



Indian and Northern Affairs Canada
Affaires indiennes et du Nord Canada

P. O. Box 1500
Yellowknife, NT X1A 2R3

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File-	N7L1-1759

Your file Votre référence

Our file Notre référence

March 1, 2001

License # N7L1-1759

Ms. Cynthia Pyc
Environmental Biologist
Inuvialuit Environmental & Geotechnical Inc.
1338 - 36th Avenue N.E. - Bay R
Calgary, AB T2E 6T6



Dear Ms. Pyc:

Re: Petro-Canada
Quality Assurance and Quality Control Plan for Collecting Representative Water Samples
Submitted: January, 2001

Thank-you for the submittal of your Quality Assurance and Quality Control Plan. Upon review, it has been found that the plan requires some revisions. Approval of the plan will be granted subject to the following:

1. Under Section 2.3, Sampling Methods, it should be stated that the sample bottles for fecal coliforms should not be rinsed. Also, the frequency of field blank and field replicate sample collection and reporting (for each SNP report) should be included.
2. Under Appendix B, the scope of testing (list of tests) for Enviro-Test Laboratories Inc. is missing.

Please provide the necessary revisions to the undersigned at your earliest convenience. Should you require further information, please do not hesitate to contact me at (867) 669-2781.

Sincerely,

Kathleen Puznicki
Analyst Under the Northwest Territories Waters Act

cc: Northwest Territories Water Board
North Mackenzie District

Canada



Inuvialuit Environmental &
Geotechnical Inc.

1338 - 36th Avenue N.E. - Bay R
Calgary, AB Canada T2E 6T6
Phone: (403) 291-0777
Fax: (403) 291-1150

MEMO

Date: January 22, 2001

To: Attn: William Coedy or Kathleen Puznicki

RE: Petro-Canada QA/QC Plan

From: Cynthia Pyc

On behalf of Petro-Canada, please find enclosed two (2) copies of the Quality Assurance/Quality Control Plan submitted as per Section B. Clause 7. of the Surveillance Network Program for Water Licence No. N7L1-1759.

If you have any questions or comments, please contact me at (403) 219-1262, via e-mail cpvc@sorel.ca or by fax at (403) 291-1150.

Sincerely,

INUVIALUIT ENVIRONMENTAL & GEOTECHNICAL INC.

Cynthia Pyc

Environmental Biologist

Received by DIAND
Jan 29/01

QUALITY ASSURANCE AND QUALITY CONTROL PLAN
FOR
COLLECTING REPRESENTATIVE WATER SAMPLES

Prepared for

Petro-Canada Ltd.
150 - 6th Avenue SW
Calgary, AB
T2P 3E3

Prepared by

Inuvialuit Environmental & Geotechnical Inc.
1338R - 36 Avenue NE
Calgary, Alberta
T2E 6T6

January 2001

1.0 INTRODUCTION

This proposal identifies: the types of sampling required; the location of sample collection; the frequency of sampling; proper sample handling methods and documentation; and the analytical parameters for laboratory analysis, to fulfill the requirements of Indian and Northern Affairs Canada Water Resources Division and the Northwest Territories Water Board Class B Licence N7L1-1759. This Licence is for an oil and gas exploration camp in the Mackenzie River Delta, located at Latitude 69° 04'36" N and Longitude 135° 19'58" W in the Northwest Territories.

Included in the Appendix are basic definitions for terms used for sampling in this proposal.

2.0 SAMPLE COLLECTION

2.1 Location

Water sample collection for laboratory analysis will occur at sampling stations 1759-1 (Treated effluent discharge prior to entering the receiving environment) and 1759-2 (Waste drilling fluids located within the sump). Sign posting will be used to identify the sampling locations. Refer to Table 1.

