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Staff Report

Applicant: Government of Yukon – Department of Highways and Public Works	
Location: Hwy #8 – Yukon Border to Inuvik	File Number(s): MV2019L8-0013 and MV2019X0027
Date Prepared: June 13, 2022	Date of Board Meeting: July 7, 2022
Subject: Inspection and Maintenance Plan Version 1.0	

1. Purpose

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) an Inspection and Maintenance Plan Version 1.0 (Plan) submitted by Government of Yukon – Department of Highways and Public Works (GY – DHPW) to fulfill Part C Condition 73 of Permit MV2019X0027 and Part B Condition 21 of Licence MV2019L8-0013.

2. Background

- August 31, 2020 – Issuance of Permit MV2019X0027 and Licence MV2019L8-0013;
- April 21, 2022 – Plan received;
- April 25, 2022 – Plan deemed complete and review commenced;
- May 20, 2022 – Comments and recommendations due and received;
- June 10, 2022 – Responses due;
- **July 7, 2022 – Plan presented to the Board for decision, and**
- August 20, 2025 – Expiration of Permit MV2019X0027 and Licence MV2019L8-0013.

3. Discussion

History

On August 31, 2020, GY – DHPW received a Permit and a Licence for the construction of an approximately 800-km fibre optic line from Dawson City, Yukon to Inuvik, Northwest Territories. For the purposes of the Permit and Licence Applications, the project was defined as the section of the Dempster Fibre Project (DFP) located in the Northwest Territories. The fibre optic cable will enter the Northwest Territories at the Yukon/Northwest Territories border and then travel approximately 271 km north, within the Dempster Highway right-of way to Inuvik. The project is located entirely within the Gwich'in Settlement Area (GSA), passing through the communities of Fort McPherson and Tsiigehtchic. The project will connect MV2019C0027 MV2019L8-0013 – Government of the Yukon – Department of Highways and Public Works – Inspection and Maintenance Plan

to an existing terminal facility in Inuvik and to existing buildings in communities along the route to provide service to those communities. The project was determined to be transboundary as outlined in the MVLWB Governance Policies – June 2019, because it crosses territorial borders.

The purpose of this project is to tie into the existing Mackenzie Valley Fibre Line, creating a continuous network running through Yukon, Northwest Territories and Northern British Columbia. This new line will ensure Yukon, Northwest Territories, and other northern communities will have access to a secondary fibre network in the event of a service disruption. It will also benefit the northern communities that tie into the line through satellite by providing redundancy.

The proposed development includes:

- Fibre optic cable and conduit to be installed adjacent to the Dempster Highway along the Right of Way, extending from the Yukon border to Inuvik; and
- Handholes along the route.

Construction and operation of the project will require the following supporting activities:

- a) The use of water and deposit of waste;
- b) Geotechnical drilling;
- c) Use of pre-existing staging areas for equipment and materials (up to five staging areas may be used at one time);
- d) The use and storage of fuel;
- e) Construction of temporary camps to accommodate work crews;
- f) Clearing of vegetation as required in the right of way;
- g) Installation of conduits and fibre optic cable;
- h) HDD drilling and/or installation of cable at watercourse crossings; and
- i) Ongoing operation and maintenance.

Management Plans

In the initial Project Description submitted with the Applications, GY – DHPW referred to several different reports and plans (Emergency Frac-Out Response Plan, Inspection and Maintenance Plan, Permafrost Protection Plan and Construction Environmental Management Plan), this was unclear to reviewers as to why these various reports and plans were not submitted with the Application. The recommendation to the Board was to include the various reports and plans in the conditions of the authorizations. GY – DHPW agreed to submit the Plans for Board approval prior to construction. To address the comments and recommendations as well as the commitments made, the Board included conditions requiring the submission noted Plans.

Part C Condition 83 (MV2019X0027) states:

A minimum of 90 days prior to the commencement of this land use operation, the Permittee shall submit to the Board, for approval, an Inspection and Maintenance Plan. The Permittee shall not commence Project activities prior to Board approval of the Plan.

Part B Condition 21 (MV2019L8-0013) states:

A minimum of 90 days prior to the commencement of Project activities, the Licensee shall submit to the Board, for approval, an Inspection and Maintenance Plan. The Licensee shall not commence Project Activities prior to Board approval of the Plan.

On April 21, 2022, GY-DHPW submitted the required inspection and Maintenance Plan.

Summary of Inspection and Maintenance Plan

Traditionally in fibre optic networks, the network operations inspection and maintenance plan will consist of a “Preventative” maintenance component and a “Corrective” maintenance component. Network Operations Centre (NOC) technology has the capability to monitor the network performance on a real time basis with sophisticated online tools that identify specific problems, the impact, and the location along the network.

