

SAHTU LAND AND WATER BOARD
DRAFT Water Licence

LICENSEE: IMPERIAL OIL RESOURCES N.W.T. LIMITED

LICENCE NUMBER: S13L1-007

**EFFECTIVE DATE OF
LICENCE ISSUANCE:**

Prepared by Board Staff January 2014

Part A: Scope and Definitions

1. Scope

- a) This Licence entitles Imperial Oil Resources N.W.T. Limited to use water and dispose of Waste for industrial undertakings in oil and gas production, and associated uses at the Norman Wells Proven Area located at Latitude 65° 17' N., Longitude 126° 51' W., in the Northwest Territories;
- b) This Licence is issued, subject to the conditions contained herein, with respect to the taking of water and the depositing of Waste of any type 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. Whenever new Regulations are made or existing Regulations are amended by the Governor-in- Council under the *Northwest Territories Waters Act*, or other statutes imposing more stringent conditions relating to the quantity or type of Waste that may be so deposited or under which any such Waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be automatically amended to conform with such Regulations; and,
- c) Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with the requirements of all applicable Federal, Territorial and Municipal legislation.

2. Definitions

In this Licence: S13L1-007

“**Act**” means the *Northwest Territories Waters Act*.

“**Acute Lethality**” means an effluent 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 Report 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**” means an Analyst designated by the Minister under Section 35(1) of the *Northwest Territories Waters Act*.

“**Aquatic Effects Monitoring Program**” means a monitoring program designed to determine the short and long-term effects in the Receiving Environment resulting from project activities; to evaluate the accuracy of impact predictions; to assess the effectiveness of planned impact mitigation measures; and to identify additional impact mitigation measures to reduce or eliminate environmental effects.

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

“**Biocell**” comprises the area or engineered cell designed for the treatment of 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**” means the Sahtu Land & Water Board established under Section 56 of the *Mackenzie Valley Resource Management Act*.

“**Central Processing Facility**” means the plant where oil, gas, and Produced Water are collected from the oilfield and separated, with plant cooling being accomplished using Mackenzie River water.

“**EC50(15)**” means in a Microtox bioassay test, the effluent is deemed excessively toxic if the light emission of a marine bioluminescent bacterium colony is reduced by more than 50% over 15 minutes when challenged by a sample containing a toxic substance. A test result of greater than 90 is considered a pass.

“**Flowline**” means a line that is used to transport fluids from a well to a production facility or vice versa, and includes intrafield export and all gathering lines.

“**Grab Sample**” means an instantaneous sample of water.

“**Groundwater**” means all water below the ground surface.

“**Groundwater Treatment Facilities**” system designed to collect and treat contaminated groundwater.

“**Impermeable Lined Diked Areas**” means 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.

“**Inspector**” means an Inspector designated by the Minister under Section 35(1) of the Act.

“**Landfarm**” comprises the lined, engineered facility designed to contain and treat, using bioremediation, hydrocarbon contaminated sediments and soil.

“**Licensee**” means the holder of this Licence.

“**Management Plans**” means the specific plans required by the Board under this Water Licence.

“**Microtox Test**” means a bioassay test that monitors changes in the level of light emission from a marine luminescent bacteria when challenged with a toxic substance or sample containing toxic materials, and is used to provide a more rapid, real-time measurement of acute toxicity. Microtox Test is measured as EC50(15) or IC50(15).

“**Minister**” means the Minister of Indian Affairs and Northern Development;

“**Modification**” in respect of a structure, means a change, other than an expansion, that does not alter the purpose or function of a structure.

“**Natural Islands**” means Bear, Goose, and Frenchy's Islands, including drilling equipment and supplies, wastes and storage facilities, well-head equipment, and temporary or permanent buildings.

“**Produced Water**” means water naturally present in the reservoir or injected into the reservoir to enhance production, produced as a co-product when gas or oil is produced.

“**Reclamation**” means activities which facilitate the return of affected areas to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment, human activities, and the surrounding environment.

“**Regulations**” means Regulations proclaimed pursuant to Section 33 of the *Northwest Territories Waters Act*.

“**Representative Grab Sample**” means a grab sample consisting of equal portions of water collected from a minimum of two locations within one site.

“**River Ice Breakup**” means 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.