2.2 Sampling Equipment

The collection of effluent at Stations 1759-1 and 1759-2 will require personal protective gear that should include: disposable latex or Nitrile gloves, rubber boots (waterproof), Tyvek or other protective clothing, eye protection, and hardhat (if sampling near overhead equipment). For the protection and preservation of the collected water samples, equipment would include: labels for sample identification, packing tape to protect labels, laboratory cleaned sample containers (see Table 1 for types required), coolers, ice packs, bubble wrap for packing, chain of custody forms, and completed field notes (see section 3.1). Additional equipment that may be required includes a pH meter, electrical conductivity meter, and temperature probe.

All sampling, sample preservation, and analysis shall be conducted in accordance with method described in the current edition of "Standard Methods for the Examination of Water and Wastewater" (20th edition, 1998).

When sampling in lakes and ponds, the sample bottle is lowered to mid-depth and rinsed three times before collecting the sample on the forth submersion. Ensure the sample container contains adequate room for mixing, preservative addition and thermal expansion.

When sampling stream water, the sample container is plunged into the current and rinsed three times before collecting the sample on the forth submersion. As in lake and pond water sampling, ensure the sample container contains adequate room for mixing, preservative addition and thermal expansion.

Glass containers should be used when sampling for hydrocarbon (oil and grease, and TPH) concentrations. Deviating from the stream, lake and pond sampling protocols, the sample is collected during the first submersion and not rinsed three times first.

In general, the protocol for sampling is as follows:

- Acquire all necessary equipment, including; personal protective equipment, sample labels, writing tool (pencil should be used to avoid running), laboratory clean sample containers, sample documenting forms (field notes, field screening results (field pH, EC, and temp values, if required), chain of custody forms, weigh bill for transportation by commercial carrier), coolers and ice packs for sample refrigeration and transportation to the laboratory, bubble wrap for packing, clear packing tape to protect sample labels and seal cooler, camera to photo document sample collection, and any additional equipment required.
- Don personal protective equipment
- At sampling location, if required, perform field screening of pH, EC, and Temperature of effluent and record values in field notes.
- Label sample containers with information described in Section 3.1.
- Place clear packing tape over label to protect information from "washing off".
- Open control sample bottles of deionized (DI) water, and add analyte of known concentration and preservative if required, seal, label, and send with other samples for laboratory analysis. Note: if possible, it is preferable to fill control sample container with DI water at the site.
- Rinse sample containers with water to be sampled if necessary.
- Collect sample in laboratory cleaned sample container (note: it is imperative that the collected samples be representative of the whole population (i.e. the effluent stream)). Qualitative observations of the sample should also be noted in the field notes at this time (i.e. sample colour, odour, clear-opaque, presence of particulates, etc.). Samples collected for TPH analysis **MUST HAVE ZERO HEADSPACE** in the sample container (i.e. absolutely no bubbles, not even a small one). To help ensure zero headspace, with preservative already in the sample container, very carefully fill container so the meniscus "bulges" above the top of the sample container, carefully re-place cap, and invert to check for bubbles, repeat sample collection if bubbles are present, note in field notes.
- Complete Chain of Custody form with required analysis listed for each collected sample.
- Carefully bubble wrap the sample containers and place in ice chilled cooler maintained at -4°C for transport directly to the laboratory for analysis. Note: this entire procedure, including the initial laboratory analysis must be completed within the allowable holding time (Table 1) from the time of sampling (e.g. within 24 hours for faecal coliform).
- Complete field notes and log samples. Retain paperwork for submission to the Board, if required.

- Analysis required (not just listed on the COC), and
- Label the sample container lid with sample identification number.

3.2 Preservation

This procedure is used to ensure the integrity of the collected sample until it is laboratory analyzed. Preservation methods include; refrigeration (refrigerated storage or ice packs), the addition of chemicals (acids, other preservatives, etc), and filtration.

Preservation methods can be parameter specific, such as the addition of Sodium Thiosulfate for BOD₅ analysis, or can be a universal method, such as refrigeration. Refer to Table 1 for the specific preservation method used for each parameter to be analyzed.

