

**Type A Water Licence S13L1-007 AMENDMENT
Imperial Oil Resources (N.W.T.) Ltd.
Norman Wells Operations – Waste Management Facility**

DRAFT

Table of Contents

- Part A: Scope and Defined Terms
- Part B: General Conditions
- Part C: Security
- Part D: Water Use
- Part E: Construction
- Part F: Waste and Water Management
- Part G: Operation and Maintenance of Structures and Facilities
- Part H: Spill Contingency Planning
- Part I: Aquatic Effects Monitoring
- Part J: Closure and Reclamation

Schedules

- Schedule 1: Annual Water Licence Report (Part B)
- Schedule 2: Security Requirements (Part C)
- Schedule 3: Waste Management Facility Design and Construction Plan (Part E)
- Schedule 4: Groundwater Management Plan (Part F)
- Schedule 5: Flowline Integrity and Mackenzie River Breakup Report (Part G)
- Schedule 6: Aquatic Effects Monitoring (Part I)
- Schedule 7: Closure and Reclamation (Part J)

Annex A: Surveillance Network Program (SNP)

- Part A: Reporting Requirements
- Part B: Quality Assurance and Quality Control
- Part C: Site Descriptions – Location of Surface Water SNP stations
- Part D: Sampling and Analysis Requirements for Surface Water SNP stations
- Part E: Surface Run-Off Facility Categories and Locations
- Part F: Sampling and Analysis Requirements for Surface Water Run-Off Facilities
- Part G: Groundwater Monitoring Wells – Description and Location
- Part H: Sampling and Analysis Requirements for Groundwater Monitoring Wells
- Part I: Flow, Volume, and Temperature Measurement Requirements

Annex B: Concordance Table of Items Requiring Submission

Annex C: Table of Revision History

Blue Highlight = Conditions required to support the Amendment

Grey Highlight = Conditions to reflect previous Board Decisions/Directions (see Summary of Board Decisions/Directions Table for supporting rationale – **(BDD – Item No.)**)

Yellow Highlight = Conditions to reflect Consequential Changes and to provide Administrative Clarity (following new Standard Water Licence Condition Template)

Red Highlight = Existing condition moved to a new section

Green highlighting = indicates where staff Fill in or Customize

Part A: Scope and Defined Terms

Scope:

1. This Licence entitles the Licensee to use Water and deposit Waste for Industrial undertakings in oil and gas production, closure and reclamation, and associated uses within the Norman Wells Proven Area located within the municipal boundaries of the Town of Norman Wells, Northwest Territories. **SCOPE**

The scope of this Licence includes the following:
 - a) Withdrawal of Water from the Mackenzie River for oil and gas production activities;
 - b) Operational and maintenance dredging;
 - c) Depositing of Waste to a Waste Management Facility;
 - d) Construction, operation, maintenance, and monitoring of the Waste Management Facility; and
 - e) Progressive Reclamation and associated Closure and Reclamation activities.

(NOTE: the scope does not include final Closure of the Operation)
2. The scope of this Licence is as described in the Preliminary Screening for S13L1-007 Amendment Application, dated [enter full date of most recent preliminary screening for the project]. **SCOPE – PRELIMINARY SCREENING**
3. This Licence is issued subject to the conditions contained herein with respect to the use of Water and the deposit of Waste in any Waters or in any place under any conditions where such Waste or any other Waste that results from the deposits of such Waste may enter any Waters. Any change made to the Mackenzie Valley Resource Management Act and Mackenzie Valley Federal Areas Waters Regulations that affects licence conditions and defined terms will be deemed to have amended this Licence. **LEGISLATION SUBJECT TO CHANGE**
4. Compliance with this Licence does not relieve the Licensee from responsibility for compliance with the requirements of any applicable federal, territorial, Déjñę, or municipal legislation. **LEGISLATIVE COMPLIANCE**

Defined Terms:

Act – the *Mackenzie Valley Resource Management Act*.

Action Level – a predetermined qualitative or quantitative trigger which, if exceeded, requires the Licensee to take appropriate actions. (BDD Item No. 12)

Acute Lethality – an effluent which is deemed acutely lethal if the undiluted (100%) effluent kills 50% or more of the fish or *Daphnia* in the test. (Biological test method: Acute Lethality Test using Rainbow Trout EPS 1/RM/9 July 1990), and (Biological Test Method: Acute Lethality of effluents to *Daphnia magna* EPS 1/RM/14 second edition December 2000), as may be amended from time to time.

Analyst – an Analyst designated by the Minister under subsection 84(2) of the *Mackenzie Valley Resource Management Act*.

Aquatic Effects Monitoring Program (AEMP) – a monitoring program developed for the Project in accordance with this Licence and the MVLWB/GNWT *Guidelines for Aquatic Effects Monitoring Programs*. (BDD Item No. 22)

Artificial Islands – the physical structure of the constructed islands, including the sand core, slope, and scour protection, drilling equipment and supplies, storage facilities, well head equipment, and temporary or permanent buildings.

Average Concentration – the arithmetic mean/discrete average of twenty-eight consecutive analytical results, as submitted to the Board in accordance with the sampling and analysis requirements specified in the Surveillance Network Program.

Bathymetric Survey – a type of hydrographic (water-based) survey that maps the depths and shapes of underwater terrain and features to illustrate the land that lies below.

Biocell – comprises the area or engineered cells designed for the treatment of hydrocarbon contaminated soil through biological processes by degradation of contaminants. The bioremediation process may involve the addition of water and nutrients, as well as aeration through mechanical processing.

Board – the Sahtu Land and Water Board, established under Part 3 of the *Mackenzie Valley Resource Management Act*.

Central Processing Facility – the plant where oil, gas, and Produced Water are collected from the Oilfield and separated, with plant cooling being accomplished using Mackenzie River Water.

Closure Cost Estimate - an estimate of the cost to close and reclaim the Project.

Closure Criteria - standards that measure the success of selected closure activities in meeting closure objectives. Closure criteria may have a temporal component (e.g., a standard may need to be met for

a pre-defined number of years). Closure criteria can be site-specific or adopted from territorial/federal or other standards and can be narrative statements or numerical values.

Closure Objectives - statements that describe what the selected closure activities are aiming to achieve; they are guided by the closure principles. Closure objectives are typically specific to project components, are measurable and achievable, and allow for the development of closure criteria.

Closure and Reclamation – the process and activities that facilitate the return of areas affected by the Project to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and human activities.

Closure and Reclamation Plan (CRP) – a document, developed in accordance with this Licence and the MVLWB/AANDC *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*, that clearly describes the Closure and Reclamation for the Project.

Commercial Operations – the period of oil production.

Component-Specific Closure and Reclamation Plan (Component-Specific CRP) – a document, developed in accordance with this Licence and the MVLWB/AANDC *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*, that clearly describes the Closure and Reclamation for a component of the Project.

Construction – any activities undertaken during any phase of the Project to construct or build any structures, facilities or components of, or associated with, the development of the Project.

Cover – A physical barrier (cap) designed to prevent surface Water contact with contaminated materials below.

Discharge – a direct or indirect deposit or release of any Water or Waste to the Receiving Environment.

Drilling Fluid – any liquid or liquid mixture, including, but not limited to clay, Water, sediment, hydrocarbons, or additives, that is pumped down-hole while drilling.

Drilling Waste – Waste material specifically produced from drilling activity.

Effluent – a Wastewater Discharge.

Effluent Quality Criteria (EQC) – numerical or narrative limits on the quality or quantity of the Waste deposited to the Receiving Environment.

Engagement Plan – a document, developed in accordance with the MVLWB *Engagement and Consultation Policy* and the *Engagement Guidelines for Applicants and Holders of Water Licences and Land Use Permits*, that clearly describes how, when, and which engagement activities will occur with an affected party during the life of the Project. **(BDD Item No.1)**

Engineer of Record - a qualified Professional Engineer who is responsible for the design and performance of the Waste Management Facility.

Engineered Structure – any structure or facility related to Water Use or the deposit of Waste that is designed by a Professional Engineer, including but not limited to the Waste Management Facility associated with the Project.

Environmental Protection Plan – A document that summarizes Imperial’s approach to environmental management for the Norman Wells Operations, and includes a description of environmental aspects, protection and mitigation measures, and sets out the procedures, practices, resources, and monitoring necessary to manage hazards and to protect the environment from proposed work or activity as required by section 9 of the Canada Oil and Gas Drilling and Production Regulations.

F-31X Treatment and Injection Facility – the on-site facility comprised of a solid/liquid separation system and the F-31X injection well, and used for downhole disposal of treated liquid materials, including Produced Water, hydrovac materials, impacted snow, diluted well workover materials, Water from Surface Water Run-off Facilities that do not meet EQC, Biocell Sump Runoff, diluted chemicals, and Leachate generated from the WMF.

Flare Pit Area – a Long Term Management Area located north of Battery 3 with anthropogenic salt impacts that extend into the underlying bedrock.

Flowline – a line that is used to transport fluids from a well to the Central Processing Facility, or vice versa, and includes intrafield export and all gathering lines.

Grab Sample – an instantaneous sample of Water.

Groundwater – as defined in section 2 of the Mackenzie Valley Federal Areas Waters Regulations: all water in a zone of saturation below the land surface, regardless of its origin.

Groundwater Management Plan – A plan that describes the sampling, testing and analysis procedures for the Groundwater Surveillance Network Program wells in and around the Norman Wells Operation, to monitor for changes that may indicate an impact from operations, and the Response Plan that outlines actions to be taken in the event of an exceedance of Action Levels, and includes the Quality Assurance and Quality Control Plan for the Groundwater sampling program.

Groundwater Treatment Facilities – a system designed to collect and treat contaminated Groundwater.

Hazardous Waste - a Waste which, because of its quantity, concentration, or characteristics, may be harmful to human health or the environment when improperly treated, stored, transported, or discharged.

(what definition is being used for hazardous waste? Hydrocarbon contaminated soil and Leachable Waste may be considered hazardous in NWT; but CEPA definition does not apply to contaminated soils from Imperial site).

Impermeable Lined Diked Areas – an area enclosed by a dike incorporating a synthetic liner that is considered to be impermeable to leakage for the purposes of completely containing all Drilling Fluids and Drilling Wastes within the diked and lined area.

Independent Review Panel – a group of experts not previously involved in or responsible for the design, operation, or Construction of the Waste Management Facility, as established pursuant to this Licence.

Inspector – an Inspector designated by the Minister under subsection 84(1) of the *Mackenzie Valley Resource Management Act*.

Liner – A membrane designed to prevent the transfer of Water.

Long Terms Management Areas (LTMAs) – containment sources or zones exhibiting liabilities that, by their nature, will likely require long term or indefinite in-situ management. LTMAs include, but are not limited to, the Refinery Bank Area and the Flare Pit Area.

Leachate – Liquids produced by contact with contaminated soil or materials.

Leachate Collection System – A system of tubes placed above a liner designed to gather Leachate from the bottom of the Waste Management Facility.

Licensee – the holder of this Licence.

