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## COAL MOUNTAIN PHASE 2 PROJECT DESCRIPTION

### **Submitted to:**

Canadian Environmental Assessment Agency  
410-701 West Georgia Street  
Vancouver, BC, T7Y 1C6

Attention: Lucille Lukey, Project Manager

### **Pursuant to:**

*Canadian Environmental Assessment Act (2012)*

### **Submitted by:**

Teck Coal Limited

September 2014

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## ACRONYMS

AB	Alberta
AOA	Archaeological Overview Assessment
ARD	acid rock drainage
BC	British Columbia
BC CDC	British Columbia Conservation Data Centre
BC EAO	British Columbia Environmental Assessment Office
BC MOE	British Columbia Ministry of Environment
BCEAA	British Columbia <i>Environmental Assessment Act</i>
CEAA	<i>Canadian Environmental Assessment Act</i>
CEMF	Cumulative Effects Management Framework
CMO	Coal Mountain Operations
COSEWIC	Committee on the Status of Endangered Species in Canada
DFO	Fisheries and Oceans Canada
e.g.	for example
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EIS	Environmental Impact Statement
ERDZ	Enhanced Resource Development Zone
ESA	Regional Environmentally Sensitive Area
ESSF	Engelmann Spruce – Subalpine Fir zone
ESSFdk	Engelmann Spruce – Subalpine Fir dry cool zone
ESSFdkp	Engelmann Spruce – Subalpine Fir dry parkland zone
ESSFdkw	Engelmann Spruce – Subalpine Fir dry woodland zone
ESSFwm	Engelmann Spruce – Subalpine Fir subzone
ESSFwmp	Engelmann Spruce – Subalpine Fir parkland subzone
ESSFwmw	Engelmann Spruce – Subalpine Fir canopy forest subzone
et al.	and others
EVO	Elkview Operations
EVWQP	Elk Valley Water Quality Plan
FRO	Fording River Operations
GDP	gross domestic product
GHG	greenhouse gas
GIS	Geographic Information System
HMC	heavy media cyclone
HR	Hosmer Ridge
i.e.	that is

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ICHmk1	Interior Cedar – Hemlock variant
ISO	International Organization for Standardization
KNC	Ktunaxa Nation Council
LCO	Line Creek Operations
LOM	Life of Mine
LSA	local study area
MEM	Ministry of Energy and Mines and Responsible for Core Review
MPMO	Major Projects Management Office
MR	Marten Ridge
MS	Montane Spruce
MSdk	Montane Spruce dry cool
NNL	No Net Loss
NO <sub>2</sub>	nitrogen dioxide
NWPA	Navigable Waters Protection Act
OGC	British Columbia Oil and Gas Commission
PAG	potential acid generating
PAH	polycyclic aromatic hydrocarbon
PM	Particulate Matter
PM <sub>10</sub>	particulate matter less than 10 µm (micrometres) in diameter
PM <sub>2.5</sub>	particulate matter less than 2.5 µm (micrometres) in diameter
RAEMP	Regional Aquatic Effects Monitoring Program
RDEK	Regional District of East Kootenay
ROM	Run-of-Mine
SARA	<i>Species at Risk Act</i>
SG	specific gravity
SO <sub>2</sub>	sulphur dioxide
STP	Sewage Treatment Plant
TAC	Technical Advisory Committee
Teck	Teck Coal Limited
the Project	the Coal Mountain Phase 2 Project
WOC	water-only-cyclones
WR	Wheeler Ridge

## UNITS

%	Percent
°	Degree
<	less than
>	greater than
\$	Canadian dollars
µm	Micrometre
bcm	bank cubic metre
BTU/hr	British thermal units per hour
cm	Centimetre
dBA	A-weighted decibel
ha	Hectare
km	Kilometre
km <sup>2</sup>	square kilometre
kV	Kilovolt
kW	Kilowatt
m	Metre
M bcm	million bank cubic metres
M bcmrc	million bank cubic metres raw coal
M bcmw	million bank cubic metres waste
M mtcc	million metric tonnes clean coal
M mtrc	million metric tonnes raw coal
masl	metres above sea level
mm	Millimetre
m/m	metres per metre
m <sup>3</sup>	cubic metre
Mmt	million metric tonnes
mt	metric tonne
t/d	tonnes per day
tph	tonnes per hour
V	Volt

## 1 PROPONENT INFORMATION

### 1.1 PROPONENT BACKGROUND

Teck Resources Ltd. is Canada's largest diversified mining company, with major business units focused on copper, zinc, energy and steelmaking coal. Teck Coal Limited (Teck), a wholly owned subsidiary of Teck Resources Ltd., is the leading North American producer of steelmaking coal. Teck operates six open-pit mines in western Canada: Cardinal River, Coal Mountain, Elkview, Line Creek, Greenhills, and Fording River. Five of these mines are in the Elk Valley of southeastern British Columbia (BC); Cardinal River is in west-central Alberta. Together, they account for annual production capacity in excess of 25 million tonnes of high-grade steelmaking coal.

Teck is proposing a new mine project as an extension of the existing Coal Mountain Operations (CMO). The proposed extension is the subject of this Project Description, which has been prepared in accordance with the guidance documents administered by the BC Environmental Assessment Office (BC EAO), and contains the content described in the *Guide to Preparing a Description of a Designated Project under the Canadian Environmental Assessment Act* (Government of Canada 2012a). For the purposes of this document, the mine extension area is referred to the CMO2 site, and the location of existing operations is referred to as the CMO site. The overall project, which includes future proposed activities at both the CMO and CMO2 site, is referred to as the Coal Mountain Phase 2 Project (the Project).

### 1.2 KEY PROPONENT CONTACTS

The Proponent of the Project is:

Teck Coal Limited  
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Calgary, AB T2G 0R3  
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Fax: 403.265.8794  
Website: [www.teck.com](http://www.teck.com)  
Registered in British Columbia on January 20, 2004 (#A0061056)

Contact information for Teck's Executive Vice President and Chief Operating Officer:

Ian Kilgour, Executive Vice President and Chief Operating Officer  
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550 Burrard Street  
Vancouver, BC V6C 0B3  
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Fax: 604.699.4750  
Email: [ian.kilgour@teck.com](mailto:ian.kilgour@teck.com)



**Teck Coal Limited: Coal Mountain Phase 2 Project Description**

For the purposes of the Environmental Assessment (EA) for the Project, the principal contact person is:

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Teck Coal Limited  
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Calgary, AB T2G 0R3  
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Fax: 403.265.8794  
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## **2 PROJECT INFORMATION**

### **2.1 PROJECT HISTORY**

Mining of steelmaking coal in the region began in the late 1890s at the Coal Creek Mine near Fernie, BC and continued throughout the 1900s. A focus on open-pit mining practices in the early 1970s resulted in development of the five active mines in the Elk Valley, all of which transitioned to Teck in mid-2008.

Mining activity at Coal Mountain began in 1908 with small underground mines and continued intermittently as open-pit operations with various owners. A major expansion was completed in 1979, which included a preparation plant, load-out facilities and the reconstruction of the rail link. Another major expansion took place in the mid-1980s which included new maintenance facilities and a heavy media wash plant. Fording Coal Limited purchased the assets in October 1994 and renamed the mine Coal Mountain Operations. Fording Coal made significant capital investments in new mining equipment and further upgrades to the process plant including the installation of a coal-fired dryer in 2000. In 2003, Elk Valley Coal Corporation was formed as a partnership between Fording Coal Limited and Teck Cominco. In October 2008, Teck Cominco acquired Fording Coal Limited and six Canadian steelmaking coal mines, which are now collectively Teck Coal.

Exploration work in the area of the CMO2 site dates back to the 1960s, when initial work was carried out by Kaiser Resources. This exploration included drilling, trenching, adits, and test pits. In 1981 Kaiser Resources sold the property to the British Columbia Resource Investment Corporation, who later became Westar Mining Ltd. Teck then acquired the property in 1992, began a drilling program in 2003, and has since had ongoing exploration at the site.

### **2.2 PROJECT OVERVIEW**

#### **2.2.1 Project Purpose and Rationale**

If approved, the proposed extension of CMO would include the creation of a new mining area, approximately 20 kilometres (km) northwest of the existing operation. Access to the CMO2 mine site would be south from Highway 3 via Corbin Road and then west to the CMO2 site via new road construction. The CMO2 site would include the creation of new roads, coal stockpile, pits, waste spoils, and site-specific maintenance and office facilities. Open-pit mining would primarily occur on Marten and Wheeler ridges, with waste spoils being placed within the Little Wheeler, Wheeler, and Snowslide drainages. The existing processing plant, breaker, rail load-out, office buildings, and coal refuse facilities would remain at the CMO site, and would be utilized as part of the Project. The raw coal would likely be transported from the new mining area to the processing plant using highway-legal haul trucks via the existing Corbin Road. However, other options for raw coal transportation are currently being evaluated as alternatives and are further explained in Section 2.4.2.2.

Coal Mountain Operations directly supports a workforce of about 340 employees and contributes substantially to the local economies in the Elk Valley and the East Kootenays, especially Sparwood, Elkford, Crowsnest Pass, and Fernie. Economic

contributions to these communities from Teck and CMO come through employment, charitable donations, local purchases, rentals, and a formal mine-property tax sharing pool.

Existing permitted mining areas at CMO could sustain operations until 2017, with production beginning to decline in 2016 (based on current projected production rates). To retain the existing workforce and meet market demands for steelmaking coal in the future, CMO is dependent on the development of the proposed Project. The Project would extend the Life of Mine (LOM) to about 2050.

Teck does not anticipate any financial support from the federal authorities for the Project.

## 2.2.2 Project Location

The CMO2 site would be situated in southeastern British Columbia (BC) in the East Kootenay Regional District, about 15 km south of Sparwood, 5 km east of Hosmer, and 20 km northwest of the existing CMO site (Figure 2.1). Distances of the CMO2 site from Canadian national parks are presented in Table 2.1. The centre of the Project footprint would be located at approximately 49° 35' 18.621" north (N) latitude and 114° 52' 2.642" west (W) longitude. The Project footprint would range in elevation between approximately 1,310 to 2,180 metres above sea level. It would be located entirely within the Michel Creek watershed, which drains into the Elk River at Sparwood (Figure 2.2).

**Table 2.1 Distances to National Parks from the Project Site**

National Park	Approximate Distance from the Park to the Project
Banff National Park	127 km south east
Glacier National Park	232 km south east
Jasper National Park	329 km south east
Kootenay National Park	131 km south east
Revelstoke National Park	271 km south east
Waterton-Glacier International Peace Park	68 km north west
Yoho National Park	201 km south east

km = kilometres

The CMO2 site would be located approximately 64 km north of the Canada-US border.

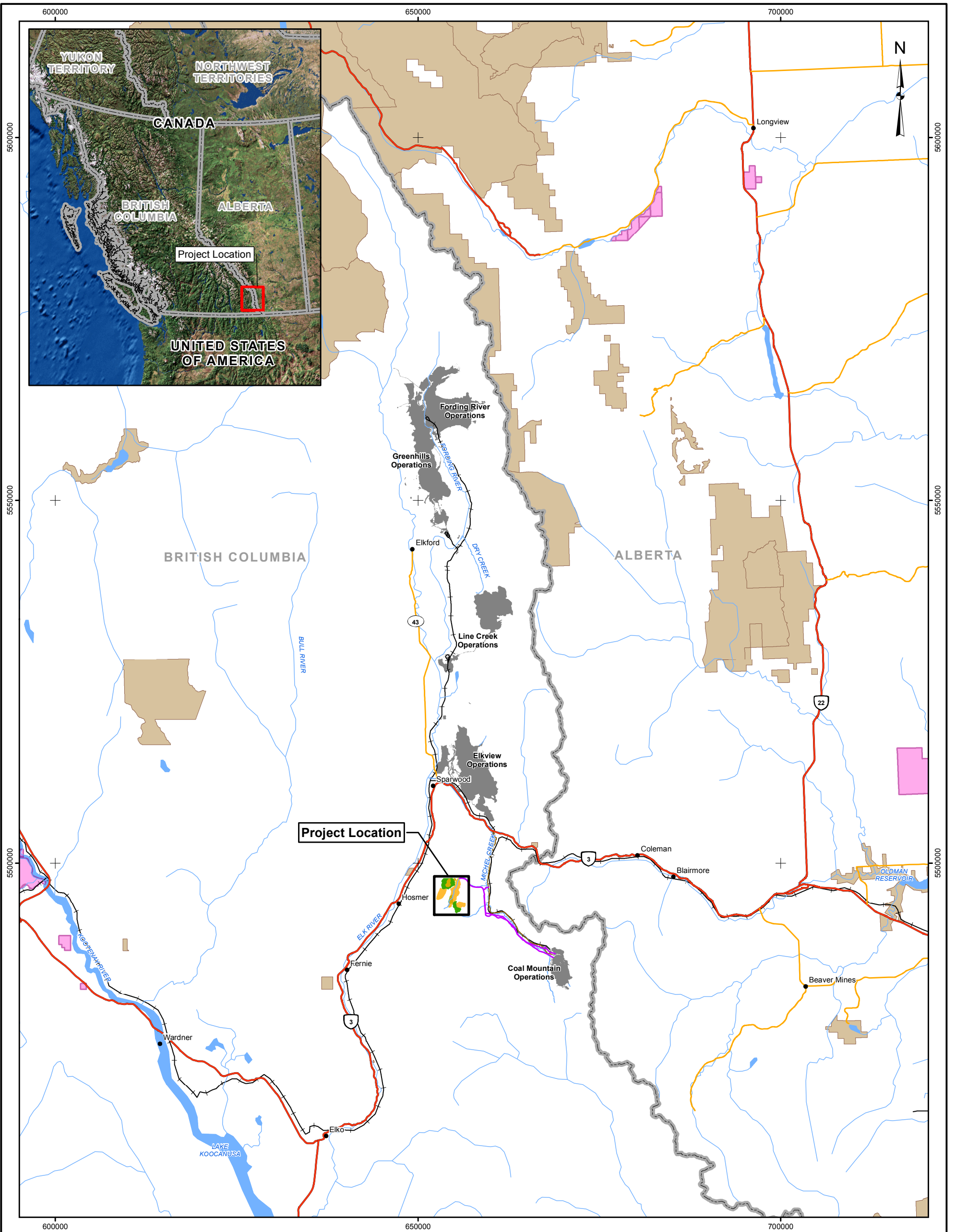
Currently, the Project would not be taking place on, or require the use of any federal lands. However, as the Project is further defined, there may be a need for certain components to be situated upon lands within Parcel 73 of the Dominion Coal Block (Figure 2.2). Examples may include roads or water management structures. Also, Wheeler Pit and Wheeler Valley Spoil at the CMO2 site are proposed to be situated immediately adjacent to Parcel 73 of the Dominion Coal Block and water would flow from a portion of the CMO2 site through the southern part of this parcel of Federal land.

### 2.2.2.1 Regional Studies

The proposed Project is not located in a region that is the subject of a "Regional Study", as defined by the Canadian Environmental Assessment Agency (Canadian

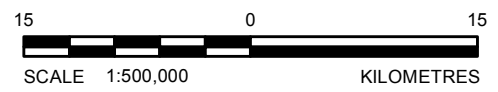
Environmental Assessment Agency 2014). However, Teck is undertaking initiatives in the Elk Valley to understand and manage effects associated with its mining operations at a regional scale. The initiatives include the following: Elk Valley Water Quality Plan (EVWQP), Regional Aquatic Effects Monitoring Program (RAEMP), Cumulative Effects Management Framework (CEMF), Regional Fish Habitat Management Plan, Biodiversity Management Planning and Terrestrial Cumulative Effects Management Plan. The EVWQP and RAEMP are described in Section 2.2.4. Overviews of the other initiatives are provided below.

- Teck and the KNC initiated the CEMF; however, this initiative is transitioning to a provincially-led program. Teck will remain involved in this initiative as a participant. The goal of the CEMF is to provide a practical, workable framework that supports decisions related to assessment, mitigation, and management decisions of cumulative effects in the Elk Valley (CEMF n.d). The CEMF is a collaborative effort among interested parties (municipalities, industry, non-governmental organizations, and Provincial and First Nations Governments) that includes both data gathering and active consultation to inform regulatory and management decisions by providing information about cumulative effects in the Elk River Watershed.
- Biodiversity Management is part of Teck's sustainability strategy. Teck's vision is to achieve a net positive effect on biodiversity by maintaining or re-establishing self-sustaining landscapes and ecosystems that lead to viable long-term and diverse land uses in the areas where Teck operates. This includes a series of short-term and long-term goals including the development of Biodiversity Management Plans at each of Teck's operations by the end of 2015.
- The Terrestrial Cumulative Effects Management Plan (scheduled to be completed in Q2 2015) is intended to provide a regional framework to support management of regional effects of Teck's operations to plants and animals. The plan's scope will be within a broader commitment that aligns with biodiversity management planning in the Elk Valley.
- The Regional Fish Habitat Management Plan (scheduled to be completed in Q1 2015) is intended to function synergistically within the CEMF. Teck's contribution to regional scale effects to fish and fish habitat will be addressed by this Regional Fish Habitat Management Plan through avoidance, mitigation and offsetting measures.



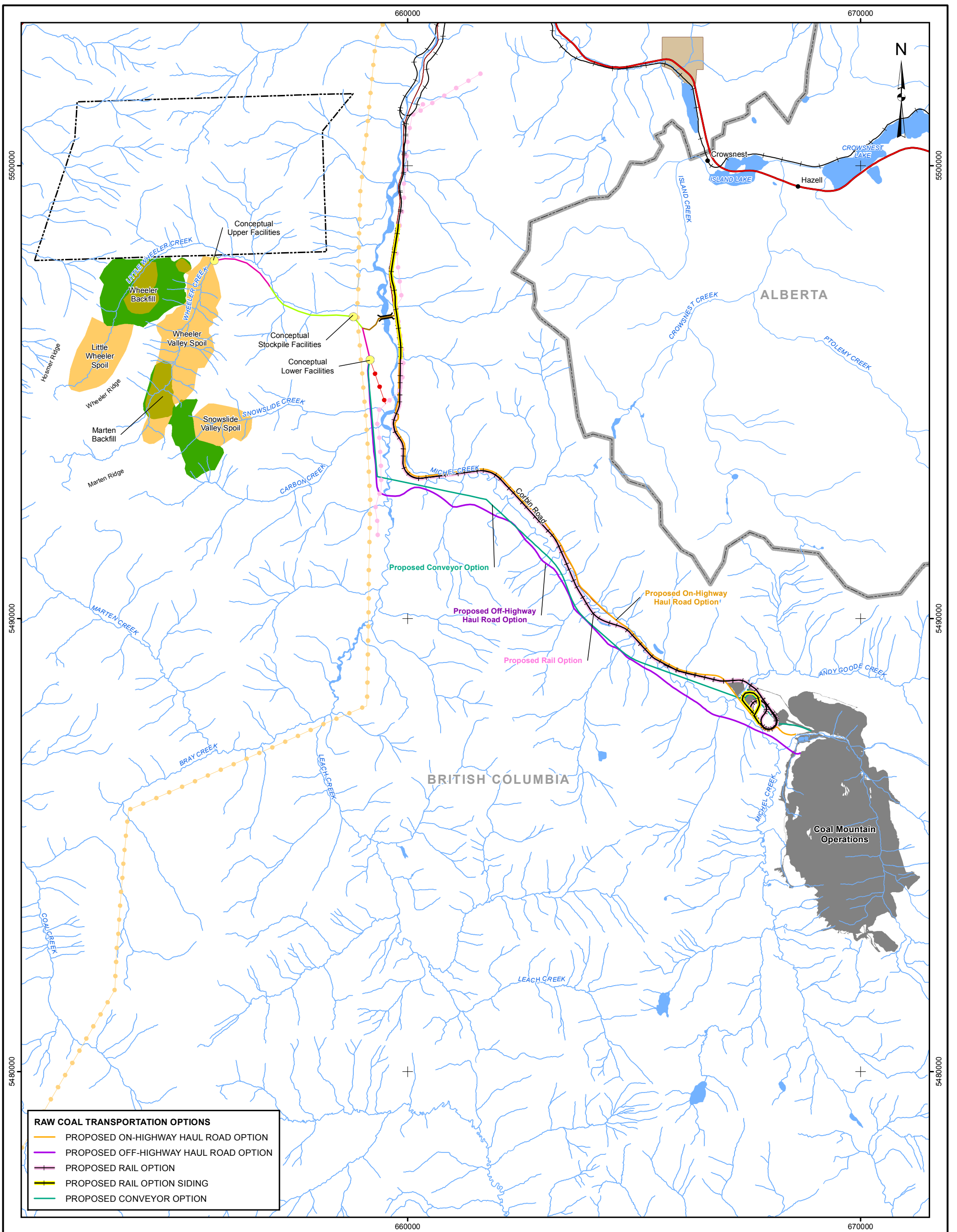
LEGEND	
●	CITY / TOWN / COMMUNITY
—	CANADIAN PACIFIC RAILWAY
—	CORBIN ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAW COAL TRANSPORTATION OPTION LOCATIONS
—	WATERCOURSE
—	BRITISH COLUMBIA - ALBERTA BORDER
—	COAL MINING OPERATION
—	FIRST NATIONS RESERVE
—	PROPOSED PIT SURFACE LIMIT (DRAFT)
—	PROPOSED SPOIL LIMIT (DRAFT)
—	PROVINCIAL PARK / PROTECTED AREA
—	WATERBODY

**REFERENCE**  
 Provincial boundaries, communities and hydrography obtained from The Atlas of Canada, Natural Resources Canada. Roads obtained from Geobase. Provincial Parks/Protected Areas, railroad and First Nations data obtained from GeoGratis. Other data obtained from Teck Coal Limited. Projection: UTM Zone 11 Datum: NAD 83



PROJECT		COAL MOUNTAIN PHASE 2 PROJECT	
TITLE		PROJECT LOCATION	
<b>Teck</b>	PROJECT No.	12-1349-0003	SCALE AS SHOWN
	DESIGN	GJ 14 Feb. 2014	REV. 0
	GIS	DR 24 Jun. 2014	<b>Figure 2.1</b>
	CHECK	FN 25 Jun. 2014	
	REVIEW	GJ 25 Jun. 2014	

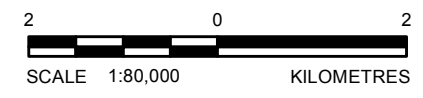
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RAW COAL TRANSPORTATION OPTIONS	
	PROPOSED ON-HIGHWAY HAUL ROAD OPTION
	PROPOSED OFF-HIGHWAY HAUL ROAD OPTION
	PROPOSED RAIL OPTION
	PROPOSED RAIL OPTION SIDING
	PROPOSED CONVEYOR OPTION

LEGEND	
<b>BASE FEATURES</b>	<b>PROPOSED PROJECT FEATURES</b>

**REFERENCE**  
 Provincial Boundary, Communities and Alberta Hydrography obtained from CanVec, Government of Canada, Natural Resources Canada. BC Hydrography, Dominion Coal Blocks and project data obtained from Teck Coal Limited. Roads obtained from Geobase. Provincial parks and Railroad data obtained from Geogratis. Projection: UTM Zone 11 Datum: NAD 83



PROJECT		COAL MOUNTAIN PHASE 2 PROJECT	
TITLE		PROJECT FOOTPRINT AND EXISTING COAL MOUNTAIN OPERATIONS	
	PROJECT No.	12-1349-0003	SCALE AS SHOWN
	DESIGN	GJ 14 Feb. 2014	REV. 0
	GIS	DR 24 Jun. 2014	<b>Figure 2.2</b>
	CHECK	FN 25 Jun. 2014	
REVIEW	GJ 25 Jun. 2014		

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### 2.2.3 Project Description

To date, Teck has produced approximately 60 million metric tonnes (Mmt) of metallurgical coal at CMO, primarily pulverized coal injection coal, for sale to various customers around the world. Pulverized coal injection coal replaces – in part – the use of coke as a source of heat and reduction for iron ore in a steel blast furnace. CMO is nearing the end of its mine life and therefore will start to slow production from existing reserves. Effects to the current work force of about 340 employees would be expected to begin in 2016. The Coal Mountain Phase 2 Project would allow for the continued employment of this work force, along with additional contracting opportunities.

Development of the CMO2 Project is expected to produce another 72 Mmt of pulverized coal injection and possibly coking coal over the estimated mine life of 34 years. The current mine plan is based on a production rate of approximately 2.25 Mmt clean coal (cc) per year though opportunities for production of 3, 4, and 5 M mtcc per year are being considered. For the purposes of this Project Description, the production of 2.25 M mtcc per year is assumed unless otherwise indicated.

The CMO2 site would include an approximate disturbance area of 1,000 hectares (ha), primarily within the Wheeler and Little Wheeler watersheds.

The CMO2 site would include the following:

- mine pit excavations;
- waste spoils near each pit;
- newly constructed and upgraded access roads;
- office facilities;
- maintenance facilities;
- natural gas supply line;
- road and power corridors;
- fuelling station;
- surface water management systems including outfalls, potential water quality mitigation measures facilities (as determined by the Elk Valley Water Quality Plan), and other water management structures; and
- coal, overburden and topsoil stockpile areas.

The CMO2 site would be linked to the existing CMO site via a raw coal transport corridor. The existing infrastructure in place at CMO would be used, including the following:

- process plant;
- the Canadian Pacific railway line and load out loop;

- additional coal stockpile areas;
- explosives storage and delivery systems; and
- coal rejects storage areas.

#### **2.2.4 Regional Context for Water Quality Planning**

On April 15, 2013, the Minister issued Ministerial Order No. M113 (the “Order”) under Section 89 of the BC *Environmental Management Act* (EMA), which designated the area for the plan, the process for development of the plan, and the issues to be addressed in the plan. The Order includes four environmental management objectives:

- protection of aquatic ecosystem health;
- management of bioaccumulation of the Order parameters in the receiving environment (including fish tissue);
- protection of human health; and
- protection of groundwater.

Teck has developed a comprehensive area based management plan, referred to as Elk Valley Water Quality Plan (EVWQP), to meet the objectives of the Order to protect the health of the Elk River watershed. As required by the Order, the EVWQP includes water quality targets for four Order parameters (selenium, nitrate, sulphate and cadmium) at specified locations in the Fording and Elk rivers and in Lake Koochanusa, and an implementation plan to meet the targets. The EVWQP implementation plan includes water treatment, and water management features to keep clean water clean (e.g., water diversions). The EVWQP also includes targets and an implementation plan for managing the formation of calcite. The EVWQP incorporates monitoring and applied research and development to adaptively manage the plan during implementation. The EVWQP was submitted to the BC Minister of Environment for approval on July 22, 2014.

The development of the EVWQP included public consultation and the involvement of a multi-party Technical Advisory Committee (TAC) to provide science-based technical advice to Teck and to the public. The TAC committee consisted of representatives from:

- BC Ministry of Environment (chair);
- BC Ministry of Energy and Mines;
- BC Environmental Assessment Office;
- Government of Canada represented by Environment Canada;
- US Federal Government;
- Montana State Government;
- Ktunaxa Nation Council (KNC);



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- An independent third-party qualified professional scientist selected by the TAC; and
- Teck.

The TAC held seven scheduled meetings during the development of the EVWQP. In addition, working groups were established to focus on key development topics: Toxicology, Human Health, and Monitoring.

As required by the Order, Section 4.0 of the Terms of Reference for the EVWQP outlined requirements for consultation under which Teck would consult with, or notify as appropriate, the following groups identified in the Order:

- the public;
- the Government of British Columbia;
- the Government of Canada;
- local governments;
- the United States federal government and the State of Montana Department of Environmental Quality;
- BC First Nations that assert interests in the Designated Area;
- the Kootenai Tribe of Idaho and the Confederated Salish and Kootenai Tribes;
- environmental non-government organizations; and
- other resource companies: Coal Valley Resources Inc.; Crowsnest Pass Coal Mining Ltd.; NWP Coal Canada Ltd.; Centermount Coal Ltd. and Centerpoint Resources Inc.

Consultation with the above groups was conducted in multiple phases during the development of the EVWQP. In circumstances where groups were not also part of the TAC, Teck exercised the additional necessary steps to ensure that they had opportunities to participate and provide feedback during the development of the EVWQP.

In consideration of trans-boundary waters, a number of environmental sampling efforts are actively conducted by Teck within Lake Kootenai through the Regional Aquatic Effects Monitoring Program (RAEMP), which is described below. These will continue during implementation of the EVWQP.

### **2.2.4.1 Regional Aquatic Effects Monitoring Program**

The RAEMP is a comprehensive, long term monitoring program that was initiated in 2012 to assess water quality and aquatic biota in the Elk Valley and Lake Kootenai. It integrates physical, chemical and biological information to assess aquatic ecosystem health. The RAEMP will be a core component of monitoring the effectiveness of the EVWQP. A wide range of environmental media are being sampled within the Elk Valley

and Lake Kookanusa as part of the RAEMP. These include surface water, sediments, and biota (plankton, periphyton, benthic invertebrates, and fish).

The RAEMP is being developed with input from the BC MOE and KNC. It will be carried out in accordance with EMA permits and requirements associated with the EVWQP. The RAEMP builds on information collected in watershed-wide monitoring programs in 2006, 2009, 2012 and in numerous supporting studies. Teck has and will continue to coordinate study design and monitoring activities in Lake Kookanusa with the Montana Department of Environmental Quality.

The first cycle of RAEMP monitoring extends from 2013 through 2016, with the second cycle running from 2017 through 2019. Results of each monitoring cycle will inform refinement of the program in subsequent cycles.

#### **2.2.4.2 BC Ministry of Environment Commitments**

In addition to the above-listed monitoring activities, BC MOE is expected to include conditions associated with the EVWQP and/or maintain a parallel process with the Montana Department of Environmental Quality during EVWQP implementation. As outlined within a July 7, 2014 letter from Deputy Minister W.H. (Wes) Shoemaker, it is anticipated that these may include:

- Under the BC-Montana Memorandum of Understanding, establish a process for ongoing monitoring to further assess whether the selenium BC Water Quality Guideline (2 µg/L) is protective of Lake Kookanusa. Elements of this process would include: joint monitoring and data sharing, joint research on Lake Kookanusa, cooperation on public consultation and awareness, and ongoing dialogue.
- BC MOE is committed to, if necessary, amending the selenium water quality guidelines for the reservoir should sound science identify that a lower concentration is required to be protective of Lake Kookanusa.
- Establishing a process for ongoing dialogue related to the assimilative capacity of Lake Kookanusa in consideration of the current selenium water quality guidelines (2 µg/L).
- Clear accountability established for the implementation of an approved EVWQP.

In consideration of monitoring activities actively being pursued by Teck through the RAEMP and the commitments made by BC MOE to the Montana state government and the U.S. Environmental Protection Agency, Teck will aim to address the concerns and advice offered by the U.S. Government during EVWQP development.

#### **2.2.5 Project Capital Cost**

In total, initial and sustaining capital costs of approximately \$396 million are currently predicted for the Project LOM plan. The project will comply with the EVWQP which may require additional capital expenditure.

## 2.2.6 Project Person Years

The approximate number of jobs predicted for the construction and operation of the proposed Project are:

- 200 person years for construction<sup>1</sup>; and
- 12,000 person years for additional mining operation.

The LOM plan without the Project would decrease the total labour requirement from 13,500 to approximately 1,500 person years to continue operations through to 2017, when existing permitted mining areas would be completed.

## 2.3 DEPOSIT GEOLOGY AND RESOURCE CHARACTERIZATION

### 2.3.1 Stratigraphy

The general stratigraphic succession on the Project property is summarized in Table 2.2 and described below.

**Table 2.2 Coal Mountain Operations Stratigraphy**

Period	Litho-Stratigraphic Units		Principal Rock Types
Recent			colluvium
Quaternary			clay, silt, sand, gravel, cobbles
Lower Cretaceous	Blairmore Group		massive bedded sandstones and conglomerates
Lower Cretaceous to Upper Jurassic	Kootenay Group	Elk Formation	sandstone, siltstone, shale, mudstones, chert pebble conglomerate, minor coal
		Mist Mountain Formation	sandstone, siltstone, shale, mudstones, thick coal seams
	Morrisey Formation	Moose Mountain Member	medium to coarse-grained quartz-chert sandstone
		Weary Ridge Member	fine to coarse-grained, slight ferruginous quartz-chert sandstone
Jurassic	Fernie Formation		shale, siltstone, fine-grained sandstone
Triassic	Spray River Formation		sandy shale, shale quartzite
	Rocky Mountain Formation		quartzite
Mississippian	Rundle Group		limestone

The Project is located in the thrust and fold belt of the front ranges of the Rocky Mountains of southeast BC.

The Fernie basin comprises the Crowsnest coalfield, one of three structurally separate coalfields in southeastern BC. The Fernie Formation consists primarily of brownish, medium to dark grey, and black marine shales. Total thickness in the Crowsnest coalfield area is 350 metres (m) (Ollerenshaw 1981). Although primarily shale,

<sup>1</sup> Includes the construction of major capital infrastructure associated with the development of the Project that will only proceed if the Project is approved.

the Fernie Formation does contain interbeds of numerous other rock types, which indicates some regression of the seas in cycles during the Jurassic Period in this area. The uppermost sub-unit is referred to as the Passage Beds. This sub unit consists of interbedded shales, siltstones, and sandstones. Locally, it can reach up to 100 m thick. The upper contact with the Morrissey Formation is placed at the first continuous sandstone that is devoid of interbedded siltstones (Gibson 1979).

The Morrissey Formation comprises massive, coarsening-upward sequences of medium dark grey to brownish grey to orange brown sandstone, with rare interbeds of carbonaceous mudstone, siltstone, and coal (Gibson 1985). This predominantly sandstone unit is generally cliff-forming and easy to recognize in the field. In the area of the Marten and Wheeler ridges, the Morrissey Formation ranges from 10 to 25 m in thickness.

The Morrissey Formation is subdivided into two members. The lower, less resistant orange, brown weathered sandstone that lies conformably on the Fernie Formation Passage Beds unit is named the Weary Ridge Member. It is argillaceous, generally fine grained, and contains pyrite and limonite throughout the quartz matrix. The upper, cliff-forming well-indurated sandstone member is named the Moose Mountain Member. It is a light to medium dark grey colour on fresh faces, and darker grey to buff on weathered faces. Texture ranges from fine- to medium-grained quartz and chert. It can contain thin beds of mudstone, shale, and bituminous coal. The upper, conformable contact of the Morrissey Formation with the overlying Mist Mountain Formation is placed at the point where the indurated sandstone gives way to less resistant beds of carbonaceous shale/mudstone, siltstone, and coal.

The Mist Mountain Formation contains the economic coal-bearing strata of interest in the Project area. It is composed of predominantly non-marine sandstone, siltstone, mudstone, shale, and thin to thick bituminous coal seams. Conglomeratic sandstone form conspicuous interbeds in parts of the Fernie Basin area. The sandstones range from fine to coarse grain and typically light to medium grey in colour. They are composed of angular to well-rounded grains of quartz and chert with minor amounts of lithic grains of various other rock types. The sandstones are moderately to well sorted and generally well indurated such that they are conspicuous as local cliff-forming features between the other rock units. The predominant siltstones are medium to dark grey in colour. They are composed almost entirely of quartz with minor chert and lesser amounts of carbonate minerals.

The Mist Mountain Formation can range in thickness from a few hundred metres to over 600 m in the upper Elk Valley. It is typically 400 to 500 m thick on the east side of the Fernie Basin. The seams of economic coal are further described in Section 2.3.2.

The Elk Formation is coal bearing, but it primarily contains very thin coal seams and has contributed in only a minor way to coal production in southeastern BC. It conformably overlies the Mist Mountain Formation, the major economic coal-bearing unit of the East Kootenay district and adjacent portions of Alberta.

The contact between the Elk Formation and the underlying coal-bearing member is placed at the base of the first sandstone above the uppermost principal seam, 2 Seam, on Marten Ridge. Minor coal beds reaching thicknesses between 0.15 m and 1.5 m

occur in carbonaceous zones in the lower portion of the formation. Needle coal (Newmarch 1953), or sapropelic coal occurs in thin bands in the upper portion of the formation up to the contact with the conglomerate of the overlying Cadomin Formation. The Elk Formation appears to reach a maximum thickness of 540 m in the Fernie basin area (Ollerenshaw 1981b).

The Elk Formation is overlain by the Cadomin Formation, the basal unit of the non-marine Lower Cretaceous Blairmore Group. In the study area, the Cadomin Formation consists of a conglomerate bed, or a series of conglomerate beds separated by maroon and green mudstones (Ollerenshaw 1981), and overlies the Elk Formation essentially conformably, with some sub-channel erosion at the contact. It consists of coarse grain sandstones, grey to black shales, and prominent chert-pebble conglomerates.

### **2.3.2 Structure**

The prominent geologic structure in the Project area is a broad, open syncline with the axis running roughly north-south beneath the east flank of Hosmer Ridge. The axis has a very shallow plunge to the south. The current Project area lies on the eastern limb of this syncline. The syncline is complicated by a series of west-dipping thrust faults with along-fault displacements varying from tens to hundreds of metres. A west-dipping, high-angle normal fault separates the Marten (up-side) and Wheeler (down-dropped side, some 225 m lower) structural blocks. The lower part of the Mist Mountain Formation comes to outcrop in the middle of the Parcel 73 of the Dominion Coal Block, to the north of Teck's property.

Coal seams are identified by a top down numbering system adopted from Teck's nearby Elkview Operations (EVO). The first seam encountered in the Mist Mountain Formation below the Elk Formation is designated 1 Seam. The last major seam at the bottom of the Mist Mountain Formation is generally labelled 10 Seam.

The 3 Seam is a major seam from the point of resource volume and is one of the best quality seams. It is naturally low in ash, high in volatiles, and the seam represents approximately 17 percent (%) of the resource. The seam has an upper and lower split with the upper split being more dominant than the lower as far as resources are concerned. The 3 Seam can range from about 1 to 34 m true thickness where it is structurally thickened. Mean thickness is about 9 m. The length and width of these structurally thickened pods have not been fully established.

The 5 Seam series represents about 9% of the resource with 5 Seam carrying the bulk of this. The 5 Seam can range in thickness from 0.8 to 24 m, averaging 3.2 m thick.

The 8 Seam series represents about 20% of the resource at the Project. It has been interpreted to contain nine seam splits with the 81 and 86 seams being the dominant seams in terms of coal tonnage (representing 79% of the 8 Seam series tonnage). Referring to the two dominant members: the 81 Seam can range from 1.8 to 18.4 m thick and average about 6.8 m, while the 86 Seam ranges from a non-mineable 0.2 m up to 11.5 m and averages 3.2 m thick.

As a package, 9 Seam represents almost 22% of the resource at the Project, most of this coming from the north end of Wheeler Ridge, where the package is heavily affected by the thrust fault repeating. The series is represented by three major splits with roughly equal volume coming from each split. Average true thickness ranges from 4.8 m for 90 Seam to 6.3 m for 91 Seam.

The 10 Seam series generally represents the lowest major coal sequence stratigraphically in the Mist Mountain Formation. The 10 Seam series consists of an upper (101), middle (100), and lower (102) split in a seam package of coal and interburden that is generally not more than 35 m of stratigraphic thickness. As with the two previous seam packages, 10 Seam series is affected by the multiple thrust faulting in the north end that cause tight folding, structural thickening, and fault repeats. The series makes up about 12% of the resource tonnage and is reasonably divided between the three main splits. The 101 Seam ranges from 1.2 to 32 m where the seam is interpreted to be directly fault repeated (suggesting a real thickness of 16 m, doubled). The average thickness of 101 Seam is 6.5 m. The 102 Seam ranges from 0.8 m to a double thickness of 29 m, also caused by fault repeating. Average thickness is 4.9 m. The 100 Seam is the thinner of the three seams, averaging 2.8 m thick and ranging to 9.4 m thick maximum, 0.8 m minimum.

## **2.4 COMPONENTS AND INFRASTRUCTURE**

### **2.4.1 Conceptual Mine Plan and Schedule**

A conceptual development plan and schedule for the CMO2 site was completed in 2014. Incorporating the coal supply from the CMO2 site into the LOM plan would allow CMO to blend coals and to meet steelmaking coal production projections (based on planned plant capacity) through to the year 2050. The plan considers the following:

- supplying the existing CMO plant with sufficient quantity and quality of feed to effectively utilize its capacity;
- balancing raw strip ratio and haul distance to uphold mine economics and maintain consistent haul truck and shovel requirements;
- utilizing pit backfilling to reduce the Project footprint, optimize mine haul distance, help with mitigating effects to water quality, and maximize reclamation opportunities; and
- techniques of spoil design that would lessen the effects of waste rock disposal on generation of selenium and other constituents of interest<sup>2</sup> that have the potential to cause water quality effects.

The following provides a general description of the Project and the conceptual schedule for its implementation. The components of the mine plan and schedule outlined below may be subject to modification at the feasibility, final engineering design, construction, and operations phases.

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<sup>2</sup> Constituents of interest include selenium, cadmium, nitrate, sulfate and calcite.

For the majority of the Project, the clean coal strip ratio<sup>3</sup> is predicted to be approximately 7:1. Waste haul distances would be as short as possible to minimize haul truck operating times. This would help to lower mining costs and overall truck hours per tonne leading to reduced greenhouse gas (GHG) emissions. The waste rock haul distance for the Project would be shorter when there is nearby access to the dumps but increases when material must be hauled out of the pit bottoms.

The proposed CMO2 site would be mined with traditional truck and shovel techniques currently being used for existing open-pit operations at CMO. Various sizes of hydraulic shovels are planned to mine the deposit. The current CMO fleet of excavators consists of one 27 cubic metre (m<sup>3</sup>) shovel and one 34 m<sup>3</sup> shovel. For planning purposes, it is assumed these shovels would transition from the existing fleet to mine at the CMO2 site.

One front-end loader would also be used to mine waste rock and coal from the CMO2 site.

A fleet of 220-tonne trucks would be used to haul waste rock and coal. The coal would be hauled to a stockpile area from where front-end loaders would reload into highway trucks. During the initial two years of production, about 10 trucks would be provided from the existing CMO fleet. It is estimated that the maximum number of trucks required for the CMO2 site will peak at 24. Support equipment such as drills, tracked dozers, rubber-tired dozers, and excavators would also be drawn from the existing fleet or be added as necessary.

#### **2.4.1.1 Development of Pits**

Currently, the CMO2 site is proposed to be developed in 10 phases over a period of 34 years.

Site preparation is scheduled to begin in 2016, subject to receipt of regulatory approvals. Mining is planned to occur primarily on the Wheeler and Marten ridges, with some mining also on the east side of Hosmer Ridge later in the mine life. The mine phase designs will be refined as more information becomes available; however, the general sequence and overall footprint should remain applicable.

The Project's first mine phase would begin within the Marten Ridge area. In 2019, mining on Wheeler Ridge would begin. Mining would continue through in six phases, and would remain active until all of its phases have been mined out. After the Wheeler Ridge pit is completed in 2043, the Hosmer Ridge phase is planned to begin. The Hosmer Ridge phase is essentially a pushback of the Wheeler Ridge pit to the west into Hosmer Ridge. In 2046, a final phase on Marten Ridge would begin to push the pit to its ultimate limit. Development would continue until the planned end of the Project in 2050. The mine phases are further explained in Table 2.3 and shown in Figures 2.3 to 2.10. The final proposed footprint showing complete pit and waste spoil limits at the end of mine life is shown in Figure 2.11.

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<sup>3</sup> The ratio of the volume of overburden or waste rock moved relative to the tonnage of clean coal produced.

Highwalls are designed with 65° face angles and are double-benched with a 12 m safety berm. Road widths are designed at 28 m running surface and sufficient widths to accommodate legal berm heights. All highwalls and haul roads would be constructed to conform to the guidelines set forth in the Health, Safety and Reclamation Code for Mines in British Columbia (2008).

The ultimate footprint of the pits would be approximately the following:

- Wheeler Ridge pit: 1,500 m by 1,500 m;
- Marten Ridge pit: 2,500 m by 700 m; and
- Hosmer Ridge pit: 500 m by 1,500 m.

**Table 2.3 Pit Summaries by Phase**

Pit	Phase	Proposed Start Date	Raw Coal (M mtrc)	Clean Coal (M mtcc)	Waste Volume (M bcmw)	Raw Coal Volume (M bcmrc)	Total Volume (M bcm)
<b>Wheeler Ridge (WR)</b>							
	WR1	Year 3 (2019)	16	10	66	11	77
	WR2	Year 3 (2019)	16	10	74	11	85
	WR3	Year 11 (2027)	8	5	23	6	29
	WR4	Year 5 (2021)	10	6	41	7	48
	WR5	Year 5 (2021)	16	10	69	11	80
	WR6	Year 12 (2028)	9	6	43	6	49
	<i>subtotal</i>		76	47	315	52	368
<b>Marten Ridge (MR)</b>							
	MR1	Year 1 (2017)	9	6	42	6	49
	MR2	Year 5 (2021)	6	4	29	4	33
	MR3	Year 31 (2046)	14	9	75	10	85
	<i>subtotal</i>		29	19	146	20	166
<b>Hosmer Ridge (HR)</b>							
	HR1	Year 27 (2043)	11	6	49	7	56
<b>Total</b>			<b>116</b>	<b>72</b>	<b>510</b>	<b>80</b>	<b>590</b>

WR = Wheeler Ridge; MR = Marten Ridge; HR = Hosmer Ridge; M mtrc = million metric tonnes raw coal; M mtcc = million metric tonnes clean coal; M bcmw = million bank cubic metres waste; M bcmrc = million bank cubic metres raw coal; M bcm = million bank cubic metres.

### 2.4.1.2 Development of Spoils

A significant effort was made to minimize the Project footprint and number of affected watersheds by using in-pit spoiling when possible. However, due to topographical, safety, and logistical considerations, suitable in-pit spoil areas are limited.

In the initial stages of the Project, waste from phase MR1 would be used to develop spoils in the Wheeler Creek Valley. Once phase WR1 is started in 2019, waste would also be directed to the Little Wheeler Creek Valley. When the mining of MR1 pit is completed in 2021, it would become available as a spoil destination for other phases.



As mining progresses to the south in the remaining Wheeler Ridge phases, waste would generally be directed to the southwest into Little Wheeler Creek Valley from the higher bench elevations (above 1,740 m), and to the southeast into Wheeler Creek Valley from the lower bench elevations (below 1,740 m). The waste from the MR2 pit phase would be directed to the Wheeler Creek Valley and the mined-out MR1 pit. Once the Wheeler Ridge phases are completed, the spoil material from phase HR1 would be placed back into the mined-out Wheeler Ridge pit. The final phase of mining would be MR3, and the destination for its spoil material would be split between Wheeler and Snowslide valleys.

The external spoils in Wheeler Creek Valley would be constructed primarily from the bottom-up by placing the lower lifts first, and then progressing up-slope with each subsequent lift. However, spoils from the upper Marten Ridge phases (MR2 and MR3) would generally be constructed top-down along the west face of Marten Ridge and into Snowslide Valley. The spoils in Little Wheeler Valley would primarily be constructed top-down with wrap-around accesses.

The in-pit spoils would generally be constructed top-down along the footwall slopes of the Wheeler Ridge pit and MR1 pit, with spoils end-dumped from the crest of the spoil. The spoils would consist of unsorted re-handle material, blasted waste rock, and overburden.

The proposed spoil configurations have been designed with final overall slopes of 2 horizontal to 1 vertical. Environmental considerations make allowances for re-sloping of final waste spoils. Where feasible, water diversions would be incorporated into spoil designs to divert clean water around the spoils. Roads in spoils and accesses would be primarily fill constructions and would incorporate a minimum 28 m running width with accommodation of necessary berms.

### **2.4.1.3 Mine Phases and Sequence**

An outline of conceptual Project activities is presented in Table 2.4. The conceptual mine sequence is illustrated in Figures 2.3 through 2.10. The final proposed footprint showing complete pit and waste spoil limits at the end of mine life is shown in Figure 2.11. Reclamation would occur progressively as the Project is developed, where possible.

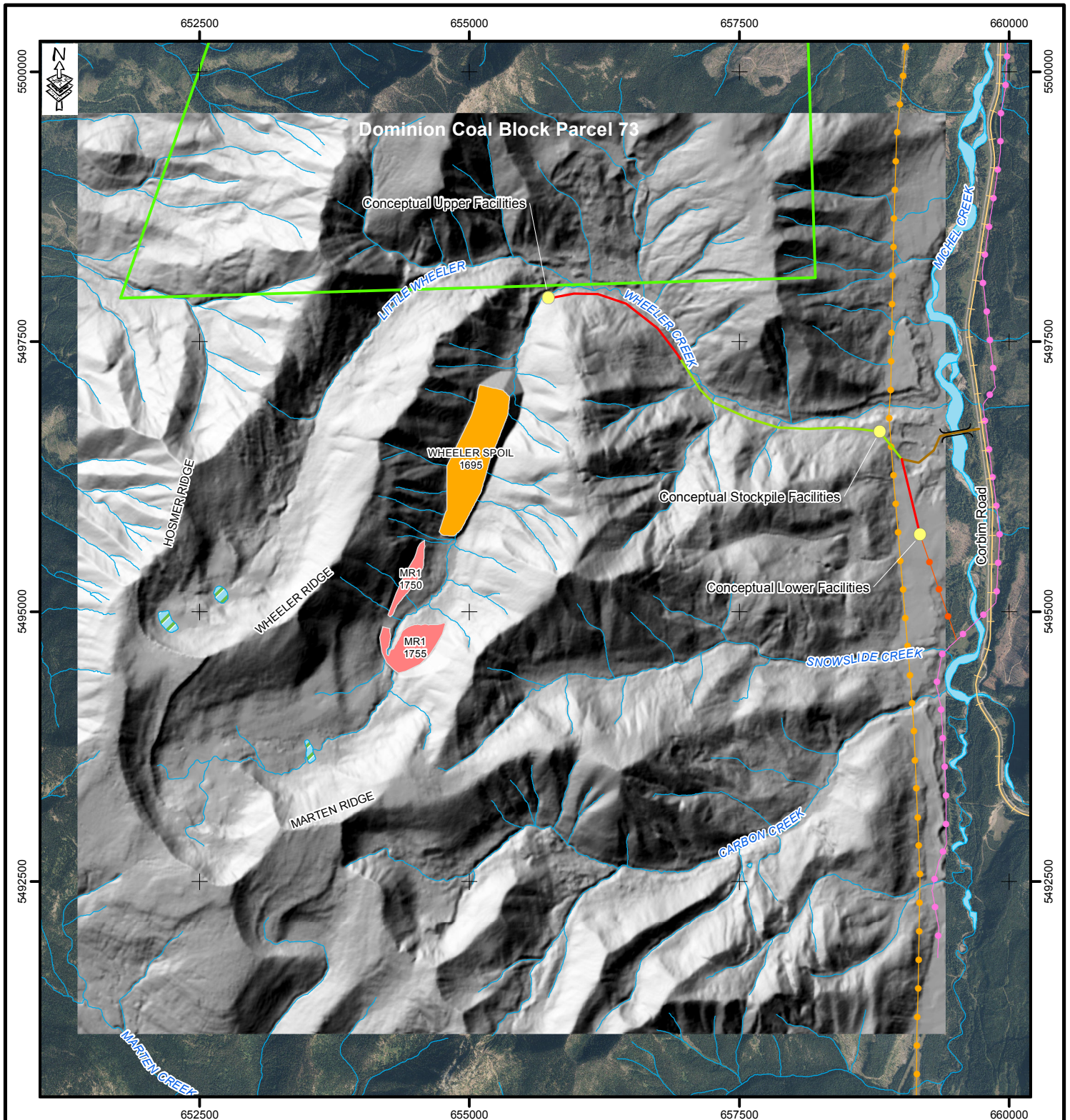
**Table 2.4 Representative Conceptual Mine Phases for the Project<sup>(a)(b)</sup>**

Year	Description
Year 1	<ul style="list-style-type: none"> <li>Timber and brush within the footprint of first Wheeler Creek Valley spoils and accesses are cleared, and topsoil is stockpiled for later use in reclamation.</li> <li>Access road to top of MR1 established.</li> <li>Mining upper benches of MR1 begins; majority of spoil material hauled to north.</li> <li>Begin development of upper and lower facilities and upgraded access road to the site.</li> <li>Begin development of water management facilities for the site.</li> </ul>
Year 5	<ul style="list-style-type: none"> <li>Timber and brush within the footprint of first Little Wheeler Creek Valley spoils and accesses are cleared, and topsoil is stockpiled.</li> <li>Access roads to top of MR2 and initial Wheeler Ridge phases established.</li> <li>Wheeler Ridge mining begins in WR1, WR2, WR4, and WR5; most spoil material hauled south into Little Wheeler Creek Valley. As spoils and accesses expand, further clearing and topsoil salvage is done.</li> <li>MR1 mining complete.</li> <li>MR2 mining begins. Waste is hauled to west into Wheeler Creek Valley.</li> </ul>
Year 10	<ul style="list-style-type: none"> <li>WR1, WR2, and WR4 are actively mining. Material mostly sent into Wheeler Creek Valley spoils.</li> <li>MR2 mining complete. Spoil material placed in-pit from Wheeler Ridge phases and MR2.</li> </ul>
Year 15	<ul style="list-style-type: none"> <li>Ex-pit spoil in Little Wheeler Valley completed, re-sloping and reclamation activities begin.</li> <li>WR1 mining complete.</li> <li>WR6 mining begins.</li> <li>WR2, WR3, WR4, and WR5 continue to actively mine; spoil haul to Little Wheeler Creek and Wheeler Creek valleys. MR1 continues to accept spoil in-pit from MR2 and MR3.</li> </ul>
Year 20	<ul style="list-style-type: none"> <li>WR2 mining complete.</li> <li>WR3, WR4, WR5, and WR6 continue to actively mine; spoil haul to Wheeler Creek Valley. MR1 continues to accept spoil in-pit from MR2 and MR3.</li> <li>Re-sloping and reclamation activities completed for the ex-pit spoil in Little Wheeler Valley.</li> </ul>
Year 25	<ul style="list-style-type: none"> <li>WR3 and WR4 mining complete.</li> <li>WR5 and WR6 continue to actively mine; spoil haul to Wheeler Creek Valley. MR1 continues to accept spoil in-pit from MR2 and MR3.</li> </ul>
Year 30	<ul style="list-style-type: none"> <li>WR5 and WR6 mining complete; spoil haul to Wheeler Creek Valley.</li> <li>HR1 mining begins and is completed. Spoil is placed into mined-out Wheeler Ridge pit.</li> <li>Access road to top of MR3 established.</li> <li>MR3 mining begins.</li> </ul>
Year 34	<ul style="list-style-type: none"> <li>MR3 mining complete.</li> <li>Reclamation activities continue.</li> </ul>
Year 37	<ul style="list-style-type: none"> <li>Completion of mine reclamation.</li> </ul>

<sup>(a)</sup> Water quality management measures, including timing of implementation, are being developed through the Elk Valley Water Quality Plan (EVWQP). Initial implementation of the EVWQP is proposed to include water treatment and water management features (e.g., water diversions). The EVWQP also incorporates monitoring and applied research and development to adaptively manage the plan during implementation.

<sup>(b)</sup> Assumes a production rate of 2.25 M mtcc/year. Other considered alternatives including 3, 4, and 5 M mtcc will accelerate activities accordingly and reduce overall mine life.

WR = Wheeler Ridge; MR = Marten Ridge; HR = Hosmer Ridge.

