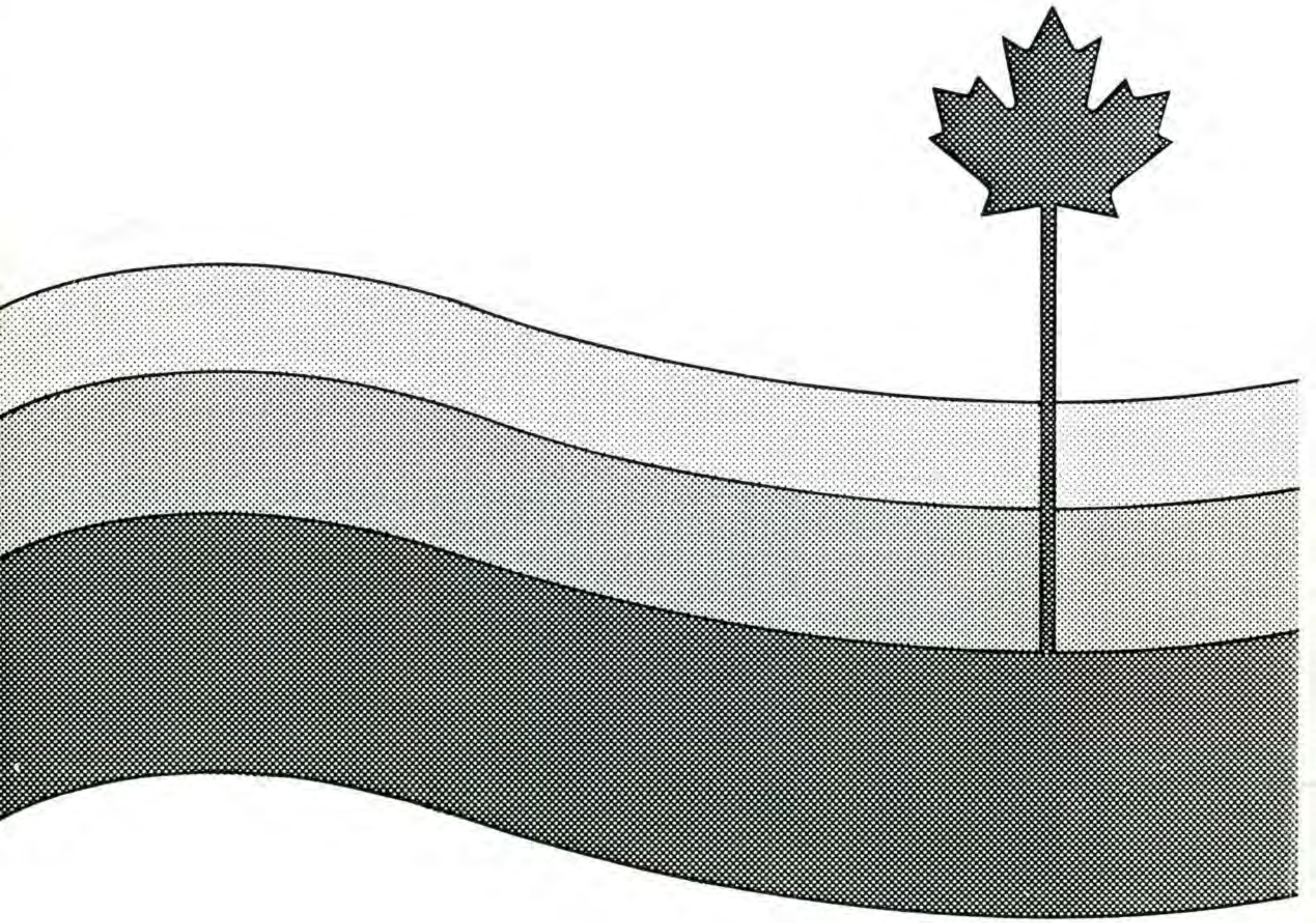
Canada Oil and Gas Lands Administration

Administration du pétrole et du gaz des terres du Canada

Initial Environmental Screening for Renewed Exploratory Drilling in Central Hudson Bay

July 1984



Energy, Mines and Resources Canada

Énergie, Mines et Ressources Canada

Indian and Northern Affairs Canada

Affaires indiennes et du Nord Canada

Canada

INITIAL

SUMMARY EVALUATION

OF

ENVIRONMENTAL CONCERNS

FOR

RENEWED EXPLORATION DRILLING

IN CENTRAL HUDSON BAY

Environmental Protection Branch

Canada Oil and Gas Lands Administration

July 19, 1984

RENEWED EXPLORATION DRILLING IN HUDSON BAY

CanOxy and ICG Exploration Agreements (EAs)

Renewed interest in exploration in Hudson Bay resulted in EAs being negotiated with CanOxy and ICG for the mid-Bay region in Nov. 1983. Two broad issues have developed since:

1. the need for environmental acceptability of the proposed exploration program in the mid-Bay area prior to renewed exploration being approved; and,
2. the role of the Hudson Bay Oil and Gas Committee (HBOGC) in the review process with regard to the environmental acceptability of renewed exploration.

A key issue related to point one is whether COGLA could grant environmental acceptability to CanOxy and ICG to initiate renewed exploration in the central western portion of the Bay. Granting of environmental acceptability by COGLA is tied to several key issues, namely:

1. the applicability of the 1980 federal interdepartmental review of Hudson Bay to the renewed drilling initiative;
2. the adequacy of the CanOxy environmental review and wildlife observation program (environmental overview as requested by COGLA EA negotiations);

3. the need for an environmental overview from ICG as similarly required by their EA;
4. the suitability of the data base for a safe exploration program;
5. the need or otherwise for an Initial Environmental Evaluation (IEE);
6. relief well capability; and,
7. the concept of environmental clearance for the entire Hudson Bay region.

An important consideration is whether all of these issues need to be resolved prior to providing the operator(s) with a statement of environmental acceptability for their proposed exploration program in central Hudson Bay.

1980 INTERDEPARTMENTAL REVIEW

The issue of the environmental acceptability of oil and gas activities in Hudson Bay was first addressed in 1980 through the Resource Management Environmental Committee (RMEC) by an interdepartmental review led by Departments of Fisheries and Oceans (DFO) and Environment (DOE). The main objective of the review was to identify acreage acceptable for disposition, and conditions under which exploratory drilling could take place.

The interdepartmental review recommended that:

1. exploration activities not be permitted within 50 miles of the coastline in the proximity of Eskimo Point, Whale Cove and Rankin Inlet (Area A on the map in Appendix 1).
2. exploration activities be allowed to proceed with extreme caution in the eastern and southern portion of Hudson Bay and suggest that an IEE be prepared for this area prior to extensive exploratory drilling (Areas B and C in Appendix 1).
3. exploration activities be allowed to proceed in the remainder of the proposed exploration area with adequate safeguards (Areas D in Appendix 1).

Specific to recommendation (3) DFO and DOE suggested that:

(i) the occurrence and distribution of marine birds and mammals be studied in the central portion of the Bay; and,

(ii) viable weather/sea/ice information be obtained to ensure a safe drilling operation in this same location.

A general conclusion of the review was that departments had no basic objections to the release of acreage in the central portion of the Bay on the understanding that activities were subject to the normal regulatory process and that appropriate information gaps were addressed.

Assessment

Since the drilling program is fundamentally the same as the one upon which the 1980 interdepartmental review was based, there is every reason to believe that DFO and DOE will agree that drilling in the central western portion of the bay is environmentally acceptable, assuming that the information gaps have been or are committed to be addressed.

ADDRESSING THE INFORMATION GAPS

CanOxy's Environmental Overview

One of the basic reasons for requiring an environmental overview in the EA was to encourage both CanOxy and ICG to develop an understanding of the biophysical and socio-economic setting in which they would be operating and to ensure that information gaps specific to their programs were identified.

The environmental overview was to provide "a consolidated overview of Hudson Bay which describes the physical, biological and directly related socio-economic settings as well as identifying information gaps and anticipated effects of the proposed drilling program" (EAs of November 1983).

Assessment

CanOxy's environmental overview took the form of a literature review which focused on the available biophysical data bases. The social setting was not discussed in detail because this information is expected to form a major part of the operators Canada benefits package. The impacts of the project were considered to a general extent but not in a comprehensive manner, particularly because sufficient oceanographic and meteorological information is not presently available to produce the site specific oil spill scenarios required under COGLA's Physical Environmental Guidelines and Oil Spill Contingency Plan Guidelines. The operator will be able to address these information gaps in the context of Drilling Program Approval (DPA) and Authority to Drill a Well (ADW). The report provides information on the biophysical environment, resource utilization, environmental sensitivities and to some extent contingency planning.

The environmental overview has been reviewed by EPB and was found to be adequate in relation to the intent. Specific recommendations were made to the company as to how the document could be updated and improved to achieve the desired information base. The report has been reviewed by the Resource Management Environmental Committee (RMEC) (see Appendix 2 for COGLA comments). Comments from RMEC are being collated.

The revised document should provide a suitable description of the biophysical setting for the Hudson Bay region which fully meets the requirements detailed in the companies' EAs.

SEISMIC SURVEYS

A condition for approval of CanOxy and ICG seismic surveys stipulated that a program of wildlife observations be conducted from the seismic vessels preferably by Inuit residents of the Hudson Bay region. Both companies complied with this condition and in 1982 and 1983 CanOxy completed a shipboard and aerial wildlife observation program which focused on the numbers, seasonal distribution, habitat, and migration routes of marine mammals inhabiting the Bay. ICG carried out a similar program in 1983. The final report is expected by the end of July 1984.

Assessment

In conducting both a shipboard and an aerial observation program in the central portion of the Bay, the companies have attempted to address one of the major concerns expressed by DFO and DOE in the 1980 interdepartmental review and by Inuit organizations in the region. The two years of wildlife observations during the proposed "drilling window", coupled with a more site specific observation program anticipated for the summer of 1984 by CanOxy, should provide a suitable data base to consider the possible effects of day to day drilling operations and an episodic event on both marine bird and mammal populations frequenting the central portion of the Bay.

ICG OVERVIEW

The question here is one of redundancy. Seismic exploration by both companies has identified the central western portion of the Bay as having the best potential oil and gas play. ICG's interests are located in the same general vicinity as CanOxy's. ICG has not as yet prepared an environmental overview as required by their EA although they did conduct a wildlife observation program in 1983. ICG has cost-shared the environmental overview submitted by CanOxy and proposes to use it to meet its requirement for an environmental overview as per their EA.

Assessment

Since both companies have access to the same data bases and since the same biophysical information gaps are pertinent to ICG's acreage, ICG could update the CanOxy report as part of their EA requirement by providing further information on the environmental setting. Another option would be to ask the operators to prepare a joint up-date. The latter is viewed as the best approach given present circumstances.

SUITABILITY OF THE DATA BASE FOR AN EXPLORATION PROGRAM

Physical environmental knowledge gaps which have been identified relate to the assessment of the possible effects of the physical environment (i.e. climate and ocean) on the design and selection of the drilling unit, on day to day operations, and on the ability to produce an oil spill trajectory analysis. Such information will be required for the DPA.

Assessment

Physical Environment

COGLA's Environmental Protection Branch (EPB) has undertaken a review of the physical environmental information and has identified gaps which must be addressed to ensure safe drilling operations. Conditions in mid-Bay would be suitable for drilling provided that normal precautions are taken for operational, occupational and environmental safety. In order to better utilize the presently available information for this assessment, EPB has recommended that:

1. Dr. S. Prinsenberg of BIO has current data from a one-year measurement program near the proposed drilling site. This data set should be analysed together with the numerical models by N. Freeman (OSS-HQ) and by R. Pingree (U.K. Marine Biological Laboratory, Plymouth, U.K.);
2. a wave hindcasting study be undertaken;
3. CanOxy should submit an analysis and results of extreme values for the physical environment;
4. action on comments provided in the memo from K. Sato to R. Engelhardt (84-05-09 See Appendix 2); and,

5. CanOxy should contact AES Climate Centre to assess available information related to Hudson Bay.

The requirements for a DPA are identified in the Canada Oil and Gas Drilling Regulations Details and Procedures are outlined in the drilling guidelines (see appendix 4). Presently identified deficiencies, with respect to these provisions, based on the environmental overview prepared by CanOxy include:

1. comments provided in the memo from K. Sato to R. Engelhardt (84-05-09 See Appendix 2);
2. an assessment of the current field using Prinsenberg's study, and the numerical models of Freeman and Pingree;
3. an assessment of the drilling season windows; and,
4. an assessment of studies on phenomena of interest or importance to Hudson Bay but carried out elsewhere.

During the actual drilling phase the operators will be required to undertake a measurement, observation and forecasting program according to the Physical Environmental Guidelines.

Biological Environment

EPB has undertaken a similar environmental screening of the existing information base and the possible effects of a drilling program on the marine biological community. This assessment was based on several assumptions which are noted below:

1. the exploration program will be undertaken during the ice free season;
2. exploration will be undertaken by a drillship or semi-submersible;
3. if more than 1 well is drilled operations may be sequential or contemporary;
4. the supply base is located at Churchill and the drillship or semi-submersible is supported by helicopter and two or three supply vessels.

The results of this preliminary screening are attached as Appendix 3. No potentially significant effects on the biological environment were discernable for normal drilling operations. Similarly, there are no non-mitigable significant environmental impacts predicted from an episodic event.

SOCIO-ECONOMIC ENVIRONMENT

Both companies have submitted a Canada benefits package to COGLA summarizing the industrial, manpower and northern benefits, technological transfer and purchasing objectives and policies accruing from their proposed EAs.

On assessing for potential impacts on the socio-economic environment the Canada Benefits Branch concluded that local impacts on traditional communities would be expected to be minimal, if the port of Churchill is used as the main supply base. Further, since Churchill has the infrastructure and socio-cultural characteristics which could benefit from a drilling program, it can be expected that the net social benefits can be expected to be positive and require few mitigating measures. The Branch has suggested that particular socio-economic concerns by Bay communities can be examined by the Hudson Bay Oil and Gas Committee, and subsequently addressed by means of negotiations of the Canada benefits plan by COGLA.

The Branch also notes that since similar projects have never before been subject to the scrutiny of a formal advisory committee review for the formal negotiations of Canada benefits plans, as is the case for the Hudson Bay program, the call for an Initial Environmental Evaluation or an Environmental Impact Statement (EIS) to address socio-economic issues related to the proposed project would be redundant.

NEED FOR AN INITIAL ENVIRONMENTAL EVALUATION (IEE)

One of the main objectives for the environmental overview and its accompanying assessment of potential impacts is to determine whether further studies such as an IEE should be undertaken.

In accordance with FEARO guidelines, and based on past practice, an IEE should be produced when the environmental and socio-economic consequences of an oil and gas project are not evident after the initial screening phase or if there are recognized potentially significant impacts for which there is not sufficient knowledge to allow effective mitigation.

Assessment

In order to determine whether this program requires further assessment such as an IEE, an initial screening was undertaken by the Environmental Protection and Canada Benefits Branches of COGLA. This assessment indicates that subsequent reviews under EARP are not required to evaluate the effects of the proposed drilling program.

This conclusion is based on the following:

1. the environmental overview prepared and soon to be updated by CanOxy/ICG will provide a suitable description of the present environmental conditions in Hudson Bay from which to assess the possible effects of the drilling program in the central portion of the Bay;
2. the physical environment information gaps related to the regulatory process and identified on page 8 through the initial screening phase can be addressed by the companies within the context of specific requirements for Drilling Program Approval and Authority to Drill a Well (ADW) (see Appendix 4);
3. particular socio-economic and environmental concerns can be examined by HBOGC, and subsequently addressed through the regulatory process and federal negotiations with the operators on their Canada benefits plans; and,

4. the expected environmental effects of the proposed drilling program on (i) the biological environment are predictable based on existing environmental data or data which will be collected and assessed in compliance with COGLA's "Guidelines and Procedures for Drilling for Oil and Gas on Canada Lands: April 1984" and on (ii) experience from many similar programs conducted on the east coast, off Labrador and in the Beaufort Sea. There is really nothing novel about the day to day operations of the proposed drilling program which would raise suspicion about whether impacts could be significantly different from those associated with drilling operations elsewhere on offshore Canada lands.

RELIEF WELL CAPABILITY

Relief well capability is of primary concern in Hudson Bay given the remoteness of the area to ongoing exploration activity on the east coast and in the arctic. This will continue to be the case in 1985-86 particularly if there is no activity off Labrador.

A relief well policy is now being reviewed for all Canada lands. The final report will provide an update on the application of relief well capability requirements on the various Canada lands including Hudson Bay. One important aspect of the report will be to review and evaluate the availability, mobilization and logistics for back-up support.

Assessment

Considerations regarding relief well capability are:

1. CanOxy and ICG decide to drill their well(s) at different times/years. This could result in only one drillship being in the Bay at any one time; or,
2. The two companies share one rig and propose drilling 2 wells one after the other.

The relief well capability problems associated with these two scenarios are obvious. The problem can, however, be effectively dealt with if the operators are encouraged to bring two rigs into Hudson Bay during the same season. This would be costly, though safer and would have implications for PIP, etc. In addition, drilling should take place at the beginning of the open water season (based on ice conditions) to ensure as large a window as possible for relief well capability (i.e. at least two months, leaving two months for countermeasures). The simultaneous drilling of two wells would be an alternate strategy. This would allow one drillship to assist the other in case of an emergency.

ENVIRONMENTAL CLEARANCE FOR THE HUDSON BAY REGION

The question of whether the entire Hudson Bay region should be granted environmental clearance prior to exploratory drilling is an issue which has been raised by OGDS. The preferred option is to review the mid-Bay area only as the CanOxy/ICG venture(s) could very likely be a one time effort.

Assessment

The 1980 interdepartmental review identified a number of areas in the Bay where exploratory drilling should not take place under any circumstances due to environmental sensitivities. Since the environmental sensitivities are still present in these areas, it is reasonable to assume that the DFO and DOE position will be consistent with the stance taken in 1980. Therefore, an attempt to obtain environmental clearance for these areas is not recommended because environmental screening would be extremely time consuming and would probably require a full formal environmental review under EARP. Furthermore, because these areas identified are not attractive oil and gas plays, there is no practical reason to subject them to an environmental screening process. Also, there is little evidence to-date which would suggest that these areas would be impacted by the proposed drilling program.

Environmental acceptability for the central portion of the Bay particularly the region defined as area D in the interdepartmental review (See appendix 1) should be acceptable to OGDs and the communities since it would appear there is little potential for environmental or socio-economic disturbance.

Granting Environmental Acceptability

Summary

The granting of environmental acceptability to CanOxy and ICG for their proposed drilling program should be contingent on the following:

1. environmental overviews and wildlife observation assessments are found acceptable and will be updated/improved on the basis of comments from OGDs and found acceptable;
2. assurance is given by the companies that any physical and biological information gaps will be addressed in the appropriate time frame;
3. that the HBOGC be given full opportunity to advise the approvals process on matters pertaining to environmental and socio-economic concerns;
4. assurance is given by the companies that environmental and socio-economic concerns identified by the HBOGC and the Canada Benefits Branch are addressed prior to or during the drilling program as appropriate;

5. relief well capability is in place prior to the commencement of a drilling program as required by specific guideline requirements (i.e., Relief Well Policy and Oil Spill Contingency Plan Guidelines); and,
6. the companies are committed to complying in full with the provisions of the Drilling Regulations, especially those governing DPA and ADW.

July 19, 1984
Environmental Protection Branch

APPENDIX 1

1980 FEDERAL INTERDEPARTMENTAL REVIEW

A SUMMARY OF DFO CONCERNS AND RECOMMENDATIONS ASSOCIATED WITH THE DISPOSITION OF LEASE ACREAGE IN HUDSON BAY

Prepared by

Department of Fisheries and Oceans

Western Region

Winnipeg, Manitoba

February 1980

INTRODUCTION:

Through the Resource Management Environmental Committee the Department of Energy Mines and Resources (EMR) requested the Department of the Environment (DOE) and the Department of Fisheries and Oceans (DFO) to undertake an environmental review of acreage in Hudson Bay for possible disposition under Section 30 of the amended Canada Oil and Gas Land Regulations. In conducting the review, comment was also provided on areas outside the designated acreage where it was felt that potential existed for significant living resource disturbances as a result of any exploration or development activity.

The results of the review were forwarded to R. H. Weir by N. Tywoniuk on February 8, 1980. The following is a brief summary of DFO concerns by area (see attached Map 1; specific locations, as numbered in the text, appear on Map 2). In all cases the recommendations are those stated in the joint DFO/DOE review.

1. Area A:

DFO Concerns

a) Arctic Char Fishery. Rivers in the vicinity of Chesterfield Inlet, Rankin Inlet, Whale Cove and Eskimo Pt. support a commercial arctic char fishery totalling - 280,000 lbs per year.

b) Marine Mammals. Beluga, walruses, and rare bowheads may occur at all times of the year in the vicinity of Whale Cove, Marble Island and Baker Forelane (N.W. Hudson Bay), when open water is available.

Recommendation

It is recommended that exploration activity (marine seismic and exploratory drilling) not be permitted in Area A.

1. Area B:

DFO Concerns

a) Belcher Islands IBP Site. Walruses, harp, ringed and bearded seals are found in the marine waters surrounding the Islands and capelin are common inshore in summer.

b) Twin Islands IBP Site, James Bay. Beluga whales winter in the offshore leads around the islands.

c) Cape Henrietta Maria. Several hundred walruses haul out on an island 25 miles to the northwest of the Cape, in the summer.

... /2

d) The scattered, small Islands, 10 to 20 miles south of the Belchers provide habitat for small numbers of walruses. These walruses are assumed to be related to those at Cape Henrietta Maria and others at the Sleeper Is.

e) Sleeper Is. and Macropeet Is. Up to several hundred walruses have been seen here.

f) Great Whale River (Poste-de-le-Baleine). The area between here and Belcher Is. has good fast ice cover. The density of ringed seals probably is greater here than elsewhere in Hudson Bay. Capelin occur here in the summer.

g) The Hopewell Islands unit encompasses the summer range for small numbers of Beluga Whale.

h) Ringed seal habitat is extremely good in this area, and Beluga Whales are found along the coast line. Anadromous Arctic char and Brook Trout streams occur in this area.

Because of the sensitivity of the Hudson Bay lowland coast, the abundance of known important and/or critical habitat to many species, it is recommended that Area B not be considered for disposition at this time.

Before lands in this area are considered for disposition an IEE should be prepared.

Area C:

DFO Concerns

a) Ottawa Islands: Walruses have been observed in this area in summer.

b) Harp Seal Migration Route. Small numbers of harp seals migrate through or nearby this area each year. Harp seals have been observed as far south as the Belcher Islands.

Recommendations

It is recommended that disposition of lease Area C be conditional upon the acquisition of marine mammal observations during the course of seismic surveys so that the effects of any escalated activity may be properly assessed. This information should be utilized in the preparation of an IEE which should be assessed before drilling is considered.

4. Area D:

DFO Concerns

a) Resource Use Conflicts. There is less potential for disturbance of marine mammals in the offshore Hudson Bay than in the previously described coastal area. It is however not known whether or where any concentrations of mammals may occur. In the face of near total ice cover during the mid-late winter months it is unlikely that many mam-animal conflicts will arise during this time.

Recommendations

In order to identify potential problem areas it is recommended that, as one of the conditions of permit acquisition, the proponents of exploration be asked to make observations on marine mammals from seismic vessels and aircraft and to collect environmental data relevant to exploration activities. This information will be of considerable importance in future exploratory application processes.

5. Area E: Outside of Proposed Lease Acreage

DFO Concerns

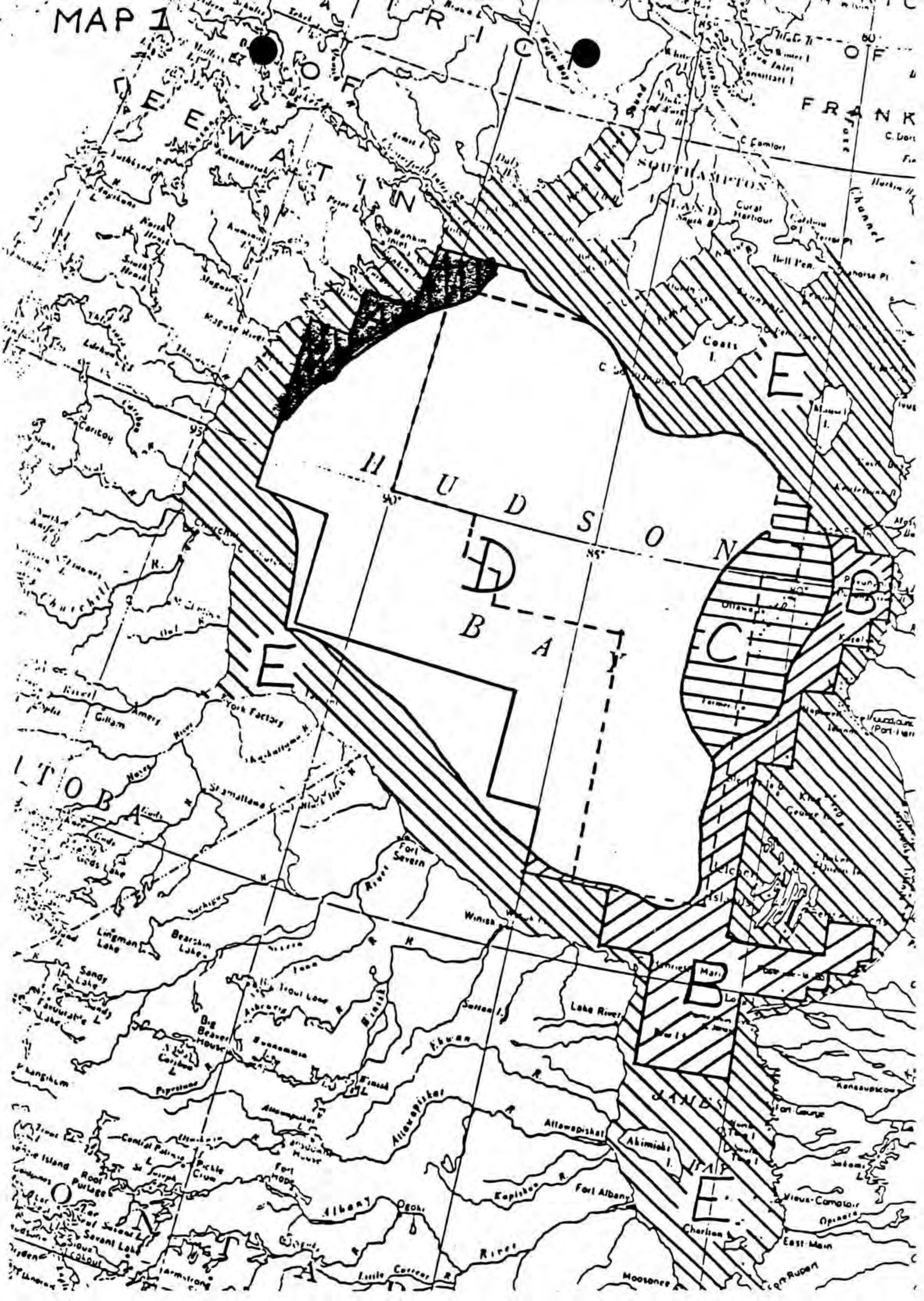
a) The importance to marine mammals of the frequent open water in the Roes Welcome Sound area and the presence of a number of IBP sites and walrus haulout areas in the Southampton-Coats Island areas are good reasons to closely restrict and regulate human disturbance to the area.

Recommendations

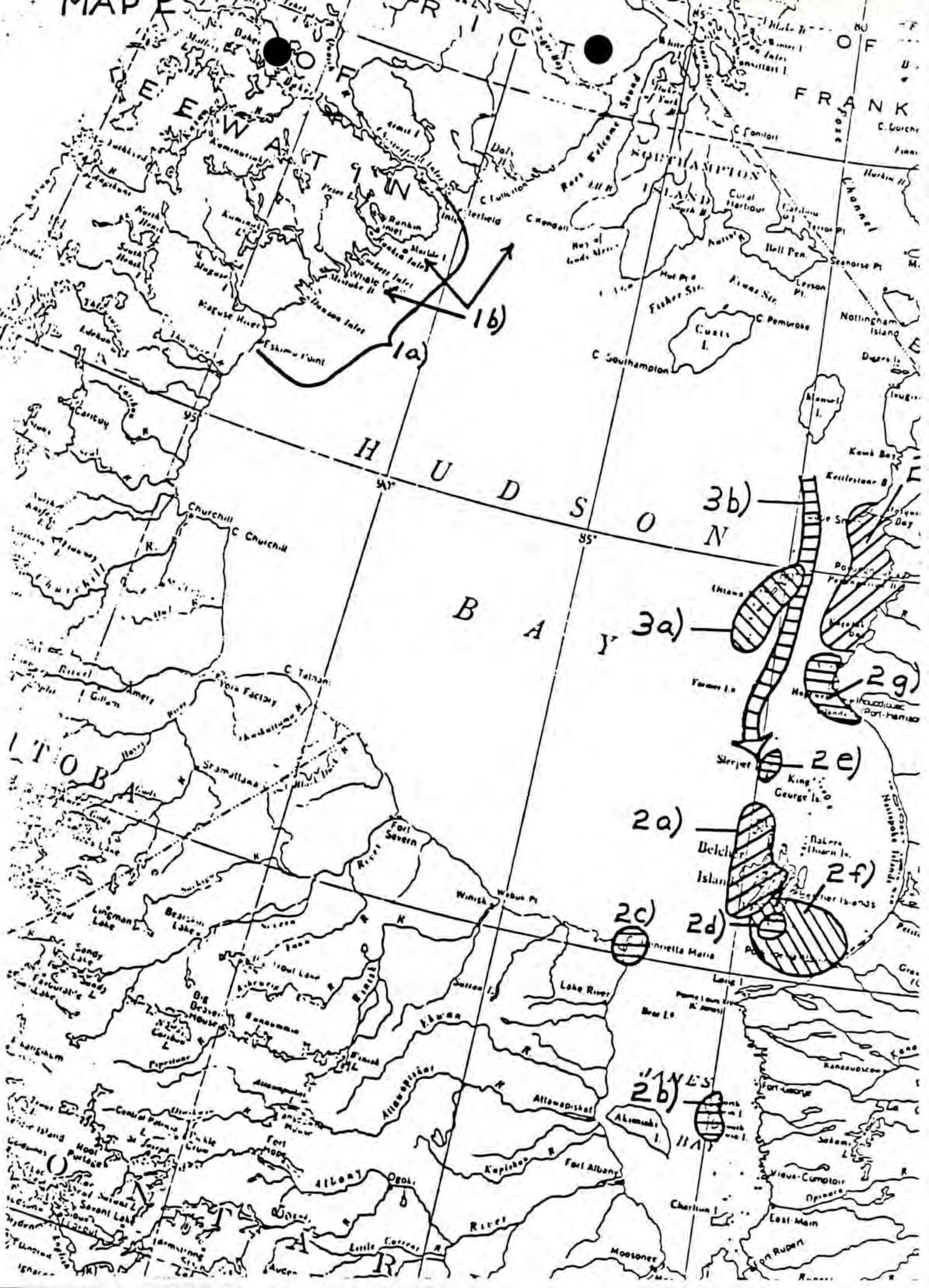
While it is recognized that this area is not being considered for oil and gas exploration per se - it is recommended that any exploration related activities (shore bases, ship and air traffic) be regulated in this region.

Any proposed development in this area (E) should come under the scrutiny of the EAR process.

MAP 1



DISTRICT OF KEEWATIN
FRANKLIN
SOUTHAMPTON ISLAND
Coats I.
Mansel I.
H U D S O N   B A Y
A
B
C
D
E
Churchill
York Factory
Fort Severn
Winisk
Lake River
Attawapiskat
Akimiski I.
Fort Albany
Moosonee
Charlton
Vieux-Comptoir
East Main
Fort George
Cape Churchill
Caribou
Gillam
Big Beaver House
Lingman Lake
Sandy Lake
Favourable Lake
Fort Hope
Pickle Crow
Albany
Ogoki
Little Current R.
Kapiskau R.
Attawapiskat R.
Coral Harbour
C. Comfort
Nastapoka Is.



MAP
DISTRICT OF KEEWATIN
FRANK
SOUTHAMPTON ISLAND
HUDSON BAY
JAMES BAY
MANITOBA
ONTARIO
1a)
1b)
2a)
2b)
2c)
2d)
2e)
2f)
2g)
3a)
3b)
Eskimo Point
Rankin Inlet
Whale Cove
Churchill
C. Churchill
C. Tatnam
York Factory
Fort Severn
Winisk
C. Southampton
Coats I.
Nottingham Island
C. Pembroke
Belcher Islands
Sleeper Is.
King George Is.
Nastapoka Islands
Attawapiskat
Akimiski I.
Fort Albany
Charlton I.
Moosonee
Vieux-Comptoir
East Main
Fort George
Lake River
Sutton L.
Big Beaver House
Fort Hope
Ogoki
Gillam
Amery
Caribou
Kasba L.
Chesterfield Inlet
Roes Welcome Sound
Bay of Gods Mercy
C. Comfort
Bell Pen.
Seahorse Pt.
Foxe Channel
Port Harrison
Kettlestone B.
Povungnituk B.
Mansel I.
Digges Is.

Environment Canada   Environnement Canada

Ottawa, Ontario
K1A 0E7

April 10, 1980

Your file   Votre référence

Our file   Notre référence

RESOURCE MANAGEMENT BRANCH
ENERGY, MINES AND RESOURCES

To: Bell

APR 16 1980

FILE # 8250-7
(copy already on
REPLY SENT 1135-123)

Mr. M. Bell
Director
Environmental Assessment Division
Resource Management Branch
Energy Mines and Resources
580 Booth Street, Room 1346
Ottawa, Ontario

Dear Mr. Bell:

In response to your request of December 14, 1979, an environmental review was undertaken with respect to the release of acreage in Hudson Bay.

Based on this review, DOE recommends that:

(a) exploration activities not be permitted within 50 miles of the coastline in the proximity of Eskimo Point, Whale Care and Rankin Inlet. (Area A on the attached map).

(b) exploration activities be allowed to proceed with extreme caution in the eastern and southern portion of Hudson Bay and suggest that an IEE be prepared for this area prior to extensive exploratory drilling. (Areas B and C on attached map).

(c) exploration activities be allowed to proceed in the remainder of the proposed lease area with adequate safeguards.

The rational for these recommendations is contained in the attached review document.

Yours sincerely,

V.V. Spence
Director, Integration & Environmental Assessment Branch

R.H. Weir
Senior Biologist
Appraisal and Control
Environmental Assessment and Design Division

J. McTaggart-Cowan
Scientific Program Coordinator
Atmospheric Environmen Service

APR [illegible] 1980

A SUMMARY OF

ENVIRONMENTAL CONCERNS

ASSOCIATED WITH THE DISPOSITION OF

LEASE ACREAGE IN HUDSON BAY

with

RECOMMENDATIONS

Prepared by

DFO & DOE

INTRODUCTION/SUMMARY

The Department of Energy Mines and Resources requested the Department of the Environment (DOE) and the Department of Fisheries and Oceans (DFO) to undertake an environmental review of acreage in Hudson Bay for possible disposition under Section 30 of the amended Canada Oil and Gas Land Regulations. This review has identified acreage that DOE & DFO jointly consider unsuitable for marine seismic surveys and/or offshore exploratory drilling. It has also identified acreage which because of a high potential for resource use conflicts is now considered unacceptable until a more complete environmental evaluation can be made. Acreage acceptable for disposition, with conditions is also indicated.

An area that does not lie within the acreage areas described by EMR, but which is in close proximity to the acreage (and in fact surrounds it) was also discussed because of the undoubted potential for significant living resource disturbances which might result from any exploratory or development activity in Hudson Bay.

Finally, information needs which pertain to minimizing undesireable project/environment interactions are briefly discussed.

AREA REVIEW & RECOMMENDATIONS

1. AREA A (see map #1)

1.1 Known resource use conflicts (map #2)

1.1.1 McConnell River. The McConnell River International Biological Programme (IBP) Site including the McConnell River Migratory Bird Sanctuary. This area (approximately 1390 km^2) is located on the west coast of Hudson Bay approximately 32 km south of Eskimo Point.

The site is characterized by extensive coastal marsh flats extending up to 8 km inland dotted with numerous small shallow water bodies. The area is prized for its rich breeding habitat for large numbers of migratory waterfowl particularly lesser snow geese (a maximum of 360,000 nesting pairs: Kerbe 1975).[1]

1.1.2 Arctic Char Fishery. Rivers in the vicinity of Chesterfield Inlet, Rankin Inlet, Whale Cove and Eskimo Pt. support a commercial arctic char fishery totalling ~ 230,000 lbs per year.

1.1.3 Marine Mammals. Beluga, walruses, and rare bowheads may occur at all times of the year in the vicinity of Whale Cove, Marble Island and Baker Foreland (N.W. Hudson Bay), when open water is available.

1.1.4 Community Conflicts. The communities of Eskimo Pt., Whale Cove, and Rankin Inlet have expressed a desire that to avoid resource use conflicts, no exploration activity take place with 50 miles of their respective communities (M. Hawkes, Environmental Assessment Coordinator, Govt., N.W.T. - personal communication).

1.2 RECOMMENDATION. It is recommended that exploration activity (marine seismic and exploratory drilling) not be permitted in Area A (map #1).

[1] Kerbes, 1975. The nesting populations of Lesser Snow Geese in the Eastern Canadian Arctic CWS Report #35.

2. AREA B (see map #1)

2.1 Known resource use conflicts (map #3)

2.1.1 Belcher Islands IBP Site. This group of Islands (56°10'N, 79°40'W) lie approximately 85 km off the southeast coast of Hudson Bay. These Islands create a large number of inlets and bays. The proposed IBP site covers the central and western portion of the Islands.

Breeding populations of Canada geese, old squaw, pintail, scoter and shorebirds are common. Approximately 35,000 eiders breed and winter in the area. Walruses, harp, ringed and bearded seals are found in the marine waters surrounding the Islands and capelin are common inshore in summer. Polar bears use the Islands for winter denning and as a summer sanctuary.

2.1.2 Long Island IBP Site. Polar bear occur here and geese use the Island as a moulting and staging area.

2.1.3 Twin Islands IBP Site, James Bay. North and South Twin Islands have been used by large numbers of polar bears for hundreds of years both as a summer sanctuary and a winter denning area. The greatest concentration occurs on Mount Murdor along the eastern ridge of North Twin Island. Large numbers of Canada Geese breed there as well as a variety of other waterfowl and passerines. Beluga Whales winter in the offshore leads around the Islands.

2.1.4 Cape Henrietta Maria. Several hundred walruses haul out on an Island 25 miles to the northwest of the Cape, in the summer. Fall concentrations of polar bears occur at Cape Henrietta Maria as do major breeding colonies of lesser snow geese.

2.1.5 The scattered, small Islands, 10 to 20 miles south of the Belchers provide habitat for small numbers of walruses. These walruses are assumed to be related to those at Cape Henrietta Maria and others at the Sleeper Is.

2.1.6 Sleeper Is. and Macropeet Is. Up to several hundred walruses have been seen here.

2.1.7 Great Whale River (Poste-de-la- Baleine). The area between here and Belcher Is. has good fast ice cover. The density of ringed seals probably is greater here than elsewhere in Hudson Bay. Capelin occur here in the summer.

2.1.8 The Hopewell Islands unit encompasses the summer range for small numbers of Beluga Whale. Breeding areas for the Common Eider are found here as are two Glaucous Gull colonies. (Arctic Ecology Map Series).

2.1.9 This area encompasses nesting territory for tens of thousands of Canada Geese, and a molting area for Canada Geese from the southwest coast of Hudson Bay. The area is an important staging area for Lesser Snow Geese as well. Ringed seal habitat is extremely good in this area, and Beluga Whales are found along the coast line. Anadromous Arctic Char and Brook Trout streams occur in this area.

2.1.10 Of special importance to waterfowl are the offshore areas in the northern half of Jurus Bay where very large concentrations of scoters occur during the summer/fall months.

3.1 Known or suspected resource use conflicts (map #2)

3.1.1 Ottawa Islands. Formerly the scene of commercial hunting of bowhead whales in the late 19th and early 20th century, but none have been seen there in recent times. These islands provide summer sanctuary for tens of polar bears. Walruses have been observed in this area in the summer, and a thick-billed murre and a gull colony is present on the northern tip of Bronson Island.

3.1.2 Harp Seal Migration Route. Small numbers of harp seals migrate through or nearby this area each year. Harp seals have been observed as far south as the Belcher Islands.

3.2 RECOMMENDATIONS It is recommended that disposition of lease Area C (map #1) be conditional upon the acquisition of marine mammal and polar bear observations during the course of seismic surveys so that the effects of any escalated activity may be properly assessed. This information should be utilized in the preparation of an IEE which should be assessed before drilling is considered.

4. AREA D (see map #1)

4.1 Resource use conflicts. There is less potential for disturbance of wildlife and marine mammals in the offshore Hudson Bay than in the previously described coastal area. It is however not known whether or where any concentrations of mammals or birds may occur. In the face of near total ice cover during the mid-late winter months, it is unlikely that many man-animal conflicts will arise during this time.

4.2 RECOMMENDATION.

In order to identify potential problem areas it is recommended that, as one of the conditions of permit acquisition, the proponents of exploration be asked to make observations on marine mammals from seismic vessels and aircraft and to collect environmental data relevant to exploration activities. This information will be of considerable importance in future exploratory application processes.

5. AREA E (see map #1) - Outside of the proposed lease acreage

5.1 Resource/Project conflicts. The rapid evolution and sensitivity of the Hudson Bay lowlands are reasonably well documented. The occurences of critical or important habitat to migratory geese, ducks and shorebirds render this coastal regime incompatible with shore based development or frequent nearshore air or ship traffic. Concentrations of polar bears, along the edge of the pack ice at various times of the year further render the coastal regions of southern Hudson Bay unsuitable for nearshore or coastal activity. Likewise, the importance to marine mammals of the frequent open water in the Roes Welcome Sound area and the presence of a number of bird sanctuaries, IBP sites, walrus haulout areas and polar bear habitat in the Southampton - Coats Island areas are good reasons to closely restrict and regulate human disturbance to the area.

RECOMMENDATION

5.2.1 While it is recognized that this area is not being considered for oil and gas exploration per se-it is recommended that any exploration related activities (shore bases, ship and air traffic) be regulated in this region.

5.2.2 Any proposed development in this area (E) should come under the scrutiny of the EAR process.

THE EFFECT OF THE ENVIRONMENT ON EXPLORATION ACTIVITY

The lack of an adequate response to the weather forecasts in Hudson Bay created difficulties and near disaster during Aquitaine's drilling program at the "Walrus" well in 1974. A storm forced the operator to abandon the drilling operation and cancel any further work. The present observational network and available routine forecasts produced for this area are not adequate for the proposed operation. Attention will need to be given to closing information gaps in the next three or four years. An increased level of service in ice forecasting is required to minimize the risk to safe offshore drilling in this environment.

INFORMATION GAPS

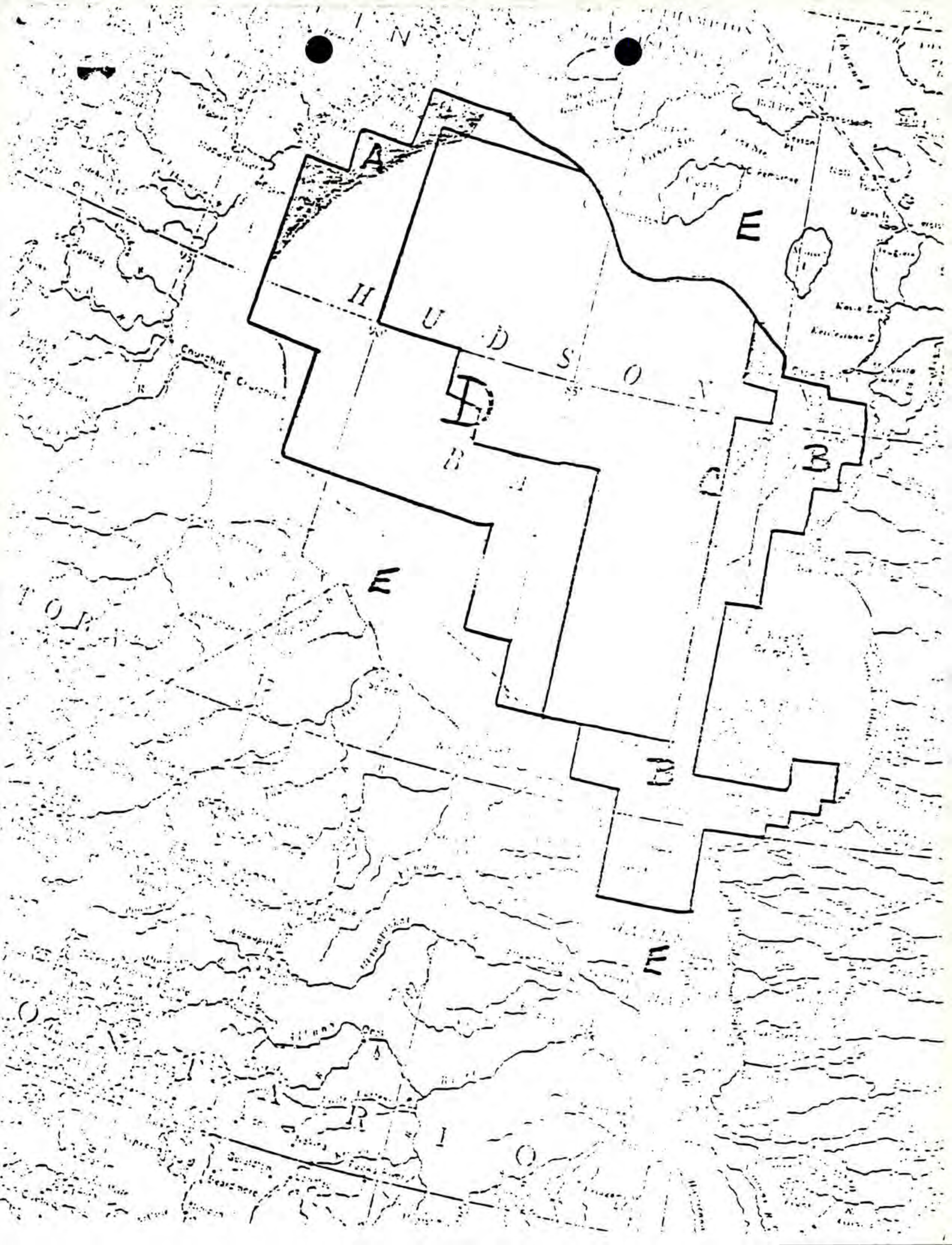
Information needs have been identified for those instances where it would be essential for the prediction of impacts. The identified needs pertain to: A. Physical Oceanography, B. Biological Oceanography, C. Coastal geomorphology and atmospheric parameters pertaining to oil slick transport.

Attention is drawn to the planned scientific symposium on Hudson/James Bay in April, 1981, which may be useful in pulling together existing knowledge of the system.

Further information is necessary for a viable weather/sea/ice information & prediction system.

RECOMMENDATION

It is recommended that the information needs identified, be addressed ~~now~~ to minimize the uncertainties of future predictions of project/environment interactions.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E
H U D S O N
D
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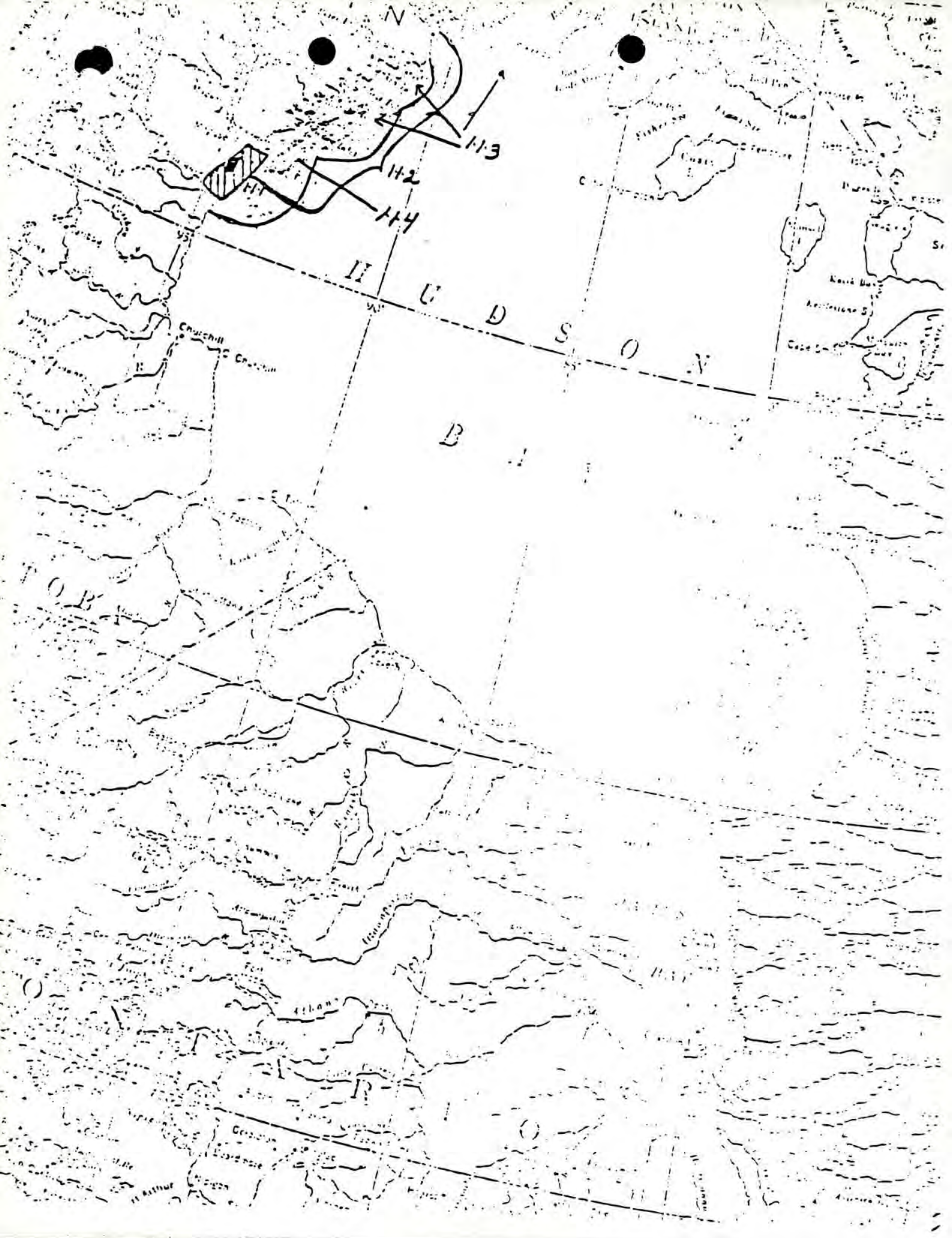
Churchill



113
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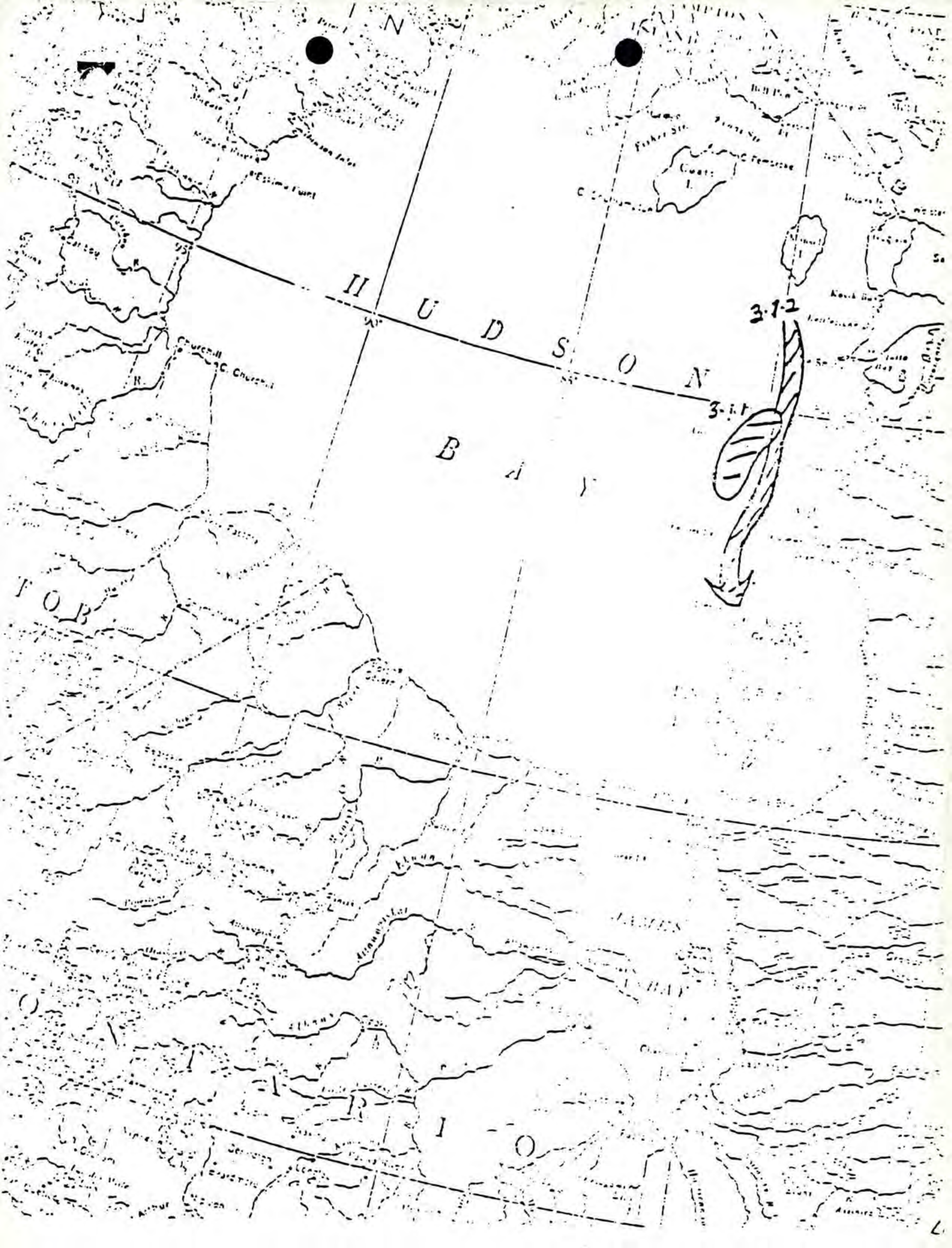

HUDSON
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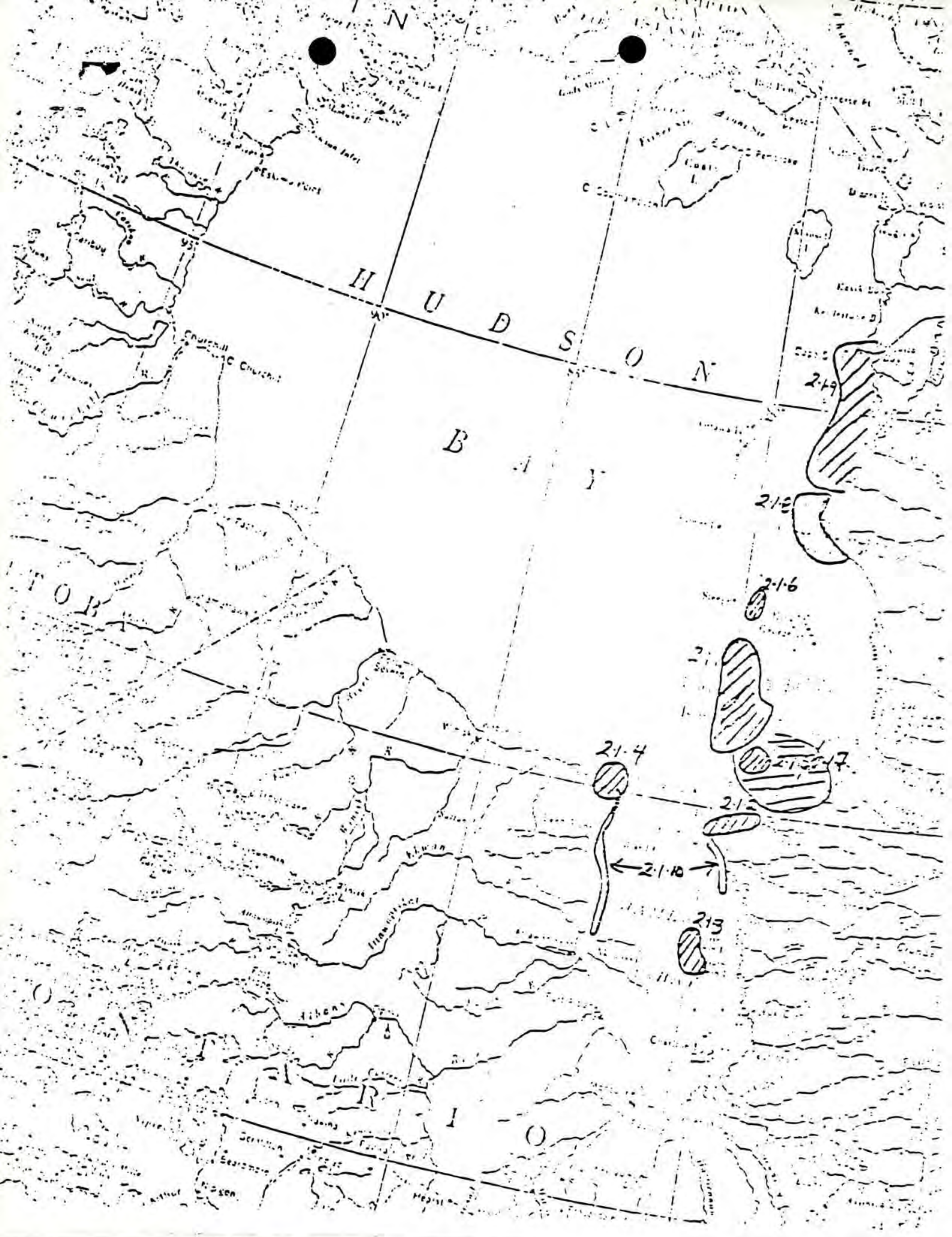
3·1·1
Churchill
C. Churchill
Coats I.



HUDSON
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Churchill
C Churchill
Eskimo Point
2·1·9
2·1·8
2·1·6
2·1·4
2·1·7
2·1·10
2·1·3

APPENDIX 2

COGLA COMMENTS ON CANOXY

ENVIRONMENTAL OVERVIEW OF HUDSON BAY

Canada Oil and Gas Lands Administration
Administration du pétrole et du gaz des terres du Canada

355 River Road
Ottawa Ontario
K1A 0E4

355, chemin River
Ottawa (Ontario)
K1A 0E4

May 17, 1984

Mr. R.T. Peirce
General Manager - Explorations
Canadian Occidental Petroleum Ltd.
1500, 635-8th Avenue S.W.
Calgary, Alberta
T2P 3Z1

Dear Mr. Peirce:

As you know, COGLA made a commitment to CanOxy to offer comments on the Environmental Overview of Hudson Bay which you presented on April 12, 1984.

The comments, which are provided in the attachment, are a compilation from reviews conducted by COGLA and by our colleagues in the Northern Affairs Program of the Department of Indian Affairs and Northern Development.

Overall, the document is well written and appears to cover the literature in a thorough fashion. It is perhaps appropriate to say that important data gaps for the biophysical environment are shortcomings of research in the region and not of the review itself. It was the general view, however, that while the physical environment section addressed the relevant parameters, discussion in some sections could be upgraded. For example, the section on winds could be upgraded if full advantage were taken of the more common data sets such as WES, MAST and AES's Wind Climatology. The section on oceanography could be strengthened by including the modelling study of R. Pingree (U.K. Marine Biological Laboratory, Plymouth, U.K.).

The biological portion of the report provides a good summary of the available literature although there appeared to be a noticeable reliance on one or two references in the discussion of specific subject areas.

.../2

We would strongly recommend that a marine mammals section be included as part of the report. This would not only strengthen the report but would minimize the problem of having to provide marine mammal information under a separate cover. It will also help to provide a sense of continuity to the overall biological description.

The chapter on environmentally sensitive areas was felt to be quite useful. The approach certainly helps to emphasize that environmental sensitivities are specific to foreshore and nearshore habitats and in areas distant from the proposed drilling site.

I hope that these few comments and those in the attachment will be of use to you should you wish to make revisions to the overview.

Yours sincerely,

Duncan Hardie

For F.R. Engelhardt
Director,
Biological Environment
Environmental Protection
Branch

Att.

SPECIFIC COMMENTS ON THE
ENVIRONMENTAL OVERVIEW

Meteorology and Oceanographic

1. Page (i), paragraph 3: Drifting buoys deployed in 1981, 1982 and 1983 are also useful for hindcast models and geostrophic winds. Also, wind data are available from AES's MAST program.

2. Page (i), paragraph 4:

   - Few surface wind data over the Bay are available.

   - It is not clear why geostrophic winds do not represent extreme wind conditions. Such winds may be the most useful wind set for surface conditions over central Hudson Bay and the only set that provides wind extremes for this area.

   - One year's weather buoy data cannot satisfy the need for long-term observations. The buoy data could be used in conjunction with geostrophic wind data for planning purposes.

   - It should be noted that wind extremes should be presented on a monthly basis as the peak winds are likely to occur during the ice-covered season.

3. Page (iv), paragraph 1: The magnitudes reported in the first sentence should be checked. In addition, a subsequent sentence states that maximum swell observed had a height of 4.0 metres.

4. Page 3, paragraph 5: It should be noted that Aviation and Weather Forecast Service may be provided only by AES according to CATCA regulations.

5. Page 4, paragraph 2: figure 2-1 should be amended to illustrate the source or upstream evolution of major storms. This could have a significant role in determining moisture and temperature of the air masses involved.

6. Page 6, section 2.3: Additional data from drifting buoys may have improved the analyses but it has not yet been demonstrated that forecasts over 12 hours have improved due to these data.

.../2

7. Page 6, section 2.4, paragraph 2: Frequency and persistence of wind speed and direction classes should be developed. Such information would be more meaningful than the annual wind roses.

8. Page 13, section 2.4, paragraph 2: The relationship between the data from Hudson Bay grid points and corresponding land stations should be analysed to determine if an applicable transfer function could be developed.

9. Page 20, section 2.4, paragraph 1: Winds from the ship reports should be extracted and compared to the geostrophic winds to assess their relationship.

10. Page 20, section 2.5.2, paragraph 1: Why do "all west stations receive less precipitation than those on the east shore"? This section should be expanded to analyse precipitation by location, month and season. Such an analysis would facilitate statements made on ice accretion on page 27. Question which should be addressed are:

    - would the incidence and integrity of icing over the open water be higher?
    - what are the synoptic criteria which lead to icing?
    - why would Churchill be more prone to icing?

11. Page 27, section 2.5.3, paragraph 1: Advection or sea fog is likely to be more persistent over the drilling area in August due to the cooling effect of the water just after break-up. The fog situation addressed in this section is the sea-smoke type which is not usually a persistent navigation problem.

    Have there been any attempts to correlate cloudiness with wind direction? Are there any data from satellites available on average cloud cover?

12. Page 54, section 3.5: While the discussion on the amphidromic is not explained well, it is not of great relevance to drilling operations.

13. Page 58, section 2.5: Although the average current seems fairly small and is affected by wind-driven circulation, modelling results by N. Freeman show that tidal currents could be up to 100 cm/sec at the drilling site.

.../3

Some idea of the current patterns for input into an oil spill model could be obtained from N. Freeman and from a modelling study by R. Pingree (U.K. Marine Biological Laboratory).

14. Page 63: Swell value of 23.5 metres should be investigated.

15. Page 63: It is difficult to assess these values without the data base or the methods used.

16. Page 69, section 3.7: Sea spray icing in combination with ice forming from freezing of wet snow or rain or drizzles could become significant. The potential for such events should be evaluated. References include: Samoda (1968), "Ice Accretion on Ships in Northern Seas of Japan"; Chaine, P.M. and Sheats P. (1974), "Ice Accretion Handbook," Environment Canada.

Marine Ecology - Sensitive Areas and Contingency Planning

1. It would be useful to include in this chapter a short discussion on food web linkages and dynamics and key energy exchange points for biota.

2. The marine algae section merits a more detailed treatment. This is suggested since there is a specific interest at Eskimo Point into the potential for a commercial kelp harvesting industry.

3. Discussions on the sensitivities of birds and mammals to oil contamination need to be referenced in the text.

4. The importance of coastal vegetation in terms of importance as wildlife habitat should receive a more detailed treatment.

5. It would perhaps be useful to expand the discussion for locally important fish species such as char, brook trout, whitefish and cisco, particularly with respect to habitat, life cycles and native use.

6. Harvesting of birds by residents, particularly along the west coast of the Bay should receive some treatment.

7. Mention might be made of Ross' gull occurrences in the Churchill area in the context of a new nest site for this extremely rare gull.

8. It would perhaps be worthwhile elaborating on I.B.P. sites and other sensitive areas where information is readily available.

APPENDIX 3

COGLA

INITIAL ENVIRONMENTAL SCREENING FOR

RENEWED EXPLORATION DRILLING IN HUDSON BAY

July 1984

APPENDIX 3

COGLA

INITIAL ENVIRONMENTAL SCREENING FOR

RENEWED EXPLORATION DRILLING IN HUDSON BAY

July 1984

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INITIAL ENVIRONMENTAL SCREENING

1. Introduction

To ensure continuity and compliance with the EAR Process where appropriate, COGLA has developed guidelines and procedures for its own internal environmental screening and assessment of major offshore oil and gas projects in the Canada lands.

COGLA and the EAR Process

In the Canadian offshore, the planning of oil and gas operations requires careful consideration of the effects of the physical environment on operations as well as the operation's potential impacts on the physical, biological and social environments. It is important to ensure that such impacts are assessed in advance, so that mitigative actions may be taken as required and that oil and gas operations are subject to effective surveillance at all stages of activity. COGLA's regulatory responsibilities under the Canada Oil and Gas Act and the Oil and Gas Production and Conservation Act are to ensure that oil and gas operations are conducted in an environmentally safe manner. The achievement of these objectives requires close collaboration among COGLA, and other Departments such as Environment (DOE), Fisheries and Oceans (DFO), Energy, Mines and Resources (EMR),Transportation (DOT), and the Northern Affairs Program of Indian Affairs and Northern Development (IAND).

The two Acts and their Regulations contain extensive provisions for pollution prevention and for remedial measures if pollution or a marine emergency were to occur. Existing and new regulations, now in preparation, are designed to enhance the technical safety of oil and gas activities and reduce the environmental risk of operations. The EAR Process complements the regulatory approvals and controls administered by COGLA on a day to day basis.

COGLA, and the Environmental Protection Branch in particular, plays a leading role in ensuring that petroleum activities in the Canada lands are considered, where and whenever appropriate, within the EAR Process.

2. EAR Process Screening Guidelines

The requirements for environmental screening of projects by federal government departments are contained in Cabinet decisions of June 8, 1972 and December 20, 1973 which relate to Pollution Prevention and Environmental Assessment. These two decisions place the responsibility on the initiating department to ensure that projects are screened and environmentally acceptable.

A key component of the EAR Process is the initial screening phase. It is this phase of assessment which decides the route for review. In keeping with the spirit and intent of the EAR Process, COGLA and the Environmental Protection Branch have adopted and, where appropriate, adapted the matrix system of analysis for project screening, as detailed by FEARO in the Guide for Environmental Screening (FEARO, 1978).

FEARO requests that all participating agencies in the EAR Process use the guidelines as a necessary and routine part of the overall environmental review process. As a result, it was hoped that by adopting the matrix analysis system it would be possible, at an early stage in the review process, to identify all potential areas of significant impact of a project and to decide which decision to take.

The following summary of the matrix approach is taken from the Guide. The Level 1 matrix is intended as a broad screening evaluation while the Level 2 matrix focuses on more specific environmental impact areas.

3. EAR Process Level 1 Matrix

In the Level 1 matrix analysis, activities which are likely to occur during the three principal phases of project development are noted below, namely:

i) site investigation and preparation;
ii) construction;
iii) operation and maintenance (of the completed project); and,

iv) future and related activities, which are considered subsequent to project development.

Level 1 identifies four main potential areas of environmental effect, namely:

i) physical-chemical;
ii) ecological;
iii) aesthetic; and,
iv) social.

Each of the areas in which environmental effects are expected as identified in Level 1, are further defined and subdivided in the Level 2 matrix. The level 2 matrix permits the screener to focus on specific problem areas.

The criteria for making screening decisions and the actual screening procedures are presented later. The reader should refer to the Guide for full details on definitions and criteria.

4. EAR Process Level 2 Matrices

The level 2 matrix identifies those activities

i) which will have no effect;
ii) for which an environmental design solution can be identified;

iii) having unknown and/or potential adverse effects; and,

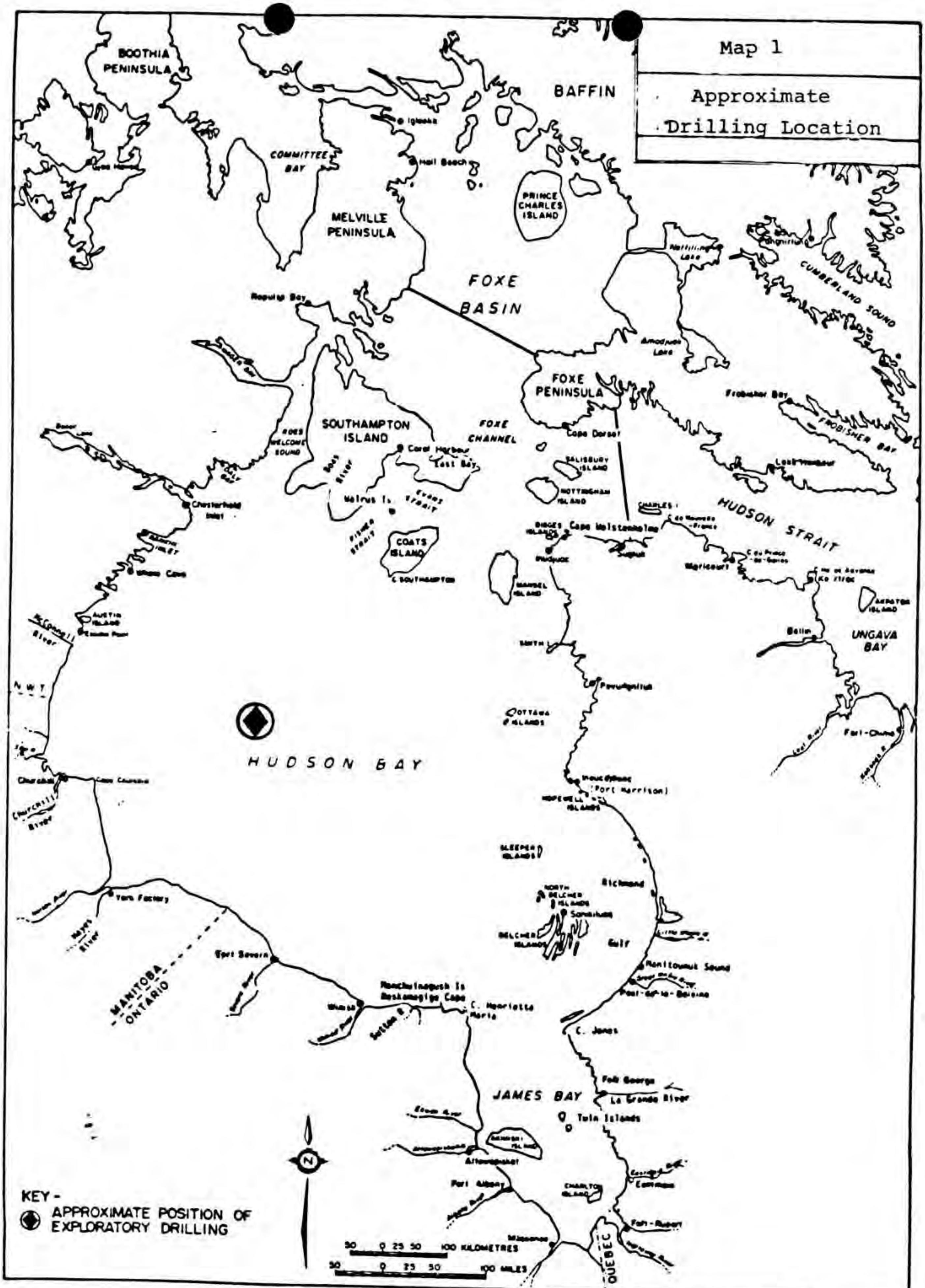
iv) having significant effects.

Project activities may differ considerably from one project to another depending on the type of project being screened. Therefore, different Level 2 matrices are required for different classes and types of projects. Projects in the Canada lands south of 60°, for which EPB is responsible, fall into two broad categories, namely oil and gas development (exploration and production) and pipelines. Separate lists of project activities have been developed for each of these categories. These lists are intended as guides to be used when a project is being screened. They are subject to revision and may be shortened or lengthened as required. The Level 2 screening matrix has been developed from the appropriate activities list noted in the Guide.

5. Renewed Exploration in Hudson Bay

5.1 Internal Screening-Biological Environment

The purpose of this screening exercise is to identify the possible ecological and aesthetic environmental effects of the renewed exploration drilling programs being proposed by CanOxy and ICG in the central and western portion of Hudson Bay (see map 1). The effects of the environment on the proposed project and the effects of the project on the socio-economic setting are discussed under separate cover.



Map 1

Approximate Drilling Location

5.2 Project Description

CanOxy and ICG have not defined the specifics of their drilling program since commitments for equipment have not been finalized. Based on the required commitments as specified in each EA the companies can be expected to drill a minimmum of 2 wells under the proposed program.

The location of the prospective plays, which would be located in the central and western portion of the Bay around 59° 45'N 87° 30'W, rule out the use of a jack-up drilling unit. Such a unit is not likely to be used due principally to water depth being in excess of 150 m and the inability of the units to disconnect quickly during an ice threat.

5.3 Screening Assumptions

To effect project screening at this early date, and based on information provided by the companies, a number of assumptions were made concerning the probable character of the proposed drilling program. These are outlined below in sections 5.4-5.7.

5.4 Drilling Equipment

This section provides a brief description of the two types of drilling units which could be used in the proposed exploration program.

The dynamically-positioned drillships (DPDs) of the Ben Ocean Lancer class used on the Labrador Shelf or the more modern class of semi-submersibles with quick-disconnect mooring or dynamically positioned station-keeping systems (such as the Sedco 709) are the systems most likely to receive attention for the proposed program (see figure 1).

Both types of vessels can operate in water depths of 150 to 2000 m and can drill to a depth of 6000 m below the seafloor. Both systems are suited to operating in remote areas, such as Hudson Bay, and both can move off a well when threatened by sea ice. Units such as the Sedco 709 are known for their rough weather capabilities.

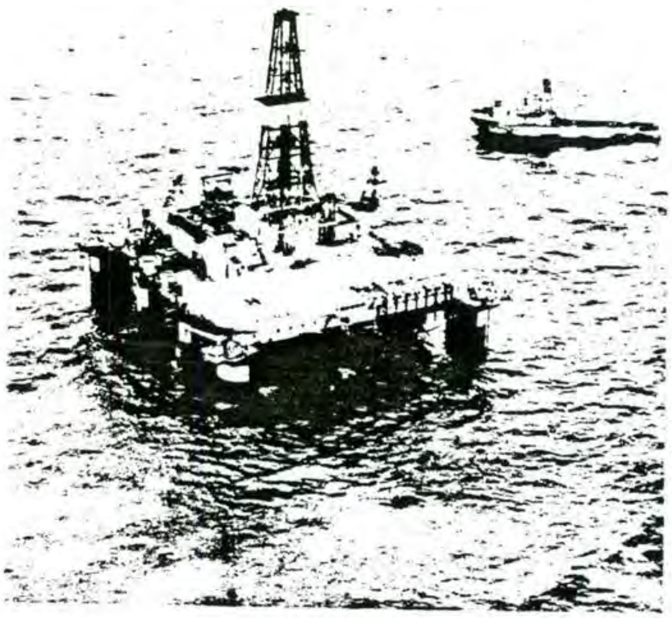
5.5 Drilling Procedures

The drilling procedures that would be used in Hudson Bay would be similar to the offshore procedures used elsewhere in the Canadian offshore south of 60°. These procedures have worked well in such areas as Labrador and the Grand Banks. Drilling requirements in Hudson Bay would be in full compliance with the Canada Oil and Gas Drilling Regulations administered by COGLA.

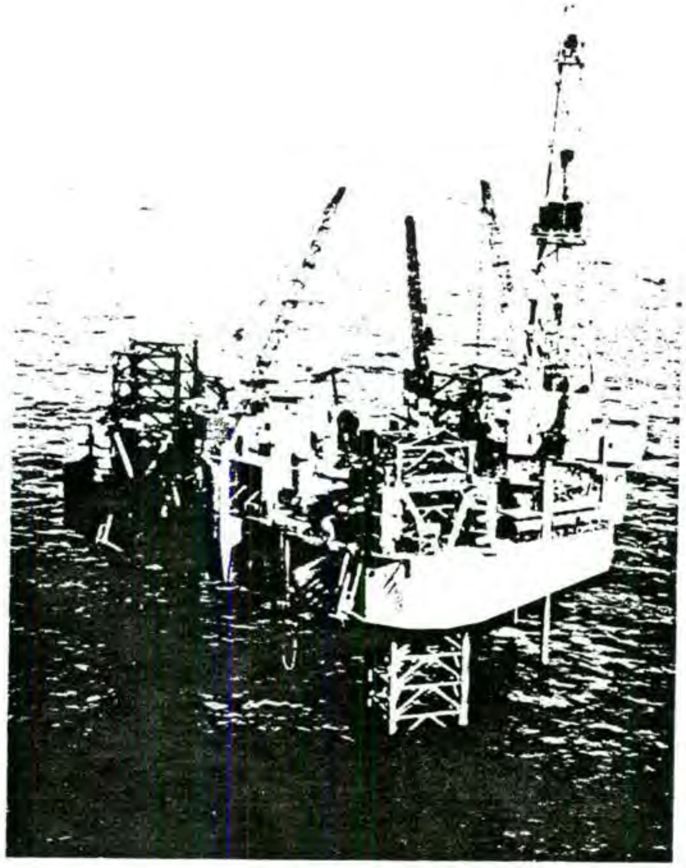
5.6 Drilling Wastes

The drilling unit(s) most likely to be used in Hudson Bay will have sewage disposal systems to process domestic and human

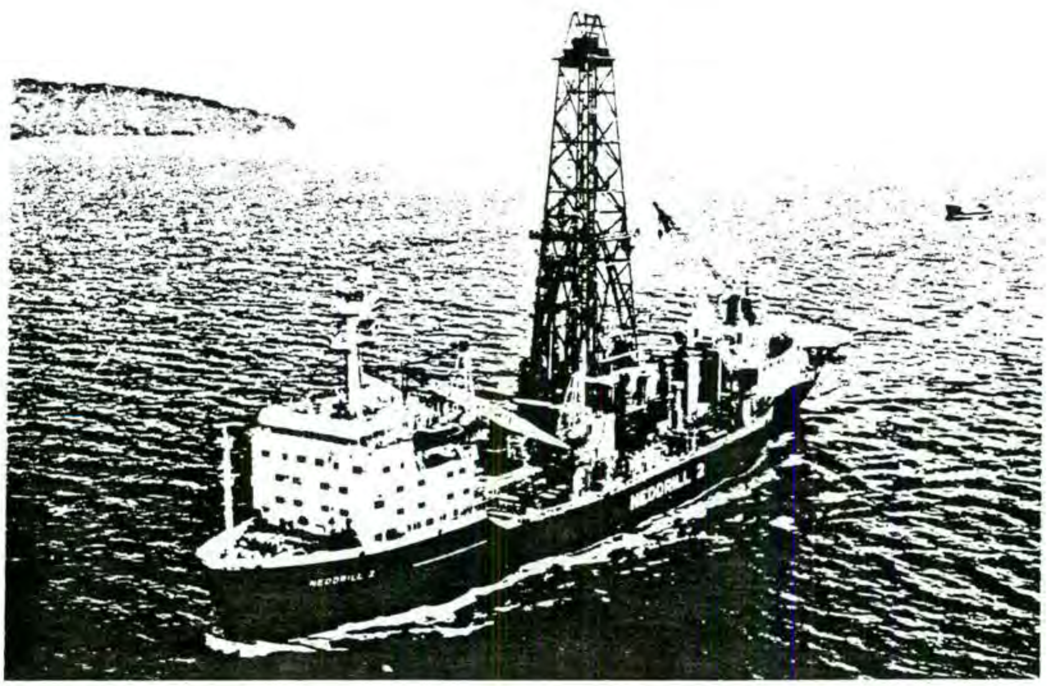
FIGURE 1



Semisubmersible drilling vessel



Jack-up drilling unit



Drillship

Source: Petro-Canada, 1982, Offshore Labrador Initial Environmental Assessment.

wastes. Combustible wastes will be incinerated aboard the rig. Non-combustible materials will be transported to shore on the supply vessels. Waste oils will be separated and burned on board or transported to shore for disposal in accordance with appropriate regulations and guidelines.

The companies can be expected to use water-based drilling muds. These are normally acceptable to COGLA for use by operators in the Canadian offshore. Typical compounds used with such a mud system include bentonite clay, barite, lignosulfonate and sodium bicarbonate.

5.7 Support Operations

Supply Vessels

Support operations for the proposed program would be located at Churchill, Manitoba. Churchill, a major grain port, provides a summer ice free harbour, dock space for supply vessels, crane services, office and warehouse space, watering and refuelling facilities and other facilities required by the companies during the mobilization, execution and demobilization phase of the proposed drilling operation.

The normal number of supply vessels required in the Canadian offshore is either two or three per drilling unit depending on the location. In waters where ice is a problem one vessel is dedicated and equipped for iceberg towing. The other two vessels are used to re-supply the drilling unit. There is a tremendous variation in the type of supply vessels used in the Canadian offshore. The characteristics of the supply vessels chosen should ensure safe operation in Hudson Bay. The proposed drilling program should require no more than two or three supply vessels at any one time.

Aircraft/Helicopter Support

Aircraft support will be required for the offshore drilling program. Charter aircraft wold bring personnel and supplies into Churchill while long range IFR-equipped helicopters such as the Sikorsky S-61 would move personnel and supplies between Churchill and the drilling vessel. Crew changes could be expected to occur every two to three weeks. Offshore drilling vessels are usually supported by one or two helicopters.

6. Environmental Effects of the Proposed Drilling Program

Introduction

The effects of a drilling operation fall into two main categories, namely those associated with routine operations and those with catastrophic events such as a major oil spill. The first group include effects that are chronic and that have a predictable frequency and intensity. Such effects occur in the daily operations of exploratory drilling. They include effects that could result from the disposal of drilling muds, additives, lubricants, fuels, or rig washes into the sea; or from the use of supply vessels and aircraft to transport crew and materials. Many of these impacts can be effectively minimized or mitigated by taking appropriate action as required.

The second type of effect is one associated with a catastrophic or episodic event which usually has a low level of predictable frequency. These may result from an oil or gas well blowout or from discharge from an oiltanker. The harmful effects of such events on the biological environment are relatively difficult to assess and are sometimes impossible to mitigate. The best remedy for minimizing such events is prevention: the use of redundant safeguard systems, vigorous training of staff, and the improvement of sea-state and weather predictions and so on. Another suitable measure is an effective oil spill cleanup and contingency plan. All operations, including CanOxy and ICG, must prepare an acceptable oil spill contingency plan for their proposed drilling program in Hudson Bay.

6.1 Assessing the Biological and Aesthetic Impacts of the Proposed Drilling Program in Hudson Bay

Detailed assessment of routine or catastrophic impacts associated with an offshore exploration program is to a large extent subjective or interpretive as a result of a lack of specific information in a number of areas. Nevertheless, most if not all of the effects related to daily operations of exploratory drilling on biological processes would be minor. The environmental effects of routine operations are usually qualitatively predictable because they are generally known.

In contrast, the environmental effects of accidents such as a particular oil spill are less predictable and therefore more difficult to control. Effects are sometimes difficult to detect in open ocean environments such as Hudson Bay because of the natural variability of the marine ecosystem, as well as the important factor of dilution by the ocean system.

6.2 Effects of Routine Drilling Operations

The effects of routine drilling operations involving a dynamically positioned drillship or semi-submersible in an open ocean environment are well documented, particularly in several initial environmental assessments prepared for similar programs elsewhere on Canada lands (see: Initial Environmental Evaluation: Offshore Queen Charlotte Islands, Petro-Canada 1983; Initial Environmental Evaluation for Renewed Petroleum Exploration in Hecate Strait and Queen Charlotte Sound, Chevron Canada Resources Ltd., 1982; Hydrocarbon Development in the Beaufort Sea - Mackenzie Delta Region: Environmental Impact Statement, Dome Pet. Ltd. and Gulf Canada Resources Inc., 1982).

6.2.1 Screening Routine Drilling Operations

Detailed assessment is subjective and is based on the following assumptions:

1. well or wells drilled by a dynamically positioned drilling unit;
2. one or two well program;
3. supply base located in Churchill;
4. drilling unit(s) serviced by two or three supply boats and helicopters;
5. drilling commencing in summer (July) and utilizing the open water season (approximately 3 months); and,
6. drilling unit leaves the Bay after well abandonment or overwinters in the Bay (most likely at Churchill).

The possible environmental effects of the drilling units and supply vessels entering or leaving Hudson Bay are not considered as significant in this screening. They are, however, subject to the provisions of the AWPPA, especially with regard to ice zones, when navigating north of the 60th parallel. The movement of the unit(s) to or from the drill site is expected to have no more impact on the marine environment than that imposed by regular shipping traffic to and from the port of Churchill.

The screening methodology used is outlined in the COGLA publication, Environmental Assessment Process and Procedures, July 1983, which is similar in intent and scope to the FEARO Guide to Environmental Screening, 1978.

6.2.2 Preliminary Assessment Information Used to Justify the Screening Decisions Made

The expected areas of interaction between the proposed drilling program and the environment were identified and displayed in the level 1 matrix chart (see figure 2). The activities and impact areas listed in the level 2 matrix (see figure 3) were carefully studied. Those relevant to this project were screened. If there was the slightest possibility of a significant adverse effect from a project activity then it was screened as "?" (see matrix 2). Map 2 depicts the routine operation corridor where interactions between the operation and the biological environment can be expected to occur.