This allows for the dispatching of the appropriate network technician skill set to respond quickly and efficiently, addressing and resolving the problem before it becomes customer impacting. Preventative maintenance also includes a field component where visual and physical checks are completed on an annual basis along the cable route to spot any obvious outside plant infrastructure issues which could cause connectivity damage to the cable or conduit along the network. Cable which is buried in conduit is generally considered better protected than cable strung on poles.

Corrective actions result from disruptions or negative impacts that occur from a deviation which was not detected during the preventative maintenance program. A corrective maintenance response in the form of a Service Level Agreement (SLA) normally contains detailed standards of performance correlated against the impact of the service disruption. The speed of the Technical Operation’s response is directly proportional to the size and scale of the disruption.

The Dempster Fibre Line is not a traditional fibre cable installation. The complexity of the terrain, the permafrost, the importance of the vegetation, ground cover, and the often severe and unpredictable northern weather extremes, make this installation much more complex than typical. The construction complexity along the Dempster highway is challenged by a myriad of terrain constraints from loose gravel, to sandy soil, to bedrock, to water crossings between the starting point in Dawson, YT and the end point in Inuvik, NWT.

Most of this long-haul network will be buried underground at various depths due to changing permafrost active layer depths encountered along the route. Climate change can impact permafrost behavior, resulting in changing environmental conditions impacting the Dempster Fibre Line installation. Given the many variables which are present in this complex build, there is a need to consider both preventative and corrective maintenance programs during the operations cycle to ensure that potential environmental issues are detected early to minimize any long-term environmental impacts.

The Dempster Fibre Line project team has developed a matrix which is intended to frame the key components of the required Inspection and Maintenance Plan. There is also a sample high-level network checklist which has supported NWTel’s field preventative maintenance program in a different, but

similarly challenging, location. The matrix and sample checklist may inform a further developed Inspection and Maintenance plan after completion of the fibre build.

The matrix considers the key environmental areas which could be impacted by the construction of this fibre network and provides an indication of the direction of inspection efforts as well as potential maintenance responses in the event of an identified concern or fault during operations. This information is presented at a high level for the purpose of this pre-construction submission and the operator may develop associated Standards of Performance in a more detailed plan once the construction has been completed. Schedule Inspection schedules have not been established but a potential format may include a spring inspection followed by remediation in the summer, followed by a spring inspection of remediation efforts in the subsequent year.

The purpose of the spring inspection would be to identify locations or areas in need of maintenance due to occurrence of erosion, deep ruts, significant settling, heaving, potholes, sink holes, or other indication of environmental impacts caused by the fibre line construction or by natural processes along the trench route. Areas for maintenance could be documented in a spring inspection report as corrective action items to be implemented before a subsequent inspection. Action items could be triaged and prioritized according to scale and timing of potential impacts to safety, fibre line operation, and the environment. All documented corrective action items may not be addressed within the same year of observation. Lower priority corrective action items could be scheduled for a subsequent season.

Efficacy of corrective actions implemented subsequent to spring would be observed in the subsequent years' inspection to make any adjustments if needed.

The spring inspection report prepared by a qualified geotechnical engineer and/or other qualified professionals could be compiled into an annual report for comment on corrective actions taken, and recommendations for additional corrective actions, if warranted. The annual report could also provide a summary of responses and/or follow-up actions taken based on professional recommendations provided in the previous annual report, and the professional's opinion on the adequacy of the corrective actions and recommendations on final close-out of the corrective action.

Once construction has completed, NWTel will integrate the Dempster Fibre Line into its inspection and maintenance portfolio. General system dimensions that operators consider when managing these activities include developing and maintaining a records database consisting of preventative and corrective actions taken, GPS coordinates of the locations, and photos and video records captured during the inspection cycles. These can serve two main purposes:

- 1) The operator will use the annual records to establish reference baselines for future year comparisons to identify common or recurring problem areas or trends which need to be addressed to protect the integrity of the fibre network and to address long-term potential impacts to the environment.
- 2) The operator will also use the records to develop annual reports as required, by the MVLWB and Land Use Authorities or any other authorities having jurisdiction. The annual reports can provide documented details of the Inspection plan findings and any maintenance response activities undertaken during the year.

4. Comments

Not applicable.

5. Public Review

On April 25, 2022, the Plan was circulated for public review on the Online Review System (ORS). By May 20, 2022, comments and recommendations were received from the Government of the Northwest Territories – Environment and Natural Resources and the Gwich'in Tribal Council.

Both parties, noted no comment there for there are no responses required from the Government of the Yukon – Department of Highways and Public Works.

6. Security

The status of security for this Project will not be affected by the Board's decisions related to the Plan.

7. Conclusion

Board staff conclude that the Plan, as submitted, is in conformity and the requirements of Permit MV2019X0027 and Licence MV2019L8-0013 and can be approved.

Board staff conclude there are no outstanding issues or concerns with this Plan.

