NWB Annual Report **Year being reported:** 2015

License No: 8BW-CLY1216 **Issued Date:** FEBRUARY 28, 2012
Expiry Date: MARCH 1, 2016

Project Name: Cape Christian Road

Licensee: Qikiqtaaluk Corporation

Mailing Address:
PO-Box 1228
Iqaluit, Nu
X0A 0H0

Name of Company filing Annual Report (if different from Name of Licensee please clarify relationship between the two entities, if applicable):

Qikqtaaluk Environmental Inc., subsidiary and consultant

General Background Information on the Project (*optional):

The licence pertains to the construction of a road from Clyde River to Cape Christian

Licence Requirements: the licensee must provide the following information in accodance with

Part B | Item 1

A summary report of water use and waste disposal activities, including, but not limited to: methods of obtaining water; sewage and greywater management; drill waste management; solid and hazardous waste management.

Water Source(s): None - no water withdraw

Water Quantity:

0	Quantity Allowable Domestic (cu.m)
0	Actual Quantity Used Domestic (cu.m)
0	Quantity Allowable Drilling (cu.m)
0	Total Quantity Used Drilling (cu.m)

Waste Management and/or Disposal

- ☐ Solid Waste Disposal
- ☐ Sewage
- ☐ Drill Waste
- ☐ Greywater
- ☐ Hazardous
- ☐ Other:

Additional Details:

No construction activities in 2015

A list of unauthorized discharges and a summary of follow-up actions taken.

Spill No.: (as reported to the Spill Hot-line)
Date of Spill:
Date of Notification to an Inspector:
Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc)

No spills occured

Revisions to the Spill Contingency Plan

SCP submitted and approved - no revision required or proposed

Additional Details:

Revisions to the Abandonment and Restoration Plan

Other: (see additional details)

Additional Details:

QC/QE went to the site with a geotechnical engineer to see what is needed to bring the road up to code. the report from the geotechnical engineer is attached

Progressive Reclamation Work Undertaken

Additional Details (i.e., work completed and future works proposed)

the geotechnical insepction in the fall of 2015 and a letter was sent to the hamlet requesting that they take over responsibility for the road licence. No answer has been received to date. Letter is attached

Results of the Monitoring Program including:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where sources of water are utilized;

Select

Additional Details:

No water sources are used

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where wastes associated with the licence are deposited;

Not Applicable (N/A)

Additional Details:

Results of any additional sampling and/or analysis that was requested by an Inspector

No additional sampling requested by an Inspector or the Board

Additional Details: (date of request, analysis of results, data attached, etc)

None

Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

No additional sampling requested by an Inspector or the Board

Additional Details: (Attached or provided below)

Any responses or follow-up actions on inspection/compliance reports

No inspection and/or compliance report issued by INAC

Additional Details: (Dates of Report, Follow-up by the Licensee)

Geotechnical inspection completed, report attached. hamlet has been contacted to take responsibiliity for the permit, letter attached.

Any additional comments or information for the Board to consider

QC is waiting for the municipality of Clyde River to respond to our letter about taking over responsibility for the licence. No response has been sent as of the date of this report. Once a decision has been made by the hamlet, then QC will proceed with a abandonment plan or work with the municipality to transfer the licence.

Date Submitted:	April 4, 2016	
Submitted/Prepared by:	Greg Johnson	
Contact Information:	**Tel:**	514-940-3332
	Fax:	
	email:	gjohnson@qenv.ca

Select

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QIKIQTAALUK CORPORATION

March 15, 2016

Mayor James Qillaq
Clyde River, Nu
X0A 0E0

RE: Cape Christian Road Permitting

Mayor Qillaq,

I am writing to you regarding the Cape Christian Road that was constructed by Qikiqtaaluk Corporation (QC) in 2009. You may not be aware that a water license from the Nunavut Water Board is required for the construction and maintenance of this road.

QC is now in a difficult position in regards to the water license obtained for the road. QC is still responsible for the road, and all activities that occur on it. The water license is expiring on the 31st of March 2016 and a decision needs to be made on what QC's continued role with the access road will be. QC is not in a position to be responsible for the road indefinitely.

Following discussions with the INAC Water Resource Officer assigned to this water license, Mr. Justin Hack (the correspondence is attached), QC has only two options to remove QC's responsibility for the license. The first option (and QC's preferred option) is to transfer the license to the Municipality of Clyde River.

An inspection was carried out on the road by INAC. In **2013** (the inspection report is attached) that identified issues that need to be resolved to bring the road into compliance with the requirements of the water license. To this end QC carried out an inspection of the road in the fall of 2015 (at our own cost) and is prepared to complete the work required to bring the road into compliance with the water license. The report detailing the work required by the geotechnical engineer who performed the inspection is attached. To complete the work, QC would require the cooperation of the municipality to supply the heavy equipment and granular materials needed to complete the upgrades. QC would supply a construction supervisor as well as all culverts needed to complete the upgrades. QC is willing to cover the Municipality's expenses by determining a lump sum value to cover all costs related to the upgrades. Once all of the work is complete, the license could then be turned over to the Municipality.

