

Report of the EUB-CEAA Joint Review Panel

**Cheviot Coal Project
Mountain Park Area, Alberta**

EUB Applications No. 960313 and 960314

Cardinal River Coals Ltd.

August 2000

Canada

 **EUB** Alberta Energy and Utilities Board

**Report of the EUB-CEAA Joint Review Panel
Cheviot Coal Project
Cardinal River Coals Ltd.
(EUB Decision 2000-59)**

September 2000

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PANEL FINDINGS

In response to a request from the President of the Canadian Environmental Assessment Agency (CEAA) and a decision by the Alberta Energy and Utilities Board (EUB), the Joint Review Panel (Panel) reopened public hearings on March 1, 2000, into the environmental, social, and economic impacts of an application by Cardinal River Coals Ltd. (CRC) to develop the Cheviot Coal Project (Project). A summary of the Panel's conclusions and recommendations to the federal government and decisions made under its provincial mandate are set out below. The information used and the Panel's reasons for reaching the various conclusions are set out in detail in the main body of this report. In general, conclusions made in this report are supplemental to those made in the Panel's 1997 report, *Decision 97-8* (Appendix 1) and include any new information obtained since the release of that report.

Conclusions

The Panel has carefully considered the new evidence it has obtained since the close of the 1997 hearings, as well as the evidence presented in the 1997 public review. A summary of the Panel's conclusions based on its review of the above evidence is set out below.

- 1) With respect to the need to consider alternative means (i.e., underground mining) to the open-pit mining proposed in the Project, the Panel believes that it has received all required information. Based on this information, the Panel concludes that the surface mining design of the Cheviot Coal Project is the only economically feasible method of coal extraction. The Panel also concludes that since the underground mining alternative does not meet CRC's long-term needs for coal, the company will in the foreseeable future still require a substantial surface mine at the Cheviot site. Therefore, the Panel concludes that there is no real reduction in the eventual cumulative adverse environmental effects associated with the underground mining alternative.
- 2) With regard to the consideration of the submissions of the Canadian Nature Federation, the Panel believes that the appropriate reports and evidence have now been entered into the record and fully considered. The Panel notes that representatives of the Canadian Nature Federation attended the hearing, presented information, responded to questioning from the other hearing participants, and provided final argument to the Panel. This information has been considered by the Panel and is described, where relevant to the Panel's mandate and its terms of reference, in the various sections of the report.

- 3) The Panel concludes that the primary sources of regional (cumulative) impacts are forestry, other mining, oil and gas, and recreational developments and that the Valued Environmental Components (VECs) and the temporal and spatial boundaries selected by CRC to assess any associated adverse effects are appropriate.
- 4) With regard to the need to acquire and consider all the available information on forestry activity in the vicinity of the Cheviot Coal Project, the Panel believes that it has now obtained this information. This information provides the most current and comprehensive basis for understanding the cumulative impacts of the Project in association with regional forestry development.
- 5) With regard to the need to acquire and consider all available information on mining activity in the vicinity of the Project, the Panel believes that it has obtained all available information on both approved and reasonably foreseeable plans for mining in the region. This information provides the most current and comprehensive basis for understanding the cumulative impacts of the Project in association with other mining development.
- 6) The Panel concludes that the information provided with respect to oil and gas development and recreational activity was complete and sufficient to address potential cumulative effects in the region.
- 7) With respect to impacts on surface water quantity, the Panel concludes that there will be no significant cumulative adverse effects on surface water flow but that some minor localized negative effects may occur with respect to short-term peak flow and annual flows. These effects can be effectively mitigated through appropriate water control designs, which include the management of storm flows and the filling of end-pit lakes in such a way as to avoid negatively affecting low flows.
- 8) With respect to water quality, the Panel is satisfied that the impacts of Project-related sediment and nitrogen inputs to surface waters will not cause significant adverse effects either on their own or in conjunction with other regional sources. A potentially significant adverse cumulative effect of sediment input could arise if a major storm event occurred while both CRC and regional oil and gas or forestry companies were engaged simultaneously in road or rail construction. This impact could be effectively mitigated through the coordination of CRC's construction schedules with those of other regional industries.
- 9) The Panel concludes that while the Project will have some significant adverse effects on fish and fish habitat, CRC's plan to enhance fish habitat in water bodies created on the site and other similar strategies provide reasonable compensation for the habitat that will be disturbed by the mine.
- 10) The Panel believes that increased angling pressure associated with improved access could adversely affect fish populations on a regional basis, but concludes that since fisheries managers can adapt local regulations to prevent overharvesting, the risk of this is insignificant.

- 11) The Panel concludes that its original findings regarding the risks of accidents and malfunctions and the impact of the environment on the Project remain relevant and any adverse effects are insignificant.
- 12) The Panel concludes that selenium levels in the aquatic environment, while warranting ongoing monitoring and research, do not currently represent a significant risk of adverse effects on regional water quality.
- 13) The Panel concludes that no significant cumulative adverse effect on the vegetative and botanical resources VEC will occur as a result of the Project. The Panel remains concerned with the efficacy of one mitigation measure, the identification and transplanting of rare and unique species, and will require that monitoring be continued and that other methods are also considered to protect this resource in order to ensure that mitigation remains effective.
- 14) With respect to elk, the Panel concludes that both Project-specific and cumulative adverse effects on this VEC will be of a minor nature and insignificant.
- 15) The Panel concludes that while cumulative impacts to various bird species through losses in habitat will occur in the region, these impacts will either not be significant or will be readily mitigable using existing techniques and planning processes, so that no significant adverse effect will occur.
- 16) In its initial report, the Panel concluded that some adverse effects on Harlequin duck populations would be experienced within the Cheviot mine site. The Panel also concluded, however, that the proposed mitigation measures, including ongoing monitoring, would be sufficient to mitigate these adverse effects and render them insignificant. The Panel believes that these conclusions continue to be well supported by the new data now available. The Panel does note that some cumulative effects due to increased recreation levels in the region are predicted but believes that, with appropriate mitigation, these will not be significant.
- 17) The Panel confirms its original conclusion that without mitigation the Cheviot Coal Project will result in significant adverse effects on grizzly bears. The Panel also concludes that without mitigation there is a significant risk of regional adverse effects, with or without the Project. Finally, the Panel concludes that the potential adverse effects of the Cheviot Coal Project on the grizzly bear can be effectively and adequately mitigated through regional planning and implementation of the February 10, 2000, “Grizzly Bear Conservation in the Yellowhead Ecosystem: A Strategic Framework” (Strategic Framework).
- 18) The Panel concludes that without additional measures there is a significant risk that the Cheviot Coal Project will have a significant impact on recreational uses of the area. The Panel also concludes that these effects can be effectively mitigated and suggests two specific steps to be considered. One is the creation of a new regionally based off-highway

- vehicle staging area. The second is the incorporation of the Cardinal River headwaters into the Whitehorse Wildland Park.
- 19) With regard to access management, the Panel concludes that road and other linear development densities are increasing in the region and without suitable mitigation will eventually result in adverse environmental effects. The Panel also concludes that a number of existing regulatory tools are available to address access. Within the context of clearly stated regional objectives for access management and an established process to achieve them, the Panel concludes that the above tools can effectively mitigate any future regional cumulative effects from human access. The Panel also concludes that the various planning initiatives in the region will play an important role in implementing these mitigative measures.
 - 20) With respect to traditional use of lands by aboriginal people, the Panel concludes that despite the measures developed by CRC in collaboration with the Alexis First Nation and the Mountain Cree Camp (formerly referred to as the Smallboy Camp) to reduce the impacts on traditional uses and traditional sites, some significant adverse effects may occur. The Panel concludes, however, that these adverse effects can be justified within the context of the Project as a whole.
 - 21) The Panel concludes that CRC has, for the purposes of this review, carried out reasonable and adequate consultation with all of the various aboriginal groups that are or may be affected by the Cheviot Coal Project, including the Treaty 8 First Nations.
 - 22) The Panel concludes that it is unlikely that the Project will adversely affect the health, socioeconomic conditions, physical heritage, cultural heritage, or current use of land resources by the Treaty 8 First Nations or by their members for traditional purposes and that if any adverse effects do occur they will not be significant.
 - 23) With respect to social benefits and costs, the Panel concludes that the Project, when compared to other potential uses of the area, will generate the greatest economic benefits to the region. The Panel concludes that the regional economic benefits of the Cheviot Project significantly outweigh the value of optimizing its current uses for recreation or alternative uses for wildlands protection.
 - 24) The Panel continues to be satisfied that CRC has demonstrated that the Cheviot Coal Project is economically viable into the foreseeable future.
 - 25) The Panel concludes that the provincial regulatory process, which includes a number of ongoing and/or renewable permits and licences for the Project, will ensure that the various monitoring programs and mitigation strategies are successfully implemented.

Recommendations

With regard to its responsibilities as set out under the *Canadian Environmental Assessment Act*, and its Terms of Reference, the Panel recommends that the Cheviot Coal Project receive regulatory approval from the Government of Canada.

The Panel has also made a number of more specific recommendations, which are summarized below:

- 1) The Panel recommends that the primary sources of cumulative effects proposed by CRC in its assessment of the cumulative environmental effects of the Project, i.e., other mining projects, forestry, oil and gas development, and recreation, be accepted by the federal government as appropriate for the cumulative environmental assessment (CEA).
- 2) The Panel recommends that the 11 VECs selected for the purpose of assessing the cumulative environmental effects of the proposed Project, i.e., surface water quantity, water quality (sediment), water quality (nitrogen), fisheries, vegetation and botanical resources, wildlife (elk), wildlife (selected bird species), wildlife (Harlequin duck), wildlife (grizzly bear), public access (recreation), and traditional use, be accepted by the federal government.
- 3) The Panel recommends that the temporal and spatial boundaries used in the CEA for the purpose of assessing the cumulative environmental effects of the proposed Project be accepted by the federal government.
- 4) The Panel recommends that Parks Canada lead the development of a program to monitor recreational activity levels in the mountain passes leading into Jasper National Park from the region.
- 5) The Panel recommends that the federal government accept the Panel's conclusion that the development of the underground mining alternative is not economically feasible, nor would it result in any substantive reduction in the environmental effects associated with the proposed Project.
- 6) The Panel recommends that the federal government accept its conclusions that cumulative adverse impacts on the aquatic VECs will be negligible to minor and that residual impacts can be either successfully mitigated or addressed through compensation.
- 7) The Panel recommends that the federal government accept its conclusion that, for the purpose of assessing the environmental effects of the Project, the risks of accidents and malfunctions and the impact of the environment on the Project have been adequately addressed and will not result in significant adverse effects.
- 8) The Panel recommends that, through the Foothills Model Forest Committee, the Department of Fisheries and Oceans (DFO), in partnership with Alberta Environment

- (AENV), lead the formation of a cooperative regional research and management subcommittee to help develop and implement aquatic monitoring and research and management programs in the McLeod and Cardinal River watersheds. The Panel also recommends that DFO actively participate in this and any other regional aquatic studies.
- 9) The Panel recommends that DFO continue to participate in the selenium working group in order to ensure that any federal requirements continue to be met.
 - 10) The Panel concludes that no significant cumulative adverse effects on the vegetation and botanical resources VEC will occur and recommends that this conclusion be accepted by the federal government.
 - 11) The Panel concludes that both Project-specific and cumulative impacts on elk will be insignificant and recommends that the federal government accept this conclusion.
 - 12) The Panel recommends that the federal government accept its conclusion that the proposed mitigation measure for impacts on various bird species, including neotropical migrants, are readily mitigable using existing techniques and planning processes and that the adverse environmental effects will be insignificant.
 - 13) The Panel recommends that the Government of Canada confirm, in a timely fashion, its position with regard to Environment Canada's request for additional research into the effects of industrial development in the boreal forest ecosystem on neotropical migrants.
 - 14) The Panel recommends that the federal government accept the proposed mitigation measures, including ongoing monitoring, as being sufficient to reduce to insignificant any Project-related adverse effects on Harlequin ducks.
 - 15) Given the regional importance of the Maligne River Harlequin duck population in Jasper National Park, the Panel recommends that Parks Canada ensure that its management of this population is integrated into and consistent with the broader regional planning process.
 - 16) The Panel recommends that the federal government accept that current provincial management plans will ensure that cumulative adverse impacts from recreation in association with other industrial development, including the Cheviot Coal Project, on Harlequin ducks are insignificant. The Panel also recommends that the Government of Canada, in cooperation with the Government of Alberta, be prepared to actively support and participate in these management programs. Such participation may include providing funding to ensure their success.
 - 17) The Panel recommends that the federal government, in its response to this report, confirm how it intends to address the issues raised by Justice Douglas R. Campbell regarding the necessary approvals from Environment Canada respecting migratory bird habitat.

- 18) The Panel recommends that the federal government accept the mitigation requirements set out for CRC and the undertakings of AENV as acceptable mitigation for the adverse effects of the Cheviot Coal Project on the grizzly bear VEC.
- 19) The Panel recommends that the federal government, in cooperation with the Government of Alberta, be prepared to actively support any associated planning and research into wildlife in the region.
- 20) Given the progress made to date in developing and implementing regional plans to address recreational issues, the Panel recommends that the federal government accept its conclusion that any adverse effects on the recreational VEC will be insignificant as a result of these mitigation measures.
- 21) The Panel recommends that the federal government allocate adequate resources for effective participation by Parks Canada in regional access planning initiatives.
- 22) The Panel recommends that the federal government accept the measures developed collaboratively by CRC, the Alexis First Nation (AFN), and the Mountain Cree Camp to reduce the impacts on traditional sites and use of the lands and resources in the Project study area as adequate to mitigate the majority of the adverse effects.
- 23) The Panel recommends that the federal government accept that any remaining significant adverse effects on traditional sites and uses are justified in terms of the Project as a whole.
- 24) The Panel recommends that, for the purposes of this review, the federal government accept that CRC has carried out reasonable and adequate consultation with regional aboriginal groups.
- 25) The Panel recommends that both levels of government assess and clarify, in a timely fashion, their perceived respective obligations in relation to consultation with First Nations in the region.
- 26) The Panel concludes that the Cheviot Coal Project as proposed will result in a net economic benefit to the region and recommends that the federal government accept this conclusion.
- 27) The Panel recommends that the federal government accept its conclusion that the Cheviot Coal Project remains economically viable into the foreseeable future.
- 28) The Panel recommends that the federal government determine, in a timely fashion, how it can best contribute to ensuring that opportunities exist for communities, such as Hinton, that are proximal to federal lands and particularly to national parks to develop a sustainable, balanced, and diverse economic base.

- 29) The Panel recommends that Parks Canada, Environment Canada, and DFO receive and assess on an annual basis the results from the various monitoring programs being carried out by CRC. The Panel also recommends that these agencies meet with the EUB and AENV on a regular basis to discuss any concerns that might arise from that review.

Decisions

Having regard for its responsibilities for matters that fall under the mandate of the EUB, the Panel has carefully considered all of the evidence and views presented at the 1997 and 2000 public hearings. The Panel has determined that it did not receive any new evidence during the reopening of the public hearings that would cause it to vary its original decision. The Panel therefore has determined that Applications 960313 and 960314 continue to meet all provincial regulatory requirements and that the Cheviot Coal Project remains in the public interest. Accordingly the Panel is prepared to uphold the approvals already issued. These approvals (Appendix 3) are conditional on commitments made by the applicant at both the 1997 and the most recent public review, as well as the conditions stipulated by the Panel in its 1997 decision (Appendix 1).

Conditions

In addition to those original conditions, the Panel will apply the following conditions to the current approvals:

- 1) CRC shall monitor selenium levels in the water and biota of new end-pit lakes, assess potential adverse effects on biota, and summarize the results in an annual report to the EUB. CRC will continue to participate in the Selenium Working Group to investigate ways to manage selenium in surface waters. As part of the annual report, CRC will describe any changes in the mine project design or operations the company proposes to avoid or mitigate potential adverse effects of selenium.
- 2) CRC shall schedule its rail and road construction after consulting with regional forestry and oil and gas companies to avoid the potential adverse cumulative effects of sedimentation that could arise should a storm event coincide with concurrent road and rail construction.
- 3) CRC shall continue to conduct recognizance-level surveys for rare plant species on the mine property and intensive surveys on parts of the site slated for development. CRC will also monitor the success of rare species transplants. The results of the rare plant surveys and transplant monitoring will be reported to AENV.
- 4) CRC shall, in consultation with the EUB, continue to refine the details of its mine plan to minimize the impact of the mine on grizzly bears. Specifically, CRC will review and address the effects of upcoming management plans for the Whitehorse Wildland Park, threshold values for landscape indicators, the development of the Strategic Framework, regional access management plans, and the response of the provincial government to the Panel's recommendation for further protection of the Cardinal headwaters.

- 5) CRC will report to the EUB on an annual basis on its efforts to identify and protect precontact and historic archaeological sites and to reduce adverse impacts on the traditional use of lands and resources.
- 6) CRC will initiate discussions with AENV to identify and develop an alternative to the Mountain Park off-highway vehicle staging area site before it is closed by mine development.
- 7) CRC will ensure that its development remains consistent with landscape indicator or other thresholds developed through ongoing regional environmental management initiatives.

DATED at Calgary, Alberta, on September 12, 2000.

**ALBERTA ENERGY AND UTILITIES BOARD
CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY**

B. F. Bietz
Panel Chair

G. J. Miller
Panel Member

T. Beck
Panel Member

1 INTRODUCTION

On June 17, 1997, the Alberta Energy and Utilities Board (EUB)/Canadian Environmental Assessment Agency (CEAA) Joint Review Panel (the Panel) released its report (*Decision 97-8*) regarding the construction and operation of the proposed Cardinal River Coals Ltd. (CRC) Cheviot coal mine and processing plant (the Project) south of Hinton, Alberta. The report also addressed TransAlta Utilities Corporation's proposed new transmission line/substation to supply electric power to the Project. *Decision 97-8*, a copy of which is attached as Appendix 1, constituted the findings of the Panel on matters that fall under the jurisdiction of the EUB and its recommendations to the Government of Canada on matters that fall under federal jurisdiction.

Under its EUB mandate, the Panel, having considered the evidence and views presented at the hearing, was satisfied that, subject to a number of conditions, the Cheviot Coal Project met all regulatory requirements and was in the public interest. Consequently, a number of permits, licences, and approvals were issued by the EUB and AENV under applicable provincial legislation.

With regard to its federal mandate, the Panel concluded that sufficient information had been provided for it to be able to determine that the majority of the environmental effects, including socioeconomic effects, were either positive or, where adverse, were not significant. Where the environmental effects were considered to be adverse and significant, they were generally considered to be justified in the context of the Project as a whole or, in the case of nonmitigable habitat loss, the proposed compensation was found acceptable. Accordingly, the Panel recommended that the Government of Canada approve the Cheviot Coal Project and accept the mitigation measures proposed by CRC and subsequently required by the EUB and AENV (previously Alberta Environmental Protection) as adequate.

In October 1997, the Minister of Fisheries and Oceans issued the *Federal Government Response to the Report*, accepting those recommendations and indicating that authorizations for the Project would be issued under the *Fisheries Act*. On August 17 and September 29, 1998, the Department of Fisheries and Oceans (DFO) issued its authorizations (the DFO Authorizations) pursuant to Section 35(2) of the *Fisheries Act*.

On October 31, 1997, a coalition of the Alberta Wilderness Association, the Canadian Nature Federation, the Canadian Parks and Wilderness Society, the Jasper Environmental Association, and the Pembina Institute for Appropriate Development (the AWA Coalition) filed the first of a series of applications for judicial review of *Decision 97-8* and the subsequent DFO Authorizations. On April 8, 1999, Justice Campbell of the Federal Court of Canada—Trial Division determined that the environmental assessment conducted by the Panel was not in compliance with the requirements of the *Canadian Environmental Assessment (CEA Act)* and the Panel's terms of reference and that the DFO Authorization of August 17, 1998, had been issued without jurisdiction and must therefore be quashed. CEAA subsequently requested the Panel to reconvene to address the issues raised by Justice Campbell in his decision in order to comply with the *CEA Act* and with the Panel's terms of reference. At the same time, the EUB determined that since a reopening of the hearing could potentially generate significant new evidence, a

review of the Panel's decision, made under Section 42 of the *Energy Resources Conservation Act (ERC Act)*, was appropriate.

A prehearing meeting was held in Hinton, Alberta, on September 9, 1999, to discuss the issues to be addressed at the reconvened hearing. A *Memorandum of Decision* in respect of the prehearing meeting was issued on September 23, 1999 (Appendix 2). The hearing itself was reconvened in Hinton, Alberta, from March 1 to 10, 2000, and from April 25 to 27, 2000. This report describes the evidence presented to the Panel at the reconvened hearing, the conclusions subsequently reached by the Panel, and the Panel's recommendations to the federal government. This report, together with *Decision 97-8*, constitutes the Report of the EUB-CEAA Joint Review Panel regarding the Cheviot Coal Project.

1.1 Project Description

The Cheviot Coal Project is a proposal by CRC for the construction, operation, and decommissioning of a coal processing plant; for the development, operation, and reclamation of an open pit coal mine; for the restoration of the Mountain Park subdivision rail line; for the upgrading of the existing access road (the Grave Flats Road) into the Cheviot mine area; and for the installation of a new transmission line and substation to supply electric power to the Cheviot mine.

The Project (Figure 1) is located in the Rocky Mountains of west-central Alberta approximately 320 kilometres (km) west of the City of Edmonton and 70 km south of the Town of Hinton. The proposed open pit (surface) mine would be centred around the former community of Mountain Park, approximately 20 km southeast of CRC's existing Luscar mine and 12 km south of the Hamlet of Cadomin.

The Cheviot mine permit area is approximately 23 km long and 3.5 km wide and located within an east-west trending valley. Mining activity has been carried out within the proposed mine permit boundary from the early 1900s until the 1950s. A more detailed description of the Project is available in Section 1.1 of *Decision 97-8* (Appendix 1).

1.2 Current and Future Authorizations

The approvals and authorizations for the Project issued by the Province of Alberta and the Government of Canada are listed in Table 1 below and are attached as Appendix 3.

Table 1. Approvals and authorizations

Approval/authorization	Issued by	Issued under	Date issued
Mine Site Permit No. C 97-14	EUB	S. 10 of the <i>Coal Conservation Act</i>	Aug. 19, 1997
Coal Processing Plant Approval No. C 97-15	EUB	S. 23 of the <i>Coal Conservation Act</i>	Sept. 5, 1997
Cheviot Mine Access Corridor Authorization *	DFO	S. 35(2) of the <i>Fisheries Act</i>	Aug. 17, 1998
Permit No. 98-44-NES (Road)	AENV	S. 11 of the <i>Water Resources Act</i>	Aug. 17, 1998
Permit No. 98-45-NES (Rail)	AENV	S. 11 of the <i>Water Resources Act</i>	Aug. 17, 1998
Authorization No. AB94-052-2 (Facilities)	DFO	S. 35(2) of the <i>Fisheries Act</i>	Sept. 29, 1998
Approval No. 46972-00-00 (Mine & Plant)	AENV	S. 65 of <i>Alberta Environmental Protection and Enhancement Act</i>	Sept. 29, 1998
Interim Licence No. 22085 (Pre-Development)	AENV	S. 24 of the <i>Water Resources Act</i>	Sept. 29, 1998

* Justice Campbell subsequently quashed this authorization in his April 1999 ruling.

Over the life of the Project, CRC will require further approvals, including

- licences from the EUB with respect to the individual pits and external waste rock dumps;
- amendments to the *Alberta Environmental Protection and Enhancement Act* approval from AENV with respect to further development within the Project area; and
- authorizations from DFO with respect to any future harmful alteration, disruption, or destruction of fish habitat resulting from pit development and mining.

2 BASIS FOR REVIEW

2.1 Directions from the Federal Court

As noted earlier, in his *Reasons for Order* with respect to Application T-1790-98, Justice Campbell found that the environmental assessment for the Project was not conducted in compliance with the requirements of the *CEA Act* and the Panel's terms of reference and declared the DFO Authorization issued on August 17, 1998, quashed.

Justice Campbell indicated that, in his opinion, the most appropriate approach would be for the Minister of the Environment to direct the Panel to "do what is necessary to make adjustments to the Joint Panel Decision so that the environmental assessment can be found in compliance" with the *CEA Act*. In this regard, Justice Campbell expressed the opinion that the following directions to the Panel must be met:

- 1) Obtain all available information about likely forestry in the vicinity of the Project, consider this information with respect to cumulative environmental effects, and, accordingly reach conclusions and make recommendations about this factor, and substantiate these conclusions and recommendations in the Joint Review Panel Report;
- 2) Obtain all available information about likely mining in the vicinity of the Project, consider this information with respect to cumulative environmental effects, and, accordingly reach conclusions and make recommendations about this factor, and substantiate these conclusions and recommendations in the Joint Review Panel Report;
- 3) With respect to alternative means, do a comparative analysis between open pit mining and underground mining at the Project site to determine the comparative technical and economic feasibility and comparative environmental effects of each, consider this information, reach conclusions and make recommendations about this factor, and substantiate these conclusions and recommendations in the Joint Review Panel Report;
- 4) Consider the documents "The Canadian Nature Federation's Response to the Environmental Impact Assessment of the Proposed Cheviot Mine Project" and "The Canadian Nature Federation's Response to Norwest's Overview of Rock Waste Disposal Cheviot Mine Plan".

2.2 Panel's Views

The Panel notes that, by correspondence to the EUB dated June 22, 1999, the President of the CEAA requested that the Panel reconvene to ensure that the environmental assessment for the Cheviot Coal Project could be found to be in compliance with the *CEA Act* and the Panel's terms of reference. The request specifically stated the Panel should address the four matters set out in Justice Campbell's decision. As noted earlier, the EUB, under Section 42 of the *ERC Act*, also decided, given the reopening of the public hearing and the possibility that new evidence not previously considered during the previous review may be raised, to review the earlier decision made in respect of the applications. During a prehearing meeting held in Hinton, Alberta, on September 9, 1999, the Panel explored the basis upon which the proposed review would be conducted. The prehearing *Memorandum of Decision* (Appendix 2) stated that the Panel "does

not believe that it is in any way fettered in its ability to address other issues that it finds to be relevant and germane to its review during the course of the public hearing.”

Having regard for the directions of the Federal Court and the regulatory obligations of the EUB, the Panel continues to hold that view. The Panel believes that the appropriate approach to the review is to first consider the new information collected, including any relevant information beyond the specific direction of the Federal Court. The next step is to test the findings and conclusions reached in the earlier review against the new information. In addition to the four items directed to the Panel by the Federal Court, the Panel notes that a large amount of additional evidence was brought forward at the hearing on a number of issues. Additionally, the passage of time since the release of the earlier decision has resulted in additional and more current information being available. For example, in some cases new information directly related to the implementation of recommendations made as a result of the earlier review was now available. The Panel believes that it must consider all relevant information available when considering the impacts anticipated from the proposed Cheviot mine.

The final step of the process is for the Panel, having regard for the information available, to draw any new conclusions and, as appropriate, confirm or revise its recommendations to the federal government. Additionally, the Panel must determine whether there is a need to vary or rescind the EUB approvals currently issued for the Cheviot mine.

3 REVIEW PROCESS

3.1 Terms of Reference/Agreement

The original terms of reference for the conduct of the Joint Review Panel were detailed in an Agreement dated October 24, 1996, between the EUB and the Government of Canada. The overall objective of that Agreement was to ensure that the Project was evaluated according to the spirit and legislated requirements of the EUB and the Government of Canada while avoiding unnecessary duplication, delays, and confusion that could arise from two separate review processes. The Agreement was based on the August 6, 1993, framework for conducting joint panel reviews included within the Canada-Alberta Agreement for Environmental Assessment Cooperation.

In the June 22, 1999, letter from CEAA requesting that the Joint Review Panel be reconvened, the President of CEAA indicated that the original October 24, 1996, Agreement between CEAA and the EUB should continue to be used for the completion of the Cheviot review. Since the terms of reference for the Joint Review Panel are included in that Agreement, they were also carried over to the second public hearing proceeding.

In a letter to the AWA Coalition dated October 11, 1999, the Panel stated that it did not believe there was a need to issue new terms of reference for the Cheviot review. The letter noted that neither Justice Campbell's directions nor the CEAA had suggested that new or modified terms of reference were necessary in order to reconvene the hearing or continue the Cheviot review process.

3.2 Prehearing Meeting

A prehearing meeting was held to provide the applicant and other interested parties with an opportunity to comment on the various issues to be addressed at the reconvened hearing. Also discussed was the availability of information needed by CRC to prepare any further submissions, the likely date of any further submissions by CRC, and the schedule and process for the review of those submissions. The prehearing meeting was also used to discuss the role of interveners at the hearing, the establishment of a public registry, and other relevant procedural matters associated with reconvening the hearing.

In the prehearing *Memorandum of Decision*, the Panel considered the scope of the hearing and decided that it must take its primary direction from the four items deemed to be deficient in Justice Campbell's decision. However, the Panel also confirmed that it was equally prepared to address other issues that it found to be relevant and germane to its review. For example, the Panel acknowledged that oil and gas development, recreation, and other sources of disturbance would also need to be considered, along with environmental resources not previously considered, to the extent that they also interact with the Project and were relevant to the Panel's mandate.

Several parties suggested at the prehearing meeting that the Panel retain independent consultants to advise it in the areas of mining, forestry, and cumulative effects. The Panel accepted that the addition of such expertise might play a useful role in obtaining adequate technical information to

carry out the additional review prescribed by Justice Campbell. As a result, the Panel obtained experts in these areas to review information supplied by CRC and others and to advise the Panel as to the acceptability of the information (see Section 3.3).

The Panel also indicated its intent to review the need for additional work in areas beyond the scope set out by Justice Campbell and noted that it would advise participants in the hearing as those decisions were made. The Panel anticipated that the extent to which other issues would need to be addressed would depend in part on the amount and type of information provided by the applicant, government, and its own experts.

With regard to the timing of the hearing, it was determined that CRC would submit its information regarding alternatives to mining, additional baseline information, and its response to the Canadian Nature Federation's (CNF) 1997 reports by October 15, 1999. CRC would then submit its amended CEA by November 15, 1999. The Panel allowed 30 working days (approximately six weeks) from the receipt of the applicant's final submissions for government participants to respond to the information provided by CRC. Written submissions from other participants were due 20 working days (approximately four weeks) later, in order to allow time to respond to the additional information.

Some parties suggested that the approvals already issued by the EUB for CRC's proposed mine and coal preparation plants (Table 1) should be rescinded or revoked. However, the Panel noted in the prehearing *Memorandum of Decision* that the EUB's legislation did not require this action while a review was undertaken. It also noted that CRC had committed to not initiate interim construction activities while continuing to meet the information requirements of the approvals. Therefore, the Panel did not believe that it was necessary to rescind the provincial approvals or that the retention of those approvals in any way fettered its discretion to vary or rescind its previous decisions subsequent to its consideration of any relevant new information.

The Panel established a public registry of materials related to the Project review to facilitate public access to the information. The registry was established in both Hinton and Edmonton until commencement of the hearing, at which time the Edmonton registry was moved to Hinton. During the hearing, daily transcripts were accessible to the public in Hinton, Edmonton, and Calgary.

3.3 Role of the Panel's Consultants

The Panel advised all participants by letter dated November 30, 1999, that it had retained three experts to address certain parts of the technical review. Each of these experts assessed the information submitted by CRC, provided their reports to the Panel and all participants, and appeared at the hearing to present information and answer questions related to their conclusions.

Dr. Everett Peterson, of Western Ecological Services, was retained to review CRC's reports on forestry activities in the vicinity of the Project and to evaluate the adequacy of that information. Dr. Peterson reviewed the information provided by CRC in November 1999 and issued a report on January 10, 2000. In that report, he noted that there was ambiguity and lack of clarity as to the amount and type of information CRC had obtained from Weldwood Canada.

Dr. Peterson issued a second report on February 29, 2000, following discussions with Weldwood, to clarify certain aspects of his earlier report. In his second report, Dr. Peterson concluded that CRC had received and had available, in cooperation with Weldwood, the most recently available forestry information, including both the currently approved forest management plan and the 1999 draft forest management plan.

Dr. William Ross, of the University of Calgary, was retained to review the completeness of the CRC's November CEA. Dr. Ross's initial report was made available January 10, 2000. Dr. Ross stated that he had based his assessment of CRC's work on four requirements for CEA. The criteria used as the basis for his evaluation and the results he provided are more fully addressed under Views of the Panel's Consultant in Sections 5 through 7 of this report. In response to material presented during the hearing, Dr. Ross submitted a second report on April 11, 2000.

Mr. H. G. Stephenson, of Norwest Mine Services Ltd. (Norwest), was retained to review the comparative viability of both underground mining and surface coal mining. Two reports were submitted to the hearing. The first (November 11, 1999) reviewed a comparison of underground and surface mining prepared by CRC and its consultants. Mr. Stephenson characterized CRC's analysis as inconclusive. He was subsequently asked by the Panel to prepare a second, independent assessment of whether underground mining could be technically and economically feasible and how it would compare with surface mining. He submitted that report on February 22, 2000.

In his second report, Mr. Stephenson concluded that the only underground mining system applicable to the conditions found at Cheviot would be the room and pillar method using continuous miners. He also concluded that none of the underground mining cases using this approach that he examined were economically feasible, even at the best coal price that he believed could reasonably be envisioned.

Each of the Panel's consultants made a presentation and was available for questioning during the course of the hearing.

3.4 Documents Submitted by the Canadian Nature Federation

CNF provided two reports in 1997 that were intended to be part of the original proceeding. The first dealt with its response to the environmental impact assessment (EIA) report of the Cheviot Coal Project. The second report was submitted following the conclusion of the public hearing process. It dealt more specifically with CNF's response to Norwest's 1997 report, *Overview of Rock Waste Disposal Cheviot Mine Plan*. CNF did not directly participate in the original hearing, although there was some indication before the Panel that CNF would be represented. Following the publication of the initial Joint Panel's review of the proposed Cheviot Coal Project, CNF participated in the federal court proceeding that resulted in the ruling of Justice Campbell. That ruling, as noted in Section 2 of this report, stated that the Panel must consider those documents in a reconvened proceeding.

For the March 2000 Panel review, CNF also submitted a February 7, 2000, document addressing certain aspects of the 1999 CEA provided by CRC. In addition, the earlier documents prepared in

1997 were entered into the proceeding. CNF also participated directly in the reconvened hearing, giving direct evidence and addressing questions from the other hearing participants.

3.5 Directions to the Participants

The Panel provided written directions to the applicant and the federal and provincial government departments and agencies throughout the process. Some of the more pertinent letters are described in this section.

In response to a request by CRC, the Panel, in a letter dated August 4, 1999, explained the type and scope of information required by the applicant to address the deficiencies outlined by Justice Campbell. In a subsequent letter dated September 15, 1999, the Panel requested that CRC provide a written explanation of the methodology and rationale used for selecting the VECs. The Panel indicated that it would forward the information to the appropriate federal and provincial government departments and agencies for their review and comments. CRC responded to this request on September 17, 1999.

On September 15, 1999, the Panel also outlined CRC's list of proposed VECs in a letter to the governments of Alberta and Canada. The Panel requested that the government departments review CRC's submissions and provide comments as to their views on the adequacy of the list.

On November 9, 1999, the Panel received a written request from the CEEA requesting that it consider a proposal from the Canadian Parks and Wilderness Society to consider mediation as a way of resolving issues associated with the Cheviot Coal Project. In response to that request, the Panel asked the applicant its views regarding a mediation process. CRC stated that it was not prepared to participate in a mediation exercise and outlined its reasons. In response to the parties, the Panel indicated its willingness to recognize the results of such a process should the parties decide to participate.

In a letter dated November 23, 1999, the Panel asked CRC to provide updated information on the long-term economic viability of the Project, including the potential for future long-term coal markets. The Panel took the position that it had already addressed this issue adequately in its previous decision but believed it should determine if there had been any substantive changes in the Project and so asked CRC to speak to the issue.

On December 6, 1999, the Panel sent a copy of the report on underground mining alternatives prepared by Norwest to CRC. The letter asked CRC to comment on the report, particularly as Norwest had noted that more underground mineable coal was available than CRC had determined. CRC replied by letter dated February 1, 2000.

3.6 Public Hearing

The hearing of the Cheviot Coal Project began on March 1, 2000, and continued until March 10, 2000. After an adjournment period, the hearing reconvened for the period April 25 to 27, 2000.

Table 2 lists the hearing participants and those who appeared on their behalf.

TABLE 2 THOSE WHO APPEARED AT THE HEARING**Principals and Representatives
(Abbreviations Used in Decision)****Witnesses**

Cardinal River Coals Ltd. (CRC)
D. R. Thomas

F. Munn
L. LaFleur
B. Logan
J. Strid
B. Ramsay
J. Gendron
B. MacCallum
J. Kansas
S. Herrero
W. Strong
A. Wolanski
B. Mackay
J. Allan
W. Veldman
K. Hale
D. Hackbarth
P. Chapman
M. Dutton

Hinton and District Chamber of Commerce
C. Mork

B. Gouthro
M. Dery
R. Carramusa
C. Mork

United Mine Workers of America, Local 1656 (UMWA)
R. Campbell

R. Campbell

Town of Hinton
R. Risvold

R. Risvold

Alberta Environment (AENV) and
Alberta Health and Wellness
R. Bodnarek
H. L. Veale

W. Macdonald
D. Cox
K. Smith
G. Stenhouse
G. Sterling
L. Notan
A. MacKenzie

Cadomin Environmental Protection Association (CEPA)

R. M. Kruhlak

C. Way

Government of Canada

P. Hodgkinson

G. Linsey
R. Tupper
J. G. LeFebvre
L. LaPalme
M. Fairbairn
W. Fenton
P. Gregoire
G. Holroyd
R. Hooper
J. Weaver
W. Bradford
S. Cardiff
D. Johnson
B. Dobson
H. Purves
D. Hodgins
W. Fenton
D. Kirkland

Weldwood of Canada Ltd. (Weldwood)

J. Bouthillier

T. Whitford

R. Udell
R. Stauffer
H. Lougheed

Alberta Wilderness Association, Jasper Environmental Society,
Pembina Institute for Responsible Development, Canadian
Parks and Wilderness Society, and Ben Gadd (AWA Coalition)

J. Klimek

D. Pachal

D. Pachal
S. Gunsch
B. Gadd
J. Seaton
R. Notnes
P. Kittredge
D. Howery
H. Stellmach

Mountain Park Environmental Protection and
Heritage Association

E. A. Godby

M. Bracko

E. A. Godby
M. Bracko

Alpine Club of Canada/Alberta Native Plant Council
(ACC/ANPC)

A. Dinwoodie

A. Dinwoodie

I. Strang, MLA for West Yellowhead

C. Breitkreuz, MP for Yellowhead

G. Griffiths

G. Griffiths

Mountain Cree Camp and
Mountain Cree Camp Syllabics Institute

M. Nadeau

B. Parry

M. Nadeau

B. Parry

G. Fedirchuk

R. Nielson

J. Budinski

Trout Unlimited Canada (TUC)

K. Brewin

T. Antoniuk

K. Brewin

Alberta Fish and Game Association (AFGA)

Q. Bochar

Alexis First Nation (AFN)

S. McDonough

E. Johnson

Chief Francis Alexis

P. Potts

Canadian Nature Federation (CNF)

K. McNamee

S. Hazell

Environmental Resource Centre

K. Charest

J. D. Clark

J. Mitchell

J. O'Chiese

Western Canada Wilderness Committee (WCWC)

L. Phillips

G. Jones

L. Phillips

G. Jones

Treaty 8 First Nations of Alberta (Treaty 8 FN)

J. Rath
J. Handel

Panel Consultants

W. Ross
E. Peterson
H. G. Stephenson

Panel Secretariat

W. Y. Kennedy
L. J. MacLachlan
D. I. R. Henderson
N. Seguin
R. Creasey
R. Powell
J. P. Thompson
L. Roberts
A. Stoddart
C. Brown
D. Morris
V. Nixon

4 ALTERNATIVE MEANS (UNDERGROUND MINING)

The AWA Coalition suggested that during the 1997 proceedings CRC had not adequately addressed underground mining as an alternative to the development of the proposed surface mine. It argued this was a failure of the applicant to meet the requirements of the *CEA Act*, which specifically requires an assessment of alternatives to a project. Its position was that underground mining, if feasible, would potentially result in significantly less environmental disturbance and therefore should be evaluated thoroughly.

The issue was addressed briefly at the previous hearing by CRC, with a limited amount of evidence provided to support the company's view that the complex geology of the region, combined with the nature of the coal seams, made underground mining technically difficult and as a result uneconomic. Representatives of the United Mine Workers of America (UMWA) presented evidence that its members were not trained in underground mining techniques and that the work environment and safety issues associated with underground mining were unacceptable. As a result, there would be significant regional social and economic impacts associated with the shift to underground mining.

4.1 Views of the Applicant

In response to the request from the Panel, CRC indicated that it had further reviewed the potential of applying underground mining methods to the proposed Cheviot Project as an alternative means to the original surface mine concept. CRC stated that it had compared the technical, economic, and environmental issues associated with both underground and surface mining and had provided an estimate of coal reserves available through underground mining and a description of underground mining methods that would be used. This included an assessment of the likely productive capability and life expectancy of an underground mine, a capital and operating cost comparison between underground and open-pit mining, and a comparison of environmental effects, including cumulative effects. CRC stated that it had also commissioned an independent third party to evaluate the technical and economic feasibility of the two mining methods.

CRC indicated that all of its studies, including that by its consultant, demonstrated that underground mining in this area was neither technically nor economically feasible. The reports concluded that due to the nature of the deposit, room and pillar mining was the only proven underground mining technique possible. CRC noted that access to and recovery of the coal would be compromised by the limitations of both available underground mining equipment and the geological nature of the reserve. The potential coal reserves available for underground mining at the Cheviot site were predicted to be limited to approximately 6 million clean metric tonnes (CMT). CRC stated that the risks associated with the highly folded and faulted geology of the area and the lack of a workforce trained for underground mining provided additional support for its conclusion that underground mining was neither technically nor economically feasible.

CRC indicated that the cost of underground mining would be approximately \$27.50 CMT, not including the cost of power or roads to the site, exploration costs, or preparation plant charges.

CRC indicated that the operating costs of the underground mining alternative would be too high for the Project to be economically feasible.

In light of its findings, CRC indicated to the Panel prior to the hearing that it did not believe an evaluation of the environmental effects of the underground mine was required by the *CEA Act*. The company noted that Section 16(2)(b) of the *CEA Act* only requires that the assessment consider the environmental effects of alternative means that are “technically and economically feasible.” The Panel Secretariat requested that the environmental comparison be completed. This suggestion was based on Justice Campbell’s direction, which required that the Panel

With respect to alternative means, do a comparative analysis between open pit mining and underground mining at the Project site to determine the comparative technical and economic feasibility **and comparative environmental effects** [emphasis added] of each, consider this information, reach conclusions and make recommendations about this factor, and substantiate these conclusions and recommendations in the Joint Review Panel Report.

In response, CRC did provide an environmental comparison between surface and underground mining alternatives. In preparing the comparison, the company elected to describe two comparable production scenarios in order to establish a common basis of comparison: one for the most likely potential underground mine and one for a reduced hypothetical surface mine with a comparable production capacity to the underground scenario. As a result, because there were significantly fewer coal reserves available through underground mining, the surface mine considered in the analysis was considerably smaller than the full surface development scenario applied for by CRC. In CRC’s view, this approach to the comparison allowed the environmental impacts of the two cases to be properly addressed on a relative basis.

CRC concluded that the underground mining alternative would have a greater relative effect on more VECs, create more adverse cumulative effects, and consequently be more detrimental to the environment than the equivalent proposed surface mine at the Cheviot site. However, CRC also noted that most of the effects associated with the underground alternative were anticipated to be mitigable, local, and negligible to minor in nature. Because under the scenarios considered coal would be processed at the existing Luscar plant rather than at a new plant, the exceptions to this were potentially elevated noise and dust levels associated with transporting the coal from the site. This could result in a major local effect, particularly in the Hamlet of Cadomin.

