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THE FEDERAL ENVIRONMENTAL ASSESSMENT AND REVIEW PROCESS AND TRADITIONAL ECOLOGICAL KNOWLEDGE

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Preamble

This study was commissioned by the Environmental Assessment Branch, Environment Canada, in cooperation with the Policy, Planning and Process Development Directorate, Federal Environmental Assessment Review Office (FEARO). This survey into the historical use of Aboriginal traditional ecological knowledge in Environmental Assessment Panel reviews represents a pro-active measure to plan for the implementation of the new Canadian ***Environmental Assessment Act. The*** Act represents a commitment to public participation, and to the role of Aboriginal people in the environmental assessment process.

An Environmental Assessment Review Panel is a group of experts selected on the basis of their knowledge and expertise of the project under review. Panels may consist of federal, provincial or territorial public servants as well as persons from the private sector. Panels examine the environmental and related implications of the project in question and report directly to the Minister of Environment. Historically, the Panel chairman was the Executive Chairman of FEARO. Today, the practice is to appoint chairmen from outside government. The Panel draws on initiators, proponents, technical agencies from within government, independent experts and the public--particularly the public which may be directly affected by the project. (***Environmental Assessment Panels. What they are and what they do.*** FEARO).Further information on Panels and how they function is contained in Appendix 2).

Apart from Sadler's evaluation of the 1990 Beaufort Sea Panel review, (Sadler, 1990) and Nakashima's work on the application of native knowledge in environmental assessment (Nakashima,1990), there has been limited research and analysis done on the extent and potential value of aboriginal knowledge of the local ecosystem into the Canadian Environmental Assessment and Review Process. This changed in 1991 when the Canadian Environmental Assessment Research Council (CEARC) co-sponsored an International Workshop on Indigenous Knowledge and Community Based Resource Management (Winnipeg, Manitoba, September 24-26, 1991). A collection of research papers on traditional ecological knowledge (TEK) has recently been published, entitled ***"Traditional Ecological Knowledge; Concepts and Cases"*** (Inglis 1993).

Current interest in TEK , or indigenous knowledge stems from Canada's commitment to sustainable development (i.e. the Brundtland Commission) and Chapter 26 of Agenda ***21:*** "Recognising and Strengthening the Role of Indigenous People and Their Communities", as well as Canada's support for the 1993 "UN Year of Indigenous Peoples".

INTRODUCTION .

Indigenous Knowledge Defined

Over the last decade, a variety of terms and definitions have come into use by anthropologists, ethno-ecologists, and the media, to try to capture the essence of the unique relationship that exists between indigenous peoples and societies with their local environment. Simply speaking it is the knowledge base acquired by indigenous and local peoples over many hundreds of years through their direct contact and experience with the environment (Bourque et. al. 1992). In the context of the Terms of Reference of this study, Traditional Ecological Knowledge, or TEK, encompasses the terms "native management systems", "native community ecological concerns" and "traditional local knowledge and wisdom". The terms traditional ecological knowledge and indigenous knowledge are used synonymously.

Indigenous knowledge is the knowledge base acquired over hundreds of years by indigenous peoples through direct experience and contact with the environment. It takes several forms: an intimate and detailed knowledge of the environment, including plants, animals and natural phenomena; the development and use of appropriate technologies for hunting, fishing, agriculture, and forestry; and a holistic or "world view", which parallels the scientific discipline of ecology. Appendix 5 contains two illustrations which compare western and indigenous knowledge.

As Bourque et.al. point out, there is a growing recognition of the value and the potential use of all the components of TEK, as an integral part of planning and decision making for the wise use of resources and the environment.

OBJECTIVES

This study was initiated to assess how TEK had been used in selected Panel reviews in each of three periods: 1987-91; 1982-86; and prior to 1982. The objectives were:

1. to review the community consultation options available to the Department of the Environment (DOE) and FEAR0 for promoting aboriginal community participation within the Environmental Assessment Review Process (EARP);

2. to develop case histories from project records, documenting the existence and type of TEK communicated first hand in a variety of community based meetings;

3. to provide a preliminary evaluation of the extent to which TEK-based concerns (including specific native community concerns, most valued ecosystems, ecological predictions, or mitigative measures) were integrated into selected Panel recommendations and scientific studies;

4. to determine if, and how, TEK was used in any of the Panel reviews which involved post-project environmental monitoring; and,

5. to recommend measures to acknowledge and more effectively integrate aboriginal communities and their local ecological knowledge into the federal environmental assessment review process.

METHODOLOGY

The case studies were selected for this study according to the following criteria:

1. that aboriginal communities directly affected by a proposed project were involved at an early point in the environmental assessment process, and in community consultations;

2. that a sufficient amount of TEK was communicated by individuals and organizations from aboriginal communities to permit a comparison of concerns and predictions based on TEK with those from the scientific community; and,.

3. that the case studies reflect, to the extent possible, the cultural diversity of aboriginal societies to provide some insight into the range of aboriginal cultures, languages, and traditional resource management strategies across Canada.

Based on the above criteria, the following four Panel reviews were chosen for study:

1987-Present
- Low level military flight training in Labrador(in progress)
- Oldman River Dam, Alberta (1992)

1982-1986
- Beaufort Sea Hydrocarbon 'Production and Transportation, N.W.T.(1984)

Prior to 1982
- Norman Wells Oil Field Development and Pipeline, N.W.T. (1981)

All existing Panel information in FEARO's documentation centre was reviewed, together with a limited amount of discussion with DOE and FEARO personnel. The TEK case histories are therefore based almost exclusively on the written record. It was felt, however, that the written record, particularly the verbatim accounts of community meetings, was extensive enough to address the objectives of this study.

The four case histories form Appendix 1 of this report.

F'INDINGS AND RECOMMENDATIONS

The following summary of findings addresses the five objectives:

1. With respect to the review of the various consultation methods available to the federal government for promoting aboriginal community participation within EARP, community meetings were found to provide the best opportunity for the Panel to obtain first-hand accounts (often through simultaneous translation) of aboriginal TEK based project concerns. Detailed findings are contained in Appendix 3. In summary, all four case studies had community information programs:

- Military flying: Proponent-sponsored community information program in Goose Bay
- Oldman River Dam: Panel-sponsored public information office in Brockett
- Beaufort Sea Pipeline: Regional Office in Inuvik
- Norman Wells Oil field: Panel-sponsored public information program in Mackenzie Valley communities.

