

Federal Federal Assets

Federal Environmental Assessment Review Office



Report of the Environmental Assessment Panel



Eastern Arctic Offshore
Drilling — South Davis
Strait Project



PANEL REPORTS

TO THE MINISTER OF THE ENVIRONMENT

ON PANEL PROJECTS

- 1. Nuclear Power Station at Point Lepreau, New Brunswick. (May 1975)
- 2. Hydro Electric Power Project, Wreck Cove, Cape Breton Island, Nova Scotia. (August 1976)
- 3. Alaska Highway Gas Pipeline Project, Yukon Territory. (Interim report, August 1977)
- 4. Eldorado Uranium Refinery Proposal, Port Granby, Ontario, (May 1978)
- 5. Shakwak Highway Project, Yukon Territory British Columbia. (June 1978)

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November 1, 1978

The Honourable Len Marchand, P.C., M.P. Minister of Environment Ottawa, Ontario K1A OH3

Dear Minister,

In accordance with the Federal Environmental Assessment Review Process, Eastern Arctic Offshore Drilling Assessment Environmental completed a review of a proposal by a consortium of oil companies to conduct exploratory offshore drilling programs in southern Davis Strait. We are pleased to submit the Panel report for consideration.

The Panel, during its deliberations, evaluated the environmental risk associated with the proposed project and considers it to be acceptable. The Panel recommends that the project proceed as proposed under certain conditions outlined in the report.

It must be emphasized that this proposal involves exploratory drilling solely, and the environmental review of any future production system must be considered at subsequent stages in the drilling program development process.

Respectfully yours,

J.S. Klenavic

Chairman

Eastern Arctic Offshore Drilling Environmental Assessment Panel ۵۸۸ 1,1978

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EXECUTIVE SUMMARY

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In the summer of 1976, a consortium of oil companies composed of Imperial Oil Limitedl, Aquitaine Company Canada Limited, and Canada-Cities Service Limited presented a proposal to the Department of Indian and Northern Affairs (DINA) to conduct exploratory offshore drilling programs to test the sedimentary basin of southern Davis Strait for hydrocarbons. DINA stated that drilling in Davis Strait would not be permitted comprehensive environmental а assessment had been conducted and that studies associated with this assessment be developed in consultation with local communities.

The Proponent has been conducting environmental studies in southern Davis Strait area since 1976. The information collected formed basis the for Environmental Impact Statement (EIS) and supporting documentation. In late 1976, the Department of Indian and Northern initiated a new program integrated environmental studies for Eastern Arctic offshore drilling proposals into one program known as the Eastern Arctic Marine Environmental (EAMES).

The EIS and supporting documentation were prepared by the oil company consortium and progressively submitted to DINA and FEARO in the first half of 1978. DINA identified information deficiencies in the EIS and the 1978 EAMES Program was designed to accommodate these.

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The Proponent proposes to drill exploratory wells commencing in 1979, to evaluate the hydrocarbon potential of the prospective area. Drilling would take place during open water seasons in water depths ranging to 6,000 feet, utilizing dynamically-positioned drill ships or semi-submersible platforms. The exploratory drilling program, at this time, is planned to last two to three years.

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During the course of its review the Panel requested and received relevant information from a variety of sources. Public hearings were held at various communities on the southern part of Baffin Island for the purpose of familiarizing the Panel with the local biological, physical and social environments. hearings also provided an oportunity for the residents to express their views about the proposed project to the Panel. A two-day general public hearing followed in Frobisher Bay, where a more structured set of procedures was pursued to hear, written and oral briefs presented to the Panel.

Following the public hearings. Panel developed a recommendation to the Minister of Environment on the project's The Panel related the acceptability. probability associated with a major oil well blowout against the impact it might have as a measure of the environmental risk of the project.

Thus, the Panel recommends that the project be allowed to proceed as proposed, only if the following conditions meet the satisfaction of the relevant regulatory agencies.

- The Proponent's detailed oil I. spill contingency plan be developed and in place, six months prior the of commencement drilling. The effectiveness of the plan in carrying out control and clean-up response action for an oil well blowout should be demonstrated prior to the commencement of the drilling operation.
- A government contingency plan II. be developed and in place prior to would delineate that responsibilities of all government agencies when oil spills occur in the Davis Strait area.
- the Proponent is able to iii) provide same-season relief well capability.

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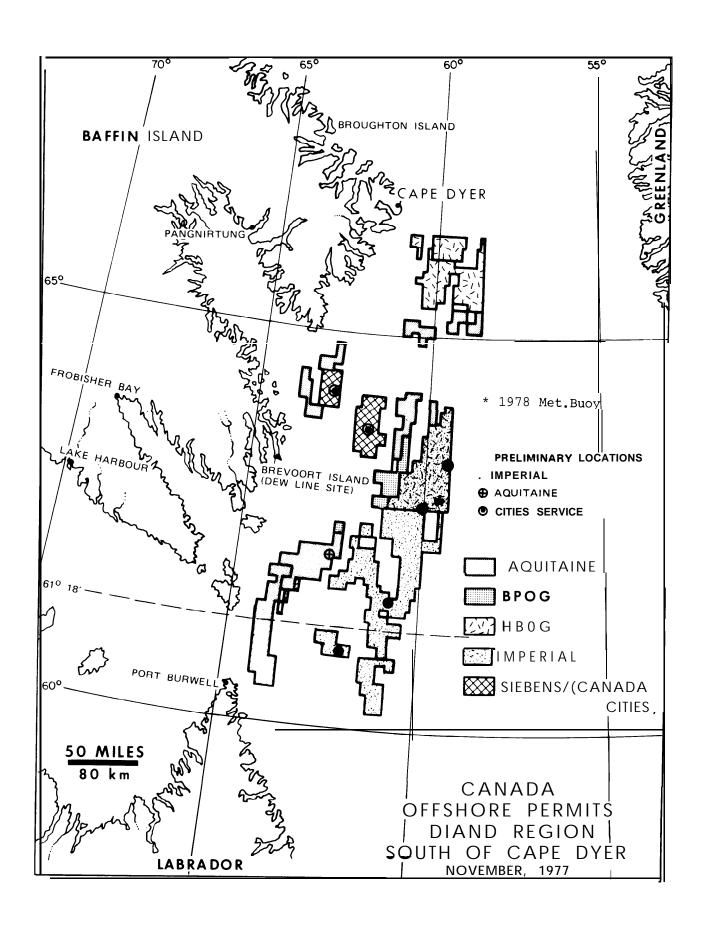
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- liability and compensation IV. provisions under existing regulations be examined by responsible regulatory authorities to ensure their adequacy under current circumstances.
- the Proponent continue to carry out adequate information programs in order to explain the progress of the drilling program to the residents of south Baffin Island.