Mackenzie Valley Federal Areas Waters Regulations – the regulations proclaimed pursuant to section 90.3 of the *Mackenzie Valley Resource Management Act*.

Mainland Sumps (MLS) Area – the area located north of Canol Drive, established in 1992, and used until 2007, for storage/disposal of drilling and well servicing Wastes, consisting of the Northern Sumps (6), the Mainland Drilling Sump, and the Well Services Sump, and known to be contaminated with petroleum hydrocarbons (PHCs -benzene, F1 to F4), polycyclic aromatic hydrocarbons (PAHs), salinity, and metals. Sump management activities include fluid removal, backfilling, remediation, and capping since 2012.

Maximum Average Concentration – the concentration of a parameter that cannot be exceeded by the running average of any four consecutive analytical results.

Maximum Grab Concentration – the concentration of a parameter that cannot be exceeded in any one analytical result.

Minister – the Minister of **Northern Affairs**.

Natural Islands – Bear, Goose, and Frenchy's Islands, including drilling equipment and supplies, Waste and storage facilities, well-head equipment, and temporary or permanent buildings.

Non-Aqueous Phase Liquids (NAPLs) – organic liquid contaminants of petroleum hydrocarbons, that do not dissolve in, or easily mix with, water. NAPLs tend to contaminate soil and Groundwater for very long periods of time and are considered persistent organic pollutants (POPs).

Norman Wells Proven Area – the Proven Area identified in the *Proven Area Agreement* between Canada and Imperial Oil dated July 21, 1944, as amended.

Oilfield Reservoir – all producing and non-producing wells located within the Norman Wells Proven Area.

Ordinary High-Water Mark – the usual or average level to which a Watercourse rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing Watercourses (rivers, streams), this refers to an active channel/bank-full level, which is often the 1:2-year flood flow return level. In inland lakes, wetlands or marine environments, it refers to those parts of the Watercourse bed and banks that are frequently flooded by Water so as to leave a mark on the land and where the natural vegetation changes from predominantly aquatic vegetation to terrestrial vegetation (excepting Water tolerant species). For reservoirs, this refers to normal high operating levels (full supply level).

Potential Contaminants of Concern (PCOC) – primary indicator parameters of the Norman Wells Operation including chloride, benzene, toluene, ethylbenzene, and xylenes (BTEX).

Produced Water – Waters naturally present in the reservoir or injected into the reservoir to enhance production and is produced as a co-product when gas or oil is produced.

Professional Engineer – a person registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists to practice as a Professional Engineer in the Northwest Territories as per the territorial *Engineering and Geoscience Professions Act* and whose professional field of specialization is appropriate to address the components of the Project at hand.

Progressive Reclamation – Closure and Reclamation activities conducted during the operating phase of the Project.

Project – the undertaking described in Part A, Conditions 1 and 2.

Quality Assurance & Quality Control Manual – the manual that outlines the steps and procedures for sampling and testing of Water for the Surface Water Surveillance Network Program.

Receiving Environment – the natural environment that, directly or indirectly, receives any deposit of Waste from the Project.

RECLAIM – the Crown-Indigenous Relations and Northern Affairs Canada's model for estimating Closure and Reclamation costs.

Reclamation Research – literature reviews, laboratory or pilot-scale tests, engineering studies, and other methods of resolving uncertainties and answering questions pertaining to environmental risks for the purpose of providing data and information that will reduce uncertainties for closure options, selected closure activities, and/or closure criteria.

Refinery Bank Area – a Long Term Management Area located on the Mainland at the Refinery Bank area, that exhibits the impacts of refined hydrocarbon products that were released from underground distribution lines used to move product from the refinery to the dock.

Refinery Bank Area Groundwater Redediation System – the groundwater /product containment and recovery system that removes Non-Aqueous Phase Liquids (NAPLs).

Remediation – the removal, reduction, or neutralization of substances, Wastes, or hazardous materials from a site in order to prevent or minimize any adverse effects on the environment and public safety, now or in the future.

Representative Grab Sample – a Grab Sample consisting of equal portions of Water collected from a minimum of two locations within one site.

Response Framework – a systematic approach to responding to the results of a monitoring program through adaptive management actions. (BDD Item No. 12)

Response Plan – a document describing the actions that will be taken by the Licensee in response to an Action Level exceedance. (BDD Item No. 12)

River Ice Breakup – the period from the time the ice first starts to move in the Mackenzie River at Norman Wells in the spring, to the time when the river is free of pack ice at Norman Wells.

Runoff – the overland flow of Water or Wastewater that occurs when precipitation, meltwater, or other Water is not absorbed by the land.

Seepage – any Water or Waste that drains, passes through, or escapes from any structure designed to contain, withhold, divert, or retain Water or Waste.

Settling Pond – any above or below-grade natural or human-made depression designated for separating solids from Water or Wastewater.

Single Composite Sample – a sample composed of proportional sub-samples taken over a time period acceptable to an Inspector, as approved by the Analyst, and submitted to the Board in accordance with the sampling and analysis requirements specified in the Surveillance Network Program.

Soil Washing Facility – a facility designed to treat salt impacted materials/soils (BDD Item No. 2)

Spill Contingency Plan (SCP) – a document developed for the Project in accordance with INAC's *Guidelines for Spill Contingency Planning*.

Sump – a human-made excavation or a natural depression designated for depositing Water and/or Waste.

Surface Water Run-Off Facilities – those locations referred to in Annex A, Part E and identified as Category A, Category B, and Category C.

Surveillance Network Program (SNP) – a monitoring program required by this Licence and detailed in Annex A.

Traditional Knowledge – the cumulative, collective body of knowledge, experience and values built up by a group of people through generations of living in close contact with nature. It builds upon the historic experiences of a people and adapts to social, economic, environmental, spiritual, and political change.

Unauthorized Discharge – a Discharge of any Water or Waste not authorized under this Licence

Waste – as defined in section 51 of the *Mackenzie Valley Resource Management Act*:

any substance that would, to an extent that is detrimental to its use by people or by any animal, fish or plant, degrade or alter or form part of a process of degradation or alteration of the quality of any water to which it is added. Alternatively, it means any water that contains a substance in such a quantity or concentration or that has been so treated, processed or changed, by heat or other means, that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that other water to which it is added. It includes:

- a) any substance or water that is deemed, under subsection 2(2) of the *Canada Water Act*, to be waste;
- b) any substance or class of substances prescribed by regulations made under subparagraph 90.3(1)(b)(i);
- c) water that contains any substance or class of substances in a quantity or concentration that is equal to or greater than a quantity or concentration prescribed
- d) in respect of that substance or class of substances by regulations made under subparagraph 90.3(1)(b)(ii); and
- e) water that has been subjected to a treatment, process or change prescribed by regulations made under subparagraph 90.3(1)(b)(iii).

Waste Management Facility (WMF) – the Waste storage area(s) and Engineered Structures designated for the disposal of non-hazardous Waste, comprised of a base Liner system, a Cover system, and a Leachate Collection System. The WMF will be constructed in two Phases, with Phase 1 to support Progressive Reclamation until end of Commercial Operations, and Phase 2 for indefinite containment /storage of impacted Waste materials from the closure of the Norman Wells Operations.

Waste Management Plan (WMP) – a document, developed in accordance with the MVLWB *Guidelines for Developing a Waste Management Plan*, that describes the methods of Waste management for the Project from Waste generation to final disposal.

Waste Management Facility Cover Integrity Monitoring Plan – A plan that describes the inspection monitoring and maintenance requirements for assessment of the physical integrity and performance of the WMF cover.

Waste Management Facility Environmental Management Plan – A plan that describes how the Waste Management Facility will be monitored and maintained during construction and operation, and includes the following components:

- WMF Environmental Protection Plan
- WMF Surface Water Monitoring Plan

- WMF Groundwater Management Plan
- WMF Leachate Monitoring Plan
- WMF Cover Integrity Monitoring Plan

Waste Management Facility Environmental Protection Plan – A plan that describes the environmental protection, or mitigation measures, for abiotic, biotic, and cultural components of the Waste Management Facility .

Waste Management Facility Groundwater Monitoring Plan – A plan that describes how the containment performance of the WMF, and its influence on local groundwater regimes (quality and levels) will be monitored by a series of wells installed around the perimeter of the WMF.

Waste Management Facility Leachate Monitoring Plan – A plan that describes the monitoring requirements for Leachate that accumulates in the WMF collection system, to assess the containment performance, and to determine future need for and design capabilities of a local treatment system, based on volumes produced, and quality of the Leachate.

Waste Management Facility Surface Water Monitoring Plan – A plan that describes the surface Water monitoring and management protocols required during construction and post-construction, including the sampling and testing of surface Waters collected in the WMF perimeter drainage ditches and Sump/catchbasins, and inspections.

Wastewater – any Water that is generated by Project activities or originates on-site, and which contains Waste, and may include, but is not limited to, Runoff, Seepage, Sewage, Minewater, and Effluent.

Water – as defined in section 51 of the *Mackenzie Valley Resource Management Act*: any inland waters, whether in a liquid or frozen state, on or below the surface of land.

Watercourse – as defined in section 2 of the Mackenzie Valley Federal Areas Waters Regulations: a natural watercourse, body of Water or Water supply, whether usually containing Water or not, and includes Groundwater, springs, swamps, and gulches.

Waterflood – the injection of Waters into the Norman Wells Oilfield Reservoir for pressure maintenance and enhanced oil production.

Water Intake – the wetwell pump and associated facilities installed in the Mackenzie River and the water line to the Central Processing Facility, and other temporary water withdrawal locations to support operational, maintenance, and Closure and Reclamation activities, as approved by an Inspector. (BDD Item No. 13, 15)

Water Management Area – a geographical area of the Northwest Territories established by section 3 and Schedule 1 of the Mackenzie Valley Federal Areas Waters Regulations.

Water Use – as defined in section 51 of the *Mackenzie Valley Resource Management Act*: a direct or indirect use of any kind other than a use connected with shipping activities that are governed by the *Canada Shipping Act*,

2001, including

- a) any diversion or obstruction of waters;
- b) any alteration of the flow of waters; and
- c) any alteration of the bed or banks of a river, stream, lake or other body of water, whether or not the body of water is seasonal.

Water Use Fee – the fee for use of Water as per the Mackenzie Valley Federal Areas Waters Regulations pursuant to section 90.3 of the *Mackenzie Valley Resource Management Act* and the *MVLWB Water Use Fee Policy*.