3.3 Transportation

The collected samples with complete documentation (sample identification and chain of custody form, as described in Section 3.1) are to be packed in bubble wrap and placed in coolers with ice packs or refrigerated. The packed samples are to be sent directly to the laboratory for analysis (ETL in Calgary, Alberta) as soon as possible. Therefore, due to the remoteness of the site, sample collection times must be logistically organized with transportation schedules to the laboratory. This will ensure the samples arrive at the laboratory and are analyzed within the allowable holding time.

4.0 LAB ANALYSIS

4.1 Lab Accreditation

See Appendix B for Canadian Association for Environmental Analytical Laboratories (CAEAL) accreditation of Enviro-Test Laboratories.

4.2 Detection Limits

Refer to Table 2 in Section 4.3 for detection limits for each parameter.

4.3 Methodology

Refer to Table 2 in this section for laboratory methods for each parameter.

APPENDIX A

Preservation refers to control methods used to ensure the integrity of the collected sample until it is laboratory analyzed. Preservation methods include; refrigeration (refrigerated storage or ice packs), the addition of chemicals (acid, base, preservatives, etc), and filtration.

Detection Limit refers to the minimum concentration of analyte that can be measured above the background noise of an instrument.

Analyte is a solution containing the parameter of interest in a known concentration.

APPENDIX B

APPENDIX C



November 30, 2000

Mr. John Kerkhoven
Supervisor, Surface Land
Petro-Canada
150-8th Avenue SW
CALGARY, Alberta
T2P 3E3

Dear Mr. Kerkhoven

ISSUANCE OF A "B" TYPE LICENCE

Attached is a duplicate of Licence No. N7L1-1759 granted to Petro-Canada 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.

Also attached are general procedures for the administration of licences in the Northwest Territories. I request that you review these and address any questions to the Board's office.

In conclusion, 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 Petro-Canada is anticipated.

Sincerely,

Gordon Wray
Chairman
N.W.T. Water Board

Attachments (2)

P.O. Box 1500, Yellowknife, NT, X1A 2R3, 2nd Floor Gega Cho Building
Phone: (867) 669-2772 Fax: (867) 669-2719

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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
P.O. Box 1500
YELLOWKNIFE, NT X1A 2R3

Phone No: (867) 669-2772
Fax No: (867) 669-2719

ANALYST: Analyst
Water Laboratory
Northern Affairs Program
Department of Indian Affairs
and Northern Development
Box 1500
4601 - 52nd Avenue
YELLOWKNIFE, NT X1A 2R3

Phone No: (867) 669-2780
Fax No: (867) 669-2716

INSPECTOR: Inspector
Inuvik District Office
Northern Affairs Program
Department of Indian Affairs
and Northern Development
P.O. Box 2100
INUUVIK, NT X0E 0T0

Phone No: (867) 777-3361
Fax No: (867) 777-2090

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

PETRO-CANADA
(Licensee)
150-6th Avenue S.W.
of CALGARY, ALBERTA T2P 3E3
(Mailing Address)


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>N7L1-1759</u>
Licence Type	<u>"B"</u>
Water Management Area	<u>NORTHWEST TERRITORIES 07</u>
Location	<u>LATITUDE 69°04'36" N. AND LONGITUDE 135°19'58" W. NORTHWEST TERRITORIES</u>
Purpose	<u>WATER USE AND WASTE DISPOSAL IN OIL AND GAS UNDERTAKINGS</u>
Quantity of Water Not To Be Exceeded	<u>150 CUBIC METRES DAILY</u>
Effective Date of Licence	<u>DECEMBER 1, 2000</u>
Expiry Date of Licence	<u>NOVEMBER 30, 2002</u>

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

NORTHWEST TERRITORIES WATER BOARD

Witness



Chairman

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"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;

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

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

"Sump" means an excavation for the purpose of catching or storing water and/or waste;

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

"Maximum Average Concentration" means the moving average of any four (4) consecutive analytical results submitted to the Board in accordance with the sampling and analysis requirements specified in the "Surveillance Network Program";

"Permeability" means the capacity to transmit water through a medium; and

"Drilling Fluids" means any liquid mixture of clay, water or chemical additives pumped downhole.

