1. OVERVIEW OF THE PROPOSED PROJECT

This chapter provides an overview of the proposed Harper Creek Project (the Project), including Harper Creek Mining Corporation (HCMC) contact information; name of the legal entity that would develop, manage, and operate the Project; and the guiding principles that will be followed by HCMC. The chapter also outlines the purpose and benefits of the proposed Project, as well as its physical setting.

1.1 INTRODUCTION

HCMC proposes to construct and operate the Project, an open pit copper mine near Vavenby, British Columbia (BC). The Project has an estimated 28-year mine life based on a nominal ore throughput of 70,000 tonnes per day (25 million tonnes per year).

The Project is located in the Thompson-Nicola area of BC, approximately 150 kilometres (km) northeast of Kamloops along the Southern Yellowhead Highway (Highway 5), approximately 10 km southwest of the unincorporated municipality of Vavenby, BC (Figure 1.1-1).

The Project consists of an open pit mine, on-site ore processing facilities, a tailings management facility (for tailings solids storage, subaqueous storage of potentially acid-generating waste rock, and recycling of water for processing), waste rock stockpiles, low-grade ore and overburden stockpiles, a temporary construction camp, ancillary facilities, mine haul roads, sewage and waste management facilities, a 24-km access road between the Project Site and a rail load-out facility located on private land owned by HCMC in Vavenby, and a 14-km power line connecting the Project Site to the BC Hydro transmission line corridor in Vavenby. Ore will be processed on site through a conventional crushing, grinding, and flotation process to produce a copper concentrate, with gold and silver by-products. The concentrate will be transported via the existing Canadian National Railway network to the existing Vancouver Wharves storage, handling, and loading facilities located at Port Metro Vancouver for shipment to overseas smelters. The Project infrastructure is shown in Figure 1.1-2.

This document constitutes an Application for an Environmental Assessment Certificate/ Environmental Impact Statement (Application/EIS) for the Project, to respectively meet provincial and federal environmental assessment (EA) requirements. As far as the provincial requirements are concerned, the Project triggers an EA under the BC *Environmental Assessment Act* (2002), since production capacity will exceed 75,000 tonnes per year of mineral ore. As far as federal EA requirements are concerned, the Project was initiated in 2011 under the *Canadian Environmental Assessment Act* (CEAA 1992; 1992) as a comprehensive study. On July 6, 2012, the CEAA 1992 was repealed and replaced by the *Canadian Environmental Assessment Act, 2012* (CEAA 2012; 2012). HCMC has been advised by the Canadian Environmental Assessment Agency (CEA Agency) that since the Project comprehensive study commenced after July 2010, it will continue to follow the requirements of the former legislation, in accordance with the Establishing Timelines for Comprehensive Studies Regulations (SOR/2011-139) of 2011.

