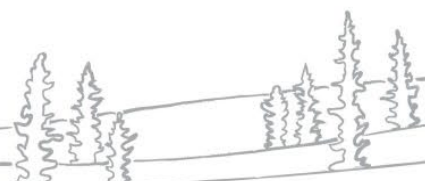




Mackenzie Valley Highway Project

Mackenzie Valley Environmental Impact Review Board
Technical Sessions

November 2024



Government of
Northwest Territories

Introductions

- GNWT Lead
 - Seth Bohnet, Director of Strategic Infrastructure, Infrastructure
- GNWT Departmental Representatives
 - ECC, ECE, EIA, FIN, JUS, HSS, ITI, MACA, NWT Housing
- Discipline Experts (K'alo-Stantec, DPRA)

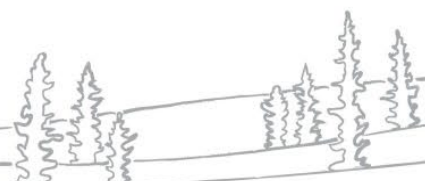




Project Overview

Mackenzie Valley Environmental Impact Review Board
Technical Sessions

November 2024

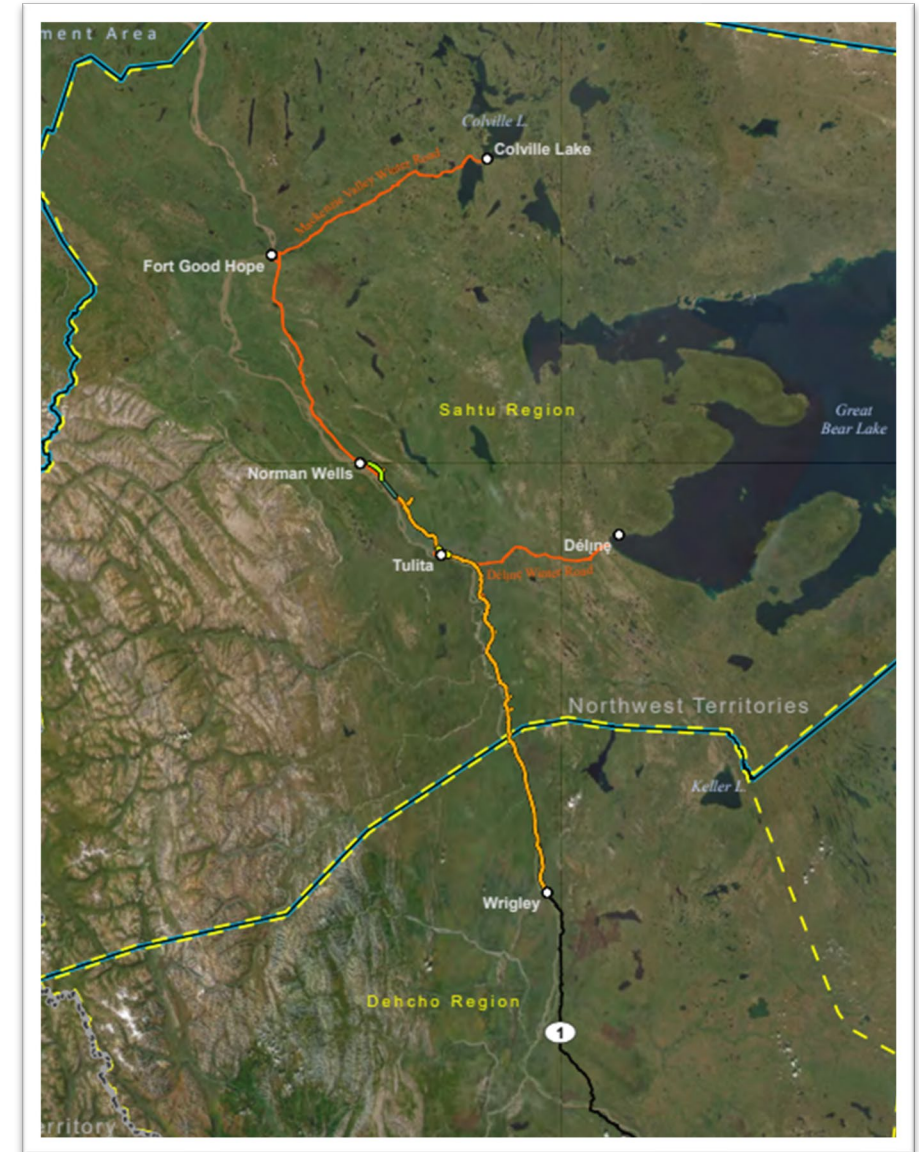


Government of
Northwest Territories

Project Description

The Project will:

- Extend the Highway #1 all-season gravel road from Wrigley, to Tulita and Norman Wells
- Replace the seasonal Mackenzie Valley Winter Road (MVWR) along this portion
- Provide needed infrastructure to support an improved quality of life and lower cost of living for NWT residents in the Mackenzie Valley, as well as support the expansion and diversification of the economy.

