



SCHEDULE C

(Waters Regulations *Subsection 5(1)*)

APPLICATION FOR LICENCE, AMENDMENT OF LICENCE, OR RENEWAL OF LICENCE

APPLICATION/LICENCE NO: _____
(*amendment or renewal only*)

1. NAME AND MAILING ADDRESS OF APPLICANT

TELEPHONE: _____ FAX: _____

2. ADDRESS OF HEAD OFFICE IN CANADA IF INCORPORATED

TELEPHONE: _____ FAX: _____

3. LOCATION OF UNDERTAKING

Latitude: _____ Longitude: _____

4. DESCRIPTION OF UNDERTAKING (*describe and attach plans*)

5. TYPE OF UNDERTAKING

- | | |
|----------------------|-----------------------------------|
| 1. Industrial _____ | 2. Mining and Milling _____ |
| 3. Municipal _____ | 4. Power _____ |
| 5. Agriculture _____ | 6. Conservation _____ |
| 7. Recreation _____ | 8. Miscellaneous (describe) _____ |

6. WATER USE

_____ To Obtain Water

_____ Flood Control

_____ To cross a watercourse

_____ To divert water

_____ To modify the bed or bank of a watercourse

_____ To alter the flow of, or store, water

Other (describe)

7. QUANTITY OF WATER INVOLVED (litres per second, litres per day or cubic metres per year, including both quantity to be used and quantity to be returned to source)

8. WASTE DEPOSITED (quantity, quality, treatment and disposal)

9. OTHER PERSONS OR PROPERTIES AFFECTED BY THIS UNDERTAKING

(give name, mailing address and location; attach a list if necessary)

10. PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION

11. CONTRACTOR AND SUBCONTRACTOR (names, addresses and functions)

12. STUDIES UNDERTAKEN TO DATE (attach list if necessary)

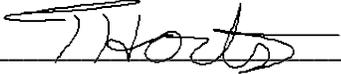
13. PROPOSED TIME SCHEDULE

Start Date: _____

Completion Date: _____

NAME: _____
(print)

TITLE: _____
(print)

SIGNATURE:  _____

DATE: _____

FOR OFFICE USE ONLY

APPLICATION FEE Amount: \$ _____

Receipt N^o.: _____

WATER USE DEPOSIT Amount: \$ _____

Receipt N^o.: _____

BACKGROUND

Imperial Oil Limited (Imperial) leased and operated the Tuktoyaktuk (Tuk) Base facility (the Site) starting in the early 1970s. The Site is on Inuvialuit 7.1 (a) Private Lands and is leased to Imperial by the Inuvialuit Land Administration (ILA). The current lease expires in 2024. The Site was constructed in the 1970s and operated as a staging and storage area for oil and gas exploration work. The Site is approximately 1.5 km southeast of Tuk and covers a land area of approximately 54 ha (Figure 1).



Figure 1: Project Site location relative to Tuktoyaktuk

Historically, the Site consisted of a camp, airstrip, fuel and equipment storage areas, warehouses and docks, along with associated infrastructure such as roads, a sewage lagoon and landfill and waste disposal areas. The Site was operated from the early 1970s to the mid-1980s.

In the early 1990s, most of the equipment and infrastructure were removed from the Site. Since then the following activities have been conducted at the Site to move it toward a complete clean-up:

- 2001: initial environmental site assessment;
- 2005 to 2006: debris clean-up and environmental site assessment;
- 2007 to 2008: removal of stored drilling muds, chemicals and debris;
- 2008 to 2011: ongoing environmental monitoring;
- 2011: demolition of remaining infrastructure (tank farm, buildings, pipelines, pilings, sleighs and other infrastructure); transportation and off-site disposal of waste at licensed facilities in British Columbia and Alberta; and
- 2012 to 2018: ongoing environmental monitoring.

Proposed Activities

In 2018, a Remedial Action Plan (RAP) outlining the remaining work to be completed on the Site was approved by the ILA. Imperial proposes to complete the work outlined in the RAP over the next three years. The project will consist of the following activities:

Remediation of Impacted Soil

Locations across the Site have been identified that require remediation of soil to meet environmental quality guidelines.

