

# MACKENZIE VALLEY HIGHWAY PROJECT

## DEVELOPER'S ASSESSMENT REPORT

*Mandate commitment of the 19th Legislative Assembly*

October 2023

### Non-Technical Summary

Government of  
Northwest Territories



# Non-Technical Summary of Developer's Assessment Report

The Government of the Northwest Territories (GNWT) is proposing to build the Mackenzie Valley Highway Project. The Project will extend Highway #1 from Pehdzéh Kì N'deh (Wrigley) to Tulít'a (Tulita) and Tłegóhłı (Norman Wells) in the Northwest Territories (NWT). The Project will connect to other existing and planned roads to create an all-season highway connection between these communities to replace the Mackenzie Valley Winter Road (winter road) in this area.

The Project is going through an environmental assessment by the Mackenzie Valley Environmental Impact Review Board (MVEIRB). To help with the assessment, the GNWT has prepared a Developer's Assessment Report (DAR) that presents the GNWT's findings about the Project's effects on the environment. The findings of the DAR are summarized in the following non-technical summary, which is also available in French, South Slavey, and North Slavey languages.

## Project Background

The Project is a strategic initiative of the GNWT and is intended to benefit the people and the economy of the Northwest Territories and Canada. The Project will support an improved quality of life and lower the cost of living for NWT residents in the Mackenzie Valley, as well as grow and diversify the NWT economy. The highway will increase the resilience and adaptability of the transportation system to the effects of climate change and will help resource exploration and development in the region.

## The Environmental Assessment and Developer's Assessment Report

The MVEIRB is conducting an environmental assessment to review how the Project will affect the environment and people of the Mackenzie Valley. In 2013, the MVEIRB held scoping meetings in communities to gather input on the topics of most concern. As a result, two key lines of inquiry need to be looked at by the GNWT in detail:

- **Local social and economic considerations:** This key line of inquiry evaluates how the Project will:
  - Affect employment, cost of living, education and training programs and traditional economy,
  - Affect health and well-being of individuals, families, and communities, as well as their cultural relationship with their traditional lands,
  - Maximize local and Indigenous employment and participation.

- **Caribou, moose and harvesting:** This key line of inquiry evaluates how the Project will:
  - Affect sensitive or important habitats, wildlife, population cycles, predator-prey relationships, human-wildlife interactions, contaminant levels in harvested species and harvesting.

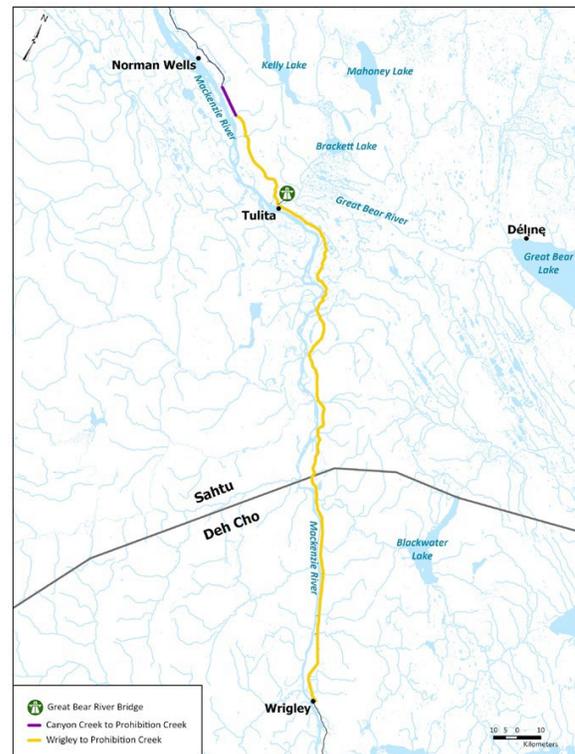
In addition to the key lines of inquiry, the DAR also considers how the Project affects other aspects of the environment including air, noise, fish, water, vegetation, wildlife, heritage resources, culture and traditional land and resource use, and non-traditional land and resource use.

## The Project

The Project will be located within the Dehcho Region and Tulita District of the Sahtu Region, as shown in the figure below. Approximately 281 km of new highway will be built from Hodgson Creek (located approximately 1 km north of Wrigley) to Prohibition Creek (located approximately 28 km southeast of Norman Wells). The highway will connect to the Canyon Creek All-Season Access Road, Prohibition Creek Access Road, and Great Bear River Bridge, once it is built, as well as existing bridges and culverts along the winter road. The Project will cross public lands and Sahtu Settlement Lands as identified in the Sahtu Dene and Métis Comprehensive Land Claim Agreement.

