

**CUMULATIVE ENVIRONMENTAL EFFECTS AND
SCREENING UNDER THE CANADIAN
ENVIRONMENTAL ASSESSMENT ACT**

**WORKSHOP PROCEEDINGS
DEPARTMENT OF ENERGY, MINES AND RESOURCES**

February 4-5, 1993

Ottawa, Ontario

Prepared For:

**The Federal Environmental Assessment Review Office and
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1. INTRODUCTION

The *Canadian Environmental Assessment Act* (CEAA) received Royal Assent on June 23, 1992, and will be proclaimed in 1993. Amongst other things, the Act requires that:

"Every screening or comprehensive study of a project and every mediation or assessment by a review panel shall include a consideration of the following factors:

*(a) the **environmental** effects of the **project...and** any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;*

*(b) the **significance** of the effects **referred** to in **paragraph (a)**;"*

(section 16(1)).

The Federal Environmental Assessment Review Office (FEARO) is currently preparing a 'Guide to the Canadian Environmental Assessment Act' which provides guidance on how to conduct environmental assessments under the Act, including the assessment of cumulative environmental effects. As well, a more detailed Reference Guide on addressing cumulative environmental effects has been drafted as a supporting document to the Guide to the CEAA. However, FEARO recognises that approaches and methods for assessing cumulative environmental effects are evolving rapidly and that any guidance offered should reflect best current practice. The Guide to the CEAA and the Reference Guide will be updated as new information becomes available.

To complement its work to date and to provide the best practical advice possible, FEARO in cooperation with other federal departments and agencies is examining how cumulative environmental effects can be considered in screenings of projects during federal environmental assessments. The departments and agencies that are participating in this initiative are:

- Environment Canada;
- Transport Canada;
- The National Capital Commission (NCC);
- The Canadian International Development Agency (CIDA);
- The Department of Indian Affairs and Northern Development;
- The Department of Fisheries and Oceans; and
- The Department of Energy, Mines and Resources.

The workshops focused on the assessment of cumulative environmental effects at the screening level of the environmental assessment process. Screening is the most common of the four tracks of the environmental assessment process (the others are comprehensive study, mediation and panel review) and is used for most smaller projects or projects that are thought to be less likely to cause any significant adverse environmental effects. Class screening, in which the environmental effects of a class of projects is assessed, is part of the screening track. The vast majority of federal environmental assessments (more than 95%) are conducted at the screening level. Also, smaller projects that are subject to screening can be important contributors to cumulative environmental effects, when reviewed collectively. In addition, there are special issues associated with addressing the cumulative environmental effects of small projects as opposed to larger ones.

Each participating department or agency was asked to select several case studies of projects that have been subjected to screening under the Environmental Assessment and Review (EARP) Guidelines Order (1984). For each case study, brief written background materials were prepared (see Chapter 2 and Appendix C). The case studies were then presented at a series of 1-2 day workshops with staff from the department or agency involved. The case studies were used as a basis for discussing how the cumulative environmental effects of projects could be addressed in screening.

At least one workshop was held by each participating department or agency. The Department of Energy, Mines and Resources (EMR) was the seventh department to hold a workshop. Two departments (i.e., Environment Canada and the Department of Fisheries and Oceans) are holding several workshops in different regions of the country. The Schedule of Workshops is shown in Appendix A.

This report summarises the results of the EMR workshop, held in Ottawa on February 4-5, 1993. It is intended to summarise the discussions, rather than to provide detailed minutes. The agenda and list of participants for the EMR workshop are shown in Appendix B. As well as this report, a set of 'consolidated proceedings' will be prepared.

The final 'consolidated proceedings' will be distributed to all participants from all workshops in March **1993**. As well, a final interdepartmental workshop will be organised to discuss common themes in assessing cumulative environmental effects in screenings, as well as inter-departmental collaboration and co-operation on this subject. This will probably be in May 1993. Subsequently, **FEARO's** Guide to the CEAA and Reference Guide will be revised to take account of the outcome of this initiative.

2. CASE STUDIES

Each department or agency participating in this initiative was asked to select several recent examples of projects subjected to screening **under** the EARP Guidelines Order (1984). In most cases, these case studies represented the range of different types of projects screened by the department or agency, as well as different-sized projects and projects in different types of ecosystems and with different types of cumulative environmental effects.

For each case study, brief written background materials were prepared summarising:

- The project;
- The project's environmental effects;

- The screening decision reached; and
- How, and to what extent could any cumulative environmental effects be addressed.

To assist in the preparation of the background materials and to familiarise the workshop participants with the subject of assessing cumulative environmental effects in environmental assessments, copies of a background paper and the draft Reference Guide on cumulative environmental effects prepared by FEAR0 were distributed to all workshop participants in advance.

The following case studies were presented at the EMR workshop:

- Entrance Road Modification - Bell's Comers Complex;
- Energy from Waste Plant, Victoria Hospital;
- Lac **Doré** Mining Project;
- Ocean Drilling Program Leg 146, Cascadia Margin; and
- Mackenzie Delta Permafrost/Geology Study.

The background materials prepared by EMR are shown in Appendix C. Some of the main issues discussed for each case study are outlined below.

Entrance Road Modification - Bell's Comers Complex

This project consisted of widening an entrance road, creating seven new parking spaces and installing a pre-fabricated guard hut at the Bell's Comers Complex. The site located adjacent to a **woodlot**. A few trees would have to be removed to accommodate the modification to the entrance road, but they would be replaced by new ones, located at a site approved by the National Capital Commission (NCC). It is unlikely that this project will lead to or encourage further development in the area.

Following the presentation of this case study the discussion focused on how to establish geographic boundaries for the assessment to take account of cumulative environmental effects and the use of relevant plans in the screening. There was general agreement that to consider the cumulative environmental effects of this project, it would be necessary to consider the effects on the entire **woodlot** and the proportion of the **woodlot** that would potentially be affected by the project, rather than just the number of trees. The **woodlot** extends beyond the property line to the north. If this is done, the effects on the total **woodlot** can be seen to be very small. The workshop participants also agreed that to consider the cumulative environmental effects of this project in combination with other future projects and activities it would be necessary to review relevant land use planning documents including the NCC's Master Plan for the Greenbelt.

Energy from Waste Plant, Victoria Hospital

It is proposed to build an energy from waste plant to replace and upgrade the existing heating unit at the Victoria Hospital in London, Ontario. Studies have indicated that municipal waste and dried sewage sludge could provide a lower cost alternative to the oil and natural gas currently being used as an energy source for the heating plant. The cost of the project is \$8 million, of which EMR would contribute 50%.

