BRULE MINE PROJECT

ASSESSMENT REPORT

With Respect to
Review of the Application for an Environmental Assessment Certificate
Pursuant to the *Environmental Assessment Act*, S.B.C. 2002, c. 43

June 9, 2006

Prepared by

Environmental Assessment Office

BRITISH COLUMBIA
www.gov.bc.ca

Environmental
Assessment Office

PROJECT DESCRIPTION

Western Canadian Coal Corp (the Proponent or WCCC) proposes to develop the Brule Mine Project (the Project) on its Burnt River Property located in northeastern British Columbia, approximately 55 km by road south of Chetwynd. The mine would produce coal by open pit mining methods, and has potential to produce up to 2 million tonnes per year of pulverized coal injection (PCI) coal for sale in the export market. WCCC's adjacent Dillon Mine is scheduled to close later in 2006. WCCC's objective is to transition directly from Dillon to Brule without interruption of production from the Burnt River Property. Coal from the Dillon mine is currently trucked to the Bullmoose load out near Tumbler Ridge.

The proposed Brule Mine Project (the Project) includes an open pit mine, a coal preparation plant and associated infrastructure at the minesite, a short term coal haul route to the existing Bullmoose Loadout, a new long term coal haul route to a new rail loadout facility at Falling Creek Flats near the Pine River west of Chetwynd, and two new power lines: a 1.5 km 25 kV line from the existing grid to the loadout facility; and a 23 km 25 kV line to connect the mine site to the existing B.C. Hydro line near the junction of Highway 29 and the Sukunka Forest Service Road (FSR). Production rate will be at least 750,000 tonnes per annum (tpa) and up to 2.0 million tpa of PCI coal, over an 11 year period.

The coal will be crushed at the minesite, processed through a coarse coal washing plant, loaded onto highway trucks and initially hauled approximately 93 km to the existing Bullmoose loadout, near Tumbler Ridge. From the load-out, the coal will be loaded into rail cars and hauled by BC Rail and CN Rail to Ridley Terminals at Prince Rupert, or if required, to the Roberts Bank coal terminal in Vancouver. Off-highway trucks will be used to transport coal approximately 60 km along the Falling Creek Connector Haul Route to the proposed Falling Creek Flats Loadout once both the haul route and new loadout are complete. The new haul route will be comprised of both existing road and 22 km of new road.

Due to a down turn in the PCI coal market, WCCC has rescheduled the construction of the Falling Creek Loadout and the new portions of the haul route from two, to three years following a certification decision. During that time, the Brule mine will continue to truck coal to the Bullmoose Loadout at the same volumes as for the Dillon operation.

Road access is currently from Highway 29 between Chetwynd and Tumbler Ridge, then approximately 17 km along the Sukunka FSR, 3 km on the Lower Burnt Road, and 11 km on the Blind Creek Road.

Capital cost is estimated to be $200 million. Employment during the one year construction phase will peak at 200. It is anticipated that direct annual employment during the 11 year operation phase will be 250 at full production.

The mine site, roads and loadouts are on Crown land.

WCCC is a public company with shares traded on the Toronto Stock Exchanges and the London AIM Exchange. The company was incorporated in 1997 and the head office is

located in Vancouver. WCCC owns two coal mines, the Dillon Mine adjacent to the proposed Project and the Wolverine Mine, 25km west of Tumbler Ridge.

APPLICATION REVIEW PROCESS

In January 2005, following WCCC's submission of the Project description, the Environmental Assessment Office (EAO) issued a section 10 order pursuant to the province's *Environmental Assessment Act* (the Act) requiring that WCCC obtain an environmental assessment certificate (the Certificate). In October 2005, the EAO issued a section 11 order, defining the scope of the required assessment and the procedures and methods to conduct the environmental assessment (EA).

In November 2005, the Proponent submitted an application for a Certificate for the Brule Mine Project, (the Application). The review was initiated in December 2005 following a compliance check against the approved Terms of Reference (ToR), describing the information required in the Application, issued by the EAO in October 2005.

A Project working group (the Working Group) comprised of representatives from First Nations, Kelly Lake Communities, federal and provincial agencies and local government was established to provide advice to the EAO during the Project review.

A mining project may trigger a review under the federal *Canadian Environmental Assessment Act* (CEAA), if certain approvals are required in areas of federal jurisdiction or if federal land or funding is involved. Following the issuance of the approved TOR it was determined that the Project did not require approvals which would trigger CEAA. The federal Department of Fisheries and Oceans (DFO) remained an active participant and member of the Working Group in the review of the Application.

Public Consultation and Feedback:

In the pre-Application phase, the Proponent held an open House in Chetwynd in March 2005 at which time concerns were raised by a group of Hasler Flats and Chetwynd residents relating to the proposed railway load-out at Hasler. These concerns were related to the potential noise from trucks and trains, coal dust, effects on crops and livestock, safety issues (truck traffic), decreased property values and general negative effects on quality of life for Hasler Flats residents. As a result, WCCC re-examined alternate loadout locations and in June, 2005, at a public meeting chaired by the EAO, presented more information on 14 potential locations it had reviewed, focusing on the selected location at Falling Creek Flats.

The EAO made the Application available for public comment during a 46-day public comment period, running from mid December, 2005 to the end of January 2006. The Proponent held open houses on the Application in Chetwynd and Tumbler Ridge, at the beginning of the public comment period. The EAO provided presentations on the EA process at the open houses and requested the public to provide written comments on the Application.

Eight public comments were received by the Environmental Assessment Office (EAO) during the 46 day public comment period. The most common concerns raised by the public at open houses and in correspondence related to the potential impacts of

emissions of fugitive coal dust from the proposed loadout and coal haul at Hasler, including potential for cumulative air quality impacts at Willow Flats with Pine Valley Coal. Other concerns included: safety on the coal haul route; water quality impacts; impacts on trapping and caribou: environmental monitoring; and the need for local employment, training and contracting opportunities.

WCCC provided written responses to the public comments. All correspondence received during the formal public comment period and WCCC's responses were posted on EAO's Project website. In addition to comments submitted to the EAO, WCCC received a number of written submissions. These submissions, as well as those sent directly to EAO, and WCCC's responses to these submissions were made available to the Working Group for consideration.

WCCC is pursuing agreements or statements of non-objection with potentially affected parties, including four trappers, the guide outfitter, the recreational license holder and land owner adjacent to the loadout, a landowner potentially affected by the mine powerline, and with industrial stakeholders, mainly oil and gas, forestry, and coal tenure holders.

The issues raised during the review were addressed by the Proponent by:

- moving the proposed load out from Hasler to Falling Creek Flats,
- WCCC's 14 environmental management plans, including, air quality and dust management, a surface erosion and sediment control, traffic management, wildlife and fish protection, selenium management; and 122 commitments;
- an agreement with one of the 4 licensed trappers. Negotiations are ongoing with the other 3 licensed trappers and the guide outfitter; and
- WCCC commitment to employ environmental monitors and to develop a community awareness program to keep residents apprised of developments and employment opportunities.

First Nations Consultation and Feedback:

Effective consultation with First Nations represents a key and integral component throughout the assessment process. Such consultations ensure that the Province complies with the *Provincial Policy for Consultation with First Nations (October 2002)*. and meets applicable legal duties of consultation and accommodation (where indicated) as set out in subsequent Court decisions including the decisions of the Supreme Court of Canada in Taku River Tlingit First Nation v. British Columbia (Project Assessment Director), 2004 SCC 74 and Haida Nation v. British Columbia (Minister of Forests), 2004 SCC 73.

The Brule Project is situated within the area covered by Treaty 8. Treaty 8 provides the signatories with the right to hunt, fish and trap within the Treaty 8 territory. While Treaty 8 provides for the taking up of lands for mining, the court has instructed that in the taking up, first Nations should be consulted about their ability to practice their rights.

The McLeod Lake Indian Band; Saulteau First Nations; and West Moberly First Nations, (the First Nations) are signatories to Treaty 8 and have identified the vicinity of the Project as part of the Treaty 8 area traditionally used by them for hunting, fishing and

trapping. The reserve communities of the Saulteau First Nations and West Moberly First Nations on Moberly Lake are among the settlements nearest to the Project.

In addition to the Treaty 8 First Nations, representatives of Kelly Lake First Nation, Kelly Lake Cree, and Kelly Lake Métis Settlement Society (Kelly Lake Communities) have also expressed interest in the Brule Project.

During the Project's Pre-Application phase, EAO provided the First Nations and Kelly Lake Communities with all Project information and review documentation. EAO met with representatives of the First Nations and Kelly Lake Métis Settlement Society, informed them of the review process under the Act and advised them of the development of study work plans and the draft Application ToR.

In response to a request from the First Nations and Kelly Lake Communities for technical assistance to participate in the Project assessment, in June 2005 the EAO and WCCC provided funding for an independent consultant (Independent Consultant) to provide advice to, and on behalf of, the First Nations and Kelly Lake Communities.

The Proponent initiated an extensive Pre-Application consultation process, designed to identify concerns and interests of First Nations and Kelly Lake Communities possibly affected by the proposed Project. The consultation and communication framework implemented for the Brule Mine Project was developed in conjunction with the EAO as reflected in the Application TOR and the section 11 order. The Application summarized WCCC's consultation program and issue identification with the First Nations and Kelly Lake Communities. Issues identified by the First Nation and Kelly Lake Communities included potential infringement on Treaty Rights, sharing in the economic benefits of mine development, air quality, water quality and traffic effects on wildlife.

The Independent Consultant working with the First Nations and Kelly Lake Communities reviewed the section 11 order, draft ToR, participated in screening the Application for compliance with the ToR prior to its acceptance for review. The Independent Consultant continued to consult with the Proponent and participated in the EA review, identifying treaty rights and other interests that may be affected, and suggesting measures to avoid, mitigate or, where appropriate, accommodate those interests. The Independent Consultant was participated in all technical Working Groups and in identification and resolution of issues.

Concerns identified by the First Nations, Kelly Lake Communities and the Independent Consultant include: infringement of Treaty 8 rights including impacts on traditional land use sites, fish, wildlife, and regional cumulative effects. Concerns were also raised regarding air quality and coal dust on berry picking, participation in environmental monitoring, the review process for mine projects below the production thresholds for review under the Act, desire for share of economic benefits and concerns that increased affluence brought about by mining could result in an increase in substance abuse.

In response to concerns regarding potential impacts to traditional use sites, the Proponent committed to avoiding the sites through establishing buffers and adjusting powerline and haul road alignments. Concerns regarding impacts of fish and wildlife were satisfactorily dealt with through proposed mitigation and conceptual environmental management plans. As a result of the proposed mitigation and commitments, the Project's contribution to regional cumulative effects will be minimized. While it is

acknowledged that individual hunters may be affected on a site specific basis during the life of the mine, EAO is satisfied that if the Project is approved First Nations should be able to reasonably practice their treaty rights to hunt, trap and fish within the Treaty 8 territory traditionally used by them.

Air quality and dust issues were address by the Proponent's proposed air quality and dust control plan which includes watering of haul roads and covering of haul trucks. WCCC has also committed to provide First Nations and the Kelly Lake Communities with regular opportunities to review environmental monitoring and reclamation results. In regards to the concern that mine projects below the threshold for review under the Act may not receive the same level of scrutiny, the EAO responded that assessment of these projects is conducted during the permitting process under the provincial *Mines Act.*

To address opportunities for economic participation, WCCC entered into Cooperation Agreements with the West Moberly and Saulteau First Nation, as well as with the Kelly Lake Métis Settlement Society and is currently in negotiations with the McLeod Lake Indian Band. These Cooperation Agreements include: mechanisms to facilitate employment and contracting opportunities related to WCCC Projects, contracting procedures and standards, and agreements concerning support for training and apprenticing opportunities. In response to concerns regarding increased potential for substance abuse, WCCC is developing an employee recovery program.

The EAO concluded that the interests of the First Nations and Kelly Lake Communities have been considered and addressed.

AGENCY FEEDBACK AND ISSUES

The key technical issues identified during the review of the Project were potential impacts on air quality (coal dust), water quality (total suspended solids, and acid rock drainage and metal leaching, particularly of selenium), fish, wildlife, cumulative effects, and human health effects. These issues have been satisfactorily addressed through WCCC's commitments and mitigation measures, including 14 environmental management plans addressing air quality, water quality, selenium and acid rock, wildlife and fisheries protection, health and safety and reclamation proposed by the Proponent.

CONCLUSIONS

In conclusion, the EA review of the Project has considered the information contained in the Application and additional commitments identified by WCCC in response to issues raised during the review by the public, First Nations, Kelly Lake Communities and the Working Group.

EAO is satisfied that:

- the Application, together with additional clarifications provided during the review, adequately identified and assessed the potential significant adverse environmental, economic, social, heritage and health effects of the Project;
- public and First Nations and Kelly Lake Communities consultation and the distribution of information about the Project have been adequately carried out by the Proponent;
- issues identified by the public, First Nations, Kelly Lake Communities, and federal and provincial agencies and local governments were adequately addressed by the

Proponent during the review of the Application, and the province's obligation to consult and accommodate treaty rights in the taking up of lands for mining have been adequately addressed; and

- practical means have been identified to prevent or reduce to an acceptable level potential significant adverse effects arising from the Project.

Based on the information provided by the Proponent, the Project should not cause significant adverse environmental, social, economic, heritage or health effects, taking into account the implementation of mitigation measures committed to by the Proponent.

TABLE OF CONTENTS

FIGURES

APPENDICES

List of Acronyms and Abbreviations

The following abbreviations and acronyms are used in this Assessment Report:

Act	B.C. *Environmental Assessment Act* (S.B.C. 2002, c. 43)
Application	Application for an environmental assessment certificate
AQDCP	Air Quality and Dust Control Plan
CCR	Coarse Coal Rejects
CEAA	*Canadian Environmental Assessment Act*
CEA Agency	Agency Canadian Environmental Assessment Agency
CEA	Cumulative Effects Assessment
Certificate	Environmental Assessment Certificate
DFO	Department of Fisheries and Oceans Canada
EA	Environmental Assessment
EAO	Environmental Assessment Office
EPCM	Environmental Protection Compliance Management
EPD	Environmental Protection Division of Ministry of Environment
ePIC	Electronic Project Information Centre
Former Act	Environmental Assessment Act, R.S.B.C. 1996, c. 119
FSR	Forest Service Road
GHG	Greenhouse Gases
KLCs	Kelly Lake Cree, Kelly Lake First Nations and Kelly Lake Métis Settlement Society
km	kilometre(s)
LWBC	Land and Water British Columbia Inc.
m	metre(s)
MAL	Ministry of Agriculture and Lands
MEMPR	Ministry of Energy, Mines and Petroleum Resources
ML/ARD	Metal Leaching and Acid Rock Drainage
MLIB	McLeod Lake Indian Band
MOFR	Ministry of Forests and Range
MOE	Ministry of Environment
MSRM	former Ministry of Sustainable Resource Management
MWLAP	former Ministry of Water, Land and Air Protection (now MOE)
NO_2	Nitrogen Dioxide
PEM	Predictive Ecosystem Mapping
PCI	Pulverized Coal Injunction
PNG	Petroleum and Natural Gas
$PM_{2.5}$	Particulate matter less than 2.5μ in diameter
PM_{10}	Particulate matter less than 10μ in diameter
PAH	Polyaromatic hydrocarbon
Project	Brule Mine Project
Proponent	Canadian Coal Corp
RWDI	WCCC's Air Quality Consultant
Se	Selenium
TEM	Terrestrial Ecosystem Mapping
TSP	Total Suspended Particulate
TSS	Total Suspended Solid
VECs	Valued Ecosystem Components
WCCC	Western Canadian Coal Corp
Working Group	Project working group

PART A
GENERAL REVIEW BACKGROUND

1. PROJECT REVIEW AND CERTIFICATION PROCESS BACKGROUND

1.1. PURPOSE AND STRUCTURE OF THIS REPORT

The Environmental Assessment Office (EAO) is a neutral provincial agency that coordinates assessment of the potential effects of major development proposals in British Columbia. The EAO reports to the Minister of Environment.

Environmental, economic, social, heritage and health effects are all considered in the assessment process. The intent of the process is to identify any foreseeable adverse impacts throughout the life cycle of a Project, including construction, start-up, operation and shut-down, and to determine ways to eliminate, minimize or mitigate those impacts. The EAO is responsible for ensuring Project assessments:

- are comprehensive and technically sound;
- involve all potentially interested parties;
- are conducted in an open, timely and efficient manner; and
- adhere to the legislation.

The assessment process results in recommendations to either grant or refuse an environmental assessment certificate (the Certificate). The recommendations will be considered by the Minister of Environment and the Minister of Energy, Mines and Petroleum Resources and these ministers will decide whether to issue a certificate for this Project. An environmental assessment certificate is the first step in the project approval process. The Project will also have to obtain provincial permits and authorizations before it can proceed.

The purpose of this report is to:

- summarize the review of WCCC's application for a Certificate as presented in the Application and supporting documentation and discuss the issues raised during the environmental assessment of the Project;
- report on whether the Application has adequately identified and assessed the potential significant adverse environmental, economic, social, heritage and health effects of the Project, including issues regarding potential effects on Treaty 8 rights and First Nations interests, and the interests of the Kelly Lake Communities;
- report on whether practical means have been identified to prevent or reduce to an acceptable level any potentially significant adverse effects; and
- report on the adequacy of the distribution of information and consultation by the Proponent during the review of the Application.

Where an issue has been raised regarding potential significant effects of the Project requiring additional information or commitments, this report provides background information on the issue and WCCC's response. A concluding statement is provided by EAO as to whether the proposed mitigation measures and related commitments will prevent or reduce, to an acceptable, level potentially significant adverse effects of the Project.

All issues arose during the review of the Application by First Nations and the Kelly Lake Communities, the public and the Project working group (Working Group) are provided in appendices C, D and E, respectively. Appendix F of this report contains a summary of the Proponent's commitments in relation to the Project.

Information required by agencies at the permitting stage following a certification decision is listed in Appendix G.

1.2. PROVINCIAL AND FEDERAL EA REVIEWS

1.2.1. Basis for Review under the BC Environmental Assessment Act

WCCC's proposal to construct, operate, dismantle or abandon the Project constitutes a reviewable Project pursuant to Part 3 of the Reviewable Project Regulations (B.C. Reg. 370/02), because the coal mine is a new facility with a production capacity greater than 250,000 tonnes/year of clean and or raw coal, or a combination of clean or raw coal. Section 8 of the provincial *Environmental Assessment Act* S.B.C. 2002, c.43 (the Act) states that an environmental assessment certificate (the Certificate) is required before a reviewable Project can proceed.

1.2.2. Provincial Environmental Assessment Review Process

In January 2005, the Proponent submitted a Project Description as the first step in the provincial assessment process. On January 13, 2005, the Environmental Assessment Office (the EAO) issued an order under section 10(1)(c) of the Act, stating that an environmental assessment certificate is required for the Project, and that the Proponent may not proceed with the Project without an assessment.

As the Brule Project is adjacent to the operating Dillon mine and certain components would be jointly used by both mines (chiefly, Dillon main sediment control pond, the Dillon pit for waste rock storage and some of the infrastructure), on April 11, 2005 the order under section 10(1)(c) was amended to include in the Brule Project assessment any proposed modification and use of existing facilities at the Dillon mine for the purpose of the Brule Project.

On October 14, 2005, the EAO issued a section 11 order pursuant to the Act, defining the scope of the required assessment and the procedures and methods for conducting the assessment for the purposes of the Act. The terms of reference (ToR) describing the information to be provided in the Certificate application (the Application) was approved by EAO on October 18, 2005.

On November 24, 2005, EAO completed the compliance screening of the Application submitted by WCCC on November 1 and determined it to have complied with the Application ToR. The pre-Application and Application public and First Nations consultation programs were also determined by EAO to have complied with the section 11 order issued in regard to the Project. The Project review was initiated on December 10, 2005 following delivery of the required number of copies of the Application to the McLeod Lake Indian Band, Saulteau First Nations and the West Moberly First Nations (the First Nations) and Kelly Lake Cree, Kelly Lake First Nations and Kelly Lake Métis Settlement Society (the Kelly Lake Communities), and the Project working group (Working Group), as well as making it available to the public.

On June 7, 2006 the Executive Director ordered a time limit extension in order to address outstanding regulatory issues associated with the assessment of potential adverse Project effects and the formulation of appropriate mitigation measures to reduce or avoid such effects before making a referral to ministers. The assessment was completed in 182 days.

1.2.3. Federal Review and Harmonization

All projects reviewed under the provincial Act are subject to the Canada–British Columbia Agreement on Environmental Assessment Cooperation (2004) if the federal legislation is triggered, as well. The agreement is intended to eliminate potential procedural duplication while allowing federal agencies to work through the provincial EA process to meet the needs of the *Canadian Environmental Assessment Act* (CEAA) while retaining their decision authority with respect to the acceptability of Projects.

A mining Project in B.C., or an element of the Project, can trigger review under the CEAA if federal approvals are required or if federal land or funding is involved. Federal agencies participated in the June 13, 2005 Working Group meeting, as well as subsequent meetings on August 16 and September 9, 2006 to assess the need for a CEAA review. On October 21, 2006, the Canadian Environmental Assessment Agency determined there were no CEAA triggers for the Project.

The Department of Fisheries and Oceans (DFO) continued to participate on the Project Working Group providing valuable advice on issues related to fisheries and fish habitat.

1.3. LOCAL GOVERNMENT REQUIREMENTS

WCCC has submitted an application to the Peace River Regional District for re-zoning to allow the use of the Falling Creek Flats Loadout site. Rezoning has been completed.

1.4. PERMITS AND OTHER LICENCES

Following issuance of a Certificate, the Proponent must obtain the statutory approvals required to construct, operate, abandon or otherwise undertake all or part of a reviewable project. These approvals cannot be issued prior to the issuance of a certificate. Appendix G identifies the major statutory authorizations required by WCCC, if issued a Certificate for the Brule Mine Project.

2. PROJECT DESCRIPTION AND SCOPE OF REVIEW

2.1. PROJECT OVERVIEW

Western Canadian Coal Corp (WCCC) proposes to develop the Brule Mine Project in northeast B.C. approximately 55 km southwest of the Town of Chetwynd by road. The objective is to produce from 750,000 to 2.0 million tonnes (Mtpa) of Pulverized Coal Injection (PCI) coal, over an 11 year period, with production starting in the third quarter of 2006. WCCC's adjacent Dillon Mine is scheduled to close in mid-2006 and the company's goal is to transition directly from Dillon to Brule without shutdown of operations.

The proposed Brule Project includes an open pit mine, a coal preparation plant and associated infrastructure at the minesite, a short term coal haul route to the existing Bullmoose Loadout, a new long term coal haul route with 22 km of new road construction to a new rail loadout facility at Falling Creek Flats near the Pine River about 60 km west of Chetwynd, and two new power lines: a 1.5 km 25 kV line from the existing grid to the loadout facility, and a 23.2 km 25 kV line to connect the mine site to the existing B.C. Hydro line near the junction of Highway 29 and the Sukunka Forest Service Road (FSR).

During the first phase of mine development (to coincide with the construction phase for the plantsite, the Falling Creek Flats rail loadout, and the Falling Creek Connector Haul Route), the coal will be hauled 93 km by on-highway trucks to the existing Bullmoose rail loadout near Tumbler Ridge. This haul operation will use the same haul route, and will be similar in scale and production rate to the coal haul operation currently being used for the Dillon Mine. Off-highway trucks will transport coal 60 km to the Falling Creek Flats Loadout once both the new loadout and haul route are completed.

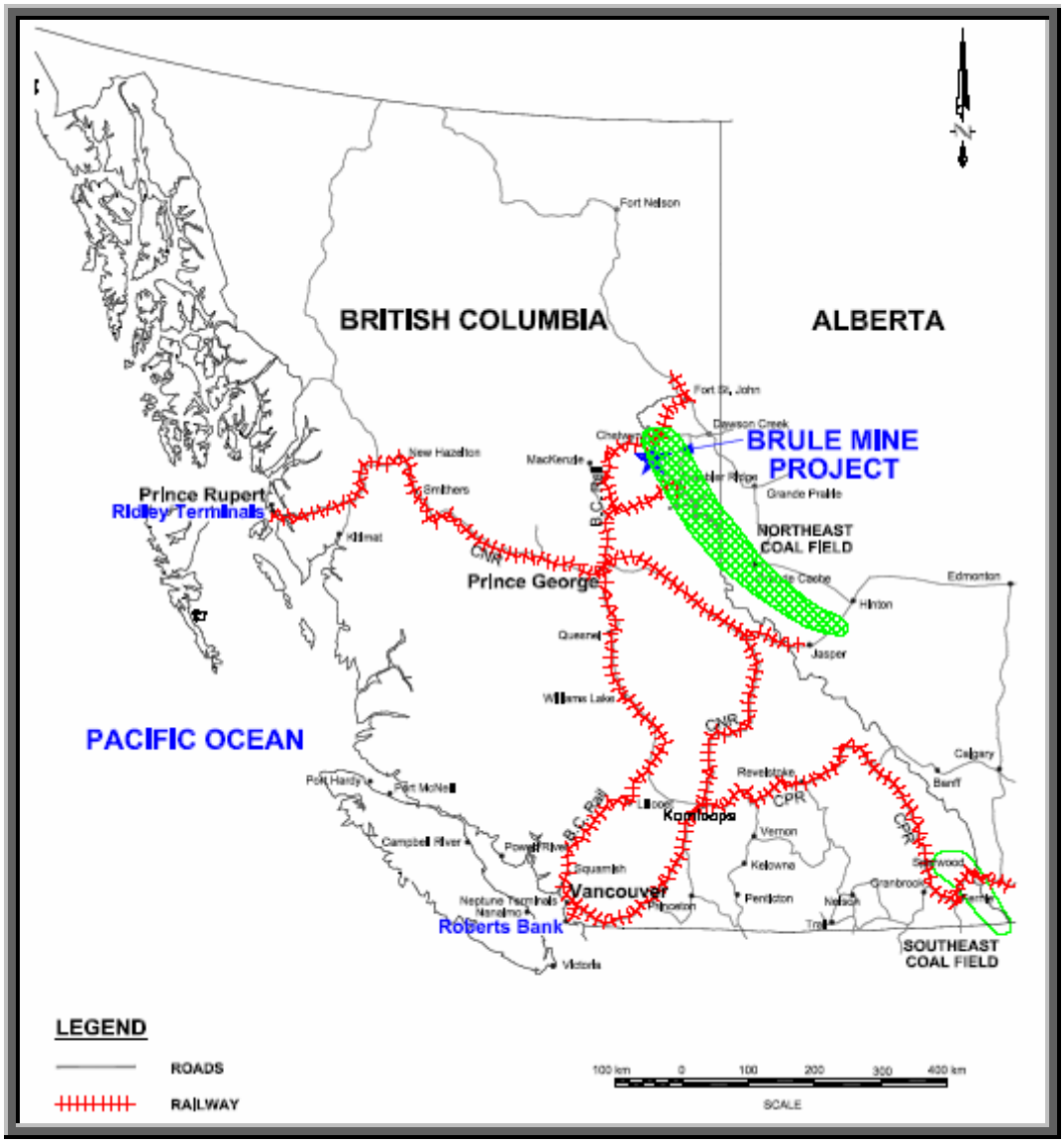
Due to a down turn in the PCI coal market, WCCC has rescheduled the construction of the Falling Creek Loadout and the new portions of the haul route from two, to three years following a certification decision. Until that time, the Brule mine will continue to truck coal to the Bullmoose Loadout. The proposed mine plan will extend the Dillon scale (840,000 tonne (t) coal production per year) operation for approximately 3 years. During this period coal haul traffic on the Sukunka Forest Service Road (FSR) would not increase from current levels. A new configuration for Dillon haul trucks is planned to bring the payload up the 40 t per trip from the present 32 t. This initiative would reduce trips required to meet production targets by 25% and would reduce coal haul costs.

The Phase 2 Brule operation (2,000,000 tpa) depends on low coal transportation costs (relative to current Dillon coal haul) that result from having a 110 t payload on an off highway haul truck. This size of payload is only possible on the proposed Falling Creek Haul Road. The cost of the coal haul to the Bullmoose Loadout would be financially prohibitive at the increased production level.

The PCI coal is to be transported by rail to the Ridley Terminals port at Prince Rupert, or if required to Roberts Banks coal terminal in Vancouver and shipped to international export markets for use in steel making.

Construction of the Project is estimated to employ up to 200 people and create about 500,000 person hours of employment over a period of one year. Capital investment for the Brule Mine Project is estimated at $200 million. The operation phase is estimated to be approximately 11 years. Average annual employment over the life of the Project is estimated at 250 direct new positions.

Figure 1 Brule Mine Project Location



2.2. SCOPE OF THE PROJECT

The scope of the Brule Mine Project includes the following on-site and off-site components:

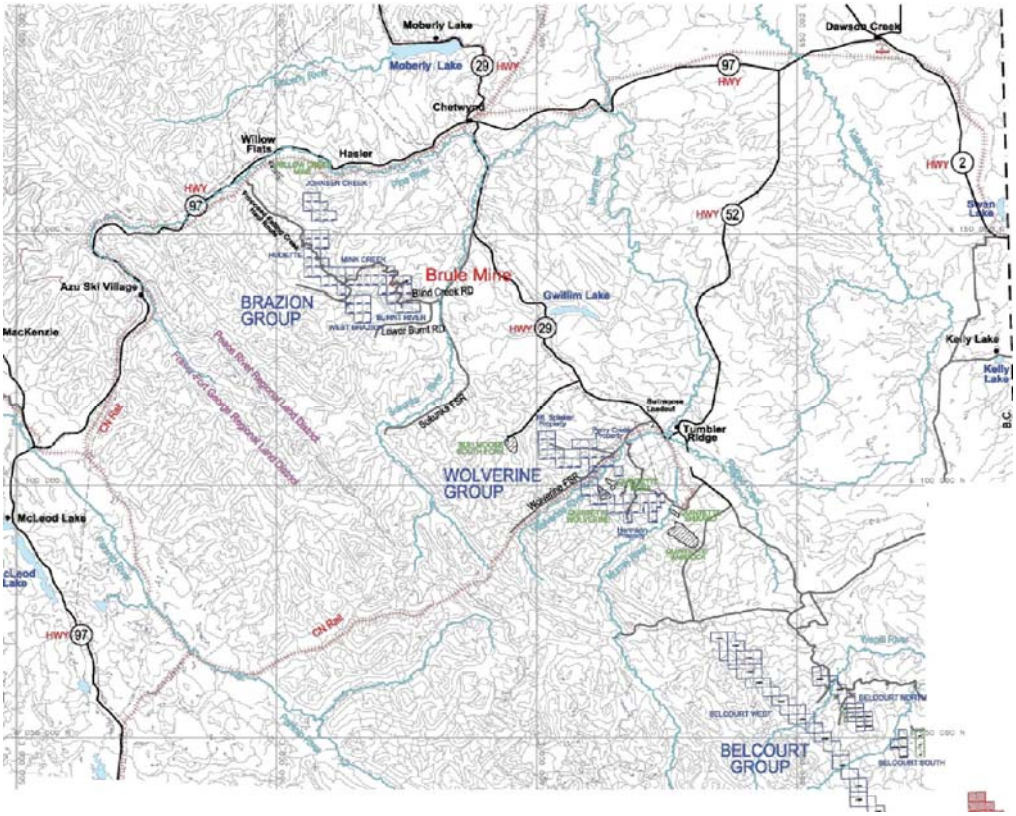
- An open pit or pits, waste rock dumps, borrow pits, overburden and topsoil storage piles, and coal processing plant, including a coarse coal wash and facilities, and ancillary infrastructure;
- A rail and truck loadout facility at Falling Creek Flats;
- A connector haul route between the Brule Minesite and the Falling Creek Flats Loadout which will include 22 km of new road construction;
- The coal haul route between the Brule property and the existing Bullmoose Loadout facility;

- Two 25 kV power lines connecting to the existing hydro-electric grid, one for the minesite (23 km) and one for the Falling Creek Flats Loadout (1.5 km);
- A temporary construction camp; and
- Any proposed modification and use of existing facilities at the Dillon Mine for the purposes of the Project.

The proposed modification and use of the facilities at the Dillon Mine for the purposes of the Brule Project include the following:

- Continued use of the Main Sediment Pond (renamed Sediment Pond 1) for the life of the Brule Project without modification;
- Incorporation of portions of the water management ditches (North and South Blind ditches built for the Dillon Mine) into the Brule Mine water management system;
- Backfilling of the un-backfilled portions of the Dillon Pit and covering of portions of the Dillon Dumps with waste rock from the Brule and Blind Pits;
- Use of the Dillon plant site area, and some existing roads;
- Transfer of portions of the Dillon plant infrastructure to the Brule plant site;
- Potential initial use of the explosives site and facilities, pending agreement with the explosives supplier; and
- Potential ongoing use of the WCCC coal haul trailers in the temporary coal haul, subject to contract decisions.

Figure 2 Brule Mine Project Regional Infrastructure



2.3. PROJECT RATIONALE

WCCC considers that the Brule Mine Project is well positioned to take advantage of increased interest by steel mills in ultra low volatile, low sulphur, low phosphorus, and low ash coals for pulverized coal injection (PCI) use in steel making.

The Brule Mine consists of the Brule Pit and the Blind Pit. It is estimated that a total of 21.7 Mt of coal will be mined from the two pits over the Project life, together producing almost 20 Mt of saleable coal. The development of the coal haul route to Falling Creek will enhance access to additional coal resources in WCCC's properties to the north that will be developed in future to augment and eventually replace production from Brule.

Competitively, WCCC advises that Burnt River PCI is regarded as one of the best PCI coals in the world when benchmarked against PCI coals from Australia, Russia, China, and Canada. WCCC has shipped trial cargos from Dillon to customers in Japan, Korea, China, and Europe. There has been strong interest from these customers in establishing a long term relationship; however this will require the long term supply that the Proponent considers the Brule Mine has the capacity to provide.

2.4. SCOPE OF THE ASSESSMENT

To meet the requirements of the Act, the Project assessment considered environmental, economic, social, heritage and health effects, taking into account practical means of preventing or reducing to an acceptable level any potential significant adverse effects of the Project. Specifically, the assessment considered potential effects on water quality, including metal leaching and acid rock drainage, air quality, wildlife and fisheries, freshwater and terrestrial ecosystems, vegetation including medicinal plants, social, economic, cultural and heritage values.

Issues regarding potential effects on Treaty 8 First Nations rights and interests, and the interests of the Kelly Lake communities were also considered.

2.5. LAND USE CONTEXT

All components of the Brule Mine Project are within the Dawson Creek Land and Resource Management Plan (LRMP) area. The Brule Mine Project is located within "Burnt River 4F Resource Management Sub-zone" of the South Peace Resource Management Zone (RMZ). The importance of natural resources (oil and gas, coal and timber) to the local economy is recognized in the LRMP. The South Peace RMZ has been designated "Enhanced Resource Development" and the LRMP encourages investments in resource development and enhancement in this area. With respect to coal mining, the stated objective for this RMZ is to provide opportunities for environmentally responsible exploration and development of surface and subsurface resources.

3. INFORMATION DISTRIBUTION AND CONSULTATION

3.1. PUBLIC CONSULTATION MEASURES UNDERTAKEN BY PROPONENT

WCCC initiated its consultation program on the Brule Mine Project in November 2004. Throughout the development of the environmental assessment work plans, Application ToR and drafts of the Application, WCCC consulted with the Working Group, individual agencies, the First Nations and Kelly Lake Communities. In the pre-Application stage WCCC held meetings with community representatives in Hasler Flats and Fort St. John. Open houses with public meetings were also held in Chetwynd and Tumbler Ridge to seek public input into Project planning and environmental assessment.

As a result of public concerns raised regarding the potential impacts of coal dust, noise, traffic, lighting, property values, air quality, water quality, environment, and health, WCCC committed to re-evaluate the railway loadout options already considered, as well as additional options. The results were presented at an EAO chaired public meeting in Chetwynd on June 1, 2005, at which Hasler residents presented a number of Personal Impact Statements concerning the potential adverse effects of the proposed Hasler Flats Loadout site. WCCC indicated that the newly conducted studies had shown the Falling Creek Flats Loadout site was likely the preferred site for technical, environmental, social and environmental reasons.