The Project activities include:

- Clearing and widening the existing winter road route to 60 metres. A new route will be cleared in some places. Then, a new two-lane gravel highway will be built within this area.
- Putting in culverts where the new highway crosses streams.
- Building access roads to rock and gravel sources (quarries and borrow sources). Rock and gravel will be used for construction of the highway, its maintenance, and for camp needs.
- Temporary camps for workers, and places to keep equipment and store fuel.
- Placing crushed rock and gravel on the ground in layers to build the highway. The construction will happen throughout the year.



- Cleaning up and reclaiming work areas, to keep them safe, clean, and not harmful to the environment.
- Removing all the equipment and camps after the highway is built. The parts of the winter road that will not be used anymore will be closed and reclaimed.
- Operating and maintaining the new highway. This includes snow clearing, grading, dust control, and culvert and bridge maintenance. To help with this, some of the quarries and borrow sources will stay open and there will be permanent highway maintenance yards built.

The Project does not include:

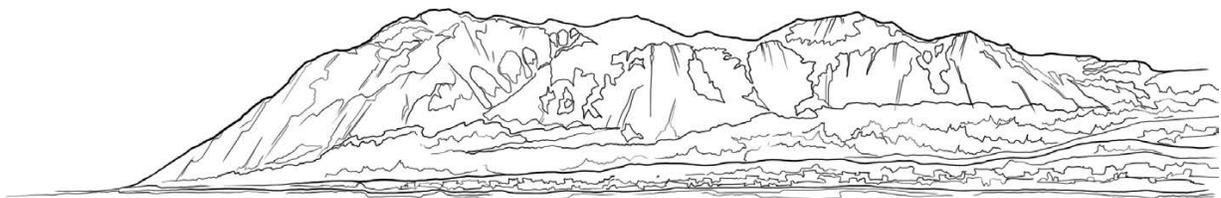
- Building the Great Bear River Bridge and access roads (this is a separate project)
- Operating, maintaining, or fixing the winter road until it is replaced by the new highway. The winter road will stay open to the public.

## Influence of Community Input and Other Studies

The Project's design is guided by:

- Safety
- Engineering and environmental standards and best practices
- Engagement with Indigenous Governments and Indigenous organizations
- Community Engagement
- Traditional Knowledge

The Project's design is not done. To get to the current stage, there were many studies done but there will be more studies and designing to do before the highway can be built. For example, the location of the highway may still be moved up to 1 kilometre to avoid features on the land or reduce effects on important areas.



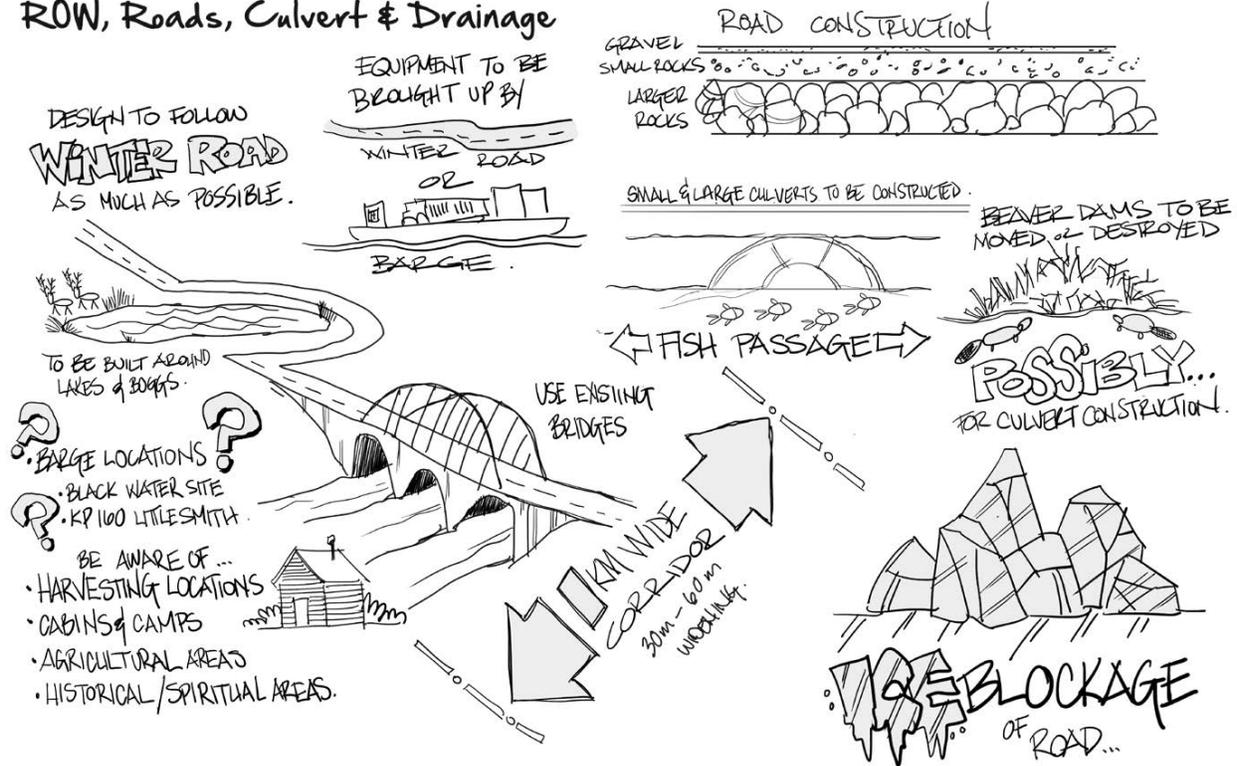
The GNWT engaged with Indigenous Governments, Indigenous Organizations, and other affected parties. Engagement feedback is summarized in “What We Heard” reports that can be found here: [Mackenzie Valley Highway Project | Infrastructure \(gov.nt.ca\)](https://www.gnwt.ca/mackenzie-valley-highway-project/infrastructure). Engagement feedback has shaped the proposed Project. For example, the GNWT has:

