

Name of Proceeding	Norman Wells Operations - EA2425-02
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TAKE NOTICE that a Request for Ruling will be made to the MVEIRB by

Imperial Oil Resources N.W.T Limited ("Imperial")

(name of party making the Request)

at **by email** ~~(time) in _____ (place), in the Northwest Territories~~
on the **9th** (day) of **October** (month), **2024** or as soon after that time as the Board
may decide to address the Request.

The Ruling requested from the MVEIRB is as follows:
(State the relief sought as clearly as possible)

Imperial respectfully requests that the Board reverse its decision to initiate environmental assessment proceeding EA2425-02. Imperial makes this request on an urgent basis. Please see attached for further detail.

The facts or information relevant to this Request for Ruling and which should be considered by the MVEIRB
are as follow: (State the information relevant to the Request in as much detail as needed)

Please see attached.

The authority or grounds for the Ruling which should be considered by the MVEIRB is as follows: (State the
Rules or any law or enactment relied on and the grounds for the Ruling).

Please see attached.

AND FURTHER TAKE NOTICE that in support of this Request for Ruling the following documents or
information have been attached: **Letter from Imperial Oil Operations NW to Joanne
Deneron, Chairperson, Re: Proceeding EA2425-02 – Norman Wells Operation -
Request for Ruling, dated October 9, 2024.**

(Set out all materials to be used to support the Request).

Dated at **Calgary, Alberta**, ~~Northwest Territories,~~ on (MM/DD/YY) **October 9, 2024**



(Signature of Party's Representative)

NATHAN A. BAINES
Barrister & Solicitor



Nathan Baines
Supervising Counsel
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October 9, 2024

JoAnne Deneron, Chairperson
Mackenzie Valley Environmental Impact Review Board
Box 938, 200 Scotia Centre
5102 - 50 Avenue
Yellowknife, NT X1A 2N7

Sent via email

Dear Ms. Deneron,

Re: Proceeding EA2425-02 – Norman Wells Operation - Request for Ruling

Imperial Oil Resources N.W.T. Limited (“**Imperial**”) requests a Ruling from the Mackenzie Valley Environmental Impact Review Board (“**Board**”) under Rule 50 of the *Rules of Procedure for Environmental Assessment and Environmental Impact Review Proceedings*¹ reversing the Board’s decision to conduct an environmental assessment (“**EA**”) of Imperial’s Norman Wells Operations (“**NWO**”).

The request has been made in the required Form 2 enclosed herewith. In accordance with Rule 52, the following provides relevant facts to the Ruling, Imperial’s written statement of the issue, explanation of the Ruling being sought, and reasons why the Board should grant the requested ruling.

Relevant Facts

On November 1, 2023, Imperial applied to the Canada Energy Regulator (“**CER**”) for a variance to Operations Authorization (“**OA**”) 1210-001.² The applied-for variance would extend the expiration date of the OA for an additional ten years to support the continued operation of Imperial’s NWO. Imperial proposed no expansions to the NWO operational footprint and no alteration to existing industrial processes. The application was unrelated to closure activities, which will be the subject of future regulatory processes.

¹ Mackenzie Valley Review Board, “Rules of Procedure for Environmental Assessment and Environmental Impact Review Proceedings” (December 2023), online: https://reviewboard.ca/process_information/guidance_documentation/rules_of_procedure. Per the definition of “Ruling” at page 4 of the Rules of Procedure, “Ruling means a decision or order made by the Board during a Proceeding and issued as part of a Directive and includes decisions in response to a Request for Ruling or an extension request made under Rule 74, or decisions made during a Public Hearing.”

² Imperial Oil Resources NWT Limited, “Application for Variance of Operations Authorization 1210-001” (1 November 2023), filing ID: [C27037](#).

During June 2024, Imperial applied to the Sahtu Land and Water Board (“**SLWB**”) to renew water licence S13L1-007 (“**Water Licence**”), also in respect of the NWO. No alterations to the Water Licence were proposed.³

Proceedings in respect of the OA variance application and Water Licence application (the “**Applications**”) have been ongoing since December 12, 2023 and June 12, 2024, respectively. The CER application is at the final stage and the SLWB application is well progressed, with decisions from the CER and the SLWB required prior to the expiry of the applicable authorizations on December 31, 2024 and March 4, 2025 respectively.

By letters dated September 30, 2024 to the CER and SLWB (the “**Referrals**”),⁴ the Sahtu Secretariat Inc. (“**SSI**”) purported to refer the Applications to the Board for an EA pursuant to section 126(2)(b) of the *Mackenzie Valley Resource Management Act* (“**MVRMA**”).⁵ Imperial understands that the decision to refer the Applications was made during meetings of the SSI Board of Directors on September 23 and 27, 2024. Imperial was not provided an opportunity to make formal submissions regarding a potential EA referral to SSI prior to the decision, nor was it provided with an opportunity to provide a response to SSI’s decision.

On October 4, 2024, responding to the Referrals, the Board issued a Notice of Environmental Assessment in which the Board concluded that it is required under section 126(2)(b) of *MVRMA* to conduct an EA of the Applications, and provided notice of its intention to proceed with a single EA of the “same development,” which Imperial understands to be the entire NWO (“**Decision**”).⁶ The Decision does not provide reasons for the Board’s conclusions that section 126(2)(b) provides a basis upon which to require an EA of the entire NWO. Imperial was not provided an opportunity to make submissions with respect to the Decision.

The Board’s most recent Decision to conduct an EA for the Application now subjects the NWO to significant immediate-term uncertainty and risk. Imperial’s OA expires December 31, 2024, and Imperial’s Water Licence expires on March 4, 2025. On October 3, 2024, the SLWB suspended Imperial’s Water Licence renewal process, and indicated that the process will resume “after the EA is completed as per subsection 72.22(2) of the *MVRMA*.” This suspension included cancellation of technical sessions scheduled for October, a pre-hearing conference (November 2024) and a hearing (January 2025), all based on the Decision.⁷ An EA of the Applications has the potential to delay the CER and SLWB issuing decisions required for Imperial to continue operating the NWO into 2025, risking an accelerated shut-in of the NWO with less than three months lead-time.

³ Imperial Oil Resources NWT Limited, “Type A Water Licence S13L1-007 Renewal Application” (June 2024), online: *Online Review System* <https://registry.mvlwb.ca/Documents/S24L1-005/S24L1-005%20-%20S13L1-007%20Renewal%20Application%20-%20Norman%20Wells%20Operation%20-%20June12_24.pdf>.

⁴ Copies of the referrals have been posted to the Board’s registry, available online: <https://reviewboard.ca/registry/ea2425-02>

⁵ *SC 1998, c 25 [MVRMA]*.

⁶ A copy of the Decision is available on the Board’s registry, online: https://reviewboard.ca/upload/project_document/Notice%20of%20EA2425-02%2C%20NWO.pdf

⁷ Sahtu Land and Water Board, October 3, 2024 Update - Norman Wells Operation Renewal Type A Water Licence, online: *Online Review System*, <https://new.onlinereviewssystem.ca/review/DD236F7A-6E32-EF11-86C3-002248B06AC1>

A winter shut-in of this nature would be typically performed only during emergencies, as it creates heightened risks to worker safety and the environment, and significant logistical challenges. Ice crossings on the Mackenzie River are not expected to start to be available until mid to late January, increasing risk through extensive use of helicopters and long lining of material during shut-in operations. Snow and ice conditions, limited daylight hours, and extreme cold are likely to extend the time and complexity of operations, increasing the risk of injuries to personnel and the risk of spills due to line freeze-ups or splitting.

Requested Relief

Imperial respectfully requests that the Board reverse the Decision and decline to conduct an EA of the Applications. Given the circumstances, Imperial requests a ruling on an urgent basis with a decision by October 23, 2024 to facilitate decisions regarding the need to shut down NWO by the end of 2024 and meet regulatory requirements if no approval is in place. If required, Imperial may seek judicial review on the grounds established in this letter. Imperial and the Court will require time to render an expedited decision prior to the date shut-in must commence.

Issue Requiring Ruling

The Decision raises the following legal issue requiring a Ruling under Rule 50: “Does section 126(2)(b) of the *MVRMA* apply to the Applications?”

Imperial submits that the answer to the above issue is “no.”

Reasons Why the Ruling Should be Granted

As confirmed recently by the Supreme Court of Canada, law and policy are clear that “environmental assessment processes are prospective in nature; they ‘seek to anticipate, prevent or reduce environmental impacts of proposed new activities rather than try to manage the impacts of existing activities.’”⁸ The NWO is an existing activity that has operated without material alterations for approximately forty years, and which is now approaching the end of its operational life. The Applications seek routine renewals in order to maintain the economic and environmental status quo for an additional five to ten years, in anticipation of final abandonment and reclamation, the latter of which will be subject to separate future applications.

Imperial submits that section 126(2) of the *MVRMA* does not apply to the Applications for the following reasons:

1. Section 157.1 of the *MVRMA* excludes the NWO from the application of Part 5 and 126(2)(b) specifically.
2. The Applications are not a “proposal for a development” as contemplated under section 126(2)(b).
3. The Referrals are duplicative of proceedings before the CER and SLWB that are substantially completed, and unnecessarily interferes with final determinations in those matters.

⁸ *Reference re Impact Assessment Act*, [2023 SCC 23](#) at para 10, citing Doelle, Meinhard, and Chris Tollefson. *Environmental Law: Cases and Materials*, 3rd ed. Toronto: Thomson Reuters, 2019.

4. Imperial was not provided an opportunity to be heard in respect of the Referrals and Board's Decision prior to their issuance.

1. Part 5 of the MVRMA Does Not Apply to the NWO

The NWO has existed for more than 100 years and underwent its last substantial alteration in the early 1980s, at which time the operations were expanded to their current footprint and operational capacity. The proposed NWO development underwent review by an Environmental Assessment Review Panel, the National Energy Board and the Northwest Territories Water Board through three separate public hearings prior to receiving applicable approvals. Thereafter Imperial held multiple authorizations, licences, and approvals in respect of the expanded development, including the following:

- a) A Development Plan Approval for the expanded NWO from the Department of Energy, Mines and Resources on March 29, 1982, a copy of which is attached as **Appendix "A"**.
- b) Water Authorization and Licence N3L3-0919, issued by the Northwest Territories Water Board in 1982, a copy of which is attached as **Appendix "B"**.

