

NORTHWEST  
TERRITORIES  
WATER BOARD



ALBERTA  
bNL

WATER REGISTER: N7L1-1797

December 15, 2003

Mr. Alan Wong  
Alaska/Mackenzie Delta  
EnCana Corporation  
150 - 9 Avenue S.W.  
CALGARY, AB T2P 3S5

Dear Mr. Wong:

**ISSUANCE OF A "B" TYPE LICENCE**

Attached is a duplicate of Licence No. N7L1-1797 granted to EnCana Corporation by the Northwest Territories Water Board in accordance with the *Northwest Territories Waters Act*. The other original of this Licence has been filed with the Department of Indian Affairs and Northern Development in Yellowknife, Northwest Territories.

Please be advised that this letter with attached procedures, all inspection reports, and correspondence related thereto are part of the public Water Register, and are intended to keep all interested parties informed of the manner in which the Licence requirements are being met. All Water Register material will be considered when the Licence comes up for renewal or amendment.

The full cooperation of EnCana Corporation is anticipated.

Sincerely,

Gordon Wray  
Chairman  
N.W.T. Water Board

Attach.

6. Specific clauses of your Licence make reference to the Board, Analyst or Inspector. The contact person, address, phone and fax number of each is:

**BOARD:** Executive Assistant  
Northwest Territories Water Board  
Box 1500  
YELLOWKNIFE, NT X1A 2R3  
Phone No: (867) 669-2772  
Fax No: (867) 669-2719

**ANALYST:** Analyst  
Water Laboratory  
Department of Indian Affairs  
and Northern Development  
Box 1500, 4601 - 52nd Avenue  
YELLOWKNIFE, NT X1A 2R3  
Phone No: (867) 669-2780  
Fax No: (867) 669-2718

**INSPECTOR:** Inspector  
North Mackenzie-Inuvik District Office  
Department of Indian Affairs  
and Northern Development  
P.O. Box 2100  
INUVIK, NT X0E 0T0  
Phone No: (867) 777-3361  
Fax No: (867) 777-2090

7. Your Licence requires a security deposit be submitted. Should the security deposit be submitted in the form of a "letter of credit", recommended wording is outlined below. It is advised that a "draft" letter of credit be forwarded to Water Resources Division for review. The contact person, address, phone and fax number of the individual administering security deposits is:

Office Administrator  
Water Resources Division  
Indian and Northern Affairs Canada  
Box 1500  
YELLOWKNIFE, NT X1A 2R3  
Phone No: (867) 669-2651  
Fax No: (867) 669-2716

THIS CREDIT IS EFFECTIVE FROM [time] A.M. ON [effective date as required by Water Licence] AND SHALL EXPIRE AT OUR COUNTERS AT [time] P.M. [expiry date] (THE "INITIAL EXPIRATION DATE"). THIS CREDIT SHALL BE RENEWED AUTOMATICALLY FOR AN ADDITIONAL ONE-YEAR PERIOD FROM THE INITIAL EXPIRATION DATE, AND FOR AN ADDITIONAL ONE-YEAR PERIOD FROM EACH FUTURE EXPIRATION DATE, UNLESS AT LEAST NINETY (90) DAYS PRIOR TO THE OPERATIVE EXPIRATION DATE WE NOTIFY YOU IN WRITING BY REGISTERED MAIL OR COURIER THAT WE ELECT NOT TO CONSIDER THIS CREDIT RENEWED FOR SUCH ADDITIONAL PERIOD.

WE HEREBY AGREE THAT ALL DRAFTS DRAWN UNDER AND IN COMPLIANCE WITH THE TERMS OF THIS CREDIT SHALL BE DULY HONOURED BY US IF PRESENTED FOR PAYMENT ON OR BEFORE THE OPERATIVE EXPIRATION DATE.

EXCEPT SO FAR AS IS OTHERWISE EXPRESSLY STATED HEREIN, THIS CREDIT IS SUBJECT TO THE UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS (1993 REVISION), INTERNATIONAL CHAMBER OF COMMERCE, PUBLICATION NO. 500. NOTWITHSTANDING ARTICLE 17 OF SAID PUBLICATION, IF THIS CREDIT EXPIRES DURING AN INTERRUPTION OF BUSINESS AS DESCRIBED IN ARTICLE 17, WE AGREE TO EFFECT PAYMENT IF THIS CREDIT IS DRAWN ON US WITHIN FIFTEEN (15) DAYS AFTER THE RESUMPTION OF BUSINESS.

