Mackenzie Valley Review Board

# Draft Terms of Reference

## *EA2425-02*

## *Imperial Oil Resources N.W.T. Limited*

## *Norman Wells Operations*

**December 2, 2025**

# Table of Contents

# List of Tables



# Abbreviations

| | |
|---|---|
| DAR | Developer's Assessment Report |
| EA | Environmental Assessment |
| GNWT | Government of the Northwest Territories |
| MVRMA | Mackenzie Valley Resource Management Act |
| Imperial | Imperial Oil Resources N.W.T. Limited |
| KLOI | Key Line of Inquiry |
| ToR | Terms of Reference |
| Review Board | Mackenzie Valley Environmental Impact Review Board |
| VC | Valued Components |

# 1. Introduction

This document outlines the minimum information that Imperial Oil Resources N.W.T. Limited (Imperial or the developer) is required to provide to complete its Developer's Assessment Report (DAR). The project being assessed is the production and operation for the remaining life of Imperial's Norman Wells Operations, for the period beyond its current authorizations.

The Review Board is aware that Imperial has compiled considerable existing information from previous regulatory proceedings, and from ongoing monitoring. **This Terms of Reference (ToR) directs the developer to organize existing material, including relevant material from the environmental assessment of Line 490, and conduct additional study and analysis as appropriate, and include all material in one stand-alone DAR submission.** The ToR is a list of requirements for the preparation of the DAR, but the structure of the DAR is at the discretion of the developer. The DAR will be used to inform all interested parties about the proposed development and the developer's impact predictions during the analytical phase of the environmental assessment (EA).

This document is arranged as follows:

- Section 1 – Introduction, and how this document was developed
- Section 2 – Scope of development and scope of assessment
- Section 3 – Approach and methodology to assessing impacts
- Section 4 – Key Lines of Inquiry
- Section 5 – General Requirements of the Developers Assessment Report
- Section 6 – Conclusion
- Appendix A - Inclusion of the Line 490 Replacement within the Norman Wells Operations environmental assessment – Rationale for inclusion
- Appendix B – Assessing impacts to support Key Lines of Inquiry
- Appendix C – Impact Assessment Methodology

## 1.1. Potentially Affected Indigenous Nations and Governments, communities and organizations

The Norman Wells Operations is located within Sahtú Settlement Area. The project has the potential to affect the following Indigenous Nations and Governments, communities and organizations:

- Sahtú Secretariat Incorporated
- Tłegǫ̀hłı Got'ınę Government
- K'áhshó Got'ınę District Land Corporation
- K'áhshó Got'ınę Committee
- Norman Wells Renewable Resource Council
- Fort Good Hope Dene Band
- Fort Good Hope Métis Nation Local #54 Land Corporation
- Yamoga Land Corporation

- Sahtú Dene Council
- Fort Norman Métis Community
- Délı̨nę Got'ı̨nę Government
- Ayoni Ke Land Corporation
- Tulít'a Land Corporation
- Tulít'a Dene Band
- Behdzi Ahda First Nation
- Gwich'in Tribal Council
- the Town of Norman Wells
- all other Sahtú communities
- downstream communities in the Gwich'in Settlement Area and Inuvialuit Settlement Area
- Sahtú Renewable Resources Board
- Dehcho First Nations
- Łíídlı̨ı̨ Kų́ę́ First Nation
- Pehdzéh Kı̨́ First Nation

Other potentially affected Indigenous groups may be identified during the EA process and through further engagement.

## 1.2. Process of developing the Terms of Reference

This EA will follow the requirements of Part 5 of the *Mackenzie Valley Resource Management Act* (MVRMA). Section 3 of the Review Board's *Environmental Impact Assessment Guidelines* describes the EA process in detail. That document, as well as other documents relevant to this assessment (the Review Board's *Rules of Procedure*, other guidelines including the *Socio-Economic Impact Assessment Guidelines* and *Traditional Knowledge Guidelines*, reference bulletins, and relevant policies) are available online or by contacting the Review Board staff.

In accordance with Section 115 of the MVRMA, the Review Board will conduct an EA of the proposed development with regard for the **protection of the environment** from significant adverse impacts, and the **protection of the social, cultural and economic well-being** of Mackenzie Valley residents and communities. Paragraph 114 (c) of the MVRMA further requires the Review Board to ensure that **concerns of the Indigenous peoples and the general public** are taken into account.

Accordingly, the Review Board has developed this ToR based on an examination of information from:

- Water Licence and Operations Authorization applications
- Review Board scoping sessions in Fort Good Hope and Norman Wells in June 2025
- Review Board scoping sessions in Délı̨nę, Tulít'a, Tsiigehtchic and Inuvik in September 2025
- Review Board technical scoping session in Yellowknife September 2025
- Written recommendations and responses on the draft *Terms of Reference* using the Online Review System
- The Review Board's public record for the EA of Imperial's Line 490 Replacement Project
- Review Board environmental assessment experience

# 2. Scope

This section describes the scope of development for the project, the scope of assessment, and the scope of issues (key lines of inquiry and valued components) in this EA.

## 2.1. Scope of development

Under subsection 117(1) of the MVRMA, the Review Board determines the scope of development for every EA it conducts. The scope of development includes all the physical works and activities required for the project to proceed. Table 1 outlines a minimum listing of project components for the scope of development for this EA.

The scope of the development includes the operation of the existing Norman Wells Operations and all associated activities, management plans, maintenance works (including flowline maintenance, flowline repair, and flowline replacement, which includes replacement of Line 490 (see section 2.1.1)) and spill responses. Where appropriate,[1] the assessment will consider the historical impacts in the Norman Wells Proven Area (Figure 1). Closure activities are not in the scope of this EA.[2]

The developer has identified the following project components and activities as part of the development:

***Table 1. Scope of Development (from Imperial's 2016 Interim Closure and Reclamation Plan, s. 4.3.3)***

| Project component | Subjects to consider |
|---|---|
| Operations | • Mainland facilities<br>• Three natural islands<br>• Six artificial islands<br>• Collecting system<br>• Central processing facility<br>• Flaring<br>• Flowline maintenance and repair |
| Waste management | • Downhole injection<br>• Shipping material out<br>• Onsite disposal |
| Transportation | • Movement of material and people to and from Norman Wells and within the Proven Area |
| Power | • Electricity generation for the site and the Town of Norman Wells |
| Water and water management | • Use of water on site |
| Monitoring and management plans | • The effectiveness of these plans |

[1] See section 3.4 for details
[2] Closure, remediation and reclamation of this oilfield is the subject of a different EA that is underway (EA2526-01).

The Review Board has decided that along with the project components noted above, the replacement and operations of Line 490 will also included in the scope of developent, as the ongoing oilfield operations are uneconomical without it.[1]