The second option is that QC would have to permanently close the road, by removing all of the culverts and blocking the bridge and the road. QC considers this to be a worst case scenario and would much prefer to work with the Municipality on the first option.

P.O. Box 1228, Iqaluit, NU X0A 0H0
Phone: (867) 979-8400 Fax: (867) 979-8433

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QIKIQTAALUK CORPORATION

Once you have had a chance to review the attached documents, and consult with the Municipality council, could you please contact me so that we may further discuss this issue so that we can resolve it to the satisfaction of everyone involved? I would appreciate an answer before the 31st of March 2016.

Sincerely,

Harry Flaherty

President & CEO

Qikiqtaaluk Corporation

P.O. Box 1228, Iqaluit, NU X0A 0H0
Phone: (867) 979-8400 Fax: (867) 979-8433

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QIKIQTAALUK CORPORATION

ᒫᔅᓯ 15, 2016

ᒪᐃᔭ ᔭᐃᒥᓯ ᕿᓪᓚᖅ
ᑲᖏᖅᖢᒑᐱᒃ, ᓄᓇᕗᑦ
X0A 0E0

ᐱᔾᔪᑖ: ᐱᖑᐊᕐᔪᒃ ᐊᑐᕆᐊᖓᓂᒃ ᐊᑐᕈᓐᓇᕐᓂᖅ

ᒪᐃᔭ ᕿᓪᓚᕐᒧᑦ,

ᑎᑎᕋᕈᑎᒐ ᐱᖑᐊᕐᔪᒃ ᐊᑐᕆᐊᖓ ᓴᓇᔭᐅᓚᐅᖅᑐᖅ ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᓐᓂᒃ 2009-ᒥ. ᐅᔾᔨᕆᔪᑦᓴᐅᓐᖏᑕᐃᑦ ᐃᒥᕐᒧᑦ ᓚᐃᓴᑖᕆᐊᖃᕆᐊᖓᓂᒃ ᓄᓇᕗᒻᒥ ᐃᒪᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓂᒃ ᓴᓇᔭᐅᓂᖓᓄᑦ ᐋᖅᑭᐅᒪᑎᑕᐅᓂᖓᓄᑦᑐ ᐊᑐᕆᐊᖅ ᑖᓐᓇ.

ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᐱᔭᕐᓃᑦᑐᒦᑦᑐᑦ ᒫᓐᓇ ᐃᒥᕐᒧᑦ ᓚᐃᓴᑖᕋᓯᐊᕐᓂᕐᒧᑦ ᐊᑐᕆᐊᒧᑦ ᑖᑦᓱᒧᖓ. ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᓱᓕ ᑲᒪᒋᒻᒪᒍ ᐊᑐᕆᐊᖅ, ᐊᒻᒪᓗ ᑕᒪᒃᑯᐊ ᐊᐅᓚᓂᐅᔪᓕᒫᑦ ᑕᑉᕙᓂ. ᐃᒥᕐᒧᑦ ᓚᐃᓴᖓ ᐃᓱᓕᓖᓕᕐᒪᑦ ᒫᔅᓯ 31, 2016-ᒥ ᐊᒻᒪᓗ ᐃᓱᒪᓕᐅᕈᑕᐅᒋᐊᖃᕐᓂᐊᓕᖅᑐᖅ ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᑲᒪᒌᓐᓇᕈᒪᓂᐊᕐᒪᖔᒍ ᐊᑐᕈᓐᓇᕐᓂᖅ ᐊᑐᕆᐊᒥᒃ. ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᐋᖅᑭᑦᓯᒪᓐᖏᓪᒪᑕ ᑲᒪᒋᔭᖃᐃᓐᓇᓂᐊᕐᓂᕐᒥᒃ ᐊᑐᕆᐊᒥᒃ.

ᐋᔩᕋᖃᑕᐅᓚᐅᖅᑎᓪᓗᒋᑦ ᐃᓄᓕᕆᔩᑐᖃᒃᑯᑦ ᐃᒪᓕᕆᔨᖏᑦ ᑎᓕᔭᐅᓯᒪᔪᑦ ᑖᑦᓱᒧᖓ ᐃᒥᕐᒧᑦ ᓚᐃᓴᒧᑦ, ᔭᔅᑎᓐ ᕼᐊᒃ (ᑕᑉᕙᓐᖓᑦ ᑎᑎᖅᑲᐅᓯᐊᖑᓯᒪᔪᖅ ᐃᓚᓕᐅᑎᓯᒪᔪᖅ ᑖᒃᑯᓄᖓ), ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᒪᕐᕈᐃᓈᓐᓂᒃ ᓇᓖᖀᕈᑎᒃᓴᓖᑦ ᐲᖅᓯᓂᕐᒥᒃ ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᑲᒪᒋᕙᑦᑕᖓᓂᒃ ᓚᐃᓴᒥᒃ. ᓯᕗᓪᓕᖅ ᓇᓖᖀᕈᑎᒃᓴᖅ (ᐊᒻᒪᓗ ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᓂᕈᐊᕐᓯᒪᔭᖓ ᓇᓖᖀᕈᑦ) ᓄᒃᑎᓇᓂᕐᒥᒃ ᓚᐃᓴᒥ ᑲᖏᖅᖢᒑᐱᖕᒥ ᓄᓇᓖᑦ ᒐᕙᒪᖏᓐᓄᑦ.

ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᖅ ᐊᑐᕆᐊᖅ ᐃᓄᓕᕆᔩᑐᖃᒃᑯᓐᓂᒃ. 2013-ᒥ (ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᐅᓂᒃᑳᖅ ᐃᓚᓕᐅᑎᓯᒪᔪᖅ) ᓇᓗᓇᐃᖅᑕᐅᑦᑐᑎᒃ ᐊᑲᐅᓐᖏᑦᓕᐅᕈᑏᑦ ᐋᖅᑭᑦᑕᐅᒋᐊᖃᕐᓂᐊᖅᑐᑦ ᐊᑐᕆᐊᖅ ᒪᓕᒐᕐᓂᒃ ᒪᓕᑦᓯᒪᑦᓯᐊᖁᑦᑐᒍ ᐊᑐᕆᐊᓕᖕᓂᒃ ᐃᒥᕐᒧᑦ ᓚᐃᓴᒥᒃ. ᑕᑉᕗᖓ ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᖃᐅᔨᓴᖅᑎᑦᓯᓚᐅᖅᑐᑦ ᐊᑐᕆᐊᒥᒃ ᐅᑭᐊᑦᓵᖓᓂ 2015 (ᓇᖕᒥᓂᖅ ᐊᑭᓕᕐᓱᑎᒍ) ᐊᒻᒪᓗ ᐸᕐᓇᓯᒪᓕᖅᑐᑦ ᐱᐊᓂᖕᓂᐊᓂᕐᒥᒃ ᐱᓕᕆᐊᖑᒋᐊᓕᖕᒥᒃ ᐊᑐᕆᐊᖅ ᒪᓕᑦᓯᒪᑦᓯᐊᖁᑦᑐᒍ ᐃᒥᕐᒧᑦ ᓚᐃᓴᒥᒃ. ᐅᓂᒃᑳᖅ ᓇᓗᓇᐃᖅᑐᕐᓯᒪᔪᖅ ᐱᓕᕆᐊᖑᒋᐊᓕᖕᓂᒃ ᓄᓇᓕᕆᔨᒃᑯᓐᓂᒃ ᐊᐅᓚᑦᓯᓯᓚᐅᖅᑐᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᓇᑦᓯᐅᑎᓯᒪᔪᖅ. ᐱᐊᓂᒃᑕᐅᖁᑦᑐᒍ ᐱᓕᕆᐊᖅ, ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᐱᓕᕆᖃᑎᖃᕆᐊᖃᕐᓂᐊᖅᑐᑦ ᓄᓇᓖᑦ ᒐᕙᒪᖏᓐᓂᒃ ᐅᖁᒪᐃᑦᑐᕐᓂᐅᑎᖃᖅᑎᑦᓯᓂᕐᒧᑦ ᐊᒻᒪᓗ ᑐᐊᐸᓕᕆᔾᔪᐊᑎᓂᒃ ᐱᐊᓂᒃᑕᐅᖁᑦᑐᒍ ᐊᓐᖑᑎᑎᑕᐅᒋᐊᕐᓂᖓ. ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᓴᓇᔨᓄᑦ ᐊᖓᔪᖅᑳᖅᑎᑦᓯᓇᔭᖅᑐᑦ ᐊᒻᒪᓗ ᑕᒪᕐᒥᒃ ᑯᒃᕙᓚᐊᖑᒋᐊᓕᓕᒫᓂᒃ ᐱᐊᓂᒃᑕᐅᒍᑎᒃᓴᖓᓂᒃ ᐊᓐᖑᑎᑎᑕᐅᒋᐊᕿᑕᐅᔪᖅ. ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᐊᑭᓖᒍᓐᓇᖅᑐᑦ ᓄᓇᓖᑦ ᒐᕙᒪᖏᑕ ᐊᑭᓕᕐᓱᖅᑕᖏᓐᓂᒃ ᓇᓗᓇᐃᕐᓯᓗᑎᒃ ᐊᑕᐅᓯᐅᓕᖅᑲᖑᔪᒥᒃ ᐊᖏᓈᕐᓯᒪᔪᒥᒃ ᐊᑭᓖᒍᑕᐅᓂᐊᖅᑐᒥᒃ ᐊᑭᕆᐊᓕᓕᒫᓄᑦ ᑕᑉᕙᓐᖓᖓᐊᓄᑦ ᐊᓐᖑᑎᑎᑕᐅᒋᐊᕐᓂᕐᒧᑦ. ᐱᐊᓂᒃᑕᐃᓇᐅᓚᐅᖅᑎᓪᓗᒋᑦ ᐱᓕᕆᐊᕆᔭᕆᐊᓖᑦ, ᓚᐃᓴ ᑐᓂᔭᐅᓕᕋᔭᖅᑐᖅ ᓄᓇᓖᑦ ᒐᕙᒪᖏᓐᓄᑦ.