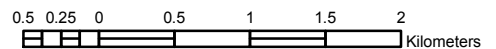


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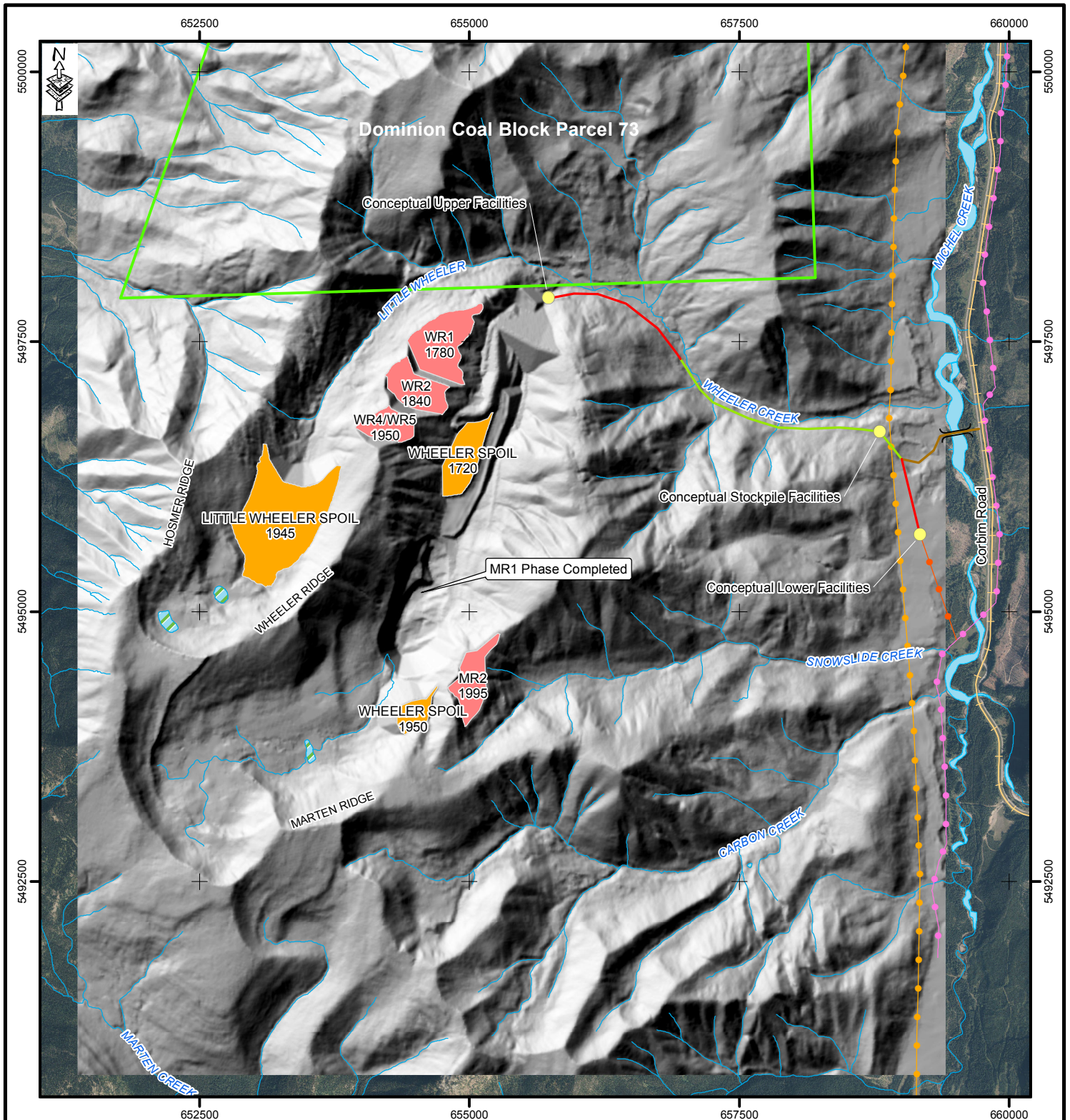
- CONCEPTUAL FACILITY
- NATURAL GAS PIPELINES
- PROPOSED NATURAL GAS SUPPLY LINE
- 500KV POWERLINE
- STREAMS
- PROPOSED NEW MINE HAUL ROAD
- PROPOSED UPGRADED ACCESS ROAD
- PROPOSED UPGRADED MINE HAUL ROAD
- RIVER AND LAKE
- ▭ WETLAND
- ▭ ACTIVE SPOIL
- ▭ ACTIVE PIT
- | PROPOSED BRIDGE UPGRADE
- RAILWAY
- ▭ DOMINION COAL BLOCK PARCEL 73

**REFERENCE**

Data obtained from Teck Coal Limited  
 DATUM: NAD 83; PROJECTION: UTM ZONE 11



<b>PROJECT</b>	<b>COAL MOUNTAIN PHASE 2 PROJECT</b>		
<b>TITLE</b>	<b>Conceptual Mine Sequence Year 1</b>		
<b>Teck</b>	SCALE 1:50,000	SCALE AS SHOWN	REV. 1
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	CHECK   FH   June 20, 2014		
REVIEW   FH   June 20, 2014	<b>FIGURE: 2.3</b>		

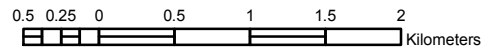


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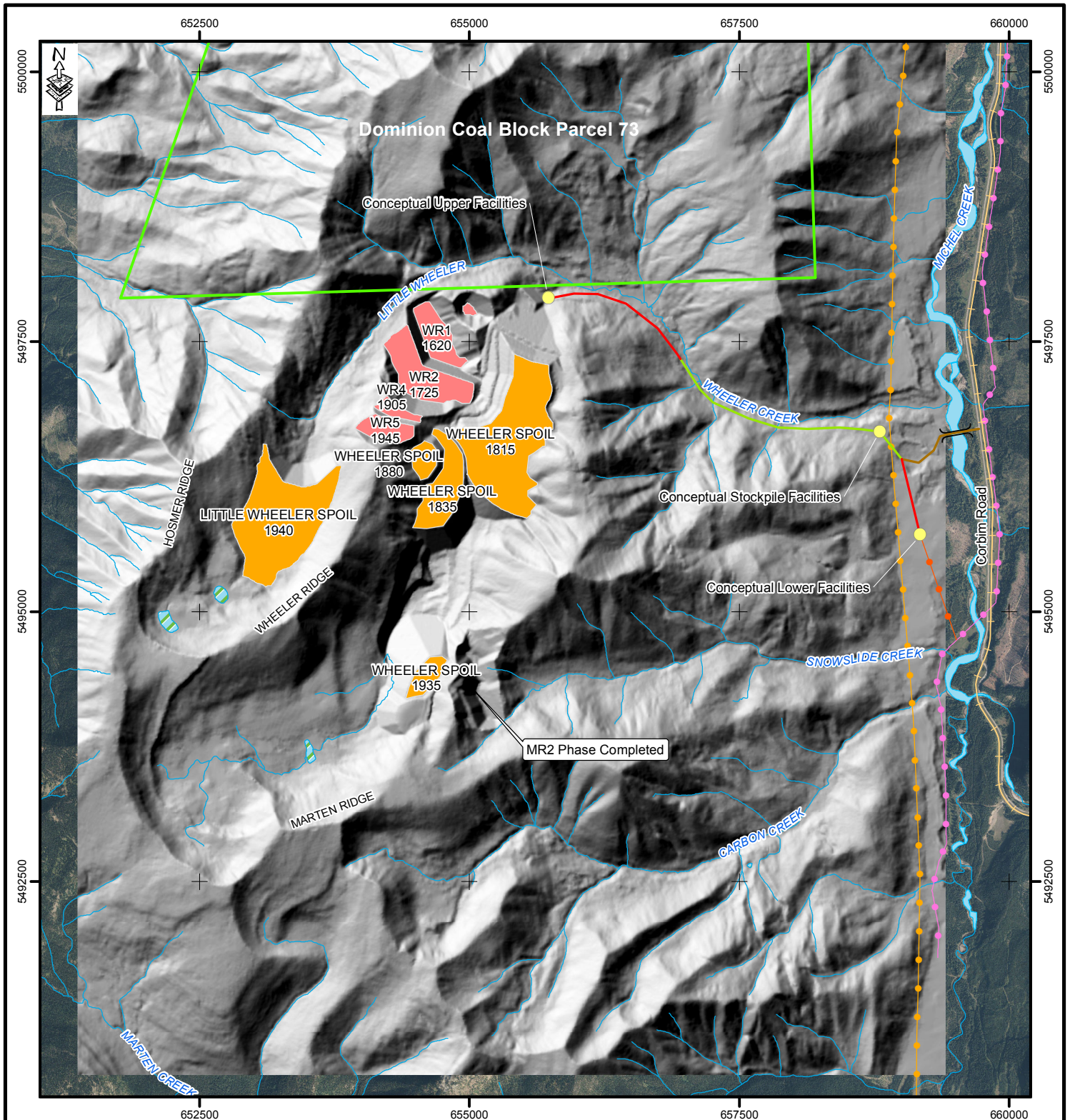
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- PROPOSED NATURAL GAS SUPPLY LINE
- 500KV POWERLINE
- STREAMS
- PROPOSED NEW MINE HAUL ROAD
- PROPOSED UPGRADED ACCESS ROAD
- PROPOSED UPGRADED MINE HAUL ROAD
- RIVER AND LAKE
- WETLAND
- ACTIVE SPOIL
- ACTIVE PIT
- PROPOSED BRIDGE UPGRADE
- RAILWAY
- DOMINION COAL BLOCK PARCEL 73

**REFERENCE**

Data obtained from Teck Coal Limited  
 DATUM: NAD 83; PROJECTION: UTM ZONE 11



<b>PROJECT</b>	<b>COAL MOUNTAIN PHASE 2 PROJECT</b>		
<b>TITLE</b>	<b>Conceptual Mine Sequence Year 5</b>		
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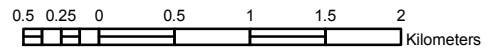


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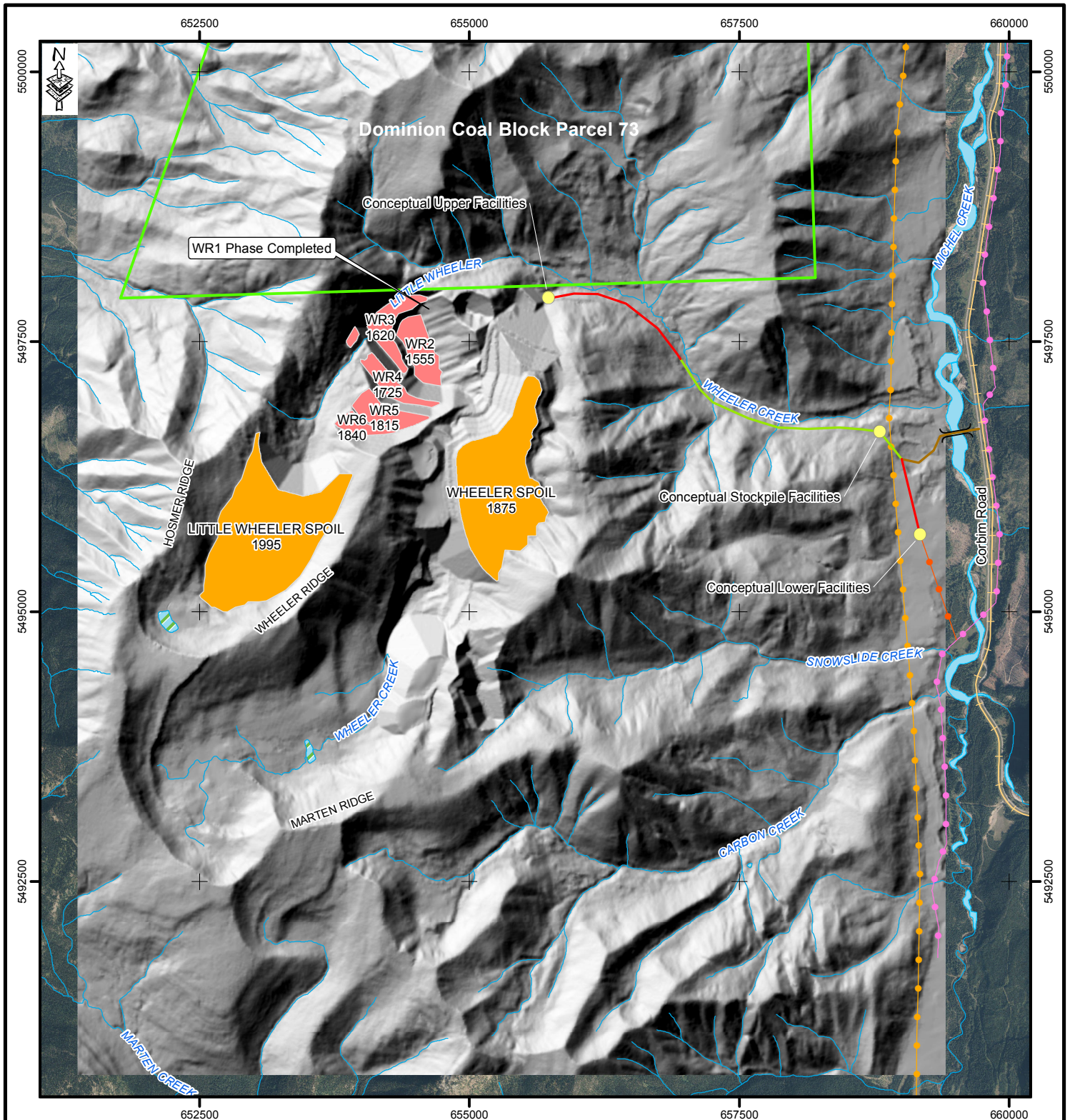
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- PROPOSED NATURAL GAS SUPPLY LINE
- 500KV POWERLINE
- STREAMS
- PROPOSED NEW MINE HAUL ROAD
- PROPOSED UPGRADED ACCESS ROAD
- PROPOSED UPGRADED MINE HAUL ROAD
- RIVER AND LAKE
- ▭ WETLAND
- ▭ ACTIVE SPOIL
- ▭ ACTIVE PIT
- PROPOSED BRIDGE UPGRADE
- RAILWAY
- ▭ DOMINION COAL BLOCK PARCEL 73

**REFERENCE**

Data obtained from Teck Coal Limited  
 DATUM: NAD 83; PROJECTION: UTM ZONE 11



<b>PROJECT</b>	<b>COAL MOUNTAIN PHASE 2 PROJECT</b>		
<b>TITLE</b>	<b>Conceptual Mine Sequence Year 10</b>		
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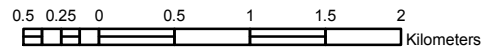


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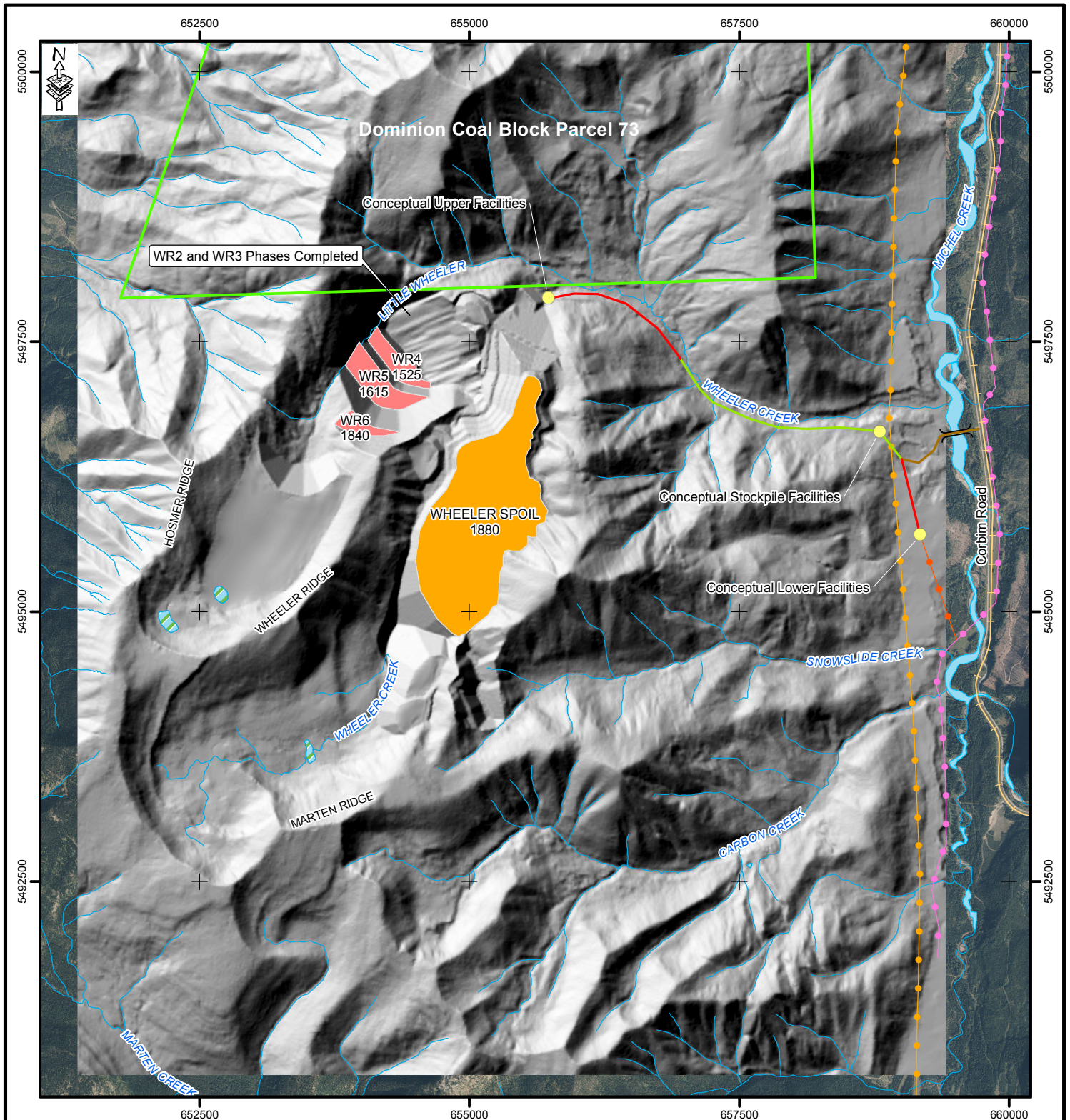
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**REFERENCE**

Data obtained from Teck Coal Limited  
 DATUM: NAD 83; PROJECTION: UTM ZONE 11



<b>PROJECT</b>	<b>COAL MOUNTAIN PHASE 2 PROJECT</b>		
<b>TITLE</b>	<b>Conceptual Mine Sequence Year 15</b>		
<b>Teck</b>	SCALE 1:50,000	SCALE AS SHOWN	REV. 1
	DESIGN   WH   Jan 30, 2014		
	GIS   RC   June 20, 2014		
	CHECK   FH   June 20, 2014		
	REVIEW   FH   June 20, 2014	<b>FIGURE: 2.6</b>	

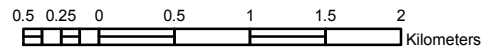


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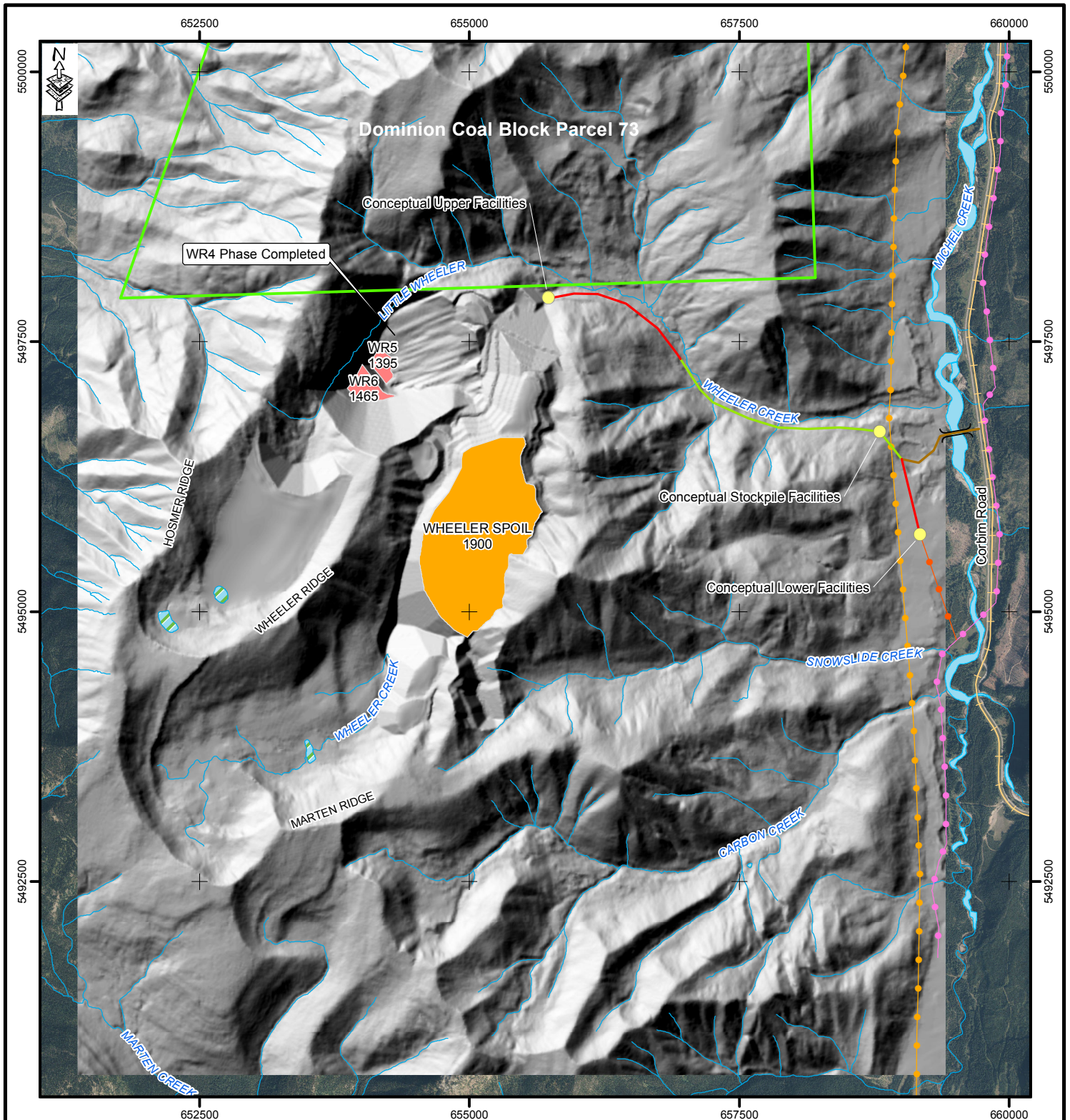
- CONCEPTUAL FACILITY
- NATURAL GAS PIPELINES
- PROPOSED NATURAL GAS SUPPLY LINE
- 500KV POWERLINE
- STREAMS
- PROPOSED NEW MINE HAUL ROAD
- PROPOSED UPGRADED ACCESS ROAD
- PROPOSED UPGRADED MINE HAUL ROAD
- RIVER AND LAKE
- ▭ WETLAND
- ▭ ACTIVE SPOIL
- ▭ ACTIVE PIT
- PROPOSED BRIDGE UPGRADE
- RAILWAY
- ▭ DOMINION COAL BLOCK PARCEL 73

**REFERENCE**

Data obtained from Teck Coal Limited  
 DATUM: NAD 83; PROJECTION: UTM ZONE 11



PROJECT	<b>COAL MOUNTAIN PHASE 2 PROJECT</b>		
TITLE	<b>Conceptual Mine Sequence Year 20</b>		
<b>Teck</b>	SCALE 1:50,000	SCALE AS SHOWN	REV. 1
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	CHECK   FH   June 20, 2014		
	REVIEW   FH   June 20, 2014	<b>FIGURE: 2.7</b>	

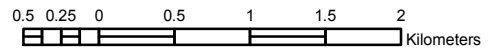


**LEGEND**

- CONCEPTUAL FACILITY
- NATURAL GAS PIPELINES
- PROPOSED NATURAL GAS SUPPLY LINE
- 500KV POWERLINE
- STREAMS
- PROPOSED NEW MINE HAUL ROAD
- PROPOSED UPGRADED ACCESS ROAD
- PROPOSED UPGRADED MINE HAUL ROAD
- RIVER AND LAKE
- ▭ WETLAND
- ▭ ACTIVE SPOIL
- ▭ ACTIVE PIT
- PROPOSED BRIDGE UPGRADE
- RAILWAY
- ▭ DOMINION COAL BLOCK PARCEL 73

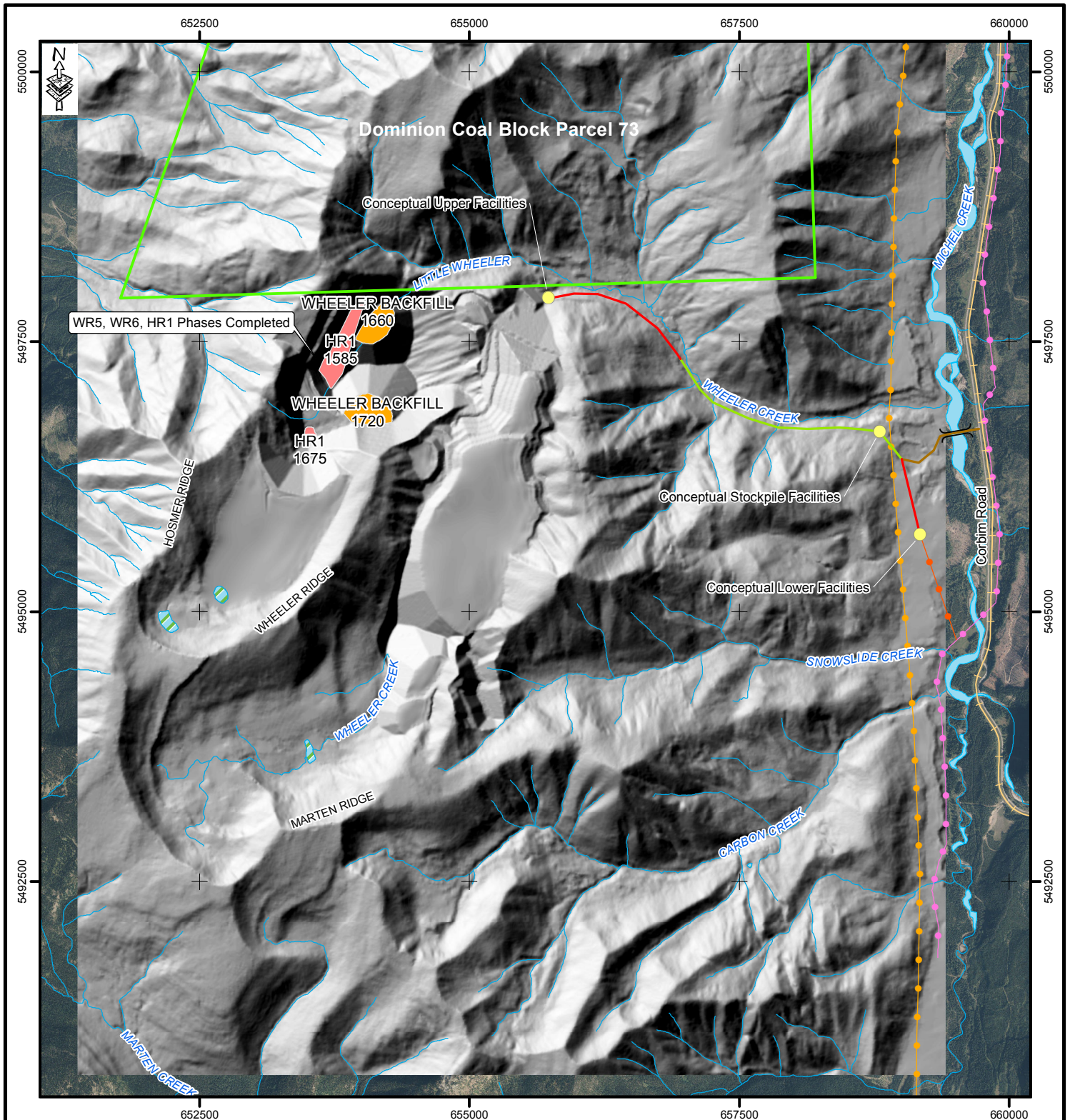
**REFERENCE**

Data obtained from Teck Coal Limited  
 DATUM: NAD 83; PROJECTION: UTM ZONE 11



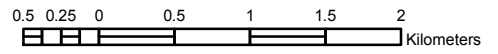
PROJECT	<b>COAL MOUNTAIN PHASE 2 PROJECT</b>		
TITLE	<b>Conceptual Mine Sequence Year 25</b>		
Teck	SCALE 1:50,000		SCALE AS SHOWN
	DESIGN	WH	Jan 30, 2014
	GIS	RC	June 20, 2014
	CHECK	FH	June 20, 2014
	REVIEW	FH	June 20, 2014
			FIGURE: 2.8





**LEGEND**

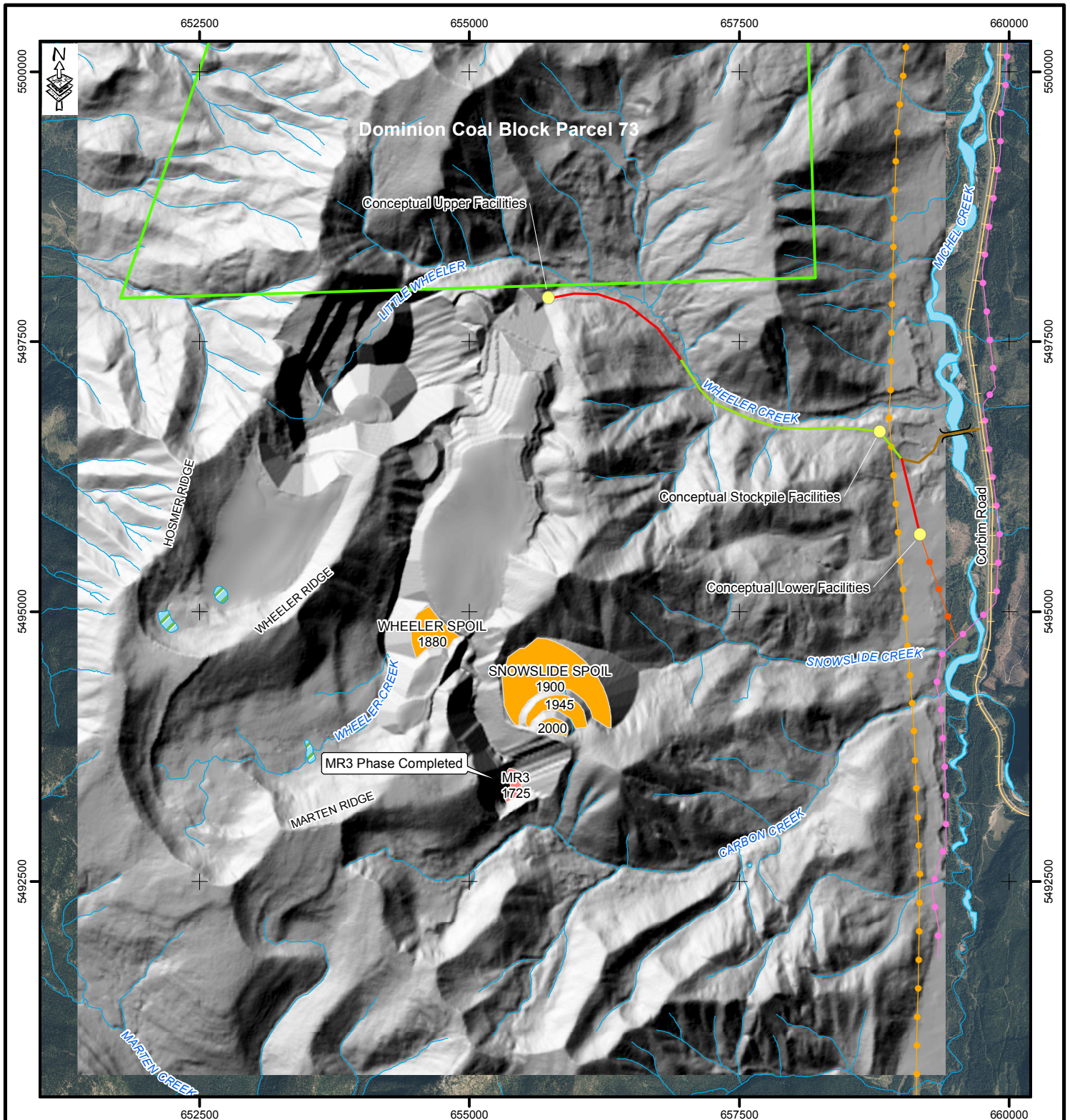
- CONCEPTUAL FACILITY
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- PROPOSED NATURAL GAS SUPPLY LINE
- 500KV POWERLINE
- STREAMS
- PROPOSED NEW MINE HAUL ROAD
- PROPOSED UPGRADED ACCESS ROAD
- PROPOSED UPGRADED MINE HAUL ROAD
- RIVER AND LAKE
- ▭ WETLAND
- ▭ ACTIVE SPOIL
- ▭ ACTIVE PIT
- PROPOSED BRIDGE UPGRADE
- RAILWAY
- ▭ DOMINION COAL BLOCK PARCEL 73



**REFERENCE**

Data obtained from Teck Coal Limited  
 DATUM: NAD 83; PROJECTION: UTM ZONE 11

PROJECT	<b>COAL MOUNTAIN PHASE 2 PROJECT</b>		
TITLE	<b>Conceptual Mine Sequence Year 30</b>		
Teck	SCALE 1:50,000	SCALE AS SHOWN	REV. 1
	DESIGN   WH   Jan 30, 2014	FIGURE: 2.9	
	GIS   RC   June 20, 2014		
	CHECK   FH   June 20, 2014		
	REVIEW   FH   June 20, 2014		

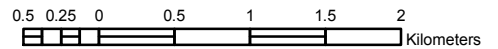


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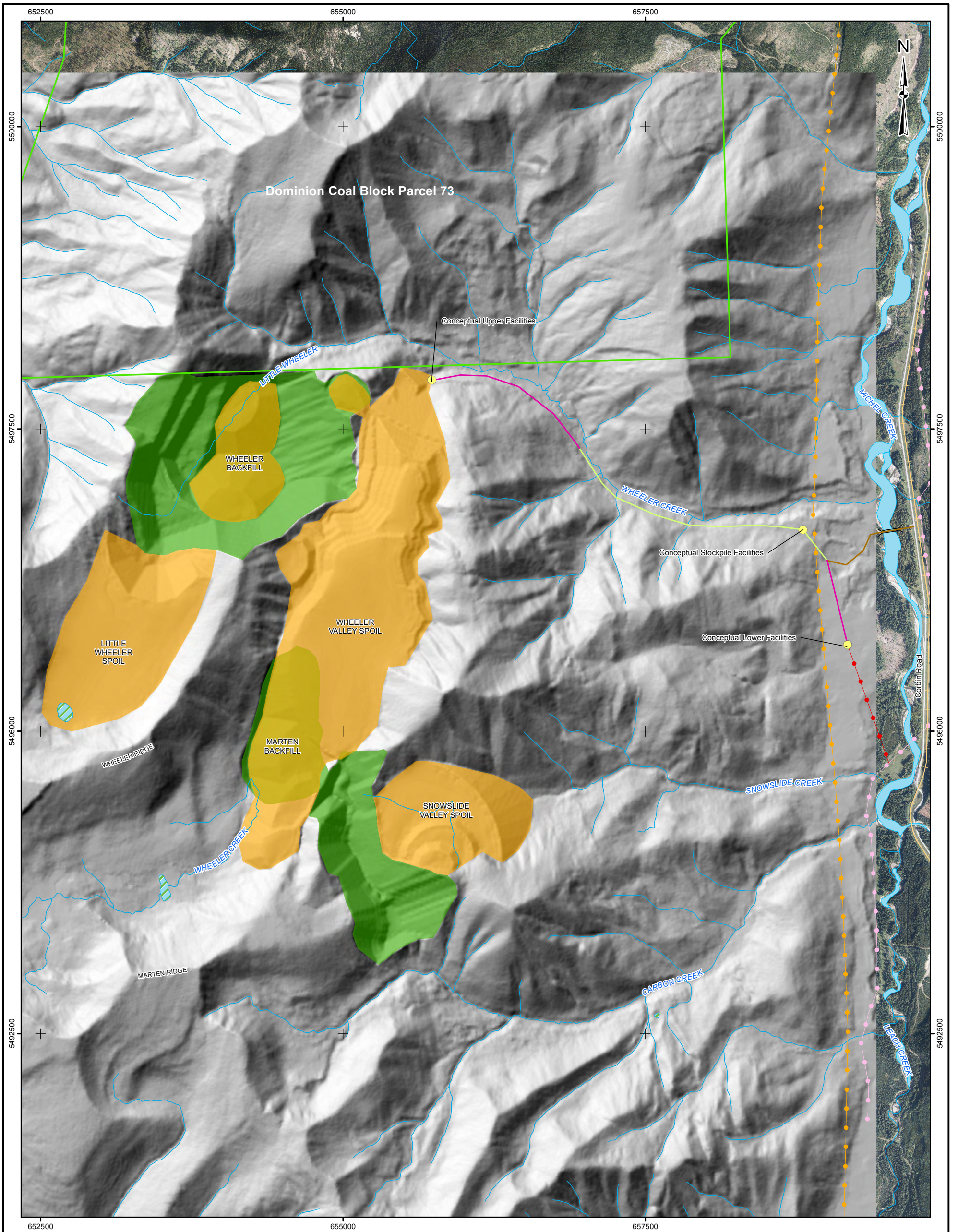
- CONCEPTUAL FACILITY
- NATURAL GAS PIPELINES
- PROPOSED NATURAL GAS SUPPLY LINE
- 500KV POWERLINE
- STREAMS
- PROPOSED NEW MINE HAUL ROAD
- PROPOSED UPGRADED ACCESS ROAD
- PROPOSED UPGRADED MINE HAUL ROAD
- RIVER AND LAKE
- WETLAND
- ACTIVE SPOIL
- ACTIVE PIT
- PROPOSED BRIDGE UPGRADE
- RAILWAY
- DOMINION COAL BLOCK PARCEL 73

**REFERENCE**

Data obtained from Teck Coal Limited  
 DATUM: NAD 83; PROJECTION: UTM ZONE 11



PROJECT	<b>COAL MOUNTAIN PHASE 2 PROJECT</b>		
TITLE	<b>Completion of Mining Year 34</b>		
<b>Teck</b>	SCALE 1:50,000	SCALE AS SHOWN	REV. 1
	DESIGN   WH   Jan 30, 2014	<b>FIGURE: 2.10</b>	
	GIS   RC   June 20, 2014		
	CHECK   FH   June 20, 2014		
	REVIEW   FH   June 20, 2014		



LEGEND	
	CONCEPTUAL FACILITY
	NATURAL GAS PIPELINE
	500 kV POWERLINE
	PROPOSED NATURAL GAS SUPPLY LINE
	PROPOSED NEW MINE HAUL ROAD
	PROPOSED UPGRADED ACCESS ROAD
	PROPOSED UPGRADED MINE HAUL ROAD
	RAILWAY
	PROPOSED BRIDGE UPGRADE
	STREAMS
	DOMINION COAL BLOCK PARCEL 73
	RIVER AND LAKE
	WETLAND
PROPOSED FINAL FOOTPRINT	
	PROPOSED BACKFILL SPOIL LIMIT (DRAFT)
	PROPOSED PIT SURFACE LIMIT (DRAFT)
	PROPOSED SPOIL LIMIT (DRAFT)

**REFERENCE**  
Data obtained from Teck Coal Limited. Projection: UTM Zone 11 Datum: NAD 83



PROJECT		COAL MOUNTAIN PHASE 2 PROJECT	
TITLE		COMPLETION OF MINING YEAR 34	
<b>Teck</b>	PROJECT No.	12-1349-0003	SCALE AS SHOWN
	DESIGN	GJ 24 Jun. 2014	REV. 0
	GIS	DR 24 Jun. 2014	
	CHECK	FN 25 Jun. 2014	
	REVIEW	GJ 25 Jun. 2014	

**Figure 2.11**

## **2.4.1.4 Development of Mining Infrastructure**

### **2.4.1.4.1 Access (Haul) Roads**

Cut and fill mine access and haul roads to the CMO2 site would need to be either upgraded or newly constructed. The roads would connect the Corbin Road access juncture and proposed raw coal stockpile area to the mine pits described in Section 2.4.1.4.2. Other haul roads associated with the Project would be constructed as required throughout the CMO2 site to allow the transport of coal and waste rock from the pits. The proposed roads to the waste rock locations and pits are presented in Figure 2.11 and include the following:

- approximately 1 km of access road upgrade to 20 m total width from Corbin Road to the proposed raw coal stockpile area;
- approximately 3 km of haul road upgrade to an average 50 m total width between a point 250 m southeast of the proposed raw coal stockpile area travelling west towards the mine pits; and
- approximately 2 km of new haul road to an average 65 m total width to access the mine pits towards the north and conceptual lower facilities to the southeast.

Haul road routes are planned in a manner that minimizes haul distances and elevation changes, and would be constructed in accordance with the requirements of the BC *Health, Safety, and Reclamation Code* (2008), including ditch structures to divert surface water runoff in accordance with the drainage plan, and a safety berm.

### **2.4.1.4.2 Raw Coal Stockpile Area**

The raw coal stockpiles at the CMO2 site would be placed on a large natural bench that is about 1 km west of Corbin Road, adjacent to the existing Project site access road. This area will be accessible to mine trucks to dump raw coal. Front-end loaders would then load the coal onto highway haul trucks for transport to CMO's existing process plant. The transportation of raw coal is described in Section 2.4.2.2.

### **2.4.1.4.3 Topsoil Stockpiles**

As pits are developed, it is expected that, where practicable, topsoil would be recovered. When possible, recovered topsoil would be hauled directly to areas already prepared for reclamation. However, because direct placement is not always an option, topsoil would also be stored in various locations until reclamation areas become available.

## **2.4.2 New Project On-Site Infrastructure**

An overview of the new facilities required for the CMO2 site is provided in Sections 2.4.2.1 to 2.4.2.11. These facilities would be located in two areas: the Upper Facilities, which are at the mine site; and the Lower Facilities, which are just southwest of the Corbin Road intersection to the Project site.

Although the proposed development would use existing CMO infrastructure to the greatest extent possible, the addition of some facilities would be required to support

operations. In all cases, opportunities to re-use and relocate facilities to support the Project from the existing operations would be the first consideration.

#### **2.4.2.1 Mine Support Buildings**

Mine support buildings would consist of offices, mine maintenance building, and support buildings. The main office complex, bathhouse, guard house, emergency medical services building, and mine entrance field office would likely be modular trailers.

The maintenance/warehouse facility would likely include sprung-type fabric structures placed end-to-end on a concrete slab, providing sufficient space for four Komatsu 830 E haul trucks. Mobile cranes would be used for heavy lifts instead of bridge cranes.

With the exception of the mine entrance field office, the mine support buildings would be located at the Lower Facilities. Most administrative activities would continue to operate from existing CMO offices, thereby reducing personnel and infrastructure requirements at the CMO2 site.

Employees would access the CMO2 area lower facilities by car or bus in a similar manner to the current access to CMO.

#### **2.4.2.2 Transport Corridor**

The current project proposal includes the transportation of raw coal from the stockpile area on the CMO2 site to the existing CMO process plant via the existing Corbin Road (total of 15 km) using 50 tonne payload side-dump highway haul trucks. An automated platform truck scale would be installed at the loading area to ensure trucks do not exceed load limits for the road. The CMO2 site would require an upgraded section of road to connect the Corbin Road to the raw coal stockpile loading area. At CMO, truck traffic would pass through the existing process plant site to the existing CMO raw coal stockpile area.

Other alternative raw coal transportation options currently under consideration for the Project include:

- a 16 km off-highway haul road with an average running width of 28 m which would roughly parallel Corbin Road to the west and south (for the use of 220-tonne class haul trucks);
- use and expansion of the rail system which would include 17 km of existing railroad, 3 km of new rail siding (1.5 km at CMO2 site and 1.5 km at CMO rail loop), and an installation of a breaker station at the CMO2 site; and
- a 15 km conveyor with maintenance access road with an approximate average right-of-way width of 20 m which would follow a similar path as the off-highway haul road. This would also include the installation of a breaker station at the CMO2 site.

In general, each of these raw coal transportation options would require similar office and maintenance facilities at the CMO2 site. Some specific infrastructure may differ

depending on the option to be utilized (e.g., off-highway haul road would not require a raw coal stockpile at the CMO2 site). These raw coal transportation options are presented in Figure 2.2. For the purposes of this Project Description, the highway haul option is assumed unless otherwise indicated.

#### **2.4.2.3 Fuelling Station**

A fuel storage depot would be located at the Lower Facilities to store gasoline and diesel, with fuel trucks used as required to bring fuel up to the mine site for fuelling large mobile equipment. The facility would adhere to relevant regulatory standards, e.g., Underwriters Laboratory of Canada, American Petroleum Institute, American Society of Mechanical Engineers, and *Health, Safety and Reclamation Code for Mines in BC*, and would provide about 5 days of diesel storage and 10 days of gasoline storage.

#### **2.4.2.4 Water Supply**

New water supply to the CMO2 site is required for activities such as drilling, dust control, fire suppression, wash water, and potable water. Two separate systems of wells, pump stations, and tanks would be built for the Upper and Lower facilities respectively.

Water would be supplied to the Lower Facility by a river intake pump system drawing from Michel Creek. A well field would also be installed for the months when there may not be sufficient water from Michel Creek. Part of the supplied water would be diverted to the potable water system to supply the various buildings at the Lower Facility. This water would be treated using a reverse osmosis and chlorination system. The average volume of water required for use at the Lower Facility will be further defined during the future stages of Project development. Teck will ensure that adequate volumes are available at all times and collection rates from Michel Creek do not exceed permitted guidelines.

Water would be supplied to the Upper Facility from a well field via a pump station and then a storage tank for all mine site-specific water usages.

#### **2.4.2.5 Natural Gas Supply**

Natural gas would be supplied to the Lower Facilities for building heat, water boilers, and heaters as necessary. A new 3 km natural gas supply line would be constructed from an existing Fortis BC valve station located south of the Lower Facilities.

#### **2.4.2.6 Septic System**

The septic system would be located at the Lower Facility. It would feature two septic tanks connected to upstream sewage sources from the buildings at the Lower Facility. Sewage would be piped from these septic tanks to a collection tank, which would be connected to a drain field consisting of several perforated pipes bedded in sized and washed river rock. A septic system would not be required at the Upper Facility because the current plan is to use portable, self-contained bathroom facilities.

#### **2.4.2.7 Hot Line Station**

The Hot Line Station would prepare standing mobile equipment for operation during cold temperatures. The Station would feature electrical outlets, pole-mounted beacons to guide equipment, compressed air outlets, and lighting.

#### **2.4.2.8 Power Lines**

Supplying power to site facilities would involve power lines, a substation, and power cables to the equipment. Power for the CMO2 site would be tapped off the existing main 69 kilovolt (kV) line that runs along Corbin Road and supplies power to CMO. A new 6-km 69 kV line would likely be constructed alongside the new CMO2 site access road up to the pit area by the Upper Facility, requiring approximately an additional 10 m of right-of-way width. Power would be stepped down at various substation locations to power CMO2 site facilities as required.

#### **2.4.2.9 Water Management and Treatment Facilities**

As discussed in Section 2.2.4, the EVWQP will describe environmental management objectives and outcomes for the Elk Valley, including: protection of aquatic ecosystem health; management of bioaccumulation of selenium, cadmium, nitrate, and sulphate in the receiving environment; protection of human health; and protection of groundwater. The EVWQP will also describe the actions, implementation plan, and monitoring that Teck will undertake to achieve these objectives and outcomes.

Any proposed surface water management features would be developed as determined by a surface water management plan consistent with the EVWQP. This could involve settling ponds to remove suspended solids from surface runoff, water diversions around spoils and pits, and other potentially required water management structures and facilities. Mine water management is discussed further in Section 2.5.3.

#### **2.4.2.10 Site Access Bridge**

The existing bridge across Michel Creek, which accesses the CMO2 site, would be inadequate for operation of the new mine for two reasons. It allows only single lane traffic and it has inadequate capacity to handle the approximately 75T raw coal highway haul trucks. Therefore, a new two lane bridge with a higher load rating is proposed.

#### **2.4.2.11 Explosives Storage**

Explosives used to develop the CMO2 site would be stored in CMO magazines until new magazine storage structures are established at the CMO2 site. Once storage is available, explosives would be kept at the CMO2 site.

### **2.4.3 Coal Mountain Operations Existing Off-Site Infrastructure**

An overview of the existing facilities located at CMO and off-site that would not change as a result of the Project is provided in Sections 2.4.3.1 to 2.4.3.8. The existing facilities include the following:

- process plant;
- access (rail and road);
- power;
- potable water;
- maintenance shop, warehouse, dry change, and office facilities;
- explosives storage;
- clean coal stockpiles; and
- rail loop and loading facilities.

#### **2.4.3.1 Process Plant**

The process plant at CMO is currently permitted to produce up to 3.5 M mtcc/year. Under current operations, the plant could process CMO2 feed at a rate 2.25 M mtcc/year. An increase of production to 4 M mtcc/year would require enhancements to the plant and rates of over 4 M mtcc/year would require more substantive upgrades, including an additional footprint. However, it is anticipated that any proposed process plant upgrades would be contained within the currently permitted CMO mine boundary. Potential effects of plant upgrades, if required, will be evaluated. The existing raw coal stockpile area at the CMO plant would also be reused. The highway haul trucks would side-dump raw coal, and as is current practice, front-end loaders would be used to blend and load the existing plant breaker.

#### **2.4.3.2 Access to Coal Mountain Operations**

Highway traffic access to CMO would remain via the Corbin Road, operated and maintained by the BC Ministry of Transportation and Infrastructure. However, some upgrades to the road and bridges would be required for the increased highway haul traffic.

#### **2.4.3.3 Power to Coal Mountain Operations**

Power to CMO is currently supplied by a 69 kV line that would also power the CMO2 site. No modification is required.

#### **2.4.3.4 Potable Water at Coal Mountain Operations**

Coal Mountain Operations operates a Small Water System as classified by the Environmental Operators Certification Program. The system uses a well system to meet its potable water supply needs. The general office, bathhouse, maintenance facility, and process plant are serviced by branches off of the potable water main. Bottled water is used at CMO for drinking water.



### **2.4.3.5 Domestic Water Treatment at Coal Mountain Operations**

Two wastewater systems are functioning at CMO: the north and the south septic systems.

#### **2.4.3.5.1 South Septic System**

The Sewage Treatment Plant (STP) system consists of the site sewer lines and related plumbing from the bathhouse, general office, maintenance shop, STP buildings, and the tile field west of the STP buildings. Wastewater from the mine dry, general office, maintenance shop and warehouse is collected and processed in this facility. The STP buildings house an extended aeration wastewater plant as well as a secondary membrane bio-reactor treatment system. Once processed, wastewater is discharged to ground through the permitted tile field. The effluent from the STP falls under the *Waste Management Act* (Permit PE-04750) and is sampled regularly to check for compliant water quality.

#### **2.4.3.5.2 North Septic System**

A tile field is located north of the breaker transfer tower that services the plant facilities. Grey water from the plant is collected in underground pump chambers located immediately north of the transformers on the west side of the plant building. The water is pumped from the pump chambers to the tile field for dispersal. The size of this system (flow) exempts it from the *Waste Management Act*.

### **2.4.3.6 Existing Building Facilities at Coal Mountain Operations**

Existing building facilities would be reused; however they may be used less. Personnel who are essential at the proposed development would be accommodated in new buildings at the CMO2 site; however, significant personnel would remain working at the CMO site. The existing bathhouse and office facilities would remain at the CMO site for personnel whose functions would be required across both sites such as loss prevention, maintenance, training, and plant processing.

The existing maintenance facility at CMO would remain to service mobile equipment such as clean coal dozers and refuse haulers, which would still be required at the CMO site.

### **2.4.3.7 Clean Coal Stockpiles at Coal Mountain Operations**

Two clean coal stockpiles are located adjacent to the rail loading facility. The stockpiles are fed into reclaim tunnels to the rail loading facility using dozers. No upgrades to this facility would be required.

### **2.4.3.8 Rail Loop and Loading Facilities at Coal Mountain Operations**

Clean coal is loaded at the existing rail loop at CMO at the rail loading facility. No upgrades to this facility would be required unless a rail option for the transportation of

raw coal between the CMO2 site and CMO was implemented. Should this occur, the rail siding extensions would be at the existing rail loop.

## **2.5 WASTE MANAGEMENT**

An outline of the proposed waste management for mine waste disposal, preparation plant reject material, and mine water management is provided in Sections 2.5.1 to 2.5.3.

### **2.5.1 Mine Waste Storage**

Waste rock generated from mining would be hauled by 220-tonne class haul trucks to waste dumps located in Upper Wheeler, Little Wheeler, and Snowslide valleys. Investigations into larger capacity haulage units (290+ tonne capacity) will be ongoing as part of the regular mine planning and economic evaluations.

Solid waste (e.g., rubber hoses, metal, plastics, wood, paper) generated as a result of the Project would be managed through the existing CMO waste management program. This program allows for the disposal of a variety of waste into waste collection drums. The wastes are picked up by a contractor, sorted, and sent through waste streams that maximize recycling and minimize sending solid waste to landfills. The program employs waste tracking to ensure compliance and consistency with waste streams. Internal auditing of compliance is a key component of the program.

Liquid wastes generated as a result of the Project would be collected and either reused within the mining process or disposed of at appropriate upland facilities. For example, waste oils would be reused in the blasting process to minimize the use of diesel fuel or are shipped off-site for processing and disposal at approved facilities. In the case of wastewater, oils would be separated from the water and reused in cogeneration or re-processed for lubricants.

Domestic wastes are expected to be managed through existing permits and disposed of in approved landfills. Food waste at CMO is handled using best waste disposal practices and ensures minimal attraction of bears or other wildlife to the site. This method has proven successful.

### **2.5.2 Preparation Plant Reject Material**

All reject material from the preparation plant would be co-mingled in a single stream from the plant's rejects bin. This material would be collected using the fleet of existing dedicated rejects haul trucks and hauled to mined-out pits. Initial rejects would be placed in CMO's 37-pit, with rejects produced later in the mine life being placed in 6-pit after 37-pit is filled.

### **2.5.3 Mine Water Management**

Weathering of waste rock generated from the mining process results in the leaching of naturally occurring elements contained within the rock. Exposure of waste rock to air and surface water can mobilize these substances and affect downstream water quality. The main constituents of interest are selenium, cadmium, sulphate, nitrates, and

deposition of calcite. Tree removal and ground disturbances associated with the mining process can also result in erosion, which can lead to the mobilization of total suspended solids. Precipitation of calcium carbonate minerals as calcite can also affect the physical character of watercourses.

The existing surface water management system of CMO is operated and maintained by site personnel in accordance with Teck's internal procedures and is designed to meet the water quality limits specified in *Waste Management Act* Permit PE-04750. Discharges to the environment are monitored through an extensive sampling program prescribed by PE-4750. Water management for the CMO2 site would be integrated with the overall water management plan for the rest of the CMO site. Please refer to Section 2.7 for more details on the water management objectives during reclamation and closure for the Project.

### **2.5.3.1 Total Suspended Solids**

Total suspended solids in water discharged from the CMO2 site would be managed through the operation and maintenance of erosion and sediment control works, such as drainage ditches, sediment ponds, and other controls (e.g., planting of disturbed areas). Erosion and sediment control works for the CMO2 site would be designed to meet required total suspended solids limits and would become part of the overall erosion and sediment control plan for the Project.

### **2.5.3.2 Other Parameters, Including Selenium**

The water management strategy for the Project would be compatible with the EVWQP, as described in Section 2.2.4. Currently, clean water diversions and active water treatment facilities are being evaluated. The net result will be that water releases associated with the proposed Project, in combination with the water releases from other Teck operations in the Elk Valley, will be managed in a manner consistent with the approved EVWQP to maintain acceptable water quality downstream of the Project.

Selenium levels in Lake Koochanusa (a trans-boundary water) are below the current BC water quality guideline of 2 µg/L and meet levels that are protective of aquatic life and other sensitive organisms (Teck Coal 2013). The EVWQP manages selenium concentrations in Lake Koochanusa to remain below 2 µg/L. The EVWQP also manages other order constituents to remain below current BC water quality guideline levels in Lake Koochanusa.

## **2.6 ENVIRONMENTAL MANAGEMENT**

Coal Mountain Operations administers an in-house Environmental Management System, which has been accredited since 2005 and is registered within the requirements of the International Organization for Standardization (ISO) 14001: 2004 framework (ISO 2004). Activities are implemented and maintained to provide effective environmental management of all CMO coal mining and processing activities within the operation's tenure. The CMO Environmental Management System Manual provides a guide to the system and identifies where different components of the system can be located. All related procedures, the Environmental Management System manual, forms, and other documents are warehoused in digital format accessible at the operation.

The CMO2 site operations would be undertaken in accordance with CMO's in-house Environmental Management System.

## 2.7 MINE RECLAMATION, CLOSURE, AND MONITORING

Reclamation is an integral part of mining activities and is a primary component of effects management for the Project. Teck is committed to successfully reclaiming areas disturbed by mining to self-sustaining conditions, including use of landform grading and re-vegetation with appropriate species, as required. Reclamation practices would be adapted from those currently used at other Teck coal mines in the Elk Valley, and will consider current research and modern reclamation techniques.

The reclamation plan for the CMO2 site would be developed to progressively reclaim areas over the life of the operation as they become available (i.e., when it is safe and once there is no future mining or other planned re-disturbance in the area). The goal of reclamation is to establish sustainable, diverse, and functional landscapes that, on a property average basis, provide capabilities for end land uses not less than those which existed before mining. These landscapes consider not only the planned end land use but also the manner in which they fit into adjacent undisturbed landscapes, with capability assessment based on pre-mining biophysical evaluations and Canada Land Inventory site ratings. End land use objectives after closure would be determined through consideration and consultation with regulators, First Nations, and other communities of interest.