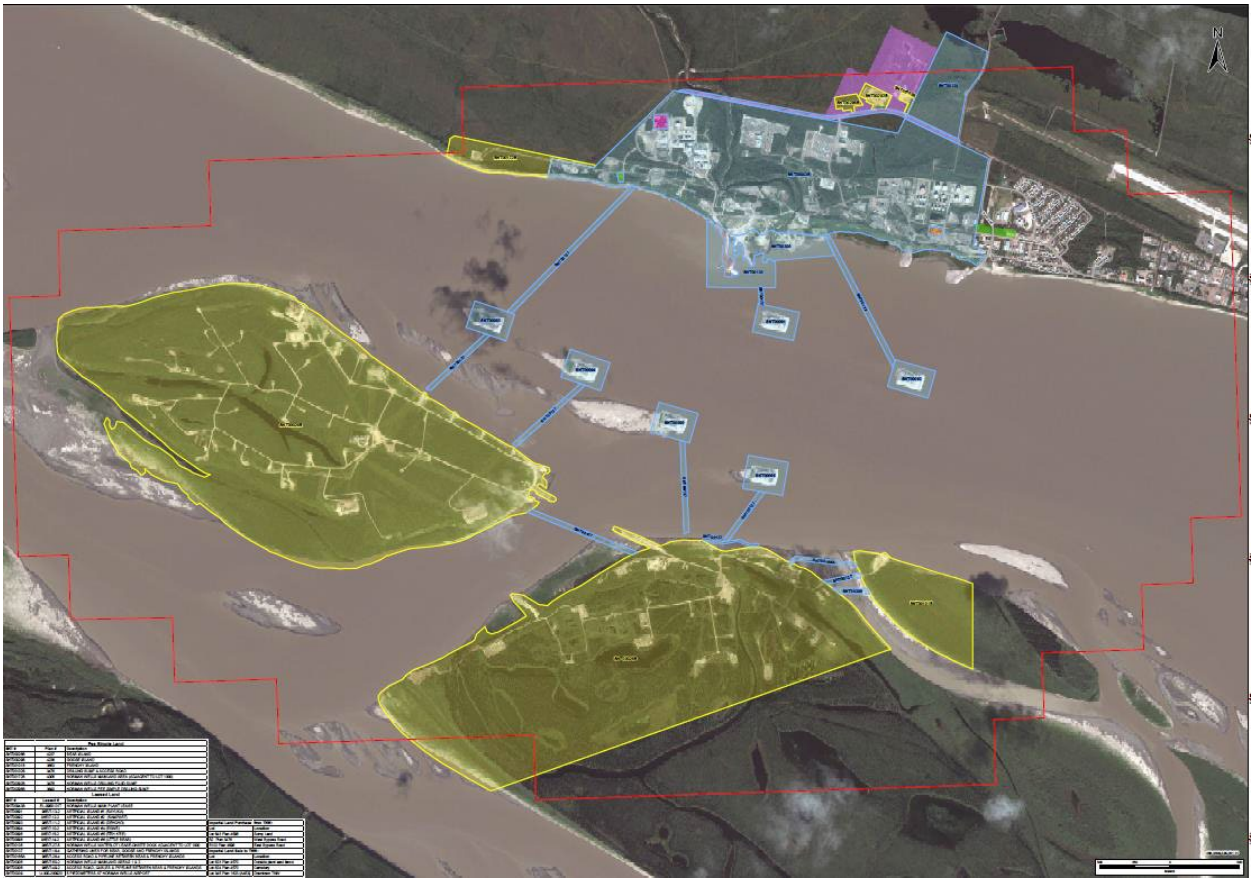

***Figure 1:*** *Norman Wells Proven Area (red line) and components of Imperial's oilfield*

### 2.1.1. Replacement of Line 490

Imperial proposes to install flowlines and conduit using horizontal directional drilling (HDD) between Goose and Bear Islands, in the Mackenzie River. The HDD will drill a single hole between the islands, at least 15 metres below the riverbed. All pipes and conduits in the Line 490 trench, including those that did not fail, would still be replaced. The flowlines and cable conduit will be bundled and installed inside a steel conduit in the existing right-of-way using HDD. The replacement and operation of Line 490, connecting Bear Island and two artificial islands to the mainland via Goose Island, is also included in the scope of development. Draft rationale for including Line 490 in the Operations EA is found in Appendix A

[1] Line 490 is also included on the basis of the linkage, dependence, and proximity tests of the Board's *Environmental Impact Assessment Guidelines* (p.28). Final *Reasons for Decision* will be issued after considering public review of this draft ToR.

## 2.2. Scope of assessment

The scope of assessment is determined by the Review Board. It describes which issues will be examined in the EA, and how broadly they will be considered. The scope of assessment includes potential impacts on valued components (see definition below) of the biophysical and human environment from the project by itself, and cumulatively. The scope of assessment identifies and prioritizes the issues the developer must examine in its DAR so that the EA can focus on issues that matter most.

### 2.2.1. Key Lines of Inquiry

Key Lines of Inquiry describe the most important issues in the EA, which require the most rigorous analysis in the DAR. They are based on the Review Board's prioritization of the issues raised during community scoping and technical scoping sessions. For each of the Key Lines of Inquiry, scoping identified potential pathways of effects on people, communities, and ecosystems from the Norman Wells Operations.

The Key Lines of Inquiry for this EA are:

1. protecting the Mackenzie River,
2. protecting traditional harvesting and the Indigenous way of life, and
3. protecting health and well-being.

This ToR is structured to produce credible answers to questions related to these three Key Lines of Inquiry (see section 4). Appendix B describes detailed information needed to thoroughly answer those questions, to support responses related to the Key Lines of Inquiry.

***Valued components***
Valued components (VCs) are parts of the biophysical or human environment that may be affected by a proposed development and that are identified as important.[1] The following is a list of VCs the Review Board has identified so far, to be used in the assessment of impacts from the project related to the three Key Lines of Inquiry:

- surface and groundwater quality and quantity
- fish and aquatic life
- waterfowl
- wildlife and wildlife habitat
- traditional harvesting
- social and community conditions
- economy and employment
- human health
- species at risk[2]
- air quality

[1] such as for ecological, scientific, social, cultural, economic, historical, archaeological, or aesthetic reasons
[2] In addition to its requirement to prevent significant impacts on the environment under the Mackenzie Valley Resource Management Act, the Review Board must meet legal requirements under s. 79 of Canada's *Species at Risk Act.*

- soils

In addition to considering the impacts on these individual VCs (see Appendix B) as part of answering questions about the Key Lines of Inquiry (see section 4), the assessment will also consider the relationships between the VCs when assessing impacts from the project.

## 2.3. Geographic scope (spatial boundaries)

The geographic scope will include all areas that may be affected by project activities. The geographic areas relevant for each VC must be appropriate for the characteristics of the VC, or the impact and nature of the impact source. For example, consideration of impacts on water must consider downstream impacts. All these areas together will be considered in the environmental assessment study area, which will be further defined by the developer in its DAR.

The developer will provide its rationale for the spatial boundaries it selects for the assessment of potential project related impacts on each VC.

Depending on the extent of predicted impacts for each Key Line of Inquiry, the geographic scope will include:

- the Norman Wells Proven Area
- the Mackenzie River adjacent to and downstream of the oilfield
- Bosworth Creek
- all Sahtú communities
- downstream Gwich'in and Inuvialuit communities
- any potentially affected Dehcho communities

## 2.4. Temporal scope

The developer will use temporal boundaries for this environmental assessment appropriate for the remaining life of the Norman Wells Operations and that capture any potential long-term impacts of the remaining operations on VCs.

The scope of *development* is limited to the operating phase of the project. The temporal scope will reflect the length of time of impacts, which may last longer than the proposed activities that caused them.

- For **project-specific** (that is, non-cumulative) **impacts**, the temporal scope will include the duration of impacts from operations only.
- For **cumulative impacts**, the temporal scope includes the period in which the impacts from continued operation activities will add to the effects of past, present, and reasonably foreseeable future projects. Imperial's Norman Wells Operations have been running since 1919, while quantitative site data may be available from 1985 onwards.
- The Review Board is currently conducting a separate EA on the closure and remediation of the Norman Wells facilities (EA2526-01). **Any potentially significant cumulative impacts from activities that will occur during project operations will be mitigated as part of this EA, except**

**for those cumulative impacts from operational activities which are more efficiently and effectively mitigated at project closure.** Those will be addressed in the closure EA.

The developer will place special focus on the consideration of time during the operations when activities are particularly intense or when VCs are particularly sensitive to potential impacts.

The developer will define and provide its rationale for the specific temporal boundaries it used to examine the potential impacts on each of the VCs in its impact assessment.

# 3. Overall approach to assessing impacts

This section describes the Review Board's expectations for how impacts should be assessed in the DAR, including intended outcomes for each assessment step. The Review Board's rationale behind this approach will follow in the *Reasons for Decision for the Terms of Reference*.

## 3.1. Describe baseline conditions and the existing environment

The DAR will describe baseline conditions for each VC in enough detail to accurately describe and assess potential impacts of continued operations. The project-specific baseline describes the how the setting would unfold *without* the impacts of the continued operations that Imperial is proposing. For that purpose, the project-specific baseline for this EA will reflect current conditions. The description of baseline conditions should include both quantitative and qualitative data, as appropriate and necessary, to understand the current environment and potential future impacts of ongoing operations. To do this, Imperial will describe project specific baseline conditions and trends that exist now (for understanding impacts of the project).

Section 3.4 (Considering cumulative effects from historic operations) describes the Review Board's approach to the cumulative baseline for this EA.

The baseline descriptions will include the Norman Wells Proven Area and any surrounding or other areas (e.g. downstream for water, fish, and harvesting) where VCs may be affected (the "study area"). Imperial should identify its study area for each VC, based on the VC's unique characteristics.

Imperial is encouraged to use existing data where available. This includes information submitted during regulatory proceedings and during the EA of the Line 490 replacement, and the use of Indigenous Traditional Knowledge, as outlined in Section 3.3. If information is lacking, Imperial will collect new information and describe the methods used, and the accuracy and precision of measurements. If baseline data for a VC has not yet been collected, Imperial will explain how and when it will be obtained. If Imperial believes baseline data for a VC is unnecessary, it must provide a clear rationale.

Additionally, Imperial will describe any analysis that uses data from outside the study area to characterize conditions within it. This includes any models used, along with their assumptions and a discussion of their accuracy.

## 3.2. Assess impacts on the environment

The DAR will assess the ways that the project could affect the environment, which includes the biophysical and the human environment, to produce thorough answers to each of the questions related

to each of the three Key Lines of Inquiry (section 4). The effects assessment should provide a clear traceable path of information from the identification of potential impacts and mitigation to residual impacts. Quantitative or qualitative information may be used as appropriate. The developer should describe and provide its rationale for any methods, including models, used in its assessment.

The developer will identify any public concerns related to the project based on its past engagement, including during past regulatory proceedings, the information now available from EA proceedings such as community scoping sessions, and the results of any ongoing engagement.

The developer will describe all mitigations that will be put into effect during operations to mitigate potential environmental effects. This includes mitigations the developer already has in place.

The developer will assess and describe the residual impacts, after mitigation, with respect to the Key Lines of Inquiry. These residual impacts will be described in terms of the nature of the impact, magnitude, direction, spatial extent, timing, frequency, duration, reversibility and likelihood of each impact. While the developer is required to characterize each impact in this manner, it is not required to provide its opinion on impact significance at this point in the EA. Opinions on significance can be provided by the developer and parties during the analysis phase of the EA.