Environmental concerns that were identified in the screening related to:

- . Air quality;
- . Noise;
- . Public interest;
- . Health and safety;
- . Municipal services;
- . Economics; and
- . General biophysical environment.

As well as a federal screening, this project was subjected to a provincial environmental assessment.

The discussion following the presentation of this case study also focused on setting boundaries. How should the geographic boundaries of the project's environmental effects be established? Should the plant's carbon dioxide emissions and their contribution to global warming be addressed in the environmental assessment? The workshop participants were of the opinion that this was not appropriate, but nevertheless the question highlights the need to identify the environmental effects to be assessed and to set the boundaries for the assessment concurrently. It was agreed that there should always be a rationale for the environmental effects, their significance and the boundaries selected, and that there should be consistency about how this is done for similar types of projects.

A second issue discussed following the presentation of this case study was the use of ambient standards or guidelines to regulate point source emissions. In this case, the Ontario Ministry of the Environment's ambient air quality standards (Regulation 308) at the 'point of impingement' are relevant. Air quality must meet the standards at the 'point of impingement'. Thus, emissions from the plant must be managed in terms of their contribution to ambient air quality, given the existence of other point sources of atmospheric emissions in the area. Frequently, this requires modelling air quality. 'This approach of managing point source emissions so that they comply with an agreed on ambient standard can be seen as one way of managing the cumulative environmental effects of multiple developments in the same area. Workshop participants also discussed the possibility that this approach could give rise to tradeable emissions permits, where different point sources are permitted to discharge a certain amount or concentrations of emissions and that such permits are tradeable.

Lac Doré Mining: Project

This mining project consists of excavating an inclined tunnel from the surface down to the 150 foot level to permit access to a copper-gold deposit. Tunnels (cross cuts and drifts) will

be excavated at the 150 foot level to cross and explore the deposit. This deposit is adjacent to one of the company's operating mines (approximately 1.5 miles south of the Copper Rand mine). Other activities related to this project include widening the containment dyke for the tailings pond and construction of a settling pond within the existing tailings pond. The EMR assistance to the project will be \$800,000, if the company spends \$7.5 million on the project and \$7.5 million in regional exploration.

The discussion following this case study raised several issues including:

- This project is located in an area where there have been mining activities for many years. There are seven mining sites and two tailings areas bordering Lac aux **Dorés**. These activities have caused cumulative environmental effects. However, the incremental environmental effects of this project should be minor. This project should not be prevented from proceeding because of the effects of other projects; and
- The federal funding for this project is for exploration only, and the screening only dealt with the environmental effects of the exploration activities. However, exploration is likely to lead to the construction and operation of a new mine. Thus, the exploration activities are likely to be 'growth inducing'. To what extent can the 'growth inducing potential' of a project be examined as part of an assessment of cumulative environmental effects under the Act?

Ocean Drilling Program **Leg 146. Cascadia Margin**

This project consisted of drilling a series of shallow holes at four sites on the continental shelf of Vancouver Island, using the **Joides Resolution**, **Sedco/BP 471** research vessel/drill ship, under long-term charter to the international Ocean Drilling Program. The drilling will result in the collection of information on the geological processes occurring in the sediments of the sea-floor, particularly as they relate to the potential for earthquakes in the region and the generation of methane hydrate in marine sediments.

Although cumulative environmental effects were not explicitly considered in the screening, the following effects with a 'cumulative dimension' were addressed:

- The effect of seismic activity on fish populations;
- The effect of ship presence on commercial fishing;
- The effect of waste discharges from the ship on water quality;
- The effect of drilling operations on the seafloor; and
- The effect of drilling operations on sea mammals.

The workshop participants discussed two matters in relation to this case study.

First, there was discussion about the cumulative environmental effects of all of the boating and shipping activities in the area combined. Would it be possible to establish a threshold level for boating and shipping activities in the area, based on their cumulative environmental effects? The workshop participants were of the opinion that the level of such a threshold would depend on the identified cumulative environmental effects. Also, no one government agency or department has the mandate to set such a threshold level.

Second, there was discussion about the role of expert departments, in terms of providing advice on cumulative environmental effects. Expert departments are required to give advice on matters related to their area of expertise only. But cumulative environmental effects often transcend the area of expertise of a single department or agency. Thus, the responsible authority should synthesise the advice received to arrive at an adequate assessment of the cumulative environmental effects. It was also noted that when expert advice is requested from other departments or agencies, advice on cumulative environmental effects should be explicitly requested.

Mackenzie Delta **Permafrost/Geology** Study

This project consisted of geotechnical drilling and a surface geophysics study of permafrost and geological conditions in the vicinity of proposed hydrocarbon development areas of the Mackenzie Delta. The main program consisted of a 600m deep **borehole** at the Taglu field, a 300m **borehole** at the Kumak field and an 100m deep **borehole** at the Unipkat field, as well

as construction and maintenance of short ice roads between ice channels. The only environmental concern raised was the trampling of vegetation, and this effect was expected to be local and minimal.

This case study raised several interesting issues including:

- Four different permits **and/or** licenses with their associated screenings, were required for this project. These included:
 - A land use permit from the Department of Indian Affairs and Northern Development;
 - A National Energy Board license;
 - A federal environmental assessment; and
 - Inuvialuit approvals.

Thus, there were several responsible authorities. However, the environmental assessments could have been better coordinated by the responsible authorities involved. As a result, several different environmental assessments were prepared. It would have been better to conduct a single environmental assessment to meet the needs of all of the responsible authorities;

- Northern ecosystems are much more fragile than other Canadian ecosystems. Environmental effects tend to persist for longer and the environment is more sensitive to the cumulative environmental effects of development activities. The ecological fragility of the North should be taken into account when assessing cumulative environmental effects; and
- Like the Lac **Doré** case study, it is probable that this project will facilitate further development, in this case, oil and gas drilling. The industries involved, Shell and Esso, need more information on the properties of permafrost before they can develop the area. Thus, the project is likely to be 'growth inducing'. To what extent can the 'growth inducing potential' of this project be examined as part of an assessment of its cumulative environmental effects under the Act?

3. APPLYING THE APPROACH IN THE REFERENCE GUIDE ON ADDRESSING CUMULATIVE ENVIRONMENTAL EFFECTS

Following the presentation and discussion of the case studies, the workshop participants applied the approach outlined in the Reference Guide on addressing cumulative environmental effects to another type of project - the burning of wood chips in Charlottetown, Prince Edward Island.

In Charlottetown, there are about 100 facilities where wood chips are burnt for space heating, mainly by small businesses. These facilities use about 15 cords of wood a year to produce about 100,000 BTU/hour. The wood is harvested locally. **EMR** provides funding for these facilities because they are alternative energy projects.