Figure 1.1-1

Harper Creek Project Location Map

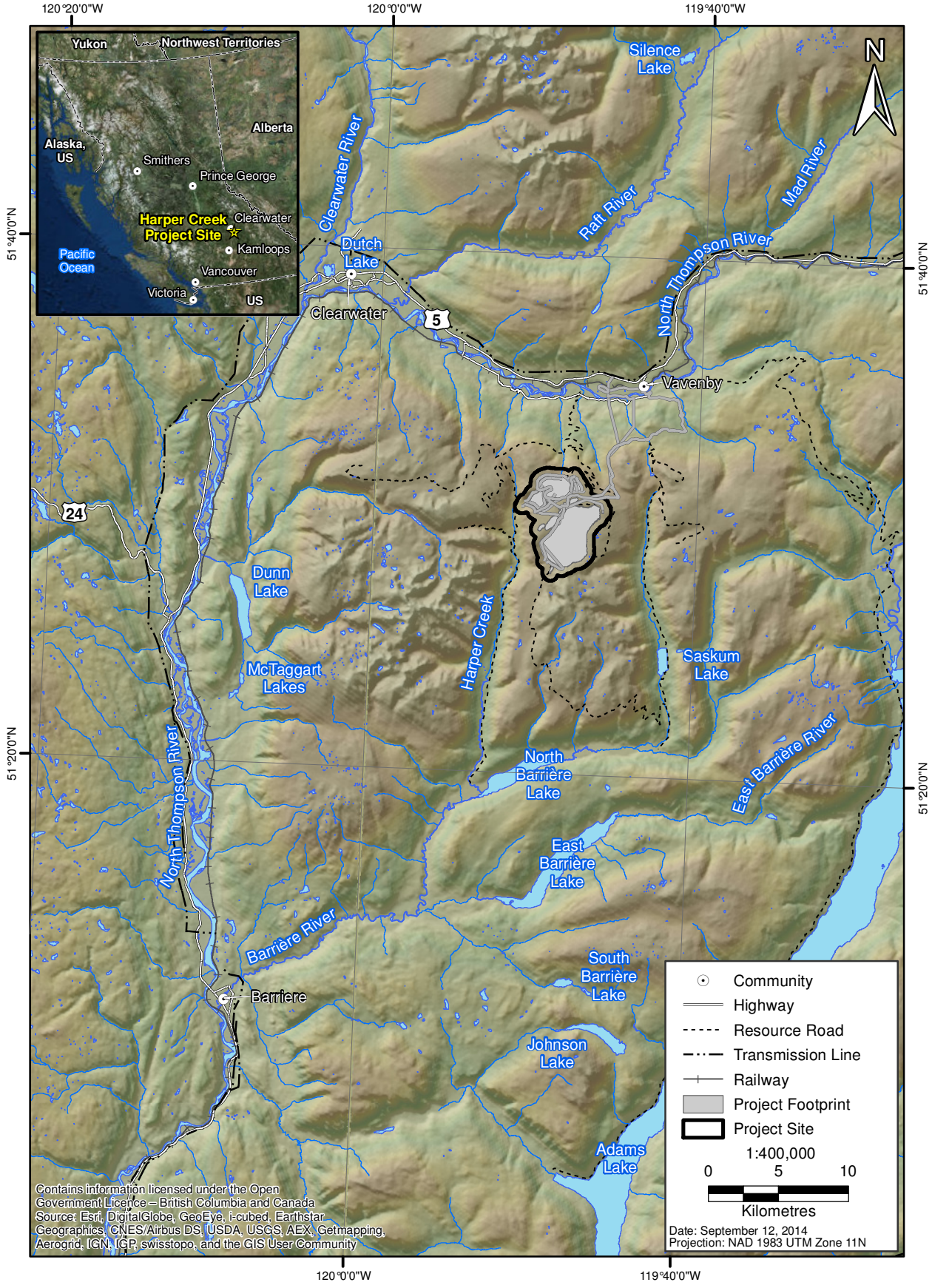
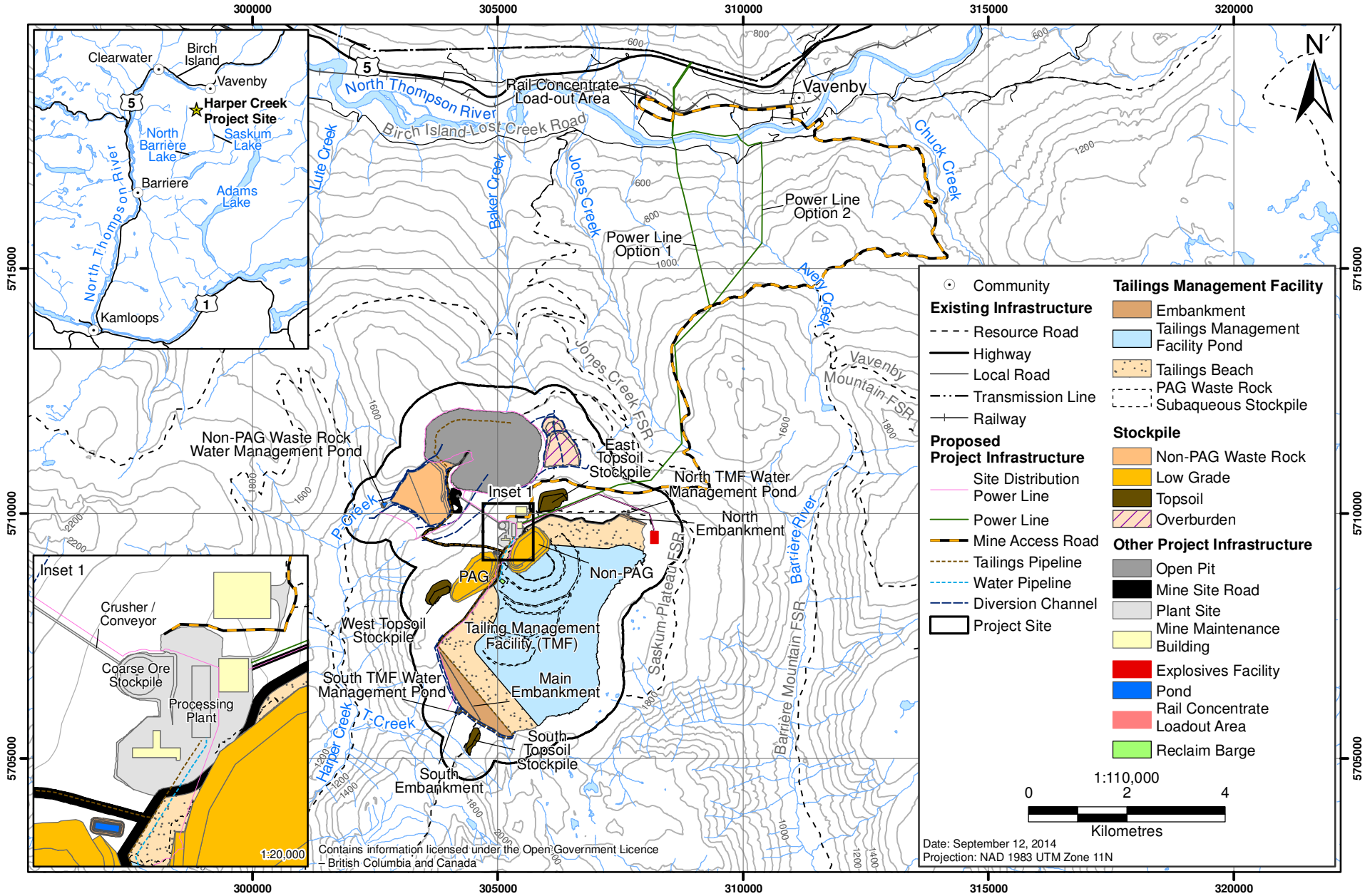