The environmental effects of offshore routine exploration activities are generally recognized and predictable. Impacts on the pelagic and benthic marine communities are usually very localized (200-300 m from the drilling vessel). In the majority of cases effects are thought to

FIGURE 2

LEVEL 1 MATRIX

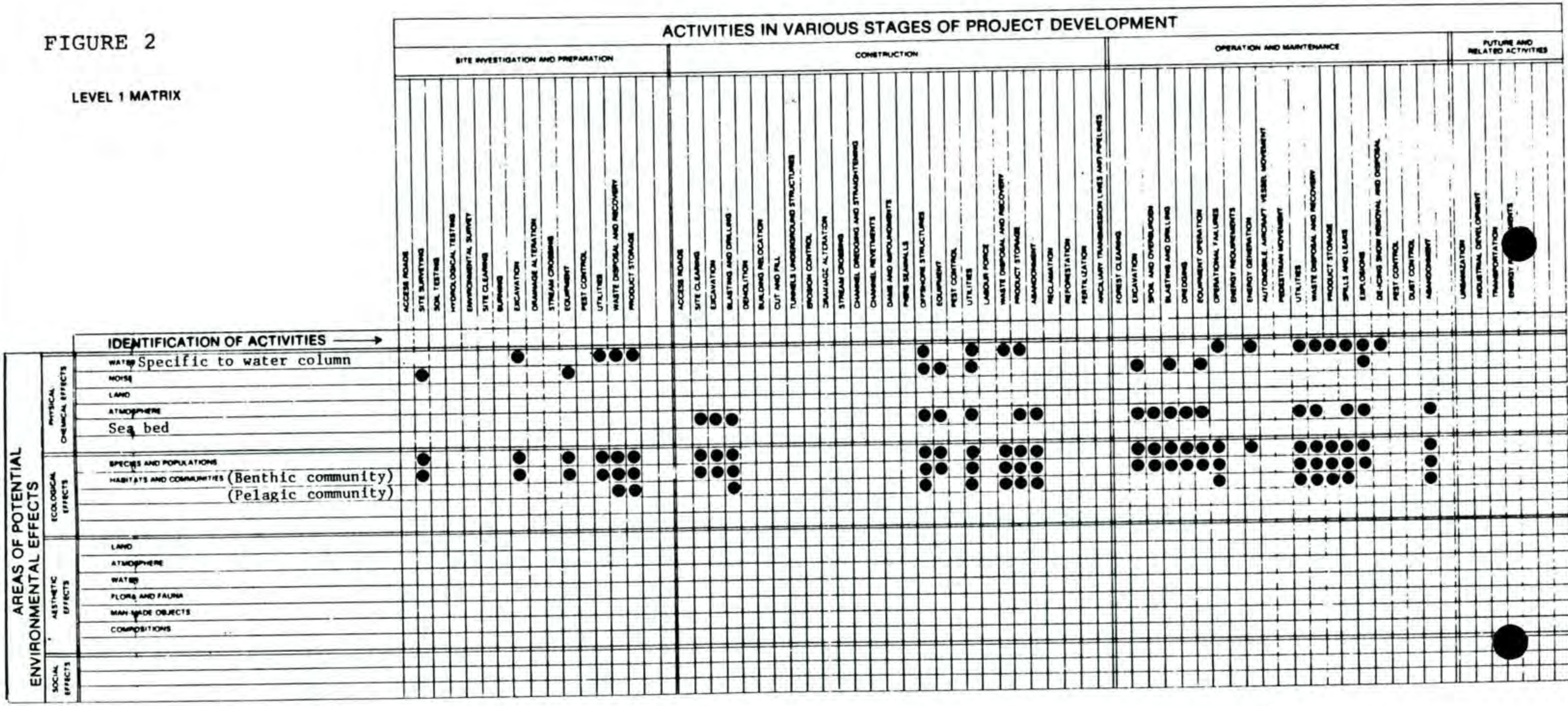
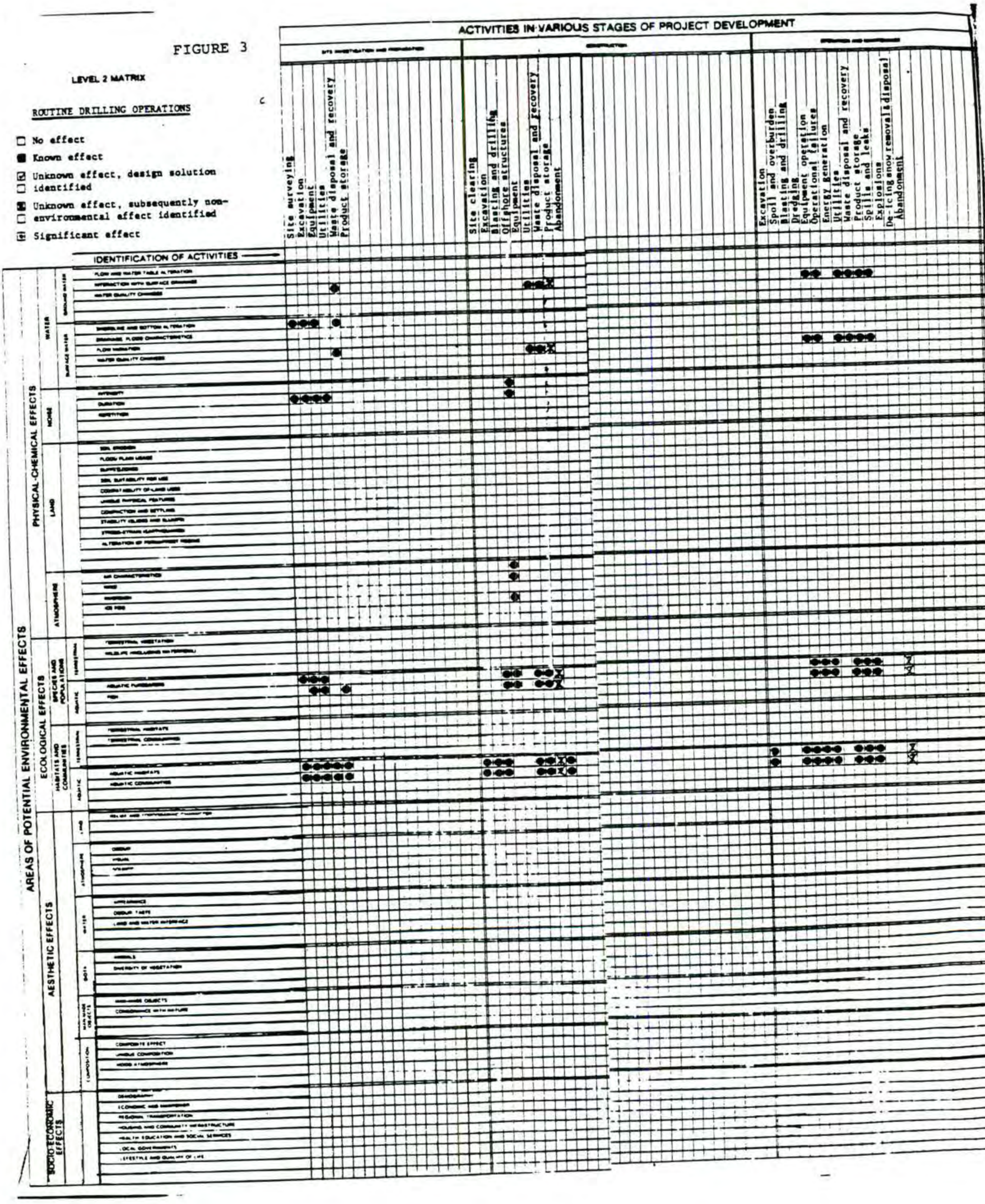


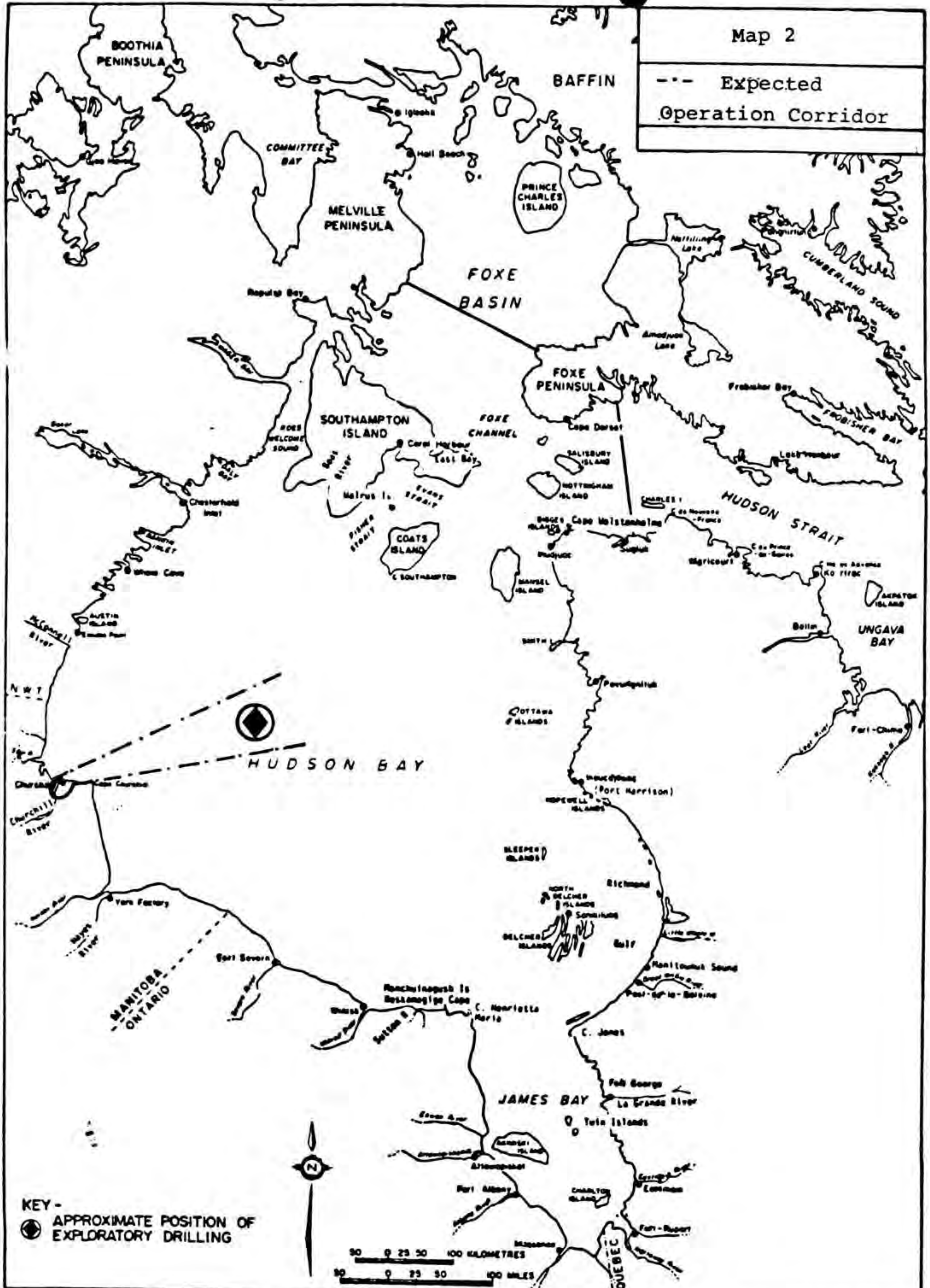
FIGURE 3

LEVEL 2 MATRIX

ROUTINE DRILLING OPERATIONS

- ☐ No effect
- ■ Known effect
- ☒ ☐ Unknown effect, design solution identified
- ■ ☐ Unknown effect, subsequently non-environmental effect identified
- ⊞ Significant effect




Map 2
Expected Operation Corridor
BOOTHIA PENINSULA
BAFFIN
COMMITTEE BAY
MELVILLE PENINSULA
Igloolik
Hall Beach
PRINCE CHARLES ISLAND
FOXE BASIN
Repulse Bay
Nettilling Lake
CUMBERLAND SOUND
Amadjuak Lake
FOXE PENINSULA
Frobisher Bay
FROBISHER BAY
Lake Harbour
SOUTHAMPTON ISLAND
ROES WELCOME SOUND
FOXE CHANNEL
Cape Dorset
Coral Harbour
SALISBURY ISLAND
NOTTINGHAM ISLAND
Walrus Is.
Evans Strait
FISHER STRAIT
COATS ISLAND
Chesterfield Inlet
Cape Wolstenholme
HUDSON STRAIT
Sugluk
Ivujivik
Whale Cove
MANSEL ISLAND
AKPATOK ISLAND
UNGAVA BAY
AUSTIN ISLAND
Eskimo Point
McConnell River
Povungnituk
N W T
OTTAWA ISLANDS
Fort-Chimo
HUDSON BAY
Churchill
Cape Churchill
Churchill River
Inoucdjouac (Port Harrison)
HOPEWELL ISLANDS
SLEEPER ISLANDS
Richmond
York Factory
NORTH BELCHER ISLANDS
Sanikiluaq
BELCHER ISLANDS
Gulf
Manitounuk Sound
Fort Severn
Poste-de-la-Baleine
MANITOBA
ONTARIO
C. Henrietta Maria
C. Jones
Fort George
La Grande River
JAMES BAY
Twin Islands
Attawapiskat
Fort Albany
CHARLTON ISLAND
Eastmain
Fort-Rupert
Moosonee
QUEBEC
50 0 25 50 100 KILOMETRES
50 0 25 50 100 MILES
KEY -
APPROXIMATE POSITION OF EXPLORATORY DRILLING

be slight to negligible. Slight impacts are defined as those being extremely localized, temporary, rapidly reversible (within 6 months to a year) or sublethal (if a short-term response).

Innovation in treatment technologies continues to reduce impacts from activities, such as drill cuttings discharges and the disposal of rig wastes. Similarly, a good understanding of sensitivities of the environment in which drilling takes place can reduce potential impacts through the application of specific mitigation measures. A few aspects, notably the choice of a shorebase, supply vessel routes, helicopter routes and the selection of drilling mud additives and discharge strategy can effectively reduce environmental impacts to acceptable levels.

6.3 Site Investigation and Preparation

Six activities, namely site surveying, excavation, equipment, utilities, waste treatment and product storage were identified as possibly having an effect on the marine environment at the wellsite. The extent and character of these effects are generally unavoidable. At the same time, their overall effect is generally thought to be slight to negligible.

Site Surveying

Under Sections 8 and 89 of the Drilling Regulations, every operator is asked to provide particulars of the nature of the seafloor in the area of a proposed drill site and information on the surface and sub-surface conditions that may affect the safety and efficiency of well drilling operations. Seabed surveys are undertaken by ship and usually cover an area 2 km x 2 km around the proposed wellsite. Seabed samples and core samples are taken at selected intervals which create minor physical disturbances to epifauna and infauna. Impacts are, however, known to be negligible.

Excavation

An operator may be required to excavate a portion of the seabed prior to spudding the well. The preparation of the sub-sea wellhead area will disturb benthic communities over a very small localized area. Impacts from this activity are usually negligible.

Equipment

Equipment utilized in wellsite excavation will propogate underwater noise. The possible effect on localized fish populations will depend on their reaction to the noise. Studies to-date (Wolfson et al., 1979) suggest the fish readily become habituated to continuous man-made noise. Impacts on fish should be negligible.

Underwater noise may be manifest in the form of ambient (natural environmental noise) or man-made noise. Drilling vessels can produce loud noises which can be detected by marine mammals. Of concern is the possible effect on marine mammal behaviour and distribution. Anecdotal information on marine mammal-rig interactions from the east coast offshore suggests that it is unlikely that low frequency noise generated from rig operations has more than a minimal effect (on numerous occasions whales have been noted to cavort around the rigs for several days suggesting that some habituation is possible).

Utilities

Utilities in this case include the drilling unit(s), supply boats and helicopter support. These are discussed in the following section.

6.4 Construction, Operation and Maintenance

Environmental screening of routine drilling operations, in the context of above stages of operations, focused on the following:

1. disposal of drilling fluids and cuttings;
2. disposal of sewage kitchen wastes and solid wastes;
3. re-supply of drillships by aircraft and supply vessels;
4. accidental spills of fuel and chemicals;and,
5. construction and use of shore-based facilities.

An assessment of these five activities was undertaken in the context of the following:

1. the proposed drillsite will be located in waters in excess of 150 m (500');
2. the proposed site will be located in an open ocean environment with an active surface wave and current regime;
3. the proposed site will be located in excess of 250 kilometers from the nearest land; and,
4. the marine bird, mammal and benthic density and biomass is low in the vicinity of the proposed drilling location.

Disposal of Drilling Fluids and Cuttings

The scientific literature defines four major concerns with respect to the disposal of drilling muds and cuttings into the sea:

1. some substances added to drilling muds and whole muds themselves can be toxic to marine life;

2. drilling cuttings rapidly settle out of solution and may either bury benthic organisms or change the texture of seafloor sediments;
3. the rig discharge plume(s) may increase the turbidity of sea water and may affect fish and plankton; and,
4. the concentration of heavy metals in drilling muds could be toxic to marine life.

Impacts on Marine Birds and Mammals

Published literature on field observations and experiments from throughout the world indicates a rapid dilution of drilling fluids in an open ocean environment with no observable effect on marine birds and mammals.

Based on the historic record of wildlife populations in Hudson Bay and on the wildlife observation program conducted, on behalf of CanOxy in 1982-83 and ICG in 1983, the disposal of drilling fluids can be expected to have no impact on the few marine birds and mammals known to frequent the central portion of the Bay.

Impacts on Marine Benthic and Pelagic Communities

The effects of the disposal of drilling fluids and cuttings on the benthic community is well documented for both exploratory and production drilling. (Carls and Rice, 1980; Neff *et al.*, 1980, 1981; Gerber, 1981; Ferbrache, 1983). Because drilling fluids are rapidly diluted, researchers have not been able to demonstrate acute toxic effects such as respiratory problems, altered larval development, alteration of enzymatic and sensory reception, etc. which are known from laboratory experiments. Further, dilution effects and the short time it takes to drill a well, particularly in the case of Hudson Bay, would tend to minimize the sublethal effects of drilling fluids on organisms in the water column specifically phytoplankton and zooplankton. In the surface waters near the point of discharge, phytoplankton and zooplankton may experience short-lived deleterious effects. These effects can be expected to be negligible due to the relatively low abundance of organisms that can be expected at the drillsite(s) even during periods of "bloom" (CanOxy, 1984), and the buffering of any population change by transmigration of organisms from adjacent areas. Drilling fluids and cuttings which reach the bottom are known to smother slow moving sessile organisms in the very localized area beneath the rig (Menzie *et al.*, 1980). In areas where currents are relatively strong muds and cuttings are usually dispersed in a very short time period.

An additional concern is the uptake of heavy metals by benthic organisms - a process known as bioaccumulation. The bioaccumulation by benthic organisms directly under the rig may exceed background levels for a period of time. However, the high dilution rate expected at the drill site should minimize heavy metals available to the benthic community and there appears to be no obligate dependency of any consumers on mid-Bay benthic production.

Data on the characteristics of the benthic community in the central portion of the Bay are scarce. However, observations from widely scattered sites throughout the Bay suggest a benthic community which is relatively diverse (approximately 300 species). It can be expected that the relative abundance and overall standing crop will vary throughout the Bay due to differences in substrate, temperature, nutrient status and depth. The existence of intense stratification, the probability that the deepwater layer is only partially mixed with the surface layer each year and the general low productivity recognized in pelagic waters would suggest that benthic communities can be expected to be of low density (CanOxy, 1984).

A wellsite survey conducted as part of the future submission for Drilling Program Approval by the operators should shed further light on the characteristics of the benthic community in the vicinity of the proposed wellsite, but is highly unlikely to change the present conclusion of negligible impact.

Impacts on Marine Fishes

Nearly all of the marine fishes offshore Hudson Bay were described by Hunter (1968), as being small, obscure bottom-dwelling forms, occurring in low abundance and of no commercial value. Fish species in the area of the drill site are not expected to be affected by the discharge of drill fluids and cuttings due to the high dilution rates and the ability of fish to avoid the area.

6.5 Disposal of Sewage, Kitchen Wastes and Solid Wastes

The disposal of waste materials in the Canadian offshore is governed by a variety of legislation, all of which is designed to regulate and minimize the discharge of deleterious substances. Effluents of the type expected from a drilling vessel such as domestic sewage, grey water, organic wastes from showers, kitchens and wash basins etc. contain material with some biological oxygen demand (BOD), as well as nitrates and phosphate nutrients. Receiving waters in the central portion of the Bay are generally well oxygenated (Barber, 1968) and the production of anoxic conditions is not expected.

The biological impact of waste disposal is expected to be negligible based on experience from similar operations on the east coast as well as on the depth and volume of the receiving waters. Mitigative measures such as the use of low toxic fluid additives, "clean" sources of barite to reduce the potential for heavy metal contamination and the restricted use of known heavy metals i.e. ferrochrome lignosulphonate, sodium chromate and chromium, and others, will reduce substantially the availability of these metals to both the pelagic and benthic community during the short drilling program.

6.6 Re-supply of Drilling Vessel(s) by Aircraft and Supply Vessels

The supply vessel base for the drilling operation would be at Churchill, Manitoba. Supply vessels and aircraft are a possible source of noise pollution particularly for marine birds and mammals. The potential effects of man-made noise has been studied extensively (Mansfield, 1983; Fraker et al., 1982).

It is expected that underwater noise and the physical presence of supply vessels sailing from Churchill to the drill site will add only slightly to the vessel traffic entering and leaving the Port of Churchill. Statistics since 1975 indicate a yearly average of 47 vessel arrivals (D.O.T.) during the period July-October. It is expected that during the drilling program supply vessels will utilize the designated shipping routes to and from the Port.

The type of drilling program proposed could require approximately 1 to 2 vessel trips per week for a total of 8 vessel arrivals per month which, based on previous records, would be less than 1/4 of the total vessel traffic (61 arrivals in 1977) to the Port.

It has been recognized for some time that routine helicopter flights at low elevations could disturb bird and mammal populations. Recently, there have been systematic studies of the responses of seabirds and marine mammals to helicopter disturbance (Anderson and Keith, 1980; Fraker _et al_., 1982). The reader is directed to these publications for a detailed discussion. Low densities of birds and mammals in mid-Bay would suggest that a negligible impact can be expected. In nearshore areas, air traffic can be expected to comply with air space restrictions to minimize the effects on shorebirds and waterfowl.

Beluga Whales

Beluga whales frequenting west Hudson Bay are more likely to interact with exploration operations than populations elsewhere. In this area the population (estimated at 10,000) of whales migrates south along the west coast to summer in the estuaries of the Nelson, Churchill, Seal and other rivers. These whales migrate north along the coast in September and October to Roes Welcome Sound eventually to winter in Hudson Strait, although some are known to winter in the Sound. Migration routes from western Hudson Bay to Hudson Strait are still unknown. In summer, the whales inhabit coastal waters primarily at river estuaries where they feed on fish and a variety of crustaceans. Calves are also born during the summer months in the estuaries.

The supply vessels are the most likely aspect of the drilling operation to interact with the summering beluga population. This interaction can be expected to be minimal, however, and restricted to chance meetings during the summer and fall migrations, particularly for the populations frequenting the Churchill and Nelson river estuaries. The impacts of supply vessel traffic on the migration of whales in the Churchill area has not been assessed. However, information from the Beaufort Sea would suggest that the relatively low frequency of supply vessel trips to the drill site is unlikely to affect whale movements (Fraker, 1979).

Bowhead Whales

Mitchell (1977) estimated that the Hudson Bay population consists of 100 or fewer bowheads. Ross (1979) indicates that the species is most numerous in the Roes Welcome Sound/Frozen Strait area south to Whale Cove but are rare elsewhere in Hudson Bay. It is possible that all or a portion of this population winters in the pack ice in Hudson Strait (McLaren and Davis, 1982). Manning's (1976) observations in the Ottawa Islands area suggests that some bowheads may summer in offshore areas of the Bay. Shipboard and aerial surveys in 1982-83 during late summer did not locate any individuals in the area of the proposed drilling program. Historical evidence and the results of the 1982-83 survey program would indicate that the interaction with these species and the day to day drilling operations will be negligible to non-existent.

Increased supply vessel traffic could increase the possibility of a vessel collision with a migrating pod of beluga. Generally, collisions happen very rarely since most marine mammals can take evasive action from a passing vessel especially in open water.

Seals

Four species of seals, namely the harp, harbour, ringed and bearded seal are known to frequent Hudson Bay (Miller and McLaren, 1983). Of these the ringed seal is the most abundant and forms the main stay of the coastal Inuit subsistance hunt. Historical information as well as the 1982-83 survey program indicate the occurrence of all four species in the area of the proposed drilling program, the shore base and probable supply vessel and helicopter routes.

Noise from the drilling vessel, aircraft and supply vessels can be disturbing to seals although reactions are highly variable from one species to another.

Interaction between the various species and drilling operations will most likely occur in coastal waters where seal numbers are higher in the open water season. Aerial surveys in 1982 and 1983 showed that densities of seals surveyed offshore were significantly lower than in nearshore areas. Summer activities associated with the drilling operation will have no effect on the breeding aspects of any of the four species. The impacts of routine supply vessel, and helicopter traffic should be negligible on the widely distributed seal populations and with the implementation of proper mitigative measures restricted to chance interactions.

Walrus

Although a highly visible and important species in the northern portion of the Bay, the walrus is not known to occur in great numbers in the central or western portion of the Bay south of Eskimo Point. One group (probably less than 100 animals) occurs in eastern Hudson Bay and probably winters in open leads near the Ottawa, Sleeper and Belcher Islands (Laughrey, 1959). During the summer the walrus haul out at well known sites on land. Most of these sites are in excess of 300 km from the proposed drilling site and shore based activities. Important walrus areas include Roes Welcome Sound, Bencas and Coats islands and the east coast of the Bell Peninsula.

Polar Bear

The polar bear occurs on the sea ice of Hudson Bay in winter and spring. When the ice disappears in summer, polar bears retreat to land. Three discrete populations occur in Hudson Bay. Of particular importance is the population which winters along the flow leads in western Hudson Bay and in summer, when the sea ice melts, moves landward along the shore of Manitoba and Ontario until they concentrate in the area from Cape Churchill to the town of Churchill. Sea ice forms early in this area in the fall allowing the bears to return to the ice and hunt seals (Stirling et al., 1977b). This population is known to den inland along the coastal area between Cape Churchill and the mouth of the Nelson River. Barring late spring ice conditions (ice continuing into June) or the formation of winter ice in the Churchill prior to the completion of the proposed drilling program, polar bears will be land bound and will have no direct contact with the drilling operation and supply vessels. Supply vessels may encounter some polar bears in the offshore area in late spring which may be on route to land from the melted offshore ice. Such encounters can be expected to be few. No polar bears were observed during either the 1982 or 1983 wildlife observation program in the offshore.

The shore based supply vessel and helicopter activities in Churchill should have a negligible effect on the polar bears of the region during the summer drilling season if all precautions are taken to minimize polar bear - people interactions particularly in Churchill and the surrounding area.

Marine Birds

Hudson Bay coastal environments provide critical nesting, staging and migration habitat for large numbers of arctic and sub-arctic marine birds, waterfowl and shorebirds. Of particular note is the importance of the coastal marshes and tidal flats of the Hudson and James Bay lowlands. The reader is directed to the detailed species accounts in the CanOxy environmental overview and to Miller and McLaren (1983) and Miller (1984) for species observed during the wildlife observation program.

Disturbance (predominantly noise) associated with the supply vessels, drilling and helicopters is a possible source of negative effects on birds. Recently, systematic studies have been undertaken on the responses of seabirds, waterfowl and raptors to aircraft and helicopter disturbance. For a detailed treatment, the reader is requested to consult: Alliston *et al.*, 1976; McLaren *et al.*, 1977; Greene, 1982; Gollap *et al.*, 1974; Nettleship, 1980.

Aircraft and helicopters disturb birds during overflights, circlings, landings and take-offs. Seabirds such as thick-billed murres, kittiwakes, razorbills and puffins are particularly vulnerable during nesting. Low flights by helicopters over such colonial nesting species are known to cause mass panic of adults resulting in nest desertion. Gulls of the genus Larus are less vulnerable because nesting is more dispersed. Seabirds and waterfowl are known to react to aircraft noise at long distances by diving or flying and are especially sensitive during migration.

Birds frequently sighted in the 1982-83 wildlife observation programs conducted by CanOxy. In the 1982-83 surveys, guillemots, murres and gulls were the species most frequently recorded. These three species were recorded in many locations including the Central Bay during the 1982-83 seismic program. With the exception of red and northern phalaropes, few shorebirds were observed offshore. A full list of species sighted is outlined in Miller (1981) and Miller and McLaren (1983).

The wildlife observation programs conducted in 1982-83 indicate, as expected, a higher number and diversity of birds in nearshore waters.

The coastal marshes, muskeg and tidal flats of the Hudson Bay Lowlands are recognized as critical breeding and feeding habitat for a wide variety of shorebirds, waterfowl and marine birds.

Experience in other areas, for example the Beaufort Sea, indicate that the effects of helicopter disturbance on birds can be effectively reduced by avoiding low flights over colonies, nesting sites and feeding areas. COGLA is fully aware of the adverse effects of aircraft disturbance on birds and will ensure the operator is aware of the appropriate regulations and operational procedures to minimize disturbance, particularly in coastal areas. Noise levels attributable to the day to day operations of supply vessels and the drilling vessel should have a negligible effect on bird populations in the Bay.

6.7 Accidental Spills of Fuel and Chemicals

In any drilling program there is always the possibility that fuels, lubricants and chemicals could be spilled accidentally during handling and transfer. Spills of petroleum products could also occur during the transfer of waste oils from the drilling vessel to the shore base.

The 1982-83 bird observation program confirms that a variety of marine birds and mammals will interact with all phases of the proposed program. The concerns for birds and marine mammals that contact fuel or chemicals on the water are the same as those expressed for crude oil from an oil blowout. The spillage of even small quantities of such substances could affect birds, particularly gulls around the drill site. The accidental release of a large quantity of fuel oil from a supply boat in nearshore waters could impact waterfowl, seabirds and shorebirds (phalaropes), seals and polar bears (particularly if the oil is washed ashore).

It is important to recognize at this stage in the screening that the biological impact of such an event would depend to a great extent on the location of the spill, the amount and type of fuel, fuel dilution and evaporation rates, and the sensitivity and resiliency of biological populations in the contaminated area. However, the screening has identified that almost all species of shorebirds, waterfowl, sea ducks, alcids, and seals frequenting the western and central portions of the Bay are at some risk from a localized spill. Also at risk are the beluga whale and perhaps to a lesser extent the polar bear. These potential effects can be reduced through the implementation of effective countermeasures.

6.8 Shore-Based Facilities

To support offshore exploratory drilling a shore base will be required. Churchill is the port that CanOxy would use as a shore base for exploratory drilling in Hudson Bay. Preliminary investigation of the port indicates that existing dock and harbour space and airport facilities would be available for supply base operation. This would eliminate the need to alter small areas of coastal and terrestrial habitats for a shore base facility as occurs in more remote locations. In such circumstances the shore base would fall within the scope of the National Harbours Board Act (RSC 1970, N-8), which would regulate the construction, maintenance and operation of shore-based facilities.

The extra demands of the proposed drilling program on Churchill's water supply, sewage treatment and landfill services have not been investigated in detail. There will be a need to assess the disposal of non-combustible wastes if additional landfill sites are required.

7. Effects of Oil and Natural Gas Blowouts on the Environment in Hudson Bay

The probability of an uncontrolled flow of oil and/or gas from an exploration well in central Hudson Bay is extremely small, but nevertheless possible. This section discusses briefly the probable fate of oil from a blowout and the possible effects on the marine environment in Hudson Bay.

The risk and severity of blowouts, amounts of oil spilled, duration of blowouts and the fate and effects of oil and natural gas are topics which have received considerable attention in the past few years. These aspects have received thorough treatments elsewhere and will not be discussed in detail here. The reader is referred to the following reference for a more thorough treatment: Hydrocarbon Development in the Beaufort Sea Mackenzie Delta Region: Environment Impact Statement, Dome Petroleum Ltd. and Gulf Canada Resources Inc., 1983; Initial Environmental Evaluation for Renewed Petroleum Exploration in Hecate Strait and Queen Charlotte Sound, Chevron Canada Resources Ltd., 1982 and Environmental Effects of Offshore Oil Production: The Buccaneer Gas and Oil field Study 1980, B.S. Middeditch (ed); Offshore Labrador Initial Environmental Assessment, Petro-Canada, 1982.

7.1 Possible fate of an Oil and Natural Gas Blowout in Central Hudson Bay

A natural gas blowout would be less of a threat to the marine environment than an oil blowout. The effects of a gas blowout would be localized to the immediate area around the drilling vessel and would probably be short-lived. Escaping gases would diffuse rapidly into the atmosphere. Any accompanying condensates would evaporate quickly. Condensates are chiefly composed of light and volatile hydrocarbon liquids. It is not uncommon for thin, fresh slicks of condensate to lose

50% by volume within 10 minutes, even under winter conditions (Mobil Oil Canada, 1983). It is unlikely that a significant long-lasting condensate slick on the water surface would impinge on sensitive environments in the Hudson Bay region.

In contrast, the effects of an oil blowout are expected to be more regional in nature and under exceptional oceanographic and weather conditions could impact sensitive coastal environments particularly along the south coast of the Bay.

7.1.1 Risk of an Oil Blowout

At present, the risk of a blowout cannot be accurately predicted for exploratory drilling in central Hudson Bay. Too few wells have been drilled (3) in the region to assess risk factors directly. To-date, data on risk factors are not completely known. Janssen and Gamble (1981) question the validity of mathematical risk modelling, since it is difficult, if not impossible, to evaluate how risk factors influence one another. However, in general, the likelihood of a blowout from drilling two or three wells is extremely small.

COGLA is of the opinion that since the likelihood of a blowout is extremely small there is little to be added in this screening exercise by an attempt to determine finite probabilities of blowouts for the proposed drilling program.

7.1.2 Oil Spill Response Plan

Both CanOxy and ICG do not as yet have an oil spill response plan for the proposed drilling program. Prior to drilling the companies must prepare a response plan as required by Appendix F of the Guidelines and Procedures for Drilling for Oil and Gas on Canada Lands, COGLA, 1984.

Two important components of the response plan are the oil slick trajectory model and the identification of environmental sensitivities.

7.1.2.1 Oil Spill Trajectory Model

Assessment of the physical data base would indicate that sufficient data exist for Hudson Bay to evaluate the fate of an oil spill from a well drilled in the central portion of the Bay.

The following is taken from the CanOxy overview.

"In the event of an oil spill, available wind and current data suggest that the spill would move toward the south east. Prevailing winds during the open-water season are from the northwesterly sector with a most frequent speed of 5-10 m/sec. Extreme geostrophic wind speeds may average over 25 m/sec for periods over 4 days. Drifter buoy measurements as discussed in the environmental overview indicate daily passages of up to 20 km per day during storm passages. As a first order estimate, based on available data and oil spill trajectory analysis off the Hibernia oil field (Environmental Applications Group, 1983), the spill could travel from 10 to 50 km per day. Thus for the minimum 250 kilometre distance, it appears that the shortest time for an oil spill to reach shore would be in the vicinity of 5 days and on average probably longer than 10 to 15 days. Over this period of time, the spill is likely to be highly degraded and emulsified with over 90 percent of the volatiles evaporated" (CanOxy, 1984). This time would also allow counter-measure resources to be assembled and put into action.

Given the distance of the proposed drilling location from the nearest shore (250 km to Cape Churchill), under normal conditions, an oil slick is more likely to remain at sea than to come ashore on the south coast of Hudson Bay or the Belcher Islands. Detailed modelling should provide sufficient insight as to the probable slick trajectories which can likely be expected from a blowout event in the central Bay.

7.1.2.2 Environmental Sensitivities

If an oil blowout were to occur in Hudson Bay and was not effectively controlled, it could have impacts on all trophic levels in the ecosystem.

The effects of a blowout on water and air quality in central Hudson Bay should be negligible.

Surface oil slicks would primarily affect birds, marine mammals, shoreline vegetation, littoral invertebrates, and a few fishes such as the beach-spawning capelin. Oil dissolved in seawater, or in oil-in-water emulsions, could affect primary productivity by phytoplankton and the survival of zooplankton, benthic invertebrates that have planktonic larvae, and marine fishes with demersal eggs. Oil entrapped in bottom and beach sediments would primarily affect benthic organisms and capelin.

There is little information on the movement of oil through marine food webs generally, and no information for Hudson Bay. Competitive and trophic relationships among Hudson Bay marine organisms are poorly understood. However, long term accumulation in fish and mammals would not be expected since these species can metabolize hydrocarbons and rid themselves of such residues once removed from exposure. The mobility of these species is a major mitigating factor. However, it is possible to infer direct mortality of marine organisms due to hydrocarbon spills from the existing literature. More subtle impacts, such as changes in the species composition, in productivity, in fecundity, or in distribution are difficult to predict.

Most of the data that evaluate the toxicity of hydrocarbons to marine life is derived from laboratory experiments that bear little resemblance to natural situations. Some studies have used dosages that greatly exceed concentrations likely to be found near oil spills in the open sea. Many different kinds of hydrocarbons, including whole crudes, heavy fuel oils, and gasoline have been used in bioassay experiments on a great variety of test organisms. It is thus difficult to extrapolate results of acute toxicity studies from organism to organism or from one type of hydrocarbon to another.

The results of the Baffin Island oil spill program suggest, however, that long-term effects of an oil spill in eastern arctic waters, both at shoreline and nearshore, are not extreme, and that there is good survival of benthic populations which had been exposed to either chemically dispersed or untreated oil. The response may be similar in Hudson Bay (Engelhardt *et al*., 1983).

Marine Birds

With respect to sensitivity to oil contamination, marine birds, waterfowl and shorebirds are collectively viewed here as being the most sensitive biological element in the Hudson Bay region. Certain of the marine mammals constitute the only other group of comparable sensitivity. This sensitivity relates largely to the extensive use of inshore and coastal waters, and to the use of tidal marshes, mud flats and beaches. The nature of feathered insulation and the structure of flight features is such that once birds become oiled, their chances of survival, especially in cold climates, are extremely low. Feeding areas for the majority of species, particularly the tidal marshes and mud flats, are also sensitive to oil contamination. Under certain circumstances some such areas could take up 10 years to recover their productivity following heavy oil contamination (CanOxy, 1984).

Distribu:ion data for the various species in the offshore suggest that marine birds would interact with an oil spill. However, the general low numbers of birds observed coupled with their very wide distribution during the open water should result in relatively few bird mortalities due to oiling.

Given the possibility of an oil spill coming ashore, the following areas, specifically along the south coast of the Bay would be of concern.

- coastal marshes and tidal mud flats from 1-10 km in width extending more or less continuously for over 2,000 km between Rupert Bay in Quebec to Cape Churchill. These areas are of major importance as moulting, staging and migration areas for millions of geese, ducks and shorebirds
- specific areas of note along the south coast include:

  - the Lesser Snow Goose colonies of Cape Henrietta Maria and Cape Churchill (55,000 and 5,000 breeding pairs)

  - the Nelson River estuary (CanOxy, 1984).

It is highly unlikely that oil from a blowout would reach the Belcher Islands since the oil could be expected to weather significantly due to evaporation, emulsification, solution, photochemical oxidation biodegradation, dissolution and dispersion (Mackay, 1982).

Also, oil spill countermeasures such as the use of dispersants could be expected to be implemented to contain, divert and remove a good portion of the oil prior to it reaching shore.

Nevertheless, in the event that oil reached the Belcher Islands, as a result of a continuous blowout, consideration would have to be given to the following:

- approximately 35,000 Common Eiders, virtually the whole of the Hudson Bay population of this species, which overwinter in open leads off the Belcher Islands
- Black Guillemots which are also likely to concentrate in this area during winter
- waters off the Belcher Islands which are of critical importance to several species of marine mammals including numbers of polar bear, walrus and seals
- the Belcher Islands, since this site has been recognized as an International Biological Programme Site with recommendations for protection (Nettleship and Smith, 1975)

Marine Mammals

The distributional data on marine mammals occupying the offshore would suggest that these animals are not likely to come into regular contact with dense oil in or on the water. If they do contact it, effects should not be serious except for the probability of some ocular and respiratory infections. Generally, seals are so dispersed in the offshore that effects are expected to be negligible for all four species.

At the same time, important estuarine breeding areas for the beluga whale and harbour seal pupping areas along the south and west coast have a low to negligible risk of being effected (see section 7.1.2.1).

Polar bears can apparently be seriously affected by coating with oil (Engelhardt, 1983). However, since polar bears are restricted to land during the open water season, contact with an oil spill is remote unless it reaches shore or becomes entrained in winter ice at which times the bears would be susceptible. The offshore migration of polar bear from the south shore or to new winter ice in the Bay would suggest that some bears from the Churchill area population would be at risk from an oil blowout continuing into the winter months.

Based on the data provided in the CanOxy environmental overview the following areas have been identified as being of biological importance to marine mammals:

- Cape Henrietta Maria Polar Bear Area

    - one of the more important polar bear denning areas in the Hudson Bay area, also contains a small walrus hauling out area associated with Manchuinagush Island and Neskamagige Cape
    - contained within Polar Bear Provincial Park (Ontario)

- Nelson River-Cape Churchill Area

    - beluga whales concentrate in summer in estuarine areas of the Nelson (7,000 individuals), Seal (1,000 individuals), and the Churchill Rivers (500 individuals)

- also a major polar bear denning area
- this area has no formal or proposed protection status

- Belcher Islands-Richmond Gulf Area

  - this area is important because of the complexity and variety of ice conditions which prevail throughout the winter months; extensive areas of land fast ice, open leads and pack ice are all present (CanOxy, 1984).

Fisheries

With respect to fish and other marine resources, the present state of knowledge permits some generalizations. Estuaries, river mouths and adjacent coastal areas are the major sites of marine productivity in Hudson and James Bays. Nutrients from the rivers mix with marine waters in a zone of more varied habitat, resulting in a relative abundance of prey organisms.

Anadromous salmonids, including arctic char and other species such as whitefish are present in nearshore areas during summer. In the case of char, the most prized species, fish will range fairly widely along the coast, perhaps reducing the chance that localized disturbances will have a major effect on any individual population (McCart, 1980). However, since these char remain very close to shore when at sea, a widespread disturbance, such as an oil spill, affecting nearshore habitats along long stretches of the coast, could affect arctic char populations.

A similar situation exists for other estuarine fish which appear to have a major dependance on the marine area for their food supply. An example is the cisco (Hunter et al., 1976) which feeds on capelin and sandlance. These estuarine and freshwater species do not likely range much beyond the mixing zone of the estuary outflow. In contrast, many of the Hudson Bay marine fish species appear to use estuaries primarily as a nursery ground, usually spawning and spending much of their adult life at sea, but often returning seasonally to the estuary (Morin et al., 1980).

Other than estuaries and associated coastal environments, the only area of potential interest would be an apparent zone of higher marine productivity west of the Belcher Island (Anderson and Roff, 1970a) which may attract higher than average concentrations of fish. This has not been documented, but in any case the Belcher Islands are populated by Inuit, and arctic char are fished at 34 named fishing sites, with the majority of cases being anadromous stocks that are exploited (Freeman, 1982). With the exception of a shore zone impact which could result in minor impacts to specific fish populations, the expected effect on fish populations is thought to be negligible.

Coastal Zone Sensitivities

Shore zones differ widely in their sensitivity to oil. As an oil slick approaches a shoreline, it is influenced by a combination of littoral processes such as waves, breakers, swash and surf action, tides, nearshore winds, and currents. These processes determine how much and how far oil may be thrown up on a beach, whether the oil is buried or resuspended, and the degree of weathering to which stranded oil will be exposed (Petro-Canada, 1983).

Shore processes and types determine both the eventual impact and persistence of oil and also the feasibility of shoreline protection and cleanup.

The coastal zone most susceptible to an oil spill is the south west coast from the Nelson River east to Cape Henrietta Maria. This is a diversified coast characterized by wide intertidal flats, lagoons, marshes, deltas, and a complex of depositional and erosional geomorphological features e.g. spits, hooks, shoals, bars etc. The tidal flats, which are the widest in the region, grade imperceptibly into the coastline. These flats for the most part are comprised of muds and sands.

This expanse of shoreline is important wildlife habitat. This is well documented in the CanOxy environmental overview. The character and extent of an oil spill impacting on these habitats will be contingent on the characteristics of the oil and the time it comes ashore. It can be expected that the oil will be highly weathered with a low toxicity. Coastal habitats and associated populations could experience moderate impacts.

7.1.2.3 Probability of Impact

Predictions of the movement of oil spilled from a hypothetical blowout, coupled with knowledge of the physical and biological environment, permit an evaluation of the possible effects and form the basis for the determination of counter-measures required to minimize impacts. Although difficult to predict, a range of potential effects from an oil spill can be anticipated. Oil spill counter-measures which would be applied to contain, direct and remove spilled oil will likely reduce the overall impact on biological resources. In case oil should approach the south shore, for example, appropriate counter-measures such as the use of dispersants, would be taken to prevent oil from reaching the more important tidal flats and nesting habitats.

To-date, considerable work has been done in developing equipment and techniques for cleaning up spills in temperate and sub-arctic environments. The reader should consult Fingas et al., 1979; Concowe, 1981 for a detailed treatment.

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APPENDIX 4

DRILLING FOR OIL AND GAS ON CANADA LANDS:

GUIDELINES AND PROCEDURES APRIL 1984

CONTENTS

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I INTRODUCTION

1. Purpose of Document

The purpose of this document is to provide actual and prospective oil and gas operators in the Canada lands with guidelines and clarifying information to assist them in meeting the regulatory requirements under the Canada Oil and Gas Drilling Regulations ("Drilling Regulations").

2. Canada Lands

The "Canada lands" refers to those areas that fall under federal jurisdiction, and consists of:

a) the Yukon Territory or the Northwest Territories, or Sable Island, or

b) those submarine areas, not within a province, adjacent to the coast of Canada and extending throughout the natural prolongation of the land territory of Canada to the outer edge of the continental margin or to a distance of two hundred nautical miles from the baselines from which the breadth of the territorial sea of Canada is measured, whichever is the greater.

3. Canada Oil and Gas Lands Administration

The agency responsible for the administration of oil and gas activity in the Canada lands is the Canada Oil and Gas Lands Administration (COGLA). COGLA was created in 1981 by the Ministers of Energy, Mines and Resources and Indian Affairs and Northern Development so as to unify the administration of Canada lands oil and gas activity. COGLA fulfils its role for the Ministers of Energy, Mines and Resources for areas south and for the Minister of Indian Affairs and Northern Development (IAND) for areas north of the line of administrative convenience, which is depicted in the map in Appendix A, p. A4.

4. Chief Conservation Officer

The Ministers of Energy, Mines and Resources and Indian Affairs and Northern Development have designated the Administrator of COGLA as the Chief Conservation Officer ("Chief") under the Oil and Gas Production and Conservation Act, thus delegating operational responsibilities over Canada lands.

5. COGLA Organization

COGLA is made up of the following organizational components, the roles of which are briefly described below:

a) Engineering Branch

This branch regulates and monitors exploratory and development drilling and production activities, and administers safety, pollution prevention and conservation standards and regulations.

b) Resource Evaluation Branch

This branch analyses results of geophysical and geological programs and results of wells; the branch also is responsible for the regulation of geological and geophysical programs.

c) Land Management Branch

This branch is responsible for the negotiation, issuance, registration, transfer and administration of exploration agreements, provisional leases and production licences, and for the collection of royalties.

d) Environmental Protection Branch

This branch assesses the effect of oceanographic, meteorological and ice conditions on offshore operations, the impact of drilling operations on the biological environment, and contingency plans; initiates remedial action; and manages the Environmental Studies Revolving Fund.

e) Canada Benefits Branch

This branch is responsible for ensuring that Canada benefits plans — which include industrial, employment and socio-economic components — submitted by operators are satisfactory to the Minister, and plays a coordinating role in the monitoring of the implementation of these plans.

f) Policy Analysis and Coordination Division

This division is responsible for the analysis, development, interpretation and implementation of policy with respect to the management of oil and gas activity in the Canada lands as well as for the provision of information on resource management policy and activity.

6. COGLA Regional Offices

COGLA has regional offices in Halifax, St. John's and Yellowknife; further, there is a field office at Inuvik and an information office in Calgary. The administrative areas of COGLA's regional offices are depicted in the map in Appendix A, p. A4.

7. Regulations

The Drilling Regulations constitute the basic document governing Canada lands drilling activity; the enabling legislation for these regulations is the Oil and Gas Production and Conservation Act. Regulations and guidelines for production, structure, pipelines, diving and geophysical operations are in preparation.

8. Addressing Material to Government

The Drilling Regulations require that prospective and actual operators meet a variety of information requirements. When reference is made in this document's text to a particular addressee, it is usually only made in short form — e.g. "COGLA (Engineering), Ottawa", or "relevant COGLA regional office". The complete address, telex and telephone number of each office, and a list of other agencies to be notified by operators are given in Appendix K.

9. Operating Licence

Although the focus of this document is placed on drilling activity, it is to be noted that the prerequisite for any work program, whether or not drilling is involved, is the issuance of an operating licence. The operating licence form can be obtained from COGLA in Ottawa and must be renewed annually. The fee is $25.00. A sample operating licence is provided in Appendix A, p. A3.

10. Format of Document

This document is divided into three principal parts, which deal with the three major regulatory requirement themes laid out in the Drilling Regulations: the Drilling Program Approval; the Authority to Drill a Well; and requirements related to drilling operations, post-drilling reports and well materials.

II DRILLING PROGRAM APPROVAL

1. Purpose

The Drilling Program Approval (DPA) permits the operator to drill in a particular region for a specified period (not to exceed three years), using the particular drilling unit, support craft and contingency plans described in the application. The DPA, which is the subject of Part I of the Drilling Regulations, is required for all Canada lands drilling programs, with the possible exception of on-land programs that use a conventional land drilling rig and are not located on an artificial island — these programs usually require only an Authority to Drill a Well (ADW). It should be noted that all applications and approvals for the DPA are administered by Ottawa, while the relevant COGLA regional office administers the ADW.

2. Procedure

a) The prospective operator is requested to notify COGLA (Engineering), Ottawa, of his intention to make a DPA application at least six months prior to the anticipated spud date for the first well. In cases where a field activity, such as dredging, precedes drilling by a year or more, the operator is required to obtain the approval of COGLA before commencing such activity (Section 3.1 of the Oil and Gas Production and Conservation Act).

b) The prospective operator is requested to prepare the DPA application (Appendix A, p.A8), the supporting documentation and other information specified in the Drilling Regulations (Sections 7-10) — and additional information as is necessary to show the proposed equipment and procedures are at least equal to regulatory requirements — for submission four months before the first well is anticipated to be spudded. The information package (see Checklist in Appendix L) is to include a complete description of the project including details of:

i) geological and geophysical overview of the area, including description of prospects proposed to be drilled;

ii) general description of possible seabed hazards;

iii) physical environmental summary of the area, including extreme events, environmental loads on the unit; observation, forecast and alert programs;

iv) logistics of the program;

v) description of the drilling unit;

vi) training and qualifications of personnel;

vii) training and succession plans for advancement of Canadians;

viii) drilling program and well design details;

ix) mud program and waste management;

x) identification of biological sensitivities;

xi) contingency plans;

xii) financial security; and

xiii) operational manuals.

If some of the above material has already been supplied in respect of a previous application for DPA, it need not necessarily be repeated, but should be referenced by date and project number.

c) Three of these packages are to be sent to COGLA (Engineering), Ottawa, and two to the relevant COGLA regional office — the map in Appendix A, p. A4, indicates the administrative areas of COGLA's regional offices.

With respect to information on the drilling unit, it should be noted that the packages sent to COGLA (Engineering), Ottawa, should include general, or layout, drawings and detailed construction drawings of the proposed unit, which will be forwarded to Canadian Coast Guard (CCG) to ensure compliance with CCG standards for mobile offshore drilling units. The packages for the relevant COGLA regional office, however, need only include general, or layout, drawings for:

i) the positioning system, including emergency release systems, and wellsite evacuation procedures;

ii) the classification of hazardous zones within the unit and a list of electrical equipment installed therein;

iii) systems for the disposal of wastes, including sewage treatment plants, incinerators and systems for the collection of oil wastes and spills; and

iv) life-saving appliances, including location and capacity of survival capsules and life-rafts.

d) After COGLA has made a preliminary review of the information submitted in support of a DPA application, the prospective operator is normally requested to make an oral presentation at COGLA, Ottawa, on the matters listed in (b) above. This occurs at least one month prior to the anticipated spud date.

e) The process is completed when the Chief signs the DPA. Usually, accompanying the two copies of the signed DPA is a letter from the Chief to the prospective operator detailing any conditions or restrictions placed on the approval. For instance, the DPA might include a requirement for certain reporting of ice conditions or a restriction on the period of operations permitted in a particular geographical area; a map of the administrative areas used for DPA purposes is provided in Appendix A, p. A7.

3. <u>Role and Notification of Other Government Departments and Agencies</u>

a) <u>Canadian Coast Guard and Department of National Defence</u>

Under a Memorandum of Understanding with COGLA, the Canadian Coast Guard (CCG) plays an inspection and advisory role on marine and marine-safety questions in offshore oil and gas activity.

The standby and support vessels used in offshore programs must meet the regulatory requirements administered by CCG. Further, specific mention is made in the Drilling Regulations and this document to the need to meet provisions of the <u>Tackle Regulations</u>, <u>Navigational Appliance Regulations</u> and <u>Collision Regulations</u> which are also administered by CCG. All the above regulations can be obtained from the Canadian Government Publishing Centre (Ottawa).

The operator must also arrange for the establishment of routine and emergency communication with CCG and the Department of National Defence (Search and Rescue).

b) Northern Affairs Program (IAND)

When a program in the North involves the use of land — e.g. for the building of a land base or the disposal of waste — the operator must receive a Land Use Permit from the appropriate Northern Affairs Program office (Whitehorse or Yellowknife); see Appendix K, for the addresses.

c) Other

Certain other government agencies must be notified of proposed drilling programs at least 45 days in advance of the commencement of activities. The operator is responsible for notifying those listed in Appendix K.

4. Notes on DPA-Related Drilling Regulations

What follows are some explanatory notes on sections of the Drilling Regulations concerning the DPA. Further elaboration and information is provided in the following appendices to this document:

i) Appendix A: Forms and Maps;
ii) Appendix B: MODU Certification and Approval Requirements;
iii) Appendix D: Training and Qualifications;
iv) Appendix E: Physical and Environmental Guidelines;
v) Appendix F: Contingency Plans; and
vi) Appendix L: DPA and ADW Checklist.

a) Preparation of Application (Section 4)

Information should be presented on white bond paper (approximately 215 mm X 280 mm). Material for the DPA and ADW applications are preferably submitted in the form of two to three booklets. Copies of any sketches, drawings, charts, maps, or graphs that are used in oral presentations are also requested. All dimensions should be in S.I. (metric) units.

b) Nature of Seabed at the Proposed Well Site

A general description of the capability of the seafloor to hold anchors or support a drilling base, and of potentially hazardous conditions, is required in the DPA information package. It should be noted that a wellsite seabed survey is normally required prior to spudding each well and is submitted with the application for an ADW. Guidelines for wellsite seabed survey programs are provided in the publication entitled, Geophysical and Geological Programs on Canada Lands, which is available from any COGLA office.

c) Certification (Section 8(f)(iii))

For both Canadian-flag and foreign-flag vessels, certificates in good standing and inspection reports are required to confirm the adequacy of the drilling unit's construction, capability and safety. The relevant Canadian Coast Guard standards are the "Interim Standards Respecting Mobile Offshore Drilling Units" (TP 4891E); these are available from the Ship Safety Branch, Canadian Coast Guard (Ottawa). For a foreign-flagged mobile offshore drilling unit, satisfaction of this Section involves the submission of the information detailed in Appendix B.

d) Construction and Drilling Base (Section 8(f) (vi))

"Drilling base" includes ice islands, caissons, berms, artificial islands and piles.

e) Support Craft Emergency Equipment (Section 17(b))

Support craft must carry the emergency equipment specified by regulations under the Canada Shipping Act. In addition, these vessels must carry survival suits for 100 per cent of the certified crew complement. Survival suits to be carried on board any support vessel must be certified as acceptable by the Canadian Coast Guard.

f) Standby Craft Emergency Equipment (Section 19)

A standby vessel must carry the same emergency equipment as the support craft in accordance with Canada Shipping Act regulations, plus the items covered under parts (a) through (d) of Section 19.

The requirement in Section 19(a) refers to the need for life-rafts for 300 per cent of certified crew complement.

The requirement of Section 19(b) is for life jackets capacity of 300 per cent of the normal crew complement, but not less than 100 per cent of the certified crew complement.

g) <u>Helicopter Landing Deck</u> (Section 26(1)(a))

Helicopter landing decks on all units will comply with Transport Canada's standard TP 2586.

The reference point for measuring the 210° clear approach for helicopters is defined as any point on the circle described in Section 26(2)(a).

h) <u>Helicopter Refuelling</u> (Section 26(1)(c)(vi))

Refuelling facilities are only required if the drilling unit is more than 150 km from the shore base, or the helicopter being used is not fitted with long-range tanks.

i) <u>Helicopter Survival Suits</u> (Section 26(4))

This section requires that helicopter passengers and crew wear exposure suits acceptable to COGLA; a standard for these suits is in preparation. It should be noted that the drilling unit is also to carry reserve suits sufficient for each person on the largest helicopter used in the operation.

j) <u>Escape Capsules</u> (Section 27)

The unit must carry survival capsules or covered lifeboats of a capacity equivalent to 200 per cent of normal crew complement while wearing survival suits. Fifty per cent of the capsules are to be located on each of two different sides of the unit.

In addition to the equipment normally carried, each survival capsule is to be equipped with:

i) a water-resistant emergency radio to permit communications with rescue vessels, helicopters and drilling units;

ii) an emergency locater transmitter; and

iii) a radar reflector.

k) Lifesaving Equipment on Drilling Unit (Section 29)

The drilling unit must have survival suits of a quantity equal to 200 per cent of normal crew complement, half of which are to be located in the accommodation area, with the remainder located at the lifeboat embarkation stations. A work suit that allows considerable freedom of movement is to be worn by any worker whenever there is risk of his being washed overboard; this situation may arise in the moonpool area, decks of work boats and on seismic vessels.

In the case of east coast operations, rescue baskets are to be maintained on the drilling unit, and drilling unit crews are to receive training in their use.

l) Reserve Storage Batteries (Section 41(2)(b))

The objective of this sub-section is to ensure that the storage batteries are capable of supplying six hours of power to navigational obstruction and aircraft warning lights — this provision does not apply to the masthead (single) aircraft obstruction light which must be capable of operating for 24 hours. The batteries must also be able to supply power to the marine radio for 24 hours of continuous reception on 156.8 MHz and for 15 minutes of transmission each hour.

Finally, they must supply the power necessary for six hours of lighting for the communications, navigation, and control areas of the drilling unit.

m) Financial Securities (Section 90)

The operator must furnish proof of financial responsibility at the time of applying for a DPA.

This security is in respect of the absolute liability imposed by Section 19.3 of the Oil and Gas Production and Conservation Act, and is to be tendered on behalf of all joint venture partners. Where operations are conducted in those areas where the Arctic Waters Pollution Prevention Act applies (i.e. all Canada lands north of 60°), a similar requirement is described in Section 8 of that Act, which is administered by the Water Resources Division, Northern Affairs Program (IAND).

The financial instrument, which may be in the form of a letter of credit, a guarantee, an indemnity bond or any other form satisfactory to the Minister, should be in the following amounts:

i) $40 million for those areas of the Canada lands to which the Arctic Waters Pollution Prevention Act applies;

ii) $30 million for Canada lands off the east coast of Canada; and

iii) $10 million for on-land operations, except where the proximity of the activities has the potential for polluting a major waterway, in which case the amount is set at $25 million.

For additional information concerning the requirement for proof of financial responsibility, operators are advised to contact COGLA (Environmental Protection), Ottawa.

n) Pre-Approval Inspections

Before a drilling rig or unit is approved for use on Canada lands, it will be inspected by COGLA. If the unit is in foreign waters, the operators are expected to assist in arrangements for inspection by a COGLA Conservation Engineer. Through its Memorandum of Understanding with COGLA, CCG may be requested to inspect the marine aspects of the unit.

Prior to spudding the first well, COGLA will arrange for the Port Meteorological Officer in AES to inspect the meteorological instrumentation on the drilling unit.

o) Person in Command

Drilling units shall at all times have one person on the unit clearly identified as responsible for the safety of the drilling unit and its crew. On floating drilling units this person shall: be qualified in marine matters; be experienced in drilling unit operations; and, possess a recognized Master Mariner's certificate. This requirement recognizes the need for the person ultimately responsible for safety to make decisions in full consultation with the person responsible for drilling operations.

III AUTHORITY TO DRILL A WELL

1. Purpose

The Authority to Drill a Well (ADW) permits the operator to drill a particular well, within an approved drilling program, using the drilling and evaluation procedures and the drilling equipment described in the application for a DPA. The ADW, which is the subject of Part II of the Drilling Regulations, is administered through the relevant COGLA regional office.

2. Procedure

a) The prospective operator is required to give written notification to the Chief, through the relevant COGLA regional office, of his intention to seek an ADW 45 days prior to spudding the well.

b) The ADW application form (a sample is included in Appendix A, p. A9) is available from any COGLA office.

c) The prospective operator is requested to submit five copies of the application form together with the supporting documentation described in Sections 82 and 89 of the Drilling Regulations. This material is to be submitted at least 21 days prior to the spudding of the well. Four copies of the form and two copies of the supporting documentation are to be sent to the relevant COGLA regional office, and one copy of the form and three copies of the supporting documentation are to be sent to COGLA (Engineering), Ottawa.

If a special structure (berm, piled platform, etc.) is required for the well, two copies of the layout and construction drawings should be sent to both the relevant COGLA regional office and COGLA (Engineering), Ottawa.

d) Following submission of the above material, the prospective operator may be requested to make an oral presentation at the relevant COGLA regional office before drilling commences.

e) The process is completed when an approved (signed) copy of the ADW is returned to the operator.

3. Notification of Other Government Departments and Agencies

Other government departments and agencies must be notified of proposed wells 45 days in advance of the spudding. The operator is responsible for notifying those listed in Appendix K.

4. Notes on ADW-Related Drilling Regulations

What follows are some explanatory notes on sections of the Drilling Regulations concerning the ADW. Further elaboration and information is provided in the following appendices to this document:

i) Appendix A: Forms and Maps;
ii) Appendix G: Naming of Wells on Canada Lands;
iii) Appendix H: Wellsite Seabed Survey Guidelines;
iv) Appendix I: Cuttings, Cores and Well Fluid Samples; and
v) Appendix L: DPA and ADW Checklist.

a) Test Holes (Section 80 (4))

Test holes, structure tests or slim holes are drilled to obtain geological or geophysical information. A test hole may also be drilled as part of a program to obtain geotechnical information on a regional or site-specific basis. Where these holes are to be drilled to depths greater than 30 m, the Chief's approval is required under this section; a sample approval application form is provided in Appendix A, p. A16. Information on the method of obtaining approval to undertake a test hole program is available from COGLA (Engineering), Ottawa.

b) Pressure Gradient Graph (Section 82(2)(k))

Other information required by the Chief for an ADW includes a plot of the anticipated fluid pressure and fracture pressure vs. depth, and an accompanying drilling curve.

c) Surveys of Rig Position (Section 87)

Technical specifications for these surveys are given in the publication entitled Specifications for Positioning Reports for Offshore Exploratory Wells, which is available without charge from any COGLA office.

Three copies of the positioning report for each well are to be submitted to COGLA (Engineering), Ottawa. Two of COGLA, Ottawa's copies are forwarded to the Surveyor General (in the Department of Energy, Mines and Resources) and one copy is subsequently returned to COGLA after the report receives the Surveyor General's stamp of approval.

d) Well Prognosis (Section 89 (3)(c))

As part of the supporting documentation for the ADW, the operator is required to submit two fully-processed, interpreted, multi-channel seismic sections that cross the proposed wellsite at, or close to, right angles, and a geophysical structure map at a scale of 1:25,000 or 1:50,000 showing contours in depth or time for each objective horizon.

e) Unconventional Drilling Methods

If turbo,air,or gas drilling is part of the proposed well program it may be necessary to take closely-spaced sidewall cores or wireline logs additional to those normally required to fully evaluate the well.

f) Unconventional Drilling Fluids

If oil-based mud, air, gas or foam is intended to be used, full details of equipment and procedures are to be submitted.

IV DRILLING OPERATIONS

1. Purpose

Once the DPA and ADW are obtained, the setting up, drilling and finishing of the well is governed by a number of Drilling Regulations that refer to inspections, reporting, testing, materials handling, waste disposal, safety drills, sampling, post-operational reports, etc. These requirements comprise Parts III to XI of the Drilling Regulations. The primary contact for routine communications related to drilling operations is the relevant COGLA regional office.

2. Notes on Operations-Related Drilling Regulations

What follows are some explanatory notes on sections of the Drilling Regulations concerning drilling operations. Further elaboration and information is provided in the following appendices to this document:

i) Appendix E; Physical Environmental Guidelines;
ii) Appendix I: Cuttings, Cores and Well Fluid Samples; and
iii) Appendix J: Final Well Reports.

a) Inspections (Section 92)

After drilling begins, a COGLA Conservation Engineer, or another inspector, inspects the drilling operation several times during the drilling of the well and may arrange his visits to observe critical phases of the program, such as formation testing or the setting of special casing strings. The routine inspections take approximately two days. COGLA also inspects the on-board physical oceanographic meteorological and ice observation and forecast activities. Finally, the Chief may authorize an observer from other government agencies to visit the rig from time to time.

Inspection visits to the site of drilling operations will normally be co-ordinated by the relevent COGLA regional office and the operator's field office.

b) Drilling Unit Requirements

i) Drilling units are to be evacuated when wind speeds exceeding 90 per cent of design standards of the unit are forecast, provided that such an evacuation, in the opinion of the person in command of the drilling unit, can be conducted in a safe manner. Dynamically-positioned drilling units will have the option to evacuate all rig personnel or move away from the forecast storm track.

ii) Evacuation may take place at lower wind speeds if, in the opinion of the person in command of the drilling unit, other factors, such as encroaching ice, structural damage, ballast control difficulties or well control problems, pose a threat to safety.

iii) Drills for ballast control, including the use of backup systems for ballast control, shall be carried out at regular intervals as a training procedure on all floating units. "Person overboard" drills, using dummies, shall also be conducted at least twice a month.

iv) Each anchored drilling unit operating on the Grand Banks is to be equipped with both a primary and a secondary method for the quick release of all mooring lines. These mechanisms are to be operable in all conditions of weather and sea state. The procedures used for each system are to be clearly documented, personnel are to be trained in their use and each system is to have been successfully demonstrated.

c) Disposal of Drilling Waste (Section 137)

Drilling units operating in open water or rigs operating on an artificial island should ordinarily be provided with a discharge line extending to at least three metres below the water surface, in order to dispose of cuttings and spent mud.

The practice of using small quantities of a pipe-freeing agent and oil or fuel to free stuck pipe is normally allowed if referred to in the drilling operation manual submitted as part of the application for DPA. However, if these attempts are repeated and more than 1.5 m^3 of oil in total are involved, the approval of the relevant COGLA regional office must be obtained.

d) Standby Vessels (Section 142 (b) and (c))

i) Each drilling unit standby vessel, in normal operation, is to keep station no more than one nautical mile from the drilling unit. In storm conditions, the standby vessel is to take up a position at a distance acceptable to the person in command of the drilling unit. The time to return to the drilling unit should not exceed 20 minutes. The person in command of the drilling unit may, however, allow the standby vessel to go beyond the 20-minute limit if this would enhance the safety of the drilling operations — e.g. if the vessel were needed for iceberg towing.

ii) Whenever a ship is identified by radar and found to be approaching on a possible collision course, attempts should be made to contact the ship in order to avoid a collision. If radio contact is not made, a standby supply vessel should move toward the course of the ship in order to warn the ship by sound signals or other means of the presence of a drilling unit. Other drilling units within the area shall be notified.

iii) A standby or support vessel shall not enter the zone of safety around a MODU (Section 101) without the consent of the person in command of the unit.

iv) Under the direction of the person in command of the drilling unit, the standby vessel is to be along side of the unit under any of the following conditions:

- weather, sea or ice conditions limit the safe deployment of a powered rescue boat from the drilling unit;
- a helicopter is landing on or taking off from the drilling unit;
- diving operations are in progress;
- drill-stem or production testing operations are being conducted;
- kick-control operations are proceeding;
- abnormal pressure zones are being penetrated; or
- abandon-ship or person-overboard drills are being conducted.

e) Protection Against Smoke and Gases (Section 153 (d))

Since beards can interfere with a good fit of a face mask or inhalator needed for protection against smoke and gases, no person with a beard or long sideburns will be allowed on any rig or unit.

f) Weekly Lithology Report (Section 179 (1)(b))

A weekly report of lithology of cuttings, all types of cores and shows is required in this sub-section. However, where daily lithology is being reported, there is no requirement for the weekly report. The daily reporting option is viewed as preferable by COGLA, as referenced in Section 179(2). The format used by operators for their own daily lithological reports is normally acceptable.

g) Daily Drilling Report (Section 179 (2))

A sample of a Daily Drilling Report is shown in Appendix A, pp. A10-11. Two copies of the report are to be transmitted by telex or facsimile: one to the relevant regional office and one to COGLA (Engineering), Ottawa. A daily report is required from the first day a unit enters on Canada lands until operations are terminated at the wellsite.

h) Accident Reporting (Section 179 (1)(d))

This section of the regulations requires the reporting of all significant events involving serious injury; the reports are to be sent to the relevant COGLA regional office and COGLA (Engineering), Ottawa. An accident report form, which is to be used for most personal injury cases that are "Lost Time Accidents," is provided in Appendix A, p. A12. Operators are also required to advise COGLA of actions to be taken to prevent such accidents from re-occurring. For consistency with other industry and government standards, a Lost Time Accident is defined as any injury that causes the patient to be absent for the rest of the shift he was injured on, and from the next regularly scheduled shift. In unclear cases, it is normally left to the Medic to determine whether or not a Lost Time Accident has taken place.

i) Wireline Logs (Section 180 (2))

Air express or courier service are the preferred means of sending field print copies of these logs to COGLA. A copy is to be sent to the relevant COGLA regional office and two copies to COGLA (Engineering), Ottawa. Note that approval to test or terminate a well may be withheld until the relevant logs are received.

j) Well Termination Report (Sections 206 and 184)

Before undertaking any operation to abandon, complete or suspend a well, the operator must submit a well termination plan to the relevant COGLA regional office for approval by a Conservation Engineer. The plan, which must be consistent with Part VIII of the Drilling Regulations, should be submitted by telex or facsimile to reach the addressee at least 24 hours before termination operations are scheduled to commence. Approval may be given orally, but will be confirmed by letter or telex. When the termination is completed, the operator must submit three copies of a Well Termination Record (a sample is provided in Appendix A, p. A13) together with a sketch of any wellhead fittings left above the seafloor, to the relevant COGLA regional office within 30 days.

k) Drill Stem Tests Approval (Section 199)

Under Section 186, the operator has an obligation to fully evaluate the well. Accordingly, the operator must consult COGLA (Engineering and Resource Evaluation), Ottawa after selection of his test intervals. Where the details of test equipment and procedures have already been submitted with previous applications, a notification of the proposed intervals to the relevant COGLA regional office and COGLA (Engineering), Ottawa, is sufficient.

Test results must be reported to the relevant COGLA regional office and COGLA (Engineering), Ottawa, by telephone or telecopier as soon as they become available. They should include data, such as flow rate, fluid type, fluid gravity, and other readily obtainable information. Any modification to the approved plan must be confirmed in the same manner required for the original program.

V APPENDICES

APPENDIX A

FORMS AND MAPS

This appendix is made up of COGLA forms and maps related to exploration activities; a list of the material is given below as is a brief explanation, when necessary. Operators are reminded that all submissions of applications to COGLA must include at least one originally signed copy.

1. Operating License (p. A3)

   This licence is required before undertaking any work on Canada lands, and must be renewed each April 1st.

2. Map of Canada Lands, EMR/IAND Line of Administrative Convenience and COGLA Regional Office Administrative Areas (p. A4)

3. Application to Conduct a Geophysical/Geological Program (p. A5)

   This application form is required whenever a geophysical or geological survey is planned, including those for wellsite seabed surveys.

4. Authority to Conduct an Environmental, Research or Feasibility Program (p. A6)

   This application form is required for studies or investigations related to petroleum exploration and development that are not part of an application for DPA or ADW.

5. Map of Drilling Program Approval Areas (p. A7)

   The DPA makes specific mention of the area to which it applies; this map outlines the boundaries of these areas.

6. Drilling Program Approval (p. A8)

7. Authority to Drill a Well (p. A9)

8. Daily Drilling Report (p. A10-A11)

9. Accident Notification Form (p. A12)

10. Well Termination Record (p. A13)

11. Application to Alter Condition of a Well (p. A14)

    This form is designed to provide notice to the relevant COGLA regional office that further work will be done on a completed or suspended well.

12. Application to Undertake a Diving Program (p. A15)

    This application form is required for any diving program that is not part of an application for DPA or ADW.

13. Authority to Drill Test Holes (p. A16)

14. Abandonment Record of Test Holes (p. A17)

    This form is to be submitted within 90 days of the completion of the project to the relevant COGLA regional office.

East Coast — Côte est ☐
West Coast — Côte ouest ☐
Northern — Du Nord ☐
Hudson Bay — Baie d'Hudson ☐

Canada Oil and Gas Lands Administration
Administration du pétrole et du gaz des terres du Canada

355 River Road
Ottawa, Ontario
K1A 0E4

355, chemin River
Ottawa (Ontario)
K1A 0E4

No.

Insert Impression of
Apposer le timbre

Office Date Stamp
Dateur de bureau

OPERATING LICENCE APPLICABLE TO OIL AND GAS IN CANADA LANDS — LICENCE DE DEVELOPPEMENT APPLICABLE AUX PETROLE ET GAZ DANS LES TERRES DU CANADA

FEE PAID/DROIT PAYÉ — $ 25.00

This operating licence issued to — La présente licence de développement délivrée à

called the Licensee, of — appelé le détenteur de la licence, de **(address — adresse)**

Telephone — Téléphone **(Responsible Officer — Personne responsable)**

in consideration of the payment of a fee of twenty-five dollars, under and subject to the Canada Oil and Gas Operations Regulations shall, unless sooner cancelled, be in force for a period of 12 months commencing on April 1st ________

moyennant paiement d'un droit de vingt-cinq dollars, en vertu et sous réserve des dispositions du Règlement sur les terres pétrolifères et gazifères du Canada, demeurera en vigueur pour une période de 12 mois à partir du 1er avril ________

This operating licence is not transferable.

La présente licence de développement est incessible.

Department of Energy Mines and Resources

Department of Indian Affairs and Northern Development

Ministère de l'Energie des Mines et des Ressources

Ministère des Affaires indiennes et du Nord canadien

Minister — Ministre

APPENDIX C

VENTILATION AND ELECTRICAL EQUIPMENT
(Sections 39 to 43.1)

Sections 39 to 43.1 are general; the following explains their intent in specific instances.

In applying Sections 39 and 43, COGLA considers the following areas to be Zone 1 Hazardous Areas, i.e. areas in which an explosive gas-air mixture is most likely to occur during normal operations:

i) any enclosed area containing shale shakers, desanders, desilter, and degassers;

ii) any enclosed area containing active mud tanks;

iii) any enclosed area holding equipment or material that gives off explosive vapor; and

iv) in outdoor locations, the zone around the exhaust outlets or other openings giving access to the above three, measured 1.5 m above, 1.5 m either side and 3 m below.

Also, COGLA considers the following areas to be Zone 2 Hazardous Areas, i.e. areas in which an explosive gas-air mixture is not likely to occur, but if it occurs, it will exist only for a short time:

i) any enclosed areas adjacent to Zone 1 Hazardous Areas having direct access through a gastight door (e.g. mud pump room, sack storage area, cement mixer room);

Canada Oil and Gas Lands Administration | Administration du pétrole et du gaz des terres du Canada

A 5

SCHEDULE
Form A

East Coast:	- Nova Scotia	☐
	- Newfoundland	☐
	- Gulf	☐
West Coast		☐
Northern		☐
Hudson Bay		☐

APPLICATION TO CONDUCT A GEOPHYSICAL/GEOLOGICAL PROGRAM ON CANADA LANDS

Operator: ....
Operating Licence No.: ....
Geographical area: ....
Exploration agreement, provisional lease or production licence to which this program applies: ....

Program

Type of work (check and provide details):
Exclusive Non exclusive
Estimated number of kilometres (geophysical work), wells studied or field location studied (geological work): ....
Program area (attach program maps): ....
Estimated dates: Commencement: .... Completion: ....
Estimated expenditures, on/off exploration agreement; provisional lease, production licence:

Field work	On:	Off: ....
Data Processing	On:	Off: ....
Interpretation/Laboratory studies	On:	Off: ....

Data acquisition equipment: ....
Vessel, aircraft: .... Attach specifications
Energy source: ....
Source parameters: ....
Detector parameters: ....
Number of persons employed: ....
Contractors: ....
Data acquisition: ....
Name: ....
Address: ....
Data processing: ....
Name: ....
Address: ....
Data interpretation or laboratory studies: ....
Name: ....
Address: ....

I understand that: (i) for the field work involved, the requisite advance notice in writing must be provided to other governmental agencies; (ii) for field work in the Yukon and Northwest Territories, the appropriate permits such as land use permits must be obtained; and (iii) a weekly progress report on the program must be provided to COGLA.

Signed: ....
(Responsible officer)
Title: ....
Name: .... Company: ....
Date: .... Phone: ....

Authorization

Conditions of Approval: ....
Signed: ....
Minister
Date: .... Program No.: ....

.... Resources Evaluation
.... Engineering
.... Environment
.... Land Management
.... Canada Benefits
....

A 6

SCHEDULE
Form C

	- Nova Scotia	☐
East Coast:	- Newfoundland	☐
	- Gulf	☐
West Coast		☐
Northern		☐
Hudson Bay		☐

AUTHORITY TO CONDUCT AN ENVIRONMENTAL, RESEARCH, OR FEASIBILITY PROGRAM

Operator: ....

Operating Licence No.: .... Est. Cost of Program: $ ....

Geographical area: ....

Exploration agreement, provisional lease or production license to which this program applies: ....
....
....
....
....
....

Has funding from the Environmental Studies Revolving Fund been allocated? .... Applied for? ....

Program

Purpose and Nature of Work (incl. program map if applicable): ....
....
....
....
....
....
....
....

Equipment, Craft and Persons to be employed: ....
....
....
....

Estimated dates: Commencement: .... Completion: ....

Prime Contractor: .... Location: ....

I understand that: (i) for the field work involved, the requisite advance notice in writing has to be provided to other governmental agencies; (ii) for field work in the Yukon and Northwest Territories, appropriate permits such as a land use permit have to be obtained; and (iii) a progress report on the study has to be provided to COGLA at least twice a month unless otherwise stated.

Signed: .... Title: ....
Responsible Officer

Name: .... Company: ....

Date: .... Phone: ....

Authorization

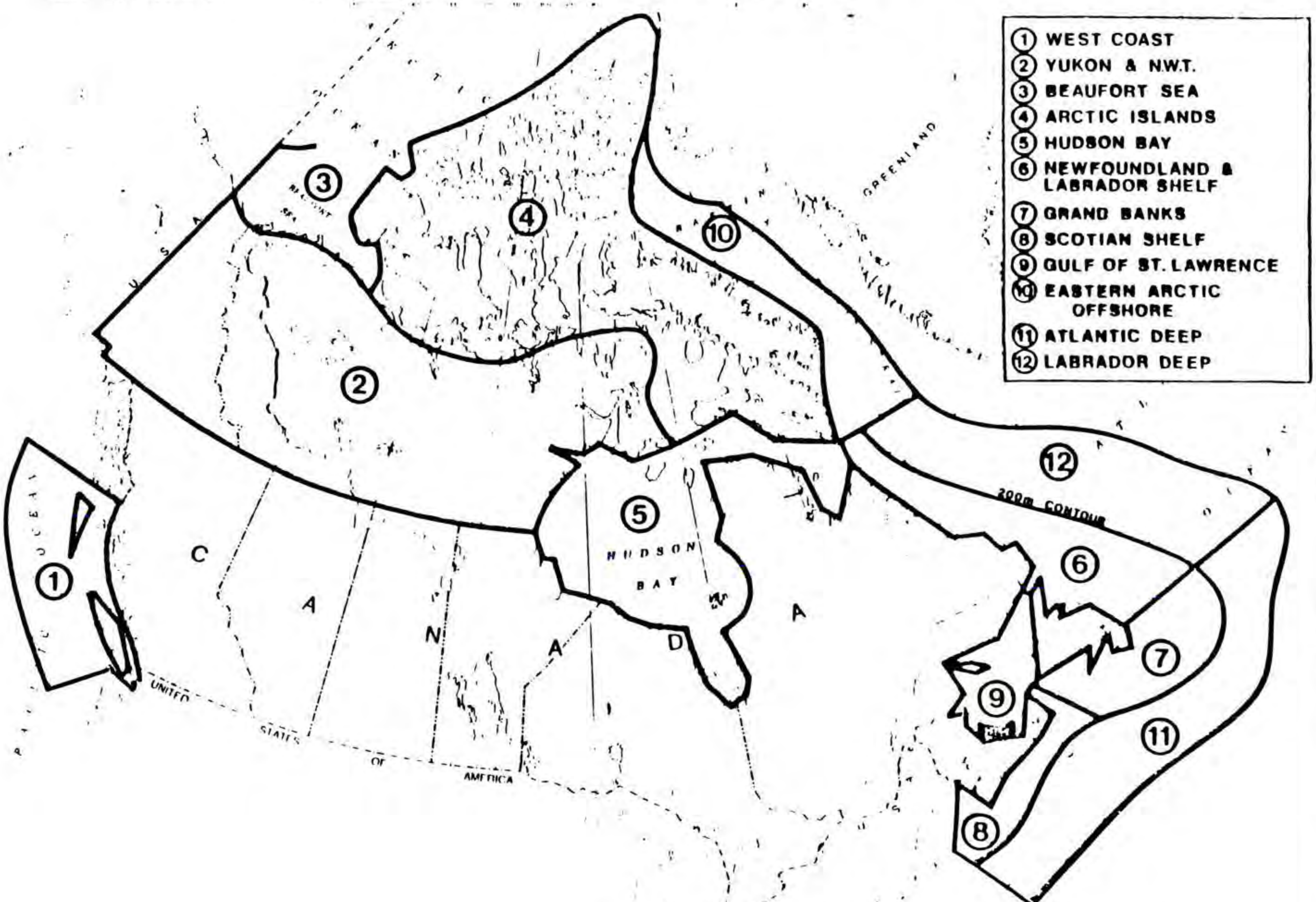
Conditions of Approval: ....

Signed: ....
Minister

Date: .... Program No.: ....

.... Environment
.... Engineering
.... Resource Evaluation
.... Canada Benefits
....

DRILLING PROGRAM APPROVAL AREAS



Canada Oil and Gas Lands Administration
Administration du pétrole et du gaz des terres du Canada

Nova Scotia ☐ West Coast ☐
Newfoundland ☐ Northern ☐
Gulf of St. Lawrence ☐ Hudson Bay ☐

DRILLING PROGRAM APPROVAL

APPLICATION

(Name of Operator)

hereby applies for approval of a proposed drilling program under Section 7 of the Canada Oil and Gas Drilling Regulations using the equipment and procedures described in the full application for Drilling Program Approval dated
It is understood that under Section 13 of the Regulations changes in equipment or procedures require the approval of the Chief in order that this approval is valid.

Signed .... Place ....

Title .... Date 19

APPROVAL

The operator named above is hereby authorized under Section 11 of the Regulations to conduct a drilling program using the drilling rig or drilling unit

....

in the region of .... for a period of .... months commencing .... 19 ... subject to compliance with the Canada Oil and Gas Drilling Regulations.

Signed: ....
Chief Conservation Officer

Date: ....

File: ....

A 9

Canada Oil and Gas Lands Administration
Administration du pétrole et du gaz des terres du Canada

Nova Scotia	☐	West Coast	☐	Exploratory	☐
Newfoundland	☐	Northern	☐	Development	☐
Gulf of St. Lawrence	☐	Hudson Bay	☐	Delineation	☐
				Service	☐

AUTHORITY TO DRILL A WELL

APPLICATION

This application is submitted with Section 82 of the Canada Oil and Gas Drilling Regulations. When approved under Section 83 of the Regulations, it is the requisite authority for the commencement of drilling operations.

Well Name in Full: ....

Operator: .... Drilling Program No.: ....

Contractor: .... Permit or Lease No.: ....

Drilling Rig or Unit: .... Estimated Well Cost: ....

Location-Unit: .... Section: .... Grid Area: ....

Coordinates: Lat.: .... Long.: ....

Area: .... Field/Pool: ....

Elevation-RT/KB: .... (ASL) Seafloor: .... (BRT)

Approx. Spud Date: .... Estimated Days on Location: ....

Anticipated Total Depth: .... Target Horizon(s) ....

EVALUATION PROGRAM

Ten-metre sample intervals ....

Five-metre sample intervals ....

Canned sample intervals ....

Conventional cores at ....

Logs and Tests ....

CASING AND CEMENTING PROGRAM

O.D.	Weight:	Grade:	Setting Depth Below Seafloor:	Cementing Program (Volumes)

B.O.P. Equipment

Other information

Signed: .... Title

Date: .... Company

APPROVAL

An approved copy of this notice is to be posted at each wellsite

Signed

Engineering Branch

Date

File

DAILY DRILLING REPORT (Suggested format)*

TO: Relevant COGLA Regional Office and COGLA (Engineering), Ottawa.

WELL NAME: DRILLING UNIT:

DATE: DAYS FROM SPUD:

N° OF PERSONS ON BOARD:

ALERT STATUS:

DEPTH (time): P.T.D.: PROGRESS: (metrage 24 hours)

LAST CASING DEPTH: SIZE:

STATUS: (Present operation)

OPERATIONS SUMMARY: (Summary by hour of operations in the past 24-hour period.)

LAST FLOT DEPTH: E.M.D.:

TESTS AND DRILLS: (Any BOP tests, pit drills, fire drills, abandon ship drills in past 24 hour period.)

OPERATIONS FORECAST: (Operations forecast in next 24 hour period.)

BIT: (Number) SIZE: TYPE:

MUD DENSITY: VISCOSITY: WL:

MAXIMUM GAS READING AND DEPTH:

WORK BOATS: (Location and activity of supply vessels.)

WEATHER: YY/MM/DD	WINDS(kts) DIR/SPEED	WAVES(m) HT/PER	SWELL(m) HT/PER/DIR	VISIBILITY (km)
EXTREMES:		Max. and Min. observed values for previous 24 hrs with (local) time of occurrence in brackets.		
0600:		Observed values at 0600 (local) time.		

VESSEL RESPONSE:		PITCH(m) ROLL(degrees) HEAVE(m)
MAXIMUM:		Maximum observed value for previous 24 hrs with (local) time of occurrence in brackets.
ICEBERGS:	Grand Banks:	- number within 60 nm of well by quadrant; and - location (range and bearing) of those within 10 nm of well.
	Labrador and Davis Strait:	- number within 20 nm of well by quadrant; and - location (range and bearing) of those within 5 nm of well.
PACK ICE:	Location (range and bearing) from well and amount.	
REMARKS:	(Any urgent, significant or unusual events; include summary of formation testing, FLOT, casing details, downhole problems, deviations in excess of six degrees.)	
LITHOLOGY:	(For last 24 hrs.), including cuttings and cores.	

* Reports from many wells, such as those drilled on land, will not require all of the above data, whereas wells drilling from specially constructed bases, such as artificial islands and ice platforms, would have their own particular report categories.

Canada Oil and Gas Lands Administration | Administration du pétrole et du gaz des terres du Canada

ACCIDENT NOTIFICATION FORM

(TO BE COMPLETED WITHIN 48 HOURS OF ACCIDENT)

DATE & TIME OF ACCIDENT .... OPERATOR ....

RIG/VESSEL NAME .... LOCATION ....

NAME OF INJURED .... OCCUPATION ....

EMPLOYER .... NATIONALITY .... IF CANADIAN, PROV. ......

NATURE & SEVERITY OF INJURIES:

BRIEF DESCRIPTION OF ACCIDENT:

PROPOSED OFFSITE MEDICAL TREATMENT ....

....

ONSITE MEDICAL ACTION ....

....

WAS INJURED EVACUATED? ☐ Y ☐ N ☐ REGULAR FLT ☐ MEDIVAC DATE & TIME ....

☐ LOST TIME ACCIDENT ☐ RETURNED TO NORMAL DUTIES ☐ ASSIGNED TO OTHER DUTIES: DESCRIBE BELOW

EXPERIENCE OF WORKER ON RIG/VESSEL _________ (MONTHS)

EXPERIENCE AT JOB AT TIME OF INJURY _________ (MONTHS)

PROPER SAFETY EQUIPMENT AND METHODS BEING EMPLOYED AT TIME OF ACCIDENT ☐ Y ☐ N IF NO EXPLAIN BELOW

OPERATION IN PROGRESS ON RIG/VESSEL AT TIME OF ACCIDENT ....

ADDITIONAL COMMENTS:

DATE .... COMPLETED BY ....

OPERATOR'S REPRESENTATIVE ....

3

Canada Oil and Gas Lands Administration
Administration du pétrole et du gaz des terres du Canada

				Well Status	
Nova Scotia	☐	West Coast	☐	Suspended	☐
Newfoundland	☐	Northern	☐	Completed	☐
Gulf of St. Lawrence	☐	Hudson Bay	☐	Abandoned	☐

WELL TERMINATION RECORD

This record is submitted in triplicate in compliance with Section 184 of the Canada Oil and Gas Drilling Regulations

WELL DATA

Well Name: .... Area: ....

Grid Area: .... Field/Pool: ....

Permit or Lease No.: .... Final Coordinates: Lat.: .... Long: ....

Drilling Unit: .... Elevations-RT/KB: .... SF/GL: ....

Spud Date: .... Rig Released: .... Total Depth: ....

CASING AND CEMENTING

O.D.:	Weight:	Grade:	Depth Set:	Cement and Additives:

PLUGGING PROGRAM

Approval of the following program was obtained by (person) .... from (person) .... of the Canada Oil and Gas Lands Administration by means of .... on 19

Type of Plug:	Interval:	Felt:	Cement and Additives:

Lost Circulation/Overpressure Zones: ....

Equipment left on Seafloor (Describe): ....

Provision for Re-entry (Describe and attach sketch) ....

Cores: Type: .... Intervals: ....

Other Downhole Completion/Suspension Equipment: ....

CERTIFICATION

I certify on the basis of personal knowledge of operations undertaken at the above named well that the above information is accurate.

Signed: .... P. Eng.   Title: ....

Name: ....   Date: ....

Acknowledged by: ....
Engineering Branch

Date: ....

File: ....

Department of Energy Mines and Resources
Ministère de l'Énergie, des Mines et des Ressources

Department of Indian Affairs and Northern Development
Ministère des Affaires indiennes et du Nord canadien

Canada

A 14

				Well Status	
Nova Scotia	☐	West Coast	☐	Suspended	☐
Newfoundland	☐	Northern	☐	Completed	☐
Gulf of St. Lawrence	☐	Hudson Bay	☐	Abandoned	☐

APPLICATION TO ALTER CONDITION OF A WELL

This application form is to be submitted in triplicate to the District Conservation Engineer at least 45 days before commencement of operations.