## 3.3. Incorporate Indigenous Traditional Knowledge

The Review Board values and considers both Indigenous Traditional Knowledge and scientific knowledge in its assessment of the impacts of the project on the environment (including people). The developer will make all reasonable efforts to incorporate, throughout its assessment, any available Indigenous Traditional Knowledge from Indigenous culture holders in its evaluation of the specific impacts required in this ToR.[1,2] In addition, the DAR will contain a summary of Indigenous Traditional Knowledge as a stand-alone section. If Indigenous Traditional Knowledge is obtained from previous information from potentially affected communities, the developer will present it to each associated Indigenous group for comment and confirmation before including it in the DAR.

The summary of Indigenous Traditional Knowledge will:

- describe what approach was taken in working with Indigenous Traditional Knowledge holders to identify and use Indigenous Traditional Knowledge
- describe how Indigenous Traditional Knowledge and Indigenous Traditional Knowledge holders influenced the developer's project design, impact assessment, and monitoring and mitigation measures provide a summary table listing:
    - any engagement sessions where Indigenous Traditional Knowledge topics were discussed
    - what Indigenous Traditional Knowledge topics were discussed

[1] The developer should refer to the Review Board's *Guidelines for Incorporating Traditional Knowledge in Environmental Impact Assessment*

[2] Indigenous communities will also have the option to submit Indigenous Traditional Knowledge directly to the Review Board for confidential consideration and handling. See here for an example of confidential Indigenous Traditional Knowledge handling by the Review Board.

- cross-reference to sections of the DAR that incorporate Indigenous Traditional Knowledge

## 3.4. Considering cumulative effects including from past operations

From a cumulative effects assessment perspective, the developer will consider the effects of the project in combination with the effects of other past, present and reasonably foreseeable future developments.[1]

The cumulative effects assessment for this EA includes the potential of the project to add to or disturb the historical releases of contaminants in areas of past operations, such as hydrocarbon contamination in soils. The cumulative effects assessment also includes the potential of the project to add to any ongoing socio-economic or cultural impacts resulting from past operations in the project area. Imperial has been operating on this site since 1919, and industrial operations intensified starting in 1985. The effects of the project in combination with legacy effects of Imperial's Norman Wells Operations to date, and from other past developments, need to be considered.

The baseline for evaluating cumulative effects is the environment without the proposed activity and all other past, present and reasonably foreseeable industrial activity. The Review Board is currently conducting an assessment of proposed closure and remediation of Imperial's Norman Wells oilfield facilities (EA2526-01). As described above in section 2.4, it will likely be more efficient and effective to evaluate and mitigate most cumulative effects (from the century of Imperial's past activities at this site) in the closure and remediation EA. For this EA, the Review Board does not expect Imperial to produce quantitative data regarding conditions before industrial activities began in 1919.

However, some concerns raised during scoping (and reflected in the Key Lines of Inquiry) are innately cumulative.[2] These concerns apply to currently proposed ongoing operations in addition to previous operations and may be reasonably assessed and mitigated in this EA. For these purposes, qualitative information, including information from Indigenous Traditional Knowledge, can be used where appropriate to describe the baseline setting prior to cumulative effects. If Imperial has relevant quantitative information about baseline conditions prior to the intensified operations of 1985, that could also help inform the cumulative effects assessment.

The developer will describe impact pathways by which a cumulative effect may occur and its potential spatial and temporal scope. It will identify any baseline trends relevant to cumulative impacts. The developer will identify mitigations for its contributions to cumulative effects and describe any residual cumulative effects.

## 3.5. Consider climate change

The referral of this project to EA included concerns about climate change. Climate change may affect the Norman Wells Operations through various pathways including increased wildfire risk, thawing

[1] The Review Board recognizes that closure of this same facility is a reasonably foreseeable future development. The current EA on the closure of the oilfield is intended partly to refine the proposed closure activities, so many details regarding the impacts of closure are not yet knowable. The Board recognizes this uncertainty with respect to the cumulative effects assessment for this EA.

[2] for example, concerns related to human health, or related to contaminants in traditional foods

permafrost, slope instability, changing ice scour, changing water levels, and others. Climate change can affect ecosystem health, community well-being, and the interrelationship between them. Indigenous peoples have a particularly intimate relationship with the environment and are more likely to experience these kinds of impacts. The Review Board will consider the effects of climate change on the project and the resulting impacts of failures or malfunctions. The Review Board will also consider the effects of the project on the environment in a changing climate.

When considering the effects of climate change on the project, the developer will assess the resilience and vulnerability of the project. This will identify and reduce risks to the environment and people from potential failures of important parts of the project (as identified in sections 4.1.1 and Appendix B p3). The developer will describe how its mitigations reflect climate adaptation, considering current climate trends and best climate predictions.

# 4. Key Lines of Inquiry

Key Lines of Inquiry describe the most important issues in the EA, which require the most rigorous analysis in the DAR. The developer will provide a stand-alone assessment for each of the following three Key Lines of Inquiry, to help parties understand the developer's predictions without having to correlate multiple documents. The developer is required to answer questions that relate to each Key Line of Inquiry. Appendix B provides more detail on the assessment work on various valued components (VCs) to answer the questions that relate to each Key Line of Inquiry. This requires predicting and evaluating project-specific effects on VCs, impacts on how the VCs interrelate in connected systems, potential accidents and malfunctions, and potential cumulative effects.

## 4.1. Using a holistic lens and systems thinking

Section 115 of the MVRMA requires the Review Board to have regard for the protection of the environment from significant adverse impacts, and the protection of the social, cultural and economic well-being of Mackenzie Valley residents and communities, as well as the importance of conservation to the well-being and way of life of Indigenous Peoples. Some of the most important concerns that parties identified during scoping were about potential impacts from the project that involve multiple interrelated parts of the environment, including elements from each of the areas specified by section 115.

This section describes three particularly important issues (the Key Lines of Inquiry). It requires the developer to consider how the impacts on interconnected VCs will affect these key lines of inquiry.

### 4.1.1. Protecting the Mackenzie River

The Mackenzie River (the Deh Cho) has intrinsic cultural and spiritual values to the Indigenous peoples of the Sahtú. The importance of the Mackenzie River must be considered during the assessment of water quality. The intent of this section is to help parties to the EA and the Review Board understand how the developer plans to protect Mackenzie River water in and around the project area so it remains:

- safe for people, aquatic life, and wildlife
- suitable for ongoing cultural use

Protecting water in and around the project area so that it remains safe and clean requires a holistic consideration of water quality, including surface and groundwater. It also requires a consideration of soil quality. The relationships between water and soil quality and other parts of the environment should inform the assessment of the key lines of inquiry. This includes consideration of:

- culture and spirituality
- Indigenous and other land uses
- human health
- fish and aquatic life, and
- waterfowl.

The DAR will describe the potential impacts from the project directly on surface water, groundwater and on other valued components. Considering the results of engagement, the developer will answer the following questions. These apply both to the impacts of the project and the cumulative impacts of the project in combination with past and current operations. (Appendix B describes requirements and detailed considerations for answering these questions).

- With the continuation of Imperial's operations, will water around and downstream of the project be clean and safe for people, waterfowl, fish and aquatic life, and wildlife?
- What is the risk of further spills to the Mackenzie River from ongoing operations, particularly given aging project equipment, including flowlines, and a changing climate (affecting conditions such as water levels and ice scour, extreme weather events, slope instability and wildfires)?
- How will the continued operations affect the quality and safety of drinking water, including downstream?
- Will the continued operations affect traditional uses of water by local Indigenous people?
- Will further changes to water quality from the continued operations lead to changes in the ways people traditionally use or experience the river (for example, due to changes in perceptions of the water, its aesthetic qualities [such as appearance, smell or taste] or its usability)?
- Will the continued operations further affect ground or surface waters in ways that might harm or otherwise cause adverse impacts to ecosystem functions?
- Will the continued operations affect the ability of local Indigenous people to take care of and steward the land and water, both now and in the future?[1]
- Will Imperial change its activities to avoid repeating any past impacts on water quality and related cultural well-being? If so, how?
- How will Imperial build or restore the trust of communities related to spills and contamination in the Mackenzie River,[2] and management responses to them?

[1] For example, will the project cause long-term impacts on the quality or quantity of water in the area, limiting the area's potential for rehabilitation and therefore ongoing stewardship? Will the project change the ability of local Indigenous people to access the land to directly observe any potential changes during operations?

[2] Scoping participants described concerns about trust, often (but not only) related to spills and contamination of the Mackenzie River, and related management responses and communication. Specifically, participants expressed concerns about:

- lack of historic transparency and engagement by Imperial on past activities

- How will continued operations affect creeks flowing into the Mackenzie River in Imperial's Proven Area?
- How will the continued operations affect the ecological integrity and cultural continuity of Ts'udé Niljné Tuyeta? [1]
- Will the spiritual significance of the Mackenzie River to Indigenous people be affected by continued operations?

### 4.1.2. Protecting traditional harvesting and the Indigenous way of life

Parties to the EA and the Review Board need to understand how Imperial plans to ensure that ongoing operations will not cause significant adverse impacts to traditional harvesting and the Indigenous way of life. Imperial will describe how it will ensure that ongoing operations will not affect or reduce:

- the safety of harvested species as healthy traditional foods
- traditional harvester's trust that harvested species are suitable for ongoing cultural use
- harvesting levels, practices, locations and timing, and the cultural benefits of harvesting[2]

Protecting traditional harvesting and the Indigenous way of life also requires consideration of the key line of inquiry keeping water safe and clean. Using the information required elsewhere in the ToR, and considering the results of engagement, the developer will answer the following questions. These apply both to the impacts of the project and the cumulative impacts of the project in combination with past and current operations.

