



Topic: Water quantity: consideration of icing and overflow on culvert design; existing culverts (DAR Table 5.1 of section 15.1.2, Table 15.8 of section 15.4; s.15.4.2.2, s.15.7.1 and s.15.7.2)

Preamble from the Mackenzie Valley Environmental Impact Review Board (Review Board):

Section 15.7.1. of the Developer's Assessment Report states that surface water quantity prediction confidence can rely on the effective implementation of design-based mitigations, which are:

- (a) "drainage culverts will be installed...in consideration of site-specific icing/glaciation effects" as described in Section 15.4.2.2; and
- (b) "major drainage have existing bridges and will not be altered or replaced" stated in Section 15.7.2.

Existing information does not appear to support the developer's statement, because:

1. There is a lack of information on naturally occurring icing and its effects. This can greatly affect the desired conveyance capacity of culverts. This is also identified as required information for design consideration in Table 5.1.
2. There is a lack of information on channel bed material and bank stability near crossings. Major drainage is not clearly defined in the project design, lumping all 85 proposed drainage structures, including bridge-culvert (sections 5.4.7.1), as minor drainages and neglecting that possible work identified in section 5.4.6.2 that "some work around existing bridges may be required to extend rip rap to accommodate the wider embankment approaches."

The Review Board has reviewed the Developer's responses to other parties' IRs posted on the ORS, which include relevant information on existing culverts (DFO-18, 21 and 29) and photos (DFO-27 and 28), design of and mitigation at crossings (DFO-04 and 15, LKFN-31).

In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.

Request from the Review Board:

- A. Please describe the developer's plan to share culvert design information and update Table 5.2 to demonstrate how community concerns about icing and overflow (location and magnitude) are addressed in culvert design.
- B. Please describe what is considered to be a 'major' drainage. Is it based on either:
 - design criteria (cross-sectional span of over 1.5 meters) or
 - watercourse width that the structure crosses (greater than 5m)?



Response from the Government of the Northwest Territories:

- A. No site-specific culvert designs have been completed. Culvert designs will be completed based on site-specific flow and channel information, and geotechnical information (if needed), as part of detailed design, and once the route of the highway is confirmed as an outcome of the environmental assessment.

Table 5.2 of the DAR identifies the minimum culvert design criteria that will be applied to all culverts. The GNWT has noted specific locations of overflow and icings communicated as part of engagement on the Project. In addition to local knowledge, where icings are known to be a potential issue, engineers assume and account for the presence of icings in the design as a safety factor for the culvert flow capacity. A safety factor may be applied differently by each Engineer of Record, depending on the specific site conditions, and therefore the GNWT does not yet have a specific design criteria for this. Generally, the culvert will be a larger diameter than it would be if ice were not accounted for. Once an Engineer of Record for the detailed design is retained, the exact method to account for icings in specific culvert design will be determined, and as part of the whole of government approach, appropriate departments will be part of the review of that information (e.g., ECC).

The GNWT is committed to sharing information and communicate with communities as requested when the aforementioned design basis is available.

- B. The DAR uses the terms ‘major watercourse’, ‘major stream’, ‘small culvert’ (less than 1.5 metre [m] diameter), and ‘large culvert’ (greater than 1.5 m diameter). Major watercourses/streams are described in the DAR as those that have existing and planned bridge and bridge-sized culvert structures installed (as part of the existing Mackenzie Valley Winter Road), as listed in Table 5.8.

The type and diameter of new watercourse crossing structures will be determined during detailed design based on modelled flow of the watercourse and width of the channel. The distinction between a ‘small culvert’ and a ‘large culvert’ is such that a large culvert (or bridge sized culvert, or bridge) typically is a bolted structural steel multi plate design, whereas a small culvert consists of a spiral wrap corrugated steel pipe.

The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories’ Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.

The following departments have been specifically involved in the drafting, review and approval of this response:

- Department of Infrastructure
- Department of Environment and Climate Change



Topic: Water quantity: effects of the environment on the highway, climate change, project description (DAR Sections 5.2.2., 15.4 (Table 15.8), and 24.3 (Table 24.9); and, Section 4.2 of Appendix 15A)

Preamble from the Mackenzie Valley Environmental Impact Review Board (Review Board):

Section 5.2.2 describes the hydro-technical criteria for drainage structure. It should "be designed for a 1:100-year flood event and the dike effect caused by the new road embankment". Section 4.2 of Appendix 15A describes the existing peak flow conditions are of 2-year and 100-year return periods. As the Dehcho region is becoming wetter and warmer, according to the participants from the Traditional Knowledge and Traditional Land and Resource Use Studies, mounting evidence of the warming climate in the North warrants flexible design changes. Culvert and bridge design consideration of storm events must meaningfully consider the effects of the warming climate, including changes in the intensity-duration-frequency of precipitation events.

The Review Board has reviewed the Developer's responses to RB-02 and 24, and DFO-14, and provides the following comment:

- GNWT explained "design of crossings will eliminate other potential pathways, including changes to surface drainage patterns." The Review Board understands that crossing design should consider changes to streamflow due to the project (i.e., road embankment) and climate change.
- GNWT explained culvert crossings, compared to bridges, is the preferred design choice based on road safety considerations. Resilience of the project in future climate scenarios was not discussed in this design choice.
- GNWT clarified the future climate conditions in the climate resilience assessment.

In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.

Request from the Review Board:

- A. Please describe if the hydro-technical criteria for drainage structure will allow for change from existing conditions, considering the potential for more frequent or more severe flooding in the future due to climate change.
- B. What are the design criteria for projected peak flows under variable future climate scenarios?

Please estimate the predicted frequency of a flood with what is currently a 100-year return period (of the same magnitude but may be more frequent in the future given climate change) over a range of periods (such as in 20, 50 and 80 years in the future), and describe the implications for project design.



Response from the Government of the Northwest Territories:

- A. While hydrotechnical engineers acknowledge the influence of ongoing and future climate change on average and peak flows, there are few well established and accepted criteria or methods for designing crossing structures that account for potential future flow (1:2 year) and flood (1:100 year) conditions due to climate change. The most appropriate such standard which is now in development, but not currently finalized or accepted, is CSA Group W231 - Developing and Interpreting Intensity-Duration-Frequency Information Under a Changing Climate.

The 2023 public review draft version of CSA W231 is located at:
<https://publicreview.csa.ca/Home/View/2142641>

Excerpts from CSA W231:

5.2 Impact of climate change on extreme rainfall

“Note: Canada’s climate has warmed substantially faster than the global mean. Global warming has resulted in an observed increase in atmospheric moisture that is expected to have caused an increase in extreme rainfall in the absence of changes in atmospheric circulation and other factors. Rainfall observations around the globe collectively indicate that extreme rainfall has increased in accordance with these expectations. Nevertheless, it is not yet possible to reliably estimate changes in observations of extreme rainfall at individual stations that are caused by human influences on the climate due to the large influence of natural variability on extreme rainfall amounts.”

Regardless of the above note, the Government of Northwest Territories (GNWT) anticipates following the recommendations of W231 for determining rainfall intensities for crossings design.

The recommended design approach from CSA W231 for addressing climate change in watercourse crossing structures based on rainfall intensity is the following Section:

Section 5.3 Deriving future extreme rainfall:

5.3.2 Estimating future extreme rainfall intensity using rainfall-temperature scaling

Future rainfall intensities shall be estimated via rainfall-temperature scaling based on the CC relation as described in Equation 5.1:

$$I_{fut,D,RT} = I_{ref,D,RT} \times (CC_{adj})^{\Delta T} \quad (5.1)$$

where $I_{ref,D,RT}$ is the historical rainfall intensity of duration D and return period RT estimated from observations following procedures described in Clause 4, $I_{fut,D,RT}$ is the corresponding projected future rainfall intensity, CC_{adj} is the Clausius-Clapeyron rainfall-temperature scaling factor (= 1.07) and ΔT is the projected change in local temperature expressed in °C. The change in local temperature ΔT is the warming that is projected to occur between a reference historical climatological period that is representative of the period covered by the data used to



calculate $I_{ref,D,RT}$ and a future climatological period that corresponds to the expected end of service life of the design for which $I_{fut,D,RT}$ will be used.

Equation 5.1 is anticipated to be utilized by the GNWT as the Owner, and by their designer when proceeding with detailed design of any new watercourse crossing structures.

- B.** As indicated in part A, it is anticipated that the GNWT will be using the methodology of CSA W231 to determine projected peak flows.

In response to the question on the increase in frequency of major rainfall events, intensity-duration-frequency (IDF) projections for the project region have been presented in the attachment to GNWT's response to IR#2 (PR#233), specifically in the Climate Profile for the Mackenzie Valley Highway Project – 2024 CCRA Addendum, which was included as Appendix A to the Climate Change Resilience Assessment Addendum (K'alo-Stantec, 2024). The data presents historical and projected total precipitation amounts (mm) in specific time interval (5 minutes to 24 hours) for various return periods (2 years to 100 years) for the Norman Wells-Tulita Climate Zone and Wrigley Fort Simpson Climate Zone, under the SSP5-8.5 climate scenario.

For example, within section 3.2.1, the Norman Wells – Tulita Climate Zone, Table 9 shows the historic precipitation data and Table 10 provides the 2020s projected data.

Taking the 100 year return / 1 hr event gives an intensity value of 25.8 mm. Table 10 has that same value as the 50 year event. Table 11 the 2050s has that same value being just slightly less than a 25 year event, and Table 12, the 2080's has that same value being slight less than a 10 year event.

The implications for project design are that the capacity of the drainage works, culverts or bridges, must be designed to the future 100 year event, rather than the current year or historic 100 year event.

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The following departments have been specifically involved in the drafting, review and approval of this response: Department of Infrastructure, Department of Environment and Climate Change.



References

K'alo-Stantec. 2024. Mackenzie Valley Highway Project – Climate Change Resilience Assessment Addendum (2024). Prepared for the Government of the Northwest Territories; PR#233.



Topic: Water quantity: climate change, dust control and pollution from mitigation, water use (Sections 5.5.7 and 15.1.5; section 16.1.2; RB ORS comment 26)

Preamble from the Mackenzie Valley Environmental Impact Review Board (Review Board):

The magnitude of change is one criterion for determining residual effects on water quantity. The Northwest Territories has experienced dramatic swings in water levels in streams and lakes in recent years. Impacts from climate change could result in a greater extreme in the natural variation of water quantity.