Of particular relevance to the early integration of TEK at the community level was the wide variety of early "scoping" meetings that were used by the Panels in the following case studies:

Type of Scoping Session	Case Study Panel Review
Information Meeting	Oldman River Dam
Community Workshop	Beaufort Sea Hydrocarbon
Scoping Session	Low level flying
Issues Meeting	Oldman River Dam
Issues Seminar	Beaufort Sea Hydrocarbon

2. Appendix 1 contains TEK case histories based on supporting documentation generated from first-hand accounts of TEK-based concerns and predictions communicated at various community meetings. Overall, the case studies yielded a wide variety of general and specific, largely anecdotal, accounts based on local ecological knowledge. These proved useful in further defining the scope and context of TEK as related to aboriginal culture and natural resource management strategy. There was no clear evidence of increased integration of TEK during the three case study time periods. There was, however, a trend towards a more systematic inclusion

of TEK-related procedures beginning with the Beaufort Sea Panel. This was done largely through the efforts of the FEAR0 Secretariat and the Public Information and Participation Program.

Unfortunately, due to varying levels of mistrust amongst Aboriginal people concerning EARP, and/or the intentions of the project proponent, access to TEK was limited for all the case studies. For example, the DND refusal to cap military flights at 1986 levels during the EARP review, which resulted in protests by the Labrador Innu; and the position of the Alberta Government to continue project construction during the (Oldman River) review, resulting in activist actions and the boycotting of the Panel review by the (Albertan) Peigan Indian Band.

3. Appendix 3 provides a listing of references to TEK in recommendations made by the four Panels. Although it is difficult, if not impossible, to attribute any final recommendation to TEK or science-based study, due to the complexity of the EARP decision making process, there was limited evidence in all cases that scientific information corroborated TEK in all of the case studies. For example, Dene resource users had noticed several fish abnormalities. Testing by DFO later confirmed that some fish were contaminated with pesticides.

4. The Norman Wells Oil Field Development and Pipeline case study was found to be the only Panel project in the survey which included aboriginal participation in environmental monitoring. Details are given in Appendix 4. In summary, the Dene and Metis were involved in the following co-management structures:

- Community Advisory Committee
- Research and Monitoring Working Group
- Joint Environmental Working Group

Based on some of the most relevant TEK-based concerns of the Dene, members of the Research and Monitoring Working Group worked to establish a set of priority environmental issues to guide the design of the monitoring program.

Detailed Recommendations on Procedures and Methods

1 Involving Aboriginal Communities in EARP

-recommendation # 1:

- The inclusion of aboriginal ecological concerns and specialized knowledge (TEK) into the Panel TOR's and operational procedures should be more systematic and detailed in future updates to the FEAR0 Operating Procedures Manual. Although there was direct reference for the inclusion of

TEK in the mandate of two case studies (Military Flying and Oldman River Dam), this appeared to be done in an ad-hoc manner by the Panel, since there were no formal operating procedures to advise the Panel on how to proceed with such measures.

- **recommendation # 2:**

  -The criteria for the selection of Panel members and outside technical experts should include a requirement for an objective understanding of the affected aboriginal community and their TEK-based concerns.

- **recommendation # 3:**

- Information liaison programs for the case-study projects that were run by locals appeared to be effective in gaining the trust and participation of the local community (e.g., Ms. Butler of Inuvik helped to ensure that community leaders were kept informed of research progress and that local people were used whenever possible, for natural resource research activities). Prior to formal meetings (i.e., as early as possible), the Secretariat should establish information offices where community members can easily obtain material on the proposal or to record their opinions or questions. In some remote northern communities, it is useful to have a convenient viewing centre which maintains all public files, regular newsletters and all upcoming meeting announcements in case mailing or telephone communications are not possible.

- Community perceptions of the potential adverse impacts of the proposal can be volatile (i.e., media coverage, competing professional views and personalities, rumours and inflammatory comments) and can greatly influence public trust and willingness to participate in the consultation process. Efforts should be made as early as possible in the consultation process to communicate directly with the affected communities (e.g., on the land or in traditional settings), to assess and defuse possible hostilities or feelings of mistrust;

- **recommendation # 4:**

- Although it may be inappropriate for government officials to conduct public opinion surveys on the perceived need to conduct early community scoping meetings (which should be carried out on a more systematic basis for affected communities), questionnaires may be useful as a planning tool to help gauge aboriginal interest and the planning of more detailed subsequent meetings and consultations.

- If necessary, Panel members, proponents and aboriginal organizations should be provided with cross-cultural training prior to community visits, in order to become more familiar and comfortable with alternative cultural and knowledge paradigms.

- recommendation # 5:

- Panel members should be aware of and respectful of aboriginal traditional ceremonies and customs when visiting communities (e.g., opening and ending prayers, meal preparations or acknowledging the traditional hierarchy of notifying elders such as Band leaders or Chiefs first). Aboriginal communities should also be consulted as early as possible by the Panel Secretariat about the optimum time and place to convene meetings. This is because traditional activities (e.g., hunting and fishing) often involve key individuals travelling outside the communities for lengthy periods of time. For example, the Oldman River Panel acknowledged that the timing of public hearings should not interfere with seasonal planting and harvesting.

2 Design and Conduct of a TEK Initiative

- recommendation # 6:

(Scoping or Issue Identification Sessions)

- Aboriginal communities that are potentially affected by a complex development proposal should receive first priority for scoping sessions;

- Once a Panel has decided to convene scoping sessions in a northern community (along with relevant information on the proposal being readily available to the community before the meetings), scheduling conflicts can be avoided by the development of simple flow charts which show the upcoming stages and time allotments in the decision-making consultation process;

- Documentation describing the proposal should be made available to the affected aboriginal communities well in advance of scoping meetings, and should be brief and easy to understand (i.e., in local languages and using descriptive charts, maps, diagrams or prepared videos describing complex traditional activities and TEK);

- Where scoping issues are not clear or priorized, the Panel should allow adequate time after scoping sessions to informally talk with local community members or invite the public to submit written final comments or concerns (i.e., important concerns and local knowledge are often triggered after people have heard detailed discussions on an issue);

recommendation # 7:

{Workshop Sessions)

- Currently, many Panels are opting to convene scoping “workshop sessions” (e.g., the Beaufort Sea Community Workshops) which can be useful at priorizing both scientific

and social issues. Although there are some advantages for integrating and priorizing the scientific and TEK issues together, Dr. Sadler points out that due to the inherent differences between the two knowledge paradigms, it may be difficult to weigh the two issues equally as reflected in the final priority listing. Such interaction between science and TEK at the early stages of EARP can be beneficial by facilitating a more cooperative atmosphere later in the review process (when discussion of substantive issues is more important than the identification of major issues).