- Avoided a moose pasture as noted by Pehdzéh Kì First Nation, by expanding the study area for the highway route further to the west, between kilometre marker (KM) 712 and KM 717 north of Mount Gaudet.
- Proposed the “Bear Rock Alignment Option” based on input from the Tulita Renewable Resources Council and Elders Council to move the study area for the highway route approximately two kilometers further from Bear Rock (Petinı́zah).
- Widened the study area for the highway route at specific river crossing locations to allow more flexibility to move the highway further from sensitive features such as cabins, harvesting areas, and water features.
- Acknowledged the need to have continuous dialogue and participation with communities regarding socio-economic impacts of the Project. The GNWT has designed a mitigative strategy that incorporates this need as identified by community members.

The GNWT has also designed the Project so that:

- The highway will be straighter, wider, and less steep than the current winter road.
- The highway will follow the winter road as much as possible and no existing bridges on the winter road will be moved.
- The Project design will avoid areas of ice-rich permafrost, wetlands, and other sensitive land, where possible.
- The Project will use existing disturbed areas and rock and gravel sources close to the highway to reduce the need for new access roads, wherever possible.
- The highway will avoid road cuts and deep fills except where a road cut is needed to reduce the steepness of the highway.
- Drainage culverts will be constructed through the roadway to help with water movement and to maintain drainage patterns; crossing culverts will be built to cross streams.
- The Project will enhance socio-economic benefits including but not limited to providing employment, training, and business opportunities to community members.

## ROW, Roads, Culvert & Drainage



## Project Timeline

The Project timeline was developed considering feedback received during community engagement and is based on the GNWT's experience advancing other similar projects through environmental assessment and construction.

To maximize local employment and business opportunities, it is anticipated that the Project will be constructed sequentially in three segments:

- Wrigley north to the Dehcho-Sahtu border (102 km) – Anticipated construction duration - three years,
- Tulita south to the Dehcho-Sahtu border (134 km) – Anticipated construction duration - four years,
- Tulita north to Prohibition Creek (45 km) – Anticipated construction duration - three years.

Once the environmental assessment is completed, the GNWT will finalize the engineering design, obtain regulatory authorizations, secure construction funding, and complete procurement processes for the first segment. This process is anticipated to take approximately two years and will be repeated for each phase. Mobilization and demobilization for the construction phase of the Project is anticipated to be one year per segment.

The actual timing of the start of construction for each segment, as well as the final duration of construction for each segment, will be influenced by available funding, available construction

capacity, as well as the receipt of regulatory approvals and the conditions of these approvals.

The winter road will stay open to traffic during construction. To maintain public access and safety during construction, the GNWT will communicate and control areas affected by construction activities. Construction activities will be scheduled to reduce disruptions as much as possible.

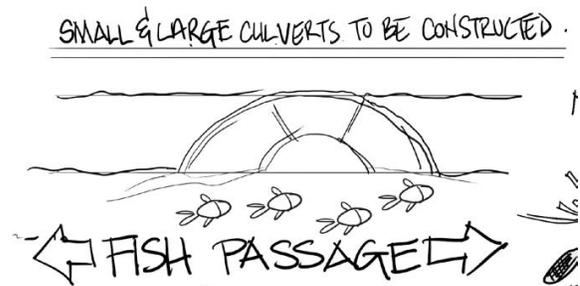
## Project Construction

Camps for 40-70 workers will be needed. Camps may be located at the existing camp facilities within Norman Wells; within municipal boundaries of Norman Wells, Tulita and/or Wrigley; and/or at one or more borrow source(s) or quarries.