The Developer responded to community concerns about dust saying that only water will be used for dust control, and citing GNWT's 2013 Guideline for Dust Suppression (s.16.1.2). Table 5.11 estimated daily water use of 100 cubic meters for dust control during operations and maintenance. For the Tłı̄chǝ Highway dusting was identified by communities as a major concern. Water use estimated for dust control to mitigate dusting impacts can potentially be greater than anticipated.

In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.

The Review Board has reviewed the developer's response to RB-26.

Request from the Review Board:

- A. Is there a contingency if actual water required for dust suppression is greater than the anticipated amount? How will the potential for increased water withdrawals be addressed? What were the lessons learned from the Tłı̄chǝ Highway on the amount of dust suppression required due to complaints from highway users about extreme dust conditions?
- B. Please describe what other dust suppressants are being considered besides what is prescribed in the GNWT 2013 Guideline (water, calcium chloride, DL-10). Please include:
 - any standard mitigation when using these prescribed suppressants (like proximity to water or wind direction)?
 - if using newer dust suppressants not in the guideline, the fate of substances in the environment and any pathways of effects on the environment.



Response from the Government of the Northwest Territories:

- A.** The Government of the Northwest Territories (GNWT) proposes to use water for dust control during construction. Water use for dust control is estimated at 10,000 cubic metres (m³) annually, which equates to approximately 1,000 water truckloads. Should this be inadequate for dust control, more will be used, up to the limits authorized by the water licence. Once the highway is constructed, the GNWT anticipates primarily using dust suppressant for dust control. There are 23 potential lake sources, and 24 potential stream water sources for water use (see Section 5.4.11 of the Developer's Assessment Report [DAR]). Based on the GNWT's experience maintaining NWT's gravel highways, dust suppressant is more effective than water for dust control during highway operations and maintenance, and results in an improved driving surface; therefore, water use is less during operations and maintenance than during construction. Annual water use for dust control on the Th̄ch̄ Highway in 2022 (operations) was just under 2,000 m³ (for 97 km of highway), which is comparable to the anticipated annual water use for dust control on the Project of 10,000 m³ (for 321 km of highway). Reported water use from all sources for all uses (including dust control) during construction of the Th̄ch̄ Highway, was 2,920 m³ in 2020, and 9,337 m³ in 2021, also comparable to the 10,000 m³ anticipated to be used annually for the Project.
- B.** The GNWT conducts dust suppression in accordance with the *Guideline for Dust Suppression* (GNWT, 2013) (the Guideline). Calcium chloride and DL10 are the only approved dust suppressants in the NWT, and currently only calcium chloride is used by the GNWT on NWT highways #1-7. No other dust suppressants are being considered. Dust suppressant is generally applied to highways every one to two years following annual resurfacing. Section 2.3 of the Guideline describes general application procedures; Section 2.4 of the Guideline describes how to apply the suppressant in consideration of environmental constraints. The GNWT specifies to contractors that suppressant is not applied when precipitation is imminent, or when the road surface is saturated. Suppressant is not applied in proximity to water, or on bridge decks.

The response to this Information Request has been prepared in accordance with the GNWT's Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.

The following departments have been specifically involved in the drafting, review and approval of this response:

- Department of Infrastructure
- Department of Environment and Climate Change



References

GNWT. 2013. Guideline for Dust Suppression. [dustsupression.pdf \(gov.nt.ca\)](#)



Topic: Water quality: Water quality and quantity, draft Water Monitoring Plan (DAR Chapter 15 and 16; Sections 23.5.5 and 23.5.6 of Volume 4)

Preamble from the Mackenzie Valley Environmental Impact Review Board (Review Board):

The DAR lacks information on how water quality monitoring will be designed to evaluate the effectiveness of mitigation. Sections 23.5.5 and 23.5.6 of the report provided objectives for water quantity and quality monitoring but there is no plan or framework currently being proposed. Submission of a draft Water Monitoring Plan during the EA will help parties and the Board understand the monitoring and mitigation of project impacts on both water quality (sedimentation) and quantity (in situ measurements at water withdrawal locations).

The Water Monitoring Plan for the Tłı̨ch̨ highway included details on instream construction monitoring (total dissolved solids, turbidity, dissolved oxygen), water withdrawal monitoring, water withdrawal sources with location maps, wastewater monitoring, training for employees, and reporting requirements.

In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.

The Review Board has reviewed the developer's responses to DFO-10, 22 and 23, ECCC-16, and LKFN-16, 21 and 28, and RB-25.

Request from the Review Board:

Please submit a draft Water Monitoring Plan for the Mackenzie Valley Highway, with similar contents and format to the one prepared for the Tłı̨ch̨ highway. Include Traditional Knowledge of water sources chosen for water withdrawal and community participation in field data collection in the Plan.



Response from the Government of the Northwest Territories:

Please see the draft Water Monitoring Plan in Attachment 1, which incorporates water use and water quality monitoring previously included in the draft Erosion Sedimentation Control Plan, and summarized in Table 23.1 of the Developer’s Assessment Report. The Government of Northwest Territories (GNWT) notes that such duplication will be addressed as the draft plans are finalized during licencing by removing duplicated monitoring requirements from one or the other plan, as may be appropriate.

The response to this Information Request has been prepared in accordance with the GNWT’s Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.

The following departments have been specifically involved in the drafting, review and approval of this response:

- Department of Infrastructure
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The following departments have been specifically involved in the drafting, review and approval of this response:

- Department of Infrastructure
- Department of Environment and Climate Change



Topic: Fish, water: Mitigation, Cumulative Effects Assessment (DAR Sections 15.1.2 and 15.2.2, and 15.5.4.3; Figure 1.2 of Appendix 15C; Sections 1 and 6 of Appendix 15D; Sections 17.2.2, 17.5.2 and 17.6.2; S.6.1 of Appendix 15D)

Preamble from the Mackenzie Valley Environmental Impact Review Board (Review Board):

Both Canyon Creek and Prohibition Creek are identified in Appendix 15D as water sources for Prohibition Creek Access Road (PCAR) and potential source in Appendix 15C for this proposed highway alignment. These two creeks have the largest watershed area among the potential water sources for this highway's segment north of Tulita, and are used for PCAR watering. Norman Wells Renewable Resource Council Traditional Land and Resource Use participants expressed concerns about lowered water levels in these two creeks (Table 15.1).

Both Creeks are important fishing sites and fish spawning ground in the Sahtú, specifically whitefish (important harvest species for Sahtú communities) only frequents Prohibition Creek (s.17.2.2). However, section 17.6.2 states that "cumulative changes to fish habitat from projects that include water withdrawal are not considered, since the Projects' contribution is considered negligible" and references s.17.5.2. Section 17.5.2, however, only discusses effects on fish health due to fishing pressure not water withdrawal. If winter withdrawal is to take place in these creeks, it may pose heightened risks (lower dissolved oxygen level) to fish overwintering (s.6.1 of Appendix 15D).

Reasonably foreseeable project activities do not include the progressive reclamation and closure of the Imperial Oil Norman Wells Operations. Please provide rationale. Hauling and water withdrawal from Imperial Norman Wells Operations will interact cumulatively with effects of the highway, including impacts to water quantity.

In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.

The Review Board has reviewed the developer's responses to DFO-10, 13, 11, 12, and 22, RB-25, and LKFN-30.

Request from the Review Board:

- A. Will the developer withdraw water from Canyon and Prohibition Creeks along the proposed Prohibition Creek Access Road alignment?
- B. If not, what are the alternatives?
- C. If water withdrawals will occur in these watercourses, how are community concerns addressed in the Cumulative Effects Assessment regarding existing and future water use? This answer should consider impacts of lowered water level on culturally important fishing sites and fish species, and of fish overwintering if winter withdrawal takes place. Include Dissolved Oxygen as a parameter in water monitoring.
- D. What are the specific measures for sensitive species, like the arctic grayling?



Response from the Government of the Northwest Territories:

- A. Prohibition Creek is identified as a potential water source in Table 5.8 of the Developer’s Assessment Report (DAR). Canyon Creek is not. Potential lake water sources are listed in Table 5.7, and potential stream sources are those listed in Table 5.8, and the Mackenzie River.
- B. This request is not applicable given response above to Part (A).
- C. Water withdrawal from approved sources (per water licence) will be in accordance with Fisheries and Oceans Canada (DFO) measures to protect fish and fish habitat, the *DFO Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut* (DFO, 2010), and *Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada* (DFO, 2013), collectively referred to here as the “guidelines”. These guidelines are in place to protect fish and fish habitat from adverse effects of water withdrawal, including those associated with overwinter oxygen depletion. Withdrawal from approved sources in accordance with the guidelines does not require additional monitoring of oxygen. The guidelines apply to cumulative water use from each source. For example, in winter during Project construction, the Government of Northwest Territories (GNWT) will be concurrently constructing and maintaining the Mackenzie Valley Winter Road (MVWR), which is a separate project. The project contractor and the GNWT may use the same water sources for the Project and MVWR. The GNWT will consider the available water in each source as based on all known potential users when applying for one or more water licences to use water.

During engagement with Indigenous Governments, Indigenous Organizations, and other affected parties, participants identified streams and lakes suitable for water withdrawal, and provided feedback on the GNWT’s proposed sources. For example, in response to concerns raised about water withdrawal from Trout Lake at the base of Bear Rock (Petınıꞑah), it was removed from consideration as a potential water source for the Project.

- D. Given the response to Part C, there are no additional requirements for sensitive species, including arctic grayling. The guidance is designed to account for all fish habitat types and fish species.

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The following departments have been specifically involved in the drafting, review and approval of this response:

- Department of Infrastructure
- Department of Environment and Climate Change



References

DFO (Fisheries and Oceans Canada). 2010. DFO Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut.

DFO. 2013. Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/017. Available at: [348881.pdf \(dfo-mpo.gc.ca\)](#)



Topic: Vegetation: Vegetation, merchantable timber, use by communities (DAR sections 18.2.2.2, 18.4.3.3)

Preamble from the Mackenzie Valley Environmental Impact Review Board (Review Board):

Section 18.2.2.2 states that merchantable timber is expected to be around 65% of the total timber volume. Table 11.23 presents recommended mitigations from Indigenous Governments and organizations. The recommendation is that people want to use any cleared wood or timber and create employment opportunities related to wood harvesting.