- As with other types of scoping meetings, care should be taken to ensure that the targeted audience is made aware of the planned meeting well in advance. The purpose of the workshop should clearly outline what is expected from participants and if necessary, logistical matters should be brought up in advance.

- Usually a Workshop will begin in the morning and run the entire day. The location and setting can play a major role in the success of the session. Local input should be obtained in order to ensure that logistics are adequate (i.e., that the timing, size and location of meeting room; transportation or accommodation arrangements; availability of required seating; presentation tools and appropriate food and non-alcoholic beverages arrangements are made in advance).

- recommendation # 8:
(Information Sessions or Seminars)

- Information meetings are carried out at the earliest stages of the community consultation process (as used for the Oldman River Dam case study) and provide an opportunity for the Panel to informally introduce themselves and obtain a preliminary understanding of the public perceptions (not including substantive issues involving TEK) before detailed public statements and positions are formally made in writing and at oral proceedings.

- These sessions can allow the Panel Secretariat to provide sound advice to the Panel as to whether more detailed scoping sessions are warranted and how they can be organized and implemented without causing disruption or mistrust in the local community. This can also be an opportune time to ensure that the Secretariat mailing list is complete and up-to-date, and can help streamline subsequent consultation activities as planned by the Panel.

- recommendation # 9:
(Public Hearing Sessions)

- The ultimate success of these more formal sessions (i.e., where TEK-concerns are communicated by key resource managers such as elders) largely relies on the success of the preceding scoping sessions as outlined above. Careful attention to results of

the preceding meetings should also provide a clear indication of the appropriate logistics and conduct required for the Public Hearings.

- These sessions (due to the subsequent development of verbatim proceedings for draft EIS guidelines and final public hearing community sessions) were by far, the most useful in this review (particularly for the Beaufort Sea and Oldman River Dam case-studies) for finding detailed evidence of community TEK-concerns and predictions of local ecological change.

- As in the case of the Beaufort Sea case study, coherent procedures for conducting Community sessions and an organizational framework for the vast collection of community proceedings (i.e. by issue key words cross-referenced for community, date and individuals providing TEK input) should be systematically utilized for future Panel Reviews - particularly for complex proposals that potentially affect a wide range of aboriginal groups and communities.

- recommendation # 10:
(Project Follow-up Environmental Monitoring)

- In the Norman Wells case study, Dene concern that the monitoring regime as recommended by the Panel final report was not sufficiently reflecting their input and standards, was partly addressed by the creation of various joint monitoring committees and working groups.

- As with other co-management regimes, it is necessary to first ask for and receive aboriginal input for the structure and operating procedures for the various planned committees. It is important to ensure that aboriginal participants are key resource users and managers (e.g., Chiefs and elders) are consulted and have equal control on all monitoring planning and implementation activities.

3 Potential Constraints to the Effective Integration of TEK in EARP

- recommendation # 11:
(Joint Research-Related Activities)

- The collection of primary information and analysis of TEK and traditional resource management systems by the proponent, scientists (i.e., as part of the preparation of the EIS report or supporting studies) should be systematically conducted in partnership with key aboriginal community members. In cases where information on aboriginal communities is obtained solely through the literature or second-hand knowledge, there is a risk that such information may not be currently relevant.

- Efforts should be taken by scientists and managers to better respect and protect aspects of TEK which correspond to intellectual property (e.g., there were many

instances in community meetings when aboriginals were reluctant to share important aspects of TEK such as sacred fishing sites etc., with the Panel or proponents for fear that they could later be exploited).

- recommendation # 12:
(Language and Jurisdictional Constraints)

- Although oral translations during community meetings was adequate, translations of written material was not consistent for the case-studies. This created mistrust and costly delays in releasing information to the communities. For example, DND was unsuccessful in attaining Naskapi translations for the EIS summary for the low-level military flying project. This delayed the Panel proceedings and threatened to put the Naskapis in an unfair position compared to other groups who received translated versions.

- Care should be taken to ensure that the correct orthographies (written and printed symbols that represent the sounds of a language) are used in written translations, as well, care should also be taken to ensure that oral translations do not lose their inherent value as traditional ecological knowledge. In such circumstances where translations may be unavailable or inadequate to translate complex understandings, the Panel and proponent should consider the merit of using audio/visual aids (e.g., GIS transferable maps or informal newsletters such as the Nov./87 military flying newsletter) to facilitate the public's understanding of the project.

- Alternative consultation mechanisms and politically neutral fora should be developed and applied in a pro-active manner to help avoid jurisdictional/political issues (e.g., frustration related to the Norman Wells land claim and resource-sharing agreements) from disrupting or conflicting with sound environmental assessment decision-making procedures.

RECOMMENDED NEXT STEPS

1. As this survey was predominantly a literature review and contained only four Panel case studies, a workshop involving participants directly related to the various Panel reviews should be held in the near future to provide a more realistic verification or peer review of the survey results and recommendations.

2. That relevant results from this survey, along with the results of the above peer review workshop, be reflected in future updating of FEAR0 operating procedures or any cross cultural-training programs.

3. An evaluation mechanism should be developed which can systematically determine the relative value of TEK and its compatibility with scientific investigation.

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APPENDICES

Appendix 1:
Case Histories of Panel Reviews and TEK

1.0 Low-level Military Flight Training in Labrador

1.1 Overview of Community Consultation

A scoping exercise was held (Aug./86) in various Innu communities to help identify the priority issues and concerns that needed to be addressed in the issuance of the draft EIS guidelines.This was in addition to the proponent-sponsored, community information program which was run by a local resident from Goose Bay (see recommendation # 3).