- How will the continuation of Imperial's proposed operations change the quality and safety of traditionally harvested species downstream of the project?
- What is the risk of further spills to traditional harvesting and the Indigenous way of life?
- How will the continuation of Imperial's operations affect perceptions about, and trust in, the quality and safety of traditional foods? How could that affect the value of cultural resources and practices?
- Would the above affect harvesting levels or harvesting experiences? Could changes in harvesting influence cultural knowledge transfer across generations?

---

- lack of ability to influence Imperial's past project decisions
- lack of timely and full information regarding the breach of Line 490
- improper and undocumented disposal of waste and contaminants on site
- lack of trust in safety and cleanliness of downstream drinking water and traditionally harvested species
- disempowerment reducing the ability of Indigenous peoples to effectively monitor the project themselves and steward their own environment.

[1] Ts'udé Niljné Tuyeta, also known as "the Ramparts", is the Indigenous and territorial protected area downstream of Imperial.

[2] Assessing impacts of the project on cultural well-being includes considering impacts on intangible cultural resources, like language and customs, that help transmit culture, knowledge, skills and values between generations. It will require the developer to work with culture holders of individual Indigenous groups and communities to identify, characterize, and assess the impacts on culture.

- How will the continuation of the operation of the Norman Wells oilfield change the biophysical or human environment and affect culture (including cultural transmission and cultural intangibles)?
    - Will it affect people's ability to practice traditional harvesting of wildlife and plants?
    - Will it affect the subsistence economy and traditional sharing of food?
- How will the Project support traditional activities?
- Will Imperial change its proposed activities to avoid repeating any past impacts on traditional harvesting and related cultural well-being? If so, how?

### 4.1.3. Protecting health and well-being

The intent of this section is to help parties to the EA and the Review Board understand:

- how the ongoing operations of the Norman Wells oilfield will affect or contribute to the health and well-being of people and communities
- if and how the ongoing operations of the Norman Wells oilfield will support the economy and the current generation without compromising future generations

As part of assessing and understanding impacts on health and well-being, the developer should consider the impacts identified in the assessments of the other key lines of inquiry and the interconnections and pathways between current use of lands, social and economic well-being, health, and Indigenous culture.

Using the information required elsewhere in the ToR, and considering the results of engagement, the developer will answer the following questions. These apply both to the impacts of the project and the cumulative impacts of the project in combination with past and current operations.

- How will continued operations of the Norman Wells oilfield affect cultural well-being?
- How might human health be affected by any predicted changes to traditional harvesting and the availability, use, consumption and quality of traditional foods (which can lead to changes to cost of living, food security and food sovereignty)?
- Will continuation of operations support health and well-being of communities (as defined or described in community wellness plans or other available information)?
- What is the risk of further spills to human health and well-being?
- How will this project act cumulatively with past, present, and reasonably foreseeable projects in the area to affect social, health, cultural, and economic conditions?

Additionally, the developer will consider the following questions.

- How will the Project continue to affect social cohesion of families and communities?
- Will people's quality of life remain stable or improve because of the continuation of operations?
- Will the continued operations of the Norman Wells oilfield improve on the skills and training of local residents, for employment at the site and for similar future work?
- Will continuation of the Project improve on the capacity of local businesses, providing goods and services for continued operations?
- What are the social and economic implications of the "no-project alternative"? What would happen in Norman Wells and the Sahtú region if Imperial did not continue its operations as proposed?

# 5. Developer's Assessment Report general requirements

This ToR describes the general information required on a subject-by-subject basis so that the developer can produce an accessible, easy to read, stand alone *Developer's Assessment Report* that fulfills the requirements of the Review Board's *Document Submission Standards*.[1]

The developer should consider information gaps identified and questions raised by interested parties on the public record in scoping submissions and comments on the draft ToR to determine the appropriate level of detail in its Developer's Assessment Report (DAR) for specific issues. This section of the ToR describes some general, overarching topics that must be included in the DAR.

The developer is encouraged to seek clarification from the Review Board in writing if specific ToR requirements are unclear. The developer should provide rationale for any items it cannot address.

## 5.1. Summary materials

The DAR will contain the following summary materials:

- a plain language summary
- a detailed concordance table that specifically cross references each numbered item in the relevant ToR sections with its corresponding section and page number in the DAR and to any supporting documents
- a commitments table listing all mitigation measures the developer will undertake, including mitigations described in the project application. These should be organized by subject for easy reference (e.g. water quality, wildlife).[2]
- a table of contents for the DAR and all supplementary materials, including appendices, for placement on the Review Board's public registry.

## 5.2. Public engagement

The DAR will describe engagement with communities, Indigenous groups, governments or organizations with interests related to areas that might be affected by the project. Indigenous groups, government agencies and other interested parties have information useful to the conduct of this EA and all reasonable efforts should be made to engage with them. The use of interpreters during meetings in Indigenous communities is encouraged to allow for full participation and understanding by community members.[3]

[1] The use of maps, aerial photographs, development component/valued component interaction matrices, full explanation of figures and table, and an overall commitment to plain language is encouraged. When it is necessary to present complex or lengthy documentation to satisfy the requirement of the ToR, the developer should make every effort to simplify its response in the main body of the text and place supporting materials in appendices.
[2] This table of DAR commitments will be supplemented by an additional table of post-DAR commitments that includes commitments generated during the ensuing EA process. These two tables will help parties to understand what additional actions the developer will take to address concerns raised during the EA.
[3] Engagement will follow community governance and cultural protocols. Please see the Mackenzie Valley Land and Water Board Engagement and Consultation Policy, which the Review Board has adopted, for guidance.

Each community and Indigenous group has a different context and a different relationship between people and the land, which affects how they experience impacts. Understanding and assessing these impacts will require close work with communities and Indigenous groups. The Review Board expects the developer to engage with communities and Indigenous governments and organizations particularly when responding to the Key Lines of Inquiry on "Protecting traditional harvesting and Indigenous way of life" and "Protecting health and well-being".

The DAR's description of public engagement activities will include:

- an engagement log describing dates, individuals and organizations engaged with, mode and length of communication, discussion topics and positions taken by participants
- all commitments and agreements made in response to issues raised by the public during these discussions and how these commitments altered the planning of the project
- all issues that remain unresolved, documenting any further efforts envisioned by the parties to resolve them
- a description of all methods used to identify, inform, and solicit input from potentially interested parties and any plans the developer has for future engagement

The Review Board further encourages the developer to meet with interested groups outside the EA process. Any information from those discussions that may be relevant to the Review Board's decision should be submitted to the Review Board for inclusion on the public record.[1]

## 5.3. Developer Information

The developer will:

- describe how it will ensure that its contractors and subcontractors honor commitments made by the developer in the context of this EA
- provide environmental compliance records of other projects it has undertaken, including its history at the Norman Wells facilities
- provide a list of all policies, codes of practice, programs or plans concerning its environmental, sustainable development, community engagement, Northern hiring, and workplace health and safety policies, with corresponding descriptions of how they relate to the project
- provide a list of required regulatory authorizations or permits required for the project
- provide a list or map of project infrastructure, coded by age, and an associated schedule of maintenance and replacement activities

## 5.4. Project purpose, needs, and alternatives

The DAR will describe the purpose and need for the project, including what would happen if the project were not to go ahead (e.g. temporary closure and maintenance (shut-in) that would happen prior to closure and reclamation). Because this project is a continuation of ongoing activities, the Review Board requires information on alternatives within the project about repair or replacement options for

[1] Meeting report templates are available on the Review Board website.

damaged flowlines (including Line 490)[1] and the "go/no-go" options for Line 490. As described in section 2.1.1, without the replacement of Line 490, one third of the oilfield resources remains inaccessible, and may result in an early shut-in of the facilities if not enough gas can be produced from the remaining wells.[2] An early shut-in, as described in Imperial's applications to the Sahtú Land and Water Board and the Canadian Energy Regulator, could result in adverse impacts to Norman Wells.

## 5.5. Species at Risk

Species at risk in the NWT are subject to territorial and federal species at risk legislation and its requirements. Species at risk legislation requires developers to provide special consideration to species at risk in project planning. The federal Section 79 of the *Species at Risk Act* requires the Review Board to consider impacts to species at risk in its environmental assessments.

The developer will:

- describe the potential direct and cumulative (in combination with impacts from past, present and reasonably foreseeable developments) adverse effects of the project on species at risk listed under Schedule 1 of the Federal *Species at Risk Act* and, where applicable, its critical habitat (including its extent, availability and presence of biophysical attributes)
- describe all mitigation measures that will be taken to avoid or lessen the impact of the project on the species and its critical habitat
- describe the residual effects (after mitigation) that are likely to result, including the extent, duration and magnitude of effects.

## 5.6. Monitoring, evaluation, and follow-up

Monitoring helps the developer recognize problems early, before they cause significant adverse impacts, and can direct timely preventive measures to ensure that small problems do not grow into unacceptable ones. This can include effects of the project on the environment or on people, or effects of the environment on the project. To help detect and prevent significant adverse impacts on the environment and people, the Review Board will analyze the adequacy of monitoring and management programs.