Opportunities for riparian habitat would exist in and around the settling ponds and diversion structures developed as a result of mining. Efforts would be made to provide a habitat complex suitable for a variety of species at these important sites.

The long-range reclamation and closure water management objective for the Project site is to leave a drainage pattern that would sustain itself in perpetuity without maintenance. Accordingly, the reclamation program for the site would necessarily include consideration of the potential for erosion and other water quality concerns over the long-term. Given that some water quality constituents may leach from the waste rock spoils for a long period of time, there is a need to manage water quality parameters beyond the operational life of the mine. It is anticipated that the CMO2 site would go through a period of active closure. Active closure is defined as a post-mining period where the majority of disturbed areas have undergone reclamation activities, but where water quality management systems would remain in place and require ongoing monitoring and maintenance. Only once they are no longer required to achieve acceptable water quality in the receiving environment, would the active closure water management systems be decommissioned and fully reclaimed.

Reclamation research is necessary to develop successful operational reclamation plans as well as to advance the science of reclamation (Smyth 2002). Teck has considerable experience with reclamation in the Elk Valley. The *2012 Annual Reclamation Research Report* (Teck 2013) was prepared for CMO, Elkview Operations (EVO), Line Creek Operations (LCO), Greenhills Operations (GHO), and Fording River Operations (FRO). The results of this research are used to develop effective reclamation programs to satisfy short- and long-term reclamation objectives. The mines in the Elk Valley have a

history of both reclamation and reclamation research dating back to 1969 when initial environmental evaluations were conducted by FRO. This research will also focus on development of effective methods to measure success of reclamation and to satisfy the definition of “reclaimed” as described by current legislation. The goal is to establish a means to determine criteria and indicators for monitoring and assessment of reclamation success, with the end objective of releasing Teck from obligations and bonding requirements. At the CMO2 site, reclaimed areas would be monitored to evaluate reclamation success.

Reclamation at CMO would be in accordance with the approved end land use objectives and reclamation plans within their existing C-84 permit. Progressive reclamation would occur where possible, accounting for applicable land development associated with the Project.

## **2.8 ALTERNATIVES**

This section outlines the alternatives that have either been reviewed or are still under review as part of development of the Project.

For the CMO2 site, alternative pit shell and dump configurations, backfilling options, and access corridor routes have been considered, as well as variable production levels:

- extensive analysis of multiple pit sizes or shells given acceptable economic factors and engineering limitations or constraints;
- evaluation of various process plant production rates including 2.25, 3, 4 and 5 million metric tonnes clean coal (M mtcc) per year;
- investigation of the effect of alternative mine phase sequencing on the overall disturbance footprint;
- feasibility of reclamation on end gradients and topography;
- appraisal of various pit backfilling options; and
- various final spoil slope configurations, including lower final slope angles that might facilitate compaction and topdressing.

Alternatives are also being investigated for raw coal transportation which included the following:

- rail transport of raw coal using the existing Byron Creek Subdivision line;
- a new haul road for 220-tonne class haulers connecting the CMO2 site pits to the existing CMO process plant that is routed approximately parallel to the existing Corbin Road but is on the west bank of Michel Creek; and
- a new conveyor having approximately the same routing as the haul road described above.

## Teck Coal Limited: Coal Mountain Phase 2 Project Description

These raw coal transportation options were evaluated at the variable production levels, which would also require necessary plant upgrades.

Teck is also analyzing additional alternatives to investigate their environmental, social, and technical merits. Options being considered through the continuing analysis of alternatives may include, but will not necessarily be limited to, the following:

- the 'no project' alternative and limited-project alternatives;
- mine spoil storage locations and designs;
- mine pit configurations;
- location of haul roads;
- coal conveyor systems and/or installation of a new breaker at the CMO2 site; and
- water management strategies to meet water quality objectives.

The EA will present a full analysis of alternatives considered for the Project, and includes assessment of effects based on the specific alternatives selected for the Project.

### 3 EXISTING ENVIRONMENT

As part of the EA process being undertaken by Teck, baseline studies have been implemented to help characterize the existing environment. These studies incorporate environmental data that were collected in and around the Project during the development of the existing CMO, as well as new data that have been collected during field programs conducted in 2012, 2013, and 2014 to date. Baseline programs being undertaken for the Project are focused on acquiring sufficient information to assess the potential environmental and socio-economic effects of the Project.

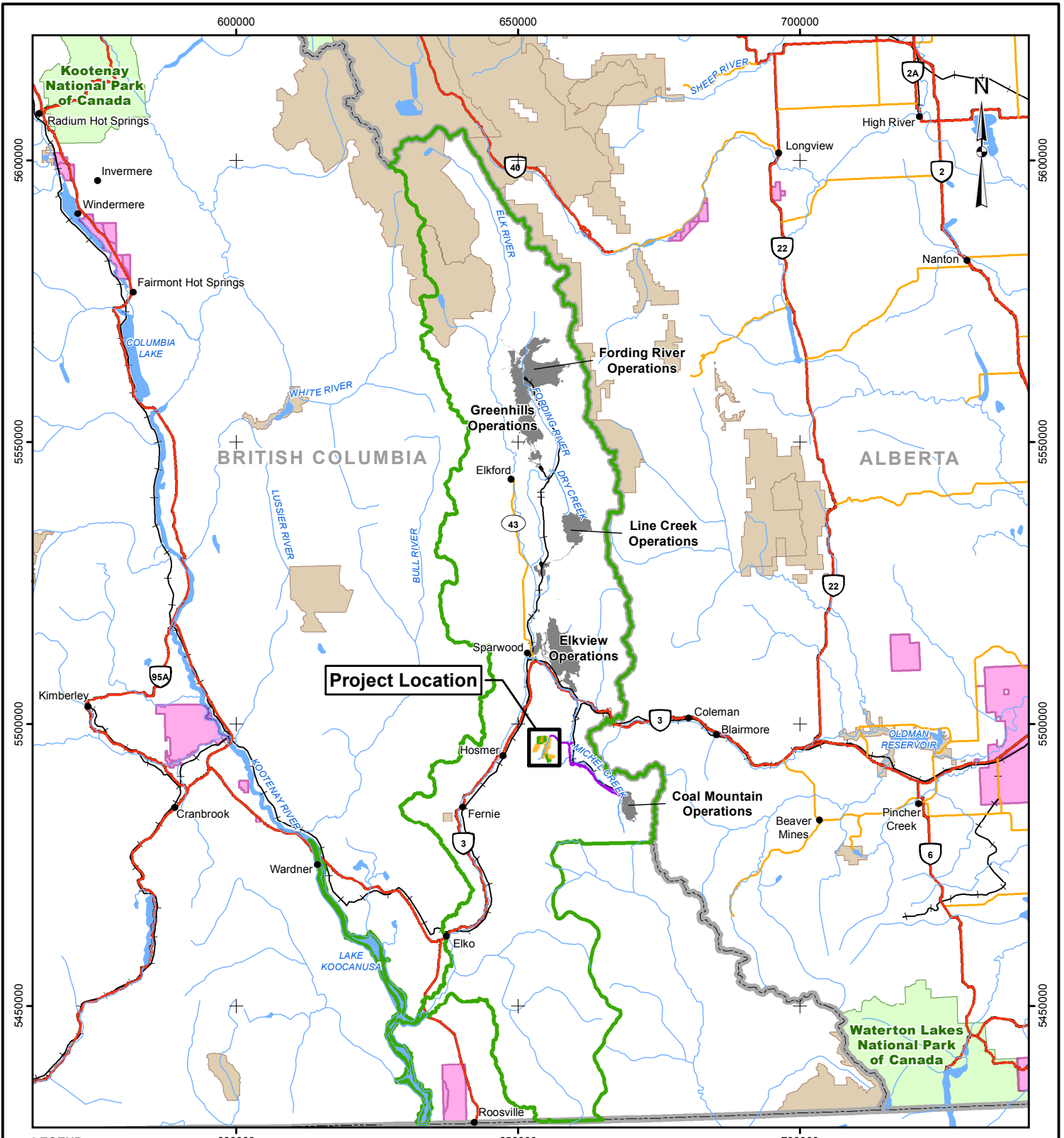
An overview of the existing environment based on available data is provided in Sections 3.1 to 3.3. For the purposes of this discussion, the Project area refers to the proposed Project footprint area (CMO2 site) and the corridor to CMO (Figure 2.2) unless otherwise stated.

The Project's aquatic study area is presented in Figure 3.1, the soils Local Study Area (LSA) is presented in Figure 3.2, and the terrestrial biology LSA in Figure 3.3.

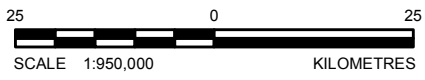
The aquatic study area (Figure 3.1) is the area where the assessment for water-related issues is focused and includes all watersheds that could potentially be directly, or indirectly, affected by the proposed Project based on current understanding of potential mine plans. These watersheds include the Wheeler, Little Wheeler, Snowslide, Carbon, and Michel creeks, which drain to the Elk River. The aquatic study area has a total area of 43,900 ha and encompasses the watershed of the Elk River and the portion of Lake Koochanusa located within Canada. The Elk River originates from Elk Lakes Provincial Park and flows south. It then turns southwest at Sparwood and eventually discharges to Lake Koochanusa about 80 km downstream of Sparwood. Major tributaries include the Fording River, Michel Creek, and the Wigwam River.

The soils LSA (Figure 3.2) is the area in which Project effects on soils, as well as land use and tenure, is assessed. It is somewhat smaller than the terrestrial biology LSA, as effects to soils and land use are typically localized near the Project footprint.

The terrestrial biology LSA (Figure 3.3) is the area in which the assessment of terrestrial biology disciplines or components (e.g., vegetation, wildlife and overall biodiversity) are assessed. The selection of the terrestrial biology LSA is based on ecologically relevant and logical breaks in the landscape surrounding the CMO2 site, and includes a buffer along the corridor route to CMO. The LSA encompasses an area large enough to assess the potential effects of the Project on terrestrial biology disciplines or components, including effects that may extend beyond the footprint.



- LEGEND**
- CITY / TOWN / COMMUNITY
  - CANADIAN PACIFIC RAILWAY
  - PRIMARY HIGHWAY
  - SECONDARY HIGHWAY
  - RAW COAL TRANSPORTATION OPTION LOCATIONS
  - WATERCOURSE
  - AQUATIC STUDY AREA
  - BRITISH COLUMBIA - ALBERTA BORDER
  - COAL MINING OPERATION
  - FIRST NATIONS RESERVE
  - PROPOSED PIT SURFACE LIMIT (DRAFT)
  - PROPOSED SPOIL LIMIT (DRAFT)
  - NATIONAL PARK
  - PROVINCIAL PARK / PROTECTED AREA
  - WATERBODY

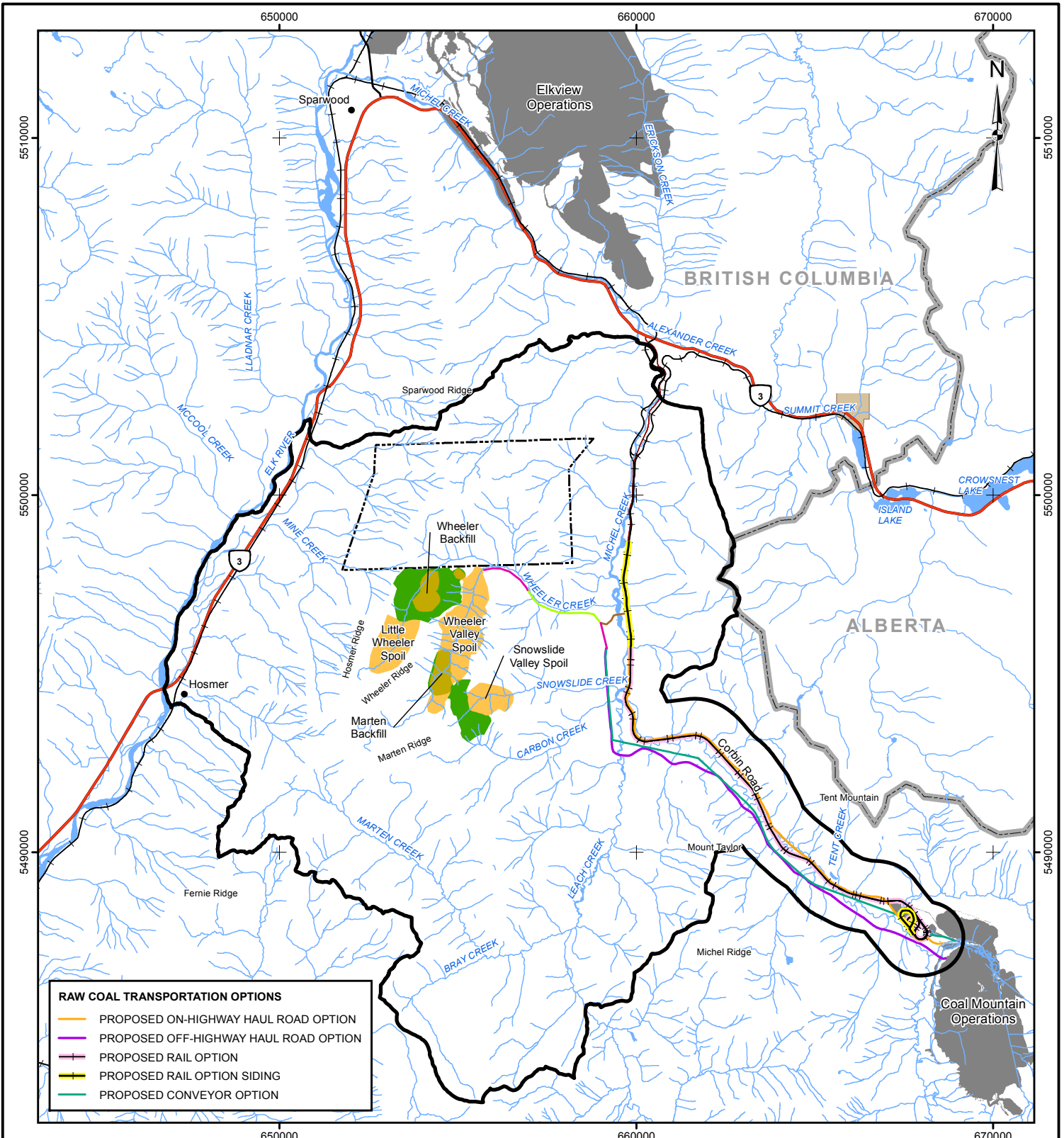


**REFERENCE**  
 Provincial boundaries, Communities and Hydrography obtained from The Atlas of Canada, Natural Resources Canada. Roads obtained from Geobase. Parks/Protected Areas, Railroad and First Nations data obtained from GeoGratis. Other data obtained from Teck Coal Limited. Projection: UTM Zone 11 Datum: NAD 83

PROJECT			
COAL MOUNTAIN PHASE 2 PROJECT			
TITLE			
AQUATIC STUDY AREA			
<b>Teck</b>	PROJECT No.	12-1349-0003	SCALE AS SHOWN
	DESIGN	FN 11 Feb. 2014	REV. 0
	GIS	DR 24 Jun. 2014	<b>Figure 3.1</b>
	CHECK	FN 25 Jun. 2014	
	REVIEW	GJ 25 Jun. 2014	

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**RAW COAL TRANSPORTATION OPTIONS**

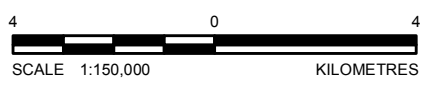
- PROPOSED ON-HIGHWAY HAUL ROAD OPTION
- PROPOSED OFF-HIGHWAY HAUL ROAD OPTION
- PROPOSED RAIL OPTION
- PROPOSED RAIL OPTION SIDING
- PROPOSED CONVEYOR OPTION

**LEGEND**

- CITY / TOWN / COMMUNITY
- CANADIAN PACIFIC RAILWAY
- CORBIN ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- PROPOSED NEW MINE HAUL ROAD
- PROPOSED UPGRADED ACCESS ROAD
- PROPOSED UPGRADED MINE HAUL ROAD
- WATERCOURSE
- BRITISH COLUMBIA - ALBERTA BORDER
- COAL MINING OPERATION
- DOMINION COAL BLOCK PARCEL 73
- PROPOSED BACKFILL SPOIL LIMIT (DRAFT)
- PROPOSED PIT SURFACE LIMIT (DRAFT)
- PROPOSED SPOIL LIMIT (DRAFT)
- PROVINCIAL PARK
- SOILS LOCAL STUDY AREA
- WATERBODY

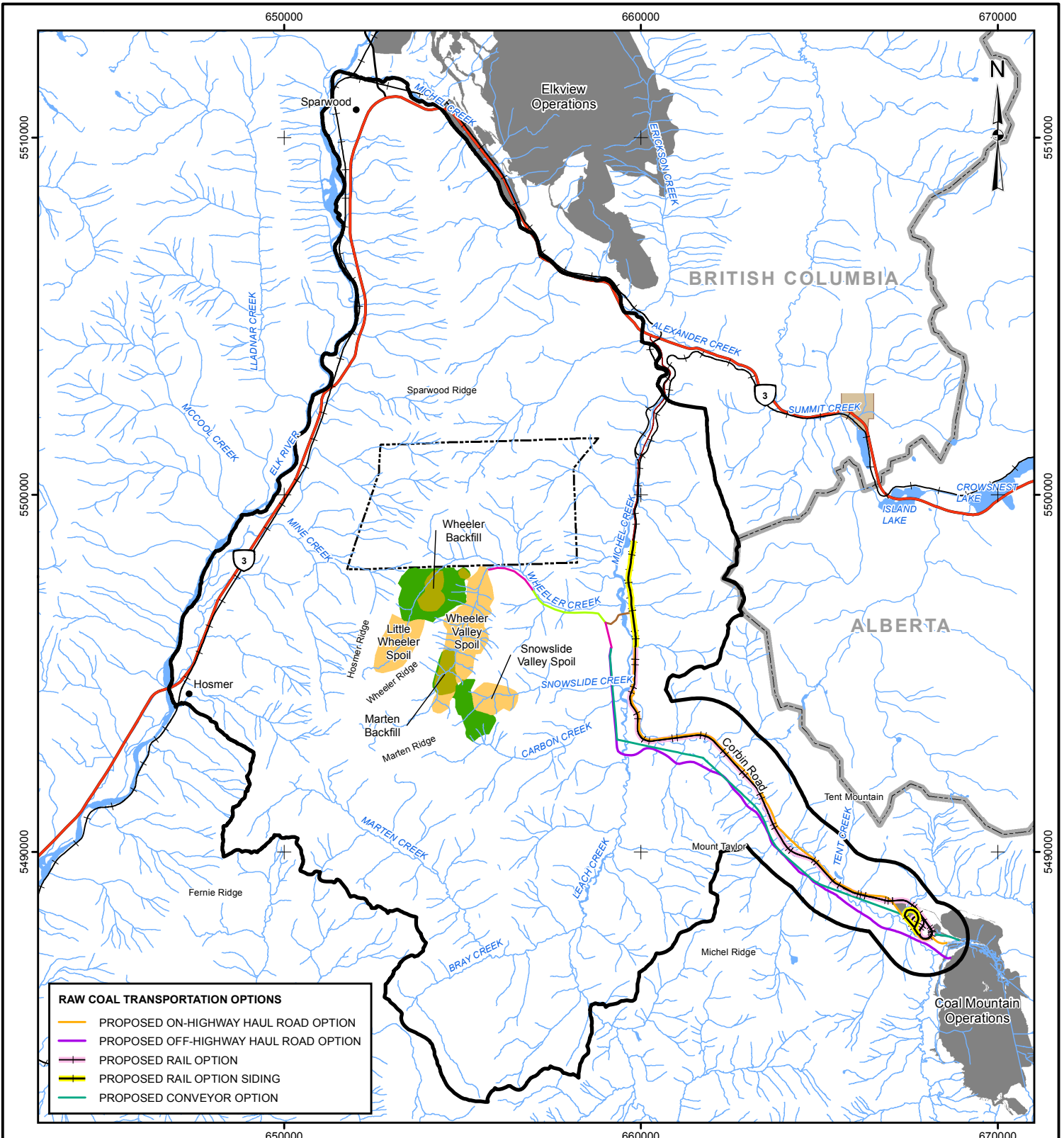
**REFERENCE**

Provincial Boundary and communities obtained from The Atlas of Canada, Natural Resources Canada. Alberta Hydrography obtained from CanVec, Government of Canada, Natural Resources Canada. BC Hydrography, Dominion Coal Blocks and project data obtained from Teck Coal Limited. Roads obtained from Geobase. Provincial parks and Railroad data obtained from Geogratis. Projection: UTM Zone 11. Datum: NAD 83



<b>PROJECT</b>	COAL MOUNTAIN PHASE 2 PROJECT		
<b>TITLE</b>	SOILS LOCAL STUDY AREA		
<b>Teck</b>	PROJECT No. 12-1349-0003	SCALE AS SHOWN	REV. 0
	DESIGN FN 11 Feb. 2014		
	GIS DR 24 Jun. 2014		
	CHECK FN 25 Jun. 2014		
REVIEW GJ 25 Jun. 2014			
<b>Figure 3.2</b>			

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**RAW COAL TRANSPORTATION OPTIONS**

- PROPOSED ON-HIGHWAY HAUL ROAD OPTION
- PROPOSED OFF-HIGHWAY HAUL ROAD OPTION
- PROPOSED RAIL OPTION
- PROPOSED RAIL OPTION SIDING
- PROPOSED CONVEYOR OPTION

**LEGEND**

● CITY / TOWN / COMMUNITY	▭ BRITISH COLUMBIA - ALBERTA BORDER
— CANADIAN PACIFIC RAILWAY	▭ COAL MINING OPERATION
— CORBIN ROAD	▭ DOMINION COAL BLOCK PARCEL 73
— PRIMARY HIGHWAY	▭ PROPOSED BACKFILL SPOIL LIMIT (DRAFT)
— SECONDARY HIGHWAY	▭ PROPOSED PIT SURFACE LIMIT (DRAFT)
— PROPOSED NEW MINE HAUL ROAD	▭ PROPOSED SPOIL LIMIT (DRAFT)
— PROPOSED UPGRADED ACCESS ROAD	▭ PROVINCIAL PARK
— PROPOSED UPGRADED MINE HAUL ROAD	▭ TERRESTRIAL BIOLOGY LOCAL STUDY AREA
— WATERCOURSE	▭ WATERBODY



**REFERENCE**  
 Provincial Boundary and communities obtained from The Atlas of Canada, Natural Resources Canada. Alberta Hydrography obtained from CanVec, Government of Canada, Natural Resources Canada, BC Hydrography, Dominion Coal Blocks and project data obtained from Teck Coal Limited. Roads obtained from Geobase. Provincial parks and Railroad data obtained from Geogratis. Projection: UTM Zone 11 Datum: NAD 83

<b>PROJECT</b>			
COAL MOUNTAIN PHASE 2 PROJECT			
<b>TITLE</b>			
TERRESTRIAL BIOLOGY LOCAL STUDY AREA			
<b>Teck</b>	PROJECT No.	12-1349-0003	SCALE AS SHOWN
	DESIGN	FN 11 Feb. 2014	REV. 0
	GIS	DR 24 Jun. 2014	
	CHECK	FN 25 Jun. 2014	<b>Figure 3.3</b>
	REVIEW	GJ 25 Jun. 2014	

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## 3.1 PHYSICAL ENVIRONMENT

### 3.1.1 Air Quality

Potential air emissions from the Project may include particulate matter (PM), sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and greenhouse gases (GHGs). The PM emissions arise from numerous mining activities such as drilling, blasting, and material handling. The SO<sub>2</sub> and NO<sub>2</sub> emissions are produced by the combustion of fossil fuels in vehicles, equipment, and coal dryers. Sources of GHGs at a coal mine include fossil fuel combustion as well as fugitive coal bed methane.

Due to lack of power sources and other logistical issues in remote terrain, historical air quality measurements are not available at the CMO2 site. Proxy baseline data to provide a representative estimate of background values in the region will be taken from background values for the Teck FRO Swift Project. Measurements of particulate matter less than 10 micrometres (µm) in diameter (PM<sub>10</sub>), particulate matter less than 2.5 µm in diameter (PM<sub>2.5</sub>), polycyclic aromatic hydrocarbons (PAHs), total dustfall, and ambient meteorology are also available from recent monitoring near Hosmer.

It is likely these data provide a conservative estimate of background values at the CMO2 site because there are more anthropogenic sources of criteria air contaminants near the Swift Project and Hosmer. Other existing air quality data in the vicinity of the Project include dustfall measurements collected at the CMO2 site, as well as measurements collected by CMO to the south for total suspended particulate, PM<sub>10</sub>, and PM<sub>2.5</sub>.

Meteorological observations are currently being collected from the following:

- the north end of the CMO2 site, where a meteorological station was installed in January 2013;
- the town of Hosmer, where a meteorological station was installed in December 2013; and
- at two other nearby stations that have been in place for longer time periods, one of which is operated by CMO (at the edge of the existing CMO site) and the other by Environment Canada (in Sparwood).

A minimum of one year of data is required to properly characterize baseline conditions. It is expected that at least one year of data from both of the recently installed stations (at Hosmer and the CMO2 Site) will be available to contribute to the baseline.

Other recent meteorological observations within the regional study area which will supplement the local data include the data from two meteorological stations maintained by Line Creek Operations about 40 km to the north, and data from two meteorological stations maintained by Greenhills Operations about 50 km to the north.

### 3.1.2 Noise

The Project includes noise-generating activities such as coal extraction, material handling, and stockpiling. Potential noise sources from mining activities associated with the CMO2 site include, but are not limited to, shovels, haul trucks, drills, blasting activities, and auxiliary equipment. Vibration would be generated by blasting activity.

Noise data have been collected from the process plants, open-pit mine activities, and ambient environment for CMO, EVO, LCO and FRO, and are likely to be applicable to the Project. Noise data from these operations are being reviewed and assessed for applicability for use in the Project EA.

The British Columbia *Noise Control Best Practices Guidelines* (OGC 2009) developed by the BC Oil and Gas Commission (OGC) establish reasonable levels around industrial facilities to minimize the effect of resource developments on the sound environment. The OGC ambient noise requirement established for remote areas are being considered as guidelines for the Project. The typical ambient noise level for a rural area is designated as 35 A-weighted decibels (dBA). The OGC requires that a facility not exceed a sound level of 40 dBA equivalent continuous sound level (Leq) at 1.5 km from its boundary in the absence of existing nearby noise-sensitive human receptors. In the case that sensitive receptors are within 1.5 km of the facilities, a permissible sound level is determined for the nearest or most affected dwelling.

Measurement and assessment of noise is receptor based and baseline measurements at receptors have been conducted. The receptors identified for the Project assessment are near Hosmer and Sparwood. Wildlife may also be considered a receptor for the Project, with specific habitat or locations to be identified within the EA.

### 3.1.3 Surface Water Hydrology

The Project area is located predominantly within the watersheds of Wheeler, Little Wheeler, Snowslide, and Carbon creeks, which are all tributaries of Michel Creek. Michel Creek flows generally northwest and discharges to the Elk River at the town of Sparwood. Other small creeks in the vicinity of the Project are Mine and Transmission creeks, which drain west to the Elk River. The Elk River flows generally southwest and discharges to Lake Koochanusa, about 80 km downstream of the Michel Creek confluence. The watersheds in the Project area are mostly natural with existing disturbances being forestry access roads, some clearings, and mine exploration activities.

Wheeler Creek watershed has a total area of about 29 square kilometres (km<sup>2</sup>) and elevations between 1,315 and 2,250 metres above sea level. The average stream gradient of Wheeler Creek is about 6%. The main tributary, Little Wheeler Creek, drains about 30% of the total watershed area and has an average stream gradient of about 9%. Snowslide Creek watershed has a total area of about 5.5 km<sup>2</sup> and an average stream gradient of about 15%. Carbon Creek watershed has a total area of about 10 km<sup>2</sup> and an average stream gradient of about 10%.

Spot flow measurements have been taken monthly and weekly during freshet at several monitoring stations. Continuous water levels and spot flow measurements have been

collected at stations at Wheeler, Snowslide, Carbon, Fir, Leach, Mine, Transmission and unnamed (tributary to Michel Creek) creeks. This information will be used to develop open-water rating curves and derive flow hydrographs.

### 3.1.4 Water Quality

In addition to the watersheds of Wheeler, Little Wheeler, Snowslide, and Carbon creeks, the Project area includes the adjacent watersheds of Fir, Hosmer, Mine, and Transmission creeks, which could be directly or indirectly affected. These creeks all drain to Michel Creek or the Elk River. Michel Creek and the Elk River both have existing mining developments within their watersheds.

Monthly water quality data has been collected by Teck from eight locations throughout the CMO2 site area since May 2012. The sampling frequency was increased to weekly for one month during the spring freshet. Water quality data collected on a sporadic basis are also available at several of the locations going back as far as 2006. The data collected have shown that water in the creeks within the Project area is generally characterized as soft to moderately soft and of high alkalinity. Specific conductivity is low to moderately low, reflecting the fluctuating trends observed in total dissolved solids throughout the year. Calcium, sulphate, magnesium, and carbonate species dominate the dissolved ions. All of the observed sulphate concentrations have been below the BC water quality guideline (BC MOE 2012a). Nitrate, nitrite, total ammonia, and total Kjeldahl nitrogen concentrations tend to be low, although some higher total Kjeldahl nitrogen concentrations have been observed. All of the observed nitrate concentrations have been below the BC water quality guideline (BC MOE 2012a). Elevated concentrations of total phosphorus compared to other streams elsewhere in the Elk Valley have been measured in all seasons, especially spring and summer. Total and dissolved metal concentrations in creeks within the Project area tend to be low and below water quality guidelines for the protection of aquatic life; however, occasional exceptions occur with metal concentrations observed above the guidelines. All of the observed selenium concentrations have been below the BC water quality guideline (BC MOE 2012a).

Water quality in the Elk River and Michel Creek is slightly alkaline with low nutrient and trace element concentrations upstream of existing operations. Levels of nitrate, selenium, sulphate, and other major ion concentrations are generally elevated downstream of existing coal mining operations relative to upstream areas.

### 3.1.5 Surficial Geology

The existing Project site geology is described in Section 2.3.

The bedrock geology for the Project area and vicinity is composed of sedimentary rock (predominately shales, siltstones, and sandstones) belonging to the Elk, Mist Mountain, Morrissey, and Fernie Formations. All three members of the Kootenay Group are present. The Mist Mountain Formation contains the economic coal-bearing strata of interest in the Project area.

The surficial geology of the Project area is complex. An open syncline, running beneath the east flank of Hosmer Ridge, is the predominant structure. The current Project area

lies on the eastern limb of this syncline. The Marten and Wheeler structural blocks are separated by a west-dipping, high-angle normal fault. The lower part of the Mist Mountain Formation outcrops in the middle of the Parcel 73 of the Dominion Coal Block.

Surficial geology will be evaluated as part of the soil and terrain discipline.

### **3.1.6 Soils and Terrain**

The Project area is part of the Rocky Mountain physiographic subdivision which is characterized by steep-walled, rugged, glacially carved, rocky peaks aligned in parallel ridges trending southeast to northwest, and broad valleys occupied by incised or meandering rivers and streams lying between ridges (Lacelle 1990). Bioterrain mapping has been completed for the Project area as part of the Terrestrial Ecosystem Mapping exercise. The bioterrain map was developed following current standard methodology (RISC 1995, 1996, 1998).

A field data validation program in 2012 and 2013 recorded attributes such as slope gradients, geomorphic processes (e.g., avalanche tracks, fluvial deposition), surficial material type and deposition, soil type, and drainage at inspection sites located within selected bioterrain polygons. The collected field data was used to finalize the bioterrain mapping in the Project area.

Surficial materials in the Project area vary widely. The dominant surficial materials include rubbly colluvium, colluvial veneers in association with rock outcrops on high-elevation steep slopes, and medium- to coarse-textured till deposits on mid- to low-elevation terrain. Other surficial materials in Project area are gravelly fluvial plains, glacial fluvial terraces, and remnants of glaciolacustrine terraces. The associated dominant soil types in the Project area include Brunisols, Podzols, and Regosols with some Gleysols, Luvisols, and organic soils found sporadically throughout the Project area.

Brunisols and Podzols are the most abundant soil types in the Project area. Brunisols are distinguished from other soils by their weakly developed soil profile evident by a slight alteration of the lower solum from the parent material, either by color and structure development or both. These soils are found at mid to lower elevations in the Project area. They are commonly found on coarse or moderately coarse-textured till or colluvial deposits on steep to very steep slopes that are well to rapidly drained sites, and where pedogenic soil development has been limited due to moisture deficit. They are also found on areas of recent deposition.

Podzols are found at mid to higher elevations in the Project area. Podzols are identified in the field by the presence of a distinct light gray leaching zone upper horizon over a reddish brown accumulation zone sub-surface horizon. Podzols in the Project area are mostly found on coarse colluvial deposits under mature forest (pine and spruce) vegetation.

## 3.2 BIOLOGICAL ENVIRONMENT

The following subsections describe the existing biological environment. Scientific names of species cited in the following sections are provided in Appendix B.

### 3.2.1 Biogeoclimatic Zones and Ecosystems

The Project's terrestrial biology LSA (Figure 3.3) is located in the Elk River Valley west of the Front Ranges of the Rocky Mountains. The LSA can be stratified by biogeoclimatic zone to describe the variation in vegetation represented across the landscape. Biogeoclimatic zone classification is a system of environmental organization that categorizes the changes in vegetation across the landscape and elevation based on the expected climax (dominant) tree species, assuming no disturbance on the landscape (e.g., stand-replacing fire; Braumandl and Curran 1992). Ecosystem field surveys were completed in 2012 and 2013 according to Resources Information Standards Committee standards using procedures and codes described in the *Field Manual for Describing Terrestrial Ecosystems* (BC MOFR and BC MOE 2010). Sites representative of ecological units that were identified as either sensitive or of moderate to high quality for the valued components based on a literature review were evaluated in the field. This information was collected within each polygon as well as during the traverses to and from each of the visited polygons where possible. Three biogeoclimatic zones were identified within the LSA: 1) Montane Spruce, 2) Engelmann Spruce – Subalpine Fir, and 3) Interior Cedar Hemlock. Each biogeoclimatic zone is further stratified into subzones and variant based on variations across the landscape, which can be largely characterized by differences in the available moisture and nutrient content in the soils. The biogeoclimatic zones, subzones, and variants found in the LSA are outlined in Sections 3.2.1.1 to 3.2.1.4.

#### 3.2.1.1 Elk Dry Cool Montane Spruce (MSdk1)

In the Montane Spruce zone, the dry cool variant (MSdk1) subzone variant ranges between 1,200 to 1,650 metres above sea level (masl) on south-facing slopes, and between 1,100 to 1,550 masl on north-facing slopes. This subzone occupies lower elevations following the valley bottoms in the north and eastern regions of the LSA. Beginning north of Lladnar Creek (i.e., 49° 39'26" Latitude) on the west side of the LSA, the MSdk1 follows the lower elevation contours of the Elk River valley and is continuous up to Sparwood. The MSdk1 traverses along the northern tip of Sparwood Ridge, and is continuous to the southeast of the LSA along Michel Creek for the entire extent of the project area. Climax zonal sites in the MSdk1 are characterized by forested stands dominated by hybrid white spruce (*Picea glauca x Engelmannii*) and subalpine fir (*Abies lasiocarpa*). Douglas fir (*Pseudotsuga menziesii*) is present usually in minor amounts. Rusty pacific menziesia (also known as false azalea; *Menziesia ferruginea*) and soopolallie (*Shepherdia canadensis*) are the prominent shrubs, while grouseberry (*Vaccinium scoparium*), northern twinflower (*Linnaea borealis*), and pinegrass (*Calamagrostis rubescens*) are the common herbs (Hope et al. 1991).

### 3.2.1.2 **Elk Dry Cool Engelmann Spruce – Subalpine Fir (ESSFdk1, ESSFdkw, ESSFdkp)**

The Engelmann Spruce – Subalpine Fir zone, and dry cool subzone (ESSFdk) occurs on the upper slopes of the Rocky Mountains, and is found throughout the LSA as different variants, following the valley topography. The ESSFdk is generally drier and cooler than the ESSFwm subzone, which is found in the southern portion of the LSA.

#### *ESSFdk1*

The Engelmann Spruce – Subalpine Fir, dry cool (ESSFdk1) variant is found throughout the northern portion of the LSA at mid-elevations between 1,650 to 2,100 masl on south-facing slopes, and between 1,550 to 2,100 masl on north-facing slopes. The ESSFdk1 follows the same corridor as the MSdk1, but is found higher upslope as a result of the cooler temperatures and shorter growing season typical of higher elevation forests. The terrain in this variant is mountainous and often steep and rugged (Braumandl and Curran 1992). The ESSFdk1 has relatively cold, short winters and a snowy continental climate (Coupé et al. 1991). The vegetation composition and structure within the ESSFdk1 varies with biophysical environmental conditions (e.g., slope, aspect, elevation). Contiguous areas are classified based on these parameters as site series, which are not defined here.

The ESSFdk1 is characterized by climax vegetation on zonal sites (ecosystems thought to best reflect the regional climatic conditions in the subzone variant), but vegetation structure and composition varies with environmental conditions. Zonal sites in the ESSFdk1 are characterized by closed canopy forests at the lower elevations throughout its range (less than 1,950 masl), with stands that contain subalpine fir and Engelmann spruce (*Picea engelmannii*) (British Columbia Ministry of Forests 1998; Braumandl and Curran 1992). The prominent shrubs represented in this variant are false azalea and black huckleberry (*Vaccinium membranaceum*). The herbs include grouseberry, low bilberry (*Vaccinium myrtillus*), western meadow-rue (*Thalictrum occidentale*), heart-leaved arnica (*Arnica cordifolia*), and one-leaved foamflower (*Tiarella trifoliata*; Braumandl and Curran 1992). Engelmann spruce often succeeds lodgepole pine (*Pinus contorta*), a pioneer species, and is typically the dominant canopy species in mature stands. However, subalpine fir dominates in moister areas, whereas lodgepole pine dominates in drier sites at maturity. Lodgepole pine is also common at lower elevations (less than 1,800 masl) in forests following large disturbance such as fire.

Subalpine grasslands in the ESSFdk1 are associated with steep, south-facing slopes. The prominent species in these ecosystems are rough fescue (*Festuca campestris*), Idaho fescue (*F. idahoensis*), pinegrass (*Calamagrostis rubescens*), and diverse-leaved cinquefoil (*Potentilla diversifolia*).

#### *ESSFdkw*

As elevation increases, growing conditions for trees can become less favourable, and the ESSFdk1 begins to transition to the generally more open canopy forest of the Engelmann Spruce – Subalpine fir dry, cool woodland (ESSFdkw) subzone. This subzone is commonly found at higher elevations above the ESSFdk1 along



Sparwood Ridge, Hosmer Ridge, and Marten Ridge, and is continuous to the highest elevations found in the northern part of the LSA. The southern-most extent of the ESSFdkw follows a contour at similar latitude to the community of Hosmer (i.e., 49° 35'07"). Much of the understorey vegetation found in the ESSFdkw is similar to the ESSFdk1; however the occurrence of lodgepole pine becomes less prominent. The greatest distinguishing feature separating the ESSFdk1 subzone from the ESSFdkw is the decreased canopy closure (40% to 10% forest cover), and the emergence of high-elevation species such as mountain heath (*Cassiope* spp.; Braumandl and Curran 1992).

### *ESSFdkp*

The highest elevation in the ESSFdk subzone are characterized by discontinuous forest (i.e. less than 10% forest cover), and is referred to as the Engelmann Spruce – Subalpine fir dry warm parkland subzone (ESSFdkp). The ESSFdkp is common at higher elevations (greater than 1,950 masl) in the northern LSA, and is characterized by islands of trees that have established in favourable microsites (Braumandl and Curran 1992). Subalpine meadows are common in this subzone where the soil remains moist throughout the much of growing season. Several herbaceous species such as common red paintbrush (*Castilleja* spp.), western meadow-rue, sitka valerian (*Valeriana sitchensis*), and Indian hellebore (*Veratrum viride*) are found in this subzone. The vegetation has strong floristic affinities with Alpine Tundra (IMAun) heath communities, containing species such as white-mountain heather (*Cassiope mertensiana* var *mertensiana*), four-angled mountain heather (*C. tetragona*), pink mountain heather (*Phyllodoce empetriformes*), and yellow mountain heather (*P. glanduliflora*).

### **3.2.1.3 Wet Mild Engelmann Spruce – Subalpine Fir (ESSFwm, ESSFwmw, ESSFwmp)**

The wet, mild Engelmann Spruce – Subalpine Fir subzone (ESSFwm) is found on upper slopes in the southern part of the LSA. The altitudinal range is between 1,600 to 1,950 masl on south aspects and 1,500 to 1,950 masl on north aspects (Braumandl and Curran 1992). This biogeoclimatic subzone typically receives more moisture than the ESSFdk1 to the north in the Elk River Valley.

### *ESSFwm*

The ESSFwm is found in the southern portion of the LSA at elevations above the Interior Cedar Hemlock biogeoclimatic zone (i.e., between 1,500 and 1,900 m; see ICHmk4 below). This subzone is found at mid-elevations in the LSA, and follows an altitudinal contour around Fernie Ridge. Both the western, southern and eastern slopes of the southern LSA have representation of the ESSFwm subzone. The vegetation within the ESSFwm is characterized by climax vegetation on zonal sites; however, vegetation composition and structure varies with environmental conditions (British Columbia Ministry of Forests 1998). The ESSFwm subzone is typically differentiated from the other subzones by closed canopy forests occurring at lower elevations (less than 1,900 m elevation). The zonal sites contain stands of subalpine fir and Engelmann spruce. White-flowered rhododendron (*Rhododendron albiflorum*), false azalea, black huckleberry,

and Utah honeysuckle (*Lonicera utahensis*) are the prominent shrubs. Mountain arnica, one-leaved foam flower, and oak fern (*Gymnocarpium dryopteris*) are the common herbs. Red-stemmed feather moss (*Pleurozium schreberi*) is the common moss species.

### *ESSFwmw*

The warm, moist woodland Engelmann Spruce – Subalpine fir (ESSFwmw) subzone is present in the southwestern part of the LSA at elevations higher than the ESSFwm (i.e., greater than 1,900 masl). The ESSFwmw is found adjacent and directly south of the ESSFdkw (i.e., south of 49° 35'07") at the highest elevations in the southern portion of the LSA. As elevation increases from 1,900 masl, growing conditions for trees decreases due to exposure and reduced moisture and nutrient availability. At these higher elevations the ESSFwm transitions into the ESSFwmw subzone. The ESSFwmw is differentiated from the zonal site by having an open canopy (40% to 10% forest cover). Much of the vegetation associated with this subzone is similar to the ESSFwm; however the emergence of high-elevation species such as mountain-heather is an indication of a change in the subzone. The high-elevation species composition is similar to that found in Alpine Tundra and forms in areas of late-lying snow (Coupé et al. 1991).

### *ESSFwmp*

The highest elevation in the ESSFwm subzone are characterized by discontinuous forest (i.e. less than 10% forest cover) and is referred to as the Engelmann Spruce – Subalpine fir warm, moist parkland subzone (ESSFwmp). The ESSFwmp is found in association with the highest elevations (greater than 1,950 masl) of the ESSFwmw in the southern LSA, and is characterized by islands of trees that have established on favourable microsites (Braumandl and Curran 1992).

The ESSFwm, ESSFwmw, and ESSFwmp have not been studied in as much detail in the Elk River Valley as the drier ESSFdk variant and subzones.

### **3.2.1.4 East Kootenay Moist Cool Interior Cedar Hemlock Variant (ICHmk4)**

The moist, cool Interior Cedar Hemlock (ICHmk4) zonal site is a transitional variant with limited range that is restricted to the lower Elk River within the LSA (Braumandl and Curran 1992). This variant of the ICH biogeoclimatic zone occupies similar biophysical environments as the MSdk1 (which occurs further north in the Elk River Valley), but is more representative of a wetter, warmer ecotype. Within the LSA, the ICHmk4 is only found on the western portion of the project area, and is continuous at the lowest elevations following the Elk River Valley up to Lladnar Creek, where the biogeoclimatic conditions transition to the cooler climes of the Montane Spruce dry, cool (MSdk1) subzone.

The altitudinal range of the ICHmk4 varies greatly in the province, with the lower range on north and east aspects being 800 to 1,000 masl, and the upper range on the same aspects being 1,450 to 1,500 masl. On south and west aspects, the lower range is 900 to 1,100 masl and the upper range is 1,550 to 1,650 masl. This variant receives

more precipitation than the other biogeoclimatic zones in the valley, which is reflected in the climax species the zone is named after.

The zonal climax species in the ICHmk4 is commonly a mixed canopy of western red cedar (*Thuja plicata*) and western hemlock (*Tsuga heterophylla*). However, mature seral stands contain a variety of tree species including lodgepole pine, hybrid white spruce, subalpine fir, Douglas fir, paper birch (*Betula papyrifera*), western larch (*Larix occidentalis*), trembling aspen (*Populus tremuloides*), and western red cedar. Subalpine fir and western red cedar often form the regeneration layer, and a well-developed shrub layer containing a variety of species such as Douglas maple (*Acer douglasii*), false azalea, Oregon-grape (*Mahonia* spp.), birch-leaved spirea (*Spirea betulifolia*), snowberry (*Symphoricarpos alba*), falsebox (*Paxistima mysinites*), Sitka alder (*Alnus sitchensis*), Utah honeysuckle, and thimbleberry (*Rubus parviflorus*) is generally present.

Disturbances including logging and fire have resulted in a lack of climax stands in the ICHmk4, with the most common forested stand age class being between 100 and 140 years. The herb layer is generally sparse and can contain the following species; twinflower, bunchberry (*Cornus canadensis*), one-sided wintergreen, rattlesnake plantain (*Goodyera oblongifolia*), Prince's pine (*Chimaphila umbellata*), and some pinegrass. Bryophytes include red-stemmed feathermoss (*Pleurozium scherberi*), knight's plume moss (*Ptilium crista-castrensis*), and step moss (*Hylocomium splendens*).

### 3.2.2 Wildlife and Wildlife Habitat

Seasonal or permanent wildlife residents that may utilize the terrestrial biology LSA include six ungulate, 17 mammalian carnivore, 23 small mammal and bat, 169 bird, and nine amphibian species (BC CDC, 2013a). Habitat conditions available to most wildlife species in the LSA are stratified by elevation within three biogeoclimatic ecosystem classification (BEC) zones. The Interior Cedar Hemlock BEC zone occurs at lower elevations. The highest elevation zones are the Engelmann Spruce - Subalpine Fir zones while the Montane Spruce Zone occurs at mid-elevations.

The conifer forests of the Montane Spruce and Engelmann Spruce - Subalpine Fir Zones provide habitat for wildlife such as red squirrel, snowshoe hare, marten, pine siskin and Clark's nutcracker. Extensive seral stands of lodgepole pine provide summer and fall range for moose and mule deer, with good thermal and hiding cover in the dense regeneration. Birds, such as the three-toed woodpecker that forage on bark-inhabiting insects, are also common in the pine forests.

Avalanche tracks that occur within the Engelmann Spruce - Subalpine Fir Zones provide important summer range for ungulates and are also important spring and summer habitats for grizzly and black bears. Bird species typically associated with this subzone include fox sparrow, American robin, dusky grouse, Rufous hummingbird, and red-tailed hawk.

The American dipper, spotted sandpiper, and harlequin duck are known to use riparian habitats within the general vicinity of the Project. American dipper may be a year-round resident while harlequin duck, if present, is a summer resident species. Amphibians such

as Columbia spotted frog, western toad, and long-toed salamander are also known to use riparian and wetland habitats in the LSA.

The local climate and anthropogenic influences are also important to wildlife habitat use patterns in the area. The climate is characterized by easterly air movements that produce cool wet winters and dry warm summers. Snowfall generally begins accumulating in December with higher depths occurring at higher elevations between January and March. Snow conditions influence the habitat conditions used by many animal species, particularly ungulates, during winter.

Anthropogenic influences affect wildlife habitat in the Elk Valley. These are more frequent at lower elevations and during the growing season. Recreation, habitation, forestry and coal mining development have occurred in this area for over a century. Transmission lines, well sites, pipelines, railways, major highways (e.g. Highway 3), and the communities of Fernie and Sparwood are all located in close proximity to the planned Project development area.

Studies being conducted to further characterize the wildlife in the LSA are habitat assessment, northern goshawk, winter track count, amphibian, riverine bird, breeding songbird, summer elk pellet count, wildlife and wildlife tree, and Gillette's checkerspot surveys.

### 3.2.3 Fish and Fish Habitat

The eastern side of Marten and Wheeler ridges are drained by several streams that discharge to Michel Creek, which is a major tributary of the Elk River. The tributaries to Michel Creek include Carbon, Snowslide, Wheeler, Leach, and Fir creeks, and an unnamed tributary to Michel Creek. The western side of Hosmer Ridge is drained by several small streams that discharge directly into the Elk River (e.g., Mine Creek and Transmission Creek). The Project would be located within the drainages of Wheeler, Little Wheeler, Snowslide, and Carbon creeks.

In general, streams within the Project area are located in high-elevation mountain settings with moderate gradients (IR 2008). Within the Project area, stream gradients are moderate to high, ranging from 5% to 10% in the lower reaches of each watershed and up to 20% or higher in the upper reaches (IR 2008). Substrate within the streams is dominated by cobble with either gravel or boulder as the subdominant substrate (IR 2008). Generally, streams within the Project area provide adequate cover for all life stages of fish in the form of overhead vegetation, undercut banks, woody debris, and boulder habitat (IR 2008).

Within the Project area, fish species present include westslope cutthroat trout (*Oncorhynchus clarki lewisii*), eastern brook trout (*Salvelinus fontinalis*), mountain whitefish (*Prosopium williamsoni*), bull trout (*Salvelinus confluentus*), and longnose sucker (*Catostomus catostomus*) (IR 2008, 2010; Lotic 2013a,b). Bull trout have only been captured or observed in Michel Creek and Alexander Creek, a reference location downstream of the Project and a tributary to Michel Creek (Lotic 2013a).

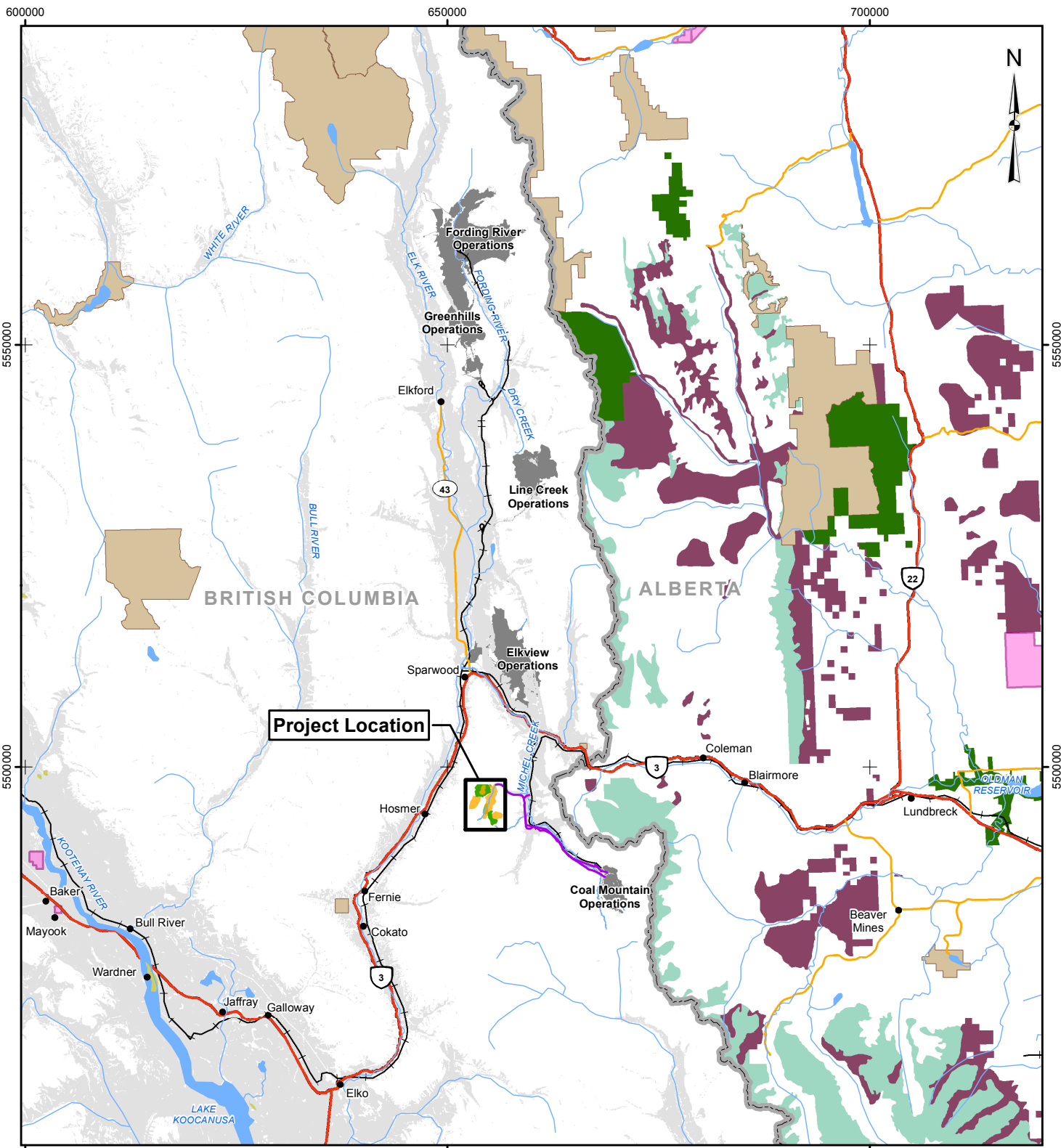
Westslope cutthroat trout and eastern brook trout have been captured and observed in Wheeler Creek (IR 2008, 2010). Based on observations in 2012 and previous studies,

Wheeler Creek has both a resident and fluvial population of westslope cutthroat trout (IR 2008, 2010; Lotic 2013a). Westslope cutthroat trout were captured in the first reach of Little Wheeler Creek from the confluence with Wheeler Creek (Lotic 2013a). An identified barrier to fish migration is located about 700 m upstream from the confluence of Little Wheeler Creek and Wheeler Creek. No fish have been captured upstream of the barrier in Reach 2 of Little Wheeler Creek (IR 2008, 2010; Lotic 2013a,b). Additionally, Reaches 1 and 2 of Carbon Creek, and Reach 1 of Snowslide Creek are fish bearing (i.e., westslope cutthroat trout and/or eastern brook trout present).

Fish sampling that is underway includes fish and fish habitat assessments, detailed habitat assessments at a subset of sites, fish abundance surveys, sediment sampling, benthic invertebrate sampling, periphyton sampling, and instream flow studies. Creeks being sampled are Mine Creek, an unnamed tributary to Mine Creek, Transmission Creek, Fir Creek, Wheeler Creek, Little Wheeler Creek, an unnamed tributary to Wheeler Creek, Snowslide Creek, Carbon Creek, Michel Creek, an unnamed tributary to Michel Creek, Leach Creek and Alexander Creek.

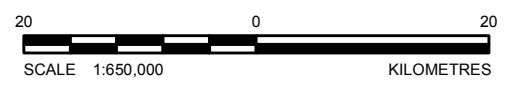
### **3.2.4 Environmentally Sensitive Areas**

Environmentally sensitive areas in the Project area are shown in Figures 3.4 (regional scale) and 3.5 (local scale).