Soil remediation will consist of the following activities:

- constructing a contained soil-sorting and treatment area on-site;
- excavating soil from identified areas and transport to the treatment area;
- segregating soil into two different types – soil that can be treated on-site to reduce hydrocarbon concentrations and soil that must be transported off-site for further treatment or disposal;
- treating hydrocarbon-containing soil using a bioremediation method, which involves adding amendments including fertilizer and/or organic matter and mixing the soil within a constructed biopile;
- placing non-treatable soil into 1-m³ bags and staging this material in secondary containment for off-site transport and disposal at an approved, licenced facility;
- soil testing within the excavated area to confirm that contaminant concentrations in soil are below the required guidelines;
- soil testing of treated soil to ensure that contaminant concentrations in soil are below the required guidelines;
- testing and, if necessary, treatment prior to disposal of any water that accumulates in open excavations or that is contained within the soil treatment area; treatment may consist of a combination of aeration, carbon filtration or physical filtration; and
- backfilling excavations to grade with either clean, treated soil or other backfill material obtained from the Site.

Remediation of Former Landfills

Through previous investigations, two former buried landfill areas have been identified on-site. These landfills will be re-excavated and waste material will be placed within constructed and contained materials processing areas which will be established near the former landfill locations. Within these processing areas, materials removed from the landfill will be characterized, sorted and prepared for off-site transport and disposal at an approved, licenced facility. Any remaining soil will be sampled to ensure it meets the required guidelines before backfilling. The landfill excavations will be sampled to ensure that soil quality guidelines are met prior to backfilling.

Debris Removal

Previous investigations have identified numerous locations of surface debris across the Site. All visible debris within the Imperial lease area will be removed and processed for off-site transport and disposal

at an approved, licenced facility. There are also two concrete pads remaining on-site. The ILA has expressed interest in re-using this concrete for shoreline protection in and around the hamlet of Tuk. The pads will be sawed into manageable-sized slabs and the slabs will be transported to Tuk for re-use (after approval has been received).

Sewage Lagoon Decommissioning

A former sewage lagoon that serviced the operations is in the northeast portion of the Site. Decommissioning activities will include sampling of the water to ensure it meets discharge criteria followed by pumping. Once drained, the lagoon will be filled in using soil from the berms that were constructed around it.

Dock Removal

Two docks exist on-site along with remains of former wooden wharf pilings. The wooden wharf pilings will be removed along with the smaller of the two docks. The dock consists of steel sheet piling sections which will be extracted using a vibratory sheet pile extraction tool attached to a large excavator. The soil inside the dock area will then be excavated and placed on shore. The larger of the two docks may also be removed prior to the end of Imperial's lease, however no firm decision has yet been made to confirm this. If the large dock is removed, the methodology would be similar to that of the small dock.

Reclamation and Revegetation

Disturbed areas will be re-graded to blend into the surrounding landscape with exposed areas of permafrost covered as soon as practical to maintain structural integrity. The reclaimed areas will then be re-vegetated using a combination of natural revegetation and seeding of native species. Natural revegetation is the preferred option as it limits the introduction of invasive plant species that may be included in seed mixes. If seeding is required (e.g., to limit the potential for erosion), native seed mixes approved by the ILA will be used to avoid the establishment of invasive species.

Planning and Logistics

The activities described above are planned to be conducted in 2019 and 2020. Work will take place primarily in the summer season (July to September) each year requiring Site crew of up to 50 people at a given time. A self-contained barge camp will be docked at the Site to provide crew quarters and a staging area. Crew movements will be limited to shift changes (every two weeks) as well as a small supply boat which will be used to ferry supplies from Tuk. Camp greywater, sewage and solid waste will be contained within the barge and will be transported off-site for appropriate disposal. Other activities will include winter road construction across the bay to the Site to allow for re-supply as well as off-site transport and disposal of waste materials at licenced facilities. It is expected that off-season access to the Site will be limited to short (1-2 week) duration activities each winter.