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CHAPTER 1

SETTING AND PERSPECTIVE

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In the summer of 1976, a consortium of oil companies composed of Imperial Oil Limitedl, Aquitaine Company of Canada Limited, and Canada-Cities Service Limited submitted a proposal to the Department of Indian and Northern Affairs (DINA) to offshore exploratory programs to test the sedimentary basin of southern Davis Strait for hydrocarbons. The Department of Indian and Northern Affairs stated that drilling in Davis Strait would not be permitted until a comprehensive environmental assessment had that conducted and the associated with this assessment would be developed in consultation with communities.

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In accordance with the 1973 Cabinet directive establishing the federal Environmental Assessment and Review Process (EARP), the Department of Indian and Northern Affairs referred the proposal for exploratory drilling in southern Davis Strait to an Environmental Assessment Panel in the summer of 1977.

This Environmental Assessment Panel was established to review the potential environmental consequences of the proposed project and to provide recommendations to the Minister of the Environment on its environmental acceptability. It should be that regional approach a encompassing southern Davis Strait (generally between 610 18'N and 660 Dyer at approximately 20'N) taken to the proposed drilling program, rather than a site-specific approach.

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^{1.} Effective September 1, 1978, Imperial Oil Limited transfered its interests in this project to Essor Resources Canada Limited.

The members of this Panel were:

Mr. J.S. Klenavic Federal Environmental Assessment Review Office Panel Chairman, Ottawa

Mr. J.R. MacDonald Environmental Protection Service Fisheries and Environment Canada Halifax

Mr. M.J. Morison Northern Program Indian and Northern Affairs Yellowknife

Mr. K. Yuen Ocean and Aquatic Sciences Fisheries and Environment Canada Ottawa

Observers: Mr. A. Kooneelusie, Broughton

Island

Mr. S. Alainga, Frobisher

Bay.

Brief biographies of the Panel members may be found in Appendix 1.

Guidelines for the preparation of the Environmental Impact Statement (EIS) were given to the industry by DINA in July 1976. Upon referral of the project to the Panel in the summer of 1977, these guidelines were modified to reflect the requirements of the Panel and were then re-issued to the Proponent by the initiating department (DINA).

Proponent had been conducting studies in southern Davis environmental Strait area since 1976. The information collected formed the basis for the Environmental Impact Statement and supporting documentation. In late 1976, the Department of Indian and Northern Affairs initiated a new program that integrated environmental 'studies for Eastern Arctic offshore drilling proposals

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in one program known as the Eastern Arctic Environmental Studies (EAMES). official government EAMES, became an program in November 1977 although management of the field funding and studies is largely provided by industry. The program included an Advisory Board which consists of one representative from each of the communities in the Baffin Island area and four scientists and two representatives from industry. Two Inuit, Chairman and Vice-Chairman of the EAMES Advisory Board, were appointed as observers to the Environmental Assessment Panel.

The EIS and supporting documentation prepared by the oil consortium and progressively submitted to the Department of Indian and Northern Affairs in the first half of 1978. Indian and Northern Affairs identified information deficiencies in the EIS and the 1978 EAMES Program was designed to accommodate these. EIS for the exploratory drilling program in southern Davis Strait region was submitted to the Panel by the initiating department, DINA, on behalf of proponent companies Imperial, Aquitaine and Canada-Cities Service for assessment. Panel secretariat distributed copies of the EIS and its supporting documentation to technical agencies and the identified public interest groups for their comment.

Proponent proposes to exploratory wells commencing in 1979, to evaluate the hydrocarbon potential of the prospective area. Drilling would take place during open water seasons in water depths ranging to 6,000 feet, utilizing dynamically-positioned drill ships or semi-submersible platforms. The exploratory drilling program, at this time, is planned to last two to three years.

In the spring of 1978, the Proponent initiated a public awareness program by conducting pubic meetings in some communities on southern Baffin Island. The

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main purpose of these meetings was to acquaint the local residents, with the proposed project, delineate its potential benefits and consequences, and provide information on the completed and on-going environmental studies.

In May 1978, the Panel secretariat visited the communities of Pangnirtung, Allen Island, Lake Harbour, Cape Dorset and Frobisher Bay to explain EARP and its procedures. Also, the local residents were encouraged to express their views to the Panel at the community public hearings that would follow in September.

Environmental Impact Statement and its summary were made available at the Hamlet Office of each of the respective Copies communities. of an Inuktitut translation of the summary were also distributed to each community. Ιn copies of addition, the EIS and its summary were placed in government offices territorial, (federal, and settlement), the C.B.C. and the Nunatsiaq Frobisher Bay. Extensive local radio and announcements newspaper provided public with information on the community hearings and the formal general hearing in Frobisher Bay.

In September 1978, the Panel held community hearings in Pangnirtung (Sept. 8), Allen Island (Sept. 11), Lake Harbour (Sept.11), and Cape Dorset (Sept. 12) to hear the views of the local residents about the project. In particular, Allen Island was visited because of its proximity to the proposed exploratory area and because of the somewhat unique dependence of this outpost community on wildlife for their basic livelihood. A representative of the Proponent was present at all the community hearings to present a brief project description and to questions answer pertaining to the proposed drilling.

Commencing September 13, 1978, the Panel held a two-day public hearing in

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Frobisher Bay where a more structured set of procedures was followed. At this hearing, a number of written and oral briefs were presented to the Panel, all of which were read into the record of the hearing.

(Copies of the transcripts may be received by submitting a written request to the Federal Environmental Assessment Review Office, Ottawa, K1A OH3).

CHAPTER 2

ISSUES AND POTENTIAL IMPACTS

2.1 Introduction

The proposed project under review involves exploratory drilling only and the environmental review of any future production system must be considered at subsequent stages in the program development process.