Well Name: .... Area: ....

Coordinates: Lat: .... Long: ....

Operator: .... Contractor: ....

Drilling Rig or Unit: .... Depth: ....

Date ATDW Issued: .... Date of Last Operation ....

TYPE OF OPERATION

....

....

SUMMARY OF PROPOSED OPERATIONS

....

....

....

....

....

....

....

....

Signed: .... Title: ....

Date: .... Company: ....

APPROVAL

An approved copy of this notice should be posted at each wellsite.

Signed: ....
Conservation Engineer

Date: ....

ATDW No: .... File: ....

SCHEDULE
Form B

A 15

- Nova Scotia	☐
East Coast: - Newfoundland	☐
- Gulf	☐
West Coast	☐
Northern	☐
Hudson Bay	☐
Drilling	☐
Construction Pipeline	☐
Inspection-Maintenance	☐
Other	☐

APPLICATION TO UNDERTAKE A DIVING PROGRAM

Operator: ....
Operating Licence No.: ....
Diving Contractor: ....
Drilling Rig or Unit: ....
Location: ....
Water Depth: ....
Period of Diving Program: ....
Type of Breathing Mixture: ....
Decompression Chamber: ....
Diving Supervisor(s): ....(1) ....
(2)..................(3)..................(4)..................(5) ....
No. of Divers: ....No. Tenders, etc.: ....
Diving Equipment: ....
Reason for Diving Program: ....
....
....
Contingency Planning: Name of Qualified Doctor: ....
....
....
Telephone No.: ....Location: ....
Nearest Rescue Equipment: ....
....
Other Information: ....
....
....
....
....
Signed: ....Place: ....
Title: ....Date: ....

Authorization

The operator and diving contractor named in the application are hereby authorized under section 3.2 of the Oil and Gas Production and Conservation Act to undertake the diving program described above.

Conditions of Approval: ....
Signed: ....
Minister
Date: ....File: ....

.... Engineering
.... Canada Benefits
....

A 16

Nova Scotia	☐	West Coast	☐
Newfoundland	☐	Northern	☐
Gulf of St. Lawrence	☐	Hudson Bay	☐

AUTHORITY TO DRILL TEST HOLES

APPLICATION

This application is to be submitted in triplicate to the District Conservation Engineer at least 45 days before commencement of operations.

Project No: .... Area: ....

Drilling Unit or Rig: .... Operator: ....

Contractor: .... Estimated Project Cost: ....

Exploration Agreement No: .... Date of Commencement: ....

Purpose of Project: ....

Project Description: ....

Evaluation Program (Logs, Cores, Cuttings): ....

Signed: .... Title: ....

Date: .... Company: ....

APPROVAL

An approved copy of this notice is to be posted at each location.

Signed:

Conservation Engineer

Date:

File:

ABANDONMENT RECORD OF TEST HOLES

This form is to be submitted in duplicate for each test hole to the District Conservation Engineer not later than 90 days after completion of the test hole project.

HOLE DATA

Name: .... Area: ....

Coordinates: Lat: .... Long: ....

Operator: .... Drilling Rig or Unit: ....

Contractor: .... Total Depth: ....

Spud Date: .... Date Abandoned: ....

CASING AND CEMENTING

....

....

....

LOGS RUN

....

....

....

....

FORMATIONS OR FLUIDS ENCOUNTERED

....

....

....

....

ABANDONMENT PLUGS

....

....

....

....

Signed: .... Title: ....

Date: .... Company: ....

APPENDIX B

MODU CERTIFICATION AND APPROVAL REQUIREMENTS

The following material is requested for the assessment of foreign-registered mobile offshore drilling units under Section 8 (f) (iii):

1. Certificates (where applicable):

   a) certificate of registry;

   b) classification certificate for hull;

   c) classification certificate for machinery;

   d) safety construction certificate;

   e) safety equipment certificate;

   f) mobile offshore drilling unit safety certificate;

   g) exemption certificate;

   h) international load line certificate including conditions of assignments;

   i) safety radiotelegraphy certificate;

   j) safety radiotelephony certificate;

k) list of safety equipment;

l) Arctic shipping pollution prevention certificate;

m) ice class certificate;

n) pressure vessel certificate;

o) cargo gear and cranes register; and

p) elevator certificates.

2. Reports:

a) last annual survey;

b) last special survey;

c) last inclining experiment/deadweight survey;

d) non-destructive testing carried out to-date; and

e) report of any damage sustained and repairs carried out to date.

3. Information on Hull and Equipment:

a) general arrangements;

b) details of steel grades;

c) loading for all decks;

d) subdivision plan;

e) tank bulkheads and flats with location of overflows;

f) diagonals and struts;

g) superstructures and deck houses;

h) structural fire protection plan to include details of insulation, lining, ceilings, deck coverings, door, etc.;

i) safety plan;

j) escape plan;

k) arrangement and details of watertight, weathertight, gastight doors, hatches and manholes;

l) general arrangement of hazardous locations;

m) ventilation arrangement including details of fans, etc.;

n) rudder and steering systems;

o) anchoring, mooring and towing arrangements;

p) seaboxes;

q) air and sounding pipes;

r) rails and stanchions, ladders, elevators and inspection platforms;

s) operations manual;

t) information on the relevant limiting functional loads together with the design environmental conditions;

u) capacity, plan, hydrostatic curves and cross curves of stability;

v) stability calculations for intact and damage conditions;

w) details of heat treatment procedures for critical joints;

x) lifesaving arrangements;

y) details of lifting gear;

z) details of helicopter deck; and

aa) details of navigating lights and other equipment as required by the Collision Regulations (promulgated under the Canada Shipping Act).

4. Machinery:

a) general arrangement of machinery and physical properties of principal parts;

b) details of stern tube and stern bush or bearing;

c) diagrammatic arrangement of the feed water, steam, exhaust, cooling water, fuel oil, lube oil and compressed air systems including vent, sounding and overflow systems for fuel oil tanks with type and capacity of pumps shown;

d) diagrammatic arrangement and description of the bilge ballast and similar pumping systems, with type and capacity of pumps shown;

e) details of engines and gearing for propulsion and services essential to the safe operation of the ship, including power to services essential for safety under emergency conditions;

f) details of main auxiliary steering systems, giving particulars of machinery, assigned torques, control systems, safety devices and physical properties of finished parts;

g) details of fuel tanks separate from the hulls;

h) plans of fixed and portable fire detection and extinguishing equipment as prescribed in the Fire Protection, Detection and Extinguishing Equipment Regulations (promulgated under the Canada Shipping Act) for a Group II ship, including helicopter arrangements; and

i) general arrangement of controls and explanation of the operating sequence of automated or remote controls for systems fitted for the operation of the unit and for systems that may affect the safety of the unit or the safety of personnel on board.

5. Electrical:

a) elementary single-line diagram of main and emergency distribution systems;

b) elementary single-line diagram or propulsion system;

c) details of switchboard including general arrangement, wiring diagram, nameplates and materials;

d) lighting circuits wiring deck plan or book of diagrams including symbol list;

e) essential interior communication systems-block diagrams;

f) essential alarm system-block diagrams;

g) fire detection system-wiring deck plan and block diagram;

h) details of automated or remote control systems including description of operation;

i) plan of hazardous locations including type and classification of all electrical equipment located therein; and

j) where an automatic start emergency diesel generator is fitted, a wiring diagram and description of operation of the automatic start circuitry.

6. Additional Data:

a) the operator must provide information on the unit's characteristics and on its response to the environmental factors that are anticipated in the geographical area of intended operations; and

b) a past history of the unit's operations.

APPENDIX C

VENTILATION AND ELECTRICAL EQUIPMENT
(Sections 39 to 43.1)

Sections 39 to 43.1 are general; the following explains their intent in specific instances.

In applying Sections 39 and 43, COGLA considers the following areas to be Zone 1 Hazardous Areas, i.e. areas in which an explosive gas-air mixture is most likely to occur during normal operations:

i) any enclosed area containing shale shakers, desanders, desilter, and degassers;

ii) any enclosed area containing active mud tanks;

iii) any enclosed area holding equipment or material that gives off explosive vapor; and

iv) in outdoor locations, the zone around the exhaust outlets or other openings giving access to the above three, measured 1.5 m above, 1.5 m either side and 3 m below.

Also, COGLA considers the following areas to be Zone 2 Hazardous Areas, i.e. areas in which an explosive gas-air mixture is not likely to occur, but if it occurs, it will exist only for a short time:

i) any enclosed areas adjacent to Zone 1 Hazardous Areas having direct access through a gastight door (e.g. mud pump room, sack storage area, cement mixer room);

ii) any enclosed areas below the drillfloor to the cellar or spider deck;

iii) any enclosed areas above the drillfloor within the enclosed boundaries of the derrick;

iv) outdoor or semi-enclosed locations, within 15 m horizontal from the drillstring, and up to 3 m above and down to 9 m below the drillfloor;

v) in outdoor locations, the zone around the exhaust outlets or other openings giving access to enclosed Zone 1 Hazardous Areas, measuring 3 m above, 3 m either side and 9 m down; and

vi) in outdoor locations, the zone around the exhaust outlets or other openings giving access to enclosed Zone 2 Hazardous Areas measuring 1.5 m above, 1.5 either side, and 4.5 m down.

Electrical equipment installed in a Zone 1 Hazardous Area must be either intrinsically safe, explosion proof or be pressurized/purged with air in a manner acceptable to the Chief. Electrical equipment installed in a Zone 2 Hazardous Area must be either equipment approved for use in a Zone 1 Hazardous Area or increased safety type. The type, design and function of equipment will determine which protection systems are applicable.

The intent of Section 43 is to ensure that enough ventilation is provided to make any enclosed Zone 1 Hazardous Area a suitable working area, to ensure a negative pressure regime exists in any enclosed Zone 1 Hazardous Area, and to ensure a positive pressure regime exists in any enclosed Zone 2 Hazardous Area.

To ensure a negative pressure regime exists in any enclosed Zone 1 Hazardous Area, it must be ventilated and maintained at negative pressure relative to atmospheric conditions. To maintain this condition, the switches for the supply and exhaust fans must be interlocked so that the supply fan cannot be activated without first engaging the exhaust fan.

Similarily, to ensure a positive pressure regime exists in any enclosed Zone 2 Hazardous Area, it must be ventilated and kept at positive pressure relative to atmospheric conditions. To maintain this condition, the switches for the supply and exhaust fans must be interlocked so that the exhaust fan cannot be activated without first engaging the supply fan.

Supply air for Zone 1 and Zone 2 Hazardous Areas must be taken from an exterior fresh source whenever possible. The exhaust air must be discharged at a location that is free from a source of ignition and remote from any ventilation intake. When supply air is not drawn from the exterior, care must be taken that there is no possibility of producing an explosive mixture. The moonpool area of a drillship is not normally considered acceptable as a source of supply air. The same applies to an enclosed spider deck of a semi-submersible drilling unit. However, in some cases the spider deck of a semi-submersible is not totally enclosed and can therefore be used as a source of fresh air. Such situations require individual assessment which is normally done during the pre-approval inspection of any drilling unit proposed for use in the Canadian offshore.

On drilling units with large enclosed spaces, the heat loss during cold weather operations occasioned by having the air continuously changed every two minutes could create other safety concerns. Therefore, while the capacity to move this volume of air must be installed in a Zone 1 Hazardous Area and a nominal ventilation maintained, it is not necessary to change the air at this rate unless the presence of combustible gas is detected. Since all Zone 1 Hazardous Areas must be fitted with a combustible gas detection and alarm system, it should be a simple matter to increase the air flow while the hazard is present.

Compliance with these requirements demands that all gastight doors be kept closed. If inspections reveal that doors and fans are not properly operated, the Chief may require that devices such as automatic door-closers, open-door alarms, differential pressure-sensor alarms or airlocks be installed.

APPENDIX D

TRAINING AND QUALIFICATIONS

1. Basic Training

Basic training requirements are set out in Part V, Sections 147, 150, 151 and 154 of the Drilling Regulations. Particular attention is drawn to Section 150, which requires that all personnel employed on a drilling program be trained in all safety and operational aspects of activities in which they are involved.

2. Supplemental Training

a) Marine Operations

All regular members of the crew of an offshore drilling rig must successfully complete instruction in the following procedures:

i) evacuation, including abandon ship routines and lifeboat deployment;
ii) escape from downed helicopter;
iii) extreme cold survival;
iv) cold water survival;
v) fire prevention and fire fighting; and
vi) operation of air breathing devices.

Additionally, appropriate marine operations personnel must successfully complete training in ballast control for floating units; drilling rig personnel at Assistant Driller and higher levels must successfully complete training in blowout prevention and well control.

Course content and school selection are subject to COGLA approval.

The following information must be included in DPA applications:

i) personnel training for contingency plans;
ii) 'Drilling Supervisors' training, work history and BOP school certificates; and
iii) Ballast Control Operator's training, experience and related documentation.

b) Medicals, Rigs Medic, First Aid and Supplies

i) Medical Suitability

Operators and contractors have a direct interest to ensure that employees are healthy and fit for duty. To this end all potential employees require a medical examination at shorebase prior to starting offshore duty. The medical director of the operator or his designate has the final determination of whether an employee is physically fit for work.

ii) Rig Medic

The provision of medical services and the qualifications for persons working as medics on drilling units is the responsibility of the operators. Requirements are currently under review and, for the present, the operator submitting an application for DPA must include a statement by a qualified medical doctor (presumably on the operator's staff) that he has reviewed the qualifications of each medic and has found them satisfactory. Operators must also provide on-shore consulting physicians under Section 35(5) (a) of the Drilling Regulations. Operators and consulting physicians should be familiar with drilling unit operations. With respect to medic training and qualifications, operators should comply with recommendations of the Offshore and Remote Medicine Committee of the Canadian Petroleum Association. The following are highlights of these recommendations:

- <u>Minimum Qualification</u>

  - RN qualification with minimum two years' experience with emphasis on clinical work in Intensive Care and/or Emergency; or
  - formal paramedic training at college level, with three years' clinical experience; or
  - recent military paramedic qualification to Grade VIB.

- <u>Additional Qualifications</u>

  - current registration with appropriate professional licensing authority;

- ACLS and/or Basic CPR Instructors Certificate;
- Restricted Radio Operators Licence; and
- experience with helicopter/fixed wing Medivacs.

- Specialized Training

  The following training may be required according to specific employment, locale and risks:

  - diving accident management, transfer procedures and physiology;
  - hypothermia, near drowning;
  - communicable disease control, public health, including food chain preparation, VD;
  - disaster planning;
  - simple suturing, wound care;
  - psychiatric, dental emergencies; and
  - sick parade management, common ills.

iii) First Aid

The level of First Aid training and personnel participation are under review by government and industry specialists. Until formal requirements are established, operators should ensure that at least one-half of all the rig crew has received basic first aid training and that an additional team of approximately eight people has been trained to the Advanced St. John's level or equivalent, with supplemental training for the treatment hypothermia and exposure to sour gas.

iv) Medical/First Aid Supplies

Levels of medical and first aid inventory are under review. Operators should meanwhile ensure inventory is maintained to their satisfaction and at levels appropriate for medical and first aid staff.

APPENDIX E

PHYSICAL ENVIRONMENTAL GUIDELINES

These guidelines are issued in connection with the following sections of the Drilling Regulations:

Section	8	on application for drilling program approval;
Section	31(2)	on meteorological forecasts;
Section	79(1)	on contingency plans;
Section	176(2)	on environmental conditions to be recorded;
Section	179(2)	on daily weather and sea state reports; and
Section	228(2)	on final well reports.

An operator should use the guidelines to respond to these sections of the Drilling Regulations. Consultation with COGLA (Environmental Protection), Ottawa in advance of the application is advisable.

These guidelines may be modified as the result of field experience, quantity and quality of data, and equipment developments.

1. DATA COLLECTION

Operators are required to make meteorological and oceanographic measurements in connection with their drilling operations in accordance with these guidelines unless COGLA has agreed to other arrangements. The standards and procedures for collecting and reporting these measurements are described below.

Automatic instrumentation is the preferred means of measurement; however, cloud conditions, present and past weather, visibility, wave direction, sea ice and ice accretion are normally determined visually and recorded in a log.

Instrumentation specifications and sampling frequencies are outlined in Table 1.

a) Parameters to be Observed or Measured

i) Wind
Average speed and direction as well as gust speed and direction. The average wind speed should be the average over a one-minute interval. The gust should be the maximum occurring during the fifteen-minute interval preceeding the wind observation.

ii) Barometric Pressure
Instantaneous value.

iii) Air Temperature
instantaneous dry bulb.

iv) Dew Point Temperatures
Instantaneous wet bulb and calculated dew point temperature.

v) Sea Surface Temperature
Instantaneous value.

vi) Sky Condition
Instantaneous amount, types and height of cloud.

vii) Present and Past Weather
Instantaneous readings.

viii) Visibility
Instantaneous.

ix) Ice Accretion
Cause, thickness, and rate of ice growth on the drilling unit.

x) Sea State
Instantaneous values of sea and swell height, period and direction.

xi) Sea Ice
Type (pack, iceberg etc.), concentration, floe size, stage of development, direction and location of ice edge, and ice movement.

xii) Iceberg or Ice Island Positions or Tracks
All bergs or islands within radar range should be monitored and plotted. Special notations should be made when a berg or island is being towed.

xiii) Iceberg or Ice Island Parameters
Length, width, height, draft and mass to be estimated for as many bergs or islands within radar range as is practically possible.

xiv) Precipitation
Amount of precipitation in the preceeding 24-hour period.

xv) Surface Ocean Wave Spectra
Instrumentation should be located such that the wave field is not disturbed by the drilling unit. The Marine Environmental Data Service (MEDS), Department of Fisheries and Oceans, Ottawa, may provide a Datawell Waverider Buoy for wave measurements. Other instrumentation may be used but the specifications stated must be met and the recording sequence should be consistent with a 20-minute continuous wave record every three hours and have the capability for continuous operation during storms.

xvi) Surface Currents (Type 1)
Upon the request of the Chief, surface current estimates should be made by deploying drifters of various types and monitoring their position. (The three most common types are drift cards, surface drift buoys or satellite-tracked buoys of the Nimbus/RAMS type).

xvii) Currents Measured from Drilling Unit (Type 2)
Real-time measurements from the drilling unit should be taken at a fixed depth. In most cases this would be at 20 m, but this depth is subject to geometry of the drilling unit and the nature of the surface layer of the ocean. Measurements at other depths using the same instrument should be taken by the operator if required for diver support, iceberg movement prediction, or oil spill trajectory predictions.

xviii) Moored Current Measurements (Type 3)

Two moorings are required. One should contain only a near-surface current meter at a depth of 20 m and a sub-surface buoy at a depth of 15 m. The meter on this mooring should have a capability for operations in the wave zone, i.e. vector averaging with a current meter that can orient its main axis or the impeller axis of rotation in the direction of the prevailing current. The other mooring should be for measurements at or near mid-water depth and approximately 20 m from the bottom. The main mooring support buoy should be located five to ten metres above the mid-water current meter. All moored current meters should have a recording interval of 20 minutes. Moorings should be left in place for as long as possible and need not be moved with every relocation of the drilling unit in a particular area.

xix) Temperature and Salinity (Conductivity)

These measurements should be recorded simultaneously with all current meter measurements.

xx) Tides (Pressure)

Tidal measurements may be required.

xxi) Turbidity

Comments on the visibility of the water in the vicinity of the well are required in the well history report.

b) Parameters to be Reported

All standard meteorological parameters, i.e. 1 (a)(i) to 1 (a)(xi), are to be transmitted to the Atmospheric Environment Service (AES) at least every three hours, but operators are encouraged to take and transmit hourly observations at all times. Hourly and special meteorological observations are required in most areas in support of aviation operations and local tactical ice forecast services.

Wave data from waveriders should be forwarded to the Marine Environmental Data Service (MEDS) every eight days (see Table 3).

c) Sampling Frequency During Storms

When the significant wave height exceeds four metres or the average wind speed is greater than 34 knots, wind and wave parameters are to be recorded continuously.

d) Description of the Measurement Program for DPA

A description of the physical environmental measurement program should be submitted with the application for Drilling Program Approval. The following details are requested:

i) Instrumentation
Make, model, specifications, location of spares.

Table I - SPECIFICATIONS FOR PHYSICAL ENVIRONMENTAL PARAMETERS

Parameter	Range	Accuracy	Resolution	Frequency
Wind Speed*	0-120 Knots	±10%	1.0 knot	3hr, hourly or continuous
Wind & Wave Direction*	0-360°	±10°	1.0°	3hr, hourly or continuous
Barometric Pressure	920-1060 mb	±0.5 mb	0.5 mb	3 hr, hourly
Air Temperature	-40° to 40°C	±0.5°C	0.1°C	3 hr, hourly
Wet-Bulb Temperature	-40° to 40°C	±0.5°C	0.1°C	3 hr, hourly
Dewpoint	-40° to 40°C	±0.5°C	0.5°C	3 hr, hourly
Sea Surface Temperature	-5° to 25°C	±0.5°C	0.5°C	3 hr
Cloud Cover	Per MANMAR (Manual of Marine Weather Obs.) Per SAWR (Sup. Aviation Weather Reports)			3 hr, hourly
Ice Accretion	Per MANMAR			3 hr
Wave Height and Spectra*	0-35 m	±5%	0.5 m	3 hr, or continuous
Wave Period*	2-25 sec	0.5 sec	0.2 sec	3 hr or continuous
Sea Ice	Per MANMAR and/or MANICE			3 hr, hourly
Iceberg or Ice Island Position	0-50 km	0.4 km	0.2 km	1 hr
Iceberg or Ice Island Length, Width Height, Draft	0-1000m	±10%	2-5 m	as required
Mass	Best estimate			

*Note: During storms (significant wave height greater than 4m or wind speed greater than 34 kts) continuous recordings should be made of wind speed and direction, and wave height and period.

Parameter	Depth	Range	Accuracy	Resolution	Frequency
Current Direction		0 - 360°	±5°	5.0°	1 hr or 20 min.
Current Speed	a) 20m b) 20m c) Mid depth d) 20 m from	5-250cm/sec 5-250cm/sec 5-250cm/sec 5-250cm/sec	±3% of full scale " " "	3cm/sec 2cm/sec 2cm/sec 2cm/sec	a) 1 hr b) 20 min c) 20 min d) 20 min

a) is for Type 2 measurements
b),c)+d) are for Type 3 measurements

Parameter	Depth	Range	Accuracy	Resolution	Frequency
Water Temp.	Same as for Currents	-2 to 25°C	±0.2°C	0.1°C	Same as for Currents
Salinity (Conductivity)	Same as for Currents	0-36°/oo	±0.2°/oo	0.1°/oo	Same as for Currents
Tides (Pressure)	Bottom	0-250 m	0.01% of full scale	0.002% of full scale	1/2 hr
Turbidity	Bottom	Visual estimates from well head	TV camera		

ii) Mounting Location and Arrangements
Height, distance to obstructions.

iii) Mooring or Deployment Arrangements
Depth of instruments, buoys, etc., include a detailed sketch indicating all components.

iv) Recording System
Equipment, sampling frequency, format, etc.

v) Calibration Procedures
Frequency of calibration.

vi) Maintenance Schedule.

vii) Disposition of Data
Approximate time recorded data (tape format) to be supplied to COGLA.

viii) Consultants
Name, address and role of any consultants involved in the program.

e) <u>Installation, Maintenance and Monitoring</u>

Regional officials of AES and OSS (Table 2 and 3) should be consulted on the installation of equipment in order to ensure optimum positioning of the instruments. Actual installation and maintenance of the equipment is the responsibility of the drilling operator. Inspection trips by AES and OSS will be coordinated with operators through the relevant COGLA regional office.

The observation programs aboard the drilling units and any ancillary vessels, which may be equipped as weather observation platforms, are monitored by COGLA, AES and OSS. Quality control actions at AES Downsview and MEDS (OSS), Ottawa, prior to archiving serve to monitor the overall operation.

f) Training

The observers taking physical environmental observations on the drilling units must have successfully completed a training course dealing with the procedures for making, recording and reporting meteorological and oceanographic observations. The training courses can be arranged through the AES Regional Director or can be conducted by the operator or his consultant with AES administering the final certification examination. Wave rider buoy training can be arranged through the Director of MEDS. The courses serve to ensure uniform standards of observing, coding and reporting. Observers who are inactive for an extended period may require retraining.

g) Recording of Observations

Physical environmental observations should be recorded in a "Meteorological and Oceanographic Log" according to the procedures described in MANMAR and SAWR. These log books are furnished by AES through the Regional Director. When completed, the logs should be sent to the Regional Director in the respective AES Region. All meteorological observations will be archived by AES, Downsview. Operators are expected to keep a separate log of hourly iceberg and/or ice island positions and characteristics.

Operators should have all parameters and data recorded on magnetic tape. Copies of the magnetic tape records should be submitted to COGLA with the final well history report in computer-compatible format.

h) Inspections

Conservation Engineers from COGLA make periodic inspections of a drilling unit. Other officers of COGLA, and from AES and OSS, make occasional offshore visits to review in detail the meteorological and oceanographic measurement program.

2. WEATHER AND ICE FORECAST SERVICES

Two types of weather forecast services are normally required by the operator:

- site-specific forecast services for normal and emergency conditions related to drilling operations; and
- aviation weather forecast services for support flights.

Two ice forecast services are required in some areas except during open water seasons:

Table 2 - AES SERVICE CHIEFS FOR DATA ACQUISITIONS

Atlantic Region	Regional Director Atmospheric Environment Service 1496 Bedford Highway Bedford, N.S. B4A 1E5	(902) 835-9328
Quebec Region	Directeur Régional Service de l'Environnement Atmosphérique 100, Boul. Alexis Nihon, 3me étage Ville St-Laurent, P.Q. H4M 2N8	(514) 333-3000
Western and Northern Region	Regional Director Atmospheric Environment Service 6325 - 103 rd Street Edmonton, Alberta T6H 5H6	(403) 437-1250
Pacific Region	Regional Director Atmospheric Environment Service 1200 West 73rd Ave. Suite 700, Vancouver, B.C. V6P 6H9	(604) 732-4673

Table 3 - OSS SERVICE ADVISORS FOR DATA ACQUISITION

All Regions	Director Marine Environmental Data Service 240 Sparks St., 7th Floor Ottawa, Ontario K1A OE6	(613) 995-2007
Atlantic and Eastern Arctic	Marine Advisory & Industrial Liaison Office Bedford Institute of Oceanography P.O. Box 1006 Dartmouth, N.S. B2Y 4A2	(902) 426-3698
Gulf of St. Lawrence, Hudson Bay and James Bay	Director, OSS Dept. of Fisheries & Oceans P.O. Box 15500 901 Cap Diamant Québec, P.Q. G1K 7X7	(418) 694-7781
West Coast and Western Arctic	Chief, Ocean Information Services Division Institute of Oceanographic Sciences Pat Bay, B.C. V8L 4B2	(604) 656-8217

- pack ice forecast services; and
- iceberg or ice island trajectory forecast services.

a) Site-specific Forecast Services

The operator should provide site-specific weather and sea state forecasts in support of their operations. These should meet the needs of both normal and emergency operations and should be at least equivalent in quality and accuracy to the services provided by the AES.

The forecast should be prepared by qualified meteorologists familiar with the AES core forecast guidance, practices and procedures and should be consistent with the AES core service for the area. The forecasts should be based on the AES core guidance material available in real time from the appropriate AES regional forecast centres. Emphasis in these site-specific forecasts should be placed on increased spatial and temporal resolution of the core guidance material using all appropriate information and facilities. Continuous monitoring of the weather, wave and ice systems is needed to ensure that updates are made as required.

If a major departure from the AES regional forecast appears warranted, the forecaster preparing the site-specific service should consult with the appropriate AES Weather Centre. Any AES Weather Warning in effect for the drilling areas must be mentioned.

In an emergency, extra services are likely to be needed. Both AES and the operator's forecasters and observers should be prepared, and familiar with the requirements of the operator's contingency plans.

Requirements for the site-specific forecast service are:

i) forecasts should be issued at least every 12 hours with a six-hour mandatory update or more frequently as required. A continuous weather watch must be maintained by a meteorologist at the special forecast office 24 hours a day;

ii) forecasts should include wind speed and direction; sea state (wave height, period and direction for both sea and swell); precipitation; visibility; sky conditions; air temperature; a synopsis of present weather patterns and, when appropriate, freezing spray and ice conditions;

iii) forecasts should extend over a 48-hour period, with emphasis on the first 12 hours;

iv) weather outlooks should cover the next 48 to 120 hours;

v) weather warnings should be issued as required and the appropriate AES Weather Center notified;

vi) in case of an emergency, special forecasts tailored to the emergency, and frequently updated, are required;

vii) at least half of the forecasters should have had substantial experience with AES core guidance material;

viii) the forecast team should have some professional forecast experience in the geographical region;

ix) acceptable forecast quality and accuracy may require the addition of observation stations to the present network, particularly upstream from the forecast point;

x) an effective data communications system is required to ensure the timely transmission and receipt of environmental data and forecasts in near real-time; and

xi) Canadian firms must be provided full and fair opportunity to participate on a competitive basis in the supply of forecast services.

b) Aviation Weather Forecast Services

The Department of Transport (DOT) requires that area aviation weather forecasts (FA) be available to support aviation services to offshore drilling units or remote shore bases; these forecasts are provided by AES. In those areas where DOT's Canadian Air Transport Administration formally identifies a requirement for aviation site-specific aerodrome forecasts (FT), these are the responsibility of the operator and may be prepared by AES or a consultant.

For both these forecasts, the operator is responsible for operating an hourly meteorological observing program. To ensure that this program meets the objectives and standards established by AES, operators are expected to enter into a formal agreement with AES. However, if the drilling unit is within 75 km of an AES hourly weather observing station, hourly observations are not required.

c) Pack Ice Forecast Services

In areas where operations are conducted in pack ice, a local tactical ice forecast service is required. To support this service, aerial reconnaissance and hourly meteorological and oceanographic observations are required in addition to the ice parameters observed from the drilling unit. Forecasts should extend over 24 hours, with emphasis on the first six hours, and should be prepared by qualified personnel.

The forecast are issued and updated as the ice situation dictates.

d) Iceberg or Ice Island Trajectory Forecast Services

When drilling operations are conducted in areas of drifting icebergs or ice islands, a local tactical iceberg or ice island trajectory forecast service is required. At least every three hours, qualified personnel should make an estimate of the time and point of closest approach for each iceberg or ice island within 40 km of the drill site.

3. ENVIRONMENTAL DATA ANALYSIS AND SUMMARY REPORT

As part of a final well history report operators should provide reports on weather, ice, and oceanographic conditions and should submit to COGLA a computer-compatible tape or tapes of all data recorded. These tapes must be in nine-track, 1600 bpi format with documentation on calibrations and conversions to engineering units. The reports should include the following:

a) plot of the three-hourly wind speed and direction; significant wave height; zero-crossing wave period; wave period at the peak of the wave spectrum; hourly current speed and direction; dry bulb temperature, dew point and sea surface temperatures; and visibility and ceiling;

b) monthly extremes (maximums and minimums), mean and standard deviation of all parameters observed or measured;

c) monthly frequency diagrams of wind speed and direction, current speed and direction, visibility and ceiling conditions (aircraft operating limits), combined wave height, period and direction, ice thickness, ice floe size, ice floe speeds, ice ridge height and keel depth, iceberg or ice island length, height, mass, draft and drift;

d) monthly tables (scattergrams) of the following parameters, with the total number of observations to be indicated:

i) wind speed versus direction; frequency tables;

ii) significant wave height versus wind speed;

iii) significant wave height versus zero crossing wave period;

iv) significant wave height versus peak wave period;

v) significant wave height versus predominant wave direction;

vi) current speed versus direction;

vii) persistence of wind speed;

viii) persistence of current speed;

ix) persistence of wind direction;

x) persistence of significant wave height;

xi) persistence of current direction;

xii) persistence of visibility;

xiii) iceberg or ice island drift speed versus mass; and

xiv) iceberg or ice island drift speed versus draft.

e) detailed analysis of major storms, and drilling unit motions, particularly if they led to waiting-on-weather, an accident, damage to equipment or excessive drilling unit motions;

f) general description of the variability in the near-bottom water turbidity (underwater visibility);

g) evaluation of data quality, instrumentation, data gaps, etc.;

h) a description of modifications made to original measurement or recording plans.

i) recommendations for change in any future measurement program; and

j) a verification of the weather, ice and sea state forecast services.

APPENDIX F

CONTINGENCY PLANS

I Introduction

The Drilling Regulations (Section 79) require operators to submit contingency plans for the following types of emergencies:

1. serious injury or death;
2. a major fire;
3. loss or damage to support craft;
4. loss or damage to a drilling unit;
5. loss of well control;
6. relief well drilling arrangement;
7. hazards unique to the drill site; and
8. oil spills.

These plans should reflect an integration of operator, drilling contractor and sub-contractor procedures, describing the responsibilities and inter-relationships of key personnel from these sectors in order that a coordinated emergency response can be implemented.

II Purpose of Contingency Plans

The purpose of the contingency plans is to:

1. define the responsibilities of key personnel and outline the basic procedures for responding to emergencies; and

2. provide a plan of action with procedures appropriate for every forseeable emergency situation.

III Submission and Review

Contingency plans are reviewed within COGLA and its resource agencies whom COGLA consults on search and rescue and environmental matters. Twenty copies of these plans are required for the review process associated with the oil spill response plan and its environmental support data. To expedite this portion of the review, a list of addresses will be forwarded to the operator by COGLA.

Operators are reminded that other documents and manuals relating to contingency plans, such as alert and evacuation plans, SAR plans, etc., are to be submitted in accordance with item 2(b), pages 6-7.

Observations received from COGLA personnel and external reviewers will be consolidated and forwarded to the operator as amendments to their contingency plans.

IV Specific Factors

While contingency plan format is a matter of operator preference, the following factors should be accommodated in plan development (e.g. the CEOSC Emergency Response Manual is a model plan based on job responsibilities as opposed to type of emergency).

1. Alert Procedures

Contingency plans should include alert procedures based upon environmental criteria, the purpose of which is to bring company management to a higher state of preparedness in the face of a potential emergency. These criteria may be based upon sea state, forecast weather conditions, pack ice or iceberg encroachment or other rig problems aggravated by environmental conditions. For example, east coast operators are required to address the following alert criteria:

a) wind speeds forecast in excess of 80 knots;
b) wind speeds forecast in excess of 70 knots with sea ice encroachment;
c) actual wind speeds in excess of 45 knots or sea ice encreachment;
d) actual wind speeds in excess of 45 knots or forecast in excess of 70 knots with ballast control, structural, or well control problems; and
d) ballast control structural or well control problems which could threaten the safety of the unit or personnel regardless of wind speed.

2. Provisions for Common Response/Alert Plans, Flight Following and Ice Management

Where more than one operator is active in a particular area, the adoption of common response/alert plans, flight following, and ice management services are required. This program of joint emergency preparedness should be complemented by operator equipment resource sharing arrangements.

3. Elements of Contingency Plans

The following arrangements or procedures should be described with respect to each of the emergency situations described in Section I above:

a) responsibilities for key personnel;
b) first aid and medical support facilities;
c) primary and secondary means of evacuation;
d) weather limitations on evacuation procedures;
e) availability of on-board firefighting equipment;
f) procedures for location downed aircraft (description of flight following procedures);
g) person overboard recovery facilities and procedures;
h) primary and secondary communications facilities between rig, vessels, aircraft, and other units in the area;
i) summary of external response procedures to be followed in the event of loss of well control;
j) cooperative arrangements for SAR, ice weather services, and equipment sharing;
k) precautions for hazards unique to the drill site, i.e. iceberg avoidance and other environmental alert criteria;

l) relief well drilling arrangements (see item (5) below; and

m) vessels and aircraft under contract.

4. Relief Well Drilling Arrangements (Section 79(f))

The Operator must demonstrate that:

a) for the proposed well another drilling rig or drilling unit suitable for the drilling of a relief well is available to complete drilling of the relief well within seasonal constraints;

b) in the case of floating drilling units, equipment suitable for the relevant water depth and drilling depth is available for use at short notice; and

c) in the case of an artificial island, a floating drilling unit, or, alternatively, a drilling rig and drilling base, such as an ice pad, is available and capable of completing a relief well within the drilling season whenever drilling occurs below the risk threshold depth.

5. Oil Spill Contingency Plan

Descriptions of Drilling Program

This section should summarize the proposed program for the benefit of reviewers outside COGLA, who are not usually privy to other documentation submitted to COGLA. This section should include:

a) well names and location;
b) dates of operation;
c) construction procedures (in brief);
d) water depth;
e) drilling units to be used;
f) logistical support;
g) organization chart(s) of office and drilling personnel; and
h) communications facilities

The oil spill contingency plan is to be concise and to the point, so that it is instructive to the personnel responsible for their implementation. Operators are required to be members of an area oil spill cooperative, and as such need not include descriptions and maintenance instructions for countermeasures hardware in the contingency plan.

The oil spill contingency plan is to be supported by a series of charts identifying pollution sensitive areas so that cleanup priorities are immediately evident to the decision making process. The charts are to be arranged sequentially by month or by season, for those areas indicated by the spill trajectories as being potentially polluted. Charts should be updated annually. The charts and other supporting documentation required are:

i) biological sensitivity charts, i.e. charts with texts that identify the area containing flora and fauna that are sensitive to spills as well a natural preserve areas;

ii) socio-economic sensitivity charts indicating local indigenous industry and the probable impact of oil spills;

iii) physical sensitivity charts of coastline areas, which identify shoreline types, coastal currents, ice forms and movement, and the nature of the littoral zone;

iv) oil spill trajectory analyses are normally required; they should be done for each month, with a three-month projection for spills originating at the wellsite and followed until:

- the slick volume is reduced to 5%;
- the shoreline is reached; or
- the slick moves out of the modelled area;

v) a presentation of the 90%, 50% and 0-50% probability of the extent of oil migration from the release point, illustrated by contours or envelopes of probability; if these data are presented in the form of transparent overlay charts in conjunction with sensitivity maps, a "one glance" oil spill impact impression is created;

vi) a series of monthly tables indicating:

- the number of slicks that might reach shore;
- their time in transit;
- their average speed in km/day; and
- the percentage of oil remaining upon impact for daily spills occurring at the wellsite;

vii) illustrations showing daily oil-slick trajectories using the most severe monthly meteorological conditions that result in maximum probability of shoreline impact over the period for which historical data is available;

viii) a chart, prepared from selected annual data, illustrating the area impacted by oil, during the period it retains 90% of the original light fraction (up to C-14); and

ix) table(s) indicating the sensitivity of the trajectory model compiled by varying the speed and direction of winds and currents.

Because oil spill trajectory modelling is a technology in evolution, operators are advised to consult COGLA (Environmental Protection), Ottawa, for further information on the requirements under this heading. The oil spill contingency plan should include a statement on the operators access to, or capability to implement, an oil spill trajectory model.

6. Oil Spill Field Exercise (Section 151)

An oil spill field exercise is required every year the operator is engaged in a drilling program. Accordingly, the operator is directed to make arrangements with the other cooperative members for an area exercise and be prepared to outline these preparations upon application for

DPA. Four weeks in advance of the exercise, the operator is to tender an operations order containing the following information:

a) objective,
b) date,
c) location,
d) protocol,
e) personnel,
f) hardware, and
g) logistical support.

A summary report of the exercise is to be forwarded to COGLA (Environmental Protection), Ottawa, within four weeks following the actual exercise.

APPENDIX G

NAMING OF WELLS ON CANADA LANDS

The names of all exploratory wells on Canada lands, are derived by combining the following pieces of information:

Operator and Partners	Well	Unit	Section	Grid
Canoil et al	Sparrow	P	-38	(unstated)

The unit, section and grid are defined in the Canada Oil and Gas Land Regulations.

The question arises as to how to designate follow-up and production wells in the same unit so that the naming of both exploratory and development wells is consistent and clearly understood by all concerned.

The first well in a unit is straight-forward and, as the enumerator is 1, it need not be stated, for example:

Operator and Partners	Well	Enumerator	Unit	Section
Canoil et al	Sparrow		P	-38

The second well in the unit would have the enumerator "2"; the third well would have the enumerator "3", and so on:

Operator and Partners	Well	Enumerator	Unit	Section
Canoil et al	Sparrow	2	P	-38
Canoil et al	Sparrow	3	P	-38

In the <u>pre-spud phase</u>, for purposes of identification between the operator and regulatory agencies, for example, the names of proposed wells in the same unit would have their enumerator in brackets:

Operator and Partners	Well	Enumerator	Unit	Section
Canoil et al	Sparrow	(4)	P	-38

The brackets are dropped when the enumerator is officially assigned to the well, which is as soon as the well spuds. Thus, the order in which the wells are drilled and the number of wells in the unit can be readily determined; also, there should be no confusion from cancelled well locations.

The unit and section identified in the official well name refer to the well's surface location. <u>If a hole is plugged back and then deviated</u> to gain new geological or reservoir information, then the enumerator for new holes will include a designator to identify the deviated hole, for example:

Operator and Partners	Well Platform	Enumerator	Unit	Section
Canoil et al	Sparrow	3 A	P	-38

Thus, this particular well would be the first deviation from the initial wellbore of the third well drilled by Canoil on the Sparrow prospect in Unit P, Section 38.

Holes deviated for mechanical reasons should not be given a separate designation, unless new geological information and a separate borehole is obtained; COGLA (Resource Evaluation), Ottawa, should be consulted if a doubt exists in the naming of such a well.

In the case of development wells on multi-well production installations, such as offshore platforms or man-made islands, the unit and section could be dropped as the location of the installation would be widely known and the official well names would be that much shorter. (In the case of development wells, operators may apply for the use of a naming system appropriate for the specific circumstances of the development program.)

Operator and Partners	Well Platform	Enumerator	Unit	Section
Seagasco	Dory	1		
Seagasco	Dory	2		
Seagasco	Dory	3		

APPENDIX H

WELLSITE SEABED SURVEY GUIDELINES

Under Sections 8 and 89 of the Drilling Regulations, every operator is asked to provide particulars of the nature of the seafloor in the area of a proposed drill site and information on the surface and sub-surface conditions that may affect the safety and efficiency of well drilling operations.

Prior to issuance of an ADW, therefore, every operator is expected to carry out a routine wellsite seabed survey, unless the required information is already available. While the survey will be primarily geophysical in nature, it is also practical to obtain information on the geotechnical characteristics of the surficial sediments. In some special cases, such as in shallow waters, areas of high environmental sensitivity, areas of high seismicity or near habitation, COGLA may require the operator to conduct additional surveys.

1. Objectives

   a) To determine the nature of the seafloor and surficial layers of the seabed as they relate to safe drilling operations.

   b) To identify any hazards that may be encountered in drilling the upper part of the well.

c) To correlate the site evaluation within a regional geological framework.

2. Hazards

A list of potential hazards to drilling is given below, some of which relate only to northern regions.

a) Permafrost.

b) Hydrates.

c) Shallow gas.

d) Shallow overpressured water.

e) Seafloor stability (foundation and anchoring conditions).

f) Seafloor sediment dynamics (mobility, erosion, deposition).

g) Ice scour of the seafloor.

h) Seabed deformation and instability (folding, slumping and faulting, relating these to slope stability and regional seismicity).

i) Man-made obstacles.

j) Boulder beds.

The list should not be construed as being definitive, and the responsibility lies with the operator to ensure that the objectives noted in item 1 above are met.

3. Extent of Coverage

The density and area of coverage must be adequate to identify and evaluate the hazards and to tie the near-surface geology into the regional picture. It is recommended that the area of coverage be large enough to allow some change of well location. An acceptable survey should cover an area of not less than 2 km by 2 km with a line spacing of not more than 0.5 km.

In addition, a photographic record of the seafloor around a proposed wellsite should be made to obtain information on seafloor topography and surficial geology and to allow identification of biota present on the seafloor. Seafloor photographs should be taken at all line intersections.

4. Approvals

Approval to conduct the survey should be applied for in the same manner as any other geophysical or geological exploration program, as outlined in Section 3 of the Geophysical and Geological Programs on Canada Lands guidelines, available from any COGLA office.

5. Reporting Requirements

A report of the results of the survey is to be submitted to the relevant COGLA regional office within one year following completion of the field work, and prior to the application for the ADW. Separate reports should be submitted for each individual wellsite investigation (if more than one site is studied during a program). Format, contents and number of copies of the report should be as specified in Section 7 of the Geophysical and Geological Programs on Canada Lands guidelines, but the following material, specifically related to the site hazard investigations, is also to be included:

a) Identification of any near surface hazards, such as faults, boulder beds, slumps, buried channels, gas pockets, permafrost zones.

b) Results of sidescan sonar surveys, including a discussion of the distribution of seabed features and, where appropriate, a discussion of ice scours, with an analysis of scour density, cross-sectional shape, depth of sediment disturbance and dimensions.

c) Location map and lithologic* description of samples and cores, and results of geotechnical investigations and any other studies carried out as part of the survey.

d) Correlations of acoustic records and seismic sections with core logs.

e) Surficial sediment map.

f) Prints of all bottom photographs with descriptions, giving information on location, area of the seafloor covered by the image and identification of the sediment and biota type.

g) Identification of man-made obstacles.

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* For northern areas, special reference should be made to the occurrence, distribution and description of permafrost.

Note: No film (mylar) copies of the seismic sections or shot-point maps are required.

6. Disposition of Samples

Seabed sample or core material collected during wellsite studies that remain after logging and/or analysis should be forwarded for curation to the appropriate laboratory as described below:

East Coast (including Baffin Bay, Davis Strait and Hudson Bay):
Canada Oil and Gas Lands Administration
Bedford Institute of Oceanography
P.O. Box 1006
Dartmouth, Nova Scotia
B2Y 4A2
(402) 426-3179

West Coast and North of 60° (excepting Baffin Bay, Davis Strait and Hudson Bay):
Institute of Sedimentary
and Petroleum Geology
3303 - 33rd Street N.W.
Calgary, Alberta
T2L 2A7

For northern areas, a recording must be kept of the thermal history (during storage and transporation) of key cores taken for permafrost studies.

7. Confidentiality

The geological and geophysical data and report will be kept confidential for the same period of time as is the case for the well for which the site investigation was conducted. In the case of investigations for which a well is not drilled, the period of confidentiality for the report and data will be the same as stipulated for such work under the Canada Oil and Gas Act, namely five years from the date of completion of the work or on reversion of the land to Crown reserve status, whichever occurs first.

Please note that if a significant hazard is detected by the survey, the Chief may inform other operators in the area in accordance with Section 232 of the Drilling Regulations.

APPENDIX I

CUTTINGS, CORES AND WELL FLUID SAMPLES

The testing, packaging and reporting of samples are dealt with in Sections 179, 186-190, 196, 199, 202-226 of the Drilling Regulations. The operator is required to provide the government with specimens, unless other arrangements have been approved. All materials are to be accurately and durably labelled, properly packaged and promptly sent.

I CUTTINGS

1. Washed Cuttings

Cuttings are to be taken at five-metre intervals in the well, cleaned, dried and packaged in vials.

Drilling Area	Sample Number, Size and Addressee
a) West Coast	One 7 ml sample to Pacific Geoscience Centre, Sidney, B.C. One 7 ml sample to ISPG, Calgary.
b) Mainland Territories, Beaufort Sea and Arctic Islands	One 7 ml sample to COGLA, Yellowknife. One 7 ml sample to ISPG, Calgary.
c) East Coast,* Hudson Bay, Hudson Strait, Baffin Bay and Davis Strait	One 25 ml sample to COGLA, Dartmouth. One 7 ml sample to ISPG, Calgary. *For Nova Scotia offshore wells only: one additional 25 ml sample to Nova Scotia Department of Mines and Energy, Stellarton, N.S.

2. Unwashed Cuttings for Geochemical Study

Cuttings are to be taken at ten-metre intervals in the well, below surface casing, and canned or bottled.

Drilling Area	Sample Number, Size and Addressee
a) West Coast, Mainland Territories, Beaufort Sea and Arctic Islands	One 500 g sample to ISPG, Calgary.
b) East Coast, Hudson Bay, Hudson Strait, Baffin Bay and Davis Strait	One 500 g sample to COGLA, Dartmouth.

The samples must be packaged in the following manner:

a) the can or bottle is to be two-thirds filled with cleaned cuttings and then filled with cold, fresh water, leaving a one centimetre air space;

b) the rim of the can or bottle must be cleaned to ensure a good seal before setting on lid (cans with bent rims may not seal properly);

c) the can or the bottle is then sealed;

d) the can or bottle must be labelled with the sample's depth and well name, using water-insoluble felt pen, on the outside surface of the can or bottle; and

e) the containers are then to be carefully packed in boxes for shipment.

3. Unwashed Cuttings for Micropaleontological, Palynological and Nano-Fossil Analysis

One complete set of unwashed cuttings, taken from the shaker or flow line at five-metre intervals in the well, in properly labelled plastic-lined cloth bags with twist-stem tops — contamination, particularly of palynological materials, may result from the use of unlined bags -- is to be sent in the same sample sizes, number and to the same addressees listed in item I (2) above.

II CORES

1. Conventional Cores

After core analysis, the operator must submit a longitudinal slab representing the full length of the core.

The specimens are to be placed in water-resistent wrappings for shipment to COGLA, (Dartmouth), or ISPG (Calgary) (as listed in I(2) above). Although the regulatory requirement is for at least one-third of each core to be sent, operators of wells offshore Nova Scotia are requested to send a half-slab of the core.

2. Sidewall Cores

Foraminiferal slides prepared from sidewall cores that have had to be destroyed for analysis may be retained by the operator for in-house studies provided that:

a) the slides are accessible at any reasonable time by authorized micropaleontologists of the federal government;

b) the slides are available for examination the same day that the other exploratory well data is released from confidential status (normally two years); and

c) the slides are to be sent to COGLA (Dartmouth) and ISPG (Calgary) (as listed in item I(2) above).

Within six months of the well termination date, the operator shall provide:

a) sidewall cores, or remnants of sidewall cores after analysis; or

b) palynological and nano-fossil slides prepared after destruction of the core.

As with conventional cores, since sidewall cores obtained from wells drilled offshore Nova Scotia are forwarded to COGLA, Dartmouth, in the context of the Canada-Nova Scotia Agreement, there is no need to supply samples to the Province of Nova Scotia.

III WELL FLUID SAMPLES

Samples of formation fluids produced on test shall be shipped to COGLA (Dartmouth) and ISPG (Calgary) (as listed in I(2) above). Sample containers must be of inert material (not plastic), suitably marked, and of at least four-litre capacity. (Samples of gas produced on test must be collected and analyzed but the sample need not be submitted.)

IV FURTHER INFORMATION

Operators requiring additional information on the requirements for cuttings or cores or fluid samples are asked to contact COGLA (Resource Evaluation), Ottawa.

APPENDIX J

FINAL WELL REPORTS

1. Format

Five copies of the Final Well Report, on letter-size paper and suitably bound, are to be prepared, three of which are to be sent to COGLA (Engineering), Ottawa, and two to the relevant COGLA regional office. The title page should include the report's date and the name of the operator's representative responsible for the report.

2. Contents

The subjects detailed below, are to be addressed in the report — if information pertaining to a particular heading does not exist, will not become available, or is not applicable to the well in question, a statement to this effect should be made. Most measurements should be given using the S.I. system and dates and time given as Yr./Mo./Day/Hr. Most information submitted will be kept in confidence as required by Sections 230-233 of the Drilling Regulations.

a) Introduction

i) Summary
A recapitulation of some 200 words to include location, nature and purpose of the well; name of the operator and contractor;

type of drilling unit used; resumé of operations at the wellsite; information on the formations penetrated; and results.

ii) Locality Map

A single page map showing the approximate location of the well with respect to an identifiable shoreline or topographic features.

b) General Data

i) Well Name and Number

Full federal designation with unit, section and grid area. See Appendix G: "Naming of Wells on Canada Lands".

ii) Well Location

Surveying systems used to determine final well position. Latitude and longitude from final well survey.

iii) Unique Well Identifier

To be supplied, if required, by COGLA (Engineering), Ottawa.

iv) Operator and Drilling Contractor

Full name and address of each.

v) Drilling Unit

Name, type or class, registry, year built and shipyard.

vi) Position Keeping
Method used to maintain drilling unit on location.

vii) Support Craft
Name, type and owner of support ships and aircraft.

viii) Drilling Unit Performance
Graphical summary of prevailing weather and sea conditions, including wave period; summary of vessel performance in response to these conditions on same time scale as first graph. The analysis should be derived from the records of the environmental observer, with emphasis on peak or critical periods.

ix) Difficulties and Delays
A summary of problems not directly associated with downhole operations, such as delays in drilling due to incompetent foundation or anchoring conditions. Causes, such as weather, pack ice, and icebergs, should also be given and broken down into hours per month, and indicated on the drilling unit performance graphical summary.

c) Summary of Drilling Operations

i) Elevations
Rotary table; sea floor.

ii) Total Depth
Drilled; logged; plugged-back depth if applicable.

iii) Date and Hour Spudded.

iv) Date Drilling Completed.

v) Date of Rig Release.

vi) Well Status (Suspended, abandoned or completed).

vii) Hole Sizes and Depths
Table of bit diameters for each section of hole.

viii) Casing and Cementing Record
Size; weight; grade; make; number of joints; type of thread; date and depth set; and sacks of cement. If a casing cementation report was not previously submitted, provide the location of shoes, centralizers and scratchers; cement additives; calculated cement rise behind casing, make and type of casing hangers and seals.

ix) Sidetracked Hole
Reason for sidetracking; method used and effectiveness of operation.

x) Drilling Fluid
Basic type of fluid system and summary of properties maintained for each phase of the hole.

xi) Fishing Operations
Number of fishing operations and identify fish left in hole.

xii) Well Kicks
Details of any kicks encountered, control methods used.

xiii) Formation Leak-Off Tests (FLOT)
Details of depth; fluid density; applied pressure; mud weight equivalent; last casing depth.

xiv) Time Distribution
A table of the hourly activity as recorded on the IADC/CAODC Daily Drilling Reports from the hour the well was spudded to the time the rig was released, also show the total hours for each type of operation.

xv) Deviation Survey
Plan view showing the location of the borehole with respect to the wellhead for a discovery well, a development well and any well that deviated more than 10° from the vertical over any part of the hole. Bottom-hole co-ordinates referenced to surface location for all wells.

xvi) Abandonment Plugs
Tables summarizing type and depths of plugs; nature of fluid remaining between plugs.

xvii) Composite Well Record
A graphical chart of drilling activities on a suitable depth scale. The information to show major lithological units; rates of penetration; gas detection curves; hydrocarbon shows, cores, bit record; casing points; test intervals and plugs. Records prepared during the course of drilling may be utilized as the basis for this composite

well record but the depth scale must be consistent and not more than two separate basic logs should be used.

d) Geology

i) Drill Cuttings
Prescribed frequency of sampling; intervals for which samples were not obtained. Distribution of samples and location of stored suites of cuttings.

ii) Cores
- Conventional: table showing core number, interval, recovery.
- Sidewall: depths sampled; percent recovered. If tested to destruction, give results (use of an appendix or separate report is acceptable).
- The location of storage for any remaining core.

iii) Lithology
Lithological description of cuttings and cores, including sidewall, wireline, conventional cores, and including any visual shows of hydrocarbons, as seen under either conventional or fluorescent light.

iv) Stratigraphic Column
Table of formations or biostratigraphic units showing name, age, lithology, palaeontology, depth, sub-sea elevation and thickness of each stratigraphic unit penetrated.

e) Well Evaluation

i) Downhole Logs
Date, run number, type, interval, service company. Consolidated copies of logs in rear pocket.

ii) Other Logs
Logs, such as computed dipmeter, deviation and drift surveys, and records from gas detection, mud-logging devices should also be included.

iii) Velocity Surveys*
Records of velocity surveys conducted during or after the drilling of a well should be submitted with the well history report.

iv) Formation Stimulation
Date, intervals, method, contractor, stimulants, quantities and results.

v) Formation and Production Testing
Date, test number, interval (method pressures and results should be presented in brief).

f) Environmental Well Report

(See Appendix E.)

g) Appendices to Well History Report

Appendices may be used to give details on the subjects below, if such have not been given elsewhere in the report:

i) Oil gas and water analyses.

ii) Reservoir engineering data on cores and cuttings, porosity, permeability, fluid saturation, density measurements, etc.

iii) Details of formation and production testing.

iv) Petrological reports.*

v) Paleontological reports.*

vi) Palynological reports.*

vii) Geochemical reports.*

viii) Age determinations (K/Ar, etc.).*

ix) Processed combination of well logs.*

x) Deviation and drift records.

xi) Gas detector log or mud logging records.

xii) Completion data such as tubing and stimulation records.

xiii) Composite well records.

xiv) Final survey plan.

* Under provisions of the <u>Canada Oil and Gas Act</u> (Section 50), information under these items may be kept confidential for five years.

APPENDIX K

DIRECTORY OF NAMES AND ADDRESSES

1. COGLA, Ottawa

Canada Oil and Gas Lands Administration
355 River Road
Ottawa, Ontario K1A 0E4

Telephone:	(613) 993-3760 (all branches)
Telex:	053-4366
Telecopier:	(613) 993-9897

Material addressed to the different branches should be sent to the attention of the relevant Director-General.

2. COGLA, Regional Offices

a) Nova Scotia

Director-General
Canada Oil and Gas Lands Administration
Cogswell Tower
2000 Barrington Street, Suite 102
Halifax, Nova Scotia B3J 3K1

Telephone:	(902) 426-8570
Telex:	019-23632
Telecopier:	(902) 426-5253

b) Newfoundland

Director-General
Canada Oil and Gas Lands Administration
Toronto-Dominion Place
140 Water Street, 5th Floor
P.O. Box 127, Station "C"
St. John's, Newfoundland A1C 6H6

Telephone:	(709) 772-2125
Telex:	016-4031
Telecopier:	(709) 772-2127

c) Yellowknife

Manager, Northern Region
Canada Oil and Gas Lands Administration
P.O. Box 1500
Yellowknife, N.W.T. X1A 2R3

Telephone:	(403) 920-8175
Telex:	034-45570
Telecopier:	(403) 873-8707

3. COGLA Information and Field Offices

a) Calgary

Liaison Officer
Canada Oil and Gas Lands Administration
220 - 4th Avenue S.E., Suite 482
P.O. Box 2638, Station "M"
Calgary, Alberta T2P 3C1

Telephone: (403) 231-5631

b) Inuvik

District Manager
Canada Oil and Gas Lands Administration
P.O. Box 2020
Inuvik, N.W.T. X0E 0T0

Telephone: (403) 979-3006

Telex: 034-44541
Telecopier: 979-2090

4. Core and Sample Depositories

a) East Coast

Canada Oil and Gas Lands Administration
Bedford Institute of Oceanography
P.O. Box 1006
Dartmouth, Nova Scotia B2Y 4A2
Attention: G. Karg

Telephone: (902) 426-3179

Nova Scotia Department of Mines and Energy
P.O. Box 999
Stellarton, Nova Scotia
B0K 1S0
Attention: D. Polley

b) North

Energy, Mines and Resources
Institute of Sedimentary and Petroleum Geology
3303-33 Street N.W.
Calgary, Alberta T2L 2A7
Attention: W. Banning

Telephone: (403) 284-0110

c) West Coast

Department of Energy, Mines and Resources
Pacific Geoscience Center
P.O. Box 6000
Sidney, B.C. V8L 4B2
Attention: C.J. Yorath

Telephone: (604) 656-8438

5. Other Addresses Referred to in the Text

a) Canadian Government Publishing Centre
Supply and Services Canada
Ottawa, Ontario K1A 0S9

b) Ship Safety Branch
Canadian Coast Guard
Transport Canada
330 Sparks Street,
Ottawa, Ontario K1A 0N5

6. Notification by Operators of Proposed Operations to Other Government Agencies and Departments

The notification is expected to take the form of a (one-page) letter or telex. In the case of a new drilling program (DPA), operators should notify the agencies listed below, according to the area in which the activity is to take place, in general terms, of their proposal to bring a drilling unit into the area for a specified period of time. Notification is also required for each well (ADW) under an approved drilling program. These notifications may take the form of a short letter identifying the location of the well, the period of activities, the rig and support craft and related operational information.

a) Scotian Shelf

i) Regional Director-General
Canadian Coast Guard
P.O. Box 1013
Dartmouth, N.S. B2Y 3Z7
Telex: 019-22510

ii) Commander
Maritime Command
Department of National Defence
FMO Halifax, N.S. B3K 2X0
Telex: 019-217-89

iii) Regional Director
Environmental Protection Service
Department of the Environment
45 Aldernay Drive
Queen's Square
Dartmouth, N.S. B2Y 2N6
Telex: 019-21565

iv) Environmental Coordinator
Fisheries,
Department of Fisheries and Oceans
Box 550
Halifax, N.S. B3J 2S7
Telex: 019-21891

v) Director-General
Aids and Waterways Branch
Canadian Coast Guard
Room 600, Tower A
Place de Ville
Ottawa, Ont. K1A 0N7
Telex: 053-3128

vi) Navigational Aids Officer
Canadian Hydrographic Service
Dept. of Fisheries and Oceans
615 Booth Street
Ottawa, Ontario K1A 0E6
Telex: 053-4228

Other federal resource agencies and provincial authorities, including members of the Environmental Coordinating Committee, will be notified by the relevant COGLA regional office.

b) <u>Gulf of St. Lawrence</u>

i) Regional Director-General
Canadian Coast Guard
P.O. Box 1013
Dartmouth, N.S. B2Y 3Z7
Telex: 019-22510

ii) Commander
Maritime Command
Department of National Defence
FMO Halifax, N.S. B3K 2X0
Telex: 019-217-89

iii) Regional Director
Department of the Environment
45 Aldernay Drive
Queen's Square
Dartmouth, N.S. B2Y 2N6
Telex: 019-21565

iv) Chief
Fish Habitat Management
Department of Fisheries and Oceans
Box 5030
Moncton, N.B., E1C 9B6
Telex: 014-2607

v) Director
Ocean Science and Surveys
Dept. of Fisheries and Oceans
B.P. 15500
901 Cap Diamant
Québec City, P.Q. G1K 7Y7
Telex: 051-3815

vi) Director-General
Aids and Waterways Branch
Canadian Coast Guard
Room 600, Tower A
Place de Ville
Ottawa, Ont. K1A 0N7
Telex: 053-3128

vii) Navigational Aids Officer
Canadian Hydrographic Service
Dept. of Fisheries and Oceans
615 Booth Street
Ottawa, Ontario K1A 0E6
Telex: 053-4228

Other federal resource agencies and provincial authorities will be notified by the relevant COGLA regional office.

c) Grand Banks and Labrador Sea

i) Regional Director-General
Canadian Coast Guard
P.O. Box 1300
St. John's Nfld. A1C 5N5
Telex: 016-3369

ii) Commander
Maritime Command
Department of National Defence
FMO Halifax, N.S. B3K 2X0
Telex: 019-217-89

iii) Regional Director
Environmental Protection Service
Dept. of the Environment
45 Aldernay Drive
Queen's Square
Dartmouth, Nova Scotia
B2Y 2N6
Telex: 019-21565

iv) Regional Director-General
Department of Fisheries and Oceans
P.O. Box 5667
St. John's, Nfld. A1C 5X1
Telex: 016-4698

v) Director-General
Aids and Waterways Branch
Canadian Coast Guard
Room 600, Tower A
Place de Ville
Ottawa, Ont. K1A 0N7
Telex: 053-3128

vi) Navigational Aids Officer
Canadian Hydrographic Service
Dept. of Fisheries and Oceans
615 Booth Street
Ottawa, Ontario K1A 0E6
Telex: 053-4228

Other federal resource agencies and provincial authorities will be notified by the relevant COGLA regional office.

d) Eastern Arctic Offshore

i) Manager
Arctic Waters
Northern Affairs Program
Dept. of Indian Affairs and Northern Development
P.O. Box 1500
Yellowknife, N.W.T. X1A 2R3
Telex: 034-45579

ii) Director
Canadian Coast Guard - Northern
Tower B, 6th Floor
Place de Ville
Ottawa, Ont. K1A 0N7
Telex: 053-3128

iii) Commander
Maritime Command
Department of National Defence
FMO Halifax, N.S. B3K 2X0
Telex: 019-217-89

Other federal resource agencies and the Government of the Northwest Territories will be notified by COGLA through the Arctic Waters Advisory Committee.

e) Beaufort Sea and Arctic Islands

i) Manager
Arctic Waters
Northern Affairs Program
Dept. of Indian Affairs and Northern Development
P.O. Box 1500
Yellowknife, N.W.T. X1A 2R3
Telex: 034-45579

ii) Regional Director
Canadian Coast Guard
Box 10060
Pacific Centre
Vancouver, B.C. V7Y 1E1
Telex: 04-53235

iii) Director
Canadian Coast Guard - Northern
Tower B, 6th Floor
Place de Ville
Ottawa, Ont. K1A 0N7
Telex: 053-3989

iv) Commander
Maritime Forces Pacific
Dept. of National Defence
FMO, Victoria, B.C., V0S 1B0
Telex: 049-7410

Other federal resource agencies and the Government of the Northwest Territories will be notified by COGLA through the Arctic Waters Advisory Committee.

f) Northwest Territories And Yukon Territory

For Land Use Permits please contact:

Regional Manager
Land Resources
Northern Affairs Program
Dept. of Indian Affairs and Northern Development
P.O. Box 1500
Yellowknife, N.W.T. X1A 2R3
Telex: 034-45579

or, as appropriate,

Regional Director
Northern Affairs Program
Dept. of Indian Affairs and Northern Development
200 Range Road
Whitehorse, Yukon Y1A 3Y1
Telex: 036-8-342

APPENDIX L

DPA AND ADW CHECKLIST

To assist operators in organizing the material to be submitted for the DPA and ADW, the following checklist has been developed. Where headings are not applicable, the operator should delete them, and by the same token should add headings where required. Data included in previous applications need not be repeated, but must be referenced if the information is still valid. The information should be separated into booklets and the order given here should be followed for each DPA and ADW application.

I DRILLING PROGRAM APPROVAL (DPA)

1. General

   a) Geology, topography and bathymetry (include maps).
   b) Time and duration of drilling program.
   c) Interest owners of the Exploration Agreement.

2. Notification of Other Agencies

   Confirmation that the required notification in writing has been given by the operator to the other agencies in such departments as DOT, DOE, DFO, DND, and the provincial or territorial governments concerned.

3. Construction of Drilling Base (ice, pile, berm or artificial island)

Refer to page 6, item 2 (re approval of pre-drilling field activities).

a) Design criteria.
b) Plan of construction (material and dimensions).
c) Material source (e.g. borrow pit).
d) Procedures for construction.
e) Monitoring and instrumentation of base, hull or caisson.
f) Measures to preserve the structure (erosion, insulation).

4. The Drilling Unit

a) The name and address of the drilling contractor.
b) Plans, diagrams and specifications for:

i) Overall dimensions and layout.
ii) Anchoring or station keeping.
iii) Cranes, derrick and drawworks.
iv) Mud system -- pumps, tanks, conditioning and disposal equipment.
v) Pipe handling, heave compensator, automatic stacker.
vi) Blow out preventer, choke manifold and diverter.
vii) Marine riser package.
viii) Navigational aids.
ix) Ballast control (or jacking equipment).
x) Anchoring, make-up, pattern, quick release devices, load limits.

xi) Lifesaving and evacuation systems.

xii) Electrical system (incl. emergency) -- line diagrams only.

xiii) Ventilation and hazardous area identification.

xiv) Fire detection, prevention, fighting.

xv) Diving equipment and submersibles.

xvi) Corrosion prevention (coatings, inhibitors, cathodic protection).

xvii) Qualifications and training of personnel.

xviii) First aid and medical services.

xix) Helicopter deck (size and refuelling apparatus).

xx) Communications (radio, telex, telephone, intercom).

xxi) Certificates.

c) Operational Manuals

i) The owner's operational manual for the unit, to include rig performance under maximum environmental and working loads, and the operation of the marine riser system.

ii) The operator's drilling practices manual which includes the procedures for coping with kicks, sour gas, permafrost, and other predictable drilling problems.

iii) The unit's safety manual, giving procedures for alerts and responses, drills and the methods used for storm or ice warning.

d) Communications

General description of network showing links between drilling unit, supply base, support craft. The chain of command listing key people and their phone numbers is to be included.

5. <u>Support Craft and Systems</u>

a) Standby and Supply Boats

i) Capacities and dimensions.
ii) Power.
iii) Equipment on board (especially safety).
iv) Manning.

b) Supply Base

i) General description.
ii) Services available.
iii) Supply problems (seasonal).

c) Aircraft Support

i) Type (fixed-wing, helicopter).
ii) Capacity and range.

6. <u>Geologic Expectation and Operating Program</u>

a) A summary of the regional geology and the prospects in the area and of the likely depth and stratigraphic column for each well.

b) A discussion of any likely hazards in the area such as overpressures, hydrates, slumping formations and the countering measures planned.

c) A description of the casing, cementation, logging and evaluation programs for a typical well.

7. Investigation of Seafloor Conditions

The general approach for determining:

a) Seabed conditions for anchoring or structural support.
b) Hazards due to shallow gas, slumping, etc.
c) The nature of the seafloor environment.

8. Environmental Items

Items in this section should be prepared in discrete packages or sections under the following headings:

a) Physical Environment

i) Summary description of prevailing weather, sea and ice conditions in the region.
ii) Drilling window and end of season criteria.
iii) Discussion or charts of environmental loading (extreme events) which affect rig performance characteristics.

iv) Details of the weather, sea and ice forecast program for the rig.

v) Description of the on-site meteorological and oceanographic observation program.

vi) Summary of the heavy weather and ice alert arrangements.

b) Waste Disposal

Summary arrangements for the collection, treatment and disposal of:

i) Sewage, grey water, kitchen trash etc.

ii) Oily waste, rig wash, waste engine oils and lubricants.

iii) Spent drilling fluids and cuttings.

c) Drilling Mud Treatment

i) Treatment methods/mud types.

ii) Disposal arrangements.

d) Contingency Plans

i) Serious injury or death.

ii) Major fire.

iii) Loss or damage to support craft.

iv) Loss or damage to a drilling unit.

v) Loss of well control.

vi) Relief well drilling arrangements.

vii) Hazards unique to drill site.

viii) Oil spills.

With emphasis on:

i) Responsibilities of key personnel.
ii) Environmental alert criteria.
iii) Flight watch and rescue arrangements.
iv) Communications facilities.
v) Ice reconnaissance and countermeasures/weather forecasting.

e) Financial Security

A letter of credit, guarantee or indemnity bond to cover any damage from oil spills or debris.

II AUTHORITY TO DRILL A WELL (ADW)

Any procedures that are standard and were submitted with the DPA application need not be repeated but should be referenced. New procedures or equipment needed for anticipated hazards or conditions unique to the well, must be described.

1. General

a) Standard COGLA form signed and dated.
b) Well information — map, coordinates, survey plan, well classification, Exploration Agreement number.
c) Identifiers — U.W.I., well name, drilling unit and contractor.
d) Elevations — KB, RT, water depth, air gap.
e) Project Summary — timing and summary of drilling program.

f) Participants and percentages for each interest holder, and their share of costs.

2. Notification of Other Agencies

Confirmation that the required notification in writing has been given by the operator to the other agencies in such departments as DOT, DOE, DFO, DND, and the provincial or territorial governments concerned.

3. Wellsite Seabed Survey

4. Specific Well Programs

a) Geological prognosis, stratigraphy and structure including objective horizons for the particular well.

b) Drilling program, step-by-step description of each phase of the well under the following topics:

i) Hole size and drilling assemblies.
ii) Casing and cementation (show design calculation and cement additives).
iii) Formation evaluation by coring, wireline logs and formation flow testing.
iv) Mud program — desired properties, individual products and their toxicity, estimated quantities; use of oil.
v) Anticipated formation pressures.

vi) Distribution of DST and cuttings samples.

vii) Well service contractor.

viii) Designation of support craft, including standby vessel.

5. Environmental Items

a) Physical Environment

Confirmation of forecast, observation and alert programs.

b) Contingency Plans

Any updates to the plan, special measures occasioned by the particular location of the well. Check with the relevant COGLA regional office to verify whether an oil spill trajectory analysis is required.

c) Drilling Mud Program

a) Products.

b) Functions.

c) Composition.

d) Any significant toxicities of components.

e) Volumes.

f) Any use of oil.

6. Completion, Abandonment or Suspension Program

7. Appendices

a) Interpreted seismic sections.

b) Geological structure maps

Reminder: Any departure from the accepted program will require the approval of a Conservation Engineer.

Classement CCEK

Titre Pétrole (1 de 2)

Type Dossiers Environementaux

Date D'ouverture 1980

Notes

10 avril 1980: Environnement Canada, sommaire sur les associations environnementales concernant les dispositions de baux d'ancrage à la Baie d'Hudson (VA)

16 octobre 1980: Déversement de pétrole dans le Nord québécois (VA)

25 novembre 1980: Invitation à joindre le groupe de travail sur l'Association de la recherche environnementale (VA)

28-30 avril 1981: Ministère de l'Évaluation environnementale, département de l'Énergie, des Mines et des Ressources, "Installations pétrolières", bulletin préparé lors du colloque de la Baie-James (VA)

16 juillet 1981: Déversement de pétrole à Aupaluk (VA)

13 novembre 1981: Carte de la Baie d'Hudson, département de l'Énergie, des Mines et des Ressources

1 décembre 1981: Environnement Canada, informations et actions prises quant au déversement de pétrole au Nouveau-Québec

5 février 1982: Invitation du CCEK au directeur général de la gestion environnementale, à la prochaine assemblée

3 mars 1982: Invitation du CCEK à M.R.T. Pierce de la pétrolière canadienne occidentale Ltd.

15 avril 1982: Programme d'exploration de la Baie d'Hudson, Canadian Oxy (VA)

25-30 avril 1982: Bulletin de notes, explorations pétrolières de la Baie d'Hudson, préparé par les Inuits Tapirisat du Canada (VA)

2 juin 1982: Administration du pétrole et du gaz des terres du Canada (VA)

29 septembre 1982: Parcs à carburant au nord du 55ième parallèle

septembre 1982: Notes pour le bulletin du comité consultatif de la Baie d'Hudson (VA)

7 octobre 1982: Communiqué de la Société d'énergie de l'Ontario, explorations initiales de la Baie d'Hudson (VA)

16 septembre 1983: Communiqué gouvernement du Canada

1983: Article dans "Oil and Gas journal": "Petroleum potential bright for Canada's Hudson Bay basin" par Donald D. Johnson (VA)

Classement CCEK

Titre Pétrole (2 de 2)

Type Dossiers Environementaux

Date D'ouverture 1980

Notes

19-21 septembre 1983: Comité du pétrole et du gaz de la Baie d'Hudson, agenda et pamphlet de leur programme (VA)

24 avril 1984: Ministère de l'Environnement, direction régionale du Nouveau-Québec, rapport d'inspection, déversement d'hydrocarbure à Baie Déception, territoire du Nouveau-Québec

27 avril 1984: Communiqué d'Environnement Québec, important déversement de carburant à Baie Déception

1 juin 1984: Réunion des 4-5 juin 1984: traitement et élimination des eaux usées, déversement à Baie Déception

23 juillet 1984: Rapport de surveillance, récupération d'hydrocarbures déversés à Baie Déception, Nouveau-Québec, par Philippe Di Pizzo

juillet 1984: Administration du pétrole et du gaz des terres du Canada: "Initial environnemental screening for renewed exploratory drilling in central Hudson Bay"

29-31 janvier 1985: Administration du pétrole et du gaz des terres du Canada: "Effects of explosives use in the marine environment"

6-7 mars 1985: Réunin du comité de la Baie d'Hudson

27 septembre 1990: Utilisation des huiles usées

30 août 1996: Hydro-Québec, demande de non-assujettissement, valorisation des résidus huileux à des fins énergétiques, Centrale diesel de Kuujjuarapik

30 septembre 1996: Direction de l'évaluation environnementale des projets en milieux hydriques et nordiques, valorisation des résidus huileux à des fins énergétiques

28 novembre 1996: Attestation de non-assujettissement

Gouvernement du Québec
**Ministère de l'Environnement
et de la Faune**

**Direction de l'évaluation environnementale
des projets en milieux hydrique et nordique**

RECEIVED

Le 28 novembre 1996

Monsieur André Delisle
Vice-président exécutif
Finances et comptabilité
Hydro-Québec
75, boulevard René-Lévesque Ouest
Montréal (Québec) H2Z 1A4

**OBJET : Attestation de non-assujettissement pour la valorisation des résidus huileux à des fins énergétiques
Centrale diesel de Kuujjuarapik
N/Référence : 3215-22-10**

Monsieur,

Conformément à l'article 192 de la Loi sur la qualité de l'environnement et suite à la décision de la Commission de la qualité de l'environnement Kativik, vous trouverez ci-joint une attestation de non-assujettissement pour votre projet de valorisation des résidus huileux à des fins énergétiques à la centrale diesel de Kuujjuarapik. Cette décision fait suite à votre demande du 30 août dernier.

Dans le cadre de la mise en oeuvre de ce projet, les huiles valorisées proviendront uniquement de Kuujjuarapik-Whapmagoostui et les huiles récupérées seront entreposées conformément à la réglementation en vigueur. Par ailleurs, tel que le recommande la Commission de la qualité de l'environnement Kativik, je vous saurais gré de déposer auprès du ministère de l'Environnement et de la Faune un rapport de suivi annuel qui fera état de la performance du système de récupération et de valorisation des huiles usées, notamment en ce qui a trait au respect des dispositions prévues au *Règlement relatif à la qualité de l'atmosphère* de même qu'au *Règlement sur les déchets dangereux*.

Édifice Marie-Guyart, 6e étage
675, boul. René-Lévesque Est
Québec (Québec) G1R 5V7

Téléphone : (418) 521-3850
Télécopieur : (418) 644-8222

Enfin, la Commission de la qualité de l'environnement Kativik signale que les huiles usées de Kuujjuarapik-Whapmagoostui, autres que celles produites par Hydro-Québec, pourraient probablement être avantageusement éliminées par ce même équipement étant donné l'éloigement des centres récupération et d'élimination.

Veuillez agréer, Monsieur, l'expression de mes sentiments les meilleurs.

Le directeur,

Pierre Lefebvre

HC/

p.j.

c.c. Mme Mallee Saunders, secrétariat, ARK
M. Jean-Guy Dugré, DRAT, MEF
M. Jacques Lacroix, secrétariat, CQEK

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Gouvernement du Québec
Ministère de l'Environnement
et de la Faune

ATTESTATION DE NON-ASSUJETTISSEMENT

DÉLIVRÉE LE : 27 novembre 1996

TITULAIRE : Hydro-Québec
75, boulevard René-Lévesque Ouest
Montréal (Québec) H2Z 1A4

PROJET : Valorisation des résidus huileux à des fins énergétiques
Centrale diesel de Kuujjuarapik

N/RÉFÉRENCE : 3215-22-10

À la suite des renseignements préliminaires datés du 30 août 1996, concernant le projet de valorisation des résidus huileux de la centrale diesel de Kuujjuarapik à des fins énergétiques et après avoir été informée de la décision de la Commission de la qualité de l'environnement Kativik, je vous avise, conformément à l'article 192 de la Loi sur la qualité de l'environnement (L.R.Q., c. Q-2), que le projet décrit ci-dessous n'est pas assujetti à la procédure d'évaluation et d'examen des impacts :

- la valorisation énergétique des résidus huileux lubrifiants de la centrale de Kuujjuarapik. Cette valorisation se fera par l'entremise d'une fournaise Clean Burn, modèle CB 1400. Celle-ci sera alimentée à partir des résidus huileux lubrifiants provenant des vidanges des moteurs diesel de la centrale de Kuujjuarapik.

Cette attestation de non-assujettissement ne vaut qu'à l'égard du projet, tel que décrit dans les documents suivants :

Lettre :

Destinataire	Date	Signataire
M. Jean Pronovost	1996-08-30	M. André Delisle

N/Réf. : 3215-22-10

Document :

Demande de non assujettissement, valorisation des résidus huileux de la centrale de Kuujjuarapik à des fins énergétiques, Hydro-Québec, région Matapédia, Réjean Morneau, Chargé d'équipe environnement, Division planification et environnement, août 1996, 21p.

En outre, cette attestation de non-assujettissement ne dispense pas le titulaire d'obtenir toute autre autorisation requise par toute loi ou tout règlement et, le cas échéant, celles pouvant être requises en vertu du chapitre I de la Loi sur la qualité de l'environnement.

La sous-ministre,

Diane Gaudet

Gouvernement du Québec
Ministère de l'Environnement et de la Faune

Bureau de la sous-ministre

Le 12 novembre 1996

Monsieur Peter Jacobs
Président
Commission de la qualité
de l'environnement Kativik
C.P. 75
Kuujjuaq (Québec) J0M 1C0

Monsieur le Président,

J'ai bien reçu votre lettre du 25 octobre 1996 concernant le projet de valorisation des résidus huileux de la centrale diesel de Kuujjuarapik-Whapmagoostui.

Je l'ai transmise au sous-ministre adjoint au Développement durable, M. André Harvey, qui lui donnera les suites appropriées.

Veuillez agréer, Monsieur le Président, l'expression de mes sentiments les meilleurs.

La sous-ministre,

Diane Gaudet

Édifice Marie-Guyart, 30e étage
675, boulevard René-Lévesque Est
Québec (Québec) G1R 5V7

Téléphone : (418) 643-7860
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Internet : bsm @mef.gouv.qc.ca

ᑲᑎᕕᒃ ᓄᓇᓕᑦ ᐱᐅᓯᕐᓯᓯᐊᕐᓂᖓᑕ ᑲᑎᒪᔩᖏᑦ
COMMISSION DE LA QUALITÉ DE L'ENVIRONNEMENT KATIVIK
KATIVIK ENVIRONMENTAL QUALITY COMMISSION
SECRÉTARIAT • C.P. 75, KUUJJUAQ (QUÉBEC), J0M 1C0 • TÉL. : (819) 964-2681

Le 25 octobre 1996

Madame Denise Gaudet
Sous-ministre
Ministère de l'Environnement et de la Faune
Édifice Marie-Guyart, 30e étage
675, boulevard René-Lévesque Est
Québec (Québec)
G1R 5V7

Objet : Valorisation des résidus huileux à des fins énergétiques
Centrale diesel de Kuujjuarapik-Whapmagoostui
N/Référence : 3215-22-10

Madame la Sous-Ministre,

La Commission de la qualité de l'environnement Kativik a procédé à l'analyse des renseignements préliminaires relatifs au projet mentionné en titre. Ces informations nous ont été transmises en votre nom par M. Pierre Lefebvre, directeur de l'évaluation environnementale des projets en milieux hydrique et nordique, le 30 septembre dernier. Ce projet d'Hydro-Québec consiste à utiliser les résidus huileux de la centrale diesel de Kuujjuarapik-Whapmagoostui comme combustible pour une fournaise spécialement conçue à cet effet.

Conformément à l'article 192 de la *Loi sur la qualité de l'environnement*, la Commission décide de ne pas assujettir ce projet à la procédure d'évaluation et d'examen des impacts sur l'environnement et le milieu social.

Dans le cadre de la mise en oeuvre de ce projet, tel que le promoteur le précise dans le document déposé pour analyse, la Commission comprend, d'une part, que les huiles valorisées proviendront uniquement de Kuujjuarapik-Whapmagoostui et, d'autre part, que les huiles récupérées seront entreposées conformément à la réglementation en vigueur.

La Commission souhaite que le promoteur dépose auprès du ministère de l'Environnement et de la Faune un rapport de suivi annuel qui fera état de la performance du système de récupération et de valorisation des huiles usées, notamment en ce qui a trait au respect des dispositions prévues au *Règlement relatif à la qualité de l'atmosphère* de même qu'au *Règlement sur les déchets dangereux*.

Finalement, la Commission vous signale que les huiles usées de Kuujjuarapik-Whapmagoostui, autres que celles produites par le promoteur, pourraient probablement être avantageusement éliminées par ce même équipement étant donné l'éloignement des centres de récupération et d'élimination.

Espérant le tout conforme à vos attentes, je vous prie d'agréer, Madame la Sous-Ministre, l'expression de mes sentiments les plus distingués.

Le président,

Peter Jacobs

Energy recovery from Kuujjuarapik's power plant by used oil recycling (Resume)

Hydro-Québec proposes to reuse the lubricating used oil of its Kuujjuarapik power plant for heating purposes. The energy recovery will be achieved by burning the used oil in a furnace specially designed for that task (Clean Burn model CB 1400).

This project is a first step towards implementing an energy recovery program for each power plant of the 14 Nunavik communities. Kuujjuarapik has been chosen because of the significant volume of used oil produced there and since necessary storage facilities are already in place.

(The total volume of used oil produced every year for the 14 communities is 55 000 liters. If all were recycled, the proponent would save around $55 000 a year).

The proponent sees many advantages of doing so. Basically, he wants to put in place an efficient and economical way of recycling used oil.

- Hydro-Québec will reduce the volume of heating oil to buy (for Kuujjuarapik, an estimated 11 000 liters in 1996) and save an estimated amount of $2 500 for transportation of the used oil to the south.
- By doing so, the proponent limits transshipments of new and used oil and eliminates a part of the risks associated to transportation.
- Hydro-Québec says that his project will not modify the surrounding environment since the recycled oil is of good quality and because of the burning efficiency of the furnace.

The Government of Quebec has set out standards for energy recovery of used oils. These must not exceed specific concentrations for arsenic, cadmium, chromium, lead, PCBs and total halogens. Analysis have been carried out on various oil samples : 2 samples from Kuujjuaq, 1 from the lower North-Shore and 195 from the power plants of Nunavik (for these last samples, only chromium and lead were analyzed). The results show that, for all the samples, measured concentrations are lower than the standards.

Used oil will be stored at Hydro-Québec's premises in a closed chamber. The chamber in itself is designed so that no accidental spill could flow outside (sealed floors, no drains, etc.). Oil is transferred directly from the power-plant's motors into the furnace's reservoir (if not full). If full, oil is transferred into barrels by the use of a pump.

Security measures in place are:

- the perimeter of Hydro-Québec's building is fenced;
- fire detection devices and alarm systems are in place;
- no vehicle can enter the storage chamber;
- the furnace is equipped with an automatic shut-down device triggered when the temperature is too high;
- an operator is present from 7 AM to 12 PM in winter.

Monitoring : the only proposal put forward by the proponent is to install a sampling hatch on the oil reservoir so it will be possible to verify the quality of the oil.

KEQC 10/96

Kativik Environmental Advisory Committee
Secretariat

October 2, 1996

To the members of the Committee,

Subject: Next meeting of the Committee

Dear members,

You will find enclosed the notice of meeting and agenda proposal for the Committee's next meeting. The draft minutes of the last meeting are also included.

- As concerns item #5, you should have in hand the document transmitted to us by the KEQC last June. If that is not the case, please advise me. I remind you that the Committee has been asked to analyse this document and formulate, the case being, comments.

- For item #8, I have prepared a budget summary covering the last two fiscal years as well as the first six months of the present fiscal year.

- As concerns the revision of the Mining Act, the ministère des Ressources Naturelles wishes to collect recommendations before finalizing the draft act. The representatives of the ministry will join us to discuss environmental aspects of the Act.

The waste management file seemed to me closed until Mme Claudette Journault, chairperson of the BAPE, phoned me. She confirmed that a complete chapter of the report to be handed to Mr. Cliche, minister of the Environment and Wildlife, will be devoted to waste management in Nunavik. Mme Journault proposes that the KEAC participate actively to the preparation of this chapter and signs it jointly with the BAPE. Practically, during the next few weeks, the BAPE will contact the secretariat to start drafting the chapter. Mme Journault aims at having a draft ready for our next meeting. At that time, the Committee will have to discuss the appropriateness of co-signing or simply discuss the role it intends to fulfill.

P.O Box 75
Kuujjuaq (Québec)
J0M 1C0

Telephone : (819) 964-2681
Fax : (819) 964-2502

Gouvernement du Québec
**Ministère de l'Environnement
et de la Faune**

**Direction de l'évaluation environnementale
des projets en milieux hydrique et nordique**

To copies Secretary

RECEIVED 96.10.7

Le 30 septembre 1996

Monsieur Peter Jacobs
Président
Commission de la qualité
de l'environnement Kativik
Université de Montréal
Faculté d'aménagement
5620, rue Darlington
Montréal (Québec) H3T 1T2

**OBJET : Valorisation des résidus huileux à des fins énergétiques
Centrale diesel de Kuujjuarapik
N/Référence : 3215-22-10**

Monsieur le Président,

Vous trouverez ci-joint une copie des renseignements préliminaires concernant le projet mentionné en titre; je transmets également des copies au secrétaire de la Commission et aux autres membres désignés par celui-ci. Ces renseignements ont été adressés au sous-ministre de l'Environnement et de la Faune, le 30 août dernier, par Monsieur André Delisle d'Hydro-Québec.