ᐊᐃᑉᐸᖓ ᓇᓖᖀᕈᑎᒃᓴᖅ ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᒪᑐᓯᑦᓯᐊᒻᒪᕆᑦᑐᑎᒃ ᐊᑐᕆᐊᒥᒃ, ᐲᔭᖅᑕᐅᓗᑎᒃ ᑕᒪᕐᒥᒃ ᑯᒃᕙᓚᐊᖑᓯᒪᔪᓕᒫᑦ ᐊᒻᒪᓗ ᐊᐳᖅᑕᕝᕙᓚᐅᕐᓗᑎᒃ ᐃᑳᕈᒻᒥ ᐊᒻᒪᓗ ᐊᑐᕆᐊᒥ. ᕿᑭᖅᑖᓗᒃ ᑯᐊᐳᕇᓴᒃᑯᑦ ᐃᓱᒪᒋᔭᖓ

ᖃᑭᖅᑕᒃᓴᒃ ᔨᐊᐅᓗᒃ
QIKIQTAALUK CORPORATION

ᐱᐅᓐᓕᓂᕐᐸᐅᓚᕆᐊᖅᓱᖅ ᑕᐅᑐᓐᖓᐊᑦᑕᕋᓂ ᐋᒪᓗᓄ ᐃᖅᑲᓇᐃᔪᕋᖅᑎᖅᖃᓕᒫᑦ ᓄᓇᓕᑦ ᓴᖅᒪᓐᓂᒃ ᓯᒪᓕᕐᓂᖅ ᓇᓕᕋᕈᑎᒃᓴᖅ ᐊᑐᓐᖓᓕᕐᓗᐊ.

ᖃᒥᕋᖏᓚᐅᔪᓄᑦ ᑕᒃᔨᐊ ᓇᕋᐅᑎᓯᒪᔪᑦ ᑎᑎᕐᓄ, ᐋᒪᓗᓄ ᖃᐅᔨᒃᑲᓚᐅᔪᓄᑦ ᓄᓇᓕᑦ ᓴᖅᒪᓐᓂᑦ ᑲᑎᒪᓐᓇᖅᑐᖅ, ᖃᐅᔨᒃᖃᓐᓂᕐᓂᐊᕐᓇᕋᓴᕐᖃᖅᖃᓐᓄᑦ ᐊᐃᔭᕋᑎᑎᕈᐊᖅᑕᓚᓴᕋᓂᕐᒧᑐᓄᑦ ᑕᓐᓇ ᐃᓕᓴᐅᓐ ᐊᖅᑭᔫᑎᒃᓴᓕᕐᓂᓄᑦ ᓇᓐᒪᑦᓴᐅᔪᓄᑦ ᐃᓄᓐᓇᓕᕐᓂᓄᑦ ᐱᓕᕐᓂᐊᕐᓇᑦ ᐃᓄᓐᓇᕐᓂᓐᓄᑦ ᐱᓇᓱᐊᖅᑎᑦᑕᓄᑦ? ᑭᐅᓴᐅᔪᓚᕋᓴᕋᐊᖅᑐᓐᖓ ᐃᑦᓂ 31, 2016-ᒋᑕᐅᓐᓂᕐᓂᖅᓯᓐᓂ.

ᑎᑎᕋᖅᑐᖅ,

ᐃᖃᐅᓪᓗᒥ ᓴᓇᔨᓴᖅ

ᐊᓐᓚᓴᖅᑲᖅ ᐊᐅᓚᑦᔪᓚᕆᐅᓪᓚᑦᑕᓂᒃ

ᖃᑭᖅᑕᒃᓴᒃ ᔨᐊᐅᔨᓚᕆᐅᓪᓚᑦ

ᑎᑎᕋᖅᓴᖅᐅᑦ 1228, ᐃᖅᑲᓇᐃᑦ, ᓄᓇᕗᑦ X0A 0H0
ᐅᖅᑳᒋᐅᑦ: (867) 979-8400 ᓯᖅᓴᓕᔪᒋᐅᑦ: (867) 979-8433

Alphard

Montreal, October 23rd, 2015

Mr. Greg Johnson, M.A.Sc., P. Eng.
Project Director
Qikiqtaaluk Environmental
Iqaluit & Montreal

Subject: Recommendations regarding the existing road from Clyde River to Cape Christian
Ref: QIE-001

Mr. Johnson,

Groupe Alphard inc. (Alphard) is proud to present its inspection report of the existing road from Clyde River to Cape Christian (Nunavut). This report outlines the current state of the road and the recommendations regarding the rehabilitation/stabilization of the road.