In response to questions from the Panel, CRC said that it expected that an underground mine would only meet its expected customers’ requirements for coal for a two- to three-year period. Once those resources were extracted, CRC indicated that it would likely need to reapply for a surface mine development at the same location if it were to continue to meet its export contracts.

4.2 Views of the Interveners

Natural Resources Canada (NRCan) stated that it supported CRC’s opinion that the underground mining alternative was neither technically nor economically feasible. It concluded that the mining assumptions made and the criteria used by CRC were realistic and sufficient to determine that the underground option was not viable to efficiently mine the coal at the Cheviot site.

NRCan took the position that CRC's hypothetical environmental comparison allowed for a valid comparison between the two alternative means and their potential effects.

The Hinton Chamber of Commerce submitted that the open-pit mining method was a more positive alternative for the people of Hinton. The Chamber felt that an open-pit mine would provide approximately 300 more direct jobs than an underground mine and was more suited to the current skills of the workforce in Hinton. The Chamber also felt that the underground alternative represented a higher risk in terms of human safety.

At the hearings, the UMWA indicated that underground mining involved a number of health and safety risks for miners. It indicated that this form of mining was used in years past and was not the type of work environment that its members wanted to go back to. The UMWA agreed with CRC's opinion that the underground mining alternative was neither technically nor economically feasible.

Based on many years of personal experience in the coal mining industry, Mr. Mitchell, a local resident, indicated that the underground mining alternative was neither technically nor economically feasible. He noted that the safety risks involved in underground operations, particularly considering the structural instability of the geology in the area, were very high and felt strongly that open-pit mining was the only feasible mining alternative at the Cheviot site.

The Cadomin Environmental Protection Association (CEPA) expressed concern with CRC's underground mining scenario, which included transporting coal by truck from the Cheviot site to the existing Luscar site. In its submission to the Panel, CEPA requested that the Panel consider the impacts on the community of Cadomin when assessing the viability of other mining alternatives.

A number of interveners did express concern over CRC's choices in creating the scenarios by which the hypothetical environmental effects comparison of underground and open-pit mining was carried out. Environment Canada felt that CRC's comparison did not allow for careful consideration of the comparative environmental effects. In its submission to the Panel, Environment Canada recommended that consideration of an environmental effects comparison based upon the actual proposed surface mine might have more effectively contributed to the implementation of improved mine development possibilities and better environmental management. It also recommended that any conclusions be clearly substantiated in order to allow the Panel to completely review and assess the associated impacts, reach conclusions, and make recommendations.

The AWA Coalition, in its submission, also expressed concern about CRC's hypothetical comparison between open pit and underground mining. It felt that this type of comparison did not meet the court's direction and that in looking at the environmental impacts of the two mining alternatives, the hypothetical reduced volume open pit model should not have been used. While the AWA Coalition conceded at the hearing that it had no expertise to address the technical aspect of the underground mining alternative, it did agree under cross-examination that underground mining did not appear to be economically feasible.

At the hearing, the AWA Coalition stated it strongly believed that CRC should also be required to assess other surface alternatives to the proposed mine at alternative locations. The AWA Coalition noted that Luscar, one of the two partners in the Cheviot Project, had recently acquired an interest in the Line Creek coal mine development in British Columbia. This mine, it argued, could be expanded sufficiently to provide the company with equivalent volumes and quality of coal. The AWA Coalition felt that this was another alternative to the Cheviot Project that should be addressed in CRC's assessment of relative environmental effects. It also suggested that a comparative analysis of sequentially placing the excavated rock into the mine pits, rather than filling stream valleys, should have been examined as an alternative approach to the proposed mining scenario.

The Alpine Club of Canada and the Alberta Native Plant Council (ACC/ANPC) also found CRC's comparison to be inappropriate. They accepted that the underground option may not have been technically or economically feasible, but felt that a more appropriate comparison of relative environmental effects would have been between the mine as currently proposed and the same mine with the addition of underground development.

The Western Canada Wilderness Committee (WCWC) also found CRC's comparison to be deficient. The WCWC felt that there was a skewed interpretation of environmental effects because the analysis used a hypothetical 6 million CMT open-pit mine, rather than the proposed 60 million CMT open-pit mine. Also, the WCWC believed that the alternative of not proceeding with the development of the mine should have been considered in terms of relative environmental effects.

4.3 Views of the Panel's Consultant

As noted earlier, Mr. Stephenson, of Norwest, was retained by the Panel to provide an independent review and evaluation of the technical and economic feasibility of underground mining at the proposed Cheviot site. He was also asked to compare an underground mining scenario with the surface mine proposed by CRC.

In his report, Mr. Stephenson agreed with CRC's conclusion that room and pillar mining was the only underground mining method that had potential to be technically and economically feasible. With the exception of a few parameters used in estimating reserves, Mr. Stephenson was also in agreement with the general methodology used by CRC's consultants for identifying reserve areas. He concluded that a reserve of up to 7.6 million CMT could be recoverable on the Cheviot site based on the shallow exploration work that had been carried out for the surface mine. He also concluded that these reserves could extend to greater depths, resulting in a purely speculative reserve of 15.2 million CMT. Mr. Stephenson indicated that his estimation of operating costs would be comparable to CRC's estimate of \$27.50 per CMT.

In his report, Mr. Stephenson also examined three different underground mine cases, all of which involved different reserve estimates and different annual production capacities. When evaluated against current market conditions, he concluded that underground mining, even at an unrealistically high production rate and assuming the highest possible coal price, was not economically feasible. Mr. Stephenson found that none of the cases he examined would have

been feasible given that the total cost of production ranged from \$50.94 to \$61.10 per CMT at the mine. Mr. Stephenson concluded that the underground scenario would add \$20.00 per CMT to the cost of producing coal compared to surface mining and indicated that it was unlikely that additional exploration drilling would change these conclusions.

In conclusion, Mr. Stephenson stated that he found himself in agreement with the findings presented by CRC regarding the absence of potentially economically viable underground reserves at the Cheviot site. He indicated that underground mining operations at the Cheviot Project site would not have been competitive with the proposed surface mining operation. Furthermore, given the export coal pricing limits applicable at that time and into the foreseeable future, they would have resulted in a nonviable project. He also noted that underground mining would have resulted in a significant detrimental impact on overall recoverable coal reserves.

4.4 Views of the Panel

Given the overwhelming weight of evidence with respect to the underground mining alternative, the Panel continues to conclude that underground mining at the Cheviot Project site is not, with current technology, economically feasible. The Panel notes that this was a consistent view among the various government experts, consultants for CRC, and its own specialists.

With respect to the relative impacts of underground mining when compared to surface mining, the Panel also concludes that for two mines of similar size any adverse environmental effects from either would be insignificant, given the limited amount of coal available from an underground mine at the Cheviot location. The Panel notes that the footprint for either the potential underground development or an equivalent surface mine development would be significantly smaller than for the proposed Cheviot Coal Project. Given that with few exceptions, the adverse effects of the much larger mine are not significant, it can be reasonably concluded that the environmental effects from either of the two smaller mine scenarios will be insignificant.

Finally, the Panel concludes that while a much smaller underground mine would not have as great an environmental effect as would the proposed surface mine, this is not a valid comparison. The Panel reaches this conclusion since the coal resources physically available using current mining technology would not in any way meet the economic requirements of the company. The Panel notes that CRC argued, under Section 16(2) of the *CEA Act*, that only technically and economically feasible alternative means would be required to undergo an environmental comparison. This seems to be a very reasonable interpretation of the meaning of the *Act*, since it is hard to imagine that Parliament would have expected applicants to carry out an environmental assessment of projects that were not technically or economically feasible.

The Panel notes that even if underground mining were feasible, it is clear that the potential underground mine option would soon reach the end of its economic life (i.e., within two to three years), assuming that the company produced and marketed coal at the expected rates. The company stated that it would then reapply for a surface mine development that would not be significantly dissimilar to the current proposal. As a result, any reductions in the eventual overall impacts that would occur should only the underground mining alternative be developed at this time would not be realized in the foreseeable future. Therefore, the Panel concludes that there is

no real reduction in the eventual cumulative adverse environmental effects associated with the underground mining alternative.

The Panel notes the criticisms of the approach used by CRC to compare the relative effects of the underground versus the surface mine options. At the same time, the Panel can understand the conundrum that such an “apples/oranges” comparison can create. The Panel expects that when the *CEA Act* was created, it was assumed there would be a reasonable opportunity for direct comparisons among feasible alternatives. Because of the lack of an economically feasible underground alternative, no such comparison is possible in this case, which emphasizes the difficulties inherent in attempting a comparison of the environmental impacts of two very dissimilar projects. The Panel is satisfied, under the circumstances, that it has the information required to make an appropriate comparison of the environmental effects of the proposed surface mine and the underground mining alternative and to reach conclusions.

The Panel is also not convinced by the position of Environment Canada that some other approach to the environmental comparison than that used by CRC would have somehow resulted in a significant opportunity for additional improvements to the proposed Project. While ongoing research into and refinement of the Project required under provincial approvals will very likely continue to reduce its impacts, the Panel is unable to conclude that this could have been better accomplished through a comparison of the proposed surface mine with a much smaller underground mining scenario.

At the hearing, the AWA Coalition took the position that the Panel is obligated to also further consider other alternatives available to the company. The AWA Coalition suggested that these alternatives included the option of developing other mining properties and the option of not developing the mine at all and devoting the land that the Project would otherwise occupy to support regional ecological integrity. The AWA Coalition also suggested that alternative approaches to carrying out surface mining, such as not placing waste rock within valleys, should be re-examined.

The Panel cannot agree with the AWA Coalition on these points. First, Justice Campbell’s directions with regard to which alternatives to the Project should be compared were clear and restricted to a comparison between underground and open-pit mining. Second, it is clear from the record at both hearings that the applicant, CRC, owns and operates only one existing mine which is nearing the end of its economic life. No alternative mines under its control exist to meet its economic objectives. While the companies that own CRC each have other economic interests, CRC stated that it does not have the authority to require these entities to turn over to the company control of these other mining interests. The Panel accepts this as reasonable. Therefore, the applicant does not have before it alternatives to the proposed Project other than purchasing other existing mines or mine properties or the use of other technologies such as underground mining. The Panel notes that the option of purchasing other mining properties was addressed in the original hearing and Justice Campbell did not question the Panel’s findings on this issue. The second alternative, i.e., the use of alternative technologies, has in the Panel’s view been thoroughly addressed in its original report and above. With regard to the alternative of not developing the Project, the issue of Project need was, the Panel believes, addressed appropriately

in *Decision 97-8*. The relative social and economic benefits of not developing the Project are also addressed in Section 10 of this report.

With regard to the further modifications to CRC's mine development plan proposed by the AWA Coalition, (i.e., the avoidance of the use of riparian areas for rock dumps), the Panel again notes that Justice Campbell gave no direction on this issue. The Panel heard extensive evidence during the first hearing with regard to relative impacts to Project economics based on the distance of haul for waste rock and on the environmental impacts of the waste disposal options proposed by the company. The Panel continues to believe that its original findings on these matters remain appropriate. No evidence was provided at the reopening of the hearing on this issue that would cause the Panel to vary its original decision made under provincial authority or to alter its recommendations to the federal government.

5 ADEQUACY OF CEA SCOPING

As noted earlier, the Panel was charged by the federal courts to examine the cumulative environmental effects of the Project relative to two other industrial activities in the region, notably forestry and other surface mines. However, the Panel believes that in order to properly address cumulative effects, it was potentially insufficient to look only at these sources of impact if other forms of significant disturbance (e.g., oil and gas development) were also occurring. It was also necessary to ensure that appropriate receptors of such impacts (i.e., VECs) be selected.

The Panel believes that the most significant impacts of the regionally dispersed developments of these other industries might differ substantially from the more localized impacts of a mine. VECs therefore had to be chosen to include potentially significant cumulative impacts of both the mine and the other developments and activities taken together. Finally, it was necessary to select the appropriate time and spatial scales for addressing these potential cumulative effects.

The Panel notes that the *CEA Practitioners Guide* has been developed by CEAA to assist applicants in their analysis of cumulative effects. This document was used by CRC in preparation of its reports, as well as by the interveners. While CEA is a relatively recent requirement of EIA, CEAs build upon the basic principles that have been learned and applied in routine EIA practice for many years. Table 3, below, taken from the guide, describes the relationship of the “basic” EIA process and how those steps relate to CEA. The Panel includes the table in this report, since it offers a reasonable and practical framework for carrying out CEA.

Table 3. Assessment Framework*

Basic EIA steps	CEA tasks
1. Scoping	<ul style="list-style-type: none"> - Identify regional issues of concern - Select appropriate regional VECs - Identify spatial and temporal boundaries - Identify other actions that may affect the same VECs - Identify potential impacts due to actions and possible effects
2. Analysis of effects	<ul style="list-style-type: none"> - Complete the collection of regional baseline data - Assess effects of proposed action on selected VECs - Assess effects of all selected actions on selected VECs
3. Identification of mitigation	<ul style="list-style-type: none"> - Recommend mitigation measures
4. Evaluation of significance	<ul style="list-style-type: none"> - Evaluate the significance of residual effects - Compare results against thresholds or land-use objectives and trends
5. Follow-up	<ul style="list-style-type: none"> - Recommend regional monitoring and effect management

*From *CEAA Practitioners Guide*

In addition to the information detailed in the *CEAA Practitioners Guide*, Dr. Ross, the Panel’s consultant, described his views on the fundamental requirements of CEA. In his evidence, Dr. Ross stated that in all cases appropriate CEAs should include the following process steps:

- 1) Identify VECs affected by the proposed Project.

- 2) Determine what other past, present, and future human activities have affected or will affect these VECs.
- 3) Predict the impacts on the VECs of the Project in combination with the other human activities, and determine the significance of the impacts.
- 4) Suggest how to manage the cumulative effects.

This section of the report examines the scoping of the CEA in terms of the identification of sources of impact, VECs, and the temporal and spatial scale of the assessment.

5.1 Other Sources of Impacts

5.1.1 Views of the Applicant

In its new submissions to the Panel, CRC confirmed its earlier views that, in addition to forestry and surface mining development, the primary sources of other significant impacts in the region would be from oil and gas development and from recreational activity. CRC provided a summary of regional projects and activities whose effects might interact with those of the mine. With respect to mining, CRC reviewed existing coal leases and plans and provided both maps and anticipated time lines for their development (Figure 2). CRC also considered the prospects for mining of other minerals. With respect to forestry, CRC provided a discussion of the most likely forest development scenario, including the anticipated area to be harvested (Figure 3) and associated road construction. With regard to oil and gas development, CRC indicated that this would include seismic, drilling, and operational activities, such as processing plants, compressors, and pipelines. CRC noted that oil and gas exploration would be largely restricted to the northeast portion of its cumulative effects study area, limiting the potential for interactions with the mine. Recreational activities identified by CRC included both mechanized (e.g., off-highway vehicles) and non-mechanized activities (e.g., hiking, camping, hunting). CRC also updated information on regional land use management and discussed the potential for a steady increase in recreational activities in the region to interact with development projects.

5.1.2 Views of the Interveners

In general, none of the interveners questioned CRC's selection of the primary sources of cumulative effects in the region, although some expressed concerns as to whether the developments and activities identified by CRC were consistently and appropriately treated in the assessments of the various VECs.

5.1.3 Views of the Panel's Consultant

Dr. Ross dealt most directly with the matter of identifying other activities that might have an impact on VECs. He noted that CRC had, in his view, appropriately identified the other human activities to consider in the CEA. He also commended CRC for choosing additional activities beyond those indicated by the courts.

5.1.4 Views of the Panel

The Panel finds that although it was only directed by the courts to consider the cumulative effects of other mine developments and of forestry, clearly it is necessary to ensure that other significant potential sources of cumulative effects are considered. In this case, CRC chose to include regional oil and gas development and recreation impacts in its CEA. The Panel believes this approach is appropriate.

The Panel has considered whether any other sources of regional impacts beyond those identified by CRC would be likely to generate significant cumulative effects in association with the Cheviot Coal Project and has been unable to identify any. The Panel also notes that none of the other hearing participants suggested that CRC's selection of primary sources of cumulative effects was incorrect, although a number expressed concerns over the manner in which these sources were treated in the assessments. The Panel will deal with the issue of how these sources of impact were treated in the assessments of impacts to VECs (Section 7). **Therefore, the Panel recommends that the primary sources of cumulative effects proposed by CRC in its assessment of the cumulative environmental effects of the Project—other mining projects, forestry, oil and gas development, and recreation—be accepted by the federal government as appropriate for the CEA.**

5.2 Selection of VECs

5.2.1 Views of the Applicant

In preparing its supplementary CEA, CRC sought guidance from the Panel as to which VECs should be included. The Panel responded that the federal court had found no fault with CRC's earlier practice of identifying key VECs. The possibility was left open by the Panel that the list of key VECs for the supplementary assessment might need to differ from the list used in the original application. The Panel asked CRC to explain in its written submission the process it used to identify and select VECs.

At the September prehearing meeting, CRC provided a proposed list of nine key VECs but did not explain how they had been selected. The Panel wrote to CRC on September 15, 1999, to request an explanation of the process used to identify and select VECs. CRC responded on September 17, 1999, with an explanation of the selection process it had used. Its approach was also explained in the November 1999 CEA.

CRC stated that it had employed a three-stage process to select key VECs from the list of 99 VECs considered in its 1997 assessment. In step 1, CRC focused on VECs that might experience Project-related effects at a regional scale. This reduced the list to 28 VECs. In step 2, CRC considered the likely magnitude of cumulative effects for each of the remaining VECs based on the earlier assessment and selected those most likely to experience moderately or highly significant effects. This yielded a list of 10 VECs. CRC also sought direction in the major review documents related to the assessment of the Project, i.e., *Decision 97-8*, the *Federal Response to the Decision*, and the court decision. This review yielded 11 VECs, including the 10 based on potentially significant regional impacts.

The final stage was to combine and consolidate the list. This resulted in the 9 VECs submitted to the September prehearing meeting. Finally, the list was reorganized slightly in response to comments received, dividing water quality into two components (sediment and nitrogen) and explicitly adding fisheries.

CRC stated that it had considered the main issues resulting from the EIA scoping exercise and input from the public, regulatory agencies, the federal court review, and the prehearing communications in generating the final list of 11 VECs. The selected VECs were

- surface water quantity
- water quality (sediment)
- water quality (nitrogen)
- fisheries
- vegetation and botanical resources
- wildlife (elk)
- wildlife (selected bird species)
- wildlife (Harlequin duck)
- wildlife (grizzly bear)
- public access-recreation
- traditional use

5.2.2 Views of the Interveners

In both written submissions and oral presentations, some participants challenged CRC's choice of VECs.

Responding to a request from the Panel to review the proposed VECs, provincial and federal government agencies stated that they were generally satisfied with CRC's initial list. However, DFO indicated concern that the aquatic resources VEC did not specifically mention potential impacts on aquatic biota in general and fish in particular. In its November 1999 CEA, CRC noted the concern over impacts to fish and added the fisheries VEC.

Parks Canada expressed the view that CRC's public access VEC should explicitly consider access to Jasper National Park. CRC responded that it felt concerns over access to the park were included in its public access VEC. It responded positively to Parks Canada's suggestion to include a linkage zone analysis to deal with wildlife access issues.

Environment Canada did not comment earlier on the selected VECs but in its submission stated that it disagreed with the applicant's specific choice of species for the selected bird species VEC, particularly neotropical migrant songbirds, stating that all bird species present or predicted to be in the development area should have been assessed. Such an individual assessment would allow one to determine the impact of the development on each of these species.

Trout Unlimited Canada (TUC) and the WCWC argued that a species-specific approach, similar to that used for wildlife, was required for fish species as well, citing the bull trout and Athabasca rainbow trout as examples of species for particular consideration.

The AWA Coalition suggested that the list of VECs be expanded to include wolves, cougars, fishers, lynx, water quality with respect to selenium and heavy metal contamination, human health, food safety, environmentally significant areas, the wildland landscape and opportunities to access it, riparian habitats, and wildlife movement corridors for species other than bears. The WCWC believed that the northern long-eared bat also warranted special attention. CRC responded that some of the species proposed by interveners, e.g., the northern long-eared bat, had been previously assessed and were not likely to experience significant cumulative effects. Others species were represented by the large mammals on the VEC list.

The Mountain Cree Camp Syllabics Institute suggested that with regard to both wildlife and traditional use, precontact trail systems should be included as a VEC.

5.2.3 Views of the Panel's Consultant

Dr. Ross noted that the selection of VECs is a standard approach to scoping environmental assessments and he was pleased that the court did not find fault with the approach. In his first report to the Panel, Dr. Ross concluded that CRC had selected appropriate VECs for its CEA and that the overall selection process was done well. The only minor criticism he had was the focus on VECs of "regional significance." However, Dr. Ross could not think of a potentially significant local cumulative effect in this case and was therefore satisfied with CRC's list of VECs.

5.2.4 Views of the Panel

To meet the directions set out by the federal court, the Panel must be satisfied that the list of VECs chosen from a potentially very large list is adequate to effectively understand the potential cumulative effects of the Project. To ensure that this part of the scoping was adequately done, the Panel sought and received an explanation from the applicant of how the key VECs were chosen. The Panel also had its independent consultant review the selection procedure, and all participants were given the opportunity to review and comment on the VEC selection. The government agencies with specialist knowledge were also specifically canvassed for comment.

No analysis of cumulative effects based on key VECs can provide specific evidence with respect to the impacts on, for example, all species that may be of concern. However, given the complexities of both the natural and social environment and the range of impacts associated with CEA, it would be impossible to assess everything. The Panel continues to believe that the best alternative is to study VECs that are important in their own right and, where possible, also serve as a proxy for VECs that are not studied. The Panel notes, for example, that among the list provided by the applicant, some VECs, such as surface water quantity and water quality, can be a proxy for the broader environmental health of aquatic ecosystems. Others, such as the grizzly bear, are apparently often accepted as indicators of ecological and landscape integrity. The Panel also notes that the issue of selenium, while perhaps not a cumulative effects issue, was nonetheless identified as a VEC due to a recent concern that had been identified related to the issue.

The Panel appreciates that those with particular interests in specific areas would undoubtedly prefer that additional VECs had been selected. The Panel was not convinced, however, by their particular arguments that adding VECs would be of enough incremental assistance to the Panel in assessing the impacts of the Project to warrant their inclusion. The Panel concludes that the key VECs chosen by CRC for the CEA were properly identified early in the process and, given the updated information and analysis provided by CRC, are appropriate. **The Panel therefore recommends that the key VECs be accepted by the federal government.**

5.3 Temporal and Spatial Boundaries

5.3.1 Views of the Applicant

CRC stated that it had developed specific temporal and spatial boundaries for various VECs or groups of VECs. For aquatic issues, for example, watershed boundaries were used as spatial boundaries and river confluences were used as impact assessment locations. The assessment area considered for assessing regional cumulative effects was the McLeod River watershed to its confluence with the Athabasca River (Figure 4). Temporal boundaries for aquatic issues were chosen at 2000, 2010, and 2025, giving current baseline, mid-term, and end-of-mine-life scenarios.

For vegetation and botanical resources, the geographical limits of analysis were based on the Cheviot Cumulative Effects Modelling (CEM) Area, a 3040 square kilometre (km²) region within 25 km of the proposed mine site encompassing the eastern portion of Jasper National Park to the west and parts of Weldwood's Forest Management Agreement (FMA) to the east (Figure 5). The most comprehensive ecological classification was available for this study area. From a temporal aspect, baseline (year 2000) and end-of-mine-life (2025) conditions were used for analysis.

For elk, Harlequin ducks, and other selected bird species, the geographic areas used were essentially the Cheviot Project and adjacent lands. For elk, the area was further defined to encompass the area occupied by the affected population and the adjacent population (Figure 5).

For grizzly bears, the choice of cumulative effects study areas was more complicated, and much of the analysis was based upon the results from extensive work in the original application review and hearing. Two overlapping study areas were established to assess regional cumulative effects on grizzly bears, depending on the type of analysis performed. The grizzly bear mortality and population viability analysis (PVA) study area was quite large (55 384 km²) because these bears are best studied at the regional ecosystem level. The second study area, known as the CEM study area, was used for the road density, habitat effectiveness, security area, and linkage zone analysis (Figure 6). This area was established by forming a polygon with a boundary 25 km outward from the boundaries of the Cheviot Project. Cumulative effects on grizzly bears were assessed over a 25-year time period, corresponding to the end-of-mine life.

Community VEC analyses focused on areas where recreational access occurs (Figure 7). CRC noted that recreational activities remain concentrated in the same locations noted in the original application, i.e., within the Cadomin to Cardinal Divide area along the Grave Flats Road.

Consistent with the approach used in other VEC assessments, the temporal time frame included a current (1999) and end-of-mine-life (2025) analysis.

For the assessment of the alteration of traditional use, emphasis was placed on lands within 25 km of the Project (Figure 8). In a similar manner to other VECs, a current (1999) and end-of-mine-life (2025) time period was considered.

At the hearing, CRC responded to the concerns of some interveners that the company should have used smaller time increments (e.g., every five years) in its CEA. In response, CRC noted that based on its assessment, it had found that much of the regional development appeared likely to show either steady growth or, in the case of other mining projects, relatively little change. For example, although there were a number of applications before the EUB for mine approvals and/or extensions in the region, these were not incremental to existing development in CRC's view. Rather, these new developments would simply replace other existing and nearby mining projects.

5.3.2 Views of the Intervenors

Several intervenors stated that the assessment should have included shorter intervals along the 25-year continuum to provide greater resolution of impacts. They noted that some VECs might experience significant impacts at some time during the life of the mine that might be overlooked in an assessment based solely on pre-mine and end-of-mine scenarios.

CNF stated that adequate temporal resolution of impacts in the assessment prepared by CRC was of vital importance to the Panel to ensure that it completes its work in a manner acceptable to governments. CNF felt that an analysis of impacts based on five-year intervals would show that those effects are at their greatest throughout the mine development and operation stages. CNF stated that the CEA must be sensitive to the different environmental effects that might arise in relation to different project stages, including construction, operation, and reclamation, in combination with other projects in the study area.

TUC noted that the spatial and temporal boundaries used for the aquatic (water quantity, water quality, and fisheries) analyses were different from those used for the terrestrial analyses. TUC was unsure why different boundaries were used and argued that the results and conclusions were influenced by CRC's selection of spatial and temporal boundaries. With respect to the spatial scope, TUC noted that the selection of a large study area increased the likelihood that an impact would be rated as insignificant because it would be relatively small in comparison. In contrast, the selection of a small study area precluded consideration of incremental and cumulative effects best evaluated over large areas. For example, TUC believed that the relative contributions of mining and forestry-related effects were diminished in the water quantity and sediment analyses by the choice of a large study area. On the other hand, the nitrogen VEC study area was also inappropriate, since it did not consider the cumulative effects of nitrate loading downstream of the town of Edson.

With respect to temporal scope, TUC noted that the CEA for water quality and sediment considered potential cumulative effects at 2000, 2010, and 2025, whereas the CEA for nitrogen

loading considered the effects of mining between 2000 and 2010. The fisheries CEA discussed only the present conditions. TUC argued that consistent projections of future conditions were necessary to facilitate comparisons with disturbance thresholds and the identification of potential conflicts at a regional scale. It was TUC's opinion that the use of different temporal scopes reduced the effectiveness of the CEA and the reliability of the conclusions established for the aquatic VECs.

5.3.3 Views of the Panel's Consultants

The Panel's consultants did not specifically address the temporal and spatial boundaries most appropriate for the Cheviot CEA.

5.3.4 Views of the Panel

The Panel believes that the *CEAA Practitioners Guide* provides some useful guidance on the matter of defining spatial and temporal boundaries:

The practitioner must determine at what point an effect is trivial or insignificant. Ultimately, the assessment response should be appropriate to the project. Setting boundaries relies less on special CEA techniques than on the time-honoured basics of EIA practice of:

1. making conservative assumptions about the magnitude and probability of the effect in the face of uncertainty (i.e. assume that effects will be greater rather than smaller),
2. relying on professional judgement,
3. practicing risk management, and
4. using an adaptive approach.

With regard to the spatial boundaries selected, the Panel believes that CRC provided reasonable estimates of the spatial extent of cumulative impacts. In reaching this conclusion, the Panel notes that CRC has attempted, where possible, to link its analysis of regional effects to both the source of the impacts (e.g., forestry, mining, oil and gas, and recreation) and to the nature of the VEC in question (e.g., nutrients, fish, large carnivores, recreational use). The Panel is comfortable that the spatial boundaries chosen encompass the primary areas where cumulative effects are likely to occur without being so large as to dilute the significance of cumulative effects that do occur. While the Panel agrees with TUC's comments that the selection of scale may tend to either mask or accentuate certain effects, this is true irrespective of the scale selected. In this case, the Panel is satisfied that the aquatic spatial boundaries selected are adequate for the Panel to understand the cumulative effects of other developments in association with the Cheviot Project and to be able to reach the appropriate conclusions.

In assessing whether the temporal scales used are appropriate, the Panel believes that it must confirm that

- 1) an adequate description of "baseline" conditions has been selected,
- 2) the long-term impacts of the Project have been adequately incorporated into the CEA, and

- 3) unique circumstances that may occur during the life of the Project (e.g., a very high but short-term increase in activity in another source of cumulative effects) have been addressed.

In this case, the Panel notes that CRC used present conditions to describe the environmental “baseline” associated with the region. The Panel believes that this is an appropriate starting point for the Cheviot Project CEA and notes that the baseline includes current mining, logging, and oil and gas activities in the region. Since these activities have already received approval, the Panel believes that their inclusion as baseline conditions (as opposed to more pristine predevelopment conditions) is appropriate. There was also no evidence in either phase of the hearing that the current recreational levels are not reasonably representative of baseline conditions.

With regard to assessing long-term regional cumulative effects, the Panel notes that the data submitted by the applicant generally focused on the end of Project life, which is anticipated to occur within 25 years. While it is true that some reclamation work will remain to be completed after that period, the Panel notes that CRC expects to reclaim a significant portion of the site before the mine closes. Therefore, it is unlikely that a significant increase in impacts due to the Project would occur following cessation of mining.

As to the predictions of effects during the life of the Project, the Panel understands the concerns raised by some of the interveners that it is possible that there could be significant increases in external sources of regional impacts that could affect the cumulative effects of the Cheviot mine. However, the Panel could not find any evidence to suggest that this is a likely scenario. First, the Panel agrees with CRC’s contention that the “new” mining projects planned for the region are effectively extensions of existing projects. Second, the Panel notes that the forestry information for the region is based on a 10-year planning horizon. No suggestion was made at the hearing by any of the expert participants that forestry activity would increase significantly after that period. Third, based on its own extensive experience with the industry, the Panel believes that the oil and gas development scenarios used by CRC in its CEA are reasonable and that steady growth in activity levels is the most likely scenario. The Panel also sees no reason to expect a major change in recreational activity in the region, with an associated increase in cumulative effects.

The Panel has no reason to believe that any one phase of the proposed mine development will result in a substantial increase in impacts as compared to other phases. The Panel notes that the development of the Cheviot Project represents a series of sequential pit developments. While the Project footprint will increase over time, these increases are gradual and to various degrees mitigated through ongoing remediation. This issue was addressed in some detail in *Decision 97-8* (Appendix 1). The Panel also believes that CRC’s CEA does examine the impacts of the operating phase of the Project in a variety of ways. For example, as can be seen in Section 7 of this report, the grizzly bear analysis considers the alienation of habitat through ongoing disturbances over the life of the Project. The aquatic VECs, such as nitrogen and sediment loadings, are also expressed as ongoing impacts over the Project life.

As a result, the Panel finds that both the temporal and spatial boundaries used in the CEA are adequate and will allow the Panel to reach the appropriate conclusions. Therefore, it recommends that they be accepted by the federal government.

6 ADEQUACY OF CEA INFORMATION

As noted earlier, Justice Campbell directed the Panel to ensure that it obtained all available information about likely forestry and mining in the vicinity of the Project. The following is an assessment of the quality and completeness of the information obtained by the Panel in these two areas, as well as for the other two major sources of regional impacts, oil and gas development and recreation.

6.1 Forestry

In its 1997 application to the Joint Review Panel, CRC relied on surrogate data for the Tri-Creeks watershed to assess the likely cumulative impacts of forestry operations near the proposed Cheviot mine. The company noted that it had done so partly because forestry plans were not on the public record and it had been unable to obtain their release. The federal courts concluded that the Panel erred in accepting this surrogate information and found the Panel did not have sufficient information in 1997 about forestry to adequately address the cumulative effects requirement of the *CEA Act*. Moreover, the Panel had an obligation to obtain the information and to use its authority to compel the information if necessary.

In order to comply with the direction from the court, the Panel sought, in advance of the hearing, to ensure that the applicant had been able to obtain the necessary forestry-related information relevant to the Project. The Panel advised CRC that it required the most recent information about forestry and associated land disturbances, such as forestry road construction. This would include, but not be limited to,

- size, location, and timing of future forestry harvests in the study area,
- a description of the vegetation types associated with the forest stands referred to above,
- the uncertainty associated with the plans referred to above,
- a listing of those forestry activities that will affect regional VECs previously identified by CRC, and
- an analysis of whether a significant cumulative effect results from the forestry activity when considered with the knowledge of the Project's residual effects.

The Panel Secretariat also met with representatives of Weldwood and the Land and Forest Service (LFS) of AENV to explain the Panel's need for full disclosure of relevant forestry information.

6.1.1 Views of the Applicant

CRC stated that it chose a 25 km radius surrounding the Project site for its assessment of regional forestry development (Figure 3). CRC noted that Jasper National Park, Weldwood, Sundance Forest Industries Ltd., the Alexis First Nation (AFN), and the Alberta LFS control the

forested areas in this region. CRC provided a discussion of available information on future forestry activities from the present until 2025.

The company noted that most of the relevant harvesting activity will be within the area bounded by Weldwood's Forest Management Agreement (FMA). CRC provided a summary of the anticipated area to be harvested in each of Weldwood's harvest compartments by "forest cover group" for the next three decades, beginning in 1996. CRC also obtained permission to provide the following Weldwood forest planning documents to the Panel in support of its application:

- the 1991 detailed forest management plan;
- the 1998/99 development plan for 1998–2007, including the harvest and road construction schedule;
- the 1999 annual operating plan for May 1, 1999, to April 30, 2000, including cut blocks approved to April 30, 2002;
- the compartment harvest plans, including Embarras 6 & 13, McLeod 3; and
- the harvest planning and operating ground rules, dated January 1, 1996.

CRC also provided the Panel with the Sundance Forest Industries Ltd. preliminary forest management plan,, dated July 15, 1997, and the Jasper National Park management plan concept, dated January 29, 1999.

CRC noted that the documents listed above do not include reference to lands managed by the AFN or the LFS. According to CRC, the AFN had told the company it had no plans at present for commercial-scale logging. The LFS, CRC stated, was developing management plans for provincial lands under its control in the vicinity, including the newly designated Wildhorse Wildland Park and the Coal Branch Forest Land Use Zone. However, no timber dispositions currently occurred in these areas and none were anticipated to be issued.

CRC explained that forestry planning by Weldwood entails a nested series of increasingly detailed plans:

- forest management plan (140-200 years)
- compartment harvest plan (20-80 years)
- general development plan (5-20 years)
- annual operating plan (2-3 years)

The higher-order plans, CRC observed, look farther into the future, are more general in nature, and are more uncertain than the short-term plans. Circumstances or management decisions may alter the long-term vision of the future. The mid-level compartment harvest plans and general development plans describe the sequencing of areas to be harvested and the associated activities.

Precise and spatially detailed forestry activity plans are available for only a few years in the future and only in those areas slated for imminent harvest. To the best of CRC's knowledge, the forestry information it provided to the Panel was both current and comprehensive.

CRC stated that its consultants had employed an ecosection-level land classification approach, in conjunction with forest cover and harvesting plans for Weldwood and Sundance, to assess forestry-related impacts to terrestrial VECs, including effects on vegetation and wildlife habitat. The assessment of forestry-related impacts to aquatic VECs was modelled using Weldwood's compartment harvest plans and an understanding of forestry-related aquatic impacts gained from the experimental Tri-Creek watersheds.

During the hearing, CRC's projections of future forestry-related road construction were criticized because they were based on an approved development plan for the ten-year period to 2007, which is a much shorter period than the time line for the CEA. In response, CRC produced new estimates of potential road densities and revised estimates of habitat effectiveness to the anticipated end of the Project life (i.e., 25 years).

6.1.2 Views of the Interveners

At the hearing, Weldwood confirmed that it holds the FMA that makes up a large part of the cumulative effects study area and is by far the largest forestry operator in the vicinity of the proposed Cheviot Project. Weldwood also confirmed that it provided CRC its approved planning documents and additional information on its ongoing planning activities. In response to concerns expressed by interveners and the Panel's independent consultant that the information before the Panel might not be the most current, Weldwood tendered its draft 1999 detailed forest management plan and noted that it had made this information available to CRC. In doing so, Weldwood stated that while it was prepared to submit these plans at the request of the Panel, it was not its normal practice to make its forest management plans public before they had been approved by the province. However, the company was prepared to do so in the interest of satisfying the Panel's requirement to have certainty with respect to the forestry information used in the Cheviot CEA.

Weldwood asserted that the information provided to CRC and its consultants is the most current information related to approved plans and plans in progress. In the company's view, it represented the most likely future for forest management operations on the FMA area. Weldwood also noted that the draft 1999 forest management plan had been reviewed by the province and that changes based on the review and its own internal review were in progress. However, Weldwood stated that the technical information it had provided to CRC had not been affected by the review.

A number of interveners questioned whether CRC had in fact used the most current information about forestry. They also criticized CRC's use in its application of only approved forestry activities and the associated road construction plans as a basis for assessing future impacts. For example, they noted that CRC used the scheduled cut of 4686 hectares (ha) of forest in the approved plans in assessing cumulative effects on grizzly bears even though this represented less than 15 per cent of the scheduled, but not yet approved, 27 017 ha to be harvested in the region

by 2025. They noted that CRC had also estimated the additional length of roads associated with the as-yet-unapproved portion of the forest management plan to be between 297 and 560 km. At the hearing, the ACC/ANPC sought to clarify some aspects of Weldwood's road construction plans. Weldwood explained that class-2 roads would be built between compartments and a class-2 haul road would be constructed between the Grave Flats Road and Mercoal.

6.1.3 Views of the Panel's Consultants

In his initial assessment of CRC's forestry submissions, Dr. Peterson stated that he found that CRC had failed to meet the Panel's request to provide the "description of the vegetation types associated with the forest stands" requested by the Panel. In his view, the "forest cover groups" used in Weldwood's compartment schedules could not be translated into vegetation classes. Further discussion with Weldwood and CRC, however, satisfied Dr. Peterson that the eight forest cover groups used could be stratified into the more detailed vegetation types. Furthermore, CRC also had access to data, by forest compartment, of areas not occupied by forest (e.g., water, grass and shrubs, industrial sites, and linear disturbances). With this clarification, Dr. Peterson said that the data provided by CRC did provide adequate stratification for the prediction of the cumulative effects of forestry operations. Dr. Peterson also stated that he was satisfied with the geographic scale of CRC's forestry-related information.

Dr. Peterson initially also questioned the value of much of the material provided by CRC to the Panel. He noted that documents such as Weldwood's "Harvest Planning and Operating Ground Rules" and the LFS "Interim Forest Management Guidelines to Plan Development" are not specific to the terrain, forest ecosystems, or operating conditions in the region. Others were of questionable value, in his view, because they were out of date or would soon be superseded. In particular, he observed that Weldwood's 1991 detailed forest management plan was developed based on 1990 information and was intended as a guide to operational planning until June 1998. The annually revised development plan and the compartment plan, he said, could be affected by the draft 1999 forest management plan. This left the "size, location, and timing of future forestry harvests in the study area" in doubt. However, CRC and Weldwood later clarified that CRC was provided the opportunity to review the draft forest management plan. As a result of learning this, Dr. Peterson stated that the Panel could be confident it had obtained up-to-date information on the size, location, and timing of future forestry activities in the cumulative effects study area.

Dr. Ross, in his assessment of the CEA, said that he had difficulty determining what information and assumptions about future forestry activities were included in the assessments of impacts for the various VECs. The analyses applied to the grizzly bear assessment, for example, were divided into a full quantitative analysis based on the approved compartment plans and a supplementary analysis of anticipated but nonapproved forestry activity. The same approach was not applied to the other VECs.

CRC responded that the approaches and methods used to assess the various VECs were different but in each case a description of the forestry activities included in the assessments was provided. Dr. Ross did state that he supported CRC's attempt to forecast the "most likely" scenario for future forestry. He also expressed the view that greater spatial detail was not necessary and the schedule of areas to be harvested was an adequate description of forestry activities for the purposes of the CEA.

6.1.4 Views of the Panel

The Panel believes that it must be satisfied that the forestry-related information it has obtained is current, comprehensive, and was used to assess the forestry-related cumulative effects on VECs. With regard to the first question, the Panel believes that it has available the most recent relevant forestry data for the region. With regard to the second question, the Panel is satisfied that CRC also had access to and made use of that data. The Panel notes that this view was also shared by its independent forestry consultant. The Panel was not made aware by any of the parties at the hearing of any other regional forestry data that would be either as relevant or comprehensive.

The Panel greatly appreciates Weldwood's role in volunteering this essential information to the applicant and the Panel. Clearly, various aspects of Weldwood's forestry operations will eventually vary from the current plan, particularly further into the future. However, the Panel believes that the data provided by Weldwood do represent its best views and those of the province regarding the most likely forestry development scenarios.

The Panel also notes that not all of the available forestry data fit easily into CRC's requirements to predict forestry activity at the regional landscape scale for 25 years. These were dictated by the requirements of the spatial and temporal scales selected for the CEA and were not part of Weldwood's planning needs. Despite these limitations, the Panel believes CRC was able to adequately integrate the available forestry data into its CEA and made appropriate use of the timber harvest schedules and compartment sequences in the forestry management plan and the 1999 development plan.

While the Panel is satisfied that the consultants who prepared the CEAs for the various VECs on behalf of CRC had access to the most recent forestry information, the Panel shares Dr. Ross's concern as to whether the same assumptions about future forestry activities were employed in each case. The Panel understands and accepts CRC's point that it was appropriate that different methods and approaches were adopted in the CEA for the various VECs. However, in the Panel's view, this observation does not bear directly on Dr. Ross's concern. In CRC's response to Dr. Ross, descriptions such as "forest management plans of Weldwood were utilized" were no doubt intended to convey something specific. Unfortunately, they do not adequately clarify what assumptions were made with respect to the inclusion of approved and nonapproved harvesting activities and the associated road developments. The Panel will therefore be mindful of Dr. Ross's caution in reviewing the assessments of impacts to the VECs.

6.2 Other Mining Activities

In August 1999, the Panel directed CRC to assess the extent of likely mining activities identified in Justice Campbell's ruling. In its direction, the Panel noted that six projects had been identified as being at the preliminary disclosure stage during the 1997 hearings.

The Panel requested that the following be included in the assessment:

- the location and timing of current and future mining operations in the study area,
- the uncertainty associated with the mining operations referred to above,

- a listing of those mining activities that will affect regional VECs previously identified by CRC, and
- an analysis of whether significant cumulative effects will result from the mining activity when considered with the knowledge of the Project's residual effects.

CRC responded to this direction in its supplemental information submission dated October 1999. Seven proposed mining projects were identified within the Cheviot CEA (Figure 2) by CRC. CRC also provided the Panel with copies of the preliminary disclosure documents for the projects. CRC requested the Panel's assistance in confirming that the number of projects had been correctly identified at the preliminary disclosure stage. Confirmation was obtained through correspondence with the Alberta Department of Resource Development (DRD) in a letter to the Panel from Mr. Ken Smith, Deputy Minister, DRD, dated November 29, 1999.