In addition to these public meetings, representatives from WCCC also met with Hasler residents and Willow Creek residents, either on a one-on-one basis, or in small groups during which some residents provided local information about the road systems and potential coal haul routes.

WCCC actively participated in the Working Group established by the EAO to review the Project. The Working Group, established by the EAO, included representatives from federal and provincial government agencies, local government, and the Treaty 8 First Nations and Kelly Lake Communities. The ToR for the Application were developed with input from the Project Working Group.

In early December 2005, WCCC and its consultants presented the Application and key environmental findings to the Working Group and to the public at open houses with public meetings at Chetwynd and Tumbler Ridge on December 12 and 13, respectively. Copies of the Application were placed in local libraries at Chetwynd, Tumbler Ridge, Dawson Creek and Prince George, and the open houses were advertised in advance in compliance with the October 2005 section 11 order. The Chetwynd and Tumbler Ridge open houses were attended by 23 and 11 individuals, respectively.

Other tenure holders in the Project area may be affected by the Project including those from the oil and gas, coal and forestry sectors, a guide outfitter, 4 licenced trappers, and as private property owners. WCCC has consulted with these stakeholders to refine Project plans to eliminate or mitigate conflict with the activities of other tenure holders, and is seeking Cooperation Agreements or Statements of Non-Objection from the holders of other tenures that might be affected by the Project. In some instances, compensation agreements are being negotiated where the Project development might have adverse economic effects.

WCCC has been negotiating with several stakeholders including, Pine Valley Coal, Canfor, Talisman, and Burlington with respect to access to the Falling Creek Flats Loadout and Road Use Agreements on the Falling Creek Connector Haul Route. No objections to sign-off on the routes are expected, with an agreement in place with Canfor, and discussions with other stakeholders currently ongoing. Negotiations of a Principle of Agreement Letter are currently ongoing with Talisman Energy in relation to shared road use and road upgrade.. An expansion of the current Road Use Agreement for Dillon Mine to include the Brule Project is currently being negotiated with the Sukunka Road User's Group.

A signed Principles of Agreement and Statement of Non-objection has been received from Kennecott Exploration Canada as it relates to the Falling Creek Connector Haul Route traversing through their coal licenses; Pine Valley Coal has not raised any objections to the Project plans.

Negotiations with CN Rail, with respect to crossing agreements and statement of non-objection for the rail loadout have reached the agreements in principle stage.

With regard to the minesite and associated powerline, WCCC has received a non-objection letter from Duke Energy, and in the absence of responses from Devon, BP Energy, and Sekani Resources concludes that these parties do not have objections. Negotiations with Burlington Resources, in relation to a well and pipeline located in the proposed Pit are ongoing, and final agreement will depend on schedules for both mine development and well site decommissioning. The details of required setbacks and operational plans will be dealt with in the *Mine Act* Permit.

With respect to the trappers located within the vicinity of the project (722T007, 722T006, 722T002 and 722T003) settlement has been reached with Trapper # 722T003, and offers have been made to 722T007, 722T006 and 722T002, with negotiations ongoing.

WCCC held a meeting with Dale Drown from the BC Guide Outfitters Association on behalf of Steve Mark, the guide outfitter in the area; however no claims have been made to date.

An agreement is currently being negotiated with the private property owner adjacent to the Falling Creeks Flat Loadout. Negotiations for acquisition of an interest in land to accommodate the powerline right-of-way to the minesite are ongoing with the private property owner who owns land at the intersection of the Sukunka FSR and Highway 29.

3.2. PUBLIC CONSULTATION MEASURES UNDERTAKEN BY EAO

The EAO, as a neutral provincial agency coordinating major project environmental assessment in British Columbia, consulted with the Treaty 8 First Nations and Kelly Lake Communities. The EAO established the Brule Mine Project Working Group as the primary source of policy and technical expertise for assessment of the Project.

During the pre-application stage, the EAO participated in the March 2005 open houses in Chetwynd and Tumbler Ridge to outline the provincial environmental assessment process and to identify public issues and concerns. The notice of availability of the

Application and initiation of the public comment period was advertised in the Tumbler Ridge News, Chetwynd Echo and Peace River Black News.

In June, 2005, EAO chaired a meeting with WCCC and concerned citizens of Hasler regarding the Proponent's earlier proposal to construct the coal load out in Hasler.

The EAO made the Application available for public comment during a 46-day review and comment period from December 12, 2005 to January 26, 2006 and participated in the December 2005 open houses that it required the Proponent to hold. Both EAO and the Proponent notified the public of the availability of information and opportunity to comment on the Application. EAO staff also maintained direct contact with representatives of Hasler Flats residents regarding resolution of their concerns about the location of the proposed railway loadout.

All correspondence received during the formal public comment period and WCCC's responses were posted on EAO's Project website. In addition to comments submitted to the EAO, WCCC received a number of written submissions. .

3.3. First Nations and Kelly Lake Communities Consultation and Project Review

The Brule Project is situated within the area covered by Treaty 8. Treaty 8 provides the signatories with the right to hunt, fish and trap within the Treaty 8 territory. While Treaty 8 provides for the taking up of lands for mining, the court has instructed that in the taking up, first Nations should be consulted about their ability to practice their rights.

The McLeod Lake Indian Band; Saulteau First Nations; and West Moberly First Nations, (the First Nations) are signatories to Treaty 8 and have identified the vicinity of the Project as part of the Treaty 8 area traditionally used by them for hunting fishing and trapping. The reserve communities of the Saulteau and West Moberly on Moberly Lake are among the settlements nearest to the Project.

In addition, to the Treaty 8 First Nations, representatives of Kelly Lake First Nations; Kelly Lake Cree Nation; and Kelly Lake Métis Settlement Society (Kelly Lake Communities) have also expressed interest in the Brule Project.

In April 2005 the provincial government (Ministry of Energy, Mines and Petroleum Resources) recognized the growing demands being placed on the Treaty 8 First Nations by proposed coal developments in the region and provided $115,000 to West Moberly and Saulteau First Nations to respond to industry requests and participate in consultation. Shortly following this McLeod Lake Indian Band also received $50,000 for increased capacity.

In addition, specific to the review of this Project funding was provided by the EAO and WCCC to contract an Independent Consultant to provide technical advice to the First Nations and Kelly Lake Communities on the review. In March 2005 the EAO provided terms of reference for an Independent Consultant to assist First Nations and Kelly Lake Communities in the technical review of the Project. Of the two consultant candidates identified by First Nations and Kelly Lake Communities, EBA Waberski Darrow Ltd. was awarded the contract in June 2005.

The Independent Consultant working with First Nations and Kelly Lake Communities reviewed the draft Section 11 order, draft TOR and participated in the screening of the Application, prior to acceptance for review.

Following receipt of the Application, the Independent Consultant met again separately with Saulteau First Nations, West Moberly First Nations and McLeod Lake Indian Band, and attempted to meet with the Kelly Lake Communities representatives. No new issues were raised during meetings in the Application phase.

On March 9, 2006, the Independent Consultant submitted their Interim Report following review by First Nations and the Kelly Lake Communities representatives. A technical and non technical version of the Interim Report was provided to the Working Group and on the Project website. These reports were provided to the Proponent for consideration and response.

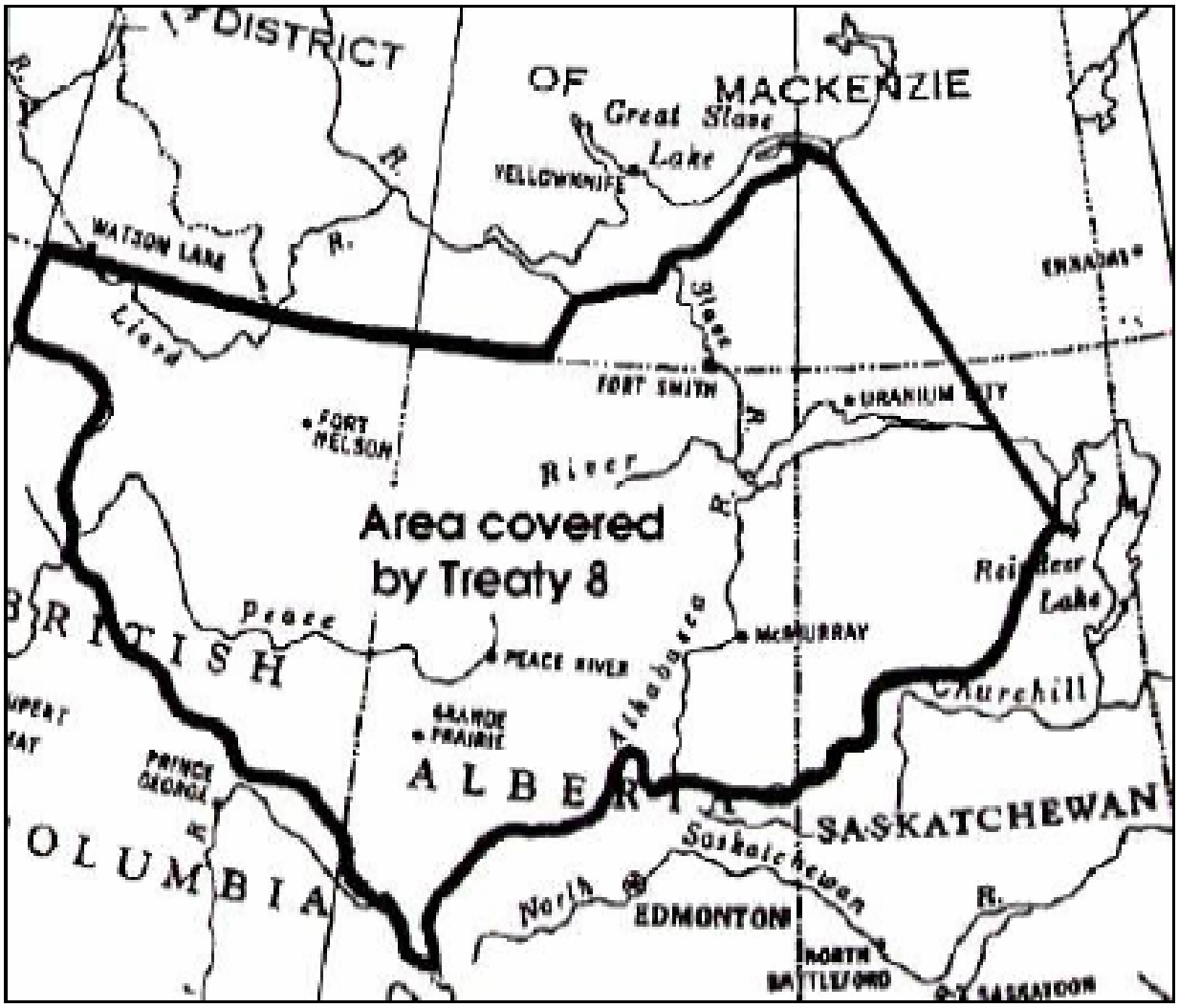
On March 20, April 4 and April 6, the Independent Consultant participated in the Metal Leaching and Acid Rock Drainage and Water Quality, Water Quality and Aquatic Resource, and Air Quality Working Group meetings, respectively. All technical issues of concern to the Independent Consultant were satisfactorily addressed.

On May 2, 2006, the Independent Consultant and the representative from McLeod Lake Indian Band were able to participate in the Working Group teleconference to discuss the draft assessment report and draft conclusions. On May 31, the Independent Consultant met with First Nations to discuss the to discuss the draft assessment report particularly Chapter 17 – *Issues Regarding First Nations Rights and Interest & Interests Identified by the Kelly Lake Communities*, the draft certificate and the Independent Consultant's draft final report. On June 5, the Independent Consultant met with a representative for West Moberly First Nations and, later that day, with Lyle Letendre of the Métis Settlement Society to discuss the findings of the Independent Consultant's Final Report.

The Independent's Consultant's Final Report was submitted on June 7, 2006 addressing issues identified by the First Nations, Kelly Lake Communities and the Independent Consultant, including potential infringement on Treaty 8 Rights regarding hunting, fishing and trapping. The conclusions are discussed in Chapter 17 of the Assessment Report.

Appendix E of this Assessment Report provides the Proponent's summary of issues raised by First Nations, Kelly Lake Communities and Independent Consultant (Appendix E-2) during the Application review stage. In addition, issues raised by First Nations, Kelly Lake Communities and the Independent Consultant are discussed in the appropriate chapters of the Assessment Report and summarized in Chapter 17.

Figure 3 Treaty 8 Territory



Measures Undertaken by the Proponent

Through its previous Projects in the area (Wolverine and Dillon) WCCC has established a working relationship with First Nations and the Kelly Lake Communities. WCCC provided the majority of the funding for the Independent Consultant. WCCC also held individual information meetings on the Project; conducted traditional use and archaeology studies for the Project area, in close consultation with First Nations and the Kelly Lake Communities; has developed, or is developing co-operation agreements (the Cooperation Agreements) with interested groups; and has adopted contracting and recruitment approaches to enhance employment and contracting opportunities.

WCCC invited the First Nations and Kelly Lake Communities to tour the Project in March 2005 and the revised loadout location at Falling Creek Flats in June 2005.

During the review of the Certificate Application, WCCC consultation efforts focused on providing capacity to the Treaty 8 First Nations and the Kelly Lake Communities to participate in the Project review, meetings with First Nations and Kelly Lake Communities, ongoing work towards a Cooperation Agreement with McLeod Lake Indian Band, and meetings to provide information on employment and training opportunities at WCCC's Wolverine Mine. Concurrently, in relation to all its projects in Northeast B.C., and the Wolverine Project in particular, WCCC has been continuing and evolving its programs related to employment, apprenticeship, and training opportunities, which are intended to provide ongoing access to economic benefits from WCCC Projects.

The Kelly Lake Cree Nation have indicated interest in a cooperation agreement with WCCC.

WCCC's signed co-operation agreements address matters such as:

- Communication protocols concerning Project-related activities;
- Mechanisms to facilitate First Nations and Kelly Lake communities' employment and contracting opportunities related to WCCC Projects;
- Contracting procedures and standards, including procedures to provide opportunities to First Nations and Kelly Lake communities for participation and benefits; and
- Agreements concerning WCCC's support for training and apprentices opportunities.

Cooperation agreements with West Moberly First Nations, Saulteau First Nations and Kelly Lake Métis Settlement Society were finalized in October 2004, January 2005 and February 2005, respectively. Discussions with respect to a Co-operation Agreement with McLeod Lake Indian Band have been ongoing. The most recent activities include a meeting between WCCC representatives and Chief Chingee of the McLeod Lake Indian Band and legal counsel on January 23, 2006, and work on an overall Protocol Agreement with drafts forwarded for comment to McLeod Lake Indian Band on February 14, 2006 and May 18, 2006.

Following the end of the public comment period, WCCC submitted a summary of its consultation efforts during the period following the submission of the Application. The Report, "Supplementary Consultations and Communications with First Nations and Kelly Lake Communities, February 2006", noted the following issues and concerns identified by First Nations and the Kelly Lake Communities:

- Infringement on Treaty Rights;
- Desire for share of economic benefits;
- Control of road dust on the Sukunka FSR;
- Effects of coal dust on vegetation and berries;
- Selenium leaching management;
- Impacts on fish in the Blind Creek;
- Wildlife corridors, wildlife monitoring and mitigation of road kill;
- Effects on wildlife of an access route connecting the Pine and Sukunka water sheds due to increased hunting access;
- Traffic effects on enjoyment and use of the Sukunka Valley for fishing, and berry picking;
- Impacts on archaeology and traditional land use sites; and
- Load out impacts on water quality of the Pine River.

Measures Undertaken by EAO

In January 2005 the EAO provided the Brule Project Description to the First Nations and Kelly Lake Communities for their information, and elicited their interest in participating in the review of the Project. Subsequently, the First Nations and Kelly Lake Communities were invited to join the Working Group and participate in the first meeting of the Group in March 2005. The First Nations and Kelly Lake Métis Settlement Society participated in the Working Group meeting March 2nd. The First Nations (Saulteau First Nations, West Moberly and McLeod Lake Indian Band) also met with EAO staff at Chetwynd and West Moberly during that week.

In May 2005 the EAO also provided assistance funding (co-funded by the Proponent) and arranged for an Independent Consultant to provide technical advice to the First Nations and Kelly Lake Communities.

In June 2005, as members of the Working Group, the First Nations, Kelly Lake Communities and the Independent Consultant were invited to participate in a Working Group meeting and site tour planned for June 15th. The First Nations and Independent Consultant participated in these activities. The latter also represented the First Nations and Kelly Lake Communities at meetings with federal agencies in July and September 2005. The Independent Consultant reviewed the draft EAO section 11 order and draft Application ToR on behalf of the First Nations and Kelly Lake Communities in September 2005. Comments received were incorporated into the final order issued October 14 2005 and the Application ToR, finalized on October 18, 2005.

The Application was distributed to the First Nations, Kelly Lake Communities and the Independent Consultant by December 10, 2005. At that time the EAO reviewed and approved reporting on the First Nations' Consultation Program provided in the Application and the Proponent's plans for future consultation.

To ensure that all Treaty 8 First Nation members were also aware of the proposed Project, in mid-December 2005 the EAO notified the remaining members (Blueberry River First Nation, Doig River First Nation, Fort Nelson Indian Band, Halfway River First Nation, and Prophet River Band) of receipt and availability of the Application, and requested them to advise if the Project had the capacity to impact areas of interest. None of these Treaty 8 First Nations responded or commented on the Application. In

addition, the Treaty 8 Tribal Association was made aware of the Application review and the involvement of the McLeod Lake Indian Band, the Saulteau First Nation and the West Moberly First Nation.

First Nations, Kelly Lake Communities and Independent Consultant were invited to participate in a Working Group meeting to present the Application and receive initial feedback on December 13, 2005. The First Nations, Kelly Lake Métis Settlement Society and the Independent Consultant participated in the Working Group meeting. EAO staff also met with the First Nations on December 12th and 14th, 2005.

The Independent Consultant participated in the EAO-chaired technical Working Group meetings on March 20, April 4 and April 6, 2006.

On May 2, 2006, EAO provided the First Nations, Kelly Lake Communities and the Independent Consultant with a the draft assessment report and invited them to the May 23, Working Group teleconference to review the draft Assessment Report and draft conclusions, and to identify any outstanding issues to be resolved prior to referral to Ministers for a decision on issuance of the Certificate. The Independent Consultant and the representative from McLeod Lake Indian Band participated in the teleconference.

On May 31, the EAO hosted the final teleconference meeting of the Working Group to review the changes in the draft assessment report resulting from the May 23 meeting and any discussions between the Independent Consultant and the First Nations. First Nations did not attend this meeting due to scheduled meetings with the Independent Consultant to discuss the draft assessment report particularly Chapter 17 – *Issues Regarding First Nations Rights and Interest & Interests Identified by the Kelly Lake Communities*, the draft certificate and the Independent Consultant's draft final report.

3.4. AGENCY REVIEW AND PROJECT WORKING GROUP

The Project Working Group is the primary source of policy and technical expertise for considering issues identified during a project assessment. In addition to conducting the EA review, the working group identifies information and consultation requirements for provincial statutory permit approvals. It also identifies any federal information needs where a review is conducted as a harmonized federal/provincial review.

The Project Assessment Manager who has delegated authority for this EA review established a Brule Mine Project Working Group, early in 2005. The Working Group included representatives from: First Nations, Kelly Lake Communities, the Independent Consultant, Ministry of Environment (MoE), Ministry of Energy, Mines and Petroleum Resources (MEMPR); Ministry of Transportation (MoT), Ministry of Agriculture and Lands (MAL), Ministry of Forests and Range (MoFR), the federal Department of Fisheries and Oceans (DFO), the Peace River Regional District (PRRD) and the District of Chetwynd (Appendix B).

The Project Working Group members undertook the following activities pursuant to the mandate of the organizations they represent:

- reviewing and commenting on drafts of the Application Terms of Reference;
- screening, reviewing and commenting on the Application;
- providing advice on issues raised during the course of the assessment of the Project; and

- providing advice on the assessment findings to be reported to the Ministers at the conclusion of the assessment of the Project.

Working Group meetings were held in March 2, and June 15, 2005 to identify specific issues and information requirements, and December 13, 2005 to initiate the review of the Application and provide preliminary comments on the Application. Technical Working Groups were established by EAO as subsets of the Working Group to provide advice in the areas of metal leaching and acid rock drainage (ML/ARD), water quality and aquatic resources, wildlife and air quality. Prior to the submission of the Application, the ML/ARD and the Water Quality and Aquatic Resources Working Groups met on July 15, 2005.

Following the end of the public comment period and distribution of these comments to the Working Group, members provided written comments to EAO. These comments were forwarded to WCCC for response. The ML/ARD and the Water Quality and Aquatic Resources Working Group met March 20, 2006. The Water Quality and Aquatic Resources Working Group and Air Quality Working Group met on April 4, and April 6 2006, respectively to discuss agency and the Independent Consultant's comments on the Application and WCCC's responses.

Notes from all Working Group meetings in both the pre-Application and Application review stages of review are available on the EAO website, as well as Working Group comments on the Application and WCCC's responses at:

http://www.eao.gov.bc.ca/epic/output/html/deploy/epic_Project_home_252.html

Appendices C and E of this Assessment Report provide a summary of issues raised by agencies and the Independent Consultant on behalf of First Nations and the Kelly Lake Communities and WCCC's responses during the Application Review.

3.5. PUBLIC REVIEW AND PUBLIC COMMENT PERIOD

The consultation held by the Proponent in the pre-Application Stage provided the public with opportunities to comment on the Project. Section 2.0 of the Project Application identifies the questions and issues raised during pre-Application consultation. The Application's Appendices contain a summary of all questions and discussions raised during this period.

During the Application review, the public was invited to provide comments on the Application to the EAO during a formal public comment period extending from December 10, 2005 to January 26, 2006. The EAO received eight written comments from members of the public during this portion of the Application Review period. These comments and responses from WCCC were made available to the Working Group. In addition to comments submitted to EAO, the Proponent received a number of submissions. Following the close of the public comment period, WCCC submitted a report summarizing public concerns and issues. This report, "Update to Supplementary Consultations and Communications with Public Stakeholders", and those comments received by EAO were posted on the Project Website along with the Proponent's responses.

The most common concerns raised by the public at the open houses and in correspondence related to the potential impacts of emissions of fugitive coal dust from the loadout and coal haul; including:

- Potential for cumulative impacts at Willow Flats with Pine Valley Coal;
- Potential impacts on human health (residents of Willow Flats and Hasler); and
- Potential impacts on property values and nuisance dust impacts affecting enjoyment of property.

Other concerns included:

- Public and user safety on Hasler FSR;
- The impact of the coal haul on mammals of interest to trappers;
- Safety standards on the coal haul route;
- The need for truck speed controls in relation to coal dust;
- Effects of predicted selenium and cadmium at the loadout;
- Protection of Falling Creek and Beaudette Creek from sedimentation;
- Independence of environmental monitors;
- What happens when air permit standards are exceeded;
- Increased traffic on highway 97 (elk crossing near Hasler); and
- Impact to caribou.

Sections 13 and 14 of this Assessment Report provide an outline of the land use and socioeconomic topics raised in relation to the proposed Project. Appendix D of this Assessment Report provides the Proponent's summary of public issues raised in the Application Review stage.

3.6. CONSULTATION SUMMARY AND CONCLUSIONS

All issues raised by the public, First Nations, Kelly Lake Communities and federal, provincial and local government agencies during the review of the Project, that are deemed to be within the scope of the review have been considered in the Application review process as part of the review.

As noted, Appendices D, E and C of this Assessment Report contain a complete list of issues identified by the public, First Nations, and government agencies during the review of the Proponent's Application, as well as the Proponent's responses to these issues.

The Proponent has complied with the notification and consultation requirements in the section 11 procedural order issued for the Project.

PART B
REVIEW OF THE APPLICATION

4. CONSIDERATION OF POTENTIAL PROJECT EFFECTS

4.1. INFORMATION CONSIDERED

This Assessment Report and its conclusions are based on a review of the information, commitments and proposals identified in the documents considered as the Application.

For the purpose of assessing the potential direct, indirect and cumulative effects of the Project, the Application includes the Proponent's November 2005 Application and supporting Appendices, as well as relevant documentation and correspondence from WCCC after submission of the Application. These documents are identified in Appendix A of this report, and are available on the EAO website at: http://www.eao.gov.bc.ca/epic/output/html/deploy/epic_Project_home_252.html

Sections 7 through 15 of the Brule Mine Project EA Application present the biophysical and social effects assessments. Components have been grouped as appropriate for the Project. Separate assessments are provided for the following:

- Climate, surface water hydrology, and groundwater flows (Section 7);
- Aquatic resources, including fish and fish habitat (Section 8);
- Terrain and soils (Section 9);
- Vegetation and wildlife (Section 10);
- Air quality (Section 11);
- Archaeological and Heritage Resources (Section 12);
- Land use (Section 13);
- First Nations and Kelly Lake Communities (Section 14); and
- Socio-community, socio-economic and public health conditions (Section 15).

Most sections of the Application are structured according to the following general topics:

- approach and methods used in the assessment, including Project components considered and methods applicable to each Project component, and a discussion of the influence of consultation on issues scoping;
- baseline conditions;
- Project effects assessment, including and identification of project/biophysical (or social) component interactions and need for mitigation, component interactions, defining appropriate mitigation measures where needed, and assessing the significance of residual Project effects during all Project phases; and
- Cumulative effects assessments (CEAs) for biophysical resources, if the criteria for a CEA are met (refer to Section 6.3 of the Application for criteria). Similar to the Project effects assessments, the CEA defines appropriate mitigation measures to be conducted by WCCC where needed, and assess the significance of residual cumulative effects during all Project phases.

The effects assessments include consideration of two stages of Project development, defined as Phase I (construction and concurrent pre-production and production activities), Phase 2 (full operations), decommissioning / reclamation, and post-closure.

The Brule Project effects assessments were conducted by qualified professionals selected by WCCC, with the involvement of, and or input from, interested and potentially affected parties. Specific responsibilities of team members are documented in Section 1.6 of the Application. Study Team members worked with WCCC on initial Project planning, initial issue identification, and initial definition of potential Project effects.

Meetings and consultations were held with Government agencies, First Nations, Kelly Lake Communities, and key stakeholders as part of the overall issue identification, mitigation planning, and effects assessment (Application Section 2 on Consultation and Section 13 on Land Use). Public meetings were also held in Chetwynd and Tumbler Ridge, including a meeting held to present information specifically to the residents of Hasler (See Section 2). Final Project design and mitigation plans reflect results of consultations.

The methods to be used in the effects assessments were formalized in the Application ToR and in 11 draft study programs submitted to the EAO and the Brule Mine Project Working Group in March 2005 and finalized in May and June 2005. Follow-up meetings were held with regulatory agencies, where requested, to refine details of assessment methods.

The information considered in the assessment of the Project includes: the Proponent's response to the issues raised by the public, First Nations and government agencies during the review (Appendices C, D and E of this Assessment Report); and WCCC's table of commitments regarding monitoring requirements and mitigation measures (Appendix F).

4.2. ASSESSMENT METHODOLOGY

4.2.1. Project Effects

Potential types of Project effects addressed in this Application include: environmental, economic, social, heritage, and health effects; and effects on First Nations treaty rights and interests and Kelly Lake Communities interests. Section 6 of the Application describes the general approach and methods used in determining Project effects for each of the biophysical and social components presented in Application Sections 7 through 15. The approach is outlined in terms of the basic steps in the assessment, the key guidelines and assumptions adopted in the overall assessment, and methods for determining conclusions of significance.

The approach to the Project effects assessments and documentation includes the following general steps:

- Identify the proposed Project facilities and activities being assessed.
- Identify potential key issues.
- Identify Potential Project Effects. Potential Project effects are determined based on a consideration of Project design, baseline information, and an assessment of the potential for Project facilities and activities to interact with biophysical and social components of the environment.
- Define methods for baseline data collection and assessments, including Local and Regional Study Areas (LSA and RSA) boundaries, applicable timeframes, types and levels of data and information required, and types of analyses and management

planning proposed. Study area boundaries for the assessments are specific to the biophysical or social components, and to the potential Project effects. Study areas that were defined included:

(a) Local Study Areas (LSAs) that cover the proposed development area and applicable areas in the immediate vicinity of the development; and
(b) Regional Study Areas, as appropriate to the issue and assessment component.

- Collect required baseline information and conduct analyses.
- Define proposed mitigation measures. Mitigation measures included for various Potential Effects identified in this project include refinements in locations of Project facilities, Project designs, and operational modifications, as well as development of management, mitigation, monitoring, and contingency plans. Level of detail of the assessments and associated mitigation planning was influenced by, and appropriate to, the potential significance of the effects.
- Conduct the detailed residual Project effects (RPEs) assessment, identifying and describing RPEs that remain based on final Project design, and commitments to mitigation, monitoring, and contingency planning. Definitions of RPEs are based on the assumption that technically and economically feasible mitigation measures (and contingency plans, if needed) have been implemented and are effective as described. The benefits of mitigation measures are considered before determining the significance of RPEs. RPEs are characterized for each component in terms of magnitude, geographic extent, duration, frequency, and reversibility. The significance of RPEs was determined based on an understanding of localized effects in a regional context, as the arbitrary nature of local study areas typically overestimates adverse effects on a resource. RPEs assessments are summarized and presented in tabular form, with both ratings criteria and summary RPEs tables. The exceptions to this are potential Project effects considered to be addressed by the proposed mitigation measures, which are described in the text. The rationale for selection of proposed mitigation measures and commitments is provided.
- For biophysical components (Sections 7 through 11 of the Application), determine if RPEs may measurably contribute to regional cumulative effects; and on that basis, whether a CEA is required.
- Where applicable, conduct CEAs to define the degree to which RPEs could contribute measurably to regional cumulative effects.

As Brule Project planning and consultation advanced, the above steps were in some cases repeated or re-iterated.

A Project Environmental Risk Assessment and Management Planning Workshop was conduced by the Study Team as part of the assessment and mitigation planning process. The workshop goal was to identify and assess potentially significant environmental risks, and to define general mitigation strategies and contingency plans. Following the workshop, more detailed assessment and mitigation plans were completed, as needed. Methods and outputs of the Risk Assessment are documented in Section 5 of the Application, and are reflected in the effects discussions in Sections 7 through 15, as applicable.

4.2.2. Cumulative Effects

OVERVIEW

Cumulative effects assessments (CEAs) were carried out for biophysical components (Sections 7 through 11 of the Application) where residual Project effects have the potential to contribute measurably to regional cumulative effects. Cumulative effects were assessed when biophysical RPEs for the Brule Project may combine with the effects of other known projects or activities (existing or likely to occur in the foreseeable future) within the specified cumulative effects study area boundary and timeframe.

CEAs were completed following CEAA methods as described in the CEA Practitioners Guide. Steps completed for each CEA include the following:

CEA Scoping
RPEs were assessed for their potential to interact in a cumulative fashion with other existing or likely and foreseeable facilities and activities. The Brule Mine Project has been considered in combination with other facilities and activities that overlap with the proposed Project within the specified Regional Study Areas and timeframes. The potential for cumulative RPEs has been assessed for construction, operations, reclamation / decommissioning and post-closure phases of the Brule Mine Project. The CEA geographic scope was identified for each residual Project effect being assessed for cumulative effects.

Other projects or activities within the relevant regional study areas and study timeframes that may interact with the Brule Mine Project were identified. As discussed below, there are significant limitations to the inclusion of future projects in quantitative CEA analyses. Potential cumulative effects were identified.

Mitigation measures considered in the determination of RPEs were identified. These mitigation measures are specific to cumulative effects, and include, for example, various types of cooperation agreements aimed at reducing combined effects of projects and activities.

Residual cumulative effects (RCE) were assessed for significance following a procedure that considers the magnitude, frequency, duration, extent and reversibility of any such residual effects. The contribution of the Brule Mine Project to any such residual cumulative effects was also identified. Additional details are provided below on determining significance.

Monitoring and any other recommended measures have been identified for residual cumulative effects identified through the assessment as significant.

CEA Context
The focus of the CEA was to place RPEs in context to the effects of the other known projects and land use activities. That is, the focus was to assess the incremental contribution of the Project within a relevant cumulative effects context. To do this, the following three conditions were evaluated:

- The condition of the biophysical resource in the regional study area (i.e. cumulative effects study area), in the absence of the Project, but with the effects of other defined relevant Projects and land use activities. This evaluation examines the conditions

existing at baseline and during the foreseeable future, without the effects of the Brule Mine Project.

- The incremental effects of the Project on the biophysical resource for all relevant Project phases and the significance of potentially cumulative RPEs within the regional study area.

- The condition of the biophysical resource, considering effects of the Project RPEs for relevant Project phases, in combination with the condition of the biophysical resource described in the first condition above (i.e. condition of the biophysical resource as affected by other projects and land use activities).

CEA Study Areas
The cumulative effects study area boundaries and scope is specific to each biophysical component and effect. A regional study area (RSA) was identified for each CEA. In most cases, project inclusion lists were also compiled to identify which known projects and / or use activities (e.g. seismic trails) were considered in each CEA.

Project inclusion lists included known projects or activities that have been carried out, or are likely to be carried out, in the foreseeable future within the specified cumulative effects study area boundary (RSA) and specified timeframe. The criterion for known projects or activities was that there must be a public record – usually based on application for, or approval of, a permit or other government authorization. In the case of spatial analyses, existing projects were typically captured by the mapping used in the analyses. Foreseeable future has typically been interpreted to mean the next five years. Even within that timeframe, there must be a publicly available application in order for the project or activity to be considered.

There are limitations to the use of foreseeable future projects in the CEAs, due to limitations in the amount of usable information available for inclusion in the analyses. Spatial analyses, such as those used for the wildlife CEAs, require map-based information for the future projects. This type of information was not available for most foreseeable future projects in the area. For instance, five-year harvesting activities now follow the pine beetle epidemic. It is known with reasonable certainty that there will be timber harvesting in the general area, however specific locations of future harvesting cannot be predicted and therefore were not included in the spatially based cumulative effects analyses. Similarly, future activities for oil and gas companies are often not publicly known until several weeks prior to the activities. Even reasonably foreseeable mining projects in the area cannot generally be included in any of the quantitative cumulative effects analyses because specific development plans have either not been formulated or are not publicly available.

Significance of Residual Cumulative Effects
The comparison of biophysical resource conditions to a regionally recognized and accepted threshold is a critical step in determining the significance of the contribution of Project effects to cumulative effects. Thresholds may be expressed as goals or targets, standards and guidelines, carrying capacity, or limits of acceptable change. Where thresholds exist, the significance of cumulative effects can be determined with relatively high certainty. However, in general, thresholds are yet to be established for most biophysical resources in northern British Columbia. Where available, definitions of thresholds (i.e. acceptable or unacceptable condition of the resource in question) are

provided for relevant biophysical disciplines. In the absence of thresholds, best available information and professional judgement was used to determine significance. In assessing the significance of cumulative effects, the identified land use objectives were also considered (e.g. Dawson Creek LRMP).

For each case where cumulative effects were identified, a determination has been made by WCCC's consultants as to whether the Project contribution to cumulative effects will be responsible for causing an unacceptable shift in the resource to occur. If this is predicted to occur, the Project's contribution to cumulative effects would be considered significant.

4.3. ISSUE RESOLUTION

A number of issues were raised during the review of the Application and by First Nations and the Kelly Lake Communities, agencies and the public. As noted earlier only issues requiring additional information or a response from the Proponent or EAO are addressed in this Assessment Report. However, all issues are identified and the Proponent's or EAO's responses are included in the issues tracking documents in Appendices C, D and E of this report.

5. PROJECT DESCRIPTION AND MINE PLAN

5.1. GENERAL

The Project Description, including the Mine Plan, is provided in Section 3.0 of the Application. The proposed Brule Mine Project will include the following primary components: Brule Mine; Falling Creek Connector Haul Route; Falling Creek Flats Loadout; power supply lines for both the mine and new loadout; and the existing Bullmoose Haul Route.

5.2. BACKGROUND INFORMATION

The Brule Mine will involve the excavation of the Brule and Blind open pits for extracting coal, the development of two large ex-pit waste rock dumps (Southeast and Northeast Dumps) plus backfilling of the Brule Pit, and the construction of ancillary facilities to support the mining activity including a mill site, haul roads, ditches and one new sediment pond. The Southeast Dump will be completed early in mine life and then reclaimed, whereas the Northeast Dump will be active for the life of the mine and is the disposal site for Coarse Coal Reject (CCR) which is not marketable. The total design area of disturbance at the minesite is approximately 635 ha. The total disturbance area, including clearing, is expected to be approximately 700 ha.