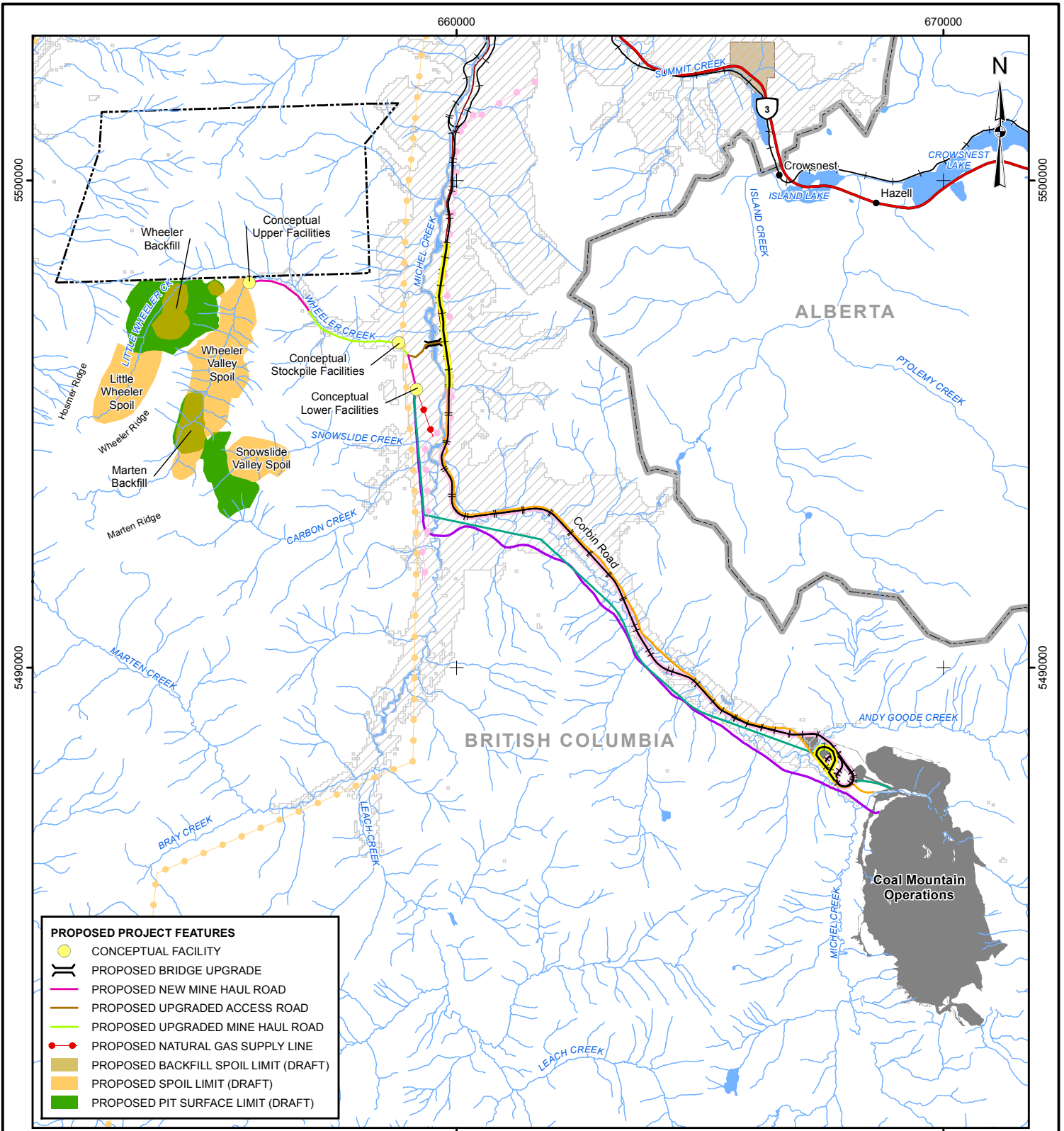
- LEGEND**
- CITY / TOWN / COMMUNITY
  - CANADIAN PACIFIC RAILWAY
  - PRIMARY HIGHWAY
  - SECONDARY HIGHWAY
  - RAW COAL TRANSPORTATION OPTION LOCATIONS
  - WATERCOURSE
  - BRITISH COLUMBIA - ALBERTA BORDER
  - COAL MINING OPERATION
  - FIRST NATIONS RESERVE
  - PROPOSED PIT SURFACE LIMIT (DRAFT)
  - PROPOSED SPOIL LIMIT (DRAFT)
  - OTHER PROTECTED AREA
  - PROVINCIAL PARK
  - WATERBODY
  - WETLAND
  - ALBERTA CRITICAL WILDLIFE AREA
  - CRITICAL WILDLIFE
  - PRIME PROTECTION
  - ENVIRONMENTALLY SENSITIVE AREA
  - UNGULATE WINTER RANGE
  - WILDLIFE HABITAT AREAS

**REFERENCE**  
 Provincial boundaries, communities and hydrography obtained from The Atlas of Canada, Natural Resources Canada. Roads obtained from Geobase. Provincial Parks/Protected Areas, railroad and First Nations data obtained from GeoGratis. Critical Wildlife Area data obtained from IHS Energy Inc. Environmental Sensitive Areas obtained from the LRDW. Other data obtained from Teck Coal Limited. Projection: UTM Zone 11 Datum: NAD 83



PROJECT		COAL MOUNTAIN PHASE 2 PROJECT	
TITLE		ENVIRONMENTALLY SENSITIVE AREAS REGIONAL SCALE	
<b>Teck</b>	PROJECT No.	12-1349-0003	SCALE AS SHOWN
	DESIGN	FN 14 Feb. 2014	REV. 0
	GIS	DR 24 Jun. 2014	
	CHECK	FN 25 Jun. 2014	
	REVIEW	GJ 25 Jun. 2014	
		<b>Figure 3.4</b>	

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**PROPOSED PROJECT FEATURES**

- CONCEPTUAL FACILITY
- PROPOSED BRIDGE UPGRADE
- PROPOSED NEW MINE HAUL ROAD
- PROPOSED UPGRADED ACCESS ROAD
- PROPOSED UPGRADED MINE HAUL ROAD
- PROPOSED NATURAL GAS SUPPLY LINE
- PROPOSED BACKFILL SPOIL LIMIT (DRAFT)
- PROPOSED SPOIL LIMIT (DRAFT)
- PROPOSED PIT SURFACE LIMIT (DRAFT)

**LEGEND**

**RAW COAL TRANSPORTATION OPTIONS**

- PROPOSED ON-HIGHWAY HAUL ROAD OPTION
- PROPOSED OFF-HIGHWAY HAUL ROAD OPTION
- PROPOSED RAIL OPTION
- PROPOSED RAIL OPTION SIDING
- PROPOSED CONVEYOR OPTION

**BASE FEATURES**

- CITY / TOWN / COMMUNITY
- CANADIAN PACIFIC RAILWAY
- CORBIN ROAD
- PRIMARY HIGHWAY

**NATURAL GAS PIPELINE**

- NATURAL GAS PIPELINE

**500 kV POWERLINE**

- 500 kV POWERLINE

**WATERCOURSE**

- WATERCOURSE

**BRITISH COLUMBIA - ALBERTA BORDER**

- BRITISH COLUMBIA - ALBERTA BORDER

**COAL MINING OPERATION**

- COAL MINING OPERATION

**DOMINION COAL BLOCK PARCEL 73**

- DOMINION COAL BLOCK PARCEL 73

**PROVINCIAL PARK**

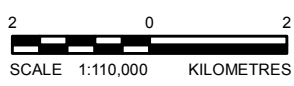
- PROVINCIAL PARK

**WATERBODY**

- WATERBODY

**ENVIRONMENTALLY SENSITIVE AREA**

- ENVIRONMENTALLY SENSITIVE AREA
- UNGULATE WINTER RANGE



PROJECT		COAL MOUNTAIN PHASE 2 PROJECT	
TITLE		ENVIRONMENTALLY SENSITIVE AREAS LOCAL SCALE	
	PROJECT No. 12-1349-0003	SCALE AS SHOWN	REV. 0
	DESIGN GJ 14 Feb. 2014		
	GIS DR 24 Jun. 2014		
	CHECK FN 25 Jun. 2014		
REVIEW GJ 25 Jun. 2014	<b>Figure 3.5</b>		

**REFERENCE**

Provincial Boundary, Communities and Alberta Hydrography obtained from CanVec, Government of Canada, Natural Resources Canada. BC Hydrography, Dominion Coal Blocks and project data obtained from Teck Coal Limited. Roads obtained from Geobase. Provincial parks and Railroad data obtained from Geogratis. Projection: UTM Zone 11 Datum: NAD 83

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### 3.2.4.1 Species at Risk

Species at risk information in BC is available from Provincial and Federal sources. Provincially, the BC MOE maintains conservation information on the BC Species and Ecosystems Explorer for several thousand species in the province. This system includes red- and blue-listed species by the province of BC (BC MOE 2012b), and endangered, threatened, or special concern species assessed Federally and listed on Schedule 1 of the Species at Risk Public Registry (Government of Canada 2012b), and on the Canadian Wildlife Species at Risk list (COSEWIC 2013).

Data on known species at risk occurrences (referred to as element occurrences) are available through the BC Conservation Data Centre (BC CDC). The BC CDC assigns a Provincial rank or listing of yellow, red, or blue to a species based on its status within BC. Red-listed species are considered to be endangered, or threatened in BC. Blue-listed species are considered to be of special concern (formally vulnerable) in BC. Yellow list species are all other species, both common and uncommon. For the purpose of the Species at Risk review within the Project EA, the focus will be on blue- and red-listed species.

Federally, species ranking is conducted by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), established under Section 14 of the *Species at Risk Act* (SARA). Schedule 1 of SARA provides the official list of species at risk. Under the COSEWIC system, species are ranked as Extinct, Extirpated, Endangered, Threatened, Special Concern, Data Deficient, or Not at Risk. A definition of each Federal and Provincial conservation status is provided in Table 3.1.

**Table 3.1 Conservation Status Definitions**

Agency	Status	Definition
COSEWIC (Federal)	Endangered (E)	A species facing imminent extirpation (no longer exists in Canada) or extinction (no longer exists).
	Threatened (T)	A species likely to become endangered if limiting factors are not reversed.
	Special Concern (SC)	A species that is particularly sensitive to human activities or natural events, but is not endangered or threatened.
BC CDC (Provincial)	Red	Any indigenous species, subspecies or plant community that is extirpated, endangered, or threatened in BC.
	Blue	Any indigenous species, subspecies or community considered to be of special concern in BC. Blue-listed elements are at risk, but are not extirpated, endangered, or threatened.

Source: BC Conservation Data Centre (CDC). 2013a. BC Species and Ecosystems Explorer. BC Ministry of Environment, Victoria BC Available: <http://a100.gov.bc.ca/pub/eswp/>. Accessed February 27, 2014.

BC CDC = British Columbia Conservation Data Centre; COSEWIC = Committee on the Status of Endangered Wildlife in Canada.

As per Section 58(1), the SARA typically only applies on Federal land, with the exception of aquatic species (i.e., fish) and migratory birds also listed in the Federal *Migratory Birds Convention Act, 1994*. Although Schedule 1 lists other designations in addition to endangered, threatened, and extirpated (e.g., Special Concern), the prohibitions of the act do not automatically apply to these species because they are not listed in the *British Columbia Wildlife Act* (BC CDC 2013a). However, in some circumstances, the Federal prohibitions could be applied to other species on private or Provincial Crown land if it is



deemed that Provincial or voluntary measures do not adequately protect a species and its residence.

A search of the BC CDC Species and Ecosystems Explorer for the Rocky Mountain Forest District produced 243 listings of Provincially designated, red-listed or blue-listed and legally designated vegetation and wildlife species (BC CDC 2013a; Appendix C).

#### **3.2.4.2 Vegetation**

Based on BC CDC records, seven element occurrences for listed vegetation species have been recorded in the general vicinity of the Project footprint and terrestrial LSA (BC CDC 2013b; Appendix C).

For vegetation, the search of the BC CDC Species and Ecosystems Explorer (BC CDC 2013b; Appendix C) listed 136 vascular plant species (53 red-listed and 83 blue-listed), and 20 moss and lichen species (5 red-listed and 15 blue-listed) in the Rocky Mountain Forest District. The search also resulted in 76 Provincially listed ecological communities.

Of the Provincially designated red- and blue-listed species identified in the BC CDC in proximity to the Project footprint or terrestrial LSA, the following four species are Federally protected under Schedule 1 of SARA (2003):

- southern maiden-hair;
- giant helleborine;
- white bark pine; and
- Spalding's campion.

A list of vegetation species that occur, or may occur, in proximity to the Project footprint or within the terrestrial LSA, and are either registered in Schedule 1 of the Federal SARA, or have been red- or blue-listed by the BC CDC, is provided in Table 3.2.

**Table 3.2 British Columbia and Federal Species Identified From the Conservation Data Centre Database, Status, and Proximity to the Project Footprint or Terrestrial Biology Local Study Area**

English Name	BCBC List <sup>(a)(b)</sup>	Federal Status (COSEWIC/SARA)	Potential Occurrence in the Elk Valley	Comments
Rocky Mountain willowherb	Red	None / None	Confirmed	Masked occurrence within the LSA and likely outside of the Project footprint; ID 4806
Shining penstemon	Red	None / None	Confirmed	Masked occurrence within the LSA and likely outside of the Project footprint; ID 1897
Curly sedge	Blue	None / None	Confirmed	Masked occurrence recorded within the RSA, outside of the LSA; ID 5994
Purple onion grass	Blue	None / None	Confirmed	Masked occurrence recorded within the RSA, outside of the LSA; ID 8935
Sandberg's desert-parsley	Blue	None / None	Confirmed	Masked occurrence recorded within the RSA, outside of the LSA; ID 8934
Drummond's milk-vetch	Red	None / None	Confirmed	Masked occurrence recorded within the RSA, outside of the LSA; ID 1385
Bent-flowered milk-vetch	Blue	None / None	Confirmed	Masked occurrence recorded within the RSA, outside of the LSA; ID 925
Southern maiden-hair	Red	E / Schedule 1	Possible	Federally designated species which may occur within the Project area/LSA
Giant helleborine	Blue	SC / Schedule 3	Possible	Federally designated species which may occur within the Project area/LSA
White bark pine	Blue	E / Schedule 1	Possible	Federally designated species which may occur within the Project area/LSA
Alkaline wing-nerved moss	Red	T / Schedule 1	Possible	Federally designated species which may occur within the Project area/LSA
Spalding's campion	Red	E / Schedule 1	Possible	Federally designated species which may occur within the Project area/LSA

(a) Red List: List of ecological communities, and indigenous species and subspecies that are extirpated, endangered or threatened in British Columbia. Red-listed species and sub-species may be legally designated as, or may be considered candidates for legal designations as Extirpated, Endangered or Threatened under the *Wildlife Act*. Not all Red-listed taxa will necessarily become formally designated. Placing taxa on these lists flags them as being at risk and requiring investigation (BC CDC 2013a).

(b) Blue List: List of ecological communities, and indigenous species and subspecies of special concern (formerly vulnerable) in British Columbia (BC CDC 2013a).

COSEWIC: Committee on the Status of Endangered Wildlife in Canada; SARA: *Species at Risk Act*; E= Endangered; SC = Special Concern; T = Threatened; LSA = local study area; ID = identification.

### 3.2.4.3 *Wildlife*

Several Provincially listed wildlife species occur, or have the potential to occur, within the terrestrial biology LSA. A search of the BC CDC Species and Ecosystems Explorer for the Rocky Mountain Forest District produced the following red- and blue-listed wildlife species (BC CDC 2013a; Appendix C):

- 14 gastropod species (5 red-listed and 9 blue-listed);
- 22 insect species (5 red-listed and 17 blue-listed);
- 3 amphibian species (2 red-listed and 1 blue-listed);
- 20 bird species (7 red-listed, 13 blue-listed);
- 14 mammal species (4 red-listed, 8 blue-listed, and 2 no status); and
- 1 reptile (turtle) species (1 blue-listed).

A list of wildlife species that occur, or may occur, in the Elk Valley and are either registered in Schedule 1 of the Federal SARA or have been red-listed by the BC CDC, is provided in Table 3.3. These species have the potential to be especially susceptible to environmental change.

**Table 3.3 Species at Risk (*Species at Risk Act* Schedule 1 and British Columbia Ministry of Environment Red-Listed) That Occur in the Rocky Mountain Forest District**

English Name	BC List <sup>(a,b)</sup>	SARA	Potential Occurrence in the Elk Valley	Comments
<b>Invertebrates</b>				
Gillette's checkerspot	Red	Not Assessed	Confirmed	
Monarch	Blue	SC- Schedule 1	Possible	Limited suitable habitat but within range <sup>(c)</sup>
Old world swallowtail, <i>dodi</i> subspecies	Red	Not Assessed	Possible	Limited suitable habitat but within range <sup>(c)</sup>
Dione copper	Red	Not Assessed	Possible	Limited suitable habitat but within range <sup>(c)</sup>
Mormon fritillary, <i>eurynome</i> subspecies	Red	Not Assessed	Possible	Suitable habitat and within range <sup>(c)</sup>
Sheathed slug	Red	Not Assessed	Unlikely	Documented range limited to the West Kootenay Mountains.
Pygmy slug	Red	Not Assessed	Possible	Suitable habitat and within range <sup>(c)</sup>
Vivid dancer	Red	Not Assessed	Possible	Limited suitable habitat but within range <sup>(c)</sup>
<b>Amphibians</b>				
Northern leopard frog	Red	E- Schedule 1	Possible	Historically known to occur in the East Kootenays; however, they have not been recorded there recently and are unlikely to be found in the Elk Valley <sup>(c, d)</sup>
Rocky mountain tailed frog	Red	E- Schedule 1	Possible	Documented range limited to the Flathead drainage; limited suitable habitat <sup>(c, d)</sup>
Western toad	Blue	SC- Schedule 1	Confirmed	
Coeur d'Alene salamander	Yellow	SC-Schedule 1	Unlikely	Documented range limited to the Rocky Mountain Trench.
<b>Birds</b>				
Brewer's sparrow, <i>breweri</i> subspecies	Red	Not Assessed	Unlikely	Documented range west of East Kootenay Mountains.
Upland sandpiper	Red	Not Assessed	Possible	Limited suitable habitat but within range <sup>(c)</sup>
Rusty blackbird	Blue	SC-Schedule 1	Possible	Within broad breeding range; limited suitable habitat within Elk Valley
Common nighthawk	Yellow	T- Schedule 1	Confirmed	
Flammulated owl	Blue	SC- Schedule 1	Possible	Within broad breeding range; limited suitable habitat within Elk Valley.
Long-billed curlew	Blue	SC- Schedule 1	Unlikely	Documented range within the Rocky Mountain Forest District limited to the Rocky Mountain Trench; limited suitable habitat within Elk Valley.
Olive-sided flycatcher	Blue	T- Schedule 1	Confirmed	
Peregrine falcon, <i>anatum</i>	Red	SC- Schedule 1	Possible	Within broad breeding range; limited suitable habitat within Elk Valley.
Prairie falcon	Red	Not at Risk	Possible	Within broad breeding range; limited suitable habitat within Elk Valley.
Short-eared owl	Blue	SC- Schedule 1	Possible	Within broad breeding range; limited suitable habitat within Elk Valley
Swainson's hawk	Red	Not Assessed	Unlikely	Documented range limited to the Southern Interior Ecoprovince; limited suitable habitat within Elk Valley.
Western screech-owl, <i>macfarlanei</i>	Red	E- Schedule 1	Possible	Documented range west of East Kootenay Mountains; limited suitable habitat

**Table 3.3 Species at Risk (Species at Risk Act Schedule 1 and British Columbia Ministry of Environment Red-Listed) That Occur in the Rocky Mountain Forest District (continued)**

English Name	BC List <sup>(a,b)</sup>	SARA	Potential Occurrence in the Elk Valley	Comments
Lewis's woodpecker	Red	T-Schedule 1	Unlikely	Documented range within the Rocky Mountain Forest District limited to the Rocky Mountain Trench; limited suitable habitat within Elk Valley.
Williamson's sapsucker	Blue	E- Schedule 1	Possible	On periphery of range; limited suitable habitat within LSA <sup>1</sup>
<b>Mammals</b>				
Red-tailed chipmunk, <i>ruficaudus</i> subspecies	Red	Not Assessed	Unlikely	Documented range limited to the Flathead drainage.
Least chipmunk, <i>selkirki</i> subspecies	Red	Not Assessed	Unlikely	Documented range limited to the West Kootenay Mountains.
American badger, <i>jeffersonii</i>	Red	E- Schedule 1	Confirmed	
<b>Reptile</b>				
Rubber boa	Yellow	SC- Schedule 1	Unlikely	Primarily limited to low elevation savannas; limited suitable habitat within Elk Valley <sup>(c,e)</sup>
Western painted turtle, Rocky Mountain population	Blue	SC- Schedule 1	Possible	Documented range limited to the Rocky Mountain Trench, and Central Interior and Southern Interior ecoprovinces; limited suitable habitat <sup>(c,e)</sup>

Source: BC CDC 2013a.

- (a) Red List: List of ecological communities, and indigenous species and subspecies that are extirpated, endangered or threatened in British Columbia. Red-listed species and sub-species may be legally designated as, or may be considered candidates for legal designations as Extirpated, Endangered or Threatened under the *Wildlife Act*. Not all Red-listed taxa will necessarily become formally designated. Placing taxa on these lists flags them as being at risk and requiring investigation (BC CDC 2013a).
- (b) Blue List: List of ecological communities, and indigenous species and subspecies of special concern (formerly vulnerable) in British Columbia (BC CDC 2013a).
- (c) University of British Columbia (2013).
- (d) Government of British Columbia (2013)
- (e) BC MOE (2013).

E= Endangered; SC = Special Concern; T = Threatened.

### 3.2.4.4 Fish

Westslope cutthroat trout are a Provincially blue-listed species and protected under the Federal SARA. *Species at Risk Act* status on Schedule 1 is Special Concern. Bull trout are a Provincially blue-listed species and the Pacific population of bull trout have been assigned a Not at Risk Federal status following the COSEWIC assessment in November 2012.

### 3.3 HUMAN ENVIRONMENT

#### 3.3.1 Land Use and Tenure

The Project would be located on fee simple land owned by Teck within the Regional District of East Kootenay (RDEK). Coal licenses exist within the vicinity of the Project (where there is Crown land) but not within the proposed footprint, and are detailed in Table 3.4.

Timber resources in the Project area are owned by Teck. By way of a Harvesting Rights Agreement, Canadian Forest Products Ltd. manages the timber resources on behalf of Teck as part of Provincial Managed Forest 471. Some cutblocks located within the proposed footprint have been harvested.

Shell Canada Limited (Shell) holds subsurface rights in the vicinity of the Project but outside the proposed footprint in Lots 81, 82, 83, 84, 85, 86, 151, 152, 153, 157, 158, 159, and 160. Within the vicinity of the Project, there are four abandoned and two cancelled oil and gas wells owned by Shell, Apache, and Chevron. A TransCanada natural gas pipeline runs north-south along the east side of the Project area. A second FortisBC natural gas pipeline is located along the Corbin Highway. Neither pipeline is within the likely footprint of the Project.

For the purposes of administering the *Wildlife Act* and BC Hunting and Fishing Regulations, the province is divided into Resource Management Units. The Project area is located in Resource Management Region 4 (Kootenay Region) within Management Unit 4-23.

Several commercial guides operate in the Kootenay Region. There is one guiding tenure within the vicinity of the Project held by Robert Cutts (Sheep Mountain Outfitters).

No shooting and no hunting areas are located near the current CMO site. All persons (including hunters) must have permission to access Teck property. Members of local hunting clubs hunt for elk, deer, moose, and grizzly bear in the vicinity of the Project. Limited entry hunting permits are available for grizzly bear and moose, and hunting for upland game birds is permitted within Management Unit 4-23 (i.e., outside restricted areas). The Sparwood Fish and Wildlife Association Gun Range is located about 2 km northwest of the Project area off of Highway 3. There is also a cabin located about 4 km northeast of the Project area and northwest of Crowsnest Provincial Park.

**Table 3.4 District Lots Within the Soils/Land Use Local Study Area**

District Lot Numbers	Area within the LSA [ha]
151 Surface ownership: Fee Simple - Tembec Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application)	97
152 Surface ownership: Fee Simple - Tembec Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application)	65
153 Surface ownership: Fee Simple - Tembec Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application)	63
154 Surface ownership: Fee Simple - Tembec Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application)	96
155 Surface ownership: Fee Simple – Tembec/Teck Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application) and fee simple - Teck	144
156 Surface ownership: Fee Simple – Tembec/Teck Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application) and fee simple - Teck	96
157 Surface ownership: Fee Simple – Tembec/Teck Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application) and fee simple - Teck	64
81 Surface ownership: Fee Simple - Tembec Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application)	192
82 Surface ownership: Fee Simple - Tembec Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application)	128
83 Surface ownership: Fee Simple - Tembec Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application)	193
84 Surface ownership: Fee Simple - Tembec Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application)	128
85 Surface ownership: Fee Simple - Tembec Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application)	194
86 Surface ownership: Fee Simple - Tembec Mineral Ownership: Fee Simple – Shell Canada Coal Ownership: Crown – Teck (application)	129

**Table 3.4 District Lots Within the Soils/Land Use Local Study Area (continued)**

District Lot Numbers	Area within the LSA [ha]
4589 Surface ownership: Fee Simple – Tembec/Teck/Government of Canada...etc... Mineral Ownership: Crown Coal Ownership: Crown and fee simple – Teck *This is one of the largest District Lots in BC*	21,087
6998 Part of CMO Coal Licence # 369890 (Teck)	116
6999 Part of CMO Fee simple lands – mineral lease # A13895	25
7000 Part of CMO Coal Licence # 369891 (Teck)	241
7001 Part of CMO Coal Licence # 332764 (Teck)	50
7002 Part of CMO Coal Licence # 332763 (Teck)	52
4588 Surface ownership: Fee Simple – Tembec/Teck ...etc... Mineral Ownership: Crown Coal Ownership: Crown and fee simple – Teck *This is one of the largest District Lots in BC*	546
<b>Total Area (ha)</b>	<b>23,709</b>

There are 2 freehold Crown Grants to which Teck owns the surface and coal rights within the LSA.

1. Lot 1, District Lot 4589, Kootenay District, Plan NEP23394 (PID # 023-553-821) forms the majority of Teck lands at CMO2 and is located south of Parcel #73 of the Dominion Coal Block. The above District Lots highlighted in blue are part of this parcel.
2. Lot 1 District Lots 4588 and 4589 Kootenay District Plan 7590, Except Plans 9262, 10797, 11205, 14030, 14643, 15615, 15081, 17773, 18084, 18351, 12403, NEP22563, NEP59847, NEP60990, NEP61045, NEP61240, NEP61298, NEP62835, NEP66365, NEP68373, NEP73532, NEP89673, EPP1729 EPP1730, EPP1731, EPP1732, EPP1733 AND EPP21193 (PID # 009-115-960) is the Teck lands north of Parcel #73 of the Dominion Coal Block within the LSA. The above district lots highlighted in red are part of this parcel.

ha = hectare; CMO = Coal Mountain Operations.

Numerous informal motorized access recreation routes are located throughout the Kootenay Region. One trail extends northward towards the southwest corner of the proposed footprint to a lookout point. Snowmobiling occurs in southern parts of the Project area. The Corbin Creek Access Management Area occurs within the eastern portions of the Project area. Motorized vehicle access is restricted within the majority of this Access Management Area. The Byron Creek Mine Access Road is open year-round.

Four traplines are located within the soils and land use and tenure LSA, and one of these traplines overlaps the proposed footprint:

- TR0423T005 (within footprint);
- TR0423T004;



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- TR0423T023; and
- TR0423T024.

Teck proposes to develop a land use plan for the Project consistent with other planning initiatives and bylaws in the East Kootenay Region including, but not limited to the following:

- the East Kootenay Land Use Plan (CORE 1994);
- the Kootenay Boundary Higher Level Plan (Integrated Land Management Bureau 2002);
- the Southern Rocky Mountain Management Plan (BC Ministry of Sustainable Resource Development 2003); and
- RDEK Elk Valley Zoning Bylaw No. 820 (RDEK 1990).

### 3.3.2 Visual Aesthetics

The Project would be located within the front ranges of the Rocky Mountains and the landscape context is characterized by wide valleys, steep slopes, and long ridgelines spotted with summits. Land cover generally consists of coniferous forests in the valley and more irregular, sparse vegetation and exposed rock at higher elevations. Previous logging and exploration activity are visible on either side of the Elk Valley and in the Project area. Vegetation regeneration is established at various stages in these areas creating a variation of textures, colour, and patterns.

Portions of the proposed Project might be visible from certain locations along the Highway 3 corridor north of Hosmer and along Corbin Road. The Elk Valley is considered a regional attraction for outdoor recreation-based tourism that typically values the aesthetic quality of the landscape. Sparwood has focused tourism efforts on celebrating the coal mining industry in the area and attracts tourists to discover and experience the community's identity as a mining community. A visual impact assessment will be completed as part of project planning.

The Project would be located within the boundaries of the Rocky Mountain Forest District and is part of the Cranbrook Timber Supply Area (MFLNRO 2011). Scenic management objectives for the Cranbrook Timber Supply Area were identified in conjunction with high-level planning objectives (MFLNRO 2011). The Project would be located within the boundaries of the Kootenay Boundary Higher Level Plan area (MFLNRO 1997a). The related Boundary Land Use Plan Implementation Strategy (MFLNRO 1997b) provides objectives and strategies for managing visual quality through specific Front Country Visual Management Guidelines.

### 3.3.3 Economics and Socio-Community Health

The Project would be located in the Regional District of East Kootenay (RDEK) (population 56,685) and the asserted traditional territory of Ktunaxa Nation. The incorporated communities of Fernie (population 4,448), Sparwood (population

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3,667), Elkford (population 2,523), and Crowsnest Pass, Alberta (population 5,565), the unincorporated community of Hosmer (population 116), and Electoral Area A of RDEK (population 1,899) are near the Project. The Project would be located about 15 km south of Sparwood and 5 km east of Hosmer.

It is anticipated that the employment and other economic benefits associated with CMO would be sustained as a result of the proposed Project developments. The Project would allow for the transfer of CMO mine personnel to the Project pits as CMO production declines, and would extend the life of the CMO coal processing operations and the employment of CMO employees until approximately 2050. Without the Project, the current CMO mine personnel would need to consider other work opportunities within a few years as the CMO mine is near end of production.

The majority of CMO employees reside in Elk Valley communities or Crowsnest Pass. Those transferring to the Project site would continue with similar work commuting patterns because of the close proximity of the Coal Mountain and Coal Mountain Phase 2 pits. Peak employment during the Project's operational phase is estimated to be approximately 400 total employees, an increase over the approximately 340 total employees currently at CMO. This number could increase by 100 to 200 people during the construction of the project, for a period of approximately 18 months. It is also possible that the proposed extension into the Project operating areas would result in an overall net increase in revenue opportunities.

Coal has been mined in the Elk Valley almost continuously since 1898 with the Elk Valley coalfields being a major coal producing area in Canada. Over the past 10 years, the economy in the Elk Valley has diversified, particularly via expansion of its winter tourism sector, but the local coal mining and processing industry remains its primary driver.

### 3.3.4 Archaeological Resources

The Project area was assessed for archaeological potential through two Archaeological Overview Assessment (AOA) studies, both completed by Wayne Choquette (2004 and 2007). The AOA process involved the synthesis of available data for the archaeology study area in conjunction with an analysis of aerial photographs of the proposed mining area and the mapping of landform-based archaeological potential polygons using Geographic Information Systems (GIS). A total of 51 AOA polygons were defined by the AOA process within the Project mine boundary, with each polygon including an approximate 100 m buffer zone.

The archaeological potential of the polygons is based on criteria derived from pre-contact land and resource use models developed by Choquette for the middle Elk River drainage area and the southern Canadian Rocky Mountains. The polygons of archaeological potential represent areas where archaeological resources may be adversely affected by developments involving ground disturbance or capping with spoil. As such, the AOA polygons represent areas that will be subject to more intensive archaeological field inspection in the form of an Archaeological Impact Assessment pursuant to Section 14 of the *BC Heritage Conservation Act* (Government of British Columbia 1996a). Upon validation of the high potential polygons, additional areas may be identified which require assessment.

A previous archaeological inspection (Wood and Tamasi 2009) within the Project area resulted in the discovery of one archaeological site (i.e., DjPr-6), situated in the Little Wheeler Creek Valley. Two other archaeological sites (i.e., DjPr-4 and 5) are located within close proximity (less than 150 m) of the Project footprint, situated to the north within Parcel 73 of the Dominion Coal Block. These two sites are located within the confluence area of Wheeler and Little Wheeler creek valleys, and were discovered during the archaeological assessment of the improvements to Wheeler Road in 2005 (i.e. DjPr-4 [Wood and Tamasi 2006]) and a forestry cut block (i.e. DjPr-5 [Tamasi et al. 2007]). Discovery of these three archaeological sites confirms pre-contact use of the landscape and a variable level of archaeological potential, which is heavily dependent on the presence of micro-topographic features that contain archaeologically favourable attributes.

A high-level Archaeological Impact Assessment will be completed in July through September 2014 under *Heritage Conservation Act* inspection permit 2011-0276, which applies to all of Teck coal's development in the southeastern operating area of British Columbia. The anticipated result of the Archaeological Impact Assessment will be an inventory of archaeological sites and their locations within the currently defined CMO2 site area.

### **3.3.5 Aboriginal, Commercial, and Recreational Fishery and Fishing Areas**

Teck is currently consulting with the ?Akisq'nuk First Nation, St. Mary's First Nation, Tobacco Plains Indian Band, and the Lower Kootenay Indian Band, through the KNC, regarding the need for a Traditional Use Study for the Project area. Identification of potential subsistence fishing will be included as part of such a study, if undertaken, and through First Nations consultation activities.

Teck is aware of commercial fishing operators who guide clients on the Michel Creek and the Elk River, and will work with those operators to understand their needs and minimize effects to their activities.

Recreational fishing opportunities are concentrated on major streams and lakes including the Elk and Fording rivers, Michel Creek, and Grave Lake. Island Lake and Crowsnest Lake are popular camping and fishing destinations on the Alberta side of the Provincial border.

## 4 POTENTIAL PROJECT-ENVIRONMENT INTERACTIONS

Development of the CMO2 site would involve the construction and operation of various mine components and infrastructure. The main activities associated with construction, operations, and closure of the CMO2 site includes the following:

- open-pit mining;
- development and operation of coal stockpiles and storage of coarse and fine rejects;
- placement of waste rock spoils in sites in Wheeler, Littler Wheeler, and Snowslide drainages within the Michel Creek watershed;
- development and operation of surface water management systems;
- construction and operation of mine infrastructure to support the Project (e.g., development of haul roads); and
- reclamation and closure of the CMO2 site and portions of the CMO Project area.

Teck will evaluate the development of the CMO2 site, proposed transportation method of raw coal between the CMO2 and CMO sites, and any components required at CMO as a result of the Project. A comprehensive evaluation of the potential effects of the Project will be conducted, including, but not limited to:

- effects to the biophysical and socio-economic environments will be assessed as part of the Environmental Assessment (refer to Section 7 for discussion on the EA processes);
- potential effects to traditional land use and areas of interest and concern within the Project area will be assessed. These potential effects will continue to be assessed throughout the EA process through ongoing consultation with potentially affected Aboriginal groups. Through the course of the EA and consultation with Aboriginal groups, Teck will confirm if the Project will require access to, use or occupation of, or the exploration, development and production of lands and resources currently used for traditional purposes by Aboriginal groups. Further study parameters will include: effects on health and socio-economic conditions, physical and cultural heritage or structures, and sites or things that are of historical archaeological, paleontological, or architectural significance for Aboriginal peoples;
- potential effects to Federal lands will be assessed, including Parcel 73 of the Dominion Coal Block (which is within the LSA) and a review of any potential longer range effects to other Federal lands; and
- the potential for trans-boundary effects in Alberta and the United States will be assessed where pathways for potential effects exist.

Potential project-environment interactions that may lead to effects based on preliminary analysis and professional judgment of the EA team are outlined in Table 4.1.

**Table 4.1 Preliminary Identification of Potential Project-Environment Interactions**

Environment Component	Issue / Potential Effect	Examples of Potential Mitigation and Management Planning Measures
<b>Environment</b>		
Air Quality	<ul style="list-style-type: none"> <li>Fugitive dust emissions from material handling and processing can result in (1) increases in ambient particulate matter concentrations that can affect human and wildlife health and (2) increases in dustfall deposition that can affect vegetation and water bodies.</li> <li>Combustion emissions from vehicles and equipment can result in increases in ambient concentrations of nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), and other contaminants that can negatively affect human health and vegetation.</li> <li>Increases in greenhouse gas emissions (GHG).</li> </ul>	<ul style="list-style-type: none"> <li>Implementing an air quality and dust control plan.</li> <li>Use of cyclones and wet scrubbers for particulate collection.</li> <li>Efficient operation of the vehicle fleet, equipment and the coal dryer to minimize GHG emissions.</li> <li>Using water injection and dust skirts during drilling on the drill deck to contain cuttings.</li> <li>Spraying flocculent mixture on long-term coal and soil stockpiles.</li> <li>Stabilizing and re-vegetating soil stockpiles.</li> <li>Watering of haul roads during non-freezing conditions.</li> <li>Covering loaded and empty coal haul truck beds used for highway transport while in transit.</li> <li>Selecting low-emission vehicles and combustion equipment when purchasing where practical.</li> <li>Minimizing the use of emergency generators.</li> </ul>
Noise and Vibration	<ul style="list-style-type: none"> <li>Increases in noise levels at receptors (human and wildlife) from mine operation activities and increases in vibration at receptors from blasting.</li> </ul>	<ul style="list-style-type: none"> <li>Use of noise minimization equipment where appropriate.</li> <li>Install engineering controls on equipment (e.g., mufflers, buildings or enclosures, air intake treatments).</li> <li>Use of waste material to create berms and barriers</li> <li>Install fixed vertical barriers.</li> <li>Implement management plans to schedule blasting events during daytime hours.</li> <li>Investigate the use of atonal or strobe light type back-up alarms.</li> </ul>
Geochemistry	<ul style="list-style-type: none"> <li>Potential for metal leaching and acid rock drainage (ML/ARD) resulting from creation of waste rock spoils and processing of coal.</li> <li>Geochemical loadings to receiving watercourses from rock weathering; primarily for selenium, cadmium, sulphate, and total dissolved solids.</li> <li>Geochemical loadings of nitrate due to leaching of explosives residuals.</li> <li>Calcite precipitation in streams.</li> </ul>	<ul style="list-style-type: none"> <li>Implementing water quality management plans or strategies consistent with the Elk Valley Water Quality Plan (EVWQP).</li> <li>Passive blending of potentially acid generating (PAG) waste rock with non-PAG waste rock to mitigate ARD potential.</li> <li>Implementing segregation and separate management of PAG rock (e.g., subaqueous disposal).</li> </ul>
Hydrogeology	<ul style="list-style-type: none"> <li>Changes to groundwater quality and alternation of groundwater regime from interaction with groundwater table and/or changes to topography.</li> </ul>	<ul style="list-style-type: none"> <li>Implementing groundwater management and monitoring plans during construction and operation.</li> <li>Implementing a reclamation and closure plan, including a drainage closure plan.</li> </ul>

**Table 4.1 Preliminary Identification of Potential Project-Environment Interactions (continued)**

Environment Component	Issue / Potential Effect	Examples of Potential Mitigation and Management Planning Measures
Surface Water Hydrology	<ul style="list-style-type: none"> <li>Changes in flow regime and quality in Wheeler, Little Wheeler, Snowslide, Carbon, Fir, Mine, Transmission, and Leach Creeks.</li> <li>Erosion/deposition associated with changes in surface water flow regime.</li> <li>Changes in sediment loading in Wheeler, Snowslide, Carbon, Leach, Marten, and Mine creeks and the Elk River.</li> </ul>	<ul style="list-style-type: none"> <li>Implementing surface water management plans during construction and operation.</li> <li>Implementing a reclamation and closure plan, including a drainage closure plan.</li> <li>Implementing erosion control and sediment management (e.g., sedimentation ponds).</li> <li>Implementing a storm water runoff control plan, as needed.</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>Changes in water quality in Wheeler, Little Wheeler, and Snowslide creeks, resulting from geochemical loading of selenium and other water quality constituents from waste rock spoils and reject piles.</li> <li>Changes in underground/surface water interactions.</li> </ul>	<ul style="list-style-type: none"> <li>Implementing water management plans or strategies consistent with the EVWQP.</li> <li>Implementing a reclamation and closure plan, including a drainage closure plan.</li> </ul>
Fish and Fish Habitat	<ul style="list-style-type: none"> <li>Changes in and/or direct loss of fish habitat resulting from placement of waste rock, changes in sediment loading and stream flows, and open pits.</li> <li>Changes in and/or direct loss of fish habitat resulting from deposition of calcite.</li> <li>Health effects to aquatic resources (e.g., fish) due to changes in water quality.</li> <li>Changes in quantity of stream flow due to pit development and subsequent watershed area reduction and groundwater interception.</li> </ul>	<ul style="list-style-type: none"> <li>Implementing appropriate management practices and environmental management plans.</li> <li>Maintaining stream flows and habitat values where possible.</li> <li>Developing a compensation plan for unavoidable loss of fish habitat.</li> <li>Implementing a drainage closure plan consistent with end land use objectives.</li> <li>Implement relevant components of a regional fish habitat management plan (currently being developed).</li> </ul>
Surficial Geology, Soils, and Terrain	<ul style="list-style-type: none"> <li>Loss of soil and changes to terrain from vegetation removal, overburden removal, storage of waste rocks and development of an open-pit mine.</li> <li>Changes to soil quality due to changes in soil chemical and physical characteristics during mining and reclamation activities.</li> </ul>	<ul style="list-style-type: none"> <li>Implementing an environmental management plan that incorporates appropriate management practices for soil erosion control and soil contamination mitigation.</li> <li>Implementing a progressive reclamation and closure plan incorporating targeted end land use objectives.</li> <li>Implementing design features to avoid, when possible, and minimize project disturbances.</li> </ul>
Vegetation	<ul style="list-style-type: none"> <li>Direct loss of vegetation.</li> <li>Health effects on vegetation due to changes in air, water, soil quality and dust deposition.</li> <li>No SARA listed marine plants are expected to be affected.</li> </ul>	<ul style="list-style-type: none"> <li>Implementing appropriate management practices and environmental management plans.</li> <li>Minimizing mine footprint through phased operation and progressive reclamation.</li> <li>Implementing a reclamation and closure plan incorporating targeted end land use objectives.</li> <li>Implementing an air quality and dust control plan, as needed.</li> <li>Implementing a storm water runoff control plan, as needed.</li> <li>Implementing relevant components of a terrestrial cumulative effects management plan.</li> </ul>

**Table 4.1 Preliminary Identification of Potential Project-Environment Interactions (continued)**

Environment Component	Issue / Potential Effect	Examples of Potential Mitigation and Management Planning Measures
Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> <li>• Direct loss of wildlife habitat.</li> <li>• Sensory disturbance of wildlife.</li> <li>• Disruption of wildlife movement patterns in regional landscape.</li> <li>• Direct mortality of wildlife due to vehicle-wildlife collisions.</li> <li>• Health effects on wildlife due to changes in air, water and soil quality.</li> <li>• Increased wildlife habitat protection for certain species.</li> <li>• Health effects to aquatic resources (e.g., water birds and amphibians) due to changes in water quality.</li> <li>• Direct loss of riparian habitats affecting water bird and amphibians that use lentic and lotic environments.</li> <li>• Potential effects to habitat connectivity that could change movement of wildlife species south of Highway 3.</li> <li>• A variety of migratory birds travel through, or use, the habitat of, the Project's terrestrial biology LSA. The Project's planned mine footprint, as well as on-site equipment, and construction of buildings and infrastructure will remove potential nesting, resting, and feeding areas and create possible hazards for migratory birds. It is expected that some migratory bird habitats (e.g., forests) will be removed.</li> </ul>	<ul style="list-style-type: none"> <li>• Implementing appropriate management practices and environmental management plans.</li> <li>• Minimize project interaction with wildlife.</li> <li>• Minimize mine footprint through phased operation and progressive reclamation.</li> <li>• Implementing a reclamation and closure plan incorporating targeted end use objectives (e.g., wildlife habitat).</li> <li>• Implementing relevant components of a terrestrial cumulative effects management plan.</li> <li>• Mitigate habitat loss to migratory birds by reusing existing disturbances, where possible, and timely reclamation. Conduct habitat clearing outside of the migratory bird nesting period wherever possible to avoid effects on nesting birds and to comply with the <i>Migratory Birds Convention Act</i>.</li> </ul>
Biodiversity	<ul style="list-style-type: none"> <li>• Potential for the Project to affect wetlands and old growth, which are regionally important for biodiversity.</li> <li>• Old growth forests take more than 140 years to reclaim, and reclamation of wetland habitat may not be fully achievable.</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing reclamation research and continual improvement in reclamation practices.</li> <li>• Enhancing features for wildlife that mimic old growth tree attributes such as nest boxes and coarse woody debris.</li> <li>• Compensating (including offsets) for wetlands and old growth forest in the Elk Valley. Examples include:                         <ul style="list-style-type: none"> <li>○ contributing to reforestation efforts of existing disturbances not attributable to Teck operations; and</li> <li>○ contributing to wetland creation or restoration.</li> </ul> </li> <li>• Limiting access on cutlines by creating barriers, such as fallen trees, re-seeding disturbed areas, and reclaiming roads to adjacent vegetation types.</li> <li>• Limiting use to current roads and cutlines to help progressive reclamation.</li> <li>• Developing and implementing a biodiversity management plan.</li> </ul>

**Table 4.1 Preliminary Identification of Potential Project-Environment Interactions (continued)**

Environment Component	Issue / Potential Effect	Examples of Potential Mitigation and Management Planning Measures
<b>Economic</b>		
Economic	<ul style="list-style-type: none"> <li>• Provincial and local economic stimulus via Project procurement and contracting for goods, services, and personal services, and consumer spending of employees.</li> <li>• Changes to employment, employment income, and training.</li> <li>• Changes to gross domestic product (GDP).</li> <li>• Changes to output (e.g., economic activity) in forestry and outdoor recreation and tourism sectors.</li> <li>• Changes to local government revenues and expenditures.</li> </ul>	<ul style="list-style-type: none"> <li>• Per current operating practices, planning for local procurement of Project goods and services.</li> <li>• Co-operating with local organizations on training programs for potential suppliers, including specific contracting procedures, quality control, and legal/contracting issues.</li> <li>• Implementing employment and training plans.</li> <li>• Supporting efforts on the part of employees to upgrade their education as a means towards job advancement.</li> <li>• Co-operating with local educational authorities and institutions in the development and implementation of high school and college training with mining sector content.</li> </ul>
<b>Social</b>		
Land Use and Tenure	<ul style="list-style-type: none"> <li>• Changes to opportunities associated with public and tenured land and resources, including changes to use of and/or access to certain public lands and waters and availability of certain species.</li> </ul>	<ul style="list-style-type: none"> <li>• Seeking and implementing input on recreational access and end land use objectives.</li> <li>• Implementing reclamation and closure plans consistent with end land use objectives.</li> </ul>
Visual Aesthetics	<ul style="list-style-type: none"> <li>• Alteration of visible landforms.</li> </ul>	<ul style="list-style-type: none"> <li>• Retaining and rehabilitating vegetation to provide screening of the Project area.</li> <li>• Implementing dust suppression techniques during construction and operation phases.</li> </ul>



**Table 4.1 Preliminary Identification of Potential Project-Environment Interactions (continued)**

Environment Component	Issue / Potential Effect	Examples of Potential Mitigation and Management Planning Measures
Socio-Community Health and Well-Being	<ul style="list-style-type: none"> <li>• Changes to and/or maintenance of community and individual health and well-being.</li> <li>• Provincial and local economic stimulus.</li> <li>• Employment, income, local government revenue generation and gross domestic product benefits.</li> <li>• Health and safety of workers and public.</li> <li>• Changes to wage and non-wage economy due to Project-driven changes in hunting, trapping, and gathering.</li> <li>• Changes to local population and demographics due to Project-driven labour market changes.</li> <li>• Changes to local community services and infrastructure due to either Project demand or Project-driven population change.</li> </ul>	<ul style="list-style-type: none"> <li>• Community management planning with First Nations and stakeholders to address provision of services and effects to community health and well-being.</li> <li>• Identify First Nations interests and Project related effects.</li> <li>• Work with First Nations to mitigate effects to opportunities associated with land access, forestry, fishing, and hunting activities.</li> <li>• Seek input on recreational/tourism access and end land use objectives.</li> <li>• Implement reclamation and closure plans consistent with end land use objectives.</li> <li>• Skills inventory, training and skills development.</li> <li>• Traditional Knowledge and Traditional Use Studies.</li> <li>• Memoranda of Understanding and Participation Agreements with First Nations.</li> <li>• Employee Health and Safety Plans.</li> <li>• Employment planning.</li> <li>• Plan for local procurement of goods and services.</li> <li>• Work with local government authorities and health, protective, and emergency service organizations to plan for and adjust to anticipated changes in population and associated changes in service demand.</li> <li>• Implement a traffic management plan.</li> </ul>
<b>Heritage</b>		
Archaeological Resources	<ul style="list-style-type: none"> <li>• Effects to archaeological resources due to land clearing, mining and associated infrastructure, logging, and spoiling of waste rock.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct archaeological impact assessment to discover previously undocumented archaeological sites within the Project area.</li> <li>• Generate recommendations to minimize or prevent effects occurring to archaeological sites.</li> <li>• Where possible, avoid ground disturbing activity within archaeological sites. If disturbance to archaeological site is anticipated to occur, implement mitigative strategies to salvage pre-contact cultural heritage information.</li> <li>• Field inspections conducted at and near the CMO2 site in 2012 and 2013 identified nine new archaeological sites, though none were found within the current proposed footprint. One of the sites is located within Parcel 73 of the Dominion Coal Block while the remainder are located near the proposed transportation corridor. In the event that the Project footprint is altered the archaeological assessment will be re-evaluated.</li> </ul>

**Table 4.1 Preliminary Identification of Potential Project-Environment Interactions (continued)**

Environment Component	Issue / Potential Effect	Examples of Potential Mitigation and Management Planning Measures
<b>Health</b>		
Human Health	<ul style="list-style-type: none"> <li>• Increased particulate matter concentrations (e.g., PM<sub>2.5</sub> and PM<sub>10</sub>) which may cause health risk to local communities.</li> <li>• Deposition of dust to plants and soil, which can result in uptake of metals and polycyclic aromatic hydrocarbons (PAHs) from coal dust to plants which are then consumed by people.</li> <li>• Water runoff may contribute metals and PAHs to downstream water bodies, which can result in uptake of metals and PAHs in fish which are then consumed by people; surface water may also be consumed by people (in a recreational scenario).</li> </ul>	<ul style="list-style-type: none"> <li>• Implementing an air quality and dust control plan, as needed.</li> <li>• Implementing a storm water runoff control plan, as needed.</li> </ul>
Terrestrial Wildlife Health	<ul style="list-style-type: none"> <li>• Deposition of dust on plants and soil, which can result in uptake of metals and PAHs from coal dust to plants, which are then consumed by wildlife.</li> <li>• Water runoff may contribute metals and PAHs to downstream waterbodies, which can result in uptake of metals and PAHs in fish which are then consumed by wildlife. Surface water may also be consumed by wildlife.</li> </ul>	<ul style="list-style-type: none"> <li>• Implementing an air quality and dust control plan, as needed.</li> <li>• Implementing a storm water runoff control plan, as needed.</li> </ul>
Aquatic Health	<ul style="list-style-type: none"> <li>• Change in and/or direct loss of aquatic habitat resulting from placement of waste rock, changes in sediment loading and streamflows, and excavation of Wheeler Creek.</li> <li>• Health effects to aquatic resources (e.g., fish) due to changes in water quality.</li> </ul>	<ul style="list-style-type: none"> <li>• Implementing appropriate management practices and environmental management plans.</li> <li>• Maintenance of stream flows and habitat values where possible.</li> <li>• Habitat compensation for unavoidable loss of fish habitat, if required.</li> <li>• Implement drainage closure plan consistent with end land use objectives.</li> <li>• Implementing water quality management plans or strategies consistent with the EVWQP.</li> </ul>

To address the potential project-environment interactions, studies are being conducted to meet the environmental planning and assessment requirements of the *BC Environmental Assessment Act* (BCEAA) and, if required, the *Canadian Environmental Assessment Act* (CEAA), as well as permitting requirements of regulatory agencies such as the BC Ministry of Energy and Mines and Responsible for Core Review (MEM), BC MOE, Fisheries and Oceans Canada (DFO), and others as may be necessary. The environmental studies include the following components:

- air quality;
- noise and vibrations;
- geochemistry;
- hydrogeology;
- surface water hydrology;
- water and sediment quality;
- aquatic health;
- fish and fish habitat;
- surficial geology, soil, and terrain;
- vegetation;
- wildlife and wildlife habitat;
- biodiversity;
- land use and tenure;
- visual aesthetics;
- socio-economics;
- archaeology; and
- human and wildlife terrestrial health.

## 5 CONSULTATION

### 5.1 FIRST NATIONS

The proposed Project, including both CMO and CMO2 sites, is located within the asserted traditional territory of the Ktunaxa Nation, as represented by the KNC, which includes the following four member groups:

- ?Akisq'nuk First Nation (formerly the Columbia Lake First Nation, Windermere);
- St. Mary's First Nation (Cranbrook);
- Tobacco Plains Indian Band (Grasmere); and
- Lower Kootenay Indian Band (Creston).

Contact information for the Ktunaxa Nation is as follows:

#### **Ktunaxa Nation Council**

Kathryn Teneese  
Chair, KNC  
7468 Mission Road  
Cranbrook, BC V1C 7E5  
Phone: 250.489.2464  
Fax: 250.489.2438

Ray Warden (Teck's primary KNC contact)  
Director, Lands and Resources  
Phone: 250.417.4022  
Fax: 250.489.2438  
E-mail: rwarden@ktunaxa.org

Nicole Kapell  
Environment and Archaeological Stewardship Coordinator  
Phone: 1-250-489-2464 ext 3123  
E-mail: NJKapell@ktunaxa.org

Member First Nations of the KNC:

#### **?Akisq'nuk First Nation**

Chief Lorne Shovar  
PO Box 130  
Windermere, BC V0B 1L0  
Phone: 250.342.6301  
Fax: 250.342.9693

**St. Mary's First Nation**

Chief Jim Whitehead  
7470 Mission Road  
Cranbrook, BC V1C 7E5  
Phone: 250.426.5717  
Fax: 250.426.8935

**Tobacco Plains Indian Band**

Chief Mary Mahseelah  
PO Box 76  
Grasmere, BC V0B 1R0  
Phone: 250.887.3461  
Fax: 250.887.3424  
E-mail: [administration@tobacco plains.org](mailto:administration@tobacco plains.org)

**Lower Kootenay Indian Band**

Chief Jason Louie  
830 Simon Road  
Creston, BC V0B 1G2  
Phone: 250.428.4428  
Fax: 250.428.7686

The closest First Nation reserves are located approximately 55 km from the Project (St. Mary's and Tobacco Plains; Figure 5.1).

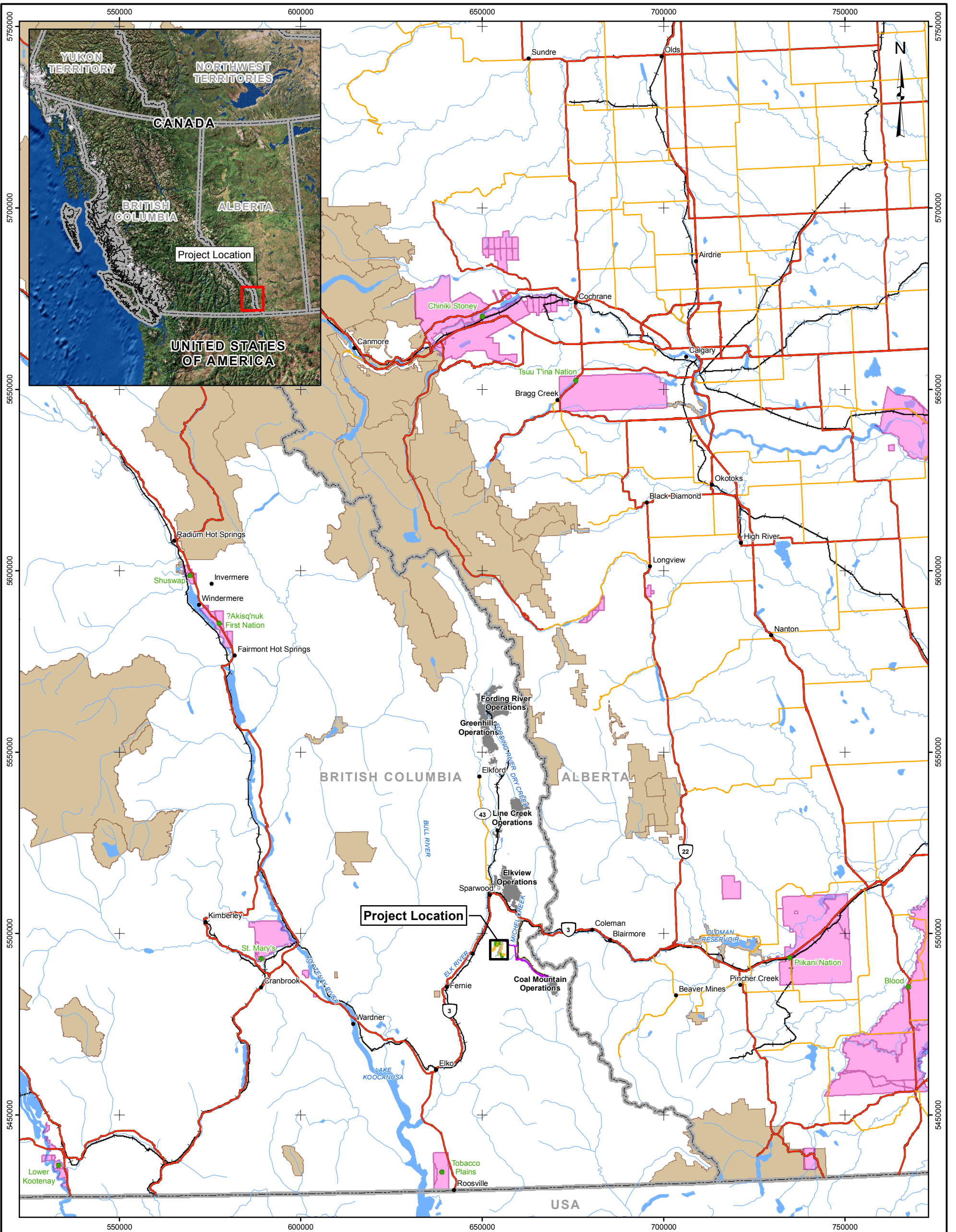
The Project is also located within the asserted territory of the Shuswap Indian Band. The BC EAO indicated in the 2013 LCO Phase 2 consultation report that the Shuswap Indian Band would not be affected by LCO Phase 2 Project, and accordingly, Teck anticipates CMO2 to have minimal effect to the Shuswap Indian Band. The Shuswap Indian Band has not been consulted during the preparation of the Project Description. Teck and the Shuswap Indian Band have a memorandum of understanding that agrees on quarterly meetings in 2014 and at least twice yearly in future years. These meetings will discuss regulatory approvals and the Shuswap Indian Band will be kept informed of the CMO2 Project development.