All trees within a 60 metre (m) wide area will be removed (cleared). This is wider than the area cleared for the winter road. All clearing of trees, brush, and stumps will be done in the winter to protect the ground surface. Smaller trees will be made available for community collection.

The Project will need crushed rock and gravel to build the highway. Fifteen rock (quarry) and gravel (borrow) sources are needed for construction. At quarries, rock will be blasted using explosives and crushed to size. Quarries and borrow sources will each have their own permits and management plans to describe how the quarry is to be operated, and the environmental protections needed.

The highway will cross about 85 streams that do not already have bridges. These will need large culverts. The culverts will keep water flowing and will allow fish to move through the culvert. Some beaver dams may need to be taken down. This will be done with a wildlife permit from the GNWT and with input from local land and resource managers.



Smaller culverts will help water move from one side of the highway to the other. This will help to reduce overflow and icing of the highway, which was a concern raised during the GNWT's public engagement meetings.

Water will be needed during construction. Water sources will be chosen based on additional studies and community input. The amount of water taken from lakes and streams will not harm fish and their habitat.

During construction, camp greywater and sewage will be stored in tanks, and then the GNWT is proposing to take it to the closest community's sewage lagoon. Camp garbage will either be burned in an incinerator or taken to the nearest community landfill (pending community government approval).

## Operations and Maintenance

The Mackenzie Valley Highway will become a part of the NWT highway system. The GNWT is responsible for all operations and maintenance activities, such as snow clearing, brushing (trimming) of vegetation, highway repair, culvert and bridge maintenance, and dust control. Some quarries and borrow sources will stay open to support operations and maintenance.

Water will also be required during the operation of the highway. Similar to the construction phase, water sources will be chosen based on additional studies and community input. The amount of water taken from lakes and streams will not harm fish and their habitat.

Two to three permanent highway maintenance yards will be built close to the highway. These maintenance yards will include a maintenance garage, gravel stockpiles, fuel storage, and equipment parking area.



## Environmental Assessment Methods

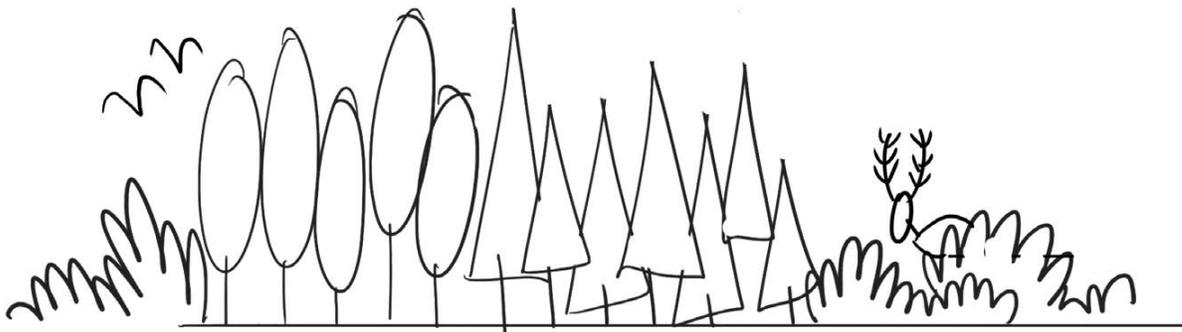
The assessment of the effects of the Project on the environment followed these steps:

- Describe what the environment (including the land, air, people, and wildlife) is like now, without the Project
- Describe how Project actions could cause a change to the environment (positive and negative)
- Propose actions to reduce potential negative effects (mitigations)
- Predict the effects on the environment after mitigation actions are taken (residual effects)
- Predict how residual effects will act together with the effects of other projects (cumulative effects)
- Evaluate whether the effects and cumulative effects will be significant
- Use the assessment findings to answer the questions and topics of the MVEIRB's key lines of inquiry

To help with the assessment, the GNWT completed studies, including:

- Archaeological surveys
- Review of available geotechnical data
- Studies of water flow at proposed culvert crossings
- Field surveys of migratory birds
- Fish and fish habitat assessments
- Community interviews and focus groups

The GNWT provided support to Tulita Renewable Resources Council, Norman Wells Renewable Resources Council and Pehdzéh Kì First Nation to complete Traditional Land and Resource Use Studies.