The Brule Pit will excavate a northwest trending anticline-syncline structure containing the three coal seams of economic interest. A total of 20.7 Mt clean coals will be produced from this pit. Mining will begin in a starter pit in the center of the pit – north of the Brazion Lateral Line (gas pipeline), then move to the southern limit of the pit, with mining then proceeding from south to north. Dumps have been located to confine disturbance to the Blind Creek watershed as much as possible. The pit was also truncated at the northwest limit to avoid surface drainage to the Mink Creek watershed. The small Blind Pit will be developed during the last year of mining (Figure 3).

Geotechnical constraints utilized in the detailed pit designs were defined by Piteau Associates in July 2002. The dip of the footwall strata was a key influence on the pit design.

The plantsite for the Brule Mine will be located external to the center of the Brule Pit, adjacent to the existing Dillon crushing facility and coal stockpiles. Primary functions at the plantsite will be coal handling, preparation, and storage. Only coarse coal will be washed. Because the very fine coal will not be washed in the plant, neither a coal dryer or a tailings pond is required for the Project. The existing Dillon crushing and coal handling system will be utilized in its current form for the Brule Mine until the new Brule preparation plant is completed.

5.3. REVIEW COMMENTS AND PROPONENT'S RESPONSES

5.3.1. Review Comments

Several review comments on the mine plan were raised by MEMPR and MOE. Most of these were requests for clarification, with several related to construction sequencing. In particular, clarification was requested that mine development activities (beyond timber

clearing) would not occur within the Sediment Pond 2 catchment until that facility and its associated ditching are complete. This was confirmed.

The other primary comments on the mine plan were as follows:
1. *Geotechnical* – MEMPR specified additional information requirements, including detailed designs, to be addressed during permitting.
2. *Oil and gas infrastructure* – MEMPR asked what the alternatives are in terms of mine planning should decommissioning of the Burlington Lateral Line (gas pipeline) and well do not proceed as expected.
3. *Soil stockpile* – MEMPR and MOE questioned the sitting of the single large stockpile, noting concerns related to potential for erosion and mass wasting.

5.3.2. Proponent's Responses

1. *Geotechnical* – WCCC will provide details of planned submissions during Mine Permitting.
2. *Oil and gas infrastructure* – WCCC responded that the detailed mine plan (showing mine phasing modified from the EA submission) to be presented in the Brule Mine Permit Application requires removal of the gas pipeline in March 2010 to allow for orderly mine progression. The mining sequence could be revised to not impact the pipeline beyond this date, however significant changes in waste dump construction sequence would be required, and the changes would impact mine economics and productivity.
3. *Soil stockpile* – WCCC responded that the soil stockpile indicated on the plans will be re-evaluated during preparation of the detailed designs to be submitted as part of the *Mines Act* Permit Application. Other options for soil placement were described.

5.3.3. Proponent's Commitments

The Proponent made the following commitments:
- Water tables in the southeast dump toes will be monitored and remedial action will be taken if an increase in the phreatic (ground water) surface impacts dump stability (Appendix F, #17);
- A qualified engineer will complete permit-level field and lab geotechnical studies, stability analyses, and construction and operating specifications for the Northeast and Southeast waste dumps for review by MEMPR as part of the Mine Permit Application (Appendix F, #18); and
- A qualified engineer will complete permit-level field and lab geotechnical studies, stability analyses, and construction and operating specifications for Sediment Pond 2 for submission to MEMPR and MOE as part of the Mine Permit and Water License Application (Appendix F, #19).

5.4. CONCLUSIONS

Based on the review of the Application and Proponent responses and commitments, MEMPR, MOE, the Independent Consultant and EAO are satisfied that an acceptable level of information on the mine plan has been provided for an Application decision. Detailed mining plans will be required by MEMPR at the permitting stage.

6. CLIMATE, SURFACE WATER HYDROLOGY & GROUNDWATER FLOWS

6.1. GENERAL

Climate, surface water hydrology, and groundwater are addressed in Section 7.0 of the Application. This section describes the approach and methods used in the assessment, existing baseline conditions, the results of Project component specific effects assessments, and recommended monitoring.

Hydrology and groundwater baseline studies and assessments were conducted for the Brule Mine and Falling Creek Flats Loadout components of the Project.

The climate in the Project area is classified as continental sub-humid, with long, cold winters and short, cool summers. Precipitation in northeast British Columbia generally increases with elevation, with mean annual precipitation in the Project region ranging from approximately 500 to 800 mm. Extreme maximum and minimum temperatures are reported in the order of 32.5°C and -42.5°C, respectively. The warmest and coldest months are typically July and January, respectively. The long-term mean annual snowfall for the Brule Mine is estimated to be 325 mm of snow water equivalent (SWE), which equates to over 3 m of snowfall. The spring thaw appears to occur earlier at lower elevations and consequently the maximum snow depths at the loadout are likely slightly less and achieved a little earlier (i.e., in late March as opposed to April) than at the Brule Mine.

6.2. BACKGROUND INFORMATION

Brule Mine

Development at the Brule Mine site will be largely confined to the Blind Creek watershed, with minimal intrusion into the neighboring Mink Creek watershed by small portions of the Brule and Blind pits. The mine structures in the Blind Creek watershed include the Brule and Blind pits, the Northeast and Southeast waste dumps, the soil stockpile, diversion ditches, and Sediment Pond 2. The Northeast waste dump will incorporate the existing Dillon Mine waste dumps, and mine waste from Brule will be backfilled into the existing Dillon Pit. The existing Dillon Mine Sediment Pond 1 will also be used for the Brule Mine. Drainage from the proposed mine facilities will be to Blind Creek via surface water discharges from sediment control ponds as well as groundwater transport. Some groundwater may also drain toward Mink Creek; however the volumes are expected to be very small.

The initial (Phase 1) mining area will drain to the existing Sediment Pond 1 at the Dillon Mine. Development of the Brule Pit to the south of the starter pit area will result in runoff to the southwest – outside of the Sediment Pond 1 catchment - requiring a new sediment control pond (Sediment Pond 2).

Water at the minesite will be sourced from two groundwater wells. Four water wells presently exist at Dillon, including one production well, one camp water well and two observation wells. The existing production well at Dillon is to be used for Brule Mine operations, requiring only one additional production well for the Project.

As part of the development planning and environmental assessment process for the Project, WCCC gathered site-specific and regional climate, flow and groundwater level data, and completed data analyses and modeling using this information. Surface water and hydrogeological studies are described in the Application (Section 7.0). The studies were for the purpose of determining design flow conditions and assessing the effects of mine development on flow conditions in Blind and Mink creeks. The primary tool used to assess potential mine effects on flows was a long-term monthly water balance model that was developed on the basis of available hydrometerologic data and the physical characteristics of the watersheds and mine structures. This model considered both surface and groundwater flows and the interaction between them. A Water Management Plan was also prepared (Section 4.4).

Project-related changes to surface and groundwater flows in the Brule Mine drainage area were modeled to predict potential effects on flows in Blind Creek and Mink Creek. The modeling results indicate that construction of mine facilities - and in particular open pits and waste dumps - will alter the volume and timing of flows in Blind Creek, as follows. Relatively minor changes to flows are predicted in the Application at the specified water quality compliance point on Blind Creek (site BC-01), with the maximum change to the annual runoff volume estimated to be an increase of approximately 4%, and the maximum decrease to low winter flows estimated to be approximately 9%. Changes to Mink Creek flows are predicted to be very small, with the annual flow volume in Mink Creek estimated to be reduced by less than 1%, and flows at the gauging station location on the small North Brule Creek tributary estimated to be reduced by a maximum of 7% in the 1:10 year low flow. Infiltration of source flows from the Brule Pit into the groundwater system of Mink Creek is expected to be extremely small (i.e. the ratio of source to non-source flows at the gauge location is expected to be consistently less than 0.2%). Flow changes to both creeks are expected to be within the natural range of variation, and therefore difficult (and likely impossible in the case of Mink Creek) to detect.

Falling Creek Flats Loadout

The Falling Creek Flats loadout facility located just south of the Pine River between Beaudette Creek to the west and Falling Creek to the east was also included in the assessment. This facility includes the development of a rail loop, coal storage pads, a conveyor/loading system, water supply and sediment control ponds, water supply wells and flood protection berms.

Surface water and hydrogeological studies were conducted for the Loadout using similar approaches to assessments completed for the Brule Mine, but using regional data as opposed to site data, which were adjusted to suit site conditions.

Project-related changes to surface and groundwater flows in the Loadout drainage area were modeled to determine the effects on flows in Falling Creek, Beaudette Creek and the Pine River. The construction of loadout facilities, and in particular water supply wells, was reported in the Application to have very little impact on flows in the neighboring creeks. The Loadout has a total area of approximately 0.6 km^2, which is substantially smaller than the drainages of the potentially affected water courses, which are 135.9 km^2, 106.5 km^2 and >10,000 km^2, respectively. Flood protection berms are located outside the riparian zones of Falling and Beaudette Creeks, and are predicted to

have minimal impact on flows in the creeks, but only during flood flows that top the creeks' banks.

Water management structures at the Loadout were originally designed to be unlined and free draining to facilitate the removal of sediment through exfiltration.

6.3. REVIEW COMMENTS AND PROPONENT'S RESPONSES

During the pre-Application stage, assessment of potential Project effects on fisheries identified the potential for flow changes in Blind Creek to affect fish habitat in lower Blind Creek. Following additional Pre-Application consultation with EAO, MOE, CEAA and DFO, the planned scope of water balance modeling for the Brule Mine was significantly expanded to provide an increased level of detail.

Regulators expressed a preference for restricting mine drainage, and associated hydrology and water quality impacts, to one watershed - particularly as the Mink Creek drainage includes more sensitive aquatic habitats. Following additional discussions and site investigations, WCCC modified the mine plan to restrict surface discharge to Blind Creek.

WCCC concluded that small predicted changes in flows resulting from the overall Project were expected to be irreversible but insignificant from a surface water hydrology/groundwater perspective within the local study area (<10% impact on flows), and negligible within the regional study area. Mine development will generally result in an increase in groundwater discharge in open pit areas and an increase in groundwater recharge in waste dump areas, with corresponding increases in groundwater discharge down-gradient of dumps. The net effect is that the annual average volume of runoff is expected to increase, reaching a maximum increase at the end of mine life of approximately 4%.

6.3.1. Review Comments

Hydrology and groundwater comments and questions on the Application included the following:

1. *Adequacy of mine site water balance* - MEMPR considered the groundwater component of the Mine Site water balance model to be insufficient to estimate flows and pathways of groundwater to the degree required.
2. *Potential for mine effects on flows in Mink Creek*- MEMPR stated that the effects of Mine development on the hydrology of Mink Creek were not adequately addressed.
3. *Confirmation of mine effects on low flows in Blind Creek*- DFO requested assurance that winter low flows in Blind Creek would be monitored to assess the accuracy of predicted impacts.
4. *Adequacy of prediction of loadout effects on flows in neighboring creeks*- MEMPR and MOE considered the groundwater component of the Loadout water balance model to be insufficient to estimate flows and pathways of groundwater to the degree required, either to predict flow effects, or to predict and monitor associated water quality effects on Falling and Beaudette Creeks and the Pine River.
5. *Need for minesite groundwater monitoring during operations* – MEMPR and MOE raised concerns with respect to the need for groundwater monitoring down-gradient of the major waste dumps to provide for early detection of water quality degradation.

6. *Flow Monitoring* - the Independent Consultant suggested integration of flow monitoring for the Sediment Pond discharges with surface water and sediment quality monitoring.

Other agency comments on hydrology/groundwater related to clarification of various aspects of the water balance model and the water management plan. Responses are provided in the tracking tables.

6.3.2. Proponent's Responses

1. *Adequacy of mine site water balance* - WCCC reviewed the basis of the modeling in detail with reviewers, and provided the required information and clarifications to satisfy MEMPR, MOE and DFO reviewers that the water balance model developed for the Mine Site was reasonable, appropriate and valid for estimating groundwater and surface water flows and pathways, and for the purpose of assessing potential Mine effects on flows in both Blind Creek and Mink Creek. Additional mapping of pre and post-mining minesite groundwater flow directions was provided in support of the model.
2. *Potential for mine effects on Mink Creek flows* - WCCC mapping of pre and post mining groundwater flow directions, an improved map demonstrating the degree of encroachment of the Brule and Blind pits into the Mink Creek drainage, and additional calculations of surface and groundwater effects were provided to support the conclusion that Mine development only has the potential for minor reductions to flows in Mink Creek.
3. *Confirmation of mine effects on low flows in Blind Creek* - It was agreed by reviewers that, because likely flow changes are small and year-to-year variations in flow are large, accurate determination of flow effects would not be practical. WCCC committed to monitoring to determine whether observed changes in flow are generally low, as predicted; or whether significant changes are observable. WCCC provided a plan to collect concurrent winter low flow spot measurements in Blind Creek and in a nearby reference stream of similar size, and committed to providing DFO with an annual report on the winter low flow monitoring data and an assessment of the flow model prediction accuracy and net impact to fish habitat within Blind Creek, based on low flow assessments. If enhancement is determined to be required by DFO, WCCC will consult with MOE and DFO to determine acceptable enhancement options (Appendix F, #50)
4. *Adequacy of prediction of Loadout effects on flows in neighbouring creeks* - WCCC committed to sampling and testing the water quality of runoff from existing Dillon Mine coal stockpiles in conjunction with Effluent Permitting to assess whether or not runoff from coal stockpiles, in undiluted form, would pose a significant risk to the receiving aquatic environment at the Loadout. If a significant risk is determined, WCCC will construct the Loadout coal pad from compacted till and line the receiving ditches and pond. Coal pile runoff would then be collected by and passed through the lined system, to be discharged directly into the Pine River where no impacts are expected. If the ditches and pond are unlined, it is agreed by WCCC that a total of one up-gradient and three down-gradient groundwater monitoring wells will be installed at the Loadout and monitored throughout operations. (Cline Resources has installed wells at this site, and WCCC would not establish duplicate wells.) With this commitment, there is no need for detailed site specific groundwater modeling to support water quality prediction or monitoring. The existing model, which is based on site-specific basin characteristics and regional climate and streamflow data, is

adequate for determining that water requirements for the Loadout will not have a significant impact on flow rates in Falling Creek, Beaudette Creek or the Pine River.

5. *Need for minesite groundwater monitoring during operations* - The close proximity of the toes of the Northeast and Southeast Dumps to SP1 and SP2, and to Blind Creek and Trib 3, respectively; and the fact that these dumps are both constructed from the bottom up; means that the potential value of groundwater monitoring as an early indication of metal leaching problems is much reduced. Monitoring of seepage from dump toes and surface water quality at the sediment ponds will serve the function of detecting potential problems. WCCC committed to operational monitoring of groundwater seeps and to groundwater quality monitoring at the existing well at SP1 (water supply for the floc plant). Additional groundwater monitoring wells will be established on a contingency basis only, if and when surface water, groundwater, and effluent monitoring indicates the need to do so to provide information for enhanced management planning.
6. *Flow monitoring* – WCCC agreed, and indicated that flow data will be collected for both SP1 and SP2.

6.3.3. Proponent's Commitments

The Proponent made the following commitments:

- WCCC will maximize the recycling and reuse of water used in industrial operations at the mine where practical (Appendix F, #32);
- WCCC commits to having a flow measuring system in place for SP2 prior to discharge (Appendix F, #33);
- The continuous flow monitor will continue to record flows during the ice free period at BC-01 (Appendix F, #47);
- WCCC will conduct spot flow measurements during the winter low flow period on both Blind Creek and a (yet to be determined) analogous reference creek (Appendix F, #48);
- WCCC will consult with DFO on the proposed Blind Creek winter low flow measurement program prior to its implementation (Appendix F, #49); and
- WCCC will provide DFO with an annual report on the winter low flow monitoring data and an assessment of the flow model prediction accuracy and net impact to fish habitat within Blind Creek, based on low flow assessments. If enhancement is determined by DFO, WCCC will consult with MOE and DFO to determine acceptable enhancement options (Appendix F, #50).

6.4. CONCLUSIONS

Based on the review of the Application and Proponent responses, MOE, MEMPR, DFO, the Independent Consultant and EAO are satisfied that the proposed mitigation measures and commitments should prevent or reduce to an acceptable level any potential significant adverse effects of the proposed Project on surface and groundwater hydrology.

7. WATER QUALITY AND AQUATIC BIOTA

7.1. GENERAL

Water quality and aquatic biota are addressed in Section 8.0 of the Application. Surface water quality, groundwater quality, sediments, benthos and periphyton were assessed relative to the proposed mine site and the Falling Creek Flats Loadout.

The primary water quality issues of concern for the proposed Project relate to the potential for metal leaching and acid rock drainage (ML/ARD) associated with the weathering of waste rock and pit-surfaces. Parameters of relevance which are predicted to be leached from waste rock include sulphate, trace elements (including selenium), as well as major ions (magnesium, calcium, etc). Other components relevant to the water quality assessment include suspended solids/turbidity, the leaching of residual nitrogen-based blasting residues, dust inputs, process chemicals, sewage management, suspended solids, and flocculent toxicity. Potential negative effects resulting from water quality alterations include: exceedences of aquatic life criteria; exceedences of drinking water criteria; shifts in nutrient regime/trophic status; chronic toxicity (decreased productivity, decreased fecundity, *etc.*); loss of habitat; and habitat avoidance.

Baseline conditions with respect to aquatic resources (fish and fish habitat, sediments, periphyton, and benthic invertebrates) for the Brule Mine (the Mine Site) and Falling Creek Flats Loadout (the Loadout) are presented in Sections 8.2.1 and 8.4.1, respectively, of the Brule Application.

The objectives of the baseline water quality environmental assessment were to: 1) provide a database of physical, chemical, and biological parameters that can be used to predict and monitor the significance of effects of mining on the surrounding environment; 2) develop mitigative activities related to mine construction, operation and post-closure, and; 3) to develop a sufficient overview of local surface water to allow the setting of area-specific water quality objectives.

Information on geochemical characterization and the potential for Metal Leaching and Acid Rock Drainage (ML/ARD), including prevention, management and monitoring, is presented in Section 4.5 of the Brule Application. The residual effects assessment relating to water quality and associated aquatic resources for the Mine Site and Loadout are presented in Sections 8.2.2 and 8.4.2, of the Application, respectively.

7.2. BACKGROUND INFORMATION

In order to assess the potential impacts resulting from mine-site discharges to aquatic resources, a mass balance approach was used in the Application to predict the residual impacts to water quality for varying flow conditions (sections 8.2.2 and 8.4.2 of the Application). Residual Project effects to aquatic resources were assessed with respect to: 1) water quality; 2) aquatic biota; 3) fish and fish habitat; and 4) water birds. The assessment addressed all parameters which will be potentially affected by mining activities, including nitrogen compounds, trace elements (including selenium), sulphate, total suspended solids/turbidity, dust (including coal dust), chemicals, phosphorus, surface flows and flocculants.

During construction, mine-related loadings of those parameters associated with waste rock exposure (nitrogen, sulphate, trace elements) will be minor due to the low volumes of waste material generated. Loadings will increase during the operational period as the volume and footprint of the wasterock dumps increase. Loadings are likely to peak either late in operations or during the closure period.

Water quality impact predictions for Blind Creek presented in the Application indicate that sulphate, selenium and cadmium have the greatest potential to exceed aquatic life guidelines in surface waters. Nitrate levels are predicted to exceed the BC drinking water guideline in Blind Creek. In contrast, the results indicate that mining-related loadings from the Brule Project will have only a minor to immeasurable influence on surface water quality in the Sukunka River. Accordingly, there are no predicted cumulative effects with respect to downstream aquatic resources. Predictions levels of sulphate and selenium in Blind Creek are predicted in the Application to have little significance with respect to aquatic resources.

The major concern related to selenium is the potential for bio-accumulation through the aquatic food chain, which can be potentially hazardous to fish and water birds if concentrations reach high levels. High selenium tissue levels can result in juvenile abnormalities and/or embryo death. The wildlife species most at risk from selenium include fish, waterfowl and other birds such as the American Dipper which feed on fish and/or aquatic invertebrates. The most significant exposure pathway for organisms is through diet, and therefore the potential for bioaccumulation and toxicity will depend on the food chain pathway. Site-specific differences in selenium toxicity can be significant, relating to the forms of selenium present, conditions of the aquatic environment (flow rates, water depth, substrate, etc.) and the types of biological communities and species present. Selenium accumulation is of less concern in flowing water systems (creeks, streams and rivers) than in stagnant water systems (wetlands, backwaters, and oxbows).

Selenium will be elevated in mine runoff and result in elevated concentrations in Blind Creek (a very small drainage). Changes in concentrations in the Sukunka River will be minor. Based on experience at other minesites in Western Canada, the levels of selenium expected are not expected to have significant adverse effects on the aquatic resources in Blind Creek; however, predicted levels are high enough that an enhanced level of monitoring, and adaptive management, are proposed.

In addition to WCCC's Selenium Management Plan, outlined in Application (Section 4.1.3.6) and discussed in Chapter 16 (16.2.2 of this Assessment Report), the Proponent has committed that selenium concentrations will be managed by controlled placement of coarse coal rejects during mine operation and by the timely reclamation of waste rock facilities with soil and vegetation covers which will reduce water infiltration and selenium discharge from those waste rock facilities. This selenium source management will be part of adaptive management, defined in a selenium management plan that includes regular seep and groundwater monitoring (Appendix F, #119). WCCC will monitor the selenium concentrations in whole body tissues in juvenile rainbow trout, the main bio-indicator for this project, in Blind Creek for the first two years of production at the Brule Mine, and after that on a schedule to be agreed with MOE. Limited collections of bull trout are also proposed to establish a baseline for this species. If tissue selenium levels increase beyond two standard deviations of background tissue levels, then a literature review will be conducted to review the state of the science with

respect to whole body tissue threshold levels that are protective for rainbow trout. Based on findings, the need for additional site specific studies, which may include reproductive assessment, will be determined. Study design will take into account movements of adult and juvenile rainbow trout in relation to Blind Creek (Appendix F, #113). Under the adaptive management program, WCCC has committed to define and undertake further mitigation measures to address unacceptable effects, if required.

Worst case predictions for total cadmium in Blind Creek exceed BC Aquatic Life Guidelines. Pre-mining baseline values are also characterized by a natural degree of enrichment, with many values also exceeding aquatic life guidelines. Given the order-of-magnitude safety factor built in to aquatic life guidelines, and the likely complexation mechanisms which will occur in the receiving environment (binding to particles, organic complexation with dissolved organic carbon, etc.), the likelihood of ecological effects resulting from cadmium exposure is low. In order to further assess the site-specific assimilative capacity of cadmium in Blind Creek, and to better assess the significance of the water quality predictions, site-specific water quality objectives were developed for cadmium using methods approved by the MOE. The results of this program are presented in Appendix D2.6 of the *Brule Post-Application Agency Issue Response Compendium*, which is posted on the EAO Project Website.

The results of the residual effects assessment for the Loadout strongly indicate that effects on receiving water courses with respect to aquatic resources will be negligible. Accordingly, there is an extremely low likelihood that activities at the loadout will contribute cumulatively to other anthropogenic effects in the Pine River watershed. Such conclusions relate to the fact that water quality predictions showed only minor effects to the Pine River.

7.3. REVIEW COMMENTS AND PROPONENT'S RESPONSES

7.3.1. Review Comments

Most comments pertaining to water quality and aquatic biota were raised by MOE, with additional (mainly clarification) questions provided by the Independent Consultant. Some questions on water quality (as it related to ML/ARD) were also provided by MEMPR and the public. Many of the comments and questions were requests for clarification on sampling methods, and modeling procedures, and assessment methods and assumptions. The following summarize the major issues raised during review of the Brule Application:

1. *Baseline data collection* - Issues were raised by MOE and the Independent Consultant over the level of detail with regards to the sampling methods for both sediment and water samples.
2. *Data for the Dillon Main Sedimentation Pond (MSP)* - MEMPR and MOE raised concerns that based on the current metals data for the MSP at Dillon, the potential for near-neutral (as opposed to acid or basic conditions) metal leaching has been underestimated for the proposed Brule Mine site.
3. *Flow scenarios modeled as part of the effects predictions* - MOE was concerned that flow scenarios modeled did not encompass the worst-case flow scenarios which offer the least dilution of mine waters. Specifically, the flow conditions modeled did not include 30-day nor 7 day low flows for a 1 in 10 dry year (30Q10 and 7Q10 flows).
4. *Use of seasonal-specific baseline data in impact predictions* - MOE suggested that the water quality predictions should have used season-specific baseline data in the

impact predictions. For the Application, mine-derived loadings were mixed with "mean annual" loadings in the receiving environment (i.e., low-flow and high-flow values were not used).

5. *Parameters modeled as part of impact assessment* - MEMPR highlighted that certain parameters with aquatic life guidelines were not modeled as part of the impact assessment (*e.g.*, hardness, barium, fluoride, manganese and thallium).
6. *Source terms used in the impact calculations* - The issue was raised by MEMPR that the source concentrations for flows in contact with waste materials may require revision.
7. *Model predictions for mixing zone in Sukunka River* - Although WQ predictions for the Sukunka River show little measurable effect from the Brule Project after complete mixing, MOE asked questions about predicted concentrations in the initial mixing zone of Blind Creek in the Sukunka River. MOE requested that WCCC model the mixing zone by assuming only a 10-fold dilution of Blind Creek flows.
8. *Potential for selenium effects in Blind Creek* - MOE, MEMPR and the Independent Consultant raised concerns regarding predicted selenium concentrations and the potential for ecological effects in Blind Creek.
9. *Sediments* – MOE had questions and concerns about: 1) the poor element recoveries for certified reference materials; 2) methods for sediment collection and analysis (e.g., grain sizes analyzed); and 3) the need to include PAHs in the effects analysis.
10. *Water quality objectives and point of compliance* – MOE expressed concern that limited number of winter sampling results prior to the start of Dillon Mine construction (for 2002 and 2004) will not be sufficient to allow the establishing of water quality objectives. Considerations for the establishment of water quality objective points (mixing and access) were also raised.
11. *Water quality impacts to Mink Creek* – MEMPR and MOE had concerns regarding the potential for water quality impacts to Mink Creek resulting from the introduction of pit-influenced groundwaters.
12. *High TSS (Total Suspended Solids) levels in groundwater samples* – MOE expressed concern that high levels of TSS in groundwater limit the applicability of these data, and in particular, may effect the water quality effect predictions.
13. *Period of baseline data collection for water quality* – MOE questioned whether data collected during 2005 (period of Dillon operations) can be included as baseline data.
14. *Potential for WQ impacts to Beaudette and Falling Creeks* – Concern was raised by MOE and MEMPR over the potential for Loadout-influenced groundwater to affect Beaudette and Falling Creeks.

7.3.2. Proponent's Response

1. *Baseline data collection* – Additional details of sampling methods for both water and sediments were provided.
2. Data for the Dillon Main Sedimentation Pond (MSP) – Examination of the current concentrations in effluents from the small Dillon mine site have been evaluated (Appendices D1.5 and D2.2 of the Brule Post-Application Agency Issue Response Compendium). A major point of clarification was that the predicted values reported in the Dillon Effluent Permit were incorrectly reported as "total" levels. These values should in fact have been reported as "dissolved". Accordingly, comparison of the total levels in MSP discharges to the predicted values is not meaningful. Dissolved metal levels in MSP effluents were underestimated as part of the Dillon predictions for nickel, and to a lesser extent for arsenic and molybdenum. However, these values have been re-visited as part of predictions for Brule, based on a large site-specific data set as well as regional

values. Further input from MEMPR into the source term evaluation was also used to refine predictions (For further discussion on this matter and acceptance by MEMPR and MOE of this approach, refer to Use of Dissolved and Total Metal Loadings in Predictions at the end of 7.3.3, below)

3. *Flow scenarios modeled as part of the effects predictions* – As per the request of MOE, additional flow scenarios have been modelled including 30Q10 flows (mean monthly flows for 1 in 10 dry years). The scenarios modelled also take into account those conditions which exhibit the lowest ratios of non-source flow to source flow (scenarios which afford lowest dilution of mine waters).The results of the revised sulphate results are presented in Appendix D2.5 of the *Brule Post-Application Agency Issue Response Compendium*. The revised water quality predictions show generally higher values for most parameters in comparison to those presented in the Brule Application. However, the results do not affect the residual effects ratings. The revised water quality predictions for Blind Creek show several parameters which exhibit values above aquatic life guidelines, including nitrate, sulphate, dissolved aluminum; total barium, total cadmium, total chromium, total cobalt, total fluoride, total iron, and total selenium. For all of these parameters, the likelihood of adverse residual effects is considered to be low, given the minor deviations above guidelines for most parameters, and given our understanding of contaminant toxicity. Dissolved aluminum, sulphate and selenium will require special management given that these parameters are most likely to exceed their respective aquatic life guidelines. With regards to on-going management, filtration and dialysis methods will be used to better quantify the truly dissolved aluminum fraction in Dillon mine waters. Data gathered to date suggest that a significant portion of the filterable fraction exists as small-diameter aluminum particles (colloids) which pass through standard 0.45 micron filter. For sulphate, toxicity test work will be conducted to establish a site-specific water quality objective for sulphate when concentrations in Blind Creek approach the100 mg/L water quality guideline. It is also anticipated sulphate management at Brule will benefit from the results of the sulphate toxicity program initiated by MOE on mine-affected waters in northeast B.C. With regards to selenium, steps will entail those outlined in the Selenium Management Plan. WCCC has committed to address future water quality issues, should they arise, through mitigation or treatment to the satisfaction of MOE.
4. *Use of seasonal-specific baseline data in impact predictions* – As per the suggestion of MOE, seasonal specific baseline values have been incorporated into the revised modelling results. The inclusion of such information affects both: a) the modelling results (*e.g.,* high flows are characterized by higher total metal levels); and b) aquatic life guidelines for parameters which exhibit hardness-dependent values. The results of the revised modelling results are presented in Appendix D2.5 of the *Brule Post-Application Agency Issue Response Compendium*.
5. *Parameters modeled as part of impact assessment* – As per the suggestion of MEMPR, additional parameters have been included which were not included in the initial modelling exercise (hardness, barium, fluoride, manganese and thallium). The results of the revised modelling results are presented in Appendix D2.5 of the *Brule Post-Application Agency Issue Response Compendium*.
6. *Source terms used in the impact calculations* – Through discussions with MEMPR, revised source terms for waters in contact with PAG/PML materials were generated. These values are reflected in the water quality predictions. The results of the revised modelling results are presented in Appendix D2.5 of the *Brule Post-Application Agency Issue Response Compendium*.
7. *Model predictions for mixing zone in Sukunka River* – In order to predict the water quality changes in the Sukunka River in the immediate mixing zone of Blind Creek, the revised modelling results included predictions assuming only a 10-fold dilution of

Blind Creek waters. The results of the revised modelling results are presented in Appendix D2.5 of the *Brule Post-Application Agency Issue Response Compendium*.

8. *Potential for selenium effects in Blind Creek* – In terms of special management for selenium, steps will entail those outlined in the revised Selenium Management Plan presented in section 3.2.6 of *the Brule Post-Application Agency Issue Response Compendium*. This program includes a variety of operational measures, including water quality and sediment monitoring, a program of analysis of biological tissues for selenium, including annual analyses for at least the first two years following initiation of mining, as well as mine waste management, water management, and reclamation measures to reduce selenium release. WCCC has also committed to address future selenium issues, should they arise, through mitigation or treatment.
9. *Sediments* – The topic of poor element recoveries for certified reference materials was resolved through explanation of the methods used for sediment analysis, which involved screening to 2 mm followed by aqua regia (mild acid) digestion. This digestion does not yield quantitative element recoveries. Rather, this method liberates the "environmentally available" metal fractions. Methods for sediment collection were described in more detail. Resolution of the PAH (polyaromatic hydrocarbons) issue was resolved during the April 4 meeting with MOE. Specifically, given the fact that coal-based PAH has relatively low bioavailability, and natural variability is high, monitoring was recommended rather than setting sediment quality objectives.
10. *Water quality objectives and point of compliance* – Given that the low-flow values exhibit relatively little variability, the available winter low-flow values will be sufficient for the generation of water quality objectives (WQO). It was agreed that a WQO site near BC-01 (water monitoring station) will require careful consideration to mixing and access. Station BC-01 is the preferred point for a compliance (water quality) point on Blind Creek.
11. Water quality impacts to Mink Creek: Water balance considerations demonstrate that mine effects on water quality in Mink Creek will be minimal. Specifically, the pit design will ensure that very little groundwater originating from within the pit will enter the Mink Creek drainage. Any source flows reporting to Mink Creek can be expected to be diluted by over two orders of magnitude. In order to verify the assumption that water quality effects to Mink Creek will be negligible, quarterly sampling of sulphate and selenium has been proposed on North Brule Creek downstream of the pit source areas. Both sulphate and selenium are sensitive indicators of waste rock/pit slope weathering, and therefore quarterly monitoring of these parameters will provide an effective means to measure mine-related effects.
12. *High TSS (total dissolved solids) levels in groundwater samples* – High TSS has been observed in the groundwater samples. However, groundwater data have an insignificant influence on the water quality predictions for sediment ponds and Blind Creek.
13. *Period of baseline data collection for water quality* – The data collected between April and December 2005 cannot be considered baseline given that the mine-related effects have been observed since early 2005. Accordingly, the only reliable baseline data extend to the end of 2004 (See Appendices D1.5 and D2.2 of the *Brule Post-Application Agency Issue Response Compendium*).
14. *Potential for WQ (water quality) impacts to Beaudette and Falling Creeks* – Water quality modeling predictions were conducted for both Beaudette and Falling Creeks. The results are presented in Appendix D2.1 of the Brule Post-Application Agency Issue Response Compendium. In general, predicted values for both creeks differ only marginally from background values, and demonstrate that only a small fraction

of the assimilative capacity is consumed by the loadout development. The latter has relevance to the potential for cumulative effects associated with other future developments in this area.

In addition, WCCC committed that if coal leachate water quality indicates that the stockpile runoff is judged at permitting to be unacceptable for discharge to groundwater, the loadout stockpile will be constructed with a low permeability till liner, and the west ditch and pond will be lined.