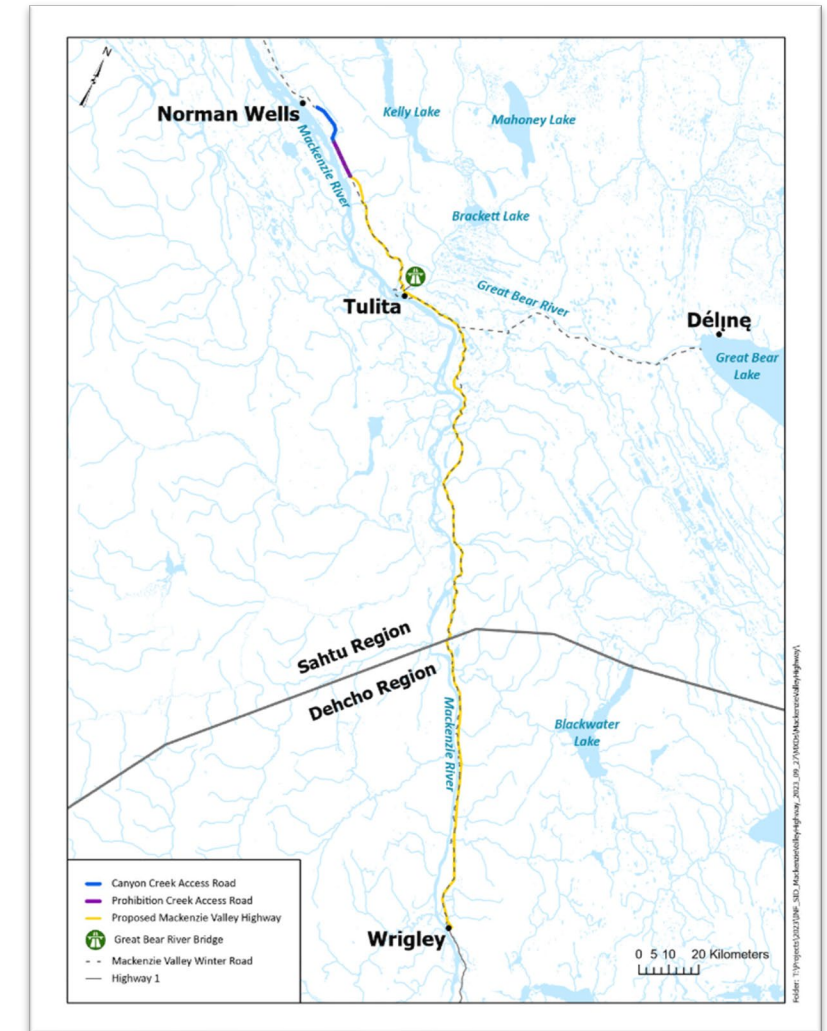


Project Scope

- 281 kilometres (km) of new highway
- Connect to 23 existing bridges along the MVWR and existing road portions
- Construction of ~85 culverts
- Development of ~6 temporary and 9 permanent quarry and borrow sources and access
- Temporary and permanent support infrastructure and workspaces to support construction
- Construction and operation of permanent maintenance yards
- Closure and reclamation of temporary borrow sources, quarries, and workspaces
- Demobilization of equipment and materials
- Highway operations and maintenance