In arriving at the measure of environmental risk presented by project, the Panel not only had to examine and determine the probability of a major oil well blowout, but also independently had to assess the nature and magnitude of potential damages that could result should a major oil well This included an blowout occur. evaluation of possible contingency plans and remedial measures that could mitigate these damages.

Throughout the community hearings and the Frobisher Bay general public hearing, many issues and potential impacts associated with the proponent's drilling proposal were presented to the Panel by various individuals and agencies (Appendix I). The Panel heard opinions within the communities that ranged from those who were against drilling to those who supported it given that adequate safeguards were followed. For the most part, the residents were not against the project proceeding but were adamant that the best technology and environmental safeguards be utilized during drilling procedures. The people expressed a desire to retain their traditional pursuits but realized that it becoming more difficult to do so. Many recognized their increasing dependence upon modern technology for fuel, food, transportation, and communications. this extent they appreciated the need for oil and oil exploration. They expressed

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James Arvaluk (President, Baffin Region Inuit Association)

It takes time for a delicate and harsh environment to be understood and it also takes time for white people to understand the Tnuit.

. ..We Inuit want all the issues to be examined carefully with our active and informed participation.

Akeeshoo (Allen Island Resident)

I feel that the people of Allen Island will help any government agency understand our way of life — today the people will never return to their traditional way with the presence of southerners and their type of food supply.

<u>Leah</u> d'Argencourt ((Inuit Tapirisat of Canada)

. ..talk to them, make them understand exactly what is going to happen, and don't leave anything out of it.

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a strong concern that their food supply could be seriously affected as a result of a major blowout or oil spill and thus requested a guarantee by the Proponent for compensation for damages if such did occur.

Others felt that only "the good side story of the the drilling" presented by the Proponent. Some opposed drilling because the oil, if discovered, would be transported to the southern part of the country and thus would not be available to the southern Baffin Island residents. Others considered submission of the Environmental Impact Statement as premature, and the hearings to be premature, and called for additional studies which would provide for a wider analysis of the environmental risks that could be associated with the proposed project. Some intervenors questioned the EAR Process itself and requested an independant inquiry directed towards all Eastern Arctic drilling proposals and the whole issue northern of energy development.

2.2 Probability of Oil Well Blowout

both main concern of intervenors and the local people was the question of a major oil well blowout. The hypothetical cases presented by the Proponent failed to destroy the image of total decimation of animal populations due to the possible widespread effects of an oil spill occurring. The Proponent mentioned the eastern Canada experience approximately 125 offshore wells drilled with no have been oil well blowouts. In addition, some icebergs have successfully been deflected from drilling platforms off Labrador by The Department of Energy, Mines towing. and Resources elaborated upon considerable geological differences between the Beaufort Sea where water blowouts have occurred as compared to Davis southern Strait. Deep drilling practices were discussed and it

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was pointed out that the technology was established. due to experience from drilling in deeper water in other parts of the world.

The Panel was presented with estimates of the probability of blowouts ranging from 3 in 10 for water blowouts in the Beaufort Sea to 1 in 3,000,000 (Proponent's estimate) for oil blowouts based upon world industry experience.

Bercha, in his report (reference -Appendix III) states that a blowout which releases a volume of oil greater than 50.000 barrels is a 1 in 1,000,000 probability.

evaluated The Proponent probability of a major oil blowout and determined it to be minimal. The Panel concluded that in view of a high degree of technology that had been developed by the oil industry and its historical performance elsewhere that probability of oil blowout is low. 2.3 Fate of Oil

describes The EIS the plume behaviour and subsequent slick path trajectory for both calm and rough sea conditions. in diffuse droplets to the surface where CLfo offension of the surface where CLfo offension of the surface where of the surface where offension of the surface where of the sur some will agglomorate into a thin slick. Lighter fractions will be vaporized and some oil will be mixed in the upper 25 feet of the water column.

In order to predict the subsequent CALa Λ condition and movement of oil Proponent employed the Sliktrak computer አተላጋርበት ያላየተርአተር ላሪያ ልነት ንብር የአንት አንበር The Proponent chose this model D/405(NPd Cd4 σ P4cD/LLC (ALAcD)F model. incorporated most factors affecting the ADaLNLCLPodDcoloD'Cda,acdiCLa movement of oil, those fractions lost to Darbockidhiland Jacabose evaporation and that portion which is c<Li\All'610. dispersed into the water column.

A total of 955 cases were simulated from six potential sites in Davis Strait 6025CDZNFDcDZLZ6-σΔ267Dσ CΔΔ5

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based on a well flow rate of 3,000 barrels per day under varying environmental conditions and duration of flow up to a maximum of 250 days. The Proponent reported that out of the 955 simulations, oil reached the shoreline in 37 cases. These originated from four of he six test source sites selected for the exercise.

The primary criticism voiced by the Department of Fisheries and Environment (DFE) regarding the model was the use of average weather data as opposed to the inclusion of weather extremes. The Panel satisfied that t.he calculations provided an adequate basis for Proponent's oil spill contingency planning.

The Panel recommends that an operational slick tracking model which incorporates real time data should be a requirement for the Proponent's oil spill contingency plan.

Some residents in Pangnirtung and Island were concerned that oil contamination could occur in their A Pangnirtung resident felt regions. that currents in Cumberland Sound should be studied since he had witnessed, in the past, pieces of trees and other objects floating in the sea that must originated elswhere. The residents of Lake Harbour and Frobisher Bay had seen similar evidence in Hudson Strait and Frobisher Bay respectively.

The Proponent noted that data on currents is presently being acquired in the nearshore areas of Cumberland Sound. However, it was noted that the exploratory wells will be drilled at a considerable distance from these identified nearshore areas and the likelihood of oil moving into these areas, especially Hudson Strait and Frobisher Bay is remote. The oil spill contingency plan must be designed accordingly.

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There is little known about the movements of ice bound oil that could occur from a blowout which continues into the winter season. The main concerns were for the time, manner and location in which the oil would be re- released and the possible resulting impacts.

is recognized that further knowledge is required to determine the fate of oil under ice. Movement and potential effects of oil or oil fouled ice moving into more southerly waters is yet poorly defined. Information obtained from such existing government programs (Offshore Labrador Biological Studies) and AMOP (Arctic Marine Oilspill useful Program) may prove in the contingency derivation of the plan. Although the Panel was not convinced that the Proponent's scenario that oil moving into southerly water was minimal, it was satisfied that resulting impacts would be low.

