### **Reporting Mechanism**

Starting September 15, Qikiqtaaluk will report on a weekly basis to the INAC Inspector and to the Nunavut Water Board by providing pictures of any remediation work achieved on the 18 areas identified above. The information will be provided by e-mail.



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We hope the information presented in the document complies with the 4<sup>th</sup> requirement of the Inspector's decision that was forwarded to us on August 24<sup>th</sup>. Should you have any comments or questions on the proposed mitigation plan, please do not hesitate to communicate with me.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Philippe Simon'.

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