Conformément à l'article 192 de la Loi sur la qualité de l'environnement, je vous demande de faire parvenir au sous-ministre la décision de la Commission

...2

Édifice Marie-Guyart, 6e étage
675, boul. René-Lévesque Est
Québec (Québec) G1R 5V7

Téléphone : (418) 521-3850
Télécopieur : (418) 644-8222

sur l'opportunité d'assujettir ce projet à la procédure d'évaluation et d'examen des impacts sur l'environnement et le milieu social et, le cas échéant, en vertu de l'article 195, ses recommandations sur la portée de l'étude à réaliser.

Veuillez agréer, Monsieur le Président, l'expression de mes meilleurs sentiments.

Le directeur,

Pierre Lefebvre

HC/

p.j.

c.c. M^{me} Mallee Saunders, secrétariat, ARK
M. Jean-Guy Dugré, DRAT, MEF

Hydro Québec

MINISTÈRE DE ... ENVIRONNEMENT ET DE LA FAUNE
REÇU LE
3215-22-10
18 OCT
25454
BUREAU DU SOUS-MINISTRE

Le 30 août 1996

André Delisle
Vice-président exécutif
Finances et Comptabilité

Hydro-Québec
75, boulevard René-Lévesque ouest
Montréal (Québec)
H2Z 1A4

Monsieur Jean Pronovost
Sous-Ministre
Ministère de l'Environnement et de la Faune
Édifice Marie-Gyart, 30e étage
675, Boulevard René-Lévesque Est
Québec (Québec)
G1R 5V7

Objet: Demande de non-assujettissement
Valorisation des résidus huileux à des fins énergétiques
Centrale diesel de Kuujjuarapik

Monsieur le Sous-Ministre,

La présente constitue une demande d'attestation de non-assujettissement à la procédure d'évaluation et d'examen des impacts sur l'environnement, relativement au projet de valorisation des résidus huileux à des fins énergétiques. Cette demande est adressée conformément au chapitre II, article 189 de la Loi sur la qualité de l'environnement.

Le projet consiste dans un premier temps, à valoriser les résidus huileux de la centrale diesel de Kuujjuarapik à des fins énergétiques. Cette valorisation énergétique se fera par l'entremise d'une fournaise spécialement conçue à cet effet. Dans un deuxième temps, en fonction des besoins, de la rentabilité et des résultats obtenus avec la centrale de Kuujjuarapik, un tel projet pourrait être appliqué à d'autres sites d'Hydro-Québec. Nous espérons que les renseignements fournis dans le cadre de cette demande suffiront à constituer une référence pour les autres centrales diesel localisées au Nord du 55e parallèle (au total, 14).

Au soutien de notre demande d'attestation de non-assujettissement et conformément à l'article 190 de la LQE, vous trouverez ci-joint 15 copies du document intitulé « Demande de non-assujettissement, valorisation des résidus huileux de la centrale de Kuujjuarapik à des fins énergétiques ». De plus, nous avons fait parvenir en parallèle, à monsieur Jean-Guy Dugré, directeur régional, ministère de l'Environnement et de la Faune, direction régionale de l'Abitibi-Témiscamingue, copie du dossier.

Nous souhaitons pouvoir débuter ce projet dès la mi-octobre dû aux conditions climatiques locales.

Pour toute information relative à ce projet, veuillez communiquer avec monsieur Réjean Morneau, chargé d'équipe Environnement, au numéro de téléphone (418) 724-1180.

Veuillez agréer, Monsieur le Sous-Ministre, l'expression de nos sentiments les plus distingués.

André Delisle

ANDRÉ DELISLE
Agissant à titre de président-directeur général

c.c. Yves Filion
Hélène Gauthier-Roy
Denise Therrien
pièces jointes

ᑲᑎᕕᒃ ᓄᓇᒥ ᐊᓯᒪᓯᓂᐅᑎᒪᔾᒋᑦᑕ ᑲᑎᒪᔾᒋᑦ
comité consultatif de l'environnement KATIVIK
KATIVIK environmental advisory committee
C.P. 9, KUUJJUAQ, QUÉBEC, J0M 1C0 • TÉL.: (819) 964-2941

Le 27 septembre 1990

M. Claude Grenier
Gérant
Administration régionale Kativik
Case postale 9
Kuujjuaq (Qc)
J0M 1C0

OBJET: UTILISATION DES HUILES USÉES

Monsieur,

Le 12 septembre dernier, le Comité consultatif de l'environnement Kativik étudiait, à la demande des représentants de l'Administration régionale Kativik, la possibilité d'utiliser les huiles usées pour abattre la poussière dans les communautés nordiques.

Le problème de la poussière qui prévaut actuellement dans plusieurs villages peut être qualifié de sérieux pour la santé publique et devrait être abordé immédiatement et de façon concrète par l'Administration régionale Kativik . A Kuujjuaq, notamment, on distingue une nette augmentation du traffic routier, un mauvais état des routes, des vents forts et la disparition progressive de la végétation environnante qui occasionne également de la poussière.

A la lumière de la discussion, il apparait que le problème de la poussière est en grande partie causé par l'absence de règlementation sur l'usage des véhicules moteurs (âge minimum, limite de vitesse, tracé, signalisation). Le non respect des zones résidentielles, des terrains recouverts de végétation et des aires de circulation entre les habitations, contribue également à éroder dramatiquement le couvert organique pouvant fixer naturellement les sols et supporter la végétation.

L'utilisation d'huiles usées dans les rues pour abattre la poussière représente évidemment une solution efficace et peu dispendieuse; cependant, en raison des effets néfastes sur la santé humaine et sur l'environnement en général que cette pratique est susceptible d'engendrer, nous croyons préférable que les municipalités et l'Administration régionale Kativik étudient sérieusement des méthodes plus douces et probablement plus appropriées pour contrôler la poussière. De plus, l'épandage d'huiles usées ne corrigerais pas le problème de la poussière hors des routes.

Le Comité consultatif recommande donc à l'Administration régionale Kativik de s'impliquer directement dans ce dossier auprès des municipalités concernées afin de les encourager à règlementer le contrôle de la circulation et à mettre sur pied un programme de renaturalisation et de revégétation.

Veuillez agréer, Monsieur, l'expression de nos sentiments les meilleurs.

Le Président,

Hubert Marcotte

Hubert Marcotte

87.180 32.3.7

HBOGC

NOV 7 1985

RECEIVED

Canterra

HUDSON BAY OIL & GAS
COMMITTEE

KIVALLIQ CONSULTING,
MANAGEMENT
AND TRAINING SERVICES

DON SUTHERLAND OF CANTERRA ENERGY LTD. CONTACTED US THIS WEEK WITH THE FOLLOWING INFORMATION : DRILLING ACTIVITIES HAVE FINISHED IN HUDSON BAY WITH THE DRILLSHIP NEDDRILL 2 HAVING BEGUN IT'S LONG VOYAGE TO ST. JOHN NEWFOUNDLAND ON OCTOBER 21.

ACCOMPANIED BY 2 SUPPLY VESSELS, INCLUDING THE ARCTIC SHIKO (THE STRONGEST ICE STRENGTH BOAT THE COMPANIES HAVE) THE SHIPS WERE PROGRESSING THROUGH THE HUDSON STRAIT BY OCTOBER 24TH.

THIS SUMMER'S DRILLING SEASON SAW 2 WELLS, BELUGA AND NETSIQ DRILLED BY CANTERRA ENERGY LTD. REPRESENTING A NUMBER OF COMPANIES IN THE SEARCH FOR OIL AND GAS IN HUDSON BAY.

CANTERRA ANNOUNCED THIS WEEK THAT TEST SAMPLES TAKEN THIS SUMMER SHOW THAT BOTH WELLS WERE DRY. AS PART OF THE PROCESS FOR MAKING SURE THE WELL IS TIGHTLY SEALED 4 CEMENT PLUGS WERE SET DOWN AT VARIOUS DEPTHS IN THE 1,040 METRE DEEP WELL. A CEMENT CAP WAS PUT AT THE TAP OF THE WELL.

VIDEO CAMERAS WERE TAKEN UNDERWATER TO RECORD THIS ACTIVITY AND THE ENSURE THAT NO BUBBLES WERE COMING OUT OF THE HOLE. THE CAMERAS WERE USED AGAIN AS PART OF THE METHOD TO ENSURE THE WELL IS COMPLETLY SEALED.

THE MEMBERS OF THE NORTHERN CREW CAME OF THE SHIPS ON OCTOBER 18. CANTERRA WILL SOON BE SENDING A DELEGATION OF SENIOR VICE-PRESIDENTS OF INTERCITY GAS (I.C.G.),

TRILLIUM RESOURCES AND THEIR OWN VICE-PRESIDENT TO RANKIN INLET ON NOVEMBER 15TH TO MEET CHAIRMAN OF THE HUDSON BAY OIL AND GAS COMMITTEE PETER ERNERK AND PRESENT ADDITIONAL INFORMATION FOR PRESS DISTRIBUTION.

WE AT KIVALLIQ HAVE BEEN BUSY INFORMING COMMUNITIES AND ORGANIZATIONS ABOUT THIS LATEST HAPPENING. WE HAVE ALSO BEEN COLLECTING INFORMATION, AND REPRESENTATIVE OF THE COMMUNITIES OF CAPE DORSET AND SUGLUK HAVE HELPED US PROVIDE WEEKLY ICE FORMATION REPORTS IN AND AROUND THE HUDSON STRAIT AREA WHICH WERE THEN PASSED ON TO CANTERRA.

AT THIS TIME THE COMPANIES REMAIN COMMITTED TO MAKING A TOUR, POSSIBLY IN JANUARY TO A NUMBER OF THE HUDSON BAY COASTAL COMMUNITIES TO PRESENT THEM WITH THE FINALIZED REGIONAL BENEFITS BOOKLETS AND WILDLIFE OBSERVATION REPORTS IN ENGLISH AND INUKTITUT.

IN OUR EFFORTS TO KEEP YOU INFORMED WE ARE ASKING YOUR CO-OPERATION IN LETTING US KNOW OF ANY QUESTIONS YOU MIGHT HAVE THAT WE CAN SEEK ANSWERS REGARDING.

PLEASE FEEL FREE TO CONTACT US HERE AT KIVALLIQ BY CALLING COLLECT ANYTIME AT (819)-645-2790 OR 2731.

SINCERELY,

CAROLINE WAH-SHEE ANAWAK

THE HUDSON BAY OIL AND GAS COMMITTEE HELD IT'S MEETING ON AUGUST 19-22, 1985 IN RANKIN INLET, N.W.T..
COMMITTEE REPRESENTATIVES ATTENDING WERE:

PETER ERNERK - CHAIRMAN AND K.I.A. REPRESENTATIVE (KEEWATIN INUIT ASSC.)
SOLOMON VOISEY/JACK ANAWAK - KEEWATIN REGIONAL COUNCIL (K.R.C.)
ANNIE NATTAQ - BAFFIN REGIONAL INUIT ASSC.(B.R.I.A.)
JOHNASSIE ARRAGUTAINAQ - BAFFIN REGIONAL COUNCIL (B.R.C.)
JOSEPHI KELEUTAK - KATIVIK REGIONAL GOV'T. (K.R.G.)
PAULOOSIE OKITUK - MAKIVIK CORPORATION

THE INDUSTRY REPRESENTATIVES FROM CANTERRA ENERGY LIMITED ATTENDING THE MEETING WAS BARRY WORBETS OF CALGARY, ALBERTA.

DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT REPRESENTATIVES WERE:

PETER KUSUGAK - D.I.A.N.D. RANKIN INLET
BERT SHAW - D.I.A.N.D. OTTAWA
DAVID LIVINGSTON - D.I.A.N.D. OTTAWA
DONAT MILORTOK - TUNGAVIK FEDERATION
METRO SOLOMON - KEEWATIN REGION - DEPARTMENT OF EDUCATION

THREE DAYS OF DISCUSSION FOLLOWED IN WHICH CANTERRA'S HIRING TRAINING AND DRILLING PROGRAMS WERE REVIEWED.

FURTHER DISCUSSION ALSO INCLUDED HOW SUCH NON-RENEWABLE RESOURCE ACTIVITY IN HUDSON BAY MAY AFFECT OTHER ISSUES SUCH AS LAND CLAIMS NEGOTIATIONS, EDUCATION AND TRAINING, ENVIRONMENTAL PROTECTION, RESOURCE REVENUE SHARING AND BUSINESS AND EMPLOYMENT OPPORTUNITIES.

IT WAS ARGUED THAT CANTERRA WOULD INFORM THE H.B.O.G.C. AS SOON AS POSSIBLE AS TO THEIR FINDINGS AT THE END OF THE DRILLING PROGRAM. AT THAT TIME THE COMPANY WILL MAKE KNOWN WHAT PLANS IT HAS EITHER TO CONTINUE IT'S PROGRAM NEXT YEAR OR TO STOP THIS YEAR BASED ON WAHT IS FOUND THIS SUMMER.

THE NEXT HUDSON BAY OIL AND GAS COMMITTEE MEETING WILL BE HELD IN NORTHERN QUEBEC IN THE EARLY WINTER.

RESOLUTIONS WERE PASSED AT THIS MEETING INCLUDING:

1) A RESOLUTION CALLING ON THE KEEWATIN, BAFFIN AND NORTHERN QUEBEC DEPARTMENTS OF EDUCATION AND FEDERAL DEPARTMENT OF MANPOWER TO GET TOGETHER TO PLAN, LOCATE FUNDING AND OFFER TRAINING COURSES THAT ADEQUATELY PREPARE NORTHERNERS FOR JOBS AT ALL LEVELS IN THE NON-RENEWABLE RESOURCE INDUSTRY.

2) A RESOLUTION IN SUPPORT OF CURRENT LAND CLAIMS' NEGOTIATIONS THAT ACKNOWLEDGES THE ON-GOING PROCESS.

3) A RESOLUTION OF SUPPORT FOR KIVALLIQ CONSULTING, MANAGEMENT AND TRAINING SERVICES LTD'S EFFORTS TO PROVIDE INFORMATION ON THE H.B.O.G.C. OIL AND GAS INDUSTRY IN GENERAL AND CANTERRA ENERGY'S PROGRAM IN PARTICULAR. THIS RESOLUTION ADVISES KIVALLIQ THAT MEMBER ORGANIZATIONS ON THE H.B.O.G.C. WISH TO CONTRIBUTE FUNDING TO ENABLE THIS COMPANY TO BE CONTRACTED FOR ADDITIONAL DAYS PER MONTH FROM OCTOBER TO DECEMBER UNTIL CANTERRA'S FUTURE PLANS ARE KNOWN.

MEMBERS OF THE H.B.O.G.C. WERE TAKEN BY BARRY WORBETS VIA HELICOPTER OUT TO THE NEDDRILL 2 DRILLSHIP AND TO CHURCHILL, MANITOBA. THE GROUP HAD THE CHANCE TO VIEW THE DRILLING OPERATION AND THE FACILITIES AS WELL AS TALK TO STAFF ON THE BOAT AND AT THE CHURCHILL BASE.

CREW CHANGES OCCURRED LAST WEEK AND FURTHER CHANGES FOR THE NORTHERN CREW WILL AGAIN TAKE PLACE DURING THE SECOND/THIRD WEEKS OF SEPTEMBER.

MINUTES OF THE FULL HUDSON BAY OIL AND GAS COMMITTEE MEETING ARE AVAILABLE FROM KIVALLIQ.

WE WILL DO OUR BEST TO KEEP YOU INFORMED. PLEASE CALL US COLLECT IF YOU HAVE ANY CONCERNS OR REQUIRE FURTHER CLARIFICATION.

SINCERELY,

CAROLINE ANAWAK

31.3.6
87.180

KIVALLIQ
CONSULTING MANAGEMENT
AND TRAINING SERVICES LTD.

BOX 155
RANKIN INLET
N.W.T.
XOC OGO

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SINCERELY,

CAROLINE ANAWAK

CWA/AA

31.3.5
87.180

CANTERRA HUDSON BAY PROGRAMS
FACT SHEET

Well Information

a) Name and Location : Trillium Soquip Onexco et al Beluga O-23: 59°12'54'N and 88°33'27'W
ICG Sogepet et al Netsiq N-01: 59°50'48"N and 87°30'59.5"W
Approximately 310 Km NE of Churchill, Manitoba

b) Water Depth : Beluga - 180 meters. Netsiq -170 meters.

c) Total Depth : Beluga - 2,400 meters. Netsiq - 1,300 meters.

d) Geological Target : Primary - Silurian Carbonates (Ekwan formation)
Secondary - Ordivician Carbinates (Redhead Rapids formation).

e) Estimated Duration : Beluga - 30-45 days.
Netsiq - 30-45 days.
Total time in Hudson Bay approximately 100-120 days.

f) Partners (W.I.) Netsiq: Canterra Energy Ltd. (5%), Inter-City Gas Frontier Exploration (41%), Sogepet Limited (39%), Trillium Group (15%).

Beluga: Trillium Exploration Corporation (20%), Sogepet Limited (40%), Canterra Energy Ltd. (5%), Canadian Occidental Petroleum Ltd (10%), Onexco Oil and Gas Ltd. (20%), Inter City Gas (15%).

Support Bases

a) St. John's : Operational control center: main mobilization area for drilling unit and supply vessel. In operation since 1979.

b) Winnipeg : Coordinating center for crew changes and freight transfers.

c) St. Albert, Alta. : Central communication system - established for all Canada Lands.

d) Churchill : Forward staging base for crew changes, freight transfer and emergency response.

e) Calgary : Company head office - overall project management and direction.

Equipment and Logistics

a) Drilling Unit : Neddrill 2: drillship rated at Arctic Ice Class A with operating capacity in both dynamic positioning and anchored mode. Contractor: Bawden Western Oceanic Offshore Ltd.

b) Supply Vessels : MV Arctic Shiko: used for rig re supply and standby duties. Rated at Arctic Ice Class I. Contractor: Seaforth Fednav Inc.

: MV Tounl: - used primarily for ice towing, standby, and anchor handling. Rated at Arctic Ice Class A. Contractor: Seaforth Fednav Ltd.

: MV Takapu: - primary useage ice towing, anchor handling and standby. Rated at Arctic Ice Class A. Contractor: Seaforth Fednav Ltd.

c) Aircraft

- Helicopter: Two bell 214 S.T. Helicopters with a passenger capacity of approx. 12-14 will be used for crew transfers to and from the rig. Contractor: Okanagan/ Universal Helicopters.
- Fixed Wing - one HS748 aircraft with passenger capacity of 30 plus freight will be used for crew changes, freight transfer and ice observation. Contractor: Bradley Air Services Ltd.
- Commercial Airlines: Crew transfers to/from Winnipeg.

Safety

1. Comprehensive emergency response plan developed for Artic waters will be adapted to the Hudson Bay area.
2. All personnel on board the vessels will have Basic Offshore Survival Training, MEDS or equivalent plus rig specific training.
3. All personnel travelling to and from rig will be required to wear full survival suit.
4. All supervisory drilling personnel have completed 2nd line blowout prevention and well control program conducted by PITS.
5. A Canterra medical doctor will be in place on rig at all times.
6. Canterra will have two helicopters in the area at all times in order to provide backup in case of emergency.

Expenditures : Estimated total expenditures - $39,500,000.
Estimated Canadian expenditures - $23,200,000 (58%)
Estimated regional expenditures - $9,300,000 (23%)
Estimated local expenditures - $3,500,000 (9%) (Hudson Bay communities).

Non-Canadian expenditures reflect foreign construction of the drilling unit, supply vessels and specialized equipment such as wellheads and large diameter casing currently not manufactured in Canada. Regional expenditures reflect expenditures made in operational areas i.e. Newfoundland during mobilization and the Hudson Bay region during drilling.

Manpower (Canterra and Contractor)

	Total	Canadian	Regional
Drilling Unit	165	112	27
Supply Vessels	76	76	34
Land Bases	51	49	29
	292	237 (81%)	90 (31%)

Regional employees reflect those workers residing in the areas where activities are occurring i.e. base locations, Newfoundland or the Hudson Bay communities. A minimum of 25 positions will be reserved for local residents of communities in the Hudson Bay region.

Indian and Northern Affairs Canada — Affaires indiennes et du Nord Canada

28.12
87.180

March 12, 1985

Your file Votre référence

Our file Notre référence
N-1165-04

Danielle Wetherup,
Director General,
Renewable Resources and
Northern Environment.

Meeting of the Hudson Bay Oil & Gas Committee, March 6-7, 1985

The Hudson Bay Oil and Gas Committee (HBOGC) met on March 6 and 7 in Ottawa to discuss a number of items, principally their terms of reference, budget, the contribution agreement, Canterra's exploratory drilling program and related environmental research.

The Committee was represented by:

Peter Ernerk, Keewatin Inuit Association (Chairman)
Eckalook Parr, Baffin Region Inuit Association
Jack Koneak, Makivik
Quppaq Tayaraq, Inuit Tapirsat of Canada
Jonah Kringayuk, Keewatin Regional Council
Joanisi Arragutainak, Baffin Regional Council
(Kativik was not represented)

DIAND was represented by Peter Koosigak (Rankin District Office), Andy Theriault (Frobisher) and myself. We were asked by the committee to attend the entire meeting. (Peter Koosigak will likely be the main DIAND contact with the Committee and will be responsible for administering the terms of the contribution agreement. He will presumably also attend Committee meetings and provide us with the minutes of these meetings, act as liaison as required and perform related functions.)

Also in attendance were:

- Lorraine Brooks, Doug Nakashima and Edward Tukkiapik of Makivik's research group (afternoon of the 6th and morning of the 7th);
- Lynn Ibeck of Trillium (morning of the 7th);
- Barry Worbetts of Canterra (morning of the 7th);
- Margaret Ault, Wayne Greenall and Jim McTaggart-Cowan of COGLA (morning and part of the afternoon of the 7th);
- John Hickes of Nunasi (6th and 7th).

Canada

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On Wednesday morning (the 6th) the Committee discussed in detail its terms of reference, budget and the contribution agreement. All were accepted as written and the Committee signed the contribution agreement in the afternoon. The Committee also unanimously passed a resolution (85-1) accepting the proposed budget of $94,600 for 1985/86.

On Wednesday afternoon Makivik's research group presented to the Committee a proposal to study eider ducks in southeastern Hudson Bay, a proposal which the group will be submitting to the ESRF for funding. The study is intended to identify critical eider habitat (i.e. breeding, moulting, feeding and wintering areas), periods of use, and to estimate the size and stability of the eider population through nest counts. The sutdy would take place in the summer of 1985 at an estimated cost of $150,000-$200,000. After considerable discussion the Committee passed a resolution (85-2) supporting the study (resolution attached).

Canterra and Trillium Resources outlined their 1985 work program on Thursday morning (7th). While the Committee seems to regard Canterra's drilling proposal as a fait accompli and welcomes the economic benefits associated with the program (twenty or more jobs), it remains very concerned about the potential environmental risks. Most of the questions directed to the industry representatives focused on these concerns although no specific recommendations for further studies were made, other than the eider duck proposal. Canterra has made a number of commitments to the Committee, including:

- a visit to the Hudson Bay communities in early May to discuss the details of the drilling program;
- funding for a full-time coordinator/facilitator for the Committee from May through September, 1985;
- hiring at least twenty individuals from the region for the drilling program;
- attending the economic development conference in Rankin Inlet, March 27 & 28, 1985.

Canterra also arranged to have the Committee members flown to St. John's for a tour of its offices and a visit to a drillship. This trip, at Canterra's expense, took place immediately following the meeting.

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On Thursday afternoon McTaggart-Cowan of COGLA briefed the Committee on the ESRF mechanism and offered his assistance should the Committee wish to present a proposal for ESRF funding. (Under the terms of reference the Committee is encouraged to prepare for ESRF funding, proposals on environmental and socio-economic issues it considers significant.) COGLA also outlined the steps required by government before the drilling program begins.

The Committee discussed a number of internal administrative matters throughout the two day meeting, including membership, procedures, location of the next meeting (probably Rankin Inlet in May), financial arrangements, Canterra's offer to fund a full-time coordinator for five months and communication amongst members. Peter Ernerk was unanimously re-elected chairman for another year.

Overall, the meeting was productive and harmonious and the Committee members seemed anxious to get on with the job. The contribution agreement must be signed by the Kativik member and returned to me so that the final arrangements can be made for funding, but beyond that the Committee does seem to be on its way. (At last).

David Livingstone

David Livingstone,
Environmental Assessment
Scientist,
Marine Environment Division,
Northern Environment Directorate.

c.c. Ted Langtry
Harry Woodward
Simon MacInnes
Robert Sterling

Att.

Resolution No. 2 March 6, 1985

Whereas the Hudson Bay Oil and Gas Committee has a mandate to review oil and gas activities in Hudson Bay in order to make recommendations to ensure the protection of the environment, wildlife and the interest of Inuit in the region;

Whereas the Committee supports, in principle, research projects designed to provide information to respond to possible negative consequences of oil and gas activity;

Whereas the Committee has had an opportunity to review a proposed project by the Research Department of Makivik to survey the eider duck populations of south eastern Hudson Bay in order to prepare baseline documentation on this important species;

Therefore be it
Resolved that the Committee supports the Research Department of Makivik's proposal to the Environmental Studies Revolving Fund to conduct studies on eider ducks in south eastern Hudson Bay.

Moved by: E. Parr

Seconded by: Jackie Koneak.

3 Support
1 against

Carried

87.180

for KEAC info 27.3.4

Government of Canada
Fisheries and Oceans

Gouvernement du Canada
Pêches et Océans

Canada Oil and Gas
Lands Administration

Administration du pétrole
et du gaz des terres du Canada

Effects of Explosives Use in the Marine Environment

A Workshop Held in Halifax

January 29-31, 1985

WORKSHOP ON EFFECTS OF EXPLOSIVES USE IN THE MARINE ENVIRONMENT

january 29 - 31, 1985

chateau halifax hotel
halifax

workshop objectives

(1) To review information and data on the use of explosives and other energy sources in marine seismic exploration and marine construction, and on the nature of discharges associated with these uses

(2) To review the effects of chemical explosives and other energy sources on marine fish, marine mammals and seabirds

(3) To review the effectiveness of mitigative measures in reducing explosives effects

(4) To assess the adequacy of existing research methods and effects models used to study and monitor marine explosives use

AGENDA

January 28 - Evening

Panel Chairmen (Sessions 2,3,4) and Working Group Chairmen and Rapporteurs (Session 5) Meet with Workshop Co-Chairmen (Rainer Engelhardt and Rod Paterson)	19:30-20:30
Session 2, 3 and 4 Chairmen Meet with Their Panelists	20:30-21:00

January 29 - Morning

Registration	08:00
Session 1: Plenary - Presentation of Background Papers	
Opening Remarks - Rod J. Paterson, Department of Fisheries and Oceans, Ottawa	08:30
(1) A History and Scientific Rationale of the Development of Guidelines to Cover the Use of Explosives in the Marine Environment Dennis Wright, Freshwater Institute, Department of Fisheries and Oceans, Winnipeg	08:45-09:25
(2) The Use of Explosives in Marine Seismic Exploration Graham Campbell, Canada Oil and Gas Lands Administration, Ottawa	09:25-10:00
(3) The Use of Explosives in Marine Construction Robert Booren, VME Associates, Toronto	10:00-10:35
Coffee	10:35-10:50
(4) The Pressure Field of Common Marine Seismic Sources Peter Duncan, Pulsonic Geophysical Ltd., Calgary	10:50-11:25
(5) Acoustic Effects of Underwater Explosive Discharges Philip Staal, Defence Research Establishment Atlantic, Dartmouth	11:25-12:00
Lunch	12:00-13:00

January 29 - Afternoon

Session 2: Panel on Effects on Fish

Panelists

Chairman: Bob Wiseman, Department of Fisheries and Oceans, St. John's

Lincoln Baxter, Falmouth, Massachusetts

Charlotte Keen, Atlantic Geoscience Centre, Dartmouth, Nova Scotia

Peter Nix, E.V.S Consultants, Vancouver

David O'Keeffe, Naval Surface Weapons Center, White Oak, Maryland

Cal Ross, Mobil Oil, Canada Ltd., Halifax

Papers

(1) Mortality of Fish Subjected to Explosive Shock as Applied to Oil Well Severance on Georges Bank L. Baxter	13:00-13:25
(2) Explosive Shots in Marine Geophysics: 20 Years of Deep Seismic Studies off Eastern Canada C. Keen, K. Louden and I. Reid	13:25-13:50
(3) The Impact of Linear Explosives on Fish C. Ross, G. Hurley and J. Parsons	13:50-14:15
(4) Monitoring of Underwater Blasting and the Effectiveness of Techniques for Reducing Fish Mortality - False Creek, B.C. P. Nix and P.M Chapman	14:15-14:40
Coffee	14:40-15:00
Open Discussion: Panelists and Participants from the Floor	15:00-16:30
No-Host Bar	17:00-18:30

January 30 - Morning

Session 3: Panel on Effects on Marine Mammals and Seabirds

Panelists

Chairman - Rainer Engelhardt, Canada Oil and Gas Lands Administration, Ottawa

Don Ljungblad, Naval Ocean Systems Center, San Diego

Charles Malme, Bolt, Beranek and Newman Inc., Cambridge, Massachusetts

John Richardson, LGL Environmental Research Associates, Toronto

Raymond Stemp, Environmental Consultant, Calgary

Papers

(1) Observations on the Effects of Seismic Exploration on Seabirds — 08:30-08:55

R. Stemp

(2) Results of a Study on the Reaction of Bowhead Whales to Seismic Blasts in the Alaskan Beaufort — 08:55-09:20

D. Ljungblad, S. Swartz and B. Wursig

(3) Behavioural Reactions of Bowhead Whales to Seismic Exploration in the Canadian Beaufort Sea — 09:20-09:45

J. Richardson

(4) Behavioural Responses of Marine Mammals (Grey Whales) to Seismic Discharges — 09:45-10:10

C. Malme and P. R. Miles

Coffee — 10:10-10:30

Open Discussion: Panelists and Participants from the Floor — 10:30-12:00

Lunch — 12:00-13:00

January 30 - Afternoon

Session 4: Panel on Research Tools, Techniques and Limitations

Panelists

Chairman - Dennis Wright, Department of Fisheries and Oceans, Winnipeg

Lincoln Baxter, Falmouth, Massachusetts (modelling techniques)

Robert Booren, VME Associates, Toronto (field techniques)

David Munday, Coastline Environmental Services Ltd., Vancouver

John Parsons, Dartmouth, Nova Scotia (field techniques)

David O'Keeffe, Naval Surface Weapons Center, White Oak, Maryland (modelling techniques)

Papers

(1) A Survey of Field Techniques for the Study of Effects of Explosives Discharges in Marine Environments D. Munday	13:00-13:30
(2) Mitigation Measures for Controlling the Side Effects of Explosives Use in Water R. Booren	13:30-13:55
Open Discussion on Field Techniques: Panelists and Participants from the Floor	13:55-14:40
Coffee	14:40-15:00
(3) A Computer Model for Predicting the Effects of Underwater Explosions on Swim Bladder of Fish and Marine Mammals D. O'Keeffe	15:00-15:25
(4) Development of a Model to Predict Effects of Buried Charges on Fish Populations in Shallow Water Areas D. Munday	15:25-15:50

Open Discussion on Modelling Techniques: Panelists and Participants from the Floor	15:50-16:30
No-Host Bar	17:00-18:30

January 30 - Evening

Panel Chairmen Meet with Workshop Co-Chairmen (Rod Paterson and Rainer Engelhardt) to Determine Topics for Session 5 Working Groups	20:00-21:00
Working Group Chairmen and Rapporteurs Meet with Workshop Co-Chairmen	21:00-21:30

January 31 - Morning

Brief Plenary to Introduce Working Groups	08:30-08:45

Session 5: Four Concurrent Working Groups, Each Addressing A Key Question Arising from Panel Sessions

08:45-10:45

Working Group A:	Chairman	Graham Campbell
	Rapporteur	Duncan Hardie
Working Group B:	Chairman	George Greene
	Rapporteur	John Appleby
Working Group C:	Chairman	Rod Paterson
	Rapporteur	
Working Group D:	Chairman	
	Rapporteur	Paul Chénard

Coffee	10:45-11:00

Session 6: Plenary Session for Presentation of Working Group Results and Workshop Wrap-up

Report of Working Groups	11:00-11:40
Closing Remarks - F. Rainer Engelhardt, Canada Oil and Gas Lands Administration	11:40-12:00

87.180

27.13.1

Indian and Northern Affairs Canada — Affaires indiennes et du Nord Canada

December 6, 1984

Your file — Votre référence

Our file — Notre référence

NOTE TO FILE

Briefing Items for KERC Meeting, December 13th

A. Canadian Occidental

1. The company is rewriting the original bibliography compiled last spring.

2. At their own initiative the company has just completed a coastal sensitivity mapping exercise with a ground truthing component. (Contract to Environmental Applications Group of Toronto)

3. The company is gearing up for its oceanographic program in support of a drilling program approval. Three separate efforts are underway:

   i) in support of the oilspill trajectory work the company will initiate a study on dominant wind direction and wave height frequency;

   ii) they will be picking up current meter buoys and nine months of data (buoys deployed by Simon Princenburg);

   iii) will be examining Physical Environment Sections of the COGLA drilling guidelines and preparing an environmental program in compliance with Section L.5.

4. The company completed their site selection survey (high resolution seismic).

Canada

5. There is a possible merging of Intercity Gas and Can Occidental for the Hudson Bay Oil and Gas venture and talk of Petro-Canada coming in as the operator.

6. The company still wants to drill in 1985. Their EA still has not been signed.

has been signed by both EMR and DIAND

7. TB submission establishing HBOG ~~is in~~ DIAND Minister's ~~office.~~

B. Nato Flights

A letter has been prepared for ministerial signature informing the Ministry of Defence of the numerous complaints from Inuit and Indian communities and associations in Labrador, Newfoundland and Northern Quebec over the low flying path of Nato fighters.

A meeting of officials was requested to discuss these matters and the invitation extended to the Minister of National Defence to meet with DIAND's Minister to reach some mutually acceptable decision.

CM

C. Mageau,
Marine Environment Division.

Canada Oil and Gas Lands Administration
Administration du pétrole et du gaz des terres du Canada

A 6

SCHEDULE
Form C

East Coast: - Nova Scotia
- Newfoundland
- Gulf
West Coast
Northern
Hudson Bay

AUTHORITY TO CONDUCT AN ENVIRONMENTAL, RESEARCH, OR FEASIBILITY PROGRAM

Operator: Canadian Occidental Petroleum Ltd.
Operating Licence No.: 527 Est. Cost of Program: $ 70,000
Geographical area: Hudson Bay
Exploration agreement, provisional lease or production license to which this program applies: EA-282-010

Has funding from the Environmental Studies Revolving Fund been allocated? No
Applied for? No

Program

Purpose and Nature of Work (incl. program map if applicable): Aerial Survey and Video of Hudson Bay shoreline focusing on sensitive areas on the Southern and Eastern coasts. Actual coverage will be subject to weather limitations.

Equipment, Craft and Persons to be employed:
Equipment: video/sound system
Craft: Twin Otter Series 300
Persons: CanOxy Representative & 2 EAG Personnel
Estimated dates: Commencement: Oct.6/84 Completion: Oct.20/84
Prime Contractor: Environmental Applications Group Ltd. Location: Toronto

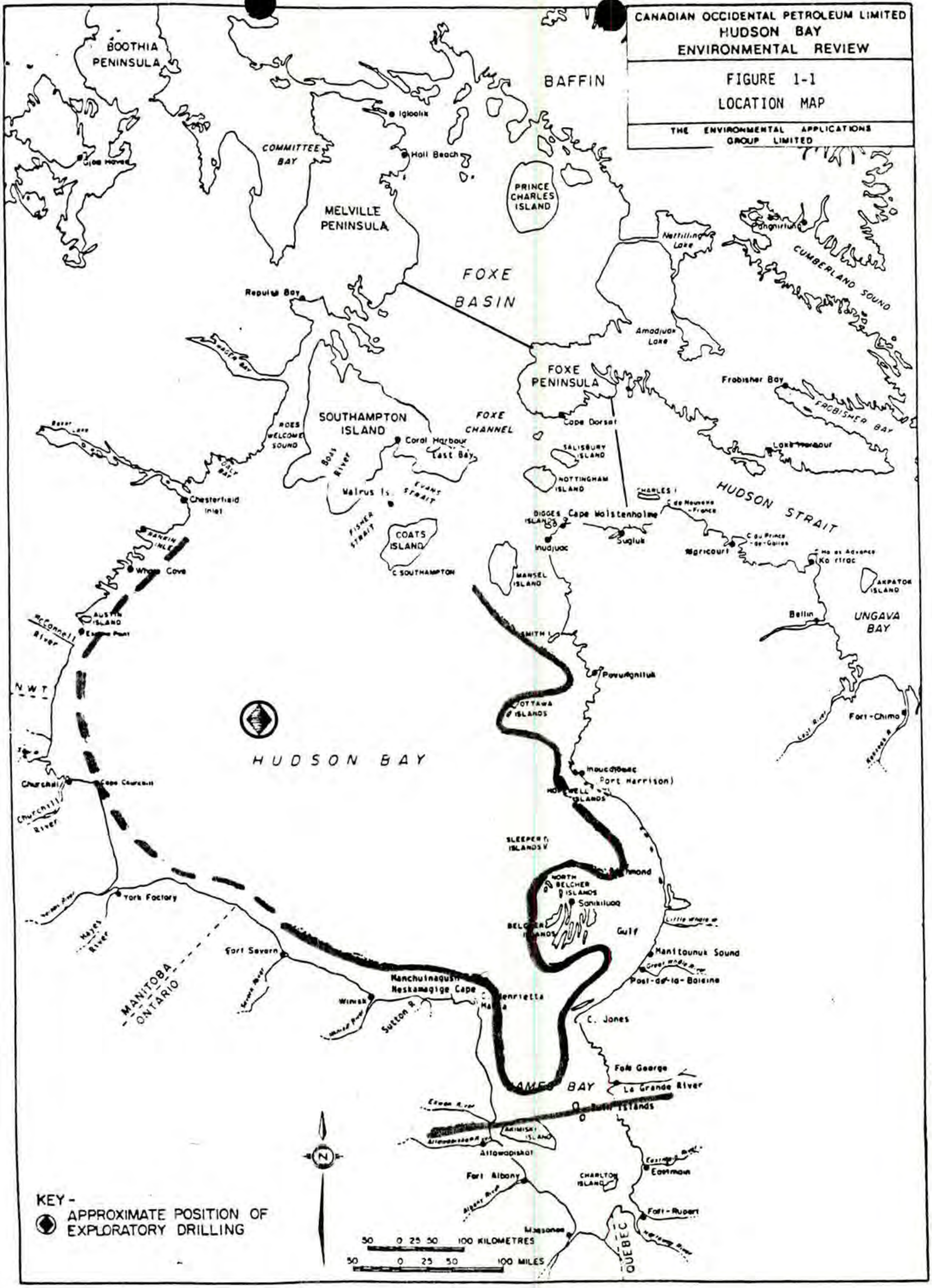
I understand that: (i) for the field work involved, the requisite advance notice in writing has to be provided to other governmental agencies; (ii) for field work in the Yukon and Northwest Territories, appropriate permits such as a land use permit have to be obtained; and (iii) a progress report on the study has to be provided to COGLA at least twice a month unless otherwise stated.

Signed: [signature] Title: Environmental Coordinator
Responsible Officer
Name: Lynne Ibach Company: Canadian Occidental
Date: Oct 1/84 Phone: 234-6840

Authorization

Conditions of Approval:
Signed: [signature]
Minister
Date: Oct 29/84 Program No.: 5740-C8-1E

Environment
Engineering
Resource Evaluation
Canada Benefits


CANADIAN OCCIDENTAL PETROLEUM LIMITED
HUDSON BAY
ENVIRONMENTAL REVIEW
FIGURE 1-1
LOCATION MAP
THE ENVIRONMENTAL APPLICATIONS GROUP LIMITED
BOOTHIA PENINSULA
BAFFIN
COMMITTEE BAY
Igloolik
Hall Beach
PRINCE CHARLES ISLAND
MELVILLE PENINSULA
FOXE BASIN
Repulse Bay
CUMBERLAND SOUND
Amadjuak Lake
FOXE PENINSULA
Frobisher Bay
FROBISHER BAY
SOUTHAMPTON ISLAND
ROES WELCOME SOUND
FOXE CHANNEL
Coral Harbour
East Bay
Cape Dorset
SALISBURY ISLAND
NOTTINGHAM ISLAND
Walrus Is.
EVANS STRAIT
HUDSON STRAIT
Chesterfield Inlet
DIGGES ISLANDS
Cape Wolstenholme
Sugluk
Inoudjouac
FISHER STRAIT
COATS ISLAND
C SOUTHAMPTON
Whale Cove
MANSEL ISLAND
AKPATOK ISLAND
Bellin
UNGAVA BAY
AUSTIN ISLAND
McConnell River
Povungnituk
N W T
OTTAWA ISLANDS
Fort-Chimo
HUDSON BAY
Inoucdjouac
(Port Harrison)
Churchill
Cape Churchill
Churchill River
SLEEPER ISLANDS
NORTH BELCHER ISLANDS
Sanikiluaq
York Factory
Hayes River
BELCHER ISLANDS
Gulf
Manitounuk Sound
Fort Severn
MANITOBA
ONTARIO
Post-de-la-Baleine
Winisk
Sutton R.
Henrietta
C. Jones
Fort George
JAMES BAY
La Grande River
Attawapiskat
Fort Albany
CHARLTON ISLAND
Eastmain
Fort-Rupert
QUEBEC
KEY -
APPROXIMATE POSITION OF EXPLORATORY DRILLING
50 0 25 50 100 KILOMETRES
50 0 25 50 100 MILES

ᑲᑎᕕᒃ ᓄᓇᒧᑦ ᐊᓯᒥᓪᓚᕆᐅᑎᓕᕆᔨᑦ ᑲᑎᒪᔨᖏᑦ

comité consultatif de l'environnement KATIVIK
KATIVIK environmental advisory committee
C.P. 9, KUUJJUAQ, QUÉBEC, J0M 1C0 • TÉL.: (819) 964-2941

Le 20 août 1984

M. Antonio Flamand
Directeur
Ministère de l'Environnement
Direction régionale du
Nouveau-Québec
C.P. 390
Radisson, Québec
J0X 2X0

Objet: Déversement d'hydrocarbures à Baie Déception

Monsieur le Directeur,

Lors de sa réunion du 17 juillet dernier à Québec, le Comité consultatif de l'environnement Kativik a fait le point sur le déversement d'hydrocarbures à Baie Déception.

Lors de cette réunion, plusieurs questions ont été soulevées sur les mesures préventives existant au Nouveau-Québec afin de prévenir et minimiser les impacts d'un déversement accidentel d'ydrocarbures. Il semble que la Société Asbestos n'aie pas fait le nécessaire afin d'ériger une digue autour de ses installations d'entreposage d'hydrocarbures, tel qu'exigé par la "Loi et règlement sur le commerce des produits pétroliers" (L.Q., 1977, c. 33).

Le Comité se demande si les autorités responsables de l'application de cette loi savaient si les installations à Baie Déception étaient ou non conformes à la loi et, si oui, pour quelles raisons aucune mesure n'a été prise pour rectifier cette situation. De plus, le Comité souhaiterait savoir s'il existe d'autres qui ne sont pas conformes aux exigences de cette loi au Nouveau-Québec. Compte tenu de la fragilité de l'écosystème nordique et afin d'éviter qu'un tel accident se reproduise, il nous semble important que les autorités responsables prennent toutes les mesures nécessaires pour faire appliquer les règlements en vigueur.

...2

Le Comité aimerait que vous lui fassiez parvenir une copie du rapport final sur le développement d'hydrocarbures à Baie Déception.

Je vous remercie de votre collaboration et vous prie d'agréer, Monsieur le Directeur, l'expression de mes sentiments les meilleurs.

Jacques Giguère

JG/rr

Jacques Giguère
Président

KEAC 25.3.1

Gouvernement du Québec
Ministère de l'Environnement
Direction régionale
du Nouveau-Québec

Radisson, le 23 juillet 1984.

Monsieur Hervé Chatâgnier,
Administration régionale Kativik,
C.P. 9,
Kuujjuaq, Qc
JOM 1CO

Objet: Déversement d'huile à la baie Déception

Monsieur,

Je vous fais parvenir, sous-pli, les rapports concernant le déversement d'hydrocarbure survenu à la baie Déception vers le 24 avril 1984.

Espérant le tout à votre satisfaction, veuillez agréer l'expression de mes sentiments les meilleurs.

RF/nc

Gaétan Soucy,
coordonnateur en région,
Urgence-Environnement.

C.P. 390
Radisson J0Y 2X0

<u>RAPPORT DE SURVEILLANCE</u>

RÉCUPÉRATION D'HYDROCARBURES DÉVERSÉS
À BAIE DÉCEPTION, NOUVEAU-QUÉBEC

du 9 au 29 mai 1984

Philippe Di Pizzo,
géographe.

/nc

Gouvernement du Québec
**Ministère de
l'Environnement**

Du 9 au 29 mai 1984, j'ai été affecté, en tant que représentant du ministère de l'Environnement, à la surveillance des opérations de récupération des hydrocarbures déversés accidentellement à Baie Déception au cours du mois de avril 1984.

Plus de 454 000 litres d'essence auraient été déversés (selon les rapports de Monsieur Richard Bonneau du MENVIQ), mais au cours des trois semaines durant lesquelles se déroula l'opération de récupération, moins de 18 000 litres d'essence ont été récupérés. A la lueur de ces chiffres, l'on constate que la récupération n'a pas réalisé les résultats anticipés:

1) l'essence a pu se diriger directement dans la baie située en aval du parc à carburant, après avoir imbibé la neige puis ruisselé sur le sol gelé jusqu'à la glace de la baie. De là, l'essence a pu emprunter une crevasse pour se diriger sur le fond de la baie;

<u>OU</u>

2) les vents, la température et l'ensoleillement ont favorisé une grande évaporation des hydrocarbures, car la persistance de l'essence dans l'environnement est très courte;

<u>OU</u>

3) l'essence a pu couler pendant plus de quatre jours sans surveillance, et la fuite aurait passé inaperçue jusqu'au 23 avril 1984.

De toute façon, il ne sera pas possible d'évaluer les impacts sur l'environnement avant la fin du mois de juin, lorsque la baie sera libérée des glaces qui l'emprisonnent. A ce moment, il serait indispensable de surveiller l'état des rives et de reprendre les opérations de récupération, s'il y a lieu de le faire.

...2

RAPPORT JOURNALIER DE SURVEILLANCE

9 mai 1984 (mercredi)

Départ pour Québec à 7h afin de rencontrer Monsieur Richard Bonneau de la direction régionale du Nouveau-Québec, lequel m'a expliqué la situation en détail, les mesures prises et celles à prendre.

Retour à Montréal à 19h.

10 mai 1984 (jeudi)

Départ pour Kuujjuaq et arrivée à 12h.

11 mai 1984 (vendredi)

Départ de Kuujjuaq vers Asbestos Hill à 8h et arrivée à 12h.

Départ pour Baie Déception avec Monsieur Jean Domergue à 13h30.

Arrivée sur le site touché par le déversement d'hydrocarbures à 14h30.

Température: -4°C
Ciel: dégagé et ensoleillé
Vent: faible

Lors de mon arrivée sur les lieux du déversement, aucun travail de récupération ou de surveillance n'était effectué. Monsieur Domergue, qui m'accompagnait, m'a conduit sur le site du déversement, et m'a exliqué ses intentions.

La température n'ayant pas été encore assez clémente, la neige qui contient une bonne quantité d'essence n'est pas fondue. Ainsi, il n'y avait que peu d'essence et d'eau dans le fond de la cuvette dans laquelle s'accumulent les eaux de ruissellement, à l'amont du ponceau. L'écoulement par ce ponceau est inexistant, car il est rempli de glace. En aval de la route, un barrage de un(1) mètre de hauteur a été érigé en travers du chenal qu'empruntent normalement les eaux de ruissellement. Il y a présence d'une mare d'essence de trois (3) mètres carrés environ, et l'écoulement du liquide est complètement arrêté en raison de la faible fonte de la neige. Le barrage est muni de tuyaux inversés, sans valve, afin de maintenir l'écoulement normal des eaux de fonte tout en retenant l'essence à la surface de l'eau. Le niveau du liquide dans la cuvette ainsi formée n'atteint même pas la hauteur des tuyaux.

Du chlorure de calcium a été étendu aux alentours du réservoir d'essence ainsi que dans le chenal d'écoulement des eaux de drainage. Plus tard en soirée, l'équipe de nuit effectuera le pompage du liquide accumulé en amont du ponceau et en amont du barrage, puis épandra du chlorure de calcium afin de favoriser une fonte plus rapide de la neige.

Depuis le début des opérations de récupération, environ 10 000 litres d'essence ont seulement été récupérés (2,195 gallons d'essence pure enregistrés en date du 4 mai dernier). Actuellement, moins de 1 300 litres de liquide sont pompés quotidiennement.

Un réservoir de 10,000 gallons (45 500 litres) sert à entreposer le produit récupéré, lequel est pompé dans la citerne à l'aide d'une pompe submersible électrique.

D'autre part, le matériau servant à ériger le barrage situé en amont du ponceau est déjà sur place, prêt à être utilisé. Les employés étendront du sel dans le fossé nord-ouest de la route pour enlever la neige et la glace afin de préparer l'assise du barrage.

<u>12 mai 1984 (samedi)</u>

Température: - 3°C
Ciel: ensoleillé avec passage de brouillard
Vent: très faible

Le sel étendu la veille a fait de l'effet et les mares d'eau et d'essence sont beaucoup plus volumineuses que la veille. La quantité de liquide qui a été pompée est d'environ 1 800 litres, ce qui est encore malgré tout très lent.

Après le pompage, du sel a été étendu afin de continuer le processus de fonte de la neige, mais celle-ci ne fondra pas en grande quantité tant que la température n'augmentera pas de façon plus prononcée.

La quantité de neige et d'essence fondue étant très faible, le pompage se fait à la fin de la journée, lorsque l'effet du sel et de l'ensoleillement ont été conjugés.

Dans la baie, il n'y a aucun changement dans la situation qui a été observée par Monsieur Richard Bonneau, l'épaisseur de la glace étant encore inchangée (environ 2,5 mètres).

13 mai 1984 (dimanche)

Température: - 3°C
Ciel: ensoleillé et dégagé, nuageux en fin d'après-midi
Vent: faible devenant moyen en fin d'après-midi

Le pompage entrepris à la fin de la journée a encore été inférieur à 1 300 litres d'eau et d'essence, car la situation reste inchangée. Une fois de plus, du sel a été étendu pendant la soirée afin qu'il fasse effet au courant de la nuit et de la journée de lundi.

14 mai 1984 (lundi)

Température: - 4°C
Ciel: ensoleillé
Vent: moyen NE 15mph

Le pompage a été effectué le matin et le soir, mais la quantité reste faible, toujours en raison de la faible fonte de la neige qui contient l'essence. Environ 1 300 litres de liquide ont été ramassés, dont moins d'un quart d'essence.

15 mai 1984 (mercredi)

Température: - 8°C
Ciel: nuageux avec brume
Vent: faible NE 10 mph

En raison de la basse température de la journée, le pompage a été fastidieux et peu de liquide a été puisé des cuvettes. Il n'y a aucun changement pour la journée. Moins de 900 litres ont été pompés, le matin et le soir.

16 mai 1984 (mercredi)

Température: - 1°C
Ciel: nuageux, un peu de brume
Vent: faible, NO 10 mph

La température clémente a permis une fonte de la neige plus appréciable; environ 2 200 litres ont été pompés, mais le liquide ne contient que très peu d'essence. Il semble que l'évaporation de l'essence soit quand même très importante, même si la température n'est pas au-dessus du point de congélation.

Aux dernières nouvelles reçues de Monsieur Daniel Berrouard, de la direction régionale du Nouveau-Québec, nous devrions recevoir sous peu du chlorure de sodium que nous étendrons sur les endroits où subsiste de la neige. Ce produit a une action beaucoup plus rapide que le chlorure de calcium et les résultats devraient être satisfaisants dans les jours suivants. Une dizaine de sacs de chlorure de sodium sont prévus pour mardi prochain le 22 mai et nous en ferons l'essai immédiatement. Si l'essai est positif, une plus grande quantité sera commandée.

17 mai 1984 (jeudi)

Température: 2°C
Ciel: ensoleillé
Vent: NO 23 mph

Aujourd'hui, la température clémente a faite fondre beaucoup de neige mais il semble qu'il ne reste que très peu d'essence imbibée dans la neige. En effet, malgré l'écoulement relativement important que l'on a observé tout au long de la journée, moins de 45 litres d'essence se sont accumulés dans la cuvette située en amont de la route alors qu'il n'y avait aucune présence d'essence dans la cuvette située en aval de la route. J'ai constaté que le liquide qui coulait du tuyau ne contenait aucune trace d'essence, ni même d'odeur.

Je considère que la situation restera inchangée même après la fonte complète de la neige; il y a lieu de croire que les estimations des experts, selon lesquelles seulement 10% de l'essence se serait dirigé dans la baie, sont inadéquates. Je crois que l'essence s'est frayée un chemin sous la neige et sous la glace de la baie, ce qui n'a pu être vérifié car la glace était, et est encore, très épaisse dans la baie. De plus, l'évaporation doit être forte, ce qui explique peut-être les résultats médiocres obtenus jusqu'ici.

19 mai 1984 (samedi)

Forte tempête de neige, visibilité nulle: impossible de se rendre jusqu'à la baie aujourd'hui.

20 mai 1984 (dimanche)

Température: - 10°C
Ciel: dégagé avec passage nuageux
Vent: O 25 mph

Nous nous sommes rendus difficilement à la baie, et nous avons effectué le travail prévu la veille. Le tempête a laissé une bonne quantité de neige, mais nous n'avons pas remarqué d'accumulation d'essence en aval de la route. Une flaque d'essence de trois-quart de pouce (3/4") d'épaisseur et de 10 pieds par 5 pieds environ reposait à la surface de la neige glacée, dans la cuvette située en amont de la route. Un peu d'essence se trouvait sous la neige, dans le chenal par lequel l'essence s'est écoulée depuis le réservoir jusqu'à la route. Je crois que cette essence provient de la surface du sol, qui a été lavée par la pluie qui a précédé la tempête de vendredi soir.

L'essence accumulée dans la cuvette a été pompée en moins d'une minute, soit une quantité inférieure à 22 litres. Par la suite, nous avons procédé au creusage de la tranchée. Cela fut très difficile en raison d'une part du sol encore très gelé, et d'autre part de la forte concentration de gros cailloux dans le sol.

Nous avons recueilli plusieurs échantillons d'eau:

1) l'eau de la baie ne contient qu'une trace d'essence;
2) l'eau de la cuvette située près du convoyeur ne contient aussi qu'une trace d'essence, non visible à l'oeil;
3) l'eau de la cuvette située en amont de la route contient environ 22 litres d'essence, soit 3/4" d'épaisseur sur la neige;
4) l'eau et la neige du chenal principal de l'écoulement semblent contenir encore une certaine quantité d'essence impossible à évaluer mais qui semble minime.

21 mai 1984 (lundi)

Température: - 4°C
Ciel: dégagé et ensoleillé
Vent: 20 mph du OSO

Monsieur Herbie Larochelle et moi-même, nous nous sommes rendus à la baie dès 8h; nous avons vérifié la tranchée creusée la veille et il n'y avait aucune trace d'essence dans cette tranchée. Le test est donc négatif. Par ailleurs, il n'y avait qu'un film d'essence dans la cuvette de laquelle nous avons pompé la veille, ce qui signifie que rien n'a coulé vers cette cuvette malgré la fonte de la neige qui a repris très vite. Il n'y avait aucune trace d'essence dans la cuvette située en aval de la route, donc aucun écoulement d'essence ne s'est fait vers la baie. Le chenal d'écoulement retient encore de la neige sous laquelle subsiste de l'essence, et nous avons donc convenu de bâtir un barrage afin de stopper l'écoulement lorsque celui-ci débutera à nouveau. Le barrage est situé non pas en avant de la calvette comme prévu, mais plutôt 15 mètres au nord, localisation la meilleure pour capter le reste de l'essence que semble contenir la neige à cet endroit-là. De toute façon, je ne crois pas qu'une grande quantité d'essence sera récupérée de cette façon. La construction de ce barrage aura lieu dans l'après-midi et le pompage sera inexistant aujourd'hui car il n'y a plus d'essence dans les cuvettes actuellement.

22 mai 1984 (mardi)

Température: - 3°C
Ciel: nuageux
Vent: SO 40 mph

Aucun pompage n'a été effectué aujourd'hui car il n'y avait aucune accumulation d'essence dans les cuvettes ni dans le chenal situé en amont du barrage érigé la veille.

23 mai 1984 (mercredi)

Température: - 1°C
Ciel: nuageux avec éclaircies
Vent: NO 30 mph

Je me suis rendu à la baie en compagnie de Messieurs Larochelle et Domergue, et nous avons constaté aucun changement dans la situation à l'exception d'une quarantaine de litres d'essence qui s'étaient accumulés en amont du barrage. Il semble peu probable que nous réussissions à récupérer beaucoup d'essence à cet endroit-là. A cause de la faible quantité d'essence récoltée, le pompage se fera plus tard en semaine, soit jeudi ou vendredi selon la quantité qui s'accumulera ultérieurement. Dans le chenal situé en aval de la route, sous le convoyeur, et qui se jette dans la baie, l'eau qui y coule ne contient aucune trace visible d'essence, bien qu'il y ait une odeur d'essence.

24 mai 1984 (jeudi)

Température - 2°C
Ciel: couvert avec quelques éclaircies
Vent: NO 18mph

En nous rendant à la baie, nous constatons que la situation de la veille n'a pas évolué. Le barrage est toujours en bon état, mais il n'y a pas davantage d'essence en amont de celui-ci et encore moins en aval. J'estime qu'il va falloir attendre le dégel complet de la baie pour mesurer exactement l'ampleur des dégats, si l'on suppose que l'essence a pris la direction de la baie avant même que l'on ne s'aperçoive qu'il y avait un déversement d'essence. La deuxième possibilité est l'évaporation de l'essence, qui explique les piètres résultats de récupération que nous avons obtenus en plus de 4 semaines de pompage.

25 mai 1984 (vendredi)

Température: - 3°C
Ciel: couvert
Vent: NO 10 mph

Il a été décidé, compte tenu de l'évolution des travaux, que la surveillance exercée par le ministère de l'Environnement pouvait être arrêtée à la Baie Déception. Il a été convenu de garder la digue en bon état et d'exercer une surveillance journalière sur le site du déversement; il faudra pomper l'essence accumulée s'il y a lieu et la laisser dans un contenant fermé et étanche en attendant d'autres recommandations quant à la disposition des hydrocarbures.

26 mai 1984 (samedi)

Température: 0°C
Ciel: dégagé
Vent: NO 20 mph

Lors de mon inspection à la baie Déception, je n'ai constaté aucun changement dans la situation qui prévalait sur le site du déversement. Je me suis promené sur la glace de la baie, à environ 1 km en amont et 1 km en aval, et je n'ai aperçu aucune trace d'essence sur la glace. La glace est par ailleurs toujours aussi épaisse qu'il y a un mois, et ne partira de la baie qu'à la fin du mois de juin.

27 mai 1984 (dimanche)

Température: 0°C
Ciel: dégagé avec passages nuageux
Vent: NO 15 mph

Mon inspection journalière n'a révélé aucune différence par rapport aux jours derniers. Bien qu'il y ait une forte odeur d'essence en décomposition, seule la neige fond mais sans apporter une quantité appréciable d'essence dans la cuvette.

29 mai 1984 (mardi)

Retour à Kuujjuaq, puis à Montréal.

* *

IMPACTS POSSIBLES

A ce jour, il est difficile d'établir les impacts sur l'environnement occasionnés par ce déversement d'essence. Néanmoins, il faut se rappeler que le milieu arctique est très fragile, la vitesse de dégradation naturelle et l'action des vagues et des marées sur le littoral est faible tout au long de l'année en raison de l'emprise des glaces.

Bien que ne comportant pas d'espèces rares ou menacées d'extinction, le site affecté par le déversement a un potentiel de rétablissement très long, supérieur à 2 ou 3 ans en général. S'il y a impact, celui-ci se verra surtout sur la faune aquatique de la baie Déception; notons que cette partie de la baie est utilisée intensivement et depuis très longtemps par les Inuit de Salluit sur une période allant de mai à fin de septembre environ. Ceux-ci tirent une importante partie de leurs ressources alimentaires (omble chevalier, phoque commun...) des eaux de la baie Déception.

Sur la rive même, la levée des glaces de mer qui s'échoueront sur la plage risque d'entrainer un mélange ou un ensevellissement des hydrocarbures avec les sédiments de la plage. Je considère donc qu'il faudra faire un suivi afin d'évaluer concrètement tous les impacts négatifs qui pourraient survenir après la débâcle de juin.

RECOMMANDATIONS

A court terme (d'ici la fin juin)

1) continuer la surveillance quotidienne sur le site du déversement;

2) pomper l'essence accumulée en amont du barrage;

3) entreposer en lieu sûr l'essence récupérée par pompage.

A moyen terme

1) effectuer une inspection à la fin du mois de juin, évaluer la situation et prendre les mesures nécessaires afin de finaliser la récupération et le nettoyage des sites affectés par le déversement.

2) disposer d'une façon adéquate de l'essence récupérée, après avoir indiqué au ministère de l'Environnement quel sera le type de disposition (réutilisation, brûlage...) envisagé.

3) la compagnie Asbestos devra nous faire connaître ses intentions précises concernant les parcs à carburant, pour l'année 1984, à savoir:

   a) fermeture de la mine: récupération immédiate des hydrocarbures entreposés sur tous les sites d'entreposage de carburant (Baie Déception et Asbestos Hill);

   b) continuation des opérations: la société Asbestos devra faire le nécessaire afin d'ériger une protection adéquate (digue ou autres) et un système de détecteur de fuite d'hydrocarbures (type Leak X) sur toutes ses installations d'entreposage d'hydrocarbures.

Le ministère de l'Environnement devra maintenir une position ferme dans ce dossier, et verra à faire respecter et appliquer toute la réglementation qui s'applique à l'entreposage des produits pétroliers (action conjointe avec le ministère de l'Energie et des Ressources du Québec) et à leur nettoyage en cas de déversement accidentel, afin que ce genre d'accident ne se reproduise pas lorsque qu'aucune mesure de protection n'a été mise en place.

PDP/nc
5 juin 1984

Gouvernement du Québec
Ministère de l'Environnement
**Direction régionale
du Nouveau-Québec**

Radisson, le 12 juillet 1984.

A: MONSIEUR JEAN-PAUL NOEL

DE: Daniel Berrouard

OBJET: Etat de la situation à Baie Déception

Le 5 juillet dernier, je me suis rendu en compagnie de Monsieur Barney Kovacs, vice-président à l'exploitation de la S.N.A. au site de Baie Déception où deux mois plus tôt s'était produit un déversement d'environ 545 000 litres d'essence. J'avais d'ailleurs à ce moment fait partie de l'équipe d'Urgence du ministère qui avait été dépêchée sur les lieux.

Depuis, les évidences majeures d'un déversement de cet envergure ont disparues et l'on ne distingue plus que quelques traces de ce dernier.

Celles-ci se résument à la présence d'un mince film (de l'ordre du micron) d'hydrocarbure localisé à l'entrée de la baie près des installations portuaires de la compagnie et à un entraînement en infirme quantité à certains endroits du produit déversé par les eaux de ruissellement. Il est cependant impossible à toute fin pratique de récupérer ce qui semble être le résidu du déversement.

La situation semble donc avoir évolué suivant les commentaires que l'on retrouve au rapport de Monsieur Philippe Di Pizzo, lequel fut affecté par notre ministère pendant près d'un mois au suivi des opérations de récupération.

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C.P. 390
Radisson J0Y 2X0

Quant aux impacts appréhendés suite à ce déversement, ceux-ci semblent assez limités et l'on peut se croire chanceux que le produit déversé n'ait été que de l'essence. On ne distingue en effet aucune détérioration évidente du milieu maritime adjacent dont la végétation est composée en bonne partie d'algues du type fucus dans la zone d'estran et à quelques espèces de graminées et d'éricacées le long des berges.

Suivant, par ailleurs, des commentaires recueillis de quelques inuit qui campaient à proximité des installations de la compagnie, il semble que le poisson, en particulier, l'omble chevalier anadrome, continue de fréquenter la région bien qu'il ait été, semble-t-il, moins abondant cette année du côté où s'est produit le déversement.

A la lumière des constatations faites sur place, nous avons donc avisé la compagnie (copie ci-jointe) que les opérations de nettoyage effectuées jusqu'à présent pouvaient être considérées comme complétées, abstraction faite toutefois du cas où une émergence imprévue du produit déversé surviendrait.

Quant aux mesures correctives visant à prévenir à cet endroit de nouveaux accidents de ce genre, celles-ci devraient être abordées dans le cadre du plan de désaffectation (permanente ou temporaire) que doit nous soumettre la S.N.A. au cours de l'été.

Daniel Berrouard,
biologiste.

DB/nc

MINISTÈRE DE L'ENVIRONNEMENT

DIRECTION RÉGIONALE DU NOUVEAU-QUÉBEC

RAPPORT D'INSPECTION

Objet: déversement d'hydrocarbure à Baie Déception, territoire du Nouveau-Québec.

Le 24 avril 1984, à 9 heures du matin, la région 08 de Rouyn, nous faisait parvenir une copie d'un télex reçu du central à l'effet qu'un important déversement de gazoline se serait produit à la Baie Déception. Cet incident serait dû à un réservoir d'essence qui s'était déversé (environ 454,000 litres) sur terre et en partie, dans la Baie, le tout suivant un bris volontaire des valves du réservoir, dont l'origine malicieuse leur (compagnie Asbestos) était encore inconnue pour l'instant.

En l'absence de notre coordonnateur, M. Daniel Berrouard prit en charge les mesures qui s'imposaient et des appels furent logés auprès de M. Barney Kovacs , vice-président de la compagnie Asbestos, afin de savoir comment se présentait la situation et les mesures qui avaient été prises. Entre temps, M. Jacques Bilodeau, directeur d'Urgence-Environnement-Québec nous faisait part qu'un DH-125 du gouvernement avait été nolisé pour nous amener jusqu'à Fort-Chimo.

A 16h, le DH-125 arriva à LG-2 après avoir pris sur son chemin M. Claude Rivet d'Environnement-Canada, à Montréal, ainsi que deux personnes de la Sûreté du Québec basées à Rouyn. A 16h20, nous nous envolâmes vers Fort-Chimo.

Liste des personnes à bord du DH-125:

M. Raymond Barrett (Urgence-Environnement-Québec centrale)

M. Claude Rivet (Urgence-Environnement-Canada, de Montréal)

M. Richard Bonneau (Urgence-Environnement-Québec, de Radisson, région 10)

M. Daniel Berrouard (Urgence-Environnement-Québec, de Radisson, région 10)

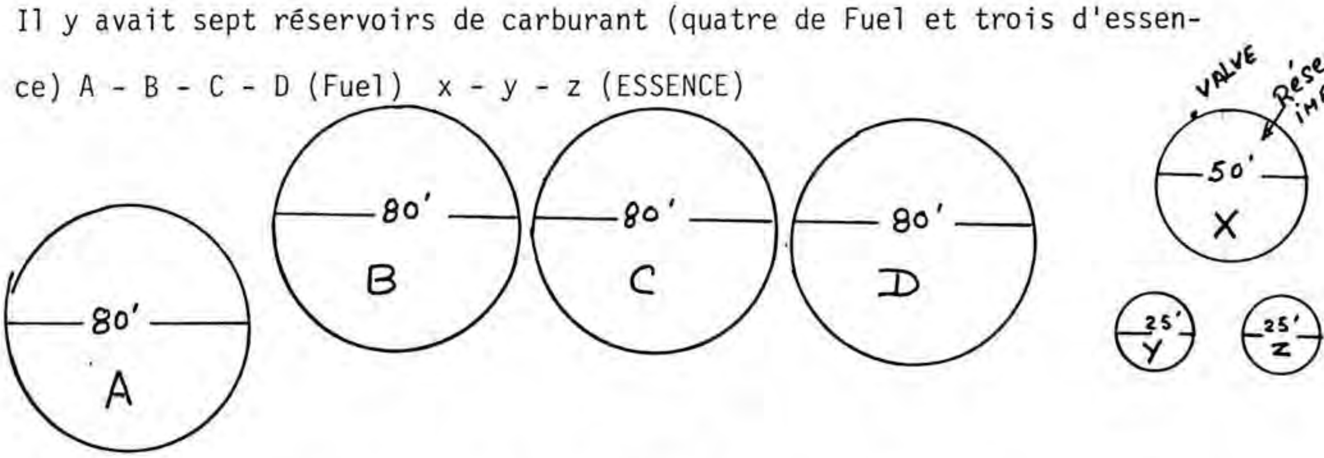
M. Howard Gleeton (S.S.Q., de Rouyn)

M. Gilles Désilet (S.S.Q., de Rouyn)(sergent)

Arrivés à Fort-Chimo à 18 heures, un Twin-Otter avait été nolisé par le central pour nous amener à Baie Déception, mais le répartiteur de Fort-Chimo nous informa que la visibilité à Baie Déception était (0-0). Nous attendîmes jusqu'à 19h30, mais comme il n'y avait aucun changement dans la température, nous avons couché au KUUJJUACK INN de Fort-Chimo. M. Daniel Berrouard communiqua à 20 heures avec M. Michael Barrett de l'administration régionale Kativik (A.R.K.).

Le 25 avril 1984 (mercredi)

Départ de Fort-Chimo à 8 heures, arrivée à Baie Déception à 10h15. Nous survolâmes les lieux du déversement. Ce dernier n'était presque pas visible (seulement quelques taches jaunes), étant donné la tempête de neige de la veille. Nous atterrissâmes sur l'ancienne piste, cette dernière se trouvant à environ 5km des lieux pollués et à 11h15, deux "pick-up" de la compagnie Asbestos sont venus nous chercher pour nous conduire sur les lieux de l'incident. Arrivés sur les lieux à 11h30, M. Jean Domergue (gérant de la mine), ainsi que M. Marcel Fournier (surveillant) nous expliquèrent comment cela s'était passé tout en nous faisant visiter les lieux. Il y avait sept réservoirs de carburant (quatre de Fuel et trois d'essence) A - B - C - D (Fuel) x - y - z (ESSENCE)



Le réservoir d'essence (X) dont la capacité est de 1 360 000 litres contenait au moment du déversement 1 100 000 litres. Après l'accident, il restait dans le réservoir 550 000 litres, donc une perte de 550 000 litres. Nous avons suivi le parcours du produit déversé et ce dernier nous conduisit jusqu'à la Baie. Inutile de dire que sur les lieux une forte odeur d'essence se dégageait.

Nous examinâmes soigneusement la Baie pour voir jusqu'où le produit avait pu se rendre. Il y avait sur le bord de la Baie, à une distance approximative de 200 mètres du point d'écoulement une flaque d'essence (10 m X 5 m). A 15 mètres plus bas, une autre flaque de (10 m X 3 m) et une troisième de (3 m x 3 m) à 20 mètres plus bas. Aucune trace n'était visible ailleurs.

A 12h30, nous sommes remontés à la mine avec le "twin" et après avoir fait la liste du matériel qu'il nous fallait, nous avons redescendu sur les lieux. Nous avons procédé à la cueillette de quelques échantillons à des endroits différents et nous avons également fait plusieurs trous dans la glace avec une foreuse à glace. Nous n'avons pas été capables de creuser assez profondément pour traverser la glace qui a de 2 à 3 mètres d'épaisseur et aucune trace de carburant dans les trous creusés, sauf une faible odeur se dégageait des fissures de la glace, ce qui laissait supposer la présence de carburant dans la Baie, mais impossible de savoir quelle en était la quantité. Selon M. Domergue la marée à cet endroit est de 3 à 4 mètres. La dénivellation entre le point d'écoulement et le niveau de la Baie est d'environ 65 mètres sur une distance approximative de 200 mètres pour nous donner une pente de terrain de 20^{o}.

Selon M. Jean Domergue (gérant de la mine), l'incident se serait produit le lundi 16 avril au soir, car du mardi au samedi matin, il y a eu une tempête et il n'y a eu personne sur les lieux. Le samedi matin, lors d'une inspection, M. Marcel Fournier se serait aperçu de l'incident, donc, le produit aurait coulé pendant 4½ jours par un petit tuyau de 3/4" ayant cependant une forte pression. Comme la valve avait un cadenas, le suspect aurait vissé un autre bout de tuyau sous le premier. Il y avait une ouverture qui le lui permettait. (VOIR PHOTO).

Le réservoir de 8.2 mètres de hauteur était rempli à 5.5 mètres avant l'incident. Maintenant, le niveau du réservoir est rendu à 2.8 mètres.

Par la suite, nous avons essayé de suivre le parcours du carburant, soit visuellement ou à l'aide de la foreuse à glace et nous avons pu ainsi établir un genre de périmètre qui couvrait approximativement une surface de 1 500 mètres carrés qui pouvait ressembler à une énorme éponge remplie d'essence.

Après avoir bien visité les lieux, nous sommes retournés au campement qui se trouvait à 65km. Dans la soirée du mercredi, nous avons rencontré les divers intervenants de la compagnie qui venaient juste d'arriver, dont voici la liste:

M. Barney Kovacs, vice-président de la compagnie Asbestos

Mme Ginette Lajoie, géomorphologue consultant SOGEAM INC.

M. Conrad Héon, directeur de la compagnie d'assurance ALLSTATE

M. Etienne Plante, ing., président de Plante et Associés

M. André Dumouchel, vice-président TECHNITROL CANADA LTEE

M. John Robertson (PH.D.) TECHNITROL CANADA LTEE

M. Alain Dulude (service juridique de la compagnie)

M. Herby Larochelle, chef de sécurité pour la compagnie Asbestos

La réunion a eu lieu au STAFF HOUSE vers 22h45 pour se terminer vers une heure du matin.

Les possibilités envisagées pour éliminer le produit ou le récupérer ont été les suivantes:

- le brûlage sur place a été éliminé étant donné le trop grand risque par rapport au produit en cause;
- le ramassage de la neige et de la glace (très long et pourrait éventuellement être dangereux (flamèches);
- faire deux barrages et récupérer le tout au printemps à la fonte des neiges, mais la fonte se produit très vite à cet endroit.

Donc, la compagnie et notre ministère retiennent le barrage, mais entre temps, ils feront des tranchées pour récupérer une partie du produit.

Le 26 avril 1984 (jeudi)

De bonne heure le matin, nous sommes partis pour Déception. Vers 11 heures, un bélier mécanique est arrivé et nous avons fait faire une petite tranchée à l'amont de la calvette,et là, nous vîmes apparaître du carburant pratiquement pur. Un système de camion-citerne avec pompe électrique fut aussitôt installé pour récupérer le produit qui s'accumulait dans la tranchée. Par la suite, le bélier mécanique descendit dans la Baie pour faire des trous dans la glace, mais là, nous abandonnâmes, car aucun liquide ne venait dans la tranchée. Nous fîmes remonter le bélier mécanique pour travailler à l'amont de la calvette et avons rélargi la tranchée pour en augmenter la surface. Le produit coulait à flot (voir photo). C'est ainsi qu'en l'espace de deux heures, nous avons récupéré quelque 3 000 litres d'essence pure.

Dans l'après-midi du 26 avril, avant le départ des principaux intervenants, nous eûmes un "débriefing" qui débuta à 15h15 pour réévaluer la situation. Cette dernière se présentait assez bien, car on pouvait presque admettre que la majeure partie du produit était contenue dans la neige à l'amont de la calvette. Il s'agissait maintenant de le retirer et de le récupérer.

Il fut conclu qu'une grosse digue avec tuyaux munis de valves serait érigée sur la route au-dessus de la calvette pour retenir les eaux au printemps. Une deuxième digue plus petite serait construite plus bas, environ 50 mètres pour récupérer le reste.

La réunion se termina à 15h45, car les intervenants devaient prendre l'avion à 16 heures.

Avant de partir, nous avons jeté un dernier coup d'oeil aux opérations et déjà le débit du produit avait passablement ralenti.

Le groupe d'Environnement-Québec et d'Environnement-Canada est parti pour LG-2 à 20 heures.

Richard Bonneau fut désigné pour rester encore quelques jours sur place pour suivre les travaux.

Le 27 avril 1984 (vendredi)

La compagnie a mis à ma disposition un véhicule et je me suis rendu sur les lieux. A mon arrivée à 10h10, il n'y avait personne, seulement la machinerie, à savoir: un camion-citerne et une génératrice pour la pompe. Cette dernière ne fonctionnait pas automatiquement et devait être activée manuellement pour la mettre en marche.

La tranchée que l'on avait faite pour récupérer le produit était presque vide. Il n'y avait pas grand chose à faire dans l'immédiat, le produit étant retenu dans la neige et la glace. Il fallait attendre le doux temps et selon M. Domergue, à la fonte des neiges, cela se produit énormément vite et en l'espace de quatre heures tout est fondu, ce qui présentait une énorme difficulté pour retenir le produit sur place lorsque la crue arriverait.

Il y avait une autre solution, faire fondre la neige artificiellement, comme ça, on pourrait mieux contrôler le produit et être en mesure de le récupérer plus adéquatement. J'ai demandé à M. Domergue s'il y avait du chlorure de calcium sur place, il m'a dit que oui. Je suis allé en chercher une poche pour faire un test qui s'avéra d'ailleurs négatif. Le chlorure dont nous disposions servait dans la mine et était trop lent à agir. Ce qu'il fallait, c'était du vrai chlorure de calcium. J'ai demandé à

M. Domergue de nous en procurer quelques poches pour en faire l'essai.

Le 28 avril 1984 (samedi)

Grosse tempête de neige, impossible de sortir.

Le 29 avril 1984 (dimanche)

Pluie verglassante. Je me suis rendu sur les lieux et les opérations se poursuivaient quand même, mais très au ralenti, le produit ne coulant presque plus.

Le dimanche matin, nous avons récupéré seulement 5 205 litres, et lors de mon départ, lundi le 30 avril, il y en avait en tout et partout de récupérés 8 200 litres.

CONCLUSION

Le pompage se faisait lentement, mais sûrement, mais je crois qu'il faudrait accélérer le pompage en faisant fondre la neige et la glace avec du chlorure de calcium.

Pour la bonne marche des opérations, je suggère les recommandations suivantes:

1° Au moins deux camions-citernes de pompage qui s'alternent ou une autre solution qui pourrait être aussi efficace;

2° au moins deux pompes (non électriques) étant donné le produit en cause;

3° une personne sur place jusqu'à la fonte des neiges serait de mise pour surveiller les travaux et nous faire un rapport quotidien de la situation. Cela pourrait être un occasionnel dont les frais sur place (gîte, couvert et transport) seraient assurés par la compagnie;

4° Un réservoir servant à l'entreposage du produit récupéré;

5° Une digue possédant des tuyaux avec valves devra être érigée sur la route à l'endroit de la calvette (pour prévenir la crue du printemps).

Richard Bonneau
Richard Bonneau

RB/gb

Le 3 mai 1984.

23.11.2

Gouvernement du Québec
Ministère de
l'Environnement

Radisson, le 1er juin 1984.

RECEIVED JUN 6 1984

Monsieur Hervé Chatagnier,
Secrétaire,
Comité consultatif de
l'environnement Kativik,
C.P. 9,
Kuujjuaq, Qc.
JOM 1CO

Objet: Réunion des 4 et 5 juin 1984

Monsieur,

Nous accusons réception des comptes rendus (anglais et français) de la réunion des 20 et 21 février 1984 à Kuujjuaq de même que l'ordre du jour de la prochaine rencontre qui se tiendra les 4 et 5 juin prochains à Kawawachicamach.

Nous réalisons qu'il est vraiment malheureux qu'un membre de la direction régionale du Nouveau-Québec n'ait pas encore été nommé sur le Comité consultatif de l'environnement Kativik et nous espérons qu'une telle nomination s'effectuera dans les plus brefs délais.

Parmi les points de l'ordre du jour de notre prochaine réunion, il en est deux qui vous touchent davantage, et sur lesquels nous devons vous apporter certaines informations qui pourront vous être utiles.

point 11 Traitement et élimination des eaux usées au nord du 55e parallèle; suivi

à ce sujet, mise à part la question litigieuse du financement des systèmes de traitement qui devrait être réglée dans les jours à venir, notre ministère a évalué la conformité des systèmes proposés pour Quaqtaq et Kangiqsualujjuaq. Nous entreprenons l'étude du système proposé pour Ivujivik et nous estimons être en mesure d'émettre les certificats d'autorisation pour ces trois municipalités d'ici la mi-juin.

OPÉRATION EAU ...propre

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point 12 <u>Rapport sur un déversement de carburant à Baie-Déception</u>

Un rapport préliminaire de constatation a été préparé le 3 mai dernier suite à une inspection du site où s'est produit le déversement d'essence (vous avez déjà ce rapport en main). Depuis ce temps, notre ministère a retenu les services d'une personne qui s'est rendue et est demeurée sur les lieux jusqu'au 29 mai, afin qu'elle coordonne et surveille les opérations de récupération du produit déversé. Cette personne est actuellement à finaliser son rapport qui devrait être disponible vers le 11 juin prochain.

Nous croyons qu'il serait préférable de reporter la discussion sur ce point à une réunion ultérieure alors que tous les éléments de cette opération auront été réunis dans un rapport global.

Espérant le tout à votre satisfaction, veuillez agréer, Monsieur Chatagnier, l'expression de mes meilleurs sentiments.

pour: Daniel Berrouard

GS/nc

KEAC 23.12.2

Gouvernement du Québec
Ministère de l'Environnement
Direction régionale
du Nouveau-Québec

DATE: 27 Avril 1984

A: MICHAEL BARRETT

DE: DANIEL BERROUARD

SUJET:

Communiqué de presse concernant le déversement à Baie Déception

NOMBRE DE PAGES: 2

A . DANIEL BEAUROUARD
De . JACQUES B[illegible]OCAU 9:40

Environnement Québec

Service de l'information

communiqué

Telbec code 1

IMPORTANT DÉVERSEMENT DE CARBURANT
À BAIE-DÉCEPTION, AU NOUVEAU-QUÉBEC

Sainte-Foy, le 27 avril 1984 - La Direction régionale du Nouveau-Québec du ministère québécois de l'Environnement révèle qu'un déversement de plus de 545 500 litres d'essence a été constaté samedi le 21 avril sur les terrains de la compagnie Asbestos, à Baie-Déception, dans le territoire du Nouveau-Québec. Des opérations de rétention et de récupération de l'essence ont été entrepris par la compagnie.

Le Directeur régional du ministère de l'Environnement du Québec, monsieur Antonio Flamand, a précisé qu'une équipe d'Urgence-Environnement-Québec s'est rendue sur les lieux dès que le Ministère fut avisé du désastre,-mardi matin, le 24 avril. Cette équipe était accompagnée des représentants d'Environnement Canada et de la Sureté du Québec.

Selon les premières informations disponibles ce déversement pourrait être d'origine criminelle. Une partie du carburant a contaminé la baie Déception et le reste est répandu dans la neige et sur le sol. Actuellement, la situation est sous contrôle et les conditions climatiques encore hivernales dans cette région favorisent une meilleure récupération du produit.

.../2

Monsieur Flamand a indiqué que des directives ont étés données à la compagnie Asbestos qui a délégué une équipe sur place afin de minimiser les conséquences environnementales de ce déversement d'essence.

\- 30 -

Source: Direction des communications
et de l'éducation
Philippe Côté
Tél.: (418) 643-6071

Renseignements: Direction régionale du Nouveau-Québec
Antonio Flamand, directeur par intérim
Tél.: 762-6551

23.12.1

QUÉBEC ENVIRONNEMENT

MINISTÈRE DE L'ENVIRONNEMENT

DIRECTION RÉGIONALE DU NOUVEAU-QUÉBEC

RAPPORT D'INSPECTION

Objet: déversement d'hydrocarbure à Baie Déception, territoire du Nouveau-Québec.

Le 24 avril 1984, à 9 heures du matin, la région 08 de Rouyn, nous faisait parvenir une copie d'un télex reçu du central à l'effet qu'un important déversement de gazoline se serait produit à la Baie Déception. Cet incident serait dû à un réservoir d'essence qui s'était déversé (environ 454,000 litres) sur terre et en partie, dans la Baie, le tout suivant un bris volontaire des valves du réservoir, dont l'origine malicieuse leur (compagnie Asbestos) était encore inconnue pour l'instant.

En l'absence de notre coordonnateur, M. Daniel Berrouard prit en charge les mesures qui s'imposaient et des appels furent logés auprès de M. Barney Kovacs , vice-président de la compagnie Asbestos, afin de savoir comment se présentait la situation et les mesures qui avaient été prises. Entre temps, M. Jacques Bilodeau, directeur d'Urgence-Environnement-Québec nous faisait part qu'un DH-125 du gouvernement avait été nolisé pour nous amener jusqu'à Fort-Chimo.

A 16h, le DH-125 arriva à LG-2 après avoir pris sur son chemin M. Claude Rivet d'Environnement-Canada, à Montréal, ainsi que deux personnes de la Sûreté du Québec basées à Rouyn. A 16h20, nous nous envolâmes vers Fort-Chimo.

Liste des personnes à bord du DH-125:

M. Raymond Barrett (Urgence-Environnement-Québec centrale)

M. Claude Rivet (Urgence-Environnement-Canada, de Montréal)

M. Richard Bonneau (Urgence-Environnement-Québec, de Radisson, région 10)

M. Daniel Berrouard (Urgence-Environnement-Québec, de Radisson, région 10)

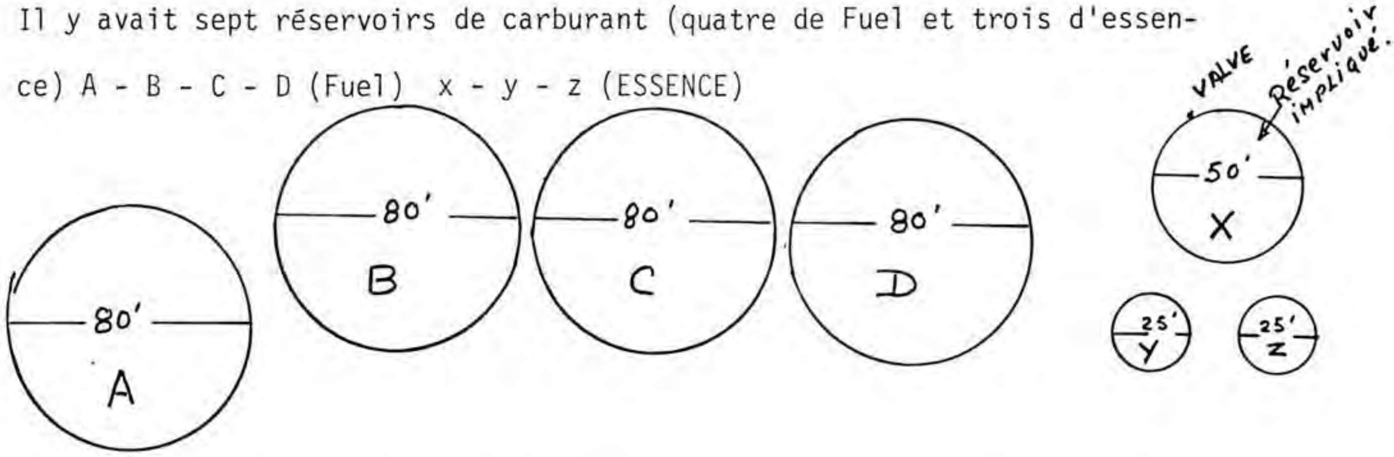
M. Howard Gleeton (S.S.Q., de Rouyn)

M. Gilles Désilet (S.S.Q., de Rouyn)(sergent)

Arrivés à Fort-Chimo à 18 heures, un Twin-Otter avait été nolisé par le central pour nous amener à Baie Déception, mais le répartiteur de Fort-Chimo nous informa que la visibilité à Baie Déception était (0-0). Nous attendîmes jusqu'à 19h30, mais comme il n'y avait aucun changement dans la température, nous avons couché au KUUJJUACK INN de Fort-Chimo. M. Daniel Berrouard communiqua à 20 heures avec M. Michael Barrett de l'administration régionale Kativik (A.R.K.).

<u>Le 25 avril 1984 (mercredi)</u>

Départ de Fort-Chimo à 8 heures, arrivée à Baie Déception à 10h15. Nous survolâmes les lieux du déversement. Ce dernier n'était presque pas visible (seulement quelques taches jaunes), étant donné la tempête de neige de la veille. Nous atterrissâmes sur l'ancienne piste, cette dernière se trouvant à environ 5km des lieux pollués et à 11h15, deux "pick-up" de la compagnie Asbestos sont venus nous chercher pour nous conduire sur les lieux de l'incident. Arrivés sur les lieux à 11h30, M. Jean Domergue (gérant de la mine), ainsi que M. Marcel Fournier (surveillant) nous expliquèrent comment cela s'était passé tout en nous faisant visiter les lieux. Il y avait sept réservoirs de carburant (quatre de Fuel et trois d'essence) A - B - C - D (Fuel) x - y - z (ESSENCE)



Le réservoir d'essence (X) dont la capacité est de 1 360 000 litres contenait au moment du déversement 1 100 000 litres. Après l'accident, il restait dans le réservoir 550 000 litres, donc une perte de 550 000 litres. Nous avons suivi le parcours du produit déversé et ce dernier nous conduisit jusqu'à la Baie. Inutile de dire que sur les lieux une forte odeur d'essence se dégageait.