6.2.1 Views of the Applicant

CRC advised that it had reviewed the preliminary disclosures for the seven mine projects. Through inquiries to the EUB and the DRD, it determined that no other mines had been identified within the Cheviot cumulative effects study area. Except for extensions to existing mines, no new mines other than Cheviot were anticipated before 2025, i.e., the end of the Cheviot Project.

6.2.2 Views of the Interveners

With the exception of the AWA Coalition's contention that the Cadomin East coal lease had not been adequately considered as an alternative, none of the interveners provided further comments with respect to the potential for other mining projects in the region beyond those considered by CRC.

6.2.3 Views of the Panel

The Panel is satisfied, given the inquiries of CRC and the confirmation from DRD, that all reasonably foreseeable mining activities in the vicinity of the Cheviot Project were identified and that all available information required has been obtained.

With regard to the AWA Coalition's comments regarding the Cadomin East property, the Panel is of the view that this matter was thoroughly addressed in *Decision 97-8* (pages 16-21).

6.3 Oil and Gas

6.3.1 Views of the Applicant

According to CRC's research, 27 energy companies held 135 petroleum and natural gas dispositions (leases and licences) either partially or entirely within the CEM study area at the time of CRC's report submission. These dispositions occupied about 18 per cent of the land within the study area. All of the dispositions fell along the eastern portion of the study area within Bear Management Unit (BMU) 3 (Figure 6).

In 1999, CRC reported that there were 64 wells in the CEM study area, of which 15 produced natural gas. Associated with those wells were 45 access roads and 19 pipelines, traversing 520 ha of land. CRC reported that the terms and conditions of those petroleum and natural gas dispositions dictated that a minimum of 70 additional wells would need to be drilled prior to their expiration dates if the companies were to retain their mineral rights.

CRC noted that four new gas wells and associated access roads and gathering pipelines were constructed in the region in the year prior to its submission. CRC stated it surveyed the eight energy companies holding the majority of the petroleum and natural gas dispositions in the CEM study area for their future plans. Given the more recent increase in prices, the survey suggested that a minimum of 15 to 20 wells could be drilled each year in the study area over the next five years. CRC noted that it was not possible to identify the specific sites where disturbance would occur and that predictions of actual development activity levels were difficult to make.

CRC stated that the location of the oil and gas leases clearly reflected the most likely zones of potential activity and the possible future trends for oil and gas development in its CEA. CRC observed that the western extent of the leases was roughly located at the McLeod River/Mackenzie River confluence. Drilling activity was expected to spread farther north and west into the foothills along the Rocky Mountains, including within the Coal Branch Integrated Resource Plan (IRP) planning area.

During the hearing, CRC provided further extrapolations on the potential for road development associated with oil and gas activity in order to estimate potential cumulative effects over the 25-year temporal boundary used in the CEA. It was suggested that an additional 786 km of new oil and gas road development could be assumed over this period.

CRC noted that no cumulative effects of oil and gas activity on the public access-recreation VEC were expected because no oil and gas activity was anticipated in the area assessed for this VEC, i.e., the Cadomin to Cardinal Divide corridor near the Grave Flats Road.

6.3.2 Views of the Interveners

Parks Canada stated that CRC's initial submission appeared to lack sufficient data on linear and point disturbances associated with oil and gas exploration and development. Parks Canada felt that because the oil and gas trend data had not been integrated into the analysis (out to the year 2025), it was likely not reflected in the determination of significance for cumulative effects.

The AWA Coalition stated that based on the predicted oil and gas development in the CEA study area, together with the current activity, the level of future oil- and gas-related industrial activity was substantial and should have been considered in the CEA.

TUC was of the opinion that the evaluation of other existing and potential activities by CRC within the CEA study area, including the potential oil and gas activity in the McLeod River watershed, was inconsistent. TUC stated that none of the analyses quantified the potential effects of the existing road network or future oil and gas activities on flow patterns, sediment yield, water quality, or fisheries in the McLeod River watershed.

TUC stated that the area cleared for seismic lines, pipeline rights-of-way, roads, well sites, and facilities associated with oil and gas operations in the Eastern Slopes frequently equals or exceeds that associated with forest development. TUC noted that CRC's grizzly bear CEA reported that linear features associated with oil and gas activity were clearly significant at the regional scale.

The WCWC said that, in its view, CRC had neglected to account for the known negative impacts of oil and gas development in its analyses of grizzly bear habitat.

6.3.3 Views of the Panel's Consultant

In his first submission, Dr. Ross stated that while the oil and gas activities identified by CRC seemed reasonable, the actual CEA seemed to assume zero petroleum activity. Dr. Ross viewed this as a minor flaw, however.

In a second submission to the Panel, Dr. Ross stated that he now believed the consideration of petroleum and natural gas development in the CEA appeared to assume these activities would cease in 2008. However, the grizzly bear VEC analysis appeared to assume that oil and gas activity would continue through to the year 2025. The latter assumption, he believed, seemed to be more reasonable.

6.3.4 Views of the Panel

The Panel agrees with CRC that accurately predicting the future levels of oil and gas development within the CEA study area is complex. The uncertainty as to where these resources are actually located, the large number of companies involved in development, their competitive nature, and the sensitivity of activity levels to prices make predictions of future development difficult. Nonetheless, the Panel believes that consideration of oil and gas developments and the access (road and pipeline) created by exploration activities must be considered when assessing the regional cumulative environmental effects of the Cheviot mine. Therefore, the Panel concludes that the inclusion of these impacts into its CEA is reasonable.

The Panel notes that it was not always clear in CRC's 1999 CEA how far into the future CRC considered the cumulative effects of oil and gas development relative to the various VECs. However, this question was addressed to a significant extent by CRC in the hearing and the Panel now believes that the information base relative to oil and gas is sufficient for the Panel to be able to assess these impacts over an acceptable time frame and reach appropriate conclusions.

6.4 Recreation

In the prehearing report, the Panel noted that since cumulative effects include "the total of disturbances similar to those related to the proposed activity," its review may need to consider motorized recreation and other sources of similar disturbance that may interact with the Project. In response, CRC provided an update of current recreational activities in the vicinity of the Project and a prediction of future recreation. This information was used both as part of the basis for determining cumulative effects of the Cheviot Project on other VECs and as background information for the public access-recreation VEC used in the CEA.

6.4.1 Views of the Applicant

CRC stated that it viewed recreation as falling into the category of “induced actions,” which it considered “unregulated, uncertain, dispersed, regional and the responsibility of regional land management agencies.” To predict future recreational trends to 2025, CRC indicated it had assumed continuation of current trends as determined through consultation with AENV staff, representatives of recreation user groups, local business operators, researchers with the Foothills Model Forest, and other CRC consultants. CRC also provided updated estimates of recreational activity in the area based on an analysis of overnight use of Whitehorse Creek and Watson Creek campgrounds. For its analysis, CRC stated it had focused on the Grave Flats Road from Cadomin to the Cardinal Divide and on either side of the road where recreational access occurs.

Overall, CRC predicted an annual 3 per cent rate of growth in recreational activity during the period to 2025 and used this as the basis for undertaking its CEA. CRC noted that recent annual increases of 5 to 10 per cent observed at campground facilities in the area were likely attributable to the creation of the Whitehorse Wildland Park and that a 3 per cent annual growth rate was more consistent with longer-term trends observed in the region. According to CRC, some implications of growing recreation demand would include increased recreational activities associated with new roads developed as part of future forestry operations. It may also include additional recreational use of reclaimed lands at area coal mines and increased use of the area east of the mine as off-highway vehicle (OHV) use is displaced from Mountain Park by the Cheviot mine.

6.4.2 Views of the Interveners

Although most interveners did not question CRC about the rate of recreational growth used in the CEA, there were a number of questions and concerns about the lack of detailed estimates of the types of recreational activities that would occur and how these activities would be distributed throughout the region. For example, Parks Canada believed that CRC’s assessment did not use all available data and that the lack of spatially explicit information on future recreational activity had caused considerable uncertainty in the analysis of cumulative effects.

The ACC/ANPC also argued that the recreational analysis was incomplete for a number of reasons. First, there was, in its view, insufficient information on the regional distribution of future recreational activity to allow the adequate assessment of the potential impacts on grizzly bears and Harlequin ducks. Second, the ACC/ANPC was critical of the recreation analysis because it did not clearly differentiate between motorized and nonmotorized recreation, and it felt that a more accurate assessment of OHV use was required for a complete assessment of cumulative effects. It noted that the physical disturbances associated with OHV use in the area were poorly documented, and it offered evidence to suggest a single OHV could have from 300 to 1000 times the impact of a hiker. The ACC/ANPC’s concern was that OHV use in the backcountry is increasing and that unless better data were available, the resulting impacts on grizzly bears could not be adequately addressed in the analysis of habitat effectiveness or security analysis.

AENV observed that, in its view, future recreational development was unlikely to occur in areas away from the existing roads.

6.4.3 Views of the Panel's Consultant

Dr. Ross concluded that the examination of recreational activities as part of the CEA was an excellent idea, and he expressed no concerns about the adequacy of the information. However, initially he did raise some questions regarding how the assumptions about increasing recreational demand had been factored into the analysis of the various VECs, especially since the compounding effect of 3 per cent annual growth in recreation over 25 years would result in activity levels significantly greater than at present. These questions, he later concluded, were largely addressed in subsequent submissions provided by CRC.

6.4.4 Views of the Panel

The Panel notes the views of all the parties to the hearing that recreational activities are a significant potential source of cumulative impacts in the region. This is consistent with the conclusions of the Panel in its previous report, and the Panel continues to hold this view. With regard to whether the data used were the best available, the Panel recognizes that, unlike forestry or mining, where it is common practice to develop long-term plans that can be referenced in a CEA, future changes in recreational activity are much more difficult to predict or anticipate. As a result, the Panel concludes that the predictions based on the subjective, and in some cases expert, opinions of the various regional business operators and regulators who were interviewed by CRC are the best available estimates. The Panel also concludes that it does have sufficient information to reach justifiable conclusions with regard to the cumulative impacts of the Cheviot Project in association with regional recreational development.

The Panel does accept Parks Canada's view that in order to effectively assess the future effects of regional development, including recreation, on Jasper National Park, the ongoing monitoring of human and wildlife use of the high mountain passes between provincial lands and Jasper National Park will be needed. However, the Panel does not believe that in this case it would be fair or appropriate to require a single proponent, such as CRC, to collect these data on a number of regional sources of impacts, most of which are not directly or even indirectly related to its proposal. Based on the testimony provided by Parks Canada, such data would seem to be critical to Parks Canada meeting its own mandate to protect the Jasper National Park's ecological integrity, even in the absence of the Cheviot Project. **The Panel therefore recommends that Parks Canada immediately initiate a program to monitor and report on recreational activity levels in these passes into Jasper National Park.**

7 ASSESSMENT OF CUMULATIVE EFFECTS

7.1 Aquatic VECs

7.1.1 Views of the Applicant

In the 1999 CEA, CRC identified four aquatic VECs for consideration. These were

- surface water quantity,
- water quality-sediment,
- water quality-nitrogen, and
- fisheries.

CRC noted that its most recent findings with regard to aquatic impacts had remained consistent with those of the original Project application. Therefore, it took the position that the additional investigations carried out since that time had only served to increase its confidence in the results and conclusions derived previously. The aquatic VEC study areas are shown in Figure 4.

Surface Water Quantity

With respect to water quantity, CRC stated that it had examined three indicators—peak, annual, and low flows—in order to describe the effects of the Project and other regional sources of impacts on the regional water regime. CRC noted that changes in the flow regime can, in turn, alter a number of components of the local stream ecology by altering habitat conditions. The applicant identified a number of mining activities that could impact the quantity of surface flow, including clearing prior to mining, stripping and stockpiling the overburden, dewatering of groundwater prior to mining, pit dewatering during mining, end-pit-lake filling, and reclamation and revegetation activities. CRC concluded that mining would result in increased low flows during the premining and pit dewatering stages, as well as during the winter period as a result of drawdown of end-pit lakes, while storm water retention in the active pits and end-pit lakes, as well as the porous nature of the rock dumps, would reduce flood peaks. CRC indicated that the filling of end-pit lakes could be accomplished in such a way as to avoid negatively affecting downstream flows. The overall net effect of mining was believed to be increased low flows and a reduction in peak flows.

CRC also assessed the impact of other mining projects in the CEA study area, forestry operations, oil and gas projects, and the upgrading of Highway 40 on surface water quantity. CRC noted that the proposed mines in the vicinity of the Project would replace depleted mines, rather than add to their number. CRC, in fact, expected the number of mines to decrease over the 25-year period selected for the assessment. Therefore, it was assumed that the future effect of other regional mines would not change significantly from the existing baseline conditions.

With regard to impacts from the proposed forestry operations, CRC noted that studies of forest harvesting in similar watersheds suggested that runoff from April through September increased, as did annual peak flows following logging. The applicant predicted that the impact of oil and gas development, the upgrading of Highway 40, and future recreational activities on the quantity of surface water flow would be insignificant.

Overall, CRC concluded that there would be no significant adverse cumulative effects on surface water flows. In the short term, mine development would cause a minor increase in peak flows due to clearing and pit dewatering, while forestry operations would also increase peak flows and annual flows. With limited harvesting in the early years of the mine, the combined cumulative effects of the two industries would be minor. In the longer term, the cumulative effects of the Cheviot mine would include an attenuation of peak flows due to storage in end-pit lakes, increased low flows in winter, and a slight decrease in annual flows. The impacts of forestry, CRC predicted, would counteract and overwhelm the impacts of mining. CRC estimated, for example, that an 8.2 per cent increase in annual flows on the McLeod River downstream of Mckenzie Creek due to forestry operations by the year 2025 would overwhelm the anticipated 1.1 per cent decrease due to mining.

Water Quality—Sediment

With respect to sediment loading and its impact, CRC indicated that it had not changed its original conclusions with respect to the Project and that the findings in the Panel's previous report remained correct. Those findings included the conclusion that although the nonmining components of the Project would have little or no effect on sediment levels, numerous sources of sediment would be generated as a result of a large surface mine. However, these impacts could be mitigated through the use of settling ponds and similar control features, including the proposed end-pit lakes during both the mining and postmining period.

CRC also assessed the cumulative impact of other mining projects in the CEA study area, as well as the impact of forestry, recreation, and oil and gas development on sediment loading. Again, it was assumed that the effect of other regional mines would not change from present conditions and would be comparable to that of the Project and, as a result, not have any long-term negative impacts either individually or collectively.

CRC reported that studies on the impact of forest harvesting in similar watersheds found that there were changes in the average annual suspended sediment yield in some studies and that peak sediment loads increased significantly during road construction and logging periods. CRC reported that due to the nature and relatively low level of recreational activity in the Project vicinity (primarily OHV crossings of creeks and watercourses), even if recreational levels doubled over the life of the Project, this was expected to have a negligible effect on sedimentation.

The only oil and gas operation CRC discussed as potentially contributing to sedimentation was pipeline construction, which the company noted was reported to increase sediment concentrations, though the magnitude of impacts depended on numerous other variables. CRC noted that if either forestry or oil and gas sediment-inducing activities occurred concurrently with the construction of the road and rail to Cheviot and a major storm event occurred, there could be a cumulative effect on sediment during this short-term construction phase. However, long-term cumulative effects were not anticipated during the operations phase of the mine due to the presence of effective sediment control systems.

CRC concluded that the cumulative effects on sedimentation from the mine in association with the various other activities considered were not significant. CRC recognized that minor adverse

effects might occur in the short term as a result of mining in combination with other activities in the drainage basin, especially during heavy rain or snowfall events. However, CRC argued that such events would have a corresponding impact on the sediment concentrations in natural watersheds and that sediment concentrations would return to pre-event levels one to several days following the event.

The applicant noted that it planned to mitigate any negative effects from sediment loading by implementing sound sediment control measures at the Cheviot Project. CRC concluded that the long-term effect of the Cheviot mine, and potentially other mines as well, on regional sediment loading would in fact be positive, largely due to the end-pit lakes controlling sediment loads. As a result, no significant cumulative effects were predicted either during the life of the Project or following closure of the mine.

Water Quality—Nitrogen

With regard to nitrogen loading, the second measure of water quality considered by CRC, the company noted that the Panel stated in its 1997 report that there was some risk of regional impacts (i.e., eutrophication) if nutrient loading were not carefully monitored and controlled. Eutrophication, or the overenrichment of surface waters with nutrients, results in increased productivity of aquatic plants and is normally regarded as undesirable. CRC observed that the Panel also noted that there would be a period of some unknown length when nutrient loading from both mines (i.e., the existing Luscar mine and the Cheviot mine) would occur. Therefore, the Panel had highlighted the importance of an adequate monitoring program to determine whether nutrient loading was creating a risk of downstream eutrophication.

In order to respond to the Panel's earlier concerns, CRC stated that it had conducted a number of water quality studies to assess the eutrophication potential in the upper McLeod River. In addition, the company noted that AENV had conducted seasonal water quality surveys to measure nitrogen concentrations in the upper McLeod River.

CRC stated that it had used nitrate loading as an indicator of cumulative effects from nitrogen, since nitrate is a byproduct of blasting used in mining operations and has been identified as the main form of nitrogen leached from coal mines into receiving waters. In order to assess the potential effects of elevated nitrate-nitrogen levels in the receiving waters, CRC conducted surveys on epilithic (i.e., attached) algae, which are the main primary producers in the streams and most likely to be affected by high nutrient loads. Those studies concluded that the algae were largely unaffected by discharges of water containing high nitrogen concentrations. CRC attributed this result to the relatively high velocity of the river, which appeared to prevent excessive amounts of algae from accumulating, and to the low levels of phosphorus, which was the limiting nutrient required for increased primary production in the stream water.

CRC established a list of activities that it believed had the potential to impact water quality. These included coal mining, timber harvesting, natural gas exploration, limestone quarry development, residential areas, tourism, and random recreational activities. For the purposes of the CEA, it was assumed that the level of industrial and other activities would remain largely unchanged until 2010-2011. Beyond 2011, mining levels were projected to decrease. Timber

harvesting activities and other commercial land uses were assumed to continue at approximately the same rate as at present.

CRC stated that it had estimated a maximum annual loading of nitrate-nitrogen to the McLeod River drainage system from mining operations, including the Luscar mine, the Gregg River mine, and the Coal Valley extension. The applicant noted that there would be a period of overlap, while the Luscar mine was winding down and the Cheviot mine was preparing for full production, during which there would be cumulative nitrogen inputs from both operations. During this transition period when both mines could be operating at maximum capacity, CRC estimated that the total loading of nitrate-nitrogen could be approximately 15 per cent greater than the nominal annual maximum.

The maximum nitrate-nitrogen concentration, when mixed with the average annual flow of the McLeod River, could be expected to be approximately 0.5 milligrams per litre (mg/L) in the river above the Embarras River confluence and was estimated to be 0.2 mg/L at the confluence of the Embarras and McLeod Rivers. These levels were both noted to be below the Alberta Surface Water Quality Guidelines (ASWQG) of 1.0 mg/L for total nitrogen. CRC indicated that the ASWQG could be exceeded immediately below the mine settling ponds. This was due to the relatively high nitrate levels in the effluents, which have occasionally exceeded levels of 15 mg/L. CRC also noted that nitrate leaching from waste rock dumps would continue for five to ten years after the mines were closed.

With respect to the forestry impacts on nutrient loadings, CRC acknowledged that Weldwood had reported increases in nutrient export from clear-cut areas from several catchment basins within Weldwood's FMA. CRC stated that another long-term study of the effects of forestry, however, in a nearby watershed, showed significant decreases in nitrate-nitrogen following logging, though decreases in organic nitrogen levels were less apparent. However, the study also detected significant increases in total phosphorus loading. CRC concluded from these results that it did not appear likely that the forestry operations in the McLeod River basin would contribute significantly to the cumulative nitrogen loading. Under questioning from TUC regarding the cumulative effects of the elevated nitrate-nitrogen concentrations from mining operations and the potential increases in phosphorus loading from forestry operations, CRC continued to maintain that there would be no cumulative or synergistic eutrophication effects of the combined nutrient releases.

With respect to the impact of other land uses on nitrogen loadings, CRC stated that it had concluded that the existing Inland Cement limestone quarry did not contribute nitrogen to the McLeod River system. CRC stated that although recreational land uses could affect water quality, it took the position that the effects of recreational activities were insignificant, particularly when compared to the effects of commercial activities. Potential nutrient contributions from the small residential developments within the McLeod River drainage were also not considered to be significant. Water quality surveys conducted in the vicinity of Robb and Cadomin suggested that they did not contribute measurable water quality changes. CRC did note that agricultural activities were important land uses north of Edson and could be a source of nutrient loading. However, these contributions were outside of the selected CEA study area boundary.

CRC reported that in its view the first major contributor of phosphorus into the McLeod River system was the Town of Edson. CRC believed that Edson was the point at which the cumulative effects of eutrophication should begin to be addressed. CRC stated that AENV had conducted studies on the McLeod River in 1984-1985 to determine the impact of anthropogenic activities. Those studies concluded that the eutrophication effect of discharge from Edson's wastewater treatment plant was evident immediately below the effluent outfall and was caused by elevated concentrations of both nitrogen and phosphorus. However, the report suggested that the assimilative capacity of the McLeod River near Edson was sufficient to rapidly reduce the effects of the enrichment from the sewage outfall.

CRC concluded that the cumulative effects of nitrate-nitrogen loading from the Cheviot mine and other likely developments in the vicinity would be insignificant. While CRC acknowledged that increased levels of nitrogen would occur in the McLeod River below the mining area, it believed that higher nitrogen concentrations, due to phosphorus limitation, would not result in eutrophication. CRC noted that cumulative nitrogen loading was also not projected to exceed surface quality objectives. CRC suggested following up this VEC with periodic aquatic surveys and monitoring of nitrogen releases from regional mine sites.

Fisheries

As a result of DFO's request to have fisheries resources added to the assessment, CRC stated that it expanded its CEA to include fish populations and fish density in the upper McLeod River basin, upstream of the mouth and including the Gregg River (Figure 4).

In CRC's original application, it was estimated that a decline in both fish numbers and biomass would occur in area streams due to the development of the Cheviot Project. It was determined that this loss would be partly compensated for by creating seven end-pit lakes on the Cheviot mine site with self-reproducing fish populations. Subsequent to the original studies, CRC stated that it undertook a more detailed investigation of the end-pit lake known as Lac Des Roches, located on the CRC Luscar mine site. That study suggested that, in part because of the relatively large size of the fish, Lac Des Roches supported significantly more biomass than was expected to be lost from area streams. CRC noted that end-pit lakes also provided overwintering habitat for fish, as well as habitat for different life stages. CRC concluded that, with appropriate monitoring programs to confirm whether or not the mitigation and compensation goals have been achieved, end-pit lakes would provide suitable compensation for the loss of fish populations in the upper McLeod River basin.

CRC stated that it had also assessed the impacts of other coal mining projects on fish populations and habitat in the cumulative effects study area. CRC noted that over the last 30 years coal mining practices had changed and environmental protection regulations had become more stringent. CRC stated that recent studies had shown fish populations in streams on or adjacent to coal mines in the study area to be relatively stable or even increasing. Rainbow trout populations were shown to be relatively stable, with the exception of West Jarvis Creek, and both bull trout and brook trout numbers were shown to have increased over the last few decades. CRC stated that although the increases could not be directly attributed to more modern coal mining practices and more stringent environmental protection regulations, the information strongly suggested that

coal mining had not had any adverse effects on fish populations in recent years and therefore would not have any negative cumulative effects in the future.

With regard to specific mines in the study area, CRC noted that it had addressed the potential negative effects on fish and fish habitat associated with each. CRC concluded that there was no evidence to show that any of the other regional mine operations had had any adverse effects on fish or fish habitat in the study area. CRC also concluded that the Inland Cement quarry was unlikely to have any adverse effects, although no definitive information was available.

CRC confirmed that it had also assessed the impacts of forestry activities in the area on fisheries resources. CRC reported that there had been no documented evidence of a decline in stream fish populations in the current study area that could be attributed to the forest industry. In its assessment, CRC stated that it had assumed that the level of forestry activity in the fisheries CEA study area would be similar to that in the Tri-Creeks experimental watershed study area. CRC noted that as the forestry activities in the Tri-Creeks experimental watershed study area did not have any adverse effects on fish populations, it was expected that future forestry activities elsewhere in the fisheries CEA study area also would not adversely affect fish. CRC noted that the available studies suggested rainbow trout were largely unaffected by forestry operations and brook trout appeared to be expanding their range throughout the upper McLeod River basin. CRC concluded that it was unlikely that the forest industry would have any adverse effects, cumulative or otherwise, on future fish populations or habitat within the study area.

With respect to the oil and gas industry, CRC concluded that the potential effects on fish populations would be similar to those of the forest industry. CRC noted that there had been no documentation of fish populations in the area being affected by the petroleum industry. The company indicated that current operating procedures for the petroleum industry had become sufficiently stringent so that any potential adverse effects would be effectively mitigated.

CRC noted that the literature suggested that the primary sources of fisheries impacts from both forestry and the oil and gas industry were generally associated with linear developments (roads and pipelines). CRC assessed the potential effects of road construction as a result of both the oil and gas industry and the forest industry. CRC stated that its analysis of the available forestry and oil and gas data suggested that road density in the Cheviot mine CEA area would increase to approximately 0.91 km/km². Based on the data from the Tri-Creeks experimental watershed studies, CRC stated that it appeared that road densities of 0.6 to 1.0 km/km² would not have adverse effects on fish populations. CRC concluded that cumulative adverse effects due to road construction would not be viewed as immediate, but it noted that the monitoring and ongoing evaluation of linear developments should be considered.

CRC noted that it had also considered the risks of overharvesting of fish due to a combination of increased numbers of recreational users and increased access due to forestry and oil and gas development. Based on provincial angling licence sales, CRC observed that angler use in the fisheries CEA study area likely could be expected to continue to be relatively stable. CRC also noted that increased access would only result in increased harvest for 5 of the 35 fish-bearing streams in the area. Due to the regulations on legal harvest size, this harvest increase should have little effect on the total population in any of these streams. CRC also stated that the Alberta

Fisheries Regulations could be used to address the potential effects of access development on fish populations. Therefore, the means to mitigate the potential effects of overharvesting due to access development were available if needed.

CRC observed that the development of mitigation to reduce or eliminate the adverse effects of industrial activities on the fisheries resource would be an ongoing process. Subsequent to the original application, CRC stated that it had implemented various follow-up and monitoring programs for fisheries in the study area. CRC stated that it intended to monitor other end-pit lakes at the Luscar mine site, establish a stream flow monitoring program in the McLeod River and Mckenzie Creek, and develop a program to monitor bull trout spawning in Mckenzie Creek. CRC noted that it had also commissioned an assessment of in-stream habitat enhancement opportunities in the upper McLeod River, implemented a fish population monitoring program in the main stem of the upper McLeod River, and planned to develop fish ponds and overwintering capabilities in areas where fish would be introduced to the system.

In response to questioning by TUC as to why a different approach was adopted for the aquatic CEA relative to the terrestrial assessment, CRC stated that the methods were established on a VEC-by-VEC basis, as in the 1996 CEA. In response to TUC's suggestion that the area used for the terrestrial CEA might be appropriate for fish, CRC agreed that a region of that size could have been used. However, CRC noted that the area would have to be defined in terms of the fisheries resource. CRC also indicated that if a CEA for fisheries were done for an area that size, it would require significant amounts of cooperative data-gathering by various stakeholders in the region. CRC recommended the Foothills Model Forest Program as a good vehicle for such work if it were to be done.

The Panel also questioned CRC as to why the aquatic CEA did not address annual mortality rates for fish populations in the Cheviot Project, as was done in the terrestrial analysis for grizzly bears. CRC responded that although the bear approach looked very sophisticated, it was still a modelling approach and was largely theoretical, whereas the aquatic CEA used empirical data. This, the company believed, provided a better estimate of likely cumulative effects.

With regard to a recommendation by TUC that CRC use a species-specific approach, focusing on bull trout and Athabasca rainbow trout, rather than the entire regional fish population, CRC responded that the use of single species such as these would not have been appropriate. While both species are regionally important, their low numbers would have made obtaining reliable population estimates difficult. Furthermore, the selection of those two species over others implied value judgements regarding relative importance that CRC was not prepared to make.

With regard to concerns raised about bull trout and their potential extirpation from the Cheviot mine area, CRC observed that since the zero harvest regulations were put in place, bull trout numbers had increased over their range. CRC also indicated that it had performed radio telemetry studies in the region of the proposed mine that had led to the identification of the bull trout spawning area on upper Mckenzie Creek. Since this was the only known spawning site in the region, CRC noted that it had done a detailed evaluation of the potential for mining to affect the site and had put a plan into place to ensure that this site was protected.

TUC also expressed concerns that the increase in brook trout populations in the area may have had an adverse effect on the native rainbow and bull trout. In response, CRC noted that there was no evidence of any adverse effects on rainbow trout. The company also indicated that any effects on bull trout might also have been significantly influenced by years of overharvesting. With the provincewide protection of bull trout, CRC indicated that their population numbers in the region might now begin to increase. CRC also observed that the non-native brook trout were not as heavily protected as bull trout, and this would positively influence the native species in the system.

At the hearing, CRC was questioned by TUC as to the effects of sediment on fish. TUC quoted from the assessment in the original application, which stated that “Sediment input to streams may constitute the most significant potential effect on fisheries resources in the basin, but the extent and the positive or negative effects of sediments on the range of fish communities and habitats in the McLeod River have not been addressed” (CRC Application, 1996, Vol. II, p. C-82). CRC stated that it did not accept TUC’s contention that the CEA failed to consider the linkage between increased sediment yield and impacts on fish. The applicant stated that the aquatic VECs were clearly linked to the fish population VEC.

7.1.2 Views of the Interveners

In its submission, TUC expressed a number of concerns regarding CRC’s aquatic CEA. In addition to concerns regarding the use of different spatial and temporal scopes and the different treatments of other sources of impact, as discussed previously, TUC believed that the report contained other inconsistencies. TUC argued that CRC’s practice of eliminating project impacts deemed to be insignificant from consideration in the CEA was wrong, noting that a series of insignificant effects could combine to create a significant effect. The sum total of disturbances needed to be looked at prior to the determination of significance, TUC said. TUC used the fisheries CEA provided by CRC as an example of where, in its view, CRC had inappropriately concluded that in the absence of evidence of recent adverse effects in the study area, there could be no significant effects.

TUC indicated that a species-specific approach, using native bull trout and Athabasca rainbow trout as VECs, would also have been more appropriate than CRC’s use of regional fish populations. TUC felt that due to the general emphasis on overall fish populations, the potential implications of the already observed changes in fish community structure were not adequately considered, particularly the expansion of non-native fish in the upper McLeod River. TUC also felt that in its analysis CRC should not have used total fish density as the sole indicator to assess effects on the regional fish populations. TUC indicated that substantial year-to-year variability in populations would have made it difficult to conclusively differentiate disturbance-related changes from other sources of variability. TUC felt that CRC should have included indicators such as size and age structure, community composition, spatial structure, distribution, connectivity, and productivity when assessing effects on regional fish populations.

TUC undertook a detailed re-evaluation of the data presented by CRC. In its re-evaluation, TUC indicated that in its view non-native brook trout had replaced native rainbow trout as the numerically dominant species in the existing mining area. TUC noted that this species shift did

not appear to be occurring elsewhere in the study area. As a result, it concluded that the fisheries data from the Coal Branch streams provided by CRC were not representative of the upper McLeod River cumulative effects study area and could therefore not be used to reach conclusions regarding the cumulative effects on regional fish populations.

TUC also expressed concern over possible adverse effects on native fish populations as a result of the introduction of non-native fish. It was particularly concerned over the increase in brook trout numbers and the potential for displacement of or hybridization with native rainbow trout or bull trout. TUC questioned the ability of the bull trout populations to tolerate additional harvest pressures, given the increasing brook trout populations. Finally, TUC felt that the expansion of non-native species was generally regarded as a sign of a stressed native fisheries, rather than a sign of a healthy fishery. The brook trout expansion should be considered to be an adverse effect on regional fish populations, it said, because it is inconsistent with the Coal Branch IRP.

With respect to forestry, TUC noted that there had been a documented expansion of non-native brook trout in the upper McLeod River study area following forest harvest. TUC also noted that forestry and other existing activities had been documented to cause movement barriers for fish in the McLeod watershed. TUC indicated that these barriers could have adverse effects on the seasonal or year-round distribution of fish species, which might not have been reflected in fish density data from long-term monitoring.

With respect to CRC's compensation plan, TUC indicated that mining and end-pit lakes also favoured the expansion of non-native brook trout populations and the decrease in native trout populations. TUC believed that the studies provided by CRC revealed that end-pit lakes had been contributing to increased stream temperatures in their outlet streams. TUC noted that there was a growing body of scientific literature that suggested brook trout would out-compete bull trout at higher stream temperatures. Due to the numerous end-pit lakes proposed, TUC was concerned with potential cumulative effects on water temperatures in both the McLeod and Gregg River watersheds. It felt that until the cumulative effects of end-pit lakes were better understood or alternative compensation measures were identified, further authorizations for end-pit lakes should not be permitted.

TUC stated that in its view the aquatic CEA assumed that all future environmental protection measures would be successful but did not believe that this claim was substantiated. TUC proposed a different scenario regarding the success of mitigative measures that it believed was more realistic. Based on the available literature and experience in the eastern slopes, TUC stated that even with the implementation of standard environmental protection measures, short-term effects would occur at all sources of disturbance and long-term chronic effects would continue at a smaller number of sites. TUC thought that these minor but additive sources of disturbance would contribute to significant cumulative environmental effects on native fish. As a result, TUC felt that CRC had underestimated potential cumulative effects on native fish species in the McLeod River watershed.

TUC undertook an assessment of the potential effects of future activities in the upper McLeod River using data provided by CRC at the hearings. Its estimates suggested that planned and likely forestry and oil and gas activities would result in a 17 to 72 per cent indirect loss of riparian

(stream bank) habitat, increased barriers to fish movement, and elevated sediment yields in the grizzly bear CEA study area. TUC also believed that predicted future road densities found in BMUs 3A, 3B, and 3C exceeded a threshold at which long-term effects on bull trout populations have been documented. Estimated road crossing densities were in the medium to high hazard range, indicating that detailed site-specific assessments were warranted. TUC also found that predicted sediment yields from road crossings alone would continue to increase beyond natural levels over the next 25 years. TUC concluded that regional fish populations would face cumulative risk beyond the conditions that currently existed from road construction, eutrophication, competition, and hybridization with introduced fish species and sediment input.

TUC provided the Panel with a number of conclusions and recommendations. It recommended that strong consideration be given to protecting the fluvial habitat of Mckenzie Creek and Redcap Creek, as they support important fish species. It did agree that CRC's proposal to introduce native Athabasca Rainbow trout into the upper McLeod River was an appropriate mitigation measure. TUC did not believe, however, that the end-pit lakes would adequately compensate for the loss of stream habitat. It believed that the applicant's compensation program should be designed to comply with the Coal Branch IRP objective of maintaining and enhancing native fish populations and should consider the merits of programs that suppress or eradicate non-native fish.

TUC also believed that CRC should adopt a number of measures to reduce the degree of harmful alteration, disruption, and destruction of fish habitat. This included the creation of overwintering pools and other habitat, maintenance of winter flows in streams, and the production of an annual public report on the Project's net effects on fish and fish habitat, among other suggestions.

TUC recommended that a cooperative regional research and management group be created to help develop and implement aquatic monitoring, research, and management programs in the McLeod and Cardinal River watersheds. It recommended that this group include federal, provincial, and municipal governments, industry, and other stakeholders, such as TUC. TUC indicated that the group's focus should be on increasing the understanding and ability to manage cumulative effects on native fish populations and water quality in the McLeod River basin. In response to questioning by the Panel, TUC added that this group could possibly be created as a subcommittee of the Foothills Model Forest Program.

TUC also expressed concern regarding the potential eutrophication of the McLeod River watershed as a result of the cumulative inputs of nitrates and phosphorus from mining and logging operations respectively. Furthermore, TUC noted that Lac Des Roches was being drained, which would terminate the long-term studies on lake aquatics conducted by CRC on that lake.

AENV stated that it accepted CRC's analysis of the impacts of the Project on surface water quantity, but it expected CRC's proposed mitigation plan to be able to address the potential effects of end-pit lake filling during periods of low flows. It believed that the actual impacts on mean annual water yield attributed to forestry would, in fact, be less than CRC predicted. AENV did accept CRC's conclusion that the Project should not significantly contribute to negative cumulative impacts on water quality as a result of sediment levels, provided that proper sediment

control was implemented. Long-term monitoring programs would, however, be essential to verify CRC's conclusions.

AENV noted that it concurred with TUC that the Tri-Creeks watershed study cited by CRC in the CEA was inconclusive with regard to the influence of forest harvesting on sedimentation because of the occurrence of a flood that masked these effects. AENV noted that specific research at Tri-Creeks showed that a small increase in sedimentation resulted in large increases in fish embryo mortality; yet population effects were not observed.

With regard to the risks of adverse impacts due to nitrogen loading, AENV expressed similar concerns to TUC regarding cumulative nutrient inputs. AENV believed that there was potential for increased human activity in the basin resulting in increased phosphorus levels, which in combination with nitrogen inputs could be of concern. It was noted that even low levels of phosphorus could be enough for significant growth of aquatic plants. AENV stated that there was potential for nutrient inputs in the headwaters to combine with nutrient inputs farther downstream and contribute to problems of overenrichment in the lower river. AENV observed that complaints had been received previously about excessive growth of aquatic plants in the lower reaches of the McLeod River.

AENV expressed uncertainty regarding CRC's conclusions that the impact of the Project on water quality was a minor long-term regional reversible effect and that nitrate release from all mining activities within the study area would not adversely affect water quality or enhance eutrophication. AENV stated that nutrient control was a general concern in northern rivers and noted that a previous study had recommended that nutrient discharges to the northern rivers be substantially reduced. In its submission and at the hearing, AENV committed to collaboration with CRC and other stakeholders to implement a long-term monitoring program and to develop strategies to manage the effects of eutrophication.

With respect to fisheries, AENV felt that the population densities described by CRC in the CEA tended to be lower, based on the Tri-Creeks study, than what it might have expected. AENV felt that these low densities and the limited number of data points may have resulted in a false assumption that the current land uses have no effects on fish populations. AENV also believed, however, that the monitoring programs developed during the approval process would provide better baseline data prior to the commencement of mining. AENV also noted that further restrictions on angling in the Mckenzie Creek and upper McLeod River watershed were proposed to commence on April 1, 2000.

AENV said that some uncertainty still remained regarding the CEA of fisheries. AENV also stated, however, that the regulatory provisions already in place, including the end-pit lake working group, provided a framework in which to gather further baseline data and develop the specific research needed for the protection of fish and fish habitat. AENV concluded that it was prepared to accept the replacement of stream habitat with self-sustaining end-pit lakes, provided that they met specific criteria.

On the matter of nitrogen loadings, Natural Resources Canada (NRCan) stated that it concurred with CRC's conclusion that elevated nitrate in the McLeod River system resulting from drainage

from the Cheviot mine would not be significant. It believed that CRC's predictions of nitrate levels as a result of mining activity were very conservative. NRCan stated that even if nitrate levels greatly exceeded the 1 mg/L surface water quality standard, eutrophication would not occur due to the absence of phosphorus. NRCan noted that eutrophication was only an issue below the town of Edson where sewage effluent was discharged into the McLeod River. NRCan perceived this to be an urbanization issue totally unrelated to upstream mining activity.

Treaty 8 First Nations of Alberta (Treaty 8 FN) provided a written submission to the Panel prior to the March 2000 hearings but did not provide any evidence in support of its environmentally related concerns at the hearing. In its written submission Treaty 8 FN stated that it believed that the impact of the Cheviot mine on First Nations was not adequately addressed in CRC's reports. With regard to aquatic issues, Treaty 8 FN expressed strong concern about the potential elevated nitrogen concentrations resulting from blasting chemicals. Treaty 8 FN stated that it did not agree with NRCan that the eutrophication potential was primarily of municipal concern and stated that consideration of the combined effects of mining and the town's contribution of nutrients was clearly of concern with respect to cumulative effects. Treaty 8 FN suggested that nitrogen concentrations well below the provincial standard of 1 mg/L could cause adverse environmental impacts if phosphorus was present. It noted that previous studies had demonstrated eutrophication effects in the presence of low levels of phosphorus and the subsequent effects of this impact on other aquatic organisms. Treaty 8 FN believed that a more thorough CEA should have considered that information. Three years of study in the area would be required to ensure a reliable assessment, it said.

Treaty 8 FN also expressed concern over the impacts of the Project on fisheries resources. It noted that some of the small streams that the Cheviot mine would affect were key spawning areas for the McLeod system. Treaty 8 FN pointed out that the Cheviot Project would affect several fish species, including the bull trout, a species it viewed as an integral part of the aquatic ecosystem. Treaty 8 FN indicated that the fisheries were an important food source for the First Nations and any effects on the resource could in turn negatively impact the health of its members.

The AFN believed that the main impacts associated with the Project had been accurately predicted and described, with suitable mitigation strategies prepared. Specific concerns raised by the AFN related to water quality included increases in sediment loading and increases of in-stream concentrations of nitrogen, heavy metals, sulphides, and phosphorus. However, it believed that the mitigation measures proposed by CRC would successfully minimize the impacts of the Project on water quality.

The AFN did believe that more information was required in a number of areas related to aquatics to facilitate the environmental assessment. This included the potential for sediment generation from upgrading the mine access road and the subsequent effects on water quality, as well as a plan for the abandonment and removal of the Harris Creek reservoir. Also included were the impacts on, mitigation of, and compensation for bull trout; fish salvage and transfer plans during the development stages of stream diversion; and a plan to address the issue of access and its subsequent effect on the fisheries resource. The AFN also noted that disposal plans for the sludges generated by the sedimentation and treatment ponds were not found in their reviews of

the CEA. The AFN made a number of recommendations regarding aquatic resources that it believed might be appropriate for the permitting processes of AENV and the EUB.

At the hearings, DFO indicated that with a phased development schedule, including sequential approvals for various phases of the Project in combination with the implementation of appropriate monitoring programs and the commitment of CRC to practise adaptive management, the potential cumulative impacts of the Project on fish and fish habitat could be addressed.

7.1.3 Views of the Panel's Consultant

In his original evaluation of the documents produced by CRC, Dr. Ross believed that the CEA on water quantity and sediment was inadequate. He believed that while the forestry impacts dominated this section of the CEA, the basis for determining these impacts was not stated, nor were the impacts reported. He noted that the conclusions drawn from the CEA were not necessarily incorrect but that the reporting of the methods and results was not explicit enough to evaluate the validity of the conclusions. Dr. Ross noted that the CEA for nitrogen would be considered adequate if the assumptions regarding forestry were correct.

At the hearing, Dr. Ross also advised the Panel that the information gaps could be easily remedied, but he noted that the information was necessary to adequately assess cumulative effects. However, the level of forestry activity was not explicit in the assessment. As a result, he expressed uncertainty about the assumptions upon which the conclusions were based. Subsequent to the submission of additional information by CRC in response to his assessment, Dr. Ross indicated that several of his concerns had now been fully addressed. He indicated that the treatment of recreation and oil and gas activities for water quality sediment and nitrogen were explained to his satisfaction. He did, however, question the effects on the fisheries VEC should a potential growth in recreational fishing occur. It was not clear to him whether such an assumption was built into the analysis.

7.1.4 Views of the Panel

With regard to surface water quantity, the Panel concludes that CRC's CEA has effectively incorporated the impacts of the proposed Cheviot Project, other mining projects in the area, forestry operations, oil and gas development, and the upgrading of Highway 40. The Panel concludes that there will be no significant cumulative adverse effects on surface water flow, but that some minor localized negative effects may occur with respect to short-term peak flow and annual flows. The Panel also reconfirms its previous requirements that CRC's water control designs include the management of storm flows and that it fill end-pit lakes in such a way as to avoid negatively affecting low flows.