## Summary of Significance of Effects

The Project is predicted to have both positive and negative effects, but the following effects are predicted to be negative, and significant:

- The Project will affect social pressures, primarily through the increase in availability of drugs and alcohol. These social pressures include increased rates of sexually transmitted infections and teen pregnancies, and increased crime including increases in impaired driving, intimate partner violence, and family dysfunction.
- The Project will affect public safety including increased rates of crime, violent crimes and abuse, as well as increasing vulnerability of Indigenous women and girls, 2SLGBTQQIA+ persons, or other vulnerable populations. The Project will also increase road traffic resulting in an increased rate of injury due to traffic accidents.
- The Project will reduce boreal caribou habitat.
- The Project will make it easier to harvest fish from some areas, which may potentially impact fish stocks in the area.

The GNWT will take actions to reduce these effects. To help mitigate negative impacts to the health and well-being of individuals, families, and communities, the GNWT will create a Mackenzie Valley Highway Corridor Working Group, which will be responsible for creating a Community Readiness Strategy that outlines the overarching approach to enhancing benefits and minimizing risk. A Wildlife Management and Monitoring Plan (WMMP) will also be required for the Project to address potential impacts to wildlife. The other proposed mitigation measures for the Project are outlined in Chapter 27 of the DAR. In addition to the proposed mitigations, the GNWT will use existing monitoring programs to track changes and identify if other actions are needed, recognizing that new programs and additional resources may be required to address issues specific to the Project.

The GNWT will also work with other governments and resource managers to design appropriate monitoring, mitigation, and adaptive management programs and share results. The GNWT will have programs in place to help communities and people be ready for the Project and benefit from it.

The following sections provide a summary of the assessment of effects of the Project on the environment and affected Dehcho and Sahtu communities.



## Human Health and Community Wellness

The Project will create local construction jobs and jobs maintaining the highway once it is built, which is anticipated to increase income levels for some residents as well as potentially reduce the cost of living. Once the Project is built, it will be easier for people in communities connected to the highway to travel year-round to other communities and bring in some goods and services. This will make it easier to visit friends and family, participate in sports or cultural events, access places to harvest and hunt, and have better access to health care services, education, or jobs. When completed, the Project will enhance the ability for egress during emergencies, such as wildfires, floods, etc. These changes are anticipated to have positive effects on people's mental and physical health.

The Project may make it harder to get traditional foods during construction, which may continue once the Project is built. The Project is likely to lead to more outsiders coming into communities and make it easier for people in communities to leave. People may have more access to drugs and alcohol and/or access to different types of drugs. Increased levels of drug and alcohol abuse can often result in increased rates of domestic violence, sexual violence, family dysfunction, and accidents, which all contribute to additional social pressures. Community members may also be exposed to more diseases or face increased risk of becoming victims of crime or violence, especially young people and women. This could have negative effects on families and children and make people feel less connected to their community.

Once the highway is built there may be more traffic accidents due to an increase in year-round traffic compared to the winter road. The GNWT will continue to build safe roads and focus on highway safety education and enforcement where emergency services are either limited or unavailable.



## Education, Training and Skills

The Project is expected to have a positive effect on education for people living in communities affected by the Project. People may seek training or education so they can take advantage of construction jobs or business opportunities with the Project. Once the Project is built, people in communities connected to the highway would have year-round access to other communities that offer education and training. This may put pressure on the ability of community learning centres to deliver needed education and technical training courses. The GNWT will take actions to help people, companies, and communities be ready for jobs and have education and training available before jobs are available and has included these considerations in project planning.



## Employment and Economy

The Project is expected to have mostly positive effects on employment and the economy. For example, the Project may lower the cost of living in communities. The Project will also increase local construction jobs and business opportunities in different areas, such as construction trades, camp services, transportation, and supplying goods and services. Workers will also be needed to carry out ongoing highway maintenance.

Once the highway is built, there will be local business opportunities related to increased people visiting communities along the highway. This likely will change pressures on existing businesses and create opportunities for new businesses to meet this demand. The GNWT will help and work with communities, Indigenous governments and local businesses to help prepare for and respond to any increases in demand.



Once the highway is built, people may find it easier to access hunting and harvesting sites, making it easier for people to participate in the traditional economy. This might create more competition for traditional food and local people may have to spend more time hunting and harvesting.

It is possible that local people working on the Project may have less time to harvest, but the GNWT will help employers and businesses consider this when employing and scheduling workers.

The resource sector, including both oil and gas and mineral development, will have improved access to conduct exploration and potential development work, which will provide local employment and business opportunities. In addition to this, there is opportunity this will increase local, regional and Indigenous tourism opportunities for visitors from both inside and outside the territory.

## Infrastructure, Services and Institutional Capacity

There may be more demand on health centres in communities if construction workers have injuries that cannot be treated by the medics at the camps. Project contractors will be responsible for transporting workers to medical facilities to limit the impact on community services.

Project construction may increase demand for municipal services like water, sewage, and waste disposal, but agreements will be developed with community governments to ensure that any increased demand can be managed.