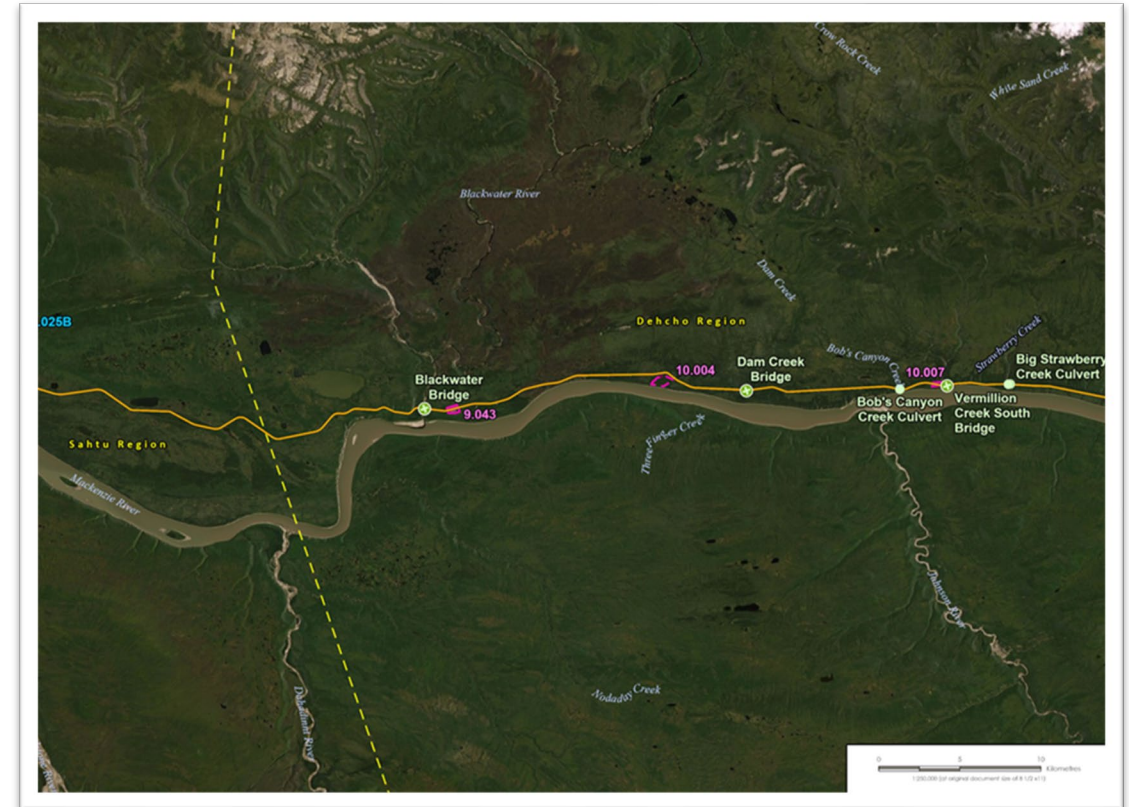
Not in MVH Project Scope

- Great Bear River Bridge
- Operations and maintenance of the MVWR
- Use of existing municipal, commercial, or public infrastructure or services, such as municipal solid waste and wastewater facilities



Project Alignment

- Proposed alignment mostly follows the MVWR
- Designed to standards of rural arterial road (RAU-90)
- Builds on region-specific Project Description Reports (2010, 2011)
 - Pehdzéh Kǫ Ndeh – Dehcho Region (PR#13)
 - Tulita District (PR#16)
- Assessed route is within a 1 km wide alignment routing corridor
- ❖ Route is not final

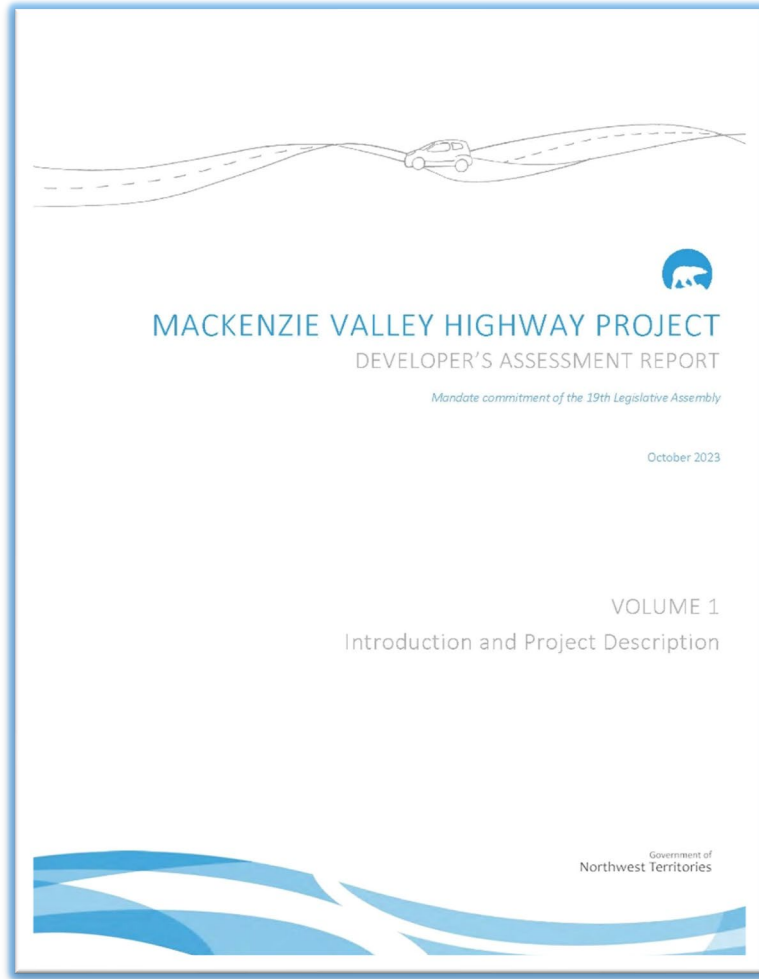


Project Schedule

- 3 construction segments
- 10 years to build over a 20 year period
- Segments will open to public use once each is built
- MVWR will remain open while construction is underway
- Highway to be operated & maintained by GNWT-Infrastructure



Developer' Assessment Report



- Developer's Assessment Report was developed to meet the Review Board's Revised Terms of Reference issued in 2015
- Submitted to the Review Board in October 2023.
- Review Board determined it met conformity requirements in November 2023