The DAR will include follow-up, monitoring and adaptive management plans and programs. For each plan or program, the DAR will describe:

- responsibilities for data collection, evaluation and dissemination
- if and how project-specific monitoring will be compatible with any regional monitoring and research programs[3]

[1] Imperial is encouraged to include relevant assessment materials from the Line 490 EA (EA2425-01) when completing this work.
[2] The gas produced at the oilfield is used to generate power for the Norman Wells facilities. Without the gas, diesel would be required, which would make the oilfield uneconomical to operate.
[3] The developer should discuss and adopt common data collection and monitoring protocols with local and regional monitoring programs, including those of GNWT – ENR, to facilitate project impact analysis.

- how the plans adhere to adaptive management best practices[1]
- how these plans relate to regulatory and non-regulatory monitoring requirements for the life of the project
- how contingency and emergency plans will be updated to accommodate any new problems arising due to climate change.

See Appendix C for additional information on monitoring and management plans.

# 6. Conclusion

The Review Board anticipates that the requirements of this document will result in a Developer's Assessment Report that builds on material already presented in the developer's Water Licence and Operation Authorization renewal applications and in the environmental assessment proceedings of Line 490. The Review Board encourages Imperial to continue to engage and collaborate with Indigenous governments and organizations, potentially affected communities, and other parties in preparing its Developer's Assessment Report. The Review Board looks forward to a Developer's Assessment Report that provides a better understanding potential impacts and a solid basis for the EA going forward.

[1] See the WLWB document *Guidelines for Adaptive Management – a Response Framework for Aquatic Effects Monitoring* for more information.

# Appendix A: Inclusion of the Line 490 Replacement within the Norman Wells Operations environmental assessment – Rationale for inclusion

## *Summary*

In follow-up to Imperial's update on the adjournment of Line 490 (PR115), the Review Board has determined that the replacement and operation of Line 490 should be included within the scope of development for the Norman Wells Operations Environmental Assessment (EA2425-02). The environmental assessment of the Line 490 Replacement Project (EA425-01), continues to be adjourned at Imperial request, leaving a critical component of the Norman Wells oilfield without an active assessment pathway. Given this ongoing adjournment—and because Line 490 is operationally, economically, and functionally integral to the continued viability of the Norman Wells Operations—it is important to consider whether the Line 490 replacement should proceed either as an independent environmental assessment or be included within the scope of the Operations EA. As outlined in the attached rationale, the Line 490 replacement satisfies all three tests in the EIA Guidelines (dependency, linkage, and proximity), relies on a substantial existing public record, and is essential to avoiding project splitting and ensuring a complete, transparent, and realistic assessment of cumulative impacts on the Mackenzie River, traditional harvesting, and community well-being.

Line 490 is a critical component of the Norman Wells oilfield, providing the only flowline connection from Bear and Frenchy's Islands and Artificial Islands 5 and 6 to Goose Island and the mainland processing system. As Imperial has indicated in regulatory filings and in the Operations EA (PR68, pages 3 and 51), without Line 490 in operation, approximately one third of the oilfield production capacity remains inaccessible, which would compromise the long-term economic viability of operations and could result in an earlier than anticipated closure of the entire operations.

Including Line 490 within the scope of this EA reflects:

- the integrated nature of the components of the Norman Wells Operations,
- the intrinsic link between flowline functionality and ongoing production, and
- the Review Board's responsibility under the *Mackenzie Valley Resource Management Act* (MVRMA) to consider developments as they exist and function in reality, rather than in isolated or artificially segmented components.

At the same time, the Review Board recognizes that a substantial body of evidence already exists for the environmental assessment of Line 490 on the existing environmental assessment record under EA2425-01. The Board will rely heavily on information already submitted by the developer and parties to that process and will integrate that record into the Norman Wells Operations EA, without requiring unnecessary duplication of effort.

This rationale sets out how Line 490 will be treated within the EA, applying tests of dependency, linkage, and proximity It also describes the Review Board's flexibility to consider a separate or continuing assessment process in the future should Imperial or parties request this and the Board determine it is appropriate.

### *Rationale for inclusion: Dependency, linkage, and proximity*

**Dependency**

The entirety of the Norman Wells Operations cannot operate as proposed without the replacement of Line 490.

- The production facilities on Bear and Frenchy's Islands and the Artificial Islands 5 and 6 are currently shut-in solely due to the rupture of Line 490.
- Imperial has stated in regulatory filings that the oilfield becomes less economical without production from these wells, and in the absence of sufficient gas production from the remaining wells, the processing facility may require early closure.
- Imperial has applied to both the Canadian Energy Regulator and the Sahtu Land and Water Board for regulatory authorizations that include the entire production facilities, which includes the currently shut -in components of the operations that would require the replacement of Line 490.

These facts show that the development for Operations that is being proposed by Imperial includes the entire oilfield that depends on the repair of Line 490. Thus the Review Board has determined under section 117(1) and considering the dependence test in the *EIA Guidelines* that the scope of assessment should include operations and the replacement of Line 490 as they are mutually dependent components of a single functional development.

**Linkage**

Line 490 is physically and functionally linked to many components of the Norman Wells Operations, including:

- production flow from wells on Bear and Frenchy's Islands and Artificial Islands 5 and 6;
- gas supply for power generation and processing;
- the central processing facility operations;
- the operator's monitoring and management regimes.[22]

The Line 490 replacement is an important operational and economic component of the continued operation of the entire Norman Wells Operations. This satisfies the linkage test of the *EIA Guidelines*.

**Proximity**

The replacement of Line 490 involves work in and under the Mackenzie River — the same geographic and cultural landscape that is central to the operational EA's Key Lines of Inquiry (protection of the Mackenzie River, protecting traditional harvesting and Indigenous way of life, and protecting health and

[22] From an assessment perspective, these linkages mean that effects (such as risks to downstream water and soils from spills) stemming from Line 490 cannot be meaningfully separated from effects of the overall operations. Assessing them together ensures the Board considers the realistic pathways of impacts raised by Indigenous governments, communities, and technical parties.

well-being). Imperial's Line 490 work and ongoing operations are proposed work by the same developer, on the same oilfield, in the same timeframe. This satisfies the proximity test of the *EIA Guidelines*.

Spatial proximity between operational activities and the Line 490 corridor means:

- the same valued components could be affected;
- the same cumulative pathways and cultural concerns apply;
- climate change stressors (e.g., ice scour, water level changes) affect both components simultaneously.

Satisfying any one of the three tests under section 3.8 of the EIA Guidelines would be a reasonable basis for recognizing that the replacement of Line 490 should be part of the scope of development for ongoing operations. In this case, all three tests have been met. For these reasons, and the implications for conducting an effective assessment that assesses the whole development, inclusion of Line 490 in the Operations EA avoids project splitting, supports clarity in cumulative pathways, and maintains the integrity of the assessment.

### *Use of existing public record from the Line 490 EA in the Operations EA*

The Review Board has already conducted a substantial portion of the assessment of Line 490 under EA2425-01. To reduce duplication for Imperial, parties, and communities, the Review Board will:

1. Import into the operations EA (EA2425-02) all relevant findings, factual information, studies, and mitigation measures from the Line 490 EA (EA2425-01) record.
2. Rely on the full public registry for EA2425-01, including:
    - the developer's submissions,
    - technical review comments,
    - community input,
    - transcripts, and
    - procedural documents.
3. Require Imperial to update, for the purposes of the Operations EA, only those components of the Line 490 assessment that:
    - have changed since the earlier EA,
    - require integration with new operational information,
    - are directly influenced by new data from the rupture, or
    - are relevant to cumulative effects or overall systemic effects on Key Lines of Inquiry.

This approach preserves efficiency while ensuring completeness and continuity of assessment.

### *Maintaining assessment integrity*

Including Line 490 in this EA does not reduce the level of scrutiny applied to either:

- the Norman Wells Operations, or
- the Line 490 replacement.

The Review Board will ensure the assessment of Line 490 within the operations EA:

- meets or exceeds the level of analysis required under Part 5 of the MVRMA,
- fully addresses the Key Lines of Inquiry,
- maintains the transparency expected by communities, and
- respects the concerns identified in earlier scoping sessions.

Importantly, incorporating Line 490 into the broader operational EA does not pre-judge the significance determination for either development component. Both will be assessed on their merits, and the Board will continue to identify impact pathways holistically and cumulatively.

### *Flexibility for a future independent assessment of Line 490*

While the Review Board considers it necessary and appropriate at this time to include Line 490 in the Operations EA, the Board also recognizes the need for procedural flexibility.

If Imperial formally requests that the Line 490 Replacement Project be considered:

- as a distinct development,
- with its own standalone assessment track, or
- in a sequenced manner ahead of the full operations EA,

the Review Board retains the authority to adapt the process accordingly under the MVRMA.

Any such decision would be made:

- following consultation with Indigenous governments and organizations,
- based on the needs of parties,
- in consideration of the existing EA2425-01 record and any additional considerations of Line 490 within EA2425-02,
- and with an emphasis on fairness, transparency, and efficiency.

The Review Board may, if appropriate, generate a separate report or decision respecting Line 490 while continuing the broader operational assessment in parallel.