7.3.3. Proponent's Commitments

The Proponent made the following commitments:

- WCCC will sample and test the water quality of runoff from existing Dillon Mine Coal Stockpiles as an input to defining the source term for the Loadout coal stockpiles for Loadout Effluent Permit Application (Appendix F, #13);
- WCC will provide the results of ongoing kinetic testwork (including barrel leach tests) as part of the Mines Act permit application to confirm earlier prediction work (Appendix F, #104). If the kinetic testwork does not confirm earlier predictions, provincial regulatory agencies may request additional testing work, modification of waste management practices and/or further mitigation, including treatment;
- WCCC will conduct a shake flask test to predict runoff quality for coal that will sit on the ground at the loadout prior to Effluent Permit Application. If leachate water quality indicates that the stockpile runoff is judged, at permitting, to be unacceptable for discharge to groundwater, the loadout stockpile area will be constructed with a low permeability liner and the West ditch and pond will be lined. (Appendix F, #46);
- As a precautionary measure, Coarse Coal Rejects (CCR) material will be placed in a controlled manner in the Northeast Dump to mitigate the potential for acidic generation and metal leaching (Appendix F, #14);
- WCCC will commit to ensure that dump development schedules provide for adequate neutralization potential from prime waste is available for the CCR during all years of operation (Appendix F, #15);
- Low detection limit analyses for mercury will be conducted on one suite of humidity cell samples (Appendix F, #16);
- WCCC will maximize recycle and reuse of water used in industrial operations at the mine where practical (Appendix F, #32);
- WCCC commits to having a flow measuring system in place for SP2 prior to discharge (Appendix F, #33);
- Sediment Pond 2 and the East and South Brule ditches will be in place for the start of mining in the southern extent of the Brule Pit (Appendix F, #34);
- No significant water quality impacts are predicted for Mink Creek. WCCC will, however, conduct limited water quality verification monitoring at Mink Creek; timing and scheduling to be decided at permitting (Appendix F, #39);
- As part of any future groundwater programs designed to monitor changes in groundwater chemistry at the minesite, the historic data set will be re-evaluated (Appendix F, #40);
- Groundwater quality of the well located at SP1 will be monitored to assess potential groundwater impacts of the Northeast Dump (which includes CCR storage) (Appendix F, #41);
- Sulphate test work will be conducted during operations to establish a site-specific water quality objective at the minesite, at such time as sulphate levels rise towards the 100mg/l objective (Appendix F, #42);

- Loadout - if the ditches and pond are unlined, WCCC will ensure that there is a total of one up-gradient and three down-gradient groundwater monitoring wells during WCCC operations at site (Appendix F, #43);
- Quarterly *C. dubia* toxicity testing will be conducted in the first year at Brule for the discharge from SP1, and requirements for effluent toxicity testing reviewed with MOE following the first year (Appendix F, #44);
- If concentrations of nitrate, or other water quality parameters, exceed the Canadian Drinking Water Quality Guidelines, WCCC will post signs at the confluence of Blind Creek and the Sukunka River noting that the water is non-potable (Appendix F, #45);
- Results of 2005 Brule Benthic invertebrates sampling will be reported when data becomes available (Appendix F, #51);
- WCCC agrees to review the 2005 aquatic sampling results and confirm sampling programs with MOE prior to 2006 sampling (Appendix F, #52);
- Photos will be taken to document sample sites and communities during the 2006 Brule benthos and periphyton study program (Appendix F, #53);
- Additional rainbow trout will be collected in Blind Creek in 2006 and tissue metal levels analyzed as part of the Selenium management plan for Brule (Appendix F, #54);
- WCCC will sample Blind Creek for selenium speciation in spring 2006 (Appendix F, #55);
- The Selenium Management Plan will be revised so that both periphyton and benthos (and fish) tissues are measured for at least the first two years following initiation of mining (Appendix F, #56);
- On a contingency basis WCCC will address unacceptable biological effects of selenium (Se), if any through mitigation or treatment (Appendix F, #57). While DFO does not consider the direct deposition (piping of sediment pond discharge directly to the Sukunka) of substances that exceed the Water Quality Guidelines into the Sukunka River to achieve greater dilution factor an acceptable mitigation measure, Provincial regulator agencies have indicated they may consider this option under certain circumstances. Cover effectiveness will be assessed during the mine life and if not sufficiently effective in minimizing leaching from the waste dumps into the receiving aquatic environment to the degree sufficient to protect aquatic resources, additional mitigation may be required by regulator agencies, including treatment. The effectiveness of treating low concentrations (of selenium for example) will need to be demonstrated before treatment is acceptable to the regulatory agencies;
- WCCC commits to the establishment of a biological/sediment baseline in the area of the loadout (Appendix F, #58);
- Sediment Quality Objectives (SQO) for PAHs (Polyaromatic hydrocarbons) will be developed during mine permitting based on 2 Standard Deviations of baseline (Appendix F, #59);
- PAH data will be normalized to Particle Size Distribution in future assessments (Appendix F, #60);
- WCCC commits to complete riprapping and outer surfacing of SP2 prior to influent flow (Appendix F, #105);
- A Surface Erosion Prevention and Sediment Control Plan (with detailed mapping, including location and distance from Trib 3) will be prepared and implemented prior to mining from the “potential riprap borrow area”. (Appendix F, #106);
- WCCC commits that disturbances from the “potential riprap borrow area” for SP2 will not cause Blind Creek sedimentation to exceed objectives. (Appendix F, #107);
- WCCC commits to meeting Water Quality Objectives for TSS/NTU at the agreed WQO site on Blind Creek (Appendix F, #108);

- WCCC agrees to repeat RBT sampling in Blind Creek in 2005; to conduct Rbt sampling in the Sukunka River as a one-time baseline program; and to conduct one-time baseline sampling of Bull trout. (Appendix F, #109);
- WCCC will monitor the selenium concentrations in whole body tissues in juvenile rainbow trout in Blind Creek for the first two years of production at the Brule Mine, and after that on a schedule to be agreed with MOE. If tissue selenium levels increase beyond two standard deviations of background tissue levels, then a literature review will be conducted to review the state of the science with respect to whole body tissue threshold levels that are protective for rainbow trout. Based on findings, the need for additional site specific studies, which may include reproductive assessment, will be determined. Study design will take into account movements of adult and juvenile rainbow trout in relation to Blind Creek. (Appendix F, #113); and
- Minesite selenium concentrations will be managed by controlled placement of coarse coal rejects during mine operation and by the timely reclamation of waste rock facilities with soil and vegetation covers which will reduce water infiltration and selenium discharge from those waste rock facilities. This selenium source management will be part of adaptive management, defined in a selenium management plan that includes regular seep and groundwater monitoring. (Appendix F, #119).

Use of Dissolved and Total Metal Loadings in Predictions

During the review of the Application, MOE and MEMPR requested clarification regarding the prediction of water quality in receiving water courses through a mass balance approach in which "dissolved" loadings from the mine site were combined with "total" loadings in the receiver.

WCCC responded that this approach is standard within British Columbia, Canada and abroad, the basis for which relates to important considerations with respect to assessment methods and metal bioavailability. MEMPR and MOE reviewers requested during the review that WCCC model the total metal loadings emanating from the mine site (e.g., particle export), which had not been considered as part of the impact assessment. This topic was discussed at length by the Working Group, and after discussions, the initially proposed methodology was accepted as appropriate for the project. The considerations put forward by the proponent on this issue are briefly outlined below.

First, predicting the total metal loading from a mine site would require predicting how sediment export from the site would change during the transition from undisturbed lands to full mine disturbance. However, meaningful methods to achieve this are currently lacking. Such an exercise would require a detailed examination of potential sediment source areas pre and post mining, and quantification of how sediment export from such source areas would be mitigated through water management (erosion control and sedimentation plan) during mining. In general, there is a high-degree of uncertainty associated with the assumptions used to generate sediment export predictions, and as such, these methods are limited in their application to environmental assessments.

Second, combining the "dissolved" loading from the mine site with the "total" loading in the receiving environment is consistent with the objective of environmental assessment from the perspective of metal bioavailability. Specifically, it has been well understood for several decades that particle-bound metals represent a poor proxy for metal bio-availability (and hence toxicity). In many environments, the "dissolved" metal fraction

can also greatly over-predict that fraction which is bio-available. Given that the objective of the impact assessment is to assess the likelihood of ecological effects to aquatic biota, the addition of a “dissolved” loading presents the most scientifically-defensible approach for predicting the probability of adverse ecological effects. In fact, this approach imparts a level of conservatism into predictions given that a fraction of the “total” metal inventory in the receiver will be present as particulate phases and largely unavailable to aquatic biota. Nevertheless, this method does not consider that some portion of the minesite particulate metal load may become soluble or otherwise bioavailability.

Third, data collected in support of metal leaching and acid rock drainage (ML/ARD) assessments are generated as dissolved values (e.g., field bins, humidity cells) as such measurements are more representative of the metal leaching properties of rocks. The purpose of ML/ARD testwork is not to predict the erosional characteristics of the disturbance footprint, but rather to predict the leachate characteristics over time.

MOE and MEMPR reviewed these considerations, namely the lack of meaningful methods for estimating sediment export, the principles of metal bioavailability, and ML/ARD testwork methods, and agreed that combining the dissolved metal loading from the mine with the total metal load in the receiving environment was an appropriate means to assess the likelihood of adverse ecological effects to aquatic biota. The agreement reflects MOE and MEMPR acknowledgement that practical methods for accurately assessing the potential bioavailability of particulate metals are not available. WCCC has agreed that water quality objectives in Blind Creek, other than for aluminum, will be based on the total metal fraction.

7.4. CONCLUSIONS

Based on the review of the Application and Proponent responses, MOE, MEMPR, DFO, the Independent Consultant and EAO are satisfied that the proposed mitigation measures and commitments should prevent or reduce to an acceptable level any potential significant adverse effects of the proposed Project on water quality and aquatic biota.

8. FISHERIES AND AQUATIC HABITAT

8.1. GENERAL

Fisheries and aquatic habitat are addressed in Section 8.0 of the Application. Surface water quality, groundwater quality, sediments, benthos and periphyton, and fish distribution and habitat use were investigated relative to the Brule mine and the Falling Creek Flats Loadout. Fisheries resources assessments were also conducted for the Falling Creek Flats Connector Haul Route and the mine and loadout power lines.

8.2. BACKGROUND INFORMATION

8.2.1. Brule Mine

Development at the Brule Mine site will be primarily confined to the Blind Creek watershed, with minimal intrusion (minor fingers of the Brule and Blind Pits) into the neighbouring Mink Creek watershed. Blind Creek enters the lower Sukunka River approximately 32 km upstream of the confluence with the Pine River and 5 km downstream of Sukunka Falls. All Blind Creek stream reaches in and adjacent to the proposed Brule Mine footprint are non fish-bearing as a result of an impassable barrier located on lower Blind Creek approximately 4.3 km upstream of its mouth. The lower two reaches of Blind Creek are accessible by fish from the Sukunka River and provide spawning and juvenile rearing habitat for non-indigenous rainbow trout, and limited seasonal rearing potential for low densities of juvenile mountain whitefish and bull trout.

Baseline fisheries resources studies and effects assessments were conducted as part of the development planning and environmental assessment process for the Project. Multiple site fisheries assessments were conducted to confirm the extent of fish habitat within Blind Creek and adjacent portions of Mink Creek, and to confirm seasonal use. Habitat suitability in Reach 1 of Blind Creek was found to be limited by subsurface flow, which results in annual dewatering of portions of the channel in late summer during most years. Late summer dewatering was found to prevent the emigration of young-of-the-year rainbow trout from the stream and to result in significant stranding mortality. Continuous surface flow is present in Reach 2 of Blind Creek and juvenile rainbow trout and bull trout remaining in this portion of the stream after dewatering on lower Reach 1 appear to over-winter successfully.

A small portion of the proposed Brule Mine development will extend across the height-of-land from the Blind Creek drainage into the headwaters of an unnamed tributary to Mink Creek, referred to as “North Brule Creek”. Under the mine development plan, surface run-off within a small area of the mine footprint, which now drains to Mink Creek, will be directed to the Blind Creek watershed, thereby minimizing potential effects of mine operations on Mink Creek surface water quality. There is potential for small quantities of Brule Pit groundwater to flow to North Brule Creek and Mink Creek, however these flows are expected to be sufficiently small that significant adverse effects on water quality of these creeks is not expected (refer to hydrology and water quality discussions in Application sections 5 and 6). Similarly, the surface water flow volumes diverted from the Mink drainage to the Blind Creek drainage are expected to be sufficiently small that no significant effects to fish or fish habitat are predicted as a result of flow alteration.

Mink Creek is a tributary to Brazion Creek, which forms a sub-basin of the Burnt River watershed, the largest tributary to the lower Sukunka River. Water from the Mink, Brazion and Burnt systems enters the Sukunka River 4.2 km upstream of the mouth of Blind Creek. A 2 metre (m) impassable barrier is located on Brazion Creek approximately 4 km upstream of its confluence with the Burnt River, preventing fish movement into the upper Brazion drainage. Geographically and genetically isolated resident populations of bull trout and slimy sculpin exist upstream of this barrier and inhabit upper Brazion Creek and its major tributaries, including Mink Creek. The mouth of Mink Creek is located 2.8 km upstream of the impasse. The progeny of rainbow trout stocked in Iver Lake, the source of Brazion Creek, are also known to be present at low densities in the upper Brazion Creek drainage.

8.2.2. Falling Creek Connector Haul Route

The 60 km Falling Creek Flats Connector Haul Route will span the height-of-land between the Sukunka River and Pine River watersheds and cross portions of the Mink Creek, Highhat River, Brazion Creek, Hasler Creek and Falling Creek drainages. With the exception of the existing clear-span bridge crossing of Mink Creek on the Talisman High Grade Road, all stream crossings along the entire route occur on non fish-bearing reaches significantly upstream of the limits of fish distribution. Impassable barriers on the lower Highhat River lower Falling Creek, upper Hasler Creek and unnamed tributary to Brazion Creek, preclude upstream fish movement to waters in the vicinity of their respective portions of the route.

Resident slimy sculpin and low densities of juvenile bull trout are present in the vicinity of the existing Mink Creek Bridge crossing; however no disturbance to the stream bed or stream banks is proposed at that location. Potential downstream effects of construction activity at non fish-bearing crossings will be minimized by the implementation of standard best practices and mitigative measures, as well as site-specific sediment control measures.

8.2.3. Falling Creek Flats Loadout

The Falling Creek Flats Loadout involves the development of a loadout facility that will be situated within the Pine River valley between the lower reaches of Falling and Beaudette creeks, up-gradient of the Pine River. This facility will include the development of a rail loop, coal storage pads, a conveyor/loading system, water supply and sediment control ponds, water supply wells and flood protection berms.

Both Falling and Beaudette creeks provide seasonal rearing and potential over-wintering habitat for sport-fish species present in the adjacent Pine River mainstem, including mountain whitefish, Arctic grayling, bull trout, and rainbow trout. No fish habitat occurs within the proposed rail loop and loadout footprint, which lays outside the riparian zones of both Falling and Beaudette creeks. Surface run-off from disturbed or exposed ground within the loadout footprint will be managed by a sediment collection system.

The results of the Proponent's residual effects assessment for the Falling Creek Flats Loadout strongly indicate that effects in receiving water courses (both flows and quality) will be negligible. No significant adverse effects are predicted on fish or fish habitat.

In addition, WCCC committed that if coal leachate water quality indicates that the stockpile runoff is judged at permitting to be unacceptable for discharge to groundwater, the loadout stockpile will be constructed with a low permeability till liner, and the west ditch and pond will be lined.

8.2.4. Powerlines

Two power lines are proposed to be constructed, one from the Brule Mine to the existing B.C. Hydro grid along Highway 29 and one from the Falling Creek Flats Loadout to the existing grid along Highway 97. Five fish-bearing crossings were identified along the two rights-of-way, including the Pine and Sukunka Rivers, Marin Creek, an unnamed tributary to the Sukunka River, and an isolated side channel within the Sukunka River floodplain. The Pine and Sukunka rivers provide summer rearing and over-wintering habitat for mountain whitefish, rainbow trout, bull trout and Arctic grayling in the vicinity of their respective crossings, as well as fall spawning potential for mountain whitefish. Martin Creek provides spawning habitat for Arctic grayling and rainbow trout, as well as seasonal rearing habitat for juvenile mountain whitefish and bull trout. The unnamed Sukunka tributary and isolated Sukunka side-channel has limited seasonal rearing potential for juvenile rainbow trout and juvenile northern pike, respectively.

No disturbance to the stream channel or streambanks is proposed at any of the five fish-bearing crossings. In addition, no temporary access across fish-bearing streams is proposed. Necessary clearing within the 15 m riparian vegetation management areas will be completed by hand-slashing with minimum root zone and shrub layer disturbance. No impact on fish or fish habitat is expected. Where there is potential for downstream impacts resulting from activity at non fish-bearing crossings, standard best practices and mitigation measures will be implemented.

8.3. REVIEW COMMENTS AND PROPONENT'S RESPONSES

8.3.1. Review Comments

Fisheries and Oceans Canada (DFO) raised most of the significant issues regarding fish and fish habitat; several additional issues were raised by the Independent Consultant and MOE. Meetings and discussions were held with DFO during the Project design and Application preparation stage, such that key concerns relating to potential Project effects on flow were largely addressed in the Application. DFO's comments on the Application were largely focused on seeking additional commitments from WCCC to confirm predictions through monitoring. Key issues raised included the following:

1. *Confirmation of model flow predictions through monitoring* – refer to section 5, Hydrology and Groundwater for additional details on this request from DFO.
2. *Contingency fish habitat proposals* – DFO requested that WCCC commit to developing fish habitat enhancement proposals specifically associated with potential over-wintering habitats of lower Blind Creek. Enhancement measures would be confirmed and implemented only if the Brule Mine were found (contrary to model predictions) to cause low flow impacts to Blind Creek.
3. *Reporting commitments* – DFO requested that they be provided with an annual winter low flow monitoring report. Referral of the final Falling Creek Flats Loadout site design was requested, as were (for information purposes) final site-specific Surface Erosion Prevention and Sediment Control (SEPSC) plans. Final designs for specified clear span bridge replacement structures and specified powerline stream

crossings are to be referred to DFO only if they do not comply with DFO Operational Statements (in which case no referral is required).
4. *Management of riparian vegetation* – DFO requested commitments to retain vegetation and adopt special construction and management measures within riparian zones, with protection measures implemented for both fish-bearing and non fish-bearing crossings.
5. *Continued dialogue* – DFO requires that there be continued dialogue to ensure that points of commitment are addressed.
6. *Habitat values* – the Independent Consultant requested clarification on fish habitat importance of Mink versus Blind creeks.
7. *Sampling methods* – the Independent Consultant was concerned about the length of fish sampling reaches.
8. *Points of clarification* – the Independent Consultant requested clarification on fish species present in Blind Creek, and expressed concern that fisheries sampling locations were not depicted on figure(s) in the Application.
9. *Contents specified in the Application Terms of Reference* – MOE expressed concern that content requirements specified in the Application Terms of Reference had not been met in the Application.

8.3.2. Proponent's Responses

1. *Confirmation of model flow predictions through monitoring* – refer to section 5 of this Assessment Report (Hydrology and Groundwater) for additional details on the response to this request.
2. *Contingency fish habitat proposals* – WCCC has identified a range of habitat enhancement options to be evaluated in detail in the event that future mine effects on over-wintering habitats of lower Blind Creek are identified. These options include a range of potential enhancement options in Blind Creek, as well as other enhancement options in the Sukunka watershed. If enhancement were required, WCCC and DFO would enter into negotiations to determine what enhancement should be implemented.
3. *Reporting commitments* – WCCC has agreed to provide an annual winter low flow monitoring report, and to refer the final Falling Creek Flats Loadout site design to DFO. WCCC has agreed to refer final site-specific Surface Erosion Prevention and Sediment Control (SEPSC) plans to DFO for information purposes. WCCC intends to design clear span bridge replacement structures and specified powerline stream crossings in accordance with DFO Operational Statements, but has committed to providing DFO with designs for any stream crossing structures that do not meet Operational Statements criteria.
4. *Management of riparian vegetation* – The Brule Application described measures to protect riparian vegetation, and WCCC has reiterated its plans to protect riparian areas during construction and operations.
5. *Continued dialogue* – WCCC has committed to continued dialogue with DFO to ensure that points of commitment are addressed.
6. *Habitat values* – WCCC responded that the Application does not assert that Mink Creek is more important than Blind Creek in terms of fish habitat. It was confirmed however, that Mink Creek does have much higher fisheries values than Blind Creek.
7. *Sampling methods* – WCCC clarified that sampling typically involved 200 m sampling site lengths as part of a general practice of exceeding RISC standards, which specify 100 m lengths.

8. *Points of clarification* – WCCC responded that there is not evidence to suggest the presence of a resident slimy sculpin population in Blind Creek.
9. *Contents specified in the Application Terms of Reference* – WCCC maintains that the fish and fish habitat requirements of the Application TOR have been met, with the information usually provided in significant detail. References to specific sections have been provided for the requested information.

8.3.3. Proponent's Commitments

The Proponent made the following commitments:

- WCCC will refer the final site design for water management of the Minesite to DFO (Appendix F, #35);
- WCCC will refer the final site design for water management of the Falling Creek Flats Loadout to DFO (Appendix F, #36);
- Design of the following clear span replacement structures, Talisman High Grade Road, Talisman Mink-Highhat Road, Whiskey Road, Falling Creek Road and Whiskey North Road will be referred to DFO, if at final design they do not meet the criteria stated in the "Pacific Region Operational Statement" (Appendix F, #37);
- Design for Duke Kwoen Powerline-Sukunka and Tributary Crossing; Pole and Access Road Design, will be referred to DFO if they do not meet the criteria stated in the Pacific Region Operational Statement for Construction of Overhead Powerlines (Appendix F, #38);
- The continuous flow monitor will continue to record flows during the ice free period at BC-01 (Appendix F, #47);
- WCCC will conduct spot flow measurements during the winter low flow period on both Blind Creek and a (yet to be identified) analogous reference creek (Appendix F, #48);
- WCCC will consult with DFO on the proposed Blind Creek winter low flow measurement program prior to its implementation (Appendix F, #49);
- WCCC will provide DFO with an annual report of the winter low flow monitoring data and an assessment of the flow model prediction accuracy and net impact to fish habitat within Blind Creek, based on the low flow assessment. If enhancement is determined by DFO to be required, WCCC will consult with MOE and DFO to determine acceptable enhancement options. (Appendix F, #50); and
- WCCC agrees to repeat RBT sampling in Blind Creek in 2005; to conduct Rbt sampling in the Sukunka River as a one-time baseline program; and to conduct one-time baseline sampling of Bull trout (Appendix F, #109).

8.4. CONCLUSIONS

Based on the review of the Application and Proponent responses, MOE, DFO, the Independent Consultant and EAO are satisfied that the proposed mitigation measures and commitments should prevent or reduce to an acceptable level any potential significant adverse effects of the proposed Project on fisheries and aquatic habitat.

9. TERRAIN & SOILS

9.1. GENERAL

Terrain and soils are addressed in Section 9.0 of the Application. Terrain and soils assessments and mapping were conducted on the Brule Minesite and Falling Creek Flats Loadout area, to provide information on baseline conditions, and to aid in Project design and mitigation planning, including reclamation planning.

9.2. BACKGROUND INFORMATION

The terrain conditions across most of the Brule Mine site are characterized by gently inclined hill slopes covered with a mantle of glacial till. Particle size analyses indicate that the till deposits are generally fine-texture, with up to about 30% of the material finer than 10 microns. Terrain mapping indicates that most of the minesite is relatively stable with a low erosion potential.

The proposed Loadout site is located on alluvial deposits comprised of predominantly cohesionless soils. Development areas are considered to be relatively stable with a low potential for erosion. The soils derived from fluvial materials are typically regosols or brunisols (depending on deposition history) with a thin organic layer (0.1 m) overlying poorly graded loamy sand to sandy loam-textured alluvial material, followed by a layer of well-graded cobbly gravel.

Development of both the Brule Mine site and the Falling Creek Flats Loadout facility will alter local topographic features. These effects will be measurable, but are considered neither positive nor negative due to the subjectivity in assessing them. Recontouring will occur during site reclamation. Residual Project effects on terrain were assessed as not significant in the Application.

Surface Erosion Prevention and Sediment Control (SEPSC) plans will be implemented to reduce soil losses. Soils sufficient for reclamation will be salvaged at all Project sites and replaced during site reclamation programs. Potential loss of soil through erosion was assessed as not significant based on the assumption that mitigation measures to prevent this would be successfully implemented. Loss of soils due to burial, removal of soil area from the productive land base, and effects on soils due to stockpiling were identified as potentially cumulative. The CEA determined that the residual Project effects of the Project on soil resources would not significantly contribute to cumulative effects in the region.

9.3. REVIEW COMMENTS AND PROPONENT'S RESPONSES

9.3.1. Review Comments

MEMPR indicated that operational and conceptual final reclamation plans, which include terrain and soils terrain components, meet their requirements. There were no specific review comments regarding terrain effects. The Independent Consultant made the following comments in relation to soils:

1. *Loss of topsoil by burial* – The Independent Consultant stated that the proposed amount of topsoil lost by burial is of concern, and requested that WCCC review its

operational plan to determine if more soil could be salvaged and stockpiled for future use.
2. *Soil sample collection* – The Independent Consultant suggested that more soil samples could be collected and analyzed prior to soil stripping and stockpiling.

9.3.2. Proponent's Response

1. *Loss of topsoil by burial* – WCCC committed to calculating quantities of soil required for final reclamation (although already done at an overview level for EA), and ensuring that adequate soil is salvaged. If the soil recovered from the pit areas is inadequate to meet the required quantities, WCCC will salvage as necessary from the Waste Dump areas, as per Health, Safety & Reclamation Code for Mines in British Columbia (Code) requirements.
2. *Soil sample collection* – WCCC responded that soil sampling to date has fulfilled requirements for reclamation planning.

9.3.3. Proponent's Commitments

The Proponent made the following commitments:
- WCCC will refer the final site specific SEPSC plans for the Loadout to DFO, Prince George, for information (Appendix F, #12).
- If the soil recovered from the pit is inadequate to meet the required quantities for reclamation, WCCC will salvage as necessary from the waste dump areas (Appendix F, #77).

9.4. CONCLUSIONS

Based on the review of the Application and Proponent responses, the MOE and MEMPR, the Independent Consultant and EAO are satisfied that the proposed mitigation measures and commitments should prevent or reduce to an acceptable level any potential significant adverse effects of the proposed Project on terrain and soils.

10. VEGETATION AND WILDLIFE

10.1. GENERAL

The Project area occurs in the Engelmann Spruce-Subalpine Fir (ESSF), Boreal White and Black Spruce (BWBS), and Sub-Boreal Spruce (SBS) ecological units. Many of the higher elevation ESSF areas (e.g., at the Brule Mine, Falling Creek Connector Haul Route, mine powerline) occur in relatively young stands of pine, spruce, and fir. More mature areas of aspen and balsam poplar occur at lower elevations in the BWBS and SBS units where the loadout, powerline, lower sections of the connector road occur. These different habitat types support a range of wildlife species including large and small mammals, birds, amphibians, and reptiles. Wildlife species of concern which occur in the region include species such as caribou, grizzly bear, wolverine, fisher, and various songbirds (e.g., black-throated green warbler).

Background information on vegetation and wildlife resource within the Project area is provided in sections 10.1.3 and 10.3.3, respectively, of the Application. A Project effects assessment was prepared to address potential effects of the Project on vegetation (Application, Section 10.1.5) and wildlife resources (Application, Section 10.1.5). Where required, a CEA was conducted on relevant vegetation features (Section 10.1.7) or wildlife species (Section 10.3.7) to assess potential contribution of the Project to regional cumulative effects.

10.2. BACKGROUND INFORMATION

Key issues related to the Project for vegetation were identified as loss or alteration of vegetation features. For wildlife, key issues included change in habitat availability, disruption to movement patterns, or increase in mortality risk.

For vegetation, three focal features were chosen to serve as indicators: wetlands, ecological communities of conservation concern, and old forest. Both wetlands and ecological communities of concern were selected due to high potential for rare plant occurrence. For wildlife, nine indicator species were identified: grizzly bear, caribou, moose, marten, fisher, wolverine, northern goshawk and black-throated green warbler. Grizzly bear, caribou, wolverine, fisher, and black-throated green warbler are blue-listed (vulnerable species). The nine indicator species were considered representative of habitat requirements of other provincially and federally listed wildlife species which may occur in the region.

Various assessment tools were used to quantify potential effects on vegetation and wildlife resources. Terrestrial ecosystem mapping (TEM) and predictive ecosystem mapping (PEM) were used to describe vegetation resources in the Project area. The loss or alteration of focal vegetation features was mapped to characterize status before (i.e., baseline), during (i.e., construction and operations), and after (i.e., decommissioning and reclamation) development of Project components. For wildlife, three assessment tools were used: wildlife habitat ratings; core security habitat (CSH) analyses; and road density analyses. Wildlife habitat ratings were developed from the ecosystem mapping to produce themed habitat maps for each species and can be used to measure changes in quality and quantity of habitat over different project phases. CSH and road density analyses were used to quantify effects of habitat fragmentation and

mortality risk (i.e., increased access density). Data collected from field programs (e.g., reconnaissance-level rare plant survey, bird survey, wildlife habitat surveys, and wetland surveys) were used to validate and supplement modeling exercises.

Effects Assessment

In general, the most dramatic effects of the Project will occur at the mine and loadout (due to clearing and excavation activities), while reduced effects are anticipated for the connector road and powerline. Reclamation activities are expected to restore many vegetation features, as well as associated wildlife habitat.

Small areas of wetlands, old forest [as defined by the Forest Practice Code of BC-Biodiversity Guidebook (BC MOF, 1995)], or ecological communities of conservation concern are directly affected by the mine. Within the Brule Mine footprint, <1.0 ha of wetland will be directly removed and not reclaimed, and no wetlands will be affected by the clearing proposed for the Falling Creek Flats Loadout. There may be some minor disruption to wetlands along the powerline right-of-way and new road segments, but in general the majority of the affected wetlands are only subject to indirect effects. Similarly, less than 1.0 ha of old forest will be cleared for mine development and 2.6 ha within the Falling Creek Flats Loadout. There may also be some minor clearing of old forest along the powerline right-of-way and new road segments, but in general the majority of the old forest will only be subject to indirect effects. Clearing may affect 16.1 ha of ecological communities of conservation concern within the Brule Mine footprint and 2.6 ha within the Falling Creek Flats Loadout. Some permanent loss of ecological communities of conservation concern is predicted as communities that have been cleared for activities are not expected to return fully to their pre-disturbance condition.

For wildlife, the Project footprint consists primarily of low to moderate quality habitat for most of the wildlife indicators. Some smaller areas of moderate to higher quality habitat are present for some species (e.g., marten and black-throated green warbler in the loadout area). Much of the area around the mine site and connector road has been recently logged and is currently of a young seral stage forest that is less valuable to wildlife. As such, wildlife habitat ratings for most species (e.g., caribou, grizzly bear, wolverine and fish) are mostly of nil or very low habitat suitability. More mature forest is located at the loadout and along segments of the powerline. However, habitat quality at these sites has been compromised due to existing disturbances.

Mitigation plans have been prepared to minimize the effects of the Project on vegetation (Application Sections 4.11 and 10.1.4) and wildlife (Sections 4.12 and 10.3.4) resources. Minimizing Project footprint, paralleling other linear features, use of existing roads, access control, vehicle restrictions, and reclamation of disturbed habitat are the major methods of mitigating effects on vegetation and wildlife. Monitoring programs have been proposed to document wildlife occurrences and incidents, as well as vegetation reclamation success (Sections 4.11 and 4.12).

The Application's Project effects assessment concluded that the Project will not result in significant changes to the three focal vegetation features, or in habitat availability for the nine focal wildlife species. Existing cumulative effects on old forest and ecological communities of conservation concern were identified for the regional study area. However, the incremental small loss of these features and wetlands resulting from the

Project was determined in the Application to be not significant in a regional context. Similarly, existing cumulative effects were identified as high for mortality risk (related to increased human access) for moose, Rocky Mountain elk, and grizzly bear. However, the incremental contribution of the Project to these existing cumulative effects was determined by WCCC's consultants to be not significant.

After the Application was submitted, numerous discussions were conducted with the MoE and WCCC to identify and resolve outstanding vegetation and wildlife issues. A meeting was held in Fort St. John on March 22, 2006, with follow-up teleconferences on March 24, 28, 30, and April 18, as well as a teleconference on May 31, to discuss MoE's concerns regarding Communities of Ecological Concern, red and blue listed species and wildlife mortality avoidance as expressed in the Pierre Johnstone's letter of May 30, 2006 (See Assessment Report, Chapter 10.3.3). The Independent Consultant also provided comments on the assessment, which are noted below.

10.3. REVIEW COMMENTS AND PROPONENT'S RESPONSES

10.3.1. Review Comments

Vegetation and wildlife issues related to the Project focused on the potential effects of vegetation loss or alteration, wildlife habitat change, movement barriers, and mortality risk. These include the potential effects of increased access, mine roads as barriers to wildlife movement, and disturbance to wildlife during construction and operation, including mortality risk. Concerns were also raised about cumulative effects of the Project in conjunction with other development activities in the area on vegetation and wildlife habitat.

The key vegetation and wildlife issues raised by MOE and the Independent Consultant are discussed below. All other vegetation and wildlife issues and resolutions are included in the issues tracking documents (Appendix C 2.4).

MOE Key Issues:

1. *Focal species selection* - Focal species or valued ecosystem component (VEC) selection process, and concerns that listed species were not adequately addressed.
2. *Wildlife movement and habitat connectivity* - Adequacy of assessment of wildlife movement and habitat connectivity.
3. *Field program intensity* - Intensity of field programs in terms of adequacy to address issues (e.g., rare plants).
4. *Cumulative effects* - Appropriateness of CEA approach.
5. *Caribou* - Adequacy of assessment of, and need for monitoring of and compensation for Caribou occurrence, distribution, and habitat effects.
6. *Regional mitigation* - Collaboration on regional mitigation with other industrial proponents.
7. *Wetlands* - Adequacy of assessment and mitigation of potential effects on wetlands and need for compensation.
8. *Loadout options analyses* - Consideration of environmental impacts for the options analyses for selection of the load out facility.
9. *Reclamation objectives* - Reclamation objectives for targeted wildlife objectives.
10. *Commitments* - Commitment to mitigation, monitoring, and compensation for wildlife effects.

Independent Consultant Key Issues:
1. *CEA Process* - Problems with the CEA process in Canada, identified by Duinker and Greig (2006).
2. *Ecosystem mapping* - The approach to conducting the Terrestrial Ecosystem Mapping (TEM), including QA/QC and combined mapping of data points from field programs and Canfor sources.
3. *Landscape level assessment* - Biodiversity mapping and a landscape level assessment to characterize the ecological integrity of the area.
4. *Succession and reclamation* - Description of primary and secondary succession for reclamation purposes.
5. *Cumulative effects baseline case* - For cumulative effects, it would be useful to consider the landscape changes prior to any development in the area (i.e., the "pristine case" prior to European settlement).
6. *Field survey detail* - Additional detail relating to the field surveys.

Public's Key Issues:
1. *Caribou migration corridors* - Concern about impact the Falling Creek Connector Haul Route will have on caribou migration corridors.
2. *Coal dust* - Concerns about coal dust impacts on wildlife.
3. *Noise impacts* - Concerns about noise impacts of haul route on wildlife.

10.3.2. Proponent's Responses

In response to the above MOE, Independent Consultant concerns, WCCC provided the following responses:
1. *Focal species selection* - All listed species were addressed in the selection of indicator species. To demonstrate that listed species in the Project area were addressed in the EA, additional columns were added to the focal species selection table (Application, Appendix E-5) to provide information on how habitat requirements/associations for listed species were captured within the selected VECs.
2. *Wildlife movement and habitat connectivity* - Habitat connectivity issues are generally captured with the Brule EA through the core security analysis, which addresses patch size and habitat fragmentation effects. Deactivation, removal, and reclamation of road segments created by WCCC are expected to restore habitat connectivity to baseline conditions. With respect to movement patterns, signs of wildlife trails or movement corridors were documented during field programs. While wildlife sign was noted at all Project locations, no major movement corridors were observed. Riparian areas and major drainage systems (e.g., Falling Creek, Sukunka) likely act as movement corridors for wildlife.
3. *Field program intensity* - Potential effects to rare plants were addressed in the baseline program and impact assessment by 1) a reconnaissance-level survey of the mine site for rare plants during fall field programs, and 2) by mapping and field truthing related to wetlands and ecological communities of conservation concern as VECs, both of which have a high potential for rare plant occurrence. More detailed survey work is not viewed as warranted. At the minesite in particular, potential for occurrence is low due to the history of disturbance over much of the area (See Assessment Report, Chapter 10.3.3).
4. *Cumulative effects* - The CEA process was transparent (e.g., used defined effects assessment criteria) and used recognized approaches (including the approach to defining significance/non-significance). Several quantitative tools were used for both project effects and CEA – i.e., habitat suitability mapping, core security habitat

analyses, and road density analysis. This approach follows those accepted by the Canadian Environmental Assessment Agency (CEAA), specifically as outlined in the *CEA Practitioners Guide*, developed by CEAA.