“**Single Composite Sample**” means 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";

“**Surface Water Run-Off Facilities**” means the Refinery Impound Basin, Battery 3 Impound Basin, Refinery Water Flood Basin, CPF Impound Basin, Miscellaneous Mainland Impound Areas, Miscellaneous Bear Island Impound Areas, Miscellaneous Goose Island Impound Areas and associated ditches provided for the collection, storage and discharge of surface run-off waters from the Imperial Oil Resources N.W.T. Limited lease;

“**Surveillance Network Program**” refer to Annex A.

“Waste” means waste as defined by Section 2 of the *Northwest Territories Waters Act*.

“Watercourse” a natural body of flowing or standing water or an area occupied by water during part of the year, and includes streams, springs, swamps and gulches but does not include groundwater.

“Waterflood” means the injections of water into the Norman Wells oilfield reservoir for pressure maintenance and enhanced oil production.

“Waters” means any inland water, whether in a liquid or frozen state, on or below the surface of the land in the Northwest Territories.

“Water Intake” means the wetwell pump and associated facilities installed in the Mackenzie River and the water line to the Central Processing Facility.

Part B: General Conditions

1. The Licensee shall ensure a copy of this Licence is maintained on site at all times.
2. The water use fee shall be paid annually in advance of any water use, in accordance with the Mackenzie Valley Land and Water Board's *Water Use Fee Policy*.
3. The Licensee shall operate in accordance with any Management Plans approved pursuant to the conditions of this Licence and with any revision to the plans as may be made from time to time pursuant to the conditions of this Licence and as approved by the Board. If any plan is not approved by the Board, the Licensee shall revise the plan according to the Board's direction and re-submit it to the Board for approval.
4. The Licensee shall annually review the Management Plans referred to in Part B: Item 9, Part E: Item 2, Part F: Item 4, Part H: Items 1 and 2 and shall submit updates to the Management Plans to the Board for approval at the following times:
 - a) If the Licensee seeks changes to the Management Plan; and
 - b) Upon the request of the Board.
5. The Licensee shall comply with the Schedules, which are annexed to and form part of the Licence, and any amendments to the Schedules as may be made from time to time by the Board.
6. The Licensee shall comply with the Surveillance Network Program, which is annexed to and forms part of this Licence, and any amendments to the Surveillance Network Program as may be made from time to time by the Board.

7. The Schedules, the Surveillance Network Program, and any compliance dates specified in this Licence may be amended at the discretion of the Board.
8. Meters, devices, or other such methods used for measuring the volumes of water used and Waste discharged shall be installed, operated and maintained by the Licensee to the satisfaction of an Inspector.
9. The Licensee shall post and maintain signs necessary to identify the stations of the Surveillance Network Program to the satisfaction of an Inspector.
10. The Licensee shall operate in accordance with the Engagement Plan, once approved. The Plan must be in accordance with the Mackenzie Valley Land and Water Board's *Engagement Guidelines for Applicants and Holders of Land Use Permits and Water Licences*, June 2013, or subsequent editions.
11. The Licensee shall file an Annual "Site Operations" Report with the Board no later than March 31st of the year following the calendar year reported. The report shall contain the information set out in Schedule 1: Item 1.

Part C: Conditions Applying to Security Deposits

1. The Licensee shall post and maintain a security deposit in accordance with Schedule 2: Item 1.
2. Upon request of the Board, the Licensee shall submit an updated Reclamation liability estimate utilizing the current version of RECLAIM, or another method acceptable to the Board.
3. The amount of the security deposit required by Part C: Item 1 and Schedule 2: Item 1 may be revised by the Board based on estimates of the current Reclamation liability referred to in Part C: Item 2 of this Licence or based on such other information as may be available to the Board.

Part D: Conditions Applying to Water Use

1. The Licensee shall obtain all fresh water from the Mackenzie River, unless otherwise approved by the Board, for Central Processing Facility cooling, Waterflood, drilling, and any other industrial or maintenance uses associated with operations utilizing the approved Water Intake.
2. The Licensee may obtain water for dust suppressant from the Surface Water Runoff Facilities only if the water meets the effluent quality criteria established in Part D: Item 1 of the Surveillance Network Program, or as otherwise approved by the Board.
3. The Licensee shall not exceed the total allowable Water(s) withdrawal limit of 3,500,000 cubic metres per year, and shall not exceed the rate of 16,000 cubic metres per day.