DRAFT

Part B: General Conditions

1. The Licensee shall ensure a copy of this Licence is maintained on site at all times. **COPY OF LICENCE**
2. The Licensee shall take every reasonable precaution to protect the environment. **PRECAUTION TO PROTECT ENVIRONMENT**
3. In conducting its activities under this Licence, the Licensee shall make every reasonable effort to consider and incorporate any scientific information and Traditional Knowledge that is made available to the Licensee. **INCORPORATE SCIENTIFIC INFORMATION AND TRADITIONAL KNOWLEDGE**
4. In each submission required by this Licence or by any directive from the Board, the Licensee shall identify all recommendations based on Traditional Knowledge received, describe how the recommendations were incorporated into the submission, and provide justification for any recommendation not adopted. **IDENTIFY TRADITIONAL KNOWLEDGE**
5. All references to policies, guidelines, codes of practice, statutes, regulations, or other authorities shall be read as a reference to the most recent versions, unless otherwise noted. **REFERENCES**
6. The Licensee shall ensure all submissions to the Board:
 - a) Are in accordance with the MVLWB *Document Submission Standards*;
 - b) Include a conformity statement or table which identifies where the requirements of this Licence, or other directives from the Board, are addressed; and
 - c) Include any additional information requested by the Board.**SUBMISSION FORMAT AND CONFORMITY**
7. The Licensee shall ensure management plans are submitted to the Board in a format consistent with the MVLWB *Standard Outline for Management Plans*, unless otherwise specified. **MANAGEMENT PLAN FORMAT**
8. The Licensee shall comply with all plans, programs, manuals, studies, including revisions, approved pursuant to the conditions of this Licence. **COMPLY WITH SUBMISSIONS AND REVISIONS**
9. The Licensee shall conduct an annual review of all plans, programs, manuals, studies and make any revisions necessary to reflect changes in operations, contact information, or other details. No later than March 31 each year, the Licensee shall send a notification letter to the Board, listing the documents that have been reviewed and do not require revisions. **ANNUAL REVIEW**
10. The Licensee may propose changes at any time by submitting revised plans, programs, manuals, or studies to the Board, for approval, a **REVISIONS**

minimum of 90 days prior to the proposed implementation date for the changes. The Licensee shall not implement the changes until approved by the Board.

11. The Licensee shall revise any submission and submit it as per the Board's directive. **REVISE AND SUBMIT**
12. If any date for any submission falls on a weekend or holiday, the Licensee may submit the item on the following business day. **SUBMISSION DATE**
13. The Licensee shall comply with the **Schedules**, which are annexed to and form part of this Licence, **and any updates to the Schedules as may be made by the Board.** **COMPLY WITH SCHEDULE(S)**
14. The Licensee shall comply with the **Surveillance Network Program**, which is annexed to and forms part of this Licence, and any updates to the Surveillance Network Program as may be made by the Board. **COMPLY WITH SURVEILLANCE NETWORK PROGRAM**
15. The Schedules, the Surveillance Network Program, and any compliance dates specified in this Licence may be updated at the discretion of the Board. **UPDATES TO COMPLIANCE DATE(S)**
16. The Licensee shall comply with all directives issued by the Board in respect of the implementation of the conditions of this Licence. **COMPLY WITH BOARD DIRECTIVES**
17. The Licensee shall ensure signs are posted for all active Surveillance Network Program stations. All sign(s) shall be located and maintained to the satisfaction of an Inspector. **POST SURVEILLANCE NETWORK PROGRAM SIGN(S)**
18. The Licensee shall install, operate, and maintain meters, devices, or other such methods for measuring the volumes of Water used and Waste discharged to the satisfaction of an Inspector. **MEASURE WATER USE AND WASTE DISCHARGED**
19. Beginning March 31, 2016, and no later than every March 31 thereafter, the Licensee shall submit an **Annual Water Licence Report** to the Board and an Inspector. The Report shall be in accordance with the requirements of Schedule 1, Condition 1. **ANNUAL WATER LICENCE REPORT**
20. The Licensee shall comply with the **Engagement Plan**, once approved. **(BDD Item No. 1)** **ENGAGEMENT PLAN**
21. The Licensee shall immediately provide written notification to the Board and an Inspector of any non-compliance with the conditions of this Licence. **NOTIFICATION – NON-COMPLIANCE WITH CONDITIONS**

- 22. The Licensee shall immediately provide written notification to the Board of any non-compliance with a Board directive issued in respect of the implementation of the conditions of this Licence.
- 23. The Licensee shall ensure that a copy of any written authorization issued to the Licensee by an Inspector is provided to the Board.
- 24. The Licensee shall submit a current Project schedule to the Board and an Inspector upon request.

**NOTIFICATION –
NON-COMPLIANCE
WITH DIRECTIVES**

**COPY – WRITTEN
AUTHORIZATION**

**SUBMIT CURRENT
PROJECT SCHEDULE**

DRAFT

Part C: Security

1. The Licensee shall post and maintain a security deposit with the Minister in accordance with Schedule 2. **POST SECURITY DEPOSIT**
2. Upon request of the Board, the Licensee shall submit an updated Closure Cost Estimate using the current version of RECLAIM or another method acceptable to the Board. **UPDATE CLOSURE COST ESTIMATE**
3. The amount of the security deposit required by Part C, Condition 1 may be adjusted by the Board:
 - a) Based on an updated Closure Cost Estimate as per Part C, Condition 2; or
 - b) Based on such other information as may become available to the Board.**ADJUSTED SECURITY AMOUNT**
4. If the amount of the security deposit is adjusted by the Board as per Part C, Condition 3, the Licensee shall post the adjusted amount with the Minister within the timeframe set by the Board. **The Licensee shall not commence any new activities associated with a security adjustment until the additional security deposit has been accepted by the Minister.** **POST ADJUSTED SECURITY AMOUNT**
5. Unless otherwise approved by the Board, the Licensee may not submit security adjustment requests except with any of the following submissions:
 - a) Closure and Reclamation Plans;
 - b) Closure and Reclamation Completion Reports; or
 - c) Performance Assessment Reports.**SECURITY ADJUSTMENT REQUESTS**

Part D: Water Use

- | | | |
|----|---|--|
| 1. | <p>The Licensee shall only obtain fresh Water for the Project from the Mackenzie River. The Licensee may withdraw up to 16,000 cubic metres (m³) of Water per day and shall not exceed a maximum of 3,500,000 m³ from this source.</p> | WATER SOURCE AND MAXIMUM VOLUME |
| 2. | <p>The Licensee may use Wastewater from the Surface Water Run-Off Facilities for dust suppression only if that Wastewater meets the Effluent Quality Criteria established in Annex A, Part F, Condition 1 of this Licence, or as otherwise approved by the Board.</p> | WASTEWATER USE |
| 3. | <p>The Licensee shall only withdraw Water using the approved Water Intake, unless otherwise authorized for temporary use, in writing by an Inspector. (BDD Item No. 13, 15)</p> | WATER WITHDRAWAL – FACILITIES |
| 4. | <p>Prior to withdrawing Water from an approved Water source, the Licensee shall post sign(s) to identify the intake for the Water Intake. All sign(s) shall be located and maintained to the satisfaction of an Inspector. (BDD Item No. 13, 15)</p> | POST WATER INTAKE SIGN(S) |
| 5. | <p>The Licensee shall construct and maintain the Water Intake(s) with a screen designed to prevent impingement or entrapment of fish.</p> | WATER INTAKE SCREEN |
| 6. | <p>Prior to locating a temporary Water Intake in the Mackenzie River, the Licensee shall obtain written authorization for the location from an Inspector. (BDD Item No. 13, 15)</p> | WATER INTAKE LOCATION – AUTHORIZATION |
| 7. | <p>The Licensee shall minimize the total amount of Water used by the Project using appropriate Water conservation methods, such as, but not limited to, the injection of Produced Water into the Norman Wells Proven Area Oilfield Reservoir.</p> | WATER CONSERVATION METHODS |
| 8. | <p>Each year, prior to March 25, and in advance of any Water use, the Licensee shall pay the Water Use Fee in accordance with the MVLWB <i>Water Use Fee Policy</i>.</p> | WATER USE FEE |

Part E: Construction – whole section is new

- | | | |
|----|--|---|
| 1. | The Licensee shall ensure that all structures intended to contain, withhold, divert, or retain Water or Waste are designed, constructed, and maintained to minimize the escape of Waste to the Receiving Environment. | OBJECTIVE –
CONSTRUCTION |
| 2. | The Licensee shall ensure that all Engineered Structures are constructed and maintained in accordance with the recommendations of the Professional Engineer responsible for the design, including, but not limited to, recommendations regarding field supervision and inspection requirements. | ENGINEERED
STRUCTURES –
GENERAL |
| 3. | The Licensee shall only use material that is clean and free of contaminants and is from a source that has been authorized in writing by an Inspector. | CONSTRUCTION
MATERIAL –
SOURCE(S) |
| 4. | The Licensee shall maintain records of Construction materials for all structures and make them available at the request of the Board or an Inspector. | CONSTRUCTION
RECORDS |
| 5. | A minimum of 90 days prior to the commencement of Construction of any Engineered Structures, the Licensee shall submit to the Board, Design Drawings stamped and signed by a Professional Engineer. A minimum of 90 days prior to implementing any proposed changes to the Design Drawings, the Licensee shall submit revised Design Drawings to the Board. | DESIGN
DRAWINGS |
| 6. | A minimum of 30 days prior to the commencement of Construction of Phase 1 of the Waste Management Facility, the Licensee shall submit to the Board, a Design and Construction Plan . The Plan shall be in accordance with the requirements of Schedule 3, Condition 1. A minimum of 30 days prior to implementing any proposed changes to the Plan, the Licensee shall submit a revised Plan to the Board. | DESIGN AND
CONSTRUCTION
PLAN –Waste
Management
Facility Phase 1 |
| 7. | A minimum of 30 days prior to the commencement of Construction of Phase 2 of the Waste Management Facility, the Licensee shall submit to the Board, a Design and Construction Plan . The Plan shall be in accordance with the requirements of Schedule 3, Condition 2. A minimum of 30 days prior to implementing any proposed changes to the Plan, the Licensee shall submit a revised Plan to the Board. | DESIGN AND
CONSTRUCTION
PLAN –Waste
Management
Facility Phase 2 |
| 8. | A minimum of ten days prior to the commencement of Construction of any Engineered Structure(s), the Licensee shall provide written notification to the Board and an Inspector. Notification shall include the Construction commencement date, and the name and contact information for the individual responsible for overseeing Construction. Written notification shall be provided to the Board and an Inspector if any changes occur. | NOTIFICATION –
CONSTRUCTION
– ENGINEERED
STRUCTURES |