5. *Caribou* - Based on all available information, including telemetry data, compiled for this assessment, caribou are infrequent users of the regional study area and are unlikely to be in the study area year-round. Additional information on caribou occurrences in the area near the Falling Creek Connector Route were provided during the Application review by a local trapper (Mr. David Embree) and was mapped in relation to Project components. This information on use near the study area, and possible crossing of the haul route, does not change conclusions in the assessment. Signs of caribou use were not observed during field programs along the Falling Creek Connector Route. While the effects of the Project on caribou habitat appear relatively large based on percent changes, only small fragmented areas of habitat are actually affected, and these areas are not within high use areas. The majority of the effect is indirect, and related to sensory disturbance, rather than to direct habitat disturbance, so there will likely be some recovery of habitat suitability during the Decommissioning/Reclamation phase.
6. *Regional mitigation* - WCCC believes that the primary responsibility for co-coordinated resource development planning rests with government. WCCC has been involved in coordinated resource development planning exercises (including early participation in the LRMP development, and participation in the caribou research program led by MOF). WCCC has also had extensive contact with other proponents related to minimizing footprints by sharing roads and right-of-ways and resolving resource use conflicts. Most notable in relation to this Project is the commitment to shared use of the Falling Creek Flats loadout site.
7. *Wetlands* - Wetlands were mapped as part of the assessment, and additional field surveys were conducted to identify smaller wetlands not captured by the primary mapping methods. The main mitigation measures to reduce potential effects on wetlands are related to design (i.e., setbacks from riparian zones at the loadout, minimization of mine footprint, shared use and paralleling of RoWs). In addition, the water management plan presented in the Application (Section 4.4) has direct application to the mitigation of effects in these areas.
8. *Loadout options analyses* - An options analysis was conducted to identify the best location for the loadout facility and considered wildlife values, as well as other environmental values (e.g., air, noise and socio-economics). The Falling Creek option was subject to more detailed work related to wildlife values (e.g., bird surveys, wildlife habitat modeling). This detailed analyses corroborated the relatively low to moderate habitat quality values identified in the options analysis for the Falling Creek area.
9. *Reclamation objectives* - The stated reclamation goal for the Project is to foster return of (primarily) forested ecosystems that will be capable of supporting a number of post-closure land uses, including but not limited to use by wildlife and commercial forest harvest. Habitat suitability for a number of wildlife indicator species was described for different general successional phases, related to structural stage.
10. *Commitments* - WCCC will commit to specific mitigation and monitoring measures. These are noted in the issues tracking document and will be further identified in the detailed Wildlife Protection Plan. An intensive monitoring program is typically only necessary if there are: 1) significant project effects, 2) uncertainties regarding mitigation measures, or 3) uncertainties related to accuracy of predictions. For wildlife, no significant effects were identified, conventional mitigation measures are recommended, and the confidence in the predictions was rated as medium to high

for all wildlife VECs. As such, detailed monitoring programs are unwarranted. However, monitoring wildlife occurrences and incidences at Project locations will be tracked in the wildlife log. In addition, monitoring is conducted to assess reclamation success (e.g., revegetation practices, measure plant nutrient status, and metal uptake) and is relevant to wildlife habitat. Given the small effects on wetlands and ecological communities of conservation concern, no compensation is planned (See Chapter 10.3.3).

In response to the above Independent Consultant concerns, WCCC provided the following responses:

1. *CEA process* - Most issues identified by Duinker and Greig (2006) are related to the general absence of a regionally initiated approach to CEAs. WCC is willing to participate in regional initiatives lead by government to better understand cumulative effects. Section 6.3 (Cumulative Effects) provides a general introduction to the overall approach of CEA in this application. Each discipline (e.g., air quality, wildlife, vegetation) has different issues, spatial scales, VECs, etc. As such, more detailed descriptions of discipline specific CEA methods (e.g., assumptions, issues, and limitations) are provided in the relevant sections. For example, spatial data to allow modeling of reasonable foreseeable RCEs was not possible, due to the unavailability of this spatial data. This limitation is stated in section 6.3.2, and reiterated in other discipline specific sections (e.g., 10.1.2.7). Note also that the Duinker and Greig publication was released several months following the Application submission.
2. *Ecosystem mapping* - A provincial ecologist did not QA/QC (Quality Assurance/Quality Control) the TEM (Terrestrial Ecosystem Mapping). However, Canfor's PEM (Predictive ecosystem mapping) underwent a reliability assessment involving 159 plots and received a reliability rating of 84%. Based on further discussion with EBA (Independent Consultant) it was indicated that further information on ecosystem units was not needed at this time. WCC will review this data and incorporate as necessary in the Reclamation Plan for the Brule Mine Permit.
3. *Landscape level assessment* - Biodiversity, including rare plant potential, is addressed to a large degree as an inherent element of the description and assessment of the vegetation VECs (Valued Ecosystem Components) (old forest, wetlands and ecological communities of conservation concern). The ecological integrity of the area is reflected at the landscape level by the modeling of the three VECs, which represent particularly sensitive elements of vegetation in the region.
4. *Succession and reclamation* - Principles of primary and secondary succession are incorporated into the predictions related to reclamation outcomes (e.g., the contrast between reclamation results on sites that have been cleared only vs. those that have been completely disturbed).
5. *Cumulative effects baseline case* - Three standard assessment scenarios were used – these scenarios allow the evaluation of pre-Project conditions, and the assessment of incremental Project-related contributions to existing residual cumulative effects. The pristine scenario is typically reserved for areas where the level of existing development is very high, making it necessary to compare the project impacts to pre-development scenarios. In the case of Brule, the pristine scenario was not considered necessary.
6. *Field survey detail* - Appendix E provides concise summaries of the more detailed field reports completed by Keystone. These reports can be made available.

In response to the above Public concerns, WCCC provided the following responses:

1. *Caribou migration corridors* - WCCC's preliminary finding with regard to the Falling Creek Haul route impacting the migration corridors of the Mt. Hudette caribou is that, according to the studies conducted to date, there is no indication that the haul route will traverse through the areas that are considered of high use by caribou. As such, the route is not expected to have a significant impact on the caribou in the area (section 10.3.6.1 Brule EA Application). This evidence is further corroborated by MOE studies and the designation of Draft Ungulate Winter Range (UWR) Conservation area which are all situated well outside of the boundaries of the Falling Creek Haul Route (See Chapter 10.3.3)
2. *Coal dust* - The EAO review for Western's Wolverine Project concluded that no information was available to indicate that there are potentially deleterious effects of coal dust on wildlife, vegetation and livestock. Additionally, a wildlife veterinarian indicated that there were unlikely to be health concerns for ungulates and livestock related to coal dust where conditions are acceptable for humans, and representatives from the Animal Disease Centre (USDA), Elk Valley Coal and Teck Cominco were not aware of any wildlife health issues related to coal dust. Where significant coal dust settles on vegetation, there would likely be non-health related effects for some wildlife species (i.e., loss of habitat), but these effects would be very localized, and given that wildlife are mobile they would most likely move out of the affected area (e.g., areas adjacent to coal stockpiles), and thus, minimize any possible health risks. The Air Quality Management Plan prepared for the Brule Coal Project addresses coal dust in a human context, and presumably dust levels that are under the threshold for humans will also be safe for wildlife.
3. *Noise impacts* - It is acknowledged that traffic noise has the potential to impact wildlife habitat use patterns (e.g., through avoidance of habitats adjacent to a source of noise). Recognizing this, noise from mine-related activities, such as traffic along the haul route, was a major consideration in the development of the 'disturbance buffers' that were used in the wildlife effects assessment. Depending on the species, a disturbance buffer of up to 800 m in width was added along the haul route to encompass the effects of noise and other sensory disturbances (e.g., smells, sights) on wildlife habitat use (incremental to the effects identified as a result of any vegetation clearing). In the case of the furbearers, the disturbance buffers used for high use activities (like the haul route) were 100 m in width for marten and fisher, and 800 m in width for wolverine. Sensory disturbance may cause an animal to avoid or reduce its use of a habitat, thus, habitats within a disturbance buffer had their value decreased to different extents depending on the species and the intensity of the activity. This is a conservative approach as habitat was 'affected' the same throughout the entire disturbance buffer although in reality a number of factors (e.g., time of day, species, age and sex class, habitat type) will influence how an animal responds to sensory disturbance, and the extent to which it may avoid or underutilize habitats within a disturbance buffer. Given the variety of factors influencing the degree of sensory disturbance (see above) the Project assessment of indirect effects is considered conservative—in reality, individual animals may utilize the habitat within these disturbance buffers more or less than predicted, and any effect is unlikely to be uniform throughout the buffer. Further, it is important to note that with the completion of mining activities the indirect effects on habitat that result from sensory (noise) disturbance will return to baseline levels. With the exception of ungulates and marine mammals, there has been little research on the effects of noise on mammals in a natural setting. Farmed mink are known to respond to sounds such as sonic booms, but with apparently no detrimental effects on reproduction (reviewed by Cottereau 1978). Most mink returned to pre-boom

activities within two minutes and appeared to habituate to the booms after exposure to three booms over an hour (Travis et al. 1974 cited in Manci et al. 1988).

10.3.3. Issues Identified by MOE Requiring Additional Discussion

During a conference call May 31, involving MOE, WCCC and the EAO, concerns raised in Pierre Johnstone's letter of May 30, 2006 were discussed. The May 30 letter called attention to the following main issues:

- the importance of Ecological Communities of Conservation Concern in this region of the province, including red and blue listed plant species to be impacted by the Project;
- the potential for wildlife mortality associated with the Project sediment ponds and the Project in general; and
- the need for clarification regarding the link between monitoring and habitat and wildlife impacts and WCCC's Wildlife Protection Plan with special attention to the threatened woodland caribou and Bay Breasted warbler.

It was agreed that the potential for erosion of the representation Ecological Communities of Conservation Concern and the associated red and blue listed plant species is an important regional management issue considering the rate of industrial development in the northeast. In response to this concern, WCCC will minimize the size of the Project footprint, and will avoid and conserve these communities and species wherever practical, and has agreed to conduct surveys of red and blue listed wetland plant species prior to clearing of the mine site and in advance of construction at other project sites to further inform their mitigation strategies which include fine tuning of drainage management and potential linear development (Appendix F, commitment #116, 117). In addition, clearing plans for the loadout will be reviewed with the objective of maintaining maximum vegetation buffers adjacent to facilities and access roads in and around the proposed Falling Creek Flats Loadout, except where safety (visibility) concerns are an issue (Appendix F, #66).

To minimize the mortality risk associated with the sediment ponds, WCCC has committed to detailed engineering of embankments/dams/ditches which will provide allowance for escape routes (i.e. shallow slope on banks) for wildlife, particularly ungulates (Appendix F, #68). In addition to minimizing the wildlife mortality associated with structures, WCCC committed to providing shallow slopes in ditches at sites along the Falling Creek Connector Route to facilitate crossings (Appendix F, #67), identification of crossings, and a limit on snow bank height at known areas where wildlife cross to a level that allows for ungulates and other large mammals to cross the road safely (Appendix F, #65). WCCC will also include Bear Aware programs to minimize mortalities (Appendix F, #69) resulting from bear human interaction as part of their Wildlife Protection Plan which will be submitted for review to MoE every two years (Appendix F, #61) and will reflect information collected during monitoring.

In recognition of the importance of the threatened woodland caribou, WCCC's Wildlife Protection Plan will include collection of and maintenance of a log of sighting data for this species, as well as other wildlife at the Falling Creek Loadout, mine site and along the haul road to the Loadout. This information will be used to further inform the Wildlife Protection Plan to minimize mortality associated with the Project, especially along the haul route. In addition, WCCC has committed to consider other sources of monitoring data such as data resulting from the Brazion area caribou studies (Appendix F, #70).

WCCC has also committed to contribute to regional efforts related to caribou management studies in the context of a government led strategy for cumulative effects management (Appendix F#118).

The presence of the Bay Breasted warbler was recorded in the vicinity of the proposed Falling Creek Loadout by WCCC. In recognition of the importance of this blue listed species, WCCC agreed not to clear the area during the breeding bird season (Appendix F, #114). In addition WCCC will conduct periodic bird surveys during operations to determine if the Bay Breasted warbler is continuing to use habitat in and near the Loadout (Appendix F, #118).

10.3.4. Proponent's Commitments

The Proponent made the following commitments:

- WCCC will maintain and update as needed a Wildlife Protection Plan for the Brule Project, and will submit this plan to MOE every two years (Appendix F, #61).
- WCCC will communicate Wildlife Protection requirements to staff and contractors at the site Orientation (Appendix F, #62).
- WCCC will prepare site specifications for contractors for clearing (including hand-cutting) at crossings of fish-bearing streams along the power lines, namely at the Pine River, Sukunka River, and Martin Creek (Appendix F, #63).
- Employees and contractors will avoid disruption of bird nests and eggs during the breeding bird window. Dens will also be avoided, except where clearing and mining activities cannot be adjusted (e.g., mine site) (Appendix F, #64).
- WCCC will limit snow bank height at known wildlife crossing points determined by the Environmental Superintendent to a level that allows for ungulates and other large mammals to cross the road safely (Appendix F, #65).
- Clearing plans for the loadout will be reviewed with the objective of maintaining maximum vegetation buffers adjacent to facilities and access roads in and around the proposed Falling Creek Flats Loadout, except where safety (visibility) concerns are an issue (Appendix F, #66).
- Wildlife crossing points (i.e., shallow slopes on ditches) will be provided, at intervals along Falling Creek Connector Route ditches at sites determined by the Environmental Superintendent, with the provision that ditch function is not compromised (Appendix F, #67).
- Detailed engineering of embankments/dams/ditches will provide allowance for escape routes (i.e. shallow slope on banks) for wildlife, particularly ungulates (Appendix F, #68).
- Any observations of a sow and cub (bears) will prompt a safety warning to staff (Appendix F, #69).
- If the monitoring data from the Brazion area caribou studies are relevant, the data will be used as part of the Brule Mine/haul route mitigation planning (Appendix F, #70).
- A wildlife/danger tree assessment will be conducted in areas of high potential occurrence i.e. in older structural stages along proposed powerline and periphery of the mine site and load out prior to clearing with a view to minimizing cutting of wildlife trees (Appendix F, commitment #71).
- Direct replacement of salvaged soil on reclaimed slopes (i.e. without stockpiling) will be maximized (Appendix F, #72).
- A baseline assessment of trace metals in vegetation at the Brule Minesite will be conducted in 2006 (Appendix F, #73).

- Monitoring of reclamation success will be conducted during mine life to determine survival and growth of vegetation selected to meet end land use objectives (Appendix F, #74).
- WCCC will develop and implement a plan to discourage the introduction of, or invasion of, undesirable vegetation from encroaching on disturbed and recently reclaimed areas (Appendix F, #75).
- WCCC will carefully examine what species are included in seed mixtures in an effort to maximize native species content and where use of introduced agronomic species is unavoidable – limit their use to species that can be expected to provide adequate cover while allowing for succession to native species (Appendix F, #76).
- If the soil recovered from the pit is inadequate to meet the required quantities for reclamation, WCCC will salvage as necessary from the waste dump areas (Appendix F, #77).
- WCCC will not clear in the loadout area during the breeding bird season, which will protect nesting adults, nests, and eggs of bird species of concern. (Appendix F, #114).
- WCCC will contribute to regional efforts related to caribou management planning. Participation by WCCC will be in the context of an overall strategy led by government for cumulative effects management, and commensurate with the Project's level of impact on key factors affecting populations. (Appendix F, #115)
- WCCC will complete additional field inventory of red and blue listed plants in wetland areas within the project footprint, which WCC agrees are with the highest potential for red and blue listed plants. These surveys will be completed for the minesite in summer 2006 (prior to clearing), and in advance of construction at other project sites (Appendix F, #116)
- In preparing SEPSC Plans for the road and powerlines, WCCC commits to include in the planning the objective of protecting wetland red and blue listed plant species (if any) identified through the rare plant inventory (Appendix F, #117)
- WCCC will conduct bird surveys (focused on Bay Breasted warbler and Cape May warbler) periodically during operations to determine if these species are using habitats in and near the loadout. (Appendix F, #118).

10.4. CONCLUSIONS

Based on the review of the Application and Proponent responses, MOE, the Independent Consultant and EAO are satisfied that the proposed mitigation measures and commitments should prevent or reduce to an acceptable level any potential significant adverse effects of the proposed Project on vegetation and wildlife.

11. AIR QUALITY

11.1. GENERAL

The Brule Mine Project will release fugitive coal dust, fugitive crustal dust, criteria air contaminants (including total particulate matter, particulate matter with a diameter less than 10 µ (PM_10), particulate matter less than 2.5 µ ($PM_{2.5}$), carbon monoxide, nitrogen oxide, sulphur dioxide, and volatile organic compounds), and greenhouse gases (including carbon dioxide, methane, nitrous oxide, and ozone) to the surrounding environment. Fugitive dust is the primary air contaminant of concern associated with the Project. The emission of fugitive dust has the potential to adversely affect human health and water bodies.

In consultation with MOE, emissions of coal dust were deemed to be of greatest concern and therefore were assessed quantitatively. Due to the uncertainty in current emission factors, effects from crustal (e.g. road dust) dust emissions were assessed qualitatively, not quantitatively. Most criteria air contaminant emissions result from mobile sources on site. Since criteria air contaminant mobile emissions are typically short in duration, intermittent, and localized, effects from criteria air contaminant emissions were assessed qualitatively. Crustal dust along with coal dust and criteria air contaminants will be managed using best practices as outlined in the air quality and dust control plan. In addition, crustal and coal dust will be managed using ambient monitoring in connection with a dust control plan at both the minesite (dustfall) and loadout (suspended particulate (PM_{10} and $PM_{2.5}$) and dustfall. Greenhouse gases from the Project were quantified, and compared to existing emissions in the study area.

Four primary components of the Brule Mine Project were assessed for air quality effects: the Brule Mine site (pits and plant site): Falling Creek Flats Loadout; existing Bullmoose Haul Route; and the proposed Falling Creek Connector Haul Route. The air quality assessment focused in particular on air quality changes in the surrounding environment resulting from the Falling Creek Flats Loadout, as a number of sensitive receptors are within 10 km of the site (Section 11.3.1.4 of the Application). Falling Flat Creek Loadout is located approximately 45km west of Chetwynd, 16km west of Hasler, and 4km from the existing Pine Valley Loadout. The nearest permanent residence is located in Willow Flats 7km from the proposed Loadout.

A general description of the Project and the air quality assessment objectives and methodology is provided in Section 11.1 of the Application. Due to the proximity (within 10 km) of residences to the Falling Creek Flats Loadout, specific objectives were developed for this Project component as follows:

- Compare the predicted air quality changes in the vicinity of the Falling Creek Flats Loadout to ambient air quality and assess compliance with provincial and/or national objectives and the degree of change in ambient baseline PM_{10} and $PM_{2.5}$ levels.;
- Evaluate the potential contribution of coal dust from the Falling Creek Flats Loadout operations to PM_{10} and $PM_{2.5}$ levels at the nearest residences in the area; and
- Evaluate the combined effect of the existing Pine Valley Loadout and the proposed Falling Creek Flats Loadout coal dust emissions on PM_{10} and $PM_{2.5}$ levels at the nearest residences in the area.

Sections 11.2 through 11.4 of the Application provide background air quality conditions and an analysis of potential residual Project effects on air quality for the minesite, loadout and haul roads, respectively. Residual cumulative effects are presented in Section 11.5. Provisions for air quality protection during the Project life are provided in the Air Quality and Dust Control Plan (AQDCP) (Section 4.10). The proposed air quality monitoring program is presented in Section 11.6 of the Application.

The effects of changes in air quality are also considered in several other sections of the Application including Aquatic Resources & Fisheries (Section 8.4.2.3), Vegetation & Wildlife (Section 10.3.2.10), Land Use (Application Section 13.4.2), First Nations & Kelly Lake Communities (Section 14.5), and Socio-Community, Socio-Economic & Public Health Conditions (Section 15.4).

11.2. BACKGROUND INFORMATION

Potential project effects at the Brule Mine site were assessed by identifying and quantifying the mitigated coal particulate emissions from the mine operating at full capacity. Fugitive dust emissions at the minesite will result from coal handling, stockpile wind erosion, bulldozing, conveyor transfers, crushing, and screening. The mitigated emissions were compared to existing industrial emissions in the area to determine the potential relative contribution of the Brule Mine Project.

For the Falling Creek Flats Loadout, the assessment involved dispersion modeling of the unmitigated and mitigated coal dust emissions during operations to predict the resulting ground-level concentrations of TSP (Total Suspended Particulate), PM_{10}, $PM_{2.5}$ and dustfall within the study area. The main source of fugitive coal dust emissions from the loadout will be wind erosion from the stockpiles. Fugitive coal dust emissions will also result from coal handling, bulldozing, and conveyor transfers. Analysis of predicted concentrations focused on residential properties and waterways within the study area. Effects from the loadout were characterized in the context of relevant ambient air quality objectives and baseline levels, including a Canada-wide standard for $PM_{2.5}$ and BC ambient air quality objectives for TSP, PM_{10}, and dustfall.

Potential Project effects from the haul routes were assessed qualitatively due to the uncertainty in current crustal dust emission factors. However, crustal dust emissions will be managed using best management practices as outlined in the Air Quality and Dust Control Plan (Application, Section 4.10).

The residual Project effects and residual cumulative effects tables are discussed in Sections 11.4 and 11.5 of the Application. Predicted PM_{10} and $PM_{2.5}$ concentrations from the loadout, which are of prime concern to human health, were predicted to be well below ambient air quality guidelines at the nearest residential properties. Predicted dustfall concentrations from the loadout were also found to be less than the applicable criteria of 1.75 mg/dm^2day. Air quality at the mine site and along the haul routes will be managed in accordance with the Air Quality and Dust Control Plan (AQDCP) (Section 4.10) and the Air Quality Monitoring Plan (Section 11.6). The overall conclusion of the assessment is that the Project contribution to residual cumulative effects on air quality is not significant.

The CEA Practitioners' Guide recommended procedure is to assess project effects with and without the effects of current and foreseeable projects. In the case of current coal

dust emission sources, the effect of the Willow Creek coal mine on Willow Flats residents and properties was assessed using the available dustfall and PM10 monitoring results. The predicted normal loadout operations coal dust increments at both the Willow Creek mine plantsite and Willow Flats were too low to significantly increase current PM_{10} baseline levels. The effect of adding the Brule $PM_{2.5}$ increments for normal operations, at these same two locations, required use of a transplanted Fort St. John baseline, and predicted a similarly low effect level.

Because of its location in an area surrounded by surface coal deposits, and government's policy to avoid duplication of facilities wherever possible, the Falling Creek loadout has the potential to be used by other operators in the near future. While no other applications for use of this location are on record, the potential for loadout and other uses must be considered, despite the fact that this potential cannot be accurately quantified at present.

WCC has included the potential for other loadout emissions by extending the effects assessment to six coal stockpiles, from the two planned for the Brule operation. Without the ability to more accurately estimate incremental contributions from future developments, a baseline air quality protection approach was applied based on MOE's recommendations. Baseline protection is accomplished by setting air quality objectives that minimize degradation of the current baseline at a sensitive receptor site, based on application of best management practices, rather than allowing new emission sources to pollute up to an objective. MOE provided recommendations on how that was to be accomplished through setting of permitted ambient objectives in the vicinity of the loadout.

This approach has been incorporated through the supplemental assessment provided in the WCCC's Agencies Compendium of Comments, Appendix D 3.4. This assessment will have to be repeated when the local baseline has been collected, prior to permitting under the *Environmental Management Act.* By setting PM_{10} and $PM_{2.5}$ objectives on the west side of Willow Creek, based on adding the predicted increments to the local baselines, it will be possible to minimize degradation of the airshed, while providing assurance that the provincial air quality objectives will be met at the sensitive receptors. MOE has recommended that the compliance site for the baseline protection objectives be located one to two kilometres east of the loadout.

11.3. REVIEW COMMENTS AND PROPONENT'S RESPONSES

11.3.1. Review Comments

The Ministry of the Environment (MOE), Independent Consultant, and local residents provided comments on the air quality assessment. There were a number of comments related to emission estimation, modeling assumptions, interpretation of modeling results and clarification of mitigation measures. These were all addressed and the resolutions are presented in the tracking tables (Appendix C and E) and, in the case of key issues, described below.

MOE also requested the following additional analysis relative to potential residual effects of PM_{10} and $PM_{2.5}$:

- assessment of predicted changes to baseline PM_{10} and $PM_{2.5}$ levels, as represented by pre-construction PM_{10} data from Pine Valley Coal and transplanted $PM_{2.5}$ data from the Pomeroy subdivision in Fort St. John;
- percentiles of model concentrations for three scenarios: normal operations unmitigated, normal operations mitigated, expanded operations mitigated; and
- assessment of the potential for increased exceedence frequencies of baseline PM_{10} and $PM_{2.5}$ levels, and specifically the two objective levels for each of these parameters, resulting from the Project emissions.

Additional air quality issues raised by the Independent Consultant related to the scope of the air quality assessment and the toxicological effects of coal. The third party reviewer also had a number of clarification requests and recommendations for improvement of the presentation and organization of air quality section.

The following is a list of the key air quality issues:

1. *Scope of the assessment* - Scope of the assessment, specifically the omission of quantified diesel exhaust and crustal dust emissions (Independent Consultant)
2. *Meteorological data* - Selection and processing of meteorological data for dispersion modeling, and rotation of the direction data to correspond to the southwest orientation of the valley at Falling Creek (MOE, public, Independent Consultant)
3. *Emission inventory and need for remodeling* - Inclusion of all coal dust generating activities in the emission inventory and dispersion modeling and need for remodeling (MOE, public, Independent Consultant)
4. *Potential effects of loadout coal dust* - Potential effects of coal dust from Falling Creek Flats Loadout on the Willow Flats area and other property (MOE, public)
5. *Haul road dust* - Potential effects of dust from haul road traffic on the Willow Flats area (public, Independent Consultant)
6. *Potential cumulative effects of loadout particulate emissions* - Potential cumulative effects of Falling Creek Flats Loadout and Willow Creek Mine particulate emissions on the Willow Flats area (MOE, public)
7. *Wildlife* - Effect of coal dust on wildlife (public, Independent Consultant)
8. *Aquatic Resources* - Effect of coal dust on aquatic resources (public, Independent Consultant)
9. *Toxicological effects* – Relative effects of fine coal dust compared to crustal dust (Independent Consultant)
10. *Cumulative effects from future sources* - Assessment of residual cumulative effects from combining the Falling Creek Flats Loadout increments with potential future sources (MOE)
11. *Coal dust control and compliance with objectives* - Control of coal dust emissions and compliance with ambient dustfall and fine suspended particulate air quality objectives surrounding the loadout, minesite, and haul route (MOE, Independent Consultant)
12. *Dust Control Plans* - At the minesite, dust management will be directed at protection of nearby waterbodies, as is the case for the Dillon and NEMI mines and the Wolverine mine and processing/loading site because of the absence of private properties and residents. However, minimum management practice standards need to be established for the Brule minesite activities. Crushers should be enclosed to mitigate wind blown coal dust.
13. *Operating Procedures* - At the Falling Creek loadout, more specific operating procedures need to be identified, especially for managing emissions during higher wind speeds, including having an operator present during stockpiling and rail car

loading. A procedures checklist and training should be established that includes: the use of a windspeed monitor along with criteria for initiating specific dust reduction measures, including application of water or other dust suppressants, reduction or shutdown of activities; and having the water sprayers and the water supply in place prior to any stockpiling.

14. *Conclusions* - Air quality assessment conclusions (Independent Consultant)

All other air quality issues and resolutions are included in the issues tracking tables.

11.3.2. Proponent's Responses

As requested by the MOE, WCCC provided additional analysis relative to the potential residual effects of PM_{10} and $PM_{2.5}$. This was accomplished through the addition of the predicted Project increment percentiles to new baseline values. Assessment of the combined baseline and Project contributions was done at two locations: the proposed local baseline monitoring site to the north/northeast and a site directly between the proposed facility and the Willow Creek Mine plantsite. This assessment is included in Appendix D3.4 of the *Post- Application Agency Issue Response Compendium*.

The results of the additional analysis of the dispersion modeling results show that at both sites, there are no additional exceedences of the $PM_{2.5}$ objective (30 $\mu g/m^3$) when the incremental contribution of emissions from the Falling Creek Flats Loadout are added to baseline observations. Also, the maximum increase in the probability of occurrence of the PM_{10} objective (50 $\mu g/m^3$) is only 0.4% and in many cases no increase is predicted. For the mitigated scenarios, the maximum increases in the likelihood of values greater than half the $PM_{2.5}$ and PM_{10} objectives due to the incremental contribution of emissions from the Loadout are 5.1% and 1.9%, respectively. The results of this analysis of residual cumulative effects are similar to the results presented in the Application and therefore the Application residual Project effects assessment ratings and conclusions remain the same.

In response to the key air quality concerns, WCCC has provided the following responses:

1. *Scope of the assessment* - The method of analysis of the various emissions was discussed with the MOE prior to commencing the assessment. Based on those discussions, it was agreed that fugitive coal dust emissions would be assessed quantitatively at both the minesite and the loadout but that crustal dust emissions and mobile source emissions would be assessed qualitatively. A quantitative assessment of air contaminants from mobile sources was not required since these emissions are typically short in duration, intermittent and localized. It is probable that these emissions will result in significant ambient air impacts either by themselves or in combination with other sources. A quantitative assessment of crustal dust emissions was not required due to the uncertainty in available emission factors. Instead, crustal dust emissions will be managed using best practices as outlined in the AQDCP.
2. *Meteorological data* - The meteorology used in the modeling was developed by combining observations from three local stations. The meteorological data were selected and processed in consultation with the MOE. Any rotation in the wind data is not expected to produce a significant increase in maximum predicted PM_{10} and $PM_{2.5}$ concentrations at residences and therefore would not alter the conclusions of the assessment.

3. *Emission inventory and need for remodeling* - RWDI (WCCC's consultant) demonstrated to MOE that all coal generating activities at the loadout were accounted for in the emission inventory and that wind-dependent emission sources such as stockpile wind erosion and coal dropping operations were modeled as variable emission sources. These were the MOE's primary concerns regarding the modeling and therefore remodeling should no longer be required.
4. *Potential effects of loadout coal dust* - With respect to the potential effects of the loadout coal dust on the Willow Flats Area, WCCC included a range of mitigation measures to limit coal dust emissions from the Falling Creek Flats Loadout facility. All maximum predicted concentrations for TSP, PM_{10}, $PM_{2.5}$, and dustfall are much less than half of their respective air quality objectives at residences and work places.
5. *Haul road dust* - Crustal dust emissions from the WCCC haul routes will be a minor contributor to PM emissions at Willow Flats. Haul road traffic dust will be managed in accordance with the AQDCP, which includes a number of dust control measures and best management practices (e.g., trucks will be covered, haul routes will be watered or chemical dust suppression applied at intersections and other areas of concern). In addition, compliance monitoring of PM_{10}, $PM_{2.5}$, and dustfall will be conducted. If exceedences of air quality objectives are observed, WCCC will investigate the source(s) of exceedances and contingency dust control measures will be implemented to mitigate the particulate levels. WCCC commits to provide more detailed procedures for responding to ambient air quality exceedances in the AQDC plan for permitting the loadout.
6. *Potential cumulative effects of loadout particulate emissions* - The loadout contribution to residual cumulative effects (i.e. with Pine Valley Coal's Willow Creek Mine) was determined to be not significant at Willow Flats residences. The incremental increase in maximum predicted cumulative PM_{10} concentrations at residences in Willow Flats due to the Falling Creek Flats Loadout was determined to be less than 0.5% of baseline concentrations. The incremental increase in maximum dustfall at Willow Flats due to the Falling Creek Flats Loadout was also determined to be negligible (less than 0.1% of baseline levels).
7. *Wildlife* - The air quality assessment addresses coal dust in a human health context, and presumably dust levels that are under the threshold for humans will also be safe for wildlife.
8. *Aquatic Resources* - Section 8.4.2.3 provides discussion of the impact of dustfall on aquatic resources, and quantifies impacts at the loadout, the area of greatest concern. In summary the results show that worst-case dust inputs could induce TSS (total suspended solids) levels of 0.048 and 0.019 mg/L for Falling/Beaudette Creeks and the Pine River, respectively. Such levels are well below the maximum allowable TSS inducement of 5 mg/L for clear-flow periods. Accordingly, dust inputs emanating from the loadout facility are not predicted to influence the health of aquatic resources in neighbouring water courses.
9. *Toxicological effects* – Evidence for greater risks from coal dust is either not available or has been found not to be significant.
10. *Cumulative effects from future sources* - Residual cumulative effects were assessed for known projects or activities, where the criterion for known projects or activities was that there must be a public record – usually based on application for, or approval of, a permit or other government authorization. Cumulative effects of a future processing plant near Falling Creek Flats Loadout can not be predicted without the relevant design and emissions information for any such facility. In addition, WCCC has agreed to install a dustfall station at the Dillon campsite in order to assess potential dustfall impacts at that site. (Note: MOE recommends protection of

baseline PM_{10} and $PM_{2.5}$ by minimizing degradation, thereby allowing for future expansion of, or for new loadout operations at this site, without causing exceedence of the air quality objectives. MOE recommends that this be done by setting baseline protection objectives, at a compliance site located about one to two kilometres east of the loadout, to be established prior to *the Environmental Management Act* permitting by adding the predicted PM increments from normal operations to baseline values measured at, or near this site prior to commencement of loadout construction.") (See Commitment #25).

11. *Coal dust control and compliance with objectives* - WCCC has applied control technology and best management practices to ensure that particulate concentrations are kept within ambient air quality objectives surrounding the minesite, loadout and haul routes. The AQDCP includes contingency measures in the event of continuous exceedences of air quality objectives. This plan will be finalized in consultation with the MOE at the permit application stage. WCCC commits to collecting 1 year of pre-disturbance baseline monitoring of PM_{10}, $PM_{2.5}$, and dustfall using TEOMs (type of monitoring device) and dustfall canisters at the loadout. WCCC will also collect PM_{10}, $PM_{2.5}$ and dustfall data throughout the life of the Project to establish compliance with air quality objectives. (Note: MOE responded that cumulative effects on PM and dustfall levels were predicted to be insignificant at the Willow Creek Mine plantsite and at the Willow Flats residences and properties, without applying increased moisture to the coal stockpiles. However, MOE experience with the Willow Creek mine is that, with moisture levels less than those provided by coal washing, compliance with dustfall and/or PM10 objectives has not been achieved. MOE recognizes that the stockpiled product is expected to contain about 6% moisture from the washing process, and recommends that moisture, from water or salt solution, should be applied to compensate for moisture reductions below this level due to drying by wind or freezing temperatures.)
12. WCCC feels that it is currently using best management practices (BMPS) as the Brule crushing and coal handling system will incorporate the following measures to control and reduce the generation of fugitive dust:
    - Raw coal feeder will be semi-enclosed;
    - All outside belt conveyors (excluding the reject belt conveyor RJ-1) will have belt covers/hoods over the carry side of the belt to minimize dust generation and reduce the effects from wind. These belt covers will be hinged on one side to facilitate maintenance and repair work. Belt covers will not be necessary over the reject conveyor RJ-1, because the reject product will consist primarily of rock material;
    - All conveyor transfer points will be contained by chutes to control the generation of dust;
    - Raw coal screener and primary crusher are enclosed units with vents;
    - A dry dust collection system (bag house) will be integral to the dry screening process in the preparation plant;
    - Product coal conveyor will contain fines on the bottom with washed coal on top; and
    - Rubber skirting will be used to contain coal dust from loadout bin to trucks; Note: The use of a wet suppression type system before the wash plant would not be appropriate since the additional moisture added to the raw coal may reduce the effectiveness of the dry screens (flip-flow live deck type) located in the preparation plant. WCCC (additional comments) April 10 – The existing Dillon crusher will be used during Phase 1 (production to 1 million tonnes per year (Mt/Y)). The raw coal process generates fugitive dust as a result of the low inherent moisture in the run-of-

mine coal. Raw coal stockpiles tend to readily adsorb moisture from precipitation over time thus reducing dust emissions from the crushing operation. The wheeled loader working around the crushed coal pile generates dust when traveling between the coal trucks and stockpile area. During operation over the winter (2005/2006), measures expected to reduce fugitive dust were identified and include the following:

- The existing passive collection (i.e. chutes built with gradual transitions, skirting, dust curtains, skirt board covers, hoods, etc.) will be monitored and repaired and upgraded when required;
- The existing cover on the screen deck is not functioning properly and will be replaced with a maintenance friendly version.
- The foam dust suppression system, which was operated intermittently during the last year while design and installation problems were rectified, will operate on a continuous basis and the resulting impact on dust levels results monitored;
- The coal loading area around the loading dock will be equipped with water sprays for use in dry weather. The sprays will supplement water truck use on the coal loading area roads;
- A mist system will be installed over the truck box for use during coal loading cycle.
- Water sprays will be installed at the discharge end of the coal stacker conveyor.