The developer states, "In locations where sufficient quantities of merchantable timber are present, the trees will be limbed and decked in a dry area and made available to a receiver." However, "If after five years post-harvest the trees have not been removed, they will be burned, chipped, or disposed of by another authorized method".

In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.

Request from the Review Board:

Please describe any options the developer has considered for the community to benefit from wood clearing, including the use of the wood, jobs clearing and harvesting wood.



Response from the Government of the Northwest Territories:

The Government of Northwest Territories (GNWT) has proposed to limb and deck merchantable timber (>14 centimetres [cm] diameter at breast height) cut for the Project and make it available to anyone holding a timber cutting permit, or a timber cutting licence from the GNWT. A timber cutting permit would allow harvest (in this case collection) of up to 5,000 cubic metres (m³) of cut timber, for up to one year. A timber cutting licence would allow harvest of more than 5,000 m³, for up to five years. There is no restriction on who may apply for a permit or licence. Non-merchantable trees are proposed to be limbed and stacked for community salvage, where possible. The GNWT's proposed approach to timber collection and salvage provides opportunities for local communities to benefit from wood clearing. Clearing will be part of the scope of the GNWT's contracted services for the Project.

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The following departments have been specifically involved in the drafting, review and approval of this response:

- Department of Infrastructure
- Department of Environment and Climate Change



Topic: Vegetation: Vegetation, Invasive species - lessons learned from Inuvik-Tuktoyaktuk highway and the Tłı̄ch̄o highway, and effectiveness of mitigation (DAR Section 18.4, table 18.8 on p18-29; Vol 1, section 18.4.2.2)

Preamble from the Mackenzie Valley Environmental Impact Review Board (Review Board):

The Review Board acknowledges GNWT's response to LKFN#12 on the subject of invasive plant species management, including mitigation techniques. The GNWT has recent experience with invasive species management on both the Inuvik-Tuktoyaktuk Highway and the Tłı̄ch̄o Highway. It would be helpful to understand what was learned and if it can be applied to the Mackenzie Valley Highway project.

In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.

Request from the Review Board:

- A. Please describe past experiences with invasive species migration and mitigation along the Inuvik-Tuktoyaktuk Highway and Tłı̄ch̄o Highway after construction.
 - Were predictions in the EA of invasive species spread accurate?
 - Was the implementation of mitigation successful? What worked and what did not?
- B. Please describe any lessons learned on mitigating invasive species migration on those new highways and how these could be applied to the Mackenzie Valley Highway to minimize the migration and impact of invasive species.



Response from the Government of the Northwest Territories:

- A. The Government of Northwest Territories (GNWT) conducts a survey of alien plant species on NWT highways every 10 years. The last survey was completed in 2016 (Oldham et al., 2016). The Inuvik to Tuktoyaktuk Highway, which was in construction at that time, was included in the survey. No alien plants were detected along the route. The next NWT highways survey is scheduled to be completed in 2026 and will include the Inuvik to Tuktoyaktuk Highway. Golder Associates Ltd. conducted an Exotic and Rare Plant Field Survey along the Tłı̄chų Highway alignment on behalf of GNWT in 2018, prior to construction of the road. Eight exotic species were documented at 27 locations concentrated along the southern section of the Tłı̄chų Highway alignment. A copy of the report from the 2018 survey will be provided with the forthcoming comprehensive WMMP report for the construction phase of the Tłı̄chų Highway. Vegetation surveys were also conducted by the Tłı̄chų Government along the Tłı̄chų Highway in 2021 and 2022, though the purpose of these surveys was to detect changes in habitat, not distribution of alien plants. These survey results have not been reported publicly.

The 2016 survey report shows that non-native invasive plants are present along NWT highways, indicating that preventative measures are not entirely effective at preventing the introduction and spread of non-native invasive species; however, mowing has been found to be effective at limiting non-native invasive plant abundance, growth, and reproduction (see the GNWT's response to ORS LKFN-22 follow-up). Additionally, mowing is a well-established control method for non-native invasive species along highway embankments throughout Canada (Government of British Columbia 2010; Government of Saskatchewan n.d.). Mowing is also the standard practice for non-native invasive species control, woody vegetation control, and maintenance of line-of-sight for highways in the NWT (GNWT 2010, NWT Council on Invasive Species, Pests, and Pathogens 2022 a & b). As such, proposed Project non-native invasive species control measures (i.e., mowing) are in alignment with accepted standards for NWT and throughout Canada and are acceptable and effective methods. Mowing has been found to be effective at limiting non-native invasive plant abundance, growth, and reproduction, including for several non-native invasive plants observed along the Mackenzie Valley Winter Road (Najda et al. 1982; Woo et al. 1991; Cole et al. 2007; Basky 2016; Bajwa et al. 2019). The GNWT generally does not endorse the application of herbicides.

- B. Please refer to the answer in part A.

The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories' Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.

The following departments have been specifically involved in the drafting, review and approval of this response:

- Department of Infrastructure
- Department of Environment and Climate Change



References

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MVEIRB - 78

Topic: Accidents and malfunctions: Communication (DAR Chapter 25)

Preamble from the Mackenzie Valley Environmental Impact Review Board (Review Board):

“Residents have expressed concern about emergency responses services and access to those services on the highway due to limited cell phone coverage (p25-4). Some suggested mitigation included satellite phones or cell phone infrastructure along the project corridor (P.9-174).

Łíídlı́ Kúé First Nation asked about emergency responses during the operation phase on the ORS (LKFN 25), to which the developer responded that those concerns would be addressed in the Road Safety Plan and the Safety and Security Plan for Vulnerable Community Members. These plans are to be “developed and implemented in collaboration with communities through a Road Safety and Security Sub-Working Group.” There is some information related to these plans in Chapter 9 (p.9-286-287), but details of these plans are not yet available.

Likewise, there is no information regarding the emergency response procedures and protocols for communications that should be in place to provide a timely and effective response to fires, as mentioned in Section 25.8.2, p. 25-7.

Additionally, the DAR does not provide the Traffic Management Plan’s framework.

In responding to this IR, the Review Board requires analysis from MACA and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer’s response.”

Request from the Review Board:

“A. Please provide extra information on the Road Safety Plan, the Safety and Security Plan for Vulnerable Community Members, and the Traffic Management Plans, including more details such as an outline or summary of components.

B. Please describe any access to and communication with emergency response services on the highway during operations. Confirm whether 'new' cell coverage is considered part of emergency response. Mention whether there will be regular emergency shelters pull outs and outhouses along the highway. Include how emergency responses during fires will be addressed in the Road Safety Plan.

C. When will the full versions of these plans will be available in draft and final form, in relation to the start of construction and operations?”



Response from the Government of the Northwest Territories:

Part A.

As detailed in Section 9.16.2 of the DAR, the GNWT is committed to a community-driven and adaptive approach for the Community Readiness Strategy and all its associated plans, including the Road Safety, Safety and Security for Vulnerable Community Members, and Traffic Management Plans. Specific information regarding these plans cannot be provided prior to collaborating with the communities to develop and implement the Sub-Working Groups and discuss the approach to the plans. The Departments of Health and Social Services and Infrastructure have indicated that they will provide examples of other safety plans, such as the NWT Road Safety Plan (2015), and other relevant documents, to support the development of tailored plans for communities. However, the Sub-Working Groups will ultimately determine the details and final form of the plans.

Part B

The GNWT departments of Health and Social Services, Justice, Executive and Indigenous Affairs, Municipal and Community Affairs, and Infrastructure (INF) have committed to be part of the Road Safety and Security Sub-Working Group (as outlined in Section 9.16.2) and will work with communities in determining the appropriate public education and awareness strategies, community emergency preparedness and response plans (based on available services), and other highway safety measures, including infrastructure controls along the highway to mitigate road accidents. As outlined in Section 9.8.3 of the DAR, emergency service response protocols are at the discretion of community governments and are typically based on assessed capacity and risk levels with expanding and/or extending services. Should the community governments decide to extend their emergency services beyond municipal boundaries, planning and coordination by both the GNWT and the community governments will be important at that time. The results of any such discussions would be reflected in the Road Safety Plan and other plans if and as appropriate.

The GNWT does not intend to provide new cellular coverage as part of the Mackenzie Valley Highway (MVH) project. Presently, there is limited or no cellular coverage on all operating NWT highways. INF currently provides guidance to the public traveling on NWT highways through its webpage on driving safety¹. This includes taking extra precautions to have a travel plan and travel with emergency supplies due to the remote nature of most NWT roads. Tools such as the newly launched 'DriveNWT'² provides road users with real-time information 24 hours a day on NWT highway conditions and can aid travel planning.

Guidance provided for traveling on winter roads includes carrying a two-way radio/satellite phone for access to radio communications. This guidance would apply to any new roads added to the winter road system and can be applied to most of the NWT road system.

The highway design proposes roadside pullouts to be provided at approximate half (1/2) hour

¹ See <https://www.inf.gov.nt.ca/en/services/highways-ferries-and-winter-roads/winter-driving#:~:text=Adjust%20your%20driving%20and%20speed,or%20direction%20when%20approaching%20them.&text=Share%20the%20road%20cautiously%20with,blow%20snow%20onto%20your%20windshield.>

² See <https://drivenwt.ca/>



intervals per the GNWT-INF standard drawings (see DAR Section 5.2). Exact locations of pullouts will be determined during detailed design and will be informed with inputs from community engagement. Structures are not part of highway design, and are considered for addition on a case-by-case basis, informed by a needs assessment.

Part C

All working groups and plans developed under the Community Readiness Strategy are intended to be created in collaboration with communities. Collaborative development is essential to ensuring that communities are able to identify their unique needs and support development of responsive and appropriate mitigations. In alignment with the principles of adaptive management and community collaboration, many of the details that will be included in the Community Readiness Strategy and associated plans (i.e. Road Safety Plan, Safety and Security Plan for Vulnerable Community Members, Contractor Training and Employment Plan, Social Monitoring Plan, Well-Being Adaptive Management Plan) have not yet been determined.

The GNWT has carried out engagement on the proposed mitigations and remains open to working with communities as the project advances to refine them, if needed. The proposed mitigations may complement the GNWT's existing programs and services to prepare communities to participate in economic benefits associated with the project. As required, adaptive management responses will be developed collaboratively with communities.