- | | | |
|----------------------------------|--|---|
| 9. | The Licensee shall ensure that all Engineered Structures are constructed in accordance with the Design Drawings and approved Design and Construction Plan(s) . | CONSTRUCT AS DESIGNED – ENGINEERED STRUCTURE(S) |
| 10. | Within 90 days of the completion of the Construction of each Engineered Structure, the Licensee shall submit to the Board, an As-Built Report stamped and signed by a Professional Engineer, which shall include, but not be limited to, the following information: <ul style="list-style-type: none"> a) final as-built drawings of the Engineered Structure(s), stamped and signed by a Professional Engineer; b) documentation, with rationale, of field decisions that deviate from the Design and Construction Plans and Design Drawings; and c) any data used to support these decisions. | AS-BUILT REPORT – ENGINEERED STRUCTURE(S) |
| 11. | Within 90 days of the completion of Construction of each Engineered Structure, the Licensee shall install Groundwater monitoring wells around the perimeter of the WMF in accordance with Alberta Energy Regulator (AER) Directive 058: <i>Oilfield Waste Management Requirements for the Upstream Petroleum Industry, 2006</i> , and the final Design and Construction Plan referred to in Part E, Condition 6 or 7 of this Licence. | WASTE MANAGEMENT FACILITY (WMF) GROUNDWATER MONITORING WELLS |
| 12. | Within 90 days following installation of WMF Groundwater Monitoring Wells for any Phase of the WMF, a description and location (GPS coordinates) shall be submitted to the Board and an Inspector. | WMF GROUNDWATER MONITORING WELLS – DESCRIPTION AND LOCATION |
| 13. | Prior to initial deposit of any Waste into the WMF, the WMF Groundwater monitoring wells shall be monitored, in accordance with the protocols established in the Norman Wells Operations approved Groundwater Monitoring Plan , for a period of X months to establish baseline conditions. | WMF GROUNDWATER MONITORING WELLS – BASELINE CONDITIONS |
| Waste Management Facility | | |
| 14. | The Licensee shall retain an Engineer of Record for the Waste Management Facility. | ENGINEER OF RECORD |
| 15. | The Licensee shall ensure that the Engineer of Record establishes quantifiable performance objectives for the Waste Management Facility and reviews the quantifiable performance objectives annually for the life of the Facility. | QUANTIFIABLE PERFORMANCE OBJECTIVES |
| 16. | A minimum of one year prior to the commencement of Construction of the Waste Management Facility, the Licensee shall submit to the Board, for approval, a Terms of Reference for the Independent Review Panel / Professional Engineer . The Licensee shall submit a revised Terms of | INDEPENDENT REVIEW PANEL / ENGINEER – |

Reference 30 days prior to implementation of any changes to the **Terms of Reference**.

TERMS OF REFERENCE

17. The Licensee shall **establish / retain** an Independent **Review Panel / Professional Engineer**. The Licensee shall pay for all reasonable direct and indirect costs associated with the **establishment/retention** of the Independent **Review Panel / Professional Engineer** and **its/their** duties that arise from the conditions of this Licence.

INDEPENDENT REVIEW PANEL / PROFESSIONAL ENGINEER - ESTABLISHMENT / RETENTION AND COSTS

18. A minimum of **30 days** prior to the commencement of Construction of the Waste Management Facility, the Licensee shall submit a **Letter of Acceptance** from the Independent **Review Panel / Professional Engineer** that indicates their review and acceptance of the final **Design and Construction Plan** referred to in **Part E, Condition X**.

INDEPENDENT REVIEW PANEL / PROFESSIONAL ENGINEER - LETTER OF ACCEPTANCE

DRAFT

Part F: Waste and Water Management

- | | | |
|----|--|---|
| 1. | The Licensee shall manage Waste and Water with the objective of minimizing the impacts of the Project on the quantity and quality of Water in the Receiving Environment through the use of appropriate mitigation measures, monitoring, and follow-up actions. | OBJECTIVE –
WASTE AND
WATER
MANAGEMENT |
| 2. | The Licensee shall minimize erosion by implementing suitable erosion control measures that shall be located and maintained to the satisfaction of an Inspector. | EROSION
CONTROL |

Management and Monitoring Plans

- | | | |
|-----|---|---|
| 3. | The Licensee shall comply with the Groundwater Management Plan , once approved. The Plan shall be in accordance with the requirements of Schedule 4, Condition 1. (BDD Item No. 3d) | GROUNDWATER
MONITORING
PLAN |
| 4. | Within 90 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, a revised Groundwater Management Plan . The Licensee shall not commence activities described in the Plan prior to Board approval of the Plan. | GROUNDWATER
MONITORING
PLAN – REVISED |
| 5. | The Licensee shall comply with the Environmental Protection Plan , once approved. (BDD Item No. 3b) | ENVIRONMENTAL
PROTECTION PLAN |
| 6. | Within 90 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, a revised Environmental Protection Plan | ENVIRONMENTAL
PROTECTION PLAN
– REVISED |
| 7. | The Licensee shall comply with the Waste Management Plan , once approved. The Plan shall be in accordance with the MVLWB <i>Guidelines for Developing a Waste Management Plan</i> . (BDD Item No. 3c) | WASTE
MANAGEMENT
PLAN |
| 8. | Within 90 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, a revised Waste Management Plan . | WASTE
MANAGEMENT
PLAN- REVISED |
| 9. | The Licensee shall comply with the Quality Assurance & Quality Control Manual , once approved. (BDD Item No. 3f, 9, 11) | QUALITY
ASSURANCE /
QUALITY
CONTROL
MANUAL |
| 10. | Within 90 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, a revised Quality Assurance & Quality Control Manual | QUALITY
ASSURANCE /
QUALITY
CONTROL
MANUAL- REVISED |

11. The Licensee shall comply with the **Waste Management Facility Environmental Management Plan**, once approved. The plan shall include:
- a) a **WMF Environmental Protection Plan (EPP)**,
 - b) a **WMF Surface Water Monitoring Plan**,
 - c) a **WMF Groundwater Monitoring Plan**, in accordance with Schedule 4, Condition 2,
 - d) a **WMF Leachate Monitoring Plan**, in accordance with Schedule 4, Condition 3, and
 - e) a **WMF Cover Integrity Monitoring Plan**.

WASTE
MANAGEMENT
FACILITY
ENVIRONMENTAL
MANAGEMENT
PLAN

12. Within **90 days** following approval of the Waste Management Facility Design and Construction Plan, referred to in Part E, Condition 6, the Licensee shall submit to the Board, for approval, a revised **Waste Management Facility Environmental Management Plan**.

WASTE
MANAGEMENT
FACILITY
ENVIRONMENTAL
MANAGEMENT
PLAN – REVISED

13. The Licensee shall maintain a copy of the **Waste Management Plan** and the **Waste Management Facility Environmental Management Plan** on-site in a readily available location to the satisfaction of an Inspector.

COPY OF PLAN

Discharge and Disposal Locations and Rates

14. The Licensee shall deposit all impacted materials and infrastructure to the Waste Management Facility, as described in the approved **Waste Management Facility Environmental Management Plan**.

IMPACTED
MATERIALS AND
INFRASTRUCTURE
– WASTE
MANAGEMENT
FACILITY

15. The Licensee shall discharge all Effluent from Central Processing Facility Settling Pond prior to discharge to the Mackenzie River as described in the approved **Waste Management Plan**.

EFFLUENT
DISCHARGE –
CENTRAL
PROCESSING
FACILITY SETTLING
POND

16. The Licensee shall discharge all Leachate from Waste Management Facility to the **location** as described in the approved **Waste Management Facility Environmental Management Plan**.

EFFLUENT
DISCHARGE –
WASTE
MANAGEMENT
FACILITY

17. The Licensee shall not deposit Hazardous Wastes generated by the Project to the Waste Management Facility.

HAZARDOUS
WASTES – WASTE
MANAGEMENT
FACILITY

- 18. The Licensee shall not use any biocides where they may enter any Watercourse unless approved by the Board. **BIOCIDES**
- 19. The Licensee shall ensure that any fuels, chemicals, or Waste associated with the Project do not enter any Waters, except in the manner described in the **Surveillance Network Program**. **DISCHARGE TO WATER**

Effluent Quality Criteria

- 20. The Licensee shall discharge Water in a controlled manner designed to avoid flooding, or erosion. **DISCHARGE RATE**
- 21. The Licensee shall ensure that Effluent from Central Processing Facility Settling Pond at Surveillance Network Program station S13L1-007 -2 has a pH value between 6.0 and 9.0 and meets the following Effluent Quality Criteria (EQC): **EFFLUENT QUALITY CRITERIA – CENTRAL PROCESSING FACILITY SETTLING POND**

EFFLUENT QUALITY CRITERIA		
Parameter	Maximum Average Concentration	Maximum Concentration of any Grab Sample
Total Petroleum Hydrocarbons	3.0 mg/L	5.0 mg/L
Phenols	0.07 mg/L	0.14 mg/L
Chloride	250 mg/L	500 mg/L
Total Suspended Solids	N/A	N/A
Specific Conductivity	N/A	N/A

- 22. The Licensee shall ensure that Discharge to Mackenzie River shall not be acutely toxic to aquatic life as determined at SNP station S13L1-007 – 2 by the test methods referenced in Annex A, Part D, Condition 3. **EFFLUENT QUALITY – TOXICITY – CENTRAL PROCESSING FACILITY SETTLING POND**
- 23. The Licensee shall submit Water quality data for samples collected from Surveillance Network Program station S13L1-007 -2 to the Board and an Inspector as follows: **TESTING BEFORE DISCHARGE – CENTRAL PROCESSING**
 - a) A minimum of five days prior to commencing or resuming Discharge of Effluent to Mackenzie River; and

- b) A minimum of five days prior to commencing or resuming Discharge of Effluent to Mackenzie River following an exceedance of the EQC specified in Part F, Condition 21.

**FACILITY SETTLING
POND**

The Licensee shall not commence or resume the Discharge until the EQC are met and an Inspector has provided written authorization.

- 24. If Water quality data from any sample collected at **Surveillance Network Program** stations S13L1-007 - 2 exceeds the EQC specified in Part F, Condition 21, or is determined to be acutely toxic as per Part F, Condition 22, the Licensee shall:
 - a) Cease the Discharge;
 - b) Notify the Board and an Inspector immediately;
 - c) Report the spill immediately in accordance with the **Spill Contingency Plan** referred to in Part H, Condition 6;
 - d) Comply with the approved **Waste Management Plan** referred to in Part F, Condition 7; and
 - e) Within 30 days of initially reporting the incident, or within a timeframe authorized by an Inspector, submit a detailed report on the occurrence, including a summary of corrective actions taken, to the Board and an Inspector.

**EFFLUENT
QUALITY CRITERIA
– EXCEEDANCE –
CENTRAL
PROCESSING
FACILITY SETTLING
POND**

- 25. The Licensee shall ensure that Leachate from the Waste Management Facility at Surveillance Network Program station xxx has a pH value between x and y and meets the following Effluent Quality Criteria:

**EFFLUENT
QUALITY CRITERIA
– WASTE
MANAGEMENT
FACILITY**

- PHC – Petroleum Hydrocarbons
- Salinity
- Metals
- PAH – Polyaromatic Hydrocarbons

(if applicable)

- 26. The Licensee shall submit Water quality data for samples collected from Surveillance Network Program station xxx to the Board and an Inspector as follows:
 - a) A minimum of five days prior to commencing or resuming Discharge of Effluent to location; and
 - b) A minimum of five days prior to commencing or resuming Discharge of Effluent to location following an exceedance of the EQC specified in Part F, Condition Y.

**TESTING BEFORE
DISCHARGE –
WASTE
MANAGEMENT
FACILITY**

The Licensee shall not commence or resume the Discharge until the EQC are met and an Inspector has provided written authorization.