The workshop participants 'scoped' the environmental effects that should be considered in screening a wood chip combustion project. The following environmental effects were identified:

Air Emissions

- **Particulates**
- Carbon monoxide
- Polyaromatic hydrocarbons
- Carbon dioxide

Wood Harvest Effects

- Effects on fish and wildlife habitat
- Effects on water quality and possibly quantity
- Stream siltation
- Soil compaction
- Snow compaction
- Reduction in forest biodiversity

There could also be effects on micro-climate and on health and socio-economic conditions.

There was agreement that the geographic boundaries for the cumulative environmental effects of wood harvesting should be set as the entire area around Charlottetown from which wood is harvested. However, boundaries for cumulative environmental effects on air quality could not be as easily defined. One would have to consider ambient air quality and the direction of the prevailing winds.

The workshop participants were of the opinion that it would be helpful to identify ‘valued ecosystem components’ (VECs) to be assessed. These could be:

- . Air quality;
- . Water quality;
- . Wildlife habitat in the forest; and
- . Community health.

To assess the cumulative environmental effects of wood chip burning adequately it would be necessary to establish a threshold or standard for each VEC and then to determine the current status of the VEC, in relation to the threshold and how the project in question would change the status of the VEC. This should take account of both the past projects and activities in the area that have affected the status of each VEC and the future projects and activities that may affect it.

Lastly, it was noted that a class screening has been prepared for wood burning projects of this type. However, it did not look at cumulative environmental effects explicitly. Workshop participants noted the need for ‘policy assessments’ and that such assessments, should address cumulative environmental effects. ‘Policy assessments’ could facilitate assessment of cumulative environmental effects at the project level.

4. OTHER ISSUES

The workshop participants discussed setting boundaries for assessments of cumulative environmental effects in some detail. There was a consensus that there should be consistency in setting boundaries for the different types of projects routinely screened by EMR. Different boundaries may be appropriate for different types of environmental effects, but they should always be established with an underlying rationale.

The participants were especially concerned about transboundary assessments, where either the cumulative environmental effects of a Canadian project could be experienced in another country and/or where the project, or part of it, was actually located in another country. The ECE Convention on Environmental Impact Assessment in a Transboundary Context was mentioned. FEARO should clarify the relationship between the requirements of the ECE Convention and the new Act, with regard to transboundary cumulative environmental effects. It will be important for Canada to consult with 'receiving' countries and to consider joint environmental assessments.

The workshop participants also discussed the role of science-based federal departments and agencies in assessing cumulative environmental effects. It was noted that such departments and agencies could:

- . Define the 'carrying capacity' in different ecosystems;
- . Help with the assessment of incremental cumulative environmental effects that already exist; and
- . Define monitoring methods for cumulative environmental effects.

5. TYPES OF PROJECTS SCREENED BY ENERGY, MINES AND RESOURCES

EMR has recently examined the types of projects routinely screened by the Department. Specifically, the last hundred projects were reviewed. This should enable EMR to identify the generic types of cumulative environmental effects that it will be assessing under the new Act. The following types of projects were identified:

- Projects relating to exploration and mining of minerals;
- Seismic surveys;
- The construction or removal of buildings and other structures;
- Funding of alternative energy projects;
- Access road construction or controlling access;
- PCB destruction initiatives;
- Controlling other hazards (e.g., asbestos removal in federal buildings);
- Advanced houses/energy efficiency projects; and
- Other miscellaneous (e.g., low level radioactive waste siting task force).

As well, two 'class assessments' have been prepared on:

- Marine geoscience projects; and
- Wood burning projects.

The workshop participants discussed the feasibility of selecting certain types of projects that would be more likely to cause significant adverse cumulative environmental effects. If this could be done, EMR could focus on these in more detail. However, it was pointed out that the significance of the adverse cumulative environmental effects of a project cannot be determined without reference to the receiving environment. One must know about the likely

environmental effects of past and future projects and activities in the area when assessing the cumulative environmental effects of a project. Therefore, it is not possible to identify which types of projects would be more likely to cause significant adverse cumulative environmental effects without knowing something about the areas in which individual projects will be located.

It may be possible, however, to provide guidance on:

- Setting boundaries for assessments of different types of projects;
- Defining different types of projects consistently;
- Cumulative environmental effects commonly associated with different types of projects;
- Mitigation measures commonly associated with different types of cumulative environmental effects.

Guidance on these, and other matters, should facilitate a consistent level of assessment of cumulative environmental effects for the different types of projects routinely screened by EMR.

Workshop participants also discussed the need -for scientifically defensible methods for assessing cumulative environmental effects and the benefits of encouraging scientists in federal departments and agencies to do research on assessing cumulative environmental effects.

6. STRATEGIES, SUGGESTIONS AND **RECOMMENDATIONS** TO ENERGY, MINES AND RESOURCES, **FEARO** AND ENVIRONMENT CANADA

At the conclusion of the workshop, the participants discussed strategies, suggestions and recommendations to EMR, FEAR0 and Environment Canada. These are in addition to those already mentioned in earlier sections of this report.

6.1 ENERGY, MINES AND RESOURCES

- Should consider addressing cumulative environmental effects in its new training materials on the *Canadian Environmental Assessment Act*.
- Should consider reviewing previous environmental assessments to examine if, and how they addressed cumulative environmental effects. This could lead to :
 - a) Developing case studies and examples of environmental assessments that addressed cumulative environmental effects; and
 - b) Recommending methods or providing guidance on how to assess the cumulative environmental effects of different types of projects routinely screened by EMR;
- Should consider further strengthening its links with other federal departments and agencies with environmental assessment programs to exchange information on **approaches** and methods for addressing cumulative environmental effects in screening.

6.2 FEAR0 AND ENVIRONMENT CANADA

- Should consider preparing a directory of key people working on environmental assessment in different federal departments and agencies. Such a directory should be updated on an annual basis, and should identify departmental contact people;
- Should provide more training for private proponents on how to comply with the requirements of the new Act;

- Should consider holding a workshop for federal departments and agencies approximately 1-1 ½ years after the new Act is proclaimed, to examine progress made on its implementation;
- Should facilitate information sharing among environmental assessment practitioners in different federal departments and agencies on approaches and methods for assessing cumulative environmental effects;
- Should continue their work on a newsletter on cumulative environmental effects;
- Should consider facilitating harmonisation between the environmental assessment requirements and processes used by different federal departments and agencies;
- Should provide more guidance on methods that can be used to address the cumulative environmental effects of different types of projects;
- FEAR0 should provide more guidance on how responsible authorities should examine the environmental effects of Canadian projects in other countries, including **transboundary** cumulative environmental effects and when the project or part of it is located outside Canada;
- FEAR0 should consider providing guidance on the legislation and regulations to be included on the 'law list'. Specifically, guidance is needed with regard to defining projects and the role and responsibilities of the responsible authorities where an environmental assessment is required as a result of a regulatory (law list) trigger; and
- FEAR0 should include case studies **and** examples of methods in the Reference Guide on assessing cumulative environmental effects.