[Bank's Name]

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[Official's Name and Position]

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[Official's Name and Position]

# NORTHWEST TERRITORIES WATER BOARD

Pursuant to the *Northwest Territories Waters Act* and Regulations the Northwest Territories Water Board, hereinafter referred to as the Board, hereby grants to

ENCANA CORPORATION

(Licensee)

150 - 9 Avenue S.W.

of \_\_\_\_\_  
(Mailing Address)

CALGARY, ALBERTA T2P 3S5

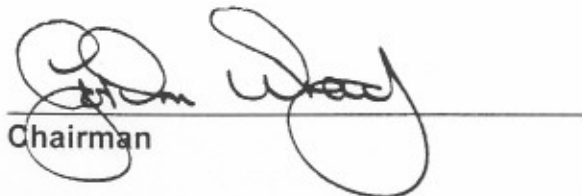
hereinafter called the Licensee, the right to alter, divert or otherwise use water subject to the restrictions and conditions contained in the *Northwest Territories Waters Act* and Regulations made thereunder and subject to and in accordance with the conditions specified in this Licence.

Licence Number	<u>N7L1-1797</u>
Licence Type	<u>"B"</u>
Water Management Area	<u>NORTHWEST TERRITORIES 07</u>
Location	<u>MACKENZIE DELTA: BURNT LAKE</u> <u>Within a two kilometre radius of:</u> <u>N16:69°25'53.1" E/134°19'06"N</u> <u>NORTHWEST TERRITORIES</u>
Purpose	<u>TO USE WATER AND DISPOSE OF</u> <u>WASTE FOR MUNICIPAL AND</u> <u>INDUSTRIAL UNDERTAKINGS</u>
Description	<u>OIL AND GAS</u>
Quantity of Water Not to be Exceeded	<u>1800 CUBIC METRES DAILY</u>
Effective Date of Licence	<u>DECEMBER 15, 2003</u>
Expiry Date of Licence	<u>DECEMBER 31, 2008</u>

This Licence issued and recorded at Yellowknife includes and is subject to the annexed conditions.

**NORTHWEST TERRITORIES WATER BOARD**

  
Witness

  
Chairman

## PART A: SCOPE AND DEFINITIONS

### 1. Scope

- a) This Licence entitles EnCana Corporation to use water and dispose of waste for municipal and industrial undertakings in the Mackenzie Delta for the Burnt Lake Drilling Program located within a two kilometre radius of the following point: N16: 69°25'53.1" E / 134°19'06" N, Northwest Territories, which entails the drilling of one well;
- 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: **N7L1-1797**

**"Act"** means the *Northwest Territories Waters Act*;

**"Active Layer"** the top layer of ground subject to annual thawing and freezing in areas underlain by permafrost;

**"Analyst"** means an Analyst designated by the Minister under Section 35(1) of the *Northwest Territories Waters Act*;

**"Artesian Aquifer"** means a water-bearing rock stratum, which when encountered during drilling operations, produces a pressurized flow of groundwater that reaches an elevation above the water table or above the ground surface;

**"Board"** means the Northwest Territories Water Board established under Section 10 of the *Northwest Territories Waters Act*;

**"Drilling Fluids"** mean any liquid mixture of clay, water or chemical additives pumped downhole;

**"Inspector"** means an Inspector designated by the Minister under Section 35(1) of the *Northwest Territories Waters Act*;

**"Licensee"** means the holder of this Licence;

**"Minister"** means the Minister of Indian Affairs and Northern Development;

**"Maximum Average Concentration"** means the running average of any four consecutive analytical results, or if less than four analytical results collected, and submitted to the Inspector in accordance with the sampling and analysis requirements specified in the "Surveillance Network Program";

**"Modification"** means an alteration to a physical work that introduces a new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion;

**"Permeability"** means the ability of a material to transmit fluids through its pores when subjected to pressure or a difference in head;

**"Permafrost"** means ground (soil or rock) that remains at or below 0°C for at least two years;

**"Permafrost Table"** means the upper boundary of permafrost as defined by the depth of the active layer;

**"Project Description"** refers to the report titled "Project Description for the Proposed EnCana Corporation Burnt Lake Drilling Program", dated Winter 2004, prepared by EnCana Corporation;

**"Regulations"** mean Regulations proclaimed pursuant to Section 33 of the *Northwest Territories Waters Act*;

**"Sewage Treatment Facility"** comprises the engineered structures that are designed to contain and treat sewage;

**"Sewage"** means all toilet waste and greywater;

**"Sump"** means an excavation designed, constructed, operated and maintained for the purpose of storing drill wastes to prevent migration of wastes;