- 27. Hydrostatic test activity shall take place outside of the Department of Fisheries and Oceans (DFO) restricted activity timing window for fish, between September 15 to July 15 for the Northwest Territories. **(BDD Item No. 19)**

**HYDROSTATIC
TEST ACTIVITY
RESTRICTED
PERIOD**

28. The Licensee shall not release hydrostatic test fluids to land or Water unless water quality testing meets Effluent Quality Criteria in Part F, Condition 21 for petroleum hydrocarbons, phenols, chloride and pH, and the following CCME Freshwater Aquatic Life Criteria for metals:

Parameter	Maximum Grab Concentration (mg/L)	Parameter	Maximum Grab Concentration (mg/L)
Aluminum	0.1	Methylmercury	0.000004
Antimony	0.006	Molybdenum	0.073
Arsenic	0.005	Nickel	0.025 ³
Barium	1	Selenium	0.001
Beryllium	0.0053	Silver	0.00025
Boron	1.5	Zinc	0.03
Cadmium	0.001	Uranium	0.02
Chromium (VI)	0.001	Vanadium	0.1
Chromium (III)	0.0089	Benzene	0.37
Cobalt	0.05	Toluene	0.002
Copper	0.002 ¹	Ethylbenzene	0.09
Iron	0.3 mg/L	Xylenes	3.9
Lead	0.001 ²	Styrene	0.072
Manganese	0.05	F1	0.81
Mercury (inorganic)	0.000026	F2	1.3

¹ If water hardness is >180 mg/L the Maximum Grab Concentration is 0.004 mg/L

² If water hardness is >180 mg/L the Maximum Grab Concentration is 0.007 mg/L

³ If water hardness is >180 mg/L the Maximum Grab Concentration is 0.007 mg/L

(BDD Item No. 19)

29. Results of hydrostatic test fluids water quality testing will be provided to an Inspector 24 hours prior to initiating Discharge. **(BDD Item No. 19)**
30. If the hydrostatic test fluid exceeds any EQC in Part F, Condition 21 and/or Part F, Condition 27, discharge shall be handled through the Licensee's downhole injection process or other means as authorized by an Inspector. **(BDD Item No. 19)**

**NOTIFICATION
BEFORE
DISCHARGE –
HYDROSTATIC
TEST FLUIDS**

**HYDROSTATIC
TEST FLUIDS
EXCEEDANCE**

PART G: Operation and Maintenance of Structures and Facilities

- | | | |
|----|--|--|
| 1. | The Licensee shall drill all wells from within Impermeable-Lined Diked Areas. | DRILL WELLS |
| 2. | The Licensee shall undertake any necessary annual maintenance required to preserve the structural integrity of the Artificial Islands, and where required on the Natural Islands. | ARTIFICIAL ISLANDS MAINTENANCE |
| 3. | The Licensee shall undertake any necessary maintenance dredging required to maintain safe access for vessel traffic and emergency response boats in accordance with Fisheries and Oceans Canada's <i>Routine Maintenance Dredging Code of Practice</i> . (BDD Item No. 20) | MAINTENANCE DREDGING |
| 4. | The Licensee shall provide 48-hour notification to an Inspector prior to undertaking any dredging activity. (BDD Item No. 20) | MAINTENANCE DREDGING – NOTIFICATION |
| 5. | The reporting of major maintenance work completed, quantities of water used, and quantity of sediment dredged from the river, is required to be reported in the Annual Report required under Part B, Condition 19 and Schedule 1. (BDD Item No. 20) | MAJOR MAINTENANCE WORK - REPORTING |
| 6. | The Licensee shall annually inspect the riverbeds, channels, and banks of the Mackenzie River in the vicinity of the Flowlines, and shall immediately notify the Inspector of any significant risk to infrastructure, public safety, or the environment from erosion and take appropriate remedial action as required. (BDD Item No. 4) | FLOWLINES – ANNUAL BATHYMETRIC INSPECTION |
| 7. | The Licensee shall comply with the Flowline Integrity Management Plan , once approved. (BDD Item No. 3e) | FLOWLINE INTEGRITY MANAGEMENT PLAN |
| 8. | The Licensee shall submit an Annual Flowline Integrity and Mackenzie River Breakup Report no later than October 31 of the year being reported. The Report shall contain the information set out in Schedule 5, Condition 1. | ANNUAL FLOWLINE INTEGRITY AND MACKENZIE RIVER BREAKUP REPORT |
| 9. | <p>The Licensee shall construct, operate, and maintain the Waste Management Facility to the design specifications and engineering standards, such that:</p> <p style="margin-left: 20px;">a) The specifications described in the Waste Management Facility Design and Construction Plan, referred to in Part E, Condition 6 or 7, as applicable, are maintained at all times;</p> | WASTE MANAGEMENT FACILITY |

- b) Any Seepage from the facility to the Receiving Environment that does not meet Effluent Quality Criteria, as specified in Part F, Condition 25 shall be collected and returned to the WMF / injected to the Oilfield Reservoir.
- c) Any deterioration or erosion of constructed structures/facilities shall be reported immediately to an Inspector;
- d) Any deterioration or erosion of constructed structures/facilities that requires repair shall be reported to an Inspector and the Board, and repaired immediately;
- e) Monitoring of the facility is sufficient to ensure that:
 - i. Performance design criteria, as described in the Design and Construction Plan referred to in Part E, Condition 6 or 7, as applicable, are being met; and
 - ii. Necessary changes in operation of the facility, including any additional mitigations, are identified.

Inspection of Structures and Facilities

10. The Licensee shall conduct [enter frequency] inspections of the Waste Management Facility or as otherwise directed by an Inspector or the Board. Records of these inspections shall be made available to the Board or an Inspector upon request.

[FREQUENCY]
INSPECTION OF
WASTE
MANAGEMENT
FACILITY

11. The Licensee shall ensure that geotechnical inspections of Waste Management Facility are conducted annually [if appropriate, enter the timing of the inspections (e.g., during the summer months)], and following any events that exceed design criteria, by a Professional Engineer. The Licensee shall:

ANNUAL
GEOTECHNICAL
INSPECTION

- a) A minimum of two weeks prior to the annual inspection, and when events that exceed design criteria occur, provide written notification to an Inspector; and
- b) Within 90 days of completing the inspection, submit the Professional Engineer’s full Geotechnical Inspection Report to the Board and an Inspector. The Report shall include:
 - i. a covering letter from the Licensee outlining an implementation plan to respond to any recommendations made by the Professional Engineer, including rationale for any decisions that deviate from the Professional Engineer’s recommendations; and
 - ii. a summary of any actions taken by the Licensee to address the recommendations made following the previous year’s inspection.

Part H: Spill Contingency Planning

- | | | |
|----|--|--|
| 1. | The Licensee shall ensure that Unauthorized Discharges associated with the Project do not enter any Waters. | OBJECTIVE –
PREVENT WASTE
INTO WATER |
| 2. | The Licensee shall comply with the Emergency Response Plan . | EMERGENCY
RESPONSE PLAN |
| 3. | The Licensee shall comply with the Spill Contingency Plan , once approved. | SPILL CONTINGENCY
PLAN |
| 4. | Within 90 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, a revised Spill Contingency Plan . The Licensee shall not commence Project activities prior to Board approval of the Plan. | SPILL CONTINGENCY
PLAN – REVISED |
| 5. | The Licensee shall carry out field and communication exercises annually to demonstrate the capability to contain, recover, and report spills under a variety of environmental conditions, such as early and late winter ice conditions, and moderate and high flow conditions. | SPILL RESPONSE
TRAINING
EXERCISES |
| 6. | <p>If a spill or an Unauthorized Discharge occurs or is foreseeable, the Licensee shall:</p> <p>a) Implement the approved Spill Contingency Plan referred to in Part H, Condition 3;</p> <p>b) Report it immediately using the NU-NT Spill Report Form by one of the following methods:</p> <ul style="list-style-type: none"> • Telephone: (867) 920-8130 • Fax: (867) 873-6924 • E-mail: spills@gov.nt.ca • Online: Spill Reporting and Tracking Database <p>c) Notify the Board and an Inspector immediately; and</p> <p>d) Within 30 days of initially reporting the incident, or within a timeframe authorized by an Inspector, submit a detailed report to the Board and an Inspector, including descriptions of causes, response actions, and any changes to procedures to prevent similar occurrences in the future. Written notification shall be provided to the Board and an Inspector if any changes occur</p> | REPORT SPILLS |
| 7. | The Licensee shall ensure that spill prevention infrastructure and spill response equipment is in place prior to commencement of the Project. | SPILL PREVENTION
AND RESPONSE
EQUIPMENT |
| 8. | The Licensee shall restore all areas affected by spills and Unauthorized Discharges to the satisfaction of an Inspector. | CLEAN UP SPILLS |

9. The Licensee shall not establish any fuel storage facilities or refueling stations, or store chemicals or Wastes within 100 metres of the Ordinary High-Water Mark of any Watercourse.

**MATERIAL STORAGE
– ORDINARY HIGH-
WATER MARK**

DRAFT

Part I: Aquatic Effects Monitoring

- | | | |
|----|---|---|
| 1. | The Licensee shall design and implement an Aquatic Effects Monitoring Program (AEMP) in accordance with the MVLWB/GNWT <i>Guidelines for Aquatic Effects Monitoring Programs</i> . | OBJECTIVE –
AEMP |
| 2. | Within one year of the effective date of this Licence, the Licensee shall submit to the Board, for approval, an AEMP Design Plan . The Plan shall be in accordance with the MVLWB/GNWT <i>Guidelines for Aquatic Effects Monitoring Programs</i> . (BDD Item No. 12, 22, 23) | AEMP DESIGN
PLAN |
| 3. | Within 90 days after the effective date of this Licence, the Licensee shall develop and submit to the Board, for approval, a Special Effects Study , in accordance with the requirements set out in Schedule 6, Conditions 1 and 2. (BDD Item No. 3a, 20, 23) | SPECIAL EFFECTS
STUDY |
| 4. | Three years following implementation of the AEMP Design Plan , and every three years thereafter, or as directed by the Board, the Licensee shall submit to the Board, for approval, an AEMP Re-Evaluation Report . The Report shall be in accordance with the MVLWB/GNWT <i>Guidelines for Aquatic Effects Monitoring Programs</i> and shall evaluate the overall effectiveness of the AEMP to date. (BDD Item No. 23) | AEMP RE-
EVALUATION
REPORT |
| 5. | Every three years following implementation of the AEMP Design Plan , or as directed by the Board, the Licensee shall submit to the Board, for approval, a revised AEMP Design Plan . The revised Plan shall be in accordance with the MVLWB/GNWT <i>Guidelines for Aquatic Effects Monitoring Programs</i> . | AEMP DESIGN
PLAN – REVISED |
| 6. | Beginning April 30, 2017 and no later than April 30 of each year thereafter, the Licensee shall submit to the Board, for approval, an AEMP Annual Report . The Report shall be in accordance with the MVLWB/GNWT <i>Guidelines for Aquatic Effects Monitoring Programs</i> and the requirements of Schedule 6, Condition 3. (BDD Item No. 19, 23) | AEMP ANNUAL
REPORT |
| 7. | If any low Action Level established in the approved AEMP Design Plan is exceeded, the Licensee shall, at a minimum, implement the response actions described in the approved AEMP Design Plan , and report the exceedance in the AEMP Annual Report . (BDD Item No. 12) | LOW ACTION
LEVEL
EXCEEDANCE |
| 8. | If any moderate or high Action Level established in the approved AEMP Design Plan is exceeded, the Licensee shall: <ul style="list-style-type: none"> a) Within the timeframe identified in the approved AEMP Design Plan, notify the Board and an Inspector; and | MODERATE OR
HIGH ACTION
LEVEL
EXCEEDANCE |