Construction of the NWO was subsequently completed pursuant to the Development Plan Approval and has continued without significant alteration pursuant to multiple renewal and extension applications for applicable authorizations, including, most recently, the Applications which are the subject of referral by the SSI.

Section 157.1 of the *MVRMA* states:

Part 5 [Mackenzie Valley Environmental Impact Review Board, ss 111-144] does not apply in respect of any licence, permit or other authorization related to an undertaking that is the subject of a licence or permit issued before June 22, 1984, except a licence, permit or other authorization for an abandonment, decommissioning or other significant alteration of the project.

Northwest Territories courts have consistently interpreted section 157.1 as exempting undertakings that held licences prior to June 22, 1984 from full-scale environmental assessments, except where the application concerns a significant alteration to that undertaking.

In *North American Tungsten Corporation Ltd. v Mackenzie Valley Land and Water Board ("Tungsten")*,⁹ the Court of Appeal quashed a decision to refer a 2002 application by North American Tungsten Corporation for renewal of a water licence first issued in 1975, which had expired and been renewed several times. The Court determined that section 157.1 grandfathers an undertaking that was licenced prior to June 22, 1984, and that there is no requirement that the pre-1984 licence remain in effect at the time of application for a new licence, permit or other authorization in respect of the same undertaking. The Court concluded, based on a review of the *MVRMA*, that section 157.1 must be interpreted in a manner consistent with its purpose, which the Court found was to exempt undertakings predating the introduction of federal EA legislation as of June 22, 1984. As the Court explained:

Both the Comprehensive Agreements and the *MVRMA* also clearly recognize that a full scale environmental review will not be appropriate

⁹ [2003 NWTCA 5](#) [*Tungsten*].

in respect of certain existing permits, projects and licences. Instead, both reflect that some grandfathering of existing developments is required to balance competing interests.¹⁰

In *Canadian Zinc Corporation v Mackenzie Valley Land and Water Board ("Zinc")*,¹¹ the Northwest Territories Supreme Court went further, quashing a decision of the Mackenzie Valley Land and Water Board to require an EA in respect of an application to reopen a winter road in 2003. The Court concluded that section 157.1 exempted the application from EA under Part 5 of the *MVRMA*, notwithstanding that the only connection between the 2003 application and the original land use permit was that the applied-for road would use the same right of way; that there would be substantial differences in, among other things, the materials and volumes that would be hauled and the renewal terms of the two licences; that the road had been in disuse for 20 years; that the initial permit had expired and had not been renewed; and that the applicant had not previously held a permit in respect of the road, having purchased assets of the defunct company that originally operated the mine to which the road was connected. Justice Schuler concluded:

...it is the project or undertaking that is exempt from s. 157.1, not the owner or the permit holder....

I find there is no requirement under the legislation that there be continuity as to the owner of the undertaking and no requirement that the pre-June 22, 1984 permit had been continued by successive renewals after that date.

The permit sought by CZC is related to the operation of the winter access road. A permit had been issued to Cadillac before June 22, 1984 in respect of that same undertaking. Therefore, s. 157.1 governs and Part 5 does not apply.¹²

As both Courts established in *Tungsten* and *Zinc*, section 157.1 applies to undertakings that were initiated and approved prior to June 22, 1984, exempting from an EA any extensions, renewals, alterations to, and transfers of licences and authorizations which do not involve significant alteration to those undertakings. Imperial's NWO was initiated prior to 1984 and received licences and permits allowing that development prior June 22, 1984, including the attached Development Plan Approval and Water Authorization and Licence. The Applications do not propose any significant alteration of the NWO from what was contemplated and approved at the time the Development Plan Approval and Water Authorization and Licence were issued. Accordingly, EA proceedings under Part 5 of the *MVRMA* do not apply to the Applications, and the Board is not required or indeed authorized to proceed with an EA upon referral by SSI.

¹⁰ *Tungsten* at para 24. Reference to "Comprehensive Agreements" includes the Sahtu Agreement discussed below.

¹¹ [2005 NWTSC 48](#) [*Zinc*].

¹² *Ibid* at paras 69-71.

2. *The Applications Are Not a “Proposal for a Development”*

Imperial submits for reasons stated above that Part 5 of the *MVRMA* does not apply to the NWO. As such there is no need to consider whether the Referrals trigger section 126(2)(b). Imperial further submits that, consistent with judicial interpretations of comparable federal EA regimes,¹³ the text of 126(2)(b) and the scheme of the *MVRMA* restricts EAs to prospective developments rather than existing operations where no new material expansions are contemplated.

Section 126(2) exists within the context of Part 5, one purpose of which is to gather information that will “provide the decision maker with an objective basis for granting or denying approval for a proposed development,”¹⁴ as opposed to an existing development. The relevant portion of section 126(2) states:

(2) Notwithstanding any determination on a preliminary screening, the Review Board shall conduct an environmental assessment of a proposal for a development that is referred to it by

[...]

(b) the Gwich’in or Sahtu First Nation, in the case of a development to be carried out in its settlement area or a development that might have an impact on the environment in that settlement area... [emphasis added]

The Board’s obligation to conduct an EA upon referral, as provided in the above text, exists only in relation to a “proposal for a development” that is “to be carried out” within the relevant settlement area.

The term “proposal for a development,” which also appears in the definition of an “environmental assessment” and screening, scoping and environmental assessment provisions, is not defined in the *MVRMA*, yet is clearly intended to be more limited than an unqualified “development” as this term is used elsewhere in the Act.¹⁵ “Proposal for a development” reflects the defined term “development proposal” in the Sahtu Dene and Metis Comprehensive Land Claim Agreement (“**Sahtu Agreement**”),¹⁶ which defines a development proposal as “a proposed development activity outside local government boundaries, or

¹³ See e.g., *Canada (Minister of the Environment) v Bennett Environmental Inc.*, [2005 FCA 261](#) at paras 80-81: “Parliament deliberately aimed the CEEA at proposed activities of specified kinds, not at every possible activity that may be undertaken by anyone, at any time. In my view, the reason for that particular focus of the CEEA is to ensure that the potential environmental effects of an activity are assessed in the planning stage. This reflects a public policy that favours an environmental assessment regime that is both effective and efficient, and that respects the need for fairness to proponents of projects.” (Emphasis in original). See also *Inter-Church Uranium Committee Educational Co-operative v. Canada (Atomic Energy Control Board)*, [2004 FCA 218](#); *Tsawwassen Indian Band v Canada (Minister of Finance)*, [1998 CanLII 7586](#) (FC); *Hamilton Wentworth (Regional Municipality Of) v Canada (Minister of The Environment)*, [2001 FCT 381](#), aff’d [2001 FCA 347](#).

¹⁴ *MVRMA*, s 115(1).

¹⁵ Development is defined at section 111(1) as “any undertaking, or any part or extension of an undertaking, that is carried out on land or water.”

¹⁶ *Sahtu Dene and Metis Comprehensive Land Claim Agreement*, Vol I, online: <https://www.rcaanc-cirnac.gc.ca/eng/1100100031147/1543258621708#chp25>

within such boundaries where the undertaking would be likely to have a significant impact on air, water or renewable resources.”

Had the Parties to the Sahtu Agreement intended that SSI be permitted to direct an existing operation to an EA during renewals, Imperial submits that section 24.3.5 would refer only to a “development,”¹⁷ without the qualification of a proposal. The choice of the forward-looking term “proposed development” in the Sahtu Agreement reflects leading case law at the time of drafting, which defined the purpose of EA as being to gather information that will “provide the decision maker with an objective basis for granting or denying approval for a proposed development.”¹⁸ This term is used throughout the enabling provisions for Part 5 of the *MVRMA*, including the specific enabling provision for section 126(2) at section 24.3.5 of the Sahtu Agreement.¹⁹

The Applications are not a development proposal. The NWO activities to which the Applications relate has been approved since at least the 1982 Development Plan Approval and the 1982 Water Authorization and Licence shown in the appendices to this submission. The Applications themselves do not propose any new “development,” as defined in the *MVRMA*.²⁰ Section 126(2) was not intended to apply to routine renewals such as the Applications, and the Board is not required to conduct an EA in response to a referral that relies on an incorrect interpretation of that section’s authority.

3. The Proposed EA Duplicates and Interferes with Ongoing Proceedings

The Referrals follow nine months of comprehensive proceedings before the CER in connection with the OA variance, including nearly 300 documents and more than 50 filings, 71 information requests of the CER, and 42 information requests of intervenor groups. Sahtu governmental authorities have issued and have had full responses to information requests through that proceeding, including extensive information regarding environmental effects of continued operation of the NWO and opportunities to propose and comment on proposed mitigations and authorization conditions. An EA at this stage is duplicative and serves only to delay decisions on the Applications, which are urgently needed to avoid unsafe and unnecessary winter shut-in of the NWO.

As acknowledged by the Courts in both the *Tungsten* and *Zinc* decisions described above, an analysis of whether an EA is required must recognize the distinction between conditions imposed before a project is built (“facility compliance”) and operational standards applicable to existing projects (“operational compliance”).²¹ The Courts acknowledged significant environmental concerns raised by intervenors in

¹⁷ See section 2.1.1 of the Sahtu Agreement, which establishes a discrete definition for a “development activity,” meaning “any private, local, territorial or federal government undertaking, or extension thereof, on land or water.”

¹⁸ *Friends of the Oldman River Society v Canada (Minister of Transport)*, [1992 CanLII 110](#), 1992 1 SCR 3 at 71.

¹⁹ The text of 25.3.4 states: “A development proposal in the settlement area or which may impact upon the settlement area may be referred for assessment to the Review Board by the Sahtu Tribal Council or any governmental authority, and by the Review Board on its own motion.”

²⁰ In the context described above, reference to “any part or extension of an undertaking” in the definition of “development” at section 111(1) of the *MVRMA* refers only to extensions of the physical activities that may result in new impacts requiring assessment, and not an extension to the term limit of a licence or authorization, which are properly referred to as a “renewal” or “amendment” throughout the legislation.

²¹ *Tungsten* at para 34; *Zinc* at para 72.

both cases that were serious and worthy of consideration, yet affirmed that, in the context of an existing project, these concerns can and should be addressed in the application proceedings and conditions attached to the permit sought. The concerns raised in the Referrals have been extensively considered in CER and SLWB proceedings during the previous nine months and are being addressed in conditions for operations compliance under the renewed OA and Water Licence.