4. The Licensee shall minimize net water withdrawals from the hydrological cycle by using appropriate water conservation methods, such as, but not limited to, the injection of Produced Water into the Norman Wells Proven Area oilfield reservoir.

Part E: Conditions Applying to Waste and Water Management

1. The Licensee shall manage Water(s) and Waste with the objective of minimizing the impacts of project activities on the quantity and quality of Water in the environment through the use of appropriate mitigation measures, monitoring, and follow-up actions.
2. The Licensee shall operate in accordance with the Waste Management Plan, once approved. The Plan must be in accordance with the Mackenzie Valley Land and Water Board's *Guidelines for Developing a Waste Management Plan*, March 2011, or subsequent editions.
3. The Licensee shall maintain a copy of the Waste Management Plan on-site in a readily available location to the satisfaction of an Inspector.
4. The Licensee shall discharge water in a controlled manner designed to avoid flooding or erosion.
5. The Licensee shall not use any biocides where they may enter any Watercourse unless approved by the Board.
6. All sewage Waste(s) shall be disposed of at a licensed sewage disposal facility.
7. The Licensee shall ensure that any fuels, chemicals, or Waste(s) associated with this undertaking do not enter any Waters, except in the manners described in the Surveillance Network Program.
8. The Licensee shall not release hydrostatic test fluids to land and/or Water(s). Hydrostatic test fluids shall be handled through the Licensees injection processes.
9. All Waste(s) discharged at SNP Station S13L1-007 – 2 to the Mackenzie River shall not be acutely lethal to fish and shall not exceed the following effluent criteria:

Parameter	Guideline
pH	6.0 – 9.0
Total Petroleum Hydrocarbons	
Phenols	0.14 mg/L

10. All other Waste(s) discharged to any other Water(s) by the Licensee shall be considered to be non-toxic and shall pass a Microtox Test as set out below:

Microtox EC50(15) Toxicity Testing*	Pass = EC50(15) > 90%
Microtox EC50(15) With Charcoal Filtration	Pass with Charcoal Filtration = EC50(15) > 90%
*If original microtox tests fail the applicant may perform the microtox test with charcoal filtration.	

Part F: Conditions Applying to Operation and Maintenance

1. The Licensee shall drill all wells from within Impermeable-Lined Diked Areas.
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.
3. The Licensee shall inspect the riverbeds, channels and banks of the Mackenzie River in the vicinity of the Flowline(s), and shall immediately notify the Inspector of any significant erosion and take appropriate remedial action as required.
4. The Licensee shall operate in accordance with the Flowline Integrity Management Plan, once approved.
5. The Licensee shall submit an Annual “Flowline Integrity and Mackenzie River Breakup” Report no later than October 31st of the year being reported. The report shall contain the information set out in Schedule 1: Item 2.

Part G: Conditions Applying to Modifications

1. The Licensee may, without written consent from the Board, carry out Modification(s) to the water supply and Waste disposal facilities, bunkers, docks, bridges, Flowlines, creek banks, and river banks provided that the Modification(s) are consistent with the terms of this Licence and the following requirements are met:
 - a) the Licensee has provided the details of the proposed Modification(s) to the Board, in writing, at least 60 days prior to the commencement of the Modification(s);
 - b) the Modification(s) does not place the Licensee in contravention of either the Licence, the Act or Federal, Territorial or Municipal Legislation;
 - c) the Board has not, during the 60 days following notification of the proposed Modification(s), informed the Licensee that review of the proposal will require more than 60 days; and
 - d) the Board has not rejected the proposed Modification(s).

2. Modification(s) for which all of the conditions referred to in Part G: Item 1, have not been met, can be carried out only with written approval from the Board.
3. The Licensee shall provide as-built plans and drawing of the Modification(s) referred to in this Licence within 90 days of completion of the Modification(s).