8. Recommendation

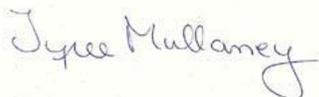
Board staff recommend the Board **make a motion to approve the Inspection and Maintenance Plan Version 1.0** as required by Land Use Permit MV2019X0027 and Water Licence MV2019L8-0013.

A draft decision letter is attached.

9. Attachments

- [MV2019X0027](#)
- [MV2019L8-0013](#)
 - [Inspection and Maintenance Plan Version 1.0](#)
- Review Comment Summary Table and Attachments
- Draft Decision Letter from the Board

Respectfully submitted,



Tyree Mullaney
Regulatory Specialist

Reviewer Comments and Proponent Responses

Project: Dempster Fibre Project

Board: Mackenzie Valley Land and Water Board

Organization: Government of Yukon - Department of Highways and Public Works

No.	Topic	Reviewer Comment	Reviewer Recommendation	Proponent Response	Board Decision
GNWT-ENR - EAM (Environmental Assessment and Monitoring) - Erin Goose					
1	Cover Letter	Comment Letter	N/A	N/A	N/A
Gwich'in Tribal Council - Lands and Resources - Kanda Gnama					
1		No concerns regarding this plan.		N/A	N/A



May 20, 2022

Tyree Mullaney
Regulatory Specialist
Mackenzie Valley Land and Water Board
P.O. Box 2130
4922-48th Street 7th Floor YK CENTRE MALL
YELLOWKNIFE, NT X1A 2P6

Dear Tyree Mullaney,

**Re: Dempster Fibre Project, Inspection and Maintenance Plan Version 1.0,
MV2019X0027**

The Department of Environment and Natural Resources, Government of the Northwest Territories has no comments or recommendations for the consideration of the Board at this time.

Should you have any general questions, please contact Erin Goose in the Environmental Assessment and Monitoring unit at email gnwt_ea@gov.nt.ca.

Sincerely,

Erin Goose
Environmental Regulatory Analyst
Environmental Assessment and Monitoring Section
Environmental Stewardship and Climate Change Division
Department of Environment and Natural Resources
Government of the Northwest Territories



June 3, 2022

Attention: AlecSandra Macdonald, Gwich'in Land and Water Board

**RE: MV2019X0027, MV2019L8-0013 -Dempster Fibre Line _Government of Yukon
- Department of Highways and Public Works**

Dear AlecSandra,

On behalf of the Gwich'in Tribal Council (GTC), I would like to thank you for the opportunity to provide feedback regarding the following plans inherent to the Dempster Fibre Line Project:

- **Closure and Reclamation Plan**
- **Emergency Frac-Out Response Plan**
- **Environmental Management Plan**
- **Heritage Resource Management Plan**
- **Inspection and Maintenance Plan**
- **Permafrost Protection Plan**
- **Sediment and Erosion Control Plan**
- **Wildlife Management and Monitoring Plan**

The submission below summarizes GTC's comments and recommendations regarding specific aspects of these Plans.

Mahsi (thanks) for your time and attention to this matter. Please do not hesitate to contact me should you have any questions.

Sincerely,

Kanda Kola Gnama
Transboundary Specialist

cc. Leigh-Ann Williams Jones, GTC Manager of Lands and Resources

GTC's comments and recommendations

- **Closure and Reclamation Plan**

Clearing

Progressive reclamation should be contemplated in areas where natural revegetation may be inhibited.

- **Emergency Frac-Out Plan**

No concerns regarding this plan.

- **Environmental Management Plan**

Section 4.2 clearing and brushing.

Progressive reclamation should be implemented in areas where natural revegetation may be inhibited to reduce the impacts of edge effects, prevent habitat fragmentation and to decrease the potential for preferential use by predators. Special attention should also be paid to key nesting and burrowing wildlife species that may be impacted through ground compaction and/or habitat loss. Restricting activity periods during peak migration times or implementing stop work orders should be contemplated when key wildlife species are present within close range to work sites, including but not limited to Moose, Porcupine Caribou, Boreal Woodland Caribou, etc.

4.5 Horizontal Directional Drilling

For Horizontal Directional Drilling Mitigation Measures, it is quite concerning that the proponent contemplates disposing of drill waste in natural depressions, irrespective of how inert the by-products may be. It is concerning to the GTC that project proponents would even contemplate such a disposal method in Arctic Regions, given the ecological sensitivity of many areas, which are continually experiencing permafrost degradation, changes in drainage patterns due to increased flooding events and runoff, and vegetation loss due to changing thermal regimes and disturbance. GTC is strongly against any deposition of any wastes within the Gwich'in Settlement Region (GSR) and would expect that all wastes be trucked outside of the GSR.

Noise disturbance: noise disturbance is lacking in this plan.

