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## Staff Report

<b>Applicant:</b> Government of Yukon – Department of Highways and Public Works	
<b>Location:</b> Hwy #8 – Yukon Border to Inuvik	<b>File Number(s):</b> MV2019L8-0013 and MV2019X0027
<b>Date Prepared:</b> May 25, 2022	<b>Date of Board Meeting:</b> July 7, 2022
<b>Subject:</b> Emergency Frac-Out Response 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 Emergency Frac-Out Response Plan Version 1.0 (Plan) submitted by Government of Yukon – Department of Highways and Public Works (GY – DHPW) to fulfill Part F Condition 31 of Permit MV2019X0027 and Part G Condition 8 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 3, 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 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 of noted Plans.

Part F Condition 31 (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 Emergency Frac-Out Response Plan. The Permittee shall not commence Project activities prior to Board approval of the Plan.

Part G Condition 8 (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 Emergency Frac-Out Response Plan. The Licensee shall not commence Project Activities prior to Board approval of the Plan.

On April 21, 2022, GY-DHPW submitted the required Frac-Out Response Plan.

#### Summary of Frac-Out Emergency Response Plan

Although directional drilling is a much less intrusive method of crossing open water than open-trench cutting, there is a possibility of surface water disturbance if a "frac-out", or inadvertent return of drilling fluid or sediment laden groundwater occurs during the drilling process. There is also the potential for sediment-laden water or other deleterious substances to enter the watercourse as the result of dewatering efforts or other construction related activities during directional boring.

Frac-out releases are typically caused by the pressurization of the drill hole beyond the containment capability of the overburden soil or sediment. Therefore, the type of material and the depth of overburden is a key factor in preventing a frac-out.

Although a frac-out can occur at any location along the directional bore, it is most probable where the drill head is the shallowest. As a result, the possibility of a release occurring is significantly lower with deeper bores.

The impact of sediment entering the watercourse is a temporary increase in turbidity or siltation that can impact aquatic life, and may be a violation of some sections of the Canadian Fisheries Act.

The purpose of this Emergency Response plan or "Frac-out" plan is to:

- Minimize the potential for a frac-out associated with HDD activities.
- Provide for the timely detection of frac-outs.
- Protect areas that are considered environmentally sensitive (streams, wetlands, rivers).
- Ensure an organized, timely, and "minimum-impact" response in the event a frac-out and release of drilling mud occurs.
- Ensure that all appropriate notifications are made in the event of a "Frac-out" to the owner, to the GNWT Environment and Natural Resources Department, the MVLWB, and to Fisheries and Oceans Canada.

The Plan:

- Prior to the start of construction, conduct a briefing for all workers to identify and locate sensitive areas at the site;
- Ensure that all field personnel understand their responsibility for timely reporting of frac-outs; and
- Maintain necessary response equipment on-site or at a readily accessible location and in good working order. This may include a vacuum truck, sandbags or hay bales, an underwater boom and curtain.

A “Frac-Out” is Identified:

- All work stops, including the recycling of drilling mud/lubricant;
- Determine the location and extent of the frac-out; and
- Immediately contact the appropriate organizations including the consultant, owner of the facility and the closest regional office for Fisheries and Oceans Canada (Regional offices are listed in Appendix A of this document).

If the Frac-out is Terrestrial:

- Isolate the area with hay bales, sandbags, or silt fencing to surround and contain the drilling mud;
- Either use a vacuum truck to pump the drilling mud from the contained area and place it in the return pit; or
- leave the drilling mud in place to avoid potential damage from vehicles entering the area and once dry, remove the excess drilling mud, level the area and reseed if necessary.

If the Frac-Out is Under Water:

- Monitor frac-out for 4 hours to determine if the drilling mud congeals. (Bentonite will usually harden, effectively sealing the frac-out location); and
- Upon consultation with the appropriate authorities, take action to resolve the problem.

This could be:

- If drilling mud congeals, take no other action that would potentially suspend sediment in the water column;
- If drilling mud does not congeal, erect isolation/containment environment (underwater boom and curtain); and
- If the fracture becomes excessively large, a spill response team would be called in to contain and clean up excess drilling mud in the water.

After frac-out is stabilized and any required removal is completed, document post-cleanup conditions with photographs and prepare frac-out incident report describing time, place, actions taken to remediate frac-out and measures implemented to prevent recurrence.

An Incident Report will be provided to the facilities’ owner, to Mackenzie Valley Land and Water Board, to GNWT Environment and Natural Resources, and to Fisheries and Oceans as soon as it is complete.