Contact information for the Shuswap Indian Band is as follows:

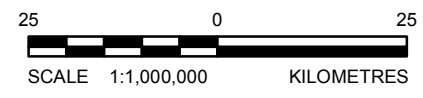
**Shuswap Indian Band**

Chief Paul Sam  
PO Box 790  
Invermere, British Columbia, V0A 1K0  
Phone: 250-342-6361

Dean Martin  
CEO, Kinbasket Development Corporation  
PO Box 2847  
Invermere, British Columbia, V0A 1K0  
Email: [dean@kinbasket.net](mailto:dean@kinbasket.net)  
Phone: 250-341-3678



- LEGEND**
- CITY / TOWN / COMMUNITY
  - FIRST NATION COMMUNITY
  - CANADIAN PACIFIC RAILWAY
  - CORBIN ROAD
  - PRIMARY HIGHWAY
  - SECONDARY HIGHWAY
  - RAW COAL TRANSPORTATION OPTION LOCATIONS
  - WATERCOURSE
  - BRITISH COLUMBIA - ALBERTA BORDER
  - COAL MINING OPERATION
  - FIRST NATIONS RESERVE
  - PROPOSED PIT SURFACE LIMIT (DRAFT)
  - PROPOSED SPOIL LIMIT (DRAFT)
  - PROVINCIAL PARK / PROTECTED AREA
  - WATERBODY



**REFERENCE**

Provincial boundaries, communities and hydrography obtained from The Atlas of Canada, Natural Resources Canada. Roads obtained from Geobase. Provincial Parks/Protected Areas, railroad and First Nations data obtained from GeoGratis. First Nations Communities data obtained from Aboriginal Affairs and Northern Development Canada. Other data obtained from Teck Coal Limited. Projection: UTM Zone 11 Datum: NAD 83

PROJECT		COAL MOUNTAIN PHASE 2 PROJECT	
TITLE		FIRST NATIONS COMMUNITIES	
<b>Teck</b>	PROJECT No.	12-1349-0003	SCALE AS SHOWN
	DESIGN	FN 21 Aug. 2014	REV. 0
	GIS	RC 21 Aug. 2014	<b>FIGURE: 5.1</b>
	CHECK	FN 21 Aug. 2014	
REVIEW	GJ 21 Aug. 2014		

I:\CLIENTS\TECK\_COAL\12-1349-0003\Mapping\MXD\ProjectDescription\B-Proj\Desc-009-GIS-FirstNations\_11x17.mxd

## **Teck Coal Limited: Coal Mountain Phase 2 Project Description**

Currently Teck does not anticipate the Project would have potential effects to the Metis Nation of British Columbia. There are no Metis settlements within proximity to the Project. The Metis Nation of British Columbia has not been consulted during the preparation of the Project Description.

Contact information for the Metis Nation of BC is as follows:

### **Metis Nation British Columbia:**

Jean Sulzer  
President, East Local – Elk Valley  
PO Box 933  
Fernie, British Columbia, V0B 1M0  
Phone: 250-423-3904

United States of America Tribes and Alberta Aboriginal groups have not been consulted during the preparation of the Project Description. However, the Kootenai Tribe of Idaho and Confederated Salish and Kootenai Tribes have participated as observers at certain TAC meetings for the EVWQP. The EVWQP includes consideration of the CMO2 Project. No further consultation activities are anticipated with United States of America Tribes.

As operator of the existing CMO, Teck has been working with the KNC to address issues and concerns relating to its existing operations in the Elk Valley. This working relationship was formalized through a protocol agreement on November 1, 2007. Under this agreement, Teck and the KNC have developed and implemented annual work plans to address issues and concerns, including how to build capacity within the KNC through training, education, employment, and procurement opportunities. A Consultation Agreement was formalized with the KNC on June 14, 2010. That agreement outlines the approach to relationship development, and will result in agreement on the level and nature of consultation activities related to specific EAs or permitting projects.

Representatives from KNC were provided with an overview of the proposed Project at a meeting on April 10, 2013. A summary of the questions and comments received from this meeting is presented in Appendix E (Table 1.1). In May 2013 they were provided with information on the planned baseline study approach. A KNC Lands and Resources Agency Chapter C Planning Meeting was held on March 27, 2014, and a summary of the questions and comments received are presented in Appendix E (Table 1.2). In May 2014, a workshop between Teck and KNC was held to review environmental baseline data-gathering methodologies and examine preliminary results. A summary of key items resulting from workshop is currently being drafted. Additional consultation has occurred through the process of developing the EVWQP, in which the proposed CMO2 is considered.

It is believed some lands locally in the Project area may be used for traditional purposes. Traditional uses may include, but not be limited to, hunting, trapping, fishing, and other resource gathering activities which could be affected by both loss of land access and exploration, development, and production of the Project. The Tobacco Plains Indian Band trap line boundary is approximately 43 km south of the project area. It is not expected the Project would have an effect on the Tobacco Plains trap line region.

Teck continues to engage the KNC through ongoing meetings and communications, and will continue to work with the KNC and other First Nations and Aboriginal groups to identify and address concerns, and build strong and mutually beneficial working relationships.

Traditional land use studies of the Elk Valley are currently underway with the KNC which will help identify potential effects in the Project area. Effects to other Aboriginal groups will be assessed throughout the EA process. Input and issues raised by Aboriginal groups and Teck's response to those issues will be documented and considered during the course of the EA process.

## **5.2 PUBLIC**

Teck has made initial contact with the Regional District Area A, to inform them about the proposed Project and address any questions. Teck met with the Regional District of East Kootenay on February 14, 2014 and provided an overview of the Project.

Teck held an information evening in Hosmer on September 11, 2013 to provide the Project's closest community an early overview of the Project and advise them of future consultation opportunities.

Teck also consulted and collaborated with local hunting and recreation groups while creating the no-unauthorized access, no hunting, and no shooting safety boundary for the Project, and will continue to work with the groups to keep them informed about the Project. A summary of questions and comments received during these public consultation meetings is presented in Section 2 of Appendix E.

In November and December 2013, Teck held a series of meetings with recreational users, local businesses, mayors/councils of Crowsnest Pass, Sparwood, Fernie, and Elkford, and environmental groups to advise them about the Project as well as opportunities to participate in consultations and provide input for baseline studies. A summary of questions and comments received during these public consultation meetings is presented in Section 3 of Appendix E.

## **5.3 AGENCIES**

The MEM was provided an overview presentation of the Project at a meeting held in Victoria in January, 2013. The Ministry of Environment (MOE), Ministry of Forests, Lands and Natural Resource Operations (MFLNRO), and other representatives of the Kootenay Mine Development Review Committee were provided a similar overview presentation of the Project at a meeting in Cranbrook in April, 2013. Teck delivered the overview presentation to the BC EAO in May 2013.

In 2013, the BC MOE and MEM were also provided with information on the planned baseline study approach. Comments received from both agencies were incorporated into the baseline study approaches.

Specific consultation with respect to this Project has not yet occurred with the U.S. Environmental Protection Agency or the State of Montana. Should such consultation be



required during the regulatory process, Teck will undertake this consultation in collaboration with the Canadian Environmental Assessment Agency and BC EAO.

## **5.4 CONSULTATION PLANNING**

First Nations and Public Consultation plans are being developed for the Project EA. These plans are being designed with the intent of meeting all EA consultation requirements as set out by the EAO and the Canadian Environmental Assessment Agency.

The fundamental objective of the consultation programs will be for First Nations, regulatory agencies, key communities, and members of the public to have the opportunity for meaningful input into the following:

- issue identification;
- baseline characterization programs; and
- review of key EA documents.

Consultation will involve a variety of activities including, but not limited to, open houses, written communications, and engagement via interviews and meetings.

## 6 SUSTAINABILITY

Teck's commitment to sustainability and continual improvement through environmental stewardship, a commitment to the communities where it operates, recognition of the First Nations within whose traditional territories the company's mines operate in, and an ongoing focus on the health and safety of its employees are all essential components of how Teck defines success. This success includes operating viable, responsible operations; demonstrating excellence in safety, health and environmental performance; fostering sustainable communities, including valuing First Nations interests; and maintaining responsive, transparent and ethical corporate governance.

Teck recognizes safety as a core business value. At the heart of that focus is Teck's vision of "everyone going home safe and healthy every day", a vision that drives the company to continually assess and improve safety performance, and work to embed a culture of safety within the employee base.

Leadership in sound environmental management remains a primary focus of the organization. Commitment to environmental performance is evident in the success of reclamation programs which begin with science and research-based foundations that result in attaining end land use values that are sustainable into the future. Using this methodology has aided CMO as evidenced by receipt of a Citation for Excellence in Coal Mining Reclamation (2009). Environmental management consistency is assured through registration with internationally recognized standards like ISO14001-2004. Currently all six of Teck's coal operations (including the five in the Elk Valley) are ISO14001-2004 registered. The Project would be accredited as part of CMO activities.

Responsible mining sustainably is crucial to the future of Teck. The company is committed to meeting the needs of the communities in which it operates, while maintaining a healthy environment and a vibrant economy for present and future generations.

## **7 ENVIRONMENTAL ASSESSMENT PROCESS AND REGULATORY PROCESS**

### **7.1 BRITISH COLUMBIA ENVIRONMENTAL ASSESSMENT ACT**

According to Part 3 of the Reviewable Project Regulation, modification of an existing coal mine meets the threshold for an EA under the BCEAA if the modification will result in the disturbance of:

- at least 750 ha of land not previously permitted for disturbance; or
- an area of land that was not previously permitted for disturbance and that is at least 50% of the area of land that was previously permitted for disturbance at the existing facility.

The current proposed footprint for the Project pits and waste spoils is estimated at 942 ha, and there would likely be an additional 50 to 60 ha required for other mine operations. This extension would result in the total new disturbance of approximately 1,000 ha, an area which is more than 50% of the CMO land previously approved for disturbance and exceeds 750 ha total. Consequently, the Project meets the threshold specified in the regulation and Teck believes that the Project requires an EA pursuant to the BCEAA.

### **7.2 CANADIAN ENVIRONMENTAL ASSESSMENT ACT**

On October 24, 2013 amendments to Section 17(d) of the Regulations Designating Physical Activities under the *Canadian Environmental Assessment Act* (CEAA 2012) came into force. These amendments state that an EA is required if the project involves the following:

- “The expansion of an existing coal mine that would result in an increase in the area of mine operations<sup>[1]</sup> of 50% or more and a total coal production capacity to 3,000 t/day or more”.

Teck is engaging directly with the Canadian Environmental Assessment Agency on the Federal review requirements under CEAA 2012. The current proposed footprint for the CMO2 site pits and waste spoils is approximately 1,000 ha. The current area of mine operations at CMO is approximately 1,100 ha. Therefore, the Project would likely result in an increase to the area of mine operations by 90%, significantly above the 50% criteria indicated in the Act. While this footprint could change as the Project is further defined, a substantial reduction resulting in an increase in area of mine operations of less than 50% is not anticipated. The production capacity would remain above 3,000 tonnes/day. It is expected that the Project will require a Federal environmental assessment.

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<sup>[1]</sup> “area of mine operations” means the area at ground level occupied by any open pit or underground workings, mill complex or storage area for overburden, waste rock, tailings or ore.

The Federal authorities have the responsibility to determine whether CEAA 2012 defines the Project as requiring a Federal EA, and if so, to define the EA. This Project Description is intended to assist in that determination.

A summary of potential for the Project to be Federally designated for assessment is provided in Appendix D.

## **7.3 FEDERAL APPROVALS**

### **7.3.1 Explosives Act**

An explosives licence is required to acquire and store industrial explosives. As explosives would be used to develop the CMO2 site, an application under the Explosives Act for a licence will be made. Explosives would be stored in CMO magazines until a new magazine storage structure is established at the CMO2 site.

### **7.3.2 Fisheries Act**

Under CEAA 2012, it is required that changes to fish and fish habitat as defined under the *Federal Fisheries Act* are taken into account as environmental effects. Section 35(1) of the *Federal Fisheries Act* (June 29, 2012 version) which came into force on November 25, 2013 prohibits “any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery”. The placement of waste rock within Wheeler, Little Wheeler, and Snowslide creeks may be considered by DFO to cause a permanent alteration to, or destruction of, fish habitat, and, as such, may require an authorization from DFO under Section 35(2) of the *Fisheries Act*. Additionally, upgrading of stream crossings of Michel Creek and construction of water management options as determined by the EVWQP may also require authorization from DFO. Additional consultation with DFO will be undertaken to determine the need for a *Fisheries Act* Authorization.

### **7.3.3 Navigation Protection Act**

The *Navigation Protection Act* was brought into law in the spring of 2014. Works and activities proposed for the Project will be reviewed to evaluate whether an application under the *Navigation Protection Act* will be required. This information will be communicated with Transport Canada to confirm the need for review.

## 7.4 KEY PROVINCIAL AND MUNICIPAL PERMITS AND APPROVALS

Key Provincial and municipal permits and approvals that may be required for the Project include, but are not limited to, those identified in Table 7.1.

**Table 7.1 Provincial Permits and Approvals Likely Required for the Coal Mountain Phase 2 Project**

Legislation	Responsible Agency	Requirement
<b>Provincial</b>		
<i>Coal Act</i>	Ministry of Energy and Mines and Responsible for Core Review	<i>Coal Lease</i> to allow large-scale mining operations. A coal lease is required when an operation moves to its production phase. The boundaries of a lease must conform to the boundaries of coal licence locations.
<i>Environmental Management Act</i> and regulations	Ministry of Environment (Environmental Protection Division)	Waste Discharge Authorization for the generation of liquid, gaseous, or solid waste. Any new sewage treatment facility will require registration under the <i>Municipal Wastewater Regulation</i> .
<i>Fire Services Act</i>	Ministry of Public Safety	Approval to store fuel on-site.
<i>Heritage Conservation Act</i>	Ministry of Forests, Lands, and Natural Resource Operations (Archaeology Branch)	<i>Heritage Investigation Permit</i> to conduct systematic data recovery to mitigate development effects (should any be identified). <i>Heritage Alteration Permit</i> to remove and/or relocate a cultural resource or artifact (should any be identified).
<i>Mines Act</i>	Ministry of Energy and Mines and Responsible for Core Review	A permit under the <i>Mines Act</i> and Section 10 of its related Health Safety and Reclamation Code will be the key permit driving planning and approval for development. A mine plan and reclamation program will be submitted to the MEM regional manager in accordance with the code that outlines the design, construction, operation and closure parameters of the Project as well as land uses, protection and reclamation plans, and other information that the MEM determines relevant.
<i>Water Act</i>	Ministry of Environment (Water Stewardship Division)	Water Licence for the authorization to divert water for multiple purposes including potable water use at the Project offices. Well construction for water supply to Project offices.
<i>Drinking Water Protection Act and Regulation</i>	Ministry of Health (Health Authorities)	Potable water permitting for water supply to Project offices.
<b>Municipal</b>		
Regional District of East Kootenay (RDEK) Elk Valley Zoning Bylaw No. 829	Regional District of East Kootenay	The Project is proposed for land that is currently zoned "Mineral Extraction". A zoning bylaw amendment is likely required for the proposed Project so that new mining areas may be included in the <i>Mine Tax Sharing Agreement</i> between the RDEK and Districts of Fernie, Elkford and Sparwood. The amendment would likely occur after Provincial approval of the Project.

Teck will consult with Provincial and Federal regulatory agencies to identify, make application for, and comply with all relevant Federal and Provincial permits, approvals, and requirements.

## 7.4.1 Proposed Environmental Assessment Schedule

The proposed schedule for major EA activities and milestones is presented in Table 7.2.

**Table 7.2 Proposed Environmental Assessment Schedule**

Date Completed or Proposed Completion Date	Activity or Milestone
March 2012	<ul style="list-style-type: none"> <li>Gap analysis and initiation of baseline data collection.</li> </ul>
March 2012 to May 2014	<ul style="list-style-type: none"> <li>Studies to characterize existing environment.</li> </ul>
February 2013 to December 2013	<ul style="list-style-type: none"> <li>Early engagement with key stakeholders.</li> </ul>
April 2014 to September 2014	<ul style="list-style-type: none"> <li>Teck submit project description to BC EAO and Canadian Environmental Assessment Agency.</li> <li>BC EAO issues Section 10 procedural order confirming the Project will undergo review under BCEAA.</li> </ul>
September 2014 to August 2015	<ul style="list-style-type: none"> <li>Canadian Environmental Assessment Agency determines whether the Project requires an environmental assessment.</li> <li>Working Group established.</li> <li>BC EAO issues Section 11 Procedural Order outlining the scope, procedures and methods for the EA.</li> <li>Canadian Environmental Assessment Agency issues Notice of Commencement.</li> <li>EAC Application Information Requirements under BC EAO and EIS Guidelines under Canadian Environmental Assessment Agency established - includes regulatory review and public comment period.</li> <li>Public and First Nations consultation on the Project.</li> <li>Teck prepares EAC Application and EIS.</li> <li>Ongoing consultation efforts and activities.</li> </ul>
August 2015 to September 2015	<ul style="list-style-type: none"> <li>Teck submits EAC Application and EIS.</li> <li>Teck submits permit applications for other relevant Provincial and Federal permits and approvals.</li> <li>Ongoing consultation efforts and activities.</li> </ul>
September 2015 to March 2016	<ul style="list-style-type: none"> <li>Review of EAC Application and EIS, including public comment period.</li> <li>Preparation of Assessment Report by BC EAO and EA Report by Canadian Environmental Assessment Agency.</li> </ul>
April 2016 to June 2016	<ul style="list-style-type: none"> <li>Ministerial review and decision.</li> </ul>

BC EAO = British Columbia Environmental Assessment Office; BCEAA = British Columbia *Environmental Assessment Act*; CEAA = Canadian *Environmental Assessment Act*; EA = Environmental Assessment; EAC = Environmental Assessment Certificate; EIS = Environmental Impact Statement.

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**Note: S.C. = Statute of Canada; R.S.C. = Revised Statute of Canada; S.BC = Statute of British Columbia; R.S.B.C = Revised Statute of British Columbia.**

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**APPENDIX A**

**DESCRIPTION OF EXISTING COAL MOUNTAIN OPERATIONS PROCESS  
PLANT**

The existing CMO process plant is located in the upper Michel Creek watershed, at the end of the Corbin Road. The Plant Site includes a breaker to size material, a heavy media cyclone (HMC), flotation machines, a clean coal thickener, a tailings thickener, a dryer, a coal stockpile area, and a waste area.

The vast majority of coal sold from CMO is a pulverized coal injection product used in the steelmaking process. Run-of-mine (ROM) coal from the mine stockpiles is sent to the breaker station (breaker) where it is stockpiled in separate piles by quality. A loader then blends ROM from these stockpiles in the desired ratios to the breaker feed bin, topped by a grizzly-screen with 30.5 cm x 61 cm openings. A mechanical apron feeder loads coal into a rotary breaker with 5 cm openings, at a feed rate of approximately 820 tonnes per hour (tph). This rotary breaker revolves and subsequently sizes ROM coal down to 5 cm top-size, while larger rock is rejected.

Once the material is sized to 5 cm or less, it is conveyed to the plant at about 780 tph. Raw coal is mixed with water in a 4-way raw coal distributor where it feeds four raw coal sieve bends with 0.75 millimetre (mm) openings preceding two multi-angle desliming screens with 0.65 mm openings. Material greater than 0.65 mm discharges from the deslime screen deck and is slurried with magnetite and water. This magnetite/water slurry is mixed to a Specific Gravity (SG) setpoint of between 1.38 and 1.50 to facilitate separation downstream in HMC. Material passing the 0.65 mm openings of the deslime sieves and screens reports to water-only-cyclones (WOC).

The primary physical property that separates coal from rock is density, with coal being less dense than rock. Hence clean coal, with a SG of roughly 1.3 to 1.4, floats in slurry with a SG of roughly 1.4, while rock with a SG of roughly 1.8 to 2.7 sinks in this slurry. This process is amplified by centrifugal forces present inside an HMC. The feed slurry to the HMC is pressurized by gravity in a simple pulping column. The 50 mm x 0.65 mm clean coal reports to the HMC overflow, and the 50 mm x 0.65 mm refuse reports to the HMC underflow.

The HMC overflow product is dewatered, and the magnetite media rinsed for re-use, on four 3.66 m x 4.88 m drain and rinse vibrating screens preceded by sieve bends. The sieve bends utilize a 0.6 mm opening while the drain and rinse screens utilize 0.5 mm openings. This clean coal at about 20% moisture is then sent to three 122 cm diameter centrifugal vibrating screen baskets to reduce the moisture content to about 6% before reporting to the thermal dryer. The HMC underflow (refuse) product similarly reports to two 3 m x 4.88 m drain and rinse screens preceded by a sieve bend. The refuse product is sufficiently dry by this point to direct it to the plant refuse bin.

Deslime screen undersize, roughly 0.65 mm x 0 material, is pressurized by gravity and reports to two banks of nine 38 cm diameter WOCs in parallel, or 18 WOCs in total. The WOCs separate material based on SG differences as well, albeit without the use of a heavy media such as magnetite. Clean coal, which is less dense, reports to the overflow of these WOCs, and is then pumped to 38 cm classifying cyclones. Classifying cyclones separate this material based on size, at about +/-0.25 mm. Classifying cyclone overflow, 0.25 mm x 0 material, reports to a flotation sump. Classifying cyclones underflow, 0.65 m x 0.25 mm material, is directed to two fine-sieve bends with 0.35 mm

openings. The overflow of these sieve bends is directed to a disc filter sump, and the underflow is directed to the flotation sump.

The WOC underflow reports to a spirals sump, whereby it is pumped to a bank of spirals for re-cleaning to recover any misplaced clean coal that may still be present. Spirals concentrate material by SG difference as well, and use forces existent in a centrifugal fluid film. The higher SG material (refuse) reports to a 1.22 m x 3 m reverse slope high-frequency dewatering screen, and the oversize from this is directed to the plant refuse bin. The lower SG material from the spirals is not directed to the final product stream, but instead recirculated to the WOCs for another attempt at recovery.

At the flotation sump, roughly 0.25 mm x 0 material is pumped to a single bank of four 28.32 cubic metres flotation machines. The flotation process takes advantage of differences in surface properties of rock and coal. For instance, coal is somewhat naturally hydrophobic (i.e., low water affinity or wettability), but will readily attach to other hydrocarbons such as kerosene. Rocks have high water affinity and are easily wettable by water, but not easily coated by hydrocarbons such as kerosene. In this manner, kerosene is added to the slurry and readily coats the coal particles, while mostly ignoring the rock particles. Fine air bubbles are mechanically entrained in the slurry, and prevented from coalescing by a frother reagent. This frother reagent gives the small air bubbles a short time period of stability such that they do not collapse. In this manner, the kerosene-coated coal particles readily attach themselves to air bubbles and are skimmed off the top of the flotation cells as product. This product then reports to a 19.8 m diameter clean coal thickener. The rock particles do not readily attach to the air bubbles, and are rejected out of the flotation machines as underflow (flotation tailings) and directed to a 19.8 m diameter tailings thickener.

At the clean coal thickener, 0.25 mm x 0 clean coal is thickened in advance of pumping the product to the previously mentioned disc filter sump. At the disc filter sump, clean coal material (consisting of clean coal thickener underflow, combined with fine-sieve bend overflow) is pumped to a vacuum disc filter with fifteen 3.81 m diameter discs. Once dewatered on the disc filters, the clean coal product reports to the thermal dryer.

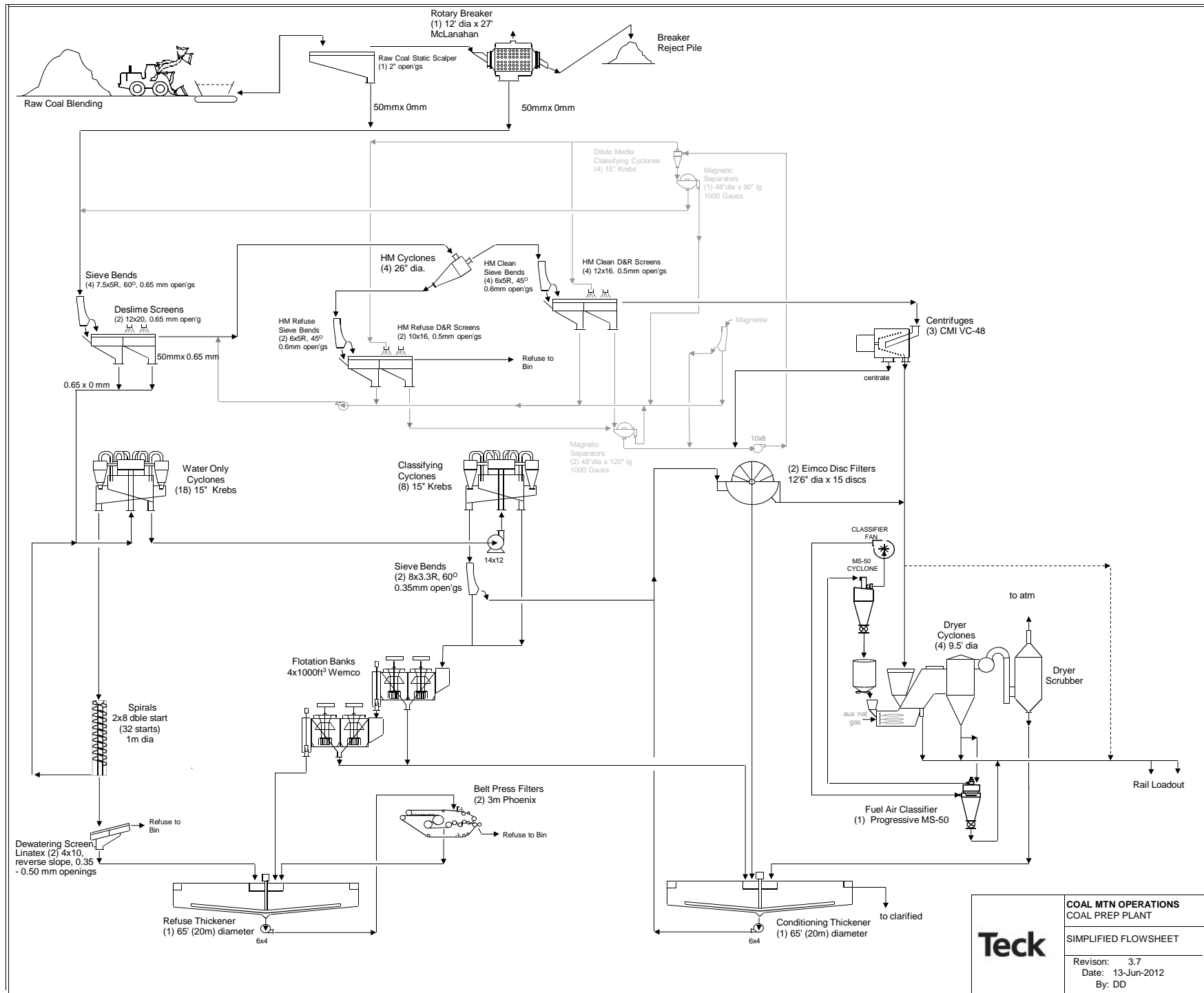
At the tailings thickener, flotation tailings are thickened before pumping to two 3-m-wide belt-filter presses for dewatering. Once dewatered, this material then reports to the plant refuse bin. The plant refuse bin contains dewatered HMC refuse, dewatered spiral refuse, and dewatered flotation tailings. This material is loaded onto haul trucks for disposal in mine waste dumps.

The thermal dryer receives dewatered clean coal from the disc filters (21% moisture) and centrifugal vibrating screen baskets (6% moisture) into a dryer feed bin. This bin meters the approximately 13% moisture coal into a fluidized bed thermal dryer with a 3 m x 5.5 m constriction rod deck. The thermal dryer is capable of a heat input of approximately 160,000,000 British Thermal Units per hour (BTU/hr) using ultrafine coal and natural gas as a fuel source. Coupled with a 1,738 kilowatt (kW) exhaust fan, the thermal dryer can evaporate up to 39.4 tph of water, in order to reduce the moisture content of the clean coal to about 7.8%. This dried coal is then directed by conveyor to a stockpile area.

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Final dried clean coal product reports to a 150,000 tonne stockpile area, from where it can be pushed with a dozer and loader into traps and onto a conveyor that feeds a rail load-out bin. At the load-out bin, 3-engine unit trains of 152 cars are loaded with about 16,000 tonnes. A solution of water and polymer is sprayed on the top of the rail cars to minimize dust generation. These trains are then directed to west coast ports such as Roberts Bank or Neptune terminals in Vancouver BC, and Ridley terminal in Prince Rupert BC.





<b>Teck</b>	<b>COAL MTN OPERATIONS</b>
	<b>COAL PREP PLANT</b>
	<b>SIMPLIFIED FLOWSHEET</b>
Revision: 3.7	Date: 13-Jun-2012
By: DD	

**APPENDIX B**  
**SCIENTIFIC NAMES OF SPECIES CITED**

**Table B-1 Scientific Names of Species Cited**

Species Cited	Scientific Name
<b>Amphibians</b>	
Columbia spotted frog	<i>Rana luteiventris</i>
Long-toed salamander	<i>Ambystoma macrodactylum</i>
Western toad	<i>Bufo boreas</i>
<b>Fish</b>	
Bull trout	<i>Salvelinus confluentus</i>
Eastern brook trout	<i>S. fontinalis</i>
Westslope cutthroat trout	<i>Oncorhynchus clarki lewisii</i>
<b>Birds</b>	
American dipper	<i>Cinclus mexicanus</i>
American robin	<i>Turdus migratorius</i>
Brewer's sparrow	<i>Spizella breweri</i>
Clark's nutcracker	<i>Nucifraga columbiana</i>
Common nighthawk	<i>Chordeiles minor</i>
Dusky grouse	<i>Dendragapus obscurus</i>
Flammulated owl	<i>Otus flammeolus</i>
Fox sparrow	<i>Passerella iliaca</i>
Harlequin duck	<i>Histrionicus histrionicus</i>
Olive-sided flycatcher	<i>Contopus cooperi</i>
Peregrine falcon	<i>Falco peregrinus anatum</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Rufous hummingbird	<i>Selasphorus rufus</i>
Pine siskin	<i>Carduelis pinus</i>
Short-eared owl	<i>Asio flammeus</i>
Spotted sandpiper	<i>Actitis macularia</i>
Swainson's hawk	<i>Buteo swainsoni</i>
Western screech-owl, <i>macfarlanei</i> subspecies	<i>Megascops kennicottii macfarlanei</i>
Three-toed woodpecker	<i>Picoides tridactylus</i>
Williamson's sapsucker	<i>Sphyrapicus thyroides nataliae</i>
<b>Invertebrates</b>	
Gillette's checkerspot	<i>Euphydryas gillettii</i>
<b>Mammals</b>	
American badger	<i>Taxidea taxus</i>
Black bear	<i>Ursus americanus</i>
Grizzly bear	<i>Ursus arctos</i>
Marten	<i>Martes americana</i>
Moose	<i>Alces americanus</i>
Mule deer	<i>Odocoileus hemionus</i>
Red squirrel	<i>Tamiasciurus hudsonicus</i>
Snowshoe hare	<i>Lepus americanus</i>
<b>Vegetation</b>	
Black huckleberry	<i>Vaccinium membranaceum</i>
Common red paintbrush	<i>Castilleja miniata</i>
Diverse-leaved cinquefoil	<i>Potentilla diversifolia</i> var. <i>perdissecta</i>
Douglas fir	<i>Pseudotsuga menziesii</i>
Douglas maple	<i>Acer glabrum</i> var. <i>douglasii</i>
Engelmann spruce	<i>Picea engelmannii</i>
False azalea	<i>Menziesia ferruginea</i>
Falsebox	<i>Paxistima myrsinites</i>
Four-angled mountain heather	<i>Cassiope tetragona</i> syn <i>Andromeda tetragona</i>
Grouseberry	<i>Vaccinium scoparium</i>

**Table B-1 Scientific Names of Species Cited (continued)**

Species Cited	Scientific Name
Heart-leaved arnica	<i>Arnica cordifolia</i>
Idaho fescue	<i>Fescue idahoensis</i>
Indian hellebore	<i>Veratrum viride</i>
Interior bluegrass	<i>Poa nemoralis</i> L.
Knight's plume moss	<i>Ptilium crista-castrensis</i>
Lodgepole pine	<i>Pinus contorta</i>
Low bilberry	<i>Vaccinium myrtillus</i>
Mountain arnica	<i>Arnica montana</i>
Oak fern	<i>Gymnocarpium dryopteris</i>
One-leaved foamflower	<i>Tiarella unifoliata</i>
One-sided wintergreen	<i>Orthilia secunda</i>
Paper birch	<i>Betula papyrifera</i>
Pinegrass	<i>Calamagrostis rubescens</i>
Pink mountain heather	<i>Phyllodoce empetriformis</i>
Prince's pine	<i>Chimaphila umbellata</i>
Rattlesnake plantain	<i>Goodyera pubescens</i>
Red-stemmed feather moss	<i>Pleurozium schreberi</i>
Rough fescue	<i>Festuca sabrella</i>
Rusty pacific menziesia	<i>Menziesia ferruginea</i>
Sitka alder	<i>Alnus viridis</i>
Sitka valerian	<i>Valeriana sitchensis</i>
Soopolallie	<i>Shepherdia canadensis</i>
Step moss	<i>Hylocomium splendens</i>
Subalpine daisy	<i>Erigeron peregrinus</i>
Subalpine fir	<i>Abies lasiocarpa</i>
Thimbleberry	<i>Rubus parviflorus</i>
Twinflower	<i>Linnaea borealis</i>
Utah honeysuckle	<i>Lonicera utahensis</i>
Western larch	<i>Larix occidentalis</i>
Western meadow-rue	<i>Thalictrum occidentale</i>
Western red cedar	<i>Thuja plicata</i>
White-flowered rhododendron	<i>Rhododendron albiflorum</i>
White mountain-heather	<i>Cassiope mertensiana</i> var. <i>mertensiana</i>
White spruce	<i>Picea glauca</i>
Yellow beardtongue	<i>Penstemon confertus</i>
Yellow mountain heather	<i>Phyllodoce glanduliflora</i>

**APPENDIX C**

**BRITISH COLUMBIA CONSERVATION DATA CENTRE SPECIES AND  
ECOSYSTEMS AT RISK INFORMATION**

Scientific Name	English Name	Species Code	Global Status	Prov Status	COSEWIC	BC List
<i>Acrocheilus alutaceus</i>	Chiselmouth	F-ACAL	G5	S3S4	NAR (May 2003)	Blue
<i>Adiantum capillus-veneris</i>	southern maiden-hair	ADIACAP	G5	S1	E (May 2011)	Red
<i>Agoseris lackschewitzii</i>	pink agoseris	AGOSLAC	G4	S2S3		Blue
<i>Amblyodon dealbatus</i>		AMBLDEA	G3G5	S3		Blue
<i>Ammodramus leconteii</i>	Le Conte's Sparrow	B-LCSP	G4	S3S4B		Blue
<i>Anaxyrus boreas</i>	Western Toad	A-ANBO	G4	S3S4	SC (Nov 2012)	Blue
<i>Androsace chamaejasme</i> ssp. <i>lehmanniana</i>	sweet-flowered fairy-candelabra	ANDRCHA1	G5T5	S2S3		Blue
<i>Anemone canadensis</i>	Canada anemone	ANEMCAN	G5	S2S3		Blue
<i>Anguispira kochi</i>	Banded Tigersnail	IM-ANGKOC	G5	S3		Blue
<i>Ardea herodias herodias</i>	Great Blue Heron, <i>herodias</i> subspecies	B-GBHE-HE	G5T5	S3B,S4N		Blue
<i>Arenaria longipedunculata</i>	low sandwort	ARENLON	G3G4	S1S3		Red
<i>Argia vivida</i>	Vivid Dancer	IO-ARGVIV	G5	S2	C (Jul 2011)	Red
<i>Arnica chamissonis</i> ssp. <i>incana</i>	meadow arnica	ARNICHA3	G5T3T5	S2S3		Blue
<i>Ascaphus montanus</i>	Rocky Mountain Tailed Frog	A-ASMO	G4	S2	T (Nov 2013)	Red
<i>Asio flammeus</i>	Short-eared Owl	B-SEOW	G5	S3B,S2N	SC (Mar 2008)	Blue
<i>Astragalus bourgovii</i>	Bourgeau's milk-vetch	ASTRBOU	G5	S3		Blue
<i>Astragalus crassicaarpus</i>	ground plum	ASTRCRA	G5	S1		Red
<i>Astragalus drummondii</i>	Drummond's milk-vetch	ASTRDRU	G5	S1		Red
<i>Astragalus vexilliflexus</i> var. <i>vexilliflexus</i>	bent-flowered milk-vetch	ASTRVEX1	G4T4	S2S3		Blue
<i>Atrichum tenellum</i>		ATRITEN	G4G5	S2S3		Blue
<i>Atriplex argentea</i> ssp. <i>argentea</i>	silvery orache	ATRIARG1	G5T5	S1		Red
<i>Bartramia longicauda</i>	Upland Sandpiper	B-UPSA	G5	S1S2B		Red
<i>Besseyia wyomingensis</i>	Wyoming kitten-tails	BESSWYO	G5	S2S3		Blue
<i>Boechera drepanoloba</i>	pointing suncrest	BOECDRE	G5T4?	S1S3		Red
<i>Boloria alberta</i>	Albert's Fritillary	IL-BOLALB	G3	S3		Blue
<i>Botaurus lentiginosus</i>	American Bittern	B-AMBI	G4	S3B		Blue
<i>Botrychium ascendens</i>	upswept moonwort	BOTRASC	G3	S2		Red
<i>Botrychium crenulatum</i>	dainty moonwort	BOTRCRE	G3	S2S3		Blue
<i>Botrychium simplex</i> var. <i>compositum</i>	least moonwort	BOTRSIM1	G5TNR	S2S3		Blue
<i>Botrychium spathulatum</i>	spoon-shaped moonwort	BOTRSPA	G3	S1		Red
<i>Bouteloua gracilis</i>	blue grama	BOUTGRA	G5	S2		Red
<i>Brickellia grandiflora</i>	large-flowered brickellia	BRICGRA	G5	S1	NAR (May 1996)	Red
<i>Bryum uliginosum</i>		BRYUULI	G3G5	S2S3		Blue
<i>Buteo platypterus</i>	Broad-winged Hawk	B-BWHA	G5	S3B		Blue
<i>Buteo swainsoni</i>	Swainson's Hawk	B-SWHA	G5	S2B		Red
<i>Calamagrostis montanensis</i>	plains reedgrass	CALAMON	G5	S3		Blue
<i>Carex crawei</i>	Crawe's sedge	CARECRA	G5	S2S3		Blue
<i>Carex enanderi</i>	Enander's sedge	CAREENA	GNR	S2S3		Blue
<i>Carex geyeri</i>	elk sedge	CAREGEY	G5	S3		Blue
<i>Carex incurviformis</i> var. <i>incurviformis</i>	curved-spiked sedge	CAREINC1	G4G5T4T5Q	S2S3		Blue
<i>Carex lenticularis</i>	lakeshore sedge	CARELEN	G5	S3		Blue
<i>Carex paysonis</i>	Payson's sedge	CAREPAY	G4G5	S2S3		Blue
<i>Carex rostrata</i>	swollen beaked sedge	CAREROT	G5	S2S3		Blue
<i>Carex rupestris</i> ssp. <i>drummondiana</i>	curly sedge	CARERUP1	G5T5	S2S3		Blue
<i>Carex scoparia</i>	pointed broom sedge	CARESCO	G5	S2S3		Blue
<i>Carex sychnocephala</i>	many-headed sedge	CARESYC	G4	S3		Blue
<i>Castilleja cusickii</i>	Cusick's paintbrush	CASTCUS	G4G5	S1		Red
<i>Castilleja gracillima</i>	slender paintbrush	CASTGRA	G3G4Q	S2S3		Blue
<i>Charina bottae</i>	Northern Rubber Boa	R-CHBO	G5	S4	SC (May 2003)	Yellow
<i>Chenopodium subglabrum</i>	smooth goosefoot	CHENSUB	G3G4	S1	T (Apr 2006)	Red
<i>Chordeiles minor</i>	Common Nighthawk	B-CONI	G5	S4B	T (Apr 2007)	Yellow
<i>Chrysemys picta</i>	Painted Turtle	R-CHPI	G5	S3	E/SC (Apr 2006)	No Status
<i>Chrysemys picta</i> pop. 2	Painted Turtle - Intermountain - Rocky Mountain	R-CHPI-02	G5T2T3	S2S3	SC (Apr 2006)	Blue
<i>Cirsium scariosum</i> var. <i>scariosum</i>	elk thistle	CIRSSCA1	G5T5?	S1S3		Red
<i>Claytonia megarhiza</i> var. <i>megarhiza</i>	alpine springbeauty	CLAYMEG1	G4G5T4?	S2S3		Blue
<i>Colias meadii</i>	Mead's Sulphur	IL-COLMEA	G4G5	S3		Blue
<i>Colias pelidne</i>	Pelidne Sulphur	IL-COLPEL	G5	S3		Blue
<i>Contopus cooperi</i>	Olive-sided Flycatcher	B-OSFL	G4	S3S4B	T (Nov 2007)	Blue
<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	M-COTO	G3G4	S3		Blue
<i>Cryptantha ambigua</i>	obscure cryptantha	CRYPAMB	G4	S3		Blue
<i>Cryptomastix mullani</i>	Coeur d'Alene Oregonian	IM-CRYMUL	G4	S3S5		Blue
<i>Cupido comyntas</i>	Eastern Tailed Blue	IL-CUPCOM	G5	S2S3		Blue
<i>Cypseloides niger</i>	Black Swift	B-BLSW	G4	S4B	C (Jul 2011)	Yellow
<i>Danaus plexippus</i>	Monarch	IL-DANPLE	G5	S3B	SC (Apr 2010)	Blue
<i>Delphinium bicolor</i> ssp. <i>bicolor</i>	Montana larkspur	DELPBIC1	G4G5T4T5	S2S3		Blue
<i>Delphinium sutherlandii</i>	Sutherland's larkspur	DELPSTU	GNR	S2S3		Blue
<i>Didymodon subandreaeoides</i>		DIDYSUB	GU	S3?		Blue
<i>Dolichonyx oryzivorus</i>	Bobolink	B-BOBO	G5	S3B	T (Apr 2010)	Blue
<i>Draba densifolia</i>	Nuttall's draba	DRABDEN	G5	S2S3		Blue
<i>Draba lactea</i>	milky draba	DRABLAC	G5	S2S3		Blue
<i>Draba porsildii</i>	Porsild's draba	DRABPOR	G3G4	S2S3		Blue
<i>Draba ruaxes</i>	coast mountain draba	DRABRUA	G4	S2S3		Blue
<i>Eleocharis elliptica</i>	elliptic spike-rush	ELEOELL	G5	S2S3		Blue
<i>Eleocharis rastellata</i>	beaked spike-rush	ELEOROS	G5	S2S3		Blue
<i>Elodea nuttallii</i>	Nuttall's waterweed	ELODNUT	G5	S3		Blue
<i>Elymus curvatus</i>	beardless wildrye	ELYMCUR	G4G5	SH		Red

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<i>Encalypta spathulata</i>		ENCASPA	G4	S2S3		Blue
<i>Epargyreus clarus</i>	Silver-spotted Skipper	IL-EPACLA	G5	S3		Blue
<i>Epargyreus clarus clarus</i>	Silver-spotted Skipper, <i>clarus</i> subspecies	IL-EPACLA-CL	G5T5	S3		Blue
<i>Epilobium glaberrimum</i> ssp. <i>fastigiatum</i>	smooth willowherb	EPILGLA1	G5T4T5	S2S3		Blue
<i>Epilobium pygmaeum</i>	smooth spike-primrose	EPILPYG	G5	S1		Red
<i>Epilobium saximontanum</i>	Rocky Mountain willowherb	EPILSAX	G5	S1S3		Red
<i>Epipactis gigantea</i>	giant helleborine	EPPIGIG	G4	S3	SC (May 1998)	Blue
<i>Erigeron ochroleucus</i>	buff daisy	ERIGOCH	G5	S1		Red
<i>Erigeron trifidus</i>	three-lobed daisy	ERIGTRI	G2G3Q	S2		Red
<i>Eriogonum androsaceum</i>	androsace buckwheat	ERIOAND	G4G5	S1S3		Red
<i>Euphagus carolinus</i>	Rusty Blackbird	B-RUBL	G4	S3S4B	SC (Apr 2006)	Blue
<i>Euphydryas gillettii</i>	Gillette's Checkerspot	IL-EUPGIL	G3	S2		Red
<i>Euptoieta claudia</i>	Variagated Fritillary	IL-EUPCLA	G5	S3N		Blue
<i>Eutrema salsugineum</i>	saltwater cress	EUTRSAL	G4G5	S1		Red
<i>Falco mexicanus</i>	Prairie Falcon	B-PRFA	G5	S1S2B	NAR (May 1996)	Red
<i>Falco peregrinus</i>	Peregrine Falcon	B-PEFA	G4	S3B	SC (Apr 2007)	No Status
<i>Falco peregrinus anatum</i>	Peregrine Falcon, <i>anatum</i> subspecies	B-PEFA-AN	G4T4	S27B	SC (Apr 2007)	Red
<i>Festuca minutiflora</i>	little fescue	FESTMIN	G5	S2S3		Blue
<i>Fluminicola fuscus</i>	Ashy Pebblesnail	IM-FLUFUS	G2	SH		Red
<i>Gastrocopta holzingeri</i>	Lambda Snaggletooth	IM-GASHOL	G5	S3?		Blue
<i>Gaura coccinea</i>	scarlet gaura	GAURCOC	G5	S1		Red
<i>Gayophytum humile</i>	dwarf groundsmoke	GAYOHUM	G5	S2S3		Blue
<i>Gayophytum racemosum</i>	racemed groundsmoke	GAYORAC	G5	S1		Red
<i>Gayophytum ramosissimum</i>	hairstem groundsmoke	GAYORAM	G5	S1		Red
<i>Gentiana affinis</i>	prairie gentian	GENTAFF	G5	S2S3		Blue
<i>Gentiana calycosa</i>	mountain bog gentian	GENTCAL	G4	S2S3		Blue
<i>Glyceria pulchella</i>	slender mannagrass	GLYCPUL	G5	S2S3		Blue
<i>Glycyrrhiza lepidota</i>	wild licorice	GLYCLEI	G5	S3		Blue
<i>Gomphus graslinellus</i>	Pronghorn Clubtail	IO-GOMGRA	G5	S2S3		Blue
<i>Grus canadensis</i>	Sandhill Crane	B-SACR	G5	S4B	NAR (May 1979)	Yellow
<i>Gulo gulo</i>	Wolverine	M-GUGU	G4	S3	SC (May 2003)	No Status
<i>Gulo gulo luscus</i>	Wolverine, <i>luscus</i> subspecies	M-GUGU-LU	G4T4	S3	SC (May 2003)	Blue
<i>Hedeoma hispida</i>	mock-pennyroyal	HEDEHIS	G5	S1		Red
<i>Helenium autumnale</i> var. <i>grandiflorum</i>	mountain sneezeweed	HELEAUT1	G5T3T5	S2S3		Blue
<i>Helianthus nuttallii</i> ssp. <i>rydbergii</i>	Nuttall's sunflower	HELINUT2	G5T5	S1		Red
<i>Hemphillia camelus</i>	Pale Jumping-slug	IM-HEMCAM	G4	S3		Blue
<i>Hesperia nevada</i>	Nevada Skipper	IL-HESNEV	G5	S3S4		Blue
<i>Heterocodon rariflorum</i>	heterocodon	HETERAR	G5	S3		Blue
<i>Hirundo rustica</i>	Barn Swallow	B-BASW	G5	S3S4B	T (May 2011)	Blue
<i>Hygroamblystegium noterophilum</i>		HYGRNOT	G4	S2		Red
<i>Hygrohypnum alpinum</i>		HYGRALI	G4G5	S3		Blue
<i>Hypericum scouleri</i> ssp. <i>nortoniae</i>	western St. John's-wort	HYPESCO1	G5T3T5	S2S3		Blue
<i>Impatiens ecalcarata</i>	spurless touch-me-not	IMPAECA	G3G4	S2S3		Blue
<i>Isoetes howellii</i>	Howell's quillwort	ISOEHOW	G4G5	S1		Red
<i>Juncus arcticus</i> ssp. <i>alaskanus</i>	arctic rush	JUNCARC1	G5T4T5	S2S3		Blue
<i>Juncus confusus</i>	Colorado rush	JUNCCON	G5	S1		Red
<i>Kootenaia burkei</i>	Pygmy Slug	IM-KOOBUR	G2	S1?	C (Jul 2011)	Red
<i>Lathyrus lanszwertii</i> var. <i>sandbergii</i>	pinewood peavine	LATHLAN1	G4	S1		Red
<i>Leptosiphon septentrionalis</i>	northern linanthus	LEPTSEP	G5	S3		Blue
<i>Lewisia triphylla</i>	three-leaved lewisia	LEWITRI	G4?	S2S3		Blue
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	IO-LIBPUL	G5	S3		Blue
<i>Lithobates pipiens</i>	Northern Leopard Frog	A-LIPI	G5	S1	E (Apr 2009)	Red
<i>Lomatium sandbergii</i>	Sandberg's desert-parsley	LOMASAN	G4	S3		Blue
<i>Lomatium triternatum</i> ssp. <i>platycarpum</i>	nine-leaved desert-parsley	LOMATRI1	G5T3T5	S2		Red
<i>Lupinus arbustus</i> ssp. <i>neolaxiflorus</i>	spurred lupine	LUPIARU1	G5T1T3	SH		Red
<i>Lupinus arbustus</i> ssp. <i>pseudoparviflorus</i>	Montana lupine	LUPIARU2	G5T2T3	S1		Red
<i>Lupinus bingenensis</i> var. <i>subsaccatus</i>	Suksdorf's lupine	LUPIBIN1	G4G5TNR	S2		Red
<i>Lycaena dione</i>	Dione Copper	IL-LYCDIO	G5	S2	C (Jul 2011)	Red
<i>Lycaena hyllus</i>	Bronze Copper	IL-LYCHYL	G5	S3		Blue
<i>Magnipelta mycophaga</i>	Magnum Mantleslug	IM-MAGMYC	G3	S2S3	SC (May 2012)	Blue
<i>Megalodonta beckii</i>	water marigold	MEGABEC	G4G5	S3		Blue
<i>Megascops kennicottii</i>	Western Screech-Owl	B-WSOW	G5	S4	T (May 2012)	No Status
<i>Megascops kennicottii macfarlanei</i>	Western Screech-Owl, <i>macfarlanei</i> subspecies	B-WSOW-MA	G5T4	S2	T (May 2012)	Red
<i>Melanerpes lewis</i>	Lewis's Woodpecker	B-LEWO	G4	S2B	T (Apr 2010)	Red
<i>Melica spectabilis</i>	purple oniongrass	MELISPE	G5	S2S3		Blue
<i>Mimulus breviflorus</i>	short-flowered monkey-flower	MIMUBRV	G4	S2S3		Blue
<i>Mimulus patulus</i>	stalk-leaved monkey-flower	MIMUPAT1	G3Q	S1S2		Red
<i>Minuartia austromontana</i>	Rocky Mountain sandwort	MINUAUS	G4	S2S3		Blue
<i>Minuartia elegans</i>	northern sandwort	MINUELE	G4G5	S2S3		Blue
<i>Minuartia nuttallii</i> ssp. <i>nuttallii</i>	Nuttall's sandwort	MINUNUT1	G5T4T5	S2S3		Blue
<i>Mnium arizonicum</i>		MNIUARI	G5?	S2S3		Blue
<i>Muhlenbergia andina</i>	foxtail muhly	MUHLAND	G4	S1		Red
<i>Muhlenbergia filiformis</i>	slender muhly	MUHLFIL	G5	S1		Red
<i>Myodes gapperi galei</i>	Southern Red-backed Vole, <i>galei</i> subspecies	M-MYGA-GA	G5TNRQ	S3S4		Blue
<i>Myotis lucifugus</i>	Little Brown Myotis	M-MYLU	G3	S4	E (Nov 2013)	Yellow
<i>Myotis septentrionalis</i>	Northern Myotis	M-MYSE	G1G3	S2S4	E (Nov 2013)	Blue