The GTC believes that noise disturbance will occur during the project construction phase and requests that mitigation measures related to this disturbance be developed to avoid potential effects on wildlife and nearby communities as required. Special consideration should be given to areas where subsistence harvesting is being conducted by Participants, including hunting, trapping, berry picking and fishing.

- **Inspection and Maintenance Management Plan**

No concerns regarding this plan.

- **Sediment and Erosion Control Plan**

Summary of the drainage conditions

The proponent did not provide a summary of drainage conditions to be encountered along the Dempster highway in the ESC. This summary is required in the Plan.

Conventional Burry (page 5 of the plan)

The proponent has proposed using vibratory plow or trencher for conventional bury. The GTC is of the opinion that to minimize ground disturbance and the project's environmental footprint; only vibratory plows should be used for this project. This is particularly important as the plan did not outline a detailed method for **dispersion of surface water**, should water begin to pond or begin to preferentially follow the trench/slice within which the FOC will be installed. Given the current challenges that our Region faces with regard to flooding and drainage, any activity that has the potential to exacerbate this challenge should be adequately scrutinized to ensure any potential negative impacts to drainage systems are sufficiently mitigated.

Surface Lay (page 5 of the plan)

The plan did not outline the potential environmental consequences of this method. GTC requests that the proponent provides more details of potential impacts.

- **Wildlife Management and Monitoring Plan**

Section 1.2 - Engagement

This section indicates that GTC and Tetlit Gwich'in Council in Fort McPherson will review this Plan. The GTC requests that the proponent reaches out to the Gwichya Gwich'in Council in Tsiigehtchic and the Nihtat Gwich'in Council in Inuvik for review and feedback.

Overall, GTC reiterates the concerns raised by the GRRB regarding this plan, especially caribou hunting along the Dempster Highway by Gwich'in participants. Caribou is a significant part of local diets and is equally important for food security. The proponent must consult with the local Renewable Resources Councils to ensure that activity periods do not coincide with subsistence harvesting and will minimize any disruption to harvesting practices, including trapping, hunting and berry picking. As per section 12.4.13 of the Gwich'in Comprehensive Land Claim Agreement (GCLCA), if a land-use conflicts with harvesting activities, the Proponent is required to consult with the GTC, as well as provide notification to any Renewable Resource Council for the area in which the land is situated.

Failure to do so, would be considered an infringement on Gwich'in hunting rights and cultural practices along the Dempster highway.

- **Heritage and Resources Management plan**

The Chance find protocols/procedures

The Chance find protocols/procedures are not written in plain language (the Yukon Government ones are, however). If these will be reviewed and used by non-technical workers, it would be beneficial if these guidelines were written in plain language.

Flagging any “chance find” sites might attract looting or even simple damage from curious members of the public who may stop and explore, especially considering this is along the highway. Can another way to identify sites be used instead? If there will be a lot of other flagging, and the flagging tape doesn't specify that it's heritage materials, then this is less of a concern.

Human remains

Covering human remains with a tarp or blanket may not be the best practice, and the RCMP and Teet'it Gwich'in should be consulted to confirm this practice before this guide is finalized.

- **Permafrost protection plan.**

Permafrost protection awareness Training:

The plan did not provide sufficient information on what training will consist of. More details about this training are required.

Thaw Sensitivity

Permafrost along much of the Dempster Highway corridor is generally warmer than about -5°C. (Page 5 of PPP).

This appears to be a gross generalization, and the characteristics of permafrost in the Gwich'in Settlement Region should be explored.

A detailed description of soil characteristics is important to determine areas where specific mitigation activities are required. A transect outlaying these characteristics is advisable.

Permafrost and Snow

Deep snow insulates the permafrost in the winter. Unnaturally deep accumulations can prevent the active layer from fully refreezing (page 6).

Considering the elevated snowpack accumulation observed this year, extra caution should be undertaken throughout the construction phase as impacts to the active layer and permafrost/water table from increased insulating factors is likely to occur. These potential impacts to the active layer and permafrost are concerning and additional mitigation measures should be explored to reduce any further impacts.

Methods for Identifying Permafrost

The plan stated that: *The following **methods and tools** will be implemented to ensure construction crew and personnel have the knowledge and resources available to identify areas with a high potential for permafrost prior to conducting installation activities* but seems to limit these methods and tools to site identification and ground probing by the construction crews.

This is confusing as the project design (engineering and Geotechnical design) should have identified thaw sensitive and thaw-stable permafrost areas. Especially with regards to the extensive research that has already been conducted and published within the GSA, that specifically addresses permafrost. Ground probing by construction crews and environmental monitors should constitute an additional contribution to protecting permafrost, not the primary detection tool.

Best Practices for Permafrost Reclamation

This section is satisfactory. The same approach should have been implemented as a proactive step to identify the different types of permafrost along the Highway corridor prior to executing project activities.