- b) Within the timeframe identified in the approved **AEMP Design Plan**, or as otherwise directed by the Board, submit an **AEMP Response Plan** to the Board for approval. The Response Plan shall be in accordance with the MVLWB/GNWT *Guidelines for Aquatic Effects Monitoring Programs*.
(BDD Item No. 12)

DRAFT

Part J: Closure and Reclamation

- | | | |
|----|---|---|
| 1. | <p>Within one year following the effective date of this Licence, the Licensee shall submit to the Board, for approval, a Closure and Reclamation Plan. The Plan must be in accordance with the MVLWB/AANDC <i>Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories</i>.</p> | <p>CLOSURE AND RECLAMATION PLAN</p> |
| 2. | <p>Three years following the previous approval, and every three years thereafter, or as directed by the Board, the Licensee shall submit to the Board, for approval, a revised Closure and Reclamation Plan. The Plan revisions shall include results of Reclamation Research and include the information set out in Schedule 7, Condition 1. (BDD Item No. 21)</p> | <p>CLOSURE AND RECLAMATION PLAN – REVISED</p> |
| 3. | <p>The Reclamation Research required by Part J, Condition 2, shall be submitted to the Board, for approval, as a Reclamation Research Report. The Report shall be in accordance with the requirements set out in Schedule 7, Condition 2.</p> | <p>RECLAMATION RESEARCH REPORT</p> |
| 4. | <p>Three years prior to the expiry date of this Licence, or a minimum of two years prior to the end of Commercial Operations, whichever occurs first, the Licensee shall submit to the Board, for approval, a final Closure and Reclamation Plan.</p> | <p>CLOSURE AND RECLAMATION PLAN – FINAL</p> |
| 5. | <p>One year prior to commencing Progressive Reclamation using the Phase 1 Waste Management Facility component of the Project, and until a final Closure and Reclamation Plan is approved, the Licensee shall submit to the Board, for approval, a Component-Specific Closure and Reclamation Plan. The Licensee shall not commence activities described in the Plan prior to Board approval.</p> | <p>COMPONENT-SPECIFIC CLOSURE AND RECLAMATION PLAN FOR PHASE 1 WASTE MANAGEMENT FACILITY</p> |
| 6. | <p>The Licensee shall endeavor to carry out Progressive Reclamation of areas affected by licensed operations as soon as is reasonably practicable.</p> | <p>PROGRESSIVE RECLAMATION</p> |
| 7. | <p>The Licensee shall provide an Annual Closure and Reclamation Progress Report no later than May 31 following the calendar year being reported. The Report shall contain the information set out in Schedule 7, Condition 1. (BDD Item No. 17)</p> | <p>ANNUAL CLOSURE AND RECLAMATION PROGRESS REPORT</p> |
| 8. | <p>Within 90 days of completing Closure and Reclamation of any specific component of the Project, the Licensee shall submit to the Board a Closure and Reclamation Completion Report. The Report shall be in accordance with the MVLWB/AANDC <i>Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories</i>.</p> | <p>CLOSURE AND RECLAMATION COMPLETION REPORT</p> |

9. Within 90 days of completing Closure and Reclamation of the Phase 1 and/or Phase 2 Waste Management Facility of the Project, or as otherwise directed by the Board, the Licensee shall submit to the Board for approval, a **Post-Closure and Reclamation Monitoring and Maintenance Plan**. The Plan shall be in accordance with the requirements of Schedule X, Condition Y.
10. Within x months of completing Progressive Reclamation using the Phase 1 Waste Management Facility component of the Project, the Licensee shall submit to the Board for approval, a **Performance Assessment Report**. The Report shall be in accordance with the MVLWB/AANDC *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*. The Licensee shall submit subsequent Reports as directed by the Board.

POST-CLOSURE AND
RECLAMATION
MONITORING AND
MAINTENANCE
PLAN

PERFORMANCE
ASSESSMENT
REPORT –
COMPONENT-
SPECIFIC

Signed on behalf of the [Enter Name of BOARD]

[Enter NAME Chair], Chair

[Enter NAME of Witness], Witness

ANNEX A: SURVEILLANCE NETWORK PROGRAM (SNP)

A. Reporting Requirements

1. The Licensee shall, within 30 days following the month being reported, submit to the Board, for approval, all data and information required by the SNP including the results of the approved **Quality Assurance and Quality Control Manual**.

B. Quality Assurance and Quality Control

1. All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the current edition of American Public Health Association's (APHA) *Standard Methods for the Examination of Water and Wastewater*, or by such other methods approved by the Analyst.
2. All analyses shall be performed in a laboratory approved by the Analyst.
3. The Licensee may, upon notifying the Inspector, clean the Settling Pond at the Central Processing Facility (CPF) according to the CPF **Settling Pond Cleaning Procedure**, approved by the Board, and amended from time to time.

C. Site Descriptions – Location of Surface Water SNP Stations

<u>Station</u>	<u>Status</u>	<u>Description</u>	<u>Location</u>
S13L1-007 -1	Active	Central Processing Facility Intake waterfrom the Mackenzie River.	W126°53.053' N65°17.230'
S13L1-007 - 2	Active	Central Processing Facility discharge returnline to the Mackenzie River.	W126°53.093' N65°17.196'

D. Sampling and Analysis Requirements for Surface Water SNP Stations

1. Single Composite Samples of Water shall be sampled at SNP Stations S13L1-007 – 1 and S13L1-007 – 2 and analyzed for the following parameters and frequencies:

Parameter	Sampling Frequency
Phenols	Once per week
Total Petroleum Hydrocarbons	Once per week
Total Suspended Solids	Twice per week
pH	Twice per week

Specific Conductivity	Twice per week
-----------------------	----------------

- Representative Grab Samples of Water shall be collected quarterly (four samples throughout the year) at SNP Stations S13L1-007 – 1 and S13L1-007 – 2 and analyzed for the following parameters:

Parameters		
pH	Chloride	Total Alkalinity
Sodium	Calcium	Specific Conductivity
Potassium	Magnesium	Total Suspended Solids
Sulphate	Phenols	Total Dissolved Solids
Total Petroleum Hydrocarbons	Total Phosphorus	Total Hardness

- The Licensee shall determine the Acute Lethality of the Representative Grab Samples of Water collected quarterly at SNP Station S13L1-007 – 2.
- A daily Grab Sample of Water at SNP Station S13L1-007 – 2 shall be field analyzed for Total Residual Chlorine, at all times except when the chlorine injection system is offline. **(BDD Item No. 5)**
- No Wastes discharged at SNP Station S13L1-007 – 2 to the Mackenzie River shall exceed the Effluent Quality Criteria (EQC) set out in Part F, Condition 21 of this Licence.
- The Licensee shall provide a 28-day Average Concentration of the parameters listed in Part D, Conditions 1 and 4 for SNP Station S13L1-007 -2. The Average Concentration shall be reported in accordance with SNP Part D, Condition 1.

E. Surface Run-Off Facility Categories and Locations

Surface Water Run-Off Facilities include all areas within the Norman Wells Proven Area that may be used to collect and temporarily store surface Water (Figure 1), which will ultimately require Discharge to lands and/or Water and include:

- impound basins and areas
- excavations
- bunkers
- bermed areas and associated ditches and Sumps/catchbains

There are three categories of Surface Run-Off Facilities:

Category A – includes excavations (in areas where there are no known historical impacts), bunkers, bermed areas, and associated ditches.

Category B – includes impound basins and areas, Sumps, and excavations (in areas where there is known historical impacts).

Category C – includes Waste Management Facility drainage ditches and Sump/catchbasins (no anticipated impacts post-construction, but monitoring required to confirm barrier performance). (requested by Applicant)

Category B Surface Run-Off Facility	Location Coordinates
CPF Impound Area	W 126°53.121' N 65°17.132'
LT 11 Impound Basin	W126°51.722' N 65°17.027'
Refinery Impound Basin	W126°50.817' N 65°16.888'
Refinery Water Flood Basin	W126°50.539' N 65°16.938'
Refinery Tank Farm	
Field Services Storage Yard	
Biocell	
Capped Sumps	
Excavations (in areas where there is known historical impacts)	
Any other area where the Surface Run-Off from Category A does not meet criteria in Part X, Condition Y	

F. Sampling and Analysis Requirements for Surface Water Run-Off Facilities

1. A representative Grab Sample of Water shall be collected in all categories of Surface Water Run-Off Facilities prior to Discharge and weekly during Discharge to land and/or Water and/or use as dust suppressant on roads, and shall be analyzed for the following parameters:
 - a) Water to be discharged from **Category A** facilities:

Parameter	Guideline/Criteria
Visible oil sheen on the Water	Presence of
Chlorides (field test)	< 500 mg/L
pH (field test)	6.0 – 9.0

b) Water to be discharged from Category B facilities:

Parameter	Guideline/Criteria
Total Petroleum Hydrocarbons	5.0 mg/L
Phenols	0.14 mg/L
pH	6.0 – 9.0
Chlorides	< 500 mg/L
Total Suspended Solids	N/A
Total Dissolved Solids	N/A
Specific Conductivity	N/A

c) Water to be released from Category C facilities: (Proposed to be same as for Category B)

Parameter	Guideline/Criteria

2. Water shall not be released from Surface Water Run-Off facilities if there is an exceedance(s) of criteria in 1 a), b), or c) above without consulting the Board and an Inspector. The Licensee shall make every effort to investigate exceedance(s) and treat the Water prior to Discharge.
3. When discharging Water volumes greater than 10 m³, the Discharge shall be monitored by obtaining a Representative Grab Sample(s), and conducting subsequent analyses as outlined in 1 a), b), or c) above. Samples shall be taken before, in the middle, and at the end of the Discharge period. For Water volumes less than 10 m³, a single Representative Grab Sample shall be collected and analyzed prior to commencing the Discharge.
4. An estimate of the total volume of Water discharged shall be recorded for each Discharge.
5. Water collected in any area within the Norman Wells Proven Area associated with operations and facilities, not listed in Part E, shall be sampled, and analyzed as per Annex A Part F Conditions 1 b), 2 and 3, as required.