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<i>Myriophyllum ussuriense</i>	Ussurian water-milfoil	MYRIUSS	G3	S3		Blue
<i>Neotamias minimus oreocetes</i>	Least Chipmunk, <i>oreocetes</i> subspecies	M-NEMI-OR	G5T3	S3		Blue
<i>Neotamias minimus selkirki</i>	Least Chipmunk, <i>selkirki</i> subspecies	M-NEMI-SE	G5T1	S1		Red
<i>Neotamias ruficaudus ruficaudus</i>	Red-tailed Chipmunk, <i>ruficaudus</i> subspecies	M-NERU-RU	G5T5	S2		Red
<i>Numenius americanus</i>	Long-billed Curlew	B-LBCU	G5	S3B	SC (May 2011)	Blue
<i>Oeneis jutta chermocki</i>	Jutta Arctic, <i>chermocki</i> subspecies	IL-OENJUT-CH	G5T4Q	S3		Blue
<i>Oncorhynchus clarkii lewisi</i>	Cutthroat Trout, <i>lewisi</i> subspecies	F-ONCL-LE	G4T3	S3	SC (Nov 2006)	Blue
<i>Oreohelix strigosa</i>	Rocky Mountainsnail	IM-ORESTR	G5Q	S3S4		Blue
<i>Oreohelix subrudis</i>	Subalpine Mountainsnail	IM-ORESUB	G5	S3S4		Blue
<i>Orobanche corymbosa</i> ssp. <i>mutabilis</i>	flat-topped broomrape	OROBCOR1	G4T3?	S3		Blue
<i>Orobanche ludoviciana</i> var. <i>ludoviciana</i>	prairie broomrape	OROBLUD1	GNR	S1		Red
<i>Orthotrichum pallens</i>		ORTHPAL	G5	S3		Blue
<i>Otus flammeolus</i>	Flammulated Owl	B-FLOW	G4	S3S4B	SC (Apr 2010)	Blue
<i>Ovis canadensis</i>	Bighorn Sheep	M-OVCA	G4	S3		Blue
<i>Packera contermina</i>	high alpine butterweed	PACKCON	G3G4	S2S3		Blue
<i>Papaver pygmaeum</i>	dwarf poppy	PAPAPYG	G3	S2		Red
<i>Papilio machaon dadi</i>	Old World Swallowtail, <i>dadi</i> subspecies	IL-PAPMAC-DO	G5T4T5	S1		Red
<i>Pekania pennanti</i>	Fisher	M-PEPE	G5	S2S3		Blue
<i>Pellaea gastonyi</i>	Gastony's cliff-brake	PELLGAS	G2G3	S2S3		Blue
<i>Penstemon nitidus</i> var. <i>nitidus</i>	shining penstemon	PENSNIT1	G5T5	S1		Red
<i>Phacelia lyallii</i>	Lyall's phacelia	PHACLYA	G3	S2S3		Blue
<i>Physaria didymocarpa</i> ssp. <i>didymocarpa</i>	common twinpod	PHYSIDID1	G5T4	S2S3		Blue
<i>Physcomitrella patens</i>		PHYSPAT	G4	S2		Red
<i>Physcomitrium pyriforme</i>		PHYSPYR	G5	S3		Blue
<i>Phylla columbiana</i>	Rotund Physa	IM-PHYCOL	G2	SH		Red
<i>Pinguicula villosa</i>	hairy butterwort	PINGVIL	G4	S2S3		Blue
<i>Pinus albicaulis</i>	whitebark pine	PINUALB	G3G4	S2S3	E (Apr 2010)	Blue
<i>Pinus flexilis</i>	limber pine	PINUFLE	G4	S3		Blue
<i>Plagiobothrys hispidulus</i>	harsh popcornflower	PLAGHIS	G5	S2S3		Blue
<i>Plantago canescens</i>	arctic plantain	PLANCAN	G4G5	S1S3		Red
<i>Plantago eriopoda</i>	alkali plantain	PLANERI	G5	S3		Blue
<i>Plethodon idahoensis</i>	Coeur d'Alene Salamander	A-PLID	G4	S4	SC (Nov 2007)	Yellow
<i>Poa laxa</i> ssp. <i>banffiana</i>	Banff bluegrass	POA LAA1	G5?T1	SH		Red
<i>Pohlia longicollis</i>		POHLLOG	G4G5	S2		Red
<i>Polemonium elegans</i>	elegant Jacob's-ladder	POLEELE	G4	S2S3		Blue
<i>Polites themistocles themistocles</i>	Tawny-edged Skipper, <i>themistocles</i> subspecies	IL-POLTHE-TH	G5TNR	S3		Blue
<i>Polygonum austinae</i>	Austin's knotweed	POLYAUS	G5T4	S2S3		Blue
<i>Polygonum engelmannii</i>	Engelmann's knotweed	POLYENG	G5T3T5	S2S3		Blue
<i>Potamogeton strictifolius</i>	stiff-leaved pondweed	POTASTR	G5	S2S3		Blue
<i>Potentilla diversifolia</i> var. <i>perdissecta</i>	diverse-leaved cinquefoil	POTEDIV2	G5T4	S2S3		Blue
<i>Potentilla nivea</i> var. <i>pentaphylla</i>	five-leaved cinquefoil	POTENIV2	G5T4	S2S3		Blue
<i>Potentilla ovina</i> var. <i>ovina</i>	sheep cinquefoil	POTEV01	G5?T5?	S2S3		Blue
<i>Prenanthes sagittata</i>	arrow-leaved rattlesnake-root	PRENSAG	G3G4	S1		Red
<i>Pristioma chersinella</i>	Black-footed Tightcoil	IM-PRICHE	G3G4	S3S4		Blue
<i>Pterygoneurum kozlovii</i>	alkaline wing-nerved moss	PTERKOZ	G2G3	S2	T (Nov 2004)	Red
<i>Pyrgus communis</i>	Checkered Skipper	IL-PYRCOM	G5	S3		Blue
<i>Racomitrium pygmaeum</i>		RACOPYG	GU	S3?		Blue
<i>Rangifer tarandus</i>	Caribou	M-RATA	G5	S3		No Status
<i>Rangifer tarandus</i> pop. 1	Caribou (southern mountain population)	M-RATA-01	G5T2Q	S1	T (May 2000)	Red
<i>Recurvirostra americana</i>	American Avocet	B-AMAV	G5	S2S3B		Blue
<i>Salix boothii</i>	Booth's willow	SALIBOO	G5	S2S3		Blue
<i>Salvelinus confluentus</i>	Bull Trout	F-SACO	G4	S3S4	SC (Nov 2012)	Blue
<i>Schistidium atrichum</i>		SCHIATR	GNR	S1S3		Red
<i>Schistidium boreale</i>		SCHIBOR	GNR	S2S3		Blue
<i>Schistidium robustum</i>		SCHIROB	GNR	S2S3		Blue
<i>Schizachyrium scoparium</i>	little bluestem	SCHISCO	G5	S1		Red
<i>Scirpus pallidus</i>	pale bulrush	SCIRPAI	G5	S1		Red
<i>Seligeria tristichoides</i>		SELITRI	G4	S3		Blue
<i>Senecio hydrophiloides</i>	sweet-marsh butterweed	SENEHYR	G4G5	S1		Red
<i>Senecio megacephalus</i>	large-headed groundsel	SENEMEG	G4	S2S3		Blue
<i>Silene drummondii</i> var. <i>drummondii</i>	Drummond's campion	SILEDRU1	G5T5	S3		Blue
<i>Silene spaldingii</i>	Spalding's campion	SILESPA	G2	S1	E (May 2005)	Red
<i>Solidago nemoralis</i> ssp. <i>decemflora</i>	field goldenrod	SOLINEM4	G5T5	S2S3		Blue
<i>Speyeria aphrodite manitoba</i>	Aphrodite Fritillary, <i>manitoba</i> subspecies	IL-SPEAPH-MA	G5T5	S3		Blue
<i>Speyeria aphrodite whitehousei</i>	Aphrodite Fritillary, <i>whitehousei</i> subspecies	IL-SPEAPH-WH	G5T4	S2S3		Blue
<i>Speyeria mormonia euryname</i>	Mormon Fritillary, <i>euryname</i> subspecies	IL-SPEMOR-EU	G5TNR	S1S3		Red
<i>Sphaeralcea coccinea</i>	scarlet globe-mallow	SPHACOC	G5	S1		Red
<i>Sphenopholis intermedia</i>	slender wedgegrass	SPHEINT	G5	S3		Blue
<i>Sphenopholis obtusata</i>	prairie wedgegrass	SPHEOBT	G5	S1		Red
<i>Sphyrapicus thyroideus</i>	Williamson's Sapsucker	B-WISA	G5	S3B	E (May 2005)	Blue
<i>Sphyrapicus thyroideus nataliae</i>	Williamson's Sapsucker, <i>nataliae</i> subspecies	B-WISA-NA	G5TU	SNR	E (May 2005)	No Status
<i>Spizella breweri breweri</i>	Brewer's Sparrow, <i>breweri</i> subspecies	B-BRSP-BR	G5T4	S2B		Red
<i>Sporobolus compositus</i> var. <i>compositus</i>	rough dropseed	SPORCOM1	G5T5	S3		Blue
<i>Stellaria obtusa</i>	blunt-sepaed starwort	STELOBT	G5	S2S3		Blue
<i>Stuckenia vaginata</i>	sheathing pondweed	STUCVAG	G5	S2S3		Blue
<i>Symphotrichum ascendens</i>	long-leaved aster	SYMPASC	G5	S1S3		Red



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<i>Taxidea taxus</i>	American Badger	M-TATA	G5	S1	E (Nov 2012)	Red
<i>Thalictrum dasycarpum</i>	purple meadowrue	THALDAS	G5	S2S3		Blue
<i>Thermopsis rhombifolia</i>	prairie golden bean	THERRHO	G5	S1		Red
<i>Tortula obtusifolia</i>		DESMOBT	G5	S3		Blue
<i>Townsendia hookeri</i>	Hooker's townsendia	TOWNHOO	G5	S2		Red
<i>Townsendia parryi</i>	Parry's townsendia	TOWNPAR	G4?	S1		Red
<i>Trichophorum pumilum</i>	dwarf clubrush	TRICPUM	G5	S2S3		Blue
<i>Trisetum wolfii</i>	Wolf's trisetum	TRISWOL	G4	S2S3		Blue
<i>Ursus arctos</i>	Grizzly Bear	M-URAR	G4	S3	SC (May 2002)	Blue
<i>Vallonia cyclophorella</i>	Silky Vallonia	IM-VALCYC	G5	S3		Blue
<i>Valvata humeralis</i>	Glossy Valvata	IM-VALHUM	G5Q	SH		Red
<i>Veronica catenata</i>	pink water speedwell	VEROCAT	G5	S1		Red
<i>Warnstorfia pseudostraminea</i>		WARNPSE	G3G4	S3		Blue
<i>Wolffia borealis</i>	northern water-meal	WOLFBOR	G5	S2		Red
<i>Zacoleus idahoensis</i>	Sheathed Slug	IM-ZACIDA	G3G4	S1S3		Red

**Search Criteria**

Search Type: Plants & Animals  
 AND Species Groups: Vertebrate Animals OR  
 AND Forest Districts: Rocky Mountain Forest  
 Sort Order: Scientific Name Ascending

Scientific Name	English Name	Element Code	Global Status	Prov Status	BC List
<i>Abies lasiocarpa</i> / <i>Menziesia ferruginea</i> / <i>Equisetum arvense</i>	subalpine fir / false azalea / common horsetail	CEBC000345	GNR	S5	Yellow
<i>Abies lasiocarpa</i> / <i>Menziesia ferruginea</i> / <i>Rhytidiopsis robusta</i>	subalpine fir / false azalea / pipecleaner moss	CEBC000368	GNR	S5	Yellow
<i>Abies lasiocarpa</i> / <i>Menziesia ferruginea</i> - <i>Shepherdia canadensis</i>	subalpine fir / false azalea - soopolallie	CEBC000344	GNR	S5	Yellow
<i>Abies lasiocarpa</i> / <i>Menziesia ferruginea</i> / <i>Tiarella trifoliata</i>	subalpine fir / false azalea / three-leaved foamflower	CEBC000341	GNR	S5	Yellow
<i>Abies lasiocarpa</i> / <i>Menziesia ferruginea</i> / <i>Vaccinium scoparium</i>	subalpine fir / false azalea / grouseberry	CEBC000343	GNR	S5	Yellow
<i>Abies lasiocarpa</i> / <i>Rhododendron albiflorum</i> / <i>Dicranum fuscescens</i>	subalpine fir / white-flowered rhododendron / curly heron's-bill moss	CEBC000191	GNR	S5	Yellow
<i>Abies lasiocarpa</i> / <i>Rhododendron albiflorum</i> - <i>Paxistima myrsinites</i>	subalpine fir / white-flowered rhododendron - falsebox	CEBC000364	GNR	S5	Yellow
<i>Amelanchier alnifolia</i> / <i>Arctostaphylos uva-ursi</i>	saskatoon / kinnikinnick	CEBC002070	G4	S4	Yellow
<i>Amelanchier alnifolia</i> / <i>Pseudoroegneria spicata</i> - <i>Arctostaphylos uva-ursi</i>	saskatoon / bluebunch wheatgrass - kinnikinnick	C5B2BASAA1	GNR	S4	Yellow
<i>Betula nana</i> / <i>Carex aquatilis</i>	scrub birch / water sedge	CEBC003052	G4	S3	Blue
<i>Betula nana</i> / <i>Equisetum</i> spp.	scrub birch / horsetails	CEBC000400	GNR	S3	Blue
<i>Carex lasiocarpa</i> / <i>Drepanocladus aduncus</i>	slender sedge / common hook-moss	CEBC001013	G3	S3	Blue
<i>Carex nigricans</i> Herbaceous Vegetation	black alpine sedge Herbaceous Vegetation	CEBC002016	GNR	SNR	No Status
<i>Carex</i> spp. / <i>Sphagnum</i> spp.	sedges / peat-mosses	CEBC001009	GNR	SNR	No Status
<i>Carex utriculata</i> - <i>Carex aquatilis</i>	beaked sedge - water sedge	CEBC001017	G4	S4	Yellow
<i>Cassiope mertensiana</i> Herbaceous Vegetation	white mountain-heather Herbaceous Vegetation	CEBC002021	GNR	SNR	No Status
<i>Cetraria nivalis</i> - <i>Dryas octopetala</i>	ragged paperdoll - white mountain-avens	CEBC002026	GNR	SNR	No Status
<i>Danthonia intermedia</i> / <i>Cladina rangiferina</i>	timber oatgrass / reindeer lichen	CEBC003011	G3G4	S3S4	Yellow
<i>Danthonia intermedia</i> Herbaceous Vegetation	timber oatgrass Herbaceous Vegetation	CEBC002027	G2G3	SNR	No Status
<i>Deschampsia cespitosa</i> Community	tufted hairgrass Community	CEBC001019	G4	S3	Blue
<i>Distichlis spicata</i> var. <i>stricta</i> Herbaceous Vegetation	alkali saltgrass Herbaceous Vegetation	CEBC003108	GNR	S2	Red
<i>Dryas octopetala</i> - <i>Festuca altaica</i>	white mountain-avens - Altai fescue	CEBC002031	GNR	SNR	No Status
<i>Dryas octopetala</i> var. <i>hookeriana</i> Dwarf Shrubland	white mountain-avens Dwarf Shrubland	CEBC002030	GNR	SNR	No Status
<i>Equisetum fluviatile</i> - <i>Carex utriculata</i>	swamp horsetail - beaked sedge	CEBC003032	G4	S3	Blue
<i>Festuca altaica</i> - <i>Festuca brachyphylla</i>	Altai fescue - alpine fescue	CEBC002071	GNR	SNR	No Status
<i>Festuca brachyphylla</i> - <i>Phleum alpinum</i>	alpine fescue - alpine timothy	CEBC002040	GNR	SNR	No Status
<i>Festuca brachyphylla</i> Herbaceous Vegetation	alpine fescue Herbaceous Vegetation	CEBC002038	GNR	SNR	No Status
<i>Festuca campestris</i> - <i>Pseudoroegneria spicata</i>	rough fescue - bluebunch wheatgrass	CEBC000173	G4	S2	Red
<i>Juncus balticus</i> - <i>Carex praegracilis</i>	Baltic rush - field sedge	CEBC001025	G3G4	S3	Blue
<i>Koeleria macrantha</i> Herbaceous Vegetation	junegrass Herbaceous Vegetation	CEBC002044	GNR	SNR	No Status
<i>Luetkea pectinata</i> Herbaceous Vegetation	partridge-foot Herbaceous Vegetation	CEBC002047	GNR	SNR	No Status
<i>Phleum alpinum</i> - <i>Carex phaeocephala</i>	alpine timothy - dunhead sedge	CEBC002049	GNR	SNR	No Status
<i>Picea engelmannii</i> x <i>glauca</i> / <i>Betula nana</i> / <i>Carex</i> spp.	hybrid white spruce / scrub birch / sedges	CEBC000408	GNR	S4	Yellow
<i>Picea engelmannii</i> x <i>glauca</i> / <i>Equisetum</i> spp.	hybrid white spruce / horsetails	CEBC000025	GNR	S5	Yellow
<i>Picea engelmannii</i> x <i>glauca</i> / <i>Gymnocarpium dryopteris</i>	hybrid white spruce / oak fern	CEBC000030	GNR	S4	Yellow
<i>Picea engelmannii</i> x <i>glauca</i> - <i>Populus tremuloidea</i> / <i>Aralia nudicaulis</i>	hybrid white spruce - trembling aspen / wild sarsaparilla	C2A2BSXLO1	GNR	S2	Red
<i>Picea engelmannii</i> x <i>glauca</i> / <i>Ribes lacustre</i> / <i>Aralia nudicaulis</i>	hybrid white spruce / black gooseberry / wild sarsaparilla	C2A2BSXRL1	GNR	S3?	Blue
<i>Picea engelmannii</i> x <i>glauca</i> / <i>Shepherdia canadensis</i> - <i>Symphoricarpos albus</i>	hybrid white spruce / soopolallie - common snowberry	CEBC000406	GNR	S4	Yellow
<i>Picea engelmannii</i> x <i>glauca</i> / <i>Shepherdia canadensis</i> / <i>Vaccinium scoparium</i>	hybrid white spruce / soopolallie / grouseberry	CEBC000403	GNR	S4	Yellow
<i>Picea mariana</i> / <i>Carex aquatilis</i> / <i>Sphagnum</i> spp.	black spruce / water sedge / peat-mosses	CEBC000093	GNR	S3S4	Yellow
<i>Pinus contorta</i> / <i>Alnus viridis</i> ssp. <i>sinuata</i> / <i>Calamagrostis rubescens</i>	lodgepole pine / Sitka alder / pinegrass	CEBC000230	GNR	S3	Blue
<i>Pinus contorta</i> / <i>Juniperus communis</i> / <i>Arctostaphylos uva-ursi</i>	lodgepole pine / common juniper / kinnikinnick	CEBC000379	GNR	S4	Yellow
<i>Pinus contorta</i> / <i>Juniperus</i> spp.	lodgepole pine / junipers	CEBC000404	GNR	S4S5	Yellow
<i>Pinus contorta</i> / <i>Mahonia aquifolium</i> / <i>Calamagrostis rubescens</i>	lodgepole pine / tall Oregon-grape / pinegrass	CEBC000405	GNR	S4	Yellow
<i>Pinus ponderosa</i> - <i>Populus tremuloidea</i> / <i>Rosa woodsii</i>	ponderosa pine - trembling aspen / prairie rose	C1A9BPPPT1	GNR	S1	Red

Scientific Name	English Name	Element Code	Global Status	Prov Status	BC List
<i>Pinus ponderosa</i> / <i>Pseudoroegneria spicata</i> - <i>Lupinus sericeus</i>	ponderosa pine / bluebunch wheatgrass - silky lupine	CEBC000415	GNR	S2	Red
<i>Populus trichocarpa</i> / <i>Cornus stolonifera</i> - <i>Rosa nutkana</i>	black cottonwood / red-osier dogwood - Nootka rose	CEBC000883	GNR	S1S2	Red
<i>Populus trichocarpa</i> / <i>Symphoricarpos albus</i> - <i>Rosa</i> spp.	black cottonwood / common snowberry - roses	CEBC003093	GNR	S2	Red
<i>Pseudoroegneria spicata</i> - <i>Koeleria macrantha</i>	bluebunch wheatgrass - junegrass	CEBC000001	GNR	S3	Blue
<i>Pseudotsuga menziesii</i> / <i>Acer glabrum</i> - <i>Shepherdia canadensis</i>	Douglas-fir / Douglas maple - soopolallie	CEBC000342	GNR	S5	Yellow
<i>Pseudotsuga menziesii</i> / <i>Calamagrostis rubescens</i> - <i>Linnaea borealis</i>	Douglas-fir / pinegrass - twinflower	C2A2BCRLB1	GNR	S3	Blue
<i>Pseudotsuga menziesii</i> - <i>Larix occidentalis</i> / <i>Calamagrostis rubescens</i>	Douglas-fir - western larch / pinegrass	C2A2BPMSX1	GNR	S2	Red
<i>Pseudotsuga menziesii</i> / <i>Mahonia aquifolium</i> / <i>Cryptogramma acrostichoides</i>	Douglas-fir / tall Oregon-grape / parsley fern	CEBC000371	GNR	S2?	Red
<i>Pseudotsuga menziesii</i> / <i>Penstemon fruticosus</i> - <i>Calamagrostis rubescens</i>	Douglas-fir / shrubby penstemon - pinegrass	CEBC000229	GNR	S3	Blue
<i>Pseudotsuga menziesii</i> / <i>Symphoricarpos albus</i> / <i>Balsamorhiza sagittata</i>	Douglas-fir / common snowberry / arrowleaf balsamroot	CEBC000399	GNR	S2	Red
<i>Puccinellia nuttalliana</i> - <i>Hordeum jubatum</i>	Nuttall's alkaligrass - foxtail barley	CEBC001031	G3?	S2	Red
<i>Purshia tridentata</i> / <i>Pseudoroegneria spicata</i>	antelope-brush / bluebunch wheatgrass	CEBC000398	G3	S2	Red
<i>Salix barclayi</i> / <i>Carex</i> spp.	Barclay's willow / sedges	CEBC002054	GNR	SNR	No Status
<i>Salix barrattiana</i> - <i>Salix barclayi</i>	Barratt's willow - Barclay's willow	CEBC002055	GNR	SNR	No Status
<i>Salix barrattiana</i> Dwarf Shrubland	Barratt's willow Dwarf Shrubland	CEBC002056	GNR	SNR	No Status
<i>Salix brachycarpa</i> / <i>Festuca</i> spp.	short-fruited willow / fescues	CEBC002057	GNR	SNR	No Status
<i>Salix brachycarpa</i> / <i>Phleum alpinum</i>	short-fruited willow / alpine timothy	CEBC002058	GNR	SNR	No Status
<i>Salix cascadenis</i> Dwarf Shrubland	Cascade willow Dwarf Shrubland	CEBC002059	GNR	SNR	No Status
<i>Salix drummondiana</i> / <i>Calamagrostis canadensis</i>	Drummond's willow / bluejoint reedgrass	CEBC003063	G3	S2S3	Blue
<i>Salix nivalis</i> Dwarf Shrubland	dwarf snow willow Dwarf Shrubland	CEBC002060	GNR	SNR	No Status
<i>Schoenoplectus acutus</i> Deep Marsh	hard-stemmed bulrush Deep Marsh	CEBC001044	G5	S3	Blue
<i>Symphoricarpos occidentalis</i> / <i>Festuca idahoensis</i>	western snowberry - Idaho fescue	C5B2AFISO1	GNR	S2?	Red
<i>Thuja plicata</i> / <i>Oplopanax horridus</i> / <i>Athyrium filix-femina</i>	western redcedar / devil's club / lady fern	CEBC000031	GNR	S4	Yellow
<i>Thuja plicata</i> / <i>Paxistima myrsinites</i> - <i>Lonicera utahensis</i>	western redcedar / falsebox - Utah honeysuckle	CEBC000228	GNR	S3	Blue
<i>Thuja plicata</i> - <i>Tsuga heterophylla</i> / <i>Equisetum arvense</i>	western redcedar - western hemlock / common horsetail	CEBC000243	GNR	S3	Blue
<i>Thuja plicata</i> / <i>Vaccinium ovalifolium</i> / <i>Gymnocarpium dryopteris</i>	western redcedar / oval-leaved blueberry / oak fern	CEBC000383	GNR	S4	Yellow
<i>Trichophorum cespitosum</i> / <i>Campyllum stellatum</i>	tufted clubrush / golden star-moss	CEBC003049	G2G3	S2S3	Blue
<i>Tsuga heterophylla</i> / <i>Paxistima myrsinites</i>	western hemlock / falsebox	CEBC000238	GNR	S4S5	Yellow
<i>Tsuga heterophylla</i> - <i>Thuja plicata</i> / <i>Paxistima myrsinites</i> / <i>Pleurozium schreberi</i>	western hemlock - western redcedar / falsebox / red-stemmed feathermoss	CEBC000246	GNR	S4	Yellow
<i>Typha latifolia</i> Marsh	common cattail Marsh	CEBC001047	G5	S3	Blue

## Search Criteria

Search Type: Ecological Communities

AND Forest Districts:Rocky Mountain Forest District (DRM)

Sort Order:Scientific Name Ascending

**APPENDIX D**  
**POTENTIAL FOR FEDERALLY DESIGNATED PROJECT**

Table D-1 Potential for Federally Designated Project

Act	Evaluation Question	CMO Phase 2 Response	If Yes, Provide This Information	Information Provided
<i>Canadian Environmental Assessment Act, 2012 (CEA Act 2012) – General</i>	Is the project a designated activity under the CEA Act 2012 the <i>Regulations Designating Physical Activities (SOR/2012-147; current to November 13, 2013)</i> ?	Yes	Describe the activities that would result in an increase in the area of mine operations by 50% or more and a total coal production capacity of 3,000 t/d or more.	The project is a designated activity as per item 17(d) of the schedule of physical activities that elicit the CEA Act (2012). "The expansion of an existing coal mine that would result in an increase in the area of mine operations by 50% or more and a total coal production capacity of 3,000 t/d or more".  The current proposed footprint for the CMO2 pits and waste spoils is estimated at approximately 1,000 ha and there will likely be an additional 50 ha – 60 ha required for other mine operations. This would result in the total new disturbance of approximately 1,000 ha, an area which is more than 50% of the CMO land previously approved for disturbance.  Therefore, the project is expected to be a designated project under the CEA Act 2012; this Project Description has been prepared in accordance with the <i>Prescribed Information for the Description of a Designated Project (July 2012)</i> .
<i>Canadian Environmental Protection Act</i>	Would this Project involve any of the following activities: <ul style="list-style-type: none"> <li>Dredge or fill operations which would result in the disposal of dredged material at seas?</li> <li>Seafloor disturbance and/or the disposal of any substance at seas?</li> <li>Disposal of any other substance into marine waters?</li> </ul>	No	Not Applicable	Not Applicable
<i>Explosives Act</i>	Will the Project involve the manufacture and storage of explosives?	Yes	<ul style="list-style-type: none"> <li>Is a factory to make explosives required at or near the site?</li> <li>Will this Project use an existing factory licence for its operation?</li> <li>Will a temporary explosives factory be used for the Project?</li> </ul>	Explosives kept and/or stored on-site: <ul style="list-style-type: none"> <li>will be used and stored in accordance with the <i>BC Mines Regulation Act</i>; and</li> <li>will be stored within an existing licensed explosives storage facility at CMO, until new magazines are established at the CMO2 site.</li> </ul> There is a requirement to modify existing licenses held by CMO in order to relocate the storage magazine of explosives to CMO2.
<i>Fisheries Act</i>	Are fish (including aquatic species at risk) present at the site, upstream, or downstream?	Yes	Describe what measures are being considered to avoid and mitigate serious harm to fish. When unable to completely avoid or mitigate serious harm to fish, the project will require authorization under Subsection 35(2) of the <i>Fisheries Act</i> .	Westslope cutthroat trout ( <i>Oncorhynchus clarki lewisii</i> ) and bull trout ( <i>Salvelinus confluentus</i> ) are the dominant fish species present within the streams of the study area. Westslope cutthroat trout have been documented within the project area. Westslope cutthroat trout, British Columbia population, is protected under the federal <i>Species at Risk Act</i> (SARA) (status on Schedule 1 is Special Concern). Provincially, both species are blue listed, considered to be of special concern. Mining activities will occur in the upper watersheds of Wheeler Creek, Little Wheeler Creek, Snowslide Creek, and Carbon Creek. All watersheds contain fish habitat and are fish bearing within at least the first few reaches.  Potential mitigation measures may include implementing a drainage closure plan consistent with end land-use objectives and maintaining stream flows and habitat values where possible. Teck will also develop and, as appropriate, participate in a regional fish habitat management plan. Reclamation and closure planning will ensure that long-term erosion and water quality objectives are designed to mitigate potential effects.  A request for authorization from the Fisheries and Oceans Canada (DFO) will be prepared when it is not possible to avoid and mitigate impacts of projects that are likely to cause serious harm to fish. The application for authorization will include information requirements and documentation that must be submitted by an applicant requesting such an authorization such as: <ul style="list-style-type: none"> <li>Description of proposed work, undertaking or activity;</li> <li>Description of fish and fish habitat (aquatic environment);</li> <li>Description of effects on fish and fish habitat;</li> <li>Measures and standards to avoid or mitigate serious harm to fish;</li> <li>Residual serious harm to fish;</li> <li>Offsetting plan; and</li> <li>Letter of credit.</li> </ul>
	Is fish habitat present at the site, upstream, or downstream?	Yes	Describe what measures are being considered to avoid and mitigate serious harm to fish. When unable to completely avoid or mitigate serious harm to fish, the project will require authorization under Subsection 35(2) of the <i>Fisheries Act</i> .	
	Will the project obstruct fish passage, modify flow or result in the entrainment of fish?	Yes	Projects that have the potential to obstruct fish passage, modify flow or result in the entrainment of fish may also cause serious harm to fish. Describe these activities. An authorization under Subsection 35(2) of the <i>Fisheries Act</i> is required	
	<ul style="list-style-type: none"> <li>Will any of the components or activities associated with the Project cause serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery. Serious harm to fish which is defined in the Act as "the death of fish or any permanent alteration to, or destruction of, fish habitat."</li> </ul>	Yes	Describe what measures are being considered to avoid and mitigate serious harm to fish. When unable to completely avoid or mitigate serious harm to fish, the project will require authorization under Subsection 35(2) of the <i>Fisheries Act</i> .	
<i>Metal Mining Effluent Regulations</i>	Does the development involve the proposed deposit in waters frequented by fish of effluent or waste rock as provided for under the <i>Metal Mining Effluent Regulations</i> ?	No	Not Applicable	Not Applicable – Coal mines do not fall under the jurisdiction of the <i>Metal Mining Effluent Regulations</i>
<i>Migratory Birds Convention Act 1994</i>	Are any federally protected migratory birds or their nest in waters or areas affected by the project?	Yes	Describe which protected species are found in the project area and what measures are being taken to avoid harm and disruption to the birds and their nests.	The Olive-sided Flycatcher ( <i>Contopus cooperi</i> ), American dipper ( <i>Cinclus mexicanus</i> ), and Harlequin Duck ( <i>Histrionicus histrionicus</i> ) are federally protected migratory birds. These three species are known to migrate through the proposed project area and have therefore been selected as valued components as part of the wildlife environmental assessment study.

Table D-1 Potential for Federally Designated Project (continued)

Act	Evaluation Question	CMO Phase 2 Response	If Yes, Provide This Information	Information Provided
<i>Navigation Protection Act</i> <sup>(a)</sup>	Are new works or undertakings proposed to take place in, on, over, under, through or across any navigable water?	To be determined by Transport Canada	<ul style="list-style-type: none"> <li>• Description of work (e.g., bridge, boom, dam, culvert) including approximate dimensions</li> <li>• Description of any associated activities (e.g., dredging, alteration of water bed and/or water banks)</li> <li>• Description of any ancillary and temporary works (e.g., cofferdams, detours, fencing or temporary bridged) including approximate dimensionsName of watercourse or waterbody</li> <li>• How water flow and level will be altered</li> <li>• If the size of vessel to be handled at any proposed marine terminal will be larger than 25,000 dead weight tonnes (DWT)</li> <li>• Measures being completed to avoid affecting navigation</li> <li>• Contingency plans for horizontal direct drilling</li> <li>• Any known navigational use of the watercourse or waterbody</li> <li>• Photos taken upstream, downstream and across the watercourse or water body of proposed crossing</li> </ul>	<p>To facilitate project development it will be necessary to construct a new bridge over Michel Creek. The bridge will be a two lane structure capable of handling loads imposed by highway legal trucks.</p> <p>Works and activities proposed for the Project will be reviewed to evaluate whether an application under the <i>Navigation Protection Act</i> will be required. This information will be communicated with Transport Canada to confirm the need for review.</p>
	Are existing works that were not previously authorized under the Navigable Waters Protection Act to be modified on a watercourse or waterbody?	No	Not Applicable	Not Applicable
<i>Species at Risk Act (SARA)</i>	<p>Are new works or undertakings proposed, which may kill, harm, harass, capture or take an individual (any animal plant or thing that is represented to be an individual) that is listed as an extirpated species, an endangered species or a threatened species?</p> <p>Are new works or undertakings proposed, which may damage or destroy the residence of one or more individuals (any animal plant or thing that is represented to be an individual) that is listed as an extirpated species, an endangered species or a threatened species?</p>	Yes	<p>Describe what measures are being considered to avoid and mitigate serious harm to species (and their residence) at risk.</p> <p>When unable to completely avoid or mitigate serious harm to species at risk, the project will require written notification to the SARA competent minister(s) as outlined in the <i>Species at Risk Act</i>.</p>	<p>Federally, species ranking is conducted by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), established under Section 14 of the <i>Species at Risk Act (SARA)</i>. Schedule 1 of SARA provides the official list of species at risk.</p> <p>Element occurrences have been researched by searching the British Columbia Conservation Data Centre (CDC). Species and Ecosystems Explorer for the Rocky Mountain Forest District produced 243 listings of provincially designated, red-listed or blue-listed and legally designated vegetation and wildlife species as outlined in section 3.2.4 of the CMO2 Project description.</p>

<sup>(a)</sup> *Navigable Waters Protection Act* was replaced with *Navigation Protection Act* in the spring 2014. As this project will not be seeking approval before the spring 2014 only the NPA needs to be considered.

Note: Table adapted from the Guide to Preparing a Project Description for a Major Resource Project (Major Projects Management Office [MPMO] 2008).

km = kilometre.

**APPENDIX E**  
**CONSULTATION**

Appendix E represents a summary of Teck Coal Limited’s (Teck) consultation and engagement activities to date with Aboriginal groups, the public, and other parties. The responses provided to the Communities of Interest during the consultation and engagement activities reflect the best available information at the time of the specific consultation activity. Certain project components have since been added and/or altered since some of those meetings and may undergo further modification as the Coal Mountain Phase 2 (CMO2) Project develops. Teck will follow-up with the Aboriginal groups, public, and other parties to relay any pertinent updates to existing information.

The engagement to date has included organized data gathering sessions, individual one-on-one meetings, informal meetings, and open houses.

## **1 CONSULTATION WITH ABORIGINAL GROUPS**

### **1.1 INTRODUCTION TO KTUNAXA NATION COUNCIL (APRIL 2013)**

**Table 1.1 Questions/Comments during the Project Presentation with the Ktunaxa Nation Council (April 2013)**

<b>Question/Comment</b>	<b>Response</b>
Ktunaxa Nation Council (KNC) is interested in receiving LiDAR and Orthophoto of the Project area	<ul style="list-style-type: none"> <li>Teck will provide mapping information as it becomes available.</li> </ul>
KNC is interested in knowing the groundwater recharge rates in the Project area.	<ul style="list-style-type: none"> <li>Teck is currently conducting groundwater baseline activities to be followed by effects assessments. This information will be made available once complete.</li> </ul>
KNC would like to see the rationale for the final choice of raw coal transportation option.	<ul style="list-style-type: none"> <li>This will be further defined through the pre-feasibility and feasibility processes and information will be provided once available.</li> </ul>
The KNC would like to be kept up to date as Project proceeds, though are also currently engaged with other Teck Projects.	<ul style="list-style-type: none"> <li>Acknowledged by Teck.</li> </ul>



## 1.2 KTUNAXA NATION COUNCIL LANDS AND RESOURCES AGENCY CHAPTER C PLANNING MEETING (MARCH 2014)

**Table 1.2 Questions/Comments during the Project Presentation with the Ktunaxa Nation Council Lands and Resources Agency Chapter C Planning Meeting (February 2014)**

Question/Comment	Response
How does Dominion Coal Block (DCB 73) fit into Coal Mountain Operations Phase 2 (CMO2) Project mine design?	<ul style="list-style-type: none"> <li>DCB 73 is not part of CMO2 mine design. Should DCB come up for sale, and should Teck bid and become the successful buyer, the appropriate studies would be undertaken to evaluate development within the DCB.</li> </ul>
Significant environmental impact due to CMO2 being a greenfield development and significant environmental studies need to be done.	<ul style="list-style-type: none"> <li>Continued engagement with KNC representatives is planned to go over baseline work plans and reports. KNC will be actively involved in Environmental Assessment process.</li> </ul>
CMO2 will have feedback from Ktunaxa citizens due to greenfield and other objections. May need to have separate engagement strategy.	<ul style="list-style-type: none"> <li>Teck is open to specialized engagement and continued consultation, and will explore this suggestion further.</li> </ul>
Teck suggested a draft engagement process to ensure both parties understand the expectation for information exchange as the Project develops.	<ul style="list-style-type: none"> <li>Teck to draft for KNC review.</li> </ul>
Which facilities will stay at CMO and which will stay at CMO2?	<ul style="list-style-type: none"> <li>A majority of the facilities will remain at CMO, but a smaller maintenance facility will need to be built at CMO2.</li> </ul>
Are water treatment facilities envisioned?	<ul style="list-style-type: none"> <li>At this time, water treatment facilities are being considered within the mine design. The Elk Valley Water Quality Plan will provide guidance on water management for all mines in the Elk Valley and CMO2 will fit within those parameters.</li> </ul>

## 2 CONSULTATION WITH THE PUBLIC

### 2.1 MEETING WITH HOSMER RESIDENT (DECEMBER 2012)

**Table 2.1 Questions/Comments during the Project Presentation with a Hosmer Resident (2012)**

Question/Comment	Response
The community feels it is very important to keep the drinking water potable.	<ul style="list-style-type: none"> <li>The Project footprint will not extend into the Hosmer Creek and groundwater impacts to Hosmer are not anticipated. Teck's consulting team will be conducting baseline activities and effects assessments to confirm.</li> </ul>
A good community engagement Project would be to convert the beta video to digital format, and to create a more lasting record of the Hosmer Heritage Restoration Project.	<ul style="list-style-type: none"> <li>This was completed by Teck in early 2013.</li> </ul>
Heard about CMO2 from his concerned neighbour.	<ul style="list-style-type: none"> <li>Teck will conduct information sessions and micro engagement (one-to-one contact with individuals) in Hosmer.</li> </ul>

### 2.2 HOSMER OPEN HOUSE (SEPTEMBER 11, 2013)

**Table 2.2 Questions/Comments during the Project Presentation at Hosmer Open House (September 11, 2013)**

Question/Comment	Response
Corbin residents - concern over potential impact of CMO2 (transportation options).	<ul style="list-style-type: none"> <li>As part of the planning process, Teck will consider mitigation needed for final raw coal transportation option.</li> <li>Teck will speak to residents about decisions re: transportation options.</li> <li>Teck will consult with the public and determine the best manner of regular communication (mail-outs /letters through door, personal contact, or other).</li> </ul>
Hosmer resident – concern there was going to be more rail traffic through Hosmer due to CMO2.	<ul style="list-style-type: none"> <li>Informed open house attendees that Hosmer rail traffic would likely not increase significantly should the production rates remain similar to current operations.</li> </ul>
A resident was worried about the transport of coal back to CMO, if the new coal haul road option was chosen he would dispute it. Significant concerns around the raw coal transportation options from other members in attendance.	<ul style="list-style-type: none"> <li>Representatives of Teck spoke one-on-one with each of the individuals on this subject:                             <ul style="list-style-type: none"> <li>Suppression of dust</li> <li>Mitigate noise impacts</li> </ul> </li> <li>Design the raw coal transportation in a fashion that would minimize footprint and impacts near homes.</li> </ul>
Residents from Corbin concerned with the prospect of having the coal transported from CMO2 to CMO via a dedicated haul road. They felt there would be a significant dusting problem and much preferred the rail option.	<ul style="list-style-type: none"> <li>Acknowledged by Teck.</li> </ul>
Corbin resident “I don't know what you do up there [at CMO] – I've never seen it. I don't expect a phone call every week; I just want to know if something is changing.”	<ul style="list-style-type: none"> <li>Spoke with Teck representative: Afterwards said “Thank you for listening – I appreciated that, all I wanted was for someone to listen to what I had to say.”</li> </ul>
Hosmer residents asking if water supply will be affected by CMO2.	<ul style="list-style-type: none"> <li>Teck is working with Lotic to get information. Water supply not predicted to change, completing baseline studies and effects assessments to confirm.</li> </ul>
Residents are also wondering about impacts to water quality in Hosmer Creek.	<ul style="list-style-type: none"> <li>We do not anticipate impacts to Hosmer Creek. As a precaution we have been sampling Hosmer Creek to assess background and ensure there are no impacts.</li> </ul>
Hosmer resident – wanted to know when the water quality testing will next take place at Hosmer Creek?	<ul style="list-style-type: none"> <li>A date and location was provided to the resident for the next water quality sampling event.</li> </ul>

## Teck Coal Limited: Coal Mountain Phase 2 Project Description

Question/Comment	Response
Residents asked if the project will affect their water supply.	<ul style="list-style-type: none"> <li>Explained the geosyncline structure and likelihood nothing would change. Currently completing baseline studies followed by effects assessments to confirm.</li> </ul>
Hosmer residents concerned about visibility from Highway 3.	<ul style="list-style-type: none"> <li>After the final mine plan is completed, Teck will ensure we have projected visual impact images before the next public consultation event.</li> </ul>
A resident expressed disappointment that the mine would now be visible from the Elk Valley.	<ul style="list-style-type: none"> <li>The Project will not be visible from Hosmer but possibly further north along Highway 3. Only a small portion of the ridge will be removed and no waste will be placed at this location.</li> </ul>
Hosmer resident asking if twinning of railway line by Hosmer is due to CMO2.	<ul style="list-style-type: none"> <li>Canadian Pacific Railway Ltd. (CP) has increased siding lengths to accommodate longer trains per the Teck/CP 10-year agreement.</li> </ul>
Questions from snowmobilers about opportunity to sled at CMO2 this winter.	<ul style="list-style-type: none"> <li>Visited local snowmobile clubs in early winter to ensure people understand the no access boundary and where recreational activities could still occur on Teck fee simple land.</li> </ul>
Resident of Crowsnest Pass has a cabin at Grave Lake. Concerned about loss of snowmobile access to Little Wheeler Canyon (from Coal Leach Road).	<ul style="list-style-type: none"> <li>Teck Safety Superintendent took him for a drive to look at the area September 12th.</li> </ul>
Residents had concerns over the transportation method and more dust in Corbin.	<ul style="list-style-type: none"> <li>Acknowledged by Teck, will provide updates on transportation planning once further information is available.</li> </ul>
Question regarding free-grazing cattle in strip between power line and (Wheeler?) Creek South Access Road.	<ul style="list-style-type: none"> <li>Teck to arrange for Community and Aboriginal Affairs team representative to liaise with them on this ongoing issue.</li> </ul>

## 2.3 SUMMARY OF OUTDOOR RECREATION, TRAPPING AND TOURISM IN SPARWOOD AND CROWSNEST PASS (DECEMBER 11-12, 2013)

### 2.3.1 Introduction

Teck and Golder Associates Ltd. (Golder) conducted a program in December 2013 to gather information and data for the Land Use and Tenure baseline report for Teck's CMO2 Project.

The program consisted of mapwork, interviews, and question and answer sessions during the evenings of December 11 and 12, 2013, in a Teck Sparwood office and the Crowsnest Pass Sports Complex respectively. Local land users who had specialized knowledge and experience of outdoor recreation, trapping, and tourism resources and activities in the vicinity of the Project were invited to attend these sessions. The sessions began with a short presentation by Teck on the CMO2 Project, during which questions from participants were invited and addressed. This was followed by a brief introduction to the BC Government's Environmental Assessment (EA) process and the related activities to be completed. The remainder of each evening's session consisted of mapwork activities and discussion of the location, type and amount of outdoor recreation and tourism activities in the vicinity of the Project.

The purpose of this component of Appendix E is to summarize the notes recorded during these program sessions.

### 2.3.2 Attendees and Disclosure

The local residents who attended the two sessions are listed in Table 2.3.

**Table 2.3 Meeting Attendees, Group Meeting with Outdoor Recreation, Trapping and Tourism Sector Participants (December 11-12, 2013)**

Name	Organization
<b>Sparwood Session</b>	
Jeff Adams	Elk Valley Mountaineers
Norris Fedorek	Elk Valley Mountaineers
Jason Bursey	Elk Valley Mountaineers
Phill Taylor	Elkford ATV Club
Kevin Marasco	Fernie Rod and Gun Club
Matt Huryn	Sparwood Fish and Wildlife Association
Sam Medcalf	Sparwood Fish and Wildlife Association
James Bonnell	Elkford Rod and Gun Club
Bob Cutts	Fernie Independent Trapper
Paul Samycia	Elk River Guiding Company
Spencer Schey	Freestone Fly Angler
Joe Caravetta	BC Ministry of Environment
Frank deBoon	BC Ministry of Environment
Scott Robinson	Fernie Search and Rescue
<b>Crowsnest Pass Session</b>	
Doug Cox	Crow Snow Riders
Daryl Ferguson	Crowsnest Pass Quad Squad
Joe Lumley	Crowsnest Pass Quad Squad
Brian Vander Linden	Hillcrest Fish and Game Association
Colton Newton	Hillcrest Fish and Game Association

A representative from each group signed a consent form allowing the use of their information in the EA, and completed a seasonal use calendar.

### 2.3.3 Project Questions and Responses

Based on the presentation delivered by Teck, questions and comments regarding the CMO2 Project with regards to the land use discipline are summarized in Table 2.4.

**Table 2.4 Questions/Comments during the Project Presentation with the Outdoor Recreation, Trapping and Tourism Sector Participants (December 11-12, 2013)**

Question/Comment	Response
Will the CMO2 Project footprint increase from the current plan presented today?	<ul style="list-style-type: none"> <li>The footprint is currently not anticipated to increase.</li> <li>The no-access area will likely be modified, but will be increased as little as possible.</li> </ul>
Access to clearcuts (which are good for hunting)?	<ul style="list-style-type: none"> <li>Access to clearcuts not expected to change dramatically.</li> </ul>
Lifespan for the CMO2 Project?	<ul style="list-style-type: none"> <li>Currently expecting a lifespan of approximately 30 years, but could be as little as 22 years depending on annual extraction rates.</li> </ul>
Status of the Dominion Blocks?	<ul style="list-style-type: none"> <li>It is our understanding that the Federal Government is investigating the sale of both Parcels, 73 and 82.</li> <li>There is a covenant on the development of Parcel 82.</li> <li>It is not known if Teck will purchase any portions of these lands.</li> <li>Teck is unable to verify the rumour that Parcel 82 might go back to the province.</li> </ul>
Impacts to creeks?	<ul style="list-style-type: none"> <li>It is anticipated that Little Wheeler and Wheeler Creeks will be impacted, and that Snowslide Creek will be less impacted.</li> <li>Clean water diversions would play a big role.</li> <li>Teck wants to minimize flow impacts to creeks so as to limit impacts on fish and fish habitat.</li> </ul>
Disruptions to elk?	<ul style="list-style-type: none"> <li>Teck is conducting studies on elk, including counts and winter tracking.</li> </ul>
How will the impact to bears of traffic along Corbin Road be modeled?	<ul style="list-style-type: none"> <li>Teck is unsure at the moment, but recognize this is a significant issue.</li> <li>Teck will be addressing this issue through further baseline studies and effects assessments.</li> </ul>
Access to Corbin Road?	<ul style="list-style-type: none"> <li>Teck cannot prevent access to Corbin Road as people have homes in Corbin.</li> <li>Highway haul is best transport option at lower production levels.</li> <li>Teck needs to investigate how it would manage traffic if highway haul option used, as well as impacts to wildlife and human access corridors.</li> </ul>
Selenium effects on terrestrial life and human health?	<ul style="list-style-type: none"> <li>Teck is not aware of any comprehensive study done to date.</li> </ul>
The CMO2 Project is located in an area that is frequented by local snowmobilers, ATV riders, hunters, anglers and mountain bike riders, largely due to its proximity to Crowsnest Pass and the Elk Valley communities, abundance of access roads and clearcuts. There are a limited number of other recreational areas in the region with a similar level of accessibility as the CMO2 site.	<ul style="list-style-type: none"> <li>Acknowledged by Teck.</li> </ul>

### 3 CONSULTATION WITH OTHER PARTIES

#### 3.1 INTRODUCTION

Teck and Golder conducted a consultation program with the Districts of Elkford and Sparwood, the Regional District of East Kootenay, the City of Fernie, and the Municipality of Crowsnest Pass in November 2013, December 2013, and February 2014 to gather information and data for the socioeconomic baseline report. This report will be integrated into the Socio-Community Health and Well-being and Sustainable Economy sections of the EAC Application for Teck's CMO2 Project.

The information provided by the participants is their personal opinion and not the position of their Councils. The representatives who attended the meetings are listed in Tables 3.2.1 – 3.5.1. All participants (Tables 3.2.1 - 3.5.1) provided their consent for a recording of the facilitated discussion to be made.

During these meetings, a presentation was given describing the CMO2 Project followed by a summary on the EA process and the socio-economic discipline. The primary purpose of the socioeconomic component of the EA is to describe all relevant issues (positive and negative) to regulators and provide an opportunity for representatives of the community to present their input and perspectives on the CMO2 Project.

Based on the presentations, questions and comments about the Project or the socio-economic discipline are included in Tables 3.2.2 – 3.5.2, and 3.6.

#### 3.2 SUMMARY OF GROUP MEETING WITH THE DISTRICT OF ELKFORD (NOVEMBER 12, 2013)

**Table 3.2.1 Meeting Attendees, Group Meeting with the District of Elkford (November 12, 2013)**

Name	Position	Organization
Dean McKerracher	Mayor	District of Elkford
Ken Wildeman	Councillor	District of Elkford
Joe Zarowny	Councillor	District of Elkford
Steve Fairbairn	Councillor	District of Elkford
Mandy McGregor	Councillor	District of Elkford
Nicole Klein	Youth Representative	District of Elkford
Curtis Helgesen	CAO	District of Elkford
Garity Stanley	Director, Leisure Services	District of Elkford
Dorothy Szawlowski	Assistant Corporate Officer	District of Elkford

**Table 3.2.2 Questions/Comments during the Project Presentation with the District of Elkford (November 12, 2013)**

Question/Comment	Response
Concern about road and traffic safety.	<ul style="list-style-type: none"> <li>There is a bus service to CMO and this is planned to continue for the CMO2 extension.</li> </ul>
Is selenium present in the CMO2 project?	<ul style="list-style-type: none"> <li>CMO2 will produce selenium.</li> <li>Teck is still getting results on this research.</li> </ul>
Neighbours can work together. Is there an opportunity to combine development efforts with local coal mining competitors?	<ul style="list-style-type: none"> <li>Crowsnest Pass Coal Mining Ltd. is doing some exploration.</li> <li>Competitors may be waiting for the results of the Elk Valley Water Quality Plan before moving ahead.</li> <li>Competitors may not be in a position to commit at this time.</li> <li>Our competitors have purchased land close to us.</li> </ul>
For transportation, what options would be less affected by a high rainfall event?	<ul style="list-style-type: none"> <li>The conveyor and rail are less likely to be affected.</li> </ul>
Some concern was raised during the presentation given by Golder about how the economic impact assessment would account for higher than average retail leakages to Alberta and US.	<ul style="list-style-type: none"> <li>The British Columbia Input-Output Model (BCIOM) which will be used for the assessment has a base leakage amount that accounts for imports, and that this amount can be adjusted when necessary.</li> </ul>

### 3.3 SUMMARY OF GROUP MEETING WITH THE CITY OF FERNIE (NOVEMBER 12, 2013)

**Table 3.3.1 Meeting Attendees, Group Meeting with the City of Fernie (November 12, 2013)**

Name	Position	Organization
Mary Giuliano	Mayor	District of Fernie
Phil Iddon	Councillor	District of Fernie
Joni Krats	Councillor	District of Fernie
Randal Macnair	Councillor	District of Fernie
Dan McSkimming	Councillor	District of Fernie
Willard Ripley	Councillor	District of Fernie
Joe Warshawsky	Councillor	District of Fernie
Bruce Lennox	Director of Planning	District of Fernie
Sheryl Zral	Staff	District of Fernie
Jim Hendricks	CAO	District of Fernie

**Table 3.3.2 Questions/Comments during the Project Presentation with the City of Fernie (November 12, 2013)**

Question/Comment	Response
How far is air quality measured? Data would be useful for Fernie.	<ul style="list-style-type: none"> <li>• Currently air monitoring for gases in Sparwood.</li> <li>• There is also a station in Hosmer for CMO2.</li> <li>• Currently there is no baseline data in Fernie.</li> </ul>
Are the coal seams for CMO2 of similar quality?	<ul style="list-style-type: none"> <li>• Teck has completed a large diameter drill program and should have results back end of January.</li> </ul>
What are the impacts to Hosmer Ridge?	<ul style="list-style-type: none"> <li>• The open house in Hosmer raised concerns from public should significant mining occur on Hosmer Ridge.</li> <li>• Teck will continue to work with communities.</li> </ul>
Will it be visible from Ridgmont?	<ul style="list-style-type: none"> <li>• The proposed Projects are a significant distance apart, and are likely not visible from one another.</li> <li>• Teck is conducting a visual effects assessment to confirm.</li> </ul>
Transport of coal?	<ul style="list-style-type: none"> <li>• The Project will either have a stockpile or breaker at Wheeler Creek.</li> <li>• Under the current plan, a coal stockpile will be created on flat area near the entrance to the Project.</li> </ul>
Measure fugitive emissions such as methane?	<ul style="list-style-type: none"> <li>• This might be a possibility, though determining how localized the emissions may be is challenging.</li> </ul>
Is it possibility to extract methane beforehand?	<ul style="list-style-type: none"> <li>• Presently not sure mining practices will allow that, and currently there are no plans to do so.</li> </ul>
What is the station at MW ridge?	<ul style="list-style-type: none"> <li>• It is likely a weather station. This station does not belong to Teck.</li> </ul>
Impact to Hosmer residents that get water from Hosmer Creek?	<ul style="list-style-type: none"> <li>• Teck is currently monitoring Hosmer Creek as a precaution.</li> <li>• Teck is not predicting impacts, and is completing baseline studies followed by effects assessments to confirm this assumption is accurate.</li> </ul>
Impact to wetlands near Hosmer?	<ul style="list-style-type: none"> <li>• The EA needs to be complete to determine impacts, but not expecting effects at these areas.</li> </ul>
CMO2 is closer to Fernie /Hosmer than CMO, what are the expected environmental changes to Fernie/Hosmer?	<ul style="list-style-type: none"> <li>• Teck is looking at this issue thoroughly, though not expecting significant environmental changes to Fernie or Hosmer.</li> </ul>
Working with the province on highways?	<ul style="list-style-type: none"> <li>• From a Project impacts standpoint, looking at a few different options for CMO2.</li> <li>• Teck may eventually undertake responsibility for Corbin Road, which would require upgrades.</li> <li>• Will take additional bussing forward as a possible Project development option.</li> </ul>
How will Teck deal with dust/mitigation?	<ul style="list-style-type: none"> <li>• Acknowledged by Teck; mitigation plan is to be developed through future stages of Project development.</li> </ul>
It is important that CMO2 maintain its workforce	<ul style="list-style-type: none"> <li>• Acknowledged by Teck.</li> </ul>
Some concern was raised during the presentation by Golder regarding the local study area communities and that these lesser affected communities (i.e., Cranbrook) would get more benefit from the Project than other more affected communities.	<ul style="list-style-type: none"> <li>• It was clarified that the socio-economic assessment was not a reflection of how much influence a given community would have in the Project.</li> </ul>



### 3.4 SUMMARY OF GROUP MEETING WITH THE DISTRICT OF SPARWOOD (NOVEMBER 15, 2013)

**Table 3.4.1 Meeting Attendees, Group Meeting with the District of Sparwood (November 15, 2013)**

Name	Position	Organization
Lois Halko	Mayor	District of Sparwood
Margaret McKie	Councillor	District of Sparwood
Ron (Sonny) Saad	Councillor	District of Sparwood
Sharon Fraser	Councillor	District of Sparwood
Harold (Hungry) Baytaluke	Councillor	District of Sparwood
Jude Smith	Business Development Liaison	District of Sparwood
Barb Nunes	Director of Finance	District of Sparwood
Terry Melcer	CAO	District of Sparwood
Nelson Wight	Planning	District of Sparwood

**Table 3.4.2 Questions/Comments during the Project Presentation with the District of Sparwood (November 15, 2013)**

Question/Comment	Response
Commented that CMO2 site is currently used for hunting.	<ul style="list-style-type: none"> <li>Acknowledged by Teck.</li> </ul>
Councillors commented that Corbin Rd has 1 to 4, year-round residents, and had concern how Project would affect them.	<ul style="list-style-type: none"> <li>Teck is communicating with the residents and will make best efforts to address any potential issues.</li> </ul>
Councillor commented that people remember the effects from previous mining projects that required the relocation of small communities.	<ul style="list-style-type: none"> <li>Acknowledged by Teck.</li> </ul>
Concern around CO2 emissions arising from the hauling of raw coal for CMO2.	<ul style="list-style-type: none"> <li>Teck is examining other coal transport methods.</li> <li>Highway hauling is not the preferred choice, though may be used if it is the only option available which results in an economically viable Project.</li> </ul>
Councillors said it was important that Teck communicate the economic importance of the CMO2 Project.	<ul style="list-style-type: none"> <li>Acknowledged by Teck.</li> </ul>
Some concern was also raised during the presentation given by Golder regarding the local study area communities and that these lesser affected communities (i.e., Fernie) would have a similar influence on the Project as Sparwood.	<ul style="list-style-type: none"> <li>It was clarified that the socio-economic assessment does not apportion the roles of a given community in the Project assessment.</li> </ul>

### 3.5 SUMMARY OF GROUP MEETING WITH THE MUNICIPALITY OF CROWSNEST PASS (NOVEMBER 15, 2013)

**Table 3.5.1 Meeting Attendees at Group Meeting with the Municipality of Crowsnest Pass (December 12, 2013)**

Name	Position	Organization
Blair Painter	Mayor	Municipality of Crowsnest Pass
Bill Kovach	Councillor	Municipality of Crowsnest Pass
Shar Lazzarotto	Councillor	Municipality of Crowsnest Pass
Dean Ward	Councillor	Municipality of Crowsnest Pass
Dave Filipuzzi	Councillor	Municipality of Crowsnest Pass
Marlene Anctil	Councillor	Municipality of Crowsnest Pass
Doreen Glavin	Councillor	Municipality of Crowsnest Pass
Sherry Poole	Economic Development Officer	Municipality of Crowsnest Pass
Sheldon Steinke	CAO	Municipality of Crowsnest Pass
Patrick Sager	Chair	Crowsnest Pass Economic Development Committee
Lynnette Jessop	Member	Crowsnest Pass Economic Development Committee
Bonnie Harry	Member	Crowsnest Pass Economic Development Committee

**Table 3.5.2 Questions/Comments during the Presentation with the Municipality of Crowsnest Pass (December 12, 2013)**

Question/Comment	Response
When will CMO run out of coal?	<ul style="list-style-type: none"> <li>Currently expected that in 2017 that CMO will start to ramp down and that steelmaking coal will run out by 2019.</li> </ul>
Will CMO2 coal be blended with products from the other mines?	<ul style="list-style-type: none"> <li>Not likely, but not completely certain.</li> </ul>
Do the Project economics for CMO2 support the transporting of coal 20km to the plant site?	<ul style="list-style-type: none"> <li>Yes, but economics are challenging.</li> <li>Some Project components may need to be adjusted to facilitate economics.</li> </ul>
Initial start date for CMO2?	<ul style="list-style-type: none"> <li>This will likely be the 4<sup>th</sup> quarter of 2017.</li> </ul>
Can the existing plant handle coal from CMO2?	<ul style="list-style-type: none"> <li>Yes, though Teck is proposing to conduct a bulk sample program to see exactly how the plant reacts to CMO2 coal.</li> </ul>
How close are the Dominion Blocks to CMO2?	<ul style="list-style-type: none"> <li>CMO2 abuts Parcel 73 and is physically constrained by this Dominion Block.</li> </ul>
Will CMO2 use the same workforce as CMO?	<ul style="list-style-type: none"> <li>Yes.</li> <li>If the highway haul option for raw coal transportation is used, there could be an employment increase.</li> </ul>
Impact of highway haul option?	<ul style="list-style-type: none"> <li>There is the potential of significant but localized impacts.</li> <li>This raw coal transportation corridor would be a significant part of the environmental assessment if highway haul was chosen, including safety issues and impact to users and wildlife.</li> </ul>

### 3.6 SUMMARY OF GROUP MEETING WITH THE REGIONAL DISTRICT OF EAST KOOTENAY (FEBRUARY 2014)

**Table 3.6 Questions/Comments during the Presentation with the Regional District of East Kootenay (2014)**

Question/Comment	Response
Quality of CMO2 coal and potential need to retrofit CMO.	<ul style="list-style-type: none"> <li>It would likely be metallurgical coal. Plans are being reviewed in regards to CMO's handling ability.</li> </ul>
Where is the access point on Corbin road? Can it handle the increase in traffic?	<ul style="list-style-type: none"> <li>Teck pointed out approximate location on PowerPoint slide and are aware of traffic concerns which will be addressed.</li> </ul>
What will be done about the increase in traffic and the dangers posed to drivers by tired shift workers?	<ul style="list-style-type: none"> <li>Teck acknowledges the potential traffic concerns and these will be further addressed during the next stages of Project development.</li> </ul>

**APPENDIX F**  
**TITLES, DEEDS, AND DOCUMENTS**

**TITLE SEARCH PRINT**

2013-05-16, 13:20:57

Requestor: PA92945

Folio/File Reference:

**\*\*CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN\*\*****Land Title District**

Land Title Office

NELSON

NELSON

**Title Number**

From Title Number

KV86818

KR123327

**Application Received**

2003-07-25

**Application Registered**

2003-08-28

**Registered Owner in Fee Simple**

Registered Owner/Mailing Address:

6069789 CANADA INC., INC.NO. A58865  
 3300 - 550 BARRARD STREET  
 VANCOUVER, BC  
 V6C 0B3  
 IN TRUST SEE KV86623 AND CA3108610

**Taxation Authority**

EAST KOOTENAY ASSESSMENT AREA

**Description of Land**

Parcel Identifier:

023-553-821

Legal Description:

LOT 1 DISTRICT LOT 4589 KOOTENAY DISTRICT PLAN NEP23394

**Legal Notations**

NONE

**Charges, Liens and Interests**

Nature:

UNDERSURFACE RIGHTS

Registration Number:

L6660

Registration Date and Time:

1977-04-06 12:55

Registered Owner:

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH  
 COLUMBIA

Remarks:

MINERALS & MINERAL CLAIMS AS THEREIN SET OUT  
 PART  
 INTER ALIA

**TITLE SEARCH PRINT**

2013-05-16, 13:20:57

Requestor: PA92945

Folio/File Reference:

Nature: TIMBER AGREEMENT  
Registration Number: S16729  
Registration Date and Time: 1983-06-30 14:50  
Registered Owner: TEMBEC INDUSTRIES INC.  
INCORPORATION NO. A75686  
Transfer Number: CA2444687  
Remarks: PARTIAL ASSIGNMENT OF B1687 REC'D 29/2/68 @ 12:47  
SEE P8227, R22075 AND R22077  
INTER ALIA  
TRANSFERRED TO CA2449991

Nature: STATUTORY RIGHT OF WAY  
Registration Number: T22634  
Registration Date and Time: 1984-10-05 14:58  
Registered Owner: BRITISH COLUMBIA HYDRO AND POWER AUTHORITY  
Remarks: PART PLANS 17072 AND 17073

Nature: STATUTORY RIGHT OF WAY  
Registration Number: XD3097  
Registration Date and Time: 1990-02-06 11:06  
Registered Owner: FOOTHILLS PIPE LINES (SOUTH B.C.) LTD. REG.#A15138  
Remarks: PART PLANS 15223 AND 15565  
INTER ALIA  
MODIFIED AND EXTENDED BY XF23153

Nature: STATUTORY RIGHT OF WAY  
Registration Number: XF23153  
Registration Date and Time: 1992-09-16 11:04  
Registered Owner: FOOTHILLS PIPE LINES (SOUTH B.C.) LTD. REG.#A15138  
Remarks: MODIFICATION AND EXTENSION OF XD3097  
PART PLANS 15223, 15565, 18924, NEP19907  
INTER ALIA

Nature: UNDERSURFACE RIGHTS  
Registration Number: XH34946  
Registration Date and Time: 1994-11-24 09:54  
Registered Owner: SHELL CANADA LIMITED REG.#A24177  
Remarks: ALL MINERALS PRECIOUS AND BASE (SAVE GOLD OR  
SILVER ORE) IN OR UNDER LOTS 81, 82, 83, 84,  
85, 86, 151, 152, 153, PART OF LOT 154, PART  
OF LOT 155, PART OF LOT 156, 157, 158, 159,160  
161, 162, 163 AND PART OF LOT 164

**TITLE SEARCH PRINT**

2013-05-16, 13:20:57

Requestor: PA92945

Folio/File Reference:

Nature:	COVENANT
Registration Number:	XK6069
Registration Date and Time:	1996-03-07 08:40
Registered Owner:	THE CROWN IN RIGHT OF BRITISH COLUMBIA REGIONAL DISTRICT OF EAST KOOTENAY
Remarks:	INTER ALIA SECTION 215 LTA

Nature:	COVENANT
Registration Number:	XK6070
Registration Date and Time:	1996-03-07 08:40
Registered Owner:	THE CROWN IN RIGHT OF BRITISH COLUMBIA REGIONAL DISTRICT OF EAST KOOTENAY
Remarks:	SECTION 215 LTA

Nature:	TIMBER AGREEMENT
Registration Number:	CA2449991
Registration Date and Time:	2012-03-22 20:06
Registered Owner:	CANADIAN FOREST PRODUCTS LTD. INCORPORATION NO. 691547
Remarks:	INTER ALIA TRANSFER OF S16729

**Duplicate Indefeasible Title** NONE OUTSTANDING

**Transfers** NONE

**Pending Applications** NONE



July 19, 2012

Mr. Lloyd Bell  
Inspector of Mines, Permitting  
British Columbia Ministry of Energy and Mines  
2<sup>nd</sup> Floor, 42 – 8<sup>th</sup> Avenue, South  
Cranbrook, British Columbia V1C 3P9

**Re: Teck Resources Limited Ownership of 6069789 Canada Inc.**

Dear Mr. Bell,

6069789 Canada Inc. is a wholly owned entity of Teck Resources Limited ("Teck"). Teck is the sole shareholder of 6069789 Canada Inc. Any and all real property owned by 6069789 Canada Inc. is subsequently owned by Teck by virtue of this arrangement.