APPENDIX A

SCHEDULE OF WORKSHOPS

<u>DEPARTMENT</u>	<u>LOCATION</u>	<u>DATE</u>
Transport Canada	Ottawa	November 10
National Capital Commission	Ottawa	November 26-27
Canadian International Development Agency	Ottawa	December 8-9
Department of Fisheries and Oceans	Ottawa	January 12
Environment Canada/Department of Fisheries and Oceans	Dartmouth	January 14-15
Environment Canada/Department of Fisheries and Oceans	Vancouver	January 25-26
Department of Indian Affairs and Northern Development	Vancouver	January 28-29
Energy, Mines and Resources	Ottawa	February 4-5
Environment Canada and other federal departments and agencies	Quebec	February 15-16
Environment Canada	Burlington	February 18-19

APPENDIX B

DEPARTMENT OF ENERGY, MINES AND RESOURCES WORKSHOP AGENDA AND LIST OF PARTICIPANTS

WORKSHOP AGENDA CUMULATIVE ENVIRONMENTAL EFFECTS AND SCREENING UNDER THE CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)

Thursday, February 4, 1993

9:30 am - 4:30 pm

Friday, February 5, 1993

9:00 am - 11:30 am

12th Floor, Room 12B5

580 Booth Street

Ottawa, Ontario

DAY ONE

- | | |
|-------|---|
| 9:30 | Welcome and review of agenda |
| 9:40 | Introductions (round table) |
| 9:50 | Brief review of the status of the Canadian Environmental Assessment Act |
| 10:00 | Cumulative environmental effects and the Act |
| 10:10 | Review of previous workshops |
| 10:30 | Coffee |
| 10:45 | Introductions to case studies
Presentation and discussion of case studies |
| | <ul style="list-style-type: none">• Entrance Road Modification - Bell's Corners Complex• Energy from Waste-Plant, Victoria Hospital• Lac Doré Mining Project |
| Noon | Lunch |

- | | |
|-------|---|
| 13:00 | Case studies continued |
| | <ul style="list-style-type: none"> • Ocean Drilling Program Leg 146, Cascadia Margin • Mackenzie Delta Permafrost/Geology Study |
| 14:00 | Case studies concluded |
| 14:15 | Coffee |
| 14:30 | Discussion on assessing cumulative environmental effects |
| 16:30 | Adjourn |

DAY TWO

- | | |
|-------|---|
| 9:00 | Review of Day 1 |
| 9:30 | Departmental procedures for assessing cumulative environmental effects during screening including criteria or means of identifying projects that will not require a cumulative effects evaluation |
| 10:30 | Coffee |
| 10:45 | Discussion continues |
| 11:00 | Recommendations to EMR, FEAR0 and Environment Canada |
| Noon | Concluding remarks/Adjourn |

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APPENDIX C
DEPARTMENT OF ENERGY, MINES AND RESOURCES
CASE STUDIES

1. **ENTRANCE ROAD MODIFICATION - BELLS CORNERS COMPLEX**

RESPONSIBLE/FEDERAL AUTHORITY: Finance and Administration/AMASB

PROPONENT: **CANMET**

DESCRIPTION OF PROJECT:

New entrance roadway, parking lot and installation of a pre-fabricated guard-hut.

ENVIRONMENTAL CONCERNS:

Project adjacent to **woodlot** and, thus, potentially located adjacent to a wildlife nesting area.

SCREENING DECISION AND HOW IT WAS REACHED:

Project involves minor expansion of existing facility with no change in operations. Project is located at boundary of undeveloped green space, but due to the expanse of this green space, the minor intrusion resulting from this project is not expected to result in any adverse impacts. No further assessment is warranted.

CONDITIONS FOR APPROVAL:

Trees removed for the modification to be replaced by new trees located at a site approved by the National Capital Commission (NCC).

SUMMARY OF HOW CUMULATIVE EFFECTS WERE CONSIDERED:

No cumulative effects were considered.

SUMMARY OF HOW CUMULATIVE EFFECTS COULD HAVE BEEN CONSIDERED:

1. Are there plans to increase the number or size of buildings at the complex, resulting in increased traffic flow through modification area?
2. Are there any other expansion plans for the area, possibly adjacent to the property but not on federal land? Examples: new housing developments, industrial/retail/office development.

ISSUES/QUESTIONS/CONCERNS:

1. If there are plans to increase the number/size of buildings at the complex, would the increased traffic not be considered under that screening? Because this project is only a minor modification to an existing road, perhaps it's not a good example for our purposes. Maybe it would be better to treat this project as a new road development into the complex in order to focus on the chief concern: the potential loss of wildlife habitat.
2. The screening decision reached for this project was based on the fact that this modification represents a minor intrusion to wildlife habitat; if additional developments were to occur nearby, this "minor" intrusion may make a difference.

2. ENERGY FROM WASTE PLANT

RESPONSIBLE/FEDERAL AUTHORITY: Mineral and Energy Technology
Sector/Efficiency and Alternative Energy
Technology Branch

PROPONENT: Victoria Hospital Corporation

DESCRIPTION OF PROJECT:

Location: Parkwood-Westminster Hospital, London, Ontario

Description:

It is proposed to build an energy from waste plant to replace and upgrade the existing heating unit at Parkwood-Westminster Hospital in London, Ontario. Studies have indicated that municipal waste and dried sewage sludge from the city of London have the potential to provide a lower cost alternative to oil and natural gas currently being used as an energy source for the heating plant.

The cost of the project is \$8 million, of which EMR will contribute 50%.

A feasibility study has indicated that investment in the plant would be repaid in five years of operation, and would result in replacement of 17,000,000 litres of fuel oil or 18.2 million cubic metres of natural gas annually. Additional benefits to the community would accrue from reduced requirements for disposal of the municipal waste at existing landfill sites and from fuel and operating cost savings at the municipal sewage treatment plant.

ENVIRONMENTAL CONCERNS:

A “Project Register and Initial Assessment Report” (PRIAR) was completed for this project. Environmental concerns identified in the screening process related to:

- air quality;
- noise;
- public interest;
- health and safety;
- municipal services;
- economics; and
- general biophysical environment.

All the impacts were considered to be low and negative, except impacts on municipal services which were moderately positive and on economics where the impacts were low and positive.