The response to this Information Request has been prepared in accordance with the GNWT's Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.

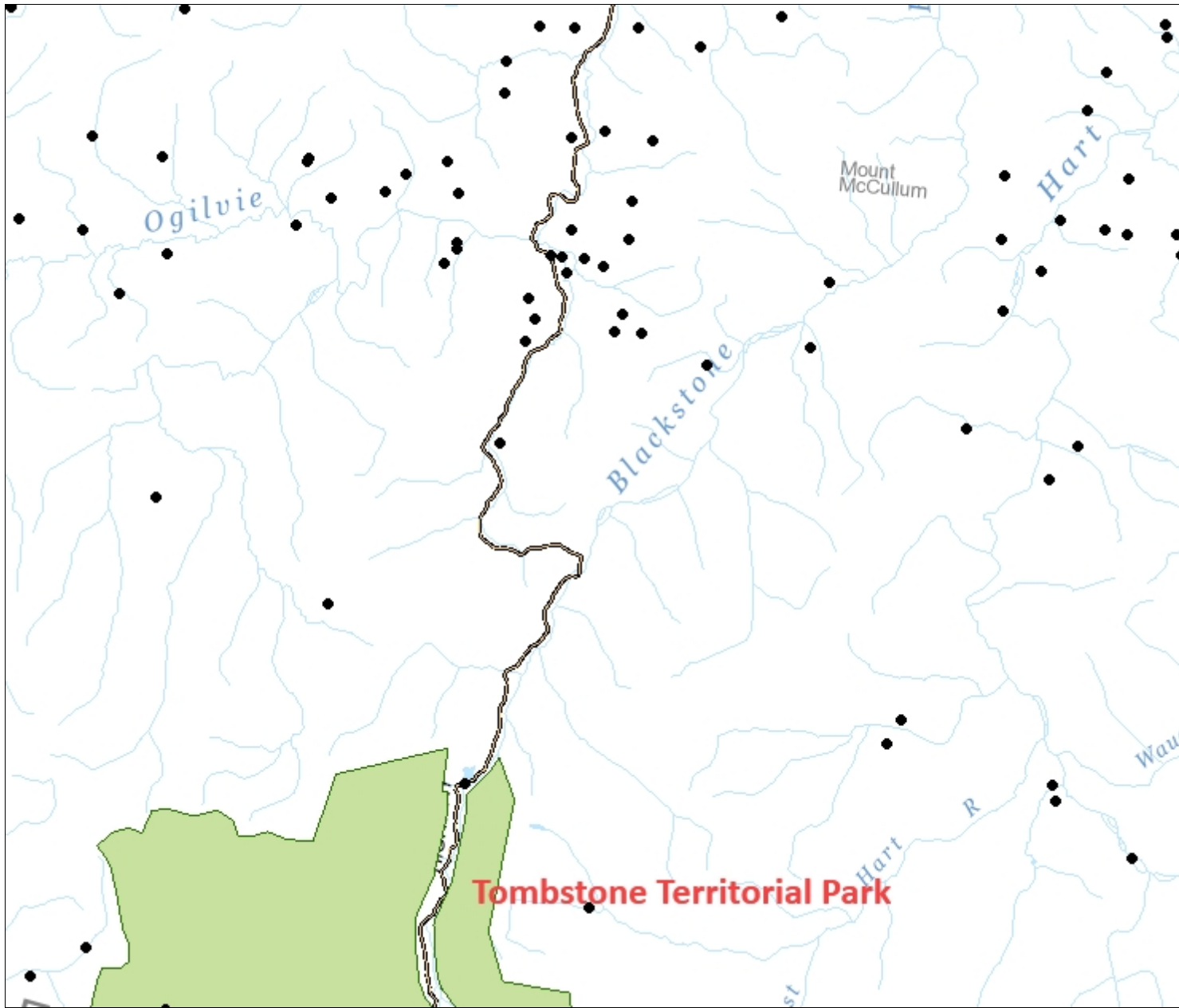
The following departments have been specifically involved in the drafting, review and approval of this response:

- The Department of Infrastructure
- The Department of Industry, Tourism and Investment
- The Department of Health and Social Services
- The Department of Justice
- The Department of Municipal and Community Affairs

References

Government of Northwest Territories. (2015). *NWT Road Safety Plan*.
https://www.inf.gov.nt.ca/sites/inf/files/resources/nwt_road_safety_plan_final.pdf

Figure 79-5: Wildfire Ignition Points Dempster Highway (North of Tombstone)



Legend

- Fire Ignition Locations
- Park and Protected Areas

Notes

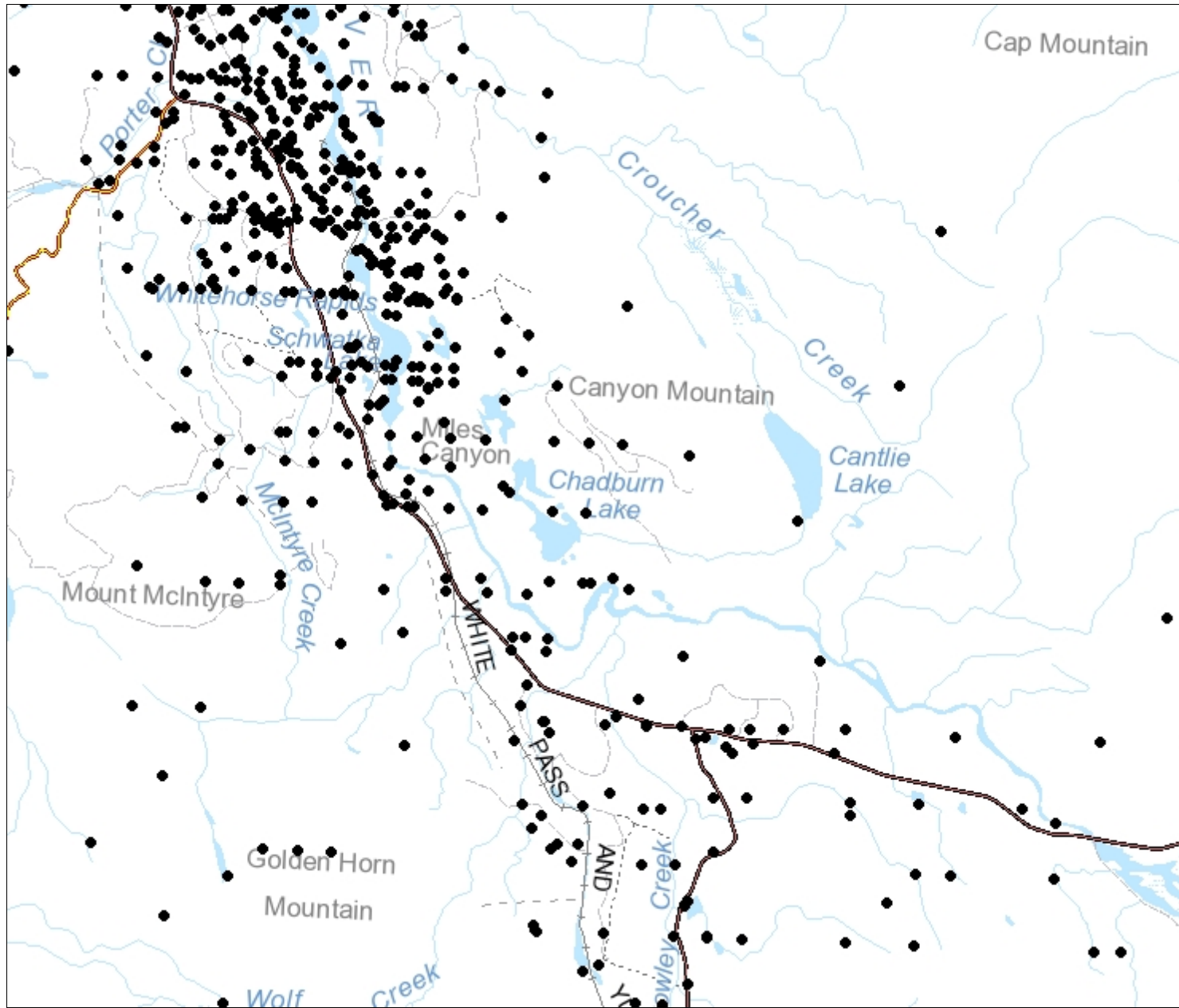
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Projection: Yukon Albers Equal Area Conic
Produced from: GeoYukon application

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Date Printed: 23-Aug-2024

Figure 79-1: Wildfire Ignition Points Alaska Highway (Dense Population)