SCOPE OF THE MANDATE

The existing road needs to be remediated to allow its transfer to the community under the current water Licence 8BW-CLY1216 issued by the Nunavut Water Board or the removal of all the culverts installed on the road is required prior to the expiry of the Licence to close it. In this context, Qikiqtaaluk Corporation asked Alphard to perform a road inspection between Clyde River and Cape Christian by a geotechnical engineer. The road inspection began at the Clyde River Bridge Crossing (Latitude: 70° 29' 23"N; Longitude: 68° 29' 27"W) along approximately an 8 km stretch, which had several stream crossings.

The inspection was carried out on September 8, 2015, and entailed the following activities:

- Review of the requirements of the Nunavut Water Board and Aboriginal Affairs and Northern Development Canada;
- Site visit in Clyde River to inspect the road in its current condition;
- Report detailing the work that is required to either reclaim or stabilise the road and the stream crossings, followed by Alphard's recommendations. If required, stamped and signed plans will be produced.

HISTORY AND OVERVIEW

In March 2009, the Nunavut Water Board (NWB) issued Water Licence 8BW-CLY0810 to the Qikiqtaaluk Corporation (QC) to allow for the disposal of waste during road construction and watercourse crossing activities at the Clyde River Road Construction Project located in the Qikiqtani Region of Nunavut. The licence allowed for the repair of a 16 km abandoned road between the Hamlet of Clyde River and the

former Long Range Navigation (LORAN) Station at Cape Christian (Cape Christian work site). Road repair works were conducted from June to September 2009. However, due to unsatisfactory ground condition, a portion of the road could not be stabilized and was therefore re-routed. The re-routed portion of the road and the alternate water crossings were constructed in the absence of NWB approval.

In August 2010, the NWB issued an amendment to Water Licence 8BW-CLY0810 authorizing the re-routed portion of the road including the addition of new culvert installations at creek crossings and including the restoration of impacted grounds and waters along the old roadway. Ultimately, the 8 km road and the re-routed portion of the road included the construction of a permanent steel free standing bridge crossing over the Clyde River and the installation of culverts at eight water crossings (in unnamed creeks). The bridge crossing and some of the culvert installations were identified by the Department of Fisheries and Oceans (DFO) as fish habitats.

Qikiqtaaluk Corporation completed all work for the clean up of the LORAN Station at Cape Christian during the summer of 2010. However, the condition of the road deteriorated over the life of the two years project. In December 2010, the NWB requested submission of an Abandonment and Restoration Plan in accordance with Licence 8BW-CLY0810, and in January 2011, the NWB received the requested Plan entitled *Road Between the Hamlet of Clyde River and Cape Christian Abandonment and Restoration Plan Licence No. 8BW-CLY0810*. In June 2011, the NWB received a written motion from the Municipality of Clyde River approving disposal of the road including removal of culverts, filling of ditches, and landscaping of the area.

Some reclamation work has been done in 2011 to complete the required abandonment and restoration work on the roadway and to close the licence with the NWB, but the licence was not closed as additional work was requested.

On February 28, 2012, a renewal and amended Licence 8BW-CLY1216 was issued by the NWB in order to address some compliance issues regarding the restoration of impacted grounds and waters along the old roadway and to complete abandonment and restoration of the road. The Licence 8BW-CLY1216 described as *Abandonment and Restoration of Road between Clyde River and Cape Christian* will be in effect until March 1, 2016.

The Licence "allows for the abandonment and restoration of the Clyde River Road located between the Hamlet of Clyde River and the former Long Range Navigation (LORAN) Station at Cape Christian including removal of culverts, backfilling of trenches and ditches, and leaving the Clyde River Bridge in place, during an undertaking classified as Miscellaneous as per Schedule II of the Regulations and within the Qikiqtani Region of Nunavut". The Licence also "allows for the use of water and disposal of waste during abandonment and restoration activities along the Clyde River Road including impacted grounds and waters along the old roadway and excluding the Clyde River bridge, located within the Qikiqtani Region, Nunavut."[1]

[1] NWB Licence No.8BW-CLY1216 Renewal/Amendment, NWB File No.: 8BW-CLY1216 Renewal/Amendment, dated February 28, 2012

Since the issuance of the Licence 8BW-CLY1216, no additional work has been done by QC. On August 20, 2013, Aboriginal Affairs and Northern Development Canada (AANDC) carried out a Water Licence Inspection on the road construction remediation and watercourse crossing remediation activities that occurred between 2008 and 2010 at the Clyde River Road Construction Project. This inspection was conducted to determine compliance with the remedial action plan (submitted by QC on August 31st, 2009) to address all impacted grounds and waters on the "old Roadway" road construction project between Clyde River and Cape Christian. The Inspection Report noted some issues with the work completed as part of the Abandonment and Restoration Plan submitted by QC.