Nous examinâmes soigneusement la Baie pour voir jusqu'où le produit avait pu se rendre. Il y avait sur le bord de la Baie, à une distance approximative de 200 mètres du point d'écoulement une flaque d'essence (10 m X 5 m). A 15 mètres plus bas, une autre flaque de (10 m X 3 m) et une troisième de (3 m x 3 m) à 20 mètres plus bas. Aucune trace n'était visible ailleurs.

A 12h30, nous sommes remontés à la mine avec le "twin" et après avoir fait la liste du matériel qu'il nous fallait, nous avons redescendu sur les lieux. Nous avons procédé à la cueillette de quelques échantillons à des endroits différents et nous avons également fait plusieurs trous dans la glace avec une foreuse à glace. Nous n'avons pas été capables de creuser assez profondément pour traverser la glace qui a de 2 à 3 mètres d'épaisseur et aucune trace de carburant dans les trous creusés, sauf une faible odeur se dégageait des fissures de la glace, ce qui laissait supposer la présence de carburant dans la Baie, mais impossible de savoir quelle en était la quantité. Selon M. Domergue la marée à cet endroit est de 3 à 4 mètres. La dénivellation entre le point d'écoulement et le niveau de la Baie est d'environ 65 mètres sur une distance approximative de 200 mètres pour nous donner une pente de terrain de 20^o.

Selon M. Jean Domergue (gérant de la mine), l'incident se serait produit le lundi 16 avril au soir, car du mardi au samedi matin, il y a eu une tempête et il n'y a eu personne sur les lieux. Le samedi matin, lors d'une inspection, M. Marcel Fournier se serait aperçu de l'incident, donc, le produit aurait coulé pendant 4½ jours par un petit tuyau de 3/4" ayant cependant une forte pression. Comme la valve avait un cadenas, le suspect aurait vissé un autre bout de tuyau sous le premier. Il y avait une ouverture qui le lui permettait. (VOIR PHOTO).

Le réservoir de 8.2 mètres de hauteur était rempli à 5.5 mètres avant l'incident. Maintenant, le niveau du réservoir est rendu à 2.8 mètres.

Par la suite, nous avons essayé de suivre le parcours du carburant, soit visuellement ou à l'aide de la foreuse à glace et nous avons pu ainsi établir un genre de périmètre qui couvrait approximativement une surface de 1 500 mètres carrés qui pouvait ressembler à une énorme éponge remplie d'essence.

Après avoir bien visité les lieux, nous sommes retournés au campement qui se trouvait à 65km. Dans la soirée du mercredi, nous avons rencontré les divers intervenants de la compagnie qui venaient juste d'arriver, dont voici la liste:

M. Barney Kovacs, vice-président de la compagnie Asbestos

Mme Ginette Lajoie, géomorphologue consultant SOGEAM INC.

M. Conrad Héon, directeur de la compagnie d'assurance ALLSTATE

M. Etienne Plante, ing., président de Plante et Associés

M. André Dumouchel, vice-président TECHNITROL CANADA LTEE

M. John Robertson (PH.D.) TECHNITROL CANADA LTEE

M. Alain Dulude (service juridique de la compagnie)

M. Herby Larochelle, chef de sécurité pour la compagnie Asbestos

La réunion a eu lieu au STAFF HOUSE vers 22h45 pour se terminer vers une heure du matin.

Les possibilités envisagées pour éliminer le produit ou le récupérer ont été les suivantes:

- le brûlage sur place a été éliminé étant donné le trop grand risque par rapport au produit en cause;
- le ramassage de la neige et de la glace (très long et pourrait éventuellement être dangereux (flamèches);
- faire deux barrages et récupérer le tout au printemps à la fonte des neiges, mais la fonte se produit très vite à cet endroit.

Donc, la compagnie et notre ministère retiennent le barrage, mais entre temps, ils feront des tranchées pour récupérer une partie du produit.

Le 26 avril 1984 (jeudi)

De bonne heure le matin, nous sommes partis pour Déception. Vers 11 heures, un bélier mécanique est arrivé et nous avons fait faire une petite tranchée à l'amont de la calvette,et là, nous vîmes apparaître du carburant pratiquement pur. Un système de camion-citerne avec pompe électrique fut aussitôt installé pour récupérer le produit qui s'accumulait dans la tranchée. Par la suite, le bélier mécanique descendit dans la Baie pour faire des trous dans la glace, mais là, nous abandonnâmes, car aucun liquide ne venait dans la tranchée. Nous fîmes remonter le bélier mécanique pour travailler à l'amont de la calvette et avons rélargi la tranchée pour en augmenter la surface. Le produit coulait à flot (voir photo). C'est ainsi qu'en l'espace de deux heures, nous avons récupéré quelque 3 000 litres d'essence pure.

Dans l'après-midi du 26 avril, avant le départ des principaux intervenants, nous eûmes un "débriefing" qui débuta à 15h15 pour réévaluer la situation. Cette dernière se présentait assez bien, car on pouvait presque admettre que la majeure partie du produit était contenue dans la neige à l'amont de la calvette. Il s'agissait maintenant de le retirer et de le récupérer.

Il fut conclu qu'une grosse digue avec tuyaux munis de valves serait érigée sur la route au-dessus de la calvette pour retenir les eaux au printemps. Une deuxième digue plus petite serait construite plus bas, environ 50 mètres pour récupérer le reste.

La réunion se termina à 15h45, car les intervenants devaient prendre l'avion à 16 heures.

Avant de partir, nous avons jeté un dernier coup d'oeil aux opérations et déjà le débit du produit avait passablement ralenti.

Le groupe d'Environnement-Québec et d'Environnement-Canada est parti pour LG-2 à 20 heures.

Richard Bonneau fut désigné pour rester encore quelques jours sur place pour suivre les travaux.

Le 27 avril 1984 (vendredi)

La compagnie a mis à ma disposition un véhicule et je me suis rendu sur les lieux. A mon arrivée à 10h10, il n'y avait personne, seulement la machinerie, à savoir: un camion-citerne et une génératrice pour la pompe. Cette dernière ne fonctionnait pas automatiquement et devait être activée manuellement pour la mettre en marche.

La tranchée que l'on avait faite pour récupérer le produit était presque vide. Il n'y avait pas grand chose à faire dans l'immédiat, le produit étant retenu dans la neige et la glace. Il fallait attendre le doux temps et selon M. Domergue, à la fonte des neiges, cela se produit énormément vite et en l'espace de quatre heures tout est fondu, ce qui présentait une énorme difficulté pour retenir le produit sur place lorsque la crue arriverait.

Il y avait une autre solution, faire fondre la neige artificiellement, comme çà, on pourrait mieux contrôler le produit et être en mesure de le récupérer plus adéquatement. J'ai demandé à M. Domergue s'il y avait du chlorure de calcium sur place, il m'a dit que oui. Je suis allé en chercher une poche pour faire un test qui s'avéra d'ailleurs négatif. Le chlorure dont nous disposions servait dans la mine et était trop lent à agir. Ce qu'il fallait, c'était du vrai chlorure de calcium. J'ai demandé à

M. Domergue de nous en procurer quelques poches pour en faire l'essai.

Le 28 avril 1984 (samedi)

Grosse tempête de neige, impossible de sortir.

Le 29 avril 1984 (dimanche)

Pluie verglassante. Je me suis rendu sur les lieux et les opérations se poursuivaient quand même, mais très au ralenti, le produit ne coulant presque plus.

Le dimanche matin, nous avons récupéré seulement 5 205 litres, et lors de mon départ, lundi le 30 avril, il y en avait en tout et partout de récupérés 8 200 litres.

CONCLUSION

Le pompage se faisait lentement, mais sûrement, mais je crois qu'il faudrait accélérer le pompage en faisant fondre la neige et la glace avec du chlorure de calcium.

Pour la bonne marche des opérations, je suggère les recommandations suivantes:

1° Au moins deux camions-citernes de pompage qui s'alternent ou une autre solution qui pourrait être aussi efficace;

2° au moins deux pompes (non électriques) étant donné le produit en cause;

3° une personne sur place jusqu'à la fonte des neiges serait de mise pour surveiller les travaux et nous faire un rapport quotidien de la situation. Cela pourrait être un occasionnel dont les frais sur place (gîte, couvert et transport) seraient assurés par la compagnie;

4° Un réservoir servant à l'entreposage du produit récupéré;

5° Une digue possédant des tuyaux avec valves devra être érigée sur la route à l'endroit de la calvette (pour prévenir la crue du printemps).

RB/gb

Richard Bonneau

Le 3 mai 1984.

hudson bay oil & gas committee

Agenda

(Sept. 19-21, 1983)

Opening Remarks - Peter Ernerk, Acting Chairman

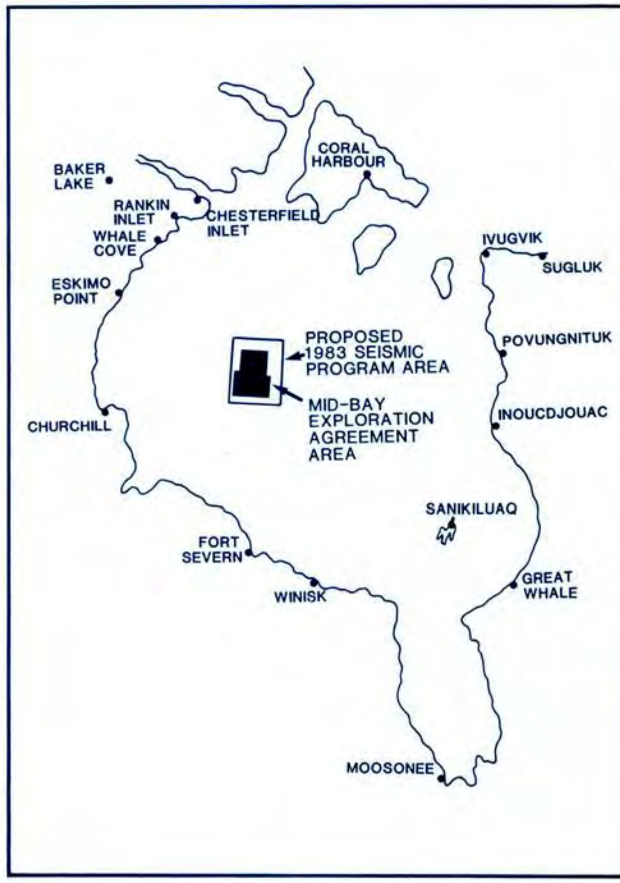
1. Hudson Bay Oil and Gas Committee Budget
2. Management of the Hudson Bay Oil and Gas Committee Staff & Budget
   -Discussion on which of the 6 Member Organizations will be given the responsibility for Administering the Budget and Supervising the work of the full-time Coordinator.
3. Scope of the Hudson Bay Oil and Gas Committee
   -Discussion of the relationship the Committee will have with the Federal Government and Industry
4. Progress Report on Activities in Hudson Bay with regard to Canadian Occidental Petroleum and Sogepet to date.
   -Federal Government Representatives
5. Briefing on what planning will be done this winter by the Companies and what activities will occur next year.
   -Federal Representatives
6. Discussion of what impact studies will be conducted.
7. Other items.

Participating Member Organizations

Makkivik Corporation	Katavik Regional Government
Baffin Regional Inuit Assoc.	Baffin Regional Council
Keewatin Inuit Assoc.	Keewatin Regional Council

20.4.1

OIL & GAS EXPLORATION PROGRAM IN HUDSON BAY 1983



ICG RESOURCES LTD.
2700, 140 - 4 AVE. S.W.
CALGARY, ALBERTA T2P 3S3
(403) 231-9000
BEN SMITH
RAY MASNIUK

lawson graphics western
PRINTED IN CANADA

THE SEARCH FOR OIL & GAS IN HUDSON BAY

Oil and gas exploration in the Hudson Bay region commenced in 1962. Our first field-work employed geologists who were efficiently assisted by Inuit guides and covered the coastlines and larger islands. This encouraged seismic studies, principally off-shore, at which stage major companies became involved with us.

Later, a few wells were drilled, five shallow ones along the coasts of Manitoba and Ontario and three deeper wells in the approximate centre of Hudson Bay. Results of work performed from 1962 to 1974 offered some technical encouragement but no oil or gas was found.

From 1974 to 1982 no exploration activity was permitted while a new Federal Oil & Gas Act was being formulated.

Under the Canada Oil & Gas Act, 1982, existing permit holders were obligated to negotiate new work programs or surrender the land held. We were existing permit holders and elected to resume exploration under a negotiated agreement with the Government of Canada.

The subject of this presentation is a relatively small area of approximately one million acres situated in the near centre of Hudson Bay, about 240 miles east of Churchill. This area is held by Sogepet Limited, ICG Resources Ltd. and Petro-Canada Exploration Inc. ICG Resources Ltd. is the group operator. An exploration agreement for this small area is still under negotiation with the Government of Canada.

Such an agreement will require our consultation and cooperation with the Inuit people and also our compliance with important regulations governing the environment and wildlife.

In conducting our search for oil and gas we understand and agree with your concern that every reasonable precaution should be taken to protect the animal life on your land and in the sea and will cooperate with you toward this goal. We will also provide employment opportunities to some of your people. Initially, this could be our employment of knowledgeable Inuit wildlife observors to assist us in monitoring the wildlife in the area of our ship explorations.

PROPOSED SEISMIC PROGRAM — 1983

The Seismic Program is proposed to begin on September 1, 1983. Sefel Geophysical Ltd. will conduct the program using their vessel, the M/S Mai. The map on the cover page shows the location of the group's exploration agreement area and Seismic Program.

The purpose of this Seismic Program is to gather data on rock layers lying beneath Hudson Bay. This data will be used to help us determine if oil and gas is present in these rocks.

Seismic data is obtained when sound waves travel from the ship down to the sea bottom, into the earth and back to the ship. The ship will tow airjets just below the sea's surface to create the required sound waves. Airjets are mechanical devices harmless to sealife which rapidly discharge compressed air into the water to create sound waves. No explosives or toxic substances will be used at any time during seismic operations. Studies of marine mammals and fish in Canada and other parts of the world show no harmful effects caused by seismic airjet operation.

Listening devices on the surface of the sea will hear and record the sound waves which are reflected from rock layers below the ocean floor. The listening devices are attached to the stern of the ship by cable approximately 2500 metres long. The sound waves are recorded on a magnetic tape on board the ship.

Churchill will be the shore base for the ship. The ship has a helicopter landing pad to move people to and from the ship.

The seismic survey would be complete before mid-October, 1983.

DATA PROCESSING

Before the picture of the rock layers can be seen, the seismic data from the ship must be processed on computers. The computers we will use are located in Calgary at Sefel Geophysical's offices.

The computer produces a picture of the rock layers by measuring the time it takes the sound waves produced by the airjets to travel down through the earth and to return to the listening devices on the ship.

These pictures help us determine areas where oil or gas might be trapped. When this interpretation is complete a decision can be made on whether or not to continue the search for oil and gas by drilling.

If we decide to drill we will hold meetings with the local communities to talk about our plans, to listen to concerns and to answer questions.

Before drilling, detailed environmental studies would take place to be certain that we protect against damage to the environment, to sea animals and to protect against interference in the normal lives of local residents during drilling.

19.3.7

Canadian Occidental Petroleum Ltd.

1983 February 17

Mr. Michael Barrett
Chairman
Katavik Environmental Advisory Committee
C.P. 9
Kuujjuaq, Quebec
JOM ICO

Dear Sir:

Enclosed are five copies each of reports covering our 1982 wildlife observation program carried out in connection with our seismic survey last summer.

One report is the technical report and literature survey in English, prepared by our wildlife consultant, L.G.L. The title is "Late Summer Wildlife Observations in Offshore Hudson Bay, 1982".

The other report is an overview summary of the wildlife observation program titled, "Late Summer Wildlife Observations in Offshore Hudson Bay 1982: Report to the Communities", in English and Inuktitut.

If you have need for more copies or additional information, please call.

We would be happy to meet with you to discuss the report, at a mutually convenient time.

Yours very truly,

CANADIAN OCCIDENTAL PETROLEUM LTD.

John Hofbauer

John J. Hofbauer

Manager, Environment and Safety

JJH/gmm
Encl.

1600 McFarlane Tower — 700 - 4th Ave. S.W., Calgary, Alberta, Canada T2P 3J5
(403) 234-6700 Telex 038-21516 TWX 610-821-4898

18.3.5

Gouvernement du Québec
Ministère de l'Environnement
Direction régionale
du Nouveau-Québec

Radisson, le 5 janvier 1983

M. Hervé Chataignier
Secrétaire C.C.E.K.
C.P. 9
Kuujjuaq
Baie d'Ungava, QC
J0M 1C0

Monsieur,

Je devais vous transmettre quelques détails suite à la dernière réunion du C.C.E.K. à Hull les voici:

1° Je vous ai déjà transmis la traduction de deux textes concernant Purtuniq.

2° Les propositions de la Direction régionale du Nouveau-Québec concernatn le règlement sur les eaux de consommation.

3° Les noms de personnes qui voudraient récupérer les barils de carburants (vides ou autres). (en transmettre une copie à M. Barrett)

J'espère le tout conforme à vos attentes.

André Dicaire

AD/ed

P.J.

C.P. 390
Radisson J0Y 2X0

LISTE DES RECUPERATEURS DE BARILS

M. Gerry Daigneault
Petro-Quip à Montréal
514-323-8622

Les Entreprises de Nivelage Matagami Inc.
C.P. 478
Matagami, QC
Att.: M. Jean Bernard
Bur.: 819-739-2815
Rés.: 819-739-2866

Elite Construction
1190, rue De Bougainville
St-Bruno, QC
J3V 3E7
Att: M. Marc Bélanger
514-653-4700

Environ.-Corp.
Att: M. Pierre Hardy
514-3258810

20.3.6

Government of Canada Gouvernement du Canada

Environmental Studies Revolving Funds

UPDATE

Vol. I(1) September 16, 1983

On behalf of the Environmental Studies Revolving Funds (ESRF), we would like to take this opportunity of the printing of the first of the Environmental Studies Revolving Funds newsletter, UPDATE, to introduce you to the key people involved in the operation of the ESRF.

For the provision of advice to the Minister of Energy, Mines and Resources, the Minister of Indian and Northern Affairs, and the Canada-Nova Scotia Offshore Oil and Gas Board, on the priority subject areas, budgets, levies, program relevancy and effectiveness, there are two ESRF Advisory Boards (see Figure 1). These two Boards have identical membership with one of us (Ruel) chairing the meeting when southern issues are being addressed and the other of us (Dubé) chairing when northern issues are on the table. We are ably assisted in carrying out the committees' functions by W. Rama and J. Hnatiuk from industry and Dr. N.J. Campbell and P. Caskey from the federal government. These two Advisory Boards are served by Dr. M. Parkes (Phone #819-997-7136) and Dr. J.D. McTaggart-Cowan (Phone #613-993-3760), the IAND and EMR Fund Managers, respectively. They in turn are assisted by a series of Program Study Committees (see Figure 1).

Based on the identified priorities for 1983, eight Program Study Committees have been formed. The committee names as well as the individuals on them are given in Table 1.

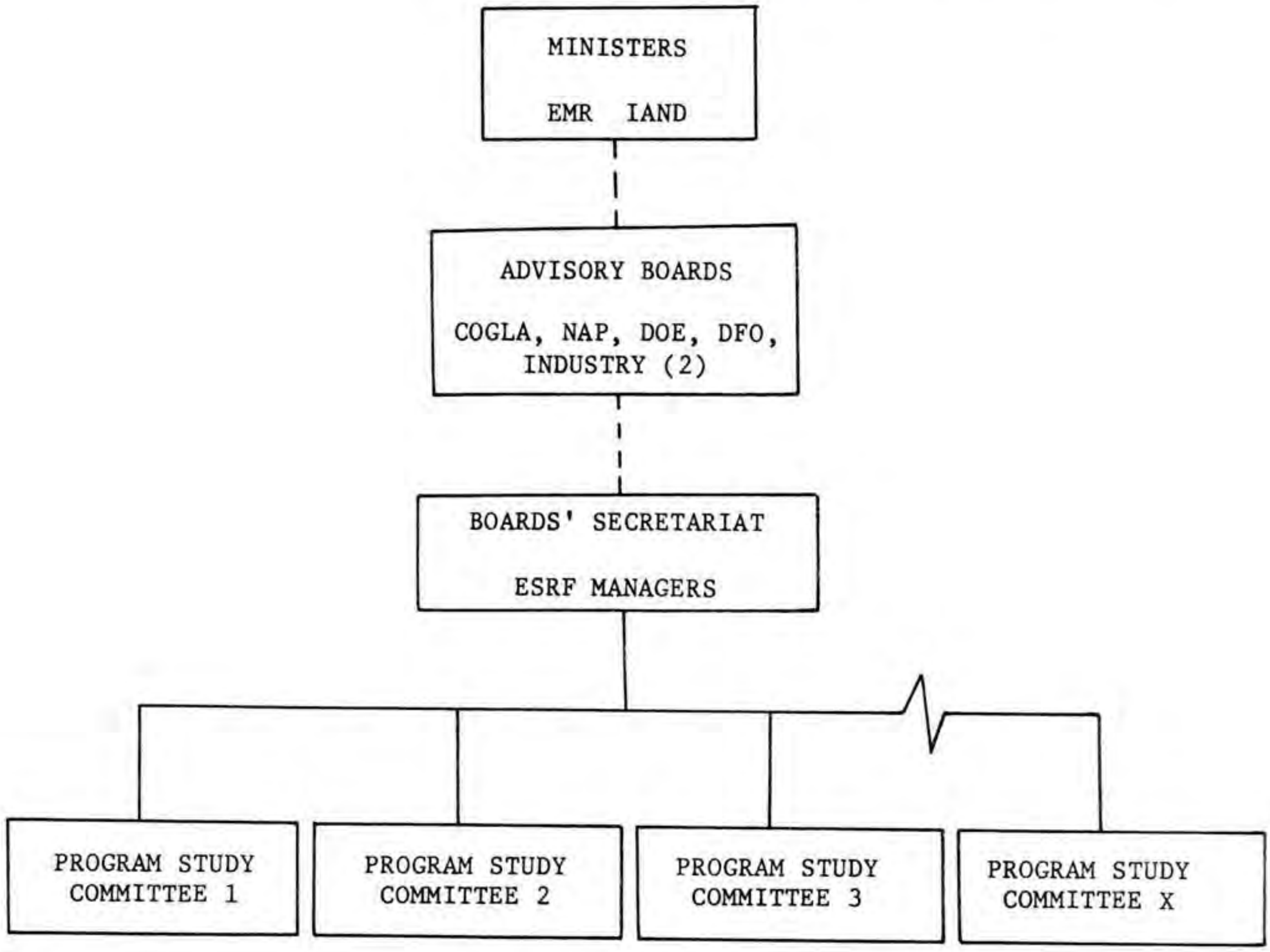
The body of this newsletter contains the detailed Priority Subjects for which we would appreciate receiving Study Proposals for 1983. It is necessary that proposals addressing these topics be received within 30 days of the date of this newsletter. These proposals should be sent to the ESRF Managers as per the directions contained in the ESRF Guidelines for Study Proposals. Forms for Study Proposals and Work Plans are available from the ESRF offices as well as extra copies of the Guidelines and information items on the ESRF.

If you have any questions pertaining to the specific subject items below, please do not hesitate to contact the appropriate ESRF Manager or ourselves if you have major concerns, and we will do our best provide the information or explanation that you need.

Yvon Dubé
Chairman ESRF (IAND)

Dr. M.J. Ruel
Chairman ESRF (EMR)

Canada



EMR	Energy, Mines & Resources
IAND	Indian Affairs and Northern Development
COGLA	Canada Oil & Gas Lands Administration
NAP	Northern Affairs Program, IAND
DOE	Department of the Environment
DFO	Department of Fisheries and Oceans

Fig. 1. Organization of the Environmental Studies Revolving Funds, 1983

TABLE 1. Program Study Committees for The Environmental Studies Revolving Funds, 1983.

Bottom Sediment Transport	Effects Monitoring	Icebergs	Oil Spill Research & Countermeasures
D. Piper - Chairman	M. Mercer - Chairman	J. Benoit - Chairman	W. Pistruzak - Chairman
R. Bailey	E. Birchard	K. Anderson	J. Gainer
M. Coolen	R. Edwards	J. Miller	E. Gauthier
P. Hale	R. Englehardt	O. Løken	S. Gill
A. Laundry	E. Pessah	W. Markham	R. Goodman
L. Lazic	D. Stone	K. Sato	T. Langtry
P. Sabatini	P. Tsui	D. Strong	W. Robson
D. Willis		G. Symonds	C. Ross
			D. Thornton
			J. Vandermeulen

Sea Bottom Ice Scour	Social Issues - North	Social Issues - South	Waves
W. Livingstone - Chairman	E. Cotterill - Chairman	L. Grattan - Chairwoman	M. Coolen - Chairman
M. Coolen	G. Alexander	L. Bouckhout	J. Buckley
L. Lazic	J. Batteke	A. Cobb	J. Ploeg
M. Lewis	R. Bergeron	G. Davies	K. Sato
W. Markham	B. Brickman	G. Leitch	V. Swail
R. Myers	R. McSkimming	D. McDonald	R. Wilson
S. Smith	D. Moll	R. Russel	B. Wright
	W. Oppen	B. Worbets	
	E. Weick		
	A. Zariwny		

BOTTOM SEDIMENT TRANSPORT

BOTTOM SEDIMENT TRANSPORT RATES

Objective

A study is needed to evaluate the methods of estimating rates of bottom sediment transport on the Scotian Shelf, particularly under storm conditions.

Statement of Work

Such a study should focus on recent advances in this field and should highlight existing weaknesses in the application of techniques. Issues to be addressed should include initiation of sediment motion under mixed wave and current regimes, bedload transport, suspended transport, the role of pore pressure in slope stability and turbidity current initiation, the use of numerical modelling, field methods for measuring transport rates, as well as other issues relevant to seabed stability of well installations and pipelines.

Recommendations should be made as to the applicability of different techniques to the problems of large movements of bottom sediment on the Scotian Shelf, particularly in areas of oil and gas activity. Limitations of the different techniques should be clearly identified.

Output

The evaluation should be in sufficient detail to allow the final report to be used in planning future detailed investigations.

General

Study proposals to review only a specific issue from particularly qualified investigators are acceptable, as well as reviews covering the entire range of issues identified above.

It is estimated that a final draft report should be able to be completed within 3 months at a cost of approximately $70,000.

SCOUR AROUND SEA FLOOR STRUCTURES: A REVIEW OF PREVIOUS EXPERIENCE

Objective

A study is needed to provide a comprehensive review of past experience, particularly within the petroleum industry, with bottom sediment scour around marine installations.

This review should include scour around gravity-based structures, pile-founded structures, and pipeline installations.

Issues to be addressed should include initiation of sediment motion under mixed wave and current regimes, bedload transport, suspended transport, the role of pore pressure in slope stability and turbidity current initiation, the use of numerical modelling, field methods for measuring transport rates, as well as other issues relevant to seabed stability of well installations and pipelines.

The intent of the review is to provide a summary of the original designs, the problems encountered, and the final solutions to scour problems as they may relate to the production-development of the current petroleum acreages held on the Scotian Slope and Shelf.

Output

It is expected that the final report will include a summary of past experiences with scour throughout the world, such that conclusions may be drawn with respect to recommendations for improved designs of marine installations.

A listing and description of analytical techniques used and remedial measures taken should also be included. A detailed list of references consulted during the review should be included.

General

It is estimated that such a study should be able to be completed within 3 to 4 months at a cost of $50,000 to $70,000.

SEDIMENT TRANSPORT - DATA ON THE SCOTIAN SHELF

Objective

A study is required to carry out a comprehensive review of the availability and quality of data on the Scotian Shelf of relevance to bottom sediment transport, as it affects both well/platform installations and pipeline routes.

Statement of Work

The geographic extent of this study should be the entire Scotian Shelf beyond the 50 m isobath to a water depth of 400 m. Emphasis should be placed on areas of oil and gas exploration activity.

The review should identify the existence, type (i.e. collecting system), quality and archive location of all data in the public domain and, where possible, that held by industry.

Relevant data include bottom grab samples, cores, near-bottom Eulerian and Lagrangian measurements, high-resolution seismic profiles (resolving the upper few meters of sediment) and sidescan sonar profiles.

All point data should be presented in both tabular and map form, while underway tracks should appear in map form, with the start and end lines tabulated to facilitate possible subsequent entry into the GSC computer data base. Scales should be suggested in the project proposal. In addition, acoustic records should be analyzed to plot the occurrence of sediment instability features such as slumps, sand waves and scours.

The review should, where possible, conform with current Geological Survey of Canada practice in data tabulation and nomenclature. Maximum use should be made of existing compilations, such as G.S.C. Open Files.

Output

The compilation and documentation should be in sufficient detail to allow the final report to be used as a working document to assist in planning future detailed investigations.

General

It is estimated that a final draft report shall be able to be submitted within 3-4 months of the start of the study and cost $40,000 - $55,000.

EFFECTS MONITORING

A STATE-OF-THE-ART REVIEW OF EFFECTS MONITORING FOR OFFSHORE OIL AND GAS OPERATIONS WITH APPLICATIONS TO THE EAST COAST OF CANADA

Objective

There is a need for a study to obtain an up-to-date knowledge of the various effects monitoring strategies used in offshore oil and gas operations around the world, in particular those used in the North Sea, the Gulf of Mexico and Cook Inlet.

Background Information

A distinction should be made between compliance monitoring and effects monitoring. Compliance or "end-of-pipe" monitoring is concerned with ensuring that pollutant discharges comply with government regulations or company standards. Effects monitoring is more concerned with determining the impact of discharges or predetermined pollutants on the receiving environment over a length of time. Time-series information is collected to identify significant changes in selected parameters. The information is used to provide timely warning and advice, so that corrective control measures can be taken.

Scope of Work

It is anticipated that the work necessary for this study may consist of the following phases:

Phase I

Review the relevant scientific literature and meet with selected workers to determine the state-of-the-art in offshore effects monitoring. A summary of the literature and information reviewed should be prepared and a copy of each of the major papers reviewed should accompany the final report.

Phase II

Critically evaluate the information developed from Phase I. This should include, but not be limited to, an analysis of the following:

- monitoring objectives;
- monitoring strategies to meet objectives;
- sampling, analytical and interpretive methodologies;
- effectively weigh and consider the overall costs and benefits of different strategies used in monitoring.

Phase III

Evaluate and recommend offshore effects monitoring options that could be generally applied in the East Coast Canadian waters south of the 60th parallel. Rationale for the recommendations should be backed by sufficient technical detail to withstand regulatory and scientific scrutiny.

Phase IV

As a test case, apply the recommendations of Phase III to the design of two monitoring programs for two potential offshore hydrocarbon production sites in the Canadian Atlantic, a deep-water site such as the Hibernia oil field and a shallow-water site such as the Venture gas field. Relevant background environmental information should be reviewed in order that factors such as natural variability of monitoring parameters, potential pollutant sinks and resources that are potentially at risk can be incorporated into the monitoring design. The procedure and rationale used in designing the monitoring programs should be clearly outlined. The program design should be of sufficient detail to allow for field verifications to be carried out in the future.

Output

The final report should contain the results of each Phase plus the supporting information.

General

It is estimated that the study should be able to be completed within three months and cost $80,000 - $100,000.

ICEBERGS

ASSESSMENT OF MARINE RADARS FOR THE DETECTION OF ICE AND ICEBERGS

Objective

The objective of this study is to provide a quantitative assessment of the present marine radar for the detection of icebergs with particular emphasis on bergy bits and growlers. The study should aim at providing the limits of detectability of various iceberg sizes in various sea states and atmospheric conditions.

Scope of Work

Phase I - Review

A review of existing marine radars used for the detection of ice and icebergs must be performed. As a minimum, this review should consist of an assessment of existing hardware and operational procedures used to detect icebergs and growlers.

Phase II - Planning

A detailed work plan to perform the data acquisition phase of this study must be provided. Use should be made of existing marine radars and rigs. Emphasis on ground truthing is critical.

Phase III - Data Acquisition

This phase consists of gathering iceberg data by radar. It should be planned to take place during periods of high iceberg density and severe environmental conditions. Duration should be sufficiently long to acquire enough data to produce meaningful statistics.

Phase IV - Report

The final report must include, but not be limited to, the following:

1. A description of the equipment used and statements as to its reliability and suitability during the project;
2. Description of the data acquisition and analysis methods;
3. Description of any problems encountered during the project;

4. Tables showing the following:

- Target size (above water) vs range
- Target detection vs met. parameters
- Target detection vs ocean parameters
- Antenna height vs target detection
- Target cross-sections vs X and S Band radar

Phase V - Recommendations

Recommendations for future work in the assessment of marine radar for the detection of icebergs and growlers should be provided. Also, recommendations to improve existing marine radars for increased detection reliability should be presented.

General

It is estimated that this study should be able to be completed in about 10 months and cost approximately $200,000.

ASSESSMENT OF AIRBORNE IMAGING RADARS FOR THE DETECTION OF ICEBERGS

Objective

Imaging airborne radar systems have been demonstrated as useful components in a strategic, regional ice mapping program. There remains, however, uncertainty as to the detection capability of the various radar systems for icebergs, bergy bits and growlers under varying seastate and environmental conditions. It is desirable to establish the envelope bounds for detection of ice targets as a function of target size and predominant seastate conditions.

A study is needed to identify the capabilities of existing synthetic and real aperture airborne imaging radars and to provide an intercomparison of their abilities. Such a study should, most likely, proceed in three phases: the first addressing the existing knowledge of the problem, the second, a field-oriented data collection program, and the third, an interpretation/reporting phase.

Scope of Work

Phase I - Review

The initial review must address the work done to date on the use of these radar systems for iceberg detection (e.g. Lapp 1982; Lowry and Miller 1983). It should identify relevant source materials, critically evaluate procedures, detail pertinent results and provide recommendations for the design of a data collection program. The review should also address the role of other operational variables (e.g. look direction, illumination angle, iceberg properties (shape, dielectric properties e.g.)) in the determination of detectability and reidentification.

Phase II - Data Collection

The field program should obtain contemporaneous radar data and field verification of targets. For the program to be of maximum value, flights by the various aircraft involved should occur at the same time to ensure that all systems are operating under the same conditions and imaging the same targets. A vessel is required to provide surface verification of target attributes and environmental conditions. The field program must be a coordinated effort operated under a single manager and it is hoped that both industry, government (eg. C.C.R.S. and A.E.S.) and other interested parties (I.I.P.) will participate to allow a complete and thorough data acquisition program.

Phase III - Data Interpretation/Reporting

The final phase is a data interpretation program to analyse the information collected during the data acquisition phase. This will identify for each sensor, the condition combinations for which detection occurred and did not occur. A comparison among the sensors which contrasts the individual and group capabilities is essential within the final report.

General

As a preliminary guideline, the phases should be scheduled such that, Phase 2 takes place between November and April, with the overall study being completed within 12 to 14 months. The total study cost is not expected to exceed $500,000.

To provide for an unbiased assessment of the acquired data, the program must be structured such that the groups participating in Phase 2 (data acquisition) do not conduct Phase 3 (data interpretation) and vice versa. Applicants should clearly identify the phase in which they wish to become participants.

As Phase 2 will involve several aircraft of diverse capabilities and availability it is recommended that joint venture undertakings be considered to minimize logistical concerns and allow for maximum benefits.

UNDERWATER ICEBERG GEOMETRY

Objective

One critical element in all deterministic iceberg trajectory models has been the determination of the underwater shape and draft of icebergs, parameters essential for calculations of drag coefficients. Design engineering also requires similar types of information for determining collision parameters.

The principal technique used to date for draft and shape determination has been side scan sonar which can, at best, give a series of underwater profiles of an iceberg. These profiles must then be extrapolated in order to determine some 3-dimensional impression of the underwater configuration.

As such work has led to considerable uncertainty in engineering calculations, a study is needed to assess the current state of knowledge of underwater iceberg geometry and to investigate and evaluate alternate methods for obtaining the required information. Three principal study phases are presently identified.

Scope of Work

Phase I - Status

Phase I would entail the identification and collection of currently available data on underwater iceberg geometry. All pertinent data sources should be investigated, such as wellsite data, and the holdings of the International Ice Patrol.

Phase II - Analysis

Phase 2 should establish the limitations or utility of the data sets identified in Phase I. In addition techniques should be examined for transforming the available keel profiles into 3-dimensional impressions of their underwater shapes. These techniques must include present methods and propose other possible methods with an evaluation of the effectiveness of each.

Phase III - Alternate Approaches

Phase 3 must involve a survey of alternate approaches to collecting 3-dimensional underwater shapes using different sonar configurations or underwater cameras as two possible techniques. Different methods can be integrated in order to maximize the data return during iceberg profiling surveys.

Output

The result of this study should be a comprehensive compilation of iceberg keel shapes, and an examination and evaluation of some alternate schemes for determining the 3-dimensional underwater shape of icebergs.

General

It is estimated that this study should be able to be completed within 6-8 months and cost approximately $100,000.

SEA BOTTOM ICE SCOUR

EVALUATION OF SEA BOTTOM ICE SCOUR MODELS

Objective

A study is required to assess the various methods available to model ice and iceberg scour.

Statement of Work

The study will consist of a detailed review of analytical, numerical and physical modelling techniques which have been applied to modelling ice and/or iceberg interaction with the seabed. Particular emphasis should be placed on past efforts which have included ground-truthing of the predicted results.

In addition, ongoing research in this area must be clearly documented. From the above investigations comments on the applicability and limitations of existing modelling techniques must be developed. Also, comments and recommendations must be developed which will identify study programs to improve existing technology. This must include detailed outlines of recommended study programs, clearly identifying the expected results from these programs, and also provide estimated costs associated with implementation of the recommendations.

General

It is estimated that such a study should be able to be completed within 6 months at a cost of between $65,000 - $75,000.

BEAUFORT SEA ICE SCOUR DATA BASE

Background Information

Government and industry have collected information on sea bottom scours in the Beaufort Sea since 1970. This information consists of echo sounder, side scan sonar and seismic profile records.

Some 4800 line-kilometers of echo sounder profiles and 3440 line-kilometers of side scan sonographs, which represent the majority of the data collected in the region during the period from 1970 to 1976, have already been analyzed. These analyses were carried out as projects funded by members of the Arctic Petroleum Operators' Association (APOA). Study results are documented in APOA Reports No. 19[1], 32[2] and 133[3]. These studies concentrated on determining basic ice scour parameters such as scour depth, orientation, density and return period.

Since 1976 an estimated 5000 line-kilometers of additional high resolution seismic records and an equivalent amount of side scan sonographs have been collected throughout the region primarily by petroleum companies. There is a need to analyse this more recent data set and to document the main parameters important to ice scour/seabed research.

Objectives

a. Prepare an inventory of ice scour data collected in the region by all sources in terms of location, quantity, quality, type and availability. This function will be carried out in conjunction with the ESRF Scientific Adviser assigned to monitor this project.

b. Statistically analyse the available data (post-1976) to derive basic ice scour parameters for the region including scour depth, width, length, form, morphology, abundance, orientation and relative age.

c. Develop evidence of relationships among the ice scour parameters, seabed and environment; relating the character and distribution of the ice scours to local bathymetry, geomorphology and sedimentology, and the concepts of seabed processes, surficial geology and oceanography.

d. Compare/integrate the basic ice scour parameters and relationships derived through this study with the findings of previous studies (e.g. APOA projects).

e. Prepare a report which describes the data, methods and limitations of analysis; illustrates features; discusses summary maps, tables diagrams and statistics. The report shall also present recommendations for future studies to augment knowledge or to improve methods of evaluating risk due to ice scour.

Consideration should be given to establishing a computerized data base to facilitate processing of the data in deriving basic ice scour parameters and relationships.

General

It is estimated that such a study should be able to be completed within 8 to 10 months at a cost of between $130,000 to $150,000.

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(1) Hunting Geology and Geophysics Ltd., Investigation of Sea-Bed Scouring in the Beaufort Sea, prepared for Gulf Canada Resources Inc; APOA Project No. 19, 1972.

(2) Hunting Geology and Geophysics Ltd., Investigation of the Sea-Bed Scouring in the Beaufort Sea, prepared for Gulf Canada Resources Inc., APOA Project No. 32, 1973.

(3) MacLaren Atlantic Ltd., Investigation of Sea-Bed Scouring in the Beaufort Sea, prepared for Gulf Canada Resources Inc., APOA Project No. 133, 1977.

REGIONAL ICE SCOUR UPDATE STUDIES: Grand Banks, Labrador Shelf, Baffin Bay, Davis Strait, Lancaster Sound

Background Information

The Atlantic Geoscience Centre in Dartmouth, Nova Scotia, has established a computerized ice scour data base[1] (System 2000) which was initiated through funding from the Federal Office of Energy Research and Development in 1980. The data base presently contains information on ice scour orientation, length, width, depth, abundance and seabed environment based on approximately 5000 line-kilometers of side scan sonographs and high resolution seismic records. These records are distributed among the various ESRF regions as follows:

ESRF REGION	EXISTING DATA ANALYZED (line-kilometers)
Grand Banks	1900
Labrador Shelf	1890
Baffin/Davis	1230
Lancaster Sound	60
TOTAL	5080

There is a need to update the existing regional ice scour data base by analysis of the following geophysical information which is available through the Atlantic Geoscience Center.

ESRF REGION	DATA TO BE ANALYZED SONOGRAPHS	(LINE-KILOMETERS) HUNTEC SEISMIC
Grand Banks	1250	-
Labrador Shelf	350	125
Baffin/Davis	3100	2850
Lancaster Sound	20	-
TOTALS	4720	2975

Up to an additional 1000 line-kilometers of Huntec DTS seismic data without accompanying side scan sonar data shall also be examined. These data are also available through the Atlantic Geoscience Centre.

Objectives

a. In addition to the above-mentioned data available through the Atlantic Geoscience Centre, the study team shall prepare an inventory of ice scour data collected by all sources in the subject ESRF regions. This function shall be carried out in conjunction with the ESRF Scientific Adviser assigned to this study.

b. For each two (2) line-kilometers of the above-mentioned data, the basic ice scour parameters shall be measured and the geotechnical nature of the seabed characterized.

c. The study team shall select a portion of the data in each ESRF region for a detailed study of their own design in order to develop evidence for relationships among the ice scour parameters, seabed and environment. The detailed study shall also determine the underlying probability distributions of ice scour parameters, demonstrate improved methods of analysis or support some other similar related objective.

d. A report shall be prepared for each of the subject ESRF regions describing the data, the methods and limitations of analysis; illustrating features; and discussing summary maps, tables, diagrams and statistics. These reports shall include recommendations for future studies to augment knowledge or to improve methods of evaluating risk due to ice scour. In short, the reports will be up-to-date statements of ice scour knowledge for each respective ESRF region.

Computer time required for the analyses will be available through the Atlantic Geoscience Centre.

General

It is estimated that such a study should be able to be completed within 6 months at a cost of between $80,000 and $120,000.

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(1) D'Apollonia, S.J. and Lewis, C.F.M., (1981), Iceberg Scour Data Maps for the Grand Banks of Newfoundland between 46°N and 48°N, Open File Report 819, Geological Survey of Canada, Dartmouth, N.S.

DOCUMENTATION OF ICEBERG GROUNDINGS: Grand Banks, Labrador Shelf, Baffin Shelf

Statement of Work

There is a need to establish a data base containing all reported iceberg groundings and associated information for the Grand Banks, Labrador Shelf and Baffin Shelf region of eastern Canada. This study involves detection of iceberg/seabed interaction (scouring) by means other than side scan sonographs and high resolution seismic records.

Potential sources of data include the following:

a. Iceberg tracks logged during East Coast drilling operations and reported to Canadian Oil & Gas Lands Administration (COGLA);

b. Iceberg statistics maintained by the International Ice Patrol;

c. Iceberg tracks logged by shore-based radar by Memorial University(1), Transport Canada and petroleum companies;

d. Icebergs tracked by satellite beacons(2);

e. Repair records of undersea telephone and telegraph cables;

f. Miscellaneous ships' reports, Notices to Mariners, etc.

A preliminary investigation carried out by C-CORE(3) has identified periods of low drift velocity during the tracks of 39 icebergs from 10 wellsites on the Labrador Shelf from 1973 to 1976. Most of these icebergs had grounding events noted on the log sheets; however, these periods of low velocity have not yet been correlated with current, wind and tide information.

Cable repair statistics offer the advantage of a long-term data base. Records of examination of the cable breaks indicate whether they are due to iceberg impacts (large crushed area), trawling or other hazards. Cable repair records are available through the Atlantic Geoscience Center, Dartmouth, N.S.

Objectives

a. Establish criteria for the positive, probable and tentative verification of iceberg grounding events;

b. Compile statistics (data base) on all reported iceberg groundings and other associated information such as location, date, duration of grounding, water depth, iceberg size, length of travel while grounded, winds, currents, and tides. This function shall be carried out in conjunction with the ESRF Scientific Adviser assigned to this study;

c. Analyse the grounding data to determine what proportion of icebergs go aground in a given area; what are the survival times between cable breaks due to icebergs along a particular route; how do grounding events correlate with variations of iceberg flux from season to season; what is the depth (draft) distribution of grounding icebergs, etc;

d. Prepare a report for each of the ESRF regions describing the data base, criteria developed for verification of groundings, methods of analysis, limitations of the data and study results.

General

It is estimated that such a study should be able to be completed within 4 to 6 months at a cost of between $40,000 and $60,000.

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(1)Dempster, R.I., 1974; The Measurement and Modelling of Iceberg Drift, IEEE Ocean 74 Conference on Engineering in the Ocean Environment, Vol. 1, pp. 125-129.

(2)Robe, R.D., Maier, D.C. and Russell, W.E.; Long-Term Drift of Icebergs in Baffin Bay and the Labrador Sea; Cold Regions Science and Technology 1, pp. 183-193.

(3)C-Core; 1980: Iceberg Grounding Review from Wellsite Observations; Geological Survey of Canada; Open File #880, 38 pp.

SOCIAL ISSUES - NORTH

NORTHERN STUDIES ANALYSIS

Study Objective

An assessment is required of relevant oil- and gas-related socio-economic studies, techniques of analyses used and their utility in order to determine their value for decision-making on Canada Lands.

Statement of Work

An overview and analysis is required of social and socio-economic studies completed by both government and private industry since 1975 relating to oil and gas exploration and development impact. Publically available documents will be compiled, annotated, analysed, and appropriate recommendations made concerning future research. The following tasks will be undertaken:

1. An evaluation of the studies' approach methodology, the accuracy of data and their utility will be undertaken in light of subsequent regulatory or company decisions regarding oil and gas exploration and development;

2. Data gaps and methodological deficiencies will be identified and used as the basis for suggestions for future research; and

3. The study will also include a review and annotated compilation of social and socio-economic studies done by industry, universities and government related to hydrocarbon exploration and development in frontier areas since 1975.

Consultation will be required with government and industry personnel who had to put into practice the results of the studies analysed.

It is estimated that this study can be completed in three months' time at a cost of $25,000 - $35,000.

SOCIAL ISSUES - SOUTH

FISHERIES/OIL AND GAS INDUSTRY INTERACTION

A Study is needed to develop an operational technique capable of determining the level of interaction between the fishing industry and the oil industry off Canada's Atlantic Coast.

The study must, in addition to gathering information, provide a procedure by which areas of heavy fishing activity and areas of ongoing or planned oil and gas activity can be identified and/or predicted on a monthly basis.

The procedure must be capable of being accessed for routine use by the fishing industry, the oil industry and government. Such access would be for obtaining estimates of potential operational interaction thus assisting both groups in planning their offshore operations.

It is expected that much of the necessary information is available through government surveillance and monitoring systems, such as MARCOM, and FLASH, and regulatory agencies such as COGLA.

The final product should be a proven procedure and contain monthly maps based on 1982 data.

It is estimated that this study should be able to be completed within two to three months at a cost of $13,000 - $17,000.

LOCATION AND IDENTIFICATION OF SEA FLOOR OBSTACLES

There is a need for a study to develop a procedure for readily identifying and displaying, probably in chart-form, the location of existing sea floor obstacles and debris in areas of regular heavy use by both the fishing industry and the oil industry. The information to be processed would include the extent, location and type of debris. Such information is necessary for determining whether or not reported damage to fishing gear from seafloor debris can be logically attributed to existing debris or to activities of the oil and gas industry.

This study should identify areas of regular heavy use by both industries on Canada's east coast from Northern Labrador to the George's Bank including the Gulf of St. Lawrence now and in the near future and identify the most useful scale of charts for displaying the location of seafloor obstacles. A cost-and time-efficient procedure for updating these charts should be described and a frequency for updating recommended.

The final product expected is: a list of areas in priority order which should be charted for existing debris and obstacles; a recommended scale for the charts; a recommended method for a frequency of updating the charts.

It is estimated that this study should be able to be completed within one to two months at a cost of $5,000 - $10,000.

EAST COAST SOCIAL ISSUES SCOPING STUDY

Objective

A study is required to identify pertinent social and economic concerns associated with offshore oil and gas exploration and production activities. This scoping study will provide the starting point for future studies concerning east coast social issues.

Statement of Work

The scoping study must involve extensive consultation with all publics to ensure that all real and perceived issues and concerns are identified and considered for further study. Consultation may include individuals, families, community groups (such as town councils, boards of trade, school boards, church groups, etc.) disadvantaged groups (such as senior citizens) and the business sector.

A matrix approach might be the most appropriate means by which to focus in on the key issues and the levels at which they should be investigated.

The scoping study should address primarily these issues:
(1) sociological effects of offshore exploration and development;
(2) economic participation by the public in petroleum-related activities;

and (3) recreational, commercial, subsistence and historical use of the shore zone. Under (1), projects should be identified which will address issues such as quality of life, social pathology, social indicators, etc. Under (2), projects should be identified which address issues such as supplier development; research and development related to industrial benefits; technology transfer; employment and training; public support for the above; and the information flow among the oil industry, present and potential suppliers, and government.

The information needs of the various publics must be identified and assessed and recommendations made as to appropriate and practical information programs by government and industry.

At this time, the scoping study should focus on the ESRF eastcoast regions. Proposed projects may have regional to national application.

Output

The final report, while containing all the background information, should highlight the relative importance of the proposed projects with respect to the time, scale and location of offshore activity.

General

It is estimated that a final draft report should be able to be submitted within 3 months of the start of the study and cost $50,000 - $75,000. A briefing of the Programs Studies Committee at 6 weeks is required.

WAVES

IDENTIFICATION OF SIGNIFICANT STORMS AFFECTING EAST COAST OFFSHORE AREAS

Objective

A study is required to select, for each East Coast area of interest, the 30 to 50 most severe storms, characterizing them by season and meteorological type.

Statement of Work

By examining existing MEDS SOWM, WES, METOC and various other oceanographic and meteorological data sets, identify storms capable of producing larger waves. By an examination of surface pressure charts and other meteorological information, characterize the identified storms by type. The storms should then be ranked by severity and characterized by season. It is expected that it will be necessary to search historical pressure and wind data bases to augment the wave data bases mentioned above and to extend the analysis beyond the 20-year period of the two major existing hindcasts.

Output

The final product should clearly identify and validate the criteria used to select and characterize the storms.

The areas to be addressed are:

- Scotian Shelf
- Grand Banks
- N.E. Newfoundland
- Flemish Pass
- Labrador Sea
- Baffin Bay - Davis Strait (south of 75° N)
- Gulf of St. Lawrence

General

It is estimated that a final draft report should be able to be submitted within 4-5 months at a cost of $65,000-$80,000.

DIRECTION WAVE SPECTRUM INTERCOMPARISON STUDY

Objective

A study requirement has been identified in the area of directional wave measurements. The study, outlined below, has been designed to complement other initiatives in place or planned in this field using other sources of funding, such as OERD-funded programs. The study has four components which may be responded to separately or as a complete package.

Statement of Work

Two months of directional wave data are to be collected in the vicinity of a drilling rig off the east coast of Canada during the 1983/1984 winter season. The data will be measured by a Datawell Wavec buoy and an Endeco Model 956 Wave-track buoy. Regular wave observations commonly taken from a drilling rig nearby will be available.

Those components of the study for which proposals are requested include:

- processing and analysis of the Wavec and Wave-track data;
- collection and analysis of (SAR) Synthetic Aperture Radar (one pass of approximately two hours over the top of the buoys);
- hindcasting of sea state at the site for two periods (3-4 days each) during the measurement program; and,
- intercomparison of the Wavec, Wave-track, SAR, hindcasting and observed wave data over the intercomparison data periods available.

Task 1

Output. The standard wave data as recorded by the two directional buoys are to be analysed to provide a data report. The report will contain at least the processed results, including standard wave statistics, directional power spectral density plots, time series plots of various parameters and other wave spectra information at the suggestion of the successful bidder. The analysis may be carried out in-house by the successful bidder or under subcontract as specified in the proposal and approved at the time of contract.

The analysis suggested should be such to enable a fair comparison of the ability of the two instruments to provide directional wave data. The report must be accompanied by a 9-track magnetic tape containing the raw and processed data.

General. This analysis and provision of the data report with accompanying magnetic tape is expected to be completed in two to three months after receipt of the raw data at an estimated cost of $30,000 - $45,000.

Task 2

Output. The remote sensing component of the study will include one overflight of the buoys to collect SAR data (approximately 2 hours of data at the site). These data are to be processed into images and spectra. A 9-track magnetic tape and an analysis report will be prepared documentating imagery and the directional spectrum of the waves at the site.

General. The report would be expected to be completed in about one month following the flight with the entire task including flight ferrying costs, standby, SAR flight and analysis budgetted at $30,000 - $40,000.

Task 3

Output. This component of the study requires the hindcasting of sea state conditions for two event periods during the overall measurement program. The events, each lasting three to four days, will be selected in consultation with the scientific authority for the work. One will be based primarily on the wave data collected (larger wave events in the records) and the other will coincide with the SAR overflight.

The study will include the assembly of the appropriate meteorological data (surface analysis, weather reports, ship reports, rig data) and the specification of the surface wind field.

Using appropriate analysis techniques and a recommended hindcast model (to be specified in the proposal), hindcast the sea state characteristics, including sea and swell height and direction with an estimate of directional spread, during the two periods identified.

The results of the analysis shall be presented in a final report which will be accompanied by a 9-track magnetic tape of the wind fields and hindcast parameters developed for each hindcast.

General. The hindcast component is expected to be completed in one to two months at a cost of $20,000 - $25,000.

Task 4

Output. This component will use the results of Tasks 1-3 to intercompare the data. The comparison must be based on statistical methods to allow for a clear determination of any differences from one measurement/prediction method to the others. This must include the use of sea state observations from a drilling unit near the measurement site to assist in ground-truth comparisons, especially in a directional sense.

General. This component is expected to be completed within two months of receipt of the reports for Tasks 1-3 at a cost of $15,000 to $20,000.

17.3.6

News release

Ontario
Energy
Corporation
101 Bloor Street, W., 5th Floor
Toronto Ontario
M5S 1P8

Telex ONT-ENER-TOR
06-218165

For Immediate Release
Thursday, October 7, 1982

For further information contact:
Wayne Brush
(416) 926-4200

Initial Exploration
Completed in Hudson Bay

Over 5,000 kilometres of seismic data was collected this summer as the first phase of a five year oil and gas exploration program in Hudson Bay. The participants in the program are the Ontario Energy Corporation (OEC), Canadian Occidental Petroleum Ltd., Calgary and Sogepet Limited of Toronto. Sogepet has a farmout agreement with Soquip of Quebec City, the Quebec government's energy company.

Wayne Brush, the OEC's Manager of Energy Resources, said that the program was well within this year's projected budget of $7.6 million. He added that the data is now being processed and full evaluation will take two or three months. "The quality of our data appears to be much better than that collected during exploration activity in the Bay conducted in the early 1970's and will greatly enhance our evaluation on a regional basis."

The seismic vessel entered Hudson Bay on August 2 and the data collection was completed on September 2, about two weeks ahead of schedule.

The Hudson Bay exploration group, for which Canadian Occidental is Operator, was granted a five-year Exploration Agreement last October by the federal government. The Agreement was effective January 1, 1982 and covers an area of 29 million hectares (72 million acres).

As part of this season's exploration activity, a wildlife monitoring program was conducted from the seismic vessel to improve the environmental information base. Two Inuit, from communities adjacent to Hudson Bay, with extensive local knowledge and hunting experience were hired as observers to collect the information. A Toronto consulting firm will be preparing an analysis of the inventory data collected during the program. This type of survey is an initial part of what will be an extensive long-term effort to ensure that the exploration and development activities are carried out in an environmentally sound manner.

The Hudson Bay Exploration Agreement requires that another 5,000 kilometres of seismic be conducted by the joint venture group next season. If the results continue to be encouraging, plans call for the selection of drill-sites and further environmental studies. This could then lead to the drilling of one or two wells sometime before the end of 1986.

The Ontario Energy Corporation is participating in the Hudson Bay exploration venture under the auspices of the Board of Industrial Leadership and Development (BILD) program.

NOTES

for

BRIEFING HUDSON BAY ADVISORY COMMITTEE ON

CANADA BENEFITS PROGRAM AND NORTHERN BENEFITS COMMITTEE

The Canada Oil and Gas Act passed in 1982 requires an approved Canada Benefits package as part of the Exploration Agreement. Approval is given by the Minister of Indian and Northern Affairs for exploration activity North of 60° and by the Minister of Energy, Mines and Resources for South of 60°. The Canada Benefits package is prepared by the company, through negotiation with Canada Oil and Gas Lands Administration, Department of Indian Affairs and Northern Development, Canada Employment and Immigration Commission and Office of Regional Industrial Benefits. Canada Oil and Gas Lands Administration (COGLA) provides the formal point of contact for the company. It details the company's policies and programs for industrial, employment and regional and social benefits that result from the exploration activity. For activity on Canada Lands North of 60°, a Northern Benefits Section, to be prepared in accordance with Department of Indian Affairs and Northern Development (DIAND) guidelines, is included in the Canada Benefits package. This section identifies benefits that will accrue to the North in terms of business, employment and training opportunities, natural renewable resources, social and cultural issues, transportation and infrastructure, and information and consultation. The concerns of the territorial governments are formally presented to and negotiated through DIAND.

.../2

Regionally based committees have been proposed by this department to deal, in a comprehensive manner, with the various elements of regional concerns related to oil and gas exploration activity North of 60°. The type of concerns to be addressed include the implementation at the operational level of industry's policies and programs in areas such as consultation, recruitment, training and business opportunities. The committees would also perform monitoring duties allowing comprehensive assessment. The committees would bring together regional expertise at the territorial, federal and community levels to develop a regional position with respect to northern benefits issues related to the Canada Benefits packages negotiated by Canada Oil and Gas Lands Administration (COGLA). The committee for the NWT would be co-chaired by the Northern Affairs Program and the GNWT with permanent regional membership from Indian and Inuit Affairs, Canada Oil and Gas Lands Adminsitration (COGLA), Canada Employment and Immigration Commission and Industry Trade and Commerce and Regional Economic Expansion and appropriate GNWT departments. The comunities would also be represented in the Northern Benefits Committee. A representative of the affected area would sit as a member of the Committee when Northern Benefits for that particular area are under consideration. For example, in the case of Hudson Bay, a member will represent the communities in that area on the Northern Benefits Committee when it is considering issues related to northern benefits resulting from activity of Intercity Gas. This member would be chosen from

.../3

the Northern Benefits Advisory Committee for that area by its members. I have a hand out that I'll distribute that explains the process involved. A Northern Benefits Advisory Committee would consist of a representative from each community in the area, selected by the community as a whole. The advisory Committee would provide community input into the Northern Benefits Committee and through it into COGLA by reviewing and assessing Northern Benefits sections of the Canada Benefits packages and annual review applicable to their area, and providing comments and suggestions for improvement; and by assisting in effectively monitoring the company's implementation of the Northern Benefits section.

The Hudson bay Advisory Committee could act as the Northern Benefits Advisory Committee for the Hudson Bay area, with the HBAC selecting one of its members to represent the HBAC on the Northern Benefits Committee.

The co-chairman representing DIAND will be located in the Department's regional office in Yellowknife as will the provision of secretarial, administrative and financial services to the Committee. As well, the regional office will provide the linkage for the input of the Northern Benefits Committee to DIAND headquarters here in Hull. Headquarters will co-ordinate the input with that from the Yukon Northern Benefits Committee, if appropriate, and with DIAND's policy concern, for submission to COGLA. COGLA will then formally forward

.../4

the regional concerns to the company. This does not preclude the Northern Committees from consulting with the companies as required.

The Northern Benefits Committee would operate in co-ordination with the Economic Development Agreement process. An EDA between Canada and the Northwest Territories was signed in December, 1982. Programming totalling $21 million under three (3) subsidiary agreements has been developed to increase the participation of northerners in economic development related projects, to strengthen the northern business community and to promote activities based on renewable resources.

I believe that covers all the major points with respect to Northern Benefits. I would be pleased to answer any questions.

CANADA BENEFITS PROCESS NORTH OF 60°

COGLA/INDUSTRY NEGOTIATIONS

EXPLORATION AGREEMENTS

CANADA BENEFITS PACKAGES

NORTHERN BENEFITS | EMPLOYMENT | INDUSTRIAL BENEFITS

DIAND

NORTHERN BENEFITS COMMITTEES
(Yellowknife & Whitehorse)

NORTHERN BENEFITS ADVISORY COMMITTEES

MEMBERSHIP OF NBC: DIAND
TERRITORIAL GOVERNMENT — CO-CHAIRMEN
CEIC
ITC/DREE
COGLA
NBAC

OBJECTIVES: OF NBC
1. Help operationalize company undertakings
2. Co-ordinate regional activities of government and industry
3. Monitor ongoing industry activity
4. Develop regional input for COGLA as required

20.4.4

September 21, 1983

HUDSON BAY OIL AND GAS COMMITTEE

WORK PLAN FOR 1983 - 84

The following work plan has been prepared for the Committee's activities in 1983-84. This plan should remain flexible to accommodate new and changing circumstances as well as changes arising out of further information made available to the Committee.

1. Evaluate the economic environmental and social aspects of exploration and development activities in Hudson Bay, concerning oil and gas, which may affect the rights and interests of Inuit in the regions in and around Hudson Bay.

2. Discuss and review proposed exploration agreements with government and industry so as to take into account regional and local concerns and build in, as appropriate, the benefits contemplated in Sections 10(2)(d) and 10(4) of the Canada Oil and Gas Act.

3. Evaluate existing economic policies and programs available to Inuit in developing a suitable overall economic benefits package.

4. Assess Environmental Studies Revolving Fund (ESRF) regulations with a view to facilitating applications to fund studies undertaken by the Committee or by Inuit organisations.

5. Determine what additional social, economic or environmental studies may be needed and, when deemed necessary, apply to the ESRF to fund studies proposed by the Committee.

6. Review the adequacy of existing studies and participate in establishing terms of reference for future studies undertaken by others so as to accommodate regional and local concerns.

7. Review existing technologies, such as those relating to oil spills, which are directly relevant to the protection of Inuit rights and interests.

... 2

workout

8. ~~Establish~~ an appropriate compensation scheme, in collaboration with government and industry, which would provide fair compensation to Inuit for damages, arising out of exploration and development activities, to the individual and collective interests of Inuit.

see BW for copies of paper

9. Maintain regular communications with government and industry in regard to oil and gas exploration and development activities in Hudson Bay, in order to effectively carry out the Committee's mandate.

10. Provide suitable mechanisms for ensuring an adequate flow of information to Inuit communities on on-going issues and activities concerning oil and gas ~~and~~ in the Hudson Bay region.

w/ 2.4 of T of R cover Loken's concerns

11. Make recommendations, in accordance with the Committee's mandate, on any matter which requires further action on the part of the federal government.

12. Prepare and submit an Annual Report on the Committee's activities to the Minister of Energy, Mines and Resources and to the Minister of Indian Affairs and Northern Development by April 1, 1984.

PROPOSED AMENDMENTS TO THE TERMS OF REFERENCE

2. Mandate

2-1. The Committee shall consider and provide advice to the Minister on economic, environmental and social aspects of exploration and development activities in Hudson Bay concerning oil and gas, which may affect the rights and interests of Inuit in the regions in and around Hudson Bay. & other Northerners [illegible]

2-2. Subject to the provisions of the Canada Oil and Gas Act as a focal point for identifying concerns for further action, as appropriate, by the federal government.

2-3. Without limiting the foregoing, the Committee may advise the Ministers regarding terms and conditions of exploration and development as they may affect or relate [illegible] to ~~Inuit~~ ~~rights and interests~~, so that ~~Inuit~~ [illegible] and concerns ~~interests~~ may be fully taken into account prior to decisions being taken or agreements entered into by the federal government.

regional & local concerns

2-4. In addition, the Committee will identify concerns and areas where additional social, economic or environmental studies may be needed, and provide advice to the Ministers on the nature of proposed studies.

2-5. Where funding for studies is required, the Committee may present the above-mentioned proposals for consideration under Section 49 of the Canada Oil and Gas Act, i.e. the Environmental Studies and Revolving Fund.

2-6. The Committee or its members may be requested by the Ministers to assist in the public distribution of information and to facilitate contact between the local people and the oil and gas companies operating in the Hudson Bay area.

2-7. When approved by all members, amendments to the present terms of reference may be proposed to Ministers by the Committee.

HUDSON BAY OIL AND GAS COMMITTEE

PROPOSED ANNUAL BUDGET

1	Meeting Expenses		
	members travel	$24,000	
	meals and accomodation	8,000	
	loss of income (honoraria)	12,000	
	translator travel, meals, accomodation	6,400	
	secretary travel	6,400	
	hall rental	1,000	
	sub-total		$ 57,800
2.	Staff Expenses		
	salary - co-ordinator	$30,000	
	employers share of contributions	1,000	
	" " " benefits	1,000	
	secretary (part-time)	8,000	
	translator/interpreter services	10,000	
	legal services	7,000	
	administrative accounting service	4,800	
	sub-total		$ 62,800
3.	Co-ordinator's Travel		
	co-ordinator's travel	$ 7,900	
	sub-total		$ 7,900
4.	Administrative and Overhead Expenses		
	office supplies and stationery	$ 3,000	
	telephone	6,000	
	office space	6,000	
	sub-total		$ 15,000
	Contingency		$ 10,000
	Consultants		6,000
	TOTAL		$159,300

HUDSON BAY OIL AND GAS COMMITTEE

Explanatory Notes to Budget

Co-ordinator

This is a position identified by the Committee which we consider essential. A person is required to be in charge of co-ordinating the work of the Committee as well as maintain contact with industry and government on an on-going basis, report regularly to the Committee and maintain continuity. It is our firm view that a full-time co-ordinator is essential if the Committee is to deal effectively with the volumes of economic, environmental, social and other technical information which the Committee must evaluate and provide advice.

Translator/Interpreter Services

Budget has been increased by $7,000 to reflect the costs of the services required. Documents are translated at 14.5¢ per word and, given the nature of the work of the Committee, many documents will require translation. Interpreter services are required at every meeting, average cost is $35.00 per hour. Therefore, for a minimum of four meetings, it would cost on the average $5,000 for this service, plus the added cost of equipment.

... 2

Legal Services

This has been increased by $6,000, as the Committee feels more legal expertise will be required and that rates for legal advice are approximately $350 - $400 per day.

Contingency

This figure of $10,000 has been added to the budget in case the Committee requires more than four meetings per year. At the present time, it is likely that additional meetings will be necessary in order to effectively carry out the Committee's mandate.

Consultants

Although the existing terms of reference state that resource staff of the federal government will be made available to the Committee, we believe the Committee should have the option of hiring their own consultants when deemed necessary.

THOMPSON/gg
Sept. 20/83

PROPOSED AMENDMENTS TO THE TERMS OF REFERENCE

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	sub-total		$ 57,800
2.	**Staff Expenses**		
	salary - co-ordinator	$30,000	
	employers share of contributions	1,000	
	" " " benefits	1,000	
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	sub-total		$ 15,000
	Contingency		$ 10,000
	Consultants		6,000
	TOTAL		$159,500

Gouvernement du Québec
Ministère de l'Environnement
Direction régionale
du Nouveau-Québec

Radisson, le 29 septembre 1982.

AUX MEMBRES DU COMITÉ CONSULTATIF DE L'ENVIRONNEMENT KATIVIK

Parcs à carburant au Nord du 55e parallèle

Dès la mise en place de la direction régionale du Nouveau-Québec, l'une de ses premières actions fut d'effectuer une tournée du territoire. Durant cette tournée, le personnel de la direction a pu constater que l'endiguement des réservoirs de carburant était tout à fait inadéquat.

Lorsque ces réservoirs furent érigés, aucun propriétaire n'a jugé bon de tenir compte des contraintes environnementales laissant les parcs à carburant sans protection contre les déversements. Ces équipements sont érigés, pour la plupart, depuis plusieurs années, augmentant le risque de fuite du carburant. La situation s'est déjà produite à quelques reprises (Aupaluk, Deception, Inukjuak, Kuujjuarapik). Ces déversements causent un tort sérieux à l'environnement. De plus, sachant le coût du litre de carburant à cette lattitude, les propriétaires ont tout intérêt à bien conserver le carburant à l'intérieur des citernes.

Ces propriétaires sont très diversifiés, allant de la multinationale Shell à la compagnie d'aviation (Austin,...), en passant par la société Hydro-Québec. Nous contacterons toutes les personnes concernées et élaborerons un protocole d'entente sur les travaux concernant l'endiguement sécuritaire de leurs installations.

C'est pour cela que présentement deux membres de la direction régionale du Nouveau-Québec du ministère de l'Environnement du Québec effectuent une visite de toutes les municipalités au Nord du 55e parallèle. Ils y feront un inventaire exhaustif de toutes les citernes du territoire et analyseront l'endiguement de chacune d'elles.

Les recommandations et les prises de décision suivront afin de rectifier la situation dans les délais les plus brefs.

Dès que les données seront disponibles, les membres du Comité Consultatif en seront saisis.

André Dicaire

AD/nc

C.P. 390
Radisson J0Y 2X0

TRANSLATION

Radisson, September 29, 1982

TO THE MEMBERS OF THE "KATIVIK ENVIRONMENT" CONSULTING COMMITTEE

Fuel depots, North of the 55th parallel

Ever since the arrival of the Regional Directorate of Nouveau-Québec, one of its firts acts was to visit the territory. During this tour, the representatives of the Directorate ascertained that the embankments of the fuel depots are totally inadequate.

When these reservoirs were installed, none of the owners considered the environmental impacts of leaving the fuel depots with no protection against overflow or leakage. For the most part, these reservoirs have been installed for several years, which raises the risk of fuel leakage. This has already happened (Aupaluk, Deception, Inukjuaq, Kuujjuarapik). These accidents cause serious harm to the environment. What is more, knowing the price of a liter of fuel at this latitude, the owners have every interest in properly conserving the fuel inside the cisterns.

The owners are very diversified, going from the multinational "Shell" to the airline companies (Austin...), and on to Hydro-Quebec. We will contact all the people concerned and will elaborate the protocol concerning the safe embankment of their installations.

For this reason, two members of the regional directorate of Nouveau-Quebec are presently touring all of the municipalities north of the 55th parallel. They will make an exhaustive inventory of all the cisterns on the territory and will analyse the embankments of each.

Recommendations and decisions will follow in order to rectify the situation with the briefest delay.

When the facts are available the members of the Consulting Committee will be fully informed.

André Dicaire

AD/ed

/5.3
84.034

RECEIVED
JUN 2 1982

Sainte-Foy, May 27, 1982

Kativik Environmental
Advisory Committee
C.P. 9, Kuujuaq
Quebec, P.Q.
JOM 1CO

Att'n: Mr. Hervé Chatagnier

Dear Sir,

We acknowledge receipt of your letter dated May 14, 1982. Mr. James Roman & myself were pleased to attend the meeting held on April 1, and we are expecting the minutes as soon as available from your committee.

Also, please take note of our change of address as mentioned below this letter.

If you require more information on our part, do not hesitate to contact us.

Sincerely

Abelardo Galvis, eng.
Operations Department

AG/mjm

Société québécoise d'initiatives pétrolières
Place d'Iberville deux, 1175, rue de Lavigerie
Case postale 10650, Sainte-Foy (Québec), Canada G1V 4P5
Tél.: (418) 651-9543 — Télex: 051-31562

84,034

May 14, 1982

Sent to participants

Re: Kativik Environmental Advisory Committee meeting,
April 1, 1982

Dear Sir,

In the name of the Kativik Environmental Advisory Committee, I would like to thank you for your participation at the meeting of April 1, 1982 in Quebec City concerning the Hudson Bay oil exploration agreement.

The discussion effectively permitted the opening of some channels of communication between C.O.G.L.A., the companies involved and the native population affected by the agreement.

You will receive a copy of the minutes of this meeting as soon as they will be adopted by the Committee.

Sincerely yours,

Hervé Chatagnier

Hervé Chatagnier
Secretary
KEAC

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comité consultatif de l'environnement KATIVIK
KATIVIK environmental advisory committee
C.P. 9, KUUJJUAQ, QUÉBEC, J0M 1C0 • TÉL.: (819) 964-2941

84.034

Kuujjuaq
May 5, 1982

Dr. Maurice Ruel
Canada Oil and Gas Lands
Administration
15th floor, Tower Bay
355 River Road
Ottawa, Ontario
K1A OE4

Dear Sir,

On behalf of the Kativik Environmental Advisory Committee, I would like to thank you for your participation at the meeting of April 1,1982 in Quebec City. As a result of this meeting, some channels of communication between C.O.G.L.A and native communities in Northern Quebec were opened with respect to the oil exploration agreement for Hudson Bay.

It was clearly understood that C.O.G.L.A has made certain commitments towards consulting and informing affected communities on (1) negotiations concerning future exploration agreements and (2) the development and implementation of environmental programs related to such projects.

Following from these commitments, the Committee raised certain questions of interest with regard to C.O.G.L.A . As C.O.G.L.A is a relatively new and growing administration, it was felt desirable to know more about the administration's general structure and objectives with respect to oil and gas lands exploration and development. In particular the Committee would also like to know what C.O.G.L.A has in terms of policy with respect to the native population affected by projects such as the Hudson Bay oil exploration project.

...

Thank you again for your participation and for the attention you will give to these requests from the Kativik Environmental Advisory Committee.

Sincerely Yours,

Michael Barrett
Chairman

/lf

F. 3

84 034

Canada Oil and Gas Lands Administration
Administration du pétrole et du gaz des terres du Canada

355 River Road
Ottawa, Ontario
K1A 0E4

355, chemin River
Ottawa (Ontario)
K1A 0E4

June 02, 1982

RECEIVED
JUN 1 4 1982

Mr. Michael Barrett
Chairman
Kativik Environmental
Advisory Committee
P. O. Box 9
Kuujjuaq, Quebec
J0M 1C0

Dear Mr. Barrett:

This letter is in response to your letter of May 5, which was a follow-up to our meeting in Quebec City. I was glad to have had the opportunity to meet with the Kativik Environmental Advisory Committee in April and to establish our communication links. With regard to your questions about COGLA's structure and objectives, I hope that the following brief description is adequate.

As you know, the government announced its new National Energy Program one and a half years ago and this past winter proclaimed the Canada Oil and Gas Act (Bill C-48) as a key element in implementing this program. The Canada Oil and Gas Lands Administration has been created to manage the new oil and gas regulatory regime established by this new Act. The three main objectives of the National Energy Program -- security of energy supply for the country, opportunity for Canadian participation, and fairness in revenue sharing -- have influenced the resultant structure of the Administration. There are six branches in the Administration: Land Management; Resource Evaluation; Engineering and Control; Environmental Protection Branch; Canada Benefits; and, Policy Coordination.

....2

As I indicated when I met with you in April, COGLA will welcome advice or comments on any exploration activities in Hudson Bay. Steps are being taken now by DIAND to assist the people in the Hudson Bay communities with the formation of an oil and gas committee as one means of facilitating this regional input to COGLA. Community input into the design of environmental projects can be accommodated by the Environmental Studies Revolving Fund. Regional study program committees will be formed which will address the program needs and propose projects to meet these needs. Government, industry and local representatives will be asked to participate on these committees.

Thank you again for the invitation to your April meeting. If you have any further questions relating to the Hudson Bay exploration program, please do not hesitate to contact me.

Yours sincerely,

M Ruel

Maurice Ruel
Director-General
Environmental Protection
Branch
Canada Oil and Gas Lands
Administration

Rainer Camille 14.8.3
KATIVIK

BRIEFING NOTES

HUDSON BAY OIL AND GAS EXPLORATION

Prepared by Inuit Tapirisat
of Canada

Keewatin Regional Council
Baker Lake, Nunavut
April 25-30, 1982

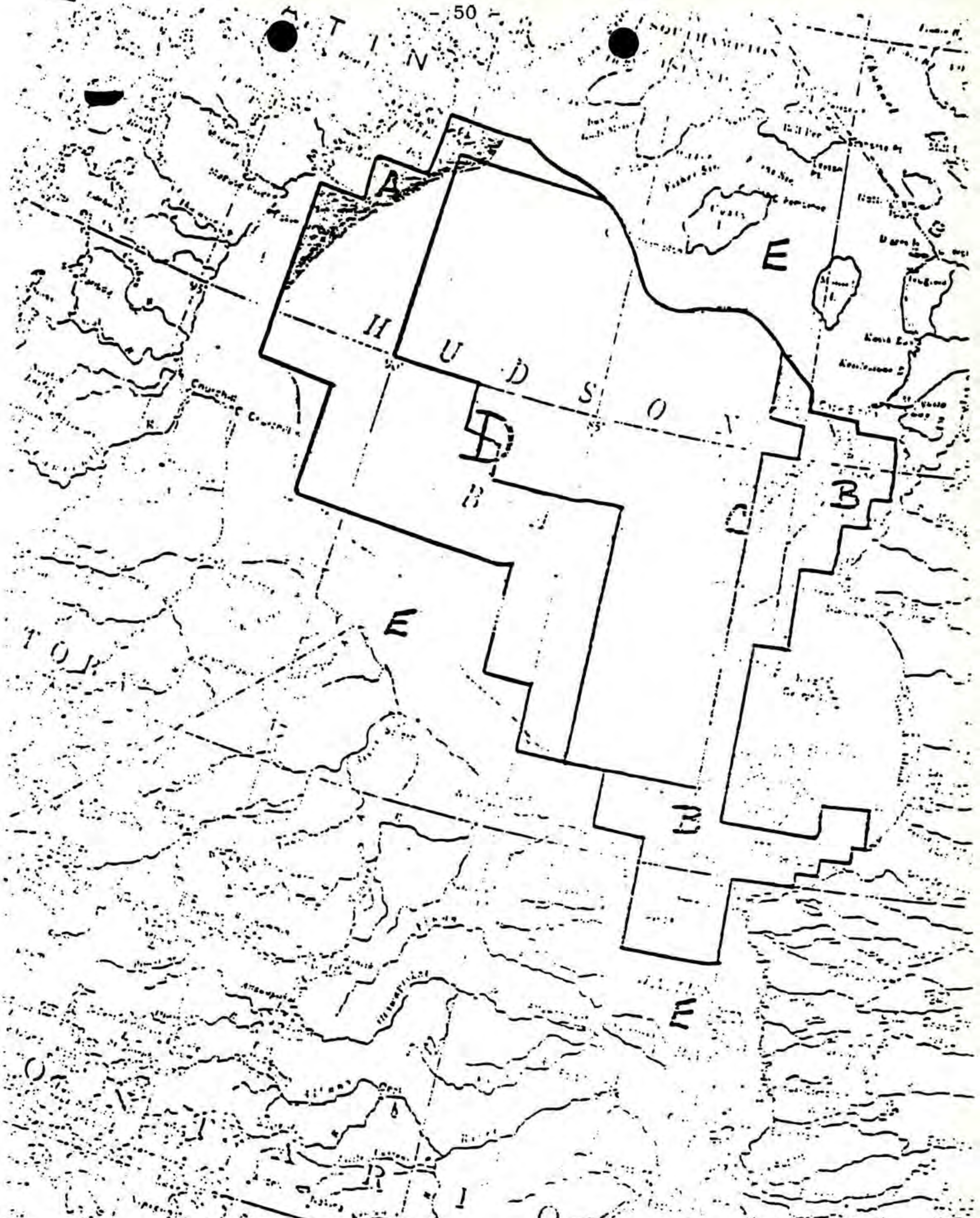
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TABLE OF CONTENTS

HUDSON BAY OIL AND GAS EXPLORATION

1. Environment/Ecology

Geology

Hudson Bay is a large saucer shaped body of water. It is a sedimentary basin making it possible that oil and gas exist.

Coastal Zone

The coastal regions are areas of high biological and ecological activity.

Hudson Bay receives much of its nutrients from fresh water sources and run off.

Water

Surface and subsurface currents move in a counter-clockwise direction.

Average water depth is approximately 100 meters.

Climate, temperatures and ice cover vary depending on the location.

Ice

Shore fast ice is found in all coastal regions. The centre of the Bay is comprised of dynamic unconsolidated pack ice.

Ice forms in late October and clears by late July.

Weather

Wind speeds in Hudson Bay and Hudson Strait are considerably greater than those experienced in the high Arctic and are generally stronger than those found in most regions of Canada.

High incidence of fog in summer.

Fish

There are 38 species of marine and anadramous fish. Of commercial importance are the Greenland cod, capelin and arctic char.

Birds

Hudson Bay is one of the most important bird migration, staging and nesting areas in Canada. However, specific data for staging and nesting areas of most birds is lacking. Coastal marshes and mud flats support thousands upon thousands of birds: half of eastern Canada Goose population Great Plain of Kjoudjuack and McConnell Sanctuary: Digges Island - 25% of Canadian thick billed murre population. Millions of dollars are generated annually through sport hunting.

Marine Mammals - beluga
- narwhal
- bowhead
- killer whale
- polar bear
- ringed seal
- bearded seal
- harbour seal
- hooded seal
- harp seal
- walrus

Parks, Sanctuaries, & IBP Sites

- Digges Island - IBP
- Belcher Islands - IBP
- Twin Islands - James Bay - IBP
- Eskimo Point - IBP
- Rankin Inlet - IBP
- South & North Southampton Island - IBP
- North Coates Island - IBP
- Akimiski Island - Sanctuary
- Ft. Rupert - Sanctuary
- Moosone - Sanctuary
- Eskimo Point - Sanctuary
- South & East South Hampton Island - Sanctuary
- Northwest James Bay - Polar Bear Provincial Park
- Parks Canada - 13 national areas of Canadian significance - two most important Foxe Peninsula and South Hampton Island

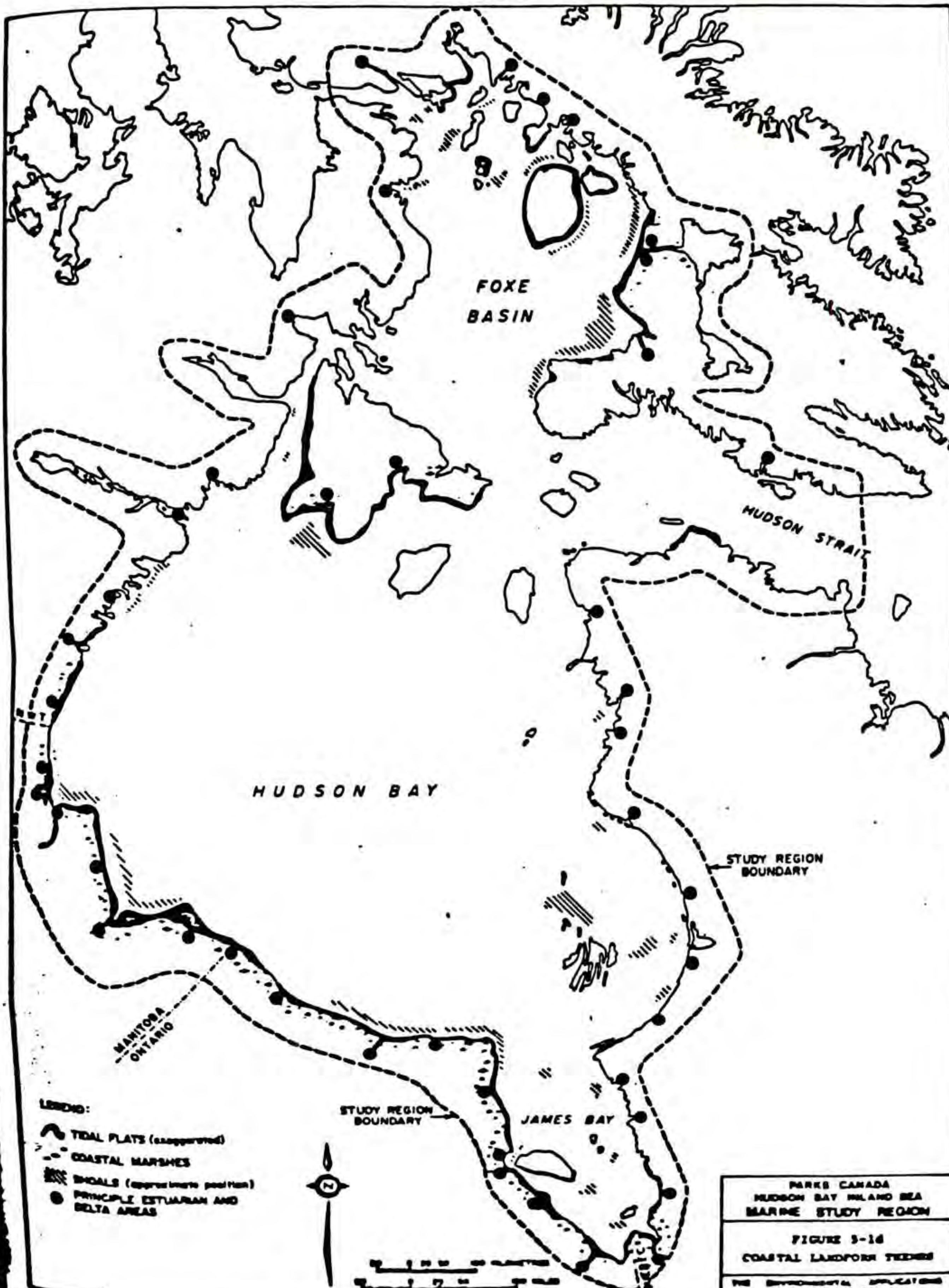


FIGURE 5-1d
COASTAL LANDFORM TRENDS

FIGURE 5-4a OCEANOGRAPHIC THEMES

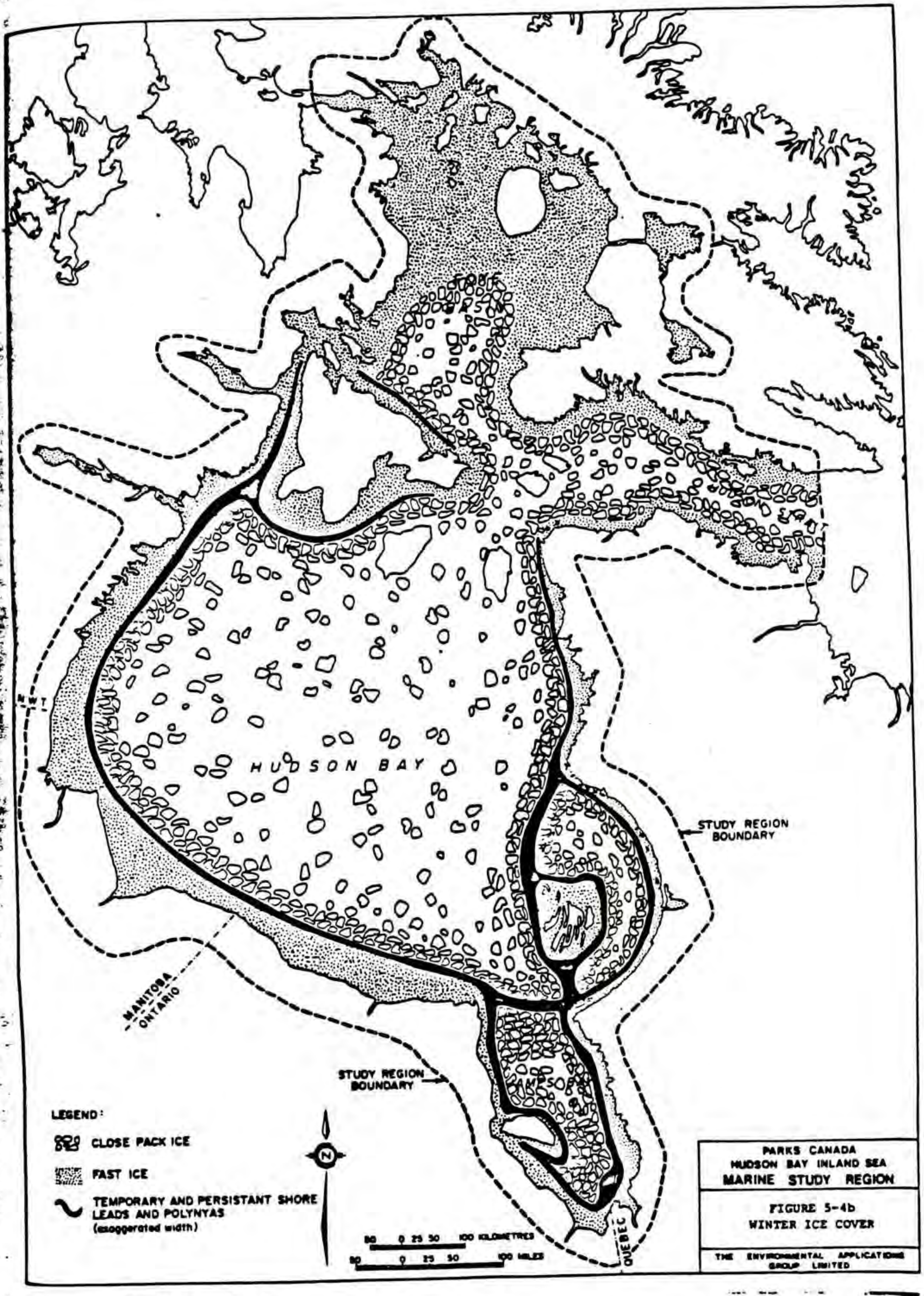


FIGURE 5-4b
WINTER ICE COVER

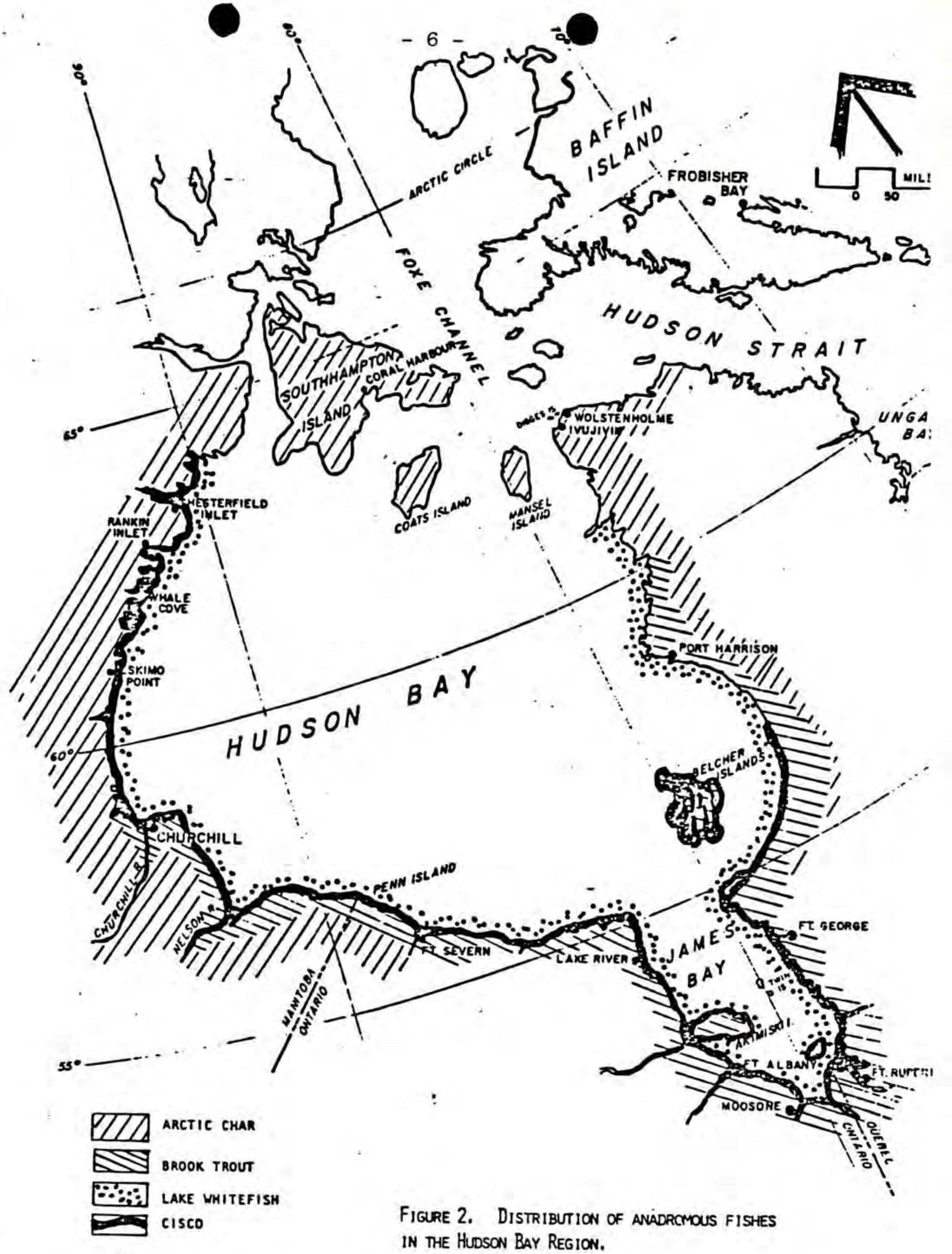


FIGURE 2. DISTRIBUTION OF ANADROMOUS FISHES IN THE HUDSON BAY REGION.