Attached to this letter are the Certified Resolutions of 6069789 Canada Inc. and the incorporation documents of both Teck and 6069789 Canada Inc. Also attached is an organizational chart for Teck and the many entities which comprise it.

Should you have any questions in respect of the foregoing, please do not hesitate to contact me via phone (+1 403 787 8507) or email ([murray.chitwood@teck.com](mailto:murray.chitwood@teck.com)).

Sincerely,

A handwritten signature in black ink, appearing to read "Murray Chitwood".

Murray Chitwood  
Land Agent  
Teck Coal Limited



**CERTIFIED COPY OF THE RESOLUTIONS OF THE  
BOARD OF DIRECTORS OF 6069789 CANADA INC.**

**"Allotment of Shares**

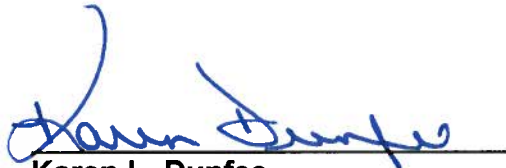
**RESOLVED** that the following share is allotted at the price of \$1, subject to receipt of subscription and payment in full of the subscription price therefor:

<b>Name</b>	<b>No. and Class of Shares</b>
Teck Cominco Limited	1 Common"

\*\*\*\*\*

**CERTIFIED** to be a true and correct copy of Resolutions of the Board of Directors of 6069789 Canada Inc. duly consented to by the Board of Directors on the 26<sup>th</sup> day of February, 2003, which resolution remains in full force and effect, unamended.

**DATED** at Vancouver, B.C., this 19<sup>th</sup> day of July, 2012.



**Karen L. Dunfee**  
Corporate Secretary of 6069789 Canada Inc.



Industry Canada

Industrie Canada

**Certificate  
of Incorporation**

**Canada Business  
Corporations Act**

**Certificat  
de constitution**

**Loi canadienne sur  
les sociétés par actions**

6069789 CANADA INC.

606978-9

\_\_\_\_\_  
Name of corporation-Dénomination de la société

\_\_\_\_\_  
Corporation number-Numéro de la société

I hereby certify that the above-named corporation, the articles of incorporation of which are attached, was incorporated under the *Canada Business Corporations Act*.

Je certifie que la société susmentionnée, dont les statuts constitutifs sont joints, a été constituée en société en vertu de la *Loi canadienne sur les sociétés par actions*.

Director - Directeur

February 26, 2003 / le 26 février 2003

Date of Incorporation - Date de constitution

**Canada**



Industry Canada

Industrie Canada

ELECTRONIC TRANSACTION  
REPORT

RAPPORT DE LA TRANSACTION  
ÉLECTRONIQUE

Canada Business  
Corporations Act

Loi canadienne sur les  
sociétés par actions

ARTICLES OF  
INCORPORATION  
(SECTION 6)

STATUTS CONSTITUTIFS  
(ARTICLE 6)

Processing Type - Mode de Traitement: E-Commerce/Commerce-É

1. Name of Corporation - Dénomination de la société  
6069789 CANADA INC.

2. The province or territory in Canada where the registered office is to be situated -  
La province ou le territoire au Canada où se situera le siège social  
BC

3. The classes and any maximum number of shares that the corporation is authorized to issue -  
Catégories et le nombre maximal d'actions que la société est autorisée à émettre  
The annexed Schedule 1 is incorporated in this form.  
L'annexe 1 ci-jointe fait partie intégrante de la présente formule.

4. Restrictions, if any, on share transfers - Restrictions sur le transfert des actions, s'il y a lieu  
The annexed Schedule 2 is incorporated in this form.  
L'annexe 2 ci-jointe fait partie intégrante de la présente formule.

5. Number (or minimum and maximum number) of directors - Nombre (ou nombre minimal et maximal) d'administrateurs  
Minimum: 1 Maximum: 20

6. Restrictions, if any, on business the corporation may carry on -  
Limites imposées à l'activité commerciale de la société, s'il y a lieu  
The annexed Schedule 3 is incorporated in this form.  
L'annexe 3 ci-jointe fait partie intégrante de la présente formule.

7. Other provisions, if any - Autres dispositions, s'il y a lieu  
The annexed Schedule 4 is incorporated in this form.  
L'annexe 4 ci-jointe fait partie intégrante de la présente formule.

8. Incorporators - Fondateurs

Name(s) - Nom(s)	Address (including postal code) - Adresse (inclure le code postal)	Signature
SANDRA M. KNOWLER	#315 - 518 MOBERLY ROAD, VANCOUVER, BRITISH COLUMBIA, CANADA, V5Z 4G3	SANDRA KNOWLER

SCHEDULE / ANNEXE 1

AN UNLIMITED NUMBER OF COMMON SHARES.

SCHEDULE / ANNEXE 2

NO SHARES OF THE CORPORATION SHALL BE TRANSFERRED WITHOUT APPROVAL OF THE BOARD OF DIRECTORS.

SCHEDULE / ANNEXE 3

None

SCHEDULE / ANNEXE 4

1. The number of shareholders is limited to 50 not including persons who are in the employment of the Corporation and persons, who, having been formerly in the employment of the Corporation, were, while in that employment, and have continued after the termination of that employment to be shareholders of the Corporation, two or more persons holding one or more shares jointly being counted as a single shareholder.
2. Any invitation to the public to subscribe for any securities of the Corporation is prohibited.
3. The directors may, between annual meetings, appoint one or more additional directors of the Corporation to serve until the next annual meeting, but the number of additional directors so appointed shall not at any time exceed  $\frac{1}{3}$  of the number of directors elected at the previous annual meeting of the Corporation.



**Certificate  
of Amendment**

**Certificat  
de modification**

**Canada Business  
Corporations Act**

**Loi canadienne sur  
les sociétés par actions**

Teck Resources Limited

Ressources Teck Limitée

446056-1

\_\_\_\_\_  
Name of corporation-Dénomination de la société

\_\_\_\_\_  
Corporation number-Numéro de la société

I hereby certify that the articles of the  
above-named corporation were amended:

Je certifie que les statuts de la société  
susmentionnée ont été modifiés:

a) under section 13 of the *Canada  
Business Corporations Act* in  
accordance with the attached notice;

a) en vertu de l'article 13 de la *Loi  
canadienne sur les sociétés par  
actions*, conformément à l'avis ci-joint;

b) under section 27 of the *Canada  
Business Corporations Act* as set out in  
the attached articles of amendment  
designating a series of shares;

b) en vertu de l'article 27 de la *Loi  
canadienne sur les sociétés par  
actions*, tel qu'il est indiqué dans les  
clauses modificatrices ci-jointes  
désignant une série d'actions;

c) under section 179 of the *Canada  
Business Corporations Act* as set out in  
the attached articles of amendment;

c) en vertu de l'article 179 de la *Loi  
canadienne sur les sociétés par  
actions*, tel qu'il est indiqué dans les  
clauses modificatrices ci-jointes;

d) under section 191 of the *Canada  
Business Corporations Act* as set out in  
the attached articles of reorganization;

d) en vertu de l'article 191 de la *Loi  
canadienne sur les sociétés par  
actions*, tel qu'il est indiqué dans les  
clauses de réorganisation ci-jointes;

Richard G. Shaw  
Director - Directeur

April 23, 2009 / le 23 avril 2009

Date of Amendment - Date de modification





## Articles of Amendment

(Section 27 or 177 of the *Canada Business Corporations Act (CBCA)*)

### Form 4

#### Instructions

**3** Any changes in the articles of the corporation must be made in accordance with section 27 or 177 of the CBCA.

A: If an amendment involves a change of corporate name (including the addition of the English or French version of the corporate name), the new name must comply with sections 10 and 12 of the CBCA as well as part 2 of the regulations, and the Articles of Amendment must be accompanied by a Canada-based NUJANS® search report dated not more than ninety (90) days prior to the receipt of the articles by Corporations Canada. A numbered name may be assigned under subsection 11(2) of the CBCA without a NUJANS® search.

D: Any other amendments must correspond to the paragraphs and subparagraphs referenced in the articles being amended. If the space available is insufficient, please attach a schedule to the form.

#### 4 Declaration

This form must be signed by a director or an officer of the corporation (subsection 262(2) of the CBCA).

#### General

The information you provide in this document is collected under the authority of the CBCA and will be stored in personal information bank number IC/PPU-049. Personal information that you provide is protected under the provisions of the *Privacy Act*. However, public disclosure pursuant to section 266 of the CBCA is permitted under the *Privacy Act*.

If you require more information, please consult our website at [www.corporationscanada.ic.gc.ca](http://www.corporationscanada.ic.gc.ca) or contact us at 613-941-9042 (Ottawa region), toll-free at 1-866-333-5556 or by email at [corporationscanada@ic.gc.ca](mailto:corporationscanada@ic.gc.ca).

#### Prescribed Fees

- Corporations Canada Online Filing Centre: \$200
- By mail or fax: \$200 paid by cheque payable to the Receiver General for Canada or by credit card (American Express®, MasterCard® or Visa®).

#### Important Reminders

**Changes of registered office address and/or mailing address:**  
Complete and file Change of Registered Office Address (Form 3).

**Changes of directors or changes of a director's address:**  
Complete and file Changes Regarding Directors (Form 6).

These forms can be filed electronically, by mail or by fax free of charge.

File documents online:

**Corporations Canada Online Filing Centre:**  
[www.corporationscanada.ic.gc.ca](http://www.corporationscanada.ic.gc.ca)

Or send documents by mail:

**Director General,  
Corporations Canada  
Jean Edmonds Tower South  
9th Floor  
365 Laurier Ave. West  
Ottawa ON K1A 0C8**

By Facsimile:  
**613-941-0999**

<b>1</b>	<b>Corporation name</b>
Teck Cominco Limited	

<b>2</b>	<b>Corporation number</b>
4 4 6 0 5 6 - 1	

<b>3</b>	<b>The articles are amended as follows:</b> (Please note that more than one section can be filled out)
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<b>A:</b>	The corporation changes its name to:  Teck Resources Limited Ressources Teck Limitée
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<b>B:</b>	The corporation changes the province or territory in Canada where the registered office is situated to: (Do not indicate the full address)
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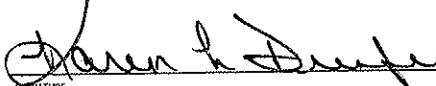
<b>C:</b>	The corporation changes the minimum and/or maximum number of directors to: (For a fixed number of directors, please indicate the same number in both the minimum and maximum options)
minimum:	maximum:

<b>D:</b>	Other changes: (e.g., to the classes of shares, to restrictions on share transfers, to restrictions on the businesses of the corporation or to any other provisions that are permitted by the CBCA to be set out in the Articles) <b>Please specify.</b>
-----------	--

See Schedule I attached

<b>4</b>	<b>Declaration</b>
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I hereby certify that I am a director or an officer of the corporation.



Karen L. Dunfee

( 604 ) 699-4060

PRINT NAME

TELEPHONE NUMBER

**Note:** Misrepresentation constitutes an offence and, on summary conviction, a person is liable to a fine not exceeding \$5000 or to imprisonment for a term not exceeding six months or both (subsection 250(1) of the CBCA).

Articles of Amendment  
Teck Cominco Limited  
**Schedule I**

D: Other changes:

1. to provide that the Corporation may use its name in either the English form, the French form or a combination of the English form and the French form; and
2. to delete in their entirety the authorized but unissued Preference Shares Series 1 and the authorized but unissued Preference Shares Series 2 in the capital of the Corporation, and the rights, privileges, restrictions and conditions attaching thereto, such that after giving effect to the foregoing, the classes and maximum number of shares that the Corporation is authorized to issue are:

An unlimited number of Class A common shares ("Class A shares") without nominal or par value, an unlimited number of Class B Subordinate Voting shares without nominal or par value and an unlimited number of preference shares, issuable in series without nominal or par value.



**Certificate  
of Amalgamation**

**Canada Business  
Corporations Act**

**Certificat  
de fusion**

**Loi canadienne sur  
les sociétés par actions**

Teck Cominco Limited

446056-1

\_\_\_\_\_  
Name of corporation-Dénomination de la société

\_\_\_\_\_  
Corporation number-Numéro de la société

I hereby certify that the above-named corporation resulted from an amalgamation, under section 185 of the *Canada Business Corporations Act*, of the corporations set out in the attached articles of amalgamation.

Je certifie que la société susmentionnée est issue d'une fusion, en vertu de l'article 185 de la *Loi canadienne sur les sociétés par actions*, des sociétés dont les dénominations apparaissent dans les statuts de fusion ci-joints.

\_\_\_\_\_  
Richard G. Shaw  
Director - Directeur

January 1, 2008 / le 1 janvier 2008

Date of Amalgamation - Date de fusion



**Industry Canada** Industrie Canada  
**Canada Business Corporations Act** Loi canadienne sur les sociétés par actions

**FORM 9**  
**ARTICLES OF AMALGAMATION**  
**(SECTION 186)**

**FORMULAIRE 9**  
**STATUTS DE FUSION**  
**(ARTICLE 186)**

1 - Name of the Amalgamated Corporation / Dénomination sociale de la société issue de la fusion  
**Teck Cominco Limited**

2 - The province or territory in Canada where the registered office is to be situated / La province ou le territoire au Canada où se situera le siège social  
**British Columbia**

3 - The classes and any maximum number of shares that the corporation is authorized to issue / Catégories et tout nombre maximal d'actions que la société est autorisée à émettre  
**The attached Schedule 1 is incorporated in this form.**

4 - Restrictions, if any, on share transfers / Restrictions sur le transfert des actions, s'il y a lieu  
**None**

5 - Number (or minimum and maximum number) of directors / Nombre (ou nombre minimal et maximal) d'administrateurs  
**minimum of eight (8) - maximum of sixteen (16)**

6 - Restrictions, if any, on business the corporation may carry on / Limites imposées à l'activité commerciale de la société, s'il y a lieu  
**None**

7 - Other provisions, if any / Autres dispositions, s'il y a lieu  
**The attached Schedule 2 is incorporated in this form.**

8 - The amalgamation has been approved pursuant to that section or subsection of the Act which is indicated as follows: / La fusion a été approuvée en accord avec l'article ou le paragraphe de la Loi indiqué ci-après

- 183
- 184(1)
- 184(2)

9 - Name of the amalgamating corporations / Dénomination sociale des sociétés fusionnantes	Corporation No. / N° de la société	Signature	Date	Title / Titre	Tel. No. / N° de tél.
Teck Cominco Limited	333105-9	<i>[Signature]</i>	Dec. 11 / 07	Authorized Officer	604-640-5333
AUR RESOURCES INC./ LES RESSOURCES AUR INC.	357393-1	<i>[Signature]</i>	Dec. 11 / 07	Authorized Officer	604-640-5333

**FOR DEPARTMENTAL USE ONLY / À L'USAGE DU SERVICE DES REVENUS**

**4460561**

**Schedule I**

The classes and any maximum number of shares that the corporation is authorized to issue are:

An unlimited number of Class A common shares ("Class A shares") without nominal or par value, an unlimited number of Class B Subordinate Voting shares without nominal or par value, an unlimited number of preference shares, issuable in series without nominal or par value, of which 790,000 are designated as Preference Shares Series 1 and of which 550,000 are designated as Preference Shares Series 2, with the rights, privileges, restrictions and conditions as follows:

**I Class A shares**

- (1) The Class A shares shall carry and the holders thereof shall be entitled to 100 votes per share at all meetings of the shareholders of the Corporation.
- (2) (a) Any holder of Class A shares shall be entitled at his option, at any time and from time to time to have all or any of the Class A shares held by him converted into Class B Subordinate Voting shares on the basis of one (1) Class B Subordinate Voting share for each one (1) Class A share in respect of which the conversion right is exercised.
- (b) The conversion right provided for in paragraph (a) hereof may be exercised by notice in writing given to the Corporation accompanied by the certificate or certificates representing Class A shares in respect of which the holder thereof desires to exercise such right of conversion and such notice shall be signed by the person registered on the records of the Corporation as the holder of the Class A shares in respect of which such right is being exercised or by his duly authorized attorney and shall specify the number of Class A shares which the holder desires to have converted. The holder shall pay any governmental or other tax imposed on or in respect of such conversion. Upon receipt of such notice, the Corporation shall issue certificates representing Class B Subordinate Voting shares upon the basis above prescribed and in accordance with the provisions hereof, to the registered holder of the Class A shares represented by the certificate or certificates accompanying such notice. If less than all the Class A shares represented by any certificate are to be converted, the holder shall be entitled to receive, at the expense of the Corporation, a new certificate for the Class A shares representing the shares comprised in the original certificate which are not to be converted. The right of a holder of Class A shares to convert the same into Class B Subordinate Voting shares shall be deemed to have been exercised, and each registered holder of Class A shares to be converted shall be deemed to have become the holder of Class B Subordinate Voting shares of record of the Corporation for all purposes on the date of receipt by the Corporation of certificates representing the Class A shares to be converted accompanied by a notice in writing as provided in this paragraph (b).

RECEIVED TIME DEC. 21. 5:49PM

notwithstanding any delay in the delivery of certificates representing the Class B Subordinate Voting shares into which such Class A shares have been converted. Upon such conversion, the Corporation shall adjust the stated capital accounts maintained for the Class A shares and the Class B Subordinate Voting shares as then provided in the *Canada Business Corporations Act* (the "Act").

- (3) The holders of Class A shares and the holders of Class B Subordinate Voting shares shall, subject to the rights, privileges, restrictions and conditions attaching to preference shares, rank *pari passu* each with the other as to dividends and to receive the remaining property of the Corporation upon dissolution.
- (4) Except as otherwise provided in these Articles, each Class A share and each Class B Subordinate Voting share shall have the same rights and attributes and be the same in all respects.

## II Class B Subordinate Voting shares

- (1) The Class B Subordinate Voting shares shall carry and the holders thereof shall be entitled to 1 vote per share at all meetings of the shareholders of the Corporation.
- (2) (a) For the purposes of this Section (2):
  - (i) "Affiliate" has the meaning assigned by the *Securities Act* (Ontario) as from time to time amended, re-enacted or replaced;
  - (ii) "Associate" has the meaning assigned by the *Securities Act* (Ontario) as from time to time amended, re-enacted or replaced;
  - (iii) "Conversion Period" means the period of time commencing on the eighth day after the Offer Date and terminating on the Expiry Date;
  - (iv) "Converted Shares" means Class A shares resulting from the conversion of Class B Subordinate Voting shares into Class A shares pursuant to paragraph (b) of this Section (2);
  - (v) "Exclusionary Offer" means an offer to purchase Class A shares that:
    - (A) is a General Offer; and
    - (B) is not made concurrently with an offer to purchase Class B Subordinate Voting shares that is identical to the offer to purchase Class A shares in terms of price per share and percentage of outstanding shares to be taken up exclusive of shares owned immediately prior to the offer by the

Offeror, and in all other material respects (except with respect to the conditions that may be attached to the offer for Class A shares), and that has no condition attached other than the right not to take up and pay for shares tendered if no shares are purchased pursuant to the offer for Class A shares;

and for the purposes of this definition, if an offer to purchase Class A shares is a General Offer but not an Exclusionary Offer, the varying of any term of such offer shall be deemed to constitute the making of a new offer unless a variation identical in all material respects is made concurrently to the corresponding offer to purchase Class B Subordinate Voting shares;

- (vi) "Expiry Date" means the last date upon which holders of Class A shares may accept an Exclusionary Offer;
  - (vii) "General Offer" means any offer to purchase Class A shares that must, by reason of applicable securities legislation or the requirements of any stock exchange on which the Class A shares are listed, be made to all or substantially all holders of Class A shares who are in a province of Canada to which any such legislation or requirement applies;
  - (viii) "Offer Date" means the date on which an Exclusionary Offer is mailed to holders of Class A shares;
  - (ix) "Offeror" means a Person that makes an offer to purchase Class A shares (the "bidder"), and includes any Associate or Affiliate of the bidder and any Person that is disclosed in the offering document to be acting jointly or in concert with the bidder;
  - (x) "Person" has the meaning assigned by the *Securities Act* (Ontario) as from time to time amended, re-enacted or replaced and includes a company or other body corporate wherever or however incorporated; and
  - (xi) "Transfer Agent" means, at any relevant time, the transfer agent of the Class A shares.
- (b) Subject to paragraph (e), if an Exclusionary Offer is made, each outstanding Class B Subordinate Voting share shall be convertible into one Class A share at the option of the holder during the Conversion Period. The conversion right may be exercised by notice in writing given to the Transfer Agent prior to the Expiry Date accompanied by the share certificate or certificates representing the Class B Subordinate Voting

shares which the holder desires to convert, together with any letter of transmittal or other documentation required by the Transfer Agent or pursuant to the Exclusionary Offer, in each case, in duly executed or completed form, and such notice shall be executed by such holder, or by his attorney duly authorized in writing, and shall specify the number of Class B Subordinate Voting shares which the holder desires to have converted. The holder shall pay any governmental or other tax imposed on or in respect of such conversion. Upon receipt by the Transfer Agent of such notice and share certificate or certificates, the Corporation shall issue a share certificate representing fully-paid Class A shares as above prescribed and in accordance with paragraph (d). If less than all of the Class B Subordinate Voting shares represented by any share certificate are to be converted, the holder shall be entitled to receive a new share certificate representing in the aggregate the number of Class B Subordinate Voting shares represented by the original share certificate which are not to be converted. Upon any conversion of any shares of any class into shares of another class, the Corporation shall adjust the stated capital accounts maintained for the respective classes of shares as then provided in the Act.

- (c) An election by a holder of Class B Subordinate Voting shares to exercise the conversion right provided for in paragraph (b) shall be deemed to also constitute irrevocable elections by such holder: (i) to deposit the Converted Shares pursuant to the Exclusionary Offer (subject to such holder's right to subsequently withdraw the shares from the offer); and (ii) to exercise the right to convert into Class B Subordinate Voting shares all Converted Shares in respect of which such holder exercises his right of withdrawal from the Exclusionary Offer or which are not otherwise ultimately taken up and paid for under the Exclusionary Offer. Any conversion into Class B Subordinate Voting shares, pursuant to such deemed election, of Converted Shares in respect of which the holder exercises his right of withdrawal from the Exclusionary Offer shall become effective at the time such right of withdrawal is exercised without prejudice to the ability to reconvert or re-tender. If the right of withdrawal is not exercised, any conversion into Class B Subordinate Voting shares pursuant to such deemed election shall become effective,
- (A) in respect of an Exclusionary Offer which is duly completed, immediately following the time by which the Offeror is required by applicable securities legislation to take up and pay for all shares to be acquired by the Offeror under the Exclusionary Offer; and
- (B) in respect of an Exclusionary Offer which is abandoned or withdrawn, at the time at which the Exclusionary Offer is abandoned or withdrawn.



- (d) No share certificates representing Converted Shares shall be delivered to the holders of the shares before such shares are deposited pursuant to the Exclusionary Offer. The Transfer Agent, on behalf of the holders of the Converted Shares, shall deposit pursuant to the Exclusionary Offer a certificate or certificates representing the Converted Shares. Upon completion of the Exclusionary Offer, the Transfer Agent shall deliver to the holders entitled thereto all consideration paid by the Offeror for their Converted Shares pursuant to the Exclusionary Offer. If Converted Shares are converted into Class B Subordinate Voting shares pursuant to paragraph (c), the Transfer Agent shall promptly deliver to the holders entitled thereto share certificates representing the Class B Subordinate Voting shares resulting from the conversion. The Corporation shall make all arrangements with the Transfer Agent necessary or desirable to give effect to this paragraph (d).
- (e) Subject to paragraph (f), the conversion right provided for in paragraph (b) shall not come into effect if:
- (i) prior to the Offer Date there is or has been delivered to the Transfer Agent and to the Secretary of the Corporation a certification or certifications signed by or on behalf of one or more shareholders of the Corporation owning in the aggregate, as at the Offer Date, more than 50 per cent of the then outstanding Class A shares, exclusive of shares owned immediately prior to the Offer Date by the Offeror, which certification or certifications shall confirm, in the case of each such shareholder, that such shareholder shall not:
- (A) tender any shares in acceptance of any Exclusionary Offer without giving the Transfer Agent and the Secretary of the Corporation written notice of such acceptance or intended acceptance at least seven days prior to the Expiry Date;
- (B) make any Exclusionary Offer;
- (C) act jointly or in concert with any Person that makes any Exclusionary Offer; or
- (D) transfer any Class A shares, directly or indirectly, during the time any Exclusionary Offer is outstanding without giving the Transfer Agent and the Secretary of the Corporation written notice of such transfer or intended transfer at least seven days prior to the Expiry Date, which notice shall state, if known to the transferor, the names of

- the transferees and the number of Class A shares transferred or to be transferred to each transferee; or
- (ii) as of the end of the seventh day after the Offer Date there has been delivered to the Transfer Agent and to the Secretary of the Corporation a certification or certifications signed by or on behalf of one or more shareholders of the Corporation owning in the aggregate more than 50 per cent of the then outstanding Class A shares, exclusive of shares owned immediately prior to the Offer Date by the Offeror, which certification or certifications shall confirm, in the case of each such shareholder:
- (A) the number of Class A shares owned by the shareholder;
  - (B) that such shareholder is not making the Exclusionary Offer and is not an Associate or Affiliate of, or acting jointly or in concert with, the Person making such offer;
  - (C) that such shareholder shall not tender any shares in acceptance of the Exclusionary Offer, including any varied form of the offer, without giving the Transfer Agent and the Secretary of the Corporation written notice of such acceptance or intended acceptance at least seven days prior to the Expiry Date; and
  - (D) that such shareholder shall not transfer any Class A shares, directly or indirectly, prior to the Expiry Date without giving the Transfer Agent and the Secretary of the Corporation written notice of such transfer or intended transfer at least seven days prior to the Expiry Date, which notice shall state, if known to the transferor, the names of the transferees and the number of Class A shares transferred or to be transferred to each transferee; or
- (iii) as of the end of the seventh day after the Offer Date a combination of certifications that comply with either clause (i) or (ii) from shareholders of the Corporation owning in the aggregate more than 50 per cent of the then outstanding Class A shares, exclusive of shares owned immediately prior to the Offer Date by the Offeror, has been delivered to the Transfer Agent and to the Secretary of the Corporation.
- (f) If a notice (the "Notice") referred to in sub-clause (e)(i)(A), (e)(i)(D), (e)(ii)(C) or (e)(ii)(D) is given to the Transfer Agent and to the Secretary of the Corporation and the conversion right provided for in paragraph (b) has not, at the time of the Notice, come into effect, the Transfer Agent

shall either forthwith upon receipt of the Notice or forthwith after the seventh day following the Offer Date, whichever is later, determine the number of Class A shares in respect of which there are subsisting certifications that comply with either clause (e)(i) or (e)(ii). For the purpose of this determination, certifications in respect of which the Notice has been given shall not be regarded as subsisting insofar as the Class A shares to which the Notice relates are concerned; the transfer that is the subject of any Notice referred to in sub-clause (e)(i)(D) or (e)(ii)(D) shall be deemed to have already taken place at the time of the determination; and the transferee in the case of any Notice referred to in sub-clause (e)(i)(D) or (e)(ii)(D) shall be deemed to be a Person from whom the Transfer Agent does not have a subsisting certification unless the Transfer Agent is advised of the identity of the transferee, either by the Notice or by the transferee in writing, and such transferee is a Person from whom the Transfer Agent has a subsisting certification. If the number of Class A shares so determined does not exceed 50 per cent of the number of then outstanding Class A shares, exclusive of shares owned immediately prior to the Offer Date by the Offeror, paragraph (e) shall cease to apply and the conversion right provided for in paragraph (b) shall be in effect for the remainder of the Conversion Period.

- (g) As soon as reasonably possible after the seventh day after the Offer Date, the Corporation shall send to each holder of Class B Subordinate Voting shares a notice advising the holders as to whether they are entitled to convert their Class B Subordinate Voting shares into Class A shares and the reasons therefor. If such notice discloses that they are not so entitled but it is subsequently determined that they are so entitled by virtue of paragraph (f) or otherwise, the Corporation shall forthwith send another notice to each holder of Class B Subordinate Voting shares advising them of that fact and the reasons therefor.
- (h) If a notice referred to in paragraph (g) discloses that the conversion right has come into effect, the notice shall:
- (i) include a description of the procedure to be followed to effect the conversion and to have the Converted Shares tendered under the Exclusionary Offer;
  - (ii) include the information set out in paragraph (c) hereof; and
  - (iii) be accompanied by a copy of the Exclusionary Offer and all other material sent to holders of Class A shares in respect of such offer, and as soon as reasonably possible after any additional material, including any notice of change or variation, is sent to the holders of Class A shares in respect of such offer, the Corporation shall

send a copy of such additional material to each holder of Class B Subordinate Voting shares.

- (i) Prior to or forthwith after sending any notice referred to in paragraph (g), the Corporation shall cause a press release to be issued to a Canadian national news-wire service, describing the contents of the notice.
- (3) In the event the Class A shares or the Class B Subordinate Voting shares or both of them are at any time hereafter subdivided or consolidated or reclassified or otherwise changed, appropriate adjustment shall be made (and if not made, shall be deemed to have been made) in the rights, privileges, restrictions and conditions, respectively, attaching to the Class A shares and to the Class B Subordinate Voting shares so as to maintain and preserve the relative rights of the holders of each of the said classes of shares.

### III Preference Shares, issuable in series

The preference shares as a class, have attached thereto the following rights, privileges, restrictions and conditions:

- (i) The preference shares may from time to time be issued in one or more series and subject to the following provisions, and subject to the sending of articles of amendment in prescribed form, and the issuance of a certificate of amendment in respect thereof, the directors may fix from time to time before such issue the number of shares which is to comprise each series and the designation, rights, privileges, restrictions and conditions attaching to each series of preference shares including, without limiting the generality of the foregoing the rate, amount or form of dividends or the method of calculating dividends, the dates of payment thereof, the redemption, purchase and/or conversion prices and terms and conditions of redemption, purchase and/or conversion, and any sinking or purchase fund or other provisions.
- (ii) The preference shares of each series shall, with respect to the payment of dividends and the distribution of assets in the event of liquidation, dissolution or winding-up of the Corporation, whether voluntary or involuntary, or any other distribution of the assets of the Corporation among its shareholders for the purpose of winding-up its affairs, rank on a parity with the preference shares of every other series and rank in priority to the Class A shares and the Class B Subordinate Voting shares and over any other shares of the Corporation ranking junior to the preference shares. The preference shares of any series may also be given such other preferences, not inconsistent with these articles, over the Class A shares and the Class B Subordinate Voting shares and any other shares of the Corporation ranking junior to such preference shares.

- (iii) If any cumulative dividends or amounts payable on the return of capital in respect of a series of preference shares are not paid in full, all series of preference shares shall participate rateably in respect of accumulated dividends and return of capital.
- (iv) The preference shares of any series may be made convertible into Class A shares or Class B Subordinate Voting shares or any other preference shares of another series.
- (v) Except when entitled to by law and except as specifically set forth herein, the holders of the preference shares shall not be entitled as such to receive notice of or to attend any meeting of the shareholders of the Corporation or to vote at any such meeting unless and until eight (8) quarterly dividends or four (4) half-yearly dividends, as the case may be, on the preference shares of any one series shall remain outstanding and be unpaid whether or not consecutive and whether or not such dividends have been declared and whether or not there are any moneys of the Corporation properly applicable to the payment of dividends. In such event but only for so long as any dividends on the preference shares of any series remain in arrears, the holders of the preference shares shall be entitled to receive notice of and to attend all meetings of shareholders of the Corporation at which members of the board of directors are to be elected and which take place more than sixty (60) days after such event and shall be entitled to elect at any such meeting, voting separately as a class, two (2) members out of whatever number of members of the board of directors are to be elected at such meeting. For such purpose, each holder of preference shares shall be entitled to one (1) vote for each preference share held. Notwithstanding the foregoing, nothing contained herein shall be deemed to limit the right of the Corporation from time to time to increase or decrease the size of its board of directors.

#### IV Preference Shares Series 1

- (1) The Preference Shares Series 1 shall have attached thereto, in addition to the rights, privileges, restrictions and conditions attaching to the preference shares as a class, the following rights, privileges, restrictions and conditions:
  - (a) **Dividends** - The holders of Preference Shares Series 1 shall be entitled to receive, and the Corporation shall pay thereon, as and when declared by the Directors of the Corporation out of moneys of the Corporation properly applicable to the payment of dividends, fixed, preferential cash dividends payable on March 31 (the "dividend payment date"), commencing not earlier than March 31, 2003.

The amount of each dividend shall be the amount payable by way of dividend out of the Dividend and Redemption Amount in accordance with paragraph (d). The amounts payable by way of dividend on the Preference Shares Series 1 shall be so calculated from and including the respective dates of issue thereof, to and

including the dividend payment dates. Each dividend on the Preference Shares Series 1 in the amount calculated shall accrue from and including the dividend payment date on which that dividend should have been paid. If on any dividend payment date the dividend payable on that date is not paid in full on all the Preference Shares Series 1 then outstanding, that dividend or the unpaid part thereof shall be paid on a subsequent date or dates as determined by the Directors of the Corporation on which the Corporation shall have sufficient moneys properly applicable to the payment of the same.

#### Rate Of Return Index

For purposes of paragraph (d):

- (i) "Rate of Return Index" means a percentage that is numerically equal to  $2.157 (Ag + 0.263 Pb + 0.00575 Pb^2) - 29.987$ ;
- (ii) "Ag" means a number that is the average of the Yearly Silver Prices stated in 1985 United States currency over the period January 1, 1986 to December 31 of the year preceding that in which the calculation is being made, inclusive;
- (iii) "Pb" means a number that is the average of the Yearly Lead Prices stated in 1985 United States currency over the period January 1, 1986 to December 31 of the year preceding that in which the calculation is being made, inclusive;
- (iv) "Yearly Silver Price" means the average Handy and Harman silver price for the year at New York as quoted in Metals Week, converted into 1985 United States dollars per troy ounce by multiplying the average price in United States dollars for that year times the U.S. Gross National Product implicit price deflator (hereinafter called the "GNP deflator") for 1985 divided by the GNP deflator for the particular year; and
- (v) "Yearly Lead Price" means one-half the sum of the following annual average lead prices: (A) Metals Week U.S. Producer Price; and (B) LME Cash Price. Both prices are those quoted in Metals Week, converted into 1985 United States cents per pound by multiplying the price averages in United States dollars for that year times the GNP deflator for 1985 divided by the GNP deflator for the particular year.
- (vi) For purposes of clauses (iv) and (v) above the GNP deflator to be used shall be the latest figure published prior to the date of calculation. If that figure is not the final figure for the year, an appropriate adjustment shall be made in the following year.
- (vii) If for any year the Yearly Silver Price or Yearly Lead Price cannot be determined by the use of the foregoing clauses (iv) or (v), the "Yearly Silver Price" or "Yearly Lead Price", as the case may be, shall be the

prices quoted in an equivalent source of information relied on by the industry.

- (b) **Payment of Dividends** - The mailing of cheques of the Corporation to the registered holders of Preference Shares Series 1 shall be deemed to be payment and shall satisfy and discharge all liability for any dividend declared on the Preference Shares Series 1 to the extent of the amounts represented thereby (plus any tax required to be and deducted or withheld therefrom), unless such cheques are not paid on due presentation.

The holders of the Preference Shares Series 1 shall not be entitled to any dividends other than or in excess of the preferential cash dividends declared thereon pursuant to paragraph (a). A dividend which is represented by a cheque of the Corporation which has not been duly presented for payment within 6 years after it was issued or that otherwise remains unclaimed for a period of 6 years from the date on which it was declared to be payable shall be forfeited to the Corporation.

- (c) **Optional Redemption** - Subject to the last paragraph of paragraph (d) and to paragraph (i) hereof, and to such of the provisions of the Act as may be applicable, the Corporation may at any time or times at its option redeem Preference Shares Series 1 in the manner provided in paragraph (e) hereof on payment of the sum of \$100 for each share to be redeemed together with an amount equal to all accrued and unpaid dividends thereon (the whole constituting the "redemption price").

- (d) **Redemption Obligations** - Prior to the dividend payment date in each of the years 2003 to 2006, inclusive, but not thereafter, an amount (the "Dividend and Redemption Amount") shall be calculated in accordance with the following Dividend and Redemption Formula and the Rate of Return Index set out in paragraph (a). The Dividend and Redemption Amount shall be applied to redemption of Preference Shares Series 1 until all but 1,000 Preference Shares Series 1 have been redeemed. Preference Shares Series 1 to be so redeemed shall be redeemed at the redemption price as provided in paragraph (c) on the dividend payment date in each of those years. After all but 1,000 Preference Shares Series 1 shall have been redeemed, the Dividend and Redemption Amount shall be paid as dividends on the Preference Shares Series 1 until the dividend payment date in the year 2005. The Dividend and Redemption Amount calculated for the year 2006 shall be applied firstly in redemption of the Preference Shares Series 1 which remain outstanding, and any balance shall be paid as an accrued dividend on those remaining Preference Shares Series 1 as part of the redemption price thereof: provided that the foregoing shall not preclude earlier redemption of the Preference Shares Series 1 which remain outstanding, if the cumulative amounts calculated under clauses (i) and (ii) of the Dividend and Redemption Formula reach the maximum amounts specified in the two provisos immediately following clause (ii).

### Dividend and Redemption Formula

The Dividend and Redemption Amount calculated under the Dividend and Redemption Formula shall be the sum of:

(i)

Rate of Return Index	Percentage of the Stated Capital Amount Outstanding on April 1, 1996 of the Redeemable Preferred Shares Series E in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.)
Less than 8%	Nil
8% to 14% inclusive	From 0 to 20% (linear)
14% to 18% inclusive	20%
18% to 24% inclusive	From 20% to 40% (linear)
Over 24%	40%; and

(ii) an amount equal to 0.145% of the aggregate stated capital amount of all Redeemable Preferred Shares Series E in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.) issued prior to April 1, 1996 for each one-tenth (1/10) of one (1) per cent that the Rate of Return Index exceeds twenty-four (24) per cent.

Provided, however, that the total calculated under clause (i) shall not exceed the aggregate stated capital value of the Redeemable Preferred Shares Series E in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.) outstanding on April 1, 1996, less the aggregate stated capital value of all Preference Shares Series I redeemed, purchased for cancellation or converted under paragraphs (c), (f) or (h);

And provided further that the total calculated under clause (ii) shall not exceed the aggregate of:

- (A) eight (8) per cent per annum of the weighted average of the stated capital amount of the Redeemable Preferred Shares Series E in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.) outstanding from the dates of issue to March 31, 1996; and
- (B) the lesser of
- (1) the sum of respectively 80%, 60%, 40%, 20% and 0% of eight (8) per cent (being 200% of eight (8) per cent) of the aggregate stated capital value of the Redeemable Preferred



- Shares Series E in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.) outstanding on April 1, 1996; or
- (2) eight (8) per cent per annum of the weighted average of the stated capital amount of the Redeemable Preferred Shares Series E in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.) outstanding during the twelve months ending on March 31 in the years 1997 to 2000, inclusive.

Notwithstanding the foregoing provisions of this paragraph (d), the payments on account of the Dividend and Redemption Amount actually made by the Corporation in respect of any year shall not exceed an amount (the "calculated amount") equal to 34.8% of the aggregate stated capital amount of all Redeemable Preferred Shares Series E in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.) issued prior to April 1, 1996. If the Dividend and Redemption Amount, as calculated, exceeds the calculated amount, the excess (the "deferred amount") shall be deferred and paid in the next succeeding year or years when the Dividend and Redemption Amount is less than the calculated amount. Any accrued and unpaid amounts calculated under the Dividend and Redemption Formula, including any such deferred amount, shall be paid as soon as the Corporation shall have sufficient monies properly applicable to payment of the same and prior to and as a condition precedent to final redemption of all outstanding Preference Shares Series 1. Nothing in this paragraph (d) shall, however, be construed as limiting the rights of the Corporation to redeem Preference Shares Series 1 pursuant to paragraph (c).

- (c) **Redemption Procedure** - In any case of redemption of Preference Shares Series 1, at least 30 days before the date specified for redemption the Corporation shall give notice in writing of the intention of the Corporation to redeem Preference Shares Series 1 to each person who at the date the notice is given is the registered holder of Preference Shares Series 1 to be redeemed. The notice of intention to redeem shall set out the redemption price, the place at which the redemption price is to be paid and the date on which redemption is to take place and, if a part only of the Preference Shares Series 1 is to be redeemed, the number thereof so to be redeemed. On or after the date so specified for redemption, the Corporation shall pay or cause to be paid to or to the order of the registered holders of the Preference Shares Series 1 to be redeemed the redemption price of those shares on presentation and surrender to the Corporation of the certificates for the Preference Shares Series 1 called for redemption at the registered office of the Corporation or at any other place within Canada designated in the notice of intention to redeem. The payment shall be made by cheque payable at par at any branch of a Canadian chartered bank in Canada. The Preference Shares Series 1 for which the redemption price is paid shall thereupon be and be deemed to be redeemed and shall not be reissued as Preference Shares Series 1. If a part only of the shares represented by any certificate shall be redeemed, a new certificate for the balance

of the shares not so redeemed shall be issued at the expense of the Corporation. From and after the date specified for redemption in any notice of intention to redeem, the holders of the Preference Shares Series 1 called for redemption shall cease to be entitled to dividends and shall not be entitled to exercise any of the rights of shareholders in respect thereof unless payment of the redemption price shall not be made upon presentation of certificates in accordance with the foregoing provisions, in which case the rights of the registered holder shall remain unaffected. At any time after the giving of a notice of intention to redeem any Preference Shares Series 1 as aforesaid, the Corporation shall have the right to deposit the redemption price of the shares which have been called for redemption or of those Preference Shares Series 1 represented by certificates which have not at the date of the deposit been surrendered by the holder thereof in connection with the redemption, to the credit of a special account in any chartered bank or any trust company in Canada named in the notice of intention to redeem. The amount deposited shall be paid without interest to or to the order of the respective registered holders of Preference Shares Series 1 called for redemption upon presentation and surrender of the certificates representing the same to the branch or branches of the chartered bank or trust company designated in the notice of intention to redeem. Upon the date the deposit is made or the date for redemption specified in the notice of intention to redeem, whichever is the later, the Preference Shares Series 1 in respect whereof the deposit has been made shall be deemed to be and be redeemed and the rights of the holders thereof after the deposit or the redemption date, as the case may be, shall be limited to receiving without interest their proportionate part of the total redemption price so deposited (less any tax required to be deducted or withheld therefrom) against presentation and surrender of the certificates representing the same. Any interest allowed on any such deposit shall belong to the Corporation.

Subject to such of the provisions of the Act as may be applicable, in case a part only of the then outstanding Preference Shares Series 1 is at any time to be redeemed, the shares so redeemed shall be redeemed pro rata (disregarding fractions) according to the number of Preference Shares Series 1 which each registered holder owns at the close of business on the Preference Shares Series 1 dividend record date last preceding the date of the notice of intention to redeem. Redemption moneys (including moneys held on deposit as aforesaid) that are represented by a cheque of the Corporation which has not been duly presented for payment within or that otherwise remain unclaimed for a period of 6 years from the date fixed for redemption shall, unless applicable law otherwise provides, be forfeited to the Corporation.

- (f) **Purchase for Cancellation** - Subject to such of the provisions of the Act as may be applicable, and to the provisions of paragraph (i) hereof, the Corporation may at any time or times, at its option, purchase for cancellation Preference Shares Series 1 by invitation for tenders addressed to all the holders of record of the Preference Shares Series 1 then outstanding, at the lowest price or prices at which, in the opinion of the Corporation, the shares are obtainable but not exceeding the redemption price of the Preference Shares Series 1 as provided in paragraph (c)

hereof, and the costs of purchase. Any Preference Shares Series 1 purchased pursuant to this paragraph, shall not be reissued as Preference Shares Series 1.

(g) **Cancellation** - If any Preference Shares Series 1 remain outstanding on April 1, 2006, the holders thereof shall only be entitled to receive any accrued and unpaid amounts calculated under the Dividend and Redemption Formula, including any deferred amount calculated under the last paragraph of paragraph (d), and such accrued and unpaid amounts shall be paid as soon as the Corporation shall have sufficient monies properly applicable to payment of the same. Subject to the foregoing, the holders thereof shall cease to be entitled to receive any dividends thereon, or any return of capital in respect thereof upon dissolution of the Corporation or otherwise, or to exercise any of the rights of holders thereof, and shall surrender the certificates in respect thereof to the Corporation for cancellation. Upon surrender of the said certificates the Preference Shares Series 1 specified therein shall be cancelled and shall not be reissued as Preference Shares Series 1.

(h) **Conversion into Further Series**

(i) The Corporation may, at any time at its option, designate a further series of preference shares and fix the rights, privileges, restrictions and conditions attaching thereto (any such further shares being hereinafter called "Replacement Preferred Shares") into which all or part of the Preference Shares Series 1 may be converted pursuant to the provisions of this paragraph (h). The Directors of the Corporation shall determine the number of Preference Shares Series 1 that may be so converted.

(ii) The Corporation may issue Replacement Preferred Shares only if on the first day on which Preference Shares Series 1 may be converted into Replacement Preferred Shares:

(A) the Articles of Amendment in respect of Replacement Preferred Shares fix the number thereof at a number at least equal to (but which may be greater than) the number of Preference Shares Series 1 which the Directors of the Corporation have determined may be converted, and determine the rights, privileges, restrictions and conditions attaching thereto; and

(B) the Corporation is not in arrears in the payment of dividends on any outstanding series of preference shares that prohibit the issue of additional preference shares in those circumstances.

The Corporation shall be entitled to rely on an opinion of counsel with respect to its compliance with either of the foregoing conditions.

(iii) If the Corporation has designated and is entitled to issue Replacement Preferred Shares, it shall notify each holder of Preference Shares Series 1 to that effect. The notice shall state the number of Preference Shares

Series 1 which the holder may convert, that number to be proportionate to the number of Preference Shares Series 1 held by each holder.

Each holder of Preference Shares Series 1 may at his option convert Preference Shares Series 1 into Replacement Preferred Shares having an aggregate issue price equal to the aggregate redemption price of the Preference Shares Series 1 to be converted by him plus any accrued and unpaid amounts calculated under the Dividend and Redemption Formula as payable on those shares, including the deferred amount referred to in the last paragraph of paragraph (d). Each holder may convert at any time commencing on the date when the notice is given and ending on the earliest of:

- (A) the close of business on the sixtieth day after the said notice is given; and
  - (B) the close of business on the third business day prior to the date fixed for redemption upon any redemption by the Corporation pursuant to paragraph (c).
- (iv) If the holder of any Preference Shares Series 1 which have been called for redemption by the Corporation elects to exercise his right of conversion as herein provided as to part only of the shares represented by any certificate, the holder shall be deemed to have elected to convert firstly up to the number of shares of that holder which have been called for redemption and secondly the balance, if any, remaining of the shares of that holder which that holder has elected to convert (unless at the time of election the holder gives written notice to the contrary to the Corporation) and the Corporation shall have no obligation to redeem any of the shares which the holder has elected or is deemed to have elected to convert.
- (v) The conversion right herein provided for may be exercised by duly completing a notice of election in the form provided for that purpose by the Corporation and delivering the same to the Corporation at its registered office, accompanied by the certificate or certificates representing the Preference Shares Series 1 in respect of which the holder thereof desires to exercise the right of conversion. The election shall be signed by the registered holder and shall specify the number of Preference Shares Series 1 which the holder desires to have converted and the name or names in which the shares resulting from the conversion are to be registered. If less than all of the Preference Shares Series 1 represented by any certificate or certificates accompanying any notice are to be converted, the holder shall be entitled to receive a new certificate without charge representing the Preference Shares Series 1 comprised in the certificate or certificates surrendered as aforesaid which are not to be converted. Replacement Preferred Shares issued as a result of conversion shall be deemed to be issued as fully-paid and non-assessable. Upon the

conversion of any Preference Shares Series 1 there shall be no payment or adjustment by the Corporation or by any holder of Preference Shares Series 1 on account of any dividends on the Preference Shares Series 1 so converted. On any conversion of Preference Shares Series 1 the share certificates representing shares resulting therefrom shall be issued in the name of the registered holder of the Preference Shares Series 1 converted or, subject to payment by the registered holder of any stock transfer or other applicable taxes, in such name or names as the registered holder may direct in writing (either in the notice above referred to or otherwise).