Monitoring and Site Closure

It is expected that following the 2020 field season (and subsequent 2021 winter access) the site remediation will be complete, and the site can undergo a period of annual monitoring to ensure that all impacts have been remediated sufficiently, and that revegetation and site reclamation have been successful. It is expected that during this time from 2020 until the end of the lease in 2024, regular monitoring inspections and sampling will take place during summer months to ensure that the project objectives are being met and that the land has been restored as expected.

Resources	Potential Impacts	Proposed Mitigation
Sensitive terrain	Soil compaction / disturbance	Minimize overall vehicle use; use of existing on-site access roads wherever possible; restrict traffic to level terrain and avoid steep slopes; avoid shorelines; grade and re-contour borrow areas and backfilled excavation areas; revegetate reclaimed areas.
Permafrost	Permafrost melt	Implement project-specific Permafrost Monitoring Plan; exposed permafrost will be covered as soon as practical; on-site fill material will be used from an approved borrow area, which will be graded and re-contoured after use; impacted soil will be excavated from several areas and excavations will be backfilled with clean material and graded. A thermistor system was installed at the site which will monitor temperatures below and at ground level. Water that may collect in excavation areas will be tested, treated (if required) and pumped; excavation area floors will be sloped away from the side walls and if necessary drainage ditches will be installed.
Soil quality	Spills / contamination	Implement Emergency Response Plan and Spill Contingency Plan; keep spill response equipment on hand; use drip trays for refuelling at designated refuelling areas and under parked equipment; use doublewalled tanks; use berms and liners for fuel storage areas; use impermeable liners for contained soil-sorting and treatment area.
Vegetation communities	Disturbance / removal of localized vegetation patches / introduction of non-native species	UTVs, trucks and equipment will travel on existing access trails whenever possible; avoid vegetated areas and areas potentially containing sensitive vegetation species; avoid low shrubs and taller vascular plants (if present); areas where impacted soil will be excavated and at the borrow area – topsoil (if existing) will be salvaged and replaced to facilitate natural re-vegetation. Re-vegetate reclaimed areas by natural revegetation and seeding of native species; if seeding, only native seed mixes approved by ILA to be used to avoid establishment of non-native species. If equipment is transported to site from other areas (outside of Tuktoyaktuk), thoroughly wash it prior to entering site; identify listed plant species in area and avoid disturbance.
Barrenground caribou (Cape Bathurst and Tuktoyaktuk Peninsula Herds)	Sensory disturbances	Use of Wildlife Monitors; cease work if caribou spotted within 500 m and resume only when they move out of the Project area; implement the project-specific Wildlife Encounter Management Plan; fence off excavation areas before they are backfilled.
Polar bears, grizzly bears	Sensory disturbances; negative human-bear encounters	Use of Wildlife Monitors and appropriate deterrent measures; train staff in bear awareness; cease work if bears spotted; maintain clean work areas with appropriate bear-proof containers; fence off excavation areas before they are backfilled; implement the project-specific Wildlife Encounter Management Plan.
Waterfowl	Sensory disturbances; habitat disturbance / loss; possible hunting interference.	Implement mitigation for vegetation to limit the disturbance to potential nesting habitat; any active nests that are encountered will be avoided; implement the project-specific Wildlife Encounter Management Plan; advise HTC of any possible interference with traditional hunting.
Water quality	Disturbance of sediment / increase in turbidity / contaminant spills into or nearby water bodies.	Minimize overall vehicle use; restrict traffic to level areas and avoid steep slopes; avoid shorelines; dewatering of lagoon will be onto surrounding terrestrial environment; implement Emergency Response Plan and Spill Contingency Plan; keep spill response equipment on hand; fuel and hazardous materials will be kept in specified, bermed, lined areas more than 100 m away from high water marks; erosion control measures will be at the Site and installed where applicable (e.g., mats, blankets, silt curtains).
Archaeological / heritage resources	Disturbance	Archaeological impact assessment was completed for lease area; one site was recorded outside of the lease area; workers will be made aware and site will be fenced; if additional suspected sites should be encountered, the Prince of Wales Northern Heritage Centre will be informed.
Socio-economic resources	Community wellness	Crews will be housed on barge camp operated by local contractor; hiring of local contractors, equipment, equipment operators, field assistants, Wildlife Monitors

Resources	Potential Impacts	Proposed Mitigation
		and Environmental Monitors; ongoing community engagement on progress of remediation works and issues encountered.