### *Avoiding project splitting and ensuring full EA coverage*

Including Line 490 within the operations EA ensures that the Review Board can fully understand:

- how the Norman Wells Operations function as an interconnected system,
- the real-world risks associated with flowline integrity and replacement,
- the cumulative effects of a century of operations combined with climate change, and
- the pathways of impact on traditional harvesting, cultural continuity, and health and well-being.

Treating the Line 490 replacement as separate at this stage would risk:

- artificially minimizing key linkages to operations,
- narrowing cumulative effects pathways,
- fragmenting issues raised in scoping sessions,

- weakening transparency in the eyes of communities, and
- producing an incomplete analysis of impacts on the Mackenzie River.

This approach maintains the integrity of both the Line 490 assessment and the operational EA.

### *Alignment with the public registry*

All information for both EAs is publicly available on the Review Board's registry. The Developer's Assessment Report (DAR) and related submissions will clearly cross-reference:

- the EA2425-01 Line 490 Replacement registry; and
- the EA2425-02 Operations registry.

Imperial will provide a concordance table showing where Line 490 information is integrated, and where updated or new information is provided. This ensures accessibility for parties and meaningful participation throughout the EA.

### *Conclusion*

Line 490 is a core operational element of the Norman Wells oilfield. Its inclusion in this EA is required to ensure the assessment is complete, realistic, and responsive to the concerns expressed by Indigenous governments, communities, and technical reviewers.

The Review Board will rely on the substantial information already developed under the Line 490 EA, while requiring Imperial to provide updated, consolidated, and integrated analysis within the DAR.

At the same time, the Board will retain flexibility to consider Line 490 as a distinct EA component in the future if requested and supported by parties.

This approach maintains:

- the integrity of the EA process,
- transparency and efficiency,
- consistency with the intent of the MVRMA, and
- clarity for all participants.

# Appendix B: Assessing impacts to support Key Lines of Inquiry

This appendix includes a combination of requirements, suggestions, and items for Imperial to consider related to assessing impacts from continued operations on several individual biophysical valued components (VCs). These predictions will form a basis for assessing the *combined* impacts on VCs in the holistic and systemic perspective, to credibly and holistically predict impacts on the Key Lines of Inquiry (section 4.1). Where appropriate, the developer should consider the biophysical impacts (Appendix B pp1-7) and how they relate to the impacts on people and communities (Appendix B pp.7-10).

## 1. Surface and groundwater quality and quantity

Water quality in the Mackenzie River is important for Indigenous and other land uses, drinking water and its connection to other VCs including fish and waterfowl. The Review Board and parties need to understand how the project could affect the quality and quantity of surface waters,[1] including any potential contamination of the Mackenzie River, and its tributaries in the Proven Area, from the Norman Wells Operations (including potential accidents and malfunctions per Appendix B p3).

**The DAR will identify, describe, and assess impacts of the project on surface water quality and quantity.** The DAR will analyze and describe changes to surface water at a scale and resolution that allows for the application of results to the assessment of impacts on other parts of the environment. At a minimum, the DAR will describe the contaminants to surface waters associated with the project, sources, their spatial and temporal extent (including potential loadings from proposed activities in combination with those of past activities). The results of this section will later provide part of the basis for assessing systemic impacts in section 4.1.1 (Key Line of Inquiry Protecting the Mackenzie River).

With respect to mitigations, the DAR will **describe the plans to mitigate** both anticipated and unanticipated adverse **impacts on surface waters**, including:

- the project elements, designs, tools and practices to limit, avoid or minimize adverse impacts to water resources
- strategies to manage cumulative effects resulting from Imperial's continued operations in combination with effects of other activities (such as Imperial's past impacts on water quality, or impacts from the airport and Town of Norman Wells)
- an estimate of how well Imperial expects each of these mitigations to work, including an assessment of the effectiveness of mitigations that Imperial has already implemented at its Norman Wells site and other oil and gas facilities it operates; include an assessment of the failure of Line 490
- a description of why these mitigations were selected
- spills, an assessment of a range of pertinent upset conditions[2], the potential impacts on the project, and any resulting impacts on VCs

[1] In this environmental assessment, "surface water" refers to water that is stored on or moves across the surface of the land.
[2] such as leaks, equipment malfunctions, line ruptures, corrosion failures, sticking valves, seal failures, or environmental conditions such as wildfires or ice scour that pose hazards to project components

- contingency plans for accidents and malfunction and analysis of potential impacts if contingencies fail

In this EA, "groundwater" refers to water that is stored, or moves, beneath the surface of the land.[1] The Review Board and parties need to understand how the project could affect the quality and quantity of groundwater in the regional study area. Some specific concerns raised during scoping include:

- The project potentially reducing groundwater quality that is already affected by past spills and wastes, and by re-injection of produced water
- Difficulties recognizing potential impacts of Imperial's operations in light of natural oil seepage
- accidents and malfunctions (including spills and leaks)

The DAR will consider the **impacts of continued operations on groundwater quality and quantity.** The DAR should analyze and describe changes to groundwater at a scale and resolution that allows for the application of results to the assessment of impacts on interrelated parts of the environment. The results of this section will later provide part of the basis for assessing systemic impacts in section 4.1.1 (Protecting the Mackenzie River).

The developer will consider:

- the contaminants associated with the project, including sources, their spatial and temporal locations and their potential flow paths (that is, groundwater seepage pathways, transport and fate of contaminants along ground and surface water pathways, including how they relate to specific on and off-site receptors) [2]
- anticipated physical and chemical changes to the receiving groundwater environment caused by continued project activities
- existing and conceptual monitoring programs for characterizing future groundwater quality, including principles of the monitoring and how the monitoring will be used to compare actual changes to the predicted effects

The developer will describe the plans to mitigate both anticipated and unanticipated adverse impacts on groundwater, considering:

- the project elements, designs, tools, and practices to limit, avoid or minimize adverse impacts
- strategies to manage the project's contribution to cumulative effects due to Imperial's past impacts on groundwater, and any other effects of other activities (such as at the airport and Town of Norman Wells) that could interact with impacts from the project.
- why these mitigations were selected
- how well Imperial expects these mitigations to work, and why
- contingency plans for upset conditions, and analysis of potential impacts if those contingencies fail.[3]

[1] This is intended to correspond to the definition in the NWT Water Regulation, as "all water in a zone of saturation below the land surface, regardless of its origin."
[2] If the developer considers attenuation mechanisms important to transport and fate of constituents of concern, mechanisms will be described in detail and supported by data.
[3] Upset condition can be defined as a sudden failure, breakdown, event or malfunction beyond the reasonable control of the operation, of any equipment or process that results in abnormal operations and requires correction.

## 2. Accidents and malfunctions

Accidents and malfunctions, and particularly risks of spills,[1] were a repeated concern described in all community scoping sessions. Spills relate to all three Key Lines of Inquiry. **Imperial will conduct a risk assessment of ongoing operations** using best practices, examining components, systems, hazards and failure modes, and carry this assessment forward to describe the potential impacts to all relevant valued components in Appendix B. This risk assessment should consider the impacts of such events in conjunction with the conditions at site that existed prior to the proposed ongoing operations.

The risk assessment will:

- identify spill risks, examining operations to identify points of vulnerability where spills could occur, including pipeline integrity.
- review historical spills over the past 20 years to provide an indication of spill likelihood, including an examination of past spill events at the Norman Wells Operations, and other similar operations in northern climates, to understand frequency, causes, and consequences.
- consider how current climate trends may affect the project design, the resilience of components, and the efficacy of any existing mitigations
- describe spill scenarios and assess the risks:
    - Develop plausible spill scenarios (e.g. pipeline rupture on land [surface or buried flowlines], pipeline rupture under the Mackenzie River, equipment malfunction).
    - Consider the age, past years of operation and condition of equipment that will be used by the proposed project in conjunction with past and current operations by Imperial when evaluating failure risks (e.g. flowline corrosion)
    - Describe initiating conditions for each scenario, and identify where initiating conditions (such as an extreme weather event or unusual river breakup) could cause multiple malfunctions.
    - Develop low-probability high-consequence spill scenarios, and well as high-probability low-consequence spill scenarios.
    - For both low-probability high-consequence and high-probability low-consequence risks, model potential environmental impacts (with a focus on the VCs in 2.2.2) to understand the potential impacts related to the Key Lines of Inquiry in section 4.
- assess likelihood, severity, and residual risk, taking into account proposed mitigation measures for each risk identified (see below)
- describe acceptability criteria for each risk
- assess consequences holistically

[1] For this Terms of Reference, the Review Board uses the word “spills” as defined in Imperial's *Spill Contingency and Response Plan*, to mean “any unauthorized discharge of petroleum hydrocarbons or other regulated substances to land, water, or air that is not fully contained within the facility’s normal operating systems. This includes: Crude oil, refined petroleum products, produced water, and chemicals used in operations; Releases from tanks, pipelines, wells, or equipment; and [includes] both reportable spills (meeting regulatory thresholds) and minor leaks that escape secondary containment”.

- provide rationale for criteria used for decisions on the various risks related to malfunctions and accidents
- describe water and tailings containment features, pumping systems, and detections systems used for early warning of spills
- Identify and evaluate mitigation measures:
    - Describe, in a brief narrative, the effectiveness of existing mitigations, including spill prevention systems, emergency response protocols, and containment infrastructure.
    - Identify gaps in the current mitigations and provide recommendations for improvement. Consider the rupture of Line 490 and the response protocols and mitigations that were in place during this evaluation and identification of improvements.
    - Provide an assessment of existing compliance with regulatory and industry standards related to spill prevention and response.