G. Groundwater Monitoring Wells – Description and Location

1. Surveillance Network Program (SNP) Groundwater Monitoring Wells¹

Station	Status	Description	Location
CPF 97-7-5	1997	Located between Central Processing Facility and Bosworth Creek.	W126°877.462' N65°286.553'
CPF-98-8-3	1998	Located between Central Processing Facility and the Mackenzie River.	W126°885.929' N65°286.553'
WSY-97-1-5	1997	Closest well located between the Well Service/Warehouse Yard and Bosworth Creek	W126°873.608' N65°288.127'
ARB-12-3-3	2012	Closest groundwater monitoring well to the biocell	W126°86.037' N65°28.759'
C38-08-1-4	2008	Located between known previous well issues (C36x) and the Mackenzie River	W126°856.857' N65°283.478'
TF-03-12-3	2003	Located between the Tank Farm and the Mackenzie River and downgradient from a known hydrocarbons source	W126°846.446' N65°282.365'
MTF-97-1-5	1997	Located between the Tank Farm and the town of Norman Wells	W126°838.576' N65°283.627'
BIS-97-1-3	1997	Located between Bear Island sump #5 (near P37X) and the Mackenzie River	W126°895.531' N65°257.705'
BI-13-3-4-5	2013	Located near Bear Island sump #6 (near M50X) and the Mackenzie River	W126°86.266' N65°25.581'
BIBG-12-1-7	2012	Located at the western edge of the development on Bear Island and the Mackenzie River	W126°91.713' N65°25.336'
GIBG-10-2-3	2010	Located between well pads on Goose Island and the Mackenzie River	W126°94.244' N65°26.778'
GIQ8-10-2-4	2010	Located between the fuel storage and handling area on Goose Island and the Mackenzie River	W126°959.796' N65°274.052'
Contingency Wells			
MEBG-10-1-3	2010	Central Location on the mainland. Located between the Mainland Sumps and the Mackenzie River	W126°857.963' N65°286.081'
BI-13-1-4	2013	Located near Bear Island sump #6 (near M50X) and the Mackenzie River	W126°85.955' N65°25.432'
GIP11-09-1-4	2009	Located between a sump and the Mackenzie River on Goose Island	W126°94.889' N65°27.444'

¹ Map of Groundwater-SNP Stations on Figure 2

2. **Waste Management Facility Groundwater Management Wells**²

Insert table when submitted

H. Sampling and Analysis Requirements for Groundwater Monitoring Wells

1. Sampling of Groundwater monitoring wells shall be conducted during the months of May to September.
2. The Groundwater monitoring wells shall be sampled yearly during the months of May to September for the following parameters and frequency and in accordance with the approved **Groundwater Management Plan**:

Parameter	Frequency
Chloride	Twice per year
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	Twice per year
ICP-MS Metal Scan (Total)/Dissolved – regulated parametrs Aluminum, Cadmium, chromium, Copper, Lead, Nickel, Zince	Twice per year
ICP-MS Metal Scan (Total)/Dissolved – monitored parametrs Manganese, Molybdenum, Selenium, Strontium, Uranium	Once per year
Major Ions Calcium, Sulphate, Magnesium, Fluoride, Potassium, Alkalinity, Hardness, Total Dissolved Solids	Once per year

I. Flow, Volume, and Temperature Measurement Requirements

1. The following qualities shall be measured and recorded daily in cubic metres:
 - a) The quantity of fresh Water pumped from the Mackenzie River;

² Map of WMF Grroundwater Monitoring Wells on Figure 3

- b) The quantity of Wastewater returned to the Mackenzie River; and
 - c) The quantity of Produced Water and fresh Water injected into the Oilfield reservoir.
2. The Water temperature shall be measured daily at SNP Station S13L1-007 – 1 and S13L1-007 – 2 in degrees Celsius.

DRAFT

Schedule 1: Annual Water Licence Report

1. The **Annual Water Licence Report** referred to in Part B, Condition 19 of this Licence shall include, but not be limited to, the following information about activities conducted during the previous calendar year:
 - a) A brief summary of Project activities;
 - b) An updated Project schedule;
 - c) The monthly and annual quantities in cubic metres of fresh Water obtained from all sources, as required in Part B, Condition 18 of this Licence;
 - d) Details on the handling, storage, treatment and disposal of all Waste(s) generated by Project activities;
 - e) A summary of the calibration and status of the meters and devices referred to in Part B, Condition 18 of this Licence;
 - f) A summary of engagement activities conducted in accordance with the approved **Engagement Plan**, referred to in Part B, Condition 20 of this Licence;
 - g) A summary of how Traditional Knowledge was accommodated into decision making;
 - h) A review of spill training and communication exercises of the previous year, including the successes and failures, as well as recommendations for improvement;
 - i) A general schedule for any planned oil spill exercises for the following year;
 - j) A summary of Construction activities conducted in accordance with Part E of this Licence;
 - k) A summary of major maintenance activities conducted in accordance with this Licence; **(BDD Item No. 20)**
 - l) A summary of activities conducted in accordance with the approved **Waste Management Plan**, referred to in Part F, Condition 7 of this Licence, including:
 - i. A summary of approved updates or changes to the process or facilities required for the management of Wastewater and other Waste;
 - ii. Monthly and annual quantities, in cubic metres, of Water obtained from the Mackenzie River from each approved Water Intake;
 - iii. Monthly and annual quantities, in cubic metres, of recycled Water, identifying both the source and use;
 - iv. Monthly and annual quantities of Water, in cubic metres, used for dust control;
 - v. Monthly and annual quantities/volumes by location of each and all Water, Wastewater, or other Waste materials managed under the plan;
 - vi. Monthly and annual quantities, in cubic metres, of Wastewater discharged to the Mackenzie River at SNP station S13L1-007 – 2;
 - vii. Monthly and annual quantities, in cubic metres, of fresh Water and Produced Water injected into the Waterflood;

- viii. Monthly and annual quantities, in cubic metres, of Water contained and discharged from the Surface Water Run-Off Facilities;
- ix. Monthly and annual quantities, in cubic metres, of Produced Water recovered from the Oilfield reservoir;
- x. A summary and interpretation of any monitoring results;
- xi. A list of any Action Level exceedances; and
- xii. A description of actions taken in response to any Action level exceedances.

m) A summary of activities conducted in accordance with the approved **Waste Management Facility Environmental Management Plan**, referred to in Part F, Condition 11 of this Licence, including:

- i. A summary of approved updates or changes to the process or facilities required for the characterization and management of Leachate and management of the Waste Management Facility;
- ii. Monthly and annual quantities, in cubic metres, of all contaminated materials, including soils and demolition debris, placed in the Waste Management Facility;
- iii. The size, height, depth, area, of the Waste Management Facility;
- iv. A summary and interpretation of results from the Leachate monitoring performed under the approved **Waste Management Facility Leachate Monitoring Plan**, including:
 - a. Site map with seepage locations,
 - b. Monthly and annual quantities, in cubic metres, of Leachate generated from the Waste Management Facility and disposal location,
 - c. Weekly, monthly, and annual volumes, in cubic metres, of Leachate disposed of by injection to the F-31X Treatment and Injection Facility;
 - d. An analysis of major trends in Leachate generation (rates and volumes) over the year and since initial operation of the Waste Management Facility, to determine the need for a Leachate Treatment Facility; and
 - e. A summary of recommendations for future Leachate monitoring and/or management actions;
- v. Record of inspections of the Waste Management Facility.
- vi. A summary of activities conducted in accordance with the approved **Waste Management Facility Groundwater Management Plan**, including:
 - a. A summary and interpretation of any monitoring results;
 - b. A list of any Action Level exceedances; and
 - c. A description of actions taken in response to any Action level exceedances;
- vii. A summary and interpretation of monitoring results, including any Action Level exceedances; and
- viii. A description of actions taken in response to any Action Level exceedances.

n) A summary of activities conducted in accordance with the approved **Groundwater Management Plan**, referred to in Part F, Condition 3 of this Licence, including:

- i. A summary and interpretation of any monitoring results;
- A list of any Action Level exceedances; and
- A description of actions taken in response to any Action level exceedances.

(BDD Item No. 3d)

o) A summary of the results and any actions taken as a result of the following inspections:

- i. Inspections conducted to fulfill Part G, Conditions 10 and 11 of this Licence;

- p) A summary of monitoring results and any Action Level exceedances as per the approved **Aquatic Effects Monitoring Program** required in Part I, Condition 1 of this Licence;
- q) Tabular summaries of all data and information generated under the SNP annexed to this Licence and graphical summaries of parameters with EQC referred to in Part F, Condition 21, at the points of compliance (SNP Stations X, Y, Z), in Excel format.
- r) A summary of activities conducted in accordance with the approved **Spill Contingency Plan**, referred to in Part H, Condition 3 of this Licence, including:
 - i. A list and description for all Unauthorized Discharges, including the date, NWT spill number, volume, location, summary of the circumstances and follow-up actions taken, and status (i.e. open or closed), in accordance with the reporting requirements in Part H, Condition 6 of this Licence; and
 - ii. An outline of any spill training carried out.
- s) A summary of activities conducted in accordance with the **Closure and Reclamation Plan**, referred to in Part J, Condition 1 of this Licence, including:
 - i. Details of any Progressive Reclamation undertaken;
 - ii. A discussion on whether planning and implementation remains on schedule, and a summary of any new scheduling setbacks;
 - iii. A summary of Reclamation Research completed;
 - iv. A summary of engagement conducted regarding Closure and Reclamation;
 - v. A list of any factors that would increase or decrease the Closure Cost Estimate the next time the Estimate is updated;
- t) A drilling schedule for the upcoming year with locations of each well;
- u) The annual amounts in cubic metres of Drilling Waste generated from all drilling activities;
- v) A list of any non-compliance(s) with the conditions of this Licence or any directive from the Board pursuant to the conditions of this Licence;
- w) A summary of actions taken to address concerns, non-conformances, or deficiencies in any reports filed by an Inspector;
- x) Any other details requested by the Board by October 31 of the year being reported.

Schedule 2: Conditions Applying to Security

1. The Licensee shall post and maintain a security deposit of CDN \$178,883,606.00 (\$180,883,606.00 less \$2,000,000.00 existing security) for the Imperial Oil Resources Norman Wells Operations, in accordance with section 72.11 of the MVRMA and Part C , Condition 1 of this Licence.

DRAFT

Schedule 3: Conditions Applying to Construction

1.	<p>The Licensee shall conduct the following studies prior to submission of final Phase 1 Design and Construction Plan referred to in Part E, Condition 6 of this Licence, to the Board:</p> <ul style="list-style-type: none">a) Supplementary geotechnical site investigations of the eastern portion of the Phase 1 footprint to validate assumptions, outcomes and conclusions of the March 2018 geotechnical assessment of the Mainland Sump Area;b) Sump material mixing and drying protocols;c) Additional assessment of the geosynthetic clay Liner to evaluate the suitability of the Liner to northern climate; andd) Additional assessment of the Cover material and design.
2.	<p>The Licensee shall conduct the following studies prior to submission of final Phase 2 Design and Construction Plan referred to in Part E, Condition 7 of this Licence, to the Board:</p> <ul style="list-style-type: none">a) Geotechnical assessment and investigation of the western portion of the proposed footprint of Phase 2 buildout;b) Topographic surveys;c) Results of the observationally driven Leachate design strategy (post-construction monitoring of Leachate flow, volume and quality) and assessment of the need for a Leachate Treatment Facility;d) Chemical characterization of the Wastes and Leachate, including completion of Waste and heat transfer modelling;e) Water balance modelling;f) Stability assessment of the final Cover;g) Failure mode and effects analysis;h) Borrow area design.