Figure 1.1-2
Project Infrastructure (Year 23)



1.2 PROPONENT DESCRIPTION

1.2.1 Proponent Contacts

The proponent of the Project is HCMC, a wholly owned subsidiary of Yellowhead Mining Inc. (YMI; Table 1.2-1). YMI was formed in 2005 as a private BC company specifically to acquire, explore, and, if feasible, develop the Project. YMI is listed on the Toronto Stock Exchange (TSX) in Canada under the trading symbol YMI. HCMC is planning to develop, manage, and operate the Project.

Table 1.2-1. Summary of Proponent Information

Proponent Name	Harper Creek Mining Corporation (a Subsidiary of Yellowhead Mining Inc.)
Head Office Address	Suite 730 - 800 West Pender Street, Vancouver, BC V6C 2V6
Telephone	1-604-681-1709
Fax	1-604-608-3524
Email	info@yellowheadmining.com
Website	http://www.yellowheadmining.com
Date of Formation	August 19, 2009
Jurisdiction Where Formed	British Columbia
Stock Exchange	Yellowhead Mining Inc. is listed on the TSX
Stock Symbol	YMI
Affiliations and Associations	Mining Association of BC

Contact details for the primary HCMC representatives managing the day-to-day aspects of the EA are presented below. Communications regarding the Application/EIS should be directed to the following contacts:

Frank D. Wheatley
Chief Executive Officer
Suite 730 - 800 West Pender Street
Vancouver, British Columbia, Canada V6C 2V6
Phone: 1-604-681-1709
Fax: 1-604-608-3524
E-mail: FWheatley@yellowheadmining.com
Website: http://www.yellowheadmining.com

Charlene Higgins, MSc, PhD
Vice President Environment, Community & First Nations Relations
Suite 730 - 800 West Pender Street
Vancouver, British Columbia, Canada V6C 2V6
Phone: 1-604-681-1709
Fax: 1-604-608-3524
Email: CHiggins@yellowheadmining.com
Website: http://www.yellowheadmining.com

1.2.2 Consultants

HCMC is supported by a team of qualified professionals in the development of this Application/EIS. A variety of consultants with specific expertise are involved to ensure that the Application/EIS meets the information requirements of the Application Information Requirements (AIR) for the Project, which was approved and issued by the British Columbia Environmental Assessment Office (BC EAO) on October 21, 2011 (BC EAO 2011). Table 1.2-2 identifies the qualified professionals involved in preparing the Application/EIS and their areas of expertise.

Table 1.2-2. Qualified Professionals

Qualified Professionals	Roles of Consultants
ERM Consultants Canada Ltd.	ERM Rescan was engaged by YMI to prepare the following components of this submission of the Application/EIS: • Executive Summary • Overview of the Proposed Project (Chapter 1); • Assessment Process (Chapter 2); • Information Distribution and Consultation (Chapter 3) and issue tracking tables; • Project Design and Alternatives Assessment (Chapter 4); • Project Description including the Terrain and Soils Baseline Report (Chapter 5); • Closure and Reclamation (Chapter 7); • Effects Assessment Methodology (Chapter 8); • Meteorological Baseline Report, Air Quality Baseline Report, Air Quality Modelling and Air Quality Effects Assessment (Chapter 9); • Noise Baseline Report, Noise Modelling and Noise Effects Assessment (Chapter 10); • Hydrogeology Baseline Report and Groundwater Effects Assessment (Chapter 11); • Hydrology Effects Assessment (Chapter 12); • Surface Water Quality Baseline Report, Surface Water Quality Data Update and Surface Water Quality Effects Assessment (Chapter 13); • Fish Habitat Baseline Report, Fish Tissue Metals Report. Fish and Aquatic Resources Effects Assessment and Fish Habitat Offsetting Plan (Chapter 14); • Wildlife Toxicology components of Chapter 16; • Socio-Economic Effects Assessment (Chapter 17); • Commercial and Non-commercial Land Use Effects Assessment including Navigable Waters Assessment (Chapter 18); • Visual Quality Effects Assessment (Chapter 19); • Archaeology and Heritage Effects Assessment (Chapter 20); • Human Health Effects Assessment including Country Foods Baseline Report (Chapter 21); • Current Use of Lands and Resources for Traditional Purposes (Chapter 22); • Assessment of Aboriginal Rights and Interests (Chapter 23); • Environmental Management Plans and Reporting (Chapter 24), with the exception of the Vegetation and Wildlife plans, and content related to metal leaching (ML) and acid rock drainage (ARD);

(continued)

Table 1.2-2. Qualified Professionals (continued)