The Decision is inconsistent with both the case law and the specific drafting of the *MVRMA* and the Sahtu Agreement, discussed above, and with the guiding principles of Part 5 of the *MVRMA*, which require that “the process established by this Part shall be carried out in a timely and expeditious manner.”²² The NWO has had, and will continue to have, operational oversight by both the CER and SLWB. To direct an EA of this longstanding operation at this stage results in considerable uncertainty and duplication.

4. Imperial Was Not Provided an Opportunity to be Heard

The Decision has the potential to directly and significantly impact Imperial’s ability to operate NWO assets from December 31, 2024 onward, with impacts on contractual, human resources and reputational issues. Imperial had a legitimate expectation of procedural fairness given the Board’s departure in its Decision from previous decisions, policies and procedures; the statutory scheme of the *MVRMA* as discussed above; and the impacts of the Decision to Imperial.

Decisions to commence an EA are typically conducted under the screening procedures of section 124 of the *MVRMA* and in accordance the Board’s “Guideline for Preliminary Screeners,”²³ which directs that screenings of large and complex projects such as the NWO, including Type A Water Licence applications specifically, be made earlier rather than later to avoid uncertainty among all parties and reduce duplication.²⁴ Imperial has held, and has regularly renewed, operating licences, permits, and authorizations for the NWO since the early 1980s. A Board EA has never previously been required of Imperial, nor is Imperial aware of the Board having previously conducted an EA in connection with any other party’s OA renewal or water licence renewal application. Most recently, in the context of Imperial’s 2014 Water Licence Renewal, the Sahtu Land and Water Board determined that the application is exempt from screening under the *Preliminary Screening Exemption List Regulations*, taking into account the preliminary screening conducted in its 2003 renewal application.²⁵ The Northwest Territories Supreme Court has recently affirmed the reasonableness of similarly relying on prior screening decisions in the context of renewal applications which do not change the project scope.²⁶ The Decision departs significantly from normal regulatory practices in the Northwest Territories and Imperial’s legitimate expectations of the same.

Given this unexpected departure from the normal course, Imperial would at a minimum have expected to be provided with the opportunity to respond to the referrals or to be make submissions in respect of the

²² *MVRMA*, s 115(1)

²³ Mackenzie Valley Review Board, “Guideline for Preliminary Screeners” (November 2022), online: <https://reviewboard.ca/file/2400/download?token=u2JAMsnR> [Screening Guideline].

²⁴ Screening Guideline at p 25, PDF p 26.

²⁵ See Reasons for Decision – S13L1-007 – Imperial Oil Resources N.W.T. Ltd., Norman Wells Operations (31 December 2014) at p 4, online: https://registry.mvlwb.ca/Documents/S13L1-007/S13L1-007 - Reasons for Decision - Dec 31_14.pdf.

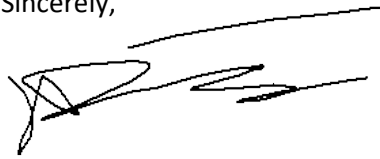
²⁶ See e.g. *Gwich'in Tribal Council v KBL Environmental Ltd et al*, [2024 NWTSC 37](#).

Decision before commencement of an EA, particularly given the timing of the Decision and the significant impact that delay to the OA and Water Licence renewals will have on Imperial's ability to safely operate the NWO, as described above. Imperial was provided no formal notice of SSI's intention to issue the Referrals and was provided no opportunity to respond to the Referrals prior to the Board issuing its Decision. Imperial submits that the Board unfairly failed to provide Imperial with an opportunity to be heard, contrary to the legal principles of procedural fairness and natural justice. Imperial respectfully requests that the Board revisit its Decision in light of these deficiencies and address incorrect interpretations of section 126(2) as set out above.

Conclusion

In summary, Imperial submits that the applicable case law and principles of statutory interpretation clearly establish that Part 5 does not apply to the Applications and that therefore this is no jurisdiction to refer or require an EA in this case. The uncertainty created by the Referrals so late in the Application review process is significant, having potential immediate and longer-term operational impacts some of which go beyond the NWO itself. For these reasons, Imperial respectfully requests that the Board reverse the Decision on an urgent basis.

Sincerely,



Nathan Baines
Supervising Counsel
Imperial Oil Limited

cc:

Valerie Gordon, Chair, SLWB
Paul Dixon, Executive Director, SLWB
Ramona Sladic, Secretary of the Commission, CER
Charles McNeely, Chairperson, Sahtu Secretariat Inc.
Erin Kelly, Deputy minister, GNWT Department of Lands
Lisa Dyer, Director General, CanNor – Northern Projects Management Office
Kim Pawley, Crown-Indigenous Relations and Northern Affairs Canada
Mike Roesch, Manager, Resource and Land Management, CIRNAC
Jaclyn Mersereau, Environment and Technical Lead, Imperial
Brad Gilmour, Osler, Hoskin & Harcourt LLP

Appendix "A": Norman Wells Development Plan Approval (29 March 1982)

355 River Road
Ottawa, Ontario
K1A 0E4

355, chemin River
Ottawa (Ontario)
K1A 0E4

APPENDIX

Our file: 9252

March 29, 1982

ACTION: Arnett

ORIGINAL: 4

COPIES: Keeling

Esso Resources Canada Ltd.
237 Fourth Avenue S.W.
Calgary, Alberta
T2P 0H6

Attention: Mr. Arnett

Dear Mr. Arnett:

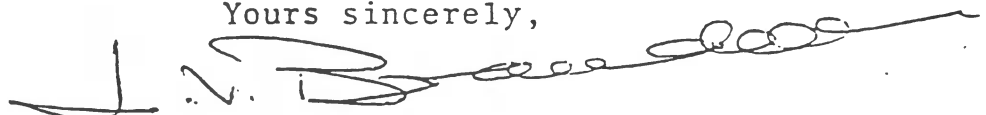
Norman Wells Development Plan Approval

Thank you for your letter of March 13, 1982 outlining several amendments to the tentative Development Plan Approval, DIAND #1-80. We have reviewed the suggested changes to the tentative approval and find them acceptable.

This letter shall constitute Development Plan Approval for the Norman Wells field expansion and is issued under Section 6 of the Canada Oil and Gas Production Regulations (January, 1982 draft). The other conditions outlined in the DIAND #1-80 approval will remain in effect. All operations should be conducted in accordance with the Canada Oil and Gas Production Regulations (January, 1982 draft). Please note that under Section 11 of the Regulations, the Operator is required to submit an application for an amendment to a Development Plan Approval when significant changes are made in the nature or timing of the development activities.

We wish you every success in the development of the Norman Wells field.

Yours sincerely,



L.V. Brandon
Director-General
Engineering and Control Branch

NORMAN WELLS PROJE	
TO	APR 07 1982
REC'D.	Keeling
FILE	
S.A.	



APPENDIX

2

AIR EXPRESS

OTTAWA, Ontario K1A 0H4

October 27, 1980

Mr. M.C. Arnett, P. Eng.,
Norman Wells Project Manager,
Esso Resources Canada Limited,
500 Sixth Avenue S.W.,
Calgary, Alberta.
T2P 0S1

Voire référence Your file

Notre référence Our file

N-7945-103

Dear Mr. Arnett:

Development Plan Approval, DIAND-#1-80 - Norman Wells Field Expansion

We refer to your submission relevant to the subject item as annexed (A) and to discussions between program officials of this Department with project officers of Esso Resources, principally in our offices on 80-07-15, as well as to other written and oral communications between our offices during recent months.

This letter shall constitute tentative approval under Section 6 of the Canada Oil and Gas Production Regulations (September, 1980 draft) annexed (B) (to be issued pursuant to the Oil and Gas Production and Conservation Act). The terms and conditions of the Development Plan Approval are subject to review and modification if there are significant implications in relevant government reports yet to be completed including, among others, the Environmental Assessment Review Panel report. Also, the approval is conditional upon possible Government granting of a Certificate of Public Convenience and Necessity in respect of the proposed Norman Wells - Zama pipeline.

Drilling Program Approval, as required by Part I of the Canada Oil and Gas Drilling Regulations, will be issued separately. Your application for Approval to Construct, in respect of the proposed gathering system, will be reviewed upon receipt of design specifications for the gathering system.

Your application for Development Plan Approval, limited as noted above, is approved subject to the following conditions:

...2

Reservoir Description

1. Oriented cores, which are representative of the reservoir, shall be obtained from at least 10% of the total number of development wells.
2. The Operator shall, prior to the commencement of crude oil delivery to the Norman Wells - Zama pipeline, conduct selective production tests on the K1 and K2 zones in at least two wells, one to be located on Bear Island and one to be located on Artificial Island #3.
3. The Operator shall carry out extensive micro-facies studies on all cores to improve reservoir description and shall submit to the Chief Conservation Officer, within six (6) months after the commencement of crude oil delivery to the Norman Wells - Zama pipeline, a comprehensive report on those studies and net porosity-metre and permeability-metre maps for each of the K1, K2, K3 and K4 zones based, in part, on log and core data obtained from the development wells.

Conservation

4. No crude oil shall be delivered to the Norman Wells - Zama pipeline until the portion of the water injection system directly offsetting the wells producing that crude is fully operational. An injection well shall be deemed to be fully operational when cumulative water injection into the well exceeds the product of (i) the daily injection rate at a wellhead injection pressure of 4000 KPa and (ii) 30 days.
5. The Operator shall submit to the Chief, on a monthly basis, during the first year of operation of the Norman Wells - Zama pipeline, a summary of the water injection and reservoir withdrawal rates and cumulative volumes for each water injection pattern.
6. The average total field crude oil production rate (the assigned rate) shall be limited to 4000 m³/day during any calendar month in which over 2% of the natural gas produced, determined on a volumetric basis, is not conserved.
7. The Operator shall submit to the Chief, on a monthly basis, during the period in which more than 2% of the natural gas produced is not conserved, a summary of the individual well test rates and actual production from each well to demonstrate that, to the extent practicable, the field is being produced to minimize the total amount of natural gas produced.
8. Raw (unprocessed) natural gas may be flared only during emergency situations and the duration of such flaring shall not exceed 48 hours unless otherwise approved in writing by the Chief Conservation Officer.

9. The quantity of C_3 (processed) natural gas flared shall not exceed $300 \times 10^3 \text{ m}^3$ per day.
10. The cumulative amount of (processed) natural gas flared over the 5-year period commencing on the date of initial oil delivery to the Norman Wells - Zama pipeline shall not exceed $300 \times 10^6 \text{ m}^3$.
11. No liquid hydrocarbons shall be flared except during emergency situations and the duration of such flaring shall not exceed 24 hours unless otherwise approved in writing by the Chief.