- (vi) The right of a registered holder of Preference Shares Series 1 to convert the same into Replacement Preferred Shares shall be deemed to have been exercised, and the registered holder of the Preference Shares Series 1 to be converted (or any person or persons in whose name or names the registered holder of Preference Shares Series 1 shall have directed the issuance of further certificates) shall be deemed to have become a holder of Replacement Preferred Shares of record for all purposes on the date of surrender of the certificates representing the Preference Shares Series 1 to be converted together with the election in writing referred to in subparagraph (h)(v), notwithstanding any delay in the delivery of the certificates representing the Replacement Preferred Shares into which the Preference Shares Series 1 have been converted.
- (i) **Restrictions** - So long as any Preference Shares Series 1 are outstanding, the Corporation shall not:
- (i) declare, pay or set apart for payment any dividends (other than stock dividends in shares of the Corporation ranking junior to the Preference Shares Series 1) on the Class A shares or the Class B Subordinate Voting shares or any other shares of the Corporation ranking junior to the Preference Shares Series 1; or
  - (ii) call for redemption, redeem, purchase or otherwise retire for value any Class A shares or any Class B Subordinate Voting shares or any other shares of the Corporation ranking junior to the Preference Shares Series 1 (except out of the net cash proceeds of a substantially concurrent issue of shares of the Corporation ranking junior to the Preference Shares Series 1); or
  - (iii) call for redemption, redeem, purchase or otherwise retire for value less than all of the Preference Shares Series 1 then outstanding; or
  - (iv) call for redemption, redeem, purchase or otherwise retire for value any shares of any class or series ranking on a parity with the Preference Shares Series 1;

unless, in each such case, all dividends accrued and unpaid on outstanding Preference Shares Series 1, other than amounts that are deferred by operation of the last paragraph of paragraph (d), shall have been paid or set apart for payment.

- (j) **Issue of Additional Shares** - Subject to any right of exchange or conversion attaching to preference shares of any other series, so long as any Preference Shares Series 1 are outstanding the Corporation shall not, without the prior approval of the holders of the Preference Shares Series 1, create or issue any shares ranking prior to or on a parity with the Preference Shares Series 1; provided that if all accrued dividends on the Preference Shares Series 1, other than amounts that are deferred by operation of the last paragraph of paragraph (d), shall have been paid or set apart for payment, the Corporation may without such approval issue additional preference shares.
- (k) **Liquidation, Dissolution or Winding-up** - In the event of the liquidation, dissolution or winding-up of the Corporation or any other distribution of property or assets of the Corporation among shareholders for the purpose of winding-up its affairs occurring on or before, but not after, April 1, 2006, the holders of the Preference Shares Series 1 shall be entitled to receive \$100 for each share together, with all accrued and unpaid dividends thereon, and any accrued and unpaid amounts calculated under the Dividend and Redemption Formula, including any deferred amounts calculated under the last paragraph of paragraph (d), the whole before any amount shall be paid to, or any property or assets of the Corporation shall be distributed among the holders of any Class A shares, Class B Subordinate Voting shares or other shares ranking junior to the Preference Shares Series 1. After payment to the holders of the Preference Shares Series 1 of the amount so payable to them, they shall not be entitled to share in any further distribution of the property or assets of the Corporation.
- (l) **Notices** - Any notice, cheque or other communication from the Corporation shall be either sent to the holders of the Preference Shares Series 1 by ordinary unregistered mail, postage prepaid, or delivered by hand to the holders, at their respective addresses appearing on the books of the Corporation, or, in the event of the address of any holder not so appearing, then at the last address of the holder known to the Corporation. Accidental failure to give any notice or other communication to one or more holders of Preference Shares Series 1 shall not affect the validity thereof but, upon the failure being discovered, a copy of the notice or other communication, as the case may be, shall be sent or delivered forthwith to the holder or holders. Unless otherwise provided herein, any notice, certificate or other communication from a holder of Preference Shares Series 1 herein provided for shall be either sent to the Corporation by ordinary unregistered mail, postage prepaid, or delivered by hand to the Corporation, at its registered office. Notice given by mail shall be deemed to be given on the third Business Day, after the day on which it is mailed unless on the day of mailing or before the said third Business Day an actual disruption of mail services has occurred in the province in or to which the notice is mailed.

- (m) **Interpretation** - If any date on which any dividend on or redemption payment in respect of the Preference Shares Series 1 is payable by the Corporation, or on or by which any other action is required to be taken by the Corporation hereunder, is not a Business Day then the dividend or redemption payment shall be payable, or the other action shall be required to be taken, on or by the next succeeding date that is a Business Day. "Business Day" means a day other than a Saturday, Sunday or any other day that is treated as a holiday in the jurisdiction in which the Corporation's registered office is located.
- (n) **Modification** - The provisions of paragraphs (a) to (m) inclusive, and of this paragraph (n) may be deleted, varied, modified, amended or amplified but only with the prior approval given as set forth in this paragraph (n). Subject to those of the provisions of the Act as may be applicable, the approval of the holders of the Preference Shares Series 1 as to any and all matters hereinbefore referred to may be given by resolution duly passed or Articles of Amendment sanctioned at a meeting of the holders of the Preference Shares Series 1 duly called for the purpose and held upon at least twenty-one days notice at which the holders of a majority of all Preference Shares Series 1 then outstanding are present in person or represented by proxy and carried by not less than two-thirds of the votes cast on a poll at such meeting. If at any meeting when originally held the holders of a majority of all Preference Shares Series 1 then outstanding are not present in person or so represented by proxy within half an hour after the time appointed for the meeting, then the meeting shall be adjourned to a day being not less than fifteen (15) days later and to a time and place as may be appointed by the chairman of the meeting and at least ten (10) days notice shall be given of the adjourned meeting, but it shall not be necessary in such notice to specify the purpose for which the meeting was originally called. At the adjourned meeting, the holders of Preference Shares Series 1 present in person or so represented by proxy, whether or not they hold more or less than a majority of all Preference Shares Series 1 then outstanding, may transact the business for which the meeting was originally convened, and a resolution duly passed thereat by not less than two-thirds of the votes cast on a poll at the adjourned meeting shall constitute the approval of the holders of the Preference Shares Series 1 hereinbefore mentioned. The formalities to be observed with respect to the giving of notice of any original meeting or adjourned meeting and the conduct thereof shall be those from time to time prescribed in the Act or the By-laws of the Corporation or by the Directors with respect to meetings of shareholders. On every poll taken at any original meeting or adjourned meeting the holders of Preference Shares Series 1 present in person or so represented by proxy shall be entitled to one vote in respect of each Preference Share Series 1 held by that holder.

**V Preference Shares Series 2**

- (1) The Preference Shares Series 2 shall have attached thereto, in addition to the rights, privileges, restrictions and conditions attaching to the preference shares as a class, the following rights, privileges, restrictions and conditions:

- (a) **Dividends** - The holders of Preference Shares Series 2 shall be entitled to receive, and the Corporation shall pay thereon, as and when declared by the Directors of the Corporation out of moneys of the Corporation properly applicable to the payment of dividends, fixed, preferential cash dividends payable on March 31 (the "dividend payment date"), commencing not earlier than March 31, 2003.

The amount of each dividend shall be the amount payable by way of dividend out of the Dividend and Redemption Amount in accordance with paragraph (d). The amounts payable by way of dividend on the Preference Shares Series 2 shall be so calculated from and including the respective dates of issue thereof, to and including the dividend payment dates. Each dividend on the Preference Shares Series 2 in the amount calculated shall accrue from and including the dividend payment date on which that dividend should have been paid. If on any dividend payment date the dividend payable on that date is not paid in full on all the Preference Shares Series 2 then outstanding, that dividend or the unpaid part thereof shall be paid on a subsequent date or dates as determined by the Directors of the Corporation on which the Corporation shall have sufficient moneys properly applicable to the payment of the same.

#### Rate Of Return Index

For purposes of paragraph (d):

- (i) "Rate of Return Index" means a percentage that is numerically equal to  $2.157 (Ag + 0.263 Pb + 0.00575 Pb^2) - 29.987$ ;
- (ii) "Ag" means a number that is the average of the Yearly Silver Prices stated in 1985 United States currency over the period January 1, 1986 to December 31 of the year preceding that in which the calculation is being made, inclusive;
- (iii) "Pb" means a number that is the average of the Yearly Lead Prices stated in 1985 United States currency over the period January 1, 1986 to December 31 of the year preceding that in which the calculation is being made, inclusive;
- (iv) "Yearly Silver Price" means the average Handy and Harman silver price for the year at New York as quoted in Metals Week, converted into 1985 United States dollars per troy ounce by multiplying the average price in United States dollars for that year times the U.S. Gross National Product implicit price deflator (hereinafter called the "GNP deflator") for 1985 divided by the GNP deflator for the particular year; and
- (v) "Yearly Lead Price" means one-half the sum of the following annual average lead prices: (A) Metals Week U.S. Producer Price; and (B) LME Cash Price. Both prices are those quoted in Metals Week, converted into 1985 United States cents per pound by multiplying the price averages in



United States dollars for that year times the GNP deflator for 1985 divided by the GNP deflator for the particular year.

- (vi) For purposes of clauses (iv) and (v) above the GNP deflator to be used shall be the latest figure published prior to the date of calculation. If that figure is not the final figure for the year, an appropriate adjustment shall be made in the following year.
  - (vii) If for any year the Yearly Silver Price or Yearly Lead Price cannot be determined by the use of the foregoing clauses (iv) or (v), the "Yearly Silver Price" or "Yearly Lead Price", as the case may be, shall be the prices quoted in an equivalent source of information relied on by the industry.
- (b) **Payment of Dividends** - The mailing of cheques of the Corporation to the registered holders of Preference Shares Series 2 shall be deemed to be payment and shall satisfy and discharge all liability for any dividend declared on the Preference Shares Series 2 to the extent of the amounts represented thereby (plus any tax required to be and deducted or withheld therefrom), unless such cheques are not paid on due presentation.
- The holders of the Preference Shares Series 2 shall not be entitled to any dividends other than or in excess of the preferential cash dividends declared thereon pursuant to paragraph (a). A dividend which is represented by a cheque of the Corporation which has not been duly presented for payment within 6 years after it was issued or that otherwise remains unclaimed for a period of 6 years from the date on which it was declared to be payable shall be forfeited to the Corporation.
- (c) **Optional Redemption** - Subject to the last paragraph of paragraph (d) and to paragraph (i) hereof, and to such of the provisions of the Act as may be applicable, the Corporation may at any time or times at its option redeem Preference Shares Series 2 in the manner provided in paragraph (e) hereof on payment of the sum of \$100 for each share to be redeemed together with an amount equal to all accrued and unpaid dividends thereon (the whole constituting the "redemption price").
- (d) **Redemption Obligations** - Prior to the dividend payment date in each of the years 2003 to 2006, inclusive, but not thereafter, an amount (the "Dividend and Redemption Amount") shall be calculated in accordance with the following Dividend and Redemption Formula and the Rate of Return Index set out in paragraph (a). The Dividend and Redemption Amount shall be applied to redemption of Preference Shares Series 2 until all but 1,000 Preference Shares Series 2 have been redeemed. Preference Shares Series 2 to be so redeemed shall be redeemed at the redemption price as provided in paragraph (c) on the dividend payment date in each of those years. After all but 1,000 Preference Shares Series 2 have been redeemed, the Dividend and Redemption Amount shall be paid as

dividends on the Preference Shares Series 2 until the dividend payment date in the year 2005. The Dividend and Redemption Amount calculated for the year 2006 shall be applied firstly in redemption of the Preference Shares Series 2 which remain outstanding, and any balance shall be paid as an accrued dividend on those remaining Preference Shares Series 2 as part of the redemption price thereof; provided that the foregoing shall not preclude earlier redemption of the Preference Shares Series 2 which remain outstanding, if the cumulative amounts calculated under clauses (i) and (ii) of the Dividend and Redemption Formula reach the maximum amounts specified in the two provisos immediately following clause (ii).

#### Dividend and Redemption Formula

The Dividend and Redemption Amount calculated under the Dividend and Redemption Formula shall be the sum of:

(i)

Rate of Return Index	Percentage of the Stated Capital Amount Outstanding on April 1, 1996 of the Redeemable Preferred Shares Series F in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.)
Less than 8%	Nil
8% to 14% inclusive	From 0 to 20% (linear)
14% to 18% inclusive	20%
18% to 24% inclusive	From 20% to 40% (linear)
Over 24%	40%; and

(ii) an amount equal to 0.145% of the aggregate stated capital amount of all Redeemable Preferred Shares Series F in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.) issued prior to April 1, 1996 for each one-tenth (1/10) of one (1) per cent that the Rate of Return Index exceeds twenty-four (24) per cent.

Provided, however, that the total calculated under clause (i) shall not exceed the aggregate stated capital value of the Redeemable Preferred Shares Series F in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.) outstanding on April 1, 1996, less the aggregate stated capital value of all Preference Shares Series 2 redeemed, purchased for cancellation or converted under paragraphs (c), (f) or (h);

And provided further that the total calculated under clause (ii) shall not exceed the aggregate of:

- (A) eight (8) per cent per annum of the weighted average of the stated capital amount of the Redeemable Preferred Shares Series F in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.) outstanding from the dates of issue to March 31, 1996; and
- (B) the lesser of
  - (1) the sum of respectively 80%, 60%, 40%, 20% and 0% of eight (8) per cent (being 200% of eight (8) per cent) of the aggregate stated capital value of the Redeemable Preferred Shares Series F in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.) outstanding on April 1, 1996; or
  - (2) eight (8) per cent per annum of the weighted average of the stated capital amount of the Redeemable Preferred Shares Series F in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.) outstanding during the twelve months ending on March 31 in the years 1997 to 2000, inclusive.

Notwithstanding the foregoing provisions of this paragraph (d), the payments on account of the Dividend and Redemption Amount actually made by the Corporation in respect of any year shall not exceed an amount (the "calculated amount") equal to 34.8% of the aggregate stated capital amount of all Redeemable Preferred Shares Series F in the capital of Cominco Ltd. (now Teck Cominco Metals Ltd.) issued prior to April 1, 1996. If the Dividend and Redemption Amount, as calculated, exceeds the calculated amount, the excess (the "deferred amount") shall be deferred and paid in the next succeeding year or years when the Dividend and Redemption Amount is less than the calculated amount. Any accrued and unpaid amounts calculated under the Dividend and Redemption Formula, including any such deferred amount, shall be paid as soon as the Corporation shall have sufficient monies properly applicable to payment of the same and prior to and as a condition precedent to final redemption of all outstanding Preference Shares Series 2. Nothing in this paragraph (d) shall, however, be construed as limiting the rights of the Corporation to redeem Preference Shares Series 2 pursuant to paragraph (c).

- (e) **Redemption Procedure** - In any case of redemption of Preference Shares Series 2, at least 30 days before the date specified for redemption the Corporation shall give notice in writing of the intention of the Corporation to redeem Preference Shares Series 2 to each person who at the date the notice is given is the registered holder of Preference Shares Series 2 to be redeemed. The notice of intention to redeem shall set out the redemption price, the place at which the redemption price

is to be paid and the date on which redemption is to take place and, if a part only of the Preference Shares Series 2 is to be redeemed, the number thereof so to be redeemed. On or after the date so specified for redemption, the Corporation shall pay or cause to be paid to or to the order of the registered holders of the Preference Shares Series 2 to be redeemed the redemption price of those shares on presentation and surrender to the Corporation of the certificates for the Preference Shares Series 2 called for redemption at the registered office of the Corporation or at any other place within Canada designated in the notice of intention to redeem. The payment shall be made by cheque payable at par at any branch of a Canadian chartered bank in Canada. The Preference Shares Series 2 for which the redemption price is paid shall thereupon be and be deemed to be redeemed and shall not be reissued as Preference Shares Series 2. If a part only of the shares represented by any certificate shall be redeemed, a new certificate for the balance of the shares not so redeemed shall be issued at the expense of the Corporation. From and after the date specified for redemption in any notice of intention to redeem, the holders of the Preference Shares Series 2 called for redemption shall cease to be entitled to dividends and shall not be entitled to exercise any of the rights of shareholders in respect thereof unless payment of the redemption price shall not be made upon presentation of certificates in accordance with the foregoing provisions, in which case the rights of the registered holder shall remain unaffected. At any time after the giving of a notice of intention to redeem any Preference Shares Series 2 as aforesaid, the Corporation shall have the right to deposit the redemption price of the shares which have been called for redemption or of those Preference Shares Series 2 represented by certificates which have not at the date of the deposit been surrendered by the holder thereof in connection with the redemption, to the credit of a special account in any chartered bank or any trust company in Canada named in the notice of intention to redeem. The amount deposited shall be paid without interest to or to the order of the respective registered holders of Preference Shares Series 2 called for redemption upon presentation and surrender of the certificates representing the same to the branch or branches of the chartered bank or trust company designated in the notice of intention to redeem. Upon the date the deposit is made or the date for redemption specified in the notice of intention to redeem, whichever is the later, the Preference Shares Series 2 in respect whereof the deposit has been made shall be deemed to be and be redeemed and the rights of the holders thereof after the deposit or the redemption date, as the case may be, shall be limited to receiving without interest their proportionate part of the total redemption price so deposited (less any tax required to be deducted or withheld therefrom) against presentation and surrender of the certificates representing the same. Any interest allowed on any such deposit shall belong to the Corporation.

Subject to such of the provisions of the Act as may be applicable, in case a part only of the then outstanding Preference Shares Series 2 is at any time to be redeemed, the shares so redeemed shall be redeemed pro rata (disregarding fractions) according to the number of Preference Shares Series 2 which each registered holder owns at the close of business on the Preference Shares Series 2 dividend record date last preceding the date of the notice of intention to redeem.

Redemption moneys (including moneys held on deposit as aforesaid) that are represented by a cheque of the Corporation which has not been duly presented for payment within or that otherwise remain unclaimed for a period of 6 years from the date fixed for redemption shall, unless applicable law otherwise provides, be forfeited to the Corporation.

- (f) **Purchase for Cancellation** - Subject to such of the provisions of the Act as may be applicable and to the provisions of paragraph (i) hereof, the Corporation may at any time or times, at its option, purchase for cancellation Preference Shares Series 2 by invitation for tenders addressed to all the holders of record of the Preference Shares Series 2 then outstanding, at the lowest price or prices at which, in the opinion of the Corporation, the shares are obtainable but not exceeding the redemption price of the Preference Shares Series 2 as provided in paragraph (c) hereof, and the costs of purchase. Any Preference Shares Series 2 purchased pursuant to this paragraph, shall not be reissued as Preference Shares Series 2.
- (g) **Cancellation** - If any Preference Shares Series 2 remain outstanding on April 1, 2006, the holders thereof shall only be entitled to receive any accrued and unpaid amounts calculated under the Dividend and Redemption Formula, including any deferred amount calculated under the last paragraph of paragraph (d), and such accrued and unpaid amounts shall be paid as soon as the Corporation shall have sufficient monies properly applicable to payment of the same. Subject to the foregoing, the holders thereof shall cease to be entitled to receive any dividends thereon, or any return of capital in respect thereof upon dissolution of the Corporation or otherwise, or to exercise any of the rights of holders thereof, and shall surrender the certificates in respect thereof to the Corporation for cancellation. Upon surrender of the said certificates the Preference Shares Series 2 specified therein shall be cancelled and shall not be reissued as Preference Shares Series 2.
- (h) **Conversion into Further Series**
- (i) The Corporation may, at any time at its option, designate a further series of preference shares and fix the rights, privileges, restrictions and conditions attaching thereto (any such further shares being hereinafter called "Replacement Preferred Shares") into which all or part of the Preference Shares Series 2 may be converted pursuant to the provisions of this paragraph (h). The Directors of the Corporation shall determine the number of Preference Shares Series 2 that may be so converted.
- (ii) The Corporation may issue Replacement Preferred Shares only if on the first day on which Preference Shares Series 2 may be converted into Replacement Preferred Shares:
- (A) the Articles of Amendment in respect of Replacement Preferred Shares fix the number thereof at a number at least equal to (but which may be greater than) the number of Preference Shares Series

2 which the Directors of the Corporation have determined may be converted, and determine the rights, privileges, restrictions and conditions attaching thereto; and

- (B) the Corporation is not in arrears in the payment of dividends on any outstanding series of preference shares that prohibit the issue of additional preference shares in those circumstances.

The Corporation shall be entitled to rely on an opinion of counsel with respect to its compliance with either of the foregoing conditions.

- (iii) If the Corporation has designated and is entitled to issue Replacement Preferred Shares, it shall notify each holder of Preference Shares Series 2 to that effect. The notice shall state the number of Preference Shares Series 2 which the holder may convert, that number to be proportionate to the number of Preference Shares Series 2 held by each holder.

Each holder of Preference Shares Series 2 may at his option convert Preference Shares Series 2 into Replacement Preferred Shares having an aggregate issue price equal to the aggregate redemption price of the Preference Shares Series 2 to be converted by him plus any accrued and unpaid amounts calculated under the Dividend and Redemption Formula as payable on those shares, including the deferred amount referred to in the last paragraph of paragraph (d). Each holder may convert at any time commencing on the date when the notice is given and ending on the earliest of:

- (A) the close of business on the sixtieth day after the said notice is given; and

- (B) the close of business on the third business day prior to the date fixed for redemption upon any redemption by the Corporation pursuant to paragraph (c).

- (iv) If the holder of any Preference Shares Series 2 which have been called for redemption by the Corporation elects to exercise his right of conversion as herein provided as to part only of the shares represented by any certificate, the holder shall be deemed to have elected to convert firstly up to the number of shares of that holder which have been called for redemption and secondly the balance, if any, remaining of the shares of that holder which that holder has elected to convert (unless at the time of election the holder gives written notice to the contrary to the Corporation) and the Corporation shall have no obligation to redeem any of the shares which the holder has elected or is deemed to have elected to convert.

- (v) The conversion right herein provided for may be exercised by duly completing a notice of election in the form provided for that purpose by the Corporation and delivering the same to the Corporation at its

registered office, accompanied by the certificate or certificates representing the Preference Shares Series 2 in respect of which the holder thereof desires to exercise the right of conversion. The election shall be signed by the registered holder and shall specify the number of Preference Shares Series 2 which the holder desires to have converted and the name or names in which the shares resulting from the conversion are to be registered. If less than all of the Preference Shares Series 2 represented by any certificate or certificates accompanying any notice are to be converted, the holder shall be entitled to receive a new certificate without charge representing the Preference Shares Series 2 comprised in the certificate or certificates surrendered as aforesaid which are not to be converted. Replacement Preferred Shares issued as a result of conversion shall be deemed to be issued as fully-paid and non-assessable. Upon the conversion of any Preference Shares Series 2 there shall be no payment or adjustment by the Corporation or by any holder of Preference Shares Series 2 on account of any dividends on the Preference Shares Series 2 so converted. On any conversion of Preference Shares Series 2 the share certificates representing shares resulting therefrom shall be issued in the name of the registered holder of the Preference Shares Series 2 converted or, subject to payment by the registered holder of any stock transfer or other applicable taxes, in such name or names as the registered holder may direct in writing (either in the notice above referred to or otherwise).

- (vi) The right of a registered holder of Preference Shares Series 2 to convert the same into Replacement Preferred Shares shall be deemed to have been exercised, and the registered holder of the Preference Shares Series 2 to be converted (or any person or persons in whose name or names the registered holder of Preference Shares Series 2 shall have directed the issuance of further certificates) shall be deemed to have become a holder of Replacement Preferred Shares of record for all purposes on the date of surrender of the certificates representing the Preference Shares Series 2 to be converted together with the election in writing referred to in subparagraph (h)(v), notwithstanding any delay in the delivery of the certificates representing the Replacement Preferred Shares into which the Preference Shares Series 2 have been converted.
- (i) **Restrictions** - So long as any Preference Shares Series 2 are outstanding, the Corporation shall not:
- (i) declare, pay or set apart for payment any dividends (other than stock dividends in shares of the Corporation ranking junior to the Preference Shares Series 2) on the Class A shares or the Class B Subordinate Voting shares or any other shares of the Corporation ranking junior to the Preference Shares Series 2; or
- (ii) call for redemption, redeem, purchase or otherwise retire for value any Class A shares or any Class B Subordinate Voting shares or any other

shares of the Corporation ranking junior to the Preference Shares Series 2 (except out of the net cash proceeds of a substantially concurrent issue of shares of the Corporation ranking junior to the Preference Shares Series 2); or

- (iii) call for redemption, redeem, purchase or otherwise retire for value less than all of the Preference Shares Series 2 then outstanding; or
- (iv) call for redemption, redeem, purchase or otherwise retire for value any shares of any class or series ranking on a parity with the Preference Shares Series 2;

unless, in each such case, all dividends accrued and unpaid on outstanding Preference Shares Series 2, other than amounts that are deferred by operation of the last paragraph of paragraph (d), shall have been paid or set apart for payment.

- (j) **Issue of Additional Shares** - Subject to any right of exchange or conversion attaching to preference shares of any other series, so long as any Preference Shares Series 2 are outstanding the Corporation shall not, without the prior approval of the holders of the Preference Shares Series 2, create or issue any shares ranking prior to or on a parity with the Preference Shares Series 2; provided that if all accrued dividends on the Preference Shares Series 2, other than amounts that are deferred by operation of the last paragraph of paragraph (d), shall have been paid or set apart for payment, the Corporation may without such approval issue additional preference shares.
- (k) **Liquidation, Dissolution or Winding-up** - In the event of the liquidation, dissolution or winding-up of the Corporation or any other distribution of property or assets of the Corporation among shareholders for the purpose of winding-up its affairs occurring on or before, but not after, April 1, 2006, the holders of the Preference Shares Series 2 shall be entitled to receive \$100 for each share together with all accrued and unpaid dividends thereon, and any accrued and unpaid amounts calculated under the Dividend and Redemption Formula, including any deferred amounts calculated under the last paragraph of paragraph (d), the whole before any amount shall be paid to, or any property or assets of the Corporation shall be distributed among the holders of any Class A shares, Class B Subordinate Voting shares or other shares ranking junior to the Preference Shares Series 2. After payment to the holders of the Preference Shares Series 2 of the amount so payable to them, they shall not be entitled to share in any further distribution of the property or assets of the Corporation.
- (l) **Notices** - Any notice, cheque or other communication from the Corporation shall be either sent to the holders of the Preference Shares Series 2 by ordinary unregistered mail, postage prepaid, or delivered by hand to the holders, at their respective addresses appearing on the books of the Corporation, or, in the event of the address of any holder not so appearing, then at the last address of the holder known to the Corporation. Accidental failure to give any notice or other



communication to one or more holders of Preference Shares Series 2 shall not affect the validity thereof but, upon the failure being discovered, a copy of the notice or other communication, as the case may be, shall be sent or delivered forthwith to the holder or holders. Unless otherwise provided herein, any notice, certificate or other communication from a holder of Preference Shares Series 2 herein provided for shall be either sent to the Corporation by ordinary unregistered mail, postage prepaid, or delivered by hand to the Corporation, at its registered office. Notice given by mail shall be deemed to be given on the third Business Day after the day on which it is mailed unless on the day of mailing or before the said third Business Day an actual disruption of mail services has occurred in the province in or to which the notice is mailed.

(m) **Interpretation** - If any date on which any dividend on or redemption payment in respect of the Preference Shares Series 2 is payable by the Corporation, or on or by which any other action is required to be taken by the Corporation hereunder, is not a Business Day then the dividend or redemption payment shall be payable, or the other action shall be required to be taken, on or by the next succeeding date that is a Business Day. "Business Day" means a day other than a Saturday, a Sunday or any other day that is treated as a holiday in the jurisdiction in which the Corporation's registered office is located.

(n) **Modification** - The provisions of paragraphs (a) to (m) inclusive, and of this paragraph (n) may be deleted, varied, modified, amended or amplified but only with the prior approval given as set forth in this paragraph (n). Subject to those of the provisions of the Act as may be applicable, the approval of the holders of the Preference Shares Series 2 as to any and all matters hereinbefore referred to may be given by resolution duly passed or Articles of Amendment sanctioned at a meeting of the holders of the Preference Shares Series 2 duly called for the purpose and held upon at least twenty-one days notice at which the holders of a majority of all Preference Shares Series 2 then outstanding are present in person or represented by proxy and carried by not less than two-thirds of the votes cast on a poll at such meeting. If at any meeting when originally held the holders of a majority of all Preference Shares Series 2 then outstanding are not present in person or so represented by proxy within half an hour after the time appointed for the meeting, then the meeting shall be adjourned to a day being not less than fifteen (15) days later and to a time and place as may be appointed by the chairman of the meeting and at least ten (10) days notice shall be given of the adjourned meeting, but it shall not be necessary in such notice to specify the purpose for which the meeting was originally called. At the adjourned meeting, the holders of Preference Shares Series 2 present in person or so represented by proxy, whether or not they hold more or less than a majority of all Preference Shares Series 2 then outstanding, may transact the business for which the meeting was originally convened, and a resolution duly passed thereat by not less than two-thirds of the votes cast on a poll at the adjourned meeting shall constitute the approval of the holders of the Preference Shares Series 2 hereinbefore mentioned. The formalities to be observed with respect to the giving of notice of any original meeting or adjourned meeting and the conduct thereof shall be those from time to

time prescribed in the Act or the By-laws of the Corporation or by the Directors with respect to meetings of shareholders. On every poll taken at any original meeting or adjourned meeting the holders of Preference Shares Series 2 present in person or so represented by proxy shall be entitled to one vote in respect of each Preference Share Series 2 held by that holder.

**Schedule 2**

(a) The board of directors may from time to time, in such amounts and on such terms as it deems expedient:

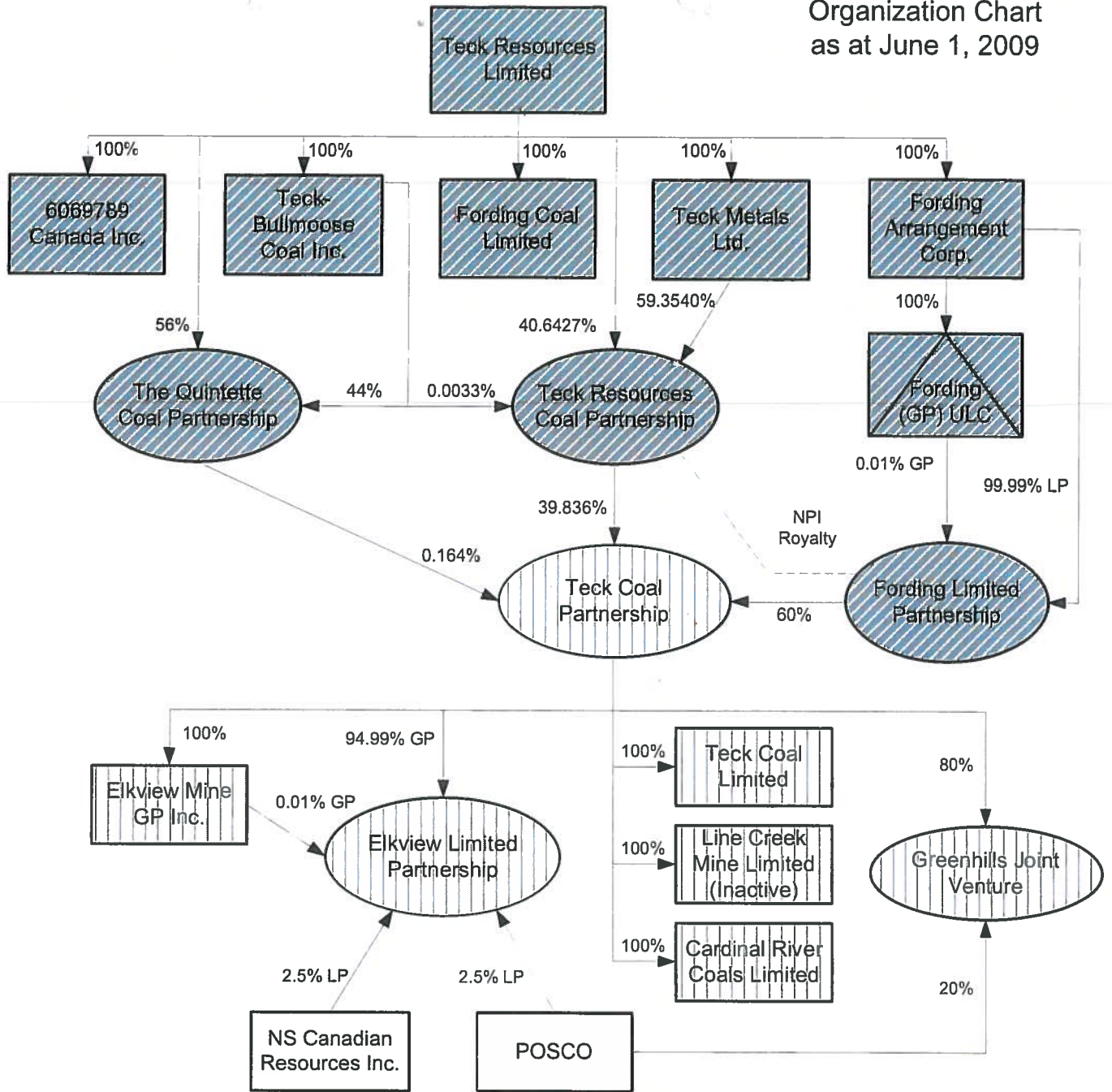
- (i) borrow money upon the credit of the Corporation;
- (ii) issue, sell or pledge debt obligations (including bonds, debentures, notes or other similar obligations, secured or unsecured) of the Corporation;
- (iii) charge, mortgage, hypothecate or pledge all or any of the currently owned or subsequently acquired real or personal, movable or immovable property of the Corporation, including book debts, rights, powers, franchises and undertaking, to secure any debt obligation or any money borrowed, or other debt or liability of the Corporation.

The board of directors may from time to time delegate to such one or more of the directors or officers of the Corporation as may be designated by the board all or any of the powers conferred on the board above to such extent and in such manner as the board shall determine at the time of such delegation.

The directors are authorized to appoint one or more additional directors, who shall hold office for a term expiring at the close of the next annual meeting of shareholders, but the total number of directors so appointed will not exceed one-third of the number of directors elected at the last annual meeting of shareholders.

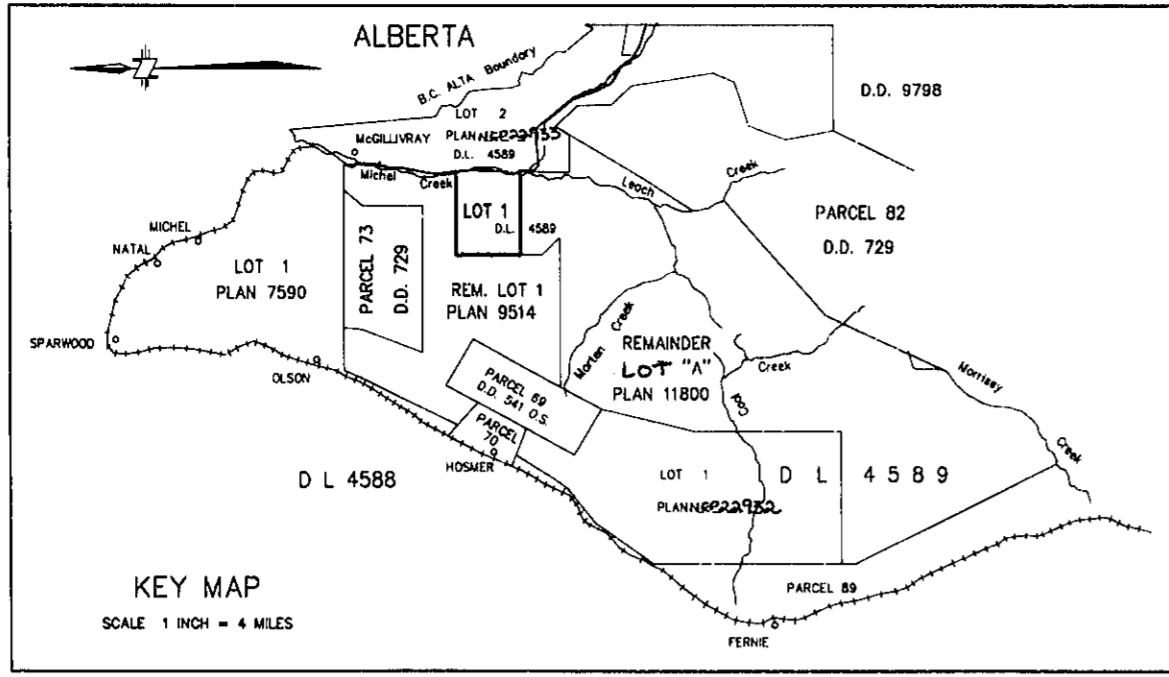
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Teck Coal Group  
Organization Chart  
as at June 1, 2009



Teck Resources Limited Entities

Teck Coal Entities



# PLAN NEP 23394

DEPOSITED IN THE LAND TITLE OFFICE AT NELSON B.C. THIS 23<sup>rd</sup> DAY OF September 1994

*Jan C. B. Smith*  
REGISTRAR *per BMB*

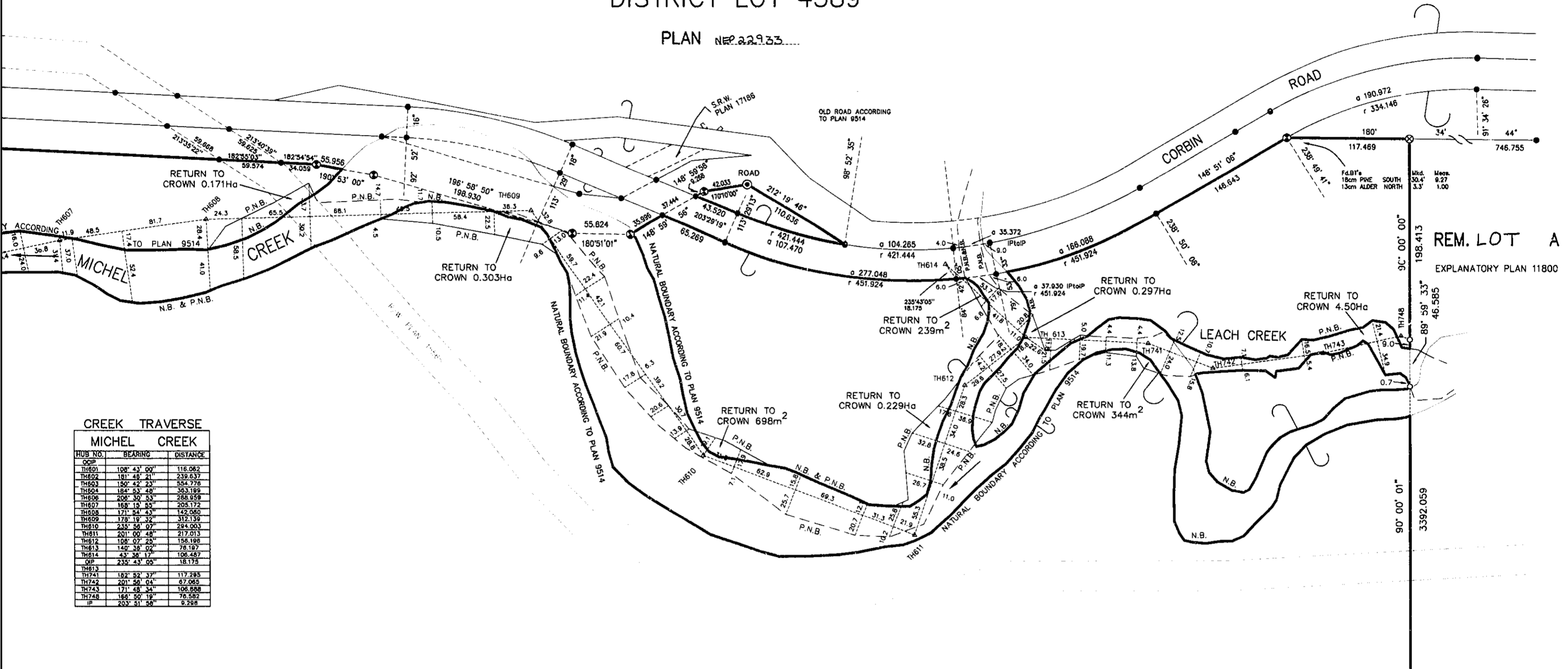
REF. No. XK27463

L 13875

LOT 2

## DISTRICT LOT 4589

PLAN NEP 23394



### CREEK TRAVERSE

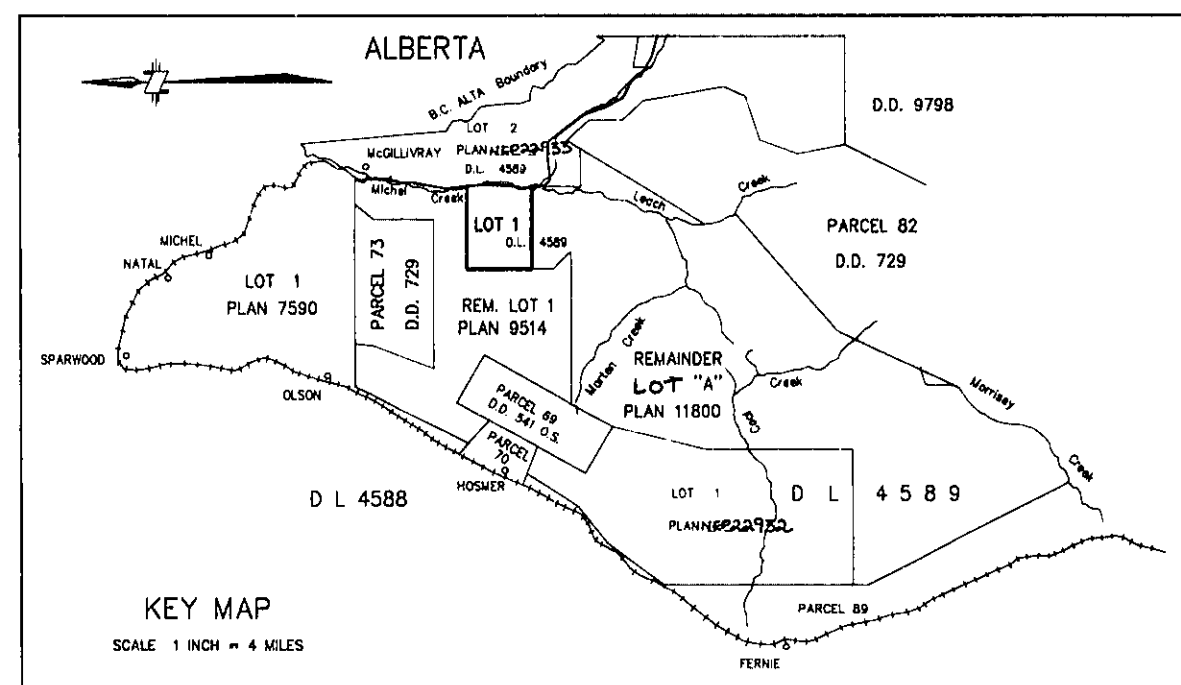
STATION	BEARING	DISTANCE
TH601	106° 43' 00"	116.063
TH602	181° 49' 21"	239.537
TH603	156° 25' 23"	354.776
TH604	184° 53' 40"	353.189
TH605	206° 30' 33"	358.659
TH606	161° 15' 35"	305.172
TH607	171° 54' 53"	142.586
TH608	176° 18' 36"	312.136
TH609	215° 58' 07"	294.203
TH610	202° 06' 48"	317.013
TH611	108° 07' 28"	156.198
TH612	145° 34' 08"	18.157
TH613	43° 30' 17"	106.457
TH614	232° 53' 59"	18.175
TH615	182° 55' 37"	117.585
TH616	202° 58' 04"	67.685
TH617	171° 48' 34"	106.868
TH618	162° 56' 19"	76.587
TH619	252° 51' 58"	6.288

**OWNERS:**  
CRESTBROOK FOREST INDUSTRIES LTD.  
(INC. NO. 65274)  
AUTHORIZED SIGNATORY(S)

*Michael J. Rouse*  
MICHAEL J. ROUSE  
*Robert H. Langin*  
ROBERT H. LANGIN  
*Joyce S. Funn*  
JOYCE S. FUNN  
230 CRAWFORD ST. NO.  
CRESTBROOK B.C. V1C 3K2  
SECRETARY  
OCCUPATION OF WITNESS

**OPTION TO PURCHASE:**  
CHARGE NO.: KP33144  
ELKVIEW COAL CORPORATION  
(INC. #13414)  
AUTHORIZED SIGNATORY(S)

*Karen Dussel*  
Corporate Secretary  
KAREN DUSSEL  
*Brian E. Abraham*  
BRIAN E. ABRAHAM  
2500-595 Burrard St.  
VANCOUVER B.C.  
ADDRESS OF WITNESS  
Solicitor  
OCCUPATION OF WITNESS

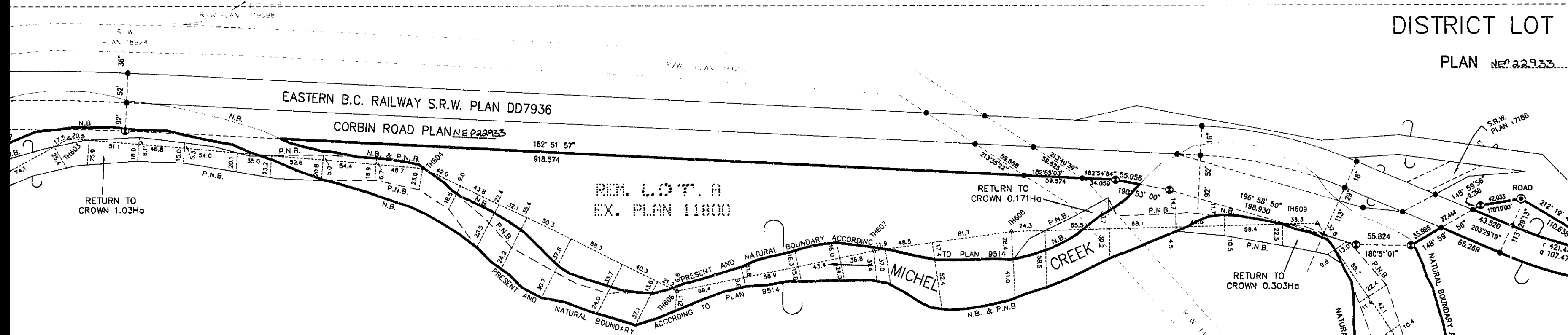


L 13876

LOT 2

DISTRICT LOT

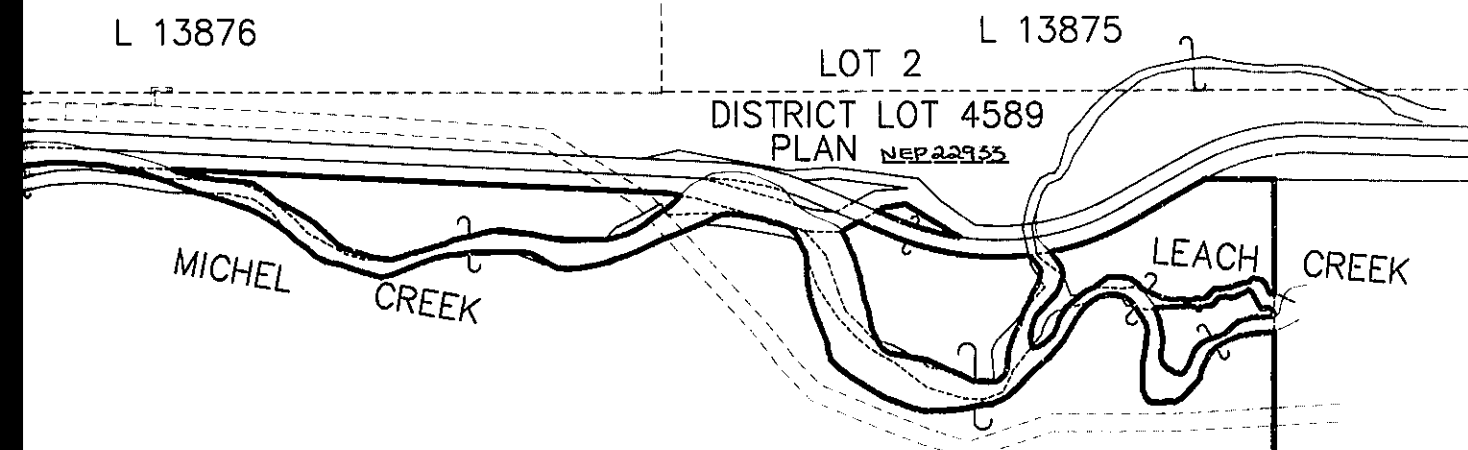
PLAN NEP 23394



LOT 1  
D.L. 4589

CREEK TRAVERSE  
MICHEL CREEK

STATION	BEARING	DISTANCE
10800	108° 42' 00"	116.282
10801	181° 52' 31"	235.031
10802	180° 42' 23"	554.778
10803	181° 53' 02"	361.195
10804	202° 30' 23"	283.855
10805	189° 12' 52"	203.175
10806	171° 44' 43"	143.080
10807	189° 12' 52"	217.175
10808	242° 28' 07"	284.003
10809	189° 12' 52"	217.175
10810	201° 07' 28"	150.189
10811	189° 12' 52"	217.175
10812	140° 36' 12"	76.397
10813	43° 46' 18"	108.487
10814	232° 42' 20"	38.175
10815	189° 12' 52"	217.175
10816	182° 22' 21"	117.385
10817	201° 07' 28"	150.189
10818	171° 44' 43"	143.080
10819	189° 12' 52"	217.175
10820	202° 31' 23"	9.288



REM. LOT A  
DISTRICT LOT 4589  
PLAN 11800

LOT 1  
DISTRICT LOT 4589

Feet  
13cm FR 54"  
15cm FR 302"

Meters  
12.4' 3.78  
12.2' 3.72

Feet  
35cm FR 49"  
38cm FR 134"  
25cm FR 210"

Meters  
13.0' 4.15  
10.2' 3.11  
6.0' 1.83

180' 00' 00" 75.037

SCALE 1 : 10,000

OWNERS :  
CRESTBROOK FOREST INDUSTRIES LTD.  
(INC. NO. 65274)  
AUTHORIZED SIGNATORY(S)

OPTION TO PURCHASE:  
CHARGE NO: XF33144  
ELKVIEW COAL CORPORATION  
(INC. #34141)  
AUTHORIZED SIGNATORY(S)

*Michael J. Rouse*  
MICHAEL J. ROUSE  
Corporate Secretary

*Robert H. Langin*  
ROBERT H. LANGIN  
Corporate Secretary

*Walter S. Gunn*  
WITNESS WALTER S. GUNN  
250 CRAWFORD ST. NO.  
CRANBROOK BC V1C 3R2  
ADDRESS OF WITNESS

*Brian E. Abraham*  
BRIAN E. ABRAHAM  
WITNESS  
2500-595 BUIVARD ST.  
VANCOUVER B.C.  
ADDRESS OF WITNESS

SECRETARY  
OCCUPATION OF WITNESS

Solicitor  
OCCUPATION OF WITNESS

# 22-EK-R5-M4-701

## SUBDIVISION PLAN OF PART OF LOT A, EXPLANATORY PLAN 11800 DISTRICT LOT 4589, KOOTENAY DISTRICT.

B.C.G.S. 82G.045/046/055/ & 056

SCALE: 1:2500



### LEGEND

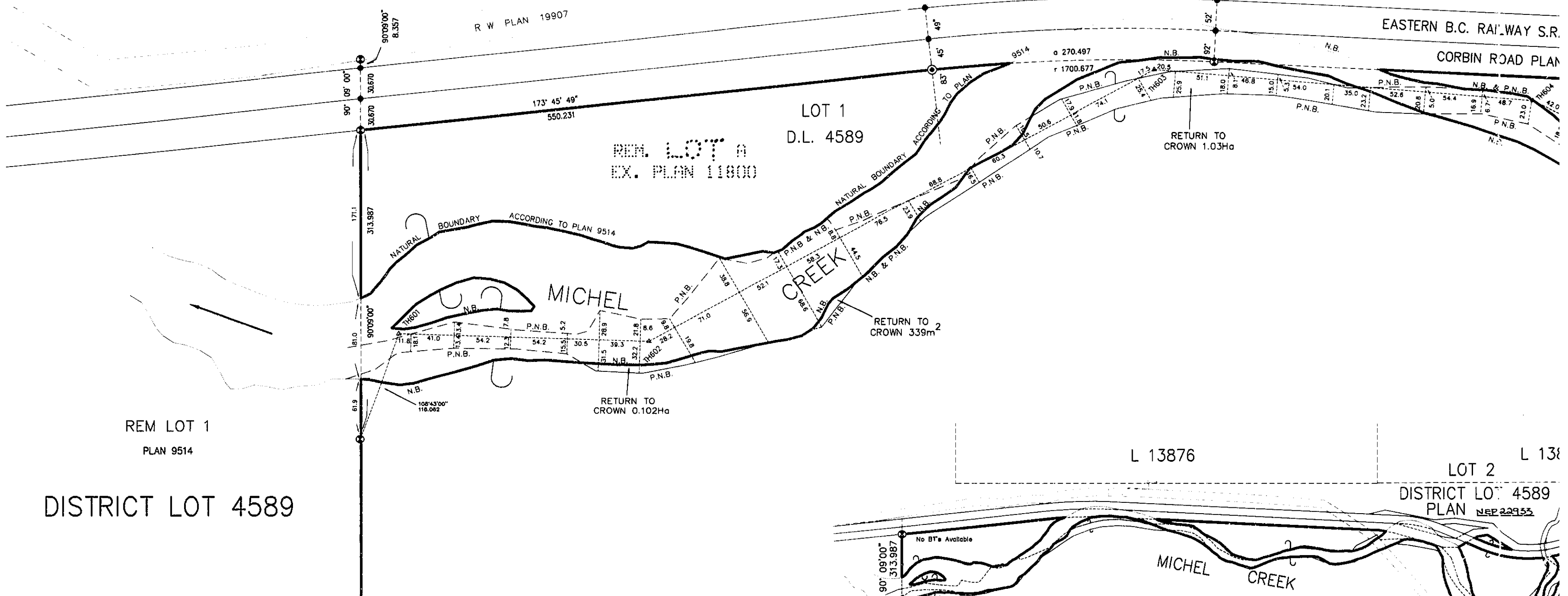
BEARINGS ARE ASTRONOMIC, DERIVED FROM PLAN 9514.  
ALL DISTANCES ARE IN METRES AND DECIMALS THEREOF UNLESS OTHERWISE INDICATED.  
BEARINGS TO BEARING TREES ARE MAGNETIC.

SYMBOLS FOUND	DESCRIPTION PLACED	DESCRIPTION
⊙	⊙	STANDARD CONCRETE POST
⊗	⊗	STANDARD CAPPED POST
●	○	STANDARD IRON POST
△	△	TRAVERSE HUB
P.N.B.	P.N.B.	PRESENT NATURAL BOUNDARY
N.B.	N.B.	NATURAL BOUNDARY ACCORDING TO PLAN 9514



L 13876

LOT 2  
DISTRICT LOT 4589  
PLAN NEP 22955



BOOK OF REFERENCE	
DESCRIPTION	AREA ha
LOT 1, D.L. 4589	1021
MICHEL AND LEACH CREEK	19.9
Returned to Crown	6.79

THE REGISTERED OWNERS DESIGNATED HEREON HAVE ENTERED INTO COVENANTS IN FAVOUR OF MINISTRY OF ENVIRONMENT, LANDS AND PARKS, THE REGIONAL DISTRICT OF EAST KOOTENAY AND MINISTRY OF TRANSPORTATION AND HIGHWAYS UNDER SECTION 215 OF THE LAND TITLE ACT, DATED THIS 11th DAY OF AUGUST, 1996.

I, JAMES D. CHRISTIE, A BRITISH COLUMBIA LAND SURVEYOR OF NORTH VANCOUVER IN BRITISH COLUMBIA, CERTIFY THAT I WAS PRESENT AT AND PERSONALLY SUPERINTENDED THE SURVEY REPRESENTED BY THIS PLAN AND THAT THE SURVEY AND PLAN ARE CORRECT. THE SURVEY WAS COMPLETED ON THE 24th DAY OF MAY, 1995.

*James D. Christie* B.C.L.S.

THIS PLAN NEED NOT COMPLY WITH SECTION 75(1)(b) OF THE LAND TITLE ACT. DATED THIS 19 DAY OF August 1996. *James Vernon* REGIONAL APPROVING OFFICER MINISTRY OF TRANSPORTATION AND HIGHWAYS

APPROVED UNDER THE LAND TITLE ACT THIS 19 DAY OF August 1996. *James Vernon* REGIONAL APPROVING OFFICER MINISTRY OF TRANSPORTATION & HIGHWAYS

INSPECTED UNDER THE LAND TITLE ACT ON THE 22nd DAY OF NOVEMBER, 1995. *James Christie* B.C.L.S.

F.d.B.T's	Mid. Meas.
35cm PINE 44'	14.2' 4.33
25cm PINE 160'	14.1' 4.30
25cm PINE 250'	11.1' 3.38

F.d.B.T's	Mid. Meas.
25cm LARCH 54'	10.1' 3.08
30cm LARCH 172'	10.5' 3.20
18cm PINE 252'	8.4' 2.58

F.d.B.T's	Mid. Meas.
25cm FIR 7'	4.7' 1.43
25cm FIR 84'	10.6' 3.28
35cm FIR 164'	14.7' 4.48

F.d.B.T's	Mid. Meas.
13cm FIR 54'	12.4' 3.78
15cm FIR 302'	12.2' 3.72

SCALE 1 : 10,000