Consultations were held with **MacLaren** Engineers Inc., Ontario Ministry of the Environment, the public, and Environment Canada.

SCREENING DECISION AND HOW IT WAS REACHED:

Environmental concerns **center** on the impact of airborne emissions on local atmospheric quality. For this reason, emission control equipment has been designed to remove particulate matter and hydrogen chloride emissions prior to their release to atmosphere from the stack. The facility will include a **baghouse** designed with a removal efficiency of at least 90% for particulate matter, and a conditioning tower with a minimum removal efficiency of 80% of hydrogen chloride. Nitrogen dioxide levels are conservatively estimated to be 36% of those allowable under Ontario regulation and other contaminant levels are 12% or less of the corresponding standards. In the event of failure of control equipment on the refuse incinerators, shut-down would be initiated automatically and emissions would be reduced to zero within an hour. Space allowance will be made in the final design of the solid waste processing plant to install additional facilities for treatment of volatile or organic compounds should it be proven necessary. The burning temperature, and the time of exposure to this temperature is far in excess of that required to kill all organisms including bacteria, viruses, fungi and any of the more heat resistant spore forms from these agents, thus the stack effluent will be sterile as will the ash remaining in the incinerators and particles trapped in **baghouse** filters.

As incinerators are the major anthropogenic source of dioxins and dibenzofurans in Canada, emission of these substances has been the subject of investigation. The province of Ontario has established standards for dioxin emissions and has included stack monitoring as a condition of operation.

Sector Recommendation:

(X) Residual Environmental Effects Mitigable or Insignificant - Proceed.

() Residual Environmental Effects/Mitigation Unknown - Further Study/IEE Required.

() Residual Environmental Effects Unacceptable.

() Abandon

() Delay

() Modify

() Residual Environmental Effects/Concern Significant - Refer for Public Review.

() Class Assessment: Confirmation that terms and conditions of class assessment will be complied with.

CONDITIONS FOR APPROVAL:

Extensive environmental study of the proposed project has indicated that construction and operation will be conducted in an environmentally sound manner. The Ontario Ministry of Environment has been involved in assessment of this project and agrees that it is anticipated to have no significant negative environmental impacts. Therefore, the only condition of approval is to:

1. Conformance to the conditions set out in the report of the Hearing Board of the government of Ontario issued August 30, 1983.

SUMMARY OF HOW CUMULATIVE EFFECTS COULD HAVE BEEN CONSIDERED:

Defining Boundaries:

Temporal Boundaries:

Construction phase - short term;

Operational phase - long term; continuous

Geographical Boundaries:

Project site as defined in the PRIAR;

Expanding to the local area immediately surrounding the project site, the community the incinerator will service and the municipality serving the area; the next boundary will be the area of impact of the smoke stack; and finally, the world, as is concerned with global warming and environmental change.

Assessing Interactions Between the Environmental Effects of the Project:

- **Air Quality:** cumulative impacts can be considered when dealing with overall or total air quality of the project area, the project impact area as determined by the stack height and global air quality.

The chemical nature of the emissions and their interactions with other emissions in the ambient air quality are critical to establishing cumulative impacts. Other factors in establishing whether there are cumulative impacts or the associated impact level include the efficiency of the incineration technology, geographical nature of the project site ie is it in a valley or area where air circulation is poor, the number of other pollution sources in the area, ambient air quality, and the thresholds for air quality established for the project impact area and global standards.

The emissions from the smokestack could add to the deterioration of the local air quality and add to global warming and environment change.

- **Noise:** when added to the noise of local traffic, ambulance sirens and emergency vehicles, increased truck traffic bringing garbage to the incinerator site can add to the noise levels of the surrounding neighbourhood.
- **Flyash:** after the waste is incinerated, **flyash** is created that is toxic; traditionally this material is landfilled and may cause a cumulative impact by adding to the toxicity of the landfill, as more of the same material is added to the landfill and as the material interacts with what is already present.
- **Energy Conservation:** the replacement of non-renewable resources with solid waste incineration will contribute to the overall energy efficiency of Canada.

Identifying Past Projects and Activities and Their Environmental Effects:

- Zoning legislation, tax rolls and city plans will give some indication of other air and noise pollution sources; reference - local municipality and provincial government.
- Traffic patterns can be obtained from local surveys; reference - local municipality.
- Records on past air quality; reference - local universities and Ontario Ministry of the Environment and other relevant government bodies.
- The Ontario Ministry of Environment, Environment Canada and other relevant government bodies should be able to provide some records or guidelines for the trends in global warming and current research into the interactions of air emissions.
- The Ontario Ministry of the Environment and the local municipality can provide information on the history of the landfill and its contents.

Identifying Future Projects and Activities and Their Environmental Effects:

- License and approvals for incinerators or the construction of new buildings will give some indication of new pollution sources that may have to be considered.
- Upcoming legislation can indicate the **trends** for incinerator legislation ie whether regulations are getting stricter or whether regulations are being developed for overall total air quality versus individual emissions.

Assessing Interactions Between the Environmental Effects of the Project. and Past and Future Activities:

- Air quality: has proven in past to be cumulative impact, contribution to overall air quality needs to be determined, feasibility to obtain information dependent on current research methodology.
- Noise: with urban planning techniques can be easily determined and is mitigable .

- Flyash: contribution to cumulative impact uncertain, would require research; feasibility of research questionable for proponent, may require depending on current research completed.
- Energy conservation: quantifying positive impact difficult; would require research to determine true impact.

Determining Likelihood and Significance of the Cumulative Environmental Effects:

- Likelihood of effects varies upon mitigation; contribution to impact on air quality certain.
- Significance of the impact on air quality is primary concern; all other cumulative impacts can be mitigated to the satisfaction of all interested parties; air quality controls are much harder to implement, the issue of best available technology becomes apparent.

3. LAC DORÉ UNDERGROUND PROJECT. CHAPAIS-CHIBOUGAMAU PROGRAM

RESPONSIBLE/FEDERAL AUTHORITIES: Mineral Policy Sector / Mineral Strategy Branch

PROPONENT: Westminer Canada Ltd.

DESCRIPTION OF PROJECT:

Location: Lac aux **Dorés**, 6km south-east of Chibougamau, Quebec

Description: Project consists of excavating an 11 percent inclined tunnel (Ramp or Decline) from surface to the 150 foot level to permit access to a copper-gold deposit and further exploration. A second inclined opening and a surface raise (opening driven from underground to surface) from the second inclined opening have been cut for ventilation purpose. Tunnels (crosscuts and drifts) will be excavated at the 150 foot level to cross and explore the deposit.