With regard to the impacts of sediment on water quality VEC, the Panel continues to expect that a large surface mine will generate numerous sources of sediment. In its earlier report, the Panel concluded that this was an ongoing concern if not properly managed, and the Panel continues to hold that view. The Panel also notes, however, that this is a common issue at all surface mines and that there are a number of technologies and management plans in place that allow for the

effective control of sediment. Therefore, the Panel continues to believe that the impacts from sediment can be prevented through sound sediment control measures.

Notwithstanding these measures, it is likely that some sediment loading from the Project will occur. Therefore, the Panel notes and supports AENV's requirements for long-term monitoring of sediment loading and any associated bio-monitoring necessary to ensure that the aquatic environment is protected. These provincial programs should effectively monitor any change in the aquatic ecosystem and ensure that effective mitigation can be carried out.

With regard to the cumulative effects from sediment, the Panel notes that CRC identified a possible adverse cumulative effect if both forestry and oil and gas activities were to occur concurrently with the construction of the road and rail to Cheviot and with a storm event. The Panel will require that CRC, through its EUB approval, ensure that its road and rail construction activities are coordinated with regional forestry and oil and gas activities to reduce the risks of this occurring to acceptable levels. The Panel also notes CRC's commitment to work with other stakeholders to implement regional industrywide operating guidelines for sound sediment control measures focused on activities such as road construction. The Panel believes that this initiative will further reduce the future risk of cumulative adverse effects from sediment generated by regional industrial development and, through the EUB, is also prepared to support such an initiative.

With respect to nutrient loading, the Panel notes that CRC chose to focus its CEA on nitrogen, and more specifically nitrate, as the basis for assessing the risks of eutrophication. In reviewing the evidence provided by CRC, the Panel concludes that this is a reasonable approach and that CRC's predictions of regional nitrogen loading, including the potential effects from other sources, are also reasonable. As is the case for all of the environmental issues addressed in this report, the Panel does accept that there is an element of uncertainty with regard to these predictions. However, the Panel concludes that the approach taken to determine future loadings was sufficiently conservative that these uncertainties, even if they do occur, will not cause any short-term adverse effects and can be addressed through a number of longer-term mitigation programs. The Panel also expects that the nitrogen levels, even at maximum input, would still generally be below the Alberta Surface Water Quality Guidelines.

The Panel notes that CRC's studies indicated that phosphorus, rather than nitrogen, is likely the limiting nutrient for potential eutrophication within the study area. In its report to the Panel, CRC also indicated that although phosphorus levels were not currently of concern in the region of the Cheviot Project, there was a possibility of future forestry activities and increased human activity resulting in increased phosphorus loadings. AENV also expressed concerns that these possible sources of phosphorus, in combination with nitrogen inputs, could potentially contribute to eutrophication of the system. Finally, it is clear that the Town of Edson does contribute measurable levels of both nitrogen and phosphorus through its sewage outfall and that nutrient loading downstream from the town has been an issue in the past. Forestry operations and agriculture may also be sources of phosphorus. Therefore, while there is no clear evidence at this time that eutrophication in the McLeod River system is or will be a significant issue, the Panel concludes that there is a potential that this could be an issue in the future unless properly managed.

The Panel notes AENV's commitment to collaborate with CRC and other stakeholders to implement a long-term monitoring program to develop strategies to manage the effects of eutrophication. The Panel accepts as reasonable the contention that the cumulative effects of nitrogen loading from Cheviot and other likely developments in the vicinity, based on available data, will be insignificant within the CEA boundaries. However, the Panel also accepts CRC's commitment to play an active role in the management program proposed by AENV, focusing on the amount of nutrients entering the system and methods to reduce these levels. The Panel, through the EUB, will also recommend to AENV that the downstream communities be invited to participate in any program designed to manage nutrient loadings on a regional basis. Based on the above, the Panel concludes that no significant regional adverse effects on eutrophication will occur due to the development of the mine.

With respect to the fisheries VEC, the Panel notes that in its previous report it concluded that some adverse effects to fish and fish habitat would occur as a result of development of the proposed Cheviot Coal Project. The Panel also concluded that compensation for that loss could be achieved and would effectively mitigate these impacts. The Panel, after reviewing the evidence, continues to conclude that its earlier findings remain appropriate.

The Panel notes that TUC believes that greater emphasis should have been placed on native (e.g., bull trout) than on introduced fish stocks (e.g., brook trout). However, the Panel agrees with the applicant that this is a value judgement. In the absence of direction to the contrary from either the provincial or federal agencies mandated to protect fisheries, the Panel can only conclude that CRC's approach is consistent with public management objectives. The Panel does note that, notwithstanding its approach to estimating cumulative effects, CRC has committed to undertake programs designed specifically to enhance the opportunities for native fish species.

The Panel also concludes that neither forestry nor oil and gas development is likely to result in significant adverse effects, cumulative or otherwise, on fish populations within the study area. The Panel believes that the approach taken by CRC to assess the significance of the impacts is sufficiently conservative to ensure that meaningful effects have been identified.

The Panel does believe that, if not properly managed, road construction and other linear features resulting from the various forms of development into the region, including recreation, may cause cumulative effects in the future. However, the Panel has no reason to believe that improper management will occur. Furthermore, the Panel believes that the ultimate road densities associated with future development are not fixed and can be managed through appropriate planning by the province. The Panel notes that a number of regional environmental planning initiatives are now under way. Since establishing thresholds for the acceptable density of linear developments will clearly be important if unacceptable cumulative effects are to be avoided in the future, the Panel will expect CRC to bring this issue forward in the appropriate planning forum. The Panel will instruct EUB staff to actively participate in any such process to manage the development of linear facilities on a regional basis. The Panel will also require CRC, through its EUB approvals, to ensure that its development remains consistent with any thresholds eventually established.

With regard to the concerns raised by Treaty 8 FN regarding the potential for adverse effects from the Project on regional water quality and fisheries also resulting in an adverse effect on its members, the Panel notes that Treaty 8 FN chose not to provide any direct evidence regarding these issues. Notwithstanding this, the Panel has been able to conclude that no significant adverse effects on surface water quantity or water quality will occur within the CEA study region as a result of the project or other area activities. The Panel has also concluded that any local adverse effects on fisheries can be addressed through various compensation programs. Therefore, the Panel concludes that no significant adverse effects on members of Treaty 8 FN making use of the CEA study region will occur.

With regard to effects downstream of the CEA study area, the Panel concludes that there will be no significant cumulative adverse effects on downstream surface water quantity, water quality, or fisheries as a result of the Cheviot Coal Project and so no associated adverse effects on the lands, resources, or members of Treaty 8 FN.

The Panel does not completely agree with CRC's contention that increased access and associated angling pressure will have little effect on the total population of fish in the Project area. This result will only occur if the fisheries managers can adapt local regulations to accurately track changes in fishing pressures. However, the Panel is aware of the current harvest protection for native species in the study area and understands that these fisheries regulations have been designed to address the potential effects of overharvesting. Therefore, while the Panel believes that poorly controlled harvesting of fish may result in cumulative effects, the Panel concludes that the risk of this occurring is sufficiently low that the likelihood of adverse effects is insignificant.

The Panel notes CRC's commitment to develop fish ponds and overwintering capabilities where fish will be introduced to the system. The Panel is aware that CRC has established a stream-flow monitoring program in both the McLeod River and Mckenzie Creek, as well as a program to monitor bull trout spawning in Mckenzie Creek. The Panel is also aware of CRC's assessment of in-stream habitat enhancement opportunities in the upper McLeod River and its fish population monitoring program in the main stem of the upper McLeod River. The Panel believes that these represent significant mitigation and monitoring commitments by the company.

The Panel notes CRC's commitment to monitor the end-pit lakes in order to establish whether mitigation and compensation goals have been achieved. The Panel expects CRC, as part of its monitoring program, to perform a study looking at the effects of end-pit lakes on outflow stream water temperatures and any resulting negative effects on native fish species. The Panel will require CRC to use the necessary adaptive management techniques should studies indicate that end-pit lakes are causing currently unforeseen negative effects on native aquatic species in the area.

DFO commented that a phased development schedule, with sequential approvals, would help to ensure that the various mitigation measures proposed were successful. The Panel notes that the EUB has a substantive approval process for each new mining phase. The current application, to be acceptable, must contain sufficient information to allow, at a minimum, for the conceptual details of the eventual mine plan to be evaluated. If sufficient information is provided under the

provincial process, a mine permit is issued by the EUB. AENV, in turn, takes the EUB mine permit into account when establishing its approvals for the proposed mine, including a Conservation and Reclamation (C&R) approval. The C&R approval establishes the long-term reclamation requirements for the mine, as well as setting out financial security requirements to ensure that the provincial reclamation goals are met. Next, the EUB regulatory process requires separate approvals for all significant components of a proposed coal mine (e.g., individual pits, rock dumps, retention ponds, etc.) before they can be developed. These are each subject to detailed technical review, including their effects on the environment, and can each also be subject to a full public hearing. Finally, the various AENV approvals are reviewed at routine intervals to ensure that they also remain relevant to the mine as it develops. Based on the above, the Panel concludes that Alberta's regulatory approval process for coal mines will be able to address DFO's concerns.

As noted above, the Panel concludes that cumulative adverse impacts to the aquatic VECs will be negligible to minor and that residual impacts can be successfully mitigated or addressed through compensation. **The Panel recommends that these conclusions be accepted by the federal government. The Panel also recommends that through the Foothills Model Forest Committee, DFO, in partnership with AENV, lead the formation of a cooperative regional research and management subcommittee to help develop and implement aquatic monitoring, research, and management programs in the McLeod and Cardinal River watersheds.** The members of the subcommittee should include regional agencies, industry, and other stakeholders, such as TUC. The Panel suggests that the group's focus should be on increasing the understanding and ability to manage cumulative effects on native fish populations and water quality. The Panel also would suggest that the committee consider whether there is a need to expand its analysis beyond the study area boundaries used by CRC in its CEA. **The Panel recommends that DFO actively participate in these and any other regional aquatic studies.**

The Panel notes that its terms of reference require that it consider "The Environmental Effects of the Cheviot Coal Project **including the Environmental Effects of malfunctions or accidents** [emphasis added] that may occur in connection with the Cheviot Coal Project..." The Panel also notes that it is expected to consider not only the environmental effects of the Project but also any change to the Project that may be caused by the environment.

These issues were addressed in the Panel's 1997 report. In that report the Panel concluded that the only reasonably foreseeable sources of accidental impacts from the Project on the environment were spills or the release of stored water and associated sediment into the McLeod River system from either the mine site or the coal plant. The Panel also concluded that one possible source of such a release was a significant rainstorm event. The Panel was unable to identify any other reasonably likely sources of environmental effects on the Project or of accidents or malfunctions that would have potentially significant adverse effects.

A significant release of either contaminants or sediment could have significant adverse effects on aquatic VECs and on species such as Harlequin ducks, which make use of riparian habitat. The Panel continues to be of the view, however, that the risk of these accidental events, including the risks associated with significant storms, has been adequately reduced by the various water

management systems proposed for the mine site and concludes that the risk of adverse environmental effects is insignificant. **The Panel notes that these findings were not questioned by the federal court and recommends that they continue to be accepted by the federal government.**

7.2 Selenium

7.2.1 Views of the Applicant

With respect to selenium levels in fish, CRC indicated that it first became aware of a possible concern a few weeks prior to a February 29, 1999, news release by Alberta Health and Wellness (Alberta Health). The news release indicated that initial results of tests on fish taken from Lac Des Roches, West Jarvis Creek, Luscar Creek, and Gregg River showed possible high levels of selenium such that consumption of such fish could result in a daily selenium intake higher than accepted guidelines. CRC stated that it recognized this as a potentially serious concern and that it was investigating the issue.

CRC indicated that a selenium working group was formed in January 2000, consisting of CRC, Luscar, AENV, DFO, the EUB, and Smoky River Coal Limited. CRC noted that the group was established to develop an understanding of the sources of the selenium, what guidelines would be appropriate, and what impact selenium would have on fish and other aquatic species. The working group was to determine if there were any adverse environmental effects caused by the reported selenium levels or if there might be any adverse impacts expected in the future. Key study components of the working group would include assessing existing and potential impacts on biota; determining sources and mobilization mechanisms of selenium; evaluating existing selenium concentrations in water, sediment, and biota in the upper McLeod River, and investigating potential control and mitigation measures.

CRC agreed with AENV's view that the studies determining the need for a serious health advisory would take approximately three months. CRC indicated that the working group had already finalized two studies related to human health risks on selenium and these had been submitted to Alberta Health to assist in its review process. These reports indicated that there was little to no health risk to humans consuming fish harvested from the vicinity of the mine. CRC noted that even though the two human health risk assessments were done separately and been undertaken independently, both had come to similar conclusions.

CRC expected that the selenium working group would take 12 to 18 months to complete its studies. CRC stated that it felt reasonably confident the group would be able to identify the source of the selenium and deal with the process by which it was released. CRC also felt that the elevated selenium levels posed a negligible risk to the surrounding environment. It noted that all the evidence indicated that Lac Des Roches, the area with the highest measured concentrations of selenium, had continued to have self-sustaining populations of aquatic species. CRC's current studies indicated that there were no abnormalities found in adult aquatic species and the egg hatching of waterfowl, including Harlequin ducks, was also found to be normal.

Responding to questioning by the AWA Coalition, CRC stated that although it did not have a selenium CEA at this time, it also did not have any evidence to show that there was a selenium issue expected with the proposed Cheviot mine. CRC responded to the AWA Coalition's questions regarding whether mining was responsible for the increased selenium levels by stating that if mining were responsible for increased selenium levels, when mining ceased, so would any activity releasing selenium.

In response to a concern raised by the AFN over selenium levels in animals, CRC indicated that throughout the cumulative effects studies numerous animals were tested for selenium. Within the study area, blood samples were taken from grizzly bears that indicated selenium levels below levels considered toxic for livestock. Sheep in the area were also sampled, and the results indicated relatively high selenium levels, although there was no evidence that they were toxic. Harlequin ducks were also sampled, and all values were found to be below toxic levels.

7.2.2 Views of the Interveners

AENV noted that, subsequent to the previous hearings for the Cheviot Project, further data and information had been collected regarding selenium, particularly in the surface waters of the upper McLeod River and other rivers in the vicinity of the coal mines. The data collected indicated that selenium levels found in the Project area were relatively elevated and that some levels exceeded current water quality guidelines for the protection of aquatic life. AENV also found that elevated selenium concentrations in tissue and eggs of fish correlated with high levels of selenium in the water.

Due to the identification of increased selenium levels in the area, AENV indicated that further detailed assessment work was being done. It specified that through the selenium working group, both AENV and industry members would work to increase the level of monitoring. Due to the uncertainties surrounding the issue, AENV noted that it was still unclear as to whether the elevated levels of selenium would be an issue for the Cheviot Project. It indicated that should the Cheviot Project be approved, the information obtained by the working group would be used to manage the development so as to control or mitigate any adverse effects associated with selenium.

A number of interveners expressed concern over the levels of selenium in surface waters. In response to questioning by the Cadomin Environmental Protection Association, AENV indicated that it would be maintaining water quality monitoring programs in the Cadomin area, including surface water testing. AENV also indicated that it would be possible to test some of the wells in Cadomin to ensure that levels of selenium were within the potable water guidelines of Alberta. AENV assured the community of Cadomin that selenium levels in the McLeod River adjacent to the town site were below guideline levels. AENV stated that management of the issue could be done at the licensing stages of approval should it become a problem.

TUC indicated that there was a need for further assessment of end-pit lakes with respect to selenium. It expressed concern over the eventual viability of the habitat compensation program, since it was intended to replace lost river habitat with lake habitat. Its main concern arose from the fact that problems with high selenium levels appear to occur in warm standing water rather

than flowing water environments. TUC also indicated a concern regarding the susceptibility of rainbow trout and bull trout to selenium. Treaty 8 FN also was concerned with the effects of mining on the selenium levels in the McLeod River system.

In its intervention, the AWA Coalition questioned what the selenium levels would be like after mining operations were complete. It felt that both the Project-specific effects and cumulative effects regarding selenium should have been looked at, particularly the effects of other mines in the vicinity of the McLeod River system. The AWA Coalition indicated that the measures proposed for dealing with selenium were both hypothetical and highly speculative. It stated that it was still unknown if any economically or technically feasible mitigation measures were available to deal with the issue.

7.2.3 Views of the Panel

In considering the issue of selenium contamination, the Panel notes that this issue has only been identified as being of potential significance for a relatively short period of time. Despite this, it is clear that the applicant and the Alberta government have made considerable progress in assessing the potential short- and long-term risks. In considering whether the potential impacts from selenium discharges from the Cheviot Project are acceptable, the expert evidence provided to the Panel on this issue by CRC was very helpful. It does appear that the current water quality guidelines for selenium are particularly conservative and that even an exceedance of those guidelines does not mean that there has been or will be an adverse environmental impact. Certainly the evidence presented to the Panel suggests that the risk to the public is minimal. Nor is there any evidence of other sources of selenium or of any associated cumulative impacts from developments other than mining. The Panel also notes that while AENV indicated clearly that the evidence of higher than expected selenium is of concern, there was a strong comfort level that the issue could be addressed and public health and safety protected.

Based on this evidence, the Panel concludes that it is reasonable to expect that selenium levels, while warranting ongoing monitoring and research, do not represent a significant risk of adverse impact on regional water quality. The Panel also concludes that, based on the evidence to date, there is negligible human health risk associated with consuming fish harvested from the vicinity of the mine. It is clear to the Panel that the provincial government and the applicant have recognized the issues around selenium and have taken a number of significant steps, not the least of which is the formation of the selenium working group, to address these. The Panel accepts as reasonable that within a year to 18 months the selenium working group will be able to identify the sources of selenium and will subsequently be able to deal with the process by which it is released. The Panel will require, as a condition of its provincial approval, that CRC use the information obtained by the selenium working group to adaptively manage the Project design, construction, and operation so as to control or mitigate any adverse effects associated with selenium. Since sequential approvals from the EUB are required, ensuring that this occurs will be straightforward.

The Panel agrees with TUC's contention that there is likely a need for further assessment of end-pit lakes with respect to selenium. The Panel also believes that there is sufficient time for CRC to complete its studies on the issue prior to the use of end-pit lakes at Cheviot. The Panel expects

CRC to continue to monitor new end-pit lakes for selenium levels and to report to the EUB and AENV on any resulting effects on aquatic species.

The Panel is aware that AENV has played a large role in collecting and processing the available data regarding selenium and will play a large role in the monitoring and management of the issue through both the selenium working group and the licensing stages of approval. The Panel agrees with the position taken by AENV that it is still unclear as to whether the elevated levels of selenium are going to be an issue for the Cheviot Project. The Panel notes and accepts AENV's commitment to ensure that water quality monitoring programs, including surface water testing, are maintained, especially in the areas surrounding the Hamlet of Cadomin. The Panel also notes AENV's commitment to administer water testing at selected wells in Cadomin to ensure that the levels of selenium remain within the Alberta potable water quality standards. **The Panel recommends that DFO continue to participate in the selenium working group in order to ensure that any federal requirements continue to be met.**

7.3 Terrestrial VECs

CRC identified five terrestrial VECs for consideration in the 1999 CEA. In CRC's view, the VECs selected represented the key regional issues relative to the proposed Project. The selected VECs were

- vegetation and botanical resources,
- elk,
- selected bird species,
- Harlequin ducks, and
- grizzly bears.

One or more indicators were associated with each VEC. CRC found no significant adverse cumulative effects for any of the terrestrial VECs studied in the 1999 CEA after mitigation measures had been taken into account. In general, CRC stated that conclusions reached in 1999 had a greater degree of confidence and certainty associated with them than the evidence considered in 1997 due to the assessment of added information.

At the hearing, CRC provided additional information (Exhibit 285) in response to concerns raised by the Panel's consultant, Dr. Ross. That exhibit was intended to identify the sources and types of information used by CRC to assess impacts to the various terrestrial VECs.

7.3.1 Views of the Applicant

Vegetation and Botanical Resources

In the 1999 Cheviot CEA, CRC defined the vegetation and botanical resources VEC as consisting of old-growth Engelmann spruce-subalpine fir stands, general vegetation composition and abundance, and valued plant species that occur within the Cheviot mine disturbance zone.

CRC stated that the additional information available for the 1999 CEA, compared to the 1996 assessment, resulted in the cumulative effect on general vegetation being downgraded to minor, with no significant cumulative effect expected. With appropriate mitigation and reclamation, loss

of vegetation was considered by CRC to be short term, reversible, and within the range of natural variability caused by events such as fire. The potential loss of 29 ha of old-growth Engelmann spruce-subalpine forest vegetation in the Powerhouse Creek area was also downgraded from a major regional to a minor local impact, based on data showing that old-growth forests were generally more abundant and secure than previously thought. In addition, CRC found that the number of valued plant species within the Cheviot mine disturbance zone was lower than in the original assessment because the rarity status of some of the species had changed and two species had been transplanted. Furthermore, the Prospect Mountain alpine portion of the mine, which contained a relatively large proportion of valued plant species, no longer formed part of the proposed development area as a result of an earlier decision by the Panel under its provincial EUB mandate.

CRC stated that the vegetation and botanical resources CEA was undertaken for a 3040 km² study area (Figure 5). CRC explained that it chose this study area in part because the most comprehensive ecological classification was available for the area. The period from 1996 to 2025 was used as the temporal boundary for the analysis.

CRC stated that it based the vegetation and botanical resources CEA on two data sources. One was an ecosection level land classification developed for use in the regional grizzly bear and elk habitat assessments. This mapping and classification system included estimates of abundance of broadly defined types of plant communities. The second data set, which incorporated an Alberta Vegetation Inventory (AVI) data source, was provided by Weldwood and Sundance Forest Industries. AVI data primarily dealt with the structure and composition of the tree layer, while the ecological land classification dealt with plant communities and understory species. These data summarized the forest cover type and amount of anticipated forest harvesting that would occur between 1996 and 2025.

CRC described how pre-existing disturbance features within the study area, such as forestry cut-blocks and mined areas, had implications with respect to the projected amount of mature vegetation cover within the study region, even though those disturbances did not occur within the temporal boundary of the CEA. CRC stated that it had also recognized the potential for future natural events such as wildfires or cyclic variation in regional climatic conditions to have a major impact on vegetation in the CEA study area during the time period considered; however, given their unpredictability, they were not included in the analysis.

CRC noted that the CEA analysis was limited to effects of the proposed Cheviot mine, likely forestry harvesting activities, and other potential mine developments. Linear disturbances associated with oil and gas (e.g., exploration roads, seismic lines) were not included. CRC explained that this was because they made up a relatively small amount of the overall area (0.9 per cent or less) and there was a lack of specific vegetation disturbance information available.

CRC clarified during the hearing that recreation was also assumed to have no significant cumulative impact on vegetation and botanical resources because such activities were either very site specific (e.g., campgrounds) or widespread (e.g., OHV use). CRC noted that exceptions to the above would occur if recreational activities incorporated the intentional use of sensitive

vegetation or valued plant species into their activities or if recreation-related activities resulted in a major disturbance, such as fire.

CRC noted that an intensive botanical survey for the entire Cheviot CEA vegetation study area was not possible. Therefore the potential cumulative effects of developments on valued plant species within the Cheviot CEA area were based in part on a review of habitat requirements and associations by species. In response to questions, CRC confirmed that predicting species occurrences from habitat was difficult and depended on the habitat-specificity of the species. CRC stated that the valued plant species identified for the Cheviot mine disturbance zone had relatively specific habitat requirements, both in terms of climate and site conditions.

CRC stated that when assessing the significance of the potential impacts on vegetation and botanical resources it had included the various mitigation strategies outlined in its earlier application and accepted previously by the Panel. These included minimizing clearing, particularly in old-growth areas, revegetating using native species and, where practical, locating and transplanting rare species.

CRC concluded that a cumulative loss or modification of existing mature vegetation within the CEA study area would occur. Within the subalpine region, about 8.7 per cent (114 km²) of the existing mature vegetation would be lost or modified as a result of overall resource development between 1996 and 2025. About 1.2 per cent (29 ha) of old-growth Engelmann spruce-subalpine fir forest would be lost. No cumulative impacts to valued plant species were expected.

Elk

CRC reported minor long-term regional positive effects on forage and negative effects on cover for elk. These effects were not considered significant after mitigation measures were taken into account. A minor adverse local effect continued to be expected as a result of vehicle collisions. CRC reported that the additional information available for the 1999 assessment gave a more specific direction on the expected outcome of the CEA and also provided additional spatial and nonspatial information for use in the CEA.

CRC reported that elk were chosen as a VEC for the 1996 CEA for several reasons, including their significance within the Coal Branch Sub-Regional IRP and the diversity of landscape features acceptable as habitat for elk. CRC noted that elk were more abundant in the region historically and tended to occupy areas that overlapped areas of human activity. In addition, elk are an important prey species for large carnivores, such as grizzly bears and wolves.

CRC stated that its 1999 CEA for elk was based on information assembled for the original Project application, complemented with more current information on elk where available. The elk CEA study area boundaries (Figure 5) included the area occupied by the population to be affected by development activity and by the adjacent populations. Boundaries were established with consideration given to the resident status of elk in the Cheviot Project area and the interchange of elk between the Cheviot Project area and the McLeod River corridor. The opportunities for interchange between elk in the Project area and Jasper National Park were also considered. CRC adopted the ecological and disturbance conditions as of fall 1999 as the baseline for the assessment. Past conditions were simulated by removing the footprint of all

developments from the current ecological condition. Future effects were determined as of 2025, when mining was projected to be completed at the proposed Cheviot Project. The future scenario included effects both with and without the Project.

CRC noted that there were no established thresholds at which disturbance, loss of habitat, or other environmental pressures were known to affect elk productivity or cause elk to leave an area. In CRC's view, however, following Project development, future elk habitat effectiveness levels and habitat supply would be generally high. Overall, without the proposed Project, summer and winter elk forage was expected to decrease over time, while summer and winter cover was expected to increase. If the mine was developed, summer and winter forage was expected to increase, while summer and winter cover was expected to decrease.

In addition to re-evaluating the impacts of the Project on elk, CRC evaluated the potential for cumulative effects of future mining, forest harvesting, oil and gas, and recreational development. CRC noted that spatially explicit information was not available in every case to conduct a thorough quantitative analysis.

Forest harvesting and oil and gas development, CRC said, were expected on the eastern boundary of the Cheviot elk CEA study area. Changes in recreation use observed between 1995 and 1999 and projected to 2025 were also incorporated into the quantitative elk CEA. Most of the future effects involved changes at specific campgrounds as a result of the proposed Cheviot mine development or forest harvest activities. CRC said that undisturbed habitat would absorb elk temporarily displaced by the mine until reclamation made new habitat available. The elk population would expand during active mining, once large areas were reclaimed and new forage was made available. CRC anticipated that trees would provide security cover for elk on the mine site 40 to 60 years after reclamation. Therefore, the cumulative impacts of the Cheviot mine development on elk after mitigation were determined to be insignificant.

CRC noted that the other industrial activities assessed in the CEA were also subject to government regulation and that they also employed mitigation practices for wildlife. Those factors were expected to further reduce regional cumulative environmental effects that the Cheviot elk population might experience in other parts of its range. CRC noted Weldwood's development of an access management plan for a portion of the Cheviot CEA study area and stated that such tools, along with CRC's own commitment to work with the government, would reduce any cumulative effect industrial development might otherwise have on wildlife. With regard to recreational impacts, the applicant noted that the Whitehorse Wildland Park and Coal Branch Forest Land Use Zone were models for the regulation of local recreation activity. CRC concluded that successful mitigation of impacts due to forest harvesting and other industrial activity in the Cheviot elk CEA, accompanied by implementation and enforcement of resource management plans, would prevent significant negative cumulative effects. Any residual effects were expected to be of minor magnitude. CRC added that as new spatially explicit information became available, periodic reassessment of elk habitat effectiveness might be warranted.

CRC described the specific mitigation it continued to believe was required to limit the impacts of the mine on elk and other wildlife populations. These included minimizing the disturbance of existing habitat where possible during mining, identifying wildlife habitat as a primary end land-

use objective, and reviewing reclamation techniques appropriate for elk. CRC said it remained committed to using reclamation techniques that create wildlife habitat by mimicking the natural disturbance regime where possible. It also said that elk abundance and distribution would be systematically monitored to document their response to the mine site reclamation. CRC proposed that road mortality should be documented in the form of a mortality database and that slowdown zones should be implemented based on the evaluation of monitoring results. However, the company could only affect reduced speeds on roads under its control.

On a regional scale, CRC noted that successful mitigation of the potential impacts on elk would rely in part on the mitigation plans of other industrial developments. CRC stated that increasing recreation use in the region would also need to be accompanied by implementation of land and resource management plans, and provincial land management agencies would need to periodically monitor elk populations in parts of the Coal Branch. CRC said it was already working with AENV to coordinate its elk surveys in the Cheviot area with broader government surveys.

Selected Bird Species

CRC stated that it had based its 1999 CEA for selected bird species on information assembled for the original Project application in 1996. For the 1999 CEA, CRC focused on 12 selected bird species that either appeared on the federal endangered species list published by the Committee on the Status of Endangered Wildlife in Canada or were listed as Red, Blue, or Yellow by AENV. CRC stated that the decision to focus exclusively on imperiled species was in response to concerns raised at the 1997 Cheviot hearing that human activity was contributing to overall population declines and ultimately contributing to the loss of biodiversity.

Of the 12 species examined in 1999, the Harlequin duck, golden eagle, pileated woodpecker, American dipper, and golden crowned sparrow were not considered neotropical migrants by definition. However, they were chosen to be included in the assessment because of their provincial status. Four species (osprey, golden eagle, prairie/peregrine falcon, and pileated woodpecker) were not known to breed in the Cheviot Project area.

The assessment of impacts to birds was conducted for an area roughly corresponding to the 895 km² elk CEA study area (Figure 5) and encompassing the mine lease and adjacent lands. In the case of impacts mediated by changes in vegetation, reference was also made to the larger (3040 km²) study area employed in the vegetation assessment (Figure 5).

Potential sources of cumulative impacts considered in the assessment of the selected bird species VEC were other reasonably foreseeable mining activities and forestry. Oil and gas activity was generally located outside the CEA study area and therefore was not expected to contribute to the cumulative effects on selected bird species. CRC stated that the selected bird species CEA assumed that a 5 to 10 per cent annual increase in recreation had occurred in the last few years and increases were expected to continue, but at lower levels.

CRC predicted that the northern harrier, cordilleran flycatcher, brown creeper, clay-coloured sparrow, and Brewer's sparrow were all likely to lose some breeding habitat as a result of human activity within the Cheviot bird CEA area. The American dipper would lose two nest locations

on the McLeod River, and the Golden eagle could experience an increased risk of vehicle collision mortality due to the proposed upgrading of the Grave Flats Road. Osprey, golden eagle, falcons, and the pileated woodpecker would probably also distribute themselves differently within the CEA study area as a result of the proposed Cheviot mine, but would continue to move through or visit the permit area. The golden crowned sparrow was not expected to lose habitat as a result of the mine permit. Vegetation loss or modification within the Cheviot CEA was thought to be within the range of natural variation. This conclusion was utilized in determining the regional effects of vegetation loss on the selected bird species VEC.

CRC confirmed that it was still proposing several mitigation measures raised during the 1997 proceedings to deal with the anticipated negative cumulative impacts to bird species. These included prohibiting vegetation clearing during the bird breeding season and minimizing the disturbance of habitat during mining. As with elk, CRC suggested that road mortality should be documented and slowdown zones implemented where indicated. CRC also suggested that the two American dipper nests could be moved from their current location to areas that would be free from disturbance.

CRC noted that some of the mitigation proposed would, of necessity, rely on the efforts of Weldwood and other land managers in the region. Examples of careful forest management practices that might mitigate impacts included establishment of riparian management zones, wildlife-related tree and deadwood retention practices, and new silviculture techniques, such as partial forest harvesting. CRC also emphasized the importance of regional resource management plans to manage and mitigate the potential impacts of relocated recreational activities.

CRC said that recognizing wildlife habitat as a primary end land use and reviewing reclamation techniques appropriate to birds could also limit the duration of impacts. It advocated the implementation of reclamation techniques that create wildlife habitat by mimicking the natural disturbance regime where possible and the periodic monitoring of population abundance and distribution to document response of birds to reclamation over time. CRC stated that progressive reclamation and revegetation of mined areas would create new habitats for selected bird species before the end of mining in 2025. Species with specialized habitat requirements would be identified in the reclamation program, and specific actions would be taken to enhance their habitat.

CRC concluded that with mitigation the four species not breeding within the Cheviot Project area would be unaffected. The remaining eight species would experience minor, local, and reversible effects, which it judged to be insignificant. These conclusions, CRC said, were similar to the 1996 results. CRC felt that it had achieved a greater degree of certainty in the 1999 assessment by focusing on provincially yellow-listed species and by identifying regional mitigation practices that might reduce the cumulative impacts of development on bird species.

CRC stated that it would monitor breeding birds to track changes in the bird community over time. As the Project developed, CRC would also generate measures of ecological factors such as abundance, species richness, and biodiversity index values, as well as information on habitat variables.

CRC provided supplemental information regarding neotropical migratory birds in response to concerns raised by Environment Canada during the hearing. This included a scoping exercise using various information sources, an analysis of which species may be of concern within the context suggested at the hearing by Environment Canada, an assessment of effects on any new species arising out of the previous two matters, and options for management of any subsequent cumulative environmental effects. CRC concluded that there were a number of methods available for CEA and that, in its view, Environment Canada's general concerns regarding bird habitat had been addressed in the original 1996 Cheviot application and in the methods used in the 1999 assessment of selected birds. CRC felt that Environment Canada's proposal to assess the entire list of neotropical migrant bird species that may occur in the region was potentially misleading and that the applicant's own methods provided an effective CEA for neotropical migrants as well as other bird species of ecological importance in the Cheviot area.

Harlequin Ducks

In the 1996 Cheviot mine application, CRC determined that the Harlequin duck population associated with the headwaters of the McLeod River was regionally important. Impacts of mine development at that time were identified to be the direct loss of two probable breeding streams (Thornton and Cheviot Creeks) through rock dumping and the modification of a third probable breeding stream (Harris Creek). The McLeod River would also be disrupted during the construction phase of development. Other potential negative impacts were identified regarding duck passage through culverts, particularly at Prospect Creek. A possible long-term reduction in the number of breeding females in the McLeod watershed was a residual impact of the Project.

The spatial boundary for the 1999 Harlequin duck CEA was defined as the McLeod River watershed (Figure 4); the temporal boundaries were the years 1996 and 2025. CRC reported in its 1999 CEA that it expected no cumulative effects on Harlequin ducks from regional activities but reported minor short-term or permanent local effects that it did not consider to be significant. CRC stated that the 1999 assessment was consistent with the 1996 results and that a greater degree of certainty had been gained due to ongoing studies and regional initiatives.

In the light of new evidence about the local and regional abundance and distribution of the species, CRC stated that it had downgraded its estimate of the magnitude of impacts on Harlequin ducks from the Cheviot Coal Project from major to minor. CRC's ongoing research showed that one of the streams that would be affected by Project, Cheviot Creek, was not, as previously suspected, a Harlequin breeding stream. It had, however, been able to confirm that Thornton and Harris Creeks were both Harlequin breeding streams.

CRC also noted that new information about the regional distribution of Harlequin ducks in Alberta had become available. The data gathered since the 1996 hearing showed that there were seven river systems in Alberta, including the McLeod/Whitehorse River system, with populations of between 40 and 80 Harlequins. Twenty systems had moderate numbers of Harlequin ducks (5 to 40 birds) and 13 systems had low numbers (1 to 4 birds). From these data, CRC concluded that Harlequin ducks were widespread throughout their range.

To assess the potential for regional impacts on Harlequin ducks, CRC reviewed the activities of other industries and activities in the region. Weldwood's compartment harvest schedules showed

that most of the planned harvesting would occur downstream of the Harlequin breeding zone. Only one stream, Mckenzie Creek, was potentially affected by forestry activity in the next 25 years. Weldwood had indicated, however, that most of the land adjacent to the stream was a designated riparian management zone, which would not contribute to the annual allowable cut, and access to the adjacent areas to be harvested would not require building a crossing of Mckenzie Creek.

Future oil and gas activity, CRC said, was mainly to the east of the Harlequin habitat and therefore unlikely to impact breeding populations of these ducks. The ongoing operations at Inland Cement also did not appear to affect Harlequin ducks immediately adjacent in the McLeod River. A proposed extension to the Gregg River mine was predicted to have no significant impact on the Harlequin duck population, and other coal mining activity in the area falls outside the Harlequin duck range.

CRC noted that Harlequin ducks were reported to be potentially sensitive to in-stream activities, such as rafting and canoeing. CRC predicted, however, that the level of rafting activity reported on the Maligne River in Jasper National Park, which also had a significant population of Harlequin ducks, was very unlikely to be matched in the McLeod River. An increase in angling activity in the McLeod River basin was expected in the prime duck brood-rearing portion of the river. CRC stated that if angling increased to the point where it impacted Harlequin ducks, the impact could be managed through angling regulation. Recreation pressures in Whitehorse Wildland Park were also predicted to stabilize in the near future. CRC saw the resource management plans being implemented in the region as tools to mitigate future impacts from recreational activities.

At the hearing, CRC reconfirmed its original plans to mitigate residual impacts on Harlequin ducks during both the construction and operation phases of the Project. A long-term monitoring program was planned to provide updated information in order to adapt these mitigation strategies throughout the life of the proposed mine. Initiation of and participation in cooperative regional studies was also a part of the management plan. CRC stated that it considered itself a catalyst to, as well as a participant in, the Foothills Model Forest Harlequin Duck Study. The purpose of that study was to establish a regional perspective on current knowledge and management needs, as well as public education opportunities in the Foothills Model Forest area.

CRC stated that regional inventories initiated by the Canadian Wildlife Service (CWS), AENV, and the Foothill Model Forest cooperative research program and detailed study on specific populations such as those found on the McLeod and Maligne Rivers have begun to provide an understanding of distribution, occurrence, and breeding biology of the Harlequin duck in Alberta. CRC believed that the identification of riparian management zones by Weldwood should also help to reduce the environmental impacts from regional development that Harlequin ducks would have experienced in the McLeod River watershed and other parts of their range.

CRC was asked under cross-examination to provide suggestions for the Whitehorse Wildland Park Draft Management Plan that might help to reduce impacts of expected increases in recreational activity on the Harlequin duck population. CRC emphasized the need to regulate angling activities, but felt that canoeing and kayaking would probably not be problematic, as

those activities did not generally occur in the park. CRC noted the need to be careful with regard to the locations of trails and campgrounds and cautioned against permitting random camping. CRC also suggested that vegetation or topography buffers between streams and trails to avoid human disturbance of Harlequin ducks were important, as was education of park visitors on the needs of Harlequin ducks.

Grizzly Bears

CRC noted that the 1996 EIA concluded that, in the absence of a regionally based mitigation program, there would be both significant direct effects from the Project as well as cumulative effects on the grizzly bear and other large carnivores from other sources of development in the region. Because the company could not directly mitigate the impacts of its Project on large carnivores solely through activities within the Project boundaries, CRC proposed to be the catalyst for a regional program, which it called the Carnivore Compensation Program.

CRC reported that since 1966 there has been significant progress made towards implementing that regional mitigation strategy. It cited the development, through the Northern East Slopes Environmental Resources Committee, of the document entitled “Grizzly Bear Conservation in the Alberta Yellowhead Ecosystem: A Strategic Framework” as an indication of that progress. CRC also cited the regional grizzly bear research program being coordinated through the Foothills Model Forest. CRC stated that due in part to the initiation of the regional conservation approach it recommended in the 1996 application, the 1999 CEA downgraded the cumulative effects on grizzly bears to insignificant. CRC stated that it also remained committed to participation in that conservation effort.

CRC considered grizzly bears to be an indicator species for the general quality of regional habitat for mammalian carnivores. CRC pointed to remarks made by Parks Canada and Dr. Ross in their submissions that validated the choice of the grizzly bear as a VEC. CRC also described the grizzly bear as an umbrella species accepted by Parks Canada as an indicator of ecosystem sustainability and integrity.

CRC described how other past, existing, and future human land uses were identified for the 1999 CEA. Past and current actions were identified through existing human use and habitat mapping and analysis of impacts of past human activities such as hunting. Future forestry activities were identified through spatially explicit compartment plans, periodic area forecasts by compartment based on the latest forest management plan process, and an extrapolation of road densities. Future mining activities were identified by CRC through spatially explicit mine plans. CRC interviewed oil and gas companies and extrapolated the numbers of wells to road and pipeline lengths and densities in order to identify future oil and gas activity. Finally, future recreation was identified by CRC through interviews with AENV land managers and extrapolation of historical use and populations.

The spatial and temporal boundaries originally established for the 1996 grizzly bear CEA were expanded upon by CRC for the 1999 assessment. There were two spatial boundaries involved for different parts of the analysis. An area of 55 000 km² was used strictly for population and mortality assessments, otherwise known as population viability assessments. No habitat or land-use mapping was done for this area. The second spatial area considered was 3040 km² and was

used for CEM (Figure 5). This area was in turn divided into three BMUs, and nine bear management subunits (BMSUs) (Figure 6). Data were analyzed for each area for the “pre-berry” and “berry-and-after” seasons. CRC explained that its CEM involved the use of landscape indicator models as well as habitat and human use mapping.

Two temporal boundaries were used in the analysis by CRC. The first was a 25-year time frame, representing the life of the proposed Cheviot Coal Project, and the second was a 100-year time frame, used for long-term population modelling.

CRC explained that the analyses used in the grizzly bear CEA were based on standard techniques originally developed in the northwestern United States. Various indicators were employed to address different aspects of the grizzly bears’ vulnerability to disturbance. The indicators used were habitat suitability, road density, habitat effectiveness, security area, linkage zone prediction, mortality, and population viability analysis (PVA). The issues of concern with respect to grizzly bears in CRC’s assessment were increased mortality, habitat alteration, habitat avoidance, and movement obstruction.

The habitat suitability component of the assessment was based on the assumption that the availability of preferred foods was the primary indicator of habitat suitability for grizzly bears. CRC concluded that grizzly bear habitat is currently diverse and productive in the regional study area. One of the BMUs supported high-quality multiseason habitat because of the presence of preferred food items and topographic diversity. CRC found that negative impacts on habitat suitability (as a result of development in the study area) were as high as 21 per cent at the BMSU level and that while regional alterations to habitat supply were positive for the pre-berry season, they were negative for the berry-and-after season. CRC added, however, that in its view, the negative habitat suitability impact in the berry-and-after season was minor.

CRC also measured the density of man-made linear features, a key element with respect to grizzly bear habitat conservation, in each BMU. CRC concluded that current road densities were well within accepted management standards for grizzly bears for all BMSUs and added that current road densities were less than the average values of core grizzly bear home ranges in Montana. CRC observed that the inclusion of the future roads associated with the approved forestry plans also did not exceed road density thresholds for any BMSUs. However, with extrapolated future forestry and oil and gas activities, road density thresholds could be exceeded in the three eastern BMSUs. CRC concluded that the effects of increased road densities on grizzly bear populations would depend on the success of access management and control.

In its initial evaluation, CRC only presented road density information for potential oil and gas development and for forestry activity until 2007. At the hearing, CRC undertook to extrapolate expected road densities until the year 2025 (Exhibit 234). This work indicated that there was not a large change expected in road density in BMU 2 between the years 2005 and 2025 for either forestry or oil and gas activity, but there was a significant change within BMU 3 over the same time frame. This extrapolation, however, also assumed no cooperation among various industries over road construction and road use.

CRC stated that the extrapolated road densities in BMU 3 would need to be halved from those projected in 2025 to ensure the survival of the grizzly bear population. The applicant stated that a key to facilitating such a reduction would be cooperation among industry members regarding access development and increased use and enforcement of access management tools, such as gated roads.