The draft EIS guidelines called on the proponent (DND) to hire and consult local persons during research. This suggestion was partly carried out with Makivik, the Labrador Inuit Association and the Naskapi of Schefferville being involved in a variety of EIS-related studies. Due in part to the position of the proponent not to cap flights (to 1986 levels) during the EARP, the Naskapi Montagnais Innu Association (NMLA) and the Conseil Attikamek-Montagnais (CAM) refused in principle, to cooperate with DND during the preparation of the EIS (see recommendation # 11).

1.2 TEK at the Draft EIS Guidelines Stage

1.2.1 Comments from Individuals

-Local considerations about military flying range being over part of northern cod stock breeding grounds; (J. Bird - Cartwright, Oct.3/86).

-Not exaggerating that wildlife reacts badly to jet noise (settler people from N.W. River had exactly same experiences); and,

-Our hunters have observed impacts to mink, marten, caribou, and migratory waterfowl; (Chief D. Ashini - Sheshatshit, Oct.13/86).

-Fox and mink farmers have also observed that these animals eat their young when flown over at low level; and,

-Biologists from the CWS report that Black ducks abandoned a lake after being overflown in 1981 only to return after flights were ceased; CWS letter to P. Penashue, Oct.29/84).

-Comment that ancestors never mentioned moose being as far north as Davis Inlet, where in last few years are commonly seen; and,

-We never see any caribou in one big herd anymore, instead they move in all different directions; (counters scientific claim that changes are due to lack of food because "we have seen that caribou moss (main source of diet) is plentiful in that part of the country); (Chief C. Rich - Davis Inlet, Oct. 29/86).

-Observation from younger hunters that caribou are wild and keep moving back and forth in many directions which contradicts historical observation that caribou never left feeding grounds except for migration to calving grounds; and,

-"I have seen caribou with some kind of disease like bad kidneys and liver" (J. Pasteen, elder from Davis Inlet).

1.2.2 Community/general TEK

-The caribou (George River herd) and effects of noise are main concerns, along with impacts to migratory bird populations, fish, lakes, rivers and land (e.g., speculation that exhaust emissions may cause of water and flora pollution); (J. Peter, Makivik submission - Fort Chimo, Oct.16/86).

Concern that flying over caribou calving grounds at low altitude is known to create serious impacts (e.g., stress) amongst females calving; (M. Breton - HFT Coordinating Committee Sub., Oct. 14/86).

-Main concerns are with caribou and lack of understanding with regional migration patterns and susceptibility to noise disturbance; (T. Moses - Grand Council of the Crees, Nov.5/86).

-Have observed correlation (since 1967) with demise of Mealy Mountain caribou herd and military activity including pressures from hunting overkill (e.g., military killing caribou from aircraft); and,

-Other concerns besides caribou (e.g., migratory nature of George River herd), which require additional study include: waterfowl and raptors, moose, black/polar bear,

mink, marten, lynx, wolf, wolverine, fox, hare, porcupine, otter, lemming, muskrat, and beaver; (Labrador Inuit Association submission, Oct./86).

1.2.3 Examples of Scientific Methodology Supporting TEK-Based Concerns

-V. Geist from Wildlife Heritage Ltd. (Nov.18/86), in a submission to the Panel, commented that since the liver and kidneys are detoxifying organs, suspicion is that organs are loaded with heavy metal which may be mostly due to acid rain as also seen in Sweden;

-Other scientific evidence has shown that frequent flying at low altitude on narrow tracks may deposit combustion products from heavy oils (e.g., vanadium and nickel) which can be accumulated in ground cover plants such as lichens and moss (which receive their mineral uptake from the air). Lichens, which are a major food source for caribou, can bioaccumulate toxic elements up the food chain to humans in much the same way as mercury does with fish.

2.0 Oldman River Dam

2.1 Overview of Community Consultation

2.1.1 TEK at the Pre-EIS Stage

In Dec./90, the Panel held Public Information Meetings in native communities of Pincher Creek and Brocket (among other cities). These informal meetings were basically intended to introduce the Panel and the Secretariat to the communities, describe EARP and its draft review process, and to invite people to ask questions or provide initial comments. As a result of these meetings, a public information office was set up in Pincher Creek to serve as a liaison role for the local community (see recommendation # 3).

As similar to the situation faced by the Labrador Innu in trying to participate in a review when the project was in progress, the participation by the Peigan in the Panel review was compromised by the on-going construction of the irrigation project during the federal review. This was largely the result of a jurisdictional dispute between the federal and Alberta government which resulted in the Peigan feeling that they were not being treated fairly in the decision-making, planning or implementation phases of the project. As such, there were no EIS guidelines, nor was an EIS prepared by the government of Alberta (see recommendation # 12).

2.1.2 TEK Communicated at an Issue Identification Meeting

The public and federal government agencies were invited to an Issue Identification Meeting in Brocket to assist the Panel in the identification of outstanding issues and information gaps in the existing documentation of the project. At the end of January, FEAR0 assembled a team of technical specialists, government and some local communities to review all the input obtained to date. The Panel then prepared a document entitled: “Response to the Panel’s Additional Information Requirements.” This document, being the closest thing to an EIS, became the focus of discussion at subsequent public meetings.

Comments from Individuals

-Environmental impacts will affect the weather pattern (e.g., will result in the wind problem getting a lot worse; (Mr. Potts Sr.).

- Concern about possible mercury-related health impacts from dam construction for aboriginals who utilize plant, animal, and fish life along river; (Mr. R. Crow Shoe).

-Concern that once reservoir is filled, there will be a change in temperature (wind and water) which will impact the Peigan community; (Mr. W. Big Bull).

-Concern about impact downstream from dam, belief that whole river will be damaged (i.e., impact to known and unknown plant species that may be lost due to flooding of river valleys and lowered water levels below dam; (Mr. J. Holloway).

Community/general TEK

-Group concerned that not enough known about the flora/fauna of river communities (e.g., protection needed for rare, threatened and endangered species); and,

Concern about impact of dam to river bottom (i.e., loss of wood such as willow used in sacred rituals); (Lone Fighter Society's submission - Brockett, Dec.18/90).