Part H: Conditions Applying to Contingency Planning

1. The Licensee shall operate in accordance with the Spill Contingency Plan, once approved. The Plan must be in accordance with Indian and Northern Affairs Canada's *Guidelines for Spill Contingency Planning, 2007*, or subsequent editions.
2. The Licensee shall operate in accordance with the Emergency Response Plan, once approved.
3. The Licensee shall carry out field and communication exercises 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.
4. The Licensee shall undertake further field and communication exercises at the request of the Board.
5. If, during the period of this Licence, an unauthorized discharge of Waste(s) occurs, or if such a discharge is foreseeable, the Licensee shall:
 - a) report the incident immediately via the 24 Hour NWT Spill Report Line. Currently the number is (867) 920-8130;
 - b) report the unauthorized discharge of Waste to the Board and an Inspector within 24 hours; and
 - c) submit to the Board and an Inspector, a detailed report on each occurrence not later than 30 days after initially reporting the event.

Part I: Aquatic Effect Monitoring Program

1. The Licensee shall submit within one year of the Licence being issued an Aquatic Effects Monitoring Program Plan for approval by the Board.
2. The Licensee shall adhere to the approved Aquatic Effects Monitoring Program Plan and shall annually review the Plan and make any necessary revisions to reflect changes in operations, technology, chemicals or fuels, or as directed by the Board. Revisions to the Plan shall be submitted to the Board for approval.

Part J: Conditions Applying to Closure and Reclamation

1. The Licensee shall submit within one year of the Licence being issued a Closure and Reclamation Plan for approval by the Board.
2. The Licensee shall adhere to the approved Closure and Reclamation Plan and shall annually review the Plan and make any necessary revisions to reflect changes in operations, technology, chemicals or fuels, or as directed by the Board. Revisions to the Plan shall be submitted to the Board for approval.
3. The Licensee shall endeavour to carry out progressive reclamation of areas as soon as is reasonably practicable.
4. The Licensee shall provide an Annual "Closure and Reclamation" Report no later than May 31st following the calendar year being reported. The report shall contain the information set out in Schedule 1: Item 3.
5. A minimum of 24 months prior to the end of commercial operations, the Licensee shall submit a Final Closure and Reclamation Plan to the Board for approval.

SAHTU LAND AND WATER BOARD

Witness

Chairman

SAHTU LAND AND WATER BOARD

LICENSEE: IMPERIAL OIL RESOURCES N.W.T. LIMITED

LICENCE NUMBER: S13L1-007

**EFFECTIVE DATE OF
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Annex A: Surveillance Network Program (SNP)

A. Location of Surveillance Stations

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

Map of Active SNP Stations in Figure 1

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 "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 shall annually review the Quality Assurance and Quality Control Manual and shall revise the manual as necessary to reflect changes in field and laboratory quality control and quality assurance testing, procedures and technology. The proposed revision(s) shall be submitted to the Board for approval. All details of the manual shall be implemented as approved by the Analyst.
4. The Licensee may, upon notifying the Inspector, clean the settling pond at the Central Processing Facility according to the CPF Settling Pond Cleaning Procedure, approved by the Board and amended from time to time).

C. Sampling and Analysis Requirements for SNP Stations

1. A Single Composite Sample of water at SNP Station S13L1-007 – 1 shall be sampled 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

2. A Representative Grab Sample of Water(s) shall be collected at SNP station S13L1-007 - 1 at least once every six months 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

3. A Single Composite Sample of water at SNP Station S13L1-007 – 2 shall be sampled 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

4. A daily grab sample of water at SNP Station S13L1-007 – 2 shall be field analyzed for Total Residual Chlorine.
5. All Waste(s) discharged at SNP Station S13L1-007 – 2 to the Mackenzie River shall not exceed the effluent criteria set out in Part E: Item 9 and 10 of the Licence.
6. A Representative Grab Sample of Water(s) shall be collected at SNP Station S13L1-007 – 2 at least once every six months 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

7. The Licensee shall determine the Acute Lethality of the Waste Waters at SNP station S13L1-007 - 2 using the biological test method prescribed in "Acute Lethality Using Rainbow Trout Report EPS 1/RM/9 July 1990", or as may be revised, and performed in a quarterly (four samples throughout the year) time frequency.

8. The Licensee shall determine the Acute Lethality of the Waste Waters at Station Number S13L1-007 - 2 using the biological test method prescribed in "Acute Lethality of Effluents to Daphnia magna EPS 1/RM/14 Second Edition December 2000", or as may be revised, and performed in a quarterly (four samples throughout the year) time frequency.
9. The Licensee shall provide a 28-day average concentration of the parameters outlined in SNP Part C: Items 3 and 4. The average concentration shall be reported in accordance with SNP Part F: Item 1.