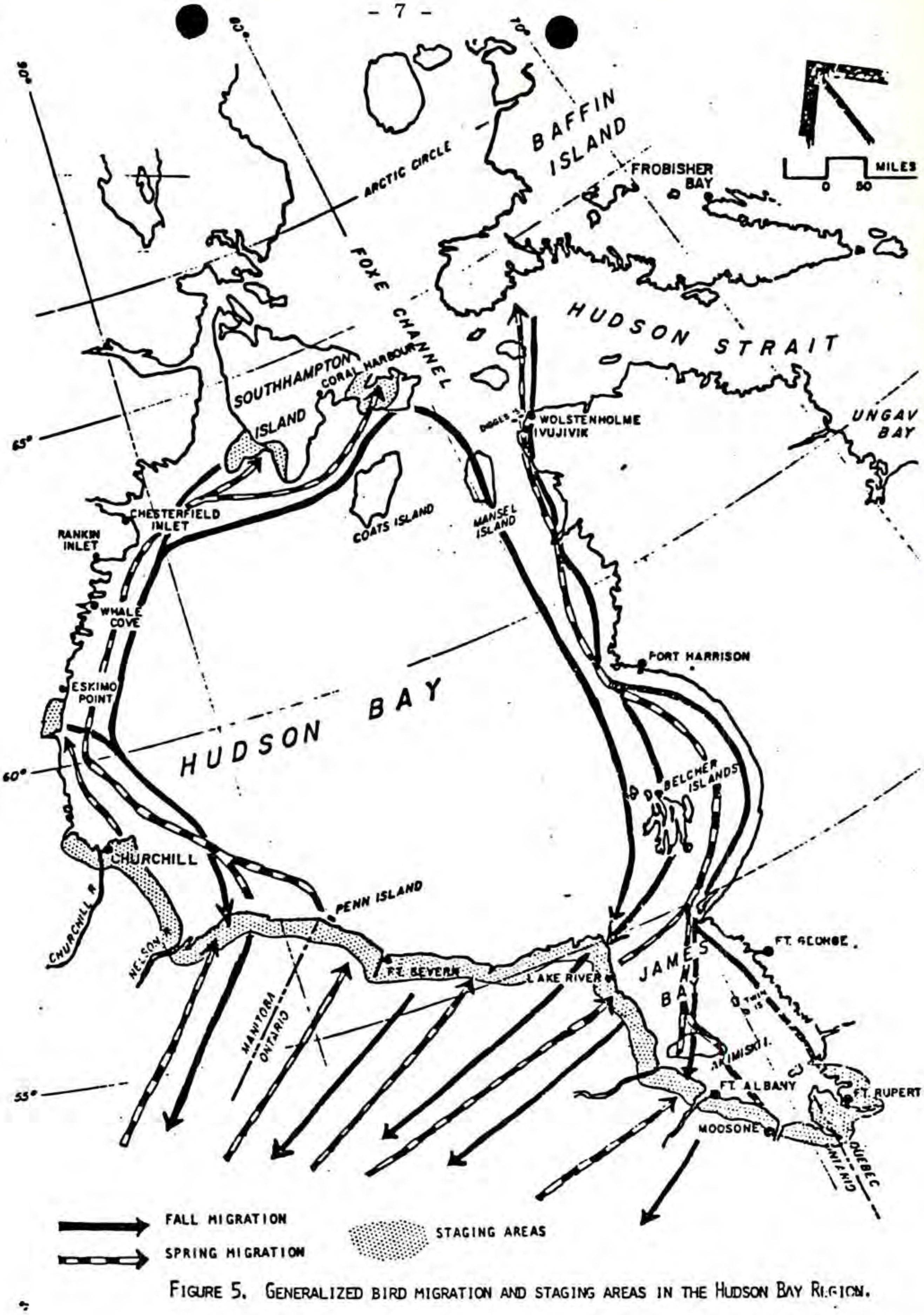


FIGURE 5. GENERALIZED BIRD MIGRATION AND STAGING AREAS IN THE HUDSON BAY REGION.

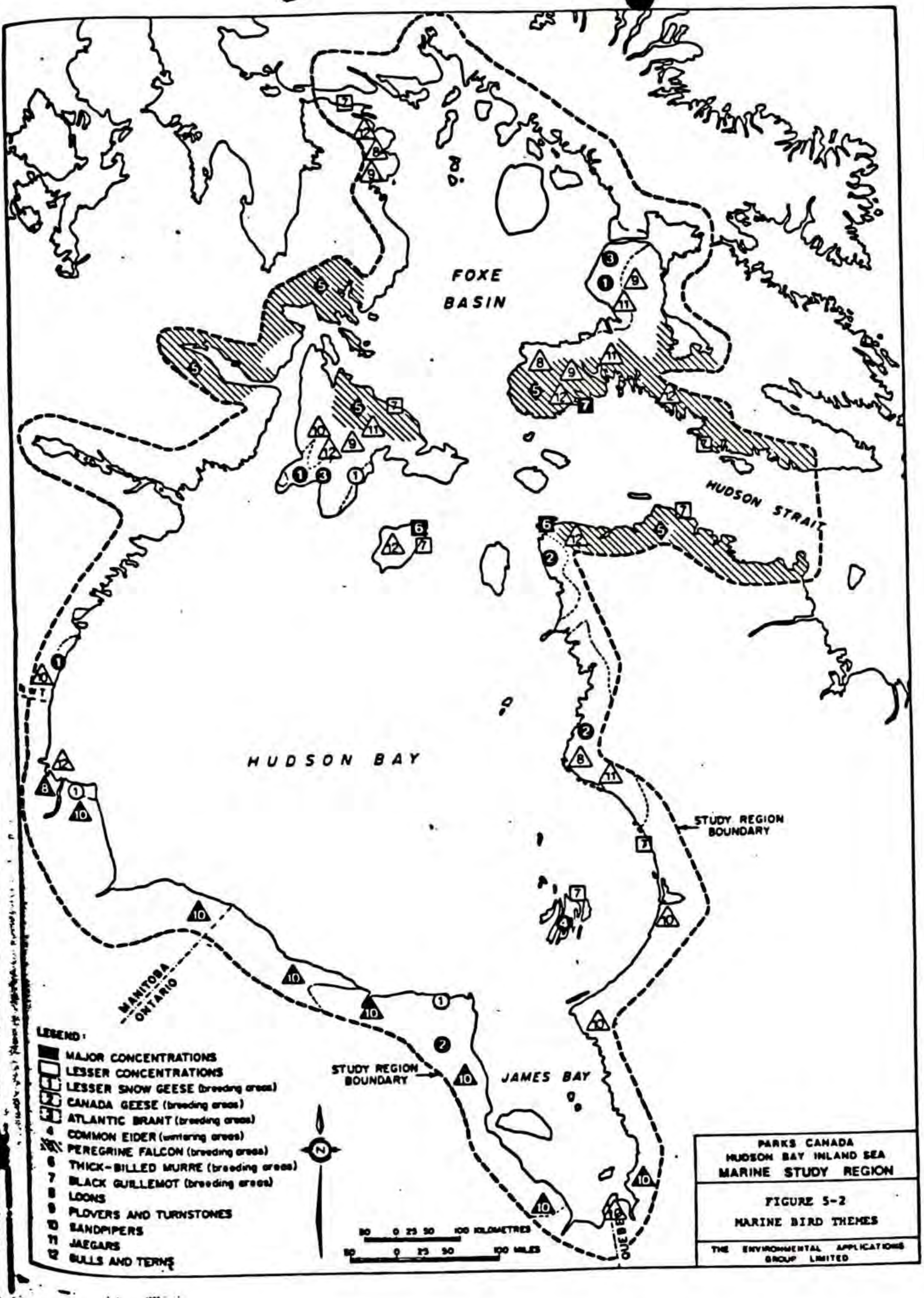

FOXE BASIN
HUDSON STRAIT
HUDSON BAY
STUDY REGION BOUNDARY
MANITOBA
ONTARIO
JAMES BAY
QUEBEC
LEGEND:
MAJOR CONCENTRATIONS
LESSER CONCENTRATIONS
1 LESSER SNOW GEESE (breeding areas)
2 CANADA GEESE (breeding areas)
3 ATLANTIC BRANT (breeding areas)
4 COMMON EIDER (wintering areas)
5 PEREGRINE FALCON (breeding areas)
6 THICK-BILLED MURRE (breeding areas)
7 BLACK GUILLEMOT (breeding areas)
8 LOONS
9 PLOVERS AND TURNSTONES
10 SANDPIPERS
11 JAEGARS
12 GULLS AND TERNS
50 0 25 50 100 KILOMETRES
50 0 25 50 100 MILES
PARKS CANADA
HUDSON BAY INLAND SEA
MARINE STUDY REGION
FIGURE 5-2
MARINE BIRD THEMES
THE ENVIRONMENTAL APPLICATIONS GROUP LIMITED

FIGURE 4. NESTING COLONIES OF LESSER-SNOW AND BLUE GEESE AND THICK-BILLED MURRES IN THE HUDSON BAY REGION.

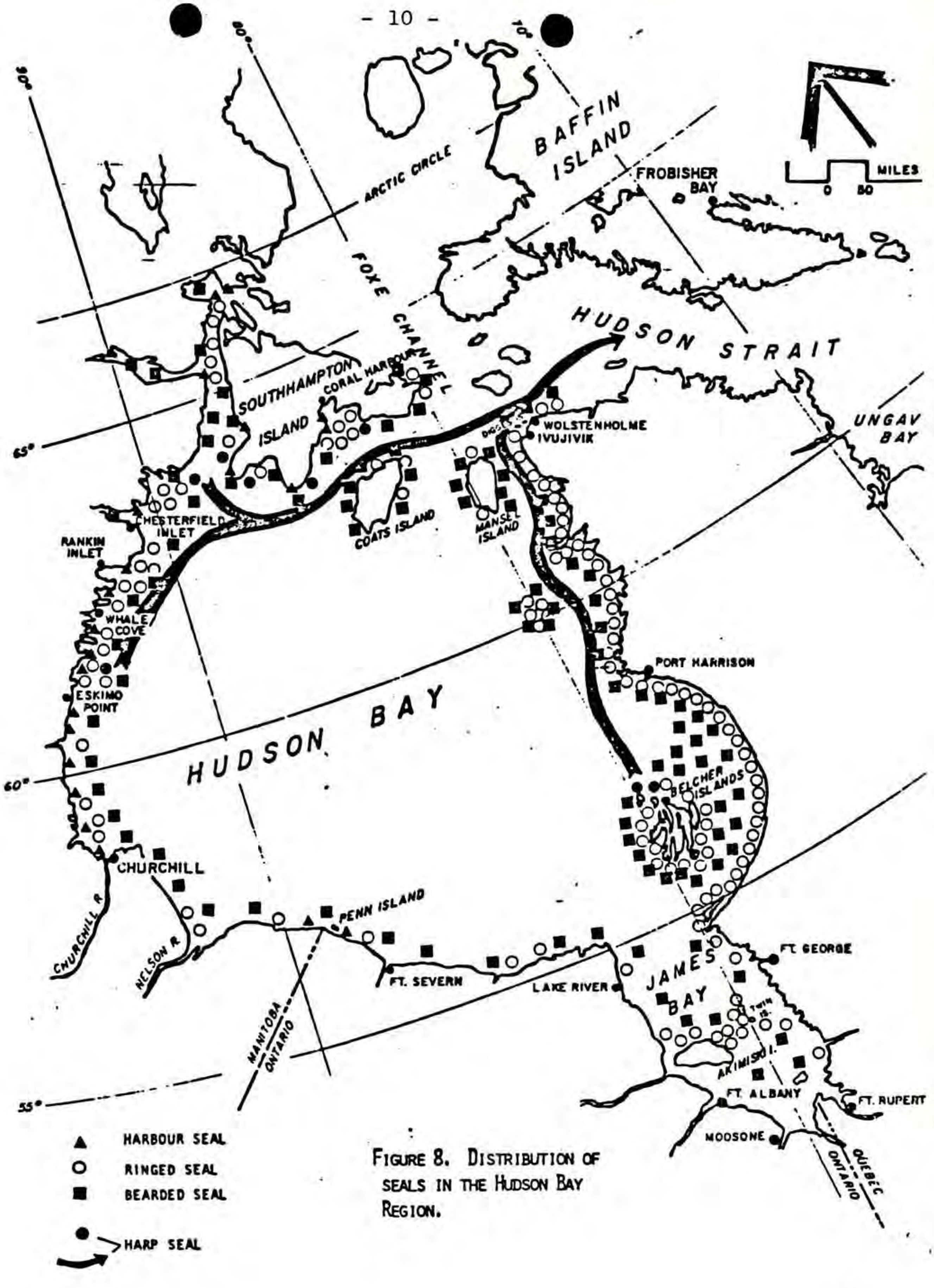
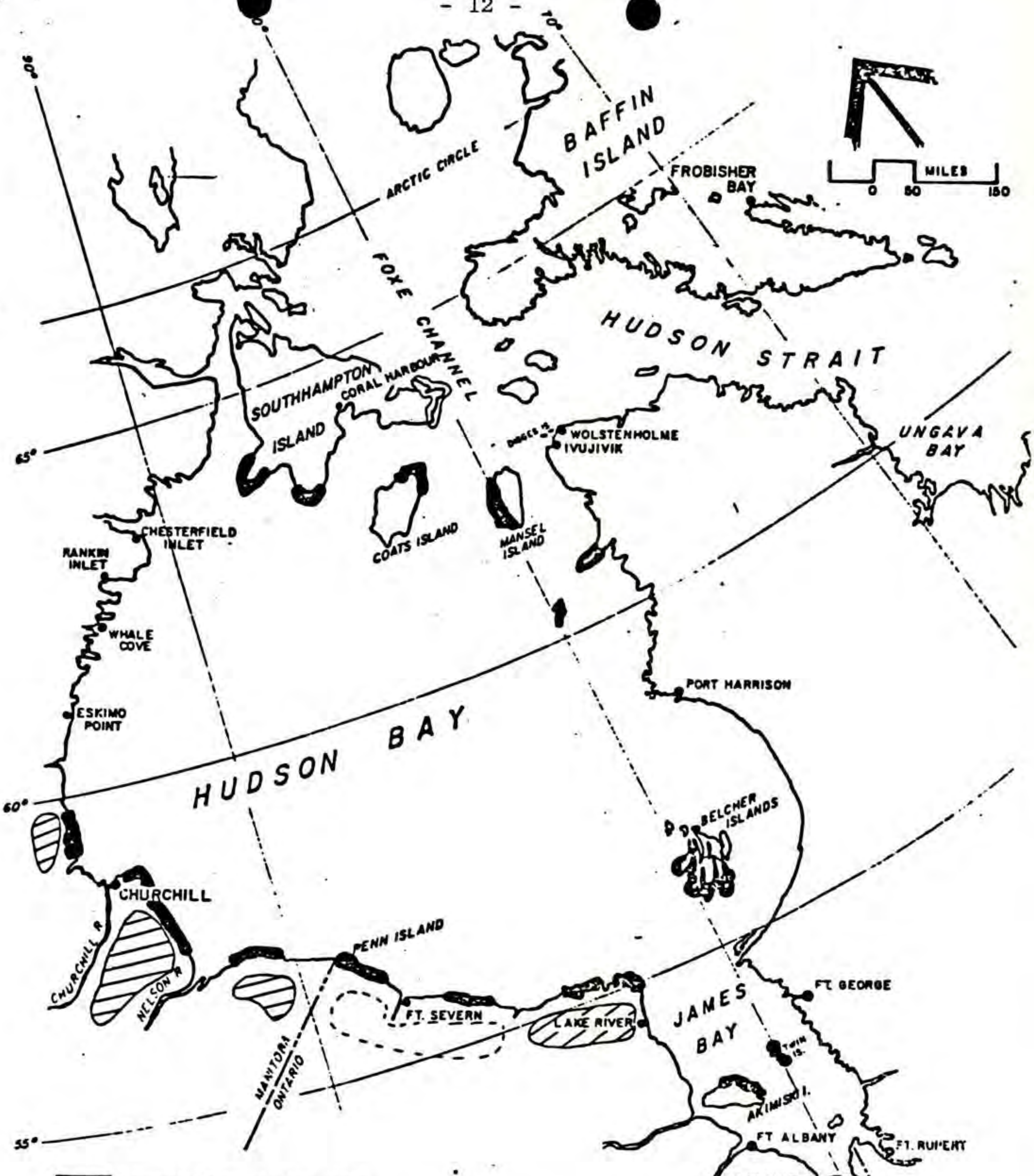


FIGURE 8. DISTRIBUTION OF SEALS IN THE HUDSON BAY REGION.

FIGURE 9. DISTRIBUTION OF WALRUSES AND WHALES IN THE HUDSON BAY REGION.



SUMMER CONCENTRATION AREAS

MATERNITY DEN SITES

POSSIBLE MATERNITY DEN SITES

FIGURE 6. DISTRIBUTION OF POLAR BEAR CONCENTRATION AREAS IN THE HUDSON BAY REGION.

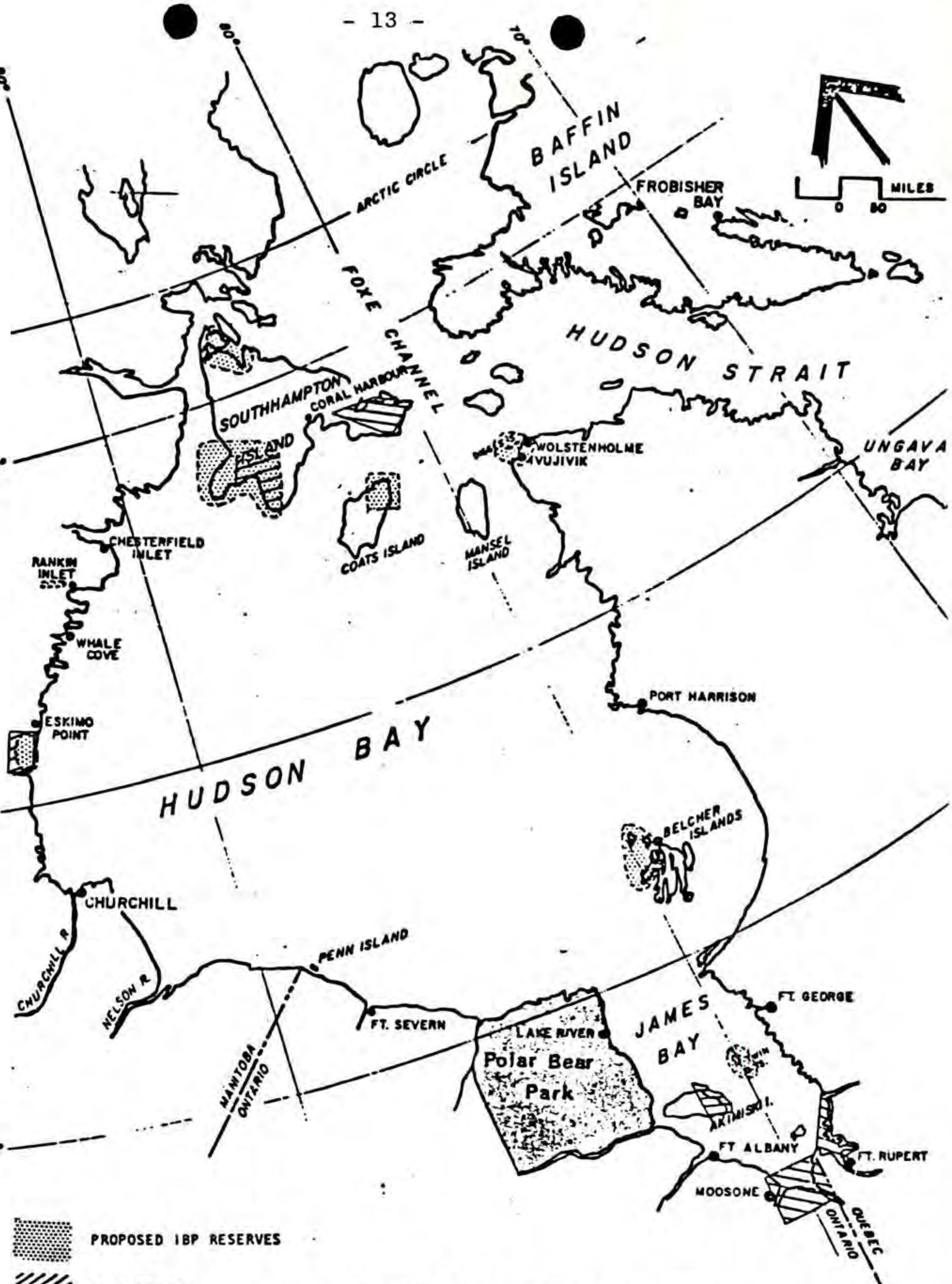
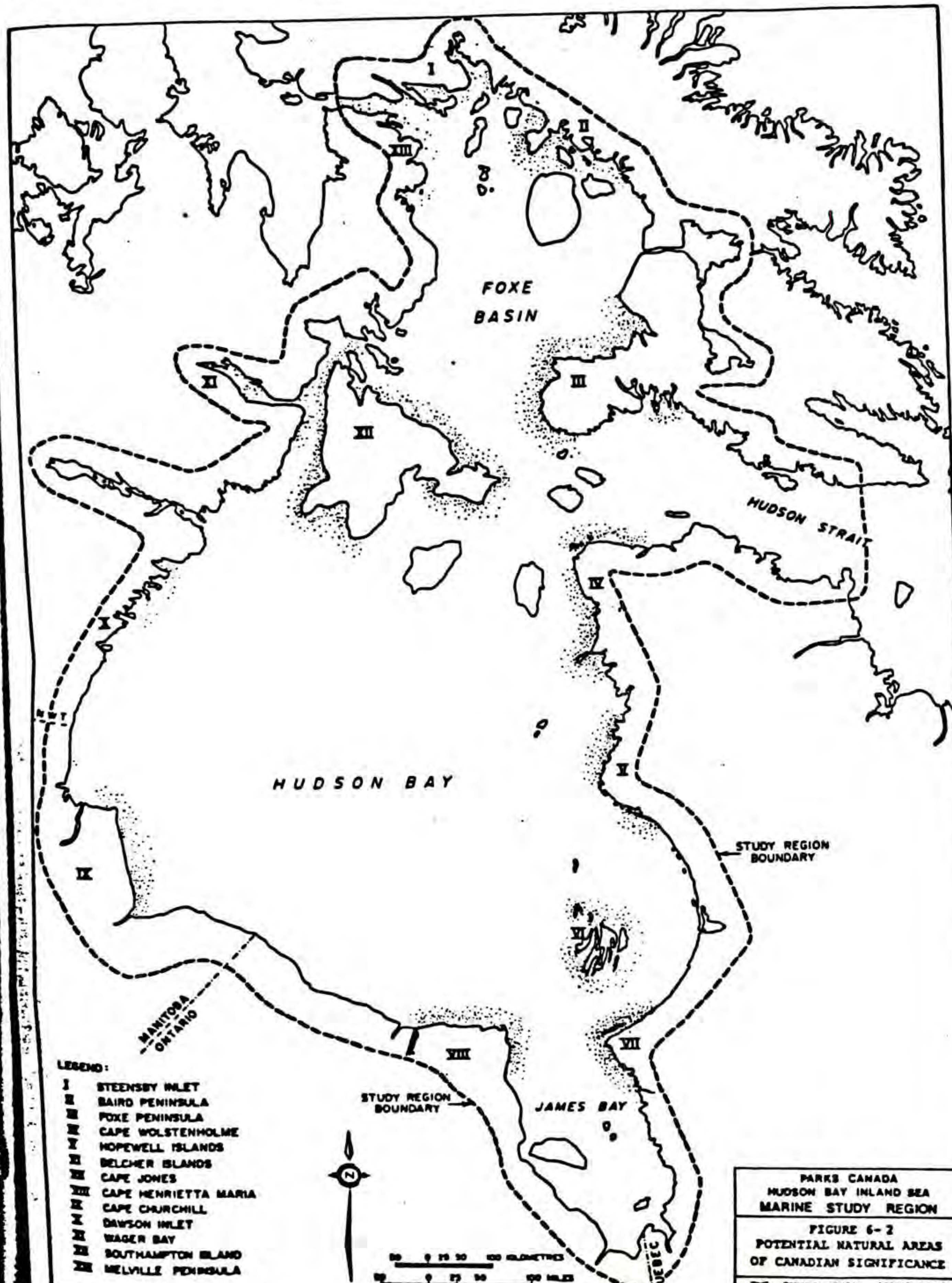


FIGURE 3. EXISTING RESOURCE SANCTUARIES AND PROPOSED NATURAL RESERVES IN THE HUDSON BAY REGION.


FOXE
BASIN
HUDSON STRAIT
HUDSON BAY
JAMES BAY
STUDY REGION BOUNDARY
STUDY REGION BOUNDARY
N.W.T.
MANITOBA
ONTARIO
QUEBEC
I
II
III
IV
V
VI
VII
VIII
IX
X
XI
XII
XIII
LEGEND:
I STEENSBY INLET
II BAIRD PENINSULA
III FOXE PENINSULA
IV CAPE WOLSTENHOLME
V HOPEWELL ISLANDS
VI BELCHER ISLANDS
VII CAPE JONES
VIII CAPE HENRIETTA MARIA
IX CAPE CHURCHILL
X DAWSON INLET
XI WAGER BAY
XII SOUTHAMPTON ISLAND
XIII MELVILLE PENINSULA
N
PARKS CANADA
HUDSON BAY INLAND SEA
MARINE STUDY REGION
FIGURE 6-2
POTENTIAL NATURAL AREAS
OF CANADIAN SIGNIFICANCE
THE ENVIRONMENTAL APPLICATIONS GROUP LIMITED

2. History of Exploration

Onshore

- 1923 - a number of onshore wells drilled in the Moosonee area
- 1928-30 - 4 more wells were drilled in the same area
- 1948-51 - 3 wells were drilled on west shore of James Bay
- 1962 - Sogepet obtained provincial licenses in Manitoba
- 1967 - Aquatine obtained provincal lines in Ontario
- 1966-74 - 13 onshore wells were drilled - 3 in Manitoba, 2 in Northern Ontario, and 8 in the Moose River Basin

Offshore

- 1962 - Sogepet acquired offshore acreage
- 1964 - Atlantic Richfield acquired 50 million acres
- 1965 - Seismic exploration began

Offshore Drilling

Aquitaine Exploration and Drilling 1969 and 1974

Walrus

- the first well was drilled by Acquitaine in 1969 58 N 87W
- Acquitaine submitted an application in the spring of 1969 and approval was given by EMR for drilling that summer - there was no environmental review
- drilling was done from a barge - there was no drill in the Bay to drill a relief well
- drilling began on August 7 and ended October 16 when a store blew the barge off the hole
- the hole which had reached 3,926 feet was not conventionally plugged until 1974
- it was noted at the time in Oilweek that little was known about waves, current and weather in the area

Narwhal &
<u>Polar Bear</u>

- the second and third wells were drilled in 1974
- the Narwhal well was located 185 miles southwest of Walrus
- the Polar Bear well was located 15 miles east of Walrus
- Acquitaine met with EMR officials in 1974 to work out plans to drill in the summer of 1974
- Dept. of Environment was consulted but it was late in the process
- DOE demanded a contingency plan and an environmental assessment
- Acquitaine did not mention its Walrus failure
- Acquitaine did not have an oilspill plan or a plan to get another right to drill a relief well if a blowout occurred or if the rig was disabled
- Just before drilling EMR incorporated 4 conditions in the permit including requirements for studies of drilling effects on acquate life - (where are these studies?)
- Drilling program lasted from August until late Oct.
- Walrus was plugged
- Narwhal was drilled to 4,341 feet
- Polar Bear was drilled to 4500 feet

<u>Chevron Standard Exploration Agreement: 1980</u>

- Chevron and the federal government negotiated an agreement in December of 1980 to explore in Hudson Bay
- the federal Government wanted 4,500 km of seismic work carried out over a 3 year period
- in the fourth year Chevron was to conduct environmental studies and detailed work
- in the fifth year 2 wells were to be drilled
- the acreage under consideration was in the vicinity of the Belcher Islands
- the deal did not go through because the company only wanted to do 1 year of seismic

Canadian Occidential Agreement 1982

- the company is to conduct seismic operations over two 18 month periods
- the company in the 4th year is to undertake instensive detailed seismic operations, predrilling work and some studies
- the company in the 5th year is to drill one or two wells
- the acreage includes areas north of 60

Exploration Expenditions & Activity

1966-78	- approximately $15 million spent on geological and geophysical work
1966-78	- approximately 33,000 kms of seismic
1966-78	- approximately $21 million spent on offshore drilling
1977-78	- approximately $100,000 spent on research and environmental work

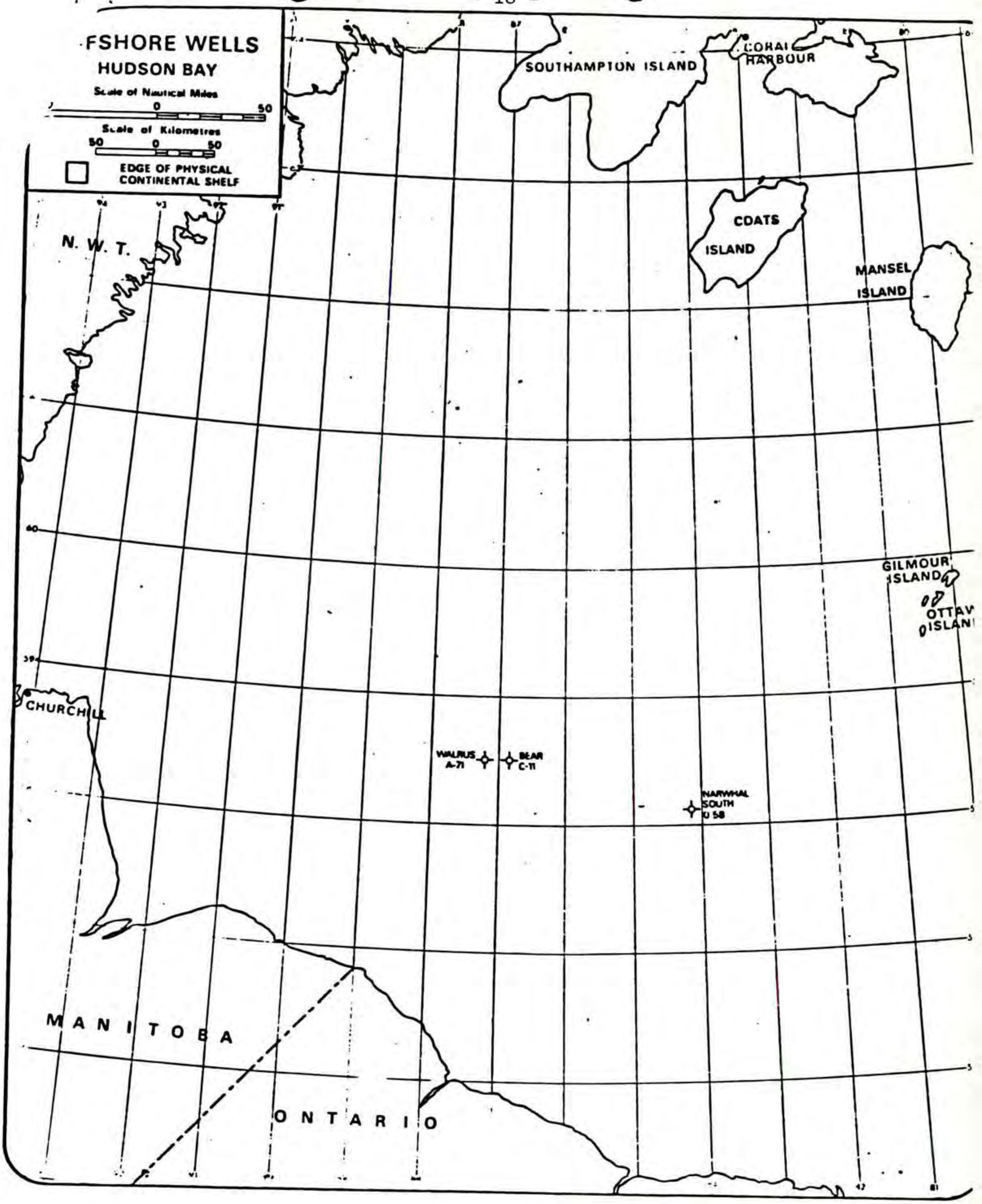
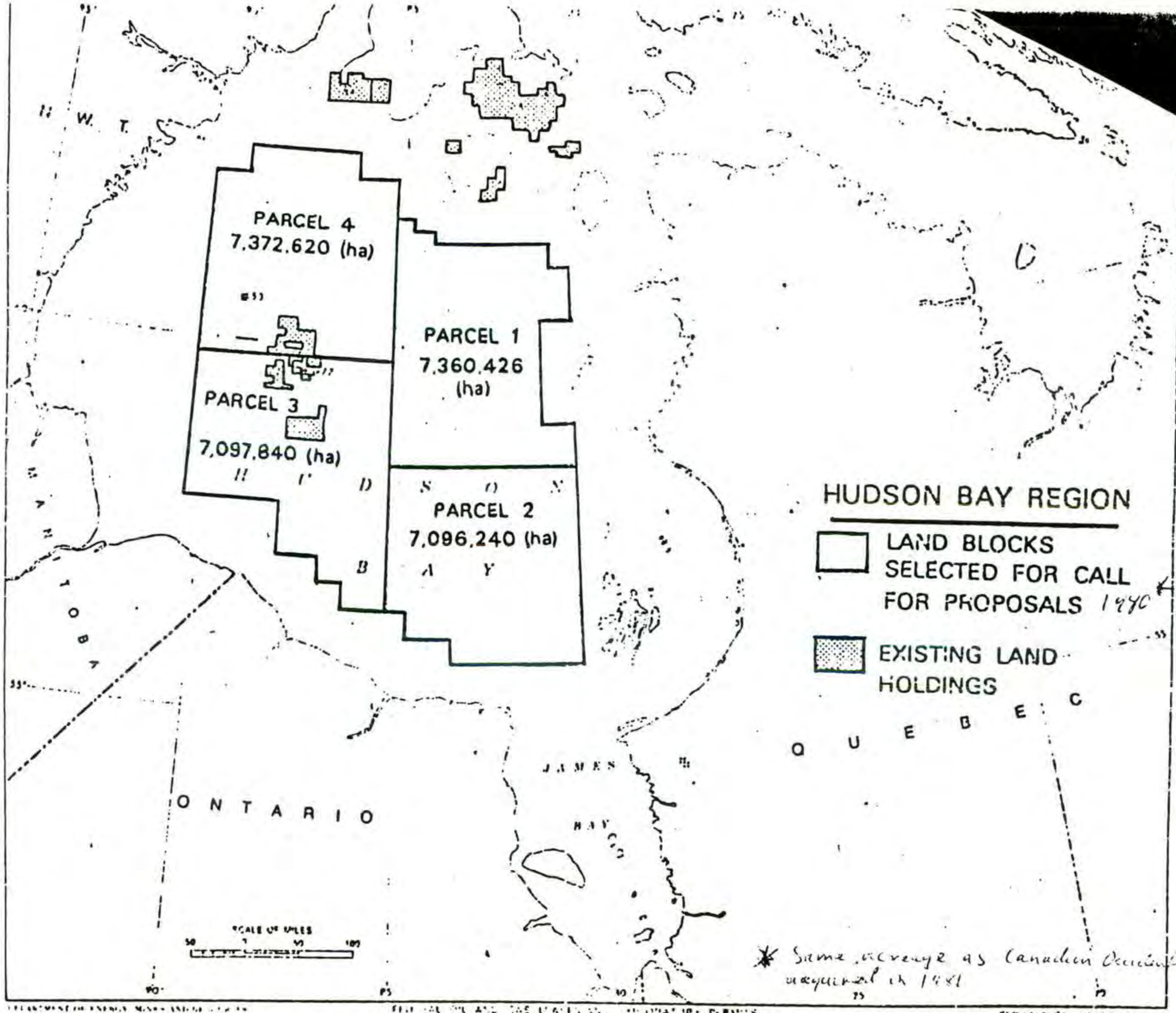

·FSHORE WELLS
HUDSON BAY
Scale of Nautical Miles
0
50
Scale of Kilometres
50
0
50
EDGE OF PHYSICAL CONTINENTAL SHELF
SOUTHAMPTON ISLAND
CORAL HARBOUR
COATS ISLAND
MANSEL ISLAND
N. W. T.
GILMOUR ISLAND
CHURCHILL
WALRUS A-71
BEAR C-11
NARWHAL SOUTH O 58
MANITOBA
ONTARIO

FIGURE 2



HUDSON BAY AND HUDSON STRAIT

3. Inuit Concerns & Actions

1974

- No one in Chesterfield Inlet, Eskimo Point, Rankin Inlet and Whale Cove knew of Aquitaine's drilling activities

- A public meeting in Chesterfield Inlet produced the following statement:

  In the past few years, there has been a large influx of mineral and oil exploration in the Canadian Arctic and still more exploratory activities are coming into existence. Due to the fact that seismic programmes and offshore drilling are now being effected in and on Hudson Bay, the Inuit people feel that the danger to the wildlife and the sea animals has increased tremendously; therefore, some measures of control over the exploration companies should be imposed in consultation with the Inuit people. Specifically, the people of Chesterfield Inlet are opposed to any seismic activity and offshore drilling in and on the Hudson Bay since it would greatly affect the sea animals, not only around the immediate area of exploration but within the waters of Hudson Bay since it would greatly affect the sea animals, not only around the immediate area of exploration but within the waters of Hudson Bay. Should there be a discovery of oil under the Bay, there is a great danger of oil spillage or leakage which may float up from the bottom of the Bay and due to sea currents may surface miles away and may not be discovered until enormous amounts of damage have already occurred. An example of oil in the sea and its effects on sea animals was experienced in Chesterfield about a year. ago. There was a leak in one of the bulk fuel tanks and during the spring thaw runoff, the oil floated down into Mission Lake and via a small creek, ended out on Spurrell Bay at the mouth of Chesterfield Inlet. Throughout the summer, there were no fish in Spurrell Bay and seals could only be caught far away from their normal habitat around Spurrell Bay.

- On May 22 the Winnipeg Free Press reported the Secretary-Manager of Coral Harbour had written the Minister of Energy, Mines and Resources expressing community concerns and asking the following questions:

  (1) Have environmental studies, similar to those proposed for the Beaufort Sea area, been completed in Hudson Bay?

(2) Does the federal government, which has given approval in principle, have full information on the effects of an oil spill on the water coastline and animals of Hudson Bay?

(3) Does Aquitaine know exactly what problems may be encountered in drilling operations this year and can they guarantee that no accident, similar to that at Walrus Hole in 1969, could occur?

(4) If an accident does occure, can the federal government guarantee that an oil spill (or blowout) can be handled without environmental damage?

(5) Is there a second rig available in Hudson Bay which can plug a blowout hold if damage occurred to the first rig, or would an oil blowout continue all winter until the hole eould be plugged after breakup?

1981 - ITC became aware of the Chevron Standard negotiations and wrote both the Minister of Indian Affairs and the Minister of Energy, Mines and Resources requesting information on the negotiations. ITC also requested consultation on any further developments. No reply was received. (see attached)

1982 - Keewatin Inuit Association and Keewatin Regional Council resolution concerning Canadian Occidental's exploration agreement. Concerns centering on consultation, environmental studies, and employment were telexed to the Minister of Indian and Northern Affairs.(see attached)

1982 - Meeting with Minister of Indian and Northern Affairs and COGLA.(see attached)

Summary of 1982 Inuit Demands of Federal Government

Keewatin Demands of Minister of DIAND

1. Information - baseline data on Hudson Bay
   - company plans for 1982, 83 & 84
   - employment opportunities for Keewatin residents
   - relevant legislation
2. Establishment of a Public Relation Programme - government, companies and Inuit
3. Establishment of oil and gas committees
4. Environmental Impact Statement before seismic activity is to take place
5. Funding
6. Inuit involvement at all levels of oil and gas development and in environmental studies

ITC Demands of Minister of DIAND

1. Has an Environmental Impact Statement been undertaken?
2. If yes - what were the guidelines employed for evaluation?
3. What consultation has taken place?

4. DIAND consider seriously social and environmental demands of Inuit.
5. DIAND consider seriously the recommendations of Inuit.
6. DIAND ensure consultation with COGLA on behalf of Inuit.
7. DIAND provide environmental studies undertaken in 1974.
8. DIAND find funding for the establishment of a working group.

Peter Ittinuar's Demands of Minister of EMR

1. Advisory body be established
2. Funding for Advisory Body be made available
3. Advisory Body be made up of Keewatin, Baffin and Quebec
4. Advisory Body involved in the renegotiation of the agreement
5. No renegotiation of the agreement until after the advisory body has become functional

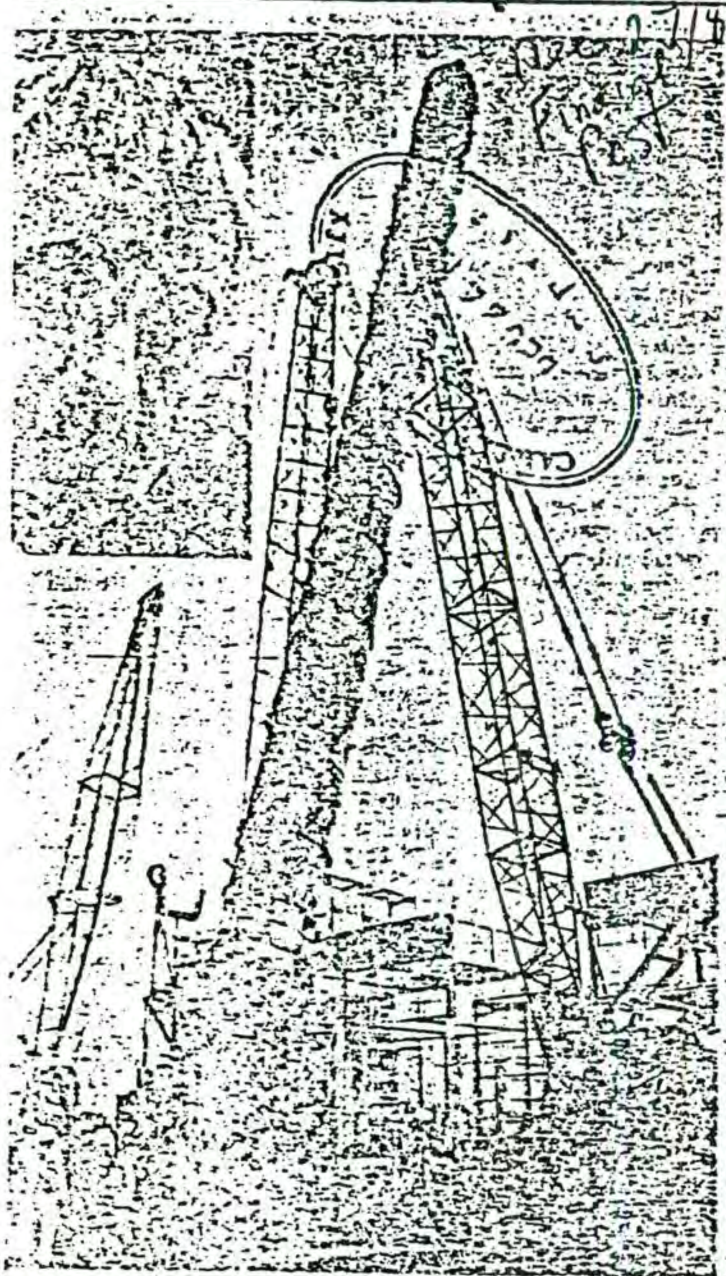
then the rights... es to pay ...agement fee for man... t in the form of adver... organizing, controlling, ...eting, obtaining fin... ng, and monitoring the ...e licensee within the

• After paym... of $5,000 Taxsavers tenders a cash performance bond of $15,000 which is applied to the promissory note and, one description of the plan says, it is neither taxable in the hands of the recipient nor deductible in the hands of Taxsavers. This is

license, nothing need ... paid to Taxsavers.

• If Revenue Canada disallows the deduction, Taxsavers says it will refund all payments and return the promissory note. But Taxsavers has the first right to represent the licensee before Revenue

CONTINUED ON P.2



...megaproject building with political savvy. Here, ...essel for Medicine Hat methanol plant

...ve plotting two genera... ...ture) the company is ... reap several benefits. ...oversupply of natural ...ill continue to provide ... supplies to Nova's ...ents. Moreover, if the ...oduction in Canada ...mand for Nova's pri... ...le — natural gas — will ...ther good news for the ...re the fruits of diversi... ...ity.

Nova (or Alberta Gas ..., as it was known until ...) was strictly a one... ...created by the Alberta

ning in 1954 to act as a common carrier of natural gas within the province. In addition, the legislation (amended in 1974) empowered AGTL to do almost anything else in the realm of hydrocarbons. Manning's goal was to provide the means for all Albertans to share in the province's growing energy wealth.

"You'd be amazed at how many old-timers, ranch hands and farmers still have their original share issues, which have since split five-for-one," says Nova Senior Vice-President Dianne Hall.

AGTL remained a common carrier until 1969. It really had no other choice. The Alberta Gas Trunkline Company Act created a seven-man board of

Chevron aims its skills at Hudson Bay

By Andrew Brown

CALGARY

FOR THE FIRST TIME in five years, the oil and gas industry is focusing on the vast Hudson Bay sedimentary basin.

The bay is federal territory, so renewed exploration there could bring more provinces into the dispute about offshore oil rights.

Last week, Chevron Standard's representatives were in Ottawa, discussing terms for the company to begin exploration in the bay.

Meanwhile, officials from the Manitoba government arrived in Calgary to quiz geologists with Aquitaine Co. of Canada about their experience with the area's geology half a decade ago.

This flurry of activity comes a mere three weeks after the federal government received no bids on its offer of 75 million acres of Hudson Bay exploration rights.

Despite the disappointing sale results, it's clear Chevron is interested in Hudson Bay. Company geophysicists, the men who discovered West Pembina's fabled Devonian reefs in Alberta and pinpointed the Mesozoic sands of Hibernia, were considering the lands offered at terms, according to a spokesman for the Department of Energy, Mines & Resources, close to the original federal work requirements.

CONTINUED ON P.2

Offshore action for 'inland' provinces?

THE ROCKY Mountain energy ... has helped give Denver a penny ... bonanza reminiscent of the gol... a century earlier. The trading r... wild west in style, but now c... and European money are addi... air of respectability (p. 9).

Tightrope

ALUMINUM producers walk a de... line between balancing capacity ... demand and again face a ... outlook next year (p. 5).

Newspaper proble...

LIFE HAS not been all smooth s... for the newspaper survivors alo... the market and new problem... being encountered (p. 7).

Leap barriers

UNHAMPERED free trade would ... up labor to enter more prod... and remunerative fields and ... Canadian workers to do what th... best, says Walter Block (p. 10).

Talking turkey

MOST PEOPLE expect to see a t... on the Christmas table but thi... not always the case in Canad... Arnold Edinborough discover... 11).

Beware of bear

A GENUINE stock market bear ... why he thinks stock prices are he... down (p. 13).

Golden voyage

TIMMY may only be a tug but ... West Coast-based chil... storybook is making waves worl... a giant liner in internati... publishing markets (p. 14).

... Hudson Bay

...tinued from...

The permit rules the ... (who has agreed to explore on these Canada lands) must carry out over a three-year period 4,500 kilometres (2,800 miles) of seismic work. In the fourth year of the permit, the explorer must conduct environmental studies and drillsite work to a maximum cost of $1.5 million. In the fifth year, two wells must be drilled to an agreed depth, likely to the bedrock (so-called basement tests). Estimates of the total cost for this program range from $20 million (using Ottawa figures) to $80 million (industry estimates).

An Ottawa source says Chevron balked at only one aspect of these requirements. While the company accepts federal drilling and environmental rules, it finds second and third year seismic requirements excessive.

This indicates Chevron has defined its objective in the Bay and wants to avoid covering more area (at between $1,500 and $3,000 per kilometre) than needed for its own exploration ... An Ottawa source also hints ... may have failed to bid at ... to avoid the ... of ... would

have followed the purchase of rights to explore a block of sedimentary land equal to half the area of Alberta.

Prior to its abandonment of exploration of those same sediments five years earlier, Aquitaine had spent, probably, $20 million operating its drillship Pentagon P-82 in the cold Hudson Bay waters. The company eventually concluded that the rocks there are similar to those that contain the oil fields of the Williston and Michigan basins in the continental U.S.

However, spokesman Bill Taylor says that even though Aquitaine delineated "seven or eight possible trapping mechanisms, ranging in size from 10,000 acres to 20,000 acres," the general feeling was reservoirs would be too small to justify the huge costs of offshore drilling and production.

But Taylor laments leaving the bay. Aquitaine's two wells penetrated the crest of dome structures. However, because the top of the dome was worn away by erosion 200 million years ago, any possible hydrocarbon accumulations had leaked away. Taylor still hopes that traps for petroleum may exist along the dome flanks.

There are even more reasons for optimism. The seismic work Aquitaine conducted was done prior to a significant improvement in the ... Now sound waves can provide data on sediment beds through an acoustic barrier of sound-absorbing rock such as found immediately beneath the Hudson Bay sea floor.

Shell, which pioneered the research and development that led to the improvements, says this has made for substantial clarification in data obtainable from Hudson Bay.

There has also been an aeromagnetic study said to have been carried out in the Belcher Island area that located deposits of younger, Mesozoic rock and piqued the interest of "elephant"-seeking oil men. (There are still some rumors around Calgary that the first sparks that lit the fires of the Hibernia discovery off the east coast of Newfoundland were ignited by aeromagnetic survey.)

But any move into Hudson Bay will also have a political effect. No longer will Newfoundland Premier Brian Peckford's claims to offshore resources be a lone voice. He likely will be joined by a chorus from Quebec's Premier Rene Levesque, Ontario's Premier William Davis and Premier Sterling Lyon of Manitoba — all of whom will want their piece of ... offshore Hudson Bay ...tion.

...l Post

Financial Post Magazine ... U.S.A. ...

INUIT TAPIRISAT OF CANADA

ᐃᓄᐃᑦ ᑕᐱᕇᓴᑦ ᑲᓇᑕ

176 Gloucester St
3rd Floor
Ottawa, Ont
K2P 0A6
Ph (613) 238-8181
Telex 053 3517

January 13, 1980

The Honourable Marc Lalonde
Minister of Energy, Mines & Resources
21st Floor
580 Booth
Ottawa, Ontario
K1A 0E4

Dear Sir:

ITC has recently learned of Chevron Standards negotiations with the federal government to undertake a 5 year exploratory drilling programme in the vicinity of the Belcher Islands, Hudson Bay. This area falls within ITC's area of claim; however ITC was not informed of the negotiations.

ITC is currently in the process of negotiating a comprehensive settlement of claims with the federal government. Since ITC intends to include industrial development in the negotiations ITC is concerned that any development in progress prior to a final agreement being signed may prejudice the outcome of the final agreement and could effectively preclude any meaningful Inuit participation.

ITC therefore requests a clarification as to the present status of negotiations between Chevron Standard and the federal government and, that as a matter of departmental policy to be kept informed of any development slated for our area of claim.

Sincerely

Michael Amarook

Michael Amarook

c.c. The Honourable John Munro
Minister
DIAND

INUIT TAPIRISAT OF CANADA
ᐃᓄᐃᑦ ᑕᐱᕇᓴᑦ ᑲᓇᑕ

176 Gloucester St.
3rd Floor
Ottawa, Ont
K2P 0A6
Ph (613) 238-8181
Telex 053 3517

January 13, 1981

The Honourable John Munro
Minister
Indian Affairs and Northern Development
Les Terrace de la Chaudiere
21st Floor
10 Wellington St.,
Hull, Quebec
K1A 0H4

Dear Sir:

During the past few weeks ITC has learned of the advancement of two northern projects. One is the TransCanada Pipeline proposal to ship LNG from King Christian/Ellef Ringnes Islands in Class 10 icebreaker carriers; and the other is Chevron Standard's proposed exploration of Hudson Bay in the vicinity of the Belcher Islands. TransCanada is presently studying liquefaction facility designs, indicating that the project has gone well beyond the conceptual stage of development. And Chevron Standard is currently in the process of negotiating an exploration agreement with the federal government.

Both the projects fall within ITC's area of interest. Since the consequences of development are invariably disruptive and long term then, as a matter of federal policy, information should be communicated to the people most effected by it. However, ITC was not informed.

Furthermore, the initiation of projects prior to a final settlement of land claims may very well prejudice the outcome of the final agreement and projects in operation at the time of the final settlement may effectively preclude meaningful Inuit participation.

....2

ITC therefore requests a clarification as to the present status of the two projects mentioned above. And ITC requests, that as a matter of policy, to be kept informed of all major developments irregardless of its degree or level of advancement.

Sincerely yours

Michael Amarook

Michael Amarook
President

c.c. The Honourable Marc Lalonde
Minister
Energy, Mines and Resources

Resolution Regarding Oil Exploration in Hudson Bay

Passed at the Keewatin Mayors Conference held in Repulse Bay, N.W.T.
January 18 - 22, 1982

WHEREAS: The Canadian Oddicental Petroleum Limited, Ontario Energy Corporation,,SOGEPET and the Department of Energy, Mines and-Resources signed a five year Exploration Agreement which took effect on January 1, 1982.

AND WHEREAS: There was no consultation with any of the communities which will be affected by such Oil Exploration

AND WHEREAS: Consultation is most necessary regarding the effects such Exploration Activities would have on sea wildlife which remains the main source of traditional food for the communities

AND WHEREAS: The Energy Mines and Resources department went ahead and consented to the Agreement without consulting with the communities or without conducting an environmental study in the affected area

THEREFORE BE IT RESOLVED: That the Federal Government, and in particular, the Department of Indian and Northern. Affairs and Energy Mines and Resources be approached and meet with Inuit Tapirisat of Canada, Keewatin Inuit Association and/or the Mayors of the Keewatin.

and

That the Keewatin Inuit Association inform Inuit Tapirisat of Canada & to confirm the meeting with the above-named Federal Government Departments.

Motion Moved By: Louis Pilakapsie, Rankin Inlet

Motion Seconded By: Charlie Tinashlu, Repulse Bay

GOVT NWT YK.

GOV GS RANKIN
RA-1718
2:20
FEB 26X/82

CC G. Thompson
R. Ames

DESMOND BRICE BENNETT
INUIT TAPIRISAT OF CANADA
OTTAWA, ONTARIO
TELEX NO 053-3517

AS PER OUR CONVERSATION ON FEBRUARY 24, 82 THE R DRAFT AGENDA FOR THE KIA REGIONAL COUNCIL MEETING WITH THE MINISTER ON OIL AND GAS EXPLORATION IN THE HUDSO BAY IS AS FOLLOWS:

1. KEEWATIN'S DISAPPROVAL OF FEDERAL GOVERNMENT GRZNTING LICENCE WITHOUT CONSULTATION
2. INFORMATIION ITEMS REQUIRED:
   A. BASELINE DATA AVAILABLE TO DATE ON THE HUDSON BAY
   B. COMPANY PLANS FOR ACTIVITIES FO R SUMMERSOF 82-83-84
   C. EMPLOYMENT OPPORTUNITIES FOR KEEWATIN RESIDENTS
   D. COPIES OF LIGISLATION AND REGULATION S FOR OIL AND GS GAS EXPLORATION
3. INSTITUTION OF A PUBLIC RELATIONS PROGRAM AS A JOINT VENTUR BETWEEN THE COMPANIES, FEDERAL GOV. AND K.I.A.
4. ENVIRONMENTAL CONCERNS TO BE ADDRESSED PRIOR TO 1985

PLEASE ADVISE ON A REFINED VERSION AND ANY SUGGESTED ADDITIONS MIIKA KILABUK OF THE MINISTER'S OFFICE WILL TRY TO SET P UP MEETING FOR MARCH 10 OR 11, 1982

THE RESOLUTION REGARDING THE OIL EXPLORATION PASSED AT THE KEEWATIN MAYORS ~~CONRR~~ CONE CONFERANCE IS AS FOLLOWS, PLEASE FORWARD ~~ONX~~ COPY OF H THIS E TELEX TO RANDY AMES FOR HIS INFORMATION:

WHEREAS: THE CANADIAN ODDICENTAL ~~XXXXXXXX~~ PETROLEUM LIMITED, ONTARIO ENERGY CORPORATION, SOGEPET AND THE DEPARTMENT OF ENERGY, MINES AND RESOURCES SIGNED A FIVE YEAR EXPLORATION AGREEMENT WHICH TOOK EFFECT ON JANUARY 1, 1982

AND WHEREAS: THERE WAS NO ~~XXXXXXXX~~ CONSL CONSULTATION WT WITH ANY OF THE COMMUNITIES WHICH WILL BE AFFECTED BY SUCH OIL EXPLORATION

AND WHEREAS: CONSULTTION IS NOT NECESSARY REGARDING THE R EFFECTS SUCH EXPLORATION ACTIVITIES WOULD HAVE ON SEA WILDLIFE WHICH REMAINS THE MAIN SU SOURCE OF TRADITIONLAL FOOD FOR THEC COMMUNITIES

AND WHEREAS: THE ENERGY MINES AND E RESOURCES DEPARTMENT WENT AHEAD AND ~~CONSENE~~ CONXENTED TO THE AGREEMENT WITHOUT CONSULTING WITH THE COMMUNIITIES OR WITHOUT CONDUCTING AN ENVIRONMENTAL STUDY IN THE AFFECTED AREA

THEREFORE BE IT RESOLVED: THAT THE FEDERAL GOVERNMENT, AND IN PARTICULAR, THE DEPARTMENT OF INDIAN AND NORTHERN AFFAIRS AND ENERGY MINES AND RESOURCES BE APPROACHED AND MEET WITH INUIT TAPIRISAT OF CANADA, KEEWATIN INUIT ASSOCIATION AND/OR THE MAYORS OF THE KEEWATIN

AND

THAT THE KEEWATIN INUIT ASSOCIATION INFORM INUIT TAPIRISAT OF CANADA D AND TO CONFIRM THE MEETN MEETING WITH THE ABOVE-NAMED FEDERAL GOVERNMENT DEPARTMENTS

MOTION MOVED BY: MR LOUIS PILAKAPSI, RANKIN INLE

MOTION SECONDED BY: CHARLIE TN TINASHLU, REPULSE BAY

THANK YOU

[illegible] ERNERK
EXECUTIVE DIRECTOR
KEEWATIN INUIT ASSOCIATION
RANKIN INLET, N.W.T.

[illegible] RANKIN
INUIT [illegible]

Minister John Munroe,
D.I.A.N.D.,
Ottawa, Ontario

REGARDING OIL EXPLORATION IN HUDSON BAY

This letter is written to register with the Government of Canada and D.I.A.N.D. and Energy, Mines and Resources in particular, the concern of the Mayors of the Keewatin Region regarding Oil Exploration activities to be carried out in Hudson Bay.

We most strongly protest the fact that an agreement was entered into between the Government of Canada and the Oil Companies without consultation with people in the communities most affected by such exploration.

In the past the Government had provided information to Inuit people in both the Western Arctic and in Baffin Region that allowed them to have prior knowledge of such activities and to be able to decide what structures should be set up to allow for their involvement and recommendations on how to proceed. This was not done in this case and a great error has been made. In fact a five year agreement has been signed without our consent or knowledge. This agreement does not allow for our participation and does not satisfy us that important environmental concerns will be adequately dealt with. Hudson Bay is a small bay - it provides us with our food and our way of life. We are very concerned that exploration activity could disturb or endanger the sea creatures or the food supply on which they depend.

We are totally dissatisfied with the process that was used in creating and signing such an Agreement and wish to proceed to recommend that our concerns are dealt with before any Agreement is allowed to proceed.

We are aware that in other Regions representatives from Inuit communities have established Committees,Boards or Joint Working Groups that provided them with financial aid to monitor these activities. In addition they were able to employ their own professional resource experts to help them evaluate the nature of the material being produced and studied being undertaken.

Since Hudson Bay spans several regions, including and affecting Inuit in Keewatin, Baffin, Arctic Quebec and Labrador, we think it necessary to create an Oil and Gas Committee made up of representatives from these areas equipped with the resources mentioned above to enable them to be truly involved in planning and evaluating each activity.

This in effect means that we demand to have our say in an organized fashion as outlined and to be allowed to make recommendations, alterations and/or suggestions that are treated with respect by the Government of Canada and by the Oil and Gas Industry.

At'the recent Mayors Conference held in January in Repulse Bay a Resolution came forth asking for full recognition of a Keewatin Regional Body which is to serve as a united voice on behalf of Keewatin municipalities. We request that you acknowledge the existence of such an organized body and proceed to deal with us through our organization. We are now equipped with an address and an Executive Officer through which you may direct future correspondence and information.

We feel very strongly that we have a right to participate at the highest level.

We appeal directly to you as Minister of D.I.A.N.D. that you carry forth our concerns to the other Ministeries involved and that you take immediate steps to provide assistance to us in setting up such a group with the kind of scope and authority as described on page one.

We wish to ensure that our Regional Body is recognized by the Oil and Gas Industry as the channel through which to deal and that we do not wish to have them dealing individually with our communities or relying on the advice of other individuals purporting to represent our point of view.

It is also our strong feeling that Environmental Impact Studies are necessary before Seismic work is started and that we be assured that such infomration will be made available to us on an on-going basis.

We urge you, as Minister of D.I.A.N.D. to represent our interest and concern aggresively to other parties concerned and to play an educating role in ensuring that these grave errors do not reoccur again. We find it hard to believe that the Federal signers of the Exploration Agreement were not aware of past protocol of involving Inuit people prior to such signing and are very worried that without further prodding these same parties may be apt to continue to function without our consent and participation.

We ask that you respond as early as possible to our request for the establishment of such a Committee and that you reply to the contents of this letter and the discussions that will ensure verbally today, in written form through our Regional Body as soon as possible.

We are aware that Bill C-48 allows for such Exploration Agreements to come open for review and possible renegotiation within 18 months after signing.

We strongly urge that consideration be given to doing so and/or ensuring that our recommendations and expectations for active participation be guaranteed at the highest levels of decision-making and operation. Should the Agreement reach this stage we demand the proper mechanism be set in place to guarantee our rightful place in the entire process of altering the old agreement or concrete guarantees being presented to us that due authority and financial assistance will be given to us to enable us to feel complete satisfaction ith the existing one.

All minutes of this meeting are to be provided and forwarded to our Executive Officer for our purposes as soon as possible.

We ask that Inuit be involved on all levels in the early stages of all Oil and Gas Development as well as Mineral Development. Environmental Studies are a key concern and must be included in all planning and prior to all stages of operation.

We invite you immediate response and ask that you communicate such to our Regional Body:

Executive Officer,
Keewatin Regional Body,
c/o Hamlet Office,
Rankin Inlet, N.W.T.
X0C 0G0

INUIT TAPIRISAT OF CANADA

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176 Gloucester St.
3rd Floor
Ottawa, Ont.
K2P 0A6
Ph: (613) 238-8181
Telex: 053-3517

March 17th, 1982

File: 135-020
Chrono

Honourable Marc Lalonde,
Minister Energy, Mines and Resources,
House of Commons,
Wellington St.,
Ottawa, Ontario
K1A 0A6

Dear Mr. Minister:

This letter of inquiry pertains to the Exploration Agreement signed in January between Energy, Mines & Resources, Canadian Occidental Petroleum Ltd., Ontario Energy Corporation and Sogepet Limited.

It is ITC's understanding that this Agreement allows for a three-year seismic program in Hudson Bay and the drilling of up to two exploratory offshore wells.

In reference to this Agreement, ITC would appreciate receiving a detailed response to the following:

1. The federal Cabinet directed in 1973 that assessments be undertaken before commitments or irrevocable decisions are made for all projects which may have an adverse effect on the environment. Was this January Agreement subject to an Initial Environmental Evaluation? If so, what were the results?

2. In reference to the above, what guidelines were used to determine the project's potential environmental effects?

3. Throughout this review process, what efforts were undertaken to consult with the affected Inuit communities and solicit their opinion on this particular project?

I look forward to your reply to this inquiry.

Yours sincerely,

Gregory Thompson

Gregory Thompson,
Executive Director

c.c. Peter Ittinuar,
CARC

INUIT TAPIRISAT OF CANADA

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March 17th, 1982

File: 135-020
Chrono

Mr. M. Taschereau,
Director - COGLA,
355 RiverRoad,
Tower B, 15th floor,
Ottawa, Ontario
K1A 0E4

Dear Mr. Taschereau:

This letter of inquiry pertains to the Exploration Agreement signed in January between Energy, Mines & Resources, Canadian Occidental Petroleum Ltd., Ontario Energy Corporation and Sogepet Limited.

It is ITC's understanding that this Agreement allows for a three-year seismic program in Hudson Bay and the drilling of up to two exploratory offshore wells.

It is in reference to this Agreement that ITC would appreciate receiving a detailed response to the following:

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3. Throughout this review process, what efforts were undertaken to consult with the affected Inuit communities and solicit their opinion on this particular project?

I look forward to your reply to this inquiry.

Yours sincerely,

GT

Gregory Thompson,
Executive Director

c.c. Peter Ittinuar,
CARC

INUIT TAPIRISAT OF CANADA

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Ph: (613) 238-8181
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Honourable John Munro,
Minister Indian Affairs
Northern Development,
Ottawa, Ontario,
K1A 0H4.

File 135-020

March 16, 1982

Dear Mr. Minister:

I am writing further to our meeting March 10, 1982 concerning Hudson Bay drilling and to confirm our understanding of some of the points discussed. I appreciated the opportunity of discussing the drilling proposal with you and am pleased with the support you extended to the Keewatin region mayors.

(1) You will consider seriously the environmental, social and other concerns raised by the Keewatin Regional Body in their hand-delivered letter of March 10, 1982. These important concerns will be conveyed by you to your Cabinet colleague, the Honourable Marc Lalonde, in order that these concerns be acted upon and satisfactory solutions found.

(2) You will consider the recommendations of the Inuit Tapirisat of Canada in reference to the offshore activities in Hudson Bay and convey these recommendations to the Hon. Marc Lalonde. ITC will provide you with this information in the near future. Of course ITC will also be seeking your support in regard to our recommendations.

(3) You will ensure that consultation with the Keewatin communities and COGLA takes place in reference to the proposed exploratory activity in Hudson Bay and in reference to all renegotiation of the earlier exploration agreement.

(4) The Department of Environment requested an environmental assessment of the 1974 drilling program undertaken by the 'Aquitaine company. You will provide the Keewatin communities and ITC with copies of all relevant material prepared in this regard.

...2

(5) The establishment of an Inuit working group on Hudson Bay issues with Inuit representatives from Baffin, Keewatin and Northern Quebec has received your support. You will endeavour to find the necessary funds to ensure that this body can operate in an informed and effective manner.

I trust the above is consistent with your understanding of the points discussed at our meeting. Again, I very much appreciated the opportunity to meet with you about this matter and look forward to your support.

Yours sincerely,

Gregory Thompson

for John Amagoalik,
President,
Inuit Tapirisat
of Canada.

JA/lm

c.c. Keewatin Mayors

Ames

ment was quickly recognized by Washington, where it was seen as the best hope of avoiding a Nicaraguan style revolution in El Salvador.

With apparent support from the Unit- ARENA as a political vehicle for himself and, reputedly, for the most conservative sectors of Salvadorean society.

A strident anti-Communist who has equated the Christian Democratic re- sticky questions. For more than two years, the United States has justified its support of the Salvadorean junta by portraying the governing Christian Democrats as a lonely force of modera- ... they simply, ... desperately Salvadoreans want to end. A democracy is only as the politicians it elects. In the em republic of El Salvador, they wi to be very good, indeed.

GM April 6/82

Keewatin voice needs to be heard, Inuit protes

The following are letters to the editor of The Globe and Mail.

Inuit from the Hudson Bay coast will find cold comfort in learning that they are not the only ones to have fared badly at the hands of the fledgling Canada Oil and Gas Lands Administration (Federal Delay Stalls Drilling by BP Canada — March 12).

The Keewatin Inuit communities learned from other sources in January that the Department of Energy, Mines and Resources signed a five-year agreement last October allowing Canadian Occidental Petroleum Ltd., Ontario Energy Corp. and Sogepet Ltd. access to more than 70 million acres of Hudson Bay. While subject to renegotiation by COGLA (under the much-criticized Bill C-48), this agreement is intended to facilitate the development and production of offshore hydrocarbons. It specifically authorizes 10,000 kilometres of seismic work and the drilling of two exploratory wells.

Much to the communities' dismay, EMR did not undertake any consultation in Keewatin prior to the signing of the agreement. And, following the October appointment of an administrator to the head of COGLA, that organization also failed to act in this regard, despite the fact that it is responsible for determining virtually all oil and gas development in the frontier regions.

Since the Inuit stand to be directly affected by this development and are negotiating an aboriginal claim over N.W.T. lands and waters, they have every reason to be concerned about this lack of involvement.

Their fears about the environmental threat posed by offshore drilling for oil and gas are equally well founded. To date, there have been three wells drilled in Hudson Bay. The first, approved by EMR in 1969 without any environmental review, was only partially completed by Aquitaine before a severe storm blew the drill barge off the hole. Five years later, the drillhole was finally plugged. Had quantities of oil escaped into the environment from this exploratory drillsite, the impact on marine life and the Inuit hunting economy would have been disastrous. The coasts of Manitoba, Ontario and Quebec would also have been similarly imperiled.

Continuing a protest over Hudson Bay drilling that began in 1974, the organization of Keewatin mayors and the president of the Keewatin Inuit Association travelled at their own expense to Ottawa this past month for meetings with Northern Affairs Minister John Munro and with COGLA officials. They demanded that mechanisms be established to ensure community involvement in the assessment of environmental impact before any exploration begins. They also demanded that Inuit be fully involved in the renegotiation of the 1981 agreement.

Considering the fact that COGLA is at present poorly prepared to meet its responsibilities, the two ministers responsible for this agency would be well advised to give the Inuit demands serious attention.

John Amagoalik
Inuit Tapirisat of Canada
Ottawa

She should tie one on

"A woman with a well-tailored suit and a firm handshake can have the world under control," says Barbara Blaes, consultant on personal appearance to the United States Government (Quote of the Day — March 18).

But without a man's choking tie, she would be only half-dressed.

Michael Fedor
Hollidaysburg, Pa.

Art nationalism

Re: The Art World's Bigfoot Battles Big-City Bias (March 18):

When your critic asked me to name a Toronto group tional pretensions, I example immediately, Seven. There are, of Toronto organizat themselves natio Globe and Mail and among them.

Incidentally, I was v when Mr. Mays aske course of our recen "Would it really matte culture was absorbed I States?" But I suppose who could call a city wi quarter of a million p town," is capable of sa ing whatever comes int

I find it amusing tha which tends to be suspi thing it considers Canac ism, allows Mr. Mays often interesting writi tant American nationali

Greg Curnoe
London, Ont.

HOUSE OF COMMONS
CHAMBRE DES COMMUNES
OTTAWA, CANADA
KIA OA6

Peter Ittinuar MP
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April 19, 1982

Mr. Marc Lalonde
Rm. 515-S
House of Commons
Ottawa, Ontario

Dear Mr. Lalonde,

During the week of April 25-30, 1982 the Keewatin Mayors will be drafting the framework for an advisory body for Hudson Bay resource exploitation under the Exploration Agreement for that area.

On April 8th I sent you a copy of a letter to Dr. M. Ruel concerning this matter. Unfortunately I shall be leaving on Wednesday the 21st, to attend the mayor's meeting and do not expect to have received and answer by that time.

In order to convey your favourable views on such a Body and your commitment for funds, I request a letter from your office confirming, if possible, the following elements:

1. An Advisory Body in development matters shall be established.
2. A budget for such Body shall be made available.
3. Members of the Keewatin region, the Baffin region and Northern Quebec shall participate in this Body.
4. This Advisory Body shall be involved in the re-negotiations of the Exploration Agreement.
5. No renegotiaion of the existing Agreement with Occidental will take place until a reasonable time has been allowed for this Body to become functional (estimated three months).

Yours truly

Peter Ittinuar

4. Regulatory Regime

- Hudson Bay is under the statutory authority of Energy, Mines and Resources
- oil and gas exploration is regulated under "Bill C-48" the "Oil and Gas Production and Conservation Act" and north of 60 under the "Arctic Waters Pollution Prevention Act".
- waters south of 60 in Hudson Bay have no specific Arctic type of regulation but depend on such legislation as the Canada Shipping Act, the Ocean Dumping Control Act, the Fisheries Act, the Migratory Birds Convention Act. These Acts provide for environmental protection, compensation and liability but do not provide for public participation
- If Hudson Bay was considered as an Inland Water it would be regulated under the "Northern Island Waters Act." This would mean exploration would require authorization or licences from the NWT Water Board. This would also mean public hearings.
- Because Hudson Bay is under EMR jurisdiction the Arctic Waters Pollution Prevention Act is administered by EMR. Thus the Arctic Waters Advisory Committee that would normally be involved if the Arctic waters were located under IANA jurisdiction is not involved in this case. Given the above Bill-C-48 is the only piece of legislation that can provide Inuit with an advisory body, funding and environmental studies.

Relevant Sections of Bill C-48

Application

Section 5(6) - "The Minister may from time to time appoint and fix terms of reference of such advisory bodies as he considers appropriate to advise the Minister with respect to such matters relating to the administration or operation of this Act as are referred to them by the Minister".

Section 5(8) - "Nothing in this Act aborgates or derogates from any aboriginal title, right or claim that pertained to the aboriginal peoples of Canada prior to the coming into force of this Act.

Section (6) - Where the Governor-in-Council considers that it is in the public interest to issue a remediel order by reason of

(a) a disagreement with any government concerning the location of an international boundary

(b) an environmental or social problem of a serious nature

(c) dangerous or extreme weather conditions affecting the health or safety of people or the safety of equipment, or

(d) any other special circumstances resulting in or necessitating the prohibition or restriction of work or activity on any Canada lands, he shall, by order applicable generally to interest holders or specifically to one or more of them, extend the term of an interest or the period provided for performing an obligation in relation to an interest, or diminish, moderate or cancel any obligation or requirement in relation to an interest."

Exploration Agreement

Section 9 - An exploration agreement confers, with respect to the relevant Canada lands, the right to explore for and the exclusive right to drill for oil or gas, the exclusive right to develop those Canada lands in order to produce oil or gas and the exclusive right, subject to compliance with the other provisions of this Act, to obtain a production licence.

Section 10(1) - The Minister may enter into an exploration agreement relating to Canada lands in the manner provided by this Act.

(2) - An exploration agreement may require the completion of specified work programs within specified periods, leading to and including the drilling of one or more wells within the term of the agreement, and may provide for any other relevant matter, including

(a) the effective date and term of the agreement and any rental payable;

(b) the payment of a cash bonus and the payment, disposition and return of deposits;

(c) the reporting and disclosure of information to the Minister;

(d) equity participation by government and Canadians, including any aboriginal peoples of Canada who may be affected by the exploration agreement;

(e) the surrender, cancellation and transfer of interests under the agreement.

(3) - An exploration agreement shall require, prior to the commencement of any work program, the submission of a plan satisfactory to the Minister for the employment of Canadians and for providing Canadian manufacturers, consultants, contractors and service companies with a full and fair opportunity to participate on a competitive basis in the supply of goods and services used in that work program.

(4) - The Minister may require that any plan submitted pursuant to subsection (3) include provisions to ensure that disadvantaged individuals or groups have access to training and employment opportunities and to enable such individuals or groups or corporations owned or cooperatives operated by them to participate in the supply of goods and services in the work program for which the plan was submitted.

Section 16(1) - The term of an exploration agreement shall not exceed five years or, where the Minister considers it necessary, eight years from the effective date of the exploration agreement and may be renegotiated for successive terms not exceeding five years each, and failing such renegotiation the exploration agreement, subject to subsections (3) and (4) and section 66, is deemed to be surrendered and the Canada lands formerly subject to the exploration agreement become Crown reserve lands.

(2) - An exploration agreement may be renegotiated in respect of all or any portion of the Canada lands under that interest and may include any related Canada lands that, immediately prior to the inclusion, were Crown reserve lands.

Environmental Studies Revolving Fund

Section 49(1) - There shall be established in the accounts of Canada,

(a) a revolving fund under the administrative responsibility of the Minister of Energy, Mines and Resources, to be known as the Environmental Studies Revolving Fund (EMR), which shall include a sub-fund for each prescribed region in the area under that Minister's responsibility; and

(b) a revolving fund under the administrative responsibility of the Minister of Indian Affairs and Northern Development, to be known as the Environmental Studies Revolving Fund (IAND), which shall include a sub-fund for each prescribed region in the area under that Minister's responsibility.

(2) - In this section, "relevant fund", in relation to any interest owner means the revolving fund established by subsection (1) for the area in respect of which the interest owner is operating or, where the interest owner is operating within a prescribed region, the sub-fund for that region.

(3) - There shall be credited to the relevant fund all amounts levied in respect thereof under this section and there shall be charged against the relevant fund all amounts directed to be paid therefrom under this section.

(4) - Every party who is an interest holder on the coming into force of this Act shall, at the time and in the manner determined by the Minister, deposit for payment into the relevant fund an amount based on the rate fixed by the Minister for the purposes of this subsection.

(5) - The rate to be fixed by the Minister under subsection (4) or (11) shall be based on the area of Canada lands subject to the relevant interest that are situated within the relevant area or prescribed region, regardless of the nature of the interest.

(6) - Where an interest owner consists of two or more holders, any levies under this section shall be collected and remitted on behalf of the interest owner by the representative of the interest owner for that purpose.

Section 49(7) - Every party who, after the coming into force of this Act, enters into an exploration agreement under this Act shall, at the times and in the manner determined by the Minister, deposit for payment into the relevant fund an amount based on a rate that equals the sum of the rates fixed under subsections (4) and (10) with respect to the relevant fund.

(8) - No interest holder is liable to make payments into the relevant fund under both subsections (4) and (7) in respect of the same Canada lands unless those lands were Crown reserve lands in the period between the making of payment under subsection (4) and the entering into of the exploration agreement referred to in subsection (7).

(9) - The Minister may direct payment from the relevant fund of the reasonable costs of such environmental or social studies carried on by any party, relating to the area or prescribed region subject to the relevant fund as the Minister determines are necessary in order to decide whether or not to authorize exploration or development activities under this Act or any other Act of Parliament.

(10) - The rate referred to in subsection (4) shall be fixed by the Minister in such a manner that, as far as possible, the payments into the relevant fund under that subsection do not, in the aggregate, result in there being an amount in the revolving fund established under paragraph (1)(a) or (b) that exceeds the total amount fixed under subsection (13).

(11) - Where the amount of the relevant funds falls below one-half of the total amount fixed under subsection (13), every interest owner who has made a payment into the relevant fund under subsection (4) or (7) shall, at the times and in the manner determined by the Minister, deposit for payment into the relevant fund an amount based on the rate fixed by the Minister for the purposes of this subsection.

(12) - The rate referred to in subsection (11) shall be fixed by the Minister in such a manner that, as far as possible, the payments into the relevant fund under that subsection do not, in the aggregate, exceed the difference between the amount in the relevant fund at the time the payments are due and seventy-five per cent of the total amount of the relevant fund fixed under subsection (13).

Section 49(13) - The total amount of each of the revolving funds established under paragraph (1)(a) or (b) shall not, at any time, exceed fifteen million dollars and every levy under this section for the respective revolving fund or a sub-fund included in that revolving fund is inoperative during any period that the revolving fund exceeds such total amount.

(14) - The Governor-in-Council may take regulations prescribing regions for the purpose of subsection (1) and for the administration of the relevant fund.

Administration and Enforcement

Section 50(1) - Information or documentation furnished under this Act or the Oil and Gas Production and Conservation Act is privileged and shall not knowingly be disclosed without the consent in writing of the party who provided it except for the purposes of the administration or enforcement of either Act or for the purposes of legal proceedings relating to such administration or enforcement.

(2) - No party shall be required to produce or give evidence relating to any information or documentation that is privileged under subsection (1) in connection with any legal proceedings other than proceedings relating to the administration or enforcement of this Act or the Oil and Gas Production and Conservation Act.

(3) - Notwithstanding subsection (1), information or documentation furnished in respect of the following matters may be disclosed, in the manner prescribed as follows:

(a) in respect of an exploratory well. on the expiration of two years following the well termination date that relates to that well;

(b) in respect of a delineation well, on the expiration of the later of

(i) two years following the well termination date that relates to the discovery well, and

(ii) ninety days following the well termination date that relates to the delineation well;

(c) in respect of a development well, on the expiration of sixty days following the well termination date that relates to that well;

(d) in respect of geological or geophysical work performed on or in relation to Canada lands, on the expiration of five years following the completion of the work or on the reversion of the lands to Crown reserve lands, whichever first occurs;

(e) in respect of any research or feasibility study or experimental project carried out on or in relation to Canada lands, on the expiration of five years following the date of completion of the research, study or project or on the reversion of the lands to Crown reserve lands, whichever first occurs; and

(f) in respect of an environmental study, accident or oil spill, the status of operational activities or the development of or production from a pool or field, on the furnishing of such information or documentation in a form acceptable to the Minister.

<u>Definition</u> - "Environmental study" means work pertaining to the measurement or statistical evaluation of the physical and biological elements of the lands, oceans or coastal zones, including winds, waves, tides, currents, precipitation, ice cover and movement, icebergs, flora and fauna both onshore and offshore, human activity and habitation and related matters;

Section 63(1) - The interest owner of a former permit, former special renewal permit or former exploration agreement shall, on or before the first anniversary date of any such interest following the coming into force of this Act or on or before six months following such coming into force, whichever is the later,

(a) negotiate an exploration agreement with the Minister; or

(b) make application to take a provisional lease

Section 63(2) - Where an interest owner referred to in subsection (1) does not comply with that subsection, the Canada lands under the relevant interest are deemed to be surrendered and become Crown reserve lands.

(3) - An exploration agreement or provisional lease under subsection (1) may be extended to include all or any portion of the Canada lands under the preceding interest and any related Canada lands that, immediately prior to such extension, were Crown reserve lands.

(4) - Where a former special renewal permit or former exploration agreement contains provisions for the drilling of one or more wells, the Minister shall offer to enter into an exploration agreement with the interest owner for a term equal to the balance of the term of the former special renewal permit or former exploration agreement remaining when this Act came into force and having the same provisions.

Section 63 - Where an exploration agreement required to be negotiated under section 63 or 64 cannot be negotiated within the period provided in those sections for any reason not attributable to the interest owner, the Minister shall extend that period to allow for such negotiation within a reasonable time or for the making of an application to take a provisional lease.

Relevant Sections of the Oil and Gas Conservation and Production Act

Licences & Authorization

Section 3.2(1) - On application made in the manner prescribed by the regulations, the Minister

(a) may issue an operating licence, renewable annually, subject to such requirements as he determines and to such fees and deposits as are prescribed by the regulations; and

(b) may authorize in writing each work or activity proposed to be carried on, subject to such approvals, requirements and deposits as he determines or as may be prescribed by the regulations,

(i) requirements, relating to liability for loss, damage, costs or expenses

(ii) requirements for the carrying out of environmental programs or studies, and

(iii) requirements for the payment of expenses incurred by the Minister in approving the design, construction and costs of production facilities and production platforms as those terms are defined in the regulations.

Section 3.2(2) - Before authorizing any work or activity under paragraph (1)(b), the Minister shall require the submission of a plan satisfactory to the Minister for the employment to the Minister for the employment of Canadians and for providing Canadian manufacturers, consultants, contractos and service companies with a full and fair opportunity to participate on a competitive basis in the supply of goods and services used in that work or activity.

(3) - The Minister may require that any plan submitted pursuant to subsection (2) include provisions to ensure that disadvantaged individuals or groups have access to training and employment opportunities and to enable such individuals or groups or corporations owned or cooperatives operated by them to participate in the supply of goods and services in the work program for which the plan was submitted.