**"Waste"** means waste as defined by Section 2 of the *Northwest Territories Waters Act*; and

**"Waters"** mean waters as defined by Section 2 of the *Northwest Territories Waters Act*.

## **PART B: GENERAL CONDITIONS**

1. The Licensee shall file an Annual Report with the Board and an Inspector not later than March 31st of the year following the calendar year reported which shall contain the following information:
  - a) the total quantity in cubic metres of fresh Water obtained from all sources;
  - b) the total quantities in cubic metres of each and all Waste discharged;
  - c) an itemized list indicating the names and quantities of all drilling mud additives used;
  - d) details of work completed;
  - e) details on the restoration of any Sumps;
  - f) a list of spills and unauthorized discharges;
  - g) results from all monitoring programs; and
  - h) any other details on Water use or Waste disposal requested by the Board within forty-five (45) days before the final report is due.
  
2. 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.

3. The Licensee shall comply with the "Surveillance Network Program" annexed to this Licence, and any amendment to the said "Surveillance Network Program" as may be made from time to time, pursuant to the conditions of this Licence.
4. The "Surveillance Network Program" and compliance dates specified in the Licence may be modified at the discretion of the Board.
5. All monitoring data shall be submitted in printed form and electronically in spreadsheet format on a diskette or other electronic forms acceptable to the Board.
6. All reports shall be submitted to the Board in printed format accompanied by an electronic copy in a common word processing format on diskette or other electronic forms acceptable to the Board.
7. Prior to the use of Water for industrial undertakings or the disposal of Waste and pursuant to Section 17(1) of the *Act* and Section 12 of the Regulations, the Licensee shall have posted and shall maintain a security deposit of Three Hundred Twenty Five Thousand (\$325,000.00) Dollars in a form suitable to the Minister.
8. The security deposit shall be maintained until such time as it is fully or in part refunded by the Minister pursuant to Section 17 of the *Act*. This clause shall survive the expiry of this Licence or renewals thereof and until full and final restoration has been completed to the satisfaction of the Minister.
9. By April 15, 2004, pursuant to Section 17(1) of the *Act* and Section 12 of the Regulations, the Licensee shall have posted and shall maintain a security deposit of One Hundred Thousand (\$100,000.00) Dollars in a form suitable to the Minister. This security deposit shall be maintained until the completion of the requirements of Part H, Item 2 have been met.
10. The Licensee shall ensure a copy of this Licence is maintained at the site of operation at all times.



**PART C: CONDITIONS APPLYING TO WATER USE**

1. The Licensee shall obtain Water from lakes and channels of the Mackenzie River as described in the Project Description or as otherwise approved by an Inspector.
2. The daily quantity of Water used for all purposes shall not exceed 1800 cubic metres.
3. The water intake hose used on the water pumps shall be equipped with a screen with a mesh size sufficient to ensure no entrainment of fish (2.54 mm).

**PART D: CONDITIONS APPLYING TO WASTE DISPOSAL**

1. All sewage shall be directed to the Sewage Treatment Facility as indicated in the Project Description or as otherwise approved by an Inspector.
2. All Waste discharged from the Sewage Treatment Facility shall be directed to the land surface or to a channel of the Mackenzie River at a location approved by an Inspector.
3. There shall be no discharge of floating solids, garbage, grease, free oil or foam.
4. All Waste discharged from the Sewage Disposal Facility shall meet the following effluent quality requirements:

<u>Sample Parameter</u>	<u>Maximum Average Concentration</u>
Biological Oxygen Demand (BOD <sub>5</sub> )	80.0 mg/L
Total Suspended Solids (TSS)	100.0 mg/L
Faecal Coliforms	10E4 CFU/dL
Oil and Grease	5.0 mg/L
Total Residual Chlorine (TRC)	0.1 mg/L

The Waste discharged shall have a pH between 6 and 9.