The third indicator employed by CRC was habitat effectiveness (HE), which was defined as the suitable habitat available to grizzly bears after taking into account the predicted avoidance effect in response to human use. CRC assessed the HE value for the regional Cheviot CEA to be 73 per cent in 1999. Effects of approved mining and forestry plans did not significantly change CRC's prediction of the HE value by 2025. Future potential oil and gas and forestry activities were predicted to result in declines in the HE value for individual BMSUs of between 9 and 20 per cent. This prediction assumed no access management or shared infrastructure. Generally, CRC predicted that a threshold HE value of 70 per cent would be exceeded in the eastern BMSUs if no access control were implemented. CRC highlighted its view that changes in HE depended on increases in the human population and recreational use of the area and was not easily quantified.

The fourth indicator for grizzly bears used by CRC was security area analysis. Secure areas were defined as areas in which bears could forage for 24 to 48 hours secure from human disturbance. CRC found that lands within the CEA supported relatively high levels of security for most BMSUs. The comparatively lower security found in Jasper National Park (BMU 1) was described by CRC to be an artifact of topography, but nonetheless indicated a sensitivity to valley bottom development. The eastern portion of the study area (BMU 3) had high security due to gentle topography and low densities of high-use roads. The central portion of the study area (BMU 2), where the proposed Cheviot mine would occur, had security areas near accepted management targets for the United States. CRC stated that areas with less than ideal security conditions might still be used by grizzly bears, but this might lead to a higher risk of mortality and habituation.

CRC used a linkage zone analysis as an indicator to assess the potential for natural corridors, natural barriers, and human disturbances on the landscape to either enhance or interrupt grizzly bear movements. CRC concluded that the vast majority of the CEM area (95 per cent) did not impede grizzly bear movement at the time of the assessment. Fracture zones (zones impeding bear movement) occurred in areas of intensive local activity, such as the proposed Cheviot mine and other mines, particularly in mountainous terrain. Neither forestry nor oil and gas activity appeared to create fracture zones. Three linkage zones were identified by CRC, and the applicant concluded that reclamation of the existing Luscar mine site by 2025 would soften the negative impact of the fracture zone identified there in 1999.

Mortality was the next indicator considered. CRC expressed the view that direct human-caused mortality was arguably the cause of virtually all grizzly bear population decline and that human access was the primary mediator of this mortality. While mortality was considered to be the fundamental limiting factor for all animal populations, it was particularly significant for grizzly bears because of their low reproductive rate. CRC concluded from its analysis of grizzly bear mortality in both Jasper National Park and the Province of Alberta that current rates were well within accepted standards and that a clear trend toward decreasing grizzly bear mortality was

revealed by the data. Legal hunting was determined to be the primary source of mortality for bears on Alberta provincial lands, while railway and highway collisions were found to be the major cause of bear mortality in Jasper National Park. CRC stated that improved garbage management in Jasper National Park and a limited entry hunt in Alberta were the main reasons for the trend towards decreasing mortality. CRC stated that the capability exists to further reduce mortality through hunting regulations and access restriction. CRC noted that the recent percentage of female grizzly bear mortality in Alberta Bear Management Area 4B (which includes the provincial portion of the CEA study area) was high and in its view needed to be reduced.

Finally, CRC conducted a PVA to evaluate the likelihood of long-term persistence of the grizzly bear population. From the PVA it predicted that the grizzly bears were likely to persist in the region for the next century. The probability of decline over a 100-year time frame was predicted to be low, with no probability of regional extirpation over that period.

Based on its analysis, CRC stated that the effects of the Cheviot mine on grizzly bears were locally significant for three of the four issues of concern (habitat alteration, habitat avoidance, and movement obstruction). Assuming the success of the majority of mitigation measures proposed, the effects of the Project were, however, regionally insignificant.

Despite its lack of significance at the time of the CEA, the potential for increased human-caused mortality was seen as the issue of most concern regarding grizzly bears. In order to further reduce the risk of increased mortality, CRC reiterated its support for firearm and hunting restrictions, waste management control, reduced traffic speeds, and bear awareness and safety training for its staff as means to mitigate some of the adverse effects of the development on bears.

On a regional basis, CRC's consultant, John Kansas, advocated the continuation of the limited-entry-draw hunting restrictions for grizzly bears in order to mitigate regional sources of mortality. He suggested that the grizzly bear hunt might be further reduced should population-monitoring results from the Foothills Model Forest research warrant that. He also recommended selective road closures in areas of secure, high, and very high-quality habitat, especially BMSU 3A. The Strategic Framework was also cited as a method to promote interindustry planning of open road access in order to reduce or restrict entry into secure, high-suitability grizzly bear habitat. It was suggested that geographic information system (GIS) technology and human-use databases be used to develop access management plans that account for the habitat and security needs of grizzly bears. To counteract potential increases in grizzly bear mortality, CRC's consultant suggested that additional hunting restrictions be considered and proposed the creation of roadside "no-hunting" buffers along the Grave Flats Road.

CRC also reconfirmed its original proposals to mitigate the potential effects of grizzly bear habitat alteration by mine development, including reclaiming the site to optimize and protect forage production and security cover.

CRC's consultant suggested that regional grizzly bear habitat maps be supplied to industry planners and that an industry/government planning framework for minimizing impacts on

seasonally important grizzly bear habitats be developed. He stated that mitigation of seasonal impacts could be achieved through avoidance and timing restrictions. The consultant also recommended that certain plant species (e.g., clover, legumes) known to attract grazing grizzlies be avoided when planting large, open rights-of-way with high traffic volumes, adding that such measures could also minimize opportunities for shooting bears from roads. Another regionally pertinent mitigation measure suggested by CRC's consultant was the selective use of certain silvicultural techniques to enhance grizzly bear forage. He suggested that to increase the effectiveness of this measure, areas selected should be based on grizzly bear needs as indicated by research findings from the Foothills Model Forest grizzly bear study. Finally, with respect to mitigation for habitat alteration, he suggested that planting food sources attractive to grizzly bears on reclaimed well pads and pipelines should be discouraged in the region.

To address the issue of habitat avoidance at the mine site, CRC reconfirmed that it would limit motorized access after reclamation until adequate cover had been re-established, restrict employee use of partially reclaimed areas, particularly in the Prospect Creek region, and incorporate sound and sight barriers into the postmining landscape features.

CRC also provided several examples of mitigation measures that could reduce grizzly bear habitat avoidance on a regional scale. The first was to improve human-use inventory and monitoring through sound monitors and other techniques to more fully understand human use of the landscape as it relates to grizzly bear CEM models. CRC also suggested monitoring the effects of human road-use levels on grizzly bear use of the landscape through the Foothills Model Forest study. CRC's consultant stated that consideration should be given to the use of the regional CEM model results from the 1999 CEA as a preliminary framework for testing grizzly bear landscape use.

Once targets for open-road densities, security, and habitat effectiveness were determined for the region, CRC's grizzly bear consultant advocated an accounting system for industries to meet these requirements through mitigation techniques such as road closures. Such a system, he believed, could be implemented through the Strategic Framework.

Finally, with respect to regional habitat avoidance concerns, CRC's consultant identified a need to work with OHV user groups to attempt to focus OHV use into intensive-use areas that do not clash with seasonal grizzly bear habitat needs. He suggested that involving OHV groups in science-based access management that reflects real (versus modelled) responses of bears to human use would facilitate successful implementation of this mitigation measure.

With regard to mitigating movement obstruction, CRC's consultant proposed the following Project-specific mitigation measures to counteract potential impacts:

- design postmining landscape features along the southern edge of the western third of the proposed mine (upper Prospect Creek area) to facilitate use of this linkage zone by grizzly bears for east-west movement;
- retain tree islands to enhance movement across the mine site, as per the Cheviot Mine Reclamation Plan; and

- design land bridges or topographic modifications to connect known use areas that have been identified through radiotelemetry data.

CRC's consultant suggested that linkage-zone prediction mapping should be updated regularly to ensure that fracture zones are kept to a minimum and that low-human-use movement corridors link areas of high-suitability, secure habitat. This measure would be particularly important along riparian areas throughout the region.

In its concluding comments regarding grizzly bears, CRC stated that the grizzly bear population density in the Cheviot CEA and the Yellowhead region was at or above levels typically observed along the eastern front of the Rocky Mountains. CRC felt that federal and provincial government departments have managed mortality effectively since the late 1980s and that landscape condition indicators at the time of assessment were generally within acceptable levels for grizzly bear population persistence. Future access development at the level predicted by CRC was seen as having the potential to breach the thresholds for these landscape indicators, particularly along the eastern portion of the CEM study area (BMU 3). The need to validate landscape indicators on a region-specific basis was identified by CRC, and the Foothills Model Forest grizzly bear study was seen as being ideally situated to monitor bear response to access management. CRC stated that shared access, selective road closures, and other techniques would be required to minimize the potential for grizzly bear landscape condition indicator thresholds to be breached.

Further comment was provided by Dr. Herrero for CRC regarding an overview of grizzly bear conservation with respect to the proposed Cheviot Project and comparing the current state of grizzly bear conservation to the status in 1997. Dr. Herrero provided the Panel with his evaluation and recommendations regarding the proposed and evolving management of specific and cumulative effects on grizzly bears related to the proposed Cheviot mine.

Dr. Herrero defined the concept of thresholds as “landscape condition values below which scientific evidence suggests that the long-term persistence of grizzly bears cannot be assured.” Regarding the proposed three-year delay in setting target and threshold values for the Strategic Framework, Dr. Herrero stated that land and grizzly bear population managers were left without firm direction. It was suggested that application of the “precautionary principle” in setting conservative thresholds should be employed, so as not to have possible irreversible negative effects on grizzly bears.

Dr. Herrero stated that the potential to achieve regional-scale grizzly bear conservation continues to evolve. He noted that the most important potential limitation of the Strategic Framework was previously identified by the Panel when it concluded that “the Panel believes that both the EUB and AEP [now AENV] may need to re-examine the process by which new licences are granted to other regional industry players for developments which may also have a cumulative effect on carnivores.” Dr. Herrero said that in order to manage the potentially adverse effects, the applicants that would cause each potential adverse effect, such as new road construction, must have their activities subject to regulation with the scientifically determined needs of grizzly bears being taken into account. He further stated that substantial progress had been made since 1996 toward understanding the status of grizzly bears in the Yellowhead Region and establishing the

conditions required for grizzly bear persistence in a landscape undergoing substantial industrial activity. Dr. Herrero added that the administrative structure for managing cumulative effects had been designed and was on the verge of being implemented through the Strategic Framework. He stated that the grizzly bear's future in the Yellowhead ecosystem hinged significantly on the successful implementation of the Strategic Framework.

During cross-examination, Dr. Herrero was asked whether at some point during the research the "umbrella-nature" of the grizzly bear species to capture the ecosystem requirements of other species was lost. Dr. Herrero responded that the landscape condition indicators for grizzly bears would be suitable for other species, but that at the level of specific habitat suitability the research results are more grizzly bear specific. He noted that if a species's ecosystem requirements were not captured through the grizzly bear research, it would likely be a species with a smaller home-range size than a grizzly bear and with higher reproductive capability, indicating a greater resilience than the grizzly bear has. He agreed, however, that in concentrating largely on the needs of grizzly bears, it was possible that other species' requirements would not be accounted for. In order to create a more comprehensive carnivore compensation strategy, as outlined in CRC's original application for the proposed Cheviot mine, Dr. Herrero agreed that other species, such as fisher and lynx, should eventually be taken into account.

When asked about the reliability of predicting cumulative effects on grizzly bears using a modelling approach, Dr. Herrero responded that the model had apparently used the best available information. He added that caution should be used when interpreting grizzly bear response to specific numbers predicted by modelling approaches, such as percentage values used to indicate habitat effectiveness.

Dr. Herrero was asked to explain why grizzly bear trails had not been used as a component of the grizzly bear research. He responded that while bear trails are fairly common and have distinctive characteristics, the scale of the research required for this CEA could not accommodate the use of trails as an indicator. Consideration of bear trails would have required a level of intensity of sampling not possible within the context of this CEA on grizzly bears. In addition, it would be difficult to differentiate between wear left by bears as opposed to other animals. He explained that the clearest trails delineated by the current research corresponded to the movement routes designated by telemetry points, and over time these were likely to reveal bear travel corridors more clearly.

Dr. Herrero was also asked about the expected significance of residual cumulative effects on bears. He stated that the success of the Strategic Framework would be fundamental to the state and distribution of the grizzly bear population. If the Strategic Framework was not completely successful, Dr. Herrero anticipated grizzly bear population declines. Despite this, he stated that he had no reason to suspect extirpation of the grizzly bear at a regional level. In summary, he said that the significance of residual cumulative effects would be affected by the assumed mitigation and management measures that have yet to be implemented.

When asked how the most crucial mitigation measure might effectively be implemented, Dr. Herrero stressed that to ensure successful implementation of such measures as road closures, a large part of the effort should be toward public involvement and information sharing. He

pointed out that despite resistance to change by individual disposition holders, scientific evidence suggested that there needed to be a change in how resource development was managed. Dr. Herrero encouraged the Panel, in its recommendations, to find methods that would be acceptable to disposition and jurisdiction holders but that would also encourage them to tackle complex issues, such as access management.

7.3.2 Views of the Interveners

Vegetation and Botanical Resources

AENV noted the downgrading of the significance of the loss of old-growth forest and the modification of the position respecting the number of valued plant species in CRC's 1999 CEA of vegetation and botanical resources. AENV emphasized that it continued to hold the view expressed in its 1997 submission that all aspects of the mine development and reclamation should be aimed towards minimizing impacts on ecologically significant vegetation types where possible and should not restrict the reclaimed sites' potential to evolve naturally.

It was the opinion of the ACC/ANPC that any marked differences in vegetation in 2025 from the 1999 scenario would indicate a significant impact. The ACC/ANPC acknowledged that some effects would diminish with time and mitigation, but maintained that the uncertainty associated with other variables required a more cautious approach to assessing impact significance. The ACC/ANPC noted that it could take 50 to 100 years for forest biodiversity to return and possibly 30 to 50 years for other plant species to become established. They pointed out that reclamation that had been ongoing for 20 years at the CRC Luscar mine site was by no means complete and that the number of recolonized native plant species remained limited.

The ACC/ANPC also believed that not accounting for linear developments, such as roads, was a major omission in CRC's vegetation analysis. While CRC had stated that this would represent a relatively small loss, ACC/ANPC believed that the potential 560 km of new roads should have been accounted for.

The ACC/ANPC noted that the nationally rare moss *Mielichhoferia macrocarpa* was omitted from the list of valued species by CRC. They believed that such species must be taken into account when dealing with road access plans. The intervener stated that other rare mosses had, in their view, also been ignored.

The ACC/ANPC stated that they were pleased to see the withdrawal of the upper Prospect Creek from the mine permit area, since that would mean less impact on rare alpine species. The ACC/ANPC believed that efforts at transplanting the remaining valued plant species should be continued, but since such efforts were not often successful, they expressed concern that the probability of success for this mitigation effort was not high.

The ACC/ANPC were not convinced that the reclassification of previously designated "old-growth" Englemann spruce-subalpine fir was appropriate, except to increase its apparent extent and thus diminish the significance of the loss of the small area in Powerhouse Creek. They argued that this mixed-aged subalpine forest, with canopy gaps and components older than individual trees, was a community worth preserving. The ACC/ANPC was in agreement with

suggestions for mitigation measures to minimize the amount of old-growth forest cleared, specifically in the Powerhouse Creek, directly adjacent to the ecologically significant Cardinal Divide.

Elk

AENV stated that it was prepared to accept CRC's analysis of the impacts on elk. In its 1997 submission to the Panel, AENV stated that the proposed mitigation by CRC required implementation of the Coal Branch Access Management Plan. AENV confirmed that in 1999 a forest land-use zone restricting motorized access in the areas identified in the Access Management Plan was established. AENV stated that it continued to hold the view that, in the event that the proposed Cheviot Project proceeded, CRC would need to establish an elk monitoring program.

Under cross-examination, AENV was asked whether, in its opinion, elk populations were recovering in the Mountain Park area to historic levels for the Eastern Slopes. AENV replied that while it did not have empirical data from 50 years ago, data collected over the last 20 years indicated that elk were not declining and that the population appeared to be viable. AENV said that because of a lack of fire control and subsequent rejuvenation of grasslands in the late 1960s, elk populations had probably peaked. AENV noted that at the turn of the last century there were few elk in Alberta, and the Ruby Lakes area was described as being one of the few refuges for elk in the province. AENV said elk numbers in west-central Alberta today were largely due to transplants of elk from Yellowstone Park to Jasper National Park and the Athabasca area just north of Hinton. AENV also explained that elk were subject to a very limited hunting harvest.

Mr. Mitchell attested to the reintroduction of elk to the area in past years and to the fluctuations in elk populations over the last several decades. In his view, the elk population in the area was likely to remain viable.

Selected Bird Species

With regard to the CEA for selected birds, Environment Canada said that this VEC should include all species that can be reasonably expected to occur in the study area, rather than indicator species alone. In its opinion, the species should be grouped by their habitat associations, and the environmental issues involving neotropical migratory birds in particular should have been examined on a much larger scale (i.e., continental) than that used by CRC. Environment Canada pointed to documented declines in North American bird species and cited its efforts targeted at preventing the loss of species, including the United Nations Convention on Biological Diversity and the Canadian Biodiversity Strategy.

Environment Canada emphasized the need to look at a large area when dealing with cumulative effects. It cautioned against basing decisions on small sample sizes, especially with respect to breeding birds, which may have very different population trends depending on whether they are considered on a provincial, national, or continental scale. Environment Canada pointed out that even if a species that was abundant in the Project area might not be significantly affected by the proposed development, it might be experiencing population declines elsewhere, highlighting the need to protect the core ranges of that species.

With respect to mitigation, Environment Canada felt that CRC should have more closely examined potential mitigation measures both within the Project area and within the entire region (i.e., the cumulative effects study area). In the regional context, Environment Canada was of the opinion that a need existed to preserve critical habitat. Environment Canada emphasized this point by explaining that the ecoregion in which the proposed Cheviot Coal Project would occur had the highest bird species richness in North America. It stated that the ecoregion, as identified by the Canadian Biodiversity Strategy, was also considered at high risk for loss of biodiversity. Environment Canada attributed these declines to the incremental impacts of human activity, and more specifically to habitat loss.

Environment Canada highlighted Canada's signing of the United Nations Convention on Biological Diversity in 1992, obliging Canada to conserve ecosystems, species, and genetic diversity to ensure that the earth's biological resources would be used wisely. It identified several initiatives aimed at breeding bird conservation, including Partners in Flight, Important Bird Areas, and the North American Bird Conservation Initiative.

Environment Canada felt that CRC had failed to adequately justify how the twelve indicator species chosen were representative of the other bird species CRC had found in the CEA area. It also believed that bird habitat had been poorly represented in the CEA. Environment Canada recommended a re-evaluation of the selected bird species VEC, involving a selection of migratory birds representative of the entire bird community, and further consideration of the need to protect riparian areas in particular. It also recommended an adaptive management approach to the maintenance of selected migratory birds and long-term monitoring and implementation of appropriate mitigation strategies, along with compensation for any losses that might occur.

Environment Canada recommended the Panel direct the applicant to re-evaluate the selected bird species CEA. It also asked the Panel to recommend to the provincial and federal governments that they undertake a CEA of human activities in the boreal forest on land birds in general.

During the hearing Environment Canada undertook to provide a description of the type of work it felt needed to be done to complete the CEA of the selected bird species VEC. It also provided an estimate of the person-hours required to complete the task and of the ability of Environment Canada to do that additional work. It indicated that the recommended re-evaluation of the bird species CEA would not be a substantial one in terms of time and resources. However, Environment Canada, when questioned, indicated that it did not have adequate resources to carry out the analysis in a timely fashion. Environment Canada also added that while the additional CEA was not likely to alter the ultimate recommendation of the Panel, such an analysis might result in a number of alternative mitigation measures. Such mitigation measures could be incorporated into the Project as it was developed. Environment Canada did agree to work with CRC to adapt the suggested process to the CEA analysis and to seek any other relevant sources of information.

The AWA Coalition and CNF stated that they agreed with Environment Canada that the assessment of the selected bird species VEC was inadequate, particularly in light of Canada's international agreements. CNF went further to say that this shortcoming damaged the validity of

the CEA. The ACC/ANPC added that inadequate mitigation had been proposed for the impacts to neotropical migratory birds.

AENV stated that CRC's analysis of potential impacts of the proposed development and cumulative effects on selected birds was, in its view, acceptable.

Mr. Clark, a consultant, proposed that Environment Canada's views regarding the CEA methods for selected bird species were unfounded, as it was unlikely that all species of birds of concern in the boreal forest would congregate at the proposed Cheviot mine site.

Harlequin Ducks

Environment Canada presented its interpretation of the research results arising from aerial surveys conducted by the CWS in cooperation with AENV in 1998 and 1999. Environment Canada stated that the surveys had confirmed that Harlequin ducks occurred in discrete clumps or patches where there appeared to be optimal habitat conditions. Although Harlequin ducks were widely distributed in Alberta, Environment Canada noted that because of their patchy distribution, they were generally uncommon in the province.

Environment Canada expressed a concern that the proposed Project might permanently damage the McLeod River Harlequin duck population, particularly since the McLeod River basin was also affected by development activities such as additional coal mining, limestone mining, road upgrading, and recreational activities. In its view, measures were required to avoid a permanent impact on Harlequin ducks resulting in an unsustainable population. Environment Canada referred to literature that emphasized that even low mortality rates might indicate long-term population decline.

Environment Canada expressed concern that long, narrow culverts at stream crossings might prove to be a barrier to Harlequin ducks. If this were the case, four breeding streams, rather than the two reported by CRC, would be impacted. In addition, if predictions with respect to water quality and water quantity proved to be inaccurate, Environment Canada felt that this could also negatively impact the Harlequin duck habitat. Environment Canada advised the Panel to use special caution when assessing the potential cumulative environmental effects on Harlequin ducks.

Related to the topic of Harlequin duck protection was Environment Canada's position with respect to riparian habitat in general. It discussed the relatively high species diversity associated with riparian areas, their function as natural travel corridors, and the need to focus on riparian areas when attempting to maintain ecosystems. Environment Canada stressed that if riparian areas were protected for the purpose of maintaining healthy Harlequin duck populations, other components of the ecosystem would also be conserved.

During the hearing, the Panel asked Environment Canada what approvals it might have sought or was intending to provide with respect to the proposed Cheviot Project. In response, Environment Canada drew attention to its original submission dated January 1997 and stated that details on its mandate were provided in that document. Environment Canada stated that an important aspect of that mandate included regulatory responsibilities under the *Canadian Environmental Protection*

Act, the Migratory Birds Convention Act and Regulations, and the Pollution Prevention Provisions, under Section 36(3) of the Fisheries Act.

AENV pointed out that the Green wildlife status designation (species not at risk) for the Harlequin duck was under review at the time of its 1997 submission, and that Harlequin ducks were now listed as a Yellow (A) species. The Yellow (A) designation in this case denoted concern about long-term population declines. AENV stated that it had a somewhat different interpretation from CRC of the results of the regional survey of Harlequin ducks. Where CRC characterized the ducks as widespread in the Northern Rocky Mountains and Foothills regions, AENV believed the ducks were patchily distributed over a wide geographic area. Overall, AENV stated that it accepted CRC's analysis of the potential impacts on Harlequin ducks, but that ongoing monitoring would be required.

By way of clarification, AENV outlined the Harlequin duck research initiatives ongoing in the Northern East Slopes region. These were the Cheviot Harlequin duck study conducted by CRC, the AENV/CWS regional surveys, and the ongoing Foothills Model Forest Harlequin duck program, which was initiated in 1998. The latter study was designed to examine the relationship between hydrologic features and Harlequin duck presence.

The ACC/ANPC commented that there was a significant difference between CRC's comment that Harlequin ducks were widespread and Environment Canada's comment that their distribution was patchy and in areas liable to development pressure. The ACC/ANPC stated that this contradiction highlighted the need to be wary when attaching significance to statistical averages while ignoring local ecosystems.

Mr. Mitchell expressed some concern with respect to the Harlequin duck population as a result of personal communication with a British Columbia resident. The concern regarded the potential for negative impacts on the Harlequin duck population in Alberta affecting the British Columbia Harlequin duck population.

The WCWC stated that it was sceptical of the conclusions drawn by the applicant regarding cumulative effects on Harlequin ducks. The WCWC highlighted CRC's statement that while recreational activities had increased at a rate of 5-10 per cent per year, recreational activities were not expected to affect Harlequin ducks in the future or that effects would be minimal. The WCWC stated that the methods used to reach those conclusions were not adequately explained and the lack of clarity was a significant shortcoming in the CEA. The WCWC stated that this shortcoming could be resolved with an additional disclosure of how CRC's conclusions regarding the effects of recreation on Harlequin ducks were drawn. There also remained uncertainty, in the WCWC's view, about the proper use of information about future forestry activity in the assessment of cumulative effects on Harlequin ducks. The WCWC felt that it would not be prudent to approve the proposed development given what appeared to be a deficient CEA.

Mr. Clark expressed the view that concern over Harlequin ducks was exaggerated. He noted that Harlequin ducks are a migratory bird resident in the Mountain Park area during summer months. He stated that this bird is common in North America and that they frequent shorelines in large

numbers. In addition, Mr. Clark stated that Harlequin ducks are summer residents in many lakes and streams in the national parks and outside of the parks.

Grizzly Bears

Parks Canada made two separate presentations to the Panel in the form of direct evidence specifically relating to the grizzly bear VEC analysis. The first presentation related to the Strategic Framework authorized in February 2000. Parks Canada explained that the main objective of the Strategic Framework was to find an effective approach to cooperative grizzly bear management, and that effective landscape or ecosystem management requires cooperation among all interests.

Parks Canada reviewed the current status of the grizzly bear, stating that in Alberta this species is currently “Blue-listed” (meaning that a species may be at risk because of noncyclical declines in population or habitat or because of reductions in provincial distribution) and that nationally the Committee on the Status of Endangered Wildlife in Canada categorizes the grizzly bear as vulnerable to human disturbance. Because of these classifications, Parks Canada identified the grizzly bear as a species of management concern regionally, nationally, and internationally.

The Northern East Slopes region was identified by Parks Canada as having an estimated 30 per cent of the provincial grizzly bear population. While such a high number might seem to indicate a secure grizzly bear population, Parks Canada described the need for better management of grizzly bears as urgent, noting several gaps in current knowledge. Parks Canada emphasized the need for a cautious and adaptive management approach while the needed research was conducted.

Parks Canada stated that the Strategic Framework had developed out of needs identified in the Panel’s 1997 decision report and reflected an agreement between the governments of Canada and Alberta regarding grizzly bear conservation and impact mitigation. The objective of the Strategic Framework was to cooperatively manage for landscape and population conditions necessary to ensure the long-term persistence of a healthy population of grizzly bears within their current range in the Alberta Yellowhead ecosystem. Parks Canada stated that the Strategic Framework clearly identified that “healthy” in the context of grizzly bears meant populations that were viable, nondeclining, and connected on the landscape. It emphasized that grizzly bear conservation must be part of an overall integrated resource management strategy. Parks Canada identified other grizzly bear management initiatives and stated that grizzly bear conservation would be implemented through existing plans and programs, such as those for park management, forest management, and access management.

Parks Canada saw threshold values for a number of conditions as necessary to maintain and enhance grizzly bear population size, health, and distribution within the regional ecosystem. It stated that suitable threshold values were recognized by grizzly bear experts to be required in five critical areas: habitat effectiveness, security area, total human-caused mortality, road density, and habitat connectivity. Parks Canada emphasized that it was important not only to establish clear threshold values for each indicator, but also to set target values that management agencies would strive to achieve. It said that the Strategic Framework identified the need to establish such landscape condition target and threshold values for each of the five criteria within

three years. It described part of the existing work plan for the Strategic Framework as including a strategy for stakeholder participation, developing a funding and participation strategy, and identifying resource requirements to implement the Strategic Framework.

Parks Canada identified the Regional Carnivore Management Group as the group that would develop an interim process to effectively deal with new development proposals, particularly issues of concern related to grizzly bear conservation. Parks Canada also described a number of partnerships supporting the goals of the Strategic Framework, such as the Yellowhead Ecosystem Working Group and the Cheviot Carnivore Compensation Program. Parks Canada concluded its views on the Strategic Framework for grizzly bears by emphasizing that despite progress to date, a great deal more work was required to move the Strategic Framework from document form to practical application.

Parks Canada made a second presentation with regard to the grizzly bear VEC assessment of the CEA. Parks Canada stated that while it was generally satisfied with the spatial boundaries and attributes of the CEA for grizzly bears, it remained concerned that the pattern of human activity across the landscape had not been adequately captured. Parks Canada did commend CRC's efforts to bring updated information before the Panel during the hearing and felt that the updated information demonstrated some significant improvements in terms of road density, security area analysis, and linkage zones when compared with the information presented by CRC in 1996.

Parks Canada's consultant commented on the various indicators used by CRC in its CEA analysis of the grizzly bear VEC. He noted that the distribution component of habitat effectiveness (HE) was very important and had been explicitly incorporated into recovery plans in the United States. Parks Canada's consultant observed that managers in many grizzly bear jurisdictions in the US were embracing HE values of 70 to 80 per cent. He suggested that for grizzly bear management to be successful, HE thresholds should be met in nearly every management unit across the landscape. This would result in a distributed population of grizzly bears. Populations with better distribution would have a better chance of persistence in the long term.

Parks Canada stated that, from its perspective, the revised values that CRC presented during the hearing regarding forestry and oil and gas activity were discouraging. It saw the maintenance of grizzly bear populations beyond the park boundaries as a key element of maintaining ecological integrity within the park. It said that future scenarios accounting for forestry, oil and gas, and recreation resulted in potential habitat effectiveness values well below what Parks Canada believed were acceptable thresholds in the eastern BMUs. Parks Canada stated that while some people might perceive such scenarios as a "worst case," managers must come to terms with the potential for that level of development. Parks Canada noted in particular a potential for significant increase in road density due to oil and gas activity in BMU 3, well above the CRC's selected total road density standard of 0.6 km/km².

Parks Canada highlighted the relationship that CRC's consultant reported in 1999 between approved forest cut-blocks and associated roads. Parks Canada expected that there would be approximately 1.27 km of new roads for every square kilometre of cut-block. When Parks Canada calculated that relationship for the 270 km² of planned forest harvest over the next 25

years in the Cheviot CEA, it found that 343 km of new roads could be built. That would increase the total road density, and in the case of BMSU 3B, the road density could be as high as 1.01 km/km². Parks Canada believed that this density was above acceptable standards for grizzly bear survival.

With respect to “security area,” Parks Canada noted that it was important to quantify this variable in terms of areas that bears actually use and to subtract the areas not available to bears. Parks Canada’s consultant also pointed out that the threshold security area values used in the Cheviot CEA were developed for use in the United States (i.e., Glacier National Park and Yellowstone Park), where most of the landscape is usable. In Canada, specifically in Jasper National Park, Parks Canada noted that much of the area was not suitable for bears due to the presence of mountains and glaciers. Parks Canada also observed that because changes in security status would occur primarily in different BMSUs than the one occupied by the proposed Cheviot mine, the cumulative effect would be a lowering of security in the overall landscape. Parks Canada also stated that the zone of influence around human activities would affect the minimum size of a security area. It noted that a considerable decrease in security areas occurred with projections of future oil and gas, forestry, and recreational activity.

Another indicator reviewed by Parks Canada was the concept of linkage zones. Parks Canada noted that the proposed Cheviot mine was near to some key mountain passes used by bears. It pointed out that the Luscar and Gregg River mines had created fracture zones, and the proposed Cheviot mine would have this effect as well.

With regard to mortality standards, Parks Canada noted that this indicator was among the better-researched and quantified areas of grizzly bear management. In the view of Parks Canada’s consultant, to ensure long-term viability of grizzly bear populations, total human-caused mortality should not exceed 6 per cent of the existing grizzly bear population, including both recorded and unrecorded mortality. He suggested that for every reported bear mortality, there was an almost equivalent unreported bear mortality rate. When reported mortality was corrected for the unreported factor, Parks Canada found that the rates in the Cheviot area were high. In Parks Canada’s opinion, implementation of limited-entry hunting in the province in 1988 had ameliorated this concern. However, a critical assumption in allowing hunting was that bear populations has been accurately estimated; therefore there was a need for caution.

Parks Canada stated that it was also concerned about CRC’s PVA modelling technique, as 60 per cent of the population modelled represented bears living in southeast British Columbia. That area, it said, had the highest density of bears in North America and the population had had very high reproductive, survivorship, and growth rates over the last 10 to 15 years. Parks Canada argued that such a population might not be representative of the bear population in the area of concern at this hearing, and therefore the CRC’s study might have overestimated the resiliency of the grizzly bear population to cumulative effects across the CEA study area. Parks Canada concluded that while the PVA was a valuable tool, some caution in the interpretation of its results was warranted.

Parks Canada stated that it did not believe that there was a cumulative effects problem on the landscape at the time of the hearing with regard to grizzly bears. However, such a problem was

potentially imminent, particularly in BMSUs 2A and 3A. Given the available information regarding the potential for future road development for oil and gas and forestry activity, Parks Canada stated that habitat suitability, habitat effectiveness, and security areas would likely fall below acceptable standards in nearly all the BMSUs within BMUs 2 and 3 in the future.

Parks Canada noted that the loss of suitable grizzly bear habitat in the region was not a unique circumstance in North America, but that the problem was increasing with time. With respect to landscape connectivity, Parks Canada felt that the potential for the development of fracture zones needed to be examined closely and alternative routes for bear travel needed to be available. It stated that human-caused mortality appeared to have been reduced in recent years but might remain at or above desired standards. It believed that the likelihood of indirect mortality might increase in the future due to increased human activity, especially road building.

Parks Canada said that maintaining a viable, connected population of grizzly bears was essential to maintaining the ecological integrity of Jasper National Park. In its view, the potential effects on grizzly bears at both the proposed project level and within the larger CEA study were significant. It also concluded that the risk of excessive mortality and obstruction of movement to grizzly bears was high. Parks Canada emphasized the need for interagency stakeholder involvement when developing grizzly bear management frameworks and the need to embrace standards or thresholds as a guide for managing large landscapes over time. It argued that such a goal could only be achieved at the regional scale and could not be accomplished solely within park boundaries. Parks Canada conceded that its regulatory role did not extend beyond the national park boundaries but also noted that it had been invited by the province to participate within the ongoing regional planning initiatives. Parks Canada confirmed that it had been actively participating in these initiatives and that it intended to do so in the future.

The ACC/ANPC commented on use of the grizzly bear as an umbrella species and cautioned that not all species share the grizzly's habitat preferences. For example, it noted that, unlike grizzly bears, the wolverine depends on old-growth forest. Therefore, not all species would be represented by grizzly bears if this were the only indicator of ecosystem health.

The ACC/ANPC commended the useful and quantitative nature of CRC's work but stated that it was concerned with the high margin of error involved. It also expressed concern regarding the use of only two temporal points in CRC's analysis of cumulative effects on grizzly bears, while acknowledging that the analysis did point to some significant conclusions. However, in ACC/ANPC's view, many of the impacts were potentially underestimated.

The ACC/ANPC stated that road density, habitat effectiveness, and connectivity were major determinants for large carnivore security and that the projected human disturbance map for 2025 presented by CRC was incomplete, because either no forestry roads were shown or they were shown as low-use OHV trails. Other roads were shown as having no changes since 1999, despite potential changes from oil and gas activities, increased OHV disturbances, and changes in recreation patterns from end-pit lakes, mine roads, etc. The increased road activity from forestry alone was estimated as an extra 560 km, which was perceived as a highly significant change. It was the ACC/ANPC's view that since only approved forestry was accounted for in the 1999 CEA, the cumulative effects of forestry activities were considerably underestimated.

The ACC/ANPC stated that frequent claims had been made that with proper mitigation wildlife (including grizzly bears) would return to reclaimed mines. The ACC/ANPC noted that the example cited to support this argument, namely the CRC Luscar mine, differs in one important respect from the proposed Cheviot mine: there is essentially no OHV or hunting activity in that area. It suggested that strong measures would be required to restrict OHV and hunting activity both during and after mining if a comparable level of successful reintroduction were to be achieved.

The ACC/ANPC noted that the security area analysis map produced by CRC showed a similar degree of disturbance for all linear features, regardless of geography, and they were consequently uncertain that all variables had been taken into account. (e.g., more alienation when food resources are concentrated in valley bottoms, less security on rock-dominated high-elevation lands and where there is less cover). The ACC/ANPC interpreted CRC's report to suggest that because of mine reclamation activities there would be an increase in pre-berry season habitat in BMSUs 2A and 2B. The ACC/ANPC stated that their analysis did not support that conclusion and in fact showed an increase in 2025 in the best habitat in upper Whitehorse Creek and Rocky Pass, which were not associated with mine reclamation. The ACC/ANPC therefore questioned the accuracy of the figures presented by CRC.

The ACC/ANPC agreed with Parks Canada that the setting of appropriate landscape targets for grizzly bears within a three- to five-year time frame should not be compromised by current and foreseeable activities. The ACC/ANPC stated that setting landscape targets should continue to be supported by all players, industry (including CRC) and government (both federal and provincial) agencies alike.

The ACC/ANPC made the following recommendations with respect to the grizzly bear VEC:

- CRC should ensure that the mitigation measures suggested by its consultant are effectively implemented.
- The logging in BMU 2C should be postponed, possibly indefinitely, to allow for the “no net loss requirement,” to improve protection in the critical BMU 2, and to give more protection near Jasper National Park.
- The habitat effectiveness and security area analyses should be reassessed, taking into account more consistent vegetation estimates and increased road fragmentation, OHV usage, and projected industry activity. The integrated resource management (IRM) of these activities should be adjusted accordingly.
- Long-term access management and control and selective road closures within the CEA must be implemented through the IRM plans in order to preserve grizzly bear security areas.
- The Grizzly Bear Research Project should continue to be supported by all players, including industry generally, CRC, and government agencies, both federal and provincial, without compromising its research with premature major activities.

AENV stated that uncertainty remained regarding the effects of potential oil- and gas-related activity and timber harvest in nonapproved forest harvest cut compartments (and associated road development) in the Cheviot CEA study area with respect to the grizzly bear CEA.

AENV said it was important to understand that current grizzly bear cumulative effects models relied heavily on habitat characteristics and that to date scientists had not been able to establish a link between habitat characteristics and population response. In light of this uncertainty, it felt that a more conservative conclusion regarding grizzly bears than that presented by CRC was warranted. AENV felt that the cumulative effects on grizzly bears were significant at both the Project level and in the regional context, but that this would not be expected to impact the status of the grizzly bear provincially. AENV noted that this was the same conclusion it had reached in 1997.

A representative for the Foothills Model Forest provided the Panel with additional information regarding the grizzly bear research program being incorporated into the management decisions arising from the Strategic Framework. The long-term objective of the Foothills Model Forest was “to provide resource managers with the necessary knowledge and planning tools to ensure long-term conservation of grizzly bears in the Northern East Slopes Region.” The Strategic Framework outlined the approach proposed to achieve integrated grizzly bear conservation in the Northern East Slopes. AENV noted that the Foothills Model Forest research program planned to link objectives from the Strategic Framework to research activities. The research would then be linked to management activities, which would lead to the practical application of research results. The intent of the research program was to improve the understanding of how grizzly bears respond to a variety of human activities.

AENV noted that a number of important research questions the Foothills Model Forest was trying to answer dealt with bear response to human activities. Many of these questions also related to components of the CEA for grizzly bears. In addition, the Foothills Model Forest was trying to develop and improve techniques used to census grizzly bear populations in order to measure the performance of management actions. Of the five key elements of the Foothills Model Forest grizzly bear research program, three (movements, status and trend, and mortality) were presented to the Panel at the 2000 hearing. AENV noted that the Foothills Model Forest research study area fell within the Strategic Framework area and encompassed the area used for the Cheviot CEA. It further pointed out that 43 per cent of the Foothills Model Forest study area also fell within Jasper National Park, providing a contrast between levels of human land use.

AENV emphasized that the data presented at the hearing were from the first year of a five-year program and therefore not conclusive. Any interpretations presented at the hearing might change as more data were gathered in the successive years of this program. AENV reported that initial findings showed no significant difference between males and females or between pre- and post-berry season movements. Six home ranges of grizzly bears encompassed a portion of the proposed Cheviot mine site during the period from April to December, and home ranges of some of those bears also crossed the Jasper National Park boundary. AENV also presented data showing grizzly bear movement across the Jasper National Park boundary, as well as the locations of bears relative to habitat types.

AENV reported that the initial results of its DNA analysis indicated an average grizzly bear density similar to historical reports for bear densities in adjacent areas. AENV stressed that while those data were encouraging for wildlife managers, future conservation concerns remained for this species.

Finally, AENV reported that the Foothills Model Forest research program was monitoring known grizzly bear mortality and stated that the issue of road mortality is a major concern. AENV said that in the second year of the program the research group planned to continue tracking bear movements using radio collars, expand the remote-sensing work to measure and track landscape change, develop models to link landscape conditions with populations, and continue efforts regarding population status and trend analysis.

During closing argument, AENV stated that it did not object to the proposed Cheviot Coal Project, subject to CRC's continued compliance with AENV's regulatory requirements for resource management and environmental protection. AENV maintained that the proposed mine was consistent with the provincial government policies for resource management as set out in the Coal Branch Sub-regional Integrated Resource Plan. AENV noted that since the Panel's 1997 report was issued, AENV had undertaken a number of important research and management initiatives, including the establishment of the Whitehorse Wildland Park and a park management planning process. The Coal Branch Access Management Plan was also implemented through a forest land-use zone designation. Regarding grizzly bears specifically, AENV noted that it had actively participated in the development of the Strategic Framework and a related grizzly bear research program.

Weldwood stated in its written submission that after 40 years of forestry development in the region, a healthy grizzly bear population continued to persist in all traditional ranges, including areas with extensive road networks open to human use. In its view, this suggested that grizzly bears were more flexible in adjusting to human activities than the existing cumulative effects model suggested. Weldwood stated that the existing adaptive management process, in conjunction with new knowledge and planning models developed from the Foothills Model Forest research program, provided an excellent safeguard against the demise of the grizzly bear population.

The WCWC stated in its written submission that protection of critical wildlife habitat was essential to the survival of species such as the grizzly bear. It argued that fragmentation caused by continued development in the region was contributing to the endangerment, and possibly the extinction, of species like the grizzly bear.

The WCWC noted that the scientific community regarded grizzly bears as an umbrella species, an indicator of the ecological integrity of an area, because their habitat needs encompass the needs of many other species. The WCWC noted that the main areas of impact on the grizzly bear population were identified by CRC to be increased mortality, habitat alteration, habitat avoidance, and movement obstruction. The WCWC noted that CRC reported significant impacts on grizzly populations at the project level in three of those four areas of impact, and Parks Canada predicted significant impacts on grizzly bear populations at a cumulative level in all four

areas of impact. The WCWC believed that grizzly bear populations in the province were in peril and that any further disturbance, be it mortality, loss of habitat, or some other impact, was intolerable.

CNF prepared a section of its written submission on the topic of the ecological integrity of Jasper National Park in relation to the grizzly bear population it shares with the proposed Cheviot Project lease area. CNF revisited the 1997 conclusions of the Panel concerning the ecological integrity of the park in light of new evidence from the Foothills Model Forest Grizzly Bear Research Program.

CNF noted that in its 1997 report the Panel concluded that it did not “believe that the Cheviot Coal Project either on its own or cumulatively, compromises the integrity of Jasper National Park.” CNF then turned to evidence provided by Parks Canada in its 2000 submission gathered through the Foothills Model Forest Grizzly Bear Research Program. It observed that the preliminary findings of the grizzly bear research program suggested that bears moved in and out of the national park through mountain passes west of the proposed mine. The mountains did not act as a barrier, as was previously suggested.