Legend

- Fire Ignition Locations

Notes

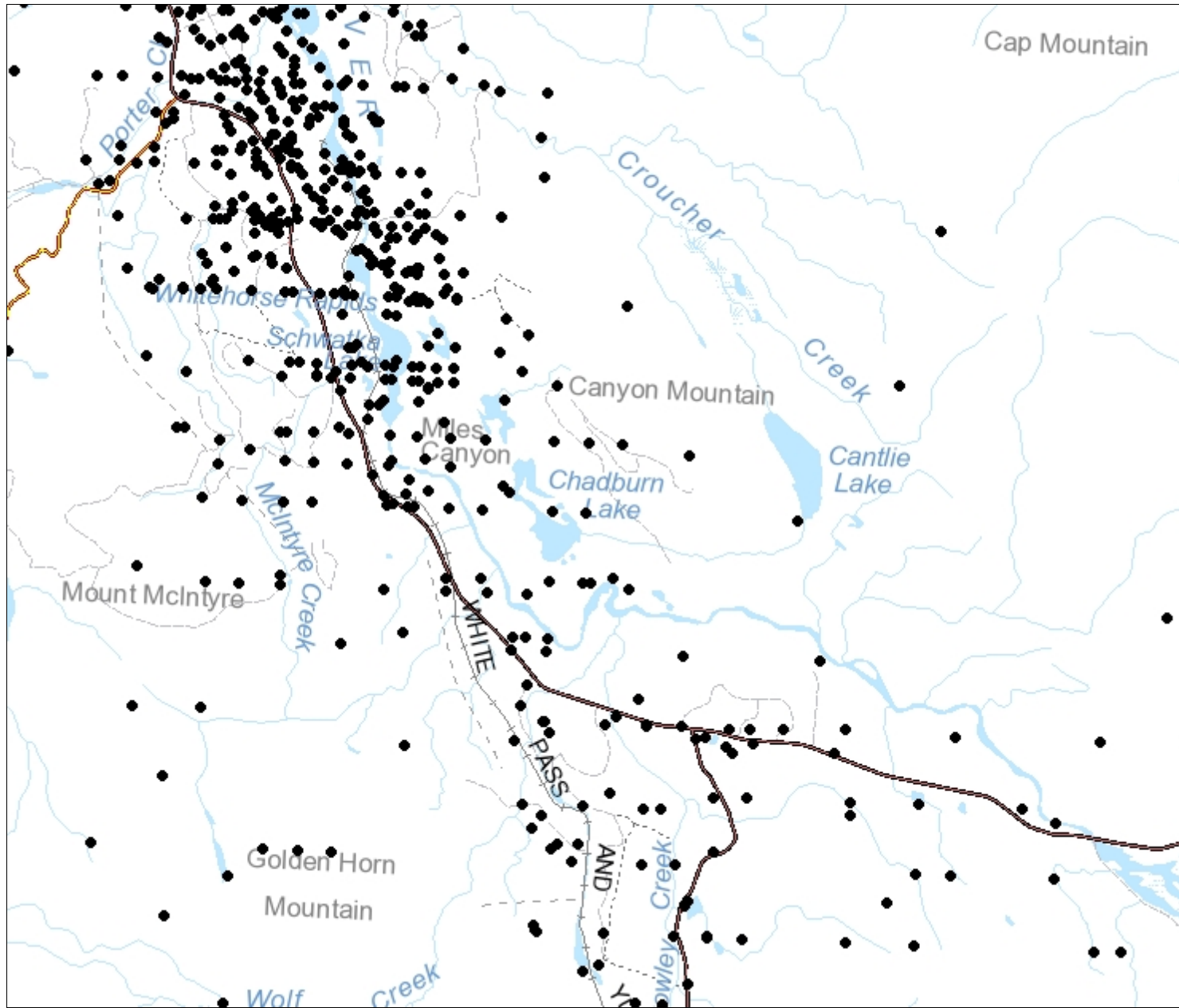
8.1 0 4.06 8.1 Kilometers

Projection: Yukon Albers Equal Area Conic
Produced from: GeoYukon application

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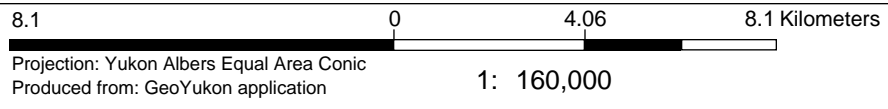
Figure 79-1: Wildfire Ignition Points Alaska Highway (Dense Population)



Legend

- Fire Ignition Locations

Notes



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Date Printed: 23-Aug-2024



Topic: Accidents and malfunctions: Fire ignition along roads (DAR Chapter 25)

Preamble from the Mackenzie Valley Environmental Impact Review Board (Review Board):

In study of sources of fire ignition in the US titled “Location, Timing and Extent of Wildfire Vary by Cause of Ignition”, authors Syphard and Keeley found that fires are more likely to start along roadways, stating “[t]he effect of roads on ignition probabilities for arson- and vehicle-caused fires is apparent through the linear features crossing the landscape”. The same study noted that equipment-caused fires are also more common close to roads.

The Review Board notes GNWT’s response to LKFN #7 re: increased probability of human caused wildfires. The Review Board notes that the proponent’s analysis excluded the southern parts of the Dempster Highway. The Review Board does not agree with the rationale for this exclusion.

In responding to this IR, the Review Board requires analysis from ECC, MACA, and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer’s response.

Reference: Syphard, A. and Keeley, J. 2015. Location, timing and extent of wildfire vary by cause of ignition. International Journal of Wildland Fire. <http://dx.doi.org/10.1071/WF14024>

Request from the Review Board:

- A. Please describe how the frequency of wildfire ignition may be affected by the highway construction, operation and increased access, and describe how this affects other related impact predictions and mitigations for other VCs.
- B. Please update the analysis of your response to LKFN #7 to include the southern portions of the Dempster Highway to give a complete picture of human caused fire frequency for the entire Dempster Highway.



Response from the Government of the Northwest Territories:

A. Wildfire Frequency

The GNWT's response to ORS LKFN-7 indicated that the Mackenzie Valley Highway (MVH) was not likely to increase wildfire fire frequency in the area it traverses. This conclusion was based on a comparison to a similar highway in a similarly remote area (i.e., the Dempster Highway in the Yukon). The request appears to seek clarification of this conclusion by asking the GNWT to describe how the MVH may affect fire frequency based a study in southern California. The GNWT has provided additional information to confirm that the comparing the MVH to the Dempster Highway was the correct approach.

The analysis presented in this response is based on data from Yukon where environmental conditions are roughly comparable to those in the Mackenzie Valley, where detailed fire ignition information is available since the 1960s. The MVH will be a remote road with few permanent settlements along its route and minimal human activity outside those locations. The Dempster Highway's characteristics are similar, especially north of Tombstone Territorial Park. Furthermore, some (though limited) traffic data is available to compare the traffic volume on the Dempster Highway to that anticipated on the MVH. Together, these data are appropriate to draw the conclusions provided in the GNWT's response to ORS LKFN-7.

Other highways, such as the Alaska Highway, exhibit more extensive development (and traffic) along some sections, while others remain relatively remote. Comparing different sections of the Alaska Highway allows us to separate effects of the highway from effects of land use along the highway. The analysis below compares sections of the Alaska Highway with different population density and land use intensity. It shows that fire frequency near the highway is related to population density and intensity of use, and that there is a close association between population density, land use intensity, and fire ignition. Based on this information, it appears that changes to fire frequency are more likely a result of intensifying land use rather than the presence of a highway by itself.

Figure 79-1 shows a stretch of the Alaska Highway covering portions of the City of Whitehorse (population 34,500), outside the central business district, as well as an area just outside city boundaries to the south of Whitehorse. This stretch of highway is characterized by relatively dense residential, agricultural, and industrial use with the density increasing closer to Whitehorse. Figure 79-2 shows a stretch north of Whitehorse that is characterized by less dense residential and agricultural use and no industrial use, which can be defined as medium density. Figure 79-3 shows a remote stretch between Watson Lake (population 1,100) and Whitehorse with few permanent residences and no industrial use, defined as sparse population for this analysis.

The density of ignition points increases with the density of permanent residences and intensity of land use. In areas of higher population density, the frequency of fires increases substantially. The number of lightning caused fires is unlikely to increase significantly in response to higher population density. The increase in density of ignition points seen closer to Whitehorse and Watson Lake is due to an increasing number of human-caused fires. The MVH is not anticipated to directly increase population density. As the example of the Dempster Highway demonstrates, the presence of a remote road does not necessarily result in induced development.



The MVH and Dempster Highway North of Tombstone can also be compared based on traffic volume. Annual average daily traffic (AADT) for the MVH is anticipated to be less than 50 vehicles per day, as discussed in the GNWT's responses to ORS ADKFN-1 and MVEIRB IR#51. Based on available traffic counts conducted between 2007 and 2011, the Dempster has similar or more traffic than the MVH (Yukon Highways and Public Works 2011):

- AADT at Dempster Corner is 108 (2011)
- AADT at Klondike Maintenance Camp is 70 (2010)
- ADT at Peel River Crossing is 101 (2007)
- AADT on the NWT side of the highway south of Fort McPherson is 70 (2011)

Therefore, it can be inferred that the fire ignition sources data from Yukon can appropriately be applied for a similarly uninhabited portion of the highway with less traffic volume.

While questioning the GNWT's earlier conclusion that the MVH is not likely to cause an increase in fire frequency, the IR79 request did not present evidence refuting over 20 years of experience with a similar road in a similar environment, which did not lead to increased fire frequency. Along the Dempster Highway lightning remains the dominant wildfire ignition cause, and it will likely remain the dominant ignition cause along the MVH. Extensive human settlement has not occurred along most NWT highways, and is not likely to occur along the MVH away from existing communities.

Wildfire ignition due to construction is possible, but has not occurred on any GNWT construction project to date. The MVH Contractor(s) will be required to have fire prevention and fire response measures in place as part of an Emergency Response Plan. Volume 5 of the DAR includes an Emergency Response Plan Framework. Specific to fire prevention and response, the GNWT requires that all contractors working on highways have fire prevention practices in place for all activities and areas where fuel may be present, including:

- Informing all workers of fire conditions during daily briefings prior to the start of work.
- Identification of fire hazards, and controls as part of daily safe work plans.
- All vehicles to include fire extinguishers.
- Fire equipment is required to be kept at all camps and is to be used exclusively for fire control.
- All rooms in camps are to be equipped with smoke detectors, and an adequate number of fire extinguishers must be present.
- Refueling is to be conducted in designated areas; fuel hoses to be equipped with emergency shut-offs
- Follow measures to prevent and respond to spills in Spill Contingency Plan
- Vehicles are parked in designated areas that have been cleared of vegetation; vehicles and equipment do not travel through non-designated areas (to avoid hot exhaust near vegetation)



- Camp incinerators are to be located away from combustible materials and stacks are to be equipped with screens
- Teams will inspect the work site and surrounding areas daily for fire hazards and report concerns to Supervisor for further preventative action.

Syphard and Keeley (2015) does not appear to be applicable to the MVH and was not considered further. Key elements that are not applicable include:

- The research was limited to two southern California sub-regions with environmental conditions that are not comparable to the Mackenzie Valley.
- In the study area more than 95% of fires were human caused, compared to remote parts of northern Canada where only a small fraction of fires are human caused, as the Yukon data along the Dempster indicates.
- The top three causes of fires in the southern California study were powerlines, power equipment, and arson. In contrast, the MVH traverses areas where lightning is and very likely will be the dominant cause of wildfires. Powerlines and power equipment are not present along most of the MVH. While arson cannot be entirely discounted, it is unlikely to become a major source of fire ignition in remote areas.