Engagement and Traditional Knowledge



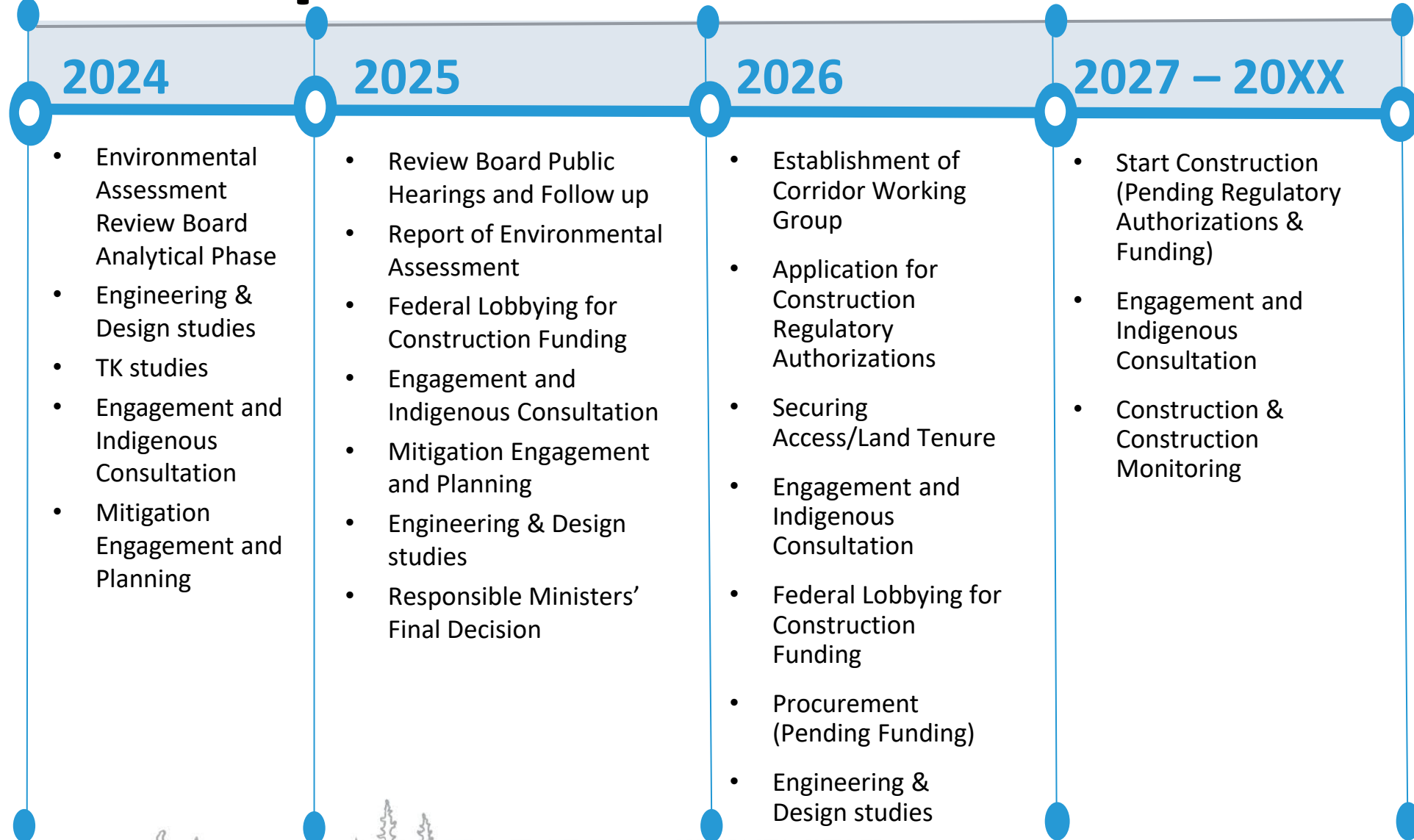
- 2010-2012 - Project Description Reports
- 2018-2020 - Project Updates
- 2021-2024 – Developer’s Assessment Report
 - Project description and construction activities
 - Potential project interactions and effects
 - Mitigation and monitoring
- Traditional Knowledge Studies:
 - Tulita Renewable Resources Council
 - Norman Wells Renewable Resources Council

Post-DAR Project Updates

- Supplemental Filings Overview
- Engagement Updates
- Alignment Work
 - Reconnaissance Flights – Tulita
 - Engineering Studies – PKFN
 - Winter 2025 Geotechnical Program
- Traditional Knowledge Studies



Next Steps



Project Overview

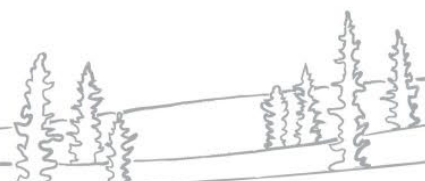
Discussion and Questions





Impacts on Caribou and Moose

Mackenzie Valley Environmental Impact Review Board
Technical Sessions



Caribou and Moose (ch.10)

- **Habitat**

- Caribou All-season Resource Selection Function (RSF), Moose Identified Habitat

Pre-existing significant effect on caribou habitat from fire disturbance in the LAA and Southern Planning Region

- **Movement**

- Collared caribou response to existing Mackenzie Valley Winter Road (EDI 2024).
- Experience from other highways and caribou and moose.