-Concern that Peigan people and land is directly and negatively affected by dam (reduced fisheries and wildlife, river bottom erosion, silting, sedimentation, elimination of cottonwood trees and many sacred/medicinal plants; (Chief L. Bastien - Nov.21/91).

2.13 TEK Communicated at the Final Public Meeting

Comments from Individuals

Concern that downstream wildlife and plant life are not as plentiful or healthy as used to be, (e.g., fish, saskatoons, chokecherries and other berries along with certain medicinal herbs); (J. Crow Shoe).

Concern for continued traditional use of willows, plants and herbs for spiritual (e.g., Sundance ceremonies etc.) and medicinal purposes (e.g., sacred medicinal bundles); (Holy Roads Woman).

-For two summers, elders have been going out to observe roots, sweetgrass, berries and there hasn't been any - today there are too many burrs growing because the rivers are over pasture; (R. Yellow Horn).

Concern that past recreational and traditional activities around irrigation weir has now ceased due to apparent danger of drowning from new existence of whirlpools and increased flow of river; and,

-Need to mitigate concern that wells adjacent to the river are drying up or are increasing in salinity and contaminants and;

Concern for breeding importance of habitat for mule and white-tailed deer in region of reservoir area; and,

-Factors affecting the movement of wildlife onto reserve lands which impact on traditional harvesting activities; (D. Small Legs).

2.2 Examples of Scientific Methodology Supporting TEK-Based Concerns

-B. Reeves (Nov.7/91) provides a white man's perspective on the potential impact of the dam on Piikani sacred ecology based on conversations with elders. Major components of the ecosystem are critical to the maintenance and continuity of Piikani religion such as: medicine lodge and fires can only be constructed of cottonwood; changes in river habitat and productivity will affect the sacred eagle population; medicine bundles are only sacred if they contain specific species of plants.

3.0 Beaufort Sea Hydrocarbon Production and Transportation

3.1 Overview of Community Consultation

A one day issues seminar was convened by FEAR0 in Calgary (Nov./80) to gain a better understanding of the issues that were most important to the possible participants. Although the timing and location of the seminar made it difficult for all aboriginal communities to attend, it was successful at reiterating the major concerns (but not significance of issues) held by the various stakeholders including the aboriginal communities present (Sadler, 1990) (see recommendation # 7).

For the first time, draft EIS guidelines prepared by the Panel (Feb./82) were scrutinized at public meetings and community individuals were able to communicate their TEK-based concerns and predictions. The inclusion of community concerns at this stage was at the request of DIAND and was reflected earlier in the Panel's (Oct./81) operational procedures and terms of reference. These guidelines were further clarified in a Panel document (Feb. 83) entitled: "Procedures for Community Sessions" which was widely distributed to aboriginal communities prior to the main public hearings (see recommendation # 9).

3.2 TEK at the Pre-EIS Guidelines Stage

At an early stage in the review, a Regional Office was opened in Inuvik to coordinate public involvement and community preparation. With support from the Secretariat staff, a local resident was hired to run the office and undertake an active program of formal and informal meetings with community leaders and residents (see recommendation # 3).

The regional office in Inuvik was complemented by the Panel sponsorship of several community workshops. These workshops mainly focused on community development

themes such as developing methods for locally-based EARP participation, and reviewing the EIS. One innovative workshop involved all issues being grouped and organized on a social and scientific criteria basis such as the effects of the proposal on resource harvesting and the traditional livelihood (see recommendation # 7). .

3.3 TEK at the Draft EIS Guidelines Stage

33.1 Comments from Individuals

-Concern that above surface pipeline will interfere with moose migration to the rivers (where fall hunt occurs); (Chief Doctor, Fort Norman; Nov.17/81).

-He and fellow hunters have seen that caribou and muskox have changed their migration route since exploration (in some cases left their feeding grounds and starved); and,

-"People in the past tell us that if animals go to a place that doesn't freeze up, they will die"; (Mr. C. Akeeagok, Pangnirtung).

-Concern that moving ice packs around Orendas Harbour are important breeding/feeding sites which could be adversely affected by the proposed tanker route; (Mr. Innotiko, Pangnirtung).

-Observation that there are less animals in the last 14 years (i.e., since ships have been coming close to the shore base); and,

-Prediction that year-round use of shipping routes and fumes of a ship will cause problems for the wildlife (e.g., a seal will not lay on top where a snowmobile has passed over the hole - whereas, there are no changes in seal behaviour if a dog goes by; (Mr. Kooneeloosie, Pangnirtung - Dec.4/81).

-Concern that disruption of seals living on newer ice may intrude onto older, thicker ice which will result in newcomer seals being killed off by resident seals; and,

-If there is too much disruption animals will move to a place where there is insufficient food or habitat for them; (Mr. Kalluk, Representing concerns for Arctic Bay - Pond Inlet).

Compendium of written submissions to the Panel

-Concern of people from Old Crow about the escalating long-term threats and integrity of the Porcupine caribou herd (e.g., illegal poaching from new roads near construction sites); (B. Simpson -Band Manager, Fort McPherson).

Concern for some of 160 species of birds and 55 mammal species in region which breed or migrate near the pipeline route, or require virtual undisturbed habitat (e.g., caribou and dall sheep); and,

-Concern about impact of noise and human disturbance of construction activities to wildlife; (R. Charlie - Band Manager, Old Crow).

3.4 TEK Communicated at Final Public Hearings

3.4.1 Individual Oral TEK

Concern with Stokes Point (construction) is that it will drive the caribou away (i.e., it is only recently that they have started coming close to Aklavik like they used to; (Mayor G. Edwards, Aklavik - Sept.15/83).

-Recommended that ship passage cease for period in spring when seals are having pups since (contrary to proponents presentation) bearded seals are concentrated right through the Prince of Wales Strait (not just shallow waters); Mr. R. Kuneyuna, Holmes Island -Sept.16/83).

-In response to concern about migrating wildlife coming into contact with an oil spill, proponent response about polar bears not swimming in summer was corrected by observation that Eastern Arctic bears do swim in summer and in winter they hunt through a seal hole and sometimes go in the water; (Mr. Allooloo - Panel member, Coppermine, Sept.19/83).