Reservoir Performance Monitoring

12. In addition to the requirements of Section 159 of the Production Regulations, the Operator shall submit a comprehensive evaluation of the reservoir performance of the Mainland Waterflood for the period January 1, 1980 to June 30, 1983 to the Chief at least 60 days prior to the date of initial oil delivery to the Norman Wells - Zama pipeline. This report shall discuss the implications of the Mainland Waterflood performance to the Norman Wells Field Development Plan.
13. Reservoir pressures shall be measured on a representative number of wells, as approved by the Chief, prior to the date of initial water injection into any well located on any of the proposed artificial islands, Bear Island or Goose Island and again prior to the date of initial crude oil delivery to the Norman Wells - Zama pipeline.

Artificial Islands

14. The design of the artificial islands shall be modified from that shown in Figure 2.4 of the "Norman Wells Development Plan" dated 80-02-28 by including two mounds of rock, 1.5 metres or more high, on the upstream end of the ice storage berm, sufficient to minimize the possibility of ice riding up onto the island surface.
15. The Operator shall submit the final design, specifications and construction timetable for each of the six (6) artificial islands, for approval in writing, to the Chief at least forty-five (45) days prior to commencement of island construction.
16. The Operator shall submit for approval a program to monitor and record the condition of the island and the physical environmental conditions in the vicinity of the islands, in writing, to the Chief at least forty-five (45) days prior to commencement of island construction. The program shall contain provision for monitoring, as a minimum, the following:
 - a) scouring of the channel bottom and erosion on the below and above water portions of the islands;

- b) deposits and build-up of material near the islands;
 - c) current and water velocities near the islands;
 - d) ice cover formation, ice movement, pile-up, ice break-up, and ice scour of the river bed.
17. Final as-built drawings and specifications of each island shall be submitted to the Chief within ninety (90) days of completion of each island. Differences between island design and constructed island and the potential effect of these differences on the safety of operations to be conducted on the island shall be fully documented and explained.
18. A supplement to the Annual Production Report (Section 159 of the Regulations) shall include:
- a) a summary comparison of design and actual physical environmental conditions based in part upon the monitoring program referenced in Condition 16;
 - b) a summary of remedial action taken to correct any movement or settlement of any part of the islands affecting their stability;
 - c) a summary of routine maintenance conducted on the islands;
 - d) an outline of a continuing maintenance program required as a result of degradation of island stability.

Well Completions

19. Each wellhead cellar shall be designed to provide for the drilling of one (1) well in addition to those "future production and injection wells" shown on Map #F20,260-8 titled "Mid K2 Target Location, July, 1980".
20. No well located on an artificial island shall be completed in the Kee Scarp formation until it has been demonstrated to the satisfaction of the Chief that the integrity of the wells on the island will be maintained during spring break-up. The Chief will not be assured of the integrity of the wells until at least one (1) island has satisfactorily survived a spring break-up.

Production Facilities

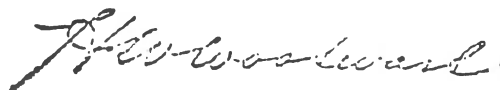
21. The Operator shall make application for a Production Facilities Construction Approval in accordance with Section 61 of the Regulations prior to contractual commitment to purchase equipment and/or prior to calling of tenders.

22. Applicable design standards for production facilities shall include those generally specified in the Regulations.

General

23. All operations shall be conducted in accordance with the Canada Oil and Gas Production Regulations (September, 1980 draft).
24. In accordance with Section 11 of the Regulations, the Operator shall submit an application to the Chief for an amendment to the Development Plan Approval when significant changes are proposed in the nature or timing of development activities.

Yours sincerely,



H.W. Woodward,
(Chief Conservation Officer)
Director,
Northern Non-Renewable Resources
Branch.

FELDMAN/cr

Norman Wells Development Plan Application Documents

- 1) "Norman Wells Development Plan", under cover of the letter, M.C. Arnett to H.W. Woodward, dated 80-02-28;
- 2) "Norman Wells Oilfield Expansion - Gas Conservation", under cover of the letter, M.C. Arnett to H.W. Woodward, dated 80-06-05;
- 3) "Norman Wells Development Application - Additional Information", under cover of the letter, M.C. Arnett to H.W. Woodward, dated 80-07-10, in response to the letter of 80-05-22, H.W. Woodward to M.C. Arnett;
- 4) "Raw Gas Production Forecast", under cover of the letter, G. Davidson to J.D. Boggs, dated 80-07-28;
- 5) "Gas-Oil Relative Permeability/Reservoir Simulation", under cover of the letter, G. Davidson to J.D. Boggs, dated 80-07-29;
- 6) "Norman Wells Development Plan Application", under cover of the letter, M.C. Arnett to H.W. Woodward, dated 80-09-26, in response to the letter of 80-08-05, H.W. Woodward to M.C. Arnett;
- 7) "Norman Wells Development Plan Application", telex M.C. Arnett to M. Feldman, dated 80-10-23;
- 8) Supporting reports by consultants including:
 - a) "Design and Construction Plan for Development Islands at Norman Wells" - Beaver Dredging;
 - b) "Some Remarks Regarding Ice Jamming and the Design of Islands in the Mackenzie River at Norman Wells" - Beaver Dredging;
 - c) "Regime of Mackenzie River at Norman Wells in Relation to Artificial Island Scheme" - Northwest Hydraulics Consultants Ltd., October, 1979;
 - d) "Geotechnical Investigation for Drilling Islands" - EBA Engineering Consultants Ltd., September, 1978;
 - e) "1980 Geotechnical Investigations Interim Data Report" - Komex Consultants Ltd., August, 1980.

Esso

ESSO RESOURCES CANADA

APPENDIX

3

G. L. HAIGHT
Vice-President and General Manager
D. D. BALDWIN
Assistant General Manager

ESSO PLAZA 337 FOURTH
CALGARY CANADA T2C 0P9

1982 03 19

Mr. M. Taschereau
Executive Director
Canada Oil and Gas Lands Administration
Tower B
355 River Road
Ottawa, Ontario

Copy to Mr. [unclear]
[unclear]

Dear Mr. Taschereau:

Re: Norman Wells Expansion Project
Development Plan Approval

Further to receiving tentative Development Plan Approval, DIAND #1-80, Norman Wells Field Expansion on 1980 10 27, Esso Resources Canada Limited has completed further design definition on production facilities and as a result we have modified the gas processing. The processing and disposition of gas and gas liquids now results in overall improved hydrocarbon conservation over the initial five years of the project life. However, owing to initial high peaks of gas production we request amendment of two clauses in Development Plan Approval DIAND #1-80 as follows:-

Clause #8

Raw natural gas flaring be permitted for the first 12 months after start-up of crude oil delivery to the Norman Wells - Zama pipeline to allow for potential facility start-up problems, and anticipated initial gas production in excess of plant design capacity. This quantity should not exceed $200 \times 10^3 \text{ m}^3/\text{d}$ under normal plant operating conditions.

Raw natural gas may otherwise be flared during emergency situations, and the duration of such flaring shall not exceed 48 hours unless otherwise approved in writing by the Chief Conservation Officer.

...../2

Clause #9

The quantity of processed natural gas flared be increased to $350 \times 10^3 \text{ m}^3/\text{d}$ for the first 12 months after commencement of delivery of crude oil to the Norman Wells - Zama Pipeline, thereafter not exceeding $300 \times 10^3 \text{ m}^3/\text{day}$.

In support of the above requests we are forwarding revised portions of Section 7 of the Development Plan as originally submitted. The most significant change from previous data submitted is that anticipated processed flare gas volumes are considerably reduced. Our request for relaxation on initial flaring restrictions is to provide flexibility in managing start-up optimization, and eliminating uneconomic plant capacity that might otherwise be utilized for a brief period only, during which time solution gas production decreases rapidly.

Another condition in the tentative Development Plan Approval, DIAND #1-80, and one that Esso feels should be deleted, is Clause 2 wherein there is a requirement for selective production testing of the K1 and K2 zones. The reason for this request is that we feel that the testing would have a low chance of success due to poor reservoir quality, and would be inconclusive due to possible communication through connecting fracture, between the zones.

We have held informational discussions on the above matters with COGLA staff, and will be pleased to further review the matter at your request. We trust you will accept these amendments to the Development Plan Approval, as we are eager to proceed with Production Facility Construction Approvals.

Yours truly,

M. C. Arnett, P. Eng.
Norman Wells Project Manager

LK:zv

Attachments

c.c. Mr. L. Brandon
w/attachments

b.c.c. J. W. Deyell
H. W. Moore
A. M. Lepine
R. J. Rodgers
ICES (with attachments)

7.4 CENTRAL PROCESSING FACILITIES

7.4.1 GENERAL

The Central Processing Facility (CPF) consists of the process, utility and offsite units required to produce up to 4 800 m³/day of stabilized crude. The CPF includes units to process a maximum of 423 000 Sm³/day of solution gas, produced with the oil, making residue gas, fuel gas, propane and C4 plus products. The residue gas is utilized as town and plant fuel gas and as gas lift gas.

Included in the CPF are facilities for the treatment and injection of 6 830 m³/day fresh river water required for reservoir pressure maintenance. The fresh water is used as cooling water on a once through basis prior to filtration deaeration and injection. Produced water skimming tanks and injection pumps are provided to handle the produced water.

The units and Facilities making up the CPF consist of:

- o Crude Stabilization unit
- o Compression facilities
- o Feed gas and liquid dehydration unit
- o NGL recovery unit
- o Fresh water treating, cooling water system and fresh water injection
- o Produced water treatment and injection
- o Crude export facilities
- o Utilities consisting of:
 - glycol/water heating system
 - plant and instrument air
 - fuel gas

- o Electrical power generating facilities for the CPF and townsite.

Note: Figures not attached to this memo tank.

7.4.2 FEEDSTREAM COMPOSITION

The composition of the incoming feedstream for which the process was designed is as shown in Table 7.1.

This table includes reservoir fluid and gaslift quantities. The plant has enough flexibility to handle the change in composition.

7.4.3 EXISTING FACILITY

Oil production from the field will be handled by the CPF and the existing facility. The existing Battery presently supplies the Norman Wells refinery with 480 m³/day of crude. This 480 m³/day capacity is in excess of the CPF's 4800 m³/day. This amount will continue to be fed to the refinery to meet Northern commitments.