Oil and Gas Spills

Section 19(3) - In section 19.2, "actual loss or damage" includes loss of income, including future income, and, with respect to any aboriginal peoples of Canada, includes loss of hunting, fishing and gathering opportunities.

(4) - The Governor in Council may make regulations authorizing the discharge, emission or escape of oil and gas or such types, in such quantities, at such locations, under such conditions and by such persons as are specified in the regulations, but Her Majesty in right of Canada has no liability whatever to any person arising out of such authorization.

5. Energy, Mines & Resources - Resource Management Branch*

The Department of Energy, Mines and Resources, through the Resource Management Branch (RMB) exercises statutory authority over offshore mineral resource development in oil areas of the Canadian offshore except in the high Arctic. pg. 1

RMB's main objective is to encourage the orderly exploration of Canada's mineral resources. "It also ensures that all exploration and production activities in respect of them are undertaken in a safe and efficient manner consistent with the safety of human life and the protection of the natural environment." pg. 1

The RMB has 4 operating divisions; mineral rights, resource geology operations and conservation; and environmental assessment. Appendix 2.

The Environmental Assessment Division's "major function is to fulfill the regulatory resource managment mandate of the Branch as it pertains to environmental concerns for resource development areas of the Canadian offshore under the jurisdiction of the Minister; to access the physical environmental factors in an area of proposed operations, the impact that offshore operations may have on marine and coastal biota and the socio-economic effects on local communities; to prepare or provide initial environmental evaluation or full environmental impact statements for major offshore oil or gas developments or deep ocean mining ventures in accordance with the Environmental Assessment and Review Process' to promote research and to ensure the development of effecitve oil spill contingency planning". Appendix 2.

In 1979 RMB requested DOE and DFO to undertake a prelimary environmental evaluation. The review identified acreage both suitable and unsuited for marine sesmic activity and drilling. "Information needs and gaps were identified in areas relating to physical and biological oceangraphy, coastal geomorphology and atmospheric paramaters pertaining to oil slick transport. It was also recognized that further information was necessary for a viable weather sea/ice information and prediction system. pg. 11.

"It should be recognized that a rigerous environmental assessment and review will be undertakn by RMB for those offshore lands recently made available for disposition prior to the approval of a drilling program". pg. 12

If it is impossible to identify all the full environmental consequences internally the project would be referred to Fearo. RMB would ask DOE to undertake on Initial Evnironmental Evaluation. If environmental effects are thought significant then the project would be referred to EARP. pg. 12.

"At the same time, the Resource Management Brach has an obligation to ensure that environmental and social issues relevant to frontier exploration are adhered to in a responsible manner" pg. 13

* "Offshore Oil and Gas" A brief prepared for the Hudson/James Bay Symposium April 28-30, 1981.

6. DOE Recommendations to EMR Concerning Hudson Exploration, April 10,1980

1. It is recommended that exploration activity (marine seismic and exploratory drilling) not be permitted in Area "A".

2. It is recommended that exploration activities not be permitted within 50 miles of the coastline in the proximity of Eskimo Point, Whale Cover and Rankin Inlet.

3. It is recommended that it be allowed to proceed with extreme cauction in the eastern and southern portion of Hudson Bay and suggest that an IEE be prepared for this area prior to extensive exploratory drilling (Areas B and C).

4. Exploration be allowed to proceed in the remainder of the proposed lease area with adequate safeguards.

5. It is recommended that disposition of lease in this area be conditional upon the acquisition of marine mammal and polar bear observation during the course of seismic surveys so that the effects of any escalated activity may be properly accessed. This information should be utilized in the preparation of an IEE which should be assessed before drilling is considered (Area "C").

6. In order to identify potential problem areas it is recommended that, as one of the conditions of the permit acquisition, the proponents of exploration be asked to make observations on marine mammals from seismic vessels and aircraft and to collect environmental data relevant to exploration activities. This information will be of considerable importance in future exploratory application processes (Area "D").

7. It is recommended that the information needs identified, be addressed to minimize the uncertainties of future predictions of project environment interaction. Needs pertain to (1) Physical Oceangraphy, (2) Biological Oceanography, (3) Coastal geomorphology and (4) atmospheric parameters pertaining to oil slick transport.

8. Further information*is necessary for a viable weather/sea/ice information and predicition system.

* The lack of an adequate response to the weather forecasts in Hudson Bay created difficulties and near disaster during Auitaine's drilling program at the "Walrus" well in 1974. A storm forced the operator to abandon the drilling operation and cancel any further work. The present observational network and available routine forecasts produced for this area are not adequate for the proposed operation. Attention will need to be given to closing information gaps in the next three or four years. An increased level of service in ice forecasting is required to minimize the risk to safe offshore drilling in this environment.

CANADIAN OXY

Canadian Occidental Petroleum Ltd.

April 15, 1982

Mr. Charlie Kudluarok
Municipality of Sanikiluaq
Sanikiluaq, N.W.T.
XOA OWO

Environmental Advisory Committee
c/o Kativik Regional Government
Fort Chimo, P.Q.

Attention: Secretary

Gentlemen:

Attached is a copy of the March 23, 1982, revision of our proposed 1982 seismic program. The position of the program is subject to some revision based on data to be interpreted presently.

I am forwarding this information at the request of Maurice Ruel, Director General of Environmental Assessment for COGLA. I understand it will form part of an information package which was promised by COGLA at the Kativik Environmental Advisory Committee meeting of April 1, 1982.

Yours very truly,

R. T. Peirce
Manager, Exploration

RTP/jmd
Attachment

cc Maurice Ruel
Canada Oil and Gas
Lands Administration

1600 McFarlane Tower — 700 - 4th Ave. S.W., Calgary, Alberta, Canada T2P 3J5
(403) 265-2390. Telex 038-21516. TWX 610-821-4898

13. 4. 5

Canadian Occidental Petroleum Ltd. - 33.3334%
Ontario Energy Corporation - 33.3333%
Sogepet Limited - 33.3333%

EXPLORATION AGREEMENT

EA-282-010

GENERAL

REGION:	Hudson Bay
AREA:	
ACRES/HECTARES:	72,169,283 acres - 29 180 724 hectares
COMMENCEMENT DATE:	January 1, 1982
TERM:	60 months comprising two 18 month periods and 2 one-year periods
RENEWAL DATES:	July 1, 1983 January 1, 1985 January 1, 1986

WORK SCHEDULE

First Period:	18 months - January 1, 1982 to June 30, 1983
Deposit:	$5 million
Work:	Carry out 5000 kms of seismic work.
Second Period:	18 months - July 1, 1983 to December 31, 1984
Deposit:	$5 million
Work:	Carry out 5000 kms of seismic work
Third Period:	One year - January 1, 1985 to December 31, 1985
Deposit:	$1.5 million
Work:	Exploration work including reconnaissance and detailed seismic, predrilling site and environmental studies satisfactory to the Chief in fulfillment of departmental requirements to obtain a Drilling Authority.

Fourth Period:	One year - January 1, 1986 to December 31, 1986
Deposit:	$4 million or $2 million
Work:	Where more than one-quarter of the lands described in Schedule I of this Agreement are retained post a deposit of $4 million and drill two exploration wells at locations to be determined following consultation with the Chief to mutually agreeable depths that will test the objectives of the exploration programs. Where one-quarter or less of the lands described in Schedule I of the Agreement are retained post a deposit of $2 million and drill an exploration well at a location to be determined following consultation with the Chief to a mutually agreeable depth that will test the objectives of the exploration program.

HUDSON BAY EXPLORATION PROGRAM

1982

Canadian Occidental Petroleum Ltd.

CANADIAN OXY

H U D S O N   B A Y   E X P L O R A T I O N   P R O G R A M   1 9 8 2

Canadian Occidental Petroleum Ltd.

Ontario Engergy Corporation

Soquip

March 1982

HUDSON BAY EXPLORATION PROGRAM 1982

INTRODUCTION

Hudson Bay, a body of water 300,000 square miles in area, and located only 1,000 miles north of Canada's heartland, was unknown to world geography before the 17th century. It found its place on the map of Canada as a result of the search for the Northwest Passage, and the stirring events connected with its exploration are described by historical records in great detail. This search, which covered some 150 years is a remarkable example of how the power of a new idea (an erroneous one) can fire the imagination of men and stimulate action that can sweep far beyond the intent of those originally involved.

The exploration of the Bay, in the 17th century, and the demonstration that it could be successfully navigated by the ships of the time, led almost inevitably to another idea, of seemingly lesser scope but more importance to the development of the northern half of this Continent. Shrewd adventurers and astute business men saw that Hudson Bay offered a sea route into the heart of the richest Canadian natural resource then known, the fur harvests of the northern area.

The immediately important consequence of this idea was the founding of the Hudson Bay Company, an organization that has since played a great role in the history of Canada. Another consequence, equally important in the long run, was the establishment of a base for land exploration that eventually filled in an important part of the map of Canada covering more than 55° of longitude from Hamilton Inlet in Labrador to the Rocky Mountains in Alberta. Still another long-term result of ship traffic into the Bay and river navigation from the hinterland to the Hudson Bay Company posts, was the idea of a railway linking the prairies with Hudson Bay and providing a short land and water route to the ports of Europe. The establishment of this route early in the 20th century was one of the landmarks of Hudson Bay history, but now it appears that the full potential of this development has not yet been realized.

At the present time, more than 50 years after the completion of the Hudson Bay railway, it is logical to ask the question, what does the future hold for the further development of the Hudson Bay region? This is a question which only the future itself can answer in detail. Nevertheless, it is a fairly safe prediction that modern science and technology, which have already revolutionized transportation and communication in Hudson Bay, will be equally successful in revealing and helping to develop the petroleum and mineral resources of this focal region of Canada. In the past 20 years, intensive geological and geophysical studies have been made, not only of the PreCambrian and younger geological areas surrounding the Bay, but also the complex rock units that lie under the waters of this great inland sea. One of the first important projects of the Bedford Institute of Oceanography was an oceanographic and geophysical survey of Hudson Bay making use of the Canadian ship HUDSON. Part of this survey consisted of the application of the most modern techniques of underwater geology and geophysics to a study of the bottom sediments and basement rocks of the Bay. At the same time, steps were being taken by companies to investigate the possibility of oil accumulations in the sediments that lie under the waters of the Bay. Between 1971 and 1974, three offshore exploratory wells were drilled to basement to investigate the culmination of basement features. An additional three earlier basement tests were drilled in the Hudson Bay Lowlands, all of which confirmed the presence of stratigraphically inviting strata. All wells drilled to date have been abandoned, but the presence of both reservoir rock and hydrocarbon in the form of gas in the formation water and oil residues in the porous carbonate have been noted.

Some of the companies which have been active in Hudson Bay and undertaken field programs in the past, either singly or as members of consortia, are: Richfield Oil, which became Arco which became PetroCanada through mergers; Aquitaine; Mobil; Shell; Total; Fina; Suncor; and Sogepet. Several thousand kilometers of refraction seismic was acquired to justify the drilling to date and an additional 17 000 kilometers of reflection data was acquired in 1973 and 1974. The reflection data is similar to the planned program and will be integrated to form our interpretation.

EXPLORATION SEQUENCE IN SEARCH FOR OIL

Oil industry operations follow a sequence of exploration, development, production, transportation, refining, and marketing. In Arctic Canada, exploration is presently the most important activity of the petroleum industry. The production and transportation of resources are being planned, but await additional discoveries (so that the resources are economic to produce), a transportation network, and, in the case of natural gas, an adequate market. Also, the production and transportation phases involve large scale projects that must first be thoroughly reviewed for their social and environmental impacts.

The exploration phase follows a sequence of activities: the prediction of petroleum's presence based on geological theory, reconnaissance geological and geophysical surveys over large areas (which is the present state of the Hudson Bay Project), seismic surveys over more local areas, and then perhaps testing the geological formation for hydrocarbons.

While petroleum is the second most abundant liquid on earth, it is found only in fairly specific locations. One task of geology is to provide theories to explain and predict the occurrence of oil and natural gas. The geologist reconstructs the earth's history and formulates a story that begins tens, or even hundreds of millions of years ago when petroleum was formed.

Water and wind eroded the exposed layers of mountains and hills. Creeks, streams, and rivers carried the weathered rock particles downstream. The river's speed determined how heavy the particles it could carry. As it drained into a sea, the river waters slowed down and progressively finer materials settled out onto the seafloor: first the gravels, then the sands, silts, clays, and finally lime. The shallow sea waters were teeming with life. As the plants and animals died, their remains were buried within these sedimentary layers.

Formation

The sediments accumulated a few millimeters or centimeters a year for hundreds of thousands or even millions of years. Shorelines periodically advanced and receded as land masses subsided or were uplifted. This meant that at any one location a variety of different sediments accumulated, layered one on top of another. This great amount of material exerted enough pressure on the more deeply buried sediments to compact them into rocks: sand to sandstone, silts to siltstone, clay to shale, and lime to limestone. The weight, heat, and chemical reactions during this long process also "cooked" the remains of the plants and animals. The result was commonly the formation of petroleum. Coal and oil shale had similar origins.

The compressing sediments squeezed the oil, natural gas, and water out from rocks having small pore spaces, like shale, into the more porous rocks such as sandstone and limestone. The source rock (where petroleum formed) was often different from the reservoir rock (where petroleum accumulated). Water and petroleum tended to migrate upwards through porous rocks, sometimes reaching the earth's surface as it does today, seeping naturally from the ocean floor at Scott Inlet, Baffin Island. At some locations, like the Alberta oil sands, the hydrocarbons reached the surface, partly by migration and partly through the later erosion of surface rocks. The gases and lighter oils evaporated leaving a thick oil residue.

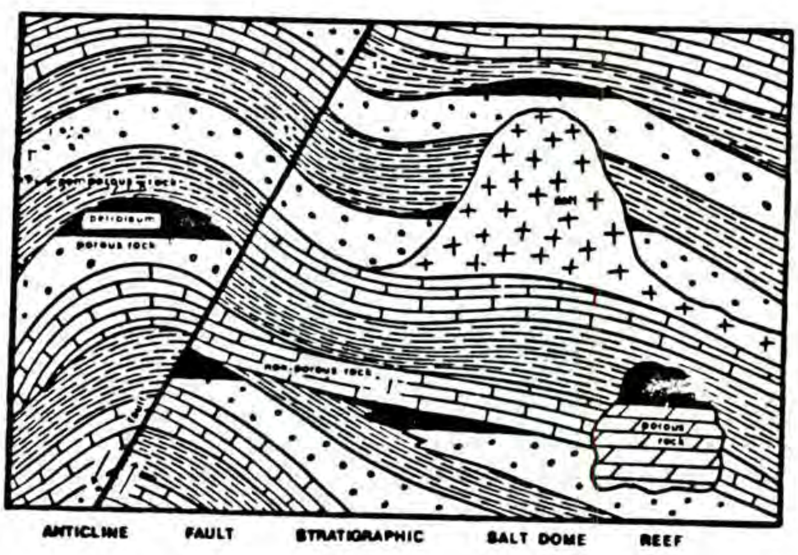
More often, petroleum and water encountered an impermeable layer of rock and moved along the edge of this layer until their travel was stopped altogether within one of a variety of geological traps.

One such geological feature is the anticlinal trap, a fold or dome in a rock layer. These folds form from pressures within the earth's crust which bend the rocks. The buoyant petroleum rises in the fold and can not escape. Increased pressures within the earth's crust may have caused the rocks to fracture along a fault zone. Usually the rock formations on one side of the fault will move up or down relative to the other side so that the strata are disjointed. Petroleum freely migrating through permeable rock encountered an impermeable layer of rock and collected in a fault trap.

In some cases, the reservoir rock pinched out between two converging layers of impermeable rock to form a stratigraphic trap.

Oil and natural gas accumulations are also often associated with salt domes, structures first formed when, over many years, an extremely salty sea evaporated and left salt beds. Under pressures of later deposited overlying sediments, the beds folded and the salt flowed upwards (like toothpaste squeezed from a tube). Traps formed against the dome's sides and also above the dome where the salt has arched, or pierced the overlying rock strata.

Ancient reefs also trapped petroleum. Present in different marine organism reefs, they grew upwards, near the water level in the shallow waters often surrounding land masses. Lime secreted by millions of individual corals and other similar organisms cemented their skeletons together to form a large vertical mass that, when later covered by an impervious shale, provided a trap to oil or gas migrating laterally or upwards into the reef.



Hypothesized Geologic Cross Section Showing Trapped Petroleum.

Drill Testing

Since there is no direct way of discovering subsurface oil, geologists concentrate on finding promising geological formations and trapping conditions. First they located promising sedimentary areas and then make a more detailed search for particular formations. The formations are tested for hydrocarbons by drilling. The search for petroleum first begins by locating areas of thick and extensive sedimentary rocks. Sedimentary rocks overlie the "basement" rocks. Either igneous or metamorphic rocks form the basement. Igneous rocks form within the earth, beneath the earth's crust. Examples are some forms of granite and lava from volcanoes. Metamorphic rocks, like marble, quartzite, and slate are former sedimentary rocks (limestone, sandstone, and shale, respectively) altered by high heat and pressure.

Sedimentary and basement rocks may differ in two properties that can be detected from above the earth's surface: density and magnetism.

A weighing device called a gravimeter measures changes in gravity which in turn depends upon density. The instrument is so sensitive that it can measure density differences of relative thicknesses of basement and sedimentary rocks. When it passes over dense basement rocks close to the earth's surface, the device gives a high reading. Over thick and less dense sedimentary rocks, the gravimeter gives a low reading.

Using a similar principle, the magnetometer gives higher readings over magnetic basement rocks than over sedimentary rocks which contain only very small amounts of magnetite.

These two methods of reconnaissance surveying provide data for mapping the thickness and extent of sedimentary rocks. The lower the basement from the surface -- the greater the thickness of sedimentary rocks and the better chance of finding petroleum.

Other methods may be used to find good petroleum areas. One example is photogeology. Geologists interpret aerial photographs to determine surface geology, which in turn gives indications of the subsurface geology. Field geology may play an important role as well, particularly in areas previously unexplored but these elements can only play a minor role in a sub marine area such as Hudson Bay.

SEISMIC SURVEYS

Having found promising areas from the geological and preliminary geophysical reconnaissance surveys, geophysicists usually conduct a seismic survey, a more detailed definition of the subsurface. Similar in principle to sonar or radar, the seismic method consists of sending sound waves into the subsurface and detecting their reflections from subsurface layers. By measuring when the pulse was sent, the speed of the pulse, and the arrival time of the reflection, the distance to the reflecting surfaces from the surface is calculated.

Sonar detects solid substances in water, radar locates solid objects in the air. With seismic, the task is more complex as numerous reflecting surfaces are present at the boundaries between layers of solid rock with different densities. Also, the speed of the pulse varies with different types of rock. Sound travels through sandstone at some 3 500 m per second; its velocity through granite is approximately 5 500 m per second or 50% faster.

Seismic pulses are often made by the explosions of small amounts of dynamite. A shot-hole rig drills a hole some 20 m into the earth where the charge is then detonated. Very heavy falling weights or vibrating metal plates are also used to create the sound or shock wave. As dynamite may kill fish or harm marine mammals, other nonharmful pulse sources only (such as the release of compressed air) are used in offshore areas.

Geophones are spread out in a line on the ground to detect the reflected shock waves, convert them to electrical impulses which are carried by cable to a recording vehicle. There the faint echoes are amplified and recorded on magnetic tape. For offshore work, hydrophones are packed into a cable which trails the ship.

The data are analyzed by computer to produce a seismic cross section, a profile of the reflecting horizons beneath the seismic line. Geologists and geophysicists then intepret the section, looking for geological formations that may have trapped oil or gas.

No matter how promising the results of the seismic work and the skill of the interpreter, the petroleum explorer does not know whether there are hydrocarbons at a specific site until the geology is tested by drilling.

GEOLOGICAL SUMMARY

Geologically, the Hudson Bay region is one of the least understood parts of Canada because of its remoteness and inhospitable nature. It was not until 1870 that it was visited by a professional geologist, when Robert Bell of the Geological Survey of Canada studied a small portion of the Hudson Bay Lowland.

Much of the bedrock around Hudson and James Bays is PreCambrian, largely peneplained metamorphic and intrusive rock deformed during the Kenoran and Hudsonian orogenies. Folded sediments and volcanics of Proterozoic age occur along parts of the east side of Hudson Bay and on most adjacent islands, notably the Belcher and Ottawa Islands. The PreCambrian bedrock along the west side of Hudson Bay is swamp-covered and largely treeless, becoming almost bare toward Rankin Inlet. The relief is very low, and elevations are generally less than 50 feet above sea level. The east coasts of Hudson and James Bays are topographically more interesting with relief up to 1,000 feet and a shoreline with numerous cliffs and natural harbours.

The Phanerozoic strata, with which our exploration group is primarily concerned, outcrop in two main areas. One is the Hudson Bay Lowland, along the southwest side of Hudson and James Bays; the other is the islands at the north end of Hudson Bay -- Southampton, Coats, and Mansel.

The Hudson Bay Lowland is a large, low flat, swampy plain of about 125,000 square miles, extending from western Quebec west and northwest through Ontario and Manitoba, to a short distance north of Churchill. Much of the surface between swamps and muskeg is covered by low trees, usually coniferous, which become very small and largely disappear toward the coast and north of Nelson River. The Lowland is underlain mainly by seaward dipping Ordovician and Silurian carbonates. Devonian strata of mixed lithology, mostly limestone and shale, underlie areas of the Southern Lowland and parts of the Central Lowland coast between Severn and Nelson Rivers. Coal-bearing Cretaceous strata are known in outcrop only from the James Bay or the southernmost lowland, together with minor Jurassic marine clastics. Except for the excellent exposures along Churchill River, outcrops of Phanerozoic strata are low and scattered, making compilation of a composite section exceedingly difficult.

PreCambrian rocks from the western and southern boundaries of the Lowland are known from two small areas within it. In the first area, the easterly trending Churchill quartzites are exposed along the coast about Churchill; in the second, Proterozoic metasediments and volcanics of Sutton Ridges are present in the Winisk and Sutton River areas about 450 miles southeast.

The Phanerozoic strata of Southampton, Coats, and Mansel Islands of northern Hudson Bay occupy an area much smaller than the Hudson Bay Lowland. They are bayward dipping carbonates of Ordovician and Silurian age, lithologically similar to their counterparts in the Lowland. The Silurian appears to be areally by far the more extensive in outcrop. In contrast to the Precambrian crystalline rocks, the Ordovician and Silurian strata of these islands occupy lowlands with relatively low relief. No trees are present; the area consists of swamp, marsh, and extensive limestone rubble-covered areas, modified by old beach lines. The Precambrian areas on the north side of Southampton and Coats have relief up to 1,600 feet, displayed in rounded hills. The Munn Hills, a small, low relief area in west-central Southampton Island, Walrus and Bencas Islands in Fisher Strait, and Cape Pombroke at the northern extremity of Coats Island are the only PreCambrian inliers known in these islands.

Until recently, the Phanerozoic sedimentary succession in the Hudson Bay Lowland and northern islands was regarded as thin, a concept which has hindered petroleum exploration in the region. It is true that thicknesses approaching 3,000 feet in the Southern Lowland, and 2,000 feet within the James Bay Basin had been well documented by drilling. However, over the vast area to the north, it has been thought that total sedimentary thicknesses are probably less. Little cognizance was given the possibility that much of Hudson Bay is underlain by Phanerozoic strata. When such a possibility was accepted, the strata were considered to be part of the same veneer as on the Lowland and islands at the north end of the Bay.

In the past 25 years, an increasing body of geophysical and borehole data, both from government and from private sources, has indicated the presence of two basins in the Hudson Bay region containing sedimentary strata both areally extensive and of considerable thickness.

The existence of the well known James Bay Basin, with sediments approaching 2,000 feet, was confirmed by these data. They also show this basin to be bounded on the north by a northeasterly trending subsurface PreCambrian high, called the Patricia Arch, over which sediments thin to less than 1,000 feet.

The most important discovery from these geophysical and well data is that nearly the whole of Hudson Bay and the adjacent Phanerozoic land masses form part of an areally extensive sedimentary basin, or basinal complex, centering in the vicinity of Latitude 59°W Longitude 87°N, which contains a maximum thickness of between 6,000 and 10,000 feet, the interpreted thickness varying with the geophysical method used. This feature is called the Hudson Bay Basin. Outcrops along the edge of the basin are in the Central and Northern Lowlands to the southwest and on Southampton, Coats, and Mansel Islands to the north. The basin is bounded on the south by the subsurface Patricia Arch and on the north by an uplift, the Bell Arch, on the northeastern part of Southampton Island. This basin holds two of the three exploration targets on which the program is designed.

In addition, recent geophysical studies by the CdnOxy Exploration Group, government agencies, and competing companies, the data from the Narwhal drill hole, together with refinements in the global plate tectonic theory, have pointed to the possibility of a major post-Permian rift on the eastern edge of the main Phanerozoic Basin.

EXPLORATION TARGETS

The prospective petroleum areas can be divided into three objectives with the present state of knowledge. Each is independent of the others as an exploration target.

Firstly, throughout the world, one of the major types of reservoirs which house large accumulations of hydrocarbons are buried biohermal and biostromal reef developments. Oil migrates from source rocks and becomes trapped in the pores which are often preserved in fossil reef carbonates.

The first and best documented target is Ordovician-Silurian reef objective. Although there is little likelihood of finding hydrocarbon accumulations in commercial quantities on Southampton, Coats, or Mansel Islands, the rocks of these regions exhibit certain lithological and structural characteristics that point to possible occurrences of these constituents in the basinward deeper offshore parts of the Hudson Bay Basin.

Bioherm pinnacle reefs in the Upper Ordovician, Red Head Rapids formation are potential oil and gas exploration targets that were unknown before the work of the Geological Survey of Canada in these areas. Similar reefs are presumably present in the offshore regions of Hudson Bay, although until further offshore seismic and drilling is carried out, it is impossible to accurately predict the trend of the reef development around the margins of the Hudson Bay Basin.

The presence of Middle Silurian, Attawapiskat reefs was also established on Southampton, Coats, and Mansel Islands; and these reefs, undoubtedly, have wide distribution around the inner margins of the Hudson Bay Basin. The reefs studied are small and stunted, but this is apparently due to their proximity to the stable shelf; and it is feasible that considerably larger reefs may be present lower in the basin where subsidence during Middle Silurian time was more pronounced. If analoguous lithostratigraphic and tectonic conditions prevailed in this area as in the Michigan Basin during the Middle Silurian, bioherm pinnacle and patch reefs can probably be expected to occur offshore, completely circumscribing the Hudson Bay Basin. Indications of reef development of major proportions are seen on reconnaissance reflection seismic, which is held by Mobil Oil at present.

A petroliferous shale unit, the "Boas River shale" of late Ordovician age, contains significant petroleum per unit volume and, if found in sufficient thickness and areal extent, should show indications of being an excellent source rock for oil accumulations in the overlying reservoirs if found within the "oil window" in the subsurface under the waters of the Bay.

The next best documented, although the least exciting of the objectives, is a target which results from the mapping of large closed basement structures in the south central and west portions of the Bay. The objectives of the Walrus and Polar Bear holes were to investigate the potential of the culmination of such structures with no commercial avail. It remains for less pronounced apexes with a possibility of thicker, better development carbonate and clastic sections to be investigated. Also, flanks of the most pronounced structures exhibit a thickening which could include pinchouts of reservoirs which would not occur on the highest point.

A third theatre of exploration is a proposed possible late Paleozoic to Cretaceous age rift on the east flank of the Hudson Bay Basin. Evidence for the rift is varied and diffuse, but includes an interpretation of the Narwhal O-55 bore hole data, a gravity survey conducted by the Department of Energy and Natural Resources and magnetic surveys conducted by the CdnOxy group and earlier exploration consortia. This data indicates that the possibility of a rift occurs in eastern Hudson Bay and that the petroleum potential is completely unknown but can only be related to similar features in other parts of the world where 10% of the world's petroleum reserves are estimated to occur in nine separate similar basins.

THE PROGRAM

The intent of the program would be to mount a reflection seismic program employing one seismic vessel for about 60 to 65 days of one navigation season, to begin in the first week of August 1982. Five thousand kilometers of data would be acquired before the navigation is curtailed in the third week of October. It is expected that early transmission and processing of data will allow for design of the latter part of the program based on the preliminary results from the beginning of the program. It is expected that this will more than fulfill the work requirements for the first period of the licence, therefore the total commitment.

The first season's seismic will be reconnaissance in nature. Its objectives will be multifold in order to prove or refute the existence and define the position and the nature of the targets which have been described. The most important and interesting aspiration of the program will be to prove the presence of the proposed eastern flank rift and to provide some insight into the areas, position, rock types, structural style, and complexities of the feature. The next objective will be to position the Lower Paleozoic reefs and provide some data as to their maximum size and thickness. The third reason for the program is to generate data on stratigraphic and structural habit of rocks surrounding the basement domes which are known to exist from earlier work. In addition, one would hope that the data would be useful in near direct hydrocarbon detection through the interpretation of amplitude anomalies and the use of other modelling techniques. Lastly, there is the possibility that a seismic grid will generate hypotheses which are not yet conceived with the sparse control which is available to our group at present.

The seismic data acquisition will be carried out on a continuous basis with as little interruption as is technically feasible and little or no physical contact with the mainland is expected. It is done by collecting sound reflections from strata beneath the sea floor of energy which is generated from an air gun source array. The source and the hydrophones (listening devices) are towed behind the vessel at approximately 5 knots and consist of a streamer which is up to 2.4 kilometers in length. The initial program will be reconnaissance in nature and is expected to range over the entire agreement area and in close proximity to it.

If results are favourable from the first work program, a second summer of seismic shooting of a like amount would be expected. It might be followed by environmental and drill site selection studies in the third summer. The best estimate of when a drill rig might be needed is approximately 1986. Because of the extended lead time involved, the ongoing development of drilling technology, and until more is known about the specific locations which might be drilled, one can only speculate about the required capabilities of the drill rig.

March 15, 1982

References:

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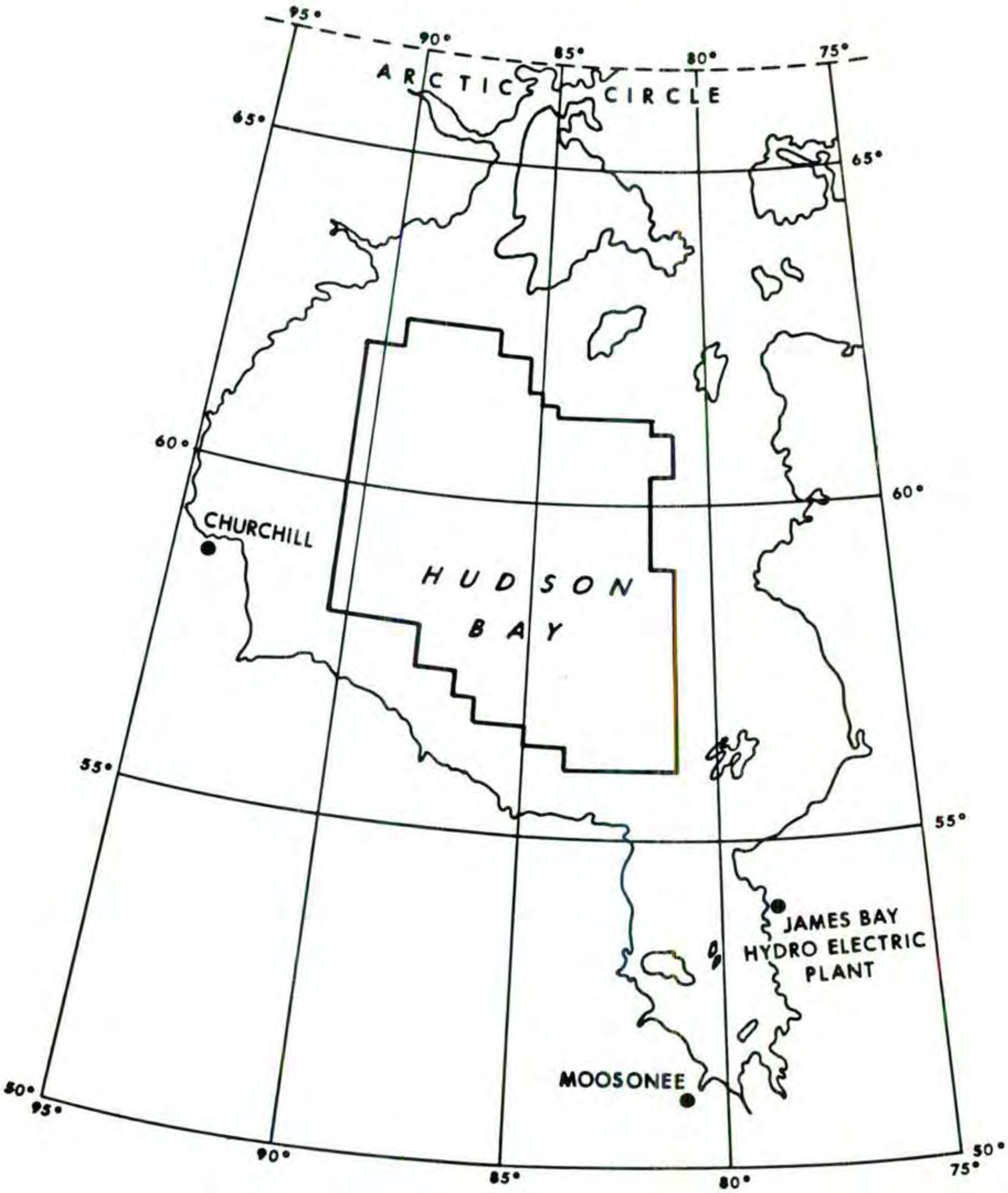
CANADIAN OCCIDENTAL

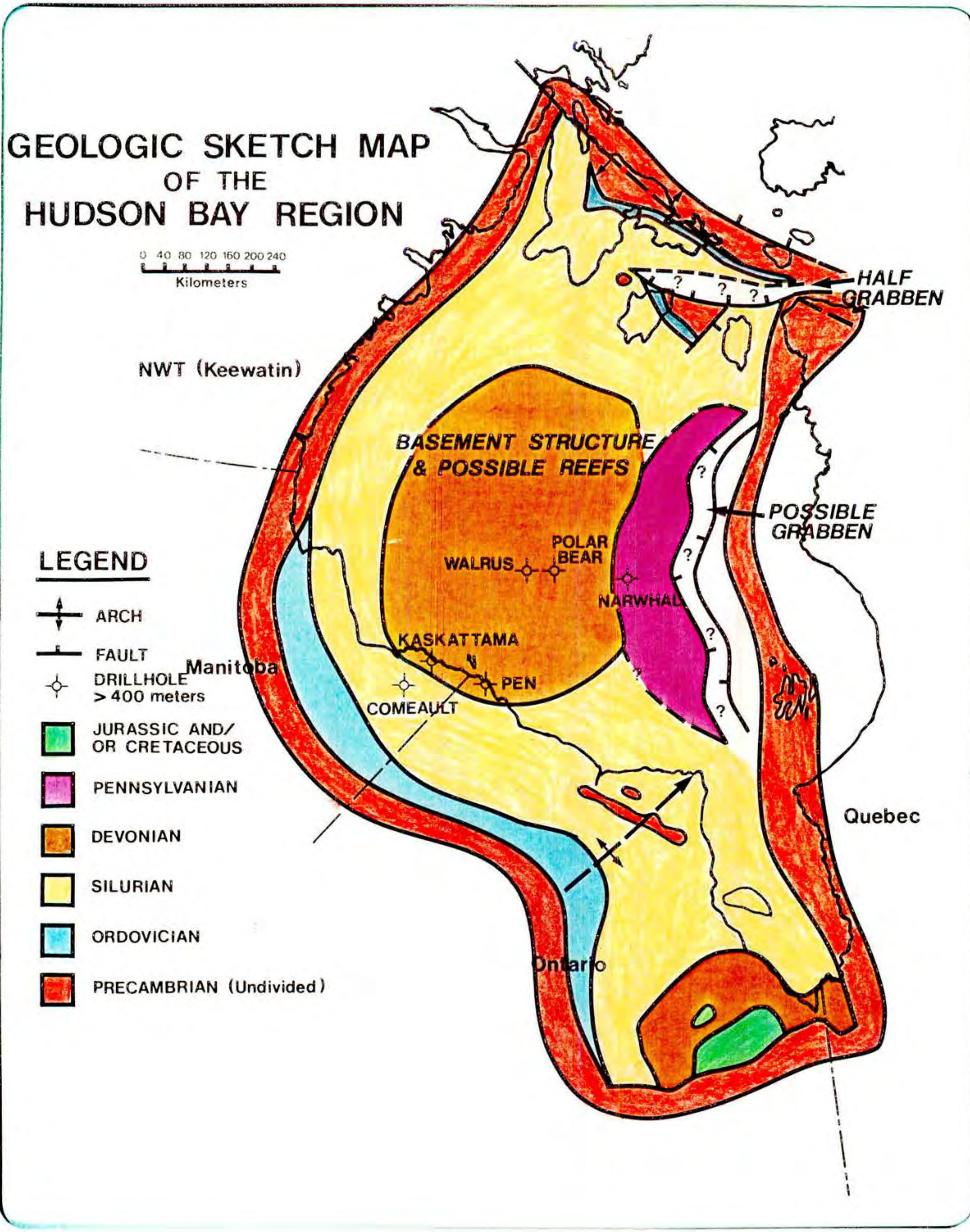
HUDSON BAY AREA

Outline of Exploration Agreement Lands

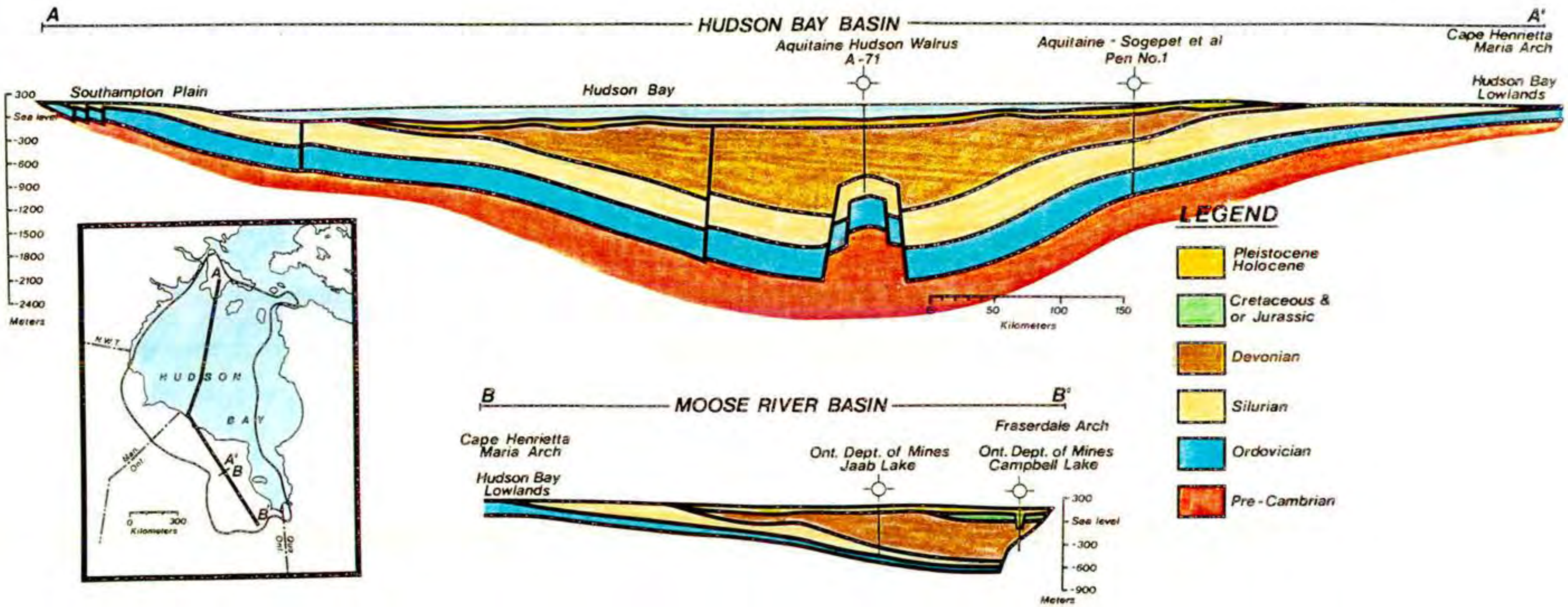
(Approx. 72 Million Acres)

Canadian Occidental Petroleum Ltd.,
Ontario Energy Corporation
and Sogepet Limited.




GEOLOGIC SKETCH MAP
OF THE
HUDSON BAY REGION
0 40 80 120 160 200 240
Kilometers
NWT (Keewatin)
LEGEND
ARCH
FAULT
DRILLHOLE
> 400 meters
JURASSIC AND/
OR CRETACEOUS
PENNSYLVANIAN
DEVONIAN
SILURIAN
ORDOVICIAN
PRECAMBRIAN (Undivided)
HALF
GRABBEN
BASEMENT STRUCTURE
& POSSIBLE REEFS
POSSIBLE
GRABBEN
POLAR
BEAR
WALRUS
NARWHAL
KASKATTAMA
Manitoba
PEN
COMEAULT
Quebec
Ontario

DIAGRAMMATIC
North to South Cross Sections
Hudson Bay & Moose River Basins
from GSC Memoir 399



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CANADIAN OXY

Canadian Occidental Petroleum Ltd.

MB

1982-03-16

Mr. Michael Barrett
Chairman Katavik Environmental
Advisory Committee
C.P. 9
Kuujjuaq, Quebec
JOM 1CO

Dear Sir:

Re: Invitation to March 30, 1982 meeting of the Katavik Environmental Advisory Committee

We thank you for your invitation to attend the next meeting of the Katavik Environmental Advisory Committee in Quebec City on March 30, and confirm our acceptance. There will be four people attending, representing the three partners, Canadian Occidental, Ontario Energy and Soquip.

We will be prepared to discuss our marine seismic program in Hudson Bay and plan to send out pre-meeting information shortly.

We look forward to seeing you March 30, and if in the meantime you have any questions, do not hesitate to contact me.

Yours truly,

John Hofbauer

J. J. Hofbauer
Manager, Environment & Safety

RECEIVED
MAR 25 1982

JJH/jks

c.c. Ontario Energy
Soquip

1600 McFarlane Tower — 700 - 4th Ave. S.W., Calgary, Alberta, Canada T2P 3J5
(403) 265-2390. Telex 038-21516. TWX 610-821-4898

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comité consultatif de l'environnement KATIVIK
KATIVIK environmental advisory committee
C.P. 9, KUUJJUAQ, QUÉBEC, J0M 1C0 • TÉL.: (819) 964-2941

March 3rd, 1982

Mr. R. T. Pierce,
Manager Exploration
Canadian Occidental Petroleum LTD
1600 McSarlane Power
700, 4th avenue S.W.
Calgary, Alberta
T2P 3J5

Re: Invitation to the next meeting of the Kativik Environmental Advisory Committee

Our reference: 84.034

Sir,

It is a pleasure to invite you to the next meeting of the Kativik Environmental Advisory Committee. During its last meeting, the members of the Committee expressed their desire in obtaining ample information on oil exploration in Northern Quebec and the waters of Hudson Bay, Hudson Strait and Ungava Bay. The Committee would also like to find out more about research programs in environment which are related to these investigations. It would be interesting for the members to have written documents concerning these matters in advance, in order that they may be well informed.

Mr. Maurice Ruel, Director of Environmental Management Canada Oil and Gas Land Administration, Energy, Mines and Resources is also invited and has kindly referred the Committee to you in order to obtain ample information on oil exploration. The next meeting of the Committee will be held on March 30th, 1982 in Quebec City at

.../

the offices of the Ministry of Fisheries and Oceans, Gare Maritime Champlain, Boulevard Champlain. Please find enclosed the agenda for the meeting.

We look forward to your participation and in the meantime, I will be glad to answer any questions you might have concerning the next meeting.

Thank you for your cooperation.

Sincerely Yours,

Michael Barrett,
Chairman,
Kativik Environmental Advisory Committee.

MB/tl
att'd.

TELEX TO BE SENT:

To: Mr. Michael Barrett
Chairman Katavik Environmental Advisory Committee

The following bulletin gives an overview of plans for our Hudson Bay Exploration program. We will be providing more information during our Meeting April 1, 1982 in Quebec City, and are looking forward to a fruitful discussion with you and your group.

Regards
J. J. Hofbauer

Address: C.P. 9, Kuujjuaq, Quebec
JOM TCO
Tel (819) 964-2941

HUDSON BAY - OIL & GAS EXPLORATION

To encourage the orderly exploration of possible offshore oil and gas reserves in Hudson Bay, the Federal Government issued a public call for proposals in 1980. This invitation to industry to tender exploration programs, for which the Minister of Energy, Mines and Resources might enter into an Exploration Agreement, appeared in the September 13, 1980 issue of the Canada Gazette.

In October 1981, Canadian Occidental Petroleum Ltd., Ontario Energy Corporation and Sogepet Ltd. were granted oil and gas exploration rights by the Canadian Government covering 28,927,126 hectares in a defined area of the waters of Hudson Bay.

THE HISTORY OF OIL EXPLORATION IN THE HUDSON BAY REGION

Exploration for oil and gas in the Hudson Bay Region dates back almost 60 years to 1923, when a number of holes were drilled in the Moosonee area. During the period 1966-74, thirteen onshore wells were drilled near the coast of Hudson Bay in Manitoba and Ontario.

Marine seismic exploration began in Hudson Bay in 1965. During the years 1973 and 1974 alone, 17,000 kilometers of semisic data was acquired. Some of the companies which have been active in Hudson Bay in the past are Aquitaine, Mobil, Richfield, Fina, Suncor and Sogepet. The first offshore well in the Bay was drilled by Aquitaine and partners in 1969. Two more offshore wells were drilled in 1974. No commercial oil or gas was discovered in any of these wells, and no further exploration has taken place since 1975.

THE PARTNERS

The project has three participants who will share equally in the costs of the exploration program, with Canadian Occidental Petroleum carrying out the work as operator.

Canadian Occidental Petroleum Ltd.

"CanadianOxy" is a diversified Canadian company with operations extending from British Columbia to New Brunswick, the Northwest Territories and the Yukon. Its principal interests are oil and natural gas operations, and the manufacture and marketing of industrial and specialty chemicals. Oil and gas operations are administered from the Company's head office in Calgary, Alberta. CanadianOxy also brings to the project, the expertise of its parent, Occidental Petroleum of Los Angeles, in offshore exploration and production.

Ontario Energy Corporation

Ontario Energy Corporation was created by the Ontario Government in 1974, to invest or otherwise participate in energy projects. Together with the private sector, OEC invests on an equity basis in all areas of energy development. Although all shares are held by the Ontario Minister of Energy, the OEC is self financing, and operates under an independent Board of Directors.

Soquip

Sogepet's interest in the project has been assigned to Soquip (Societe Quebecoise d'Initiatives Petrolieres), - a state-owned company created by the Quebec Government in 1969. Soquip's main activities are natural gas distribution in Quebec and oil and gas distribution, exploration and production in Quebec, Western Canada and in frontier areas.

THE PROGRAM

Based largely on a re-examination of old data, together with information from more recent magnetic and gravity surveys collected by the CanadianOxy group and the Department of Energy Mines and Resources, the partners believe it is possible hydrocarbon reserves exist under Hudson Bay.

The intent of the present program is to carry out a reflection seismic program employing one seismic vessel for about 60 - 65 days of one navigation season. A minimum of five thousand kilometers of data would be acquired in August, September and October 1982.

If the results are favourable from the first work program, a second program of seismic shooting involving another 5000 kilometers would be expected before the end of 1984. During 1985, the acreage would be reduced by 50%, drillsites would be selected, and environmental studies carried out. The participants will have the option to drill either one or more wells during 1986.

Marine Seismic Method

The purpose of the seismic program is to gather information on the structure and type of the rocks underlying the Hudson Bay in order to determine where oil and gas might occur. This is accomplished by collecting sound reflections from strata beneath the sea floor. The sound is generated by an air gun trailed behind the boat, which sends pulses of air bubbles downward toward the sea bottom. The sound bounces off the various levels of rock layers, and echoes back to the hydrophones (sensitive listening devices) which are also towed on a long cable behind the boat.

The boat will steam continuously back and forth across the grid, collecting data, and except on turnarounds, will be hundreds of kilometers offshore. At the turnaround points the ship should not come any closer than 15 or 20 kilometers to headlands at five or six locations around the Bay.

This method does not use explosives or toxic materials, or any other substances harmful to the environment. Fish and mammals in the immediate path would avoid the boat as they would the passage of any type of local disturbance. However after the ship had passed, no affects would be expected. Experience with this method, throughout the world, including prime fishing areas, has not produced any evidence of environmental damage.

Canada Oil and Gas
Lands Administration

355 River Road
Ottawa, Ontario
K1A 0E4

Administration du pétrole
et du gaz des terres du Canada

355, chemin River
Ottawa (Ontario)
K1A 0E4

8121-11

Le 25 février 1982

M. Michael Barrett
Président du Comité
Comité Consultatif de
L'Environnement KATIVIK
C.P. 9,
Kuujjuaq, Québec
J0M 1C0

Monsieur,

Merci pour votre lettre du 5 février, 1982. Tel qu'entendu, je veux confirmer notre conversation téléphonique et vous informer qu'il me ferait plaisir d'assister à la rencontre du comité consultatif de l'environnement KATIVIK, le 30 mars, 1982.

Bien à vous,

M Ruel

M. Maurice Ruel
Directeur général
Gestion environnementale
Administration des terres de
l'essence et du gaz

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comité consultatif de l'environnement KATIVIK
KATIVIK environmental advisory committee
C.P. 9, KUUJJUAQ, QUÉBEC, J0M 1C0 • TÉL.: (819) 964-2941

Le 5 février,1982

84.030

M. Maurice Ruel
Directeur général
Gestion environnementale
Administration des terres de l'essence et du gaz
Energie Mines et resources Canada
15ème étage, Tower Bay
355 River Road
Ottawa, Ontario
KIA 0Z4

Sujet : Invitation à la prochaine assemblée du Comité Consultatif de l'environnement Kativik.

Monsieur,

Il me fait plaisir de vous inviter à la prochaine assemblée du Comité Consultatif de l'environnement Kativik. En effet lors de la dernière réunion du comité, les membres ont exprimé leur intéret d'obtenir de plus amples renseignements sur les recherches pétrolière effectuées dans le territoire nordique du Québec et dans les eaux de la baie et du détroit d'Hudson ainsi que de la Baie d'Ungava. De plus le Comité serait intéressé à connaître les programmes de recherches en environnement liés à ces investigations pétrolières. Il serait intéressant, afin que les membres profitent au maximum d'une telle rencontre, qu'ils puissent disposer à l'avance de documents écrits afin de se mettre au courant des activités et recherches s'effectuant~~s~~.

Ainsi Mme Camille Mageau référa le comité à votre Ministère afin d'obtenir de plus amples renseignements. La prochaine assemblée du Comité devrait se tenir le 30 mars 1982 à Québec dans les locaux du Ministère des Pêches et Océans à la gare Maritime Champlain. Nous espérons qu'il sera possible à vous ou d'autres membres de votre personnel d'assister à cette réunion.

Nous vous remercions à l'avance de l'attention que vous porterez à la demande du Comité. Je suis à votre entière disposition si de plus amples renseignements vous étaient nécessaires. Je vous pris monsieur d'agréer mes plus sincères salutations .

Michael Barrett

MICHAEL BARRETT
Président du Comité

/lf
cc. M. Michael Bell

Environnement Canada Environment Canada

Région du Québec Quebec Region

Direction générale régionale

2700, boulevard Laurier, C.P. 10 100
Edifice Champlain - 5^{e} étage
Sainte-Foy (Québec) G1V 4H5

84.034.

Le 1er décembre 1981

NB

Monsieur Marc Voinson
Secrétaire
Comité consultatif de l'environnement
Kativik
Case postale 9
Kuujjuaq (Québec)
J0M 1C0

N/Réf.: 1165-100-49

Objet: Déversement de pétrole au Nouveau-Québec

Monsieur,

Tel que discuté lors de la dernière rencontre du Comité consultatif, tu trouveras ci-jointes des informations et des actions prises sur ce dossier.

Je te prie d'agréer l'expression de mes meilleurs sentiments.

Normand Lafrenière

p.j.

Government of Canada   Gouvernement du Canada

MEMORANDUM   NOTE DE SERVICE

TO / À
M. Normand Lafrenière
Aviseur économique
Environnement Canada
Région du Québec

FROM / DE
Fernand Leduc, ing.
Chef,
Division des Urgences & Résidus
SPE - Région du Québec

SECURITY - CLASSIFICATION - DE SÉCURITÉ	005095
OUR FILE/NOTRE RÉFÉRENCE	4475-82/5
YOUR FILE/VOTRE RÉFÉRENCE	
DATE	Le 20 novembre 1981

SUBJECT / OBJET: Déversement de pétrole au Nouveau-Québec

Suite a votre lettre du 28 octobre 1981 et tel que proposé Monsieur Rivet de notre division est entré en communication avec Monsieur Roger Leduc du Ministère de l'Environnement du Québec à Radisson afin de discuter du sujet mentionné en rubrique.

Veuillez trouver ci-joint la lettre que Monsieur Rivet a adressée à Monsieur Roger Leduc.

De plus Monsieur Chapron de la compagnie pétrolière Shell (transporteur) a aussi été contacté afin de le sensibiliser a la situation particulière que l'on rencontra a cet endroit.

Fernand Leduc

Fernand Leduc

FL/hb

Pièce jointe

Environment Canada | Environnement Canada

Environmental Protection | Protection de l'environnement

1550, de Maisonneuve O.
suite 410
Montréal, Québec
H3G 1N2

Your file Votre référence

Our file Notre référence

Le 5 novembre 1981 4475-82/5

M. Roger Leduc
Ministère de l'Environnement
du Québec
C.P. 390
Radisson, Québec
J0X 2X0

Objet: Déversement de pétrole au Nouveau Québec

Monsieur,

Tel que discuté lors de notre conversation téléphonique du 30 octobre 1981 concernant les problèmes de déversements de pétrole lors de livraison par navire ou autrement, plusieurs intervenants peuvent contribués à votre recherche.

Du côté maritime l'organisme directeur est la Garde Côtière Canadienne. Vous trouverez ci-joint une copie de deux (2) parties de document pertinent:

1- Code Termpol
2- Plan d'urgence maritime de la région des Laurentides.

Pour de plus amples renseignements vous pouvez contacter M. André Leduc, gestionnaire régional des Urgences Maritimes au numéro de téléphone: (418) 694-4556.

Pour ce qui est des installations terrestre la Loi Québécoise sur le commerce des produits pétroliers est l'un des meilleurs standard pour la conception de dépôts pétroliers.

M. René Rochette est l'expert du service de la distribution du Ministère Québécois de l'énergie (no. de téléphone (418) 643-3327).

.../2

Pour notre part nous pouvons vous fournir plusieurs documents techniques qui pourraient vous être utiles. (Voir liste ci-jointe)

De plus nous pouvons collaborer avec vous tant pour l'élaboration de plans d'urgences efficacent que pour les opérations sur place.

Finalement, il est convenu que lorsqu'il y a un déversement inconnu qui pourrait être d'une source normalement régie par le Fédéral, ou pouvant traverser les frontières du Québec, nous sommes l'organisme qui commande et finance l'opération de nettoyage. (Voir texte ci-joint)

Nous espérons que ces renseignements sauront vous être utiles.

Veuillez agréer, Monsieur Leduc, l'expression de nos sentiments les meilleurs.

Claude Rivet, Chim.P.
Responsable des Opérations
d'Urgences
Division des Urgences & Résidus
SPE - Région du Québec

CR/hb

Pièces jointes.

11-15-1

Government of Canada | Gouvernement du Canada

MEMORANDUM | NOTE DE SERVICE

TO / À: M. Bell
Director, HQ Operations
Environmental Protection Branch

FROM / DE: Head,
Geophysics Section
Resource Evaluation Branch

SECURITY - CLASSIFICATION - DE SÉCURITÉ:

OUR FILE/NOTRE RÉFÉRENCE: ~~971-26~~ 8121-11

YOUR FILE/VOTRE RÉFÉRENCE:

DATE: December 18, 1981

SUBJECT / OBJET: SEISMIC EXPLORATION PROGRAM IN HUDSON BAY

A seismic exploration program is being planned by Canadian Occidental Petroleum Company over lands included in their Exploration Agreement for central Hudson Bay. Their chief geophysicist has presented us with a preliminary program map which indicates the proposed location of the regional seismic lines (reduced scale copy attached). The program consists of the acquisition of approximately 5000 km of reflection seismic data during the months of August, September and October 1982.

The company has discussed this program with us now so that any potential problems with approvals may be identified and dealt with immediately. In particular, they are concerned about a possible reaction by native peoples in the area. One potential source of concern is the location of some of the seismic lines. Four of the lines are located approximately 15 kilometres from the islands along the east side of the Bay. If there is a serious objection to marine seismic operations in these areas, the Company would need to know in advance in order to make the necessary program changes.

Marine seismic operations of this type do not lend to any noticeable environmental impact. The vessel proceeds at a slow rate of speed along an imaginary line, towing a thin streamer through the water. The source energy will be generated by airguns fired under the surface of the water. The vessel will be moving continuosly, and will not be located in any given area for more than a few days. Other than movement of the vessel through the area, there is no other noticeable effect of a marine seismic operation.

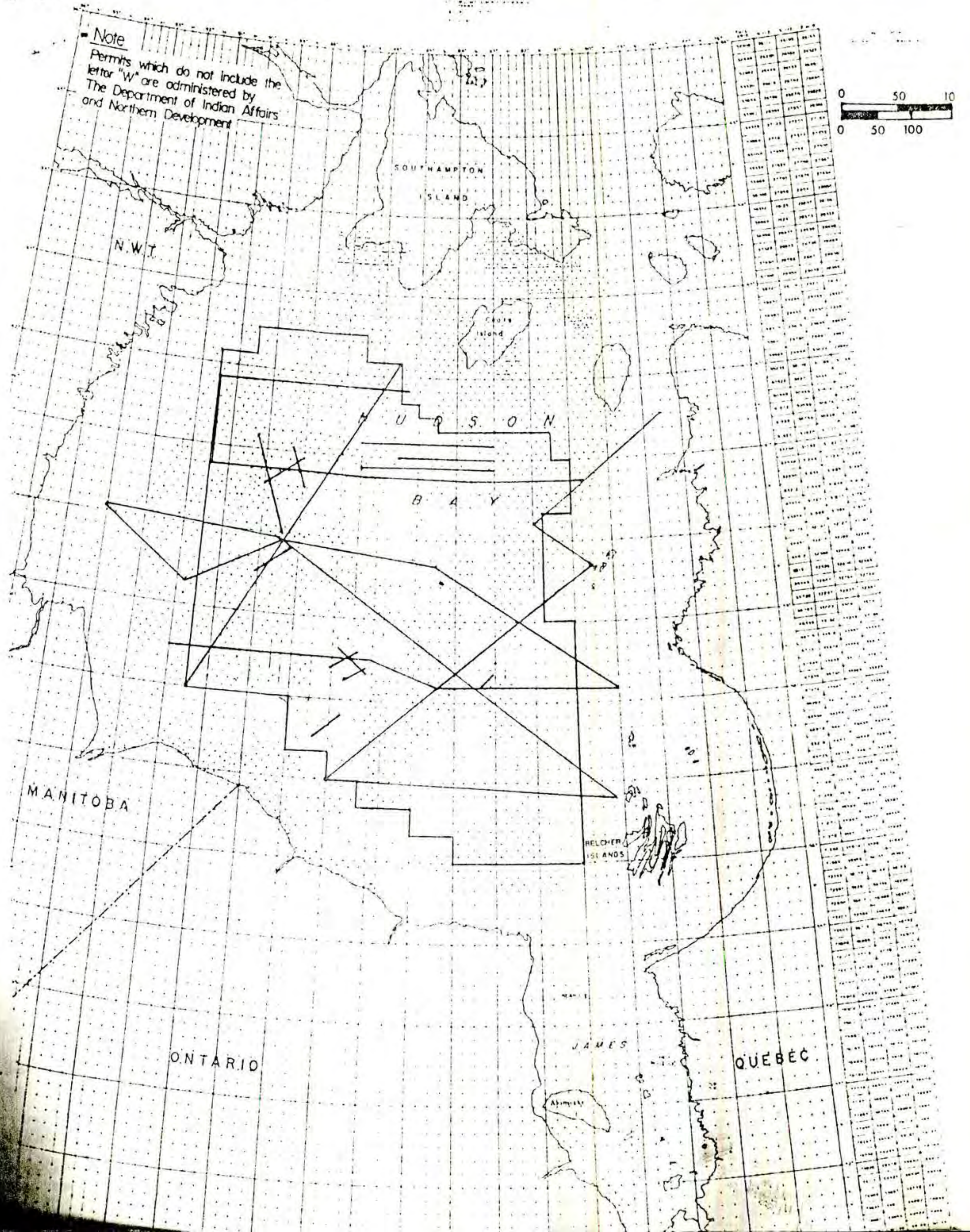
Any information that we could provide the Company concerning this program would be appreciated.

G.R. Campbell

G.R. Campbell

FEDERAL OIL & GAS EXPLORATORY PERMITS

Index to Grid Areas



11

Government of Canada / Gouvernement du Canada

MEMORANDUM NOTE DE SERVICE

TO / À

Fernand Leduc
Service de la protection de l'environnement
Montréal

FROM / DE

Normand Lafrenière
Aviseur économique
Environnement Canada
Région du Québec

SECURITY - CLASSIFICATION - DE SÉCURITÉ

OUR FILE/NOTRE RÉFÉRENCE
1165-100-49

YOUR FILE/VOTRE RÉFÉRENCE

DATE
Le 28 octobre 1981

SUBJECT / OBJET
Déversement de pétrole au Nouveau-Québec

Tel que discuté, le Comité consultatif de l'environnement Kativik est préoccupé par les problèmes causés par les déversements de pétrole dans les eaux près des localités Inuit de la Baie d'Ungava et de la Baie d'Hudson.

Avant que le Comité puisse recommander aux autorités concernées les actions à entreprendre, il a été convenu que des représentants d'Environnement Québec et d'Environnement Canada étudient plus en profondeur l'état de ce dossier.

J'apprécierais grandement que tu communiques avec M. Roger Leduc du ministère de l'Environnement du Québec à Radisson, case postale 390, tél.: (819) 638-8495. Je l'ai informé que tu entreras en contact avec lui.

Je te remercie de ta collaboration.

Normand Lafrenière

NL/jp

c.c. Roger Leduc - Environnement Québec (Radisson)
Georges Mezzetta - SPE - Montréal
Marc Voinson - Comité consultatif Kativik

9.12.1

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Administration Régionale KATIVIK Regional Government
P.O. Box 9, KUUJJUAQ (Fort Chimo), Quebec J0M 1C0

Kuujjuaq
July 16, 1981

40.145

Alain Gariepy
Director Régional - Région 10
Ministère de l'Environnement
Radisson

Dear sir,

Like many others, we learned of the oil spill at Aupaluk through unofficial sources. We had assumed that M.T.P.A had at least notified you and that clean up plans were being formalized. Had it been anyone but a Quebec Government department we would have taken pains to ensure that it was reported.

It was thus a shock to learn that M.T.P.A. had not notified anyone; and much worse that apparently no clean up plans exist. It appears that we were very mistaken in assuming M.T.P.A would act responsible in this matter.

Could you please forward a copy of your inspectors report and a summary of the situation to date.

If you have not already done so, we ask that M.T.P.A. prepare and carry out a full clean up of the 26 000 gallons that was spilled form it's installations.

At the next meeting of the Kativik Environmental Advisory Committee we will ask for a complete report. Should the response not be satisfactory we will then decide how to proceed.

Yours truly

Michael Barrett

MICHAEL BARRETT
Kativik Regional Government

MB/lf

9.12-2

RADISSON
June 9th, 1981

TELEX

KRG translation

Mr. Marcel Grégoire
Regional director
M.T.P.A.
1150 rue Scott
Quebec, QC

RE : Oil spill in Aupaluk Bay

Sir,

On May 27, 1981, Miss Colette Couture, nurse in Aupaluk, sent a letter to Mr. Daniel Beauvais of the Ungava Hospital in Fort Chimo. This letter mentioned that heating fuel was spilled throughout the winter following the accidental damage caused to a pipe by a back-hoe. According to the information, this failure occured from 100 to 150 feet from the Bay and a rough estimate of approximately 20,000 gallons of fuel were spilled.

We were informed of this accident on June 5th through Mr. Beauvais who sent us a copy of this letter. We thus learned it very unofficially when section 21 of the Environment Quality Act (revised statutes, 1977, chapter Q.2) states that "whoever is responsible for the accidental presence in the environment of a contaminant contemplated in section 20 must advise the director without delay".

Our Department considers you responsible for the damages to the environment that could result from this spill. On our part, it is planned that one of our inspectors travel to the site of the spill. Normally, he should be in Kuujjuaq (Fort Chimo) Wednesday, June 10th and in Aupaluk, Thursday 11th.

We feel it is essential that your Department sends a person specialized in fuels to meet our inspector (Réal Thériault) in Aupaluk. It will be under the responsibility of this person to decide, according to the scope and gravity of the spill, of the measures to apply to stop this spill. Cleaning operations will be under his responsibility and in this regard, we request you to notify us of the schedule and the nature of the cleaning operations to be undertaken according to the situation.

Yours truly,

ALAIN GARIEPY
Regional director
Department of Environment - Quebec

NB : Please contact today Mr. Alain Gariépy at the (819) 638-8495

Dex No: K.R.G.
Received: R. Leduc
Date: June 10/81
Operator: Beyette

ENV RAD BJS

ENV QBC

RADISSON, LE 9 JUIN 1981

DIRECTION REGIONALE DU NOUVEAU-QUEBEC
DATE: 81-06-10
A : Michael Barrett
DE : Alain Gariépy
1 PAGES / 1 PAGES TÉLÉCOPIEUR

MONSIEUR MARCEL GREGOIRE
DIRECTEUR REGIONAL - REGION 10
MTPA
1150, RUE SCOTT
QUEBEC, QC

OBJET: DEVERSEMENT D'HUILE DANS LA BAIE D'AUPALUK

MONSIEUR,

LE 27 MAI 1981 MADEMOISELLE COLETTE COUTURE, INFIRMIERE A AUPALUK, ADRESSAIT UNE LETTRE A MONSIEUR DANIEL BEAUVAIS, HOPITAL D'UNGAVA, FORT-CHIMO. CETTE MISSIVE MENTIONNAIT LE FAIT QU'UN DEVERSEMENT D'HUILE A CHAUFFAGE S'EST PRODUIT DURANT TOUT L'HIVER SUITE A UN BRIS ACCIDENTEL DE TUYAU PAR UNE RETRO-EXCAVATRICE. CE BRIS, SELON LES INFORMATIONS, A ETE PRODUIT A ENVIRON CENT (100) OU CENT CINQUANTE (150) PIEDS DE LA BAIE ET UNE EVALUATION SOMMAIRE DE LA QUANTITE D'HUILE DEVERSEE DONNERAIT ENVIRON VINGT MILLE (20 000) GALLONS.

NUSAVONS ETE PREVENUS DE CET ACCIDENT LE 5 JUIN A LA RECEPTION D'UNE COPIE DE LA LETTRE DE MADEMOISELLE COUTURE PAR L'INTERMEDIAIRE DE MONSIEUR BEAUVAIS ET CE UNIQUEMENT DE FACON OFFICIEUSE ALORS QUE L'ARTICLE 21 DE LA LOI DE LA QUALITE DE L'ENVIRONNEMENT (LOI REFONDUE, 1977, CHAPITRE Q.2) STIPULE QUE ''QUICONQUE EST RESPONSABLE DE LA PRESENCE ACCIDENTELLE DANS L'ENVIRONNEMENT D'UN CONTAMINANT VISE A L'ARTICLE 20 DOIT EN AVISER LA DIRECTION SANS DELAI''.

NOTRE MINISTERE VOUS TIENT COMME RESPONSABLE DES DOMMAGES A L'ENVIRONNEMENT POUVANT RESULTER DE CE DEVERSEMENT. DE NOTRE COTE, IL EST PREVU QU'UN DE NOS INSPECTEURS SE RENDE SUR LES LIEUX DU DEVERSEMENT. NORMALEMENT, IL DEVRAIT ETRE A KUUJJUAQ (FORT-CHIMO) MERCREDI LE 10 JUIN ET A AUPALUK JEUDI LE 11 JUIN.

NOUS CONSIDERONS COMME ESSENTIEL QUE VOTRE MINISTERE DELEGUE UNE PERSONNE SPECIALISEE EN HYDROCARBURES POUR REJOINDRE NOTRE INSPECTEUR (REAL THERIAULT) A AUPALUK.
IL SERA DE SA RESPONSABILITE DE DETERMINER, SELON L'AMPLEUR ET LA GRAVITE DU DEVERSEMENT, LES MESURES A PRENDRE POUR RETENIR ET ENRAYER CE DEVERSEMENT. LES OPERATIONS DE NETTOYAGES SERONT SOUS SA RESPONSABILITE ET SUR CE POINT NOUS VOUS DEMANDONS DE NOUS AVISER QUANT A L'ECHEANCIER ET A LA NATURE DES OPERATIONS DE NETTOYAGE A ENTREPRENDRE A LA LUMIERE DE LA SITUATION QUI PREVAUDRA A CE MOMENT-LA.

BIEN A VOUS,

ALAIN GARIEPY
DIRECTEUR REGIONAL - REGION 10
MINISTERE DE L'ENVIRONNEMENT

Dex No:
Received: R. Leduc
Date: June 10/81
Operator: [illegible]

N.B.: PRIERE DE CONTACTER MONSIEUR ALAIN GARIEPY DES AUJOURD'HUI AU NUMERO (819) 638-8495.

13.4.10

Resource Management Branch

Department of Energy, Mines and Resources

Ottawa

"OFFSHORE OIL AND GAS"

A Brief Prepared for the Hudson/James Bay Symposium

April 28-30, 1981

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Introduction

The Department of Energy, Mines and Resources, through the Resource Management Branch (RMB), exercises statutory authority over offshore mineral resource development in all areas of the Canadian offshore except in the high Arctic. Offshore areas in the far north are administered by the Department of Indian Affairs and Northern Development, although there is a move to unify the two regulatory agencies. In any event, the same oil and gas legislation applies to all areas under federal jurisdiction.

RMB's main objective in exercising its policy-advisory mandate is the development of a system of offshore mineral and energy resource management designed to encourage the orderly exploration of Canada's frontier mineral resources, while at the same time safeguarding the interests of the owners of those resources, the Canadian public. In light of the current energy situation, there is a particular need to discover and develop secure sources of hydrocarbon resources now and for the future.

The Branch is responsible for the federal interests in mineral resources off Canada's East and West coasts and in the Hudson Bay and Hudson Strait regions, as well as the administration of those federally-owned mineral rights in the provinces that become available for development. This responsibility involves the evaluation of these rights and their disposition for development. It also ensures that all exploration and production activities in respect of them are undertaken in a safe and efficient manner consistent with the safety of human life and the protection of the natural environment.

The main statutes under which the Branch operates are outlined in Appendix 1. To accomplish effectively the various roles assigned to it the Branch is divided into four operating divisions. The roles and responsibilities of each of the divisions and regional offices are outlined in Appendix 2.

The Branch's resource management responsibilities involve it as well in related domestic and international resource negotiations, including federal-provincial mineral rights negotiations, bi-lateral offshore boundary negotiations and negotiations at the United Nations level aimed at preserving the integrity of Canada's sovereign rights to resources.

Proposed Canada Oil and Gas Act

The present government, in its National Energy Program, released October 28 has stated that:

> "the legal framework now governing oil and gas activity on the Canada Lands is inadequate. Many of the provisions of the land regulations were established nearly 20 years ago, at a time when the world energy situation was much different, and when the potential of the Canada Lands was not fully appreciated. A fundamental restructuring of these rules is needed, to reflect current realities. The National Energy Program includes new legislation to provide a modernized regulatory basis for the management of these lands." (Government of Canada, EMR, 1980.)

To rectify this, the proposed Canada Oil and Gas Act (Bill C-48) has been formulated. The Bill received second reading in the House of Commons on January 15, 1981. Future exploration in Hudson/James Bay will be subject to the proposed new Act as well as to the Oil and Gas Production and Conservation Act and north of 60^{o}, to the Arctic Waters Pollution Prevention Act.

Hudson Bay/Hudson Strait - Exploration History

The history of exploration for oil and gas in the Hudson Bay region goes back almost 60 years to 1923, when a number of drill holes were first put down in the Moosonee area. Four additional wells were drilled for oil and gas in the same area in 1928-30, while the Ontario Department of Mines drilled three diamond drill holes for stratigraphic information on shore west of James Bay in 1948-51. The region experienced a wave of industrial exploration activity in the period 1962-75 which saw exploration and drilling onshore as well as offshore in the Bay.

This phase of activity was prompted by the published results in 1960 of government airmagnetometer surveys along the south-west coast of Hudson Bay. These surveys indicated that the thickness of sedimentary rocks favourable for containing hydro-carbons was considerably greater under the coast and offshore in the Bay than had been realized from previous geological studies, including the results of earlier drilling west of Moosonee.

In the onshore portion of the Lowlands, provincial licences were obtained from Manitoba in 1962 by Sogepet and in Ontario in 1967 by Aquitaine, with several other companies following suit in subsequent years. Thirteen onshore wells were drilled in the period 1966-74, including three in northern Manitoba, two in northwest Ontario (all near the Hudson Bay coast) and eight in the Moose River Basin west of James Bay. In addition, companies carried out onshore field geological studies and seismic and airmagnetometer surveys. No hydrocarbons were discovered as a result of this onshore effort, and no further exploration has taken place since 1974.

. . . 4

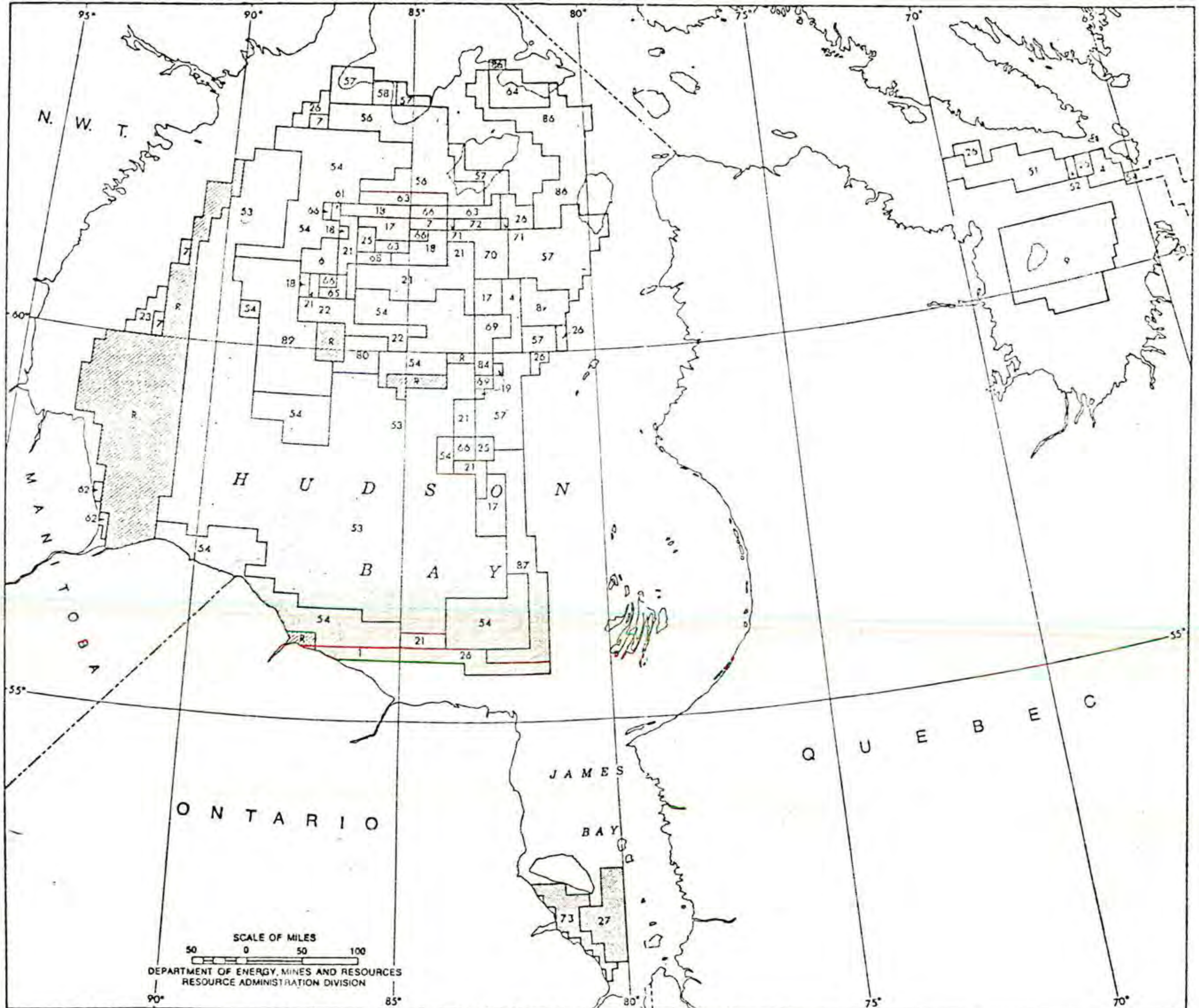
In the offshore, federal exploratory permits for oil and gas were first taken out in Hudson Bay in 1962 by Sogepet, and by 1970 some 120 million acres were held covering the central portion of Hudson Bay and the western portion of James Bay. The extent of oil and gas exploratory permits held by various companies in Hudson Bay in 1970 are shown in Figure 1. The largest block of offshore acreage, comprising some 50 million acres, was acquired by Atlantic Richfield in December, 1964.

Marine seismic exploration for oil and gas by industry, backed by government geophysical surveys, began in Hudson Bay in 1965. These initial surveys were followed up by marine seismic exploration in 1967, 1968, 1971, 1973, 1974 and 1975, with a total of $19 million spent for all geophysical programs during this period. The first well offshore in the Bay was drilled by a consortium headed up by Aquitaine in 1969. The well reached a total depth of 1197 metres, still in sedimentary rocks. Further drilling, involving two offshore wells, was undertaken by Aquitaine and partners in 1974; both wells penetrated the sedimentary section and bottomed in Precambrian granite. No hydrocarbons were discovered in any of these offshore wells.

In 1969 a well was drilled on Akpatok Island in Ungava Bay by Premium-Homestead under the administration of the Department of Energy, Mines and Resources. The well was plugged and abandoned at a depth of 370 m and no exploratory activity has taken place since in the Hudson Strait region. The location of wells drilled in Hudson Bay is illustrated in Figure 2.

Expenditures for offshore drilling in the Hudson Bay and Hudson Strait region has totalled to date about $22 million. Since 1975, the last year of active exploration, federal acreage held has

. . . 5



FEDERAL OIL AND GAS EXPLORATORY PERMITS
HUDSON BAY AND HUDSON STRAIT
JULY 1, 1970

FIGURE 1

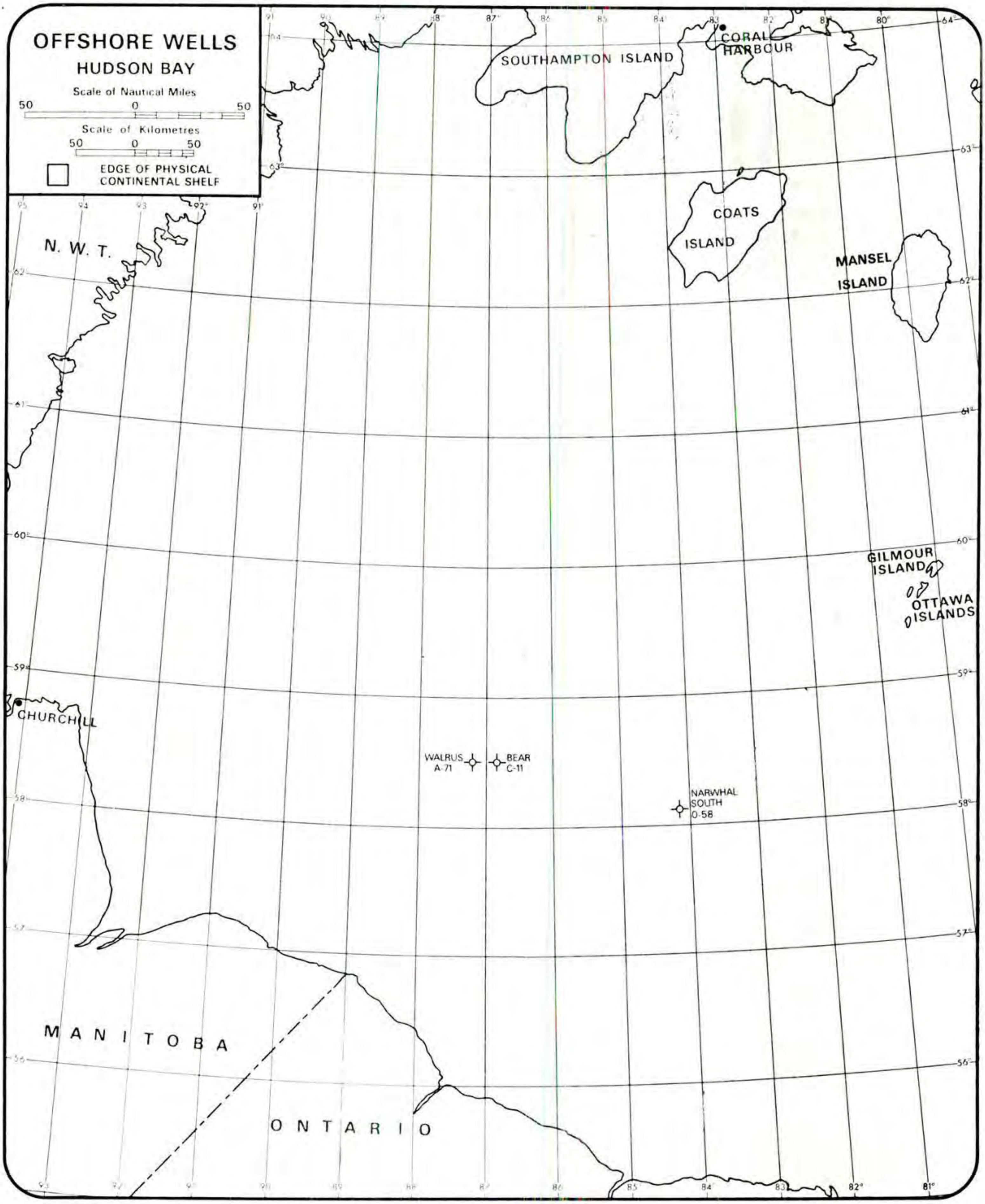

OFFSHORE WELLS
HUDSON BAY
Scale of Nautical Miles
50 0 50
Scale of Kilometres
50 0 50
EDGE OF PHYSICAL CONTINENTAL SHELF
SOUTHAMPTON ISLAND
CORAL HARBOUR
COATS ISLAND
MANSEL ISLAND
N. W. T.
GILMOUR ISLAND
OTTAWA ISLANDS
CHURCHILL
WALRUS A-71
BEAR C-11
NARWHAL SOUTH 0-58
MANITOBA
ONTARIO

FIGURE 2

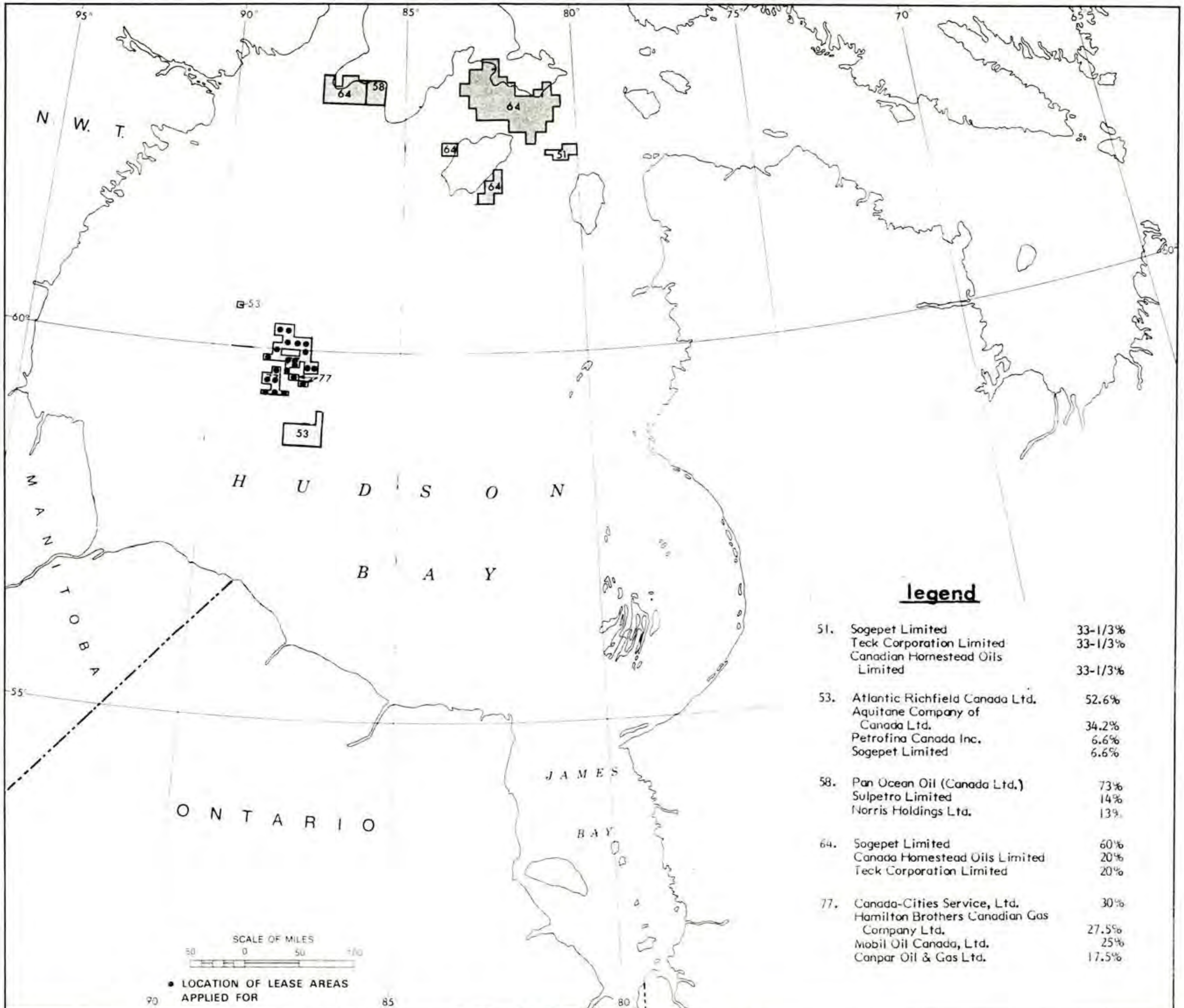
declined to less than four million acres, mostly in the northern portion of the Bay where exploration has been suspended pending settlement of native land claims. The tables in Appendix 3 summarize offshore oil and gas costs and activity for Hudson Bay. As well they compare activity in the Bay to other areas in the Canadian offshore for the period 1966-78. The status of federal oil and gas leases and exploratory permits as of July 1, 1980 is shown in Figure 3.

Call for Proposals

On September 13, 1980 a Call for Proposals went out to industry inviting tenders for exploration programs on four offshore blocks covering an area of 71 million acres (Figure 4). No proposals were received by the deadline of November 17, 1980. However, interested parties had 90 days beyond this date within which to submit proposals on their own, for which the Minister may enter into an exploration agreement on whatever terms and conditions he may determine. No proposals have been entertained up to the time of writing.

Environmental Concerns Related to Offshore Exploration

Concerns for the natural environment as well as the aspirations of native peoples have influenced, over the years, offshore exploration activity in Hudson Bay. In 1971 as a result of opposition from the community of Coral Harbour to offshore seismic exploration and its possible impacts on local walrus and seal populations as well as traditional life styles of the Inuit community, the federal government imposed a one-year moratorium on exploration in Evans and Fisher Straits in northern Hudson Bay. The exploratory permits that remain in the area today are still subject to the moratorium and are shown in Figure 5. The restricted zone shown on the same figure refers to the area which was declared off limits to seismic exploration.