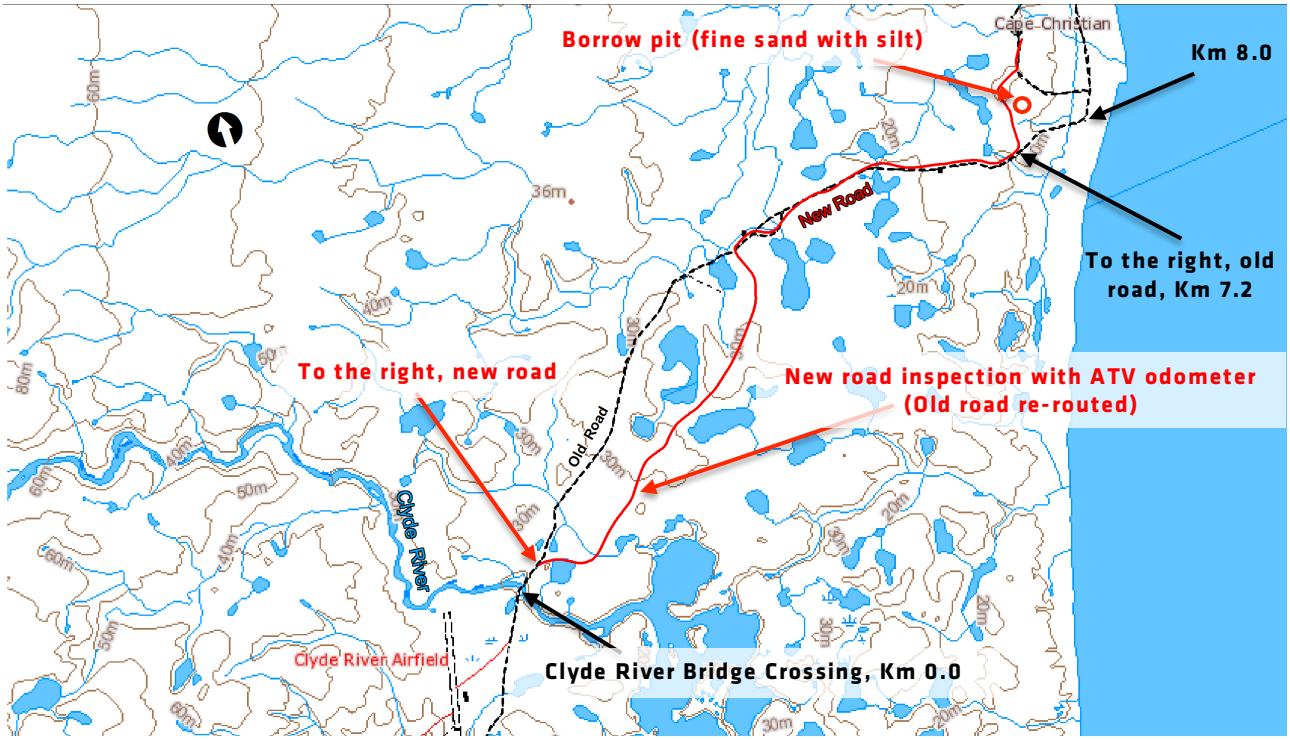
The community did some upgrades to the road since last years. Therefore, the state of the road was unknown before the site visit since QC has left the community in 2011. The road is now used by community members to bring their boats to the ocean and to access cabins they have built there.

SITE VISIT AND ROAD INSPECTION IN CLYDE RIVER

OVERVIEW

On September 8, 2015, Alphard performed an inspection of the new road from the Clyde River Bridge Crossing to access the Cape Christian work site. An old section of the road was also inspected from the intersection at Km 7.2 to the end of the road at Km 8.0. Figure 1 shows the pathway of the old road and the re-routed portion of the new road after the bridge.

Figure 1: Road from the Clyde River Bridge Crossing to access the Cape Christian work site



The new road, which includes a re-routed portion at the beginning and an old portion for the last 800 meters, is approximately 8 km long with several stream crossings that required the installation of culverts. Table 1 shows the location and the details of the culverts that were identified on the road during the inspection.

Table 1: Culverts locations and details

Stream Crossing #	Distance from Clyde River Bridge Crossing* (km)	Number of Culverts	ø of Culverts** (mm)
1	0.8	2	1 500
2	2.6	2	600
3	4.5	1	300
4	4.8	2	1 000
5	5.9	1	1 000
6	6.6	1	450
7	6.9	1	200
8	7.6	2	1 250

* The distance was taken from the ATV's odometer
** The diameters of culverts are a visual approximation

Before the site visit, pictures dating from 2011 were sent by Qikiqtaaluk Environmental regarding the state of the road. As seen on the pictures, the road seemed in very poor conditions: deep ruts, standing water on the road, ditches full of water, etc.