Schedule 4: Conditions Applying to Waste and Water Management

1. The Licensee's **Groundwater Monitoring Plan** referred to in Part F, Condition 3 of this Licence, shall contain the following information:
 - a) An assessment of available baseline information;
 - b) A plan to collect additional information necessary to establish baseline conditions for Groundwater monitoring wells;
 - c) Proposed criteria for all sampled parameters that indicate contamination;
 - d) Identification of Groundwater monitoring wells that show contamination;
 - e) Identification of Groundwater monitoring wells that are indicating a trend towards contamination before end of Commercial Operations; and
 - f) A detailed Response Plan to address contaminated and potentially contaminated Groundwater.

2. The Licensee's **Waste Management Facility Groundwater Monitoring Plan** referred to in Part F, Condition 11 of this Licence, shall contain the following information:
 - a) An assessment of the establishment of baseline contaminant levels following installation of the wells;
 - b) Proposed criteria for all sampled parameters that indicate an increasing trend of contamination;
 - c) A detailed Response Plan to address contaminated and potentially contaminated Groundwater.

3. The Licensee's **Waste Management Facility Leachate Monitoring Plan** referred to in Part F, Condition 11 of this Licence, shall contain the following information:
 - a) Commencing after initial placement of impacted material to the WMF, monitoring of Leachate levels and volumes produced in all collection Sumps/catchbasins will be undertaken weekly;
 - b) Once Leachate accumulation rates have stabilized, or are in decline, the monitoring interval shall be adjusted to no less than monthly, as authorized by an Inspector and the Board;
 - c) Leachate quality from each collection Sump/catchbasin shall be sampled and tested monthly for the parameters set out in Annex A, Part H, Condition 2;
 - d) Summary and analysis of the Leachate quality data to establish baseline quality and develop Effluent Quality Criteria/Action Levels and Response Plan for any exceedances.

Schedule 5: Conditions Applying to Operations and Maintenance of Structures and Facilities

1. The Licensee's Annual **Flowline Integrity and Mackenzie River Breakup Report** required by Part G, Condition 8 of this Licence, shall contain the following information:
 - a) The results of Bathymetric Surveys (**BDD Item No. 4**) and inspections of the physical condition of each Artificial and Natural Island, including channel erosion, island scour holes and erosion, Flowline landfalls, the condition of rip rap and the following information:
 - i. locations, depth, and volume of channel scour in the vicinity of any Flowline(s);
 - ii. locations and magnitude of Artificial Island(s) slope erosion;
 - iii. locations and severity of Artificial Island(s) rip rap disturbance;
 - iv. structural integrity of the Artificial Islands, and other related structures; and
 - v. structural integrity of the Natural Islands where it is applicable to Project activities.
 - b) The dates and results of Flowline(s) and fuel storage tank (hydrostatic) integrity tests; and
 - c) Details on necessary repair and maintenance work along with a schedule for completing such work prior to the following spring Mackenzie River Breakup period.
- 2.

Schedule 6: Conditions Applying to Aquatic Effects Monitoring Program

1. The **Special Effects Study** required under Part I, Condition 3 of this Licence will address the following:
 - a) Validation that visible sheen is an effective indicator of the lack of hydrocarbons; and
 - b) To establish any threat posed by metals and ions in surface or Groundwater by monitoring in the Mackenzie River, upstream of the facility, and at the Groundwater SNP stations listed in Annex A, Part G, for a period of two years (minimum 12 samples), and submit to the Board for approval.
2. Within three months of Board approval of the **Special Effects Study**, the Licensee shall submit a report to the Board with recommendations on the need for Effluent Quality Criteria for metals or ions, based on the results of the monitoring and trend analysis. **(BDD Item No. 22)**
3. The **AEMP Annual Report** referred to in Part I, condition 6 of this Licence shall include, but not be limited to, the following: **(BDD Item No. 23)**
 - a) A plain language summary and interpretation of the major results obtained in the preceding calendar year;
 - b) A summary of activities conducted under the AEMP;
 - c) A summary of any spills, activities, or other considerations within the report time frame that could influence the results of the AEMP;
 - d) Tabular summaries of all data and information generated under the AEMP, in Excel format;
 - e) An interpretation of the results, including an evaluation of any identified environmental effects that occurred as a result of the Project;
 - f) A comparison of predicted mixing and dilution of Effluent in Mackenzie River in comparison to monitoring data;
 - g) An analysis that integrates the results of individual monitoring components collected in a calendar year and describes the ecological significance of the results;
 - h) A comparison of monitoring results to Action Levels as defined in the approved **AEMP Design Plan**;
 - i) For any low Action Level exceedances, a summary of the nature and extent of the exceedance, as well as a description of actions taken in response to the exceedance;
 - j) An evaluation of any adaptive management response actions implemented;
 - k) Recommendations, with rationale, for changes to any aspect of the **AEMP Design Plan**; and
 - l) Any other information specified in the approved **AEMP Design Plan**.

DRAFT

Schedule 7: Conditions Applying to Closure and Reclamation

1. The Licensee's **revised Closure and Reclamation Plan** referred to in Part J, Condition 2 of this Licence shall include, but not be limited to the following information: **(BDD Item No. 6)**

A. General Information Updates

- a) Clearly state the assumption that the two bridges over Watercourses and three docks as depicted on (revised) Figure 5-14 will remain in place post-closure, to support the needs and preferences of the Norman Wells community;
- b) Include a description of the best practices and mitigation measures that will be used to avoid potential impacts to Watercourses upon closure;
- c) Include an explanation for the assumption that hydrocarbons and chlorides are likely to be the primary parameters of concern in Leachate generated by the Waste Management Facility;
- d) Describe the specific nature, scale, and operating configuration of the Biocells and Soil Washing Facility and how they will be integrated with the WMF to manage the entire Norman Wells Operations soil inventory;
- e) Describe the location, duration, and anticipated frequency of monitoring related to surface and Groundwater during the closure and post-closure periods.
- f) Include an expanded section on Traditional Knowledge inputs as well as more updated historical local knowledge of inputs from past contaminated sites.

B. Waste Management Facility Planning and Design

- a) Develop specific guidelines and specifications for differentiating between areas revegetated naturally and by seeding;
- b) Complete detailed planning and/or engineering studies, plans, assessments, and designs required to support the preferred Mainland concept option;
- c) Complete additional site characterization to compile a more complete inventory of local waterbodies across the Norman Wells Proven Area;
- d) Consider the potential influence of chemical changes on the stability of materials post-closure;
- e) Complete detailed inventories of Flowline locations, lengths, depths and other characteristics;
- f) Complete detailed inventories of all above-ground structures (including tanks); and
- g) Provide more definitive descriptions of the management and monitoring scopes, monitoring duration, and frequencies for terrestrial vegetation, the Mackenzie River and Bosworth Creek, Groundwater, and geotechnical characteristics at the Waste Management Facility location and proposed footprint.

C. Reclamation Research

- a) A **River Dynamics Study** to address the following information:
 - i. Provide a detailed assessment of the potential impacts of sediment releases to downstream fish and fish habitat for all potential Artificial Island(s) closure options;
 - ii. Provide the hydrological modelling calculations with a description of the criteria and assumptions used in the development of the models;
 - iii. Provide an assessment of the fish and fish habitat that may occur within the armouring and sandbars of the Artificial Islands; and
 - iv. Conduct an assessment and quantification of the potential impacts to any fish and fish habitat that may have established within the armouring and sandbars of the Artificial Islands and mitigation measures to minimize negative effects.

- b) A plan to confirm the source of metal concentrations in Bosworth Creek and the potential impacts of the elevated metals on the aquatic ecosystem within Bosworth Creek;
 - c) A monitoring plan for Groundwater inputs and other anthropogenic sources of hydrocarbon and salts in Bosworth Creek to determine trends and to determine if remediation efforts are required to address issues with hydrocarbons or salts in Bosworth Creek;;
 - d) A plan and timeline to determine exact volumes of material and degree of contamination as part of ongoing characterization efforts; physical conditions;
 - e) A more specific definition of sediment and Water quality closure criteria;
 - f) Quantification of areas to be recontoured, areas to be revegetated, and roads that require reclamation, and quantification of fill required for backfill and its source;
 - g) Develop a protocol for differentiating between natural and anthropogenically derived impacts and for accurately defining background conditions and their influences on the selection of final remediation criteria;
 - h) Develop assessments to ecological receptors (plant species, fish, and wildlife) if it is determined that final Closure and Reclamation Plans should apply site-specific, risk-based criteria for remediation; and
 - i) Design and implement a post-remediation Groundwater and surface Water monitoring program, to be undertaken as long as is required to demonstrate with reasonable certainty that remediation/closure criteria have been achieved.
2. The **Reclamation Research Report** Referred to in Part J, Condition 3 of this Licence and detailed in Schedule 7, Condition 1C, shall include, but not be limited to, the following information:
- a) A plain language summary of the results, and a plain language interpretation of the significance of the results;
 - b) A discussion of whether Reclamation Research planning and implementation remains on schedule;
 - c) Analysis and interpretation of the data collected during the reporting period and to date;
 - d) An explanation of the significance of the results for Closure and Reclamation planning;
 - e) Reclamation Research data for the reporting period; and
 - f) An evaluation of the effectiveness of the Reclamation Research plan.
3. The Licensee's **Annual Closure and Reclamation Progress Report** required by Part J, Condition 7 of this Licence, shall contain the following information, where applicable to this work:
- a) A summary of any **Progressive Reclamation** work completed during the year and an outline of any work anticipated for the next year; **(BDD Item No. 17)**
 - b) Activities related to the Water Intake facilities and Water distribution infrastructure;

- c) Activities related to Waste disposal sites and facilities;
- d) Activities related to the petroleum, chemical, and/or Hazardous Waste storage areas;
- e) Details related to the restoration of natural drainage and stream banks related to Project activities;
- f) Details related to the extent of and mitigation measures for soil and Groundwater impacts and remediation systems;
- g) Activities related to the Oilfield collection and gathering system, especially the Flowline(s);
- h) Activities related to Surface Water Run-Off Facilities;
- i) Details on any site affected by Unauthorized Discharges and/or releases;
- j) Activities related to the Waterflood facilities and/or infrastructure;
- k) Activities related to the Central Processing Facility;
- l) Activities related to the Artificial and Natural Islands;
- m) Activities related to the former refinery area and associated infrastructure;
- n) Activities related to the Groundwater treatment facilities;
- o) Details on any other facility or infrastructure which could potentially impact land and/or Water;
- p) Cataloguing of all closed wells and Sumps, identifying the status of each, including any planned mitigation or remediation measures;
- q) Activities related to revegetation; and
- r) Post-closure monitoring plans for any facility and/or infrastructure.