2.4 Marine Birds

The potential impact of a major oil spill upon birds was not raised as a concern by local residents. However, raised by this was DFE and Denmark, and the Proponent acknowledged that oil "blowout" could have a major impact on thick-billed murres, as well as moderate and minor impacts on other bird species at various times of the year.

The main concern was the potential impact upon flightless murres during their swimming migration period in late Some two to four million birds August. were estimated to be swimming, number of routes, the details of which are not known and more information is required to locate them. Data could be enhanced by reporting sitings of birds from drilling platforms, support vessels,

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Dick Brown (Canadian Wildlife Service)

. ..probably two million birds are involved in each migration route. The vulnerability hardly needs to be overemphasized. At the wrong place at the wrong time you could wipe out a whole year's class.

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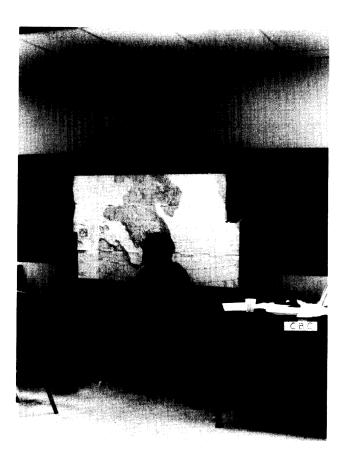
<u>Tom Beck</u> ((Aquitaine Company of Canada Limited)

If a spill occurs, the company will be responsible for damages without question.

We want residents to participate and need their inputs as well as the scientists.

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and aircraft. The contingency plans must recognize the vulnerability of this species during the migration period, and consideration must be given to the use of mitigating measures including the judicious use of dispersants.

information on migratory Further patterns to develop adequate counter essential. measures is The Panel considers this issue of major importance and thus recommends that the responsible regulatory agency ensures that the Proponent's contingency plan be designed to give these birds the best possible protection; even to the extent of suspension of drilling temporary operations during the migratory period, should this be judged appropriate.

2.5 Marine Mammals

The major issue associated with the effect of an oil spill on marine mammals the potential impact on food supply. The possible residents' loss of revenue due to a decrease in animals or damage to furs and skins was also mentioned. Αt one community a concern was directed towards possibility of contaminated mammals migrating to an area outside the spill animals or and being eaten by other residents. Also, some residents mentioned that the exploration operation activity might change the migration patterns of certain types of sea mammals.

Although no numerical estimates of sea mammals were available in the area of the proposed drilling, it was stated that the ringed seal was abundant in the Allen Island area and was the most important marine mammal for the Tnuit. The importance of the harvest of beluga whales and walrus was also stated.

The Panel noted the available information on the abundance of marine mammals in the Davis Strait region. Many

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species provide a key food source to the local Inuit and therefore it is essential to maintain these regional populations. On the basis of interventions made by Nature Canadian Federation individuals, the Panel agrees that the information in EIS is the lacking comprehensive baseline data on behaviour, migration and distributions, life stages of numerous species, e.g. belugas, and this polar bear, seals, makes it difficult to predict impacts with precision. While the EIS does include a good survey of the available scientific literature, the state of knowledge on impacts of oil upon marine mammals is limited and is concerned mostly with large doses of oil and lethal or near lethal effects. Little of the scientific literature addresses the of the effects concentrations of oil, sub lethal or long term effects.

Despite these difficulties, the Proponent did conduct an impact analysis, based upon worst case scenarios. Panel heard no serious criticisms of the method of analysis except for the problem limited data and knowledge available. The "major" impacts identified related to polar bears and hooded seals at the ice edge in late. winter and walrus near shore in late summer. The Panel also heard evidence of experimentation with sea mammals e.g. seals, when fed large doses of oil, eventually recovered. On the other hand, opinions were heard that some whale species could be more sensitive to oil than are Additionally, it was expressed that some mammals such as polar bears and seals would avoid oiled areas.

The Panel is generally satisfied that the impacts identified in the EIS represent a probable upper limit. It is also believed that significant improvements in knowledge on specific impacts are not likely to emerge in the

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short term. The Panel therefore concludes impacts to marine that the risk for mammals is acceptable because affected ADYJaSbLCa9JaSb LC Dendarysholl. populations are likely to recover.

The Panel feels some additional data gathering by the Proponent is necessary, to ensure that an adequate data base is in place for contingency response in the It is noted event a blowout occurred. that DFE and some residents felt that this work could be conducted concurrent with drilling. At the same time, the Panel accepts the Proponent's argument that not all outstanding information on marine mammals is critical to a decision on drilling, (Proponent's responsibility) but rather is a prerequisite to resource management (a Government responsibility). The Panel therefore recommends that the existing consultative mechanisms between government and industry be utilized to determine precisely the extent of further

work required for contingency planning

2.6 Fish

purposes.

With one exception, potential impacts of blowout on fish were not identified as a major concern during the hearings. A concern was voiced over scarcity of knowledge over the effects of GDPLNGSGYOUS GOOGLELIC CLa DAGS oil on under ice biota which in turn ہے مرک میں کا مدید کا میں ہے۔ وہا کا میں میں میں میں میں میں میں میں میں ا related to arctic cod populations. indicates potential impacts of EIS minor to moderate nature on five fish σσηηίνος c dσί r βοσηρησησιώνοΔ species. present day knowledge, that should expected to be limited.

2.7 Lower Part of Food Chain

Considerable discussion took place the Frobisher Bay hearing on the food chain with specific reference to the 'LCDAJJAAGB6CG<ALDGN6CDN6CDD under ice communities. In general, the off ACOTD ALOGO consensus was that a spill would have a Problem accordered, CLPNOBSTA

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to determine the extent of the impact.

The EIS has predicted that in the event of a serious blowout the lower levels of biota could be affected but not in a major way. The EIS further suggests that effects would most likely be greater in selected areas such as the near-ice The edge or at the nearshore area. inference is drawn that recovery to pre-spill levels would be expected to occur over a relatively short period of The criticisms voiced over the time. information adequacy of the is understandable given the magnitude of the task of studying the lower level biota and their contributions to the food chain. Such criticisms are not restricted to arctic environment studies are rather universal. The low probability of a single spill which could affect the lower trophic levels as described is believed to be an acceptable risk but the chances for additional oil particularly should spills, production become feasible, will dictate the need and allows time for future work in this field.