For Phase 2 operation, (production to 2 Mt/y), WCCC feels that it is currently using Best Management Plans (BMPS) as the Brule crushing and coal handling system will incorporate the following measures to control and reduce the generation of fugitive dust:

- Raw coal feeder will be semi-enclosed and equipped with a water/calcium chloride spray system;
- All outside belt conveyors (excluding the reject belt conveyor RJ-1) will have belt covers/hoods over the carry side of the belt to minimize dust generation and reduce the effects from wind. These belt covers will be hinged on one side to facilitate maintenance and repair work. Belt covers will not be necessary over the reject conveyor RJ-1, because the reject product will consist primarily of coarse rock material;
- All conveyor transfer points will be contained by chutes to control the generation of dust. Passive dust control measures will be incorporated in the design and construction of transfer points;
- Raw coal screener and primary crusher are enclosed units with vents. The crusher will be equipped with a water/calcium chloride spray system;
- A dry dust collection system (bag house) will be integral to the dry screening process in the preparation plant;
- Product coal conveyor will contain dry fines on the bottom with moist washed coal on top. Mixing is expected as the conveyor discharges;
- Rubber skirting will be used to contain coal dust from loadout bin while loading trucks; and
- The outside crushed coal stockpile will be equipped with a water/calcium chloride spray system for dust suppression. Note: The use of a wet suppression type system before the wash plant would not be appropriate since the additional moisture added to the raw coal may reduce the effectiveness of the dry screens (flip-flow live deck type) located in the preparation plant;

13. *Operating Procedures:* Inclusion of a windspeed monitoring at the Falling Creek loadout is anticipated. Furthermore, the windspeed monitor can be checked on a regular basis as there will be a full time operator located in a work station adjacent to

the truck dump. WCCC commits to watering or applying chemical dust suppressant to the stockpiles if needed.

14. *Conclusions* - The residual Project effects and residual cumulative effects tables are discussed in Sections 11.4 and 11.5 of the Application. The overall conclusion of the assessment is that the Project contribution to residual cumulative effects on air quality is not significant.

11.3.3. Proponent's Commitments

The Proponent made the following commitments:

- Loadout- Coal stacking emissions at the loadout will be minimized by the use of a luffing (coal) stacker that can be raised or lowered to minimize drop height (Appendix F, #20).
- Loadout- Wind erosion from stockpiles at the loadout will be managed by maintaining the forested area around the loadout for natural wind sheltering and by using rainbird water sprays and chemical dust suppression during winter months as required. If ambient monitoring indicates that these mitigation measures are not sufficient, additional mitigation measures will be considered (Appendix F, #21).
- WCCC will review alternatives to open burning at the loadout (Clearing phase) (Appendix F, #22). Note: MOE will require authorization of any open burning of land clearing woody debris at the loadout site.
- WCCC will carry out dust suppression measures to reduce dust generation from coal handling activities at the Brule Mine site and the Falling Creek Flats Loadout. WCCC will use adequate controls to manage fugitive dust emissions at the minesite and loadout (Appendix F, #23).
- As part of a loadout dust control contingency plan, WCCC will review the use of bag houses (for dust control) at the truck unloading and rail loading stations at the loadout, if proposed control measures prove inadequate (Appendix F, #24).
- WCCC will collect a full year of baseline PM_{10}, $PM_{2.5}$, and dustfall data at an agreed baseline site located northeast of the loadout prior to loadout construction. The weather station at the Falling Creek Loadout will contain equipment and be located so as to meet provincial standards for use of the wind speed, wind direction and air temperature data to model impacts from future developments in this area. (Appendix F, #25). MOE recommends that a full year of continuous, validated PM10 and PM2.5 baseline data should be collected and provided to MOE prior to the start of land clearing or other construction activities at the loadout site.
- During operations, WCCC will maintain weather stations at the Brule Mine and near the Falling Creek Flats Loadout to provide data for air quality management, hydrological analyses, and reclamation (Appendix F, #26).
- WCCC will water or apply surface treatments on roads to reduce dust emissions when required to meet public safety, to achieve ambient air quality and dustfall permit objectives, and to achieve safe operating conditions (Appendix F, #27).
- During construction of the Falling Creek Connector Haul Route, WCCC will water roads in the community of Hasler, if and when needed, to mitigate dust impacts of traffic generated as a result of road construction activity on the Falling Creek Connector Haul Route (Appendix F, #28).
- WCCC will install additional upgrades to the Dillon crushing plant prior to mining at Brule (Appendix F, #29).

- WCCC will seek to collaborate with Cline Mining Corp. and Pine Valley Coal/Falling Mountain Coal on air quality monitoring programs near the Falling Creek Flats Loadout (Appendix F, #30).
- The boxes of the Brule Project coal haul trucks will be covered during transport to and from the Mine, the Falling Creek Flats Loadout, and the Bullmoose Loadout to minimize coal dust generation (Appendix F, #31).
- More detailed procedures for responding to ambient air quality exceedances will be provided in the AQDC plan for permitting of Loadout. (Appendix F, #110)
- WCCC will collect PM10, PM2.5 and dustfall data at the loadout, throughout the life of the Project to establish compliance with air quality objectives (Appendix F, #111)
- WCCC will install a dustfall station at the Dillon Campsite in order to assess potential dustfall impacts at that site (Appendix F, #112)
- WCCC commits to achieving the air quality objectives for total dustfall at the designated compliance site (of reasonable distance from the mine and coal handling areas) to be refined and agreed with by MOE for Brule permitting. If these objectives are not met, WCCC commits to applying the Air Quality Dust Control Plan or other measures necessary to achieve compliance. (Appendix F, #120)
- WCCC commits to achieving the site specific air quality objectives for PM10, PM 2.5, and total dustfall that will be established, based on collection of local baseline data, for MOE's air emission permit for the Falling Creek Flats Loadout. The dustfall objectives will be met at those sites designated for compliance in MOE Permit (tentatively depicted in figure 11.6.1-2, to be confirmed at permitting). If these objectives are not met, WCCC commits to applying the Air Quality Dust Control Plan, or other measures necessary to achieve compliance. (Appendix F, #121).

11.4. CONCLUSIONS

Based on the review of the Application and Proponent responses, MOE, MEMPR, the Independent Consultant and EAO are satisfied that the proposed mitigation measures and commitments should prevent or reduce to an acceptable level any potential significant adverse effects of the proposed Project on air quality.

12. ARCHAEOLOGICAL AND HERITAGE RESOURCES

British Columbia's *Heritage Conservation Act* protects archaeological resources located on both public and private land within the province. These sites and objects are protected under Section 13 by virtue of their antiquity (pre-1846) or under Section 9 of the act as "*Provincial Heritage Sites*" if designated as such by an order-in-council. The act necessitates that a permit issued by the Minister or designate must be in place prior to the altering of any protected archaeological sites (Sections 12 and 14). The British Columbia Ministry of Tourism, Sports and the Arts, Archaeology Branch administers the *Heritage Conservation Act* and issues all permits (Ministry of Tourism, Sports and the Arts, Archaeology Branch 1996).

Fieldwork was conducted on several components of the Brule Mine Project during the Archaeological Impact Assessment, including: the Brule Minesite, Falling Creek Flats Loadout and Power Transmission Line, Falling Creek Connector Haul Route, and the Mine Power Supply.

Representatives from Kelly Lake Cree, Kelly Lake First Nations, Kelly Lake Métis Settlement, McLeod Lake Indian Band, Mile Zero Métis Society, Saulteau First Nations, and West Moberly First Nations, accompanied Landsong Heritage Consulting Ltd on the 2004 Archaeological Impact Assessment of the Brule Mine Project. All of the above communities, with the exception of Kelly Lake First Nations, participated in the 2005 Archaeological Impact Assessment. Kelly Lake First Nations were notified of the Archaeological Impact Assessment, but were unable to participate. Participants were selected by the Chief and Council or Land Use Department of each community.

Thirteen known archaeological sites, GiRl-1, GiRk-2, GiRj-5, GiRj-1, GiRj-3, GiRj-2, GiRj-6, GiRk-1, GiRl-3, GiRj-8, and GiRj-7, are located within 5 km of the proposed development. Of these, one site GiRl-1 is in direct conflict with the proposed Falling Creek Connector Haul Route.

No new archaeological resources were identified within any of the proposed Brule Mine Project components. The proposed Brule Mine development area was also surveyed for Culturally Modified Trees (CMTs). No CMTs were identified during the assessment.

Archaeological Site GiRl-1 is located adjacent to the north boundary of the existing Talisman High Grade Road, on the east bank of Mink Creek, and will be impacted if the road is widened to the north. WCC will make every effort to avoid Archaeological Site GiRl-1 by restricting the widening of the existing access road to the south side of the road. If avoidance is not possible, an application for an Alteration Permit, under Section 12 of the *Heritage Conservation Act,* may be required.

Further details of the archaeological resource assessment can be found in Section 12 of the Project Application. The Archaeological Branch of the Ministry of Tourism, Sport and the Arts assessed the Archaeological Resources section of the Application and concluded that no additional information was required for an environmental assessment certificate level decision.

12.1. PROPONENT'S COMMITMENTS

The Proponent made the following commitments:

- Contracts for vegetation clearing and haul road construction and maintenance will include specifications for avoidance and protection of Archaeology Site (GiRI-1) in the vicinity of the Falling Creek Connector Haul Route. Specifications will be developed based on a field visit and consultation with Landsong Heritage Consulting. The Environmental Superintendent will be responsible for marking the site, contractor orientation, and monitoring during construction (Appendix F, #79).
- Contracts for vegetation clearing and powerline installation will include specifications, if needed based on final powerline routing, for avoidance and protection of the three Traditional Land Use sites identified along the proposed powerline route. Final routing will be developed based on consultation with Landsong Heritage Consulting and the relevant First Nations and Aboriginal groups. The Environmental Superintendent will be responsible for marking the site, contractor orientation, and monitoring during construction (Appendix F, #80).
- Contracts for vegetation clearing and haul road construction and maintenance will include specifications for avoidance and protection of the three Traditional Land Use sites identified in the vicinity of the Falling Creek Connector Haul Route. Specifications will be developed based on a field visit and consultation with Landsong Heritage Consulting and the relevant First Nations and Aboriginal groups. The Environmental Superintendent will be responsible for marking the site, contractor orientation, and monitoring during construction (Appendix F, #81).

12.2. CONCLUSIONS

Based on the review of the Application and Proponent responses, Ministry of Tourism, Sports and the Arts' Archaeological Branch, the Independent Consultant and EAO are satisfied that the proposed mitigation measures and commitments should prevent or reduce to an acceptable level any potential significant adverse effects on archaeological and heritage resources.

13. LAND USE

13.1. GENERAL

The land use setting and existing land use and tenure information on lands within and/or in proximity to the Brule Project area are outlined in Section 13 of the Application.

13.2. BACKGROUND INFORMATION

All components of the Brule Mine Project are within the Dawson Creek Land and Resource Management Plan (LRMP) area. The Brule Mine Project is located within "Burnt River 4F Resource Management Sub-Zone" of the South Peace Resource Management Zone (RMZ). The importance of natural resources (oil and gas, coal and timber) to the local economy is recognized in the LRMP. The South Peace RMZ has been designated "Enhanced Resource Development" and the LRMP encourages investments in resource development and enhancement in this area. With respect to coal mining, the stated objective for this RMZ is to provide opportunities for environmentally responsible exploration and development of surface and subsurface resources.

Oil and gas exploration and development is prolific in the RMZ, with gas wells, gas plants and pipelines located in the vicinity of the mine, the haul road, the loadout, and the power transmission line.

All components of the Brule Mine Project are also located within Block 4 of Canadian Forest Products' (Canfor's) Tree Farm Licence (TFL) #48.

Four trapping tenures overlap various Project components. The maintenance of furbearers and their habitat to ensure the continuation of these trapping tenures is an objective of the LRMP. Portions of this RMZ have potential for commercial recreation opportunities. Licenced guide outfitting occurs within the RMZ.

Specific land tenures in the vicinity of the Project are identified in Figure 13.1.1-1 of the Application.

Potential effects of the Brule Mine Project on other industrial and economic activities in the region (oil and gas exploration and development, coal exploration and mining, forestry, trapping, guide/outfitting, etc.) were recognized during the pre-Application review. Through consultation with potentially affected parties, WCCC attempted to define impacts, and has developed, or is developing, cooperation agreements to address any negative affects on industrial activities and other land uses.

Examples of pre-Application changes in Project design to accommodate other land users or land uses include the refinement of the Falling Creek Connector Road centerline; the selection of power supply options and the routing of the Mine power line, the adjustment of mine phasing to accommodate the Burlington well and pipeline in the pit area, traffic management planning, commitments to refinement of Mine Powerline and Falling Creek Connector Road centrelines to avoid traditional land use sites, and decisions related to final reclamation of Project roads and the Falling Creek Flats Loadout.

A land use issue of note is Burlington Resources' Brazion Lateral Line that traverses the southern portion of the Brule Pit area. WCCC advises that the mine plan has been developed to enable mining further north in the pit while the gas line is still operational. The gas line and well could be decommissioned if complete, allowing mining through this area although timing is uncertain. If the well is not complete, changes to the mine plan may be necessary.

Mitigations and accommodations related to most land uses are discussed in Section 13.2.2.2 and information on Traditional Land Use is provided in Section 14.3.3.2 of the Application.

13.3. REVIEW COMMENTS AND PROPONENT'S RESPONSES

13.3.1. Review Comments

The following are the key Land Use issues raised by members of the public and MOE:

- *Second coal loadout in the Pine Valley* - Concerns related to the construction of a second coal loadout in the Pine Valley, and the risk that the loadout may not accommodate more than one user.
- *Potential impacts on traplines* - Concerns about the impact the Haul Route will have on traplines 722T006, 722T007 and 722T002.
- *Potential impacts on trapline* - Concern about the impact of the minesite on trapline 722T003.
- *Re-zoning at loadout* - WCCC will need to apply to the Peace River Regional District for re-zoning to allow for use of the Falling Creek Flats Loadout site.
- *Private property adjacent to loadout* - Concern about the impact of Falling Creek Flats Loadout on the private property adjacent to the loadout, as well as a commercial recreation license held on the Pine River by the property owner for proposed future activities.
- *Mine powerline route* - MOE questioned why the powerline for the minesite did not share the same route as the Duke Energy pipeline.

13.3.2. Proponent's Reponses

- *Second coal loadout in the Pine Valley* – Concerns related to air quality effects of a second loadout in the Pine Valley are addressed in Section 11 of the Application (and discussed in Chapter 11 of the Assessment Report). WCCC has planned the loadout such that it could accommodate another user, and has sent a draft Joint Venture Arrangement to Cline, who is currently in the process of reviewing the document.
- *Potential impacts on traplines* - WCCC negotiations are currently ongoing with trappers, 722T006, 722T007 and 722T003.
- *Potential impacts on trapline* - WCCC has successfully negotiated a settlement with trapper 722T003.
- *Re-zoning at loadout* - WCCC submitted an application to the Peace River Regional District for re-zoning to allow the use of the Falling Creek Flats Loadout site. Rezoning has been completed.
- *Private property adjacent to loadout* - WCCC is currently negotiating with the private property owner.

- *Mine powerline route* - Comments noted. WCCC is already examining the potential relocation of the Sukunka crossing, in conjunction with locations of traditional use sites. The decision to locate the powerline away from the existing pipeline crossing of the Sukunka River was based on the geographic constraints due to the braided nature of the river crossing at the existing pipeline. The selected crossing will be a single channel which has been designed to be clear span. Crossing at the pipeline location would require that there be a supporting structure located in between the two distinct channels. The pipeline location crossing was also found to create a larger disturbance in the Riparian Area. As the river floodplain is significantly larger in cross-section at the pipeline, the total disturbance within the riparian area is also some what larger.
- Utilizing the exiting Brazion Pipeline alignment for the powerline is possible, however it was discounted for the following reasons: the current alignment retains a lower total disturbance area; the Brazion Alignment would be approximately 1 km longer and would constitute a total of a minimum additional 1.5 ha of disturbance; and the current alignment was effective in decreasing the total number of stream crossings. In utilizing the Brazion Line, there would have been the need for and additional stream crossing by the powerline.

13.3.3. Proponent's Commitments

The Proponent made the following commitments:

- WCCC, in consultation with stakeholders, will update and implement a Traffic Management Plan for the Construction of the Falling Creek Connector Haul Route (Appendix F, #1).
- WCCC will negotiate a mutually acceptable agreement with Burlington Resources with respect to the Brazion Lateral pipeline and the C-66-F sour gas well in the Brule Pit, either for the abandonment of these facilities prior to mining in the area; or, if necessary, for relocation of the line and establishment of a buffer zone/setback of mining from the operating facilities. The agreement will meet the requirements of the BC Ministry of Mines and Petroleum Resources, and the BC Oil and Gas Commission (Appendix F, #85).
- WCCC will continue to pursue negotiations for Co-operation Agreements with the three trappers (with whom settlements have not been reached) (traplines 722T002, 722T006, 722T007) and the guide-outfitter (License 722P999) in the Brule Project area for mitigation and/or compensation, based on actual effects, if any, of the Brule Project on their operations (Appendix F, #86).
- WCCC will work with Cline Mining Corp. and other future coal producers to reach a mutually acceptable commercial arrangement for shared use of the Falling Creek Flats Loadout (Appendix F, #87).
- WCCC will pursue negotiations with the owner of Lot DL2704 Peace River District, Except 32142 with the objective of a mutually acceptable agreement for an easement across this property, allowing the Brule Mine Powerline right-of-way to cross the lot parallel to the existing Duke Powerline ROW (Appendix F, #88).
- WCCC will pursue negotiations with the property owner adjacent to the Falling Creek Flats Loadout (owner of Blocks A and B of District Lots 381, 382, 383, and 384) with the objective of concluding an agreement for mitigation/compensation for actual losses (if any) related to Project effects on the property due to operations at the loadout (Appendix F, #89).

- WCCC will work with Pine Valley Coal / Falls Mountain Coal to reach an arrangement with respect to management of increased construction traffic passing by the Willow Creek mine plantsite and loadout (Appendix F, #90).
- WCCC will work with other coal license holders (Kennecott and Pine Valley Coal) if they identify any issues related to haul road construction across their Coal Licenses. Issue resolution with Kennecott will follow the principles outlined in the Letter "Principles for Kennecott – WCCC Joint Use Agreement" dated and signed by both two parties in April 2006 (Appendix F, #91).
- WCCC will work with the commercial recreation license holder to negotiate mitigation or compensation related to losses, if any; caused by the project (Appendix F, #92).
- WCCC will work with PNG companies to develop operational Agreements as needed, including agreements regarding Emergency Planning Zones, pipeline and ROW crossing agreements, and other agreements regarding operations (including access through the minesite) (Appendix F, #93).
- WCCC will work with PNG companies and Canfor to enter into road use and maintenance agreements as needed for each segment of haul road (Appendix F, #94).
- If PNG companies and Canfor do not require, and choose not to take on the responsibility and cost of maintaining, roads built by WCCC for this project; at closure WCCC will decommission the Blind Creek Road through the minesite, and new roads built by Western for this project, specifically connections between the two Talisman Roads (Segments 4) and the portion between Hasler FSR and Whiskey Road (Segment 7) and Falling Creek Road and Whiskey Road (Segment 9) (Appendix F, #95).

13.4. CONCLUSIONS

Based on the review of the Application and Proponent responses, the proposed mitigation measures and commitments, MAL, MOE, MEMPR, Peace River District, District of Chetwynd, the Independent Consultant and EAO are satisfied that all land use issues have been addressed sufficiently for the purposes of a certificate decision.

14. SOCIO-COMMUNITY, SOCIO-ECONOMIC & HEALTH

14.1. GENERAL

Socio-economic information on Tumbler Ridge and Chetwynd, the communities potentially most affected by the Project, is contained in Section 5 of the Application. Section 1.3.4 outlines potential Project economic benefits to the regional economy.

14.2. BACKGROUND INFORMATION

The incorporated communities closest to the Project are Tumbler Ridge and Chetwynd. Other communities, such as Dawson Creek, Taylor, Hudson's Hope and the area around Falling Creek Flats, and Hasler Flats could also be affected. All these communities are expected to experience the economic effects of the Project and to participate in the labour force.

The region has a network of roads and trails used for dispersed, non-commercial recreation. Snowmobiling and four-wheel driving are popular activities in this area. Hiking, wildlife viewing, hunting, fishing, and camping are also popular. Scenic areas within the South Peace RMZ are found along stream and travel corridors or at site-specific locations near recreation sites and trails. Several developed recreation sites exist within this RMZ providing a variety of outdoor recreation opportunities.

Development of the Brule Mine is anticipated to diversify the economic base for the Chetwynd district, and contribute to the Provincial economy through job creation and export earnings. It will result in improvements to existing infrastructure, including nearby power supply and access routes, and facilities developed for the Dillon Mine. It will use the existing B.C. Rail Line (operated by CN) and CN northern mainline to Prince Rupert and the Ridley Coal Terminal, where the coal will be loaded into ships for export to Asia, Europe and South America. The Ridley Coal Terminal had been idle for several years following the shutdown of the Bullmoose Mine, and was re-activated for shipments of Dillon Mine coal.

With a capital investment of $200 million, the Brule Mine Project will contribute socioeconomic benefits to the region and the Province. With an estimated construction period of one year and a mine life of approximately 11 years, the Application notes that the Project will bring added stability to the region's economy. Construction of the Project is estimated to employ as many as 200 people and create about 500,000 person hours of employment. WCCC has committed to using regional contractors to the maximum extent possible, so that a major portion of this investment will have a direct effect on the area's economy.

WCCC has committed to emphasizing local hiring of the construction workforce. Average employment over the life of the Project is estimated at 250 direct new positions (comprised of about 144 positions in mining and maintenance, 16 in processing, 4 in loadout operation, 51 in supervision and administration and 40 in coal transport).

In combination with WCCC's Dillon and Wolverine Projects, and other coal mining Projects in the area, the Application notes that the Brule Mine Project will help restore mining employment to levels that make a significant contribution to the regional

economy. WCCC anticipates that service industries from Dawson Creek, Fort St. John, and Prince George can also expect to benefit from the development of this new mine.

On a provincial and federal basis, the Brule Project will provide government revenues in the form of the B.C. Mineral Tax and federal and provincial income tax.

During the pre-Application phase, the public and stakeholders raised issues regarding possible socioeconomic impacts related to the railway loadout and the proliferation of coal infrastructure, as well as the potential for conflicting land uses, including forestry, petroleum and natural gas activities, ranching, trapping, guide outfitting and commercial recreation tenure (see Section 13.0 of this Assessment Report).

Proponent Responses to Pre-Application Issues

Impact of railway loadout on residents - Hasler Flats residents expressed concern about the potential adverse effects of a coal loadout facility in Hasler Flats on public health, property values, agricultural activity, road safety and quality of life in their rural neighbourhood. In response to these concerns, WCCC continued its evaluation of alternative sites, which ultimately led to the selection of the Falling Creek Flats site (see Option Analysis, Appendix N of the Application). WCCC considers this option has minimal impact on local residents, and avoids direct impact to land and the Agricultural Land Reserve. WCCC documented locations of residential properties within a 10-km radius, and modeled air quality effects at all locations to support evaluation of Project effects on local residents. Willow Flats is located approximately 7 km from the WCCC Loadout, and 3km from the Pine Valley Loadout.

Shared Use of Loadout – During the pre-Application consultation process, area residents and local and regional governments asked WCCC to consider sharing a loadout facility with other users to centralize coal loading activities and avoid impacting multiple sites in the Pine Valley. Accordingly WCCC designed the Falling Creek Flats Loadout facility to accommodate shared use with Cline Resources, as well as, potentially, a third user. WCCC reports that they has reached an agreement-in-principle with Cline Resources related to shared use of the loadout, and is sharing site data with Cline.

General Health Effects - Potential effects of the Project on human health are discussed elsewhere in this Assessment Report: including air and water quality and concerns about the effects on wildlife. Mine site health and safety is addressed in section 4.0 of the Application, in particular Section 4.13.

14.3. REVIEW COMMENTS AND PROPONENT'S RESPONSES

14.3.1. Issues Raised

Most socio-community, socio-economic and health issues were raised by concerned members of the public. The Independent Consultant raised questions about the potential health issues related to coal dust. Agency comments from MOE focused on health protection issues, and related to potential effects on air quality at the Pine Valley Coal property and potential effects of the loadout on water quality of the Pine River, which is the water supply for Chetwynd. The issues were:

- *Property values and recreational activities* - Concern that loadout activities will adversely affect property values and recreational activities of residents living

downwind of coal loadout (public – residents of Hasler and Willow Flats, and adjacent property owner).
- *Traffic at Hasler* - Concern over traffic through and near the community of Hasler during construction (Public).
- *Potential health effects* - Concerns related to health effects of coal dust, including a concern that fine particulate might enter the blood stream.

14.3.2. Proponent's Responses

- *Property values and recreational activities* - WCCC has made every effort to minimize potential effects of the proposed Brule Mine Project on the lifestyles of local residents. The loadout was situated as far as practical from local residents, especially the community of Hasler, in order to minimize potential effects. With the proposed technology and management plans for the loadout, RWDI indicates that potential contributions of the loadout on cumulative impacts on air quality at Willow Flats, 7 km from the loadout site, will be much less than 1%. As Hasler is even further from the proposed loadout, no measurable effects of loadout operations on air quality are expected. WCCC is in discussion with the one adjacent property owner with the objective of reaching a mutually satisfactory agreement.
- *Traffic at Hasler* - Coal dust from traffic on Highway 97 and through Hasler to the Hasler FSR should not be an issue. There will be no coal haul traffic on either route, as the coal haul is by off-highway vehicles to Falling Creek.
- By use of the off-highway haul from the Brule Mine to the Falling Creek Flats Loadout, mine-related traffic through the Hasler area will be kept to a minimum. Mine-related use of Highway 97 and the road from Highway 97 to the Falling Creek Flats loadout will primarily be limited to construction traffic and (during operations) service vehicles. Loadout staff and some coal haul truck drivers will likely use Highway 97; however the number of vehicles will be relatively low.
- The highest levels of traffic through Hasler due to the Project are expected to be related to the construction and upgrading of the segments of the haul route that cross or are near the Hasler Road. Coal dust will not be an issue at this time. WCCC anticipates a maximum of 20 to 35 vehicles per day during peak construction activities.
- *Potential health effects* - The concern that coal dust may enter directly into the bloodstream was reviewed and is not scientifically supported.

14.3.3. Proponent's Commitments

The Proponent made the following commitments:
- WCCC will advertise job opportunities in Tumbler Ridge and Chetwynd and, wherever possible, require contractors to implement the company goal of maximizing local employment (Appendix F, #96).
- WCCC will support training programs and provide apprenticeship opportunities for local residents who meet WCCC general requirements for employment, but require skills training for specific jobs. WCCC will develop, in conjunction with local post-secondary institutions, training programs to assist workers to obtain transferable skills that can be used in other areas of life and employment. WCCC will also provide scholarships or bursaries (Appendix F, #97).
- WCCC will provide on-site operator training for mine and coal preparation plant positions (Appendix F, #98).

- WCCC will facilitate subcontracting opportunities where appropriate, for local and regional businesses. WCCC will include local contractors and suppliers in its corporate database (Appendix F, #99).
- WCCC will request that bidders for contracts disclose their policies and practices for providing opportunities to local businesses and residents, including First Nations and Kelly Lake Communities. WCCC will encourage contractors to hire locally and will work with contractors to promote local hiring (Appendix F, #100).
- WCCC will develop a community awareness program related to the Project to keep area residents apprised of developments and employment opportunities at the Project. Existing community awareness program will be on-going due to the low production rate anticipated during Project Phase 1 of Brule; with little or no major activity occurring until the increase in production in 2009. During Project Phase 2 of Brule (2009) further community awareness programs will be developed to address any issues related to the larger workforce required for Project Phase 2 and associated housing requirements. (Appendix F, #101).
- WCCC will provide cultural awareness training to on-site staff (Appendix F, #102).

14.4 CONCLUSIONS

Based on the review of the Application and Proponent responses, MOE, MEMPR, Peace River Regional District, District of Chetwynd, the Independent Consultant and EAO are satisfied that the proposed mitigation measures and commitments should prevent or reduce to an acceptable level any potential significant adverse effects of the proposed Project on socio-economic conditions and human health.

15. CUMULATIVE EFFECTS

15.1. GENERAL

Cumulative effects assessments (CEAs) are included as subsections of the biophysical resource assessments (Sections 7.0 through 11.0 of the Application) with methodology in Section 6.3 and in Chapter 4.2.2 of the Assessment Report. A summary of residual cumulative effects is provided in Section 19.0 of the Application.

15.2. BACKGROUND INFORMATION

Cumulative effects result from residual Project effects of a project when combined with residual effects of other past, existing and imminent projects and activities. Cumulative effects include changes to the environment that would adversely affect health, socio-economic and environmental values, physical and cultural heritage, or current use of land and resources for traditional purposes.

Cumulative effects assessments were conducted by WCCC for biophysical resources or focal parameters where there was a potential for residual Project effects to contribute incrementally to cumulative effects. The CEAs were limited to those residual Project effects that may interact with effects of other land use activities resulting from past, present or reasonably foreseeable actions. Cumulative effects were considered for all relevant project phases and spatial boundaries were developed for each focal parameter.

While it is important to identify residual Project effects that may contribute to overall cumulative environmental trends, it is equally important to examine the regional context in which the Project exists. Primary land uses in the northeastern region of British Columbia include oil and gas developments, mining, forestry, agriculture, trapping, hunting, guide outfitting, and recreation activities. These are consistent with land use objectives, as described in the Dawson Creek Land and Resource Management Plan. Specifically for the Brule area, land use objectives are directed at enhanced resource development.

The analyses of residual Project effects in the Application indicated that the following resources might contribute incrementally to cumulative effects: soils, vegetation, forest capability, wildlife, and air quality.

For these resources, the Application reports that the contribution of residual Project effects to Regional Cumulative Effects was determined through the WCCC's cumulative effects assessment to not be significant. The definition of not significant is that Project-related effects considered in combination with the effects from other projects and activities do not cause any of the focal parameters to shift to an unacceptable state.

For the soils, wildlife, ecological communities of conservation concern, and forest capability assessments, WCCC's, cumulative effects assessment indicated that current or future conditions without the Project may surpass acceptable levels, and therefore, significant residual cumulative effects do exist.

The Application notes that forest harvesting activities and access road development related primarily to oil and gas and forestry activities have resulted in wildlife habitat fragmentation and loss of old forest and ecological communities of conservation concern. Soils and forest capability are also affected by the road development. In contrast, the CEA for wetlands and air quality indicated that current or future conditions without the Project are within an acceptable level, and therefore, no significant residual cumulative effects exist or are predicted. The Application concludes that in no case, was the Project contribution to residual cumulative effects considered significant.

15.3. ISSUES RAISED AND PROPONENT'S RESPONSES

15.3.1. Review Comments

MOE, the Independent Consultant, members of the public, and stakeholders raised issues about potential cumulative effects. Most of these comments and questions were focused on air quality in the vicinity of the Falling Creek Flats Loadout, and on cumulative effects on area wildlife (See Chapter 10.3.3). Specific cumulative effects issues included the following:

1. *Potential cumulative effects of loadout particulate emissions* – MOE and the public questioned the potential cumulative effects of Falling Creek Flats Loadout and Willow Creek Mine particulate emissions on the Willow Flats area.
2. *Cumulative effects from future air emissions sources* – MOE requested assessment of residual cumulative effects from combining the Falling Creek Flats Loadout coal dust increments with potential future sources of coal dust in the area.
3. *Cumulative effects on the landscape* – the Independent Consultant commented that in order to adequately characterize cumulative effects, it would be useful to consider the landscape changes prior to any development in the area (i.e. the "pristine case" prior to European settlement).
4. *Cumulative impacts of loadout on water quality* – MOE stated that cumulative impacts of the Falling Creek Flats Loadout (and resulting water quality objectives) need to anticipate future operations in the Falling and Beaudette watersheds.
5. *Cumulative effects approach for wildlife assessment* – MOE questioned the appropriateness of the approach used for the wildlife CEA.
6. *Regional mitigation* – MOE requested collaboration on regional mitigation with other industrial proponents.

15.3.2. Proponent's Responses

1. *Potential cumulative effects of loadout particulate emissions* – The loadout contribution to residual cumulative effects (i.e. with Pine Valley Coal's Willow Creek Mine) was determined to be not significant at Willow Flats residences. The incremental increase in maximum predicted cumulative PM_{10} concentrations at residences in Willow Flats due to the Falling Creek Flats Loadout was determined to be less than 0.5% of baseline concentrations. The incremental increase in maximum dustfall at Willow Flats due to the Falling Creek Flats Loadout was also determined to be negligible (less than 0.1% of baseline levels).
2. *Cumulative effects from future sources* – Residual cumulative effects were assessed for known projects or activities, where the criterion for known projects or activities was that there must be a public record – usually based on application for, or approval of, a permit or other government authorization. Cumulative effects of a future

processing plant near Falling Creek Flats Loadout cannot be predicted without the relevant design and emissions information for any such facility.

3. *Cumulative effects on the landscape* – WCCC responded that three standard assessment scenarios were used, which allow the evaluation of pre-Project conditions, and the assessment of incremental Project-related contributions to existing residual cumulative effects. The pristine scenario was not considered necessary or required by MOE.
4. *Cumulative impacts of loadout on water quality* – WCCC responded that the maximum coal footprint (6 coal stockpiles) was included in the water quality modelling for the loadout. Therefore, with respect to loadout-influenced drainages to groundwater and surface water, the potential for increased use has been taken into consideration.
5. *Cumulative effects approach for wildlife assessment* – WCCC responded that the CEA methods used in the wildlife assessment were transport (e.g. used defined effects assessment criteria) and used recognized approaches. Several quantitative tools were used for both Project effects and CEAs. This approach used follows those accepted by the Canadian Environmental Assessment Agency (CEAA), specifically as outlined in the *CEA Practitioners Guide*, developed by CEAA.
6. *Regional mitigation* – WCCC responded that the primary responsibility for coordinated resource development planning rests with government. WCCC has been involved in coordinated resource development planning exercises. WCCC has also had extensive contact with other proponents related to minimizing footprints by sharing roads and rights-of-way and resolving resource use conflicts. Most notable in relation to this project is the commitment to shared use of the Falling Creek Flats loadout site.

15.4. PROPONENT'S COMMITMENTS

In addition to commitments discussed in the previous Chapters to minimize residual effects that may contribute to regional cumulative effects on water and air quality, and fish and wildlife resources, the Proponent has committed to contribute to regional efforts related to caribou management planning is willing to participate in regional based programs directed by government and including other stakeholders to reduce the effects of access proliferation. Participation by WCCC will be in the context of an overall strategy led by government for cumulative effects management, and commensurate with WCCC's level of impact on key factors affecting populations. (Appendix F, #115)

15.5. CONCLUSIONS

Based on the review of the Application and Proponent responses, MOE, the Independent Consultant and EAO are satisfied that the Proponent's proposed mitigation measures and commitments should minimize the Project's contribution to regional cumulative effects.