12. Studies Undertaken to Date

- Advisian, 2017. 2015-2016 Phase II Environmental Site Assessment - Tuk Base, Tuktoyaktuk, NT. Prepared for Imperial. Ref. 407074-00293-500. May 25, 2017.
- Advisian, 2017. Tuk Base: 2017 UAV Magnetic Survey and Debris Search Report. Prepared for Imperial. Ref. 407074-00293-600. October 5, 2017.
- Advisian, 2018. Tuk Base: Proposed Remediation Guidelines. Prepared for Imperial. Ref. 407074-00293-600. January 31, 2018.
- Advisian, 2018. Tuk Base 2018 Soil Assessment. Prepared for Imperial. Ref. 407074-00293-702. October 26, 2018.
- Advisian, 2018. Tuk Base: Remedial Action Plan. Prepared for Imperial. Ref. 407074-00293-701. October 30, 2018.
- Advisian, 2018. Tuk Base – Wharf D3 and Small Wharf, Level II Condition Assessment. Prepared for Imperial. Ref. 407074-00293-702. November 8, 2018.
- Advisian, 2018. Tuktoyaktuk Base - 2018 Thermistor and Groundwater Monitoring Update. Prepared for Imperial. Ref. 407074-00293-702. November 22, 2018.
- Komex (Komex International Ltd.), 2001. Phase I and II Site Characterization Investigations at Tuktoyaktuk Base Camp. Prepared for Imperial. August 2001.
- Lifeways (Lifeways of Canada), 2018. Archaeological Impact Assessment, Former Imperial Oil Limited Oil & Gas Exploration Logistics Base near Tuktoyaktuk, NWT. (Permit No. 2017-022). January 2018.
- WorleyParsons (WorleyParsons Canada Services Ltd.), 2012. Hazardous Materials Survey at Esso Tuk Base, Tuktoyaktuk, Northwest Territories. Prepared for Imperial. July 17, 2012.
- WorleyParsons (WorleyParsons Canada Services Ltd.), 2013. Preliminary Phase II Environmental Site Assessment, Tuktoyaktuk Base Camp. Prepared for Imperial Oil. November 4, 2013.
- WorleyParsons (WorleyParsons Canada Services Ltd.), 2013. 2011 Tuk Base Demolition, Tuktoyaktuk Base Camp. Prepared for Imperial Oil. July 26, 2013.
- WorleyParsons (WorleyParsons Canada Services Ltd.), 2014. 2013 Electromagnetic Investigation, Tuktoyaktuk Base Camp. Prepared for Imperial Oil. Ref. 307074-01938-200. May 22, 2014.
- WorleyParsons (WorleyParsons Canada Services Ltd.) 2015. Phase I Environmental Site Assessment – Tuktoyaktuk Base Camp. Prepared for Imperial Oil. April 21, 2015.
- WorleyParsons Komex, 2008. 2007 Assessment and Decommissioning Activities, Tuktoyaktuk Base Camp. Prepared for Imperial Oil. Ref. C54600200. April 8, 2008.

Water Use Fees Calculator:

Northwest Territories Waters Regulations s. 9(1)(a), (b), and (c)

AGRICULTURAL UNDERTAKING

Enter the volume of authorized water use (m³/year)

Calculated Annual Water Use Fee (\$)

INDUSTRIAL, MINING and MILLING or MISCELLANEOUS UNDERTAKING

Enter the volume of authorized water use (m³/day)

Enter the volume of authorized water use (m³/year)

Calculated Annual Water Use Fee (\$)

POWER UNDERTAKING

Identify the class of Power Undertaking (0, 1, 2, 3, 4, 5, 6)

For class 6 Power Undertakings enter the authorized output (kW)

Calculated Annual Water Use Fee (\$)