Qualified Professionals	Roles of Consultants
ERM Consultants Canada Ltd. *(cont'd)*	• Capacity of Renewable Resources (Chapter 25); • Environmental Effects of Accidents and Malfunctions (Chapter 26) • Effects of the Environment on the Project (Chapter 27); and • Summary and Conclusions (Chapter 28).
Knight Piésold Ltd.	Prepared the Application/EIS submitted in 2013, and collected the majority of the baseline data used in this Application/EIS, including: Air Quality, Noise, Groundwater, Hydrology, Water Quality, Aquatic Resources, and Fish data. The reports contributed by Knight Piésold in this submission (2014) include: • Numerical Groundwater Modelling report; • Surface Hydrology Baseline report; • Watershed Modelling report; • Instream Flow Assessment; • Surface Water Quality Predictive Model; • Fish and Aquatic Habitat Baseline report; • Mine Waste and Water Management Design Report; • Geotechnical Site Investigation Factual Report (2011 and 2012); and • Seismicity Assessment.
Laurie McNeil and Associates	Collected the socio-economic baseline information that was included in the Application/EIS submitted in 2013.
Merit Consultants International Inc.	Technical Report and Feasibility Study for the Harper Creek Copper Project, appended to the Project Description (Chapter 5).
Dillon Consulting Ltd.	Dillon completed the water quality sampling program which is described in the water quality baseline report prepared by ERM Rescan appended to the Surface Water Quality Effects Assessment (Chapter 13).
Polar Geoscience Ltd.	Polar Geoscience prepared the Terrain Mapping and Geohazards Report appended to the Project Description (Chapter 5).
Mrs. Susan Ames	Mrs. Susan Ames contributed to the Closure and Reclamation Chapter of the Application (Chapter 7).
ALS Canada Ltd.	Analysis of water quality, tissue and sediment samples collected in the various field programs, as described in the baseline reports.
SRK Consulting (Canada) Inc.	ML/ARD Characterization report and Geochemistry chapter of the EA (Chapter 6), and the ML/ARD component of the Mine Waste and ML/ARD Management Plan.
AMEC	Aboriginal and public consultation database
Keystone Wildlife Research Ltd.	Vegetation and wildlife data collection, Terrestrial; Wildlife and Vegetation Baseline report, Terrestrial Ecology Effects Assessment (Chapter 15) and Wildlife and Wildlife Habitat Effects Assessment (Chapter 16).
McElhanney Consulting Services Ltd.	Traffic Impact Assessment appended to Chapter 5.
Terra Archaeology Ltd.	Archaeological Overview Assessment and Archaeology Impact Assessment appended to Chapter 20.

(continued)

Table 1.2-2. Qualified Professionals (completed)

Qualified Professionals	Roles of Consultants
Simpcw Resources Group	Traditional Land Use & Ecological Knowledge Study (Appendix 22-A).
Mr. Bjorn Simonsen	A History of Grazing and Other Land-Use by the Moilliet and Mitchell Families in the Proposed Harper Creek Mine Development Area appended to Chapter 20.
Strategic Group	Visual Impact Assessment appended to the Visual Quality Assessment in Chapter 19.
BC Stats	Economic modelling using the Input Output Model, as described in and appended to this chapter.

1.3 GUIDING PRINCIPLES

HCMC is committed to using the EA process as a planning tool to ensure that Project decisions (and related physical activities and components) are considered in a careful and precautionary manner in order to avoid or mitigate possible adverse effects. HCMC has defined an Environmental Management System in support of its commitment to undertaking the proposed Project in a sustainable manner that accords with its guiding principles on environmental management. The Environmental Management System appears in Section 24.1 of the Application/EIS.

Key principles that will guide the development of the Project are described below.

1.3.1 Project Design

The AIR requires that HCMC provide a thorough assessment of potential environmental, social, economic, heritage, and health effects of operation/maintenance, and decommissioning of the Project, including a description of recommended mitigation measure to reduce or eliminate potential effects.

HCMC will use technically and economically feasible mitigation measures to avoid and mitigate adverse effects that may arise from the Project. HCMC is committed to applying technically and economically feasible mitigation measures as a strategy in all phases of Project planning and design.