The Review Board acknowledges that much of this information is already held by Imperial through various regulatory proceedings. Imperial will compile and present this information in a format that is easily accessible and readable by parties.

# 3. Fish and aquatic life

Fish and aquatic life are VCs for this EA and relate to the Key Lines of Inquiry "Protection of the Mackenzie River" and "Protecting traditional harvesting and the Indigenous way of life". This VC includes fish habitat.[1] The Review Board has determined that the geographic scope of assessment for fish and aquatic life and habitat will include the Mackenzie River adjacent to the project and downstream, Bosworth Creek, and any other fish-bearing tributaries or the Mackenzie River in the Proven Area.

Impacts from the project to fish and aquatic life from the development could arise because of changes in surface water quality and groundwater quality (see Appendix B p1 or from spills (see Appendix B p3). These disturbances may result in changes to fish and fish habitat that could affect traditional and other land uses. The results of this section will later provide part of the basis for assessing systemic impacts in section 4.1.2 (Protecting traditional harvesting and the Indigenous way of life).

At a minimum, the developer will describe:

- any **impacts to fish (at all developmental stages) and fish habitat**, including calculations of any potential habitat loss or degradation, including from sedimentation and sediment contamination
- potential downstream effects to water and sediment quality, including in waterbodies identified as fish habitat and areas known for traditional fishing
- the potential for contamination of fish and bioconcentration of contaminants in fish downstream of the project, include potential for contamination and bioconcentration of contaminants in their prey
- methods for the prevention, management, and mitigation of impacts on fish, fish habitat and aquatic life and habitat, including all relevant monitoring and management plans

[1] As defined in subsection 2(1) of the *Fisheries Act*.

# 4. Waterfowl

The Mackenzie Valley[1] is one of North America's most traveled migratory corridors for waterfowl breeding along the Arctic Coast.[2] Traditional harvest of waterfowl (such as ducks and geese) is of particular importance to Indigenous groups in the vicinity of the project, as noted in community scoping sessions. Migratory birds are subject to considerations under the federal *Migratory Birds Convention Act, 1994*.[3] The results of this section will later provide part of the basis for assessing systemic impacts in section 4.1.2 (Protecting traditional harvesting and the Indigenous way of life). To understand potential impacts on this Key Line of Inquiry, it is necessary for the developer to **describe potential impacts on waterfowl.**

The developer will:

- describe the interactions between the continuation of the Norman Wells operations and waterfowl and their habitat due to project components and activities
- **predict potential effects of the project on waterfowl**, their eggs and nests – including on waterfowl species at risk (see section 5.5), priority Bird Conservation Region species, and those important to Indigenous and local communities. The developer will consider potential changes to:
    - habitats important for nesting, foraging, staging, overwintering, rearing and moulting
    - habitat due to loss, fragmentation or structural change. Provide maps showing important habitats that were considered, including riparian zones, wetlands and open waters
    - habitat use (including avoidance) and any change in diversity, abundance, density, and population
    - Important Bird Areas including the Middle Mackenzie River Islands (NT081) and the Lower Mackenzie River Islands (NT080), along the Western Central Flyway
    - mortality risk
    - relative abundance, distribution, and daily or seasonal movement patterns, due to disturbance (such as sound, artificial light, presence of workers), considering the critical periods for waterfowl (such as breeding, nesting, staging, stopover, migration and overwintering)
    - contaminants and bioaccumulation of contaminants, including any contaminants of concern in waterfowl that may be consumed by Indigenous communities
- provide an assessment of the availability of species of waterfowl for traditional use purposes. This will be detailed enough to carry results into the assessment of effects on the Key Line of Inquiry "Protecting traditional harvesting and the Indigenous the way of life". This assessment will consider community and Indigenous Traditional Knowledge.

[1] referring in this case to the hydrological valley of the Mackenzie River, not to the broader legal boundary described in the *MVRMA*

[2] https://www.canada.ca/en/environment-climate-change/services/migratory-bird-conservation/regions-strategies/description-region-6.html

[3] For clarity, the word "birds" in this ToR includes migratory birds.

# 5. Wildlife and wildlife habitat

To understand potential impacts to the Key Lines of Inquiry "Protecting traditional harvesting and the Indigenous way of life" and "Protecting health and wellbeing" the developer needs to understand **how the continued operations of the Norman Wells oilfield will affect wildlife and wildlife habitat** (excluding waterfowl and species at risk, which are included in other sections of this Terms of Reference). This will include a particular focus on harvested species.

The developer will describe:

- the effects that each project component and activity may have on wildlife and wildlife habitat, which will include:
    - potential direct and indirect effects to habitat, with a quantification of that effect
    - disruption or changes (daily or seasonally) to wildlife movements and migration patterns, population cycles, home ranges, distribution and abundance
- provide an assessment of the availability of species for traditional use purposes. This should be detailed enough to carry results into the assessment of effects to protecting traditional harvesting and the Indigenous way of life (section 4.1.2) and that takes into consideration community and Indigenous Traditional Knowledge.

The developer will describe overall how impacts to wildlife will be mitigated. A draft wildlife management and monitoring plan (WMMP)[1] should be included in the DAR. This plan should integrate population data and harvest levels.

# 6. Air quality

Changes to the air quality resulting from the Project can have adverse impacts on a wide range of valued components. The developer will **describe all airborne emissions and assess their effects** on the environment and people. The developer should:

- provide a description of emission sources of air pollutants from the Project including all point sources, fugitive sources, mobile sources, and road sources
- estimate annual volume of natural gas consumption for power generation
- conduct air dispersion modelling for the central processing facility, including the flare stack, to assess the impact of emissions on ambient air quality.
- provide a description of all the methods and practices that are currently employed along with others that may be deployed to reduce and control emissions

[1] as well as migratory birds, waterfowl, and others as determined in cooperation with GNWT

# 7. Soils

Impacts to soils can affect other VCs, and understanding the soils in the project area is also important for future closure planning. This is particularly true given the extended history of project activities in the area, and that the presence and locations of soils contaminated by hydrocarbons and other contaminants are not fully known. Although the closure and remediation of the site will be addressed in the closure EA (EA2526-01), preventing additional impacts to soils from continuing operations is part of this EA. The developer will **describe and evaluate the potential effects of the ongoing operations on soil**. The developer will consider:

- soil conditions
- areas of natural seepages
- areas of contamination, including biocells or other areas of progressive reclamation

# 8. Traditional harvesting

To understand the potential impacts of ongoing operations on the second Key Line of Inquiry (see section 4.1.2 Protecting traditional harvesting and the Indigenous way of life), the Review Board requires a thorough consideration of **how the project could affect traditional harvesting by nearby Indigenous groups.** Changes to traditional harvesting includes impacts on fishing, hunting, and trapping of wildlife, or gathering of plants for human uses (such as for food, medicine and ceremonial purposes). The developer will assess the following potential impacts of the project on traditional harvesting[1]:

- changes to harvesting and gathering practices, locations, timing, methods, and experiences
- changes to food security (access, availability, use and stability) and food sovereignty[2]
- changes to culturally important species or harvested species (considering the results of the water quality, fish, waterfowl, and wildlife assessments)
- changes to the perception of and connection to the land (including observed experience on the land) by traditional users, including any impacts on the safety, quality and health of the area

The developer should describe:

- methods used to collect information on traditional harvesting (particularly the involvement of Indigenous Governments, communities and groups)
- how the results of those methods were integrated into the assessment of impacts on the Indigenous way of life
- any mitigation of impacts on traditional harvesting, including mitigation of impacts to other related parts of the environment
- any mitigation relevant to addressing the lack of trust harvesters have that the water is clean and the land is healthy, including for traditional harvesting

[1] Section 4.1.1 describes issues related to scoping participants' trust in Imperial. Imperial should consider this context when preparing its responses.
[2] Food sovereignty refers to peoples' agency to self-determine their own food system.