CNF stated that it drew several conclusions based on the 1997 Panel report and the subsequent response by Parks Canada to that report, along with recent research findings. First, it concluded that developments adjacent to Jasper National Park, including the Cheviot Coal Project, were having a growing and significant impact on the ecological integrity of the park. Second, the likely increase in human alteration of landscapes for industrial and road development and human activity through recreation was likely to increase the potential for significant mortality risk to grizzly bears. Third, grizzly bears were an important component of the Jasper National Park ecosystem, and the maintenance of ecological integrity demanded the continued persistence of a healthy grizzly bear population.

CNF recommended that the Panel consider not approving the proposed Cheviot Coal Project until such time as the Northern East Slopes Environmental Resources Committee included agreed-upon targets and thresholds in the Strategic Framework. Such targets would, in CNF’s view, ensure the long-term persistence of a healthy population of grizzly bears within its current range in the Alberta Yellowhead ecosystem.

The Mountain Cree Camp Syllabics Institute presented evidence regarding potential alternative methods of assessing grizzly bear habitat use through the assessment of bear trails. It suggested that some human/bear conflicts could be avoided if a distinction was made between trails used by grizzly bears and those used by people and described potential methods, such as the use of synthetic aperture radar (SAR), whereby the existence of such trails could be assessed.

The AWA Coalition noted that the proposed Project fell within the northern half of the provincial Bear Management Area (BMA) 4B. The AWA Coalition also noted the provincial goal of increasing grizzly bear numbers to 1000 and therefore said that increasing bear numbers should also be a goal for BMA 4B. The AWA Coalition pointed out that evidence presented by CRC in 1996 suggested a declining regional grizzly bear population and stated that if the Cheviot development were to proceed, the project-specific and cumulative effects on grizzly

bears could be severe and contradictory to the provincial management plan. The AWA Coalition stated that since the grizzly was an umbrella species, the significant cumulative effects would also potentially affect species other than this large carnivore. The AWA Coalition felt that significant uncertainty remained regarding the risk to regional populations of grizzly bears, including those frequenting Jasper National Park, and that the implications for Jasper National Park remained an unresolved concern.

The AWA Coalition stated that it supported Parks Canada's recommendation that the western portion of the CRC mine permit area be protected and maintained as secure habitat. The AWA Coalition also suggested that the mine permit be removed from the critical wildlife zone and that this area, together with the headwaters of the Cardinal Divide, be added to the Whitehorse Wildland Park with a clear management intent of preservation.

7.3.3 Views of the Panel's Consultants

Vegetation and Botanical Resources

Dr. Ross stated in his submission to the Panel that the analysis for the vegetation and botanical resources VEC met the key criteria for an acceptable CEA. Dr. Peterson commended the analysis for this VEC as, in his view, it provided an excellent overview of the amount of disturbance to mature vegetation expected from various developments between 1996 and 2025.

Elk

During cross-examination, Dr. Ross stated that he would have been reassured about the completeness of the CEA for elk had he seen a clear statement from CRC regarding the assumptions made about forestry, oil and gas, and recreational activity. Dr. Ross said that he had subsequently been reassured that this was the case. Dr. Ross also expressed ongoing concern, however, that the success of the mitigation measures prescribed for most of the VECs, including elk, depended on management strategies that were outside the scope of CRC's control.

Selected Bird Species

Dr. Ross also expressed concern as to whether the impacts of forestry on the selected bird species VEC had been adequately addressed, since, as he noted before, he remained uncertain as to the exact forestry information provided to CRC's consultants at the time of their CEA. He also felt that uncertainty remained regarding the anticipated levels of recreation in the Cheviot CEA area and therefore was concerned that there might be some impacts on bird species that remained unaccounted for. In addition, he found that the amount of oil and gas activity considered for the CEA of birds was unclear. Despite these concerns, Dr. Ross found that the CEA for selected bird species was reasonably well done and met the key criteria for an acceptable CEA.

Harlequin Ducks

Dr. Ross noted that the Harlequin duck was designated as Yellow (A) status by AENV, due primarily to potential conflicts with recreational user groups. He then pointed out the contradiction apparent in CRC's assessment that the impact of recreation activities on Harlequin ducks was expected to be minimal. He noted that CRC's written submission specific to Harlequin ducks also concluded that recreation activities were presently minimal and were not expected to affect Harlequin ducks in the future. Dr. Ross observed that CRC reported that an

increase in recreational activity was expected, but that resource management plans were being developed to mitigate potential impacts of recreation on Harlequin ducks. Dr. Ross stated that given the potential for the growth in recreation and the potential for subsequent impacts, particularly on Harlequin ducks, this aspect of the CEA required more in-depth treatment.

Grizzly Bears

Dr. Ross stated that he found the assessment of grizzly bears for the CEA to be well done. He said that the evaluations of human-use-level monitoring provided by the grizzly bear CEA in order to update the cumulative impact on grizzly bears was a valuable contribution to better environmental impact assessment.

7.3.4 Views of the Panel

The Panel concludes that it has obtained all supplemental information necessary to determine the significance of the impacts of the proposed Project and of the cumulative effects of other reasonably foreseeable development projects within the region on terrestrial VECs. The Panel also finds that the recommendations and proposed mitigation measures outlined in its report of 1997 remain relevant and notes that CRC must continue to adhere to the provincial requirements of that decision, as well as any additional requirements that arise as a result of this Project.

Vegetation and Botanical Resources

The Panel concludes that no significant cumulative adverse effects to the vegetation and botanical resources VEC will occur. **The Panel recommends that the federal government accept this conclusion.**

The Panel accepts CRC's assessment of the potential cumulative effects on vegetation and botanical resources as reasonable and also believes that the evaluation of reasonably foreseeable mining and forestry activity and their potential cumulative effects have been adequately considered. The Panel notes the increase in the level of information exchange between Weldwood and CRC since the last hearing and believes that this improvement in communication will allow both companies to significantly reduce the collective impact of their activities. The Panel, through the EUB, will work with AENV to ensure that this high level of cooperation and coordination continues. As a result, the Panel concludes that no significant adverse cumulative effects on vegetation and botanical resources are expected to occur from either regional mining or forestry operations in association with the Cheviot Coal Project.

The Panel notes that two of the key issues in *Decision 97-8* were the impacts to old-growth forest in the vicinity of Powerhouse Creek and the potential impacts to alpine vegetation in upper Prospect Creek. The EUB addressed the latter issue in *Decision 97-8* by excluding that portion of the mine lease from development. With regard to the first issue, the Panel agrees that the additional surveys by CRC now indicate that the potential loss of 29 ha of old-growth Engelmann spruce-subalpine forest vegetation in the Powerhouse Creek area is not significant at a regional level, as old-growth forests were found to be generally more abundant and secure than previously thought. The Panel continues to believe that CRC's mitigation strategies, combined with the approaches proposed to be used by Weldwood in its forestry management practices, will

adequately address these impacts and therefore no significant cumulative adverse effects to these vegetative resources will occur.

The Panel also concludes that the effects of oil and gas activity and recreation on vegetation and botanical resources will also not be significant on a regional scale. The Panel notes in particular that on Crown lands in the province there is already good coordination between the road construction needs of the oil and gas industry and the forestry industry. This will reduce the risk of duplicative roads being constructed and further reduce the risk of impacts from oil and gas developments.

The Panel also notes that the mitigation measures set out in the earlier decision are generally consistent with the recommendations made by the various interveners at the reopening of the hearing. The Panel will ensure that these requirements continue to be captured in any new provincial approvals.

The Panel does remain concerned that the probability of success of transplanting rare or unique plant species, one of the mitigation measures proposed, may not be high. In addition, in the absence of ongoing surveys, there is a reasonable likelihood that additional rare species that might exist within the mine site would be overlooked. Therefore the Panel will, in conjunction with AENV, the agency responsible for site reclamation, require that monitoring of rare and valued species continue and that CRC also closely monitor and report regularly on the success of valued plant species transplants. Other methods to safeguard the rare plant populations, such as seed collection and storage, must also be considered as a backup to augment the uncertain outcome of transplants. If these mitigation strategies are followed, the Panel believes that any significant adverse impacts to rare plant species will be avoided.

Elk

The Panel concludes that both project-specific and cumulative impacts on elk from the range of expected development activities in the region considered in the CEA will be of a minor nature and not significant. **The Panel recommends that the federal government accept this conclusion.**

The Panel notes that while some components of CRC's assessment were questioned at the hearing, the other participants to the hearing, including the Panel's consultants and the government experts, generally did not challenge this conclusion.

The Panel found in its earlier decision that elk, while clearly an important component of the regional ecosystem, are not particularly vulnerable to the types of disturbance associated with mine development. It appears likely to the Panel that with the absence of hunting on the mine site and surrounding region due to restricted access and through the use of agronomic species in CRC's reclamation programs, elk populations within the CEA study boundaries may in fact benefit. The Panel notes that CRC should be cautious when implementing reclamation techniques for the purpose of ameliorating elk habitat, so that efforts to improve forage or cover for elk do not conflict with revegetation of native species or attract grizzly bears to unsuitable areas.

The Panel notes that among the mitigation measures for elk recommended by CRC's consultant was the implementation of slowdown zones along roads where there is known wildlife use and the development and maintenance of a mortality database. This mitigation measure also coincides with mitigation measures recommended for the selected bird species and the grizzly bear VECs. The Panel will expect CRC to ensure that this measure is implemented in a timely manner in those areas under its control.

The Panel notes that the success of mitigation for elk relies in part upon effective wildlife mitigation actions by other industrial developers in the region. The Panel is satisfied that the various regional planning initiatives being carried out by the province, in consultation with industry and the federal government, will ensure that wildlife management in the region is closely tied to the monitoring of the success of those industrial mitigation plans. The Panel expects that the industries that are regulated by the EUB will continue to be active participants in those planning processes.

Selected Bird Species

The Panel concludes that while cumulative impacts to various bird species through losses in habitat will occur in the region, these impacts will be small or readily mitigable using existing techniques and planning processes, so that any adverse effects are insignificant. **The Panel recommends that the federal government accept this conclusion.**

The Panel is satisfied that the applicant considered all of the relevant expected mining and forestry developments when assessing the potential cumulative effects on the selected bird species VEC and that this evaluation of cumulative effects was consistent with the methods used for other VECs. The Panel also concludes that the impact of regional oil and gas and recreational development on bird populations is likely to be minimal.

The Panel notes the difference in views between CRC and Environment Canada with respect to the numbers and types of species that should have been selected for analysis in the CEA. Environment Canada suggested that in order for the CEA to be complete, CRC should have assessed the potential impacts on all of the neotropical migratory bird species expected to make use of the CEA study area rather than focusing on a selected group of species. Only after such an analysis would CRC be able to assess the total potential impact on this group of species. Environment Canada argued that even if a species was common within the region, it was important to understand population trends for the species on a continental scale in order to assess the magnitude of the impact of further habitat loss.

Environment Canada's position appears to be based on the fact that on a continental basis there have been significant declines in the populations of a number of bird species, particularly neotropical migrants, with many of these reductions tied to loss of habitat. Because these habitat losses were individually small but collectively significant, it was important that any habitat losses from CRC's proposed development be considered in this light.

CRC in its submissions did not appear to take exception to the position by Environment Canada regarding the importance of ensuring that neotropical migrants were adequately protected. CRC indicated that the approach to CEA for the selected bird species VEC advocated by Environment

Canada if carried out would have been actually less comprehensive than the approach used. CRC noted that while there was some overlap in the species that would have been considered in the two approaches, in its view, its assessment included a broader range of species with more national and regional significance. CRC also noted that its selection process was based on more data sources and in particular on data from bird surveys carried out within the region.

The Panel can understand Environment Canada's concerns regarding the international loss of wildlife and its desire to ensure its protection. However, in comparing the results of the analyses carried out respectively by CRC and Environment Canada in terms of the issues that the Panel must address, there appears to be relatively little difference. In fact, Environment Canada came to a similar conclusion, i.e., that both methods would tend to lead to a similar finding with respect to the significance of Project impacts on birds. Both reviews confirm that the Cheviot mine site and the surrounding region contain a rich avifauna. Both indicate that the risk to some species is higher than others due to a number of factors, including the amount and availability of habitat that may be lost. Perhaps the greatest difference is the interpretation of the relative importance of these impacts on a continental scale. However, both reports indicate that many, if not all, of these impacts can be avoided through ongoing adaptive management and the protection of certain habitat types. Since this is already a requirement for CRC, the Panel believes that the conclusion that the risk of cumulative impacts to these species will be insignificant is a reasonable one.

At the hearing, Environment Canada went on to suggest that it also believed that there was a strong need for additional research throughout the boreal forest regions of Canada on neotropical migrants. While it confirmed that this research did not need to be completed before the Cheviot Coal Project was considered, it did believe that this should be carried out before future developments were approved. While the Panel is certainly supportive of any research that will help to ensure that future impacts are addressed, the Panel believes that the second issue raised by Environment Canada is beyond the Panel's mandate. **The Panel recommends that the federal government confirm, in a timely fashion, its position with regard to Environment Canada's request for additional research into the effects of industrial development in the boreal forest ecosystem on neotropical migrants.**

Harlequin Ducks

In its earlier report, the Panel observed that while it believed that the McLeod River Harlequin duck population was regionally important, it was also of the view that additional survey work would likely determine that Harlequin ducks were more widespread than previously thought. Since the release of that report, there has been a significant amount of new research carried out into Harlequin duck distribution and population size in Alberta, confirming that although patchy in distribution, there are a number of regional populations in the province. In its initial report, the Panel concluded that some adverse effect on Harlequin populations would be experienced within the Cheviot mine site. The Panel also concluded, however, that with the proposed mitigation measures, including ongoing monitoring, these adverse effects would be insignificant.

The Panel believes that these conclusions continue to be well supported by the new data now available and continues to believe that adverse effects on Harlequin ducks will be insignificant. **The Panel recommends that the federal government accept these conclusions.**

The Panel does note that this prediction is largely dependent on the success of the mitigation measures proposed by CRC. The Panel continues to believe that there is a need to closely monitor the effects of the proposed mine on all Harlequin duck life history stages (i.e., nesting, brood rearing, staging) and will require CRC, through its EUB approval, to meet its commitments in this regard.

Resource management plans being implemented in the region are seen by the Panel as tools that should also mitigate impacts on Harlequin ducks in the future. The Panel notes that the evidence suggests Harlequin ducks may be particularly vulnerable to the effects of recreation. CRC made a number of suggestions for the management of Wildhorse Wildland Park with regard to trail and campground locations, random camping, and public education. These could be incorporated into the Wildhorse Wildland Park draft management plan to help further reduce regional impacts to Harlequin ducks. **Given the regional importance of the Maligne River Harlequin duck population in Jasper National Park, the Panel would also strongly recommend that Parks Canada ensure that its management of this population, given the high levels of recreational activity within the Park, is integrated into and consistent with the broader regional planning process.**

The Panel notes the overall acceptance by AENV of CRC's analysis of potential impacts on Harlequin ducks. However, AENV also noted that ongoing monitoring was required. The Panel adds that any management actions taken by CRC must incorporate the findings of all regional initiatives focused on Harlequin ducks, including results of the Foothills Model Forest research examining the relationship between hydrologic features and Harlequin duck presence.

The Panel considered the position presented by Dr. Ross that the impacts of recreation on Harlequin ducks should receive a more in-depth examination and the subsequent summary of the impacts of recreation on Harlequin ducks and potential remedies to those impacts provided by CRC (Exhibit 321). The Panel notes that most of the concerns and recommendations relate directly to the effective drafting and implementation of the Wildhorse Wildland Park management plan and an associated access management plan. In addition, careful monitoring and adjustment to angling restrictions in Harlequin duck habitat appear to be necessary.

While CRC retains responsibility to continue its participation in regional Harlequin duck studies, the Panel believes that the onus is on AENV to ensure that results of research and monitoring programs are being effectively implemented. As noted earlier in this report, the Panel believes it has been provided with substantial evidence that the provincial government has been and intends to continue ensuring that these regional concerns are addressed. As a result, the Panel concludes that current provincial management plans will ensure that adverse impacts from recreation on Harlequin ducks are insignificant. **The Panel recommends that the federal government accept this conclusion and be prepared to actively support and participate in these management programs, including providing funding, to ensure their success.**

The Panel notes that Justice Campbell visited the issue of Harlequin duck habitat destruction through the disposal of waste rock ("rock-dumping"). He stated that, based on the Panel's 1997 report and the evidence provided by Environment Canada, "the issuance of Fisheries Act authorizations for the proposed mine operations will result in the deposit of harmful substances

in areas frequented by migratory birds. Thus, the actions of DFO will be ‘contrary to law’ (Section 35 of the *Migratory Birds Convention Act Regulations*) and subject to judicial review.” Justice Campbell did not, however, make a specific ruling with respect to this issue. The Panel believes that it adequately addressed the potential direct impacts of the Cheviot Coal Project on birds and bird habitat in its original report and has also addressed the cumulative effects of the Project, in association with other reasonably foreseeable developments, in this report. The Panel believes that the questions associated with the specific nature of any federal approvals required for the Cheviot Coal Project are beyond the authority of the Panel to address. **However, given the importance of these issues, the Panel recommends that the federal government, in its response to this report, confirm how it intends to respond to the issues raised by Justice Campbell.**

Grizzly Bears

The Panel continues to believe that the ongoing viability of grizzly bear populations in the region represents an excellent measure of the success of a range of ongoing management initiatives. In this case, the Panel believes that CRC’s efforts to predict cumulative impacts on grizzly bears in the CEA study area were thorough and carried out with a high degree of scientific rigour. The Panel finds that CRC has contributed substantially to research efforts and understanding of the regional grizzly bear population. The Panel particularly notes the efforts made during the hearing to extrapolate potential oil and gas and forestry activity and its cumulative effects on linear development and, by association, grizzly bears. The Panel also recognizes CRC’s contribution to the ongoing grizzly bear research program and the Strategic Framework.

The Panel notes that while CRC concluded, as a result of its research, that its earlier predictions with regard to the impacts of its Project on grizzly bears were perhaps too conservative, the company did believe that the risk of cumulative effects on grizzly bears in the region remained high. AENV, however, argued that a more conservative conclusion regarding the cumulative effects on grizzly bears was still warranted. Both AENV and Jasper National Park took the position that the cumulative effects on grizzly bears might be significant at a project level as well as in a regional context. AENV did not expect that the provincial status of grizzly bears would change, however, while Jasper National Park was of the view that even without the Cheviot Project, significant cumulative impacts to bears may occur as a result of other forms of regional development.

The Panel generally agrees with AENV’s view in this regard. While the Panel acknowledges the strong technical base to CRC’s assessment, ultimately that view is dependent on the results of primarily modelled rather than empirical data. The Panel believes that, given the uncertainties associated with any ecological model, it is better to apply more rather than less conservatism to the results. The Panel also notes that the success of the Strategic Framework is considered critical to achieving a healthy grizzly bear population, but that the successful implementation of such a framework will likely require time to perfect. If the Strategic Framework is not successful, CRC’s own consultants anticipate that the regional grizzly bear population will decline. The Panel therefore confirms its original conclusion that without mitigation the Cheviot Coal Project will result in significant adverse effects on grizzly bears. The Panel also concludes that without mitigation there is a significant risk of regional adverse cumulative effects with or without the Project.

The Panel believes that Parks Canada's relatively speculative prediction regarding the likely future for grizzly bears in the region, while it could occur, is overly conservative. The Panel notes that AENV has the responsibility for the management of provincial grizzly bear populations and that AENV has initiated, often in consultation with Parks Canada, a number of regional initiatives to address cumulative impacts on bears in the region. The Panel is comfortable, based upon the available evidence, that these initiatives are proceeding in a timely fashion.

In its 1997 report, the Panel stated that it believed that CRC's proposed Carnivore Compensation Program could, if successfully implemented, provide adequate regional mitigation for site-specific impacts to grizzly bear populations. The Panel notes that since the issuance of the report, the Strategic Framework has been developed. This program, and all of the various associated research being carried out, now appears to provide an even more significant opportunity to provide for regional mitigation of the cumulative effects on grizzly bears. As a result, the Panel concludes that the potential adverse effects of the Cheviot Coal Project can be mitigated through regional planning and implementation of the Strategic Framework.

Given the rate of development within the region, the Panel's original concern with the rate of implementation of the Strategic Framework does still remain. At the same time, the Panel is particularly pleased that both levels of government, as well as a number of industry players, including oil and gas, other mining interests, and forestry, are now directly involved in its design and implementation. Therefore, while the Panel reconfirms its original requirement that CRC must be able to demonstrate the successful implementation of a regional program to adequately address impacts on grizzly bears within three years of Project approval, the Panel is also more confident that this goal will be achieved.

The Panel is also convinced that the establishment of realistic management targets and threshold values is key to the success of the Strategic Framework. The Panel concludes that the values for landscape condition indicators cited as working hypotheses in the Strategic Framework are suitably conservative until more set values can be determined within the expected planning window. The Panel therefore supports the interim use of these working hypotheses by resource managers and land-use planners. The Panel notes that CRC must confirm within three years a plan to address regional impacts on grizzly bears. The Panel would be prepared to accept the establishment of threshold values as a suitable measure of successful implementation of a regional mitigation program.

The Panel recommends that the federal government accept the mitigation requirements set out for CRC and the undertakings of AENV as acceptable mitigation for the adverse effects of the Cheviot Coal Project on the grizzly bear VEC.

The Panel also recommends that the Government of Canada be prepared to actively participate in any research into the impacts of area development on wildlife in the region.

The Panel notes that CNF recommended that the Panel consider not approving the proposed Cheviot Coal Project until such time as the Northern East Slopes Environmental Resources

Committee approved a Strategic Framework containing agreed-upon targets for indicators. Such targets would, in CNF's view, ensure the long-term persistence of a healthy population of grizzly bears within its current range in the Alberta-Yellowhead ecosystem. However, as the Strategic Framework has also provided working hypotheses until such time as more definitive thresholds and targets can be established, the Panel is prepared to accept that these are an acceptable and practical approach to the near-term management of grizzly bear habitat in the Yellowhead region. The Panel notes that it has tied CRC's approval to the successful implementation of the Strategic Framework. The Panel believes that this will also help to address the concerns of the AWA Coalition regarding ensuring that development does not result in a decline in the regional grizzly bear population, contrary to provincial management goals.

In the 1997 Panel report, concern was conveyed regarding the potential blockage of carnivore movements from Jasper National Park to provincial lands, as well as the need to ensure that bear populations on the border of the park remain viable. In considering this issue, the Panel was struck by, on the one hand, the high quality of the upper Cardinal River habitat for carnivores and, on the other, by the relatively low habitat effectiveness of the region based on the CEA models, due apparently to road development and OHV use within the valley. No evidence was presented at the 2000 hearing to alter the Panel's view in this regard, and the Panel asks that AENV consider the effectiveness of the access management plan implemented in this area. Further detail is provided in Section 8.

Since the release of *Decision 97-8*, the Panel notes that the Government of Alberta has created the Whitehorse Wildland Park. The Panel believes that this should serve to some degree as a buffer between the Cheviot development and Jasper National Park. The Panel also notes the high-quality habitat in both the pre-berry and berry-and-after seasons for grizzly bears in BMSU 2A both in 1999 and in 2025, as well as the linkage zones created by mountain passes between Jasper National Park and the Whitehorse Wildland Park. In light of this evidence, the Panel believes that there likely remains a need for the provincial park management plan to include specific measures aimed at securing effective habitat for grizzly bears. The Panel encourages those developing the Whitehorse Wildland Park management plan to give special consideration to issues regarding access management. The Panel believes that this should be given priority so the necessary management plans are put in place as early as possible in the process of developing the Cheviot mine. Information gleaned as part of the various studies into regional bear population behaviour should of course be incorporated directly into these plans as well.

As noted earlier, the Panel remains convinced that the grizzly bear is an excellent indicator of landscape integrity and therefore a suitable VEC for consideration in this assessment. Furthermore, the Panel believes that if ecological integrity for grizzly bears is maintained, it is very likely that impacts to other carnivores will also be kept at acceptable levels. It is suggested, however, that a more comprehensive carnivore compensation strategy also be considered to account for other species such as fisher or lynx. The Panel expects that this program can be developed as one component of the other regional plans under way, again preferably within the next three years.

7.4 Public Access—Recreation

CRC addressed two VECs in its CEA directly related to regional social issues. These were public access-recreation and traditional use. Interveners, including government experts, appeared to generally support this selection of community VECs, with a specific request that the CEA needed to consider the effects of the displacement of recreational activities in both a local and regional context. The public access-recreation VEC is addressed below, while traditional use is addressed in Section 9 of this report.

7.4.1 Views of the Applicant

CRC concluded that development of the Cheviot mine, in combination with other projects and activities in the region, would not have a significant cumulative effect on public access for recreation. This conclusion was based on the belief that the regulatory framework and protection plans for other mines, forestry, and oil and gas would ensure that any impacts on recreation would be mitigated. For example, CRC noted its direct experience that the requirements for mitigation of any impacts on recreation are routinely addressed as part of the approvals process for new and expanded mine developments. CRC believed that future forestry development, including the construction of a main forestry road for the Pembina River-Grave Flats area, would result in additional opportunities for OHV and snowmobile access to the east of the Project, subject to access management strategies to be developed in consultation with regional land managers and public stakeholders. In the case of petroleum and natural gas development, CRC believed that future development in the region would be located at some distance from the proposed mine site and would therefore have no effect on public recreation.

CRC also believed that any future impacts on recreation arising from the Cheviot mine and/or other projects or activities could be dealt with adequately using existing regional management mechanisms. It noted that in the 1997 decision report, the Panel concluded that without some form of regulatory control, recreational activities displaced by the Cheviot mine could compromise other land-use objectives, including the preservation of ecological values in the Cardinal Divide Natural Area. CRC noted that with the establishment of the Coal Branch Forest Land Use Zone and the Whitehorse Wildland Park in 1998, appropriate mechanisms to manage public access and recreation in the vicinity of the proposed Cheviot mine were now in place. CRC also confirmed its plans to continue its involvement on the Coal Branch Access Management Advisory Committee and on the Whitehorse Wildland Park Advisory Committee.

CRC concluded that the proposed mines would have no cumulative impacts on access to and enjoyment of Jasper National Park, the Cardinal Divide Natural Area, the Cadomin Caves, or the Whitehorse Creek Campground. For the Mountain Park staging area and cemetery, the Grave Flats Road, designated motorized trails, and nondesignated (random) camping sites, CRC concluded that cumulative impacts on public access for recreation would be minor, short term, and reversible. To help mitigate the potential adverse effects associated with closure of the Mountain Park OHV staging area, CRC indicated that it was working with AENV to identify an alternative staging area, but a suitable location had not yet been identified.

7.4.2 Views of the Interveners

Several interveners questioned CRC's predictions about where future recreational activities were likely to occur in the region once the mine was developed and expressed concerns about the resulting impacts on the landscape. The ACC/ANPC suggested that closure of the mine area to random camping and other activities would displace the current recreationists using the area and would result in increased use of Whitehorse Creek, right up to Fiddle Pass. It noted that the Whitehorse Creek drainage offers significant habitat for both grizzly bears and Harlequin ducks, both of which are susceptible to human intrusion. The AWA Coalition expressed similar concerns about how recreational users displaced from the mine site might affect the viability of grizzly bear populations.

A second concern related to how mining and other activity in the region might affect patterns of OHV use. Several interveners questioned CRC's assumption that closure of the Mountain Park staging area would most likely displace OHV users to areas east of the mine. The ACC/ANPC stated that it was concerned that OHV use may actually be displaced west into the Cardinal River headwaters and Rocky Pass. It noted that increased OHV use of this area could have a significant impact on grizzly bears and other species and pointed out that the continued integrity of this area as wildlife habitat was a key assumption in the analysis of cumulative effects for several VECs. The ACC/ANPC provided photographic evidence showing the cumulative effects of OHV usage in selected parts of the Cardinal headwaters since 1993. As a solution, it suggested that the Cardinal headwaters be closed to OHV use and that this area, right up to Rocky Pass, also be designated as a part of the Whitehorse Wildland Park. Other interveners, including Mr. Mitchell, supported this concept.

The ACC/ANPC also argued that the present mechanisms for managing recreational access in the region were not effective. It was concerned that the recent creation of the Coal Branch Forest Land Use Zone has in fact served to attract more OHV use of the area and noted that some illegal OHV use is still occurring, presumably because of lack of education and enforcement. The ACC/ANPC suggested that a more proactive approach for managing recreation should be adopted. For example, it noted the recent proliferation of random campsites throughout the area and suggested that action be taken to establish specific areas for OHV use away from the areas used by people engaged in nonmotorized activities. The ACC/ANPC further noted that the demand for facilities by all recreational users displaced by the mine could exceed the capacity of the existing campgrounds but at present there were no specific plans to build additional facilities in the area. Without the development of additional facilities at specific locations away from key wildlife areas, the ACC/ANPC strongly believed that proliferation of random campsites and their associated problems would continue.

AENV summarized its current enforcement activities and noted that it would be increasing its enforcement activities in the region. It acknowledged, however, that its resources for monitoring and enforcement were limited. AENV indicated that if OHV use of the area affected by the mine was further restricted, it was possible that OHV users could leave the area altogether because areas east of the mine site were less attractive. AENV confirmed that the Coal Branch Access Management Advisory Committee and the Whitehorse Wildland Park Advisory Committee

would continue to manage recreational activities in the region. AENV also noted that it was working with Weldwood on a long-term access management plan for the company's FMA.

7.4.3 Views of the Panel

In its 1997 report, the Panel concluded that the cumulative effects of the Cheviot Coal Project on recreation in the region could be significant. The Panel also recognized that such impacts could be reduced through the establishment of acceptable alternative recreational opportunities and through stronger regulatory control of access by land managers. The Panel believes that the establishment of the Coal Branch Forest Land Use Zone and the Whitehorse Wildland Park since 1997 provides two concrete examples of increased regulatory control that directly address the Panel's original concerns.

Despite these recent regulatory initiatives, the Panel remains concerned that the impacts of the Cheviot mine, in combination with other development in the region, could still have a significant cumulative adverse impact on recreation in the area. CRC has indicated that development of the mine will dislocate a considerable amount of recreational activity, and the Panel concludes that unless more measures are taken to proactively and systematically relocate these people to other sites, there is a significant risk that growing demand for recreation in this area will have undesirable impacts on the landscape and its ecological resources.

The Panel commends CRC for its commitment to continue its participation on the various advisory committees and is encouraged by AENV's efforts to develop access and recreation management plans for the region. However, the Panel concludes that additional efforts are required to manage the Project's impacts on recreation.

The Panel will require that CRC continue discussions with AENV to find a replacement staging area for OHVs, and include regional representatives of OHV associations and other recreational groups in these discussions. The Panel believes that the success of such an initiative will eventually be critical to the company's meeting its other obligations to protect key ecological values, including regional grizzly bear populations. The Panel encouraged the development of such a site in its original decision, noting that the McLean Creek site in Kananaskis Country has been successful in resolving conflicts with OHV use in southern Alberta. The new staging area should be established preferably before the Mountain Park site is closed, so OHV enthusiasts will have alternative facilities. This replacement site should be selected so that OHV use will not jeopardize key regional environmental objectives, such as those related to grizzly bear habitat, and to minimize conflicts with nonmotorized recreation.

The Panel also strongly believes that the headwaters of the Cardinal River should be considered for additional protection. One possibility would be to incorporate it into the Whitehorse Wildland Park so that more intensive management controls can be placed on recreational and other users of the area. Evidence before the Panel suggests that Rocky Pass and other passes through the front ranges of the Rocky Mountains are extensively used by grizzly bears. If this population is to be maintained in light of the cumulative effects of proposed developments, human disturbance of these headwater areas needs to be managed. The Panel again reiterates its belief that this step

would go a considerable way towards the successful mitigation of impacts on a number of VECs, including carnivores, in the region.

The Panel concludes that with the implementation of appropriate mitigation, the adverse effects of the Cheviot Coal Project on recreation, including cumulative effects, will be insignificant. **The Panel recommends that the federal government accept this conclusion.**

8 ACCESS MANAGEMENT

From the foregoing sections it is clear that many of the cumulative impacts to the regional environment are due to the development and use of linear developments such as seismic lines, utility rights-of-way, and roads. Industry creates these linear disturbances to gain access to resources. The public uses them for recreational access. Over time, the number of access routes has proliferated and the number of people using them has grown, placing stress on the regional ecosystem.

All participants who spoke about access at the hearing recognized the need for its management if impacts were to be minimized. The Panel believes that the management of both the development and use of access will significantly influence the potential success of regional resource management initiatives and project-specific mitigation of cumulative effects. In reaching its conclusions regarding the proposed Cheviot Project, the Panel believes it must determine whether the access-related cumulative effects of the Project are acceptable. In doing so, the Panel intends to have regard for the regional cumulative effects of access as well as for the concerns about the impacts of access at particular locations near the proposed mine.

8.1 Views of the Applicant

CRC stated that it understood the importance of managing access as a means to mitigate the adverse cumulative effects of industrial development and recreation in the region. Although access affects many aspects of ecological integrity, the litmus test in the eastern slopes, CRC said, was the effect of human access on the survival of the large carnivores, particularly grizzly bears. Mr. Kansas, on behalf of CRC, quoted the well-respected grizzly bear biologist Dave Mattson:

Management of human access is currently viewed by most managers - I would say all managers, pretty much, that are worth their salt - as the most critical element of grizzly bear habitat conservation.

Mr. Kansas also said:

...it's very clear from the grizzly bear scientific literature that direct human-caused mortality is the cause of virtually all grizzly bear population declines in North America and that human access is the primary mediator of that mortality.

CRC presented an analysis of current and extrapolated future road densities in order to estimate the potential cumulative impacts of access development in the regional cumulative effects study area. The modelled scenario extrapolated oil and gas, forestry, and recreational access to the year 2025. CRC concluded that, for grizzly bears at least, road densities were currently below the threshold densities employed in other regions. In the future, however, unless road densities were actively managed through shared access and selective road closures, these thresholds could be breached. CRC also urged caution against uncritically adopting threshold values from other regions and stressed the need for site-specific verification through the Foothills Model Forest grizzly bear research program. Finally, CRC concluded that the proliferation of human use in the region could be a serious problem if not properly managed within the next five years.

CRC stated that it hoped to minimize the impacts of access development by coordinating its activities with other industrial users of the region. Dr. Hererro, on behalf of CRC, said that the proposal to coordinate access among industrial users would require both regulatory agencies and industrial users to adopt a somewhat different approach to land use than they have had in the past.

8.2 Views of the Interveners

AENV noted that the level of public use in the area was increasing, but that this in itself was not a concern. AENV cited the many tools available to deal with the effects of public access, including multiple-use corridors, joint-use roads, timing constraints, gating, and removal of drainage structures and bridges prior to final reclamation. AENV noted that although maps of the CEA study area gave the appearance of a proliferation of roads and trails on a severely impacted landscape, many of these roads and trails might be impassable for some or all types of vehicles. Furthermore, it said, a number of groups were already dealing with access management. AENV stated that it and Weldwood were working together on a long-term access management plan for the company's FMA. Other groups, including the Northern East Slopes Environmental Resource Committee, the Yellowhead Ecosystem Working Group, the Model Forest, the Coal Branch Access Management Committee, and the Whitehorse Wildland Park Advisory Group, were also addressing access among other matters. AENV, in response to comments from the ACC/ANPC, agreed that resources available to enforce existing access restrictions were limited, but said that despite these limitations, more would be done to enforce the Coal Branch Forest Land Use Zone in the future.

The ACC/ANPC said that faulty assumptions used by CRC in its projections of road densities and usage had led the company to underestimate the regional impacts of both. The ACC/ANPC noted that CRC's human-use feature maps appeared to depict practically no changes in the road densities between 1999 and 2025 and no discernible changes in their use status. Forestry road projections were only shown to 2008, even though the map was labelled "projection to 2025." When additional evidence was tendered during the hearing to fill that gap, the ACC/ANPC noted that the estimated amount of linear disturbance increased by about 200 per cent, or another 1000 km of roads, with obvious implications for the CEA.

The ACC/ANPC stated that the claims that OHV users were restricted from the Whitehorse Wildland Park were incorrect and noted that there were frequent violations of the access limitations of the Coal Branch Forest Land Use Zone. The ACC/ANPC observed that many users of the area were ill informed or misinformed about restrictions placed on public access, and it believed that the government must do more to educate area users. The ACC/ANPC noted that the lower Prospect Creek trail, which is designated for horses and hikers only in the access management plan, is mistakenly shown as an OHV route on maps currently in circulation. The ACC/ANPC also noted that AENV had few resources at its disposal to educate, monitor, and enforce restrictions on vehicle access.

The ACC/ANPC recounted how the Cardinal River headwaters, once designated Zone 1 (prime protection) was redesignated Zone 4 (general recreation) under the access management plan to allow use by OHVs. As a result, the ACC/ANPC observed, the headwaters had become a

designated area for off-road vehicle use. It was the belief of the ACC/ANPC that the temporary designation was to have been for a limited trial period, after which the headwaters were to have been closed if the trails were damaged. The ACC/ANPC claimed that the recreational use of motorized vehicles had heavily abused the area and provided photographs to document the damage. In light of this evidence, the ACC/ANPC said, the area should be immediately rezoned as prime protection under the Coal Branch Forest Land Use Zone.

The ACC/ANPC also believed that the area from Grave Flats Road where it meets the Cardinal River across to Mount Mackenzie and west to Jasper National Park should be included in the Whitehorse Wildland Park as soon as possible. The ACC/ANPC commented that the concern expressed in 1997 by the Panel over the potential displacement of motorized recreation into the Cardinal River headwaters was all the more acute now that the only designated OHV trail in the area was up the Cardinal River headwaters. The ACC/ANPC urged an immediate prohibition of motorized vehicle access to the Cardinal River headwaters from the Grave Flats Road.

In addition to its specific recommendations for the protection of the upper Cardinal River watershed, the ACC/ANPC proposed a number of recommendations with respect to access management in the region. It stated that road development and access management must be part of a “whole integrated system design.” The Panel, it believed, should remind the province of the need for a regional access management plan and for government-directed regional integrated resource management plans to ensure that cumulative effects of industry and other activities do not exceed sustainable levels.

The AWA Coalition stated that it shared many of the ACC/ANPC’s concerns and recommendations, noting that the area slated for OHV use included all of the critical wildlife zoned lands in the cumulative effects study area. The forest land-use zone designation, it said, had the potential to make the area south of Cadomin, including the Cardinal headwaters, a provincial destination for OHV use. The net effect had been to increase motorized recreation in the area, not to reduce it, as was recommended by the Panel in 1997. The AWA Coalition stated that, in its view, motorized vehicle access in this area threatened high-quality grizzly bear habitat and that in the absence of regular monitoring and enforcement, OHV intrusions into Jasper National Park and the Wildland Park were to be expected.

Parks Canada questioned the completeness of the linear disturbance data and the assumptions employed by CRC in its projections of linear disturbance densities. In particular, Parks Canada said that forestry road development was underestimated, OHV use of trails was downgraded, and the expected displacement of recreational vehicles from Mountain Park to the upper Cardinal area was not included in the CEA.

Mr. Clark stated that he was looking forward to improved access to the Cardinal Divide if the road were upgraded. He expressed the view that this would be a benefit.

The AFN noted that the upgrading and paving of Highway 40 would increase levels of human activity during and after the life of the mine. It questioned the value of upgrading the Graves Flat Road to 90 km standards, noting that speeds greater than 60 km were associated with increased wildlife mortality.

8.3 Views of the Panel's Consultants

Dr. Peterson expressed two concerns with respect to the access information provided by CRC. The first was whether the Panel could rely on estimates of road construction rates if the forestry plans before them were not current. Weldwood later resolved this issue by providing its most current draft management plans. Second, he asked whether Weldwood's road construction plans, particularly in compartments 316 and 317, would be altered by an approval of the Cheviot mine. Weldwood, in response, indicated that an approval of the Cheviot Project would not affect road-building schedules up to 2025.

Dr. Peterson noted that the 1996 Weldwood Harvest Planning and Operating Ground Rules called for a stewardship report to be submitted annually and to be made available to the public. The stewardship report required Weldwood to produce a road management plan as part of the annual operating plan, identifying all roads that were active, constructed, maintained, or reclaimed during the year. The company was also required to maintain a road management catalogue summarizing the status of each active road in the FMA. This record keeping, Dr. Peterson said, along with data from other industrial users in the area, may be an underutilized resource that could be employed to manage cumulative effects in the region.

As noted earlier in this report, Dr. Ross indicated that he was concerned as to whether the assumptions made with respect to access were consistent among the component VEC analyses. He also stated that he was pleased to see that CRC had recognized the need to manage the cumulative impacts of access on a regional basis and appeared to be willing to collaborate with regulators and other resource users to this end.

8.4 Views of the Panel

In the Panel's view, two aspects of access management are relevant to its mandate in reaching appropriate conclusions and making recommendations with regard to the proposed Cheviot mine. First, the Panel must have an adequate understanding of current access in the region and its use by industry and the public against which to assess the impacts of the Project. Second, the Panel must determine whether approval of the Cheviot mine would alter the likely future regional access patterns and whether any resulting potential cumulative adverse effects were significant.

In its 1997 report, the Panel concluded that careful access management would be required to avoid significant impacts on regional land-use objectives and ensure the success of CRC's mitigation programs for wildlife. In its EUB capacity, the Panel placed two conditions on its approval of the Cheviot mine to mitigate access-related impacts. The first required CRC, in consultation with AENV and ACC/ANPC, as the stewards of the Cardinal Divide Natural Area, to ensure that no access points were created into the Cardinal Divide Natural Area. The second condition required CRC to monitor changes to public access and use patterns resulting from the development and to advise AENV if any of these appeared to unduly increase wildlife mortality or damage wildlife habitat. The Panel concludes that these two conditions continue to be relevant and will ensure that they are extended into any new approvals issued by the EUB.

At the recent hearings, the Panel heard that a number of circumstances surrounding the proposed Cheviot mine site have changed since the original public hearings. Foremost among those

changes were the designation of the Whitehorse Wildland Park and the creation of the Coal Branch Forest Land Use Zone. In the Panel's view, these land-use designations should eventually result in better access control for the areas immediately surrounding the proposed mine. Evidence before the Panel at the present time, however, suggests that neither has as yet produced a marked positive effect in curtailing the damaging effects of OHVs on wildlife habitat or on backcountry trails.

In the Panel's opinion, the lack of clear positive results thus far does not mean that the land-use controls enabled by these designations cannot achieve the required level of access control in the mine's vicinity. The Panel remains confident that they are the beginnings of the right approach. However, it is clear that much remains to be done to ensure effective access management. It also means that the Panel cannot accept CRC's assessment of the residual impacts of the proposed Project without some further assurance that the adverse impacts of access can be effectively managed.

The Panel notes that the draft management plan for the Whitehorse Wildland Park is currently in preparation. The Panel believes, based on the presentations by the provincial regulators at the hearing, that the access management provisions of that plan will include an objective of mitigating the impacts of the proposed Cheviot mine, particularly the impacts of the Project on grizzly bears.

The Panel also notes that Parks Canada is now an active participant in the regional planning initiatives. This should allow the federal government to ensure that its interests, particularly in Jasper National Park, are addressed. As noted earlier, however, the Panel believes that it is incumbent on the federal government that it be prepared to make whatever contributions to the process are required to ensure that federal interests are protected. **The Panel recommends adequate resources for effective participation by Parks Canada in regional access planning initiatives be identified.**

As noted earlier in this report, the Panel also continues to believe that habitat protection, particularly for wildlife, should be increased in the upper Cardinal River watershed. In *Decision 97-8*, the Panel suggested that the most effective means to accomplish this might be to amend the existing protective notation to further restrict motorized access or to include the upper Cardinal River watershed into the Cardinal Divide Natural Area. The Panel recognized at that time that such restrictions would have some adverse effect on access by motorized recreation users, but concluded that the numerous direct and indirect benefits outweighed the cost.