16. ENVIRONMENTAL & OPERATIONAL MANAGEMENT PLANS

16.1. GENERAL

Environmental mitigation and management measures are integral to the Brule Mine Project design. Additional measures will be implemented under the supervision of WCCC staff and in accordance with the WCCC Environmental Management System (EMS). Key plans to be implemented by WCCC during the construction, operation and reclamation phases of the Brule Mine Project are described in Section 4.0 of the Application, and include:

- *Environmental Monitoring and Management Plan* – includes monitoring programs for specific environmental and geotechnical issues, and provides for internal and external reporting.
- *Construction Environmental Management Plan* – covers the construction schedule; construction coordination and management; construction workforce; Phase 1 construction activities; Falling Creek Connector Haul Route construction activities; power supply construction; safety and first aid; site security; fire protection; and implementation of the specific environmental management plans.
- *Preliminary Surface Erosion Prevention and Sediment Control Plan* – establishes a framework for surface erosion prevention and sediment control during Project construction, operations, and closure.
- *Water Management Plan* – describes the water management systems at the Brule Mine and Falling Creek Flats Loadout.
- *ML/ARD Prevention, Management and Monitoring Pla*n – describes ML/ARD prediction work, along with planned prevention, management and monitoring measures. The primary focus is on the Brule Mine, however assessments were also conducted for coal stockpiles at the Falling Creek Flats Loadout and (supplementary to the Application in Agency Compendium Appendix D 1.9) and for road cuts along the Falling Creek Connector Haul Route.
- *Selenium Management Plan* – describes predictive studies on the potential for selenium leaching at the Project site; establishes a range of management options; and describes monitoring.
- *Waste Management Plan* – covers solid wastes other than mining wastes, and liquid wastes other than sanitary sewage.
- *Chemicals and Materials Storage and Handling Plan* – provides guidelines to achieve safe and appropriate use of hazardous materials. It addresses delivery to site, proper identification, appropriate storage, and safe use.
- *Fuel Management Plan* – provides guidelines for the delivery of fuel to, and subsequent storage and dispensing at, the minesite and the loadout facility. Its primary focus is on spill prevention, but also provides guidance and direction on how to proceed in the event of a spill so as to minimize environmental impact.
- *Air Quality and Dust Control Plan* – outlines the management practices and mitigation measures that will be undertaken to minimize the air quality impacts of the mine, loadout operations, and haul routes, including protection of residents and potentially affected aquatic environments.
- *Wildlife and Fisheries Protection Plan* – addresses wildlife habitat, movement patterns, and mortality risk. Key components of fisheries protection are provided in the mine planning and management plans associated with erosion prevention, water management, and water quality.

- *Conceptual Reclamation and Decommissioning Plan* – describes reclamation planning, soil salvage and replacement, revegetation and other aspects of reclamation and decommissioning for the primary Project components.
- *Health and Safety Plan* – deals with issues related to the health and safety of anyone working on the Brule Mine Project, having access to the Project facilities, or traveling through the Project area.
- *Traffic Management Plan* – addresses the use of the Bullmoose Haul Route and the Falling Creek Connector Haul Route.

16.1.1. Proponent's Commitments

The Proponent made the following commitments relating to the environmental management plans:

- WCCC, in consultation with stakeholders, will update and implement a Traffic Management Plan for the Construction of the Falling Creek Connector Haul Route (Appendix F, #1).
- WCCC will assign the responsibility for Environmental Monitoring and regular Environmental Site Inspections on all construction sites to the WCCC Environmental Superintendent. The Environmental Superintendent, as well as the Mine Manager, WCCC Project Manager, and Site Supervisors will have the authority to shut down activities in the event of unacceptable impact to, or unacceptable risk of impact to, the environment (Appendix F, #2).
- WCCC will assign responsibility to the WCCC Project Manager, the Environmental Protection Compliance Manager (EPCM), Project Manager, and the Brule Mine Manager for implementation of environmental design commitments and environmental management plans in their areas of responsibility, as per regulatory approvals and permits. The Manager of Technical Services and the Environmental Superintendent will be assigned lead roles in supporting implementation; the VP Environmental & Regulatory will be responsible for monitoring compliance (Appendix F, #3).
- Brule Mine Project contractors will be required to comply with the Project Fuel Management Plan (Appendix F, #4).
- Brule Mine Project contractors will be required to comply with the Project Chemicals and Materials Storage and Handling Plan (Appendix F, #5).
- WCCC will develop an Environmental Management System for the construction and operations phases of the Project (Appendix F, #6).
- The Project site orientation will include an introduction to the Environmental Management System (EMS) (Appendix F, #7).
- The Emergency Preparedness and Response Plan for the Dillon Mine will be customized and updated to apply to Brule Project Sites (Appendix F, #8).
- WCCC will orient contractors and employees to the Emergency Response Plan (Appendix F, #9).
- WCCC will co-ordinate Emergency Response Planning with Burlington Resources and Talisman Energy with respect to their operations and facilities on the Brule Mine site and along the Falling Creek Connector Haul Route and the Blind Creek Road (Appendix F, #10).
- Surface Erosion Prevention and Sediment Control Plans (SEPSC) will be a part of the contract documents for earthworks contracts for construction of the Brule Mine, Falling Creek Flats Loadout, Falling Creek Connector Haul Route, and Powerlines.

Plans for the mine and loadout will be part of the water management plans for those facilities (Appendix F, #11).
- WCCC will refer the final site specific SEPSC plans for the Loadout to DFO, Prince George, for information (Appendix F, #12).

16.2. BACKGROUND INFORMATION

Several key management plans are addressed in conjunction with related sections of the Application, as follows:
- Water Management Plan items are addressed in the Climate, Hydrology and Groundwater section;
- Air Quality and Dust Control Plan items are addressed in the Air Quality section; and
- Wildlife and Fisheries Protection Plan items are addressed in the Wildlife and Fisheries sections.

Additional background is provided for key management plans that were the subject of Application review comments.

16.2.1. ML/ARD Prevention, Management and Monitoring Plan

Metal Leaching / Acid Rock Drainage (ML/ARD) can be caused when sulphide minerals are weathered by exposure to air and water. ARD results when the naturally acid consuming minerals (such as carbonates) are not present in sufficient quantities to offset the acid produced by weathering of sulphide minerals. ML/ARD is a concern at many metal mines and some coal mines, where there are locally elevated concentrations of sulphide minerals and metals. Mining greatly increases the amount of rock surface exposed to the weathering processes resulting in ML/ARD. Many potential inorganic contaminants become highly soluble under acidic conditions although significant metal leaching can also happen in neutral or alkaline drainage conditions.

Dissolved elements such as copper, zinc, cadmium and selenium can be toxic to fish and animals and can adversely affect ecosystem health. Metals can also be absorbed and accumulate in plant and animal tissue.

In order to assess the potential impacts resulting from minesite discharges to aquatic resources, ARD and metal leaching were predicted for all Brule Mine site facilities, including waste rock dumps, mine pit backfill and the proposed Brule and Blind pits. A reasonable worst case approach was used to ensure that any potential effects would be identified. A mass balance approach was used to predict the residual impacts to water quality in Blind Creek for varying flow conditions and for the maximum footprint of mine development during operation and closure (Application Section 8). Within this assessment, all potential mining-related inputs were considered, including nitrogen compounds, trace elements (including selenium), sulphate, phosphorus, metals and total suspended solids/ turbidity, dust (including coal dust), process chemicals and flocculants.

At the Brule Mine Project, the potential for ARD generation at the minesite was concluded to be low due to the high acid buffering capacity of the majority of the waste rock. WCCC will implement good ARD prevention practices by ensuring that the marker horizons and seam cleaning are mixed into waste dumps and not placed at the base of waste rock dumps where they can be exposed to fluctuating water levels. The Coarse

Coal Refuse (CCR) will be surrounded by and layered with higher pH, calcareous waste rock in the Northeast Dump.

Based on the impact assessment and analysis of baseline conditions, the primary water quality issues of concern identified by WCCC relate to aluminum, selenium and sulphate since these parameters are most likely to exceed their aquatic life guidelines in Blind Creek. Specifically, water quality impact predictions (based on the ML/ARD assessment and flow information from the hydrology and groundwater studies) indicate that mining operations may result in increases in aluminum, sulphate, and selenium to levels which may exceed their respective aquatic life guidelines. All three of these parameters are associated with the weathering of waste materials (e.g., waste rock) in receiving water courses. Selenium and sulphate are leached from waste materials (e.g., waste rock), while nitrogen compounds arise from the use of nitrogen-based explosives. The water quality impact assessment concluded however, that even the worst case predicted increases in these parameters are not expected to result in ecologically significant impacts (refer to Section 8.2.2.3 of the Application).

16.2.2. Conceptual Reclamation and Decommissioning Plan

WCCC will minimize the amount of disturbed land at any one time through phased clearing and progressive reclamation. Adequate topsoil to meet reclamation prescriptions will be stripped from the disturbed areas and stockpiled. Stockpiles will be stabilized and re-vegetated. Early land reclamation will be carried out as an important strategy to control fugitive dust emissions and prevent erosion.

All waste rock dump and the pit backfill will be reclaimed to productive end land use. Waste dumps will be resloped prior to being covered with previously salvaged topsoil and revegetated. Reclamation will be progressive, over the life of the mine. At closure, the plantsite and other structures will be removed and the minesite will be reclaimed. The Falling Creek Flats Loadout and any new segments of the Falling Creek Connector Haul Route not required by WCCC or other industrial users will also be reclaimed at closure. The power lines to the mine and loadout, if not required for industrial users, will be removed.

16.2.3. Selenium Management Plan

Selenium is an element that is released from coal mining wastes in the Rocky Mountains, and is recognized as requiring management in coal mining developments. The objectives of the Brule Mine Selenium Management Plan include providing sound scientific data for effects assessment; establishing a range of management options and contingency plans to prevent selenium leaching; and setting environmental effects monitoring programs related to selenium.

Maximum predicted concentrations of selenium in Blind Creek at BC-01 (upstream limit of fish distribution) exceed the B.C. Guideline during all flow conditions considered. However, selenium uptake by flora and fauna is known to occur more readily in lentic (slow-moving water/wetland) environments. There are no significant lentic environments associated with Blind Creek and receiving water, thus the potential for selenium toxicity from the Brule Mine is lessened. The results of WCCC's water quality assessment indicate the mining-related loadings from the Brule Project will be small enough and

diluted to the extent that they are not expected to cause unacceptable biologic effects in Blind Creek, or to be measurable in the Sukunka River.

16.2.4. Preliminary Surface Erosion Prevention and Sediment Control Plan

This plan establishes a framework for surface erosion prevention and sediment control during construction, operations and decommissioning/reclamation of the minesite, loadout, roads and the two power lines. The potential for surface erosion and sediment release is generally highest during construction, when vegetation cover is first removed and soils and subsoils are excavated or disturbed. The potential for sediment release will be greatly reduced on the minesite by the containment of most Phase 1 development areas within the catchment of the existing Sediment Pond 1 and associated ditches. Minimizing erosion and controlling any sediment release will help protect water quality.

16.3. REVIEW COMMENTS AND PROPONENT'S RESPONSES

Primary review comments and proponent's responses on key environmental and operational management plans were as follows.

16.3.1. Construction Environmental Management Plan

Review Comments

Most of the review comments provided on the Construction Environmental Management Plan pertained to other specific environmental management plans (e.g. sediment control, water management) and are covered under those headings. The primary comments specific to the Construction Environmental Management Plan were as follows:

1. *Environmental Monitor* – MOE asked if an Environmental Monitor or equivalent is planned, and outlined expectations for construction reporting and communications with MOE, and a member of the public asked about the independence of environmental monitors.
2. *Gravel Wash Water* – MOE asked where gravel wash water and truck wash-out for the Concrete Batch Plant will be treated.

Proponent Responses

1. *Environmental Monitor* – WCCC responded that WCCC's Environmental Superintendent will be responsible for monitoring construction work for compliance with environmental design specifications, design guidelines for regulatory requirements, quality control on environmental monitoring programs and for compliance monitoring. He will be expected to hold staff and contractors to the commitments made, and to applicable regulatory standards. The Environmental Superintendent and Monitors will report to MOE, as required in the effluent permits under MOE's *Environmental Management Act.*
2. *Gravel Wash Water and Truck Washout* – WCCC responded that production of concrete aggregates (i.e. screening and washing of gravel) will probably not be done at the Brule Mine. Aggregates would be trucked to the batch plant as was done for the Wolverine Mine. Gravel wash water will therefore not be produced at the mine and will not require treatment there. Cement trucks originating at the batch plant would return to the plant for washing out and wash water would be collected and 'treated' via exfiltration.

16.3.2. Preliminary Surface Erosion Prevention and Sediment Control Plan

Review Comments

Most comments on the preliminary Surface Erosion Prevention and Sediment Control (SEPSC) Plan were provided by MOE, with the public also expressing concern that Falling Creek and Beaudette Creek be protected from sedimentation (potentially) originating at the loadout. WCCC responded that water management structures, including sediment ponds, are part of the loadout facility design and that SEPSC planning will also be done for the loadout. The primary review comments on the preliminary SEPSC were as follows:

- *Small soil particle sizes and potential for sediment ponds to exceed the discharge criterion for Total Suspended Solids* – MOE noted that particle size analyses suggest problematic size fractions will be present in mine site runoff into settling ponds (i.e. particle sizes which are too fine to actually settle) and suggested that the results indicate that pond discharge quality would exceed 50 mg/L TSS.
- *Containment of runoff containing sediment* – MOE questioned whether there will be any runoff containing sediment that is not recovered and directed into the sedimentation ponds.

Proponent's Responses

- *Small soil particle sizes and potential for sediment ponds to exceed the discharge criterion for Total Suspended Solids* – WCCC responded that the "problematic" fine particle content in runoff feeding Sediment Pond 1 is now being successfully controlled during the operation of Sediment Pond 1. The same results are expected at Sediment Pond 2. The flocculation plant used at Sediment Pond 1 has been proven effective. It will continue to be used, and a similar plant will be installed at Sediment Pond 2. In addition, detailed SEPSC planning will be done for Brule. These measures are expected to result in acceptable levels of TSS in Brule sediment pond discharges.
- *Containment of runoff containing sediment* – WCCC confirmed that the proposed water management plan is designed to capture and route all surface runoff from the mine site into sedimentation ponds prior to release to Blind Creek. Collection ditches are planned for the entire lower perimeter of the mine area. Pumping of runoff is only potentially envisioned for water trapped in low areas in the pits, which cannot be discharged by gravity. The topography of the site and the planned placement of ditches and sedimentation ponds ensures that any water discharged from the pits (either pumped or by gravity) must eventually enter a sedimentation pond prior to discharge to Blind Creek.

16.3.3. ML/ARD Prevention, Management, and Monitoring Plan

Review Comments

Most of the comments and concerns related to the ML/ARD Prevention, Management and Monitoring Plan were provided by MEMPR, with some additional comments provided by MOE and the Independent Consultant:

- *Determination of ARD potential* – MEMPR raised concerns about the methods used to determine the potential for ARD in some rock units, and expressed concern that

the potential for both ARD and near-neutral metal leaching had been under-estimated. MOE reiterated these concerns based on the MEMPR review.

- *Management of potentially ARD generating rock units* – MEMPR indicated concerns about the lack of detail on overall management of a low percentage of potentially ARD generating units and management plan for the coarse coal reject (CCR).
- *Prediction of Metal Leaching (ML) in sources* – MEMPR and MOE recommended additions to the list of metal parameters evaluated, and clarification of the evaluation methods and the derivation of some input values.
- *Effects to Mink Creek* – MEMPR was concerned that a portion of the Brule Mine will be partially located within the Mink Creek watershed and that potential effects to hydrology and groundwater of this watershed had not been adequately addressed.
- *Groundwater by-passing the Sediment Ponds* - MEMPR was concerned that drainage, composed mostly of groundwater, by-passing the Sediment Ponds may be problematic if treatment of ML/ARD is ever needed.
- *Coal stockpile runoff quality* – MEMPR and MOE were concerned that coal stockpile runoff quality at the Falling Creek Flats Loadout may be problematic.
- *Seepage quality* – the Independent Consultant suggested that seepage quality be monitored throughout mine operations.

Proponent's Responses

- *Determination of ARD potential* – WCCC met with MEMPR and the ML/ARD and Water Quality Working Group, and provided additional information to clarify methods and assumptions used in determining ARD potential, including the approach used for averaging. With respect to the methodology for calculation of AP, it was agreed that with either method, the volumes of PAG waste would be similar. It is understood that there are no outstanding issues with respect to test methodology and determination of ARD potential.
- *Management of potentially ARD generating rock units* – WCCC provided the ML/ARD and Water Quality Working Group with supplementary information to clarify volumes and handling of potentially ARD generating units and CCR. WCCC committed to ensure through mine planning during all phases of mine life that Coarse Coal Reject (CCR) and other potentially ARD generating (PAG) wastes are co-disposed with not-PAG wastes. The ML/ARD and Water Quality Working Group concluded that sufficient information regarding management of ARD at the Brule Mine Project had been presented for a Certificate level decision.
- *Prediction of Metal Leaching (ML) in sources* – the ML/ARD and Water Quality Working Group was provided with supplemental information to address concerns regarding the parameters evaluated. Additional information was also provided to clarify the evaluation methods and the derivation of some input values. Reasonable worst case source terms were compared with back-calculated waste rock leaching of dissolved metals shown by the Dillon MSP. The method was used to provide revised source terms for manganese and a minor revised source term for copper, and to develop new source terms for several parameters requested by MEMPR (including barium, iron, manganese and thallium). With minor changes, the proposed source terms were accepted at the Working Group meeting of March 20th, 2006.
- *Effects to Mink Creek* – WCCC clarified that the pit design will ensure that very little groundwater flow from the pit floor will enter the Mink Creek drainage, and provided calculations to estimate the small potential flow volumes. It was generally agreed in discussions with MEMPR that a small area of the pit- estimated to be approximately 10% of the pit encroachment recharge area - might remain a recharge area with groundwater flow towards the Mink Creek drainage. The remainder of the pit areas

within the Mink Creek drainage would have groundwater discharge into the pits rather than remain as groundwater recharge areas. As a result, the total reduction in flows would be less than 7%. Correspondingly, the amount of groundwater expected to migrate from the pits to the Mink Creek Drainage represents approximately 0.14% of total flows in North Brule Creek at the gauge location. Furthermore, given that pit encroachment into the North Brule Tributary drainage is expected to be approximately 0.7% during the first few years of operation, affected groundwater migrating from the pits is expected to comprise approximately 0.014% of the flow at the gauging location in the creek during this period. Consequently, it was concluded that mine effects on water quality in Mink Creek will be minimal, and particularly so during the first several years of operations.

- *Groundwater by-passing the Sediment Ponds* – WCCC clarified that although 25% of net precipitation was estimated to bypass the collection system for the Southeast Ex-pit Dump, only 10% is estimated for the Northeast Ex-pit Dump and no bypass was estimated for the backfills. Small seepage losses from the Blind pit will either be collected by or be part of the bypass of the SP-1 collection system. Water quality sampling will be conducted at seep locations near the toes of waste dumps, in the sediment ponds and at points in Blind Creek. Any water quality concerns associated with the mine development will be expressed in the surface water prior to it showing up in the groundwater. If a water quality issue is detected in the surface water, then a groundwater monitoring program can be implemented for the purpose of better identifying the source of the problem.
- *Coal stockpile runoff quality* – It was concluded by the ML/ARD and Water Quality Working Group that assessment coal stockpile runoff quality at the Falling Creek Flats Loadout is not needed in order to make an EA Certificate level decision. The facility is not required for several years and can be better designed to address coal stockpile runoff quality concerns raised by the Working Group when site specific data on coal weathering is obtained from the mine site. WCCC committed to collect information on drainage chemistry for coal stockpiles to provide support for design, assessment and permitting of the Falling Creek Flats Loadout. WCCC also committed to evaluate the reactivity of organic sulphur in waste coal. In addition, WCCC committed that if coal leachate water quality indicates that the stockpile runoff is judged at permitting to be unacceptable for discharge to groundwater, the loadout stockpile will be constructed with a low permeability till liner, and the west ditch and pond will be lined.
- *Seepage quality* – WCCC responded that the company will monitor the seeps generated from waste rock piles and pit sumps as required by the *Mines Act* Permit.

16.3.4. Selenium Management Plan

Review Comments

Comments and concerns related to the Selenium Management Plan were provided by MEMPR and MOE:

- *Selenium management measures* – MEMPR was concerned that the proposed contingency measure of resloping and capping dumps if necessary to reduce infiltration and selenium loadings may be inadequate – potentially leading to a necessity for collection and treatment.
- *Selenium management measures* – MOE expressed concern that selenium levels may eventually exceed Aquatic Life Guidelines during the life of mine, but that

management planning for this must occur now. Details of potential treatment options were requested.

- *Se influence on the Sukunka River* – MOE requested additional consideration of an initial mixing zone in the Sukunka River.
- *Additional biological monitoring* – MOE stated that some level of biological monitoring – beyond that committed to by WCCC – is required on a regular basis. Triggers for sampling, reliance on more than one medium, and fish tissue warning levels were identified as topics requiring additional discussion.

Proponent's Responses

- *Selenium management measures* – WCCC responded that capping is a logical possibility because it can reduce infiltration and potential contaminant loadings. WCCC has committed to further mitigation or treatment of water if needed to address potential unacceptable biologic effects in Blind Creek; however it is not expected that this will be needed.
- *Selenium management measures* – WCCC responded that the approach used to estimate water quality effects has focused on a reasonable worst case approach so that there is a low probability that actual concentrations could exceed the values predicted. The assessment approach has indicated that selenium will significantly exceed aquatic water quality guidelines, but this guideline is accepted as being too low. The effects assessment indicates that that probability of significant biologic effects is low. The plan is to address this concern by monitoring and, if ultimately necessary, further measures. The preferred option is to reduce infiltration, which will reduce loadings to the environment. The monitoring will indicate to what degree infiltration would need to be reduced and therefore the method used (soil, engineered cover, etc). Technologies available to treat selenium were also described.
- *Selenium influence on the Sukunka River* - WCCC completed additional requested water quality modeling and provided the results to MOE. For predictions for Sukunka River, a 10-fold dilution was applied to predicted values at BC-05. Results indicated that predicted selenium levels in the Sukunka River are not expected to result in any adverse effects to aquatic resources.
- *Additional biological monitoring* – WCCC responded that based on MOE's concerns, the selenium management plan will be modified so that benthos, periphyton and fish are monitored yearly initially, with the option to reduce the frequency of monitoring (adaptive monitoring) dependent on the results of the initial 2 years of monitoring during mining. This change from a water-only trigger obviates discussion regarding the appropriate selenium water trigger. The focus on tissue chemistry is appropriate for selenium whose main mode of chronic toxicity is via food uptake; toxicological and taxonomic studies are more appropriate for metals for which both acute and chronic toxicity occurs primarily via the water column.

16.3.5. Chemicals and Materials Storage and Handling Plan

Review Comments

MOE asked if the hazardous materials or waste storage area will have an impermeable floor; consideration has been given to spill containment; and if the plan addresses the various fuel storage containers.

Proponent's Responses

WCCC responded that as indicated in the Chemicals and Materials Storage and Handling Plan, petroleum products, explosives and miscellaneous hazardous materials will be stored in facilities that comply with applicable requirements of the B.C. Fire Code and the National Fire Code of Canada i.e. 100% containment. WCCC confirmed that the plan addresses all fuel product storage containers to be maintained at Brule.

16.3.6. Fuel Management Plan

Review Comments

MOE and MEMPR provided the following comments on the Fuel Management Plan:

- *Provisions for oil spills during construction* – MOE noted that there should be provisions to address oil spills at the equipment erection site.
- *Fuel handling* – MOE stated that the B.C. Fuel Handling Guideline should be adhered to and the Hazardous Waste Regulation followed.
- *Spill response* – MOE noted that the Application states spills will be reported to MOE within 24 hours. MOE stated that WCCC is to note existing PEP spill reporting requirements, as per the existing Dillon Mine permit.
- *Spill Notification* - MOE noted that they are to be notified immediately in the case of spills that enter a watercourse, and requested clarification as to who would have the responsibility to provide such notification.
- *Fuel storage and management at loadout* – MOE noted general concerns with fuel storage in proximity to Pine River tributaries and questioned details of the storage and management planning.
- *Secondary containment* – MOE requested specific details of containment measures.

Proponent's Responses

- *Provisions for oil spills during construction* – WCCC responded that all facilities located at the Brule Mine – including the equipment erection site – will be subject to the requirements set out in the Fuel Management Plan and Chemicals and Materials Handling Plan.
- *Fuel handling* – WCCC noted the comments. WCCC intends to comply with regulatory requirements.
- *Spill response* – WCCC noted the comments and requirement.
- *Spill notification* – WCCC noted the comment and clarified that notification responsibility would fall to the Environmental Protection Compliance Management) (EPCM) contractor, Mine Manager, or their designate.
- *Fuel storage and management at loadout* – WCCC provided additional details on fuel storage and management plans, including secondary containment.
- *Secondary containment* – WCCC provided details of secondary containment measures.

16.3.7. Conceptual Reclamation and Decommissioning Plan

Review Comments

MEMPR indicated that Brule Mine Project operational and conceptual final reclamation plans meet their requirements for EA Certificate determination. MOE and the Independent Consultant provided the following comments on the Conceptual Reclamation and Decommissioning Plan:

1. *Vegetation species selection for use in reclamation* – The Independent Consultant recommended that agronomic species known to uptake selenium should be excluded from reclamation seed mixes.
2. *Metal uptake in vegetation* – The Independent Consultant recommended that an upland plant uptake-monitoring program that includes both growth media and foliage sampling for selenium should be included as a requirement for the Brule Mines Act Permit.
3. *Post-closure monitoring* – The Independent Consultant stated that performance criteria should be used to determine the end of post-closure monitoring instead of a fixed time period.
4. *Monitoring* - The Independent Consultant recommended that a well-conceived and integrated monitoring program should be developed to ensure that the long-term interests of First Nations and other stakeholders concerning ecosystems and forest capability are protected.

Proponent's Responses

1. *Vegetation species selection for use in reclamation* – WCCC responded that to their knowledge, there is no evidence that selenium accumulates in vegetation on reclaimed land in NE B.C. In fact, studies on the Bullmoose minesite indicated that vegetation on reclaimed areas was lower in selenium than on control areas. WCCC is also aware that much of the hay produced in the Peace region needs to be enriched with selenium because soils in the area can be selenium deficient. WCCC is prepared to revisit the issue if the Independent Consultant provides data to support the request, or if reclamation monitoring of selenium levels in vegetation indicates high selenium concentration.
2. *Metal uptake in vegetation* – WCCC committed to monitoring the uptake of metals and selenium in vegetation as part of its reclamation monitoring program.
3. *Post-closure monitoring* – WCCC clarified that as noted in the Application, WCCC has committed to conducting post-closure reclamation monitoring for the mine site and Falling Creek Flats Loadout until a self-sustaining vegetation cover that meets end land use objectives has been established and documented. Monitoring will be in compliance with the Mine Code and the Brule *Mines Act* Permit.
4. *Monitoring* – WCCC responded that the Mine Permit reclamation program will include a monitoring program that over time will assess progress toward ecosystem and forest capability objectives. Monitoring programs will be updated and refined as reclamation advances.

16.3.8. Health and Safety Plan

Review Comments

Comments provided by MEMPR related to Health and Safety included the following:

1. *Mining in proximity to operating oil and gas infrastructure* – MEMPR requested details of how worker Health and Safety would be addressed in relation to the operating pipeline and producing sour gas well.

2. *Sour gas well decommissioning* – MEMPR requested details of sour gas well decommissioning and worker Health and Safety in relation to mining in proximity to the decommissioned well.
3. *Blind Creek Road relocation* – MEMPR requested details of the planned Blind Creek Road relocation and – if the road is to be near the Sediment Pond access road – what precautions will be taken to protect the public from waste dump failures.
4. *Brule Internal Pit backfill* – MEMPR requested details of safety measures to be undertaken when the pit backfill is higher than the mine workings.
5. *Highway Safety* – After the May 23rd Working Group Meeting the representative for MOT requested that following certification that WCCC discuss safety measures such as handling spills, accidents and an incident handling procedure for WCCC's use of public roads for the life of the mine.

Proponent's Responses

1. *Mining in proximity to operating oil and gas infrastructure* – WCCC provided standoff distances to address worker Health and Safety, based on evaluation by a blasting consultant.
2. *Sour gas well decommissioning* – WCCC described Oil & Gas Commission (OGC) regulations and procedures of decommissioning sour gas wells, and provided additional details of how the general procedure will need to be modified to accommodate (safe) mining.
3. *Blind Creek Road relocation* – WCCC clarified that the location of the Blind Creek Road during each phase of the mining operation will be defined as part of the detailed design for the Mine Permit Application. The road will not be located in the toe area of active dumps, and traffic control measures will be implemented.
4. *Brule Internal Pit backfill* – WCCC specified separation distances and other safety measures to be implemented when the pit backfill is higher than the mine workings.
5. *Highway Safety* – In a follow up conversation with EAO WCCC committed to contacting MOT to discuss these issues with MOT.

16.4. CONCLUSIONS

Following the review the Application and Proponent responses, MEMPR, MOE , the Independent Consultant and EAO are is satisfied that the Proponent's environmental management system and management plans should prevent or reduce to an acceptable level any potential significant adverse environmental, heritage or health effects of the proposed Project.

17. ISSUES REGARDING FIRST NATIONS RIGHTS AND INTERESTS & INTERESTS IDENTIFIED BY THE KELLY LAKE COMMUNITIES

17.1. GENERAL

The Brule Project is situated within the area covered by Treaty 8. Treaty 8 provides the signatories with the right to hunt, fish and trap within the Treaty 8 territory. While Treaty 8 provides for the taking up of lands for mining, the court has instructed that in the taking up, first Nations should be consulted about their ability to practice their rights.

The McLeod Lake Indian Band; Saulteau First Nations; and West Moberly First Nations, (the First Nations) are signatories to Treaty 8 and have identified the vicinity of the Project as part of the Treaty 8 territory traditionally used by them for hunting fishing and trapping. The reserve communities of the Saulteau and West Moberly on Moberly Lake are among the settlements nearest to the Project.

In addition, to the Treaty 8 First Nations, representatives of Kelly Lake First Nations; Kelly Lake Cree Nation; and Kelly Lake Métis Settlement Society (Kelly Lake Communities) have also expressed interest in the Brule Project.

Section 14 of the Application provides background information on First Nations and Kelly Lake Communities in the Project area.

To assist First Nations and the Kelly Lake Communities to participate in the Project review and to assist First Nations to identify potential impacts on Treaty rights and interests, and the interests of the Kelly Lake Communities, EAO and the Proponent provided funding to engage an independent consultant (Independent Consultant) to work on their behalf.

17.2. CONSULTATION

The EAO plans and conducts environmental assessments to include meaningful participation by First Nations with asserted rights and treaty rights in the area of a project. This effort begins at the pre-application stage and continues through to the referral of a project to Ministers. The Act requires the assessment of the potential effects of a reviewable project. In addition, EAO consultations with First Nations are also guided by the Provincial Policy for Consultation with First Nations (October 2002) and current court rulings.

Measures Undertaken by the Proponent

Through its previous Projects in the area (Wolverine and Dillon mines) WCCC has established a working relationship with First Nations and the Kelly Lake Communities.

The Proponent initiated an extensive Pre-Application consultation process, designed to identify concerns and interests of the Treaty 8 First Nations potentially affected by the proposed Project. The consultation and communication framework implemented for the Brule Coal Project was developed in conjunction with the EAO as reflected in the Application Terms of Reference and the Section 11 order which were reviewed by First Nations, Kelly Lake Communities and the Independent Consultant. The Application

summarized WCCC's consultation program and issue identification with the First Nations and Kelly Lake Communities. Following submission of the Application, the Proponent submitted the report, "Consultation and Communication with First Nations and Kelly Lake Communities" describing WCCC's consultation activities during the period following submission of the Application to the end of the public comment period (June 26, 2005).

WCCC held individual information meetings on the Project; conducted traditional use and archaeology studies and gathered baseline socio-economic information for the Project area, in close consultation with First Nations and the Kelly Lake Communities. WCCC also developed, or is developing co-operation agreements (the Cooperation Agreements) with interested groups; and has adopted contracting and recruitment approaches to enhance employment and contracting opportunities.

WCCC invited the First Nations and Kelly Lake Communities to tour the Project in March 2005 and the revised load out location in June 2005.

During the review of the Certificate Application, WCCC consultation efforts focused on providing capacity to the Treaty 8 First Nations and the Kelly Lake Communities to participate in the Project review, meetings with First Nations and Kelly Lake Communities, ongoing work towards a Cooperation Agreement with McLeod Lake Indian Band, and meetings to provide information on employment and training opportunities at WCCC's Wolverine Mine. Concurrently, in relation to all its projects in Northeast BC, and the Wolverine Project in particular, WCCC has been continuing and evolving its programs related to employment, apprenticeship, and training opportunities, intended to provide ongoing access First Nations and Kelly Lake Communities to economic benefits from WCCC Projects.

In 2004 WCCC offered a Mentoring Program to respond to the desire of some First Nations and Kelly Lake Communities to have opportunities for their youth to acquire knowledge, skills, and experience in environmental management and monitoring. Representatives of four of the six groups worked in the 2004 summer field program, assisted in specific environmental monitoring programs, and/or attended the B.C. Reclamation Symposium under the sponsorship of WCCC. A follow-up mentoring program was offered in 2005. Representatives of two First Nations and Kelly Lake Métis Settlement Society attended the 2005 B.C. Reclamation Symposium under sponsorship by WCCC.

Cooperation Agreements with West Moberly First Nations, Saulteau First Nations and Kelly Lake Métis Settlement Society were finalized in October 2004, January 2005 and February 2005, respectively.

WCCC's signed co-operation agreements address matters such as:

- Communication protocols concerning Project-related activities;
- Mechanisms to facilitate First Nations and Kelly Lake communities' employment and contracting opportunities related to WCCC Projects;
- Contracting procedures and standards, including procedures to provide opportunities to First Nations and Kelly Lake communities for participation and benefits; and,
- Agreements concerning WCCC's support for training and apprentice opportunities.

Discussions with respect to a Co-operation Agreement with McLeod Lake Indian Band (MLIB) have been ongoing. The most recent activities include a meeting between

WCCC representatives and Chief and legal counsel on January 23, 2006, and work on an overall Protocol Agreement with drafts forwarded for MLIB review and comment on February 14, 2006 and May 18, 2006.

The Kelly Lake Cree Nation has indicated interest in a Cooperation Agreement with WCCC.

Measures Undertaken by EAO

In January 2005 the EAO provided the Brule Project Description to the First Nations and Kelly Lake Communities for their information, and elicited their interest in participating in the review of the Project. Subsequently, the First Nations and Kelly Lake Communities were invited to join the Working Group and participate in the first meeting in March 2005. The First Nations and Kelly Lake Métis Settlement Society participated in the Working Group meeting March 2nd. The First Nations also met with EAO staff at Chetwynd and West Moberly during this week.

In May 2005 the EAO provided assistance funding (co-funded by the Proponent) and arranged for an Independent Consultant acceptable to the First Nations and Kelly Lake Communities to provide technical advice during the review.

In June 2005 the First Nations, Kelly Lake Communities and the Independent Consultant were invited to participate in a Working Group meeting and site tour planned for mid June. In addition, the Independent Consultant attended EAO chaired meetings with federal agencies in July and September 2005. The Independent Consultant also reviewed the draft EAO Section 11 order and draft Application ToR in September 2005 on behalf of First Nations and the Kelly Lake Communities.

The Application was distributed to the First Nations, Kelly Lake Communities and the Independent Consultant in mid-December 2005. At that time the EAO reviewed and approved the Proponent's reporting on the First Nations' Consultation Program provided in the Application and the Proponent's plans for future consultation.

To ensure that all Treaty 8 First Nations members were also aware of the proposed Project, the EAO notified the remaining members (Blueberry River First Nation; Doig River First Nation; Fort Nelson Indian Band; Halfway River First Nation; and Prophet River Band) of receipt and availability of the Application, and requested them to advise if the Project had the capacity to impact areas of interest and significance to their membership. None of these Treaty 8 First Nations responded or commented on the Application. In addition, the Treaty 8 Tribal Association was made aware of the Application review and the involvement of the McLeod Lake Indian Band, the Saulteau First Nations and West Moberly First Nations.

As members of the Project Working Group, First Nations, Kelly Lake Committees and the Independent Consultant were invited to participate in a compliance screening of the Application against the information requirements described in the Terms of Reference. In the December, 2005 the Working Group met with the Proponent to initiate the Application review. The First Nations and the Independent Consultant attended. EAO staff also met with the First Nations in their communities in mid December, 2005.

On March 9, 2006 the Independent Consultant submitted his Interim Report on the Application on behalf of the First Nations and Kelly Lake Communities. The comments were passed on to WCCC for their information and response. The Proponent's responses to these comments are provided in Appendix E to this Assessment Report.

The Independent Consultant's interim report concluded that in general the Project Application fulfills the requirements of the Application TOR. While there were no issues or deficiencies that would prevent the Project from proceeding there were sections of the Application, particularly air quality, where information appeared incomplete or deficient. The Independent Consultant felt that all issues could be corrected during the review or permitting stage of the development.