Not significant effect on caribou movement

- **Mortality Risk**

- Direct: collision risk. Indirect: harvest by improved harvester access

Not significant effect on mortality risk



Caribou and Moose Information Requests

- Local Assessment Area spatial scale
- Zone of Influence (ZOI) that quantifies indirect habitat
- Updated information on human disturbance and wildlife layers
- Evidence and the potential barrier effects from the highway
- Caribou critical habitat and habitat biophysical characteristics
- Offsetting caribou habitat loss
- Cumulative effects spatial scale
- Potential increased harvest access



Caribou and Moose Responses

- Updated habitat disturbance values (DAR Table 10.18) with current human disturbance and wildfire data (Response to MVEIRB-52)
- Contextualized predicted effects on caribou and moose based on Project setting (local ecology, existing disturbance, landscape features)
- Incorporated information from supplemental studies, analyses, and the published literature to address outstanding concerns

Table 52-1. Existing Disturbance and Project Contribution in NT1 Boreal Caribou Range, Affected Range Planning Regions, and the Caribou and Moose LAA (updated DAR Table 10.18)

Boundary Name	Boundary Area (ha)	Before Project				Project	After Project					
		Human Disturbance Area (ha) ¹	Human Disturbance Area Percentage (%)	Total Disturbance Area (ha) ²	Total Disturbance Area Percentage (%)	MVH Disturbance Area (ha) ³	Human Disturbance Area (ha) ⁴	Human Disturbance Area Percentage (%)	New Disturbance Area (ha) ⁵	Total Disturbance Area (ha) ²	Total Disturbance Area Percentage (%)	Percent Change from Project (%)
NT1 Boreal Caribou Range	44,292,049	4,472,625	10.10	14,607,918	32.98	2,962	4,475,587	10.10	1,317	14,609,235	32.98	0.003
Range Planning Region: Sahtu	14,901,479	1,147,439	7.70	3,426,573	22.99	2,368	1,149,807	7.72	745	3,427,318	23.00	0.005
Range Planning Region: Southern NWT	16,241,765	2,810,094	17.30	7,855,359	48.37	594	2,810,688	17.31	573	7,855,931	48.37	0.004
Caribou and Moose LAA*	1,010,686	215,101	21.28	590,458	58.42	2,962	218,063	21.58	1,317	591,775	58.55	0.130



DRAFT Wildlife Management and Monitoring Plan (WMMP) — Caribou and Moose

- The draft Wildlife Management and Monitoring Plan (DAR Vol. 5) includes the GNWT's proposed mitigations, monitoring, and adaptive management for caribou and moose.
- Design elements (e.g., 3:1 slope) to allow wildlife crossing (4.4)
- Caribou, moose and big game have the crossing right-of-way (4.5)
- Wildlife crossings identified and marked (4.5)
- Continued collar-based studies for caribou to assess response to road (5.2.2, 5.2.3)
- Continued moose surveys (5.2.4)
- Access and harvest monitoring (5.2.8)



Impacts to Caribou, Moose, and Wildlife

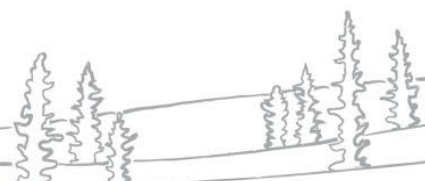
Discussion and Questions





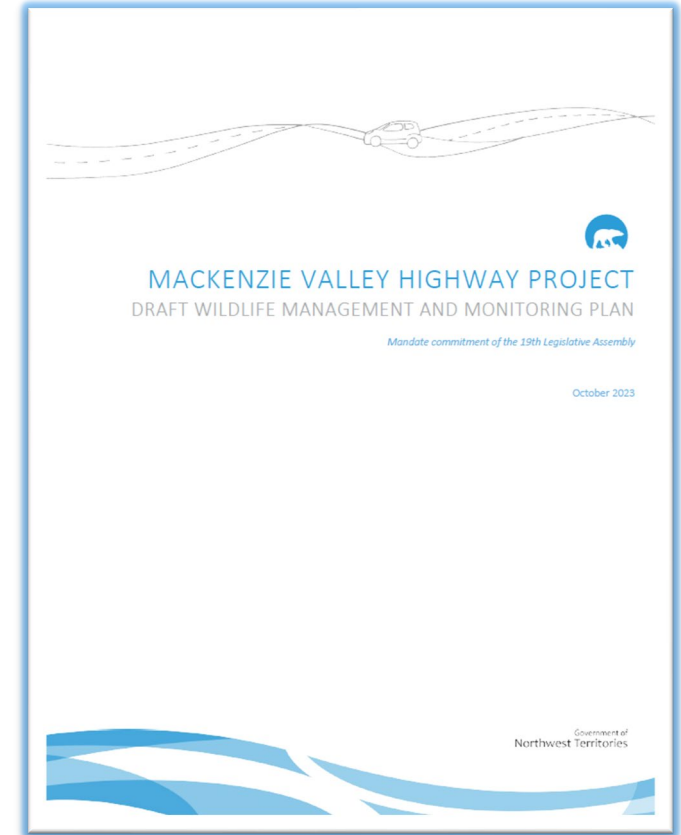
Impacts on Other Wildlife

Mackenzie Valley Environmental Impact Review Board
Technical Sessions



Other Wildlife and Birds (ch.19, 20)

- The residual effects of the Project on other Wildlife and Wildlife Habitat, and Birds and Bird Habitat are predicted to be not significant.
- Assessment focused on wildlife and bird species at risk, and potential effects on Important Wildlife Areas and Important Bird Areas.
- The draft Wildlife Management and Monitoring Plan (Vol. 5 of the DAR) includes the GNWT's proposed mitigations, monitoring and adaptive management applicable to wildlife and birds.
- The GNWT will continue to engage on the Wildlife Management and Monitoring Plan.