In light of the evidence presented at the recent hearing, it is clear that motorized access to the upper Cardinal River watershed likely continues to erode its value for wildlife. It also appears to greatly reduce its value as a buffer between areas of significant human use and the protected natural areas in Jasper National Park and the Cardinal Divide. The Panel continues to be of the view that the further protection of this area offers a significant opportunity to mitigate the effects of the Cheviot Project on regional wildlife populations, particularly the grizzly bear. Once again, the Panel strongly suggests that AENV seriously consider prohibiting OHV access to the Cardinal River alpine zone as soon as possible, preferably through its inclusion into some form of permanent protected area designation. However, this action should also occur in conjunction

with a plan to ensure that these activities are transferred to a more suitable location and not just into another sensitive environment.

With regard to the regional cumulative effects of increased access, the Panel notes that, despite the best efforts of all participants to the hearing, there does remain a relatively high degree of uncertainty associated with the future extent of new access development in the region. The Panel also understands that there are inherent difficulties in quantifying the extent of linear disturbances, estimating the intensity of their use, and deciding how these estimates might be projected into an uncertain future. There is also uncertainty about the threshold densities at which linear disturbances threaten the ecological integrity of a region.

In spite of the difficulties in quantifying the impacts of regional access patterns, the Panel believes some conclusions can be reached. First, it would appear that road densities in most of the BMSUs are either below or just approaching the acceptable road density thresholds for grizzly bears that have been set for other regions of the continent. Second, these thresholds will likely be exceeded in the future in a number of BMSUs under plausible assumptions about industrial road development unless the development and retirement of access are managed through such means as shared roads and road closures. The Panel infers from this that the long-term preservation of grizzly bears in this region will likely only be compatible with other land uses if steps are taken to coordinate access management on a regional basis.

The Panel agrees with AENV that tools such as multiple-use corridors, joint-use roads, timing constraints, and gating are available to limit the adverse impacts of access. Within the context of clearly stated regional objectives for access management and an established process to achieve them, the Panel concludes that the above tools can effectively mitigate any regional future cumulative effects from human access. The Panel also concludes that the various planning initiatives in the region should all be able to play an important role in the implementation of these options. **Therefore, the Panel recommends that the federal government accept these initiatives as acceptable mitigation for future potential impacts associated with regional access.**

The Panel understands that the Strategic Framework process is intended to establish targets and thresholds for landscape conditions in support of grizzly bear conservation and that the process is expected to take about three years. This time period with respect to the Cheviot mine and its impacts on regional access is acceptable. However, the Panel encourages AENV to also consider setting interim thresholds for linear disturbances within the broader region until specific targets are established. The Panel notes that there is a growing body of literature that could be used to provide some guidance in this task. While it is understood that there is a risk in uncritically borrowing benchmarks from other jurisdictions, the Panel also notes that there is also an inherent risk that the planning processes may take longer than expected to complete. It would be unfortunate if the events that all parties are working so hard to prevent, such as significant damage to regional bear populations, should occur during the planning process.

The Panel also notes that some of the tools required to manage the cumulative impacts of linear disturbances appear to be available already. In particular, Weldwood's road management plan and road management catalogue (part of its annual stewardship report) appear to provide at least

some of the monitoring data needed to manage road densities for the portion of the cumulative effects study area constituting Weldwood's FMA. It would seem reasonable that similar data could be collected for other forms of linear development (primarily oil- and gas-associated seismic, road, and pipeline development) and incorporated into a single database. The Panel will ask EUB staff to work with AENV to ensure that the activities of the energy industries are coordinated with other developments on a regional basis to the extent possible. Once regional thresholds have been established, the Panel will also instruct EUB staff to ensure that both the coal and the oil and gas industries coordinate their development activities in such a manner that road density levels are maintained below the agreed-upon standards.

9 ABORIGINAL ISSUES

In undertaking its CEA, CRC examined traditional use as one of the eleven VECs. However, during the hearing, questions were also raised about the adequacy of consultation with aboriginal peoples. Both issues are discussed below.

9.1 Traditional Use of Land and Resources

9.1.1 Views of the Applicant

CRC stated that it had conducted a regional traditional-use study as part of its 1996 application to the Panel. CRC supplemented this assessment in its 1999 CEA, which considered traditional use as a VEC. Additional information on policy and treaty considerations and the results of continued discussions with affected aboriginal groups regarding their traditional-use histories and interests in the region were also provided.

CRC indicated that it had focused its assessment of Project impacts on traditional use on those lands within about 25 km of the mine site. However, it had also considered traditional use of lands at a regional scale, since the AFN, a signatory to Treaty 6, claimed traditional use over most of the area. CRC's interpretation of traditional use of the region by the various aboriginal interests is provided in Figure 8. The temporal boundaries for the CEA on traditional use consisted of current conditions (fall 1999) and the predicted conditions at the end of the Project life (2025). Traditional uses in the Project region covered a range of activities, including hunting, trapping, fishing, gathering (particularly medicines), spiritual values, ceremonial sites, historic homesteads, burial sites, and various trails.

In assessing the potential cumulative impacts on traditional use and access, CRC focused on two general types of effects: direct impacts on traditional sites and restriction of access to traditional-use areas. CRC noted that it did not directly assess cumulative effects on other traditional-use activities, such as hunting and fishing, that might be affected through Project effects on biophysical components (e.g., wildlife populations and fisheries). These were considered, instead, as part of its assessment of cumulative effects on each VEC.

With respect to direct impacts on specific traditional sites, CRC reported that its investigations of graves and ceremonial sites had determined that there were such sites located in an area north of the Red Cap Range. Mining in the Red Cap area, scheduled to occur several years into the Project development, would affect these traditional uses. The loss of specific sites due to the Cheviot mine would be permanent, with the magnitude of the effect being specific to the site involved. Given some of the spiritual values noted for this area, CRC predicted that from an aboriginal perspective the effects of the Cheviot Project would be considered major, long term, and potentially not recoverable.

CRC observed that traditional trails passing through the Cheviot mine site and precontact archaeological sites along these trails, particularly in the Harris Creek Valley, had also been recorded and were assessed as part of the requirements under the *Alberta Historical Resources Act*. CRC reported that it was collaborating with the Mountain Cree Camp Syllabics Institute to

further study the existence of these trails, especially in the vicinity of proposed mining operations. Additional trail studies had also been undertaken by the Mountain Cree Camp Syllabics Institute with Suncor Energy and TransCanada Transmission in areas adjacent to the Cheviot study area. CRC predicted that the Project's effects on these historic trails would be limited to the Project area, long term, minor, and possibly not recoverable. CRC did note that a physical trail could be incorporated into the postmining landscape.

With respect to other development in the region, CRC reported that traditional-use consultations between Luscar and the aboriginal communities regarding its mine extension proposals had indicated there were no sites within the existing or proposed development area for Coal Valley and that the Project effects on traditional use were insignificant at Gregg River. CRC also noted that the Inland Cement quarry occupied a relatively limited area and its effect on traditional use, if any, would be localized.

CRC noted that timber harvesting and associated road construction activities had taken place for an extended period of time in the region and were scheduled to continue and expand throughout much of the study. CRC believed that the provincial regulatory requirements for aboriginal consultation prior to approval would ensure that any disturbances of traditional-use sites on a local basis would be effectively mitigated. CRC summarized that effects from forestry development activities on traditional use would be regional, long term, minor, and recoverable.

With regard to current and future oil and gas development, CRC reported that it was aware that consultations between industry and aboriginal groups were taking place regarding impacts on traditional use and the appropriate mitigative measures. CRC noted that seismic, road construction, and well site and pipeline development were carried out under a provincial regulatory system that required application, review, and approval before direct disturbance could occur. These steps also required consultation with aboriginal communities, identification of direct effects on local traditional-use sites, and avoidance or protection where such sites were identified. For these reasons, CRC concluded that any effects of petroleum and natural gas activity on traditional use would be regional, long term, minor, and recoverable.

In terms of cumulative effects on access to traditional-use areas, CRC stated that it had determined that the AFN and Mountain Cree Camp had general traditional-use interests in the Cheviot Project area in terms of access for hunting and gathering of medicinal plants. CRC indicated that as mining progressed over the projected 20-year mine life, the full development area would eventually be covered with a mineral surface lease and that access to this area would be restricted for reasons of safety. Although the impacts of access restrictions would depend on the traditional use sought at a particular time, CRC predicted that these impacts would be limited to the Cheviot mine site. These impacts would be local and short term, since access restrictions applied by CRC would be removed upon completion of the mining development.

CRC stated that it had also examined the extent to which other resource development activities might affect access for traditional use. For forestry, CRC noted that such operations have historically placed few restrictions on access by others, so that general access to traditional-use areas was expected to be largely unaffected by forestry operations. While vegetative cover would

be removed, CRC believed that current planning practices would ensure the maintenance of general forest conditions over time.

In terms of recreation, CRC noted that although the newly established Whitehorse Wildland Park and implementation of the Coal Branch Forest Land Use Zone would have implications for traditional-use access, AENV had committed to honour treaty rights for traditional pursuits in the new park, including hunting, fishing, and traditional gathering of plant material. AENV had also indicated an intention to conduct further consultations directly with aboriginal peoples regarding traditional uses in the park. With implementation of these plans, CRC expected that the effects of regional recreational developments on access to traditional-use areas would be negligible.

In terms of mitigation measures, CRC reaffirmed the commitments made in its 1996 EIA and indicated that these were appropriate to reduce impacts on aboriginal traditional use. The measures included

- undertaking environmental protection programs to minimize the Project's effect on aquatic, terrestrial, and other resources;
- providing familiarity with environmental monitoring programs through involvement of the local aboriginal communities in site monitoring;
- implementing an access management review with local aboriginal communities whereby annual development plans were reviewed and access provisions related to traditional uses such as medicinal plant harvest were established;
- conducting ongoing consultations and investigations related to possible traditional-use sites and the development and implementation of protocols in the event such sites were encountered;
- participation in regional resource management initiatives undertaken by provincial authorities; and
- maintaining a "good neighbour" relationship with the local aboriginal communities and respecting the people and their culture.

Even with mitigation, CRC predicted that there was a high probability that aboriginal land use would be affected by the cumulative effect of all of the above activities—ongoing and planned—in the Project vicinity. However, CRC concluded that the probable magnitude and duration of these effects were difficult to determine. This was due in part to lack of a comprehensive inventory of traditional-use interests, the wide variety and sometimes dispersed nature of traditional uses, and the nature and variable effects of the likely development activities.

Overall, CRC believed that the effects on traditional use and access would be insignificant from the perspective of both the Project and regional cumulative effects. In terms of the Cheviot mine, CRC offered several reasons for this conclusion. First, while some loss of access to the mine site area would occur, such losses were anticipated under Treaty 6 (where lands taken up for mining

and other activity are removed from treaty rights). Second, some of the potential effects would be minimized by CRC's commitments to local and regional mitigation. Third, the mining operation was a temporary use of the lands and these lands could continue to be used for traditional activities when reclaimed. CRC said that it recognized that effects on the traditional use of the Red Cap Creek drainage portion of the mine may be considered significant by the Mountain Cree Camp, but it was encouraged by the statement that the Mountain Cree Camp was becoming more open minded about mitigation.

CRC offered other reasons for concluding that the regional cumulative effects on traditional use would also be insignificant. It noted that general access for traditional pursuits would be relatively unaffected, except in local areas primarily associated with mine sites, because forestry or petroleum and natural gas activities usually placed rather limited restrictions on access. Second, CRC believed that there appeared to be effective consultation between industry and aboriginal peoples in the region for the purposes of identifying and avoiding the development of potential traditional-use sites. Third, CRC expected the direct impacts of forestry, the most extensive future development activity in the region, to be relatively low, particularly on specific traditional sites. This was due to procedures in place to inventory and mitigate significant sites and to adapt forest harvest activities to mimic natural events, such as fire disturbance patterns. Finally, CRC noted that relatively few traditional sites had been identified. It believed that this was in part due to the lack of inventory, but intensive reviews of at least three mine sites had found few sites, suggesting that they may not be common in the region.

9.1.2 Views of the Interveners

The AFN, represented by Chief Alexis, summarized its long-term plans for Reserve lands that border the southeast corner of the Cheviot lease and lie approximately 24 km from the processing plant (Figure 8). The AFN stated that it hoped to establish an aboriginal cultural centre and ecotourism operation that would require "an interesting diverse environment with clean water, abundant wildlife and clean air" in as natural a state as possible. The AFN stated that the location of the Reserve, selected subsequent to the announcement of the Project, was chosen as much for its natural attributes as "for the future socioeconomic benefits this Project may hold for our community." To that end, the AFN and CRC had entered into a socioeconomic agreement regarding job creation, business opportunities, and other Project-related benefits for AFN members. The AFN and CRC were also in the process of negotiating a memorandum of understanding respecting monitoring, assessment, and mitigation both on and off site and on Reserve.

The AFN affirmed both its concerns about the environment and its support for the Project. It observed that to date CRC had demonstrated goodwill and good faith in its consultations and negotiations. Chief Alexis said that, according to their oral history, the intent of the treaties of 1876 was to share the land and to have a working relationship with the dominant society. He said that the AFN's dealings with CRC marked the first time in the history of his people that they had had the opportunity to have input into that sharing relationship "to work together; a partnership, joint ventures."

The Mountain Cree Camp stated that members of the camp continued to live in the area of the Project and in the zone of cumulative effects of industry. Consequently, camp members wanted to be part of the ongoing process of communication and involvement in resource development activities. The Mountain Cree Camp stated that it continued to be very concerned about the adverse effects from the Project, particularly on its philosophy and on the environment it needs for its survival. The Mountain Cree Camp expressed particular concerns regarding the need to notify residents of the camp about activities that might affect them. They also expressed interest in the opportunities for researchers to share the traditional knowledge of their elders and the need for the involvement of their young people in helping to carry out land- and animal-related research. The Mountain Cree Camp was still of the opinion that the Cheviot mine was not a good idea for that area and that it would prefer a natural preserve. However, the Mountain Cree Camp also indicated that it was willing to work with industry, wanted to have employment, wanted to use technology to mitigate the effect of development on their people, and admired CRC's good-neighbour policy.

The Mountain Cree Camp also expressed concern about the effects of mining, oil and gas, and forestry activities on traditional grizzly bear and human trails and described its work with the Mountain Cree Camp Syllabics Institute to identify these trails. The Mountain Cree Camp Syllabics Institute stated that it was a registered charitable organization concerned with the investigation and interpretation of petroglyph and pictograph sites. It provided the Panel with a description of the need for and potential means of identifying and protecting trails in the area. Through the work of the Mountain Cree Camp Syllabics Institute, the Mountain Cree Camp hoped to discover the pattern of precontact trails region, in part because these ancient trails may guide them to as yet undiscovered petroglyph sites. Moreover, the Mountain Cree Camp Syllabics Institute suggested that identification of trails used routinely by grizzly bears may also provide a means of avoiding conflict with humans to the benefit of both species.

The Mountain Cree Camp Syllabics Institute noted that the regional historic trails were created in a variety of ways. Some were created by various animals, including grizzly bears, as paths or travel corridors to move about the landscape. Indigenous peoples created other trails, including ceremonial trails associated with the rites of passage of the Cree and Sauteaux peoples, and trade trails linking this area to other parts of North America. According to the Mountain Cree Camp Syllabics Institute, the proposed surface disturbances associated with the Cheviot mine were located at a convergence of these routes and threatened to obscure the evidence of precontact trails and their destinations. The Mountain Cree Camp Syllabics Institute therefore wished to document any evidence of prehistoric trail patterns before the cumulative effects of development erased the trails. Trails of archaeological value could then be preserved.

Consultants for the Mountain Cree Camp Syllabics Institute described how synthetic aperture radar, a remote sensing technology useful in detecting surface and near-surface features, had been used to find archaeological resources elsewhere and could be used to detect undiscovered trails in the area. The Mountain Cree Camp Syllabics Institute believed that a remote sensing study of trails in the area would "...satisfy indigenous, archeological, local, community, historical, and many other interest groups' curiosity and wish to preserve a history, a prehistory, and a grizzly bear travel ethologue, all otherwise subject to the cumulative effects in the area."

The Mountain Cree Camp Syllabics Institute asked the Panel to recommend that a remote sensing study be undertaken to document the pattern of trails in the area.

Ms. O'Chiese, an aboriginal woman, said she spoke to the Panel as a representative of Mother Earth. Ms. O'Chiese stated that she had been named after Mother Earth and came forward "to speak for her because she cannot speak for herself." Ms. O'Chiese spoke of her concerns over land loss and degradation caused by mining activities in the general area of the proposed mine ("in the Foothills and the mountains") and by industrial development generally in Canada. She also spoke about aboriginal philosophies and ways of life and strongly emphasized that, in her view, the Project was at odds with these. She also discussed her people's understanding of aboriginal treaties and the *Indian Act*, noting the discrepancies between what the treaties and *Indian Act* were meant to protect/preserve and what, in her view, was actually happening.

The Treaty 8 FN argued that through an oral tradition the First Nations people of Treaty 8 FN had long had the belief that the area around the proposed Cheviot Coal Project had been part of their traditional hunting and gathering grounds. This area was also an important route for trade and commerce with aboriginal people from the west and the south.

9.1.3 Views of the Panel

The Panel notes that none of the interveners to the hearing challenged CRC's views as to the cumulative effects of the Project in association with other forms of area development on traditional use in the region. The Panel believes that, with one exception, CRC's assessment is a reasonable one. The Panel does not accept CRC's finding that preventing access to traditional-use areas within the mine site for 25 years or more is a short-term effect. The Panel believes that this adverse effect is long-term, from the perspective of the Mountain Cree Camp and that the impact is significant. The Panel does conclude that, with the exception of traditional uses within the mine development area and traditional sites located in the Red Cap portion of the mine and with implementation of the mitigation measures designed collaboratively by CRC and each of AFN and the Mountain Cree Camp, the regional adverse effects on both traditional use and traditional sites are not significant.

The Panel accepts and understands the ongoing concerns of the Mountain Cree Camp and the AFN and notes that CRC has continued to work to try to alleviate these. The Panel concludes that the measures developed collaboratively by CRC, the AFN, and the Mountain Cree Camp to reduce the impacts on traditional use of the lands and resources in the Project study area will be effective. The Panel also accepts the company's commitment to continue to work with these communities and attempt to ensure that they have an opportunity to share in the economic benefits of the Project. The Panel therefore concludes that any residual adverse effects on traditional use and traditional sites can be justified within the scope of the Project as a whole.

The Panel recommends that the federal government accept these conclusions and the mitigative strategies for impacts to traditional uses and sites.

The Panel, through its EUB approvals, will require CRC to report to the EUB annually on its success in carrying out the various mitigative measures that it has proposed to identify and protect traditional sites and reduce adverse impacts on traditional use of the lands and resources.

With regard to the need to further map traditional trails in the region, while the Panel found the presentation to be of interest, the Panel was unable to determine whether such studies were warranted. The Panel does note that other companies in the region have participated in such studies and would suggest that CRC avail itself of the results from those investigations. The Panel notes that CRC has committed to ensuring that, to the degree practical, traditional-use sites will be protected from the effects of mining operations and would suggest that the company reconsider the proposal after seeing those results.

9.2 Consultation with Aboriginal Persons

9.2.1 Views of the Applicant

On the issue of consultation, CRC reported that its communication with Treaty 8 FN began in the summer of 1998 after Treaty 8 FN had withdrawn from the federal court action. CRC indicated that at a meeting requested by the Treaty 8 FN environmental secretariat it offered Treaty 8 FN the opportunity to respond to its EIA. Treaty 8 FN agreed to submit a proposal and budget for preparing this response and subsequently did so. CRC stated that discussions broke down in early 1999 after it rejected Treaty 8 FN's proposal because the scope and expense of the proposal was significantly beyond what CRC had anticipated. According to CRC, Treaty 8 FN's prime concern appeared to be related to water and the effects of the Project given its location "at the headwaters of rivers running through Treaty 8 lands." Further, Treaty 8 FN had proposed an extensive study and monitoring committee similar to that in place for the Northern River Basins Study. When asked if Treaty 8 FN had ever mentioned consultation by government as a precondition to talking with the company, CRC replied that it had not. The parties had, however, discussed the list of items to be considered in the consultation process between them.

CRC argued that there was no proper legal basis for the Treaty 8 FN's position that Treaty 8, together with the *Natural Resources Transfer Act, 1930*, meant that aboriginal people must be consulted before government could approve resource development activities anywhere in the province. Based on Treaty 8 FN's decision not to put evidence before the Panel, CRC argued there was no factual basis for Treaty 8 FN to have a position in front of the Panel in relation to the Project. CRC observed that there was no evidence that any members of Treaty 8 FN (bands or individuals) would be affected by the environmental effects of the Project. Nor was there any evidence that any members of Treaty 8 FN (bands or individuals) exercised any rights in the Project area or that any members of Treaty 8 FN (bands or individuals) were making a claim with respect to aboriginal or treaty rights in relation to the Project area or the cumulative effects study area.

CRC further stated that the Panel's duty under its federal mandate was only to make recommendations. The obligation to consult, if any, would be applicable, CRC argued, at the point where a federal decision is to be made, and likely that point would be prior to DFO making its decision to issue its authorization under the *Fisheries Act*. On the provincial side, CRC noted

that the EUB decisions are already in place and had not been challenged since their issuance. Consequently, CRC concluded that the time for initiating any legal challenge to those authorizations had expired and the EUB's decision, as represented in its 1997 decision report, could not be appealed.

9.2.2 Views of the Interveners

Treaty 8 FN chose not to present any evidence at the hearing. Rather, Treaty 8 FN claimed through its counsel that while it had environmental concerns associated with the Project, it could not begin to address those issues adequately until it had been consulted by the Crown in relation to its treaty rights. Treaty 8 FN's counsel took the position that because the Crown had not carried out its consultation obligations with the First Nations covered by Treaty 8, there was no information before the Panel on either the actual impacts on those First Nations or the mitigation measures that could be undertaken by the Crown. It was these mitigation measures, Treaty 8 FN argued, that the Panel must assess under Section 16(1) (a) of *CEA Act*. In its view, there was no requirement for Treaty 8 FN to submit evidence to the Panel to make its case, because the issues were entirely legal in nature.

Those legal issues, Treaty 8 FN argued, related to the Crown's fiduciary duty to consult aboriginal people about effects an activity might have on their aboriginal and treaty rights before granting approval for that activity to proceed. Where there was infringement of an aboriginal or treaty right, the Crown must ensure that compensation for that infringement was forthcoming. Treaty 8 FN asserted that Treaty 8 and the *Natural Resources Transfer Act, 1930*, created for its members a constitutionally entrenched right to hunt, trap, and fish anywhere in the Province of Alberta and, further, that the Project constituted a *prima facie* impact on its treaty and aboriginal rights. In particular, Treaty 8 FN identified potential effects from the Project on the Athabasca River system and on the surrounding area affected by forestry and mining.

Treaty 8 FN stated that it had been unable to identify those impacts in any detail because it had not been consulted by the Crown. Treaty 8 FN argued that in law, the onus was on the Crown to consult with potentially affected First Nations to address aboriginal interests. If it were then determined to be affected, the Crown would have an obligation to assess whether that effect was warranted in accord with the approach set out by the Supreme Court of Canada regarding consultation and compensation for infringement of treaty rights. Treaty 8 FN argued that the Crown's failure to do this was unfair to both the aboriginal people and the applicant. Furthermore, it would be an error in law for the Crown to fail to report to the Panel whether any adverse effects on aboriginal and treaty rights were justified.

Treaty 8 FN went on to state that while the Panel owed no fiduciary duty, the Panel was acting in a judicial capacity with regard to the matters before it and therefore its decision would be subject to Section 52 of the *Constitution Act, 1982*. Treaty 8 FN believed that the Panel could not, therefore, approve the Project unless it was confident that consultation with the affected First Nations had been completed by those representatives of the Crown who had a fiduciary obligation to those First Nations. Treaty 8 FN argued that the Panel would not be fulfilling its duty under the *Canadian Constitution Act, 1982*, or under *CEA Act* if it made a decision in relation to the Project before that consultation had properly taken place. Treaty 8 FN

recommended that the Panel's final approval of the Project be subject to the condition that the Crown conclude its consultation obligations to Treaty 8 FN and that recommendations for mitigation of the impacts arising from that consultation process be presented to the Panel.

The AFN also argued that the Crown had a duty to fully assess the impacts of the Project on the exercise of its treaty rights. The Crown also had a duty to direct mitigation and where necessary order compensation prior to issuing any approvals that potentially interfered with or infringed upon the exercise of their constitutionally enshrined treaty rights. The AFN stated that it had not been approached by either the federal or provincial government with regard to the potential impacts of the Project on either its lands or treaty rights. Further, the AFN claimed that neither level of government had consulted it on its views regarding the impacts of the Project or provided financial support to address these issues.

The AFN stated that the fiduciary relationship between the Crown and First Nations requires the Crown to place the interests and rights of First Nations before those of other parties. Based on the likelihood that the Project activities may adversely affect the exercise of the treaty right to hunt, the aboriginal right to acquire plants for medicinal and spiritual purposes, and the quantity and quality of water flowing through its Reserve, the AFN expected full consultation from the Crown. The AFN felt that the result of those consultations would ensure that all reasonable precautions would be taken by CRC and the governments themselves to prevent unreasonable infringement and to protect water flowing through the Reserve.

With respect to CRC's consultation efforts, the AFN noted that it had been working cooperatively with CRC to review and assess the environmental and socioeconomic effects of the Project on the AFN. Further, the AFN indicated that it had cooperated in an extensive traditional aboriginal land-use study of the area in 1994-1995 and that CRC had agreed to additional consultation on future permit applications. Although the AFN was satisfied this consultation process would occur, it reserved the right to intervene in future application processes if unsatisfied with either CRC's consultation process or its mitigation or remediation measures.

At the hearing, Mr. Percy Potts, speaking as a member of the AFN, stated that CRC had sat down with the AFN and carried out a consultation process that was meaningful. CRC had recognized that the members of the AFN had a right to the fish and wildlife resources, to be employed, and to have security for their children and their health. He further said that CRC had given the AFN the opportunity to participate with industry and he hoped that the AFN would be able to establish similar relationships with the oil and gas industry. He asserted that the Project was located in Treaty 6 territory and thanked CRC for respecting the treaty. He also asserted that the Panel should not interfere with discussions between First Nations regarding the matter of traditional territories.

Mr. Nadeau, on behalf of the Mountain Cree Camp, stated that elders of the Mountain Cree Camp, on their own initiative, made the deliberate decision to leave the society of government-dominated programs to return to living on the land. He said that it was a type of healing and it was very important for them to have a place to continue their way of life. Not only did they want to be notified about activities that might affect their livelihood, safety, and way of life, but they

also wanted to be involved in the studies related to development projects. He said it was disheartening to see the results of studies that did not even mention their group, because they actually live in the area where the projects and studies were taking place. He felt the Mountain Cree Camp had traditional knowledge to contribute that would be of value to those studies. Moreover, participation by their young people would be good for their education and make them useful members of both societies.

The All Colors Society submitted but did not speak to a letter that alleged that the Panel process was not properly representing the treaty rights or constitutional rights of aboriginal peoples. In the letter, the All Colors Society reminded the Panel of its responsibility to inform all ministers at both levels of government of those rights.

The Provincial Crown, as represented by the Minister of Environment and the Minister of Health and Wellness, was of the opinion that the issue of adequate consultation was outside the jurisdiction of the Panel. First, it took the position that this issue went beyond any deficiencies identified by Justice Campbell. It argued that the Panel's only obligation in the context of aboriginal peoples was to evaluate and make decisions and recommendations in respect of how the Project in combination with other industrial and recreational disturbances might affect traditional land use.

Second, the Provincial Crown was of the opinion that there was no basis upon which the Panel could make a determination of Treaty 8 FN's alleged constitutional right to be consulted by either the federal or provincial governments. It argued that the matter of consultation was not properly before the Panel, so there was no need or obligation to make a determination prior to making a decision and/or recommendations relative to the Project. Furthermore, it argued that it was beyond the Panel's jurisdiction as both a quasi-judicial body under the *ERC Act* or as a body under the *CEA Act* to adjudicate on constitutional rights matters.

The Provincial Crown noted that the issue of whether there was a constitutionally entrenched right of the Treaty 8 FN to be consulted in circumstances where Alberta had exercised its authority, under the *Natural Resources Transfer Agreement* (confirmed as a Schedule to the *Constitution Act, 1930*), to take up land for purposes such as mining was currently before the courts. The Provincial Crown also referenced decisions of the Alberta Environmental Appeal Board and the EUB that acknowledged their respective lack of jurisdiction to make determinations of aboriginal rights.

9.2.3 Views of the Panel

On the issue of consultation, the Panel notes that CRC has developed a positive working relationship with the aboriginal peoples who currently routinely use the Project mine site and the Project area for traditional purposes or whose lands might potentially be directly affected in the future by the Project, i.e., the Mountain Cree Camp and the AFN respectively. Sustained consultation by CRC both prior to the original hearing and subsequently has resulted in several apparent benefits. These include the creation of a mechanism by which the AFN will participate in monitoring environmental effects of importance to the AFN and the conclusion of an agreement regarding socioeconomic benefits for members of the AFN. CRC has also initiated

further trail studies with the Mountain Cree Camp in an attempt to mitigate the effects they feel might impact them negatively. **Therefore, the Panel concludes that CRC has carried out reasonable and adequate consultation with these two aboriginal groups and recommends that the federal government accept this conclusion.**

With respect to the issue of Project-related notification and consultation with Treaty 8 FN, the Panel notes that CRC has met with Treaty 8 FN on a number of occasions. The Panel finds, given the circumstances, that the consultation initiatives undertaken by CRC have been adequate. Despite disagreement over the scope of and financial support for Treaty 8 FN participation, CRC has expressed a willingness to keep the channels of communication open to explain its Project and its predicted environmental effects. In this case, the Panel concludes that CRC has met the current standards for public consultation by an applicant. The Panel also notes that Treaty 8 FN received funding through the *CEA Act* participant funding program and appeared and argued a number of issues before the Panel in the current hearing phase. These, the Panel believes, represent additional opportunities for consultation with regard to the proposed Project. **The Panel recommends that these conclusions also be accepted by the federal government.**

With regard to the legal aspects of the Crown's obligation to consult, the Panel is of the opinion that it has no jurisdiction to make a determination in relation to either the aboriginal or the constitutional rights of Treaty 8 members. The Panel also notes that this issue is currently before the courts for resolution.

With respect to environmental effects on Treaty 8 FN, the Panel notes that in his decision, Justice Campbell found that the Panel had not adequately fulfilled its obligation under the *CEA Act* to obtain all available information about likely mining and forestry activities in the vicinity of the Project and then to consider that information with respect to cumulative environmental effects when reaching conclusions and making its recommendations. The Panel believes that it has now met those obligations. Justice Campbell did not find the Panel in breach of its duty to obtain all available information about Project-related effects (direct or cumulative) on use of lands and resources by aboriginal people for traditional purposes, even though this issue was raised by Treaty 8 FN in those proceedings.

Nevertheless, the Panel is mindful of Justice Campbell's remarks requiring the Panel to obtain all available relevant information regarding the factors listed in Section 16 of the *CEA Act*. In the context of Treaty 8 FN and the *CEA Act*, the factors the Panel must address in its consideration are set out in the terms of reference established for the review. These state that the Panel must address the effects of Project-related environmental changes, including the effect of

any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by aboriginal persons, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

The Panel finds that CRC has provided sufficient information in its 1996 EIA, its 1999 CEA, and the evidence presented during the hearing to enable the Panel to address these issues, reach conclusions, and make appropriate recommendations to the federal government. Based on that information, the Panel concludes that it could find no evidence that would reasonably suggest that the proposed Cheviot Project will cause any change to the health and socioeconomic

conditions of any First Nations of Treaty 8. Nor did the Panel find that there was any significant risk to their physical or cultural heritage or to their current use of lands and resources for traditional purposes.

With respect to the specific environmental concerns raised by Treaty 8 FN related to effects on water quality (levels of selenium and of nitrogen from blasting), water quantity, fish and the fishery, and wildlife), the Panel notes that the lands covered by Treaty 8 and the locations of the Treaty 8 FN communities are at some considerable distance from the Project study area and outside the area where Project-related effects (direct or cumulative) are anticipated to occur. CRC's assessment of the Project-related and cumulative effects predicted for each component of the environment raised by Treaty 8 FN also did not indicate any negative effect on the Treaty 8 FN. At no point did Treaty 8 FN present evidence to the Panel that would suggest that there was a reason to suspect that there could or would be any Project-related effect on Treaty 8 FN members or on their access to and use of lands and resources. The Panel therefore concludes that there is an insignificant risk of any negative adverse effect as a result of the cumulative effects of the Cheviot Project on these various environmental components that will result in a change to the health and socioeconomic conditions of the members of Treaty 8 FN. The Panel reaches the same conclusion regarding their physical heritage, cultural heritage, and their current use of lands and resources for traditional purposes.

On the issue of consultation by the Crown, the Panel notes that all aboriginal groups that appeared before the Panel reported that there had been no consultation or communication by either level of government with them regarding treaty or aboriginal rights that might be affected by the Project. The Panel believes that the persistence of this issue—an issue of tremendous significance not only to aboriginal peoples but to industry as well—does not foster a positive environment within which industry and First Nations can develop a good-neighbour policy and pave the way for constructive, enduring relationships. **The Panel recommends both levels of government assess and clarify, in a timely fashion, their perceived respective obligations in relation to consultation with First Nations in the region.**

10 OTHER ISSUES

10.1 Project Benefits, Costs, and Viability

In November 1999, the AWA Coalition applied for intervener funding to undertake studies to address what it perceived to be gaps in the information provided to the Panel by CRC. These were

- 1) an assessment of alternatives to the Project,
- 2) a social benefit-cost analysis, and
- 3) an analysis of the Cheviot Project within future coal markets.

Although none of the Panel's previous findings on this matter was questioned in Justice Campbell's ruling, the Panel believed that it was appropriate to determine whether there had been a substantive change from the information on this subject submitted at the previous hearing.

Therefore the Panel stated that it was prepared to provide funding directly to the AWA Coalition in order to ensure that the costs and benefits of the Project from a provincial perspective were addressed thoroughly. The Panel also directed CRC to provide additional information on the long-term viability of the Project and to be prepared to speak to this issue at the hearing.

At the hearing, CRC objected to the AWA Coalition presenting evidence or opinion on the viability of the Cheviot mine or the analysis of social benefit-cost of the Project. CRC argued that such information was clearly beyond the four issues identified by Justice Campbell and related specifically to the question of Project need, which CRC believed was fully dealt with in the Panel's original 1997 decision report. Furthermore, CRC noted that the adequacy of the analysis of Project need had been raised as part of the federal court litigation and that Justice Campbell had specifically concluded that the Panel had met its duty under Section 16 (1)(e) of the *CEA Act* with respect to considering the private and public need for the Project.¹

In reply, the AWA Coalition argued that in the prehearing meeting *Memorandum of Decision* the Panel had indicated that it was prepared, if needed, to look beyond the four issues identified by Justice Campbell and had in fact provided it with funding for the social benefit-cost analysis. The AWA Coalition also argued that both CRC and NRCan had provided new information on coal markets and project viability, and therefore the AWA Coalition should be allowed to address that evidence. Furthermore, the AWA Coalition argued that evidence related to Project need and viability must be balanced against evidence relating to environmental effects and was therefore germane and relevant to the hearing.

Having considered these arguments, the Panel reconfirmed that it was prepared to consider new relevant evidence related to Project need and viability.

¹ See Federal Court-Trial Division, No. T-1790-98, decision rendered April 8, 1999, footnote 46.

10.1.1 Social Benefits and Costs

10.1.1.1 Views of the Applicant

CRC noted that it had submitted an assessment of the economic impacts of the Project as part of its initial application. That assessment showed that operation of the Cheviot mine would result in 640 person-years of employment and \$31.2 million in household income per year in the Hinton/Edson region. Were the Project not to proceed, the existing workforce at the Luscar mine, which was scheduled to close shortly, would be forced to seek employment elsewhere. Therefore, the estimates of Project economic benefits could also be viewed as the economic cost of not proceeding with the mine. At the 2000 hearing, CRC reiterated its conclusion that Project benefits would exceed costs and disagreed with the findings of the research conducted by the AWA Coalition that showed the Project's benefits and costs would be of approximately the same magnitude. CRC stated that it also continued to strongly believe that the regional economic benefits of the Project clearly outweigh the environmental impacts.

CRC argued that, for various reasons, the alternative estimates of Project benefits calculated by the AWA Coalition were incorrect. It argued that in using a Social Accounting Matrix (SAM) model, the AWA Coalition used the wrong measure for the value of coal production (i.e., \$90 million instead of \$126 million) and consequently calculated much lower estimates of Project economic impacts. Had the correct value of production been used, CRC stated, the results of the SAM model would have been similar to its estimates of regional impacts.

CRC also questioned the AWA Coalition's second method for estimating Project benefits. Although it agreed that Computable General Equilibrium (CGE) models better reflected how economies really worked, CRC argued that reducing its original estimates by a factor of five to seven times, based on the results of selected studies done elsewhere, would not accurately reflect conditions in the Hinton/Edson region. It noted that if the Project were not approved, the resulting loss of 400 mine jobs and associated income (\$28 million) would be much higher than the \$7 to \$11 million suggested by the AWA Coalition's analysis, unless the majority of displaced mine workers were to find other, equivalent jobs in the region. CRC believed that this was highly unlikely, particularly given that the CEA had concluded that there were no new mines planned for the region in the near future. CRC believed that a CGE analysis could be used to better estimate Project benefits, but only if the model were developed specifically for the Hinton/Edson region and for the mining sector.

CRC also questioned the procedure used by the AWA Coalition to quantify the benefits of leaving the landscape in its existing state. While it agreed that nonmarket values existed, could be measured, and could be factored into a social benefit-cost analysis, CRC disagreed with the procedure that the AWA Coalition used to assign values to the protection of habitat for grizzly bears and other endangered species in the region. CRC noted that the AWA Coalition employed a valuation process called "benefits transfer," whereby value estimates from a study conducted in one area were applied to a similar situation in another area. In this case, CRC noted that the AWA Coalition based its analysis on the results of an academic research paper that compared two different approaches to measuring nonmarket values using the woodland caribou habitat

enhancement program in Alberta as a case study and associated data from a survey of a sample of Edmonton residents.

CRC questioned the AWA Coalition's use and interpretation of the research paper on four counts. First, it disagreed that values for grizzly bear habitat could be inferred from a study of woodland caribou, especially since caribou were not found in the area surrounding the Cheviot Project. Second, CRC suggested that assuming a value of \$75 per year as a conservative estimate of the value that households would place on increasing caribou populations was an incorrect interpretation of the study results. Third, the company questioned whether data collected from Edmonton residents were relevant for other Alberta households. And finally, CRC noted that the AWA Coalition had been unable to show that the Cheviot mine would actually impede achievement of the provincial grizzly bear management plan, which CRC argued was a central assumption of the AWA Coalition's analysis. For these reasons, CRC concluded that the context, methods, and assumptions used in the caribou study were sufficiently different from the Cheviot situation that the resulting value estimates should not be used in the social benefit-cost analysis.

CRC also believed that the analysis presented by the AWA Coalition could not actually be considered a formal social benefit-cost analysis and that there were several reasons for reaching this conclusion. First, CRC noted that the AWA Coalition had factored the economic impacts of the mine into the analysis, rather than the actual benefits. Since impacts address distributional considerations rather than a Project's net economic gain (or loss), a comparison of Project impacts with economic costs would not, in CRC's view, yield any meaningful information about the net benefit of the Project. Second, there was no projection of future benefits or costs with or without the Project. Third, the majority of the analysis did not use discount rates to factor future benefits and costs into present value equivalents.

10.1.1.2 Views of the Interveners

The AWA Coalition presented the results of its social benefit-cost analysis and drew two key conclusions. The first conclusion was that CRC had substantially overstated the economic benefits of the proposed Cheviot mine. The second was that preserving the area could result in benefits at least equivalent to the expected economic benefit of proceeding with the mine. Based on these findings, the AWA Coalition concluded that the Cheviot Project would be a risky use of public resources and would not be in the public interest.

In its analysis, the AWA Coalition claimed that the methodology used by CRC to derive Project impacts on Alberta gross domestic product (GDP) significantly overstated Project benefits. It argued that CRC's use of input/output (I/O) analysis was inappropriate because this reflected an outdated, static view of a provincial economy. I/O analysis, in the AWA Coalition's view, could not adequately describe how producers and consumers would behave in a dynamic regional economy, where prices and technology were always changing and there may be limits to labour, capital, and natural resources. As an alternative, the AWA Coalition advocated the use of a CGE model, which it claimed would better capture demand and supply relationships, consider substitution effects, and employ more realistic assumptions about resource constraints. The AWA provided several examples of studies that showed that the results of I/O models were often five to seven times greater than the estimates generated by CGE models. Consequently, the

AWA Coalition completed its analysis by assuming that the CRC estimates should be deflated by a factor of five to seven. Instead of an annual increase in provincial GDP of \$97.3 million, as estimated by CRC, the AWA Coalition asserted that a more accurate assessment would be in the range of \$12 to \$20 million.

To further support its assertion that Project benefits were overstated, the AWA Coalition also compared the results of CRC's I/O analysis with a SAM model. The SAM model, it noted, was employed in a 1998 study to measure economic impacts in the Foothills Model Forest region, which includes the site of the proposed mine. The AWA Coalition observed that SAM models were similar to I/O models in terms of general methods and assumptions but were built using information specific to a region and were therefore considered more reliable than a regional interpretation of provincial I/O models. The AWA Coalition suggested that since this particular SAM model was used to assess the impacts of closing a \$90 million-per-year coal mine in the Foothills Model Forest region, the results could be directly compared to the predicted economic impacts of CRC's Cheviot mine, which would produce coal worth \$85 million per year. When compared, the SAM model predicted only 64 per cent of the regional GDP effects estimated by CRC, thereby confirming that CRC's estimates of benefits were overstated.

With regard to its analysis of the social benefit-cost of not proceeding with the mine, the AWA Coalition noted that it had not had sufficient time and resources to collect primary data on the potential benefits of maintaining the region in a relatively undeveloped state. Therefore, it relied on information from other studies to assess both use and nonuse values. Use values, the AWA Coalition noted, referred to benefits arising from direct use of the potentially affected area for recreation. For this aspect of social value, the AWA Coalition stated that it was able to directly use research undertaken by the Canadian Forest Service in the Foothills Model Forest region. This research assessed the economic losses associated with the closure of random camping in the area affected by the proposed mine. Over the life of the Project, this loss-of-use value was expected to be \$190 000, assuming a 4 per cent discount rate. The AWA noted that it believed that this amount understated use values because it did not consider activities other than camping, such as day use, nor did it account for any future growth in recreational activity in the region.

The AWA Coalition also noted that Albertans benefited from knowing that wilderness and wildlife species existed, whether they choose to visit a particular area or not. It said such benefits were termed nonuse values. To measure nonuse values for Cheviot, the AWA Coalition noted that it had had to rely on values from studies conducted elsewhere and for wildlife species other than grizzly bears. However, the AWA Coalition argued that the results of a 1995 study of Edmonton residents pertaining to protection of woodland caribou were directly applicable to the Cheviot area. It noted that both species are endangered, have a high public profile, and have similar management plans.

The AWA Coalition stated that this study found that Edmonton households would be willing to pay between \$75 to \$200 per household, or a total of \$21.75 million per year, to achieve sustainable levels of caribou. Furthermore, they were prepared to do so even if this meant higher taxes, decreased recreation, and reduced employment in the regional forestry sector. The AWA Coalition argued that the results from the Edmonton-based survey could also be extrapolated to a provincial level because the collective opinions of Calgary residents, at least, would likely be

similar. Thus, the Coalition estimated the total nonuse value of protecting woodland caribou within Alberta to be about \$75 million per year.