7.4.4 FIELDGATE BALANCE

The Fieldgate balance in Table 7.2 includes 480 m³/day consumed by the refinery.

TABLE 7.1

INLET STREAM COMPOSITIONS¹

<u>COMPONENT</u>	<u>COMPOSITIONS</u>		
	1985	1990	2000
C ₁	0.33664	0.19771	0.09540
C ₂	0.09651	0.09912	0.03503
C ₃	0.06297	0.07952	0.02141
C ₄	0.01136	0.01427	0.00270
C ₅	0.03191	0.03997	0.00840
C ₆	0.01279	0.01542	0.00290
C ₇	0.01585	0.01931	0.00360
C ₈	0.01682	0.02100	0.00390
C ₉	0.02537	0.03183	0.00592
C ₁₀	0.02216	0.02785	0.00518
C ₁₁	0.01594	0.02005	0.00373
C ₁₂	0.02072	0.02606	0.00485
C ₁₃ *	0.02979	0.03747	0.00697
C ₁₄ *	0.02979	0.03747	0.00697
C ₁₅ *	0.02979	0.03747	0.00697
C ₁₆ *	0.02979	0.03747	0.00697
C ₁₇ *	0.02172	0.02732	0.00508
C ₁₈	0.00451	0.00191	0.00094
H ₂ O	0.18255	0.22625	0.77199
CO ₂	0.00300	0.00251	0.00108
	1.00000	1.00000	1.00000

- 1 - Includes reservoir fluid and gaslift gas.
- Pseudo components

sb. ~ 5/10 H₂O

*1.77199
0.77199
21.5 - 4*

*5/10
fluid*

*This is excessive to high for 198.
even that certain gas pump
of pressure installed at that
time
dunk*

TABLE 7.2
 MATERIAL BALANCE PREDICTIONS
 FOR NORMAN WELLS FIELDGATE

YEAR	AVG DAILY RES FLUID PROD 'N		PLANT FUEL CONSUMP.		LPG PROD 'N		STOCK TANK OIL PROD 'N		WATER PROD 'N		SURPLUS * GAS	
	KMOL/D		KMOL/D	10 ³ M ³ /D	KMOL/D	M ³ /D	KMOL/D	M ³ /D	KMOL/D	N ³ /D	KMOL/D	10 ³ M ³ /D
1985	66 660		12 840	190	5 280	232	14 070	3 195	8 780	160	25 690	380
1987	53 530		12 840	190	6 720	295	16 250	3 690	10 150	185	7 570	112
1989	51 820		11 220	166	7 020	308	18 320	4 159	11 410	208	3 850	57
1991	47 810		7 770	115	7 020	308	17 980	4 082	11 190	204	3 850	57
1993	67 300		6 220	92	7 310	321	17 390	3 950	32 530	593	3 850	57
1995	85 100		2 230	33	7 020	308	16 040	3 642	55 960	1 020	3 850	57
1997	101 170		2 160	32	6 630	291	13 150	2 987	75 380	1 374	3 850	57
1999	121 020		810	12	5 580	245	10 710	2 432	100 070	1 824	3 850	57
2001	108 410		0	0	4 420	194	8 380	1 903	91 890	1 675	3 720	55

* Gas volume ex. plant available for town and IPPL.

7.4.5 CRUDE STABILIZATION

The Crude Stabilization unit is shown schematically in Figure 7.7.

Production from Goose Island, Bear Island and the mainland enters the CPF via three separate lines each of which discharges directly into the two phase inlet separator/slug catcher. The inlet separator is designed to handle a 40m³ liquid slug.

The relatively light gas, containing high fractions of methane and ethane, released in the inlet separator is sent to first stage suction of the Main Compression Unit. The operating pressure and temperature of the inlet separator are 343 kPa (abs) and 2°C, respectively.

Liquids from the inlet separator, consisting of crude oil, lighter hydrocarbons and water, are pumped with the inlet separator pump through the crude exchanger where the temperature is increased to 29°C, by heat exchange with the hot stabilized crude stream. The liquids are then heated to 49°C in the fired crude heater prior to entering the crude oil treater.

Gas liberated due to the higher temperature and lower pressure in the treater (49°C and 276 kPa (abs)) is separated in the surge portion (top of the treater) and fed to the suction of the booster compressor. The liquids flow to the bottom portion of the treater where the water is separated from the oil by the provision of sufficient residence time. This separation is enhanced by both the high temperature and the electrostatic grid in the treater which aid in breaking the oil-water emulsion. The water from the treater is sent to the produced water skimming tank.

Oil from the treater is fed to the vapour boot at 103 kPa (abs) and 48.9°C where the third and final stage of stabilization occurs. A stabilized crude product with an RVP of 69 kPa is established in this vessel.

Gas from the vapour boot is combined with the gas from treater and sent to the booster compressor. The oil from the boot is pumped by the stabilized crude pump via the crude exchanger, where the temperature is reduced to 16°C, to the storage facilities. A 795 m³ wet crude tank is provided for off-spec product with requires recycling.

An inlet separator liquids heater and free water knock-out drum will be installed between the crude exchanger and crude heater in 1991, due to the increased water production forecasted to occur in 1992.

7.4.6 GAS COMPRESSION AND PROCESSING

Revised PFD's in Figures 7.8, 7.9, 7.10 and 7.11 illustrate the compression, dehydration and processing of inlet gas.

Gas from the primary inlet separator flows through suction scrubbers directly into the first stage suction of the main compressors. Gas from the treater and boot is compressed from 0 kPa (ga) to 245 kPa (ga) and joins the separator gas at the first stage suction scrubbers.

In the first stage, the gas is compressed to 1078 kPa (ga) and then cooled to 38°C. Gas and condensate are separated in interstage scrubbers. The condensate is piped to the inlet separator at a pressure of 254 kPa (ga).

Gas from the first stage is then compressed in the second stage to 3988 kPa (ga). The second stage discharge stream is cooled to 38°C and directed to the discharge scrubber where the stream is separated into gas and liquid phases and routed to their respective dehydration units for water removal. A dual bed, molecular sieve dehydration unit is used for both gas and condensate drying. Water from the discharge scrubber goes to the produced water system.

The dehydrated gas from the feed dryer is chilled to 20°C by heat exchange through a feed gas/residue gas exchanger. It then enters the feed gas chiller where further cooling to -21°C takes place.

Following this, a low temperature separator drops out liquids from the gas stream. The gas is processed through a centrifugal separator and then used for town fuel and future lift gas requirements. Condensate from both separators is combined and piped to the de-ethanizer tower at about 3700 kPa (ga).

7.4.7 CONDENSATE PROCESSING

Ethanes, and 50% of the C₃ which are drawn off the de-ethanizer are used for fuel. Condensates from

the de-ethanizer tower are sent to the depropanizer where 50% of the propane is recovered and used for reinjection into the formation. In following years when fuel gas supply cannot match demand, propane will be used as a fuel.

Remaining is an LPG consisting of butanes (C₄) and heavier products. This liquid will be combined with stabilized crude to produce a product with a R.V.P. of 101 kPa to be shipped south in the pipeline.

Any fuel gas in excess of fuel demand will be flared. However flaring of this gas will only take place during the first three years of plant operation.

7.4.8 DISPOSITION OF GAS

Table 7.5 is a revised summary of the gas disposition at the Norman Wells Fieldgate.

Gas volumes from 1985 until 1991 reflect decreasing GOR as reservoir pressure is increased to original conditions. After 1990, gas volumes decrease with decline in reservoir productivity. Norman Wells community requirements were based on forecasts made by Norman Wells production personnel. At present, consideration is being given to converting as much plant equipment to run on natural gas as practical. This would decrease flare volumes.

Revised tables of the energy balance and product specification are also provided. Improvement has been made in the long term with respect to conservation. Flaring has been reduced to a little over three years. Both oil and gas conservation have improved in the third year of operation, although being somewhat reduced in the first year. Overall conservation of 100% is achieved in 1988.

TABLE 7.3
 NORMAN WELLS FIELDGATE
 DISPOSITION OF PRODUCED GAS

YEAR	RAW GAS 10 ³ M ³ /D	LPG SHRINKAGE 10 ³ M ³ /D	PLANT FUEL 10 ³ M ³ /D	IPPL STATION 10 ³ M ³ /D	TOWN FUEL 10 ³ M ³ /D	FLARE GAS 10 ³ M ³ /D
1985	625	55	190	14	43	323
1987	372	70	190	14	43	55
1989	296	73	*166	14	43	-
1991	245	73	115	14	43	-
1993	225	76	+92	14	43	-
1995	183	73	53	14	43	-
1997	158	69	32	14	43	-
1999	127	58	12	14	43	-
2001	101	46	0	12	43	-

* From this point on propane is required to meet plant fuel demand.
 + From this point on butane is required to meet plant fuel demand.

TABLE 7.4
NORMAN WELLS FIELDGATE
OIL LINE WITH NGL
ENERGY BALANCE

YEAR	AVERAGE PLANT FEED BTU/D x 10 ⁹			AVERAGE GAS DISPOSITION BTU/D x 10 ⁹					OVERALL CONSERVATION %
	TOTAL H.C. PROD	** P/L CRUDE	REFINERY	RAW GAS	* LPG	FUEL GAS	FLARE	% GC	
1985	137	104	10	23	2	9	12	56	91
1987	143	120	10	13	2	9	2	85	99
1989	157	136	10	11	3	8	-	100	100
1991	152	133	10	9	3	6	-	100	100
1993	148	129	10	9	3	6	-	100	100
1995	135	119	10	6	2	4	-	100	100
1997	112	97	10	5	2	3	-	100	100
1999	93	79	10	4	2	3	-	100	100
2001	76	62	10	4	1	3	-	100	100

* LPG Includes C₃ & C₄+

** For actual P/L flows add LPG component of raw gas

TABLE 7.5
AVERAGE PRODUCT SPECIFICATION

<u>COMPONENT</u>	<u>MOL FRACTIONS</u>	
	<u>1999</u>	<u>1995</u>
C ₁	0.000	0.000
C ₂	0.002	0.003
C ₃	0.016	0.024
iC ₄	0.027	0.028
nC ₄	0.09	0.086
iC ₅	0.038	0.040
nC ₅	0.048	0.050
C ₆	0.053	0.053
C ₇₊	0.724	0.716
N ₂	-	-
CO ₂	-	-
	1.000	1.000

7.4.9 SOURCE WATER SUPPLY SYSTEM

A maximum of 369 m³/h of fresh water is pumped with the river water pumps located at the new dock immediately south of the plant. A coarse screen is provided on the suction of these pumps to prevent the intake of fish and other large objects.