On March 20, April 4 and April 6, the Independent Consultant participated in the Metal Leaching and Acid Rock Drainage and Water Quality, Water Quality and Aquatic Resource, and Air Quality Working Group meetings, respectively. All technical issues of concern to the Independent Consultant were satisfactorily addressed.

On May 2, 2006, EAO provided the First Nations, Kelly Lake Communities and the Independent Consultant with a the draft assessment report and invited them to the May 23 Working Group teleconference meeting to review the draft and identify any outstanding issues to be resolved prior to referral to Ministers for a decision on issuance of the Certificate. The Independent Consultant and the representative from McLeod Lake Indian Band were able to participate in the teleconference.

On May 31, the EAO hosted the final teleconference meeting of the Working Group to review the changes in the draft assessment report resulting from the May 23 meeting and discussions between the Independent Consultant and the First Nations and Kelly Lake Communities. First Nations did not attend this meeting due to scheduled meetings with the Independent Consultant to discuss the draft assessment report particularly Chapter 17 – *Issues Regarding First Nations Rights and Interest & Interests Identified by the Kelly Lake Communities*, the draft certificate and the Independent Consultant's draft final report. On June 5, the Independent Consultant met with a representative of the West Moberly First Nation and, later that day, with Lyle Letendre to discuss the findings of the Independent Consultant's Final Report.

The Independent's Consultant's Final Report was submitted on June 7, 2006 addressing issues identified by the First Nations, Kelly Lake Communities and the Independent Consultant, including potential infringement on Treaty 8 Rights regarding hunting, fishing and trapping. The conclusions are discussed in the subsequent sections.

Independent Consultant's Final Report

On May 31, 2006, the Independent Consultant met with representatives from McLeod Lake Indian Band, Saulteau First Nations and West Moberly First Nations to discuss the draft Independent Consultant's Final Report. During these meetings, the Independent Consultant reviewed the draft Assessment Report (circulated for discussion at the May 23 Working Group), teleconference, as well as the most recent draft of Chapter 17 regarding First Nations Rights and Interests and the Interests of the Kelly Lake Communities with specific reference to the First Nations treaty rights to hunt, trap and fish within the Treaty 8 area.

The Final Report was submitted on June 7, 2006. Comments on the Project and recommendations were provided by each of the 3 First Nations representatives; as follows:

- McLeod Lake Indian Band :
  - Potential infringement on Treaty rights has not been specifically raised by McLeod Lake Indian Band;
  - Wildlife monitoring should be done as reclamation progresses to determine if it is effective;
  - The mentoring program of 2004 and 2005 should be continued;
  - McLeod Lake Indian Band would like to be notified before the use of pesticides on the Brule Project;
  - McLeod Lake Indian Band requests clarification as to who will monitor the Project recommendations and commitments.

- West Moberly First Nations:
  - Traditional Land Use Studies did not include hunters, fishers and trappers;
  - Importance of use of native species in reclamation;
  - Strain on infrastructure (police and health) due to increases in population due to development;
  - Cumulative the effect of one development may be minor but becomes a larger issue when other areas of the development are considered.

- Saulteau First Nations:
  - While mining often brings good wages to a small community where social assistance has been the prime income source, added wealth may result in substance abuse and there is a need for facilities and program to address this potential side effect;
  - Saulteau First Nations is concerned about the loss of medicine plants and that the Traditional Land Use Study should have interviewed the medicine men regarding this issue; and
  - Saulteau First Nations found that Assessment Report's conclusion that hunting rights are not affected was unacceptable, noting that the effect is subjective and that for one hunter using a favourite location this would be significant to him.

The Independent Consultant's Final Report concluded that the Project is acceptable considering the WCCC's commitments,, as well as future regulation of the operation through government permits, approvals and licenses. In addition, communication with First Nations and Kelly Lake Communities is to continue and that monitoring of the operation is an important component of the mine operation.

17.3. OVERVIEW OF FIRST NATIONS AND KELLY LAKE COMMUNITIES CONCERNS AND RESOLUTION

Meetings with the First Nations and Kelly Lake Communities during the pre-application and application stages of the review and the Independent Consultant's Final Report identified the following main issues of concern:

- Infringement of Treaty 8 rights including:
  - Impacts on traditional land use sites
  - Impacts on fish
  - Impacts on wildlife,

  - Regional cumulative effects
- Air quality and coal dust on berry picking
- Impacts on traditional uses by the Kelly Lake Communities
- Participation in environmental monitoring;
- Review process;
- Desire for share of economic benefits; and
- Social infrastructure effects of development.

17.3.1 Potential Effects on Treaty 8 Rights

17.3.1.1. Traditional Use Sites

The Traditional Land Use Studies were based on interviews with participants identified by each First Nation and Kelly Lake Community, although West Moberly First Nations noted that specific hunters may not have been contacted. Discussions did not result in any specific identification of any particular portion of the Project area that is of particular importance to them for hunting, fishing and trapping. In any event the traditional use site details are confidential and this information is considered proprietary to participating representatives of First Nations and Kelly Lake Communities. The traditional land use study in which First Nations and Kelly Lake Communities were extensively involved, confirms historic and current aboriginal use of the Project area.

The Project areas, located within the Sukunka and Pine River watersheds, fall within areas known and used by some of the identified potentially affected First Nations and Kelly Lake Communities. McLeod Lake Indian Band advised that physical evidence of their existence would be cabins, lean-tos, pack trails, Tee-Pee poles, racks for drying meats, campsites, spirit poles, wire snares, metal traps, burial grounds (gravesites) culturally modified trees (CMTs), historical trails, arrow heads or other artifacts.

Section 14.3 of the Application provides a detailed discussion of traditional use in the vicinity of the Project. Sites identified include 13 archeological sites as recognized by the provincial *Heritage Conservation Act* and 31 traditional use sites (Table 14.3.3.3) identified by First Nations and the Kelly Lake Communities. The latter could include the following types: game trails and animal habitat sites,; traps and snares; campsites; historic structure sites; medicinal plant sites; plants for food and berry picking sites; human birth places and burials; and sacred and ceremonial sites. Not all site types were identified within the proposed Brule Mine Project.

Of the 13 Archeological sites associated with the Project, one site (GiR-1) is in direct conflict with the proposed Falling Creek Connector Haul Route.

To ensure that GiR-1 is protected, WCCC has committed that contracts for vegetation clearing and haul road construction and maintenance will include specifications for avoidance and protection of Archaeology Site (GiRI-1) in the vicinity of the Falling Creek Connector Haul Route. Specifications will be developed based on a field visit and consultation with Landsong Heritage Consulting. The Environmental Superintendent will be responsible for marking the site, contractor orientation, and monitoring during construction (Appendix F, commitment #79).

Seventeen Traditional Land Use Sites were identified within the proposed Falling Creek Connector Haul Route. Of these, two sites, TLUS #21 and #27, would be adversely affected by construction of the development.

Four Traditional Land Use Sites were identified within the proposed Mine Power Supply. Of these, three sites, TLUS #28, #29, and #30, will be adversely affected by construction of the development. The recommended option is to move the section of the right-of-way in question to the south, so that it parallels the existing Grizzly Valley Gas pipeline right-of-way.

To insure that these traditional use sites are protected, WCCC has committed that contract for vegetation clearing, haul road construction and powerline installation will include specifications, if needed based on final powerline routing, for avoidance and protection of the 5 Traditional Land Use sites identified along the proposed haul and powerline routes. Final routing will be developed based on consultation with Landsong Heritage Consulting and the relevant First Nations and Aboriginal groups. The Environmental Superintendent will be responsible for marking the site, contractor orientation, and monitoring during construction (Appendix F, commitment #80, 81).

Traditional Land Use studies involving representatives from the local Treaty 8 First Nations and Kelly Lake Communities evaluated plants of traditional use importance. In 2004 WCCC funded a study of plants of traditional use importance in the Wolverine and Hermann Project areas. Plants identified as important in that study are candidate species for use in WCCC reclamation programs (Appendix F; commitment #76).

In addition, increased traffic on the Sukunka FSR, as it relates to enjoyment of the area for fishing and other activities was identified as an impact on traditional land use. In response, the Proponent noted that traffic levels on this road are high in the absence of the Project, requiring traffic management and radio controls. The projected use of the Sukunka FSR for coal haul is approximately two three years. Once the new load out is constructed, coal haul traffic will be to the north, and traffic on the Sukunka FSR related to the Project will be restricted to mine access vehicles.

Conclusion: EAO is satisfied that the proposed mitigation measures and commitments should prevent any potential significant adverse effects of the proposed Project on identified archaeological and traditional use sites.

17.3.1.2. Fish

First Nations and the Kelly Lake Communities expressed concern that the Project may impact water quality and fish populations, as a result of selenium leaching and sedimentation in Blind Creek, and the Sukunka and Pine rivers.

Sections 8 of the Application and Chapters 7 and 8 of this Assessment Report provide background information and discuss potential Project impacts to water quality, aquatic life and fish and proposed mitigations.

Section 4 of the Application and Chapter 15 of the Assessment Report identify key environmental management plans to be implemented by WCCC during the construction, operation and reclamation phases of the Brule Mine Project to protect water quality, aquatic life and fish.

Proposed Environmental Management Plans to address the concerns regarding the leaching of selenium from waste dumps at the mines site and coal storage piles at the Falling Creek load out, and prevention and minimization of sediment movement associated with surface disturbance into water bodies include:

- *Selenium Management Plan* – describes predictive studies on the potential for selenium leaching at the Project site; establishes a range of management options; and describes monitoring.
- *Surface Erosion Prevention and Sediment Control Plan* – establishes a framework for surface erosion prevention and sediment control during Project construction, operations, and closure.
- *Environmental Monitoring and Management Plan* – includes monitoring programs for specific environmental and geotechnical issues, and provides for internal and external reporting.
- *Construction Environmental Management Plan* – covers the construction schedule; construction coordination and management; construction workforce; Phase 1 construction activities; Falling Creek Connector Haul Route construction activities; power supply construction; safety and first aid; site security; fire protection; and implementation of the specific environmental management plans.
- *Water Management Plan* – describes the water management systems at the Brule Mine and Falling Creek Flats Load out.
- *ML/ARD Prevention, Management and Monitoring Pla*n – describes ML/ARD prediction work, along with planned prevention, management and monitoring measures. The primary focus is on the Brule Mine, however assessments were also conducted for coal stockpiles at the Falling Creek Flats Load out and (supplementary to the Application in Agency Compendium Appendix D 1.9) and for road cuts along the Falling Creek Connector Haul Route.
- *Waste Management Plan* – covers solid wastes other than mining wastes, and liquid wastes other than sanitary sewage.
- *Chemicals and Materials Storage and Handling Plan* – provides guidelines to achieve safe and appropriate use of hazardous materials. It addresses delivery to site, proper identification, appropriate storage, and safe use.
- *Fuel Management Plan* – provides guidelines for the delivery of fuel to, and subsequent storage and dispensing at, the mine site and the load out facility. Its primary focus is on spill prevention, but also provides guidance and direction on how to proceed in the event of a spill so as to minimize environmental impact.

In response to issues raised by the agencies, First Nations and Independent Consultant, the Proponent made a number of commitments to protect water quality, flows, aquatic life and fish which are listed in Chapters 6, 7 and 8 and summarized in Appendix F of this Assessment Report. Those addressing potential selenium and sediment impacts include:

- Environmental site inspectors will have the authority to shut down activities in the event of unacceptable risk to the environment (#2);
- Lining of ditches and load out coal storage pads if leaching tests indicate that the coal pile runoff will be unacceptable (#46) and, if unlined, then monitoring of ground water as it migrates to the tributaries leading to the Pine River (#43);
- Will address any unacceptable biological effects of selenium through mitigation or treatment (#58); and

- WCCC will prepare site specifications for contractors for clearing (including hand-cutting) at crossings of fish-bearing streams along the power lines, namely at the Pine River, Sukunka River, and Martin Creek (#63)

In addition, WCCC committed to monitoring during winter low flows (#48) in Blind Creek and a reference creek to confirm that any changes in flow patterns or volumes will be insufficient to impact fish populations in Blind Creek. WCCC has agreed that if habitat enhancement is required, WCCC and DFO would enter into negotiations to determine what enhancements should be implemented. WCCC identified possible enhancements for over wintering potential for Bull Trout and rainbow trout in Blind Creek and other portions of the Sukunka watershed, as well as enhancement of spawning habitat for rainbow trout in Blind Creek. WCCC also identified the need to collect baseline data to inform the management of Bull trout in the Sukunka watershed.

The Independent Consultant on behalf of the First Nations and Kelly Lake Communities submitted their interim report on the Application on March 9, 2006 following review by First Nations and Kelly Lake Community representatives, and reported that:

- Interests were protected by the following management plans: surface erosion and sediment control; water management; metal leaching and acid rock drainage; selenium management; and the conceptual reclamation and decommissioning plan.
- The Project effects on surface water quality have been assessed conservatively and that proper application of the proposed mitigation measures will maintain good water quality.
- While the fisheries habitat capability assessment was appropriate and acceptable, additional information on mitigation of potential impacts was requested and provided.

Conclusions: EAO is satisfied that the proposed mitigation measures and commitments should prevent or mitigate any potential adverse effects of the proposed Project on fish populations and the fishing.

17.3.1.3. Wildlife

First Nations and the Kelly Lake Communities expressed concern regarding the potential impact on wildlife due to disruption of wildlife corridors, road kills, disruption of wildlife during calving season, noise, access management and end land use objectives and coal dust effects on vegetation and wildlife.

Background information on vegetation and wildlife resources, an assessment of potential impacts, proposed mitigations and commitments is provided in Section 10 of the Application and summarized in Chapter 10 of this Assessment Report.

Project Impacts

In general, the most dramatic effects of the proposed Project would occur at the mine and load out (due to clearing and excavation activities), while reduced effects are anticipated for the connector road and powerline. The Application notes that 744 ha, 62 ha and 30 ha of surface disturbance will be associated with the mine site, road construction and improvements and the rail load out, respectively. At the close of operations, reclamation activities are expected to restore many vegetation features, as well as associated wildlife habitat although this may take some time depending on the habitat needs of particular wildlife species. Most, if not all of the mine site will be reclaimed following the end of mine life expected to be approximately 11 years. The rail

load out is not likely to be reclaimed for some time after that since it is anticipated that it will be used for other coal properties.

Small areas of wetlands, old forest, or ecological communities of conservation concern are directly affected by the mine. Within the Brule Mine footprint, <1.0 ha of wetland will be directly removed and not reclaimed, and no wetlands will be affected by the clearing proposed for the Falling Creek Flats Load out. There may be some minor disruption to wetlands along the powerline right-of-way and new road segments, but in general the majority of the affected wetlands are only subject to indirect effects. Similarly, less than 1.0 ha of old forest growth will be cleared for mine development and 2.6 ha within the Falling Creek Flats Load out. There may also be some minor clearing of old forest along the powerline right-of-way and new road segments, but in general the majority of the old forest will only be subject to indirect effects. Clearing may affect 16.1 ha of ecological communities of conservation concern within the Brule Mine footprint and 2.6 ha within the Falling Creek Flats Load out. Some permanent loss of ecological communities of conservation concern is predicted as communities that have been cleared for activities are not expected to return fully to their pre-disturbance condition.

For wildlife, the Project footprint consists primarily of low to moderate quality habitat for most of the 9 wildlife indicators (grizzly bear, caribou, moose, marten, fisher, wolverine, northern goshawk and black-throated green warbler). Some smaller areas of moderate to higher quality habitat are present for some species (e.g., marten and black-throated green warbler in the load out area). Much of the area around the mine site and connector road has been recently logged and is currently of a young seral stage forest that is less valuable to wildlife. As such, wildlife habitat ratings for most species (e.g., caribou, grizzly bear, wolverine and fish) are mostly of nil or very low habitat suitability. More mature forest is located at the load out and along segments of the powerline. However, habitat quality at these sites has been compromised due to existing disturbances.

Based on all available information, including telemetry data, compiled for this assessment, caribou are infrequent users of the regional study area and are unlikely to be in the study area year-round. Signs of caribou use were not observed during the Proponent's field programs along the Falling Creek Connector Route. While the effects of the Project on caribou habitat appear relatively large based on percent changes, only small fragmented areas of habitat are actually affected, and these areas are not within high use areas. Caribou are only present seasonally and in very low numbers in the study area. Based on the effects assessment, increased mortality risk is the major concern and no significant habitat effects are predicted. WCCC has committed to wildlife protection and reclamation plans that will largely mitigate mortality risks. WCCC is also prepared to collaborate with other parties on the management of cumulative effects in the area. A no hunting policy at the mine site and the Falling Creek Loadout will be required by the *Mines Act* which will have an impact on the area available to First Nations for hunting.

Mitigation plans have been prepared to minimize the effects of the Project on vegetation (Application Sections 4.11 and 10.1.4) and wildlife (Sections 4.12 and 10.3.4) resources. Minimizing Project footprint, paralleling other linear features, use of existing roads, access control, vehicle restrictions, and reclamation of disturbed habitat are the major methods of mitigating effects on vegetation and wildlife. Monitoring programs have been

proposed to document wildlife occurrences and incidents, as well as vegetation reclamation success (Sections 4.11 and 4.12).

The Application's Project effects assessment concluded that the Project will not result in significant changes in habitat availability for the nine focal wildlife species.

Existing cumulative effects on old forest and ecological communities of conservation concern were identified for the regional study area. The incremental small loss of these features and wetlands resulting from the Project was determined to be not significant in a regional context. Similarly, existing cumulative effects were identified as high for mortality risk (related to increased human access) for moose, Rocky Mountain elk, and grizzly bear. However, the incremental contribution of the Project to these existing cumulative effects was determined by the Proponent's wildlife consultants to be not significant.

WCCC has made the following commitments regarding the minimizing of impact to wildlife at the proposed mine site, haul road route and Falling Creek load out:

- Maintain and update as needed a Wildlife Protection Plan for the Brule Project, and submit this plan to MOE every two years (Appendix F, commitment #61).
- Communicate Wildlife Protection requirements to staff and contractors at the site Orientation (Appendix F, commitment #62).
- Employees and contractors will avoid disruption of bird nests and eggs during the breeding bird window. Dens will also be avoided, except where clearing and mining activities cannot be adjusted (e.g., mine site) (Appendix F, commitment #64)
- Clearing plans for the load out will be reviewed with the objective of maintaining maximum vegetation buffers adjacent to facilities and access roads in and around the proposed Falling Creek Flats Load out, except where safety (visibility) concerns are an issue (Appendix F, commitment #66)
- Detailed engineering of embankments/dams/ditches will provide allowance for escape routes (i.e. shallow slope on banks) for wildlife, particularly ungulates (Appendix F, commitment #68)
- A wildlife/danger tree assessment will be conducted in areas of high potential occurrence i.e. in older structural stages along proposed powerline and periphery of the mine site and load out prior to clearing with a view to minimizing cutting of wildlife trees (Appendix F, commitment #71).

WCCC will also be required to develop a final reclamation and closure plan for the load out and the mine site which will include wildlife habitat as an end land use objective. When specific wildlife species benefit from the reclamation will depend on their favoured successional stage. Some will prefer the earlier successional vegetation and others the more mature stages.

Project Effects on Wildlife Corridors and Mortalities

With respect to movement patterns, signs of wildlife trails or movement corridors were documented during field programs. While wildlife sign was noted at all Project locations, no major movement corridors were observed by the Proponent. WCCC's wildlife consultants concluded that riparian areas and major drainage systems (e.g., Falling Creek, Sukunka) likely act as movement corridors for wildlife.

WCCC's preliminary finding with regard to the Falling Creek Haul route impacting the migration corridors of the Mt. Hudette caribou is that, according to the studies conducted

to date, there is no indication that the haul route will traverse through the areas that are considered of high use by caribou. As such, the route is not expected to have a significant impact on the caribou in the area (section 10.3.6.1 Brule EA Application). This evidence is further corroborated by MOE studies and the designation of Draft Ungulate Winter Range (UWR) Conservation area which are all situated well outside of the boundaries of the Falling Creek Haul Route.

In response to concerns regarding wildlife corridors, the Proponent committed to:

- Limit snow bank height at known wildlife crossing points determined by the Environmental Superintendent to a level that allows for ungulates and other large mammals to cross the road safely (Appendix F, commitment #65).
- Wildlife crossing points (i.e., shallow slopes on ditches) will be provided, at intervals along Falling Creek Connector Route ditches at sites determined by the Environmental Superintendent, with the provision that ditch function is not compromised (Appendix F, commitment #67)
- If the monitoring data from the Brazion area caribou studies are relevant, the data will be used as part of the Brule Mine/haul route mitigation planning (Appendix F, commitment #70).

Concerns were also raised regarding the potential for increased mortalities resulting from the increased truck traffic.

In response, the Proponent noted that WCCC's coal traffic volume to the Bullmoose loadout, which will be utilized until the Falling Creek load out has been constructed, will not likely increase from the current situation. The Brule mine will switch to the Falling Creek Load out haul route after 3 years of production until the end of the mine life (8 more years).

In addition to the comments above regarding identification of wildlife corridors and crossing points, WCCC noted that the haul truck speeds will be relatively slow, about 60 km/hr and frequently around 30 km/hr.

Air Quality Effects on Wildlife

First Nations and the Kelly Lake Communities raised concerns regarding the potential impact of coal dust on wildlife.

The EAO review for Western's Wolverine Project concluded that no information was available to indicate that there are potentially deleterious effects of coal dust on wildlife, vegetation and livestock. Additionally, a wildlife veterinarian indicated that there were unlikely to be health concerns for ungulates and livestock related to coal dust where conditions are acceptable for humans, and representatives from the Animal Disease Centre (USDA), Elk Valley Coal and Teck Cominco were not aware of any wildlife health issues related to coal dust. Where significant coal dust settles on vegetation, there would likely be non-health related effects for some wildlife species (i.e., loss of habitat), but these effects would be very localized, and given that wildlife are mobile they would most likely move out of the affected area (e.g., areas adjacent to coal stockpiles), and thus, minimize any possible health risks.

The Air Quality Management Plan prepared for the Brule Coal Project addresses coal dust in a human context, and presumably dust levels that are under the threshold for humans will also be safe for wildlife.

In addition to implementing a dust management plan, the Proponent committed to:

- Water or apply surface treatments on roads to reduce dust emissions when required to meet public safety, to achieve ambient air quality and dustfall permit objectives, and to achieve safe operating conditions (Appendix F, #27).
- During construction of the Falling Creek Connector Haul Route, WCCC will water roads in the community of Hasler, if and when needed, to mitigate dust impacts of traffic generated as a result of road construction activity on the Falling Creek Connector Haul Route (Appendix F, #28).
- The boxes of the Brule Project coal haul trucks will be covered during transport to and from the Mine, the Falling Creek Flats Loadout, and the Bullmoose Loadout to minimize coal dust generation (Appendix F, #31).

Noise Effect on Wildlife

The Proponent acknowledged that traffic noise has the potential to impact wildlife habitat use patterns (e.g., through avoidance of habitats adjacent to a source of noise). Recognizing this, noise from mine-related activities, such as traffic along the haul route, was a major consideration in the development of the 'disturbance buffers' that were used in the wildlife effects assessment. Depending on the species, a disturbance buffer of up to 800 m in width was added along the haul route to encompass the effects of noise and other sensory disturbances (e.g., smells, sights) on wildlife habitat use (incremental to the effects identified as a result of any vegetation clearing). In the case of the furbearers, the disturbance buffers used for high use activities (like the haul route) were 100 m in width for marten and fisher, and 800 m in width for wolverine.

Sensory disturbance may cause an animal to avoid or reduce its use of a habitat, thus, habitats within a disturbance buffer had their value decreased to different extents depending on the species and the intensity of the activity. This is a conservative approach as habitat was 'affected' the same throughout the entire disturbance buffer although in reality a number of factors (e.g., time of day, species, age and sex class, habitat type) will influence how an animal responds to sensory disturbance, and the extent to which it may avoid or under utilize habitats within a disturbance buffer. Given the variety of factors influencing the degree of sensory disturbance (see above) the Project assessment of indirect effects is considered conservative—in reality, individual animals may utilize the habitat within these disturbance buffers more or less than predicted, and any effect is unlikely to be uniform throughout the buffer. Further, it is important to note that with the completion of mining activities the indirect effects on habitat that result from sensory (noise) disturbance will return to baseline levels. With the exception of ungulates and marine mammals, there has been little research on the effects of noise on mammals in a natural setting. Farmed mink are known to respond to sounds such as sonic booms, but with apparently no detrimental effects on reproduction. Most mink returned to pre-boom activities within two minutes and appeared to habituate to the booms after exposure to three booms over an hour.

End Land Use and Reclamation Objectives

First Nations and the Kelly Lake Communities express concern that the end land use and reclamation objectives would not consider wildlife. In response, WCCC's stated that the reclamation goal for the Project is to foster return of (primarily) forested ecosystems that will be capable of supporting a number of post-closure land uses, including but not limited to use by wildlife and commercial forest harvest. Habitat suitability for a number of wildlife indicator species was described in the Application for different general

successional phases, related to structural stage. Principles of primary and secondary succession are incorporated into the predictions related to reclamation outcomes (e.g., the contrast between reclamation results on sites that have been cleared only vs. those that have been completely disturbed).

In addition to inclusion of wildlife as an end land use objective in the proposed reclamation plan, WCCC committed to:

- Monitoring of reclamation success will be conducted during mine life to determine survival and growth of vegetation selected to meet end land use objectives (Appendix F, commitment #74);
- As part of the Wildlife Protection Plan, a wildlife log will be kept recording use of Project over the mine life (Appendix F, commitment #61);.
- Will consider plants identified as important in WCCC 2004 study of plants of traditional use importance in the Wolverine and Hermann Project areas as candidate species in WCCC reclamation programs (Appendix F, commitment #76);.

Access Effects

Concerns were also raised regarding the potential for increased hunting due to increased access along the Falling Creek load out haul road. It is acknowledged that increased road access has the potential to increase human activity and hunting pressure.

While the mine site and load out will for safety reasons be closed to hunting under the *Mines Act,* the 16 km of road construction connecting the Brule mine to the Falling Creek Loadout will provide on going access unless decommissioned. However, relative to the increasing access associated with other industries, it will make a very small contribution to increased access in the region.

Conclusion: EAO is satisfied that the proposed mitigation measures and commitments should either prevent or mitigate any potential adverse effects of the proposed Project on wildlife, trapping and hunting.

17.3.1.4. Regional Cumulative Effects

First Nations and the Kelly Lake Communities expressed concern as to the potential effect of the Brule Project together with past, current and anticipated development in the region. Their focus was on the cumulative effects on air quality, water quality and access on fish and wildlife.

The Application discusses cumulative effects in section 7 to 11 for biophysical resources and provides a summary in Section 19 and Section 4, a review of the cumulative effects methodology. Discussion on cumulative effects provided in Chapters 8 and 10 of the Assessment Report regarding fish and wildlife resources, respectively with an overall summary provided in Chapter 15.

As noted in Chapter 15 of the Assessment Report, land uses in the north eastern region of British Columbia include oil and gas developments, mining, forestry, agriculture, trapping, hunting, guide outfitting, and recreation activities.

In particular, the Application notes that forest harvesting activities and access road development related primarily to oil and gas and forestry activities have resulted in

wildlife habitat fragmentation and loss of old forest and ecological communities of conservation concern. In contrast, the cumulative effects assessment for wetlands and air quality concluded that current or future conditions without the Project are within an acceptable level, and therefore, no significant residual cumulative effects exist or are predicted. In no case was the Project contribution to residual cumulative effects considered significant.

WCCC is also prepared to collaborate with other parties on the management of cumulative effects in the area.

Conclusion: EAO concludes that the Proponent's proposed mitigation and commitments should minimize the proposed Projects contribution to regional cumulative effects. However, it does contribute to the potential effects on Treaty 8 rights. At this time it is the conclusion of the EAO that the First Nations should, with the addition of this proposed Project, reasonably continue to practice their rights in their traditional harvesting areas.

17.3.1.5. Conclusions on Potential Infringement of Treaty 8 Rights

As noted earlier, Treaty 8 provides the signatories with the right to hunt, fish and trap within the Treaty 8 territory. The McLeod Lake Indian Band, the West Moberly First Nation and the Saulteau First Nation have expressed concern that the Brule Project may impact their ability to practice their treaty rights specifically within the Treaty 8 area traditionally used by these groups.

The assessment of the Project's impact on the ability of First Nations to practice their rights looked at both the Project effects on the health of regional wildlife and fish populations, and First Nations ability to access those resources.

The Assessment Report concluded that the Proponent's proposed mitigation measures, including environmental management plans and commitments should prevent or reduce impacts on wildlife and fish populations.

The ability to access fish and wildlife will be impacted to some degree by the loss of wildlife habitat on the disturbed portions of the mine and load out and the loss of physical access to these sites due to the prohibition of hunting on lands designated as a mine under the *Mines Act*. At the end of mine life, the habitat should slowly recover and the use by wildlife will return to baseline levels. At some time following reclamation and closure, land and wildlife will be accessible to First Nations. Loss of access to wildlife associated with the Falling Creek load out will likely continue for some years following the Brule mine closure due to its planned use by other coal properties in the area. However, given the relatively small size of the area that will for a time not be available to First Nations to hunt and trap and the lower value of the habitat compared to the region as a whole, it is not expected that the Project should have a significant effect on First Nations ability to practice these Treaty rights.

Since no fish are found directly at the disturbed areas of the mine and load out, and no significant impacts to fish habitat and water quality are anticipated in association with the Project, no effect on the availability of fish is anticipated.

Conclusion: While it is acknowledged that individual hunters may be affected on a site specific basis during the life of the mine, EAO is satisfied that if the Project is approved First Nations should be able to reasonably practice their treaty rights to hunt, trap and fish within the Treaty 8 territory traditionally used by them.

17.3.2 Additional Issues of Concern for First Nations and the Kelly Lake Communities

17.3.2.1. Coal and Road Dust on Berry Harvesting

Potential effects of coal and road dust on berries, and impacts of traffic on berry picking along the Sukunka FSR were identified by the McLeod Lake Indian Band as a concern.

The Proponent responded that it is expected that with washing to remove dust, there is no health concern associated with eating berries that have had dust on them. Coal hauling associated with the Brule mine will cease as soon as the WCCC's Falling Creek load out is operational.

In addition to implementing a dust management plan, the Proponent committed to:

- Water or apply surface treatments on roads to reduce dust emissions when required to meet public safety, to achieve ambient air quality and dustfall permit objectives, and to achieve safe operating conditions (Appendix F, #27).
- During construction of the Falling Creek Connector Haul Route, WCCC will water roads in the community of Hasler, if and when needed, to mitigate dust impacts of traffic generated as a result of road construction activity on the Falling Creek Connector Haul Route (Appendix F, #28).
- The boxes of the Brule Project coal haul trucks will be covered during transport to and from the Mine, the Falling Creek Flats Loadout, and the Bullmoose Loadout to minimize coal dust generation (Appendix F, #31).

Conclusion: EAO is satisfied that road and coal dust should not likely have an impact on berry picking along the Sukunka Forest Service Road.

17.3.2.2. Participation in Environmental Monitoring

McLeod Lake Indian Band expressed a desire to be involved in environmental monitoring, and that mercury should be monitored. In addition, McLeod Lake Indian Band sought clarification regarding the monitoring of commitments and recommendations.

In response, the Proponent, made the following commitments:

- WCCC will provide regular opportunities for First Nations and Aboriginal communities to review environmental monitoring and reclamation results for the Brule Project, and to provide input to evolving monitoring programs and reclamation plans (Appendix F, commitment #83).
- WCCC is willing to arrange for annual visits to the Brule mine site for First Nations and Kelly Lake Communities (Appendix F, commitment #84).
- WCCC will conduct low level mercury tests on a suite of humidity cell and barrel tests to confirm that mercury leaching levels are low. A decision by regulatory agencies on the need to monitor mercury in the receiving aquatic environment will await these results.

In addition, McLeod Lake Indian Band sought clarification regarding the monitoring of commitments and recommendations. In response to this, EAO notes that Condition 5 of the Brule Mine Project Certificate requires that the Proponent report to the EAO regarding its commitments listed in Schedule B of the Certificate and in Appendix F of this Assessment Report. Reporting will be due prior to significant surface disturbance, prior to start of full scale commercial production and one year following start of full scale full scale commercial production. In addition, authorizations issued following certification may require reporting on commitments made during the Project assessment.

Conclusion: EAO is satisfied with the Proponent's commitments to involve First Nations and the Kelly Lake Communities in environmental monitoring.

17.3.2.3. Share of Economic Benefits

The Proponent reports that a significant thrust of the discussions with the First Nations and Kelly Lake Communities has been the need for, and potential mechanisms for, providing a share of the economic benefits of WCCC's mining Projects (Application, section 14.2.2.3.1).

In response, WCCC signed Co-operation Agreements with the West Moberly First Nations, the Saulteau First Nations and the Kelly Lake Métis Settlement Society. WCCC is currently in negotiations with McLeod Lake Indian Band and the Kelly Lake Cree have expressed and interest in a cooperative agreement with WCCC.

Groups that have not signed Agreements also have access to the recruitment and training programs and contracting opportunities that WCCC is offering.

Table 14.2.2.1 summarized the main issues that have been discussed and advanced between WCCC and First Nations and Kelly Lake Communities. Section 14.2.2.3.2 outlines the contracts awarded to First Nations and the Kelly Lake Communities for WCCC's Dillon and Wolverine mines, as well as employment.

WCCC has committed to provide opportunities to participate in the economic benefits of the Brule Project through contract bid opportunities, jobs and training program opportunities (Appendix F, commitment #82).

Although economic accommodation may not be required in the case of proposed Brule Mine, WCCC has outlined mechanisms to facilitate employment, contracting and training opportunities in its Cooperation Agreements.

17.3.2.4. Review Process

A representative of West Moberly First Nations expressed concern regarding government systems in place to protect the regional environment and treaty rights. In this context he cited proposed coal Projects in the region falling under the EA review threshold and the potential for them not to receive the same level of scrutiny as projects in the EA process. As well, he had observed coal dust in the vicinity of the Pine Valley operation and could not trust government safeguards in relation to the Brule Project.

Assessment of mining proposals which do not trigger review under the province's *Environmental Assessment Act*, is considered during the application process for a *Mines Act* permit. Air quality monitoring will be required in the vicinity of the Brule Project and the operation will be required to meet provincial standards as identified in the Air Permit under the *Environmental Management Act*.

17.3.2.5. Social and Infrastructure Effects of Development

During discussions with the Independent Consultant on May 31, West Moberly First Nations and Saulteau First Nations indicated concern regarding social and health issues.

The Saulteau First Nation representative noted that while mining often brings good wages to a small community where social assistance has been the prime income source, added wealth may result in substance abuse and there is a need for facilities and programs to address this potential side effect. While this concern is not seen by EAO as the responsibility of a single employer, it should be noted that WCCC is developing an employee assistance program to assist in dealing with substance abuse and family issues for its coal projects in the north east.

In addition, McLeod Lake Indian Band identified the potential strain on infrastructure (police and health) due to increases in population due to development as a concern. The EAO will communicate this concern to the provincial government.

Conclusion: The EAO is satisfied that the interests of First Nations and the Kelly Lake Communities have been considered and addressed.

PART C
CONCLUSIONS OF THE REVIEW

18. REVIEW CONCLUSIONS

In conclusion, the EA review of the Project has considered the information contained in the Application and additional commitments identified by WCCC in response to issues raised during the review by the public, First Nations, Kelly Lake Communities and the Working Group.

EAO is satisfied that:

- the Application, together with additional clarifications provided during the review, adequately identified and assessed the potential significant adverse environmental, economic, social, heritage and health effects of the Project;
- public and First Nations and Kelly Lake Communities consultation and the distribution of information about the Project have been adequately carried out by the Proponent;
- issues identified by the public, First Nations, Kelly Lake Communities, and federal and provincial agencies and local governments were adequately addressed by the Proponent during the review of the Application and that the province's obligation to consult and accommodate treaty rights in the taking up of lands for mining have been adequately addressed; and
- practical means have been identified to prevent or reduce to an acceptable level potential significant adverse effects arising from the Project.

Based on the information provided by the Proponent, the Project should not cause significant adverse environmental, social, economic, heritage or health effects, taking into account the implementation of mitigation measures committed to by the Proponent.