2.8 Operational Practices and Waste Management

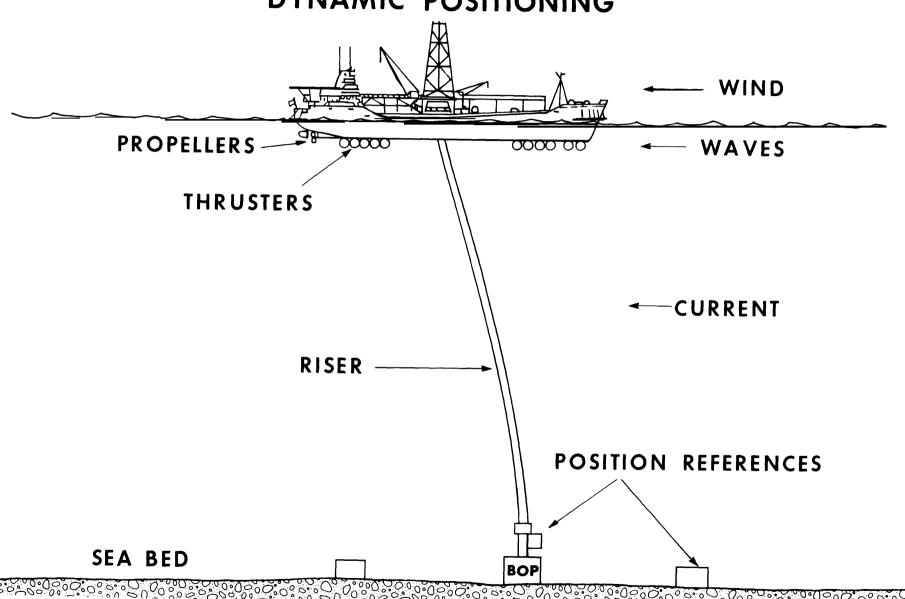
The Panel felt that adequate mechanisms currently in regulatory are that safe effect to ensure and environmentally sound operating procedures will be followed throughout the drilling program. The Panel noted with concern the additional complexity of drilling from a moveable platform in the deepest arctic waters that the industry has encountered to date. Ιt was recognized that the industry had previously drilled from moveable (dynamically positioned) platforms, had also drilled in deeper waters as well having faced the iceberg but not in the same combination before; of hazards that the southern Davis Strait presented.

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DYNAMIC POSITIONING



Compensatory factors to the above noted hazards were the improved drilling technology available, the Proponent's use of improved geophysical (seismic) data to design their drilling program, and the comprehensive environmental data that can serve as an operational planning tool as well as a protective baseline measure.

Finally, it was noted that seemingly complex technical problems are the precipitated by more mundane questions of comunications between crews and general housekeeping procedures, such that some two thirds of all blowouts have been attributed to human error. Panel recommends that well-trained crews, communicating in a common language should minimize this occurrence and that chain of command as well as the respective authorities must be delineated both routine and emergency procedures.

The Proponent's waste management programs which encompass both domestic and industrial effluents as well as the disposal of solid wastes, were viewed by the Panel as adequately covered by government regulations and codes of good practice.

The ice which alert system, was described in the proponent's supplementary submission of September 22, 1978 details the actions to be taken for each of three levels of alarm proximity of approaching icebergs). Panel recommended that this procedure be reassessed as both the iceberg tracking techniques and offshore drilling programs are modified to reflect the experiences of actual Eastern Arctic offshore drill sites as well as those of the Beaufort Sea and offshore Labrador locations.

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2.9 Monitoring & Prediction - Physical Environment

a) Weather

The need for sound weather prediction systems was recognized by both the Proponent and the technical agencies day to day management of for the that operations. It noted the was Proponent has already installed automatic Brevoort stations at Resolution Island and that a meteorological/oceanographic discus buoy will be The Proponent has deployed this year. indicated that work is underway to develop weather prediction system for the operating region.

Data derived from the Proponent's stations will be fed into the Weather Model. Consultations Prediction underway between the Proponent and the Atmospheric Environment Service on the design of the system including the appropriate regional establishment of standards. AES agreed that a system could technically be put into place in advance of the 1979 drilling season.

b) Waves

The Proponent has acknowledged that sea state is a necessary parameter in selecting safe drilling conditions. Therefore, the Panel recommends that sea systems including real-time state monitoring accompany drilling operations. stated that more The Proponent measurements will in fact be incorporated into the discus buoy program. These measurements should permit the Proponent more develop a accurate forecasting system in conjunction with weather predictions.

c) Currents

Since both winds and currents will affect iceberg movement and in view of

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the variability of currents, the Panel recommends that the monitoring of surface and subsurface currents in the vicinity of the drill ships should also be undertaken on a real-time basis. Both wind-wave, and current data will also be needed for operational prediction of slick movements in the event of a blowout and to improve predictive capabilities for ice movement.

d) Icebergs

studies of The statistical occurrence, general tracks, Local size, and type, were described. residents had difficulty believing that icebergs could be towed. Nevertheless, upon towing experience, Proponent was confident that 50% of all icebergs in the Davis Strait could be towed or deflected away from a drill site. As a result the average frequency with which iceberg incursion is likely to delay drilling is one incident in 40 days in The inshore Davis Strait. frequency would be less for sites further offshore.

that the The Panel recommends give consideration to an Proponent iceberg prediction system in Davis Strait will provide more reliable information on iceberg movement utilizing local real-time wind, current and state data.

e) Iceberg Scour

The Proponent indicated that the probability of iceberg scour is in the order of a scour within 200 feet of any given point every 30 years. The well head, including the BOP Stack, rises above the sea floor about 40 feet while drilling is under way, but after the well has been abandoned and the BOP stack removed the remaining stucture would be just under the sea floor. Studies to

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date have indicated that sea floor scours have been found in water depths ranging to 1200 feet. With the majority of proposed well locations in deep water, the Proponent does not propose to take any steps to place the cap deeper beneath the sea floor. Abandonment of drilling operation will be conducted in accordance with the oil and gas regulations.