DRAFT Wildlife Management and Monitoring Plan (WMMP) — Wildlife

- Mitigations are primarily focused on reducing areas of new clearing and disturbance, conducting clearing activities in the winter, and controlling dust and noise.
- Additional wildlife surveys will be completed before construction, in accordance with the WMMP.
- Specific to birds, the GNWT used a habitat-based approach to assessing effects on birds using habitat associations supplemented by Boreal Avian Modelling (BAM) and autonomous recording unit (ARU) data.
- The GNWT is open to considering how additional available data can be used to help design the project-specific monitoring programs included in the WMMP.



Impacts on Other Wildlife

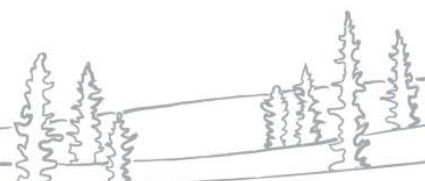
Discussion and Questions





Impacts on Communities

Mackenzie Valley Environmental Impact Review Board
Technical Sessions



Notable Socio-Economic Assessment Findings

- Communities are supportive of the Project and want to be prepared
- Most adverse socio-economic effects are not significant when proposed mitigations are applied
- Positive effects in areas of education, training, employment and economy
- Two significant adverse effects:
 - Increased drug and alcohol availability and use (social pressures)
 - Construction and operation of road will affect public safety, especially for vulnerable populations
- Community Readiness Strategy is proposed to mitigate adverse effects and enhance positive effects



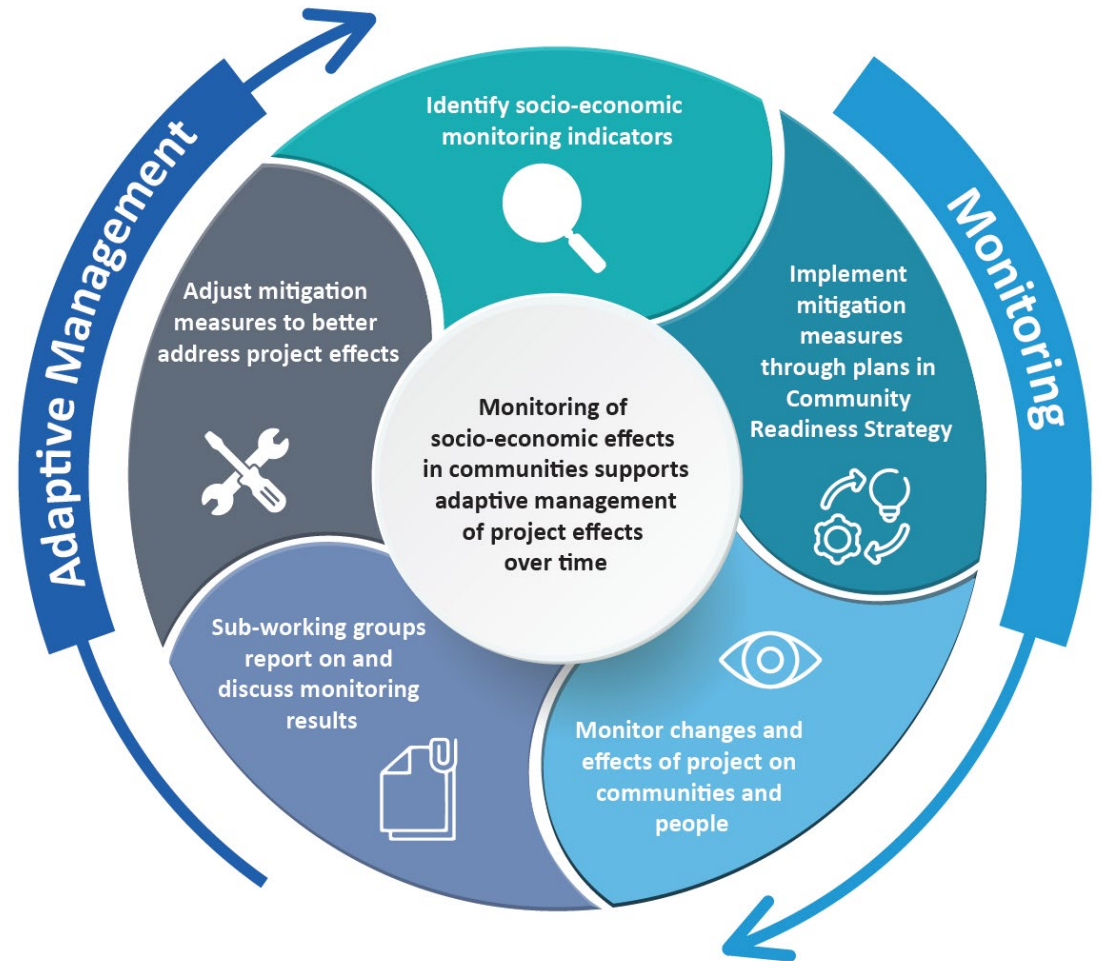
Proposed Community Readiness Strategy

- Strategy is the overall approach to addressing socio-economic effects
- Community input and involvement is key to decision-making
- Focus is on working together with communities and partners
- Overseen by Mackenzie Valley Highway Corridor Working Group
 - Dedicated Sub-Working Groups and Plans focused on specific issues
- Informed by monitoring and adaptive management