Concern that some of the Rat Lakes had gone dry due to ice roads constructed beside the lakes and that fish had become scarce in areas where creeks were filled in; (Mr. H. Andre, Arctic Red River resident at Fort McPherson Comm. Session - Sept.21/83).

-Observation of damage to a site that was used for land drilling was no longer used by caribou after drilling had ceased (reinforces concern for potential damage to caribou calving grounds); (Chief J. Charlie, Fort McPherson).

Concern over caribou in Hammer mountain area, where people (non-natives) go out on bikes to hunt caribou without local hunter and trapper groups having any say; (Ms. Doolittle, Norman Wells -Sept.26/83).

-Observed dead animals and general wildlife decrease on seismic roads (also roads constructed along 2 lakes wiped out the rat population); (Mr. F. Andre - 80 yrs., Fort Norman - Sept.28/83).

3.4.2 Community/general TEK

-Concern from noise from ice-breaker on delicate hearing and communications of sea mammals (e.g., whelping areas of the bearded and ringed seals), including effects on breeding habits and habitats; and,

-Prediction that if bearded seal's habitat is split into two or more pods, new pods may starve because of a lack of sea bottom vegetation in new locations; and,

-Prediction that when tanker corridor becomes uninhabitable by the prey of polar bears and Arctic foxes (e.g., due to noise or delayed spring breakup from ice build-up), they too will follow suit in search of a new location which is already populated by animals of the kind, therefore creating [disharmony] in the very delicate environment; (Sachs Harbour Trappers Association, 1983).

-Prediction that when an alien intruder (i.e., ice-breaker) is introduced to their breeding and pupping grounds, changes to behavioral patterns can be detrimental to long-term survival (e.g., fear that numerous ringed and bearded seals in Prince of Wales Strait may split into many pods and intrude on other established pods, thus creating a stress to the ecosystem due to an over-population of animals); (Beaufort Hunters and Trappers Association, undated).

-Local hunters know that Amundsen Gulf is a major feeding ground for Beluga before they head west to the Mackenzie Bay area because these whales are fatter than those found in the Mackenzie Bay area, and,

-Although unproved by biologists, beluga are believed by locals to have migrated west to Amunsden Gulf before heading west to the Mackenzie Bay area; and,

-Observations by elders indicate that char in the Koojuak river are reported to migrate as far as 200 miles; and,

-All known areas by the Inuit are considered to be critical areas for different reasons, community TEK has been used to identify and map out critical habitat areas for migrating, feeding and staging, for producing, spawning and nesting, and for hunting, trapping, fishing and traditional camp sites; (The Inter-Relationships of the Beaufort Sea Amundsen Gulf Ecosystem and Possible Impacts of Development from the Perspective of Holman Island - R. Kuptana, Apr./1983).

4.0 Norman Wells Oil Field Development and Pipeline

4.1 Overview of Community Consultation

The Panel Secretariat undertook a public information program for communities affected by the project. In preparation for the public meetings, Panel members and staff visited the Mackenzie Valley communities to distribute the EIS and to hold information meetings in Band and Settlement offices in the project area and in the Yellowknife and Hay River areas. The Panel followed guideline procedures by placing advertisements in local newspapers and compiling a mailing list. Media announcements and public notices were made of the times and locations of upcoming public meetings. In a number of communities, local interpreters provided translation to the native language of the community (Slavey or Dogrib) (see recommendation # 12).

Throughout the community meetings and from written submissions, one issue repeatedly brought to the Panel's attention was that "Dene land claims and rights should be settled before a decision could be made on the approval of the project". Unfortunately, this outstanding issue (along with a request for revenue sharing), precluded any substantive consultation for which TEK-based concerns could be communicated by aboriginal resource managers (see recommendation # 12).

Appendix 2:
Obtaining TEK in Panel Reviews

1.1 Selection of Panel Members and Advisors

The collective knowledge and experience of the EARP Panel membership plays a significant role in the ultimate weighing (i.e., preparation of final recommendations) of the multi-stakeholder concerns. A Panel typically begins by identifying the key disciplines and special areas of knowledge relative to the assessment. Provision of this expertise is coordinated by FEARO, particularly the Scientific Advisor (Figure 1). Although the criteria for selecting hired technical experts are similar to those for screening Panel members, experts residing in the potentially affected area are preferred for their familiarity with the local environment, if they are perceived as impartial. Table 1 summarizes the extent of Panel member biographies that demonstrated an understanding (or direct involvement), with the activities and cultures of the local aboriginal communities involved in the study (see recommendation # 2).

Table 1: Extent of Panel Membership Understanding of TEK Concerns

Panel Review Case-Study	Total Number of Panel Members	Panel Members With TEK Understanding
Military Flying Activities	7	3
Oldman River Dam	6	1
Beaufort Sea	7	3
Norman Wells	5	2

Figure 1: Panel Structure Describing Panel Membership and Support Staff

Panel Chair

Members (formerly 4 to 8, now 2 to 4 members)
(Selected exclusively from outside the federal public service and appointed by Minister of the Environment)

Support Staff (provide staff support to Panel)
- Panel Manager (Regional Manager, FEAR0 Operations)
- Scientific Advisor
- Technical Experts (outside consultant/academic experts)
- Other Support staff (FEARO), as needed

1.2 Panel Terms of Reference and Operating Procedures

In accordance with existing federal guidelines and in consultation with the initiating department, FEAR0 staff are responsible for drafting the Terms of Reference and Operating Procedures for the Panel. The Panel mandate is usually based on the letter of the referral and designed to be broad and flexible in order to help the Panel prepare a final report to the Ministers. The Panel report contains the information deemed essential by the Panel to contribute to the decision-making process. The mandates for the Panel case-studies were not consistent at requesting that aboriginal special knowledge of the local environment (TEK) be made throughout the Review process (see recommendation # 1).

1.3 Role of the Panel Manager and the Public Information and Participation Program

The Panel Manager coordinates the Panel's Public Information 'and Participation Program. The program is initiated by preparing announcements (e.g., local media) outlining pertinent information for public meetings such as locations, timing, and agenda to encourage public comments and participation.

1.4 Community Consultations

1.41 Public Information Meetings

In small communities or remote, sparsely populated regions that may to be affected by a project, the Panel's support staff may conduct local public/information meetings. These are convened at the discretion of the Panel in close consultation with the Panel Manager (i.e., advises the Panel on whether sessions are necessary according to FEAR0 corporate memory and consultation with colleagues).