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

See Figure 1 for map of Surface Water Run-Off Facilities

1. A Representative Grab Sample and Analysis of all water collected in the Surface Water Run-Off Facilities (listed in Schedule 3) discharged to lands and/or Waters, and/or to be used for dust suppressant on roads, shall be obtained prior to release.
 - a) Water to be released from Surface Water Run-Off Facilities listed as Category A in Schedule 3 shall be analyzed for the following prior to discharge:

Parameter	Guideline
Visible oil sheen on the water	N/A
Chlorides (Field Test)	< 500 mg/L
pH (Field Test)	6.0 – 9.0

- b) Water to be released from Surface Water Run-Off Facilities listed as Category B in Schedule 3 shall be analyzed for the following prior to discharge:

Parameter	Guideline
Total Petroleum Hydrocarbons	
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 will not be released from Surface Water Run-off Facilities if there is exceedance(s) in the above criteria without consulting the Board and Water Licence Inspector. The licensee shall make every effort to investigate exceedance(s) and treat the water before discharge.
 - d) A Microtox Test shall be performed for any discharge to Water(s) from Surface Water Run-Off Facilities:

Microtox EC50(15) Toxicity Testing*	Pass = EC50(15) > 90%
Microtox EC50(15) With Charcoal Filtration	Pass with Charcoal Filtration = EC50(15) > 90%
* If original Microtox test fails, the Licensee may perform the Microtox test with Charcoal Filtration	

- e) While 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 SNP Part D: Items 1 (a) or (b), from before, the middle, and the end of the discharge. For water volumes less than 10 m³, a single Representative Grab Sample will be collected and analyzed.
- f) Water(s) collected in any area associated with Imperial Oil's Norman Wells operations and facilities not listed in Schedule 3 shall be sampled and analyzed as per SNP Part D: Items 1 (a-e), as required.

E. 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;
 - b) the quantity of Waste water returned to the Mackenzie River; and
 - c) the quantity of Produced Water and fresh water injected into the oilfield reservoir;
- 2. The water temperatures shall be measured daily at SNP station S03L1-01 and S03L1-02 in degrees Celsius.

F. Reports

- 1. The Licensee shall within 30 days following the month being reported, submit to the Board, all data and information required by the SNP.

SAHTU Land and Water BOARD

Witness

Chairman

Schedule 1
Of Water Licence S13L1-007

1. The Licensee's Annual "Site Operations" Report required by Part B: Item 11 of the Licence shall contain the following information:
 - a) The monthly and annual quantities, in cubic metres, of fresh water obtained from all sources;
 - b) The monthly and annual quantities, in cubic metres, of each and all Waste discharged;
 - c) The monthly and annual quantities, in cubic metres, of Waste discharged to the Mackenzie River at SNP Station S13L1-007 – 2;
 - d) The monthly and annual quantities, in cubic metres, of fresh water and Produced Water injected to the Waterflood;
 - e) The monthly and annual quantities, in cubic metres, of Water(s) contained and discharged from the Surface Water Run-Off Facilities;
 - f) The monthly and annual quantities, in cubic metres, of Produced Water recovered from the oilfield reservoir;
 - g) Tabular summaries of all data generated under the Surveillance Network Program (SNP);
 - h) A list of unauthorized discharges, identification of waterbodies affected and the current status of mitigation measures;
 - i) An annual drilling schedule for the upcoming year to the Board with locations of each well;
 - j) The annual amounts in cubic metres of Waste(s) generated from all drilling activities;
 - k) A summary of the measures taken to minimize net water withdrawals from the hydrological cycle as required by Part D: Item 4 of the Licence.
 - l) Details on the handling, storage, treatment and disposal of all Waste(s) generated by project activities;
 - m) A review of spill training and communication exercises of the previous year, including the successes and failures, as well as recommendations for improvement;
 - n) A general schedule for any planned oil spill exercises for the following year;
 - o) A summary of any Modification(s) and/or major maintenance work carried out as per Part G of the Licence.