Monitoring and Adaptive Management

- Monitoring and adaptive management are critical components of Strategy
- Ensures Community readiness
Strategy is responsive to community needs and respond to changing socio-economic conditions
- Indicators and monitoring will be developed collaboratively with communities



Socio-Economic Engagement

- Critical component of assessment, development of mitigations, and future adaptive management and monitoring
 - Engagement began in 2020 for the socio-economic assessment
- Ongoing engagement on Community Readiness Strategy started May 2024
 - Norman Wells, Tulita, Fort Simpson to date
 - Objectives include:
 - Discussing the proposed Community Readiness Strategy
 - Gathering feedback and comments on potential changes to the Community Readiness Strategy
 - Including the MVH Corridor Working Group, Sub-Working Groups and associated Plans
- Further community engagement meetings planned



Impacts to Communities

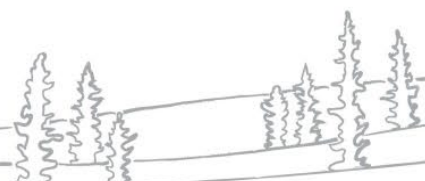
Discussion and Questions





Impacts on Culture and Traditional Land Use and Harvesting

Mackenzie Valley Environmental Impact Review Board
Technical Sessions



Culture and Traditional Land Use, Including Harvesting (ch.11)

- The Project will not result in long term change to the availability of traditional resources for cultural use, or access to traditional use areas.
- The Project will change the availability of harvested resources on, and adjacent to, the PDA that are directly affected by habitat loss (vegetation clearing).
- The Project will increase and improve access to traditional use areas, cultural resources, and harvested resources.
- Individual land users may experience effects differently.
- The GNWT will continue engagement with Indigenous Governments, Organizations, and other affected parties on mitigations.



Culture and Traditional Land Use, Including Harvesting (ch.11)

- Assessment is based on:
 - TLRU studies by the Tulita Renewable Resources Council and Norman Wells Renewable Resources Council
 - Project Description Reports (Pehdzeh Ki Ndeh [2012] and Tulita District [2011])
 - Publicly available sources
 - Project-specific engagement 2010-2012 and 2021-2023
- Assessment is conservative – assumes potential cultural use and presence of resources, even if not identified by studies.
- The GNWT will review and incorporate additional TLRU information from GNWT-funded studies by Pehdzéh Kǰ FN and Líídlǰ Kúę FN, once available.



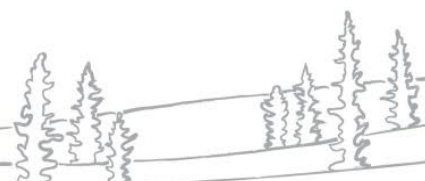
Impacts on Culture and Traditional Land Use and Harvesting Discussion and Questions





Impacts on Water and Fish

Mackenzie Valley Environmental Impact Review Board
Technical Sessions



Water Quantity (ch. 15)

- The residual effects of the Project on Water Quantity are predicted to be not significant.
- The Project's greatest water needs are during construction (per segment).
- Water withdrawal will be in accordance with established protocols and technical guidance, and water licence limits – low magnitude effects.
- Potential stream and lake water sources have been identified based on available field data, and desktop evaluation.
- This approach is appropriate – source-specific water availability will need to be confirmed in the field prior to licencing/withdrawal.
- The presence of groundwater at excavations, quarries, and road cuts will be established during future geotechnical investigations.



Water and Sediment Quality (ch.16)

- The residual effects of the Project on Water and Sediment Quality are predicted to be not significant.
- General effect pathways considered for surface water are:
 - Erosion and sedimentation (due to clearing of vegetation, instream works, alteration of permafrost)
 - Fugitive dustfall
 - Potential ARD/ML (from quarries, rock cuts, stockpiles, embankment materials)
 - Potential nitrogen loading from explosives
- Mitigations, included management plans, are well-established:
 - Erosion and Sedimentation Control Plan
 - Permafrost Protection Plan
 - Quarry Development Plans
 - Explosives Management Plan
 - Dust control



Water and Sediment Quality (ch.16)

- The Project does not involve point-source discharges to surface water; predictive modelling is not appropriate/practical for the scope of the Project.
 - Established mitigations that cover each effect pathway are effective
 - A detailed/quantitative characterization of baseline conditions would have no influence on the conclusions of the EA (not necessary or appropriate)
 - The baseline section of the EA included a review of available data and a data inventory to support future monitoring objectives
- Water quality will be monitored at culvert installation sites (upstream reference and downstream of culvert) during construction.
- Performance monitoring will occur, as well as inspection of erosion and sedimentation control measures.
- Additional monitoring of relevant water quality parameters could be performed in waterbodies of cultural importance.