However, between 2011 and 2015, the community did some upgrades to the road, so the actual state of the road was unknown prior to the site visit. The inspection was carried out in ATV with Qikiqtaaluk Environmental and a member of the community in order to have information regarding the history of the road construction and the actual issues of the road. The ATV's odometer was used to perform a chaining.

ROAD INSPECTION

It could be seen from the first few kilometers that the road in its current state was in fairly good condition. The following observations and comments were noted:

- At Km 0.8, stream crossing #1: For the first time in five years, the backfill material has been washed out in Spring 2014. This suggests the need to add at least one culvert of 1 500 mm.

- At Km 3.2: The ditches are full of water. The water level is uneven on either side of the road, suggesting that the water does not flow through it as the road is probably frozen. The road is stable and elevated approximately 0.3 m above natural flat ground, preventing runoff water from overflowing onto the road.
- At Km 4.0: The ditches are full of water. Even if the road is almost at the same level as the natural flat ground, it seems stable.
- At Km 4.7, right before stream crossing #4: According to the local community member, each spring, the hollow of the road is submerged and washed out by a creek coming out from its bed.
- At Km 4.8, stream crossing #4: One of the culverts is completely deformed and inefficient. The second one is above the natural water flow. However, according to the local community member, there is no issue with the road at this location.
- New road from Km 6.5 to Km 7.2 and Old road from Km 7.2 to Km 8.0: It has been noted that the ruts from the ATV are deeper, which suggests that the backfill material (sand) is loose and of lower quality. The backfill material (coarse sand with rounded grains that is difficult to compact adequately) is of particularly poor quality between Km 7.5 and Km 8.0 (old road portion).
- At Km 7.6 (old road portion), stream crossing #8: One of the culverts is partly deformed and the second one is above the natural water flow. Each spring, the backfill material is washed out, suggesting the need to add at least one culvert of 1 250 mm. The backfill material (coarse sand with rounded grains) is of poor quality, loose and not compactable, and was probably collected from the seashore, 400 meters away, at Km 8.0.

Following the new road inspection, three locations with stability issues were identified: Km 0.8, Km 4.7 and Km 7.5 to Km 8.0 (including stream crossing #8).

BACKFILL MATERIAL AVAILABLE

During the inspection, Qikiqtaaluk Environmental indicated some borrow pits along the road that could be used. One pit was found to be potentially usable as the material (fine sand with silt) looked similar to the material used on the first 6.5 km of the new road. The available volume is estimated to be 500-750 m^3. This pit is positioned on Figure 1 above.

Furthermore, the last 800 meters of road used to access Cape Christian work site (and this potential borrow pit) were in good condition, suggesting that the material is of good quality. Qikiqtaaluk Environmental informed Alphard that this portion of the road is no longer used by the community so that the road could be decommissioned and the material used.

Finally, a stockpile of unsorted material and a stockpile of riprap belonging to the community were identified respectively in and near the town of Clyde River. However, Qikiqtaaluk Environmental cannot guarantee the availability of this material for the road stabilisation where necessary.

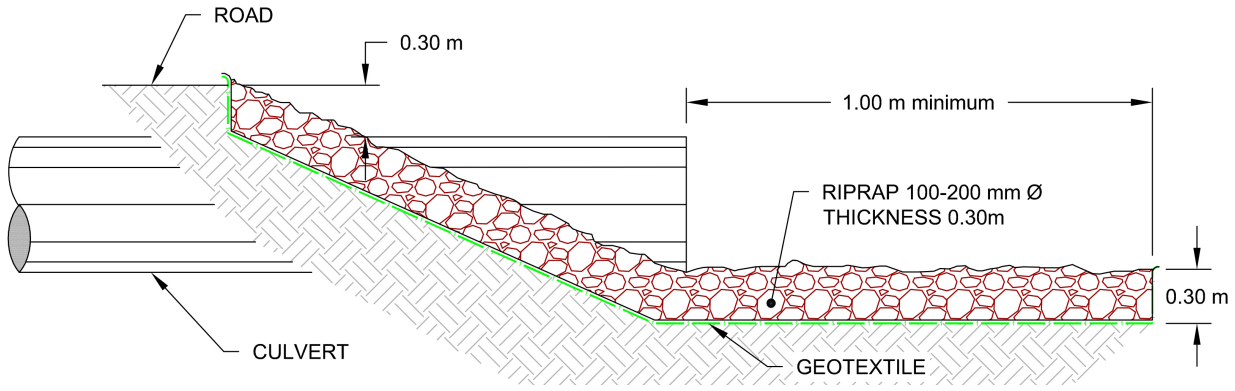
RECOMMENDATIONS

The *Abandonment and Restoration Plan: Road between the Hamlet of Clyde River and Cape Christian* submitted by Qikiqtaaluk Corporation states that "the access road which was constructed under the permit will be decommissioned and returned to the original ground profile. The pre-existing drainage courses will be re-established and all culverts removed."