B. Southern Dempster Fire Frequency

The southernmost portion of the Dempster Highway was excluded from the analysis in the GNWT's response to ORS LKFN-7 referenced in Part A above. IR79-B asks the GNWT to include this portion to create a more complete understanding of fire frequency along the Dempster. This section explores whether including the southernmost portion of the Dempster is warranted to meet that objective. As outlined below, the evidence suggests that the MVH's characteristics are similar to the Dempster Highway north of the Tombstone Territorial Park more so than south of the park.

Figures 79-4 and 79-5 show ignition points along the Dempster Highway south of Tombstone Territorial Park and north of it, respectively. The most southern portion of the Dempster shows higher fire frequency within 10 km of the road than any portion of the Dempster north of the park. It is possible that the higher frequency is associated with use of or land use along the Dempster Highway. It is also possible, and perhaps more likely, that the higher frequency is associated with the use of the North Klondike Highway (AADT at junction with Dempster Highway was 223 [2010]), as well as mining activities as Figure 79-6 suggests. There are no mining activities close to the highway north of Tombstone.

In conclusion, the southernmost portion of the Dempster is not representative of the Dempster Highway as a whole regarding fire ignition. The MVH will be a remote road more comparable to the Dempster north of Tombstone Park. Excluding the southernmost section of the Dempster from analysis was therefore appropriate and as such the GNWT reasserts its current approach and conclusions.

The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories' Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the



drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.

The following departments have been specifically involved in the drafting, review and approval of this response:

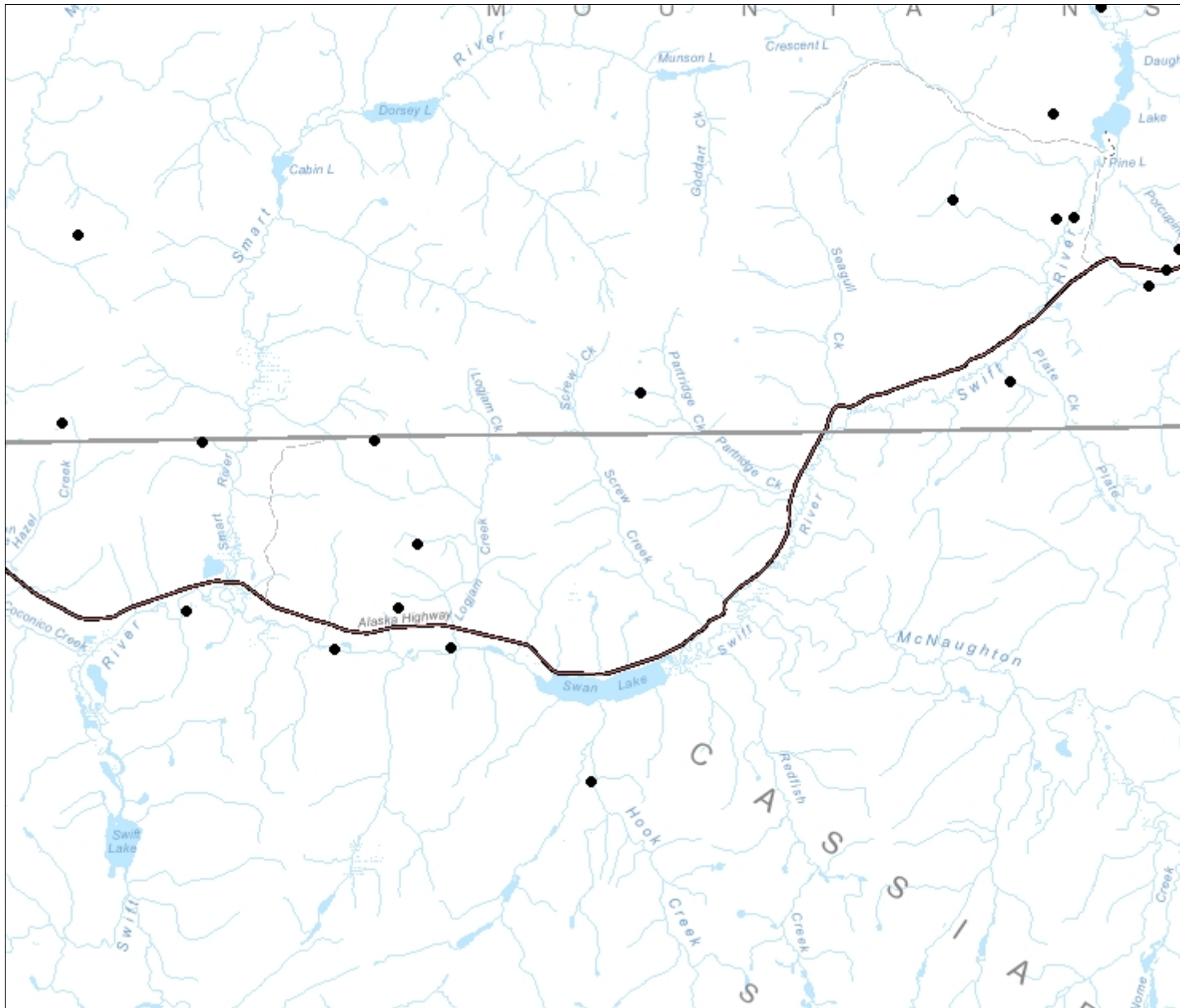
- Department of Infrastructure
- Department of Environment and Climate Change
- Department of Municipal and Community Affairs



References

Yukon Highways and Public Works. 2011. Yukon Traffic Count Summary. Whitehorse, Yukon.
Available at: <https://emrlibrary.gov.yk.ca/hpw/yukon-traffic-count-2011.pdf>

Figure 79-3: Wildfire Ignition Points Alaska Highway (Sparse Population)



Legend

- Fire Ignition Locations

Notes

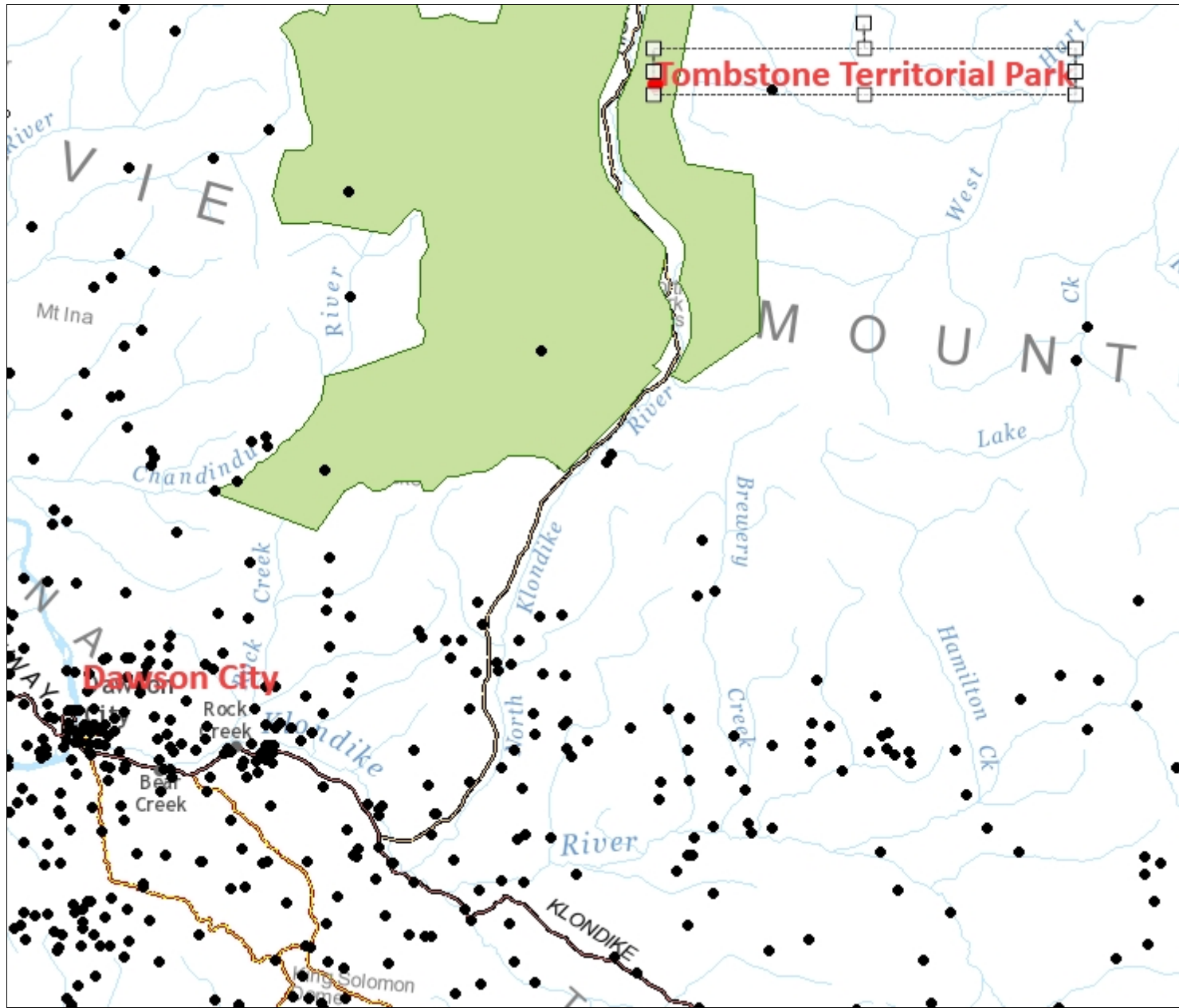
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Projection: Yukon Albers Equal Area Conic
Produced from: GeoYukon application

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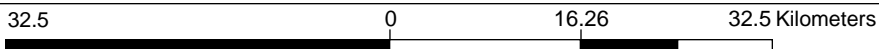
Figure 79-4: Wildfire Ignition Points Dempster Highway (South of Tombstone)



Legend

- Fire Ignition Locations
- Park and Protected Areas

Notes



Projection: Yukon Albers Equal Area Conic
Produced from: GeoYukon application

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MVEIRB-80

Review Board Preamble:

Many of the concerns from community members regarding social impacts of the MVH are similar to the impacts that were predicted and experienced from TASR. In particular, people are very concerned about drugs and alcohol in their communities.

In responding to this IR, the Review Board requires analysis from the RCMP and any other relevant expert departments or agencies. Please engage with the federal government in responding to this question. Please make it clear what information was provided by each group and how that information was used in the developer's response.