Underground diamond drilling will be performed to explore in depth. This deposit is adjacent to one of the company's operating mines (approximately 1.5 miles south of the Copper Rand mine). The project will be independent of the mine. Other activities include widening the containment dyke for the tailings pond and construction of a settling pond within the existing tailings pond. The EMR assistance allowance to the project will be \$800,000 if the company spends \$7.5 million on the project and \$7.5 million in regional exploration.

ENVIRONMENTAL CONCERNS:

A "Project Register and Initial Assessment Report" (PRIAR) was completed for this project. Environmental concerns identified in the screening process related to:

Positive concerns:

- Public interest (potential for employment); and
- Economics.

These impacts were considered to be low to moderate.

Negative concerns:

- Surface water quantity and quality;
- Fish/fish habitat;
- Air quality;
- Vegetation; and
- Noise.

All these impacts were considered to be insignificant.

A preliminary impact study was prepared by the consulting firm Sotramex. An Authorization Certificate was obtained from the Quebec Ministry of the Environment.

SCREENING DECISION AND HOW IT WAS REACHED:

This project will take place entirely within an existing mining site at Chibougamau. The site is adjacent to the company's Copper Rand mine and concentrator. The concentrator is rated at 3240 tons per day, although present throughput from the Copper Rand and Portage mines is approximately 2000 tons per day.

The inclined tunnel portal is located on **Pilcher** Island. Construction of the portal will involve clearing an area of approximately 150 x 50 feet. Another area, around the ventilation shaft, will be cleared for fire prevention. The existing access road will be extended by 0.15 miles to reach the ventilation raise (width will be 10 feet), so there will be some clearing here, too. As far as possible, tree trunks will be used underground; the remaining wood and branches will be burned.

The access road from the portal to the concentrator will follow the containment dyke for the existing tailings pond. An existing road, which is 16 feet wide, will be widened to 65.5 feet over a length of 0.68 miles. This widening will be achieved by extending the containment dyke towards the interior of the tailing pond, using waste rock from the underground excavations. No modifications are planned to the dyke walls facing Lac aux **Dorés**.

Water from underground will be pumped to surface and into a settling pond, although some of this water will be recycled for use underground. The settling pond will be constructed on the **Pilcher** Island beside the portal. The effluent from the settling pond will flow into the tailings pond.

Lac aux **Dorés** is bordered by seven mine sites, including two tailings ponds, that have been active since the Chibougamau camp was discovered. Nevertheless, the project activities have been designed to avoid a direct impact on Lac aux **Dorés**, thereby mitigating potential effects

on areas outside the mine site. The incremental effects of the present project on the environment should be minor, bearing in mind the extent of past and existing mining operations.

Although not detailed in the impact study, the potential for accidental damage to the environment should be limited to leakage of mine water from the pipe running between the portal and the settling pond. Potential contaminants in the mine water could include sediment, explosive residues and, possibly, lubricants and fuel; the water might also be acidic, if there is leaching of pyrite in the ore zone. Accidental discharge should be unlikely, given the type and installation of the pipeline, and the fact that the pipeline is easily accessible (and visible) along its path. The impact of any such discharge would be dependant on the water flow rate, the concentration of any contaminants in the water, and the volume discharged. Nevertheless, any impact would be minor given the present state of the lake and the contaminants that it receives from other sources (e.g.: from mines, cottages and floatplanes).

The company has received an Authorization Certificate from the provincial Ministry of the Environment (MENVIQ). This certificate details the conditions that the company must meet during the exploration phase. This authorization includes mining a 30 000 ton bulk sample for testing. However, the **authorization** from the MENVIQ indicated clearly that if a production decision is taken, the company must submit a new request for environmental approval.

SECTOR RECOMMENDATION

- (X) Residual Environmental Effects Mitigable or Insignificant - Proceed.
- () Residual Environmental Effects/Mitigation Unknown - Further **Study/IEE** Required.
- () Residual Environmental Effects Unacceptable.
 - () Abandon
 - () **Delay**
 - () Modify

- () Residual Environmental Effects/Concern Significant - Refer for Public Review.
- () Class Assessment: Confirmation that terms and conditions of class assessment will be complied with.

CONDITIONS FOR APPROVAL:

Within this federal-provincial assistance program for the Chapais-Chibougamau district, the EARP screening is attached to the Evaluation Committee's recommendations which are forwarded to the (Senior) Management Committee for **final** funding approval.

While the residual environmental effects of the project are insignificant, some concern remains for the adequacy of the proponent's spill would become quickly apparent, given the access to the pipe running from the portal to the **settling** pond at the surface and any impacts would be minimal.

It is understood that should federal funding be requested for the development phase, an additional environmental assessment will be submitted to the **Office** of Environmental Affairs before any irrevocable decisions are taken by the proponent.

The conditions for approval are:

1. All federal, provincial and municipal permits be obtained.
2. Compliance with terms and conditions of Ministry of Environment, Quebec (MENVIQ) authorization permit 76 1 o-02-01 0207000 is a condition of this approval.
3. No chemical products used in blasting work will be disposed of on site. All waste products will be treated by the mine site workshops at Copper Rand.
4. Spill response provisions to be planned and implemented on site to minimize major environmental contamination in case of accidental spills.

5. Proponent to monitor natural environment for unforeseen impacts of activities, especially with respect to water quality in Lac aux Dorés.
6. Any changes to approved program requires MENVIQ and OEA notification and review.

SUMMARY OF HOW CUMULATIVE EFFECTS WERE CONSIDERED:

The Chibougamau area has been an important mining camp for over 40 years. The cumulative effects of the present project, in comparison with past and present mining activities, will be insignificant.

SUMMARY OF HOW CUMULATIVE EFFECTS COULD HAVE BEEN CONSIDERED:

ISSUES/QUESTIONS/CONCERNS:

4. OCEAN DRILLING PROGRAM (ODP)- LEG 146. CASCADIA MARGIN, SEPT. 26-NOV. 21, 1992

PROPONENT: International Ocean Drilling Program and the Geological Survey of Canada

DESCRIPTION:

Scientific drilling of a series of shallow holes at four sites on the continental shelf of Vancouver Island using the **JOIDES RESOLUTION**, **Sedco/BP** 471 research vessel/drill ship under long-term charter to the international Ocean Drilling Program. The drilling will obtain information on the geological processes occurring in the sediments of the sea-floor particularly as they relate to the potential for earthquakes in the region and the generation of methane hydrate in marine sediments.

ENVIRONMENTAL CONCERNS:

A “Project Register and Initial Assessment Report” (PRIAR) was completed for this project. The PRIAR was based on a report entitled “Initial Environmental Assessment of a Scientific Drill Core Program on the Continental Slope off Vancouver Island,” prepared for the Pacific Geoscience Centre of the Geological Survey of Canada, by Homal Consultants Ltd. and Roger A. Stacey Consultants Ltd.