The Panel agrees that the probability of damage by ice is remote and therefore agrees that steps to lower the well head below the sea floor are This matter presently not required. should be left to the judgement of the regulatory agencies involved. However, should be recognized that the probability of ice scour will increase in shallower waters and that each drilling site will require an evaluation based upon thorough knowledge of the historical ice scour in the area to determine what protective action need be taken.

f) Ice Prediction Systems

The Panel endorses the Proponent's intentions to introduce pack-ice prediction system to ensure same season relief capability.

g) <u>Earthquakes</u> and <u>Sediment s</u> Slumping

The seismic loading (earthquake potential) in the proposed area has been estimated to be 3 to 4 percent of gravity. The Proponent stated that the well head equipment is designed to withstand forces in excess of figure. It was indicated by Energy Mines and Resources that sedimentation rates in Strait region are low and Davis therefore there is little potential for slumping (sea-bed mud slides). Nevertheless, the Proponent noted site-specific sea bed studies are conducted to ensure that the well head is location placed in a having a

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potential for slumping.

2.10 Contingency Plan

considering containment and physical recovery of oil with existing equipment, the Proponent stated four foot significant wave heights represented the present limit for effective dav with no break through in operations With present day technology envisaged. equipment it was indicated that up to 20% of any spilled oil might be recovered from calm waters, with a further 50% dissipated by evaporation. In rougher water conditions mechanical containment and recovery could be impossible but the increased wave energy would cause the slick to break up and disperse into the water column. To supplement the capacity and availability of equipment, the need inter-industry mutual aid programs was noted.

The Proponent has indicated that the contingency plan will be in place by the end of 1978 or six months prior to the commencement of drilling in accordance with the drilling program approval requirements. This plan will have the benefit of the results of the additional 1978 studies and must meet the standards of the responsible regulatory agency.

Clearly identified at the Frobisher Bay hearing was the need for a Government Contingency Plan similar in nature to the Beaufort Sea Government Contingency Plan which would delineate the response of all government agencies when oil spills occur In the Davis in the Davis Strait area. Strait Government Contingency Plan there is a need to clarify authorities on such use approval for of matters as dispersants, authorities south of for 600. and authorities necessary into Greenland waters. entrance Government Plan must be completed before the drilling program commences and should co-ordinated the Proponent's with

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contingency plan.

Recognizing that the Davis Strait region is ice covered for a large part of the year, the Panel stresses the need for season relief well capability. same Dynamically positioned vessels have the capability to move off site in the event of a blowout and can return to drill the relief well. The Proponent therefore stated that a standby drilling vessel was The Proponent indicated not required. some questions require resolution with respect to location of a substitute marine riser and a blowout preventer (BOP) to allow for relief well drilling. The Panel recommends that identification of a back up drilling vesel and the ready availability of substitute relief well should be included in equipment Proponent's contingency plans. Further information required for biological is contingency planning purposes addressed in other sections of the report.

2.11 Compensation & Liability

Concern for the loss of food and livelihood as a result of an oil spill was expressed in every community in which the Panel held hearings. The Proponent assured the residents that they would be compensated in full should they incur losses. The Arctic Water Pollution provides Prevention Act liability for damages and clean-up costs (in order) in an amount up to \$10 million per well. This liability becomes effective at the time the authorities are issued.

The Panel in recognition of the requests of the residents asks that the responsible regulatory agency specifically ensure that the matter of liability is properly addressed with the Proponent at the time of acceptance of the drilling program. Consideration should also be given to increasing the amount of liability, if upon examination,

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the present regulatory level for compensation is not commensurate with the present day values of potential losses. In addition the Panel recommends that a mechanism is required to compensate affected people south of 60° as well as residents of Greenland.

2.12 Energy Policy, Tax Incentives, and Exnloration Permits

The Panel has noted the national energy policy, respecting "need to know" of Canada's frontier energy resources. The Panel has also noted the special investment tax credit incentives under the Canada Income Tax Act which apply up The proposed drilling to July, 1980. program is in direct response to these Furthermore, government policies. exploration permit arrangements for the question (secured acreage in by performance deposit) are due to expire variously in the period 1981-1983. As a result, the Proponent is pursuing the aquisition of environmental approvals with considerable urgency.

Taxation incentives in particular have encouraged the Proponent to perform within a time frame that is inconsistent comprehensive with the environmental studies and impact analysis being done. As a result, information deficiencies have had to be rectified subsequent to the preparation of the EIS in order to obtain a timely environmental clearance. case the new information has not altered the Proponent's assessment but it does place the public, the intervener, and the Panel in the disadvantageous position of not having the completed report for review.

2.13 Employment

The Proponent mentioned that of the 150 jobs necessary to operate a drilling platform, 20 to 40 would be available to the local residents. As personnel acquire additional skills through

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on-the-job training, more jobs would become available. Employment of local residents had been done in the past to assist the proponents with their environmental studies.

community hearings, the the residents expressed a desire for meaningful, long-term positions with on-the-job training. Some also expressed concern over language needs as many of the jobs demanded a good working ability in a common language. As indicated earlier by the Proponent, such needs would be based on factors such as ship and crew safety. The Proponent also pointed out that failure on their part to discover oil or qas would lead to curtailment of the drilling program in as little as two years. This would of course affect the viability of any long term or permanent employment for local residents.

2.14 Public Information by Proponents

Although most of the residents in the communities were happy with the Proponent's visits to the settlements in order to explain the proposed project, many felt that a continued public information should be pursued.

The Proponent indicated that this would be done and mentioned that some workers employed for the drilling would be operation hired from the communities. These workers could keep communities informed of drilling operations.

The Panel appreciated the concern expressed by the communities for more in-depth project information and public participation by the Proponent and thus encourages the Proponent to continue its communication with the related communities. Special attention should be given to advising the communities of oil spill contingency plans in an effort to

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2.15 Land Claims

This issue was not directly raised at the community hearings but was addressed specifically at Frobisher Bay by representatives from the Baffin Region Inuit Association and the Eastern Arctic Bar. Their interventions included a call for a moratorium on any type of drilling operation in the Eastern Arctic until the broader issue of land claims was settled.

Matters related to land claims were mentioned at the community hearings. One of the community residents felt that the southerners had once contributed to the demise of the whales in the immediate area and now a similar situation could develop with possible oil reserves. Another resident asked whether Eastern Arctic would be guaranteed an adequate future oil supply if large quantities were taken to southern Canada.

The Panel considers comments pertaining to the issue of Land Claims are not part of its mandate.