# 9. Social and community conditions

The social and community characteristics of the places people live have a strong effect on their day to day lives. Although social and community impacts from a project could be direct, they can also be the result of indirect, additive changes to other parts of the environment. It is important to consider the results from all other relevant assessments in Appendix B to understand the social and community impacts that could result from the remaining years of operation. The developer will **assess how continued operations will affect social and community conditions**, including:

- how the continued operation of the Norman Wells oilfield affects social indicators, social structures and way of life
- social impacts of income inequity and uneven distribution of benefits, including intensification of social division or reduction of community cohesion in communities that might result from ongoing operations
- potential for ongoing operations to worsen existing social issues in communities (such as alcohol and drug use, prostitution, sexually transmitted infections, crime, gambling, domestic violence, ethnicity or gender-based violence, racism, housing pressures, education access/quality/level of completion)
- impacts on the safety of Indigenous and non-Indigenous women, girls, 2SLGBTQQIA+ and two-spirited people, and impacts on any other vulnerable groups[1]
- social and community impacts of the "no-project alternative" in Norman Wells and the Sahtú region if Imperial did not continue its operations as proposed

The developer should **describe any mitigation relevant to minimizing or avoiding impacts on social and community conditions**, including mitigations for other parts of the environment and mitigations specific to certain communities. This should include:

- any programs, policies, or commitments to protect and promote individual, family and community wellness.
- any policies and programs related to Imperial employees
- any need for new or expanded services, facilities, and infrastructure as a result of continued project-related impacts
- any plans or procedures for contributing to the maintenance of infrastructure used by the project or for working with local governments to limit impacts on social and community services

# 10. Economy and employment

Understanding how the continued operations of the Norman Wells oilfield will affect economics and employment is an important part of assessing the impacts on people, and is a necessary part of considering impacts on Key Line of Inquiry "Protecting health and well-being" (section 4.1.3). The project could continue to provide many beneficial economic impacts, and could also continue to contribute to

[1] For example, see Call to Justice 13.1 of the *Inquiry into Murdered and Missing Indigenous Women and Girls*.

certain adverse impacts (such as income inequity and social divisions, or undesirable changes to the non-wage traditional economy). The Review Board and parties need to understand the potential effects (both adverse and beneficial), as well as how those impacts will be distributed among communities, populations and vulnerable groups, and how any adverse impacts will be mitigated.

The developer will **assess the economic effects of the project on potentially affected communities** and populations. The developer should consider whether the project will make economic issues better or worse and describe any mitigation measures for adverse impacts, as well as any opportunities to enhance the benefits of the project and complement any other community goals or aspirations. The developer will describe employment and procurement opportunities, and any relevant current or forthcoming socio-economic initiatives or agreements.[1] The developer will also provide ten years of socio-economic performance data.

The developer will predict the impacts on economy and employment, considering the following:

- short and long-term direct, indirect and induced economic effects of the project
- availability of local workforce, considering both direct and indirect employment opportunities and contracting opportunities
- barriers to employing, retaining, or advancing Indigenous people and other northern residents, including how training and skill gaps that hinder employability for the project could be resolved
- how well communities and Indigenous peoples in the project area stand to benefit from direct and indirect contracting and business opportunities
- anticipated local, regional, and Indigenous participation compared to the total project requirements (for workers, wages and income, and contacts)
- anticipated direct, indirect and induced wages from the project
- products and services required during operations, including estimated procurement and contract values and how those opportunities will be attributed (including for local and Indigenous businesses)
- how the project would affect gross domestic product at the federal and territorial levels
- predicted government revenues from the project, including royalties and federal and provincial tax payments
- economic and employment impacts of the “no-project alternative” in Norman Wells and the Sahtú region if Imperial did not continue its operations as proposed

The developer will describe any mitigation relevant to minimizing or avoiding impacts or to enhance benefits on the economy and employment. These mitigations include those already in place. This may include:

- any practices, plans, or actions taken to increase education, training, hiring, and advancement of Indigenous people, poorly represented groups (such as women and single parents), or marginalized groups
- any initiatives to encourage advancement of Indigenous and NWT resident employees within the company

[1] If details of these agreements are confidential, Imperial will identify the existence of such agreements and provide a description of the topics covered in each agreement.

- any commitments to promoting gender parity
- any cultural awareness or competency training and how those programs were developed
- any plans, programs, or policies to encourage local and Indigenous contracting and procurement
- any additional mitigation measures to prevent adverse effects disproportionately affecting Indigenous and vulnerable groups
- any plans for actively soliciting and ensuring the confidentiality of complaints and encouraging suggestions, and how complaints and suggestions will be addressed
- any plans for annual reporting on hiring, employment, value of goods and services, participation in training, terminations, business forecasts or other information

# 11. Human health

"Protecting health and well-being" is a Key Line of Inquiry (see section 4.1.3). To understand how the project will affect people it is necessary to understand how it will affect human health.[1] This requires close work with communities and must consider the different context and experiences of Indigenous peoples and diverse or vulnerable subgroups in each community.

**The developer will assess potential impacts on human health**, considering interconnections between all the other VCs in this section. Once the most likely pathways of effects on human health have been identified, consider which determinants of health would be most appropriate for identifying changes. If necessary, identify new indicators that can detect changes from those pathways. The developer will use community-based health indicators or determinants and to understand impacts on health. The developer will describe which indicators or determinants of health were used for physical, mental and spiritual health, including:

- any specific indicators for Indigenous peoples or vulnerable subgroups (such as Indigenous women, youth, Elders and 2SLGBTQQIA+)
- any indicators, determinants of health, or community health priorities that were developed in conjunction with Indigenous groups

The developer will assess:

- how any predicted effects to water could affect human health (considering the results of the water quality assessment in Appendix B p1)
- any ways that contaminants from the project could be absorbed into traditional foods or introduced to inhabited areas. In doing so, consider the results of the surface and groundwater quality, air quality and soil assessments (Appendix B, pp.1, 6 and 7)
- any health impacts related to flaring

Other questions related to impacts on human health are included in section 4.1.2 (Protecting traditional harvesting and the Indigenous way of life). The assessment of potential impacts on human health will

[1] Human health refers to physical, mental, and spiritual health, which are also closely tied to community, environment and quality of life.

consider risks from and consequences of accidents and malfunctions (reflecting the results of Appendix B p3).

When describing mitigation, the developer should describe how mitigation measures were developed, including any collaboration with potentially affected communities or subgroups, and consider:

- whether any specific or separate mitigations will be required for non-Indigenous or Indigenous peoples, and for each Indigenous community
- which mitigations for other parts of the environment are also relevant to human health

# Appendix C: Assessment methodology

The developer will predict the impacts of ongoing operations for each Key Line of Inquiry (section 4), supported by answers to each of the questions related to each Key Line of Inquiry. Imperial will provide described detailed information on valued components (see Appendix B) needed to thoroughly answer those questions. The Key Lines of Inquiry rely on interconnected valued components.

When assessing impacts on the biophysical and human environment, the DAR will do the following:

1. Describe baseline conditions and trends, as described in section 3.1. For the cumulative effects assessment, describe the baseline for cumulative effects (where historic information is available- see section 3.4). Differentiate between natural fluctuations in conditions and the effects of human activity.
2. Identify predicted climate trends. When assessing predicted effects, the developer will consider reasonable climate change scenarios (high, medium and low) when predicting impacts of the project on valued components. Discuss how the changing climate may affect the development (such as a consideration of wildfire risks or changing water levels and ice scour in the Mackenzie River), and any resulting impacts on valued components.
3. Reflect on potential impacts, including those observed in the failure of Line 490, to identify the need for additional mitigation. Consider technical and economic feasibility and likely effectiveness to reduce or avoid the predicted impact. Discuss constraints, uncertainties and implementation challenges to the effective use of the developer's proposed measures and clearly identify all mitigation commitments. Include a description of any plans, strategies or commitments to avoid, reduce or otherwise manage and mitigate the identified potential adverse impacts, considering best management practices for the valued component or development component in question.
4. Identify potential interactions of the project with valued components and any potential direct and indirect residual impacts (that is, after the developer's proposed mitigation). Predict and assess potential project-specific impacts, holistic/systemic impacts and cumulative impacts on the valued components. When predicting impacts:
    a. Describe impact prediction methods and models (as applicable). Identify all analytical assumptions and where professional judgement was used. Identify and provide rationales for using quantitative or qualitative methods. Describe uncertainties and confidence levels for each prediction.
    b. Consider Indigenous Traditional Knowledge in impact predictions where appropriate.
    c. Describe causal mechanisms for each predicted effect.
    d. Compare the predicted project-specific impacts to the baseline, and predicted cumulative impacts to the baseline for cumulative effects.
    e. Use a methodology for characterizing residual impacts that includes:
        - nature of the impact
        - geographic extent
        - duration, timing and frequency of the impact
        - magnitude of the impact (what degree of change is expected)
        - reversibility of the impact
        - likelihood of the impact

- uncertainty associated with prediction

5. Include a cumulative impact assessment that assessed potential residual impacts from the proposed project in combination with the effects from other past, present and reasonably foreseeable human activities and developments. This should particularly consider the potential for impacts for the proposed ongoing operations to add to impacts from past or current operation of Imperial's Norman Wells Operations. The cumulative effect assessment will:
    a. identify the valued components of the environment affected by the development and by other human activities
    b. determine what other developments and activities could substantially affect those valued components
    c. predict the combined effects of the project in conjunction with the developments and activities identified in (b) above
    d. identify mitigations as needed to reduce or avoid significant cumulative effects.

    When doing (c) the developer will describe how a cumulative effect may occur and its potential spatial and temporal extent, and describe the baseline for cumulative effects.

6. For valued components where follow-up programs are proposed, present the impact predictions in a manner that facilitates the formulation of testable questions. When designing follow-up, consider timing of feedback loops and related information. Describe monitoring, evaluation, and adaptive management plans used to:
    a. detect potential unexpected changes
    b. ensure that EA predictions are accurate
    c. determine the effectiveness of mitigations
    d. proactively manage to prevent adverse impacts of uncertain likelihood and severity

The criteria described above will be used in the DAR as a basis for the developer's effects predictions.

The Review Board will make the ultimate determinations of significance after considering all the evidence on the public record in the EA. For additional information on the above criteria, please refer to Section 3.2 and Appendix H of the Review Board's *Environmental Impact Assessment Guidelines*.