The environmental concerns identified in the PRIAR are given in the Table:

(References to Homal Report)	Impact of Project on Factor	Impact of Factor on Project
Marine Environment:	-1. Minor disturbances of sea-floor, debris from drilling minimal. Discharges from ship well controlled (4.2, 4.3).	3. Drilling at sea is a highly complex expensive operation. JOIDES RESOLUTION is acknowledged as the most advanced scientific drill ship in the world.
Fish/Fish Habitat (Commercial)	-1 Minor disturbance due to ship presence, and noise. Mitigating measures will be requested.	0
Geology/Geophysics	-1 Disturbance of geology is minor. Holes on seafloor and surrounding disturbance typically a radius of 1- 10m. Concerns over release of methane addressed in mitigating factors. Understanding and knowledge of geology will be considerably improved by the project.	3. Geology is the primary goal of the drilling program and location of project is on the basis of geological/geophysical information of sea-floor structure.
Weather/Climate	0	1. Ship can operate in moderate to rough sea states due to its positioning systems. Procedures to abandon and re-enter holes in the case of storms are in place and frequently used.

Wildlife (mammals, birds, non-commercial)	-1. Minor disturbance due to ship presence, noise and lights. Ship will be on drill sites for almost two months (4.2).	0
Public Interest	+1. Impact of 1991 drilling program was assessed through a consultation process. The visit of the drill-ship to Victoria attracted low to moderate local interest as shown by tours of the ship and attendance at public lectures. Reactions were positive and supportive. Both Greenpeace and Sierra Club representatives toured the ship and were impressed by the science being conducted.	Considerable efforts have been made to publicize the program, give public tours of the ship in port and generate articles, TV coverage etc. on ODP. Nevertheless on the whole public interest is low and has not had much impact on the project as a whole.
Health and Safety	-1. Effects of drilling on health and safety of ships crew has been comprehensively addressed through Pollution Prevention and Safety Guidelines, mitigating measures adapted for each situation and on-board procedures and regulations. There have been no serious accidents to date in the long record of ODP. Extra safety measures for the drilling proposed close to munition dumps will be specified. Effect of the project on the health and safety of the personnel involved is judged low. Effect on others (fisherman, recreational boating etc.) none.	3. Health and safety concerns have had a profound effect on the conduct of the drilling in ODP. The, deliberations of the Pollution Prevention and Safety Panel, expenditures on equipment, medical supplies etc. are all at the highest standards. This is attested by personal inspection of the ship and an impeccable safety record.
Navigation	-1. The location of the RESOLUTION on station for many weeks will have some impact on navigation. All notices to mariners, navigation lights etc. will be complied with.	3. Accurate navigation and the use of available radio beacons, satellites, transponders is the key to the successful achievement of the objectives of the proposal.

Economics.

+2. The program will have two beneficial effects on the Canadian economy. The direct expenditure in Victoria of ODP during the port call at the start of the cruise will likely total around \$600,000. Secondly, the scientific impact of any information on the earthquake risk of S.W. British Columbia could be considerable in economic terms. This will be longer term, but could stretch to many billions of dollars.

The drill locations were discussed in detail and approved by the **JOIDES** Pollution Prevention and Safety Panel, which is an international panel of drilling experts. The operator of the **JOIDES** RESOLUTION drill ship, Texas A & M University, has completed its own safety review.

Consultations were held with: a) government organizations, including the National Energy Board (for drilling safety), Energy, Mines and Resources (gas hydrates), Transport Canada (Coast Guard), National Defence (for location, identification of munition dumps), Environment Canada (Inland Waters), Fisheries and Oceans (fish habitat), B.C. Environment, B.C. Energy, Mines and Petroleum Resources and the U.S. Geological Survey; b) scientists, including the Woods Hole Oceanographic Institute (effect of explosions on ship safety), University of Victoria, University of British Columbia, University of Calgary, University of Saskatchewan; and c) special interest groups, including B.C. Environmental Network, Call for Inquiry, First Nations of South Tribal Council, Friends of Clayoquot Sound, Greenpeace Foundation of Canada, Nuu-Chah-Nulth Tribal Council, Ocean Resource Conservation Alliance, Sierra Club of Western Canada (B.C. Chapter), Society Promoting Environmental Conservation, United Fishermen and Allied Workers' Union, Western Canada Wilderness Committee, and the Marine Life Sanctuaries Society of B. C.

OTHER ENVIRONMENTAL ASSESSMENTS:

The U.S. National Science Foundation, the main **funder** of this program, has also completed, in November **1985**, a generic Environmental Impact Statement (EIS) for the second phase of the

Ocean Drilling Program. This phase included the extension of the drilling program to high latitudes (the **Weddell** Sea), to environmentally sensitive areas (the Georges Bank), to continental margins (the Mid-America Trough), and to the active spreading centres such as the East Pacific Rise and the Juan de Fuca Ridge. The conclusion of the EIS was as follows:

“The continuation of scientific ocean drilling throughout the global oceans will have negligible impacts on major oceanic ecosystems. Environmental effects of normal drilling operations will be temporary and will be detected only in the immediate vicinity of the drill-ship (surface waters) or drill hole (sea-floor).”

In 1990, Roger A. **Stacey** Consultants Ltd. carried out an initial environmental assessment of a proposal to drill a series of holes in the Middle Valley of the Juan de Fuca Ridge, 200 km offshore Vancouver Island during July and August 1991.

The ODP Program has a clean safety record for the 20 years of drilling in all of the world's oceans.

SCREENING DECISION AND HOW IT WAS REACHED:

The Office of Environmental Affairs acknowledged the very careful and detailed environmental assessment performed for this project. The safety record of the Ocean Drilling Program, it was said, is a reflection of the detailed planning performed in selecting the drilling sites, and of the careful review made by the Pollution Prevention and Safety Panel before giving site approval.

It was **recognized** that in addition to the usual planning considerations for ocean drilling projects, this undertaking presented two new challenges. These were related to drilling through the Bottom Simulating Reflector (BSR) and to avoiding the disused munition sites.

It is understood from the documentation presented that special precautions would be taken by the crew of the **Joides** Resolution drill ship regarding:

- De-selecting drilling sites located on BSR highs;
- On-board handling of cores which might release natural gas or other gases;
- Ventilation of core storage facilities to prevent accumulation of natural gas;
- Deployment of hydrocarbons release sniffers; and,
- Provision of notices to mariners using the area contiguous to the drill ship.