Once the Project is built, the increase in visitors might affect housing. This may be the result of individuals relocating to communities to pursue new businesses and/or employment opportunities in the tourism field. This will mean more people are looking for temporary accommodations (e.g., hotels).

Increased access to drugs and alcohol, and potentially more traffic accidents, are likely to increase demand on health and protective services in communities.

The GNWT will work with communities to be ready for increased visitors. This could include supporting communities to develop community tourism plans when requested. The GNWT will work with communities to monitor conditions and identify if other measures are needed.

## Non-Traditional Land and Resource Use

During construction, there could be disruptions to recreation and non-traditional harvesting of wildlife and fish. Although these disruptions will be temporary, construction noise, dust, and traffic could affect land use and how the landscape looks. Once the Project is completed, there will be year-round access to camping, harvesting, hunting, fishing, tourism and resource projects.



## Caribou

The Project is in the range of boreal caribou. Boreal caribou are sensitive to changes in habitat. Over half of the boreal caribou habitat within 15 km of the Project has been affected by forest fires and previous human activities. New project disturbance to boreal caribou habitat will add to this. To reduce the amount of new boreal caribou habitat lost, the Project will follow the winter road and use existing disturbances as much as possible. The Project will remove a very small amount of additional boreal caribou habitat (0.03%) in this area.

Boreal caribou generally avoid areas of human disturbance. Activities like blasting, construction, and traffic will cause noise and dust which disturb caribou and change where and how they move through their habitat. Dust will be reduced during construction, blasting, and highway operations and maintenance using methods such as spraying water. The effects of noise will be reduced by blasting less during sensitive periods for caribou and reducing some activities when caribou are nearby. The Project's Wildlife Management and Monitoring Plan will describe the actions that the GNWT must take to reduce effects on boreal caribou.

The highway might be a barrier to boreal caribou movement, especially during construction. How much of an obstacle is not known for certain. Boreal caribou have been seen close to the winter road in all seasons, suggesting that they may be crossing the winter road. So, it is reasonable to say they will probably cross the highway, but maybe less than they did before.

The Project-specific WMMP will contain detailed monitoring and mitigation measures to be implemented for the duration of the construction and operation phases of the Project.



## Moose

Traditional Knowledge identifies moose pastures close to the Project (winter road) and calving areas on islands with high willow growth within the Mackenzie River. The Project crosses important moose habitat areas all along the shores of the Mackenzie River. Effects on moose habitat will be reduced by avoiding moose pastures where possible, using already disturbed areas as much as possible, and limiting the amount of new clearing.

The Project may change moose movements, but this will not affect their number or distribution. Moose have been using, crossing, and traveling along the winter road in the summer and winter, including when there is traffic on the road. Building the highway may change their behaviour. Actions to reduce changes to moose habitat and reduce noise and dust will also help to reduce effects to moose movements.

The Project is not expected to cause changes to moose health from contaminants such as dust and runoff from Project activities because of actions taken during construction - like using best practices to reduce emissions of pollutants and dust and having a Spill Contingency Plan to reduce potential for release of contaminants.



## Harvesting

The Project may make caribou and moose harvesting easier by providing all-season access to some areas. Making it easier to harvest in areas that were previously only accessible by winter road may contribute to local overharvesting and illegal harvesting, particularly close to the highway. The GNWT Department of Environment and Climate Change and Indigenous co-management boards will continue to monitor caribou and moose, to see if any changes to mitigations are needed.

The Project will make it easier to access harvested resources such as caribou, moose, and fish that are currently accessible only in the winter using the winter road, or in the summer by boat. This will generally have a greater effect on resources harvested in the summer such as fish, birds, and plants. Better access to these resources could have both negative (bad) and positive (good) effects. Survey programs, currently conducted by the GNWT, will continue to collect information on distribution, abundance, and population trends of caribou, recognizing that new programs and additional resources may be required to address issues specific to the Project. The Wildlife Management and Monitoring Plan will be designed to determine if the highway is resulting in harvest of caribou that could be a concern. Extra monitoring of wildlife harvesting will be needed.

Arctic grayling is the most common large fish found in creeks crossed by the highway and the most likely to be affected by more fishing. Since fish stocks of large fish near the Project are not well known, the amount of increased fishing that would be a concern is also unknown. The GNWT, working with regulatory bodies with responsibilities for fisheries management and land claim organizations, may need to monitor harvesting activities along the highway to determine if additional management may be needed.



## Culture and Traditional Land Use

The Project could affect traditional activities, sites, and resources relied upon by Indigenous land users. Project-specific traditional land and resource use studies were completed by the Tulita Renewable Resources Council and the Norman Wells Renewable Resources Council. Another study is underway by the Pehdzéh Kì First Nation. The GNWT also collected information about land and resource use during engagement with Indigenous Governments and Indigenous Organizations.