- p) Any other details on Water(s) use or Waste(s) disposal requested by the Board no later than January 31st of the year following the calendar year reported.
2. The Licensee's Annual "Flowline Integrity and Mackenzie River Breakup" Report required by Part F: Item 5 of the Licence shall contain the following information:
- a) The results of 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 slope erosion;
 - iii) Locations and severity of Artificial Island 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 integrity tests;
 - 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.
3. The Licensee's Annual "Closure and Reclamation" Report required by Part J: Item 4 of the Licence shall contain the following information, if applicable to closure and Reclamation work;
- a) A summary of any closure and Reclamation work completed during the year and an outline of any work anticipated for the next year;
 - b) Activities related to the Water Intake facilities and Water(s) 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 soil and groundwater impacts and proposed Remediation;

- g) Activities related to the oil collection system, especially any 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 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(s);
- p) Cataloguing of all closed wells and sumps, identifying the status of each, including any planned mitigation measures;
- q) Activities related to revegetation;
- r) Post monitoring plans for any facility and/or infrastructure;

Schedule 2
Of Water Licence S13L1-007

To be completed upon receipt of relevant responses to IRs. Security related schedule.

Schedule 3
Of Water Licence S13L1-007

This Schedule is intended to outline any area associated with Imperial Oil's Norman Wells operations and facilities that may be used to collect surface water, which will ultimately require discharge to land(s) and/or Water(s).

Surface Water Run-Off Facilities include Impound Basins and Areas, excavations, bunkers, bermed areas, and associated ditches provided for the collection, storage, and discharge of Surface Water Run-off from Imperial Oil's Norman Wells operations and facilities. Figure 1 provides a colour coded map of the different Surface Water 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;

Location	Coordinates
CPF Impound Area	W126°53.121' N65°17.132'
LT 11 Impound Basin	W126°51.722' N65°17.027'
Refinery Impound Basin	W126°50.817' N65°16.888'
Refinery Water Flood Basin	W126°50.539' N65°16.938'