The water is pumped through a cyclone separator located at the plant site where 98% of the solid particles are removed. A 5.3 m³/h stream from the bottom of the separator continuously carries the solids to a backwash pond.

From the separator, water is pumped through certain process areas to be used as process cooling. Return from the cooling water distribution flows either to the water injection system and/or backwash water pond.

Water required for injection flows through a water treatment facility. This consists of dual treatment units of flocculation, settling chamber and mixed media filter. Backwash of these filters is initiated automatically and flushing occurs back to the backwash pond.

Filtered water will then be pumped through a deaerator tower which is a vacuum type typically used in waterflood operations.

The basic process flows are shown on Process Schematic Figure 7.12.

7.4.10 PRODUCED WATER DISPOSAL

Initially, there will be very little produced water. However, with time the water content of production wells is expected to increase. This produced water after separation from the oil in a skimming tank is reinjected into the wells.

It should be noted that no produced water shall be returned to the Mackenzie River.

7.4.11 MEASUREMENTS AND STORAGE

Custody transfer measurement of oil delivered to IPL is by means of turbine meters owned by IPL.

Normally crude is shipped continuously as it is produced. A 795 m³ dry crude oil surge tank is provided to smooth the rate of crude entering the IPL system.

Wet crude, detected by the crude moisture analyzer, will be produced to a 795 m³ wet crude storage tank. Wet crude is recycled to the inlet separator.

If required, the crude from the plant can be stored in an existing 12,720 m³ tank. Contents of this existing tank can be pumped to the plant for shipping or to the refinery.

7.5 POWER GENERATION AND DISTRIBUTION

7.5.1 GENERAL

Power is presently supplied to the Norman Wells area by the Northern Canada Power Commission (NCPC). Additional loads resulting from the Expansion Project will greatly exceed the NCPC generating capability, consequently a power generation station and distribution system are included as part of the project.

7.5.2 GENERATING COMPLEX

The generating station will be located in a non-hazardous area in the CPF. This location was selected since the fuel gas normally burned in the gas turbine is produced at the CPF. Also, approximately 80% of the generated power will be used at the CPF.

Power will be generated by 3 50% units providing the most reliable alternative. Two units would be in operation while the third would serve as a standby unit, for planned maintenance and unexpected failure.

Throughout the life of the project the primary generator/turbine fuel will change from fuel gas to fuel and propane and finally fuel gas plus NGL. Back-up or emergency fuel for the turbines will be diesel fuel.

Instrumentation will be provided to allow the local control of each unit. Signals will be sent to remote meters and status indicators located in the main control for constant monitoring of the generating facility.

This station will be capable of providing for some future growth of the project and supplying the requirements of starting the large drivers on the field gate gas compressors. A load summary for the 12 MW plant is presented in Table 7.6.

7.5.3 DISTRIBUTION

The generating complex will supply power at 4.16 KV, 3 phase and 60 HZ.

A four wire distribution system is utilized within the town of Norman Wells, with loads supplied through 2400 volt, single phase transformers connected phase to neutral.

Inside the CPF, the distribution system will employ standard 5 KV nominal indoor switchgear with roll out type breakers. All motor control centres and switchgear will be located indoors in non-hazardous areas.

Distribution of power is detailed in Table 7.6.

TABLE 7.6

ELECTRICAL DISTRIBUTION SYSTEM
LOAD SUMMARY

<u>Service Description</u>	<u>Load (kw)</u>	
	<u>Connected</u>	<u>Max. Demand</u>
Feeder A - Existing Esso loads including some expansion loads.	1 883	966
Feeder B - Mainland Satellite LT4, Island Satellites IS1 and IS2, Freshwater pumphouse, tracing and some existing Esso loads.	950	545
Feeder C - Satellites IS3, IS4, IS5, IS6, Bear and Goose Islands	1 026	484
Feeder D - Commercial and NCPC loads	1 225	769
CPF - including all motor, misc. plant and office loads.	<u>9 000</u>	<u>8 000</u>
	14 084	10 764

Appendix "B": Water Authorization and Licence (1982)



DOUBLE REGISTERED

Esso Resources Canada Limited
Esso Plaza
237-4th Avenue S.W.
Calgary, Alberta
T2P 0H6

Water Register: N3L3-0919 AUG 03 1982

*N.B. I believe July 20, 1982.
This is similar to the version
Ken Keeling sent me dated
82-07-13. However, please
check carefully to ensure
no changes have slipped through
that will impact us further.*

ACTION: FILE

ORIGINAL: "

COPIES: _____

Attention: M.C. Arnett

Dear Sir:

RE: Norman Wells Oilfield

Attached is a copy of the Water Licence N3L3-0919 granted by the Northwest Territories Water Board and approved by the Minister of Indian Affairs and Northern Development in accordance with Section 10 of the Northern Inland Waters Act. The original of this Licence is held at the office of the Controller of Water Rights in Yellowknife, Northwest Territories. A copy of the Procedure for Furnishing the Security Deposit requested by the Board in Part A, Item 4 is also attached.

Although Esso Resources Canada Limited has been issued Licenses from the Water Board in the past, I wish to reiterate how these Licenses are administered:

1. Once a Licence has been issued, a copy is placed in the Water Board Register at the Board's office in Yellowknife and is available to the public.
2. The administration of the Water Licence rests with the Department of Indian Affairs and Northern Development through the Water Resources Division in Yellowknife and the District office in Inuvik.
3. To enforce the terms and conditions as required in the Licence, the Minister of Indian Affairs and Northern Development appoints Inspectors in accordance with Section 29 of the Northern Inland Waters Act. The Inspectors are coordinated through officials of the Water Resources Division of the Department of Indian Affairs and Northern Development, Yellowknife.

NORMAN WELLS PROJECT	
AUG 4 1982	
ACTION	
MCA	
JWB	
GJM	
AML	CC
TWM	CC
HWM	CC
AST	CC
...	CC

NORMAN WELLS PROJECT	
AUG 4 1982	
REC'D.	<i>W. Smith</i>
FILE	
S.A.	

.../2

4. To keep the public and members of the Water Board informed of the Licensee's conformity to Licence conditions, the Inspectors prepare reports which detail observations on how each item in the Licence is being met. These reports are forwarded to the Licensee with a covering letter indicating what action, if any, should be taken. The inspection reports and covering letters are placed on the public Water Register, as are any responses received from the Licensee pertaining to the inspection reports. It is therefore of prime importance that you react to all areas of concern regarding all inspection reports so that these concerns may be clarified.


5. If the renewal of a Licence is contemplated, it is the responsibility of the Licensee to apply to the Water Board for a new Licence. The past performance of the Licensee plus the points raised during the required public hearing will be used to determine the terms and conditions of a new Licence. Please note that if one Licence expires and another one is not issued, then the use of water must cease or the company is in contravention of the Northern Inland Waters Act. It is suggested that application be one year in advance of an existing licence expiry date.

An official from the Water Resources Division of the Department of Indian Affairs and Northern Development will review this Licence with company officials to ensure that its contents are fully understood which should enable the Company to proceed with oilfield development and operation within the restrictions contained in the Licence.

I hope as a result of this letter you will have clearly established the Board's requirements which must be met if you are to use water and dispose of waste under the Licence attached. Clarification of points pertaining to technical matters are to be addressed to Water Resources officials, however, matters relating to the Licence should be addressed directly to the Board.

In conclusion, I must stress, that the Water Licence and all inspection reports, and correspondence related thereto are part of the public Water Register and are intended to keep everyone informed of the manner in which the Licence requirements are being met. This will form a part of the material considered when the Licence comes up for renewal. The full cooperation of your company is anticipated.

Yours truly,


Glen B. Warner
Chairman
Northwest Territories
Water Board

SECURITY DEPOSIT

1. The Security Deposit may be in the form of:
 - (a) A promissory note guaranteed by a chartered bank in Canada payable to the Receiver General for Canada,
 - (b) a certified cheque drawn on a chartered bank in Canada payable to the Receiver General for Canada,
 - (c) a performance bond issued by a surety approved by the Treasury Board for the purposes of the Government Contract Regulations; or
 - (d) any combination of the securities described in paragraphs (a) to (c).
2. A promissory note is the more common form of deposit. However, in the event a certified cheque is forwarded as security and is deposited into the Consolidated Revenue Fund, interest will be paid at a rate of interest of 2½%.
3. Security deposits cannot be obtained from insurance companies until after a Licence has been issued.
4. The Security deposit is to be filed at Ottawa within 30 days of issuance of the Licence.
5. The Security deposit shall cover the period commencing on the effective date of the Licence up to and including 365 days following the expiry date of the Licence.
6. The Security along with the legal conditions pertaining to the deposit, including PART A of the Water Licence, shall be forwarded to:

Director of Management Support Services
Northern Program
Department of Indian Affairs and Northern Development
Ottawa, Ontario
K1A 0H4
7. The Director of Northern Finance and Administration will place the deposit with the Security Deposit Division, Department of Supply and Services and will advise the Licensee of such action.



Indian and Northern Affairs Affaires indiennes et du Nord

WATER LICENCE

Issued pursuant to
Northern Inland Waters Act and Regulations

ESSO RESOURCES CANADA LIMITED

(Licensee)

Licence Number N3L3-0919 issued on JULY 1 19 82

NORMAN WELLS OILFIELD AT APPROXIMATELY LATITUDE
Location 65°17'N and LONGITUDE 126°51'W

NORTHWEST TERRITORIES WATER BOARD

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

ESSO RESOURCES CANADA LIMITED

(Licensee)

of ESSO PLAZA, 237 - 4th AVENUE S.W., CALGARY, ALBERTA
(Mailing address) T2P 0H6

hereinafter called the Licensee, the right to alter, divert or otherwise use water subject to the restrictions and conditions contained in the Northern Inland Waters Act and Regulations made thereunder and subject to and in accordance with the conditions specified in this licence:

Licence Number NBL3-0919

Water Management Area NORTHWEST TERRITORIES 03

Location NORMAN WELLS OILFIELD at APPROXIMATELY LATITUDE
65°17'N and LONGITUDE 126°51'W

Purpose INDUSTRIAL

Description ISLAND CONSTRUCTION, OILFIELD DEVELOPMENT AND
EXTRACTION AND PRODUCTION OF OIL AND GAS

Quantity of Water Not to be Exceeded AS PER PART D

Rate of Use of Water Not to be Exceeded AS PER PART D

Effective Date of Licence JULY 1, 1982

Expiry Date of Licence JUNE 30, 1988

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

Northwest Territories Water Board

[Signature]
Witness

[Signature]
Chairman

[Signature]
Approved by

[Signature]
Minister of Indian Affairs
and Northern Development

GENERAL CONDITIONS

PART A

1. Scope

This Licence encompasses the construction, maintenance, and operation of the Norman Wells Oilfield and Expansion Project facilities and all associated activities, including Islands in the Mackenzie River at Norman Wells, the Central Processing Facility, drilling of wells, all wells and wellhead equipment, the mainland water intake and distribution system, the oil collection system, use of water for drilling camps, well drilling, waterflood, and Central Processing Facility cooling, as well as disposal of drilling fluids, camp and other wastes, and cooling water.