Review Board Request:

Please provide any lessons learned for the Review Board to consider, based on its experience with the construction and operation of the Tłı̄chǫ Highway and the resulting social and policing issues in Whatì or elsewhere?

Response from the Government of the Northwest Territories

In response to the request from the Review Board, the RCMP provided the following response:

“The Whatì Detachment did indeed see a drastic increase in calls for service which correlates with the timing of the TASR [Tłı̄chǫ Highway] opening. Further analysis would be needed to determine what was the impact of the road opening, vs other factors that could have contributed to this increase. Given the increase in workload, the RCMP conducted an exercise known as the General Duty Police Resourcing Model Review (GDPRM) which is an in-depth exercise to determine the policing needs of the community based on a myriad of factors including call volume, type of calls, distance traveled to calls, amount of time available to the members to do proactive work etc. The GDPRM recommended an increase to the detachment surplus. Working with the contract partner and GoC, two FNIPP [First Nations and Inuit Policing Program] positions were very recently assigned to Whatì Detachment and are in the process of being staffed.”

The GNWT would also note that the Tłı̄chǫ Highway was constructed between September 2019 to October 2021 and officially opened in November 2021. During that time, the NWT experienced the global COVID-19 pandemic, which impacted the territory in several ways. These include:

- Reported measures of mental wellness were reported to have declined throughout the pandemic and measures of mental wellness began to recover slightly in 2022.
- Alcohol consumption increased during the pandemic across the NWT and Canada; alcohol use and abuse is associated with chronic health problems, injuries, violence, lost productivity, criminal justice issues, family problems and premature death.
- Closure and/or reduction in access to programs and services due to pandemic related isolation requirements.

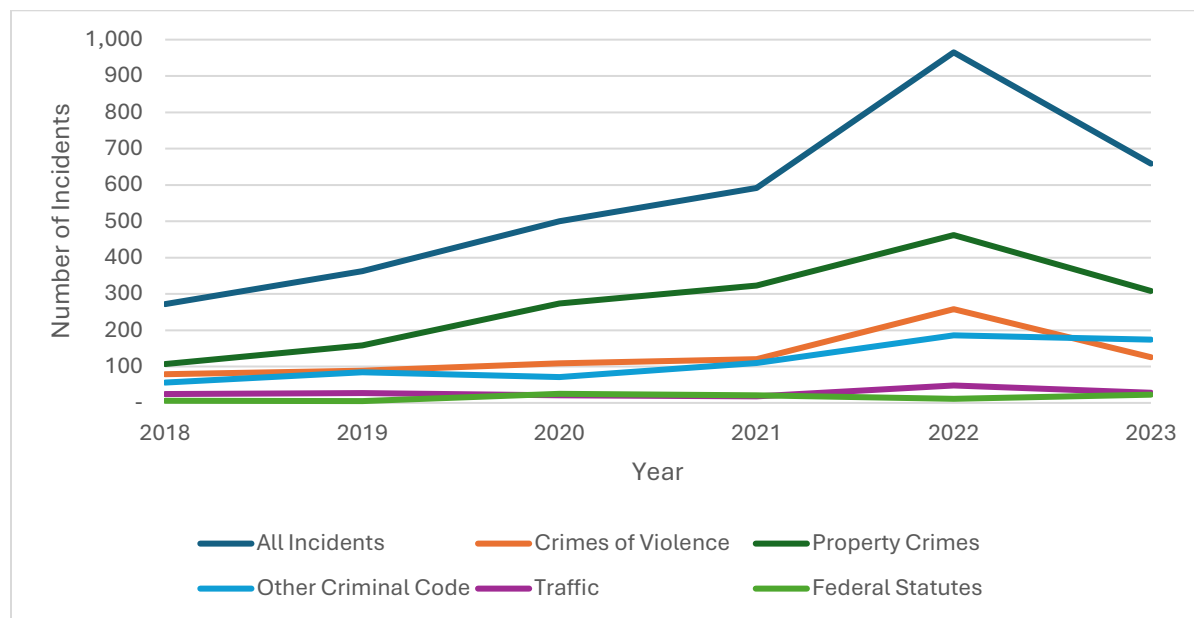


- Canada Emergency Response Benefit payments were widely available across the territory, increasing available spending money.

The volume of calls for service increased in Whatì in 2022 and were generally trending upward before then. The increasing calls for service trend continued in 2023. Calls for service in Whatì rose from 816 in 2020 to 928 in 2021, 1224 in 2022, and 1741 in 2023.

However, 2023 data indicate that crimes in Whatì did not increase alongside calls for service. Actual property crime incidents rose from 274 in 2020, to 323 in 2021, to 462 in 2022. Property crime incidents then declined to 308 in 2023. Actual violent crime incidents rose from 109 in 2020, to 120 in 2021, and to 258 in 2022, before declining back to 126 in 2023.

It is too soon to speak confidently about trends in the data. There are general limitations with data as well, including the fact that it is not controlled for population change, and only reflects reported incidents.



Source: Statistics Canada, Uniform Crime Reporting Survey

Notes: Incidents are subject to revision; incidents in a particular detachment may include incidents from surrounding communities.

Based on observations from the work around the Tłı̨ch̨o Highway, through the Tłı̨ch̨o Highway Corridor Working Group, and the Tłı̨ch̨o Highway Socio-Economic Working group, the GNWT will take a similar approach to mitigate potential impacts of the Mackenzie Valley Highway Project. As discussed in Section 9.16 of the Developer’s Assessment Report (DAR), a Community Readiness Strategy will be developed to mitigate the potential adverse socio-economic effects of the Project on the LAA and RAA communities and enhance the potential positive effects. The Community Readiness Strategy will be developed and overseen by the Mackenzie Valley Highway Corridor Working Group (MVHCWG). The foundation of the mitigation approach for the Project is community readiness and preparedness, continued engagement, and collaboration.



The Community Readiness Strategy will leverage and augment existing programs and services available across the GNWT to mitigate potential adverse effects/enhance positive effects of the Project. A Social Monitoring and Adaptive Management Sub-Working Group reporting to the MVHCWG will be established. This Group will develop and implement a Social Monitoring Plan and a Well-Being Adaptive Management Plan. The Social Monitoring and Adaptive Management Sub-Working Group will be responsible for annually monitoring changes in community well-being indicators related to project activities and/or effects and responding with appropriate adaptive management measures.

This adaptive management approach focused on leveraging and augmenting existing services and programs is consistent with the approach taken by GNWT for similar projects. For example, the adaptive management approach taken for the Tłı̨chǫ Highway focused on implementing initiatives grounded in existing programming and approaches to respond to socio-economic conditions that were identified through collaborative monitoring activities with communities and standard monitoring activities that are undertaken by the Department of Health and Social Services (HSS).

It should be noted that there are limitations and caveats on drawing direct lessons learned between the Tłı̨chǫ Highway and the proposed Project. These limitations and caveats are documented in the response to IR 3 previously submitted to the MVEIRB and include:

- Social and well-being impacts in communities associated with the Tłı̨chǫ Highway are not experienced in isolation and are affected by the confounding influence of the COVID-19 pandemic and long-term effects of the 2023 wildfire season; and,
- There are fundamental differences between the two projects from an environmental perspective that limit direct comparisons.

Further, despite any potential benefits from drawing on lessons learned from the Tłı̨chǫ Highway, mitigations must be identified and tailored to the needs of communities affected by the Project. Through the Community Readiness Strategy and its associated Working Groups/Sub-Working Groups and plans, mitigations will be developed, implemented, and monitored collaboratively with affected communities to ensure that plans and measures are responsive to the local needs of communities.

The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories' Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.

The following departments have been specifically involved in the drafting, review and approval of this response: Health and Social Services, Justice, and Infrastructure. Information provided by the RCMP was incorporated into the response.



MVEIRB-80

Review Board Preamble:

Many of the concerns from community members regarding social impacts of the MVH are similar to the impacts that were predicted and experienced from TASR. In particular, people are very concerned about drugs and alcohol in their communities.

In responding to this IR, the Review Board requires analysis from the RCMP and any other relevant expert departments or agencies. Please engage with the federal government in responding to this question. Please make it clear what information was provided by each group and how that information was used in the developer's response.

Review Board Request:

Please provide any lessons learned for the Review Board to consider, based on its experience with the construction and operation of the Tłı̄chǫ Highway and the resulting social and policing issues in Whatì or elsewhere?

Response from the Government of the Northwest Territories

In response to the request from the Review Board, the RCMP provided the following response:

“The Whatì Detachment did indeed see a drastic increase in calls for service which correlates with the timing of the TASR [Tłı̄chǫ Highway] opening. Further analysis would be needed to determine what was the impact of the road opening, vs other factors that could have contributed to this increase. Given the increase in workload, the RCMP conducted an exercise known as the General Duty Police Resourcing Model Review (GDPRM) which is an in-depth exercise to determine the policing needs of the community based on a myriad of factors including call volume, type of calls, distance traveled to calls, amount of time available to the members to do proactive work etc. The GDPRM recommended an increase to the detachment surplus. Working with the contract partner and GoC, two FNIPP [First Nations and Inuit Policing Program] positions were very recently assigned to Whatì Detachment and are in the process of being staffed.”

The GNWT would also note that the Tłı̄chǫ Highway was constructed between September 2019 to October 2021 and officially opened in November 2021. During that time, the NWT experienced the global COVID-19 pandemic, which impacted the territory in several ways. These include:

- Reported measures of mental wellness were reported to have declined throughout the pandemic and measures of mental wellness began to recover slightly in 2022.
- Alcohol consumption increased during the pandemic across the NWT and Canada; alcohol use and abuse is associated with chronic health problems, injuries, violence, lost productivity, criminal justice issues, family problems and premature death.
- Closure and/or reduction in access to programs and services due to pandemic related isolation requirements.