2.16 Environmental Assessment and Review Process (EARP)

Other than a few requests for the the Panel to return. Environmental Assessment and Review Process was not questioned at the community hearings. At Frobisher Bay various groups addressed the fundamentals of the process. Lack of public funding for intervenors was an issue in addition to the EARP's narrow terms of reference. Consultation methods, timing, and procedures were also expressed as being "not enough". expressed for independent an (Government free) mechanism to examine he whole question of drilling in the Prdo d A466cσ <ΔΩαγαραςνσήσAb Ab Ab Ac <

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At the Frobisher Bay hearings, some intervenors stated that insufficient time was allowed for the Inuit in the communities to adequately prepare for the hearings as many of them had just returned from a summer of living off the land. The Panel recognized the problems associated with little time being made available for persons to review the Environmental Impact Statement and to prepare comments for presentation at the hearings.

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CHAPTER 3

CONCLUSIONS AND RECOMMENDATIONS

Probability of Major Oil Well Blowout

The Panel concluded that potential impact of an oil well blowout was the most important factor to consider evaluating the environmental acceptability of the proposed project.

The Panel further concluded however that the probability of a major oil well blowout is low.

Fate of Oil in the Event of Major 2. %ふ△cしって ひづくっ もつも b co-< くいくし Oil Well Blowout

The Panel concluded that calculations presented by the Proponent provided a reasonable basis for impact analysis.

The Panel further concluded that oil from a major well blowout will generally move in a southerly direction. Under adverse winds oil could impact shorelines or ice edges but likely in low concentrations. Should a blowout continue over the winter, oil could be entrained under ice.

Effects of Oil in the Event of a 3. %ocl さゅつしょっぱ ひとくっ (L)L Major Oil Well Blowout

The Panel concluded that the most serious impact could be on swimming birds.

The Panel concluded that there could be an impact on sea mammals and polar Such impact could adversely affect the food source and livelihood of some residents of southern Baffin Island. The Panel concluded that, based upon the limited scientific evidence, populations would recover from adverse effects within

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a relatively short period of time.

The Panel concluded that the effects upon the lower part of the food chain from a single oil spill would not be major and would likely be localized near the ice edge and in near shore areas. The use of oil dispersing chemicals may increase this impact to some extent although dispersants may provide a degree of protection to birds.

4. <u>Operational Practices and Waste</u> Management

The Panel concluded that existing regulatory mechanisms and codes of good practices are adequate to ensure safe and environmentally sound operating procedures including waste management, at both sea-borne and land-based facilities.

5. Iceberg Scour

The Panel concluded that the probability of a blowout caused by iceberg scour is remote. The Panel noted that additional data on scouring may be necessary prior to approvals to drill in shallower waters in the region (nearer to shore).

6. Land Claims

The Panel concluded that comments pertaining to land claims by the Inuit were not related to the Panel's mandate to advise the Minister of the Environment on the environmental acceptability of the proposed project.

7. Maior Conclusion

THE PANEL CONCLUDED THAT THE ENVIRONMENTAL RISK OF THE PROJECT IS ACCEPTABLE PROVIDED THE CONDITIONS OUTLINED BELOW ARE FOLLOWED.

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$8 \, \bullet \,$ Conditions for acceptability of the project

a. <u>Monitoring</u> and <u>Prediction</u> - Physical Environment

There is an identified need for real-time monitoring and prediction systems for safe operations under normal procedures and to provide essential information for countermeasure activity in the event of a blowout. This system must include information on weather, seastate and currents.

b. Industry Contingency Plans

A detailed industry contingency plan must be submitted to the responsible regulatory agency six months prior to drilling and approved before drilling. There is a need to demonstrate the effectiveness of the plan (i.e. "dry run") to the satisfaction of the responsible regulatory agency.

The industry plan must give highest priority to the protection of flightless birds.

The results of information acquired fromt he 1978 environmental studies must be incorporated into the contingency plan. (e.g. strategies for protection of exposed sea mammals).

The contingency plan must clearly indicate the methods to be used to ensure same-season relief well capability.

The contingency plan should also include the use of an operational slick tracking model for real time prediction of slick movement.

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$c_{\:\raisebox{1pt}{\text{\circle*{1.5}}}}$ Government Contingency Plan

A government contingency plan must be in effect prior to drilling. This plan must delineate the response of government agencies when oil spills occur in the southern Davis Strait region. This plan must include, among other matters, the necessary authority for the use οf dispersants, the responsibility and authority for government oil spill response south of 600 Latitude, and the authority and procedures for response activities that may be necessary in Greenland waters.

d. Compensation and Liability

The responsible regulatory agency must give consideration to increasing the limits of liability of a proponent for damages and cleanup costs, where existing levels for compensation may not be commensurate with present day values.

9. OTHER RECOMMENDATIONS

a. Continuing: Environmental Studies

recommends The Panel that existing consultative mechanisms between government agencies and the Proponent be utilized to determine the extent of further environmental studies. Some possible study areas are identified in Chapter II. As a matter of principle, the Panel recommends that industry accept as responsibility those necessary to improve and enhance contingency plans, while government agencies accept as responsibility those studies related to resource management.

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b. Compensation and Liability

The Panel recommends that the responsible regulatory agency develop a mechanism to ensure that compensation for damages and cleanup costs is available for potentially affected people south of 60° as well as for residents of Greenland.

c. Iceberg Prediction System

The Panel recommends that the Proponent give consideration to the development of an operational prediction system for iceberg movement in the vicinity of the drillship.

d. Energy Policy Tax Incentives and Exploratory permits.

The Panel recommends that future national energy policies and tax regulations take into account the time requirements for adequate environmental studies and assessment.

e. Employment

The Panel recommends that the Proponent employ as many of the southern Baffin Island residents as is feasible for positions associated with the drilling program.

f. Public Information by Proponent

The Panel recommends that the Proponent continue its communications program with the southern Baffin Island residents. Special attention should be given to explaining the contingency plans that would come into effect in the event of a major oil well blowout.