2. Definitions

In this Licence:

"Act" means the Northern Inland Waters Act;

"Regulations" means Regulations proclaimed pursuant to Section 26 of the Northern Inland Waters Act;

"Board" means the Northwest Territories Water Board established under Section 7(1) of the Northern Inland Waters Act;

"Licensee" means the holder of this Licence;

"Controller" means the Controller of Water Rights for the Northwest Territories.;

"Inspector" means an inspector designated by the Minister under Section 29 of the Northern Inland Waters Act;

"Waste" means waste as defined by Section 2(1) of the Northern Inland Waters Act;

"Maximum Average Concentration" means the average of the last four analytical results submitted to the Board in accordance with the sampling and analysis requirements specified in the Surveillance Network Program;

"Islands" means the physical structure of the artificial islands to be constructed as well as Bear, Goose, and Frenchy's Islands, including sand core, slope and scour protection, drilling equipment and supplies, wastes and storage facilities, well head equipment, and temporary or permanent buildings and camps;

"Central Processing Facility" means the plant where oil, gas and produced water is collected from the oilfield and separated, with plant cooling utilizing Mackenzie River water;

"Water Intake" means the wetwell pump and associated facilities installed in the Mackenzie River and the water line to the Central Processing Facility;

"Waterflood" means the injection of water into the Norman Wells oilfield reservoir for pressure maintenance and enhanced oil production;

"Pipeline" means the group of pipes for transporting oil, gas, and produced water between the oilfield reservoir and the Central Processing Facility, the pipes for transporting water used in the waterflood, and the pipes used to house the power cables;

"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; and

"Approved Sumps" means sumps as approved in this Licence or approved under other Federal or Territorial legislation.

3. The water use fee shall be paid annually in advance.
4. The Licensee shall furnish the Board with a security deposit in the amount of \$1,000,000.00 pursuant to Section 11(3) of the Act and Section 13 of the Regulations.
5. The Licensee shall file an annual report pursuant to Section 10(2) of the Act and Section 15(1) of the Regulations not later than February 1st of the year next following the calendar year reported, which shall contain a summary of the following information:
 - (a) the major maintenance work carried out on project facilities specified in Part A, Item 1;
 - (b) the physical condition of each Island, including inspections of each artificial Island and vicinity for channel erosion, Island scour and erosion, at the Pipeline landfalls and condition of rip rap;
 - (c) the drilling activities on the Mainland and on each Island;
 - (d) the weekly and annual quantity of water in cubic metres pumped from the Mackenzie River at the Mainland dock at Surveillance Station No. 0919-01;
 - (e) the weekly and annual quantity of water in cubic metres and the mean daily temperature of the cooling water returned to the Mackenzie River at Surveillance Station No. 0919-02;
 - (f) the weekly and annual quantity of water in cubic metres used in the Waterflood;
 - (g) the weekly and annual quantity of Produced Water in cubic metres recovered from the oilfield reservoir;
 - (h) the dates and results of Pipeline system pressure tests;
 - (i) the annual amounts of water used in all drilling, and the amounts of waste deposited from each Island;
 - (j) details on the handling, storage and disposal of the waste solids and sludge waste from the waste treatment system;
 - (k) a statement on the latest revisions to the Contingency Plan;
 - (l) a progress report on the upgrading of the leak detection capabilities of the oil collection Pipeline;
 - (m) data generated under the "Surveillance Network Program"; and
 - (n) any other details as may be requested by the Board by November 1st of year being reported.
6. 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 any place under any conditions where such waste or any other waste that results from the deposit of such waste may enter any waters. However, in accordance with

...these regulations are amended by the
Governor in Council under the Northern Island Waters Act, or other
statute 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.

7. The Licensee shall comply with the "Surveillance Network Program" annexed to this Licence.
8. The "Surveillance Network Program" annexed and the compliance of reporting dates may be modified at the discretion of the Board.
9. Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with other Federal or Territorial legislation.

CONDITIONS APPLYING TO CONSTRUCTION

PART B

1. The Licensee shall maintain construction schedules specified in the scheduling Calendars, Norman Wells Expansion Project, Mainland Facilities and Island Construction as shown in Drawing No. SS-WBI dated May 18, 1982 unless written approval authorizing changes is received from the Controller.
2. The Licensee shall construct the Water Intake, Pipeline, Central Processing Facility, and associated facilities as shown in Drawing Nos. 96-0179-130-501 dated May 5, 1982, 96-0179-130-503 dated May 7, 1982, 96-1079-130-504 dated May 6, 1982, 96-0100-090-504 dated April 30, 1982, 96-0100-010-511 dated April 30, 1982 and D-30-FS-1 dated May 4 1982, or as revised and approved by the Controller.
3. The Licensee shall construct the Pipeline according to the schedule specified in Part B, Item 1, or shall submit a written request for approval of schedule revisions to the Controller at least fourteen (14) days prior to the proposed date of commencement of operations. The request shall include details on the method, timing, and location of the dredging operation together with such other information as may be required by the Controller. The Licensee may proceed with rescheduled work if the Controller fails to respond to the request within the fourteen (14) day period or advises the Licensee of the approval for such changes.
4. The Licensee shall construct the six (6) artificial Islands according to design information presented in Exhibit 2, submitted to the Controller in support of the application dated May 26, 1980 and according to Drawing Nos. 3 to 10 dated August, 1981 and March 1982.
5. The Licensee shall conduct dredging operations according to the schedule specified in Part B, Item 1, and shall submit a plan detailing the method, location, extent and volume of the dredging operations to the Controller for approval prior to January 1, 1983. Written requests for revisions to the schedule and plan shall be submitted to the Controller at least sixty (60) days prior to the proposed commencement of the operations. The request shall include details on the method, timing, location, and extent of the dredging operation together with such other information as may be required by the Controller.

3. The Licensee shall provide as-constructed plans and drawings of the Water Intake, the Pipeline and the Artificial Islands within one hundred and eighty (180) days of their completion.

CONDITIONS APPLYING TO OPERATION AND MAINTENANCE

PART C

1. The Licensee shall submit a drilling schedule for the period of this Licence to the office of the Board by January 1, 1983. Any revisions shall be submitted to the office of the Board.
2. The Licensee shall drill all wells on the Islands from within the approved impermeable lined dyke areas.
3. The Licensee shall ensure no flow of formation fluid to surface is possible from any well on an artificial Island until at least one (1) artificial Island has experienced one (1) post-construction River Ice Breakup period. A survey of the conditions of the Island shall be carried out, and a detailed report satisfactorily demonstrating artificial Island integrity submitted to the office of the Board in support of Island-based drilling during River Ice Breakup.
4. The Licensee shall terminate all artificial Island based drilling and minimize storage of drilling and petroleum products on Islands during the River Ice Breakup period of the first year of operation. The Licensee may carry out all operations during subsequent breakup periods, unless otherwise advised by the Board.
5. The Licensee shall undertake any necessary annual maintenance required to preserve the structural integrity of the Islands.
6. The Licensee shall check for leakage and undertake hydrostatic pressure tests on the portion of the Pipeline carrying oil, gas and water from the oilfield reservoir to the Central Processing Facility. Water used in the hydrostatic testing shall be directed through the Central Processing Facility.
7. The Licensee shall notify the Controller at least ten (10) days prior to the proposed and the scheduled pressure test, but is permitted to undertake pressure tests without this prior notice if circumstances require it and so long as the Controller is advised of the testing being undertaken, and shall submit a report on details of the test within thirty (30) days following the test.
8. The Licensee shall immediately shut down the affected portions of the Pipeline should any leakage or loss of pressure during operation or pressure testing be detected, and shall immediately notify the Controller and take appropriate follow-up action to prevent any discharge from the Pipeline to the Mackenzie River or other bodies of water.
9. The Licensee shall undertake an annual inspection for scour in the bed, channel, and banks of the Mackenzie River in the vicinity of the Pipeline which may expose or threaten to expose the buried Pipeline and shall immediately notify the Controller of this and take appropriate follow-up action.

CONDITIONS APPLYING TO WATER USE

PART D

1. The Licensee shall obtain all fresh water from the Mackenzie River for Central Processing Facility cooling and the Waterflood utilizing the approved Water Intake described in Drawing No. 96-0100-010-511 dated April 30, 1982.
2. The total annual quantity of fresh water used shall not exceed the following rates:
 - (a) July 1, 1982 to May 31, 1984 - 1,200,000 cubic metres per year; and
 - (b) June 1, 1984 to June 30, 1988 - 5,800,000 cubic metres per year.
3. The rate of water withdrawals from the Mackenzie River as described in Part D, Item 1 shall be limited to a maximum rate of 110,000 cubic metres per week during the period of this Licence.
4. The Licensee shall minimize water withdrawals from the Mackenzie River by reinjecting the Produced Water from the oil wells into the Norman Wells oilfield reservoir, and other appropriate water conservation measures.
5. The Licensee shall obtain fresh water:
 - (a) for drilling purposes on the Islands and the Mainland from the Mackenzie River; and
 - (b) for camp use on the Islands from well points on the Island.
6. The Licensee shall install, operate and maintain meters for measuring the volumes of water used.