Indigenous Governments, Indigenous Organizations, and other affected parties shared information and had concerns related to culture and traditional land use, including the following:

- It is a priority to protect culturally important areas such as Bear Rock (Petıııʔah), burial sites, and cabins, and to keep access to the winter road for traditional hunters and harvesters.
- Concerns were raised about hunting rights and whether the highway will increase the amount of harvesting in the area.
- Engagement participants asked to be involved in developing mitigation, management, and monitoring plans for harvested species, including wildlife and fish.
- Concerns were raised about effects on burial grounds, traditional hunting grounds, and other historical or meaningful locations.
- Concerns were raised about impacts to cabins located near the existing winter road.

The Project will make it easier to access cultural use sites and areas. Archaeological, cultural, and spiritual sites such as traditional camps and cabins have been identified near the Project. Bear Rock (Petıııʔah) is also a significant cultural site in the Sahtu Land Use Plan. The Project will pass close to Bear Rock.

Easier access to cultural sites may be better for cultural use, or it may remove or decrease the cultural value of these sites. Where concerns about effects have been heard through engagement, the GNWT has provided options to avoid culturally sensitive or important areas, such as Bear Rock (Petıııʔah) and a moose pasture north of Mount Gaudet



Traditional resources for cultural use and access to traditional resources will continue to be available. The main way to reduce effects on cultural resources is to follow the winter road as much as possible and to continue working with land users as the design advances to identify ways to reduce effects to these areas.

## Air Quality and Noise

Changes to air quality are measured by the amount of certain gases, and particles such as dust. Effects will be reduced by using dust control methods, keeping equipment in good running order, and making construction equipment travel at lower speed.

Changes in noise levels can affect community life, land use activities, and wildlife. The main sources of noise during construction will be equipment working and blasting and rock crushing. Once the highway is open, traffic and ongoing road maintenance activities will create noise.

In general, the areas crossed by the Project are mostly unaffected by human noise. Communities will be informed well in advance of planned activities that increase local noise. Some project activities close to Wrigley might cause noise effects to residents in Wrigley. This will last up to two weeks, a few days at a time, while the construction is nearby. The areas affected by increased noise will move as the construction moves along.



## Land, Soils and Permafrost

The Project will cross areas where there is permafrost. Building on permafrost is unavoidable, so there will be some local permafrost thawing as the ground conditions change. Effects of the Project on permafrost will combine with the ongoing effects of climate change, which will cause permanent thawing of permafrost in some places next to the highway. These local changes to permafrost are expected and the highway's design accounts for this.

Soils that have more ice in them are more sensitive to disturbance. Engagement participants noted concerns about changes to permafrost and potential for slumping and other changes to the land. Participants also noted that forest fires have a big effect on permafrost.

To reduce disturbance to areas with sensitive soils, the Project will use existing disturbed areas as much as possible, avoid areas with sensitive soils and steep slopes, and install culverts to keep drainage patterns. The Project will apply a Permafrost Protection Plan and Erosion and Sedimentation Control Plan. These two plans include best Northern practices for protecting soils and permafrost from erosion.

## Vegetation

Vegetation along the Project route will be cleared during construction and trimmed regularly. This will cause permanent changes in plant communities and plant species in cleared areas. Construction activities can also change plant communities by introducing weeds or creating dust.

To reduce effects on vegetation, including harvested plants, the Project will follow the route of the winter road as much as possible and make sure equipment from outside of the NWT is cleaned before it arrives. Dust will be reduced by limiting construction vehicles' speeds and using water to control dust.

Once cleared areas are no longer needed for construction, they will be reclaimed. Indigenous Governments and Indigenous Organizations will be notified of the construction schedule to provide a chance to harvest plants before they are removed.



## Wildlife and Wildlife Habitat

The Project can affect wildlife through clearing, dust, spills, and from food and waste storage at camps leading to human-wildlife conflicts (such as problem bears). The completed highway itself may change wildlife movements or result in more animal collisions.

Wildlife monitors and qualified biologists will assess areas close to the Project for the presence of wildlife, including dens, bat roosts, nests, and species at risk. These areas will be avoided, or activities will be re-scheduled or reduced during sensitive times for wildlife. The GNWT is open to further discussions with the Guardian Program to explore the best approach for the Project. Environmental Monitors will be employed.

To restore habitat, once construction is complete, work areas will be closed and reclaimed. Project wastes will be managed according to the Waste Management Plan to reduce wildlife attractants and all Project personnel will receive wildlife awareness training. The Project will have a Wildlife Management and Monitoring Plan details the actions GNWT will take to reduce, monitor, report, and manage effects of the Project on wildlife and birds.