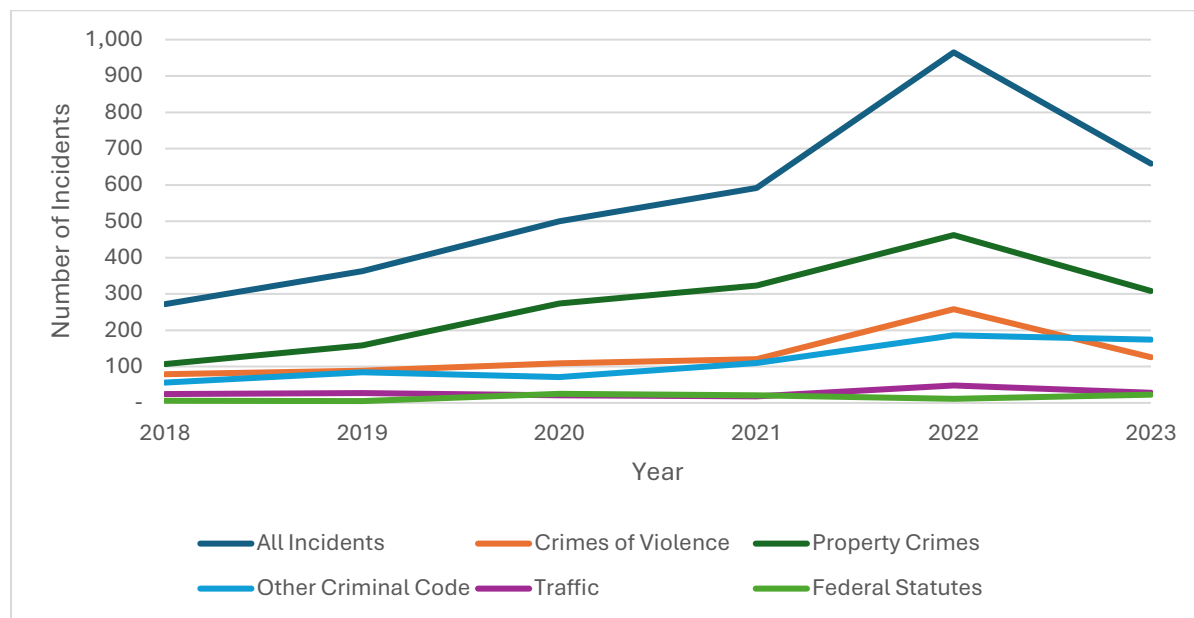


- Canada Emergency Response Benefit payments were widely available across the territory, increasing available spending money.

The volume of calls for service increased in Whatì in 2022 and were generally trending upward before then. The increasing calls for service trend continued in 2023. Calls for service in Whatì rose from 816 in 2020 to 928 in 2021, 1224 in 2022, and 1741 in 2023.

However, 2023 data indicate that crimes in Whatì did not increase alongside calls for service. Actual property crime incidents rose from 274 in 2020, to 323 in 2021, to 462 in 2022. Property crime incidents then declined to 308 in 2023. Actual violent crime incidents rose from 109 in 2020, to 120 in 2021, and to 258 in 2022, before declining back to 126 in 2023.

It is too soon to speak confidently about trends in the data. There are general limitations with data as well, including the fact that it is not controlled for population change, and only reflects reported incidents.



Source: Statistics Canada, Uniform Crime Reporting Survey

Notes: Incidents are subject to revision; incidents in a particular detachment may include incidents from surrounding communities.

Based on observations from the work around the Tłı̨ch̨o Highway, through the Tłı̨ch̨o Highway Corridor Working Group, and the Tłı̨ch̨o Highway Socio-Economic Working group, the GNWT will take a similar approach to mitigate potential impacts of the Mackenzie Valley Highway Project. As discussed in Section 9.16 of the Developer’s Assessment Report (DAR), a Community Readiness Strategy will be developed to mitigate the potential adverse socio-economic effects of the Project on the LAA and RAA communities and enhance the potential positive effects. The Community Readiness Strategy will be developed and overseen by the Mackenzie Valley Highway Corridor Working Group (MVHCWG). The foundation of the mitigation approach for the Project is community readiness and preparedness, continued engagement, and collaboration.



The Community Readiness Strategy will leverage and augment existing programs and services available across the GNWT to mitigate potential adverse effects/enhance positive effects of the Project. A Social Monitoring and Adaptive Management Sub-Working Group reporting to the MVHCWG will be established. This Group will develop and implement a Social Monitoring Plan and a Well-Being Adaptive Management Plan. The Social Monitoring and Adaptive Management Sub-Working Group will be responsible for annually monitoring changes in community well-being indicators related to project activities and/or effects and responding with appropriate adaptive management measures.

This adaptive management approach focused on leveraging and augmenting existing services and programs is consistent with the approach taken by GNWT for similar projects. For example, the adaptive management approach taken for the Tłı̨chǫ Highway focused on implementing initiatives grounded in existing programming and approaches to respond to socio-economic conditions that were identified through collaborative monitoring activities with communities and standard monitoring activities that are undertaken by the Department of Health and Social Services (HSS).

It should be noted that there are limitations and caveats on drawing direct lessons learned between the Tłı̨chǫ Highway and the proposed Project. These limitations and caveats are documented in the response to IR 3 previously submitted to the MVEIRB and include:

- Social and well-being impacts in communities associated with the Tłı̨chǫ Highway are not experienced in isolation and are affected by the confounding influence of the COVID-19 pandemic and long-term effects of the 2023 wildfire season; and,
- There are fundamental differences between the two projects from an environmental perspective that limit direct comparisons.

Further, despite any potential benefits from drawing on lessons learned from the Tłı̨chǫ Highway, mitigations must be identified and tailored to the needs of communities affected by the Project. Through the Community Readiness Strategy and its associated Working Groups/Sub-Working Groups and plans, mitigations will be developed, implemented, and monitored collaboratively with affected communities to ensure that plans and measures are responsive to the local needs of communities.

The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories' Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.

The following departments have been specifically involved in the drafting, review and approval of this response: Health and Social Services, Justice, and Infrastructure. Information provided by the RCMP was incorporated into the response.



MVEIRB-81

Topic: 4-Socio-economic: Use of Parameters (DAR Section 9.3)

Preamble from the Mackenzie Valley Environmental Impact Review Board (Review Board):

“Many of the concerns from community members regarding social impacts of the MVH are similar to the impacts that were predicted and experienced from TASR. In particular, people are very concerned about drugs and alcohol in their communities.

In responding to this IR, the Review Board requires analysis from the RCMP and any other relevant expert departments or agencies. Please engage with the federal government in responding to this question. Please make it clear what information was provided by each group and how that information was used in the developer’s response.”

Request from the Review Board:

“Please provide any lessons learned for the Review Board to consider, based on its experience with the construction and operation of the Tlicho Highway and the resulting social and policing issues in Whati or elsewhere?”



Response from the Government of the Northwest Territories:

The Whatì Detachment experienced a noticeable increase in calls for service correlating with the timing of the Tłıchq Highway opening. Further analysis would be required to determine the impact of the road opening, as opposed to other factors that could have contributed to the increase. The RCMP has advised that no formal reviews have been conducted to evaluate the impact of the Tłıchq Highway opening.

Provinces and territories administer justice in their jurisdictions. The federal government has a limited direct role in this area. Consultations with the federal government were fulfilled solely through engagement with the RCMP. The RCMP is the federal agency contracted to provide policing services in the Northwest Territories under the Territorial Police Service Agreement.

Given the increase in workload, the RCMP conducted an exercise known as the General Duty Police Resourcing Model Review (GDPRM). The GDPRM is an in-depth exercise to determine the policing needs of the community based on a myriad of factors. These factors include call volume, call type, distance travelled to call, amount of time available for members to do proactive work, and more. The GDPRM recommended an increase to the number of Officers assigned to the detachment. In collaboration with the RCMP and Government of Canada, the GNWT has secured two additional Officers for the Whatì detachment using the First Nations and Indigenous Policing Program. These positions are in the process of being staffed.

In general terms, the RCMP note that substance abuse issues, particularly those related to alcohol and drugs, contribute to a rise in violence, including domestic violence, sexual assault, and aggravated assault cases that require police intervention. Addiction impacts the individual, their families, communities, and ultimately the overall social fabric. It is important to understand the complex dynamics at play when addressing these challenges to effectively mitigate their impacts on individuals, families, and communities.

The RCMP engages in a strategic intelligence-led approach to combat criminal activities. However, due to the sensitive nature of investigations, it is not possible to share specific examples to ensure the confidentiality of operations and safety of the Officers involved.

The GNWT notes that there was an increase in the volume of calls for service that coincided with the opening of the road in late 2021. Calls for service in Whatì rose from 816 in 2020 to 928 in 2021, 1224 in 2022, and 1741 in 2023.

Examining actual incidents reported to the Whatì Detachment shows a spike in 2022, the year following the opening. This increase lasted for one year. In 2023, the number of incidents decreased to levels similar to before the road was opened. Actual property crime incidents rose from 274 in 2020, to 323 in 2021, to 462 in 2022. Property crime incidents then declined to 308 in 2023. Actual violent crime incidents rose from 109 in 2020, to 120 in 2021, and to 258 in 2022, before declining back to 126 in 2023.



There are limitations to the interpretation of these statistics. These are not controlled for annual population change and only reflect reported criminal incidents. It remains too early to establish a consistent trend regarding the potential impacts of the Tł̨chq Highway.

There were multiple contributing factors resulting in increased calls for service and criminal incidents between 2020 and 2022. The COVID-19 pandemic and the most significant public health measures occurred throughout this timeframe. Canada Emergency Response Benefit (CERB) payments were also distributed during this time. This coincided with road construction and the commencement of operation. Further, severe forest fires in 2023 caused the evacuation of many communities representing most of the territorial population, in addition to interruptions to essential services.

These observations from the Tł̨chq Highway have contributed to the GNWT commitment to establishing a Mackenzie Valley Highway Corridor Working Group and Road Safety and Security Working Group in place prior to the construction of the highway.

The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories' Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.

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Response from the Government of the Northwest Territories:

The Whatì Detachment experienced a noticeable increase in calls for service correlating with the timing of the Tłı̨chų Highway opening. Further analysis would be required to determine the impact of the road opening, as opposed to other factors that could have contributed to the increase. The RCMP has advised that no formal reviews have been conducted to evaluate the impact of the Tłı̨chų Highway opening.

Provinces and territories administer justice in their jurisdictions. The federal government has a limited direct role in this area. Consultations with the federal government were fulfilled solely through engagement with the RCMP. The RCMP is the federal agency contracted to provide policing services in the Northwest Territories under the Territorial Police Service Agreement.

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