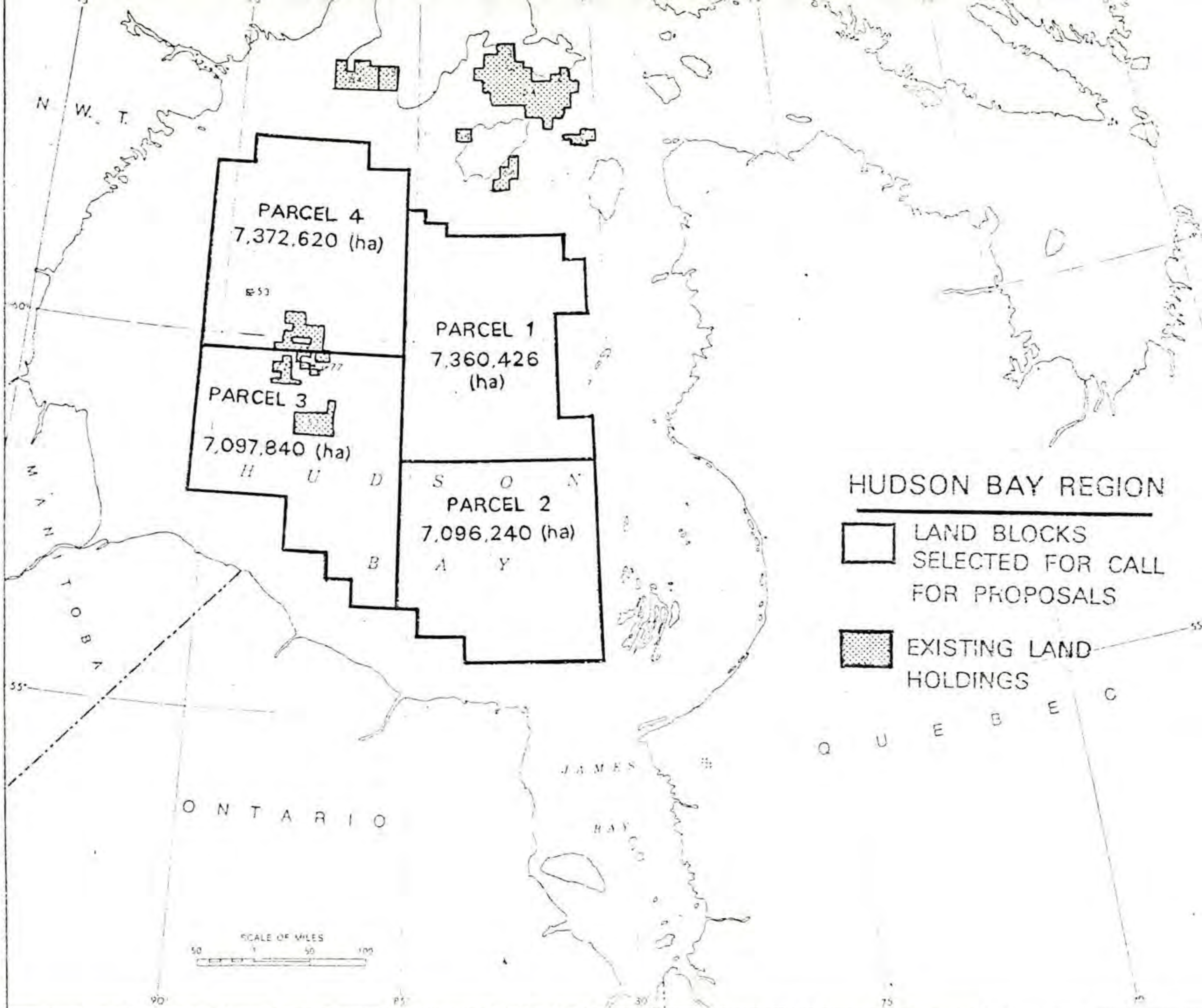
DEPARTMENT OF ENERGY, MINES AND RESOURCES

FEDERAL OIL AND GAS LEASES AND EXPLORATORY PERMITS

HUDSON BAY AND HUDSON STRAIT

RESOURCE MANAGEMENT BRANCH

FIGURE 2



FEDERAL OIL AND GAS LEASES AND EXPLORATORY PERMITS

HUDSON BAY AND HUDSON STRAIT

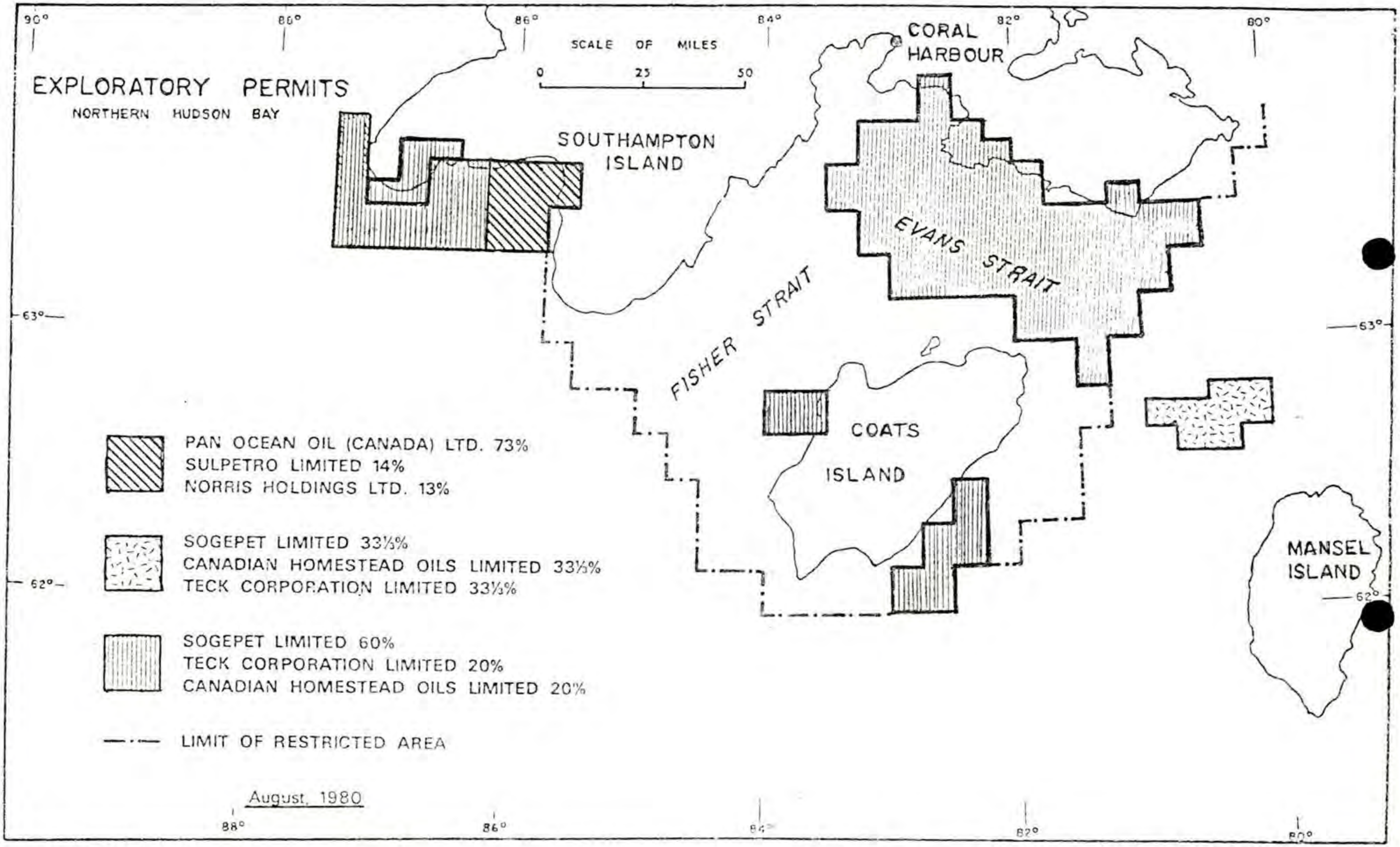

EXPLORATORY PERMITS
NORTHERN HUDSON BAY
SCALE OF MILES
0 25 50
SOUTHAMPTON ISLAND
CORAL HARBOUR
EVANS STRAIT
FISHER STRAIT
COATS ISLAND
MANSEL ISLAND
PAN OCEAN OIL (CANADA) LTD. 73%
SULPETRO LIMITED 14%
NORRIS HOLDINGS LTD. 13%
SOGEPET LIMITED 33⅓%
CANADIAN HOMESTEAD OILS LIMITED 33⅓%
TECK CORPORATION LIMITED 33⅓%
SOGEPET LIMITED 60%
TECK CORPORATION LIMITED 20%
CANADIAN HOMESTEAD OILS LIMITED 20%
LIMIT OF RESTRICTED AREA
August, 1980
90° 88° 86° 84° 82° 80°
63° 62°

FIGURE 5

The possible impacts of offshore drilling in south-central Hudson Bay were first addressed by Aquitaine et al in their report An Environmental Impact Assessment Concerning the Proposed Drilling of Two Exploration Wells Offshore in the Hudson Bay (1974). Subjects addressed included environmental protection, physical, biological and human resources, and impact considerations. The document effectively summarized much of the environmental information available at the time for the coastal and offshore regimes in the areas at and adjacent to the proposed drilling sites (refer to Figure 2). Environmental research relating directly to offshore exploration waned after disappointing results were obtained from the Walrus, Polar Bear and Narwhal South wells.

In view of the fact that certain Canada lands in Hudson Bay may become available for Exploration Agreements under section 30 of the amended Canada Oil and Gas Land Regulations (or the proposed Canada Oil and Gas Act) the Resource Management Branch as early as 1979 requested the federal Departments of Environment (DOE) and Fisheries and Oceans (DFO) to undertake, on its behalf, a preliminary environmental evaluation of these offshore lands. This review identified acreage that DOE and DFO jointly considered both suitable and unsuitable for marine seismic surveys and/or offshore exploratory drilling. Identified was acreage which because of its potential for resource use conflicts required a more thorough environmental evaluation prior to its being acceptable for disposition. Information needs and gaps were identified in areas relating to physical and biological oceanography, coastal geomorphology and atmospheric parameters pertaining to oil slick transport. It was also recognized that further information was necessary for a viable weather/sea/ice information and prediction system.

Those areas which were recognized to be environmentally and culturally sensitive were excluded in the recent Call for Proposals. It should be recognized that a rigorous environmental assessment and review will be undertaken by RMB for those offshore lands recently made available for disposition prior to the approval of a drilling program.

RMB and EARP

The Federal Environmental Assessment and Review Process (EARP) established by Cabinet in 1973 and amended in 1977, can be viewed as government's self-assessment, advisory and public hearing process.

All federal departments and agencies are bound by the Process with the exception of proprietary Crown Corporations and federal regulatory agencies, e.g. EMR, which are invited, rather than directed, to participate in the Process.

It is the goal of RMB to ensure that offshore exploration for oil and gas is undertaken with minimum risk to human safety and the natural environment. If, in the case of Hudson Bay, it is not feasible to identify the full environmental consequences and their significance for offshore exploration activities through internal departmental screening procedures by RMB, then the project would be referred to the Federal Environmental Assessment and Review Office. If this is the decision taken, then RMB would ask the Minister of Environment to undertake on its behalf an Initial Environmental Evaluation (IEE) for the prospective program. If the IEE shows the effects are not significant, then RMB would allow the offshore program to proceed with proper safeguards. If the environmental effects of the project are thought to be significant, the project would be referred to the Minister of Environment for a formal review under EARP.

Summary

Canadians, as owners of the Canada lands and as taxpayers, have a real stake in decisions about oil and gas development. At the same time, the Resource Management Branch has an obligation to ensure that environmental and social issues related to frontier exploration are addressed in a responsible manner. The need to explore the offshore frontier in Hudson/James Bay will continue and activity may increase as our "need to know reserves" increases. The development of frontier resources will benefit all Canadians only when the need for these resources does not override the responsibility to preserve for future generations of Canadians our coastal and marine heritage.

APPENDIX 1

LEGISLATION AND REGULATIONS

APPENDIX 1

Oil and Gas Production and Conservation Act

This Act provides authority for controlling all oil and gas operations, including the conservation of resources, the prevention of pollution and the safety of personnel. Canada Oil and Gas Drilling Regulations have been promulgated under this Act. Currently being prepared for publication under the Act are regulations concerning geophysical surveys, oil and gas production, structures, pipelines and diving.

Public Lands Grants Act and Territorial Lands Act

The major set of oil and gas regulations affecting Canada Lands promulgated under these Acts are the Canada Oil and Gas Land Regulations. These Regulations deal with the issuance and maintenance of licences, permits and leases and exploration agreements in the offshore and in the Yukon and Northwest Territories. The Canada Mining Regulations are also promulgated under these Acts.

APPENDIX 2

RESOURCE MANAGEMENT BRANCH

DEPARTMENT OF ENERGY, MINES AND RESOURCES

APPENDIX 2

RESOURCE MANAGEMENT BRANCH - OPERATING DIVISIONS

Mineral Rights

The Mineral Rights Division makes available oil, gas and mining rights and ensures that the holders of such terminable grants fulfil the terms and obligations stipulated in them and in the relevant Regulations in order to maintain them in good standing.

The Division's responsibilities include: providing for the issuance of exploration rights by way of public tender, issuing, recording and administering exploratory oil and gas permits, exploration agreements and production leases, as well as mining claims and mineral production leases; approving expenditures to be allowed for credit against permit and lease obligations; recording and accounting for guaranty work deposits, annual lease rentals and royalties.

Resource Geology

This Division evaluates geological and geophysical information submitted by offshore operators and assesses the mineral resource potential of prospects and specific areas in Canada's offshore regions, as well as in respect of federally-owned mineral rights in the provinces, for resource management purposes. The Division participates in the National Hydrocarbon Inventory (basis for Canada's Energy Policy) and evaluates the potential impact of deep seabed mineral resources on Canada's land-based mining industry.

. . . 2

The Division is responsible for requirements and procedures respecting the submission, confidentiality and subsequent examination of geophysical and geological data, including well materials, provided to the Branch in accordance with regulatory requirements. Involved here are the quality control and curation of lithologic and paleontologic materials from offshore wells, and the assembly and maintenance of a data bank of geological and geophysical information obtained from the offshore.

Operations and Conservation

The Operations and Conservation Division exercises regulatory control over exploration, drilling and production activities, including the analysis of possible operational hazards of proposed equipment and installations, and the nature and productive potential of reservoirs. The Division ensures that operators meet satisfactory requirements as regards the safety of personnel, the prevention of pollution, and the conservation of resources.

Control is effected by means of a supervisory system that includes procedures for approval for each proposed work program for each individual well, ongoing inspections of activities as they are carried out, and authorizations in respect of any amendments or changes during the course of work.

Environmental Assessment

The Division's major function is to fulfil the regulatory, resource management mandate of the Branch as it pertains to environmental concerns for mineral resource developments in areas of the Canadian Offshore under the jurisdiction of the Minister; to assess the physical environmental factors in an area of proposed operations, the impact that offshore operations may have on the marine and coastal biota and the socio-economic effects on local communities; to prepare or procure initial environmental evaluations or full environmental impact statements for major offshore oil or gas developments or deep ocean mining ventures in accordance with the Environmental Assessment and Review Process; to promote research, e.g. on ice and icebergs; and, to ensure the development of effective oil spill contingency planning.

REGIONAL OFFICES

Maritime Region

The East Coast office and laboratory is located at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia. The two main functions of this office are to undertake the engineering supervision of East Coast offshore operations, and to collect, process and curate cores, cuttings, paleontological materials, reports and other industry resource data and make these available for public examination. The office is set up to coordinate offshore exploration in the Scotian Shelf and Hudson Bay areas.

Newfoundland Region

The office in St. John's has been set up to coordinate all operational matters associated with offshore exploration on the Grand Banks and Labrador Sea areas.

APPENDIX 3

SUMMARY OF OFFSHORE OIL AND GAS COSTS AND ACTIVITY 1966 - 1978

ESTIMATED EXPENDITURES GEOLOGICAL & GEOPHYSICAL WORK 1966-1978

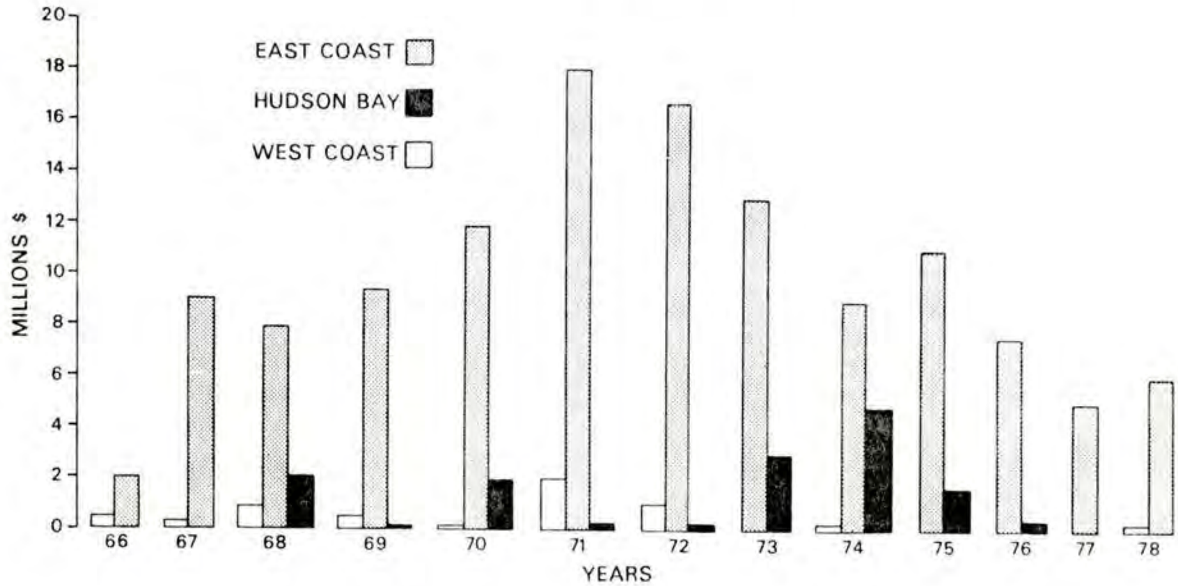


TABLE 1

MARINE SEISMIC ACTIVITY 1966-1978

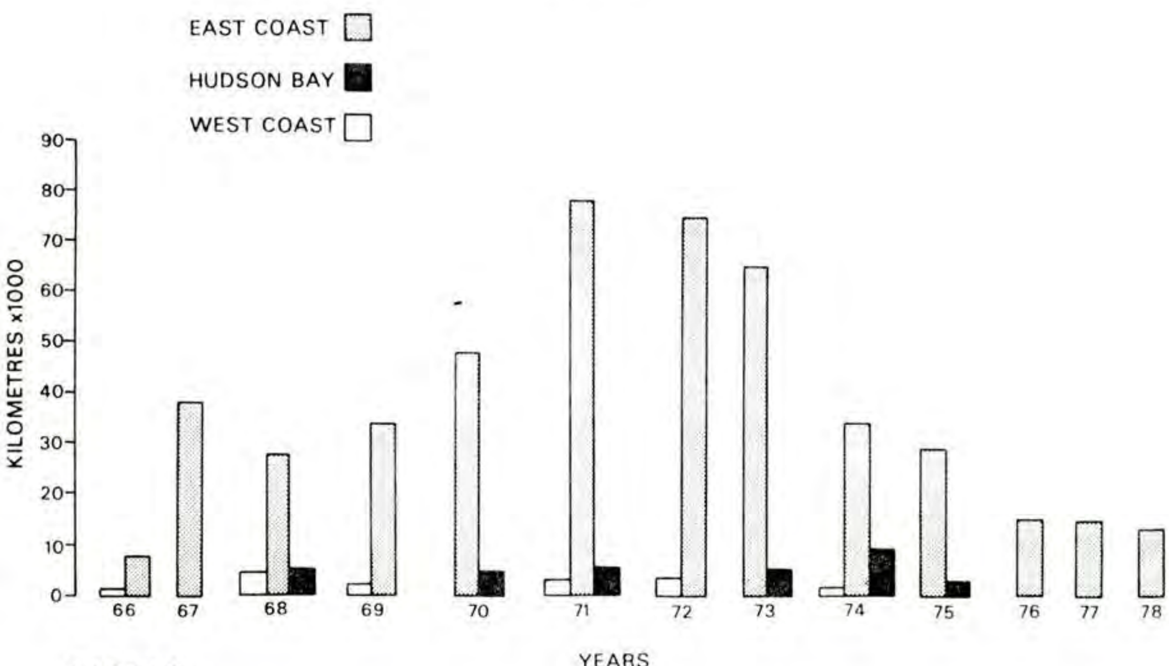


TABLE 2

Published by Resource Management Branch

ESTIMATED EXPENDITURES
RESEARCH/ENVIRONMENTAL WORK
1966-1978

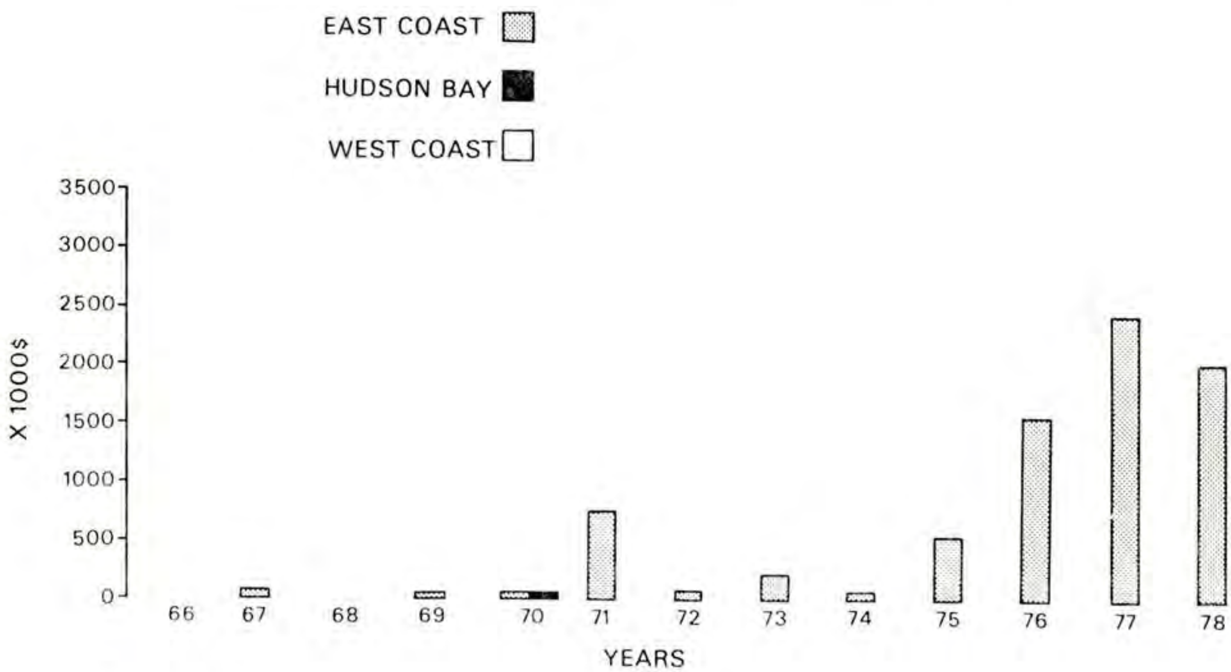


TABLE 3

ESTIMATED EXPENDITURES
DRILLING OFFSHORE
1966-1978

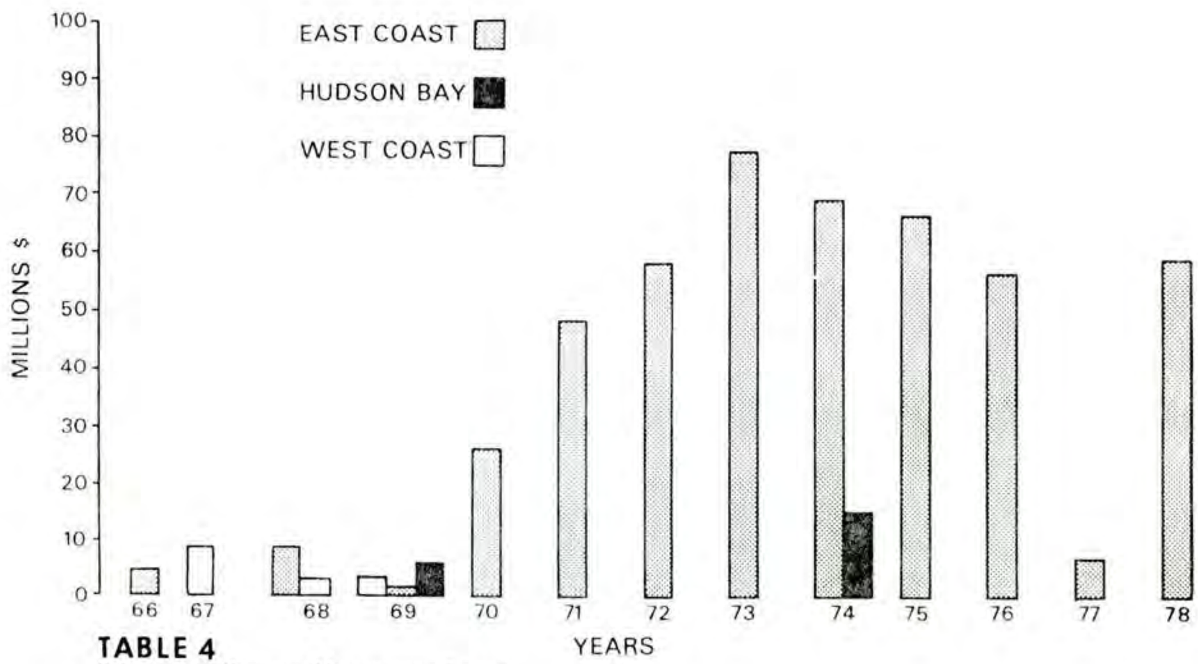


TABLE 4

Published by Resource Management Branch

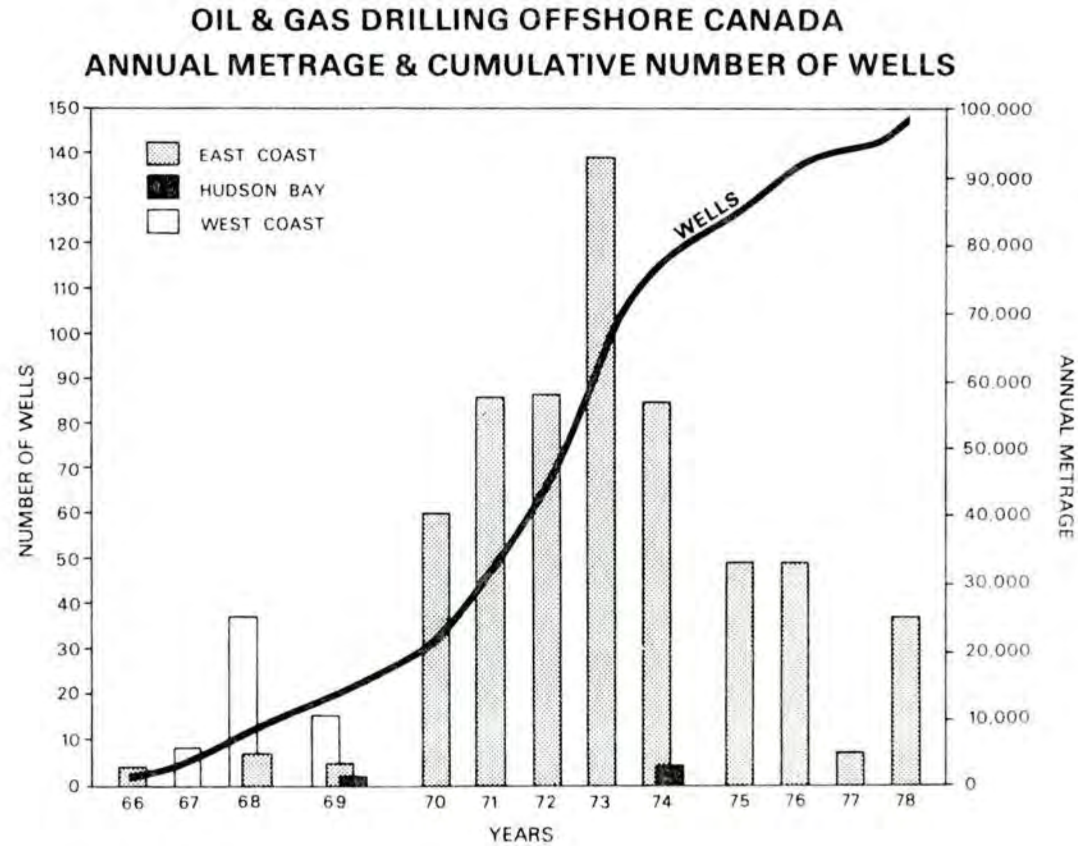


TABLE 5

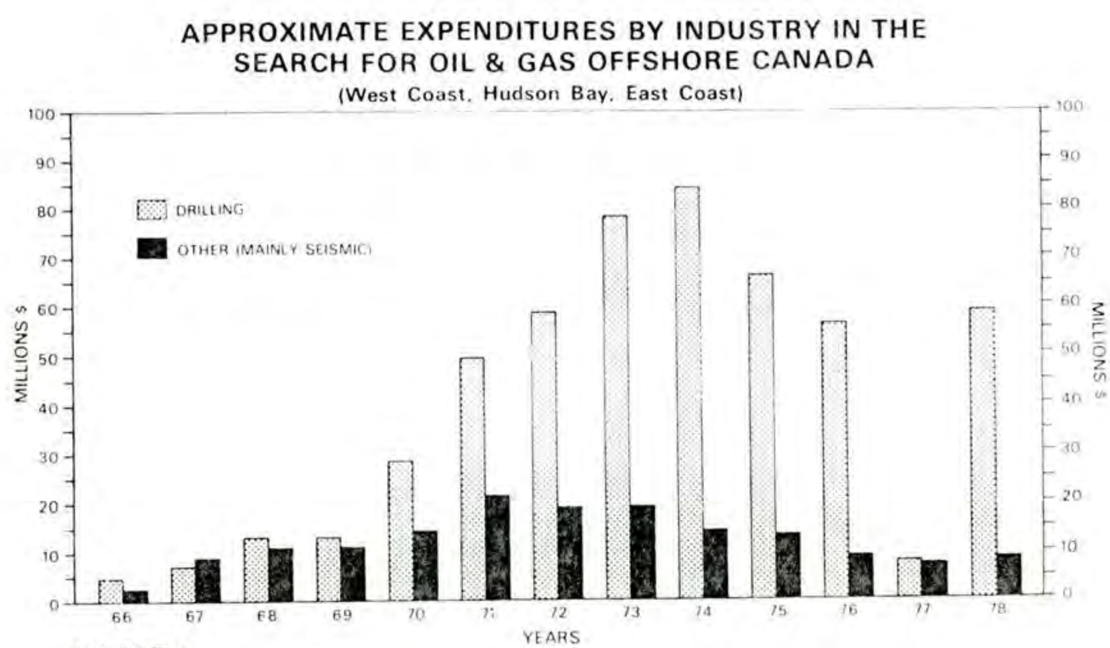
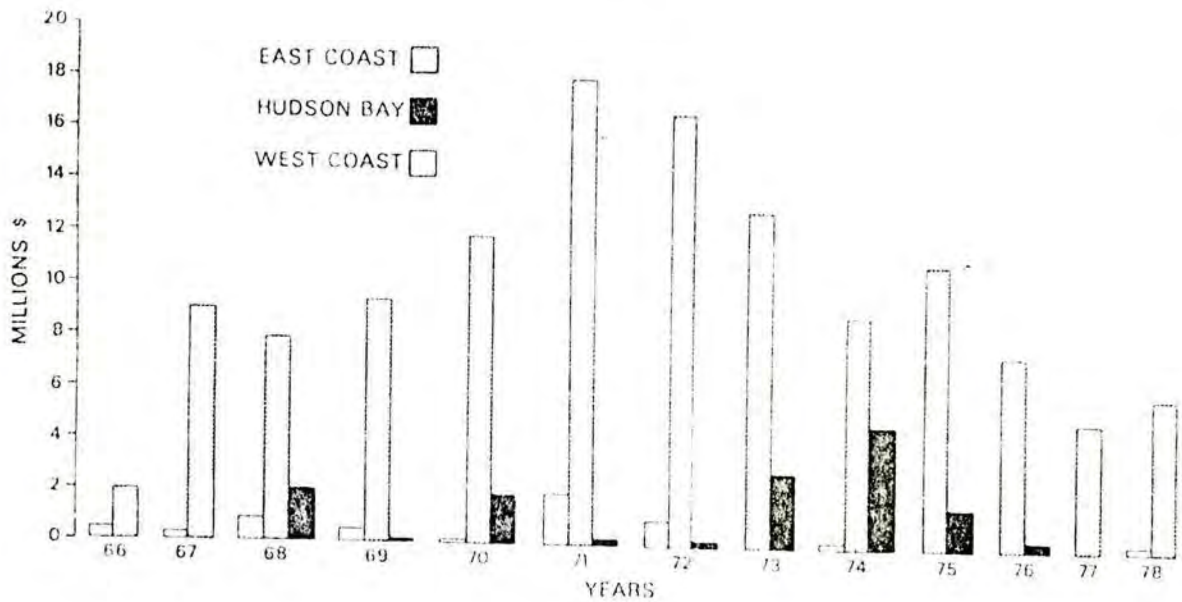
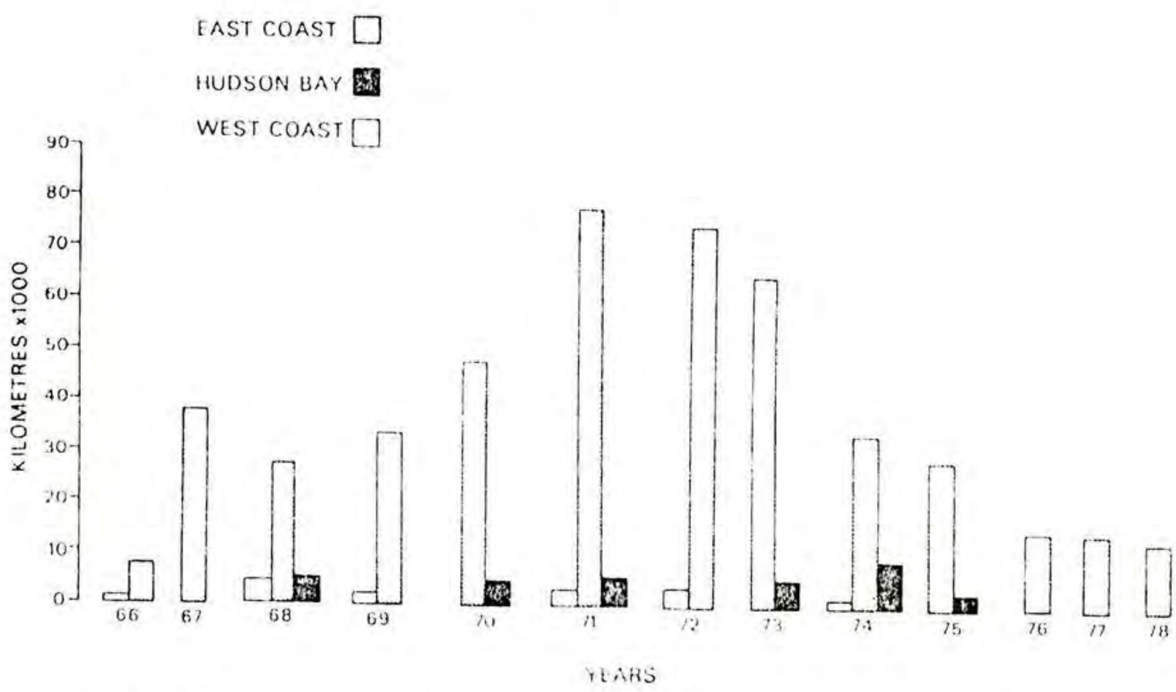


TABLE 6
Published by Resource Management Branch

ESTIMATED EXPENDITURES
GEOLOGICAL & GEOPHYSICAL WORK
1966-1978



MARINE SEISMIC ACTIVITY
1966-1978



Published by Resource Management Branch

LGL LIMITED

environmental research associates • SUITE 414, 44 EGLINTON AVENUE WEST, TORONTO, CANADA M4R 1A1 (416) 481-5641 TELEX 06-23172

25 November 1980

84.034

Dr. O. Loken
Director
Environment Protection Branch
Department Indian Affairs and Northern Development
Ottawa, Ontario
K1A 0H4

Dear Dr. Loken

Enclosed is an invitation for either T. Langtrey or C. Mageau to attend the workshop on arctic marine mammal management sponsored by Department of Fisheries and Oceans in Winnipeg. LGL Ltd. is assisting DFO in the organization of this workshop.

In view of the relevance of the subject matter of the workshop to your group, we hope that it will be possible for you to be represented.

Yours sincerely

LGL LIMITED
environmental research associates

Rolph A. Davis

Rolph A. Davis, Ph.D.
President

RAD/cep

Enclosure

RECEIVED
DEC 18 1980

Jan. 6, 1981

from Olav H. Løken
8/12/80

DEC 2 1980

INVITATION
TO
ATTEND A WORKSHOP
ON
ARCTIC MARINE MAMMALS

Dear Participant/Observer:

The Canada Department of Fisheries and Oceans is holding a workshop on present and future research needs relating to marine mammals in the Canadian Arctic. The workshop is being organized by LGL Ltd. for DFO and will be held at the Freshwater Institute in Winnipeg from 8 to 11 December 1980.

The workshop will be organized into two separate sessions with partially overlapping participants.

<u>8-9 December</u>

The first session will address the potential impacts on marine mammals of impending offshore hydrocarbon developments in the Canadian Arctic and adjacent waters. It is hoped that this session will focus on questions such as the following:

What is known about the potential effects of offshore industrial activities?

Are mitigative measures available to alleviate potential problems?

What are the critical data gaps?

What species are most at risk and where?

What are the key research initiatives that should be undertaken before, during and after the industrial activities?

DFO has also asked that the workshop recommend policies that should be instituted to afford protection of the marine mammal resources.

<u>10-11 December</u>

The second session will address questions pertaining to the exploitation and management of arctic marine mammals in Canada. Although this session overlaps with the previous one, it is intended to focus on wildlife management and habitat concerns. The purposes of the second session are to review briefly the present status of arctic marine mammals, and to identify present and future management problems. The output from this session would be a list, in order of priority, of the research initiatives required to address these problems.

Workshop Format

The workshop will be small and informal. There will be few formal presentations since the participants are experts and extensive presentations of background material will be unnecessary. The chairman will attempt to keep the proceedings focused on important issues.

DFO wishes to have a report prepared on the results of the two workshops. It is hoped that a consensus of opinion among the participants can be reached and can be reflected in the report. To this end, the latter part of each session will consist of a review and discussion of the major issues raised and conclusions reached during the session.

Preparation of the report is the responsibility of LGL. We will prepare a draft that, hopefully, will accurately reflect the discussions and conclusions of the workshops. On or about 1 January 1981, the draft will presented to the participants for comments. Because of DFO time-constraints, we will need comments within 2-3 weeks of receipt of the draft. The report will be publicly available; probably in the DFO Technical Report Series.

Further Information

Additional information about the agenda, meeting location, time of sessions, hotel, etc., will be sent to you shortly.

I hope you will be able to attend the workshop. Please call me if you have any questions.

Yours sincerely,

LGL LIMITED
environmental research associates

Rolph A. Davis

Rolph A. Davis
President
RAD:bg

MARINE MAMMAL WORKSHOP
TENTATIVE AGENDA

Session 1: 8-9 December 1980

Offshore Hydrocarbon Development and Arctic Marine Mammals

Opening Comments: John Loch, DFO

Chairman: Rolph Davis -- comments on format and objectives of workshop

Review of Proposed Hydrocarbon Developments

Beaufort Sea - Canada - B. Smiley

- U.S.A. - H. Braham

High Arctic

Baffin Bay/Davis Strait

Other Areas

Identification of Potential Impacts

A review of the components of offshore developments that could affect marine mammals with more detailed discussions of those elements considered to be important. The possibility of mitigating potential effects should be considered here.

Release of Contaminants
- Drilling Fluids
- Formation Cuttings
- Cement Slurry/Scrap Steel
- BOP Fluids
- Methyl Alcohol
- Sewage
- Heated Water

Release of Natural Gas

LNG Accidents

Release of Crude and Refined Oils

Dredging

Shock Waves -- Seismic, Ice Management

Underwater Noise
- Major Sources
- Source levels
- Transmission loss
- Ambient noise
- Hearing thresholds
- Masking
- Direct effects
- Indirect effects

Ice-breaking
- Direct Effects
- Creation of artificial leads
- Disruption of ice-edges
- Disruption of ice-sheets

Effects of Artificial Islands on Break-up

General Disturbance and Physical Presence
- Drilling rigs
- Artificial islands
- Ice-breakers
- Workboats
- Aircraft
- Ports, harbours, dry docks, etc.
- Undersea oil storage
- Undersea pipelines

Recreation and Increased Access
- Workers
- Inuit
- Tourists

Cumulative Effects
- Compensatory?
- Additive?
- Synergistic?
- Indirect?
- Food Chain?

Species Most at Risk

A discussion of the species that are most likely to be affected by the above activities. Discussion will relate to geographical regions where activities are likely to occur.

Beaufort Sea
- Bowhead
- White whale
- Ringed seal
- Bearded seal

High Arctic and Baffin Bay
- Narwhal
- White whale
- Bowhead
- Ringed seal
- Bearded seal
- Harp seal
- Walrus

Davis Strait
- Narwhal
- Bowhead
- Hooded seal
- Other Whales -- several open-water species

Important Data Gaps

Impact-related
Area-related
Species-related
System-related

Critical Research Initiatives

Role of Government vs. Role of Industry

Timing of Studies
- Pre-development
- During operations
- Mitigation
- Monitoring

Recommended Studies

Recommendations for DFO Policies

The topics 'Important Data Gaps' and 'Critical Research Initiatives' are the key sections of the workshop. They will occupy most of the second day. It is hoped that the workshop will identify any policy initiatives that should be applied to offshore development in order to protect marine mammals.

Session 2: 10-11 December 1980

Management Requirements

Opening Comments: Roger Peet, DFO

Chairman: Rolph Davis -- format of workshop

General Considerations

Potential for Increased Harvest Levels

Trend to Commercial Use of Mammals
- e.g. narwhal and walrus tusks

Role of Inuit in Present and Future Management Strategies

International Aspects
- U.S.
- Greenland

Species-by Species Review

A review of current knowledge about each species and a discussion of short-term and potential long-term management problems associated with each species. Data gaps would also be identified here.

The review should include discussion of:

Population Levels

Stock Discreteness and Sub-Populations

Sustainable Yield

Current Harvest Levels

Distribution of Harvest

Data Gaps

Assessment of Potential Management Problems

Species of concern include:

White Whale

Narwhal

Bowhead

Walrus

Harbour Seal

Harp Seal

Hooded Seal

Ringed Seal

Bearded Seal

<u>Species Interrelationships</u>

<u>Food Webs</u>

<u>Management Concepts</u>

<u>Habitat Requirements and Protection</u>

<u>Summary of Major Data Gaps</u>

<u>Recommendations for Critical Research and Management Initiatives</u>

- Establish Priorities
- Recommend Types of Studies for Each.

The last point is the major purpose of the workshop and will occupy most of the second day and will be the subject of the resultant report.

Marine Mammal Workshop

General Information

Dates: 8-9 December 1980 -- Offshore Hydrocarbon Development

: 10-11 December 1980 -- Management Requirements

Meeting Place: Main Floor Meeting Room
Freshwater Institute
501 University Crescent
Winnipeg, Manitoba

Meeting Times: Morning and Afternoon Sessions
: Begins 09:15
: Coffee available

Hotel: Marlborough Inn
in Downtown Winnipeg

Informal Reception: Sunday evening after 19:30
Marlborough Inn
in Room registered in name of
Rolph Davis -- Call on house phone
Bar available

Wednesday Evening: Special Walleye and Whitefish Dinner
sponsored by and partially funded by DFO

For additional information, please call Dennis Wright, DFO - (204) 269-7379 or Rolph Davis, LGL - (416) 481-5641

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Administration Régionale KATIVIK Regional Government
P.O. Box 9, KUUJJUAQ (Fort Chimo), Quebec J0M 1C0

84.001
84.034 ✓

KUUJJUAQ
October 16, 1980

To those concerned

RE : Oil spills in Northern Quebec

As a result of some questions regarding the unloading procedures for oil and gas, I contacted the authorities of Shell Canada in Montreal.

The questions mainly concerned whether oil was left in the flexible line connecting the ship with the end of the pipeline. According to Shell after unloading is finished, compressed air is pumped from the ship into this line. The passage of this air can be seen in the line as it will become more buoyant.

Once it is passed the sampling point near the end of the pipeline some time is given for the air to pass into the pipeline then the valve at the end of the pipeline is closed. The compressed air is then bleed off at the ship. The flexible line is uncoupled at the pipeline and capped. Then it is reeled back on ship. There may be one or two gallon spillage at the uncoupling but they insisted no more.

One problem they indicated could exist is that they might have a defective flexible line. This happened this year at Kuujjuaraapik where the line broke twice. Here there will be some spills. The broken line will cause the pressure to drop and when this is registered at the ship the pump is stopped and the line is repaired. Because of the tension of the anchor cables placed at regular intervals along the line, the lack of pressure in the line causes the flexible line to flatten thus preventing a complete discharge of the line in the water. In this case, the problem was in the manufacture of the flexible line and it was returned to the company that made it.

...

The foregoing was from Shell's point of view. For sure there will be some spills. The important questions are of what size and if they can be prevented. If they are of a few gallons and cannot be reasonably prevented it is difficult to request major changes. Of course, if they are of larger scale or can be prevented then we can request investigation or changes.

If you wish this followed further or have other questions do not hesitate to contact the undersigned.

MICHAEL BARRETT
Environment

MB/lp

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Administration Régionale KATIVIK Regional Government
P.O. Box 9, KUUJJUAQ (Fort Chimo), Quebec J0M 1C0

ᑯᑦᔪᐊᖅ
ᐊᒃᑐᐸ 16, 1980

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ᐱᑦᔪᑎᖓ : ᐅᕐᓯᐊᓗᑉ ᑯᕕᓂᖓ ᑯᐸᒃ ᑕᕐᕿᖓᓂ

ᓄᐃᑎᑕᖕᒪᑕ ᐊᐱᕆᔪᑎᐅᔪᑉ ᐱᑦᑎᕆᑦᓯᒍ ᐅᕐᓯᐊᓗᒥ ᐊᒪᓗ ᑲᓴᓕᒥ ᐅᓯᖕᕆᐊᕐᓂᐅᑉ ᒪᓕᕆᐊᓕᖕᕆᑦ ᐅᖅᑲ-ᑎᖅᑕᐅᕐᑐᖕᒐ ᑲᒪᔨᓂ Shell-ᑯᓂ ᒪᓐᑐᔨᐊᒥ.

ᐊᐱᑎᐅᑎᐅᓚᑎᐅᓚᐅᕐᑐ ᑕᒪᓇ ᐅᕐᓯᐊᓗ ᐃᓂᖅᑲᕐᑐᑕᐅᓂᕐᒪᖕᒐ ᓂᐅᖕᒐᕐᓇᑐᒥ ᑐᓯᐊᒥ ᐅᒥᐊᕐᔪᐊᒥ ᐃᓕᖕᒐᑦᓯᓂ ᑕᒍᖕᒐ ᐅᕐᓯᐊᓗᖅᑕᐅᑎᒍ. ᑕᑯᐊ Shell ᐅᖃᐅᓯᑎᓚᐅᕐᑕᖕᒐ ᐅᓯᖕᕆᐊᑎᕐᒪᑕ ᖃᐅᑎᒍ ᐅᒥᐊᕐᔪᐊᒥ ᐱᔪᖅ ᐊᑐᕐᓯᒍ ᑕᓇ ᐅᕐᓯᐊᓗ ᑐᓯᐊᒍᑎᑕᐅᓯᖅ. ᑕᒪᓇ ᑕᑯᑦᓴᐅᔪᖅ ᖃᓗᔭᐅᓂᖕᒐ ᑕᓇ ᑐᕐᓯᐊᖅ ᐸᑦᑕᕈᓇᒪ ᖃᓄᓕᒪᖅ ᐅᕐᓯᐊᓗᒥ.

ᐅᑦᑐᕋᕐᑕᐅᒋᕐᒪ ᑕᒪᓇ ᑐᕐᓯᐊᕐ ᐃᓯᐊ ᐊᑯᓂᐊᐱ ᐅᑕᕿᓯᖅ ᑕᓇ ᕿᐸᑕᖕᒐ ᒪᑐᔭᐅᒋᕐᒪ ᖃᓗᓯᓯᖅ. ᑕᐃᒪ ᐅᒥᐊᕐᔪᐊᒥ ᐸᑦᓚᖅ ᑐᕐᓯᐊᒍᕐᑕᐅᓯᑦᓯᓂ ᑕᒪᓇ ᑐᕐᓯᐊᖅ ᕿᐸᑦᔭᑕᐅᒋᐊᖅᑲᓯᖅ ᑕᒪᓇ ᐸᓚᐅᓂᕋᕐᑕ ᓯᖕᒍ-ᔪᑦᓯᓂ ᑐᕐᓯᐊᒍᕐᑕᐅᓕᕐᒪᖅ. ᐃᒪᖅᑯ ᖃᓗᑎ ᐊᑕᐅᓯ ᐅᕙᓗᓂ ᒪᕐᕈ ᑯᕕᓯᑦ ᑕᓇ ᑐᕐᓯᐊᖅ ᕿᐸᑦᔭᑕ-ᐅᑎᓗᒍ.

ᐊᑕᐅᓯ ᐱᓇᐃᓗᑕᐅᓚᔭᕐᑐ ᓄᐃᓚᔭᕐᑐᑎᔭᖕᒐ ᑕᓇ ᑐᕐᓯᐊᑯᑕ ᐃᒪᖅ ᓂᐅᖕᒐᖅᔭᕋᔭᕆᓪᒪ ᑕᒪᓇ ᑕᐃᒪᐃᓕᓚᐅᕐᑐ ᑯᑦᔪᐊᕋᐱᒥᒃ ᒪᕐᕈᕕᑦᓯᓂ ᑐᕐᓯᐊᖅ ᓯᕐᑯᒥᖅᑕᓚᐅᕐᒪᑦ ᑯᕕᓂᖅᑕᓚᐅᕐᑐ ᐅᕐᓯᐊᓗ ᑕᓕᓂ. ᑐᕐᓯᐊ ᓯ-ᕐᑯᒥᒍᓂ ᖃᐅᑎᒥ ᓯᑲᐃᓕᑎᑦᓯᒍᓇᑐᖅ ᑕᒪᓇ ᖃᐅᔨᔭᐅᒍᓂ ᖃᐅᑎ ᓄᖅᑎᑕᐅᒍᓇᑐᖅ ᑐᕐᓯᐊ ᐊᕿᑕᐅᓂᐊᕐᒪᖅ.

ᑕᒪᑯᐊ ᐅᖃᔭᐅᔪᑦ Shell-ᑯ ᐅᖃᐅᓯᑎᓚᐅᕐᑕᕆᑦ ᑯᕕᔪᖅᑲᑕᓕᖕᔪᑦ ᖃᐅᔨᒪᓇᕐᑐᒐᓗᐊᑦ ᒪᓇᐅᔪᖅ ᖃᐅ-ᔨᔭᐅᒍᒪᓕᑎᑦᑐᖅ ᖃᓄᖅ ᐊᕐᕆᔪᒥ ᑯᕕᓂᖅᑲᕈᓇᒪᖕᒐ ᐊᒪᓗ ᖃᓄᖅ ᑯᕕᑕᐃᓕᑎᑕᐅᒍᓇᒪᖕᒐ. ᖃᐅᑎᑦ ᐃᑭᑐᐊᐱᑦ ᑯᕕᐸᑕ ᐊᒪᓗ ᑕᒪᓇ ᐊᕿᕆᐊᕐ ᕕᖅᑲᕆᓗᑐᕐᐸᑦ ᑕᐃᒪ ᖃᓄᓕᑎ ᐊᕿᕆᐊᕐᑯᕆᐊᕐᕆᑦ ᓇᓗᓇᕐᑐᑦ. ᐱᔭᓇᒪᑎᑐᒐᓗᐊᑦ ᑕᒪᓇ ᑯᕕᓂᖓ ᐊᕐᕆᓂᕐᓴᐅᐸᑦ ᐊᒪᓗ ᐊᕿᕆᐊᕕᖅᑲᕈᓇᐸᑕ ᐊᕿᕆᐊᕐ ᕕᓴᕐᕆᑦ ᕿᒥᕈᔭᐅᖅᑯᓇᑕᕋᓗᐊᕐᑦ ᐅᕙᓗᓂᑦ ᐊᓯᑦᔨᖅᑯᓕᑦ ᐅᓯᖕᕆᐊᕐᓂᒥᓂ.

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ᑲᒪᒋᔭᐅᒋᐊᓚᖁᒍᑦᓯᐅ ᐊᒪᓗᓂ ᐊᐱᕐᓯᑎᒋᐊᓚᕐᑲᕈᑦᓯ ᐊᕐᑎᒥᓂ ᐊᓚᓯᒪᔪᒧᑦ ᐅᖃᓚᕕᖁᓇᑐᑎ.

ᒪᐃᒃ ᐱᐊᕋᑦ

ᒪᕐᑲᐃᑎᑦ ᓴᐳᒥᔭᐅᓂᖓ

13.4.6

Environment Canada Environment Canada

Ottawa, Ontario
K1A OE7

April 10, 1980

Your file Votre référence

Our file Notre référence

RESOURCE MANAGEMENT BRANCH
ENERGY, MINES AND RESOURCES

To: Bell

APR 16 1980

FILE # 8250-7
(copy already on
REPLY SENT 1135-123)

Mr. M. Bell
Director
Environmental Assessment Division
Resource Management Branch
Energy Mines and Resources
580 Booth Street, Room 1346
Ottawa, Ontario

Dear Mr. Bell:

In response to your request of December 14, 1979, an environmental review was undertaken with respect to the release of acreage in Hudson Bay.

Based on this review, DOE recommends that:

(a) exploration activities not be permitted within 50 miles of the coastline in the proximity of Eskimo Point, Whale Care and Rankin Inlet. (Area A on the attached map).

(b) exploration activities be allowed to proceed with extreme caution in the eastern and southern portion of Hudson Bay and suggest that an IEE be prepared for this area prior to extensive exploratory drilling. (Areas B and C on attached map).

(c) exploration activities be allowed to proceed in the remainder of the proposed lease area with adequate safeguards.

The rational for these recommendations is contained in the attached review document.

Yours sincerely,

V.V. Spence
Director, Integration & Environmental Assessment Branch

R.H. Weir
Senior Biologist
Appraisal and Control
Environmental Assessment and Design Division

J. McTaggart-Cowan
Scientific Program Coordinator
Atmospheric Environmen
Service

APR 14 1980

In order to conserve energy and resources this paper contains 45 per cent recycled post-consumer fibre

A des fins de conservation de l'énergie et des ressources ce papier contient 45 pour cent de fibres recyclées

A SUMMARY OF

ENVIRONMENTAL CONCERNS

ASSOCIATED WITH THE DISPOSITION OF

LEASE ACREAGE IN HUDSON BAY

with

RECOMMENDATIONS

Prepared by

DFO & DOE

INTRODUCTION/SUMMARY

The Department of Energy Mines and Resources requested the Department of the Environment (DOE) and the Department of Fisheries and Oceans (DFO) to undertake an environmental review of acreage in Hudson Bay for possible disposition under Section 30 of the amended Canada Oil and Gas Land Regulations. This review has identified acreage that DOE & DFO jointly consider unsuitable for marine seismic surveys and/or offshore exploratory drilling. It has also identified acreage which because of a high potential for resource use conflicts is now considered unacceptable until a more complete environmental evaluation can be made. Acreage acceptable for disposition, with conditions is also indicated.

An area that does not lie within the acreage areas described by EMR, but which is in close proximity to the acreage (and in fact surrounds it) was also discussed because of the undoubted potential for significant living resource disturbances which might result from any exploratory or development activity in Hudson Bay.

Finally, information needs which pertain to minimizing undesireable project/environment interactions are briefly discussed.

AREA REVIEW & RECOMMENDATIONS

1. AREA A (see map #1)

1.1 Known resource use conflicts (map #2)

1.1.1 McConnell River. The McConnell River International Biological Programme (IBP) Site including the McConnell River Migratory Bird Sanctuary. This area (approximately 1390 km^2) is located on the west coast of Hudson Bay approximately 32 km south of Eskimo Point.

The site is characterized by extensive coastal marsh flats extending up to 8 km inland dotted with numerous small shallow water bodies. The area is prized for its rich breeding habitat for large numbers of migratory waterfowl particularly lesser snow geese (a maximum of 360,000 nesting pairs: Kerbe 1975).[1]

1.1.2 Arctic Char Fishery. Rivers in the vicinity of Chesterfield Inlet, Rankin Inlet, Whale Cove and Eskimo Pt. support a commercial arctic char fishery totalling - 280,000 lbs per year.

1.1.3 Marine Mammals. Beluga, walruses, and rare bowheads may occur at all times of the year in the vicinity of Whale Cove, Marble Island and Baker Foreland (N.W. Hudson Bay), when open water is available.

1.1.4 Community Conflicts. The communities of Eskimo Pt., Whale Cove, and Rankin Inlet have expressed a desire that to avoid resource use conflicts, no exploration activity take place with 50 miles of their respective communities (M. Hawkes, Environmental Assessment Coordinator, Govt., N.W.T. - personal communication).

1.2 RECOMMENDATION. It is recommended that exploration activity (marine seismic and exploratory drilling) not be permitted in Area A (map #1).

[1] Kerbes, 1975. The nesting populations of Lesser Snow Geese in the Eastern Canadian Arctic CWS Report #35.

2. AREA B (see map #1)

2.1 Known resource use conflicts (map #3)

2.1.1 Belcher Islands IBP Site. This group of Islands (56°10'N, 79°40'W) lie approximately 85 km off the southeast coast of Hudson Bay. These Islands create a large number of inlets and bays. The proposed IBP site covers the central and western portion of the Islands.

Breeding populations of Canada geese, old squaw, pintail, scoter and shorebirds are common. Approximately 35,000 eiders breed and winter in the area. Walruses, harp, ringed and bearded seals are found in the marine waters surrounding the Islands and capelin are common inshore in summer. Polar bears use the Islands for winter denning and as a summer sanctuary.

2.1.2 Long Island IBP Site. Polar bear occur here and geese use the Island as a moulting and staging area.

2.1.3 Twin Islands IBP Site, James Bay. North and South Twin Islands have been used by large numbers of polar bears for hundreds of years both as a summer sanctuary and a winter denning area. The greatest concentration occurs on Mount M rdor along the eastern ridge of North Twin Island. Large numbers of Canada Geese breed there as well as a variety of other waterfowl and passerines. Beluga Whales winter in the offshore leads around the Islands.

2.1.4 Cape Henrietta Maria. Several hundred walruses haul out on an Island 25 miles to the northwest of the Cape, in the summer. Fall concentrations of polar bears occur at Cape Henrietta Maria as do major breeding colonies of lesser snow geese.

2.1.5 The scattered, small Islands, 10 to 20 miles south of the Belchers provide habitat for small numbers of walruses. These walruses are assumed to be related to those at Cape Henrietta Maria and others at the Sleeper Is.

2.1.6 Sleeper Is. and Macropeet Is. Up to several hundred walruses have been seen here.

2.1.7 Great Whale River (Poste-de-la- Baleine). The area between here and Belcher Is. has good fast ice cover. The density of ringed seals probably is greater here than elsewhere in Hudson Bay. Capelin occur here in the summer.

2.1.8 The Hopewell Islands unit encompasses the summer range for small numbers of Beluga Whale. Breeding areas for the Common Eider are found here as are two Glaucous Gull colonies. (Arctic Ecology Map Series).

2.1.9 This area encompasses nesting territory for tens of thousands of Canada Geese, and a molting area for Canada Geese from the southwest coast of Hudson Bay. The area is an important staging area for Lesser Snow Geese as well. Ringed seal habitat is extremely good in this area, and Beluga Whales are found along the coast line. Anadromous Arctic Char and Brook Trout streams occur in this area.

2.1.10 Of special importance to waterfowl are the offshore areas in the northern half of Jurus Bay where very large concentrations of scoters occur during the summer/fall months.

3.1 Known or suspected resource use conflicts (map #4)

3.1.1 Ottawa Islands. Formerly the scene of commercial hunting of bowhead whales in the late 19th and early 20th century, but none have been seen there in recent times. These islands provide summer sanctuary for tens of polar bears. Walruses have been observed in this area in the summer, and a thick-billed murre and a gull colony is present on the northern tip of Bronson Island.

3.1.2 Harp Seal Migration Route. Small numbers of harp seals migrate through or nearby this area each year. Harp seals have been observed as far south as the Belcher Islands.

3.2 RECOMMENDATIONS It is recommended that disposition of lease Area C (map #1) be conditional upon the acquisition of marine mammal and polar bear observations during the course of seismic surveys so that the effects of any escalated activity may be properly assessed. This information should be utilized in the preparation of an IEE which should be assessed before drilling is considered.

4. AREA D (see map #1)

4.1 Resource use conflicts. There is less potential for disturbance of wildlife and marine mammals in the offshore Hudson Bay than in the previously described coastal area. It is however not known whether or where any concentrations of mammals or birds may occur. In the face of near total ice cover during the mid-late winter months, it is unlikely that many man-animal conflicts will arise during this time.

4.2 RECOMMENDATION.

In order to identify potential problem areas it is recommended that, as one of the conditions of permit acquisition, the proponents of exploration be asked to make observations on marine mammals from seismic vessels and aircraft and to collect environmental data relevant to exploration activities. This information will be of considerable importance in future exploratory application processes.

5. AREA E (see map #1) - Outside of the proposed lease acreage

5.1 Resource/Project conflicts. The rapid evolution and sensitivity of the Hudson Bay lowlands are reasonably well documented. The occurences of critical or important habitat to migratory geese, ducks and shorebirds render this coastal regime incompatible with shore based development or frequent nearshore air or ship traffic. Concentrations of polar bears, along the edge of the pack ice at various times of the year further render the coastal regions of southern Hudson Bay unsuitable for nearshore or coastal activity. Likewise, the importance to marine mammals of the frequent open water in the Roes Welcome Sound area and the presence of a number of bird sanctuaries, IBP sites, walrus haulout areas and polar bear habitat in the Southampton - Coats Island areas are good reasons to closely restrict and regulate human disturbance to the area.

RECOMMENDATION

5.2.1 While it is recognized that this area is not being considered for oil and gas exploration per se-it is recommended that any exploration related activities (shore bases, ship and air traffic) be regulated in this region.

5.2.2 Any proposed development in this area (E) should come under the scrutiny of the EAR process.

THE EFFECT OF THE ENVIRONMENT ON EXPLORATION ACTIVITY

The lack of an adequate response to the weather forecasts in Hudson Bay created difficulties and near disaster during Aquitaine's drilling program at the "Walrus" well in 1974. A storm forced the operator to abandon the drilling operation and cancel any further work. The present observational network and available routine forecasts produced for this area are not adequate for the proposed operation. Attention will need to be given to closing information gaps in the next three or four years. An increased level of service in ice forecasting is required to minimize the risk to safe offshore drilling in this environment.

INFORMATION GAPS

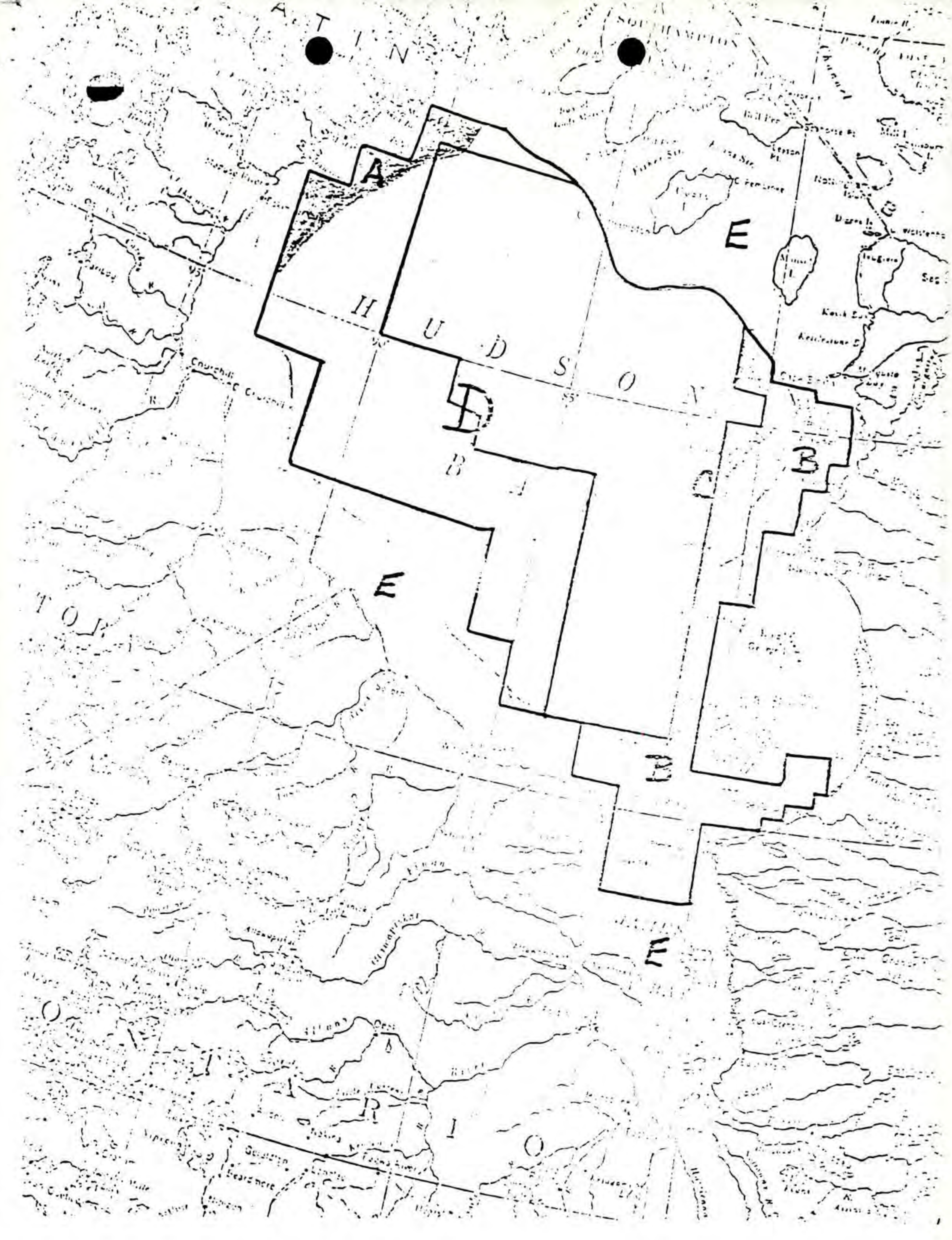
Information needs have been identified for those instances where it would be essential for the prediction of impacts. The identified needs pertain to: A. Physical Oceanography, B. Biological Oceanography, C. Coastal geomorphology and atmospheric parameters pertaining to oil slick transport.

Attention is drawn to the planned scientific symposium on Hudson/James Bay in April, 1981, which may be useful in pulling together existing knowledge of the system.

Further information is necessary for a viable weather/sea/ice information & prediction system.

RECOMMENDATION

It is recommended that the information needs identified, be addressed ~~now~~ to minimize the uncertainties of future predictions of project/environment interactions.



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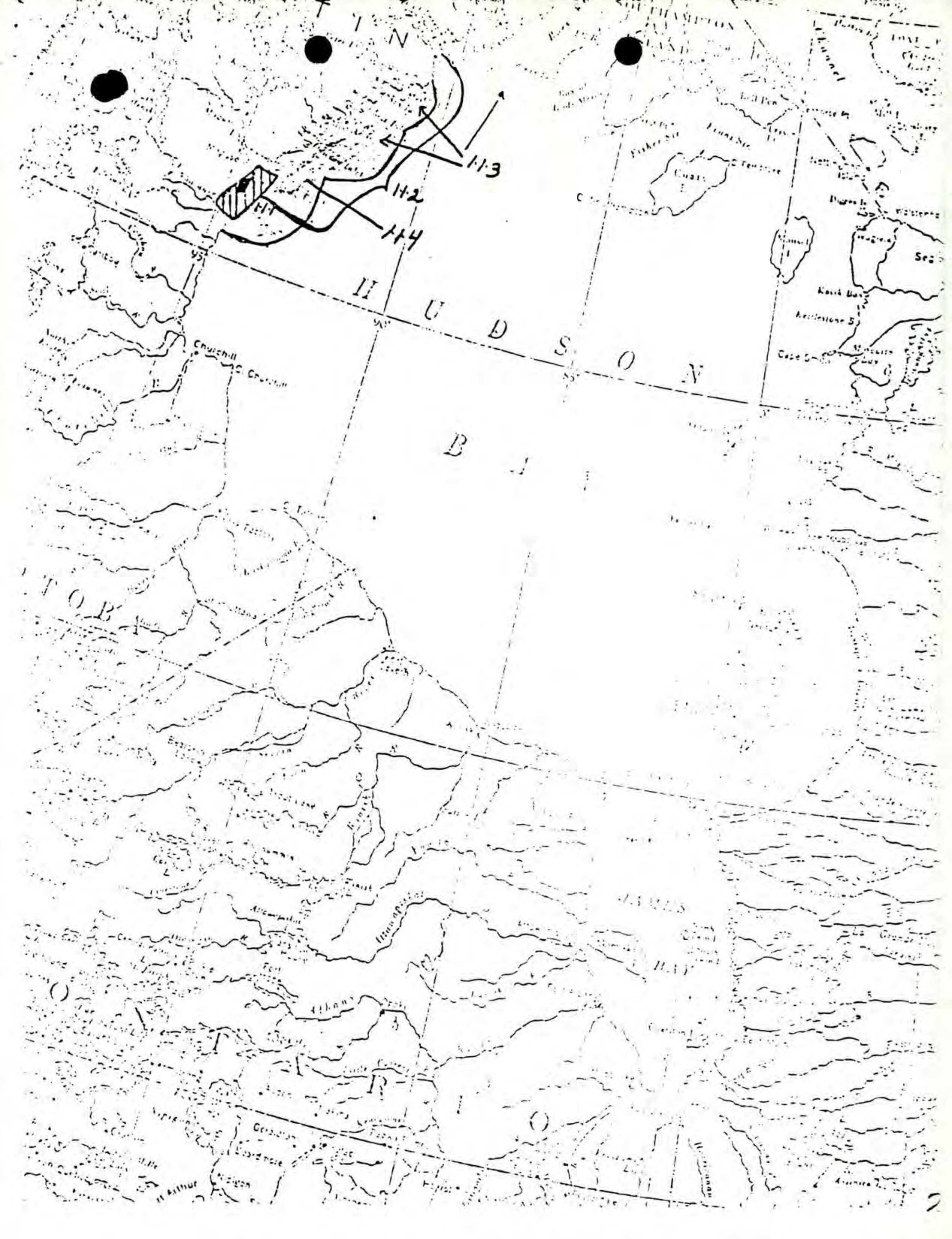
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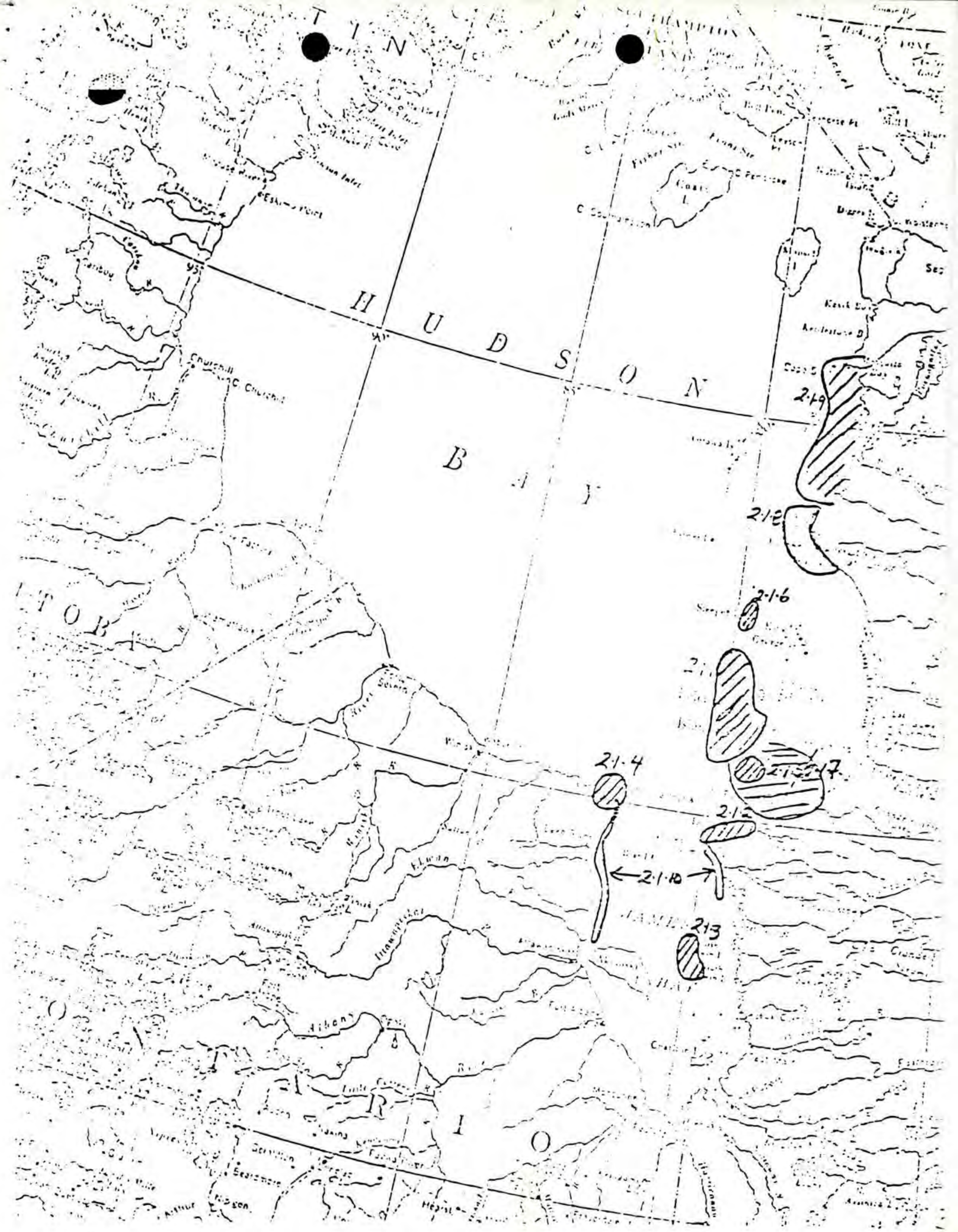
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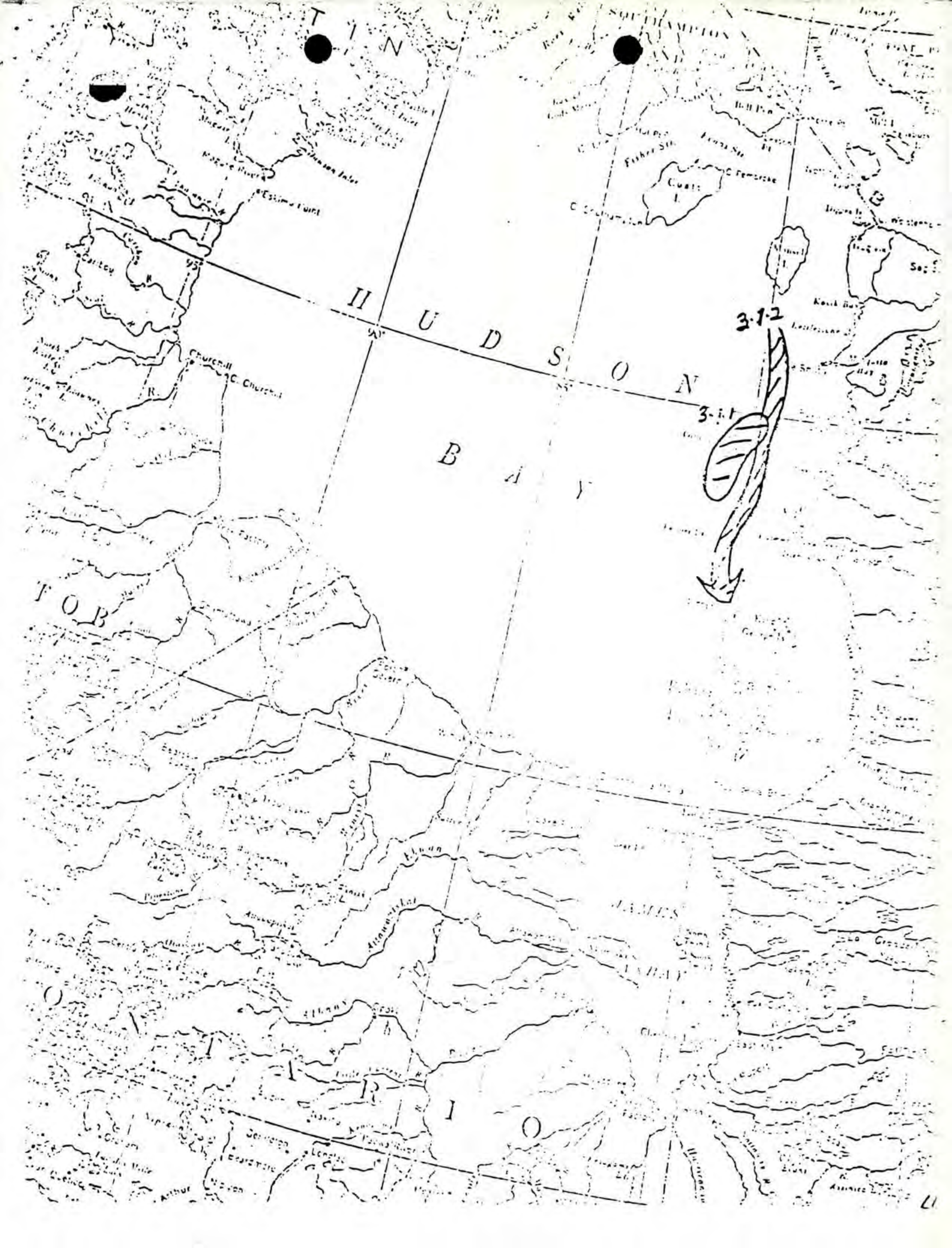

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C. Churchill
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3.1.2
3.1.1

13.4.F3

DEPARTMENT OF ENERGY, MINES & RESOURCES
RESOURCE MANAGEMENT & CONSERVATION BRANCH

HUDSON BAY & HUDSON STRAIT

FEDERAL OIL & GAS EXPLORATION PERMITS

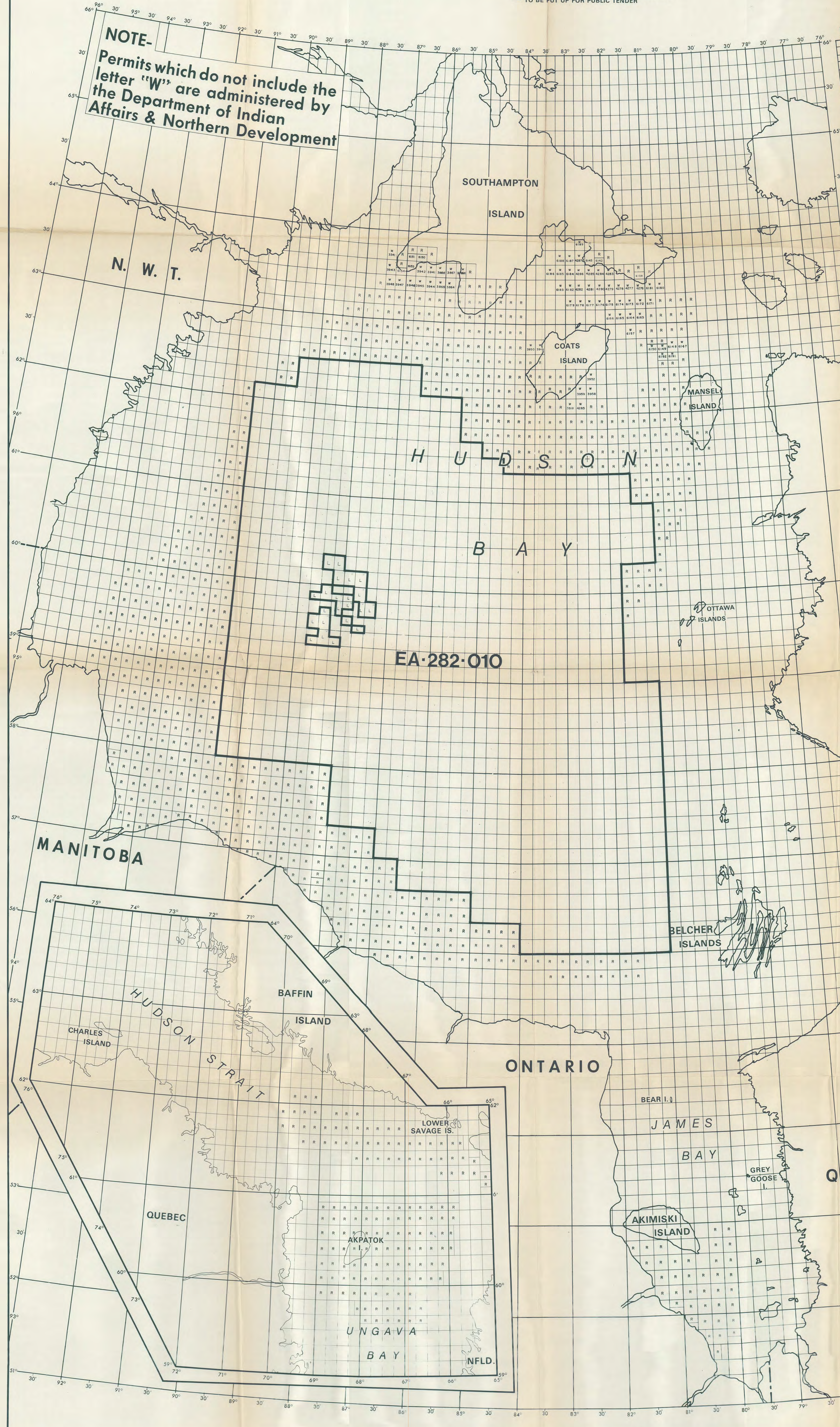
INDEX TO GRID AREAS
Scale: 1 = 1,584,000(Approx.)

81/11/13

WARNING:
THE PUBLIC IS WARNED AGAINST USING THIS INDEX AS A RELIABLE INDICATION OF GEOGRAPHIC LOCATION OF ANY GROUND FEATURE. SELECTION OF GRID AREAS SHOULD BE BASED ON RELIABLE LARGER SCALE MAPS OR OTHER MEANS.

L LEASE
OPEN
AREAS UNDER EXPLORATION PERMIT
R AREAS FORMERLY UNDER PERMIT REQUIRED TO BE PUT UP FOR PUBLIC TENDER

NOTE-
Permits which do not include the letter "W" are administered by the Department of Indian Affairs & Northern Development



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21152	10560	10592	10576	H
52306	26111	26195	26153	A
21288	10624	10664	10644	H
52644	26280	26364	26322	A
21424	10696	10728	10712	H
52982	26449	26533	26491	A
21560	10760	10800	10780	H
53320	26618	26702	26660	A
21696	10832	10864	10848	H
53656	26786	26870	26828	A
21832	10896	10936	10916	H
53992	26955	27037	26996	A
21968	10968	11000	10984	H
54328	27123	27205	27164	A
22104	11032	11072	11052	H
54664	27291	27373	27332	A
22240	11104	11136	11120	H
55000	27459	27541	27500	A
22376	11168	11208	11188	H
55334	27626	27708	27667	A
22512	11240	11272	11256	H
55668	27793	27875	27834	A
22648	11304	11344	11324	H
56000	27959	28041	28000	A
22776	11368	11408	11388	H
56332	28125	28207	28166	A
22912	11440	11472	11456	H
56664	28291	28373	28332	A
23048	11504	11544	11524	H
56996	28457	28539	28498	A
23184	11576	11608	11592	H
57328	28623	28705	28664	A
23312	11640	11672	11656	H
57660	28789	28871	28830	A
23448	11704	11744	11724	H
57990	28954	29036	28995	A
23584	11776	11808	11792	H
58320	29119	29201	29160	A
23720	11840	11880	11860	H
58650	29285	29365	29325	A
23848	11904	11944	11924	H
58980	29450	29530	29490	A
23984	11976	12008	11992	H
59310	29615	29695	29655	A
24112	12040	12072	12056	H
59640	29780	29860	29820	A
24248	12112	12136	12124	H
59968	29944	30024	29984	A
24376	12176	12200	12188	H
60296	30108	30188	30148	A
24512	12240	12272	12256	H
60622	30271	30351	30311	A
24640	12304	12336	12320	H
60948	30434	30514	30474	A
24776	12376	12400	12388	H
61272	30596	30676	30636	A
24904	12440	12464	12452	H
61596	30758	30838	30798	A
25040	12504	12536	12520	H
61920	30920	31000	30960	A
25158	12568	12600	12579	H
62244	31082	31162	31122	A
25296	12632	12664	12648	H
62568	31244	31324	31284	A
25432	12704	12728	12716	H
62890	31405	31485	31445	A
25560	12760	12800	12780	H
63212	31566	31646	31606	A
25688	12832	12856	12844	H
63534	31727	31807	31767	A
25816	12896	12920	12908	H
63854	31888	31966	31927	A
25950	12950	13000	12975	H
64174	32047	32127	32087	A
26080	13030	13050	13040	H
64493	32207	32286	32246	A
26210	13090	13120	13105	H
64812	32366	32446	32406	A
26340	13150	13190	13170	H
65131	32526	32605	32565	A
26460	13210	13250	13230	H
65449	32685	32764	32724	A
26590	13280	13310	13295	H
65766	32843	32923	32883	A
26720	13350	13370	13360	H
66083	33002	33081	33041	A
26850	13400	13450	13425	H
66399	33160	33239	33199	A
26980	13480	13500	13490	H
66715	33318	33397	33357	A
27100	13540	13560	13550	H
67030	33476	33554	33515	A
27230	13600	13630	13615	H
67345	33633	33712	33672	A
27360	13660	13700	13680	H
67659	33790	33869	33829	A
27480	13730	13750	13740	H
67972	33947	34025	33986	A
27610	13790	13820	13805	H
68284	34103	34181	34142	A
27740	13850	13890	13870	H
68596	34259	34337	34298	A
27860	13910	13950	13930	H
68908	34415	34493	34454	A
27990	13980	14010	13995	H
69219	34571	34648	34609	A
28110	14040	14070	14055	H
69529	34726	34803	34764	A
28240	14100	14140	14120	H
69839	34881	34958	34919	A
28360	14160	14200	14180	H
70148	35035	35103	35074	A
28490	14230	14260	14245	H
70456	35190	35266	35228	A
28610	14290	14320	14305	H
70764	35344	35420	35382	A
28740	14350	14390	14370	H
71071	35497	35574	35535	A
28860	14410	14450	14430	H
71378	35651	35727	35689	A
28990	14490	14500	14495	H
71684	35804	35880	35842	A
29110	14550	14560	14555	H
71989	35956	36033	35994	A
29230	14600	14630	14615	H
72293	36109	36184	36146	A
29360	14660	14700	14680	H
72597	36261	36336	36298	A
29480	14730	14750	14740	H
72900	36412	36488	36450	A
29600	14790	14810	14800	H
73203	36564	36639	36601	A
29720	14850	14870	14860	H
73505	36715	36790	36752	A
29840	14900	14940	14920	H
73806	36865	36941	36903	A
29970	14970	15000	14985	H
74107	37016	37091	37053	A
30090	15040	15050	15045	H
74407	37166	37241	37203	A
30210	15100	15110	15105	H
74707	37316	37391	37353	A
30330	15150	15180	15165	H
75006	37466	37540	37503	A
30450	15200	15250	15225	H
75304	37615	37689	37652	A
30570	15270	15300	15285	H
75601	37763	37838	37800	A
30690	15340	15350	15345	H
75897	37912	37985	37948	A
30810	15400	15410	15405	H
76193	38059	38134	38096	A
30930	15450	15480	15465	H
76489	38208	38281	38244	A
31050	15500	15550	15525	H
76784	38355	38429	38392	A
31170	15570	15600	15585	H
77078	38502	38576	38539	A
31290	15640	15650	15645	H
77371	38649	38722	38685	A
31400	15690	15710	15700	H
77663	38795	38868	38831	A
31520	15750	15770	15760	H
77955	38941	39014	38977	A
31640	15800	15840	15820	H
78247	39087	39160	39123	A
31760	15860	15900	15880	H
78538	39233	39305	39269	A
31870	15920	15950	15935	H
78828	39378	39450	39414	A
31990	15990	16000	15995	H
79117	39522	39595	39558	A
32110	16050	16060	16055	H
79405	39667	39738	39702	A
32220	16100	16120	16110	H
79693	39811	39882	39846	A
32340	16150	16190	16170	H
79980	39954	40026	39990	A
32460	16210	16250	16230	H
80267	40098	40169	40133	

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