## Birds

Bird habitat could be changed or lost by destroying nests, clearing, and/or noise disturbance. The release of dust and other contaminants onto land or in water can affect bird health.

Potential effects to birds will be reduced using previously disturbed areas as much as possible, clearing vegetation in the winter, and reclaiming work areas. Wildlife monitors and qualified biologists will assess areas close to the Project for bird nests. If an active bird nest is found, it will not be disturbed. All Project personnel will receive wildlife awareness training, and will not be allowed to feed, harass, or hunt wildlife while working on the Project.



## Water and Sediment

The Project could affect the quality and the amount of water in streams and lakes. To reduce changes to stream flows, culverts in streams will be designed to maintain flow and fish passage. Smaller drainage culverts will be installed along the highway to help water move from one side to the other and to maintain drainage patterns. Guidelines for taking water will be followed. Quarries and borrow sources will not be located where there is a high groundwater table.



To reduce potential effects on water quality from erosion and contaminants, the Project will apply an Erosion and Sedimentation Control Plan, and each quarry and borrow source will apply a Quarry Development Plan. These plans follow best practices and include actions to reduce the amount of sediment and other contaminants that enters waters. The GNWT will test and use material from quarries that have low potential to release contaminants.

## Fish and Fish Habitat

The Project could affect fish habitat and fish health. Project activities in or near water could cause changes to water quality and can change the amount or quality of habitat that fish use for feeding, spawning, resting, or growing. Changes to flows or amounts of water can also affect fish health. Culverts will be designed to keep water flowing and to let fish pass. Water, when taken from creeks and lakes, will follow best practices.

The assessment identifies potential significant effects from overfishing during operation of the highway. This is because the amount of additional fishing that the Project will cause is not well known, and the amount of fishing that fish populations can sustain is also not well understood. Extra monitoring of fishing may be needed. This would include monitoring of harvest which can then be used to identify the need for management actions to be taken by the appropriate resource management organization. The need for management actions will be evaluated with regulators and resource management agencies including the GNWT, DFO and agencies such as the SRRB.



## Accidents and Malfunctions

Accidents and malfunctions are not predictable, but they can be planned for, so that if they happen, potential harm to the land, water, air, and the people and animals are reduced. The priority is to reduce the chance of an accident or a malfunction happening. Then, if something does happen, to have a plan ready to respond.

Building a highway involves trucks, fuel, blasting, moving rock and gravel and lots of heavy

equipment. The most likely type of accidents and malfunctions are spills of contaminants. There could also be explosions, fires, and transportation accidents.

The evaluation of effects related to accidents and malfunctions associated with public use of the highway once operational was evaluated under the Human Health and Community Wellness. As a result, the mitigations proposed for the effects are focused on construction and maintenance of the highway.

To reduce the chance of accidents happening, and to then reduce potential harm if they do happen, the GNWT will have several important management plans like a Spill Contingency Plan and Emergency Response Plan in place.

## Cumulative Effects

The GNWT predicts traffic of 50 vehicles per day, including a mix of vehicles such as pickup trucks and truck trailers. There are no known future heavy industrial users of the highway, but there are other projects that are already affecting the environment. These include the winter road and Norman Wells Pipeline for example, which have affected habitat. The Project will contribute to noise, habitat loss, harvest pressure, and potential for contaminants, but these combined effects will not lead to unsustainable changes, and the Project's contribution to cumulative effects will be low. Other factors, such as climate change and forest fires are already affecting the environment, so changes will have to be monitored to see if the GNWT's actions to reduce the effects of the Project on the environment are working.



The Project will contribute to negative effects on public safety and is predicted to add to existing social pressures linked to colonialism and intergenerational trauma, systemic racism and systemic barriers and these changes will be significant. If other projects in the region happen at the same time as project construction, the cumulative effects on social pressures and public safety will be significant and will require additional management actions to be developed by the GNWT. Based on other indicators of human health and community wellness, education training and skills, employment and economy, infrastructure, services and institutional capacity, and non-traditional land and resource use, overall negative cumulative effects on the socio-economic environment will be low.

## Conclusion

The assessment concludes that the Project is predicted to have certain positive effects on people and communities, but could also lead to negative effects during construction, and once the highway is completed. These effects will be monitored and managed collaboratively by the GNWT working with communities. Effects of the Project on boreal caribou from changes to habitat will contribute to existing effects that are already significant. Other potential effects, such as effects on fish from increased access to harvesting will need to be carefully watched. The Wildlife Management and Monitoring Plan includes measures to monitor, review and respond to changes in caribou and other wildlife species over the life of the Project. The GNWT is open to and interested in discussions with Indigenous Governments, Indigenous Organizations, and other affected parties on how best to incorporate their recommendations.