Miscellaneous Mainland or Natural Island Impound Areas

Biocell

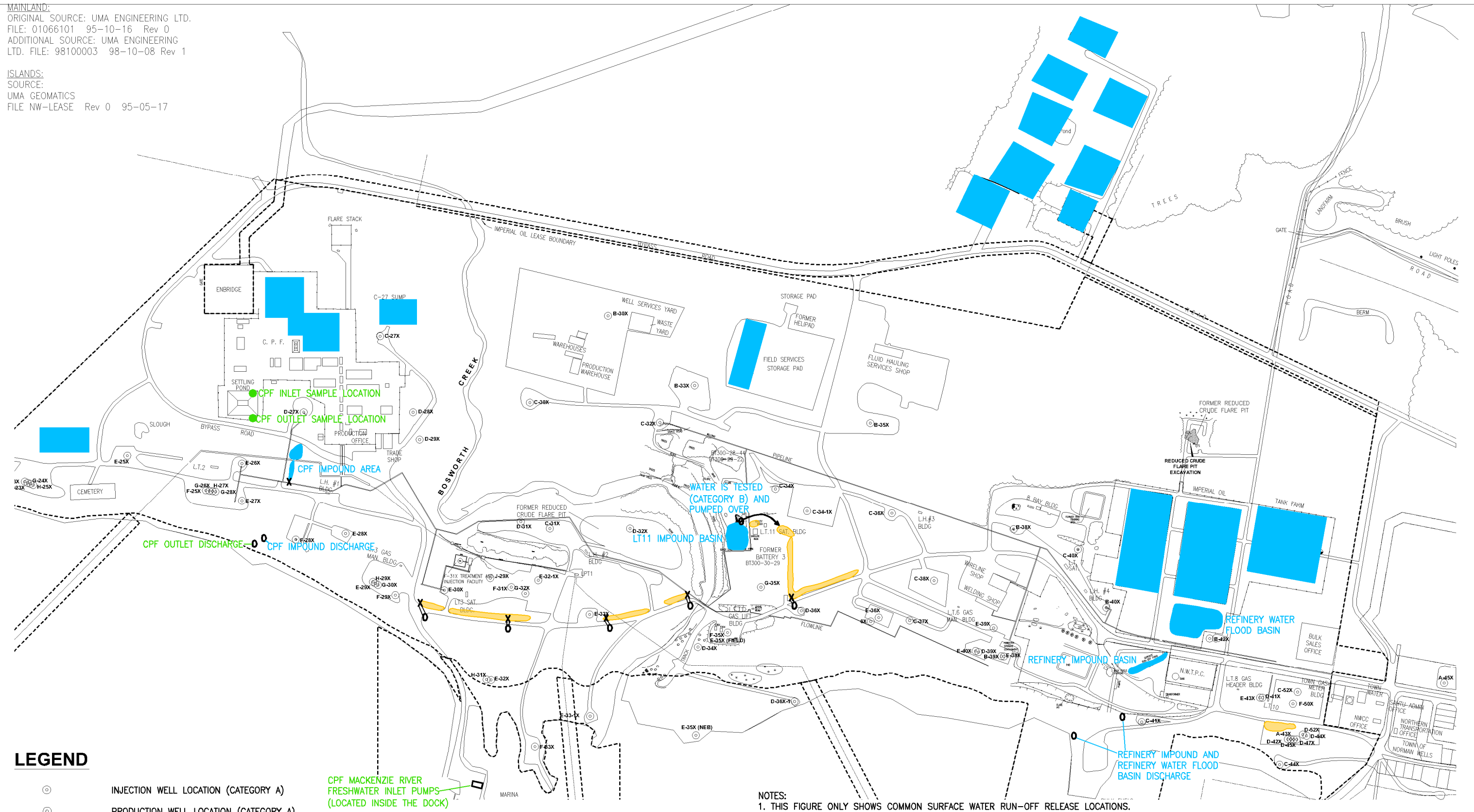
Capped Sumps

Excavations (in areas where there is known historical impacts)

Or any area where the Surface Water Run-Off from Category A does not meet the requirements outlined in SNP Part D: 1(a).

MAINLAND:
 ORIGINAL SOURCE: UMA ENGINEERING LTD.
 FILE: 01066101 95-10-16 Rev 0
 ADDITIONAL SOURCE: UMA ENGINEERING
 LTD. FILE: 98100003 98-10-08 Rev 1

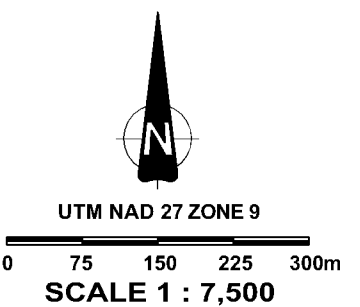
ISLANDS:
 SOURCE:
 UMA GEOMATICS
 FILE NW-LEASE Rev 0 95-05-17



LEGEND

- ⊙ INJECTION WELL LOCATION (CATEGORY A)
- ⊙ PRODUCTION WELL LOCATION (CATEGORY A)
- IMPERIAL OIL LEASE BOUNDARY
- FLOWLINE R/W
- UTILIDOR LOCATION
- CPF INLET AND OUTLET SAMPLE LOCATION
- X CULVERT GATE/PUMP LOCATION
- END OF PIPE/CULVERT/PUMP DISCHARGE LOCATION
- ▬ CATEGORY A SURFACE WATER RUN-OFF COLLECTION LOCATIONS
- ▬ CATEGORY B SURFACE WATER RUN-OFF COLLECTION LOCATIONS

CPF MACKENZIE RIVER
 FRESHWATER INLET PUMPS
 (LOCATED INSIDE THE DOCK)



NOTES:
 1. THIS FIGURE ONLY SHOWS COMMON SURFACE WATER RUN-OFF RELEASE LOCATIONS.
 2. ALL INJECTION AND PRODUCTION WELLS FOR THE ENTIRE SITE FALL UNDER CATEGORY A.

IMPERIAL OIL RESOURCES		Infrastructure & Environment	
NORMAN WELLS RENEWAL APPLICATION FOR WATER LICENCE			
SNP INLET, OUTLET AND SURFACE WATER RUN-OFF COLLECTION LOCATIONS			
30-JAN-14	date	B.M.F.	edited by
		M.Y.T.	drawn by
			app by
PREPARED SOLELY FOR THE USE OF OUR CLIENT AS SPECIFIED IN THE ACCOMPANYING REPORT. NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH WORLEYPARSONS HAS NOT ENTERED INTO A CONTRACT.		PROJECT NUMBER: 307074-01618-1500	FIGURE: 4.3