CONDITIONS APPLYING TO WASTE DISPOSAL

PART E

1. The Licensee shall not discharge drilling fluid waste to the Mackenzie River. All Island drilling fluid wastes must be stored in temporary storage facilities for transportation and disposal to approved sumps. Temporary and permanent sumps shall totally contain all fluids and provide a minimum freeboard of 0.3 metres at all times.
2. The Licensee shall contain all wastes on the Islands within the approved impermeable lined dyked areas and shall direct all contaminated internal drainage to sumps for approved disposal on the Mainland. No waste shall be discharged to the Mackenzie River, other than that described in Part E, Items 3 and 5.
3. All other industrial wastes discharged to the Mackenzie River by the Licensee shall meet the following effluent quality standards:

PARAMETER	MAXIMUM AVERAGE CONCENTRATION	MAXIMUM CONCENTRATION OF ANY GRAB SAMPLE
Phenols	0.10 mg/l	0.40 mg/l
Sulphide	0.10 mg/l	0.20 mg/l
Ammonia Nitrogen	2.00 mg/l	4.00 mg/l
Total Suspended Solids	50 mg/l	100 mg/l
Oil and Grease	No visible sheen	

The waste shall have a pH between 6.0 and 9.5 and have a temperature no greater than 10°C above the ambient Mackenzie River water temperature. All industrial waste discharge to the Mackenzie River shall be not acutely lethal to fish.

4. The Licensee shall discharge the Central Processing Facility cooling water to the Mackenzie River in a manner acceptable to the Board.
5. Camp wastes discharged to the Mackenzie River by the Licensee shall meet the following effluent quality standards at the point of discharge:

PARAMETER	MAXIMUM AVERAGE CONCENTRATION	MAXIMUM CONCENTRATION OF ANY GRAB SAMPLE
Total Coliforms per 100 ml	2×10^5	4×10^5
BOD ₅	90 mg/l	180 mg/l
Suspended Solids	110 mg/l	220 mg/l
Oil and Grease	No visible sheen	

The waste shall have a pH between 6.0 and 9.0 and no solids or sludge collected as part of the camp waste water treatment process shall be discharged to the Mackenzie River.

6. The Licensee shall install, operate, and maintain meters for measuring the volume of wastes disposed.

CONDITIONS APPLYING TO CONTINGENCY PLANS

PART F

1. The Licensee shall have the Contingency Plans in place and approved by the Board by January 1, 1983. These plans shall include but not be limited to the following:
 - (a) Oil Spill Contingency Plan;
 - (b) Hazardous Materials Contingency Plan; and

(c) General Contingency Plan.

2. The Oil Spill Contingency Plan shall describe in detail:
 - (a) actions to be taken to prevent, terminate, contain, recover and dispose of any discharges of oil or of fluids and solids contaminated by petroleum products;
 - (b) a program of studies to demonstrate the capability to contain, recover and to report spills under a variety of environmental conditions, including early and late winter ice conditions, spring River Ice Breakup, and high and moderate summer flow conditions; and
 - (c) a minimum of six (6) oil spill recovery exercises over the first three (3) years of this Licence.
3. The Hazardous Materials Contingency plan shall include the following:
 - (a) the on-site hazardous materials inventory for project construction and operation;
 - (b) the normal and the emergency handling procedures for hazardous materials;
 - (c) an on-site emergency equipment inventory and location index; and
 - (d) directions as to how this Manual relates to the Norman Wells Emergency Measures Organization Plan.
4. The Licensee shall have a General Contingency Plan, which describes the action to be taken to remove personnel, materials and equipment from an Island, and shut down oil production facilities, should the structural or operational integrity of an Island, the underwater Pipeline or other project facilities be a concern during River Ice Breakup or any other time.
5. The Contingency Plans shall be reviewed annually by the Licensee and modified as necessary to reflect changes in operation and technology. The proposed modifications shall be approved by the Board.
6. The Licensee shall undertake further field and communication exercises at the request of the Board.
7. The Licensee shall submit to the office of the Board a detailed report on the successes and the failures of the exercises as well as recommendations for improvement within forty-five (45) days after completion of the exercise.
8. If during the period of this Licence major damage occurs to facilities covered by this Licence, an unauthorized discharge of waste occurs, or if such damage or discharge is foreseeable, the Licensee shall:
 - (a) employ the Contingency Plans to prevent or terminate the damage or discharges and repair or contain and clean up the waste;
 - (b) advise an inspector immediately; and
 - (c) submit a detailed report on each occurrence to the Controller not later than thirty (30) days after initially reporting the event.

CONDITIONS APPLYING TO MODIFICATION

PART G

1. The Licensee may, without written consent from the Board, carry out modifications to the water supply, waste handling and related facilities provided the following conditions are:
 - (a) the Licensee has notified the Board of the proposed modifications at least sixty (60) days prior to making the modifications;
 - (b) such modifications do not place the Licensee in violation of either of this License or of the Act;
 - (c) the Board has not, during the sixty (60) days following notification of the proposed modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
 - (d) the Board has not rejected the proposed modification.
2. Modifications for which all of the conditions referred to in Part G, Item 1, have not been met, can be carried out only with the written consent from the Board.
3. The Licensee shall provide as-constructed plans and drawings of modifications referred to in this License within ninety (90) days of their completion. These plans and drawings shall be submitted to the Controller on material that will reproduce with the use of a standard printer.

CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION

PART H

1. The Licensee shall, by January 1, 1985 or one year before any proposed closure date, whichever comes first, submit to the office of the Board an Abandonment and Restoration Plan which shall describe the procedures and resources that will be utilized by the Licensee to remove or abandon all facilities, as well as restore all temporary and permanent waste storage and disposal areas. This plan shall be reviewed and updated annually to reflect changes in technology and operation.
2. The Licensee shall consider but not be limited to the following areas of concern in completing or revising the Abandonment and Restoration Plan with respect to this or any subsequent License:
 - (a) the Water Intake and distribution system;
 - (b) the petroleum and chemical storage areas;
 - (c) the oil collection system, especially above ground or near-surface pipes;
 - (d) the waterflood sediment settling lagoons;
 - (e) the drilling fluids and camp wastes storage areas;
 - (f) any site affected by waste spills, especially dyked storage areas;

- (g) the Mainland and underwater Pipelines;
- (h) the Waterflood facilities;
- (i) the Central Processing Facility;
- (j) the Islands; and
- (k) any other facility which could potentially create a pollution problem.

3. The Licensee shall modify the proposal referred to in Part H, Item 1 as required for its acceptance by the Board should the plan be deemed unacceptable to the Board.
4. The Licensee shall complete all abandonment and restoration work within the time schedule specified in the proposal referred to in Part H, Item 1, or as subsequently revised and approved by the Board.
5. Notwithstanding the time schedule referred to in Part H, Item 4, the Licensee shall, for all areas referred to in Part H, Item 2, which are abandoned prior to closure of operations, carry out the Abandonment and Restoration Plan as accepted by the board upon abandonment of such areas unless approval for other restoration schedules is received in writing from the Board.
6. Compliance with the Abandonment and Restoration Plan stipulated in this Licence will not limit the legal liability of the Licensee, other than liability arising by operation of this Act.

NORTHWEST TERRITORIES WATER BOARD

James [Signature]
Witness

[Signature]
Chairman

NORTHWEST TERRITORIES WATER BOARD

LICENSEE: Esso Resources Canada Limited
LICENCE NUMBER: N3L3-0919
EFFECTIVE DATE OF LICENCE: JULY 1, 1982
EFFECTIVE DATED OF SURVEILLANCE NETWORK PROGRAM: JULY 1, 1982

SURVEILLANCE NETWORK PROGRAM

A. LOCATION OF SURVEILLANCE STATIONS

<u>Station Number</u>	<u>Description</u>
0919-01	Intake water from the Mackenzie River
0919-02	Central Processing Facility cooling flow return line to the Mackenzie River
0919-03-1	Point of discharge, camp waste treatment plant, artificial Island No. 1
0919-03-2	Point of discharge, camp waste treatment plant, artificial Island No. 2
0919-03-3	Point of discharge, camp waste treatment plant, artificial Island No. 3
0919-03-4	Point of discharge, camp waste treatment plant, artificial Island No. 4
0919-03-5	Point of discharge, camp waste treatment plant, artificial Island No. 5
0919-03-6	Point of discharge, camp waste treatment plant, artificial Island No. 6
0919-04	Point of discharge, camp waste treatment plant, Bear Island
0919-05	Point of discharge, camp waste treatment plant, Goose Island

B. SAMPLING AND ANALYSIS REQUIREMENTS

1. Water at Station No. 0919-02 shall be sampled weekly and analysed for the following parameters:

Phenols	Suspended Solids
Sulphide	pH
Ammonia Nitroten	Specific Conductance

The temperature of the water at Station No. 0919-02 shall be measured daily and recorded at the time of sampling.

2. Water at Station No. 0919-02 shall be sampled once every three (3) months and analysed for the following parameters in addition to the requirements of Part B, Item 1 of the "Surveillance Network Program":

Total Copper
Total Phosphorous

Effluent at Station Nos. 0919-03 to 0919-04 inclusive for which discharge to the Mackenzie River is planned, shall be sampled prior to discharges being approved, and at least once every week during decanting, and analysed for the following parameters:

pH
Suspended Solids

Total Coliforms
Fecal Coliforms

4. All sampling and sample preservation shall be conducted in accordance with methods approved by the Controller.

5. 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 methods as are approved by the Controller.

C. DATA REQUIREMENTS

1. The following quantities shall be measured and recorded weekly in cubic metres:

- (a) the quantity of water pumped from the Mackenzie River;
- (b) the quantity of water returned to the Mackenzie River; and
- (c) the quantity of water injected into the oilfield reservoir.

2. The following temperatures shall be measured daily in degrees Celcius:

- (a) the surface water of the Mackenzie River; and
- (b) the water returned to the Mackenzie River

D. MONITORING AND ANALYSIS REQUIREMENTS

1. The Licensee shall conduct annual inspections of the Islands excepting Bear and Goose Island and their vicinity to determine:

- (a) location, depth, and volume of channel scour;
- (b) location and magnitude of Island slope erosion;
- (c) location and severity of Island rip rap disturbance; and
- (d) structural integrity of the Islands, oil and water distribution systems on the Islands and in the Mackenzie, and other related structures.

1. The licensee shall submit results of all sampling required by Part B of the "Surveillance Network Program" to the Controller within sixty (60) days of the date of sampling.
2. The licensee shall submit a report to the Controller every three (3) months which contains all the recorded data required by Part C of the "Surveillance Network Program".
3. The licensee shall submit to the Controller results of the island and Pipeline data analysis required in Part D of the "Surveillance Network Program" by August 15 of each year, together with evaluations of repair and maintenance work required, and a schedule for completing such work prior to the following spring River Ice Breakup period.

NORTHWEST TERRITORIES WATER BOARD

[Signature]
Witness

[Signature]
Chairman