The following strategies minimize the effects of directional boring and the impacts that could result should a frac-out or sedimentation occur:

- Select low flow times for the directional bore timing;
- Maximize distance of entry and exit holes for drilling from mature riparian vegetation;
- Maximize distance of entry and exit holes for drilling from the bank of the watercourse. The entry and exit holes should be excavated as per buffer zone requirements and far enough away from

any watercourse to allow containment of any sediment or deleterious substances above the ordinary high- water mark;

- When dewatering drilling holes, treat water or divert it into a vegetated area or settling basin to remove suspended solids to prevent sediment and other deleterious substances from entering the watercourse; and
- Since releases are caused by pressurization of the drill hole beyond the containment capacity of the overburden of material, maximize the distance between the bed of the river and the depth of the directional bore.

## Creeks and Streams

When directional drilling under a creek or stream:

- The Contractor will temporarily suspend forward progress of the drilling operations if sedimentation is noted and the surface of the drill path will be examined for release;
- If a surface release has occurred, check effectiveness of the sediment barrier, make necessary repairs; and
- Remove the sediment by shovel or vacuum truck. Ensure clean-up measures are suitably applied so as not to result in further disruption to the bed and/or banks of the watercourse.

## Wetlands

When a suspected frac-out is identified or sediment-laden water or other deleterious substances enters the wetland while drilling:

- The Contractor will temporarily suspend forward progress of the drilling operations and the surface of the drill path will be examined for release;
- If a surface release has occurred, isolate the area with sediment/silt fencing, hay bales, and/or sandbags to contain the spread of sediment; and
- The sediment will be removed by the use of hand shoveling or the use of small, mechanized equipment outside the wetland area.

## Rivers

If a frac-out is suspected while drilling in the river:

- The Contractor will temporarily suspend forward progress of the drilling operations if sedimentation is noted, and the water will be examined to determine the presence and/or extent of a sediment plume;
- Small aquatic releases with no visible sediment plume are allowed to dissipate since clean- up efforts in these cases could potentially result in increased suspension of sediments in the water column;
- The on-site construction manager will notify any appropriate downstream water intake authorities of the existence of any plume which extends beyond 500 metres downstream; and

- In the case of a terrestrial release while drilling near the river, the procedures outlined in the terrestrial section of this plan will be followed.

#### Terrestrial/Shoreline Areas

When a frac-out is suspected while drilling in a terrestrial/shoreline area or there is the potential for sediment laden water or other deleterious substances to enter the watercourse from the shoreline area:

- The contractor will temporarily suspend forward progress of the drilling operations and the surface of the drill path will be examined for release.
- If a surface release has occurred or there is the potential for sediment-laden water or other deleterious substances from entering the watercourse isolate the area with hay bales, sandbags, or silt/sediment fencing to contain the spread of sediment-laden water and ensure that it does not enter the watercourse.
- The contained sediment area will be left in place to dry
- The dried sediment will be removed by shovel or vacuum truck to grade and the area restored as to its original condition.

Although each bore may have its own site-specific characteristics, the Contractor will have the following general guidelines:

1. The proposed boring path will be reviewed prior to starting to alleviate any conditions which may result in a frac-out.
2. During drilling operations, the bore path will be continuously monitored and observed for signs of frac-out or surface migration.
3. Drilling fluid pressure and rate of return flow will be monitored and if loss is detected, drilling will cease operations until the problem can be rectified
4. If frac-out occurs under a watercourse, boring will cease immediately, and implement the plans contained in this document.
5. Material/Equipment required to control fluid loss will be site specific and contained in the drill plan for that bore. Some examples of containment methods could include hay bales, silt fence, fluid additives for drilling mud as well as mechanical methods.

#### **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. The comments and recommendation submitted state that they have no comments or recommendations for the consideration of the Board at this time. As there were no comments or recommendations submitted, GY-DHPW did not need to respond.

## 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 Emergency Frack-Out Response Plan Version 1** as required by Land Use Permit MV2019X0027 and Water Licence MV2019L8-0013.

A draft decision letter is attached.

## 9. Attachments

- [MV2019X0027](#)
- [MV2019L8-0013](#)
  - [Emergency Frac-Out Response 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
<b>Gwich'in Tribal Council - Lands and Resources - Kanda Gnama</b>					
1		No concerns regarding this plan.		N/A	N/A
<b>GNWT-ENR - EAM (Environmental Assessment and Monitoring) - Erin Goose</b>					
1	Cover Letter	Comment Letter	N/A	N/A	N/A





May 20, 2022

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

Dear Tyree Mullaney,

**Re: Dempster Fibre Project, Emergency Frac-Out Response Plan Version 1.0  
(MV2019X0027, MV2019L8-0013)**

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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](mailto: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**

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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.