In extrapolating this information to arrive at nonuse values for the Cheviot area, the AWA Coalition stated that it had made two further assumptions. First, it argued that since grizzly bears were only one of the endangered species in the Cheviot region, the total Alberta nonuse benefits associated with the region could exceed \$95 million per year for two species or \$135 million for four species. This extrapolation was based on other results from the Edmonton survey, which found that willingness to pay to protect endangered species, as expressed in terms of the successful implementation of species management plans, increased in proportion to the number of species being considered.

Second, the AWA Coalition proposed that because the Cheviot Project was not the only threat to successful protection and management of endangered species in the region, only a portion of the total annual nonuse benefits would be compromised by development of the mine. Because of uncertainty about the extent of the impacts of the mine on endangered species, the AWA Coalition assumed that the mine would be only 20 per cent responsible for not successfully achieving the desired effects of wildlife management plans. With this assumption, the AWA Coalition argued that loss of nonuser values as a result of the Cheviot mine would range from \$15 million per year in the case of grizzly bears, up to \$27 million if three other endangered species were included. If the impact of Cheviot amounted to only a 5 per cent loss in the ability to successfully implement wildlife management plans, then the annual loss of nonuse values associated with Cheviot was estimated to be in the range of \$4 to \$7 million. The AWA Coalition believed that these numbers clearly demonstrated the value of preserving the area that would otherwise be developed as part of the Cheviot Project.

The AWA Coalition then compared the adjusted benefits of the Project, which it estimated to be in the range of \$12 to \$20 million per year, with the loss of use and nonuse values, estimated to range from \$15 to \$27 million. In making the comparison, the AWA noted that its evaluation may have understated use and nonuse values, since it was based on only a few examples of the types of use and nonuse benefits that Albertans enjoy from the Cheviot area in its current state. It also noted that if the destruction of wildlife habitat proved more severe than predicted or if proposed mitigation measures were not fully effective, the costs of proceeding with the Cheviot mine could also be higher than shown. Consequently, the AWA Coalition concluded that its analysis of social benefit-cost provided a significant reason why the Panel should recommend that the mine not proceed at the proposed location and that the area be given some sort of protected status.

The United Mine Workers of America (UMWA) disagreed strongly with the results presented by the AWA Coalition. The UMWA noted that neither of the analyses presented by CRC or the AWA Coalition fully considered the benefits of the mine in terms of its social and economic effects on the community. It claimed, without using quantitative information, that the benefits of the mine, as measured in terms of employment in a rural economy, clearly outweighed the need to protect large areas of land. It also argued that the AWA Coalition's analysis did not consider the relocation or dislocation costs that would result if the mine were not allowed to proceed. Without the mine, the UMWA contended, people would have to leave their homes behind and

uproot their families or, worse, leave their families in Hinton and commute to new jobs somewhere else.

The Hinton and District Chamber of Commerce also concluded that the AWA Coalition's analysis was incomplete because, in its view, it did not adequately consider the Project's impacts on the citizens or businesses of the community. It also criticized the AWA Coalition for basing part of its analysis on a survey of Edmonton residents when it would be the residents of the Yellowhead region who would experience the impacts of the mine's closure. It also questioned the appropriateness of the AWA Coalition's analysis because it measured the benefits of protecting caribou, which do not occur in the affected area, yet ignored the potential benefits of increased mountain sheep populations that have resulted from the reclamation activities at other nearby mines in the region.

The Mountain Park Environmental Protection and Heritage Association stated that it had assumed that a social benefit-cost analysis would have been completed for the initial hearings and would have included an assessment of the economic values of the Mountain Park landscape, as it now exists. The Mountain Park Environmental Protection and Heritage Association believed that the analysis prepared by the AWA Coalition represented only an initial attempt at quantifying these values, particularly the costs that would result if the Project were to proceed. It strongly disagreed with CRC's apparent assumption that the present value of the existing landscape was zero and that the mine's impact on the scenic landscape would be insignificant. The Mountain Park Environmental Protection and Heritage Association believed that proceeding with the mine might result in a loss of benefits to Albertans that would exceed the economic benefits from mining. However, since the AWA Coalition had to rely on secondary information sources, the Mountain Park Environmental Protection and Heritage Association believed that the real value of the status quo would remain unknown and should be the subject of additional studies. Until such time as these studies were done, the Mountain Park Environmental Protection and Heritage Association noted that there would remain a group of citizens who did not believe that their concerns were or could be addressed by the Panel.

10.1.1.3 Views of the Panel

The Panel agrees that a social benefit-cost analysis can be a useful tool in supporting decision-making. It can be used as a framework for comparing the various benefits and costs of a project and for measuring the economic efficiency of a particular type of resource allocation. However, economic efficiency is but one measure of the public interest, and the Panel must consider many other measures in ascertaining whether a particular project is in the public interest. It must also review and consider quantifiable scientific assessments of impact, as well as the perceptions and values of all interveners.

The Panel commends the efforts of the AWA Coalition in attempting to produce a social benefit-cost analysis in a short period of time and without the benefit of primary research. The Panel also agrees that landscapes and other resources do have intrinsic value, which is often significant. However, it also recognizes that the methods for quantifying these values continue to be contentious, especially if the process requires borrowing value information from studies conducted in other areas. This was clearly evident in the extensive discussions around the

reliability of the estimates of both project benefits and costs of the parties to the hearing. The Panel also notes that the social benefit-cost analysis provided by the AWA Coalition did vary from current accepted practices to a considerable degree. As a result, the Panel must take some caution in accepting its findings at face value.

Having weighed the evidence, the Panel concludes that the AWA Coalition's analysis does not adequately support its contention that the economic effects of retaining the wildland areas in the region of the proposed Cheviot mine is of approximately the same order of magnitude as proceeding with the mine. The Panel does agree that CRC's approach likely overstates the economic value of the Project to the region. The Panel also agrees that the value assigned to recreational use of the mine area is likely too low. The Panel believes, however, that the analysis used by the AWA Coalition has had the opposite effect, likely underestimating the economic benefits of the Project and overestimating the benefits of not proceeding with the mine. For example, the Panel believes that the assumption of the AWA Coalition that most of the miners displaced by the closing of the Luscar mine will be able to find other employment in the region is unrealistic. Furthermore, it is even less likely that they would be able to find employment providing even close to their current incomes.

The Panel was also not convinced that the data collected regarding public perceptions and willingness to pay regarding caribou protection and forestry are sufficiently applicable to the facts currently under consideration. The Panel notes that the AWA Coalition's analysis assumes that proceeding with the Cheviot Project will prevent the province from meeting its goals with regard to protecting grizzly bear populations at least and possibly for other species as well. Even if it is accepted that a direct extrapolation of the data for caribou and forestry can be made, this assumption is at odds with the Panel's earlier findings. First, the Panel concluded that it will be possible to mitigate, on a regional basis, the impacts to bear populations. Second, should these mitigation programs not be in place within three years after receipt by CRC of the necessary licences and permits, the Panel is prepared to revisit its approval at that time, on the assumption that any impacts to bears in particular would still be reversible.

The Panel believes that it has available sufficient economic data to support its conclusions and reconfirms its earlier conclusion that the Cheviot Coal Project as proposed will result in a net economic benefit to the region. **The Panel recommends that this conclusion be accepted by the federal government for the purposes of assessing the cumulative effects of the proposed Project.**

10.1.2 Project Viability

10.1.2.1 Views of the Applicant

CRC stated that there had been no substantive changes in the economic viability of the Cheviot Project since 1997. Although world coal prices had declined since 1997, it noted that coal markets, like those of other resource industries, tended to be cyclical in nature, and it expected prices to recover by the time CRC negotiates contracts with its customers. CRC also noted that it had had a 30-year relationship with the Japanese steel mills and had developed a very good reputation for coal quality and security of supply.

To demonstrate the viability of the Project, CRC offered two letters of intent from Japanese mills to purchase coal—one for the first five years of operation of the Project and the second beyond the initial five-year period. These letters of intent would eventually be converted into annual contracts that would specify coal volumes and prices. CRC stated that it also had contracts to supply coal to Korean and Chilean steelmakers. In total, CRC stated that it had commitments to purchase 2.6 to 3.1 million tonnes of coal per year from the Cheviot mine.

CRC acknowledged that Australian mines did have geological and geographic advantages in the coking coal markets. However, CRC claimed that Alberta coal mines had had better labour relations and a better history of reliability. CRC expected that the Cheviot operations would have labour productivity that is 40 per cent greater than current operations at the Luscar mine, and this improvement would ensure its long-term competitiveness in world markets. According to CRC, development of the Cheviot Coal Project did represent a financial risk to the company but, based on its analysis of world markets, it was a risk that CRC was prepared to take.

10.1.2.2 Views of the Interveners

NRCan agreed with the independent expert forecasts used by CRC's consultant to assess world coal markets and also with CRC's analysis and conclusions.

The AWA Coalition provided extensive evidence related to world coal markets and the potential for coal from the Cheviot mine to compete in these markets. The AWA Coalition claimed that Japanese steel producers, the world's largest purchasers of coking coal, were shifting their technology in order to be able to use semi-soft coal, rather than the harder coking coals that would be produced at Cheviot. Therefore, with the demand for hard coal dropping, coal prices were predicted to remain low. As a result, the AWA Coalition stated that although coal prices were cyclical, the general trends suggested that prices were not expected to recover to previous levels. In addition, it claimed that the Japanese steel industry was now basing its purchasing decisions on coal prices, rather than security of supply, and demanding more flexibility in coal contracts. Thus, it claimed, there was also more uncertainty in the marketplace.

In terms of world supply, the AWA Coalition testified that Australian mines were expected to expand their production of both hard and semi-soft coking coals, both of which were higher in coke strength than coal from Cheviot. It also noted that the Australian mines had very low operating costs, due to significant increases in labour productivity and recent reductions in royalty rates, and suggested that these mines would have a significant cost advantage (about 20 per cent, or \$7 per tonne) over Canadian coal mines. It argued that the Australian mines' lower costs of production had already led to the closure of the Quintette mine in British Columbia because of its much higher production costs and despite its contractual arrangements with the Japanese to supply three million tones of coal per year. The AWA Coalition argued that in order to remain competitive for Japanese coal markets, western Canadian coal mines would have to find means of further reducing their costs of production.

The AWA Coalition also provided an analysis of the costs of production for various coal mines in Canada. Its analysis showed that average costs would range from US\$28.90 to US\$41.14 per

tonne, with the costs for Cheviot being US\$34.68. The AWA Coalition suggested that the main reason for the variability among mines was mining costs and the amount of materials that had to be moved to access coal deposits (stripping ratios), rather than transportation costs. The AWA Coalition argued that the relatively higher stripping ratio for Cheviot would put it at a competitive disadvantage with respect to some other western Canadian mines. It also argued that a potential expansion of Luscar's Line Creek mine in British Columbia could produce the same quantity of coal as the Cheviot mine but at a lower cost.

Based on its analysis, the AWA Coalition concluded that the cost of producing Cheviot coal would be slightly higher than the average costs of Canadian competitors and significantly higher than the average costs of Australian competitors. Based on its expectations of a shrinking world market and lower prices for hard coking coal, the AWA believed that the Cheviot mine development was a significantly risky business proposition and that shareholders would not get a full return on their capital investment. Because of this risk, the AWA Coalition concluded that the Cheviot Project was not in the public interest.

The UMWA challenged the AWA Coalition's evidence on the mine's operating costs. It noted that the Luscar mine had recently decreased its operating costs by \$5 million without reopening its labour contract, reducing jobs, or suffering operating losses. It suggested that such changes in operating costs would allow Alberta mines to remain competitive in world markets.

10.1.2.3 Views of the Panel

The Panel has reviewed the evidence on project viability and world coal markets provided by CRC and various interveners to determine whether there has been a substantive change since the previous hearing. At this hearing, the AWA Coalition presented many of the same arguments about declines in the demand for coking coal from Japanese steel producers that it presented at the 1997 hearing. At the most recent hearing, however, these arguments were supplemented with considerable new information on the costs of mining at Cheviot and at other mines in western Canada and Australia.

The assessment of the viability of a project in the face of changing market conditions is always a difficult proposition, especially where a project may operate for 20 years or more. In this case, the Panel was faced with conflicting assessments about future conditions where all parties have appeared to use many of the same independent expert forecasts, but with different interpretations. The Panel does agree that coal markets have been highly variable and that current market conditions have continued to be significantly less than optimal for coal producers.

Notwithstanding the above, the Panel continues to believe, as it did in 1997, that the available evidence indicates that the Cheviot Coal Project remains economically viable into the foreseeable future. **The Panel recommends that the federal government accept this conclusion for the purposes of assessing the cumulative effects of the Project.**

The Panel notes in reaching this conclusion that CRC clearly has a well-established market niche and a proven record of successfully marketing its products on a world scale. The Panel also notes that CRC is still seeking regulatory approval for its Project, despite the three-year delay since

receiving the original approvals and additional information about future world coal markets. CRC's continued commitment to invest the substantive amount of capital needed to develop the Cheviot mine and its 20 years of successful operation of the Luscar mine, the Panel believes, strongly support CRC's contention that the Cheviot Project is economically viable.

The Panel also notes that the Project will be developed sequentially over several years.

Therefore, impacts to the regional landscape will to some degree be incremental, particularly in the more environmentally sensitive western portions of the mine. If the Project does become uneconomic in the future, impacts beyond the extent of development to that date will be limited.

10.2 Mountain Park

10.2.1 Views of the Applicant

At the reconvened hearing CRC took no further position with respect to the former community of Mountain Park.

10.2.2 Views of the Interveners

At the hearing, the former residents of Mountain Park took the opportunity to again raise its concerns with regard to the disturbance of the former town site by the proposed coal development. In its submission, the Mountain Park Environmental Protection and Heritage Association noted other intervener submissions that indicated the Mountain Park landscape does have value in monetary terms. It suggested that this landscape value should be incorporated into a benefit-cost analysis for the Project. The Mountain Park Environmental Protection and Heritage Association also drew the Panel's attention to a membership survey that strongly suggested the need to avoid filling in creek valleys and to ensure that pits are backfilled.

10.2.3 Views of the Panel

The Panel notes that the issues raised by the Mountain Park Environmental Protection and Heritage Association were addressed in some detail in the original decision. Nor was any new evidence presented for the Panel's consideration during the new hearing. In addition, Justice Campbell did not identify this as an area where the Panel had potentially made a reviewable error. While the Panel can understand the strong ties of the former residents to Mountain Park, the Panel is not persuaded that there is a compelling reason for it to vary or rescind its original decisions regarding this matter.

10.3 Harrison/Long Coal Lease No. 138204007

In its original decision, as a condition of the EUB approval of the Project, the Panel excluded all of Section 35-45-24-W5M and the southwest quarter of Section 36-45-24-W5M from the mine permit area. This decision was taken as a result of the Panel's concern with the potentially extensive environmental impacts associated with mining in this alpine and subalpine region. In making this decision, the Panel was cognizant of the fact that this exclusion would have an effect on a coal lease held by the Harrison/Long family.

10.3.1 Views of the Applicant

CRC took no further position during the reconvened hearing with respect to the exclusion of Section 35-45-24-W5M and the southwest quarter of Section 36-45-24-W5M from the mine permit area and the impact of this on the Harrison/Long coal lease.

10.3.2 Views of the Interveners

While there was no representative of the Harrison/Long family at the reconvened hearing, Mr. William Long, on behalf of the family, provided a submission that expressed disappointment with respect to the Panel's decision to exclude a portion of its coal lease from the mine permit area. In the submission, Mr. Long advised that contact had been made with the Alberta Department of Resource Development with a view to initiating discussions regarding compensation.

10.3.3 Views of the Panel

The Panel has reviewed its earlier decision with respect to the exclusion of Section 35-45-24-W5M and the southwest quarter of Section 36-45-24-W5M from the mine permit area. The Panel is still of the opinion that exclusion of this area from active mining is in the public interest. The Panel is therefore not prepared to vary its decision with respect to the exclusion of these lands from the mine permit area.

10.4 Sustainability and Economic Diversity

10.4.1 Views of the Applicant

At the initial hearing, CRC presented evidence to show that the operation of the Cheviot mine would have considerable economic benefits for the residents of Hinton and the surrounding region. These benefits would be in the form of direct and indirect employment, household income, and municipal tax payments. CRC argued that if the mine were not approved, there would be few alternative employment opportunities for existing mine workers who would lose their jobs when the Luscar mine inevitably closed. In its view, the long-term health of the regional economy was closely tied to approval of the new mine.

CRC presented similar evidence at the second hearing. It noted that the regional economy was still heavily dependent on coal mining and that, even with approval of Cheviot, direct employment in the mining sector would likely decrease over time, as mines reached the limits of their coal reserves. CRC reported that the Luscar mine was scheduled to close in 2003, the Gregg River mine was to close in 2008 and, aside from the Cheviot Project, there were no plans to replace these mines. Thus, it still believed that the long-term sustainability of the regional economy was dependent on approval of the Cheviot mine and that the delays resulting from the appeal of the Panel's original decision and the second hearing had resulted in considerable economic and social uncertainty for the mine workers and their community.

10.4.2 Views of the Interveners

Various interveners questioned whether a decision to approve the Cheviot mine would represent the best means of securing the economic future of the region. The AWA Coalition suggested that the wildland and environmental attributes of the region represented its greatest options for achieving an economically sustainable future. It argued that the Coal Branch Sub-Regional Integrated Resource Plan outlined the need for economic diversification and described the role that the wildland landscape could play in achieving this goal. In its opinion, the Project area in its current state was a significant public asset that should not be developed for what it believed was a risky and relatively short-term coal development. The AWA Coalition submitted that the best use of the area was being designated as a park.

CNF raised the concept of having Hinton become a sustainable “gateway” community. CNF argued that because Hinton is a gateway to Jasper National Park and the relatively undisturbed wilderness of the foothills, the town could learn much from similar communities in the United States. It summarized the results of a recent study that examined U.S. gateway communities to determine how they had balanced the need for a healthy economy with safeguarding natural and historic areas. According to CNF, this study showed that communities that preserved their character and natural values had economies that consistently outperformed those of communities that had not. In conclusion, CNF suggested that the Panel recommend that the federal and provincial governments provide the resources necessary to empower regional residents to help define a future that would be environmentally, economically, and socially sustainable.

WCWC supported the idea of economic diversification for the region. It noted that alternative energy technologies were being developed such that the world demand for coal may be further reduced, resulting in the collapse of communities heavily reliant on coal for their economic base. It noted that without economic diversity, human communities, like ecosystems, were unstable. WCWC suggested that the opportunity for tourism in general and nature-tourism in particular in the Mountain Park area should be explored as an alternative option to continued dependence on coal mining.

Other interveners expressed support for regional economic diversification but disagreed that protecting the Cheviot Project area as a park would result in a net benefit for the community relative to the development of a new mine to replace the Luscar mine. The UMWA questioned how quickly an equivalent number of jobs in tourism and recreation would evolve and noted that such jobs were typically much lower paying than jobs in the resource sectors. It indicated that studies of similar communities on the east slopes of the Canadian Rocky Mountains had indicated that although economic diversification was an important goal, maintaining the economic wealth associated with resource industries was more important. Furthermore, the UMWA argued that the Hinton region already benefited from considerable tourism and recreational development and that coal mining was actually part of the economic diversity of the region.

The Hinton Chamber of Commerce stated that it also supported economic diversification but noted that coal mine sites, when reclaimed, could still offer considerable opportunities for tourist activities, including wildlife viewing, hiking, and horseback riding. It stated that, based on

examples from Grande Cache and Tumbler Ridge, conversion from a primary resource-based economy to an economy based on tourism and service industries was not simple. Furthermore, it believed that because gateway communities in the United States were different from those in Alberta, transplanting their solutions for increased economic development might not be successful.

The Mayor of Hinton provided other examples of how the town economy was diversifying through ecotourism development and manufacturing and concluded that taking away opportunities for coal mining would in fact reduce its economic base and cause economic hardships for residents. He suggested that ecotourism and industrial development could coexist and that approval of the Cheviot mine would assist Hinton's attempts to maintain a diverse economy.

10.4.3 Views of the Panel

The Panel believes that there is strong support for regional economic diversification from all parties. The disagreement lies in how this increased diversity will be achieved. The Panel strongly agrees with the view that increased economic diversification can help resource-based communities accommodate the cyclical nature of resource markets and the inevitable closures of mines and other nonrenewable resources. The Panel believes that the concerns about economic diversification and community sustainability will be ongoing and will certainly arise in Hinton again as the proposed closure dates for other mines draw near. However, while the Panel supports the concept of diversification, it can only address this concern within the context of its decision on the Cheviot mine application with respect to Project need. This issue has already been addressed in the Panel's original report (Appendix 1).

The Panel does note that the federal government, through Parks Canada, clearly has a mandate to protect the ecological integrity of Jasper National Park. Environment Canada and CNF described a number of international conventions regarding Canada's commitments to sustainable development. The Panel also notes that the federal government on a number of occasions indicated its concern that meeting these obligations was at some risk.

The Panel believes that the creation of a sustainable, balanced, and diverse economic base in communities such as Hinton that are proximal to federal lands and particularly national parks would be of significant benefit to the Government of Canada in meeting its national and international obligations. **Therefore, the Panel recommends that the federal government determine, in a timely fashion, how it can best contribute to ensuring that this occurs. The Panel recommends that, at a minimum, the federal government be prepared to provide the resources necessary for Hinton and other similar communities to begin to develop long-range sustainable development plans for their regions.**

10.5 Monitoring Programs

During both the initial hearings and the current public review, CRC committed to carry out a number of monitoring programs to ensure that its predictions of adverse effects and the effectiveness of its mitigation and compensation strategies can be determined. These

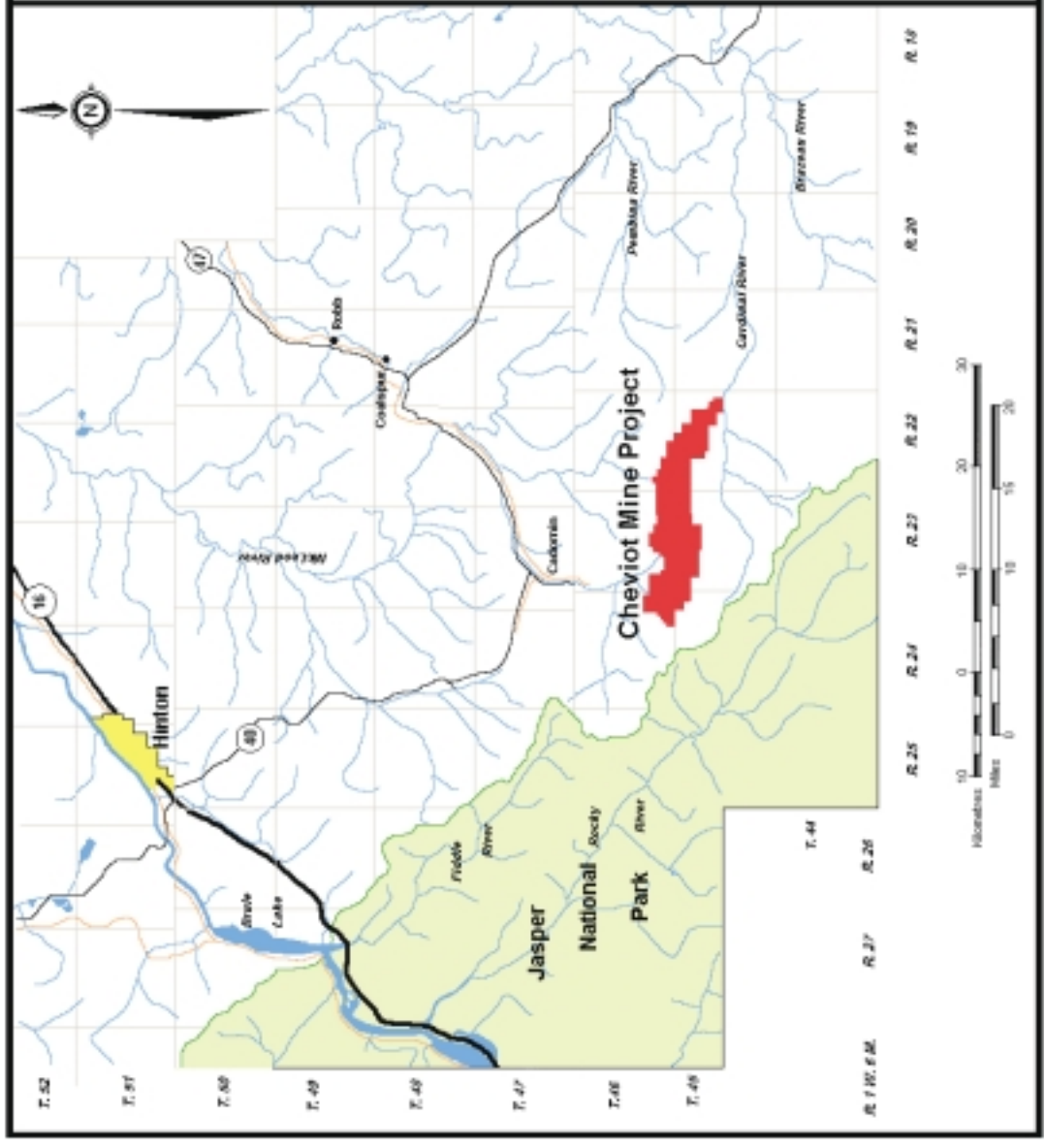
commitments are described in this report and/or contained in the company's submissions. The Panel, through its authority under the EUB, has accepted these undertakings and considers these to be conditions of its approval, whether set out explicitly or not in its two reports and associated approvals. Should CRC fail to carry out these programs, this could result in enforcement actions by the EUB up to and including the shutting-in of mining operations.

In addition, the Panel, again through its EUB authority, has set out in both its original report and in this report additional monitoring programs that it will require CRC to carry out. Again, failure by CRC to carry out these programs will result in the appropriate enforcement actions by the EUB.

As noted earlier, the provincial approval process requires coal mines to apply for sequential approvals for the development of each new pit, waste rock dump, etc. This permits the EUB, AENV, and the public to routinely monitor the ongoing impacts of a project and the success of the various mitigative strategies. The company is also allowed to apply to amend its various monitoring and mitigation programs (i.e., adaptive management) in order to address new or unforeseen circumstances, but changes that vary substantively from the original approvals are brought back by EUB staff to the Panel for its consideration. Based on this, the Panel concludes that the provincial approval process will ensure that the Cheviot Coal Project is carried out in an effective manner.

Some of the interveners to this hearing noted the federal government's relatively limited regulatory role regarding the Cheviot Project. This caused some concerns regarding whether federal objectives would also continue to be met once the Project had received approval. **The Panel notes this concern and recommends that Parks Canada, Environment Canada, and DFO ensure that they receive and assess on an annual basis the results of the various monitoring programs carried out by CRC. The Panel also recommends that these agencies prepare a summary report of their views as to the effectiveness of these programs in addressing federal concerns and meet with the EUB and AENV on a regular basis to discuss any concerns that may arise from that review.**

FIGURE 1
LOCATION PLAN OF THE
CHEVIOT MINE PROJECT



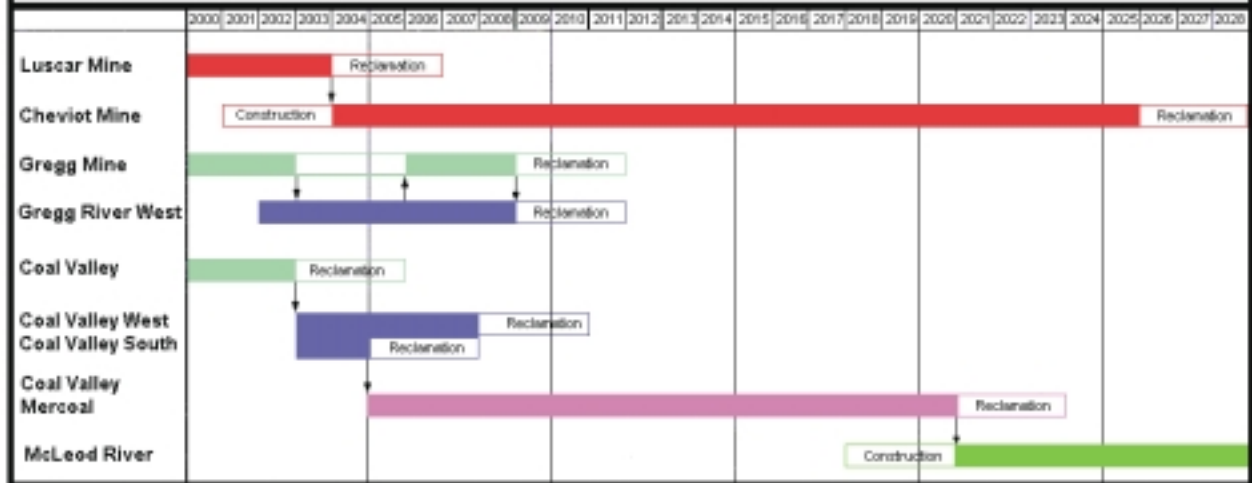
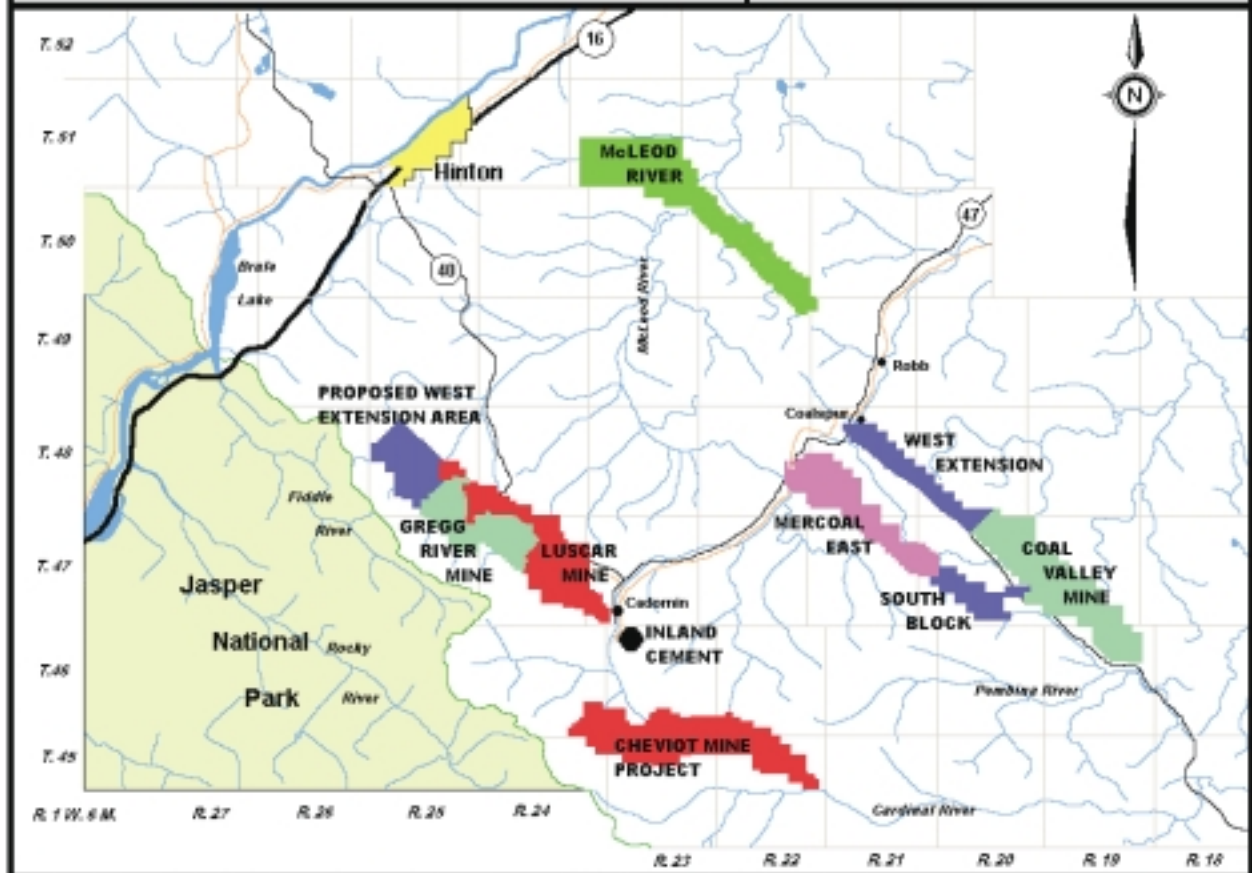
LEGEND

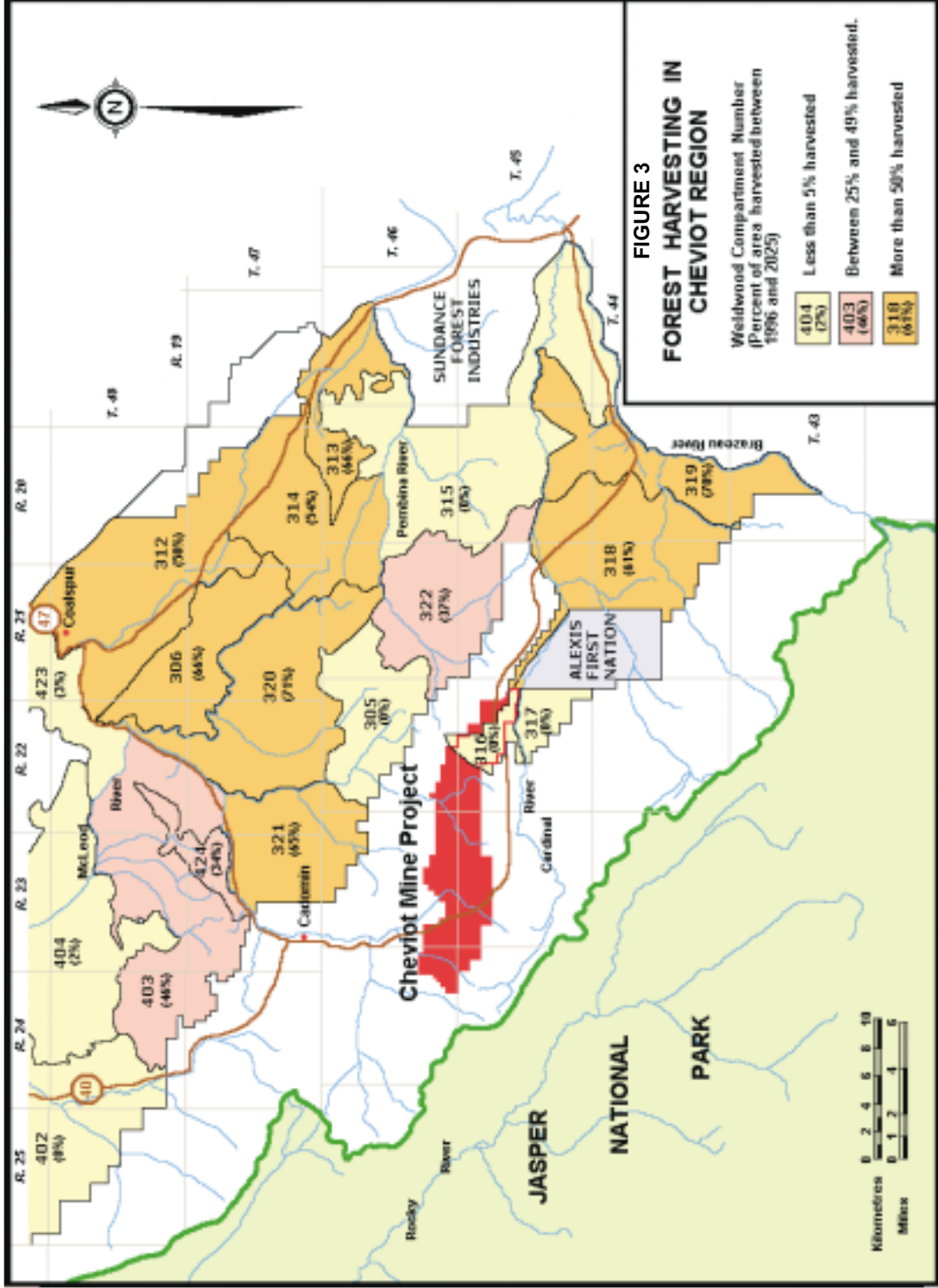
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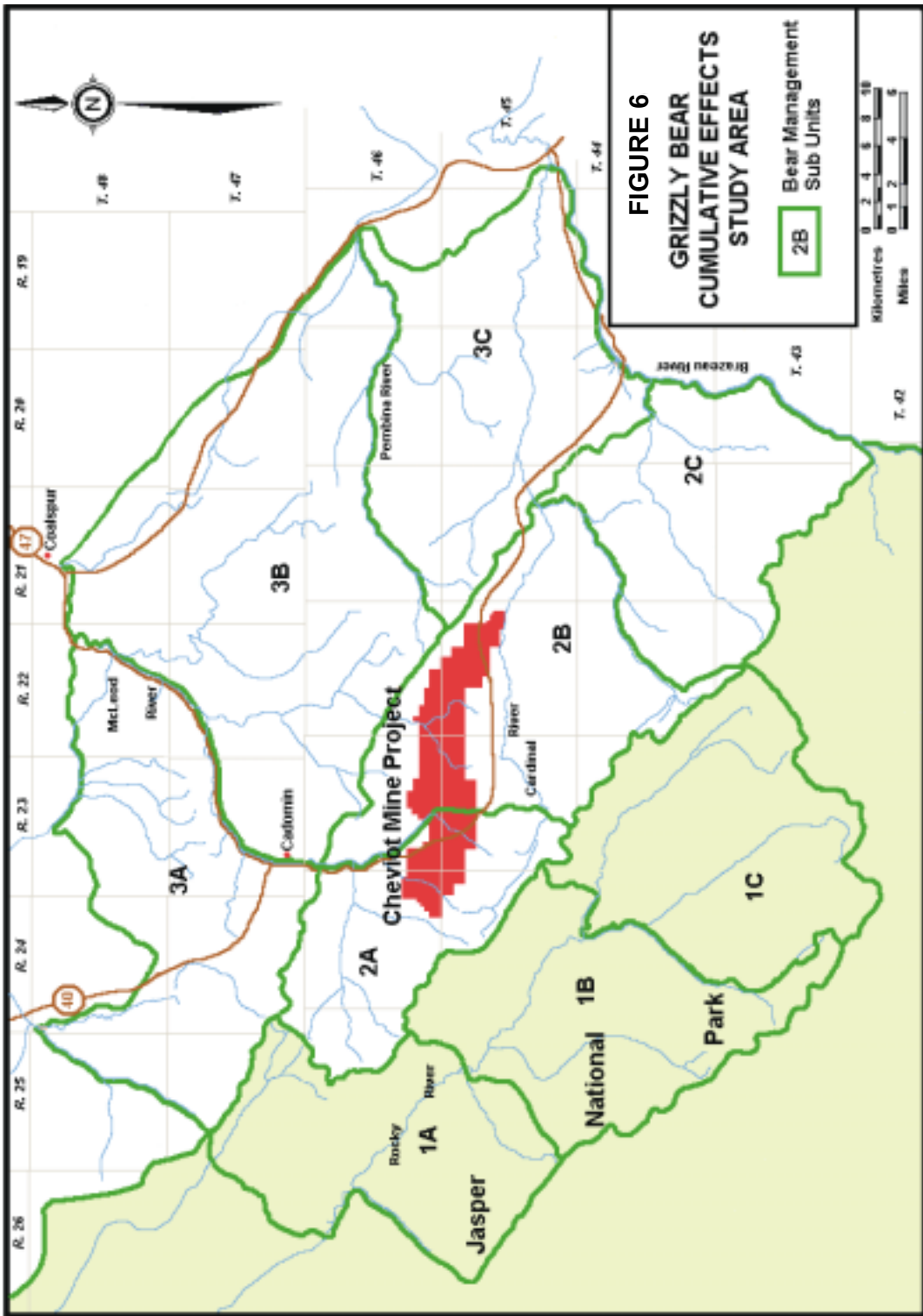
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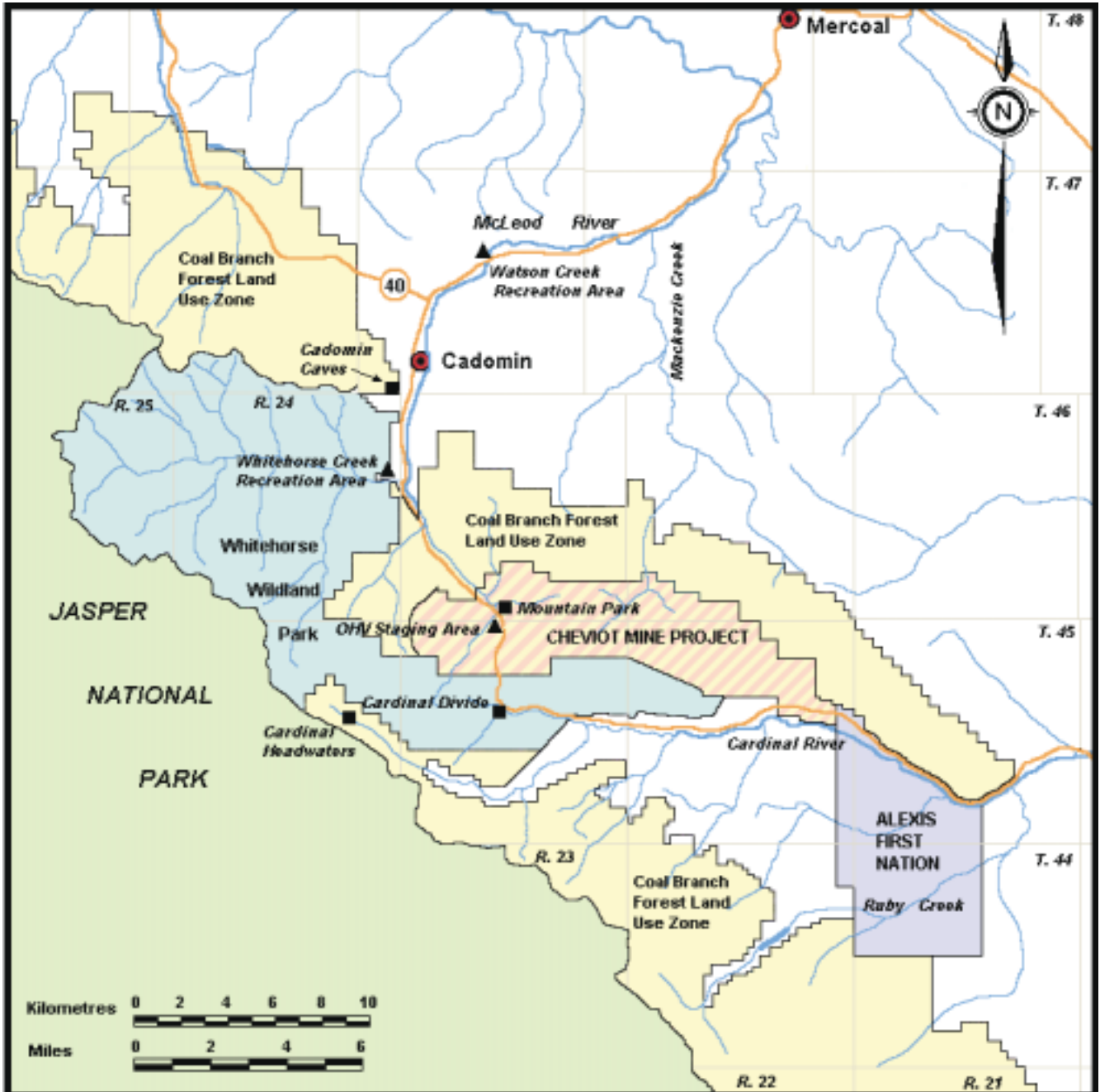
FIGURE 2

DEVELOPMENT PROJECT (2000-2025)









LEGEND	
	Whitehorse Wildland Park
	Coal Branch Forest Land Use Zone

FIGURE 7
FOREST LAND USE ZONES AND SIGNIFICANT RECREATIONAL FEATURES