1.3.2 Community Knowledge and Aboriginal Traditional Knowledge

Subsection 16(1) of the CEAA 1992 states that "Community knowledge and aboriginal traditional knowledge may be considered in conducting an environmental assessment." This recommendation remains in the CEAA 2012 under subsection 19(3). Community knowledge and Aboriginal traditional knowledge refers to knowledge acquired and accumulated by an Aboriginal or non-Aboriginal community, through generations of living in close contact with a particular area or territory.

The integration of community knowledge and Aboriginal traditional knowledge is an important consideration during the EA planning process. HCMC will consider and, where practical, utilize community and traditional knowledge as appropriate to ensure Project effects on potential or established Aboriginal rights and interests in the Project area, are minimized to the extent practical. HCMC recognizes the importance of ongoing consultation and is committed to maintaining an open and transparent dialogue with potentially affected First Nations.

1.3.3 Public Participation

One of the principles identified in the CEAA 1992 and the BC *Environmental Assessment Act* (2002) is to ensure there are opportunities for meaningful participation during the EA process. Both acts require that the public have an opportunity to participate in an EA and an opportunity to comment on documents produced during an EA. The overall objective of meaningful public participation is best achieved when all parties have a clear understanding of the proposed Project as early as possible in the EA process. Proponents are required to provide current information about their project to the public and, in particular, to the communities likely to be most affected by their project.

HCMC recognizes the importance of public participation and is committed to considering and, where possible, addressing the issues and/or concerns raised by the public throughout all phases of the EA. Chapter 3 of the Application/EIS describes the information distribution and consultation activities with Aboriginal groups, government agencies, local governments, and the public undertaken during the pre-Application stage and the activities planned during the Application/EIS review stage.

1.4 NEED FOR AND PURPOSE OF THE PROJECT

The purpose of the Project is to undertake sustainable mineral exploration and extraction activities in alignment with the objectives of responsible resource development, as outlined in the Government of Canada's *Economic Action Plan 2012* (Government of Canada 2012), and to foster economic growth and prosperity in BC as outlined in *British Columbia's Mineral Exploration and Mining Strategy* (BC MEM 2012) and in the *BC Jobs Plan* (Government of British Columbia 2012).

The "need for and purpose" of the project is defined by the CEA Agency as the problem or opportunity that the proposed project is intending to solve or satisfy and what is to be achieved by carrying out the project. From the perspective of HCMC, the Project will meet a three-fold need and purpose, as follows:

- help meet the current and forecasted demand for copper, gold, and silver;
- provide employment and business opportunities in an area of BC that is adjusting from the collapse of the local forestry sector; and
- provide an important source of income to governments through the direct and indirect payment of various taxes including corporate, mineral, income, provincial sales, goods and services, and property taxes.

Copper is a primary metal used in many industrial and consumer applications worldwide and the demand for copper continues to grow. Global economic development from rapidly developing nations where economic growth is at a high level, such as China and India, is the primary factor that creates demand for copper. Between 2013 and 2016, global copper consumption has been forecasted to grow on average by 5% each year (US Global Investors 2012). The proposed Project will help meet the current and forecasted demand for copper. Additionally, new gold and silver mine production in recent years has only replaced that of closed mines and future production is expected to be flat or declining. With the increasing difficulty in finding new deposits, increased costs of mine production,

and the long lead times required to develop new mines, the gold and silver from the Project will help meet the current and forecasted demand.

In addition to meeting the current and forecasted demands for copper, gold, and silver, HCMC anticipates that the Project will bring training, employment opportunities, and increased investment in services to the local population and BC. On a national level, the Project is timely given current copper, gold, and silver prices. Development of the Project will contribute to Canada's role as a producer of copper, gold, and silver in the world economy. This purpose is consistent with the Government of Canada's overall strategy of encouraging private corporations to generate national export commodities and tax revenues from natural resource development.

Section 1.9 discusses in greater detail the anticipated benefits of the Project including employment opportunities, government revenues, and contribution to community developments.

1.5 PROJECT SETTING