5. The Licensee shall direct all Wastes that do not meet the requirements in Part D, Item 5 to a Sewage Treatment Facility as approved by an Inspector.
6. Introduction of Water to Waste for the purpose of achieving effluent quality requirements in Part D, Item 5 is prohibited.
7. The Licensee shall, to the satisfaction of an Inspector, contain all drilling Waste in a drilling Sump near the drill site, or at an alternate Sump location as approved by an Inspector.
8. Sumps shall be constructed, to the satisfaction of an Inspector, in materials that normally exhibit low Permeability and in a manner that prevents intrusion of runoff Water.
9. All drilling Waste shall be contained in the drill Waste Sump a minimum of one (1) metre below the Permafrost Table.
10. In the event the initial drill Waste Sump site does not contain materials that exhibit low Permeability, the Licensee shall select an alternate Sump location to the satisfaction of an Inspector.
11. The Licensee shall construct and maintain the Sumps to the satisfaction of an Inspector.
12. There shall be no disposal of Drilling Fluids from the Sumps into any Waters or onto any land surface where Drilling Fluids may enter any Waters.
13. The Licensee shall ensure that Chloride concentrations at SNP Station 1797-2 do not exceed 100,000 mg/L.
14. The Licensee shall, prior to abandonment of a Sump, obtain a representative sample from the Sump using the information requirements outlined in the "Sampling and Analytical Requirements for Characterization of Sump Supernatant Fluids" (Appendix A).

15. If during the drilling, an Artesian Aquifer is encountered producing water flowing at the surface, the Licensee shall notify an Inspector immediately. A sample of not less than ten (10) litres shall be collected from the flowing source at the point of discharge from the well. Five (5) litres shall be made available to an Inspector for analysis, and the Licensee shall have the remaining five (5) litres analysed.
16. Any fluids generated to surface, including those produced from an Artesian Aquifer, shall be contained and shall not be disposed of without approval of an Inspector.
17. All 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 as may be approved by an Analyst.
18. No oil-based Waste products are to be disposed of on-site. Oil-based additives and drill cuttings associated with these additives are to be disposed of at an approved offsite location to the satisfaction of an Inspector.
19. Any on-site treatment of oil-based Waste products must be done with the approval of an Inspector.
20. Lost circulation that may contaminate groundwater must be immediately reported to an Inspector.
21. The Licensee shall dispose of all solid Waste in a manner acceptable to an Inspector.

**PART E: CONDITIONS APPLYING TO MODIFICATIONS**

1. The Licensee may, without written approval from the Board, carry out Modifications to the planned undertakings provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:
  - a) the Licensee has notified an Inspector in writing of such proposed Modifications at least five (5) days prior to beginning the Modifications;

- b) such Modifications do not place the Licensee in contravention of either this Licence or the Act;
  - c) an Inspector has not, during the five (5) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than five (5) days; and
  - d) an Inspector has not rejected the proposed Modifications.
2. Modifications for which all of the conditions referred to in Part E, Item 1 have not been met may be carried out only with written approval from an Inspector.
  3. The Licensee shall provide to the Board as-built plans and drawings of the modifications referred to in this Licence within ninety (90) days of completion of the modifications.

**PART F: CONDITIONS APPLYING TO STREAM AND WATER BODY CROSSINGS**

1. The Licensee shall ensure that only clean snow and ice is used on all stream or water body crossings, and that no debris is left on the surface of the crossings.
2. Stream or water body crossings shall be notched or removed before spring break-up to facilitate natural flow.
3. The removal of naturally occurring material from the bed or banks of any stream or water body below the ordinary high water mark is not permitted.

**PART G: CONDITIONS APPLYING TO CONTINGENCY PLANNING**

1. The Licensee will maintain a copy of the approved Emergency Response Plan onsite in a readily available location, to the satisfaction of an Inspector.

2. The Licensee shall ensure that petroleum products, hazardous material and other Wastes associated with the project do not enter any Waters.
3. The Licensee shall ensure that all containment berms are constructed of an impermeable material, to the satisfaction of an Inspector.
4. If, during the period of this Licence, an unauthorized discharge of Waste occurs, or if such a discharge is foreseeable, the Licensee shall:
  - a) report the incident immediately via the 24 Hour Spill Reporting Line (867) 920-8130; and
  - b) submit to an Inspector a detailed report on each occurrence not later than thirty (30) days after initially reporting the event.

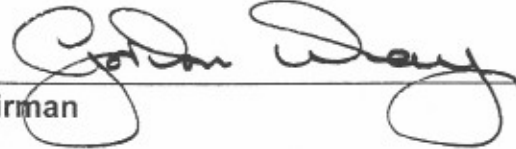
**PART H: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION**

1. Upon completion of all activities, the Licensee shall ensure that all equipment and materials are removed from the site. Other final restoration activities as outlined in the Project Description should be implemented to the satisfaction of an Inspector.
2. The Licensee shall monitor the drilling Waste Sump after closure for a period of at least five (5) years during the thaw season consisting of the following measures:
  - a) install subsurface monitoring systems designed to detect thawing of the drilling Waste in the following manner:
    - i) placement of at least four (4) thermistor strings (Appendix B):
      - one (1) in the center of the Sump cap;
      - one (1) on the lee side of the Sump with respect to the winter wind direction at the interface between undisturbed ground and the Sump cap;
      - one (1) at the interface between undisturbed ground and the Sump cap where most of the drilling muds have been placed; and
      - one (1) in undisturbed terrain next to the Sump to monitor background conditions.
    - ii) mean daily temperature readings must be recorded at a minimum of 0.25, 0.5, 0.75, 1.5, 3, 6, 9, and 12 metre depths.