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10. SUPPLEMENTARY CONCLUSIONS AND RECOMMENDATIONS

- The Federal Environmental Review Office Assessment should institute a follow-up mechanism to evaluate and report on the degree to which the Panel's conclusions and recommendations have been accepted and acted upon.
- b. The Panel endorses the Proponent's efforts to inform the residents of southern Baffin Island about the proposed project. The Panel concludes that such initiatives by a proponent are fully compatible with the EAR Process.
- c. The Panel recommends that the
 Federal Environmental Assessment
 Review Office actively pursue the
 use of federal funding and other
 assistance for the public
 participation as intervenors in
 future Panel projects.
- The Panel recognizes the difficulties in carrying out communications meaningful with groups whose mother tongue is not an official language of Canada. The Panel recommends that proponents, initiators, and future Panels recognize the need for additional (for such matters translation of documents) and make efforts to special ensure timely information is available in the language of the people who may be affected by project. а

10. ΔεΓΗΡΘΟΓΚΟΡ ΔΗΔΩ ΛάΗΡΟ-ΓΩ ΔΗΓΓΗΡΟ-ΓΩΩ

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 ENVIRONMENTAL ASSESSMENT PANEL

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APPENDIX I

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PRESENTATION TO THE PANEL

ABELSON, Emil Greenland

ALAINGA, Simonie
Vice-Chairman, EAMES Advisory Board

ARVALUK, J.

President, Baffin Regional Inuit Association

BALDWIN, D.D.

Imperial 011 Limited

BARRET, Jim

Department of Indian and Northern Affairs

BECK, T.

Aquitaine Company of Canada Limited

BERRY, M.

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Fisheries and Environment Canada

BIRCHARD, E.C.
Imperial Oil Limited

BRINKER, Jim

Aquitaine Company of Canada Limited

BROWN, R.G.

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Fisheries and Environment Canada

BURCH, J.

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STIRLING, $I_{\:\raisebox{1pt}{\text{\circle*{1.5}}}}$ Canadian Wildlife Service, Edmonton

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Imperial Oil Limited

TOD, J.

Imperial Oil Limited

UNDERHILL, J.C.
Imperial Oil Limited

WALLACE, Ron Ecologist

WATMORE, T.

Imperial Oil Limited

APPENDIX II

PANEL MEMBERS

CHAIRMAN

JOHN KLENAVIC, (Federal Environmental Assessment Review Office, Department of Fisheries and the Environment).

Mr. Klenavic was born in St. Catharines, Ontario and attended schools in Ontario, British Columbia and Manitoba. He graduated from the Royal Military College, Kingston, and Queen's University with a degree in Chemical Engineering (B.Sc.).

He served in the Canadian and British Armies from 1960 to 1968 and subsequently worked as an industrial engineer and quality control chemist in the food processing industry in Toronto. In 1973 he was appointed Acting Director of the Environmental Emergency Branch, Environmental Protection Service of the Federal Department of the Environment. This Branch is concerned with the prevention of, and response to, spills of pollutants into the environment.

Mr. Klenavic was appointed to his present position of Director, Operations, Federal Environmental Assessment Review Office in mid-1977 and is currently chairman of fifteen Environmental Assessment panels.

 $\mbox{Mr.}\xspace$ Klenavic is a member of the Association of Professional Engineers of Ontario.

MEMBERS

J.R. MacDONALD, Department of Fisheries and the Environment.

Born in Baddeck, Nova Scotia, Mr. MacDonald received his early education there and in Ottawa. He received his B.Sc. (Biology) from St. Francis Xavier University in Antigonish, Nova Scotia. Mr. MacDonald joined the Department of Fisheries in 1960 and after the formation of the Department of Fisheries and the Environment, joined the Environmental Protection Service in 1972. Mr. MacDonald is currently Acting Director of the Environmental Services Branch, Atlantic Region.

M.J. MORISON, Department of Indian and Northern Affairs

Mr. Morison was born in Fredericton, New Brunswick. He graduated from the University of Toronto with a degree in Forestry in 1959. Upon graduation he was employed with the Ontario Department of Lands and Forestry where he held various positions related to land use and resource management in Northern Ontario.

He joined the Department of Indian and Northern Affairs in 1973 being positioned in both Fort Smith and Yellowknife. In these capacities he was attached to the Land Use Committee, North West Territories Water Board and Arctic Water Advisory Committee. As part of his duties in the Department of Fisheries and Environment in Vancouver in 1975-77 he was responsible for coordinating the studies and presentation to be made by the Department in preparation of the Panel hearings related to the Alaska Highway Gas Pipeline proposal. In 1977 he returned to Yellowknife to assume the position of Assistant Director, Non-Renewable Resources where he is responsible for the N.W.T. mines, mineral and oil and gas interests of DINA.

KENNETH B. YUEN, Department of Fisheries and Environment.

Mr. Yuen was born in Victoria and received is education at the University of British Columbia and at Waterloo University. Currently, Mr. Yuen is Chief, Ocean Science Affairs Division, Fisheries and Environment Canada. In 1970, he was assistant to the Scientific Coordinator for "Operation Oil" — the government response to the Arrow oil spill. Subsequently he was appointed Secretary of the Departmental Coordinating Committee of the development of deep water oil ports study and has served as Assistant to the Chairman, NATO Colloquium on Oil Spills. He worked with Transport Canada in developing the Termpol Code for the prevention of pollution at Marine Terminals. Mr. Yuen has had substantial involvement on a number of working groups involving the Maritime Code and Anti-Pollution Sections of the Canada Shipping Act within the 200 mile limit.

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APPENDIX IV

ACKNOWLEDGMENTS

The Panel wishes to express its sincere thanks to all those community residents who attended and contributed to the community and public hearings at Pangnirtung, Allen Island, Lake Harbour, and Cape Dorset and the general public hearing at Frobisher Bay. In addition, a note of thanks is extended to the secretary managers and field service officers at each community who made each community hearing the success that it was. An expression of thanks is also extended to representatives of the N.W.T. Territorial Governmenmt, the Village Council of Frobisher Bay, and the DINA District Ofice for their excellent support and assistance throughtout the Frobisher Bay hearing.

Special mention is made to our three members of the EAMES Advisory Board, Allen Kooneelusie, Simonie Alainga, and Abe Ookpik for their valuable contributions and of course, to our three interpreters, Maudie Qitsualik, Simona Arnatiaq, and Iniak Korjak without whom the proceedings could not have taken place.

The Panel members would also like to thank the Panel Secretaries and the administrative and secretarial support staff for assisting them to be able to complete the Panel report.

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