As the road in its current state is in fairly good condition and only needs to be stabilised in few locations, it is not recommended to proceed to its decommissioning. Furthermore, the road is now used to bring boats to the ocean, so its removal would be a loss for the community.

It is important to note that Alphard does not have any information regarding the hydrology of Clyde River. Therefore, the recommendations for new culvert installations are based on factual information obtained during the site visit as it is not possible to do calculations and design. Figure 2 shows a typical cross section for culvert installation.

Figure 2: Typical cross section for culvert installation



NEW ROAD – KM 0.8, STREAM CROSSING #1

In Spring 2014, a large amount of rain caused the washed out of the backfill material as the currently installed culverts were insufficient to allow for the water to flow through the road. It is therefore suggested to add at least one culvert of 1 500 mm in order to provide sufficient drainage capacity. The culvert should be installed properly using geotextile and riprap on both extremities.

NEW ROAD – KM 4.7, BEFORE STREAM CROSSING #4

According to the local community member, each spring, the creek beside the road rises, overflows and washes out the backfill material of the road. Therefore, it is recommended to raise the road and install culverts to minimise the impact of the overflows on the road.

To stabilise this portion of the road, it is recommended to fill the natural hollow of the road which is about 50 meters long. To do so, fill of at least 1 250 mm high using 500 mm of 100-200 mm riprap or unsorted material has to be placed on the existing road, followed by 500 mm of coarse material (unsorted material) and 250 mm of natural silty sand (see the two first paragraphs of the above section "Backfill Material Available"). A minimum of two to three culverts of 1 000 mm should also be installed properly using geotextile and riprap on both extremities.

In the case where the materials mentioned above are not available, it is suggested to use the natural silty sand for the entire thickness. However, this solution is not the one recommended by Alphard and should only be used if the community cannot provide the proper materials.

It is important to note that since this issue involves a creek coming out from its bed and overflowing onto the road, it is quite possible that stabilisation work will be needed on an occasional basis, every spring.

OLD ROAD PORTION – KM 7.6, STREAM CROSSING #8

Each spring, the backfill material is washed out. To stabilise the road, it is recommended to re-install properly the two existing culverts as they are currently too high for the water to flow in naturally. It is also recommended to add at least two more culverts of 1 250 mm. The culverts should be installed properly using geotextile and riprap on both extremities. The existing backfill material should be completely removed, disposed of properly, and replaced by a proper material such as the ones described in the above section "Backfill Material Available".

WORKING METHOD AND EQUIPMENT TO BE USED

The construction method to stabilise the new road to the three locations identified will require the use of heavy equipment. The heavy equipment could damage the road further if used improperly. As the road is currently in good condition, the stabilisation work must have minimal impact on it in order to prevent damaging it to an irreversible point. Equipment with low ground pressure should be used and the trucks carrying the material should not be fully loaded. Load tests with trucks should also be performed on the road prior to the transportation of the material to the problematic locations. Those tests will show how the road behaves under heavy loads and how it can support them.

Jérôme Pepin, Eng.
Project Manager

Francis Gagnon, P. Eng., M.A.Sc.
Project Director – Associate
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Appendix 1:
Photographic Report

Photo 1: Clyde River Bridge Crossing, Km 0.0	
Photo 2: Road inspection in ATV	

Photo 3: Stability issue at stream crossing #1, Km 0.8	
Photo 4: Stream crossing #2, Km 2.6	

Photo 5: Ditches full of water, Km 3.2	
Photo 6: Ditches full of water, Km 4.0	

Photo 7: Stream crossing #3, Km 4.5	
Photo 8: Stream crossing #4, Km 4.8	

Photo 9: Stream crossing #4, Km 4.8

Photo 10: Stability issue near stream crossing #4, Km 4.7

Photo 11: Road inspection in ATV, road in good condition	
Photo 12: Stream crossing #5, Km 5.9	

Photo 13: Stream crossing #6, Km 6.6

Photo 14: From Km 6.5 to Km 8.0, backfill material (sand) is loose and of lower quality, deeper ruts from the ATV observed

Photo 15: Stream crossing #7, Km 6.9

Photo 16: Intersection at Km 7.2, road inspection to the right (old road), Cape Christian work site to the left (new road)

Photo 17: Stability issue at stream crossing #8, Km 7.6	
Photo 18: Stability issue at stream crossing #8, Km 7.6	

Photo 19: Cape Christian, Km 8.0, deep ruts from the ATV

Photo 20: Borrow pit (fine sand with silt) near Cape Christian work site (new road)

Photo 21: Borrow pit (fine sand with silt) near Cape Christian work site (new road)

Photo 22: Stockpile of riprap belonging to the community

Photo 23: Stockpile of material belonging to the community	
Photo 24: Stockpile of unsorted material belonging to the community