- iii) installed thermistors must be designed to allow for manual field measurements to be taken.
- b) monitor for salinity migration using electromagnetic induction; and
- c) conduct an annual inspection of the site during the thaw season, and submit a written report of the inspection, including photographs of the site, to the Board by December 1<sup>st</sup> of the year the inspection is conducted.

  
Witness

**NORTHWEST TERRITORIES WATER BOARD**

  
Chairman

## APPENDIX A - SAMPLING AND ANALYTICAL REQUIREMENTS FOR CHARACTERIZATION OF SUMP SUPERNATANT FLUIDS

Prior to abandoning a drilling Waste Sump, the Licensee shall sample the Sump using the following method:

Divide the Sump into a grid of six equal areas, take three samples in the vertical profile (surface, mid-depth, just above the mud/supernatant interface) at the centre of each area. Mix these eighteen samples together to form a single Composite Sample, from which as many sub-samples may be obtained as necessary for analysis. An additional sample must be taken from the surface of the Sump.

The Licensee shall have the Composite Sample analyzed for the following parameters:

- Total and Dissolved Metals:
  - Copper
  - Cadmium
  - Iron
  - Nickel
  - Lead
  - Chromium
  - Zinc
- Sulphate
- Conductivity
- pH
- Total Suspended Solids
- Total Reactive Chlorine
- Chloride
- Sodium
- Potassium
- Calcium
- Magnesium
- Oil and Grease
- Toxicity (Microtox Bioassay)

The Licensee shall have the Surface Sample analyzed for the following parameters:

- Oil and Grease

# NORTHWEST TERRITORIES WATER BOARD

LICENSEE: EnCana Corporation  
LICENCE NUMBER: N7L1- 1797  
EFFECTIVE DATE OF LICENCE: DECEMBER 15, 2003  
EFFECTIVE DATE OF SURVEILLANCE NETWORK PROGRAM: DECEMBER 15, 2003

## SURVEILLANCE NETWORK PROGRAM

### A. Location of Sampling Stations

<u>Station Number</u>	<u>Description</u>
1797 - 1	Discharge from the Sewage Treatment Facilities
1797 - 2	Drilling Waste Prior to Entering the Drilling Sump

### B. Sampling and Analysis Requirements

1. Water at Station Number 1797 -1, shall be sampled every week during decant, and analyzed for the following parameters:

BOD <sub>5</sub>	Total Suspended Solids
Oil and Grease	Faecal Coliforms
Ammonia	pH
Total Residual Chlorine	



2. Waste Water at Station 1797-2, shall be sampled monthly, and analysed for the following parameters:

Total Sulphur	Total Calcium
Total Chloride	Total Sodium
Total Residual Chlorine	

3. More frequent sample collection maybe required at the request of an Inspector.
4. 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 an Analyst.
5. All analysis shall be performed in a laboratory approved by an Analyst.
6. The Licensee shall, by January 6, 2004, submit to an Analyst for approval a Quality Assurance/Quality Control Plan.
7. The Plan referred to in Part B, Item 6 shall be implemented as approved by an Analyst.

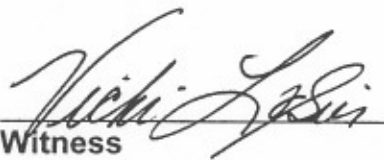
**C. Flow and Volume Measurement Requirements**

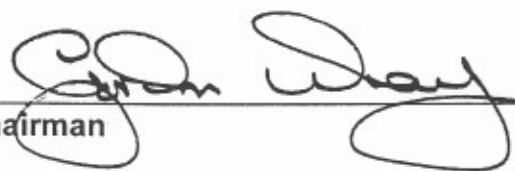
1. The daily and monthly quantities of Water obtained from channels of the Mackenzie River shall be measured and recorded in cubic metres.

D. Reports

1. The Licensee shall, within thirty (30) days following the month being reported, submit to the Board and an Inspector all data and information required by the "Surveillance Network Program" including the results of the approved Quality Assurance Plan.

**NORTHWEST TERRITORIES WATER BOARD**

  
Witness

  
Chairman