Panels may sometimes hold meetings midway in a review to assist participants in seeking further clarification of an EIS. These meetings are usually held before written comments on the adequacy of the EIS have been received by the Panel, and before the Panel makes its final decision on the adequacy of the EIS (see recommendation # 8).

Individuals from outside the affected community are not usually present at these meetings (unless invited by the local community residents). The meetings are structured to provide a comfortable and non-confrontational atmosphere (see recommendation # 5).

1.4.2 Public Scoping Meetings

The earliest stages of aboriginal community consultation in EARP involve closely related "scoping" meetings known as: Issues Identification Meetings or Issues Seminars. These meetings are structured to help the Panel fulfil its mandate by: (a) - Introducing the Panel members to the community and informally discussing the Panel Operating Procedures; and, (b) - Focusing the Draft EIS guidelines on the most important issues as determined by locally affected aboriginal community members.

The Panel usually makes **a** public announcement of the planned scoping meetings to enable interested parties to register and receive an Issues Paper in advance of the meeting. An output of scoping meetings usually includes transcripts or summaries and a compendium of comments received which assists the Panel in preparing the subsequent draft EIS Guidelines (see recommendation # 6).

1.43 Public Workshop Sessions

If scoping meetings have not taken place, comments from aboriginal communities can also be obtained from public workshops. The setting, structure and timing of these informal meetings are determined by the Panel (see recommendation # 7).

1.4.4 Public Hearings

These hearings are mandatory for all Panel Reviews and may involve three types of sessions. “Community sessions” are convened to obtain local concerns on the EIS, including any supplementary information requested by the Panel. The proponent(s) can send one or more representatives (e.g., technical experts), the media are also invited to attend and the full Panel must be present. Any serious or significant concerns raised by local residents that cannot be addressed adequately in this setting may be raised again by the Panel at “general sessions” held in larger centres (where proponent experts and technical agencies are present). If deemed necessary by the Panel, arrangements can also be provided for aboriginal representatives from small or remote communities to attend the general sessions (see recommendation # 9). When necessary, “technical sessions” which focus on specific issues may also be held, usually in larger centres; these may also .be attended by all interested parties, including aboriginal people.

Appendix 3:
References to TEK in Panel Recommendations

1.0 Low-level flight training in Labrador

As the final public meeting and Panel report is currently pending on required information from DND (as requested in the revised deficiency statement - Dec./91), the following TEK concerns and predictions as made by the Naskapis of Quebec and the Montagnais of Labrador are mentioned in the Panel's revised deficiency statement:

-The EIS must incorporate relevant material on the Naskapis and Montagnais of Labrador and Quebec and must draw upon research on related aboriginal groups (see recommendation # 11);

-The proponent must identify a comprehensive set of valued ecosystem components including the aspirations of the residents of the Project Area (see recommendation # 11);

-The EIS must take into account the past, present and future dynamism of the ecosystem, including that of the relevant cultures, societies and economies, in relation to the duration of the project.

-The EIS must make full use of the knowledge, understandings, and interpretations of aboriginal persons. Should any aboriginal organization refuse to cooperate, the Panel will accept such relevant information as can be derived from the literature on the data, knowledge, understandings and interpretations possessed by aboriginal persons (see recommendation # 11);

-The EIS must contain a thorough, critical review of the published literature on the impacts of noise on wildlife;

-The proponent must take all necessary steps, including consultation with aboriginal peoples and review of the literature, to identify the full range of possible impacts of the Project;

2.0 Oldman River Dam

Of the 23 recommendations made by the Oldman River Dam Panel in their final report (May, 1992), the following TEK-based concerns (Appendix 1) raised by the Peigan Nation were covered in the Panel's final recommendations:

Peigan TEK-Based Concerns	Relevant Panel Recommendations
Concern for potential mercury impact to fisheries	Routine monitoring program for mercury in downstream fishes should be instituted
Concern for downstream impact to flora river communities such as cottonwood and willow trees, and medicinal uses of herbs and plants	Monitoring, evaluation and management of riparian cottonwood forests should be made a condition of approval
More info. needed on flora/fauna of downstream river communities	Conduct surveys of down-stream plant species and regulate water discharge to maintain riparian ecosystems
Prediction of impact to wildlife breeding habitat and traditional harvesting activities	Ensure long-term wildlife mitigation program that is inclusive of Peigan concerns
	Assist Peigan in carrying out assessment to identify and mitigate potential impacts to Peigan people, religion, culture and land

3.0 Beaufort Sea Hydrocarbon Production and Transportation

Of the 83 recommendations made by the Beaufort Sea Panel in their final report (Jul./84), the following TEK-based concerns (Appendix 1) raised by the region's indigenous peoples' were covered in the Panel's final recommendations:

Aboriginal TEK-Based Concerns	Relevant Panel Recommendations
Concern about animal populations decreasing	Governments give communities (hunters and trappers) a stronger role in harvesting and monitoring studies (e.g., fish and wildlife resource planning and decision-making)
Concern of noise impact to delicate hearing of sea mammals including habitat disruption to seals and other marine life	DFO to undertake research on extent to which vocal sounds used by marine animals are masked or interfered with by ship-sounds; and, determine extent of any acute physiological response resulting from ship sounds
Concern for species of birds and animals which breed or migrate near pipeline route	CWS and DOE expand baseline data research on most important bird species likely to be affected
Concern of pipeline disruption to caribou migration habits	Undertake computer simulation modelling of caribou population dynamics for design of mitigation/monitoring programs

4.0 Norman Wells Oil Field Development and Pipeline Project

Since the proponents (Esso and IPL) submitted a joint EIS in Apr./80, before the Panel formation was complete, the Panel did not issue guidelines or hold pre-EIS community consultation sessions. Instead, during the Panel EIS review period (May-Sept/80), four requests for additional information were issued to the proponents (i.e., "Summary of Issues on Which the Panel Requests Further Information" - Aug./80), of which there was no direct mention of the proponents

utilizing or integrating TEK from the Dene and Metis of the region in the various scientific studies undertaken (see recommendation # 11).