These precautionary measures are taken on cruises in general, or specifically on those performing drilling in similar geological structures; they are considered routine for an experienced crew and therefore were not placed as conditions for this approval.

However, the precautions needed to be taken in relation to the munition dumps were not considered routine, and were conditions attached to the approval. The conditions stipulated by Fisheries and Oceans Canada were also part of this approval.

Following the approval of the assessment by the Office of Environmental Affairs, the Geological Survey of Canada has sought further clarification on the navigational accuracy used in 1975 for locating the dump at **48°16'N, 126°20'W** and on the content of this dump. Based on this information, it was proposed that the precautionary radius around this dump be reduced to 2 nautical miles. National Defense Headquarters and OEA have agreed with this recommendation.

RECOMMENDATION:

☒ Project can Proceed (See Conditions)

CONDITIONS FOR APPROVAL:

1. Seismic surveying within 25 miles of fishing vessels and 2 km of marine mammals will be suspended.

2. For drill sites located closer than 10 nautical miles from the disused munition sites, the crew will:
 - a) Visually inspect, through drill string video, the sea floor before spud-in;
 - b) “Wash-down” to 20 m. below sea floor (that is, no samples will be brought to deck in this interval);
 - c) Acquire relevant gas sniffers, protective equipment (rubber gloves, goggles), decontamination kits and medical supplies;
 - d) The first two or three "APC" cores will be handled only by the trained personnel on the drill floor, until they have been checked for possible contamination;
 - e) Relay any relevant information that might assist in better locating the dump sites in the future to the National Defense Directorate of Ammunition Operations and Explosives Safety.
3. The precautionary radius for the site located at **48°16'N, 126°20'W** is 2 nautical miles.

SUMMARY OF HOW CUMULATIVE EFFECTS WERE CONSIDERED:

Although “cumulative effects” were not specifically referred to by name, the Initial Environmental Assessment has considered the following effects, which have a cumulative dimension:

- Effect of seismic activity on fish populations;
- Effect of ship presence on commercial fishing;
- Effect of waste discharge from the ship on water quality;
- Effect of drilling operations on sea floor; and
- Effect of drilling operations on sea mammals.

None of these effects were found to be significant. The effect of drilling operations on the sea floor needs further explanation. This operation on **Joides** Resolution uses surface sea water, rather than “drilling mud.” This is because drilling mud would mask the information being sought by scientists. The drill cuttings emerging from the hole at the sea floor can impact the benthic community around the drill hole by smothering any animals living there. The maximum volume of cuttings from any hole would be less than 150 m³. Observations made after drilling in the Middle Valley from the submersible DSRV Alvin revealed that at one hole the cuttings had raised the sea floor by a maximum of 4 m around the re-entry cone. At another hole, there was an annular ring of cuttings up to 0.5 m high about 7 metres away from the centre of the hole. These latter holes had basaltic material, which are courser and denser than the cuttings expected from the Cascadia holes.

SUMMARY OF HOW CUMULATIVE EFFECTS COULD BE CONSIDERED IN MORE DETAIL:

The cumulative effects of this and other projects could be discussed by setting specific boundaries. An example of boundaries is:

a) Temporal boundaries:

Ship time = 2 months

b) Geographic boundaries:

Study area as defined in PRIAR, with more local boundaries as defined for fishing vessels (25 km) and marine mammals (2 km).

Other boundaries can also be defined. The participants in the workshop might wish to discuss how to set these boundaries.

Another area of discussions is the actual cumulative effects of:

- Seismic activity on fish populations and commercial fishing;
- Drill ship on water quality; and
- Drilling operations on sea floor, sea mammals and other creatures.

5. MACKENZIE DELTA PERMAFROST/GEOLOGY

RESPONSIBLE/FEDERAL AUTHORITIES: Geological Survey of Canada/Sedimentary and Cordilleran Geoscience Branch

PROPONENT: Same

DESCRIPTION OF PROJECT:

Geotechnical drilling/surface geophysics study of permafrost and geological conditions in the vicinity of proposed hydrocarbon development areas of the Mackenzie Delta. The main program will consist of a 600m deep **borehole** at the Taglu field, a 300m **borehole** at the Kumak field and a 100m deep **borehole** at the Unipak field.

The drilling equipment will comprise of a "**geotechnical**" rig enclosed in a skid trailer. An **oil**-based mud will be used in the drilling. The boreholes will be logged and a thermistor string will be installed. A small surface geophysical program may be carried out along a straight line between Kumak and Unipak to measure the electromagnetic properties of the permafrost.

The field team will comprise of about 25 persons. Accommodation for these personnel will be at Shell's existing Camp Farewell, which will be open at that time of year to support Shell's exploration activities. Casual personnel will stay at hotels in Inuvik and commute to the site. Transportation between camp and site will be by crew cabs. Shell will likely subcontract heavy equipment to the project on an as required basis. This equipment will be used to construct and

maintain the short ice roads to the sites from Camp Farewell and more equipment between sites. The expected duration of the field work is 35 days and would be carried out in March and April of 1992. Mobilisation of equipment would be via ice road in February. Equipment and samples would be trucked back to Alberta in April.

ENVIRONMENTAL CONCERNS:

The only environmental concern raised was the trampling of vegetation, and that this impact was local and minimal.

SCREENING DECISION AND HOW IT WAS REACHED:

The screening decision was that the environmental effects were mitigable or insignificant and that the project could proceed with conditions.

CONDITIONS FOR APPROVAL:

1. Oil based drilling mud must be removed from the sumps at the drill site following the two year monitoring program.
2. Any variance from Condition 1 must receive prior approval from the Office of Environmental Affairs.
3. A license to conduct the project must be obtained from the Science Institute of the Northwest Territories prior to project start-up. Any conditions of the Science Institute license shall be conditions of this approval.
4. A Land Use Permit must be obtained from the Department of Indian and Northern Affairs prior to the project start-up. Any conditions of the Land Use Permit shall be conditions of this approval.

SUMMARY OF HOW CUMULATIVE EFFECTS WERE CONSIDERED:

N/A.

SUMMARY OF HOW CUMULATIVE EFFECTS COULD HAVE BEEN CONSIDERED:

ISSUES/QUESTIONS/CONCERNS:

1. The impact of this project appears to be very **localized**, but the information gained will extend to other future projects i.e., pipeline construction. How far in the future should the assessment be taken? How should this project be separated from local land use planning issues? If taken at face value, is it possible to conclude that this project has no cumulative impacts?

CEA ISSUES RAISED BY OTHER DEPARTMENTS

1. What is the role of the municipality? Do they need to consider cumulative effects of their activities?
2. How do you know when a threshold has been reached? breached? (i.e., receiving waters)