Fish and Fish Habitat (ch.17)

- Potential effects on Fish and Fish Habitat can occur through culvert installations, vegetation clearing, and water withdrawal.
- Potential effects on fish health can occur through water withdrawal, changes in water quality, use of explosives near water, and increased access to fishing.
- The Project will connect to existing bridge crossings over large rivers/streams.
- New culverts will be designed to maintain flow and fish passage.
- Fish and fish habitat assessments are ongoing.
- Additional geotechnical and hydrotechnical studies will inform crossing designs.
- The GNWT will submit site-specific culvert designs and supporting technical studies to DFO to meet requirements of the *Fisheries Act*. It is too early to identify/confirm offsetting requirements.



Fish and Fish Habitat (ch.17)

- The draft Erosion and Sedimentation Control Plan is based on industry best practices for erosion and sedimentation control, monitoring, and DFO codes of practice.
- Mitigations for effects from changes to Fish and Fish Habitat, and from changes to water quality, are considered effective.
- Regular inspections will confirm whether culverts and erosion and sedimentation control measures are working as intended, or whether remedial actions are recommended.
- Increased access *may* lead to overfishing of large-bodied fish. Conservatively, this residual effect is considered significant. The GNWT recommends monitoring of fishing based on TASR experience, and discussion with the resource managers.



Impacts on Water and Fish

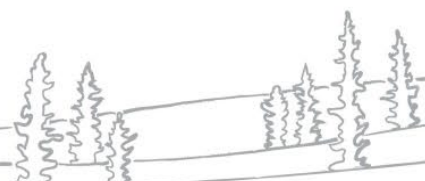
Discussion and Questions





Impacts on Terrain and Permafrost

Mackenzie Valley Environmental Impact Review Board
Technical Sessions



Terrain, Soils and Permafrost (ch.14)

- The residual effects of the Project on terrain, soils, and permafrost will be mostly limited to the PDA. They will be not significant.
- Changes to terrain and permafrost are anticipated primarily from clearing, ground disturbance, and changes to local drainage patterns.
- Mitigations to reduce effects are included in the Permafrost Protection Plan and Erosion and Sedimentation Control Plan (Volume 5 of the DAR).
- Principal mitigations include:
 - Limiting areas of new disturbance, excavation, cuts
 - Advancing work in new areas when the ground is frozen
 - Avoiding areas of sensitive soils/terrain where possible
 - Installing drainage culverts



Terrain, Soils and Permafrost (ch.14)

- Permafrost is warm and discontinuous. It will continue to warm and disappear over the life of the Project.
- Project-specific design mitigations are intended to protect the infrastructure where effects on sensitive soils cannot be avoided.
- Site-specific geotechnical information (e.g., soils, ice content, temperature) will be used for site-specific design.
- Proposed ongoing monitoring and inspection is described in the PPP.



Impacts on Terrain, Soils, and Permafrost

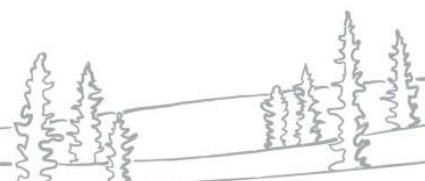
Discussion and Questions





Impacts on Air Quality, Noise, and Vegetation

Mackenzie Valley Environmental Impact Review Board
Technical Sessions



Air Quality, Greenhouse Gas (ch.12)

- The residual effects of the Project on Air Quality from changes to criteria air contaminants (CACs) are predicted to be not significant.
- The assessment considers the effects from CAC emissions to human health and the environment from emission sources that are mobile, transient and temporary.
- The greenhouse gas assessment estimates Project emissions compared to NWT total emissions.
- Mitigations include best practices to reduce emissions during construction:
 - A dust control program to reduce dust emissions
 - Efficient operation of construction equipment
 - Reduce areas of new clearing, and promote natural revegetation
- The GNWT also plans to develop an Adaptive Air Quality Management Plan involving the monitoring of CAC concentrations at key receptors.



Noise (ch.13)

- The residual effects of the Project on noise are predicted to be not significant.
- The noise assessment considers noise emissions received by receptors in communities, which may lead to adverse effects such as annoyance.
- Noise mitigations include best practices to reduce noise during construction:
 - Reduce use of residential roads for construction equipment
 - Blast techniques and procedures
 - Efficient operation, and maintenance of construction equipment
 - Inform communities of upcoming noise-emitting construction events including time period and type of activity
- The GNWT also plans to develop a noise complaint resolution plan to track noise complaints, and responses to manage and mitigate feedback.



Vegetation and Wetlands (ch.18)

- The residual effects of the Project on Vegetation and Wetlands are predicted to be not significant.
- The assessment predicts permanent changes to vegetation within the PDA from direct clearing, and indirect effects within and adjacent to the PDA (e.g., dust, edge effects, invasive species, wetland clearing).
- Principal mitigation is to reduce areas of new disturbance by following the Mackenzie Valley Winter Road as much as possible.
- Invasive species will be managed through regular mowing.
- Periodic invasive plant surveys will identify areas of infestation that may require additional mitigation.
- Targeted surveys of species of conservation concern, and specific plant species of interest, will be conducted prior to construction.



Impacts on Air Quality, Noise and Vegetation

Discussion and Questions