Of the 61 recommendations made by the Panel in their final report (Jan./81), the following recommendations reflect aboriginal concerns even though the Dene did not participate in public hearing for reasons described in Appendix 1:

Relevant Panel Recommendations

-The proponent should submit plans on the pipeline route with emphasis on route changes to minimize project impacts on the lives and activities of the native people in Mackenzie Valley and Alberta (i.e., to keep the pipeline further east from communities of Fort Norman and Wrigley);

-A public information program is immediately needed to inform residents about the potential project impacts and mitigation measures, and to obtain the advice of Mackenzie Valley residents for the purposes of planning and decision-making;

-IPL should undertake baseline studies on hunted and trapped species to provide an assessment on the impact on wildlife and to develop mitigation measures;

-Construction and drilling activity on the islands should cease during the peak spring waterfowl migration period (1-2 weeks) and that helicopter access to the islands should be restricted;

-All aspects of project development which affects Fort Simpson and Hay River should be planned and carried out in close cooperation with local authorities in those communities;

Appendix 4:
Aboriginal Involvement in Post Project Approval Environmental Monitoring

1.0 Dene and Metis Participation in the Norman Wells Project

1.1 Environmental Monitoring Program

The Norman Wells EARP Panel was mandated to compile recommendations on environmental terms and conditions under which the project would proceed. In the Panels final report, the following recommendations were made in regard to a post-project approval role played by the affected Dene and Metis communities:

> #(59) - "It is recommended that liaison between the communities in the project area, the GNWT and the proponents should be formally organized immediately. This consultation is necessary not only in pre-construction planning and construction phases, but also in the first few years of the operation of the project"; and,
>
> #(60) - "It is recommended that the Department of Indian and Northern Development (DIAND) take the initiative in identifying the agencies to address the terms and conditions raised by the Dene Tha Band, and in coordinating the responses to them".

DIAND subsequently responded by creating a Project Coordinating Committee (PCC), a voluntary, non-regulatory group chaired by a Project Co-ordinator from DIAND. Although the PCC was mandated to facilitate coordination and information and liaison responsibilities, the Dene did not have any input into the TOR's for the co-ordination structure. The following structures were intended to provide opportunities for input from the Dene and Metis communities to help manage and monitor project-related environmental impacts (Appendix 1):

(i) the Community Advisory Committee (CAC);
(ii) the Research and Monitoring Working Group (RMWG); and,
(iii) the Joint Environmental Working Group (JEWG).

1.2 The Norman Wells Research and Monitoring Working Group

In August of 1982, Jim Bourque (Government of Northwest Territories) made a request for the development and implementation of an intergovernmental

research and monitoring program (later called the Research and Monitoring Working Group) for the Norman Wells region. Based on some of the most relevant TEK-based concerns of the Dene, members of the Working group worked to establish a corresponding set of priority environmental issues to guide the design of the monitoring program:

Dene General TEK Concerns	Research and Monitoring Working Group Priorities
-"people have fear to drink the water and that the their fish will be gone", and	-fish quality and physiological condition downstream of Norman Wells refinery; and,
"I don't study the fish like white people do, but I know what it's doing, because I live with it, and now all the things they said they're going to put in the water maybe goes down in the river, all the fishing is going to be stopped. They say it's not going to go that far but the fish will tell us." (George Blondin - Ft. Franklin)	aquatic impacts from the construction of pipeline stream crossings.

1.3 The Norman Wells Joint Environmental Working Group

In Nov. 1983, the Dene Nation made a submission to the Project Coordinating Committee, suggesting some changes to the joint monitoring regime. As outlined in a report released in 1985 by the Dene Nation, changes were necessary because the existing regime provided no mechanism for Dene/Metis input (i.e., no integration of TEK); and because monitoring requirements being enforced were not sufficient to meet Dene standards for environmental protection (see recommendation # 10).

An important change proposed by the Dene Nation included the establishment of the Joint Environmental Working Group (JEWG) to help co-ordinate, evaluate, and recommend improvements to the monitoring regime. The JEWG sub-committee has been successful in providing a forum for seeking action on some of the major environmental concerns identified by Dene communities along the Mackenzie river. Fisheries related TEK concerns

(particularly the poor health and quality of Mackenzie river fish downstream of Norman Wells), were raised more often than any other issue at the EARP and Water Board community hearings.

Community members of Fort Good Hope (due to the importance of traditional fishing camps) made a request to the NWT Water Board in Aug. 1983 to consider implementing a fish monitoring and sampling program. By Nov. 1983, Dene resource users had identified fish abnormalities (e.g., black stunted livers, internal tumors, blood-spotting in fish eggs, general small size, and soft watery flesh); as well, a general decrease in the number of fish harvested (Dene Nation, 1985).

This program was followed up in April 1985 with a three-year co-operative study effort between the Dene and the Department of Fisheries and Oceans (DFO) to collect, sample, and analyze fish from four locations. It was later confirmed in subsequent testing by DFO, that some fish were indeed, contaminated by pesticides (Brian Wilson, DOE comm. - Sept./92).

Appendix 5:
A Comparison of Knowledge Systems

Wolfe et. al. (1991) provide a useful table (Figure 2) which makes some comparisons between the western scientific knowledge paradigm and the indigenous knowledge paradigm.

Figure 3 provides another perspective of the two knowledge systems for managing natural resources and the environment (Bourque et. al. 1992).

Figure 2

SOME COMPARISONS BETWEEN INDIGENOUS KNOWLEDGE AND WESTERN SCIENTIFIC KNOWLEDGE

	INDIGENOUS KNOWLEDGE	WESTERN SCIENTIFIC KNOWLEDGE
Relationship	Subordinate	Dominant
Dominant Mode of Thinking	Intuitive	Analytical
Communication	Oral	Literate
	Teaching through doing and story-telling	Didactic
Characteristics	Holistic	Reductionist
	Subjective	Objective
	Experiential	Positivist
Effectiveness		
Data Creation	Slow/Inclusive	Fast/Selective
Prediction	Short-term cycles	Short- term linear
	Recognizes the onset of long-term cycles	Poor long-term prediction
Explanation	Spiritual - Includes the Inexplicable	Scientific Hypotheses Theory and Laws
Classification	***	***
Biological Classification	Ecological	Genetic and Hierarchical
	Inclusive - internally differentiating	Differentiating