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report with the Board not later than March 31 of the year following the calendar year reported which shall contain the following:
 - a) The total quantities in cubic metres of fresh water obtained from all sources;
 - b) the total quantities in cubic metres of each and all waste discharged;
 - c) a summary of any modifications carried out on the Water Supply and Waste Disposal Facilities, including all associated structures;

2. The daily quantity of water used for all purposes shall not exceed 150 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.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall direct all piped and pumpout sewage to the Sewage Treatment Facilities or as otherwise approved by the Board.
2. The Licensee shall provide at least five (5) days notice to an Inspector prior to commencement of any discharges from the Sewage Treatment Facilities.
3. The Licensee shall ensure that erosion control structures are maintained to the satisfaction of the Inspector.
4. All Sewage effluent discharged by the Licensee from the Sewage Treatment Facilities at "Surveillance Network Program" Station Number 1759-1 shall meet the following effluent quality requirements:

<u>Sample Parameter</u>	<u>Maximum Average Concentration</u>
BOD ₅	30.0 mg/L
Total Suspended Solids	35.0 mg/L
Faecal Coliforms	250 CFU/dL
Oil and Grease	5.0 mg/L

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

5. The Licensee shall maintain the Sewage Treatment Facilities to the satisfaction of and Inspector.

d) indicate in writing to an Inspector;

- the method of decant;
- the direction of flow;
- the location of fresh water bodies where the decanted effluent is expected to go; and
- any treatment that will be applied to the Sump.

13. The Licensee may commence decanting upon receipt of an Inspector's approval.
14. 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.
15. 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 offsite location to the satisfaction of an Inspector.
16. Any on-site treatment of oil-based waste products must be done with the approval of an Inspector.
17. Lost circulation that may contaminate ground water must be immediately reported to an Inspector.

PART E: CONDITIONS APPLYING TO MODIFICATIONS

1. The Licensee may, without written approval from the Board, carry out modifications to the Water Intake and Waste Treatment Facilities provided that such modifications are consistent with the terms of this Licence and the following requirements are met:
 - a) the Licensee has notified the Board in writing of such proposed modifications at least forty-five (45) days prior to beginning the modifications;

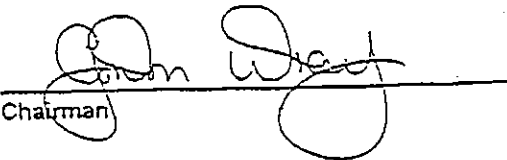
2. If, during the period of this Licence, an unauthorized discharge of waste occurs, or if such a discharge is foreseeable, the Licensee shall:
 - a) employ the appropriate contingency plan;
 - b) report the incident immediately via the 24 Hour Spill Report Line. The current telephone number is (867) 920-8130; and
 - c) 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. The Licensee shall submit to the Board for approval within one year of issuance of this Licence, an Interim Abandonment and Restoration Plan in accordance with the Board's "Guidelines for Mines in the Northwest Territories," September 1980, or subsequent edition.
2. The Licensee shall implement the Plan specified in Part G, Item 1 as and when approved by the Board.

NORTHWEST TERRITORIES WATER BOARD

Witness



Chairman

2. Water at Station Number 1759-2, shall be sampled monthly, and analysed for the following parameters:

Potassium Chloride

Total Petroleum Hydrocarbons

3. Samples shall be collected immediately after spring thaw in the vicinity of the treated sewage outfall to the satisfaction of an Inspector and analysed for the following parameters:

BOD₅

Oil and Grease

Ammonia

Total Suspended Solids

Faecal Coliforms

4. More frequent sample collection maybe required at the request of an Inspector.
5. 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.
6. All analysis shall be performed in a laboratory approved by an Analyst.
7. The Licensee shall, by January 31, 2001, submit to an Analyst for approval a Quality Assurance/Quality Control Plan.
8. The plan referred to in Part B, Item 5 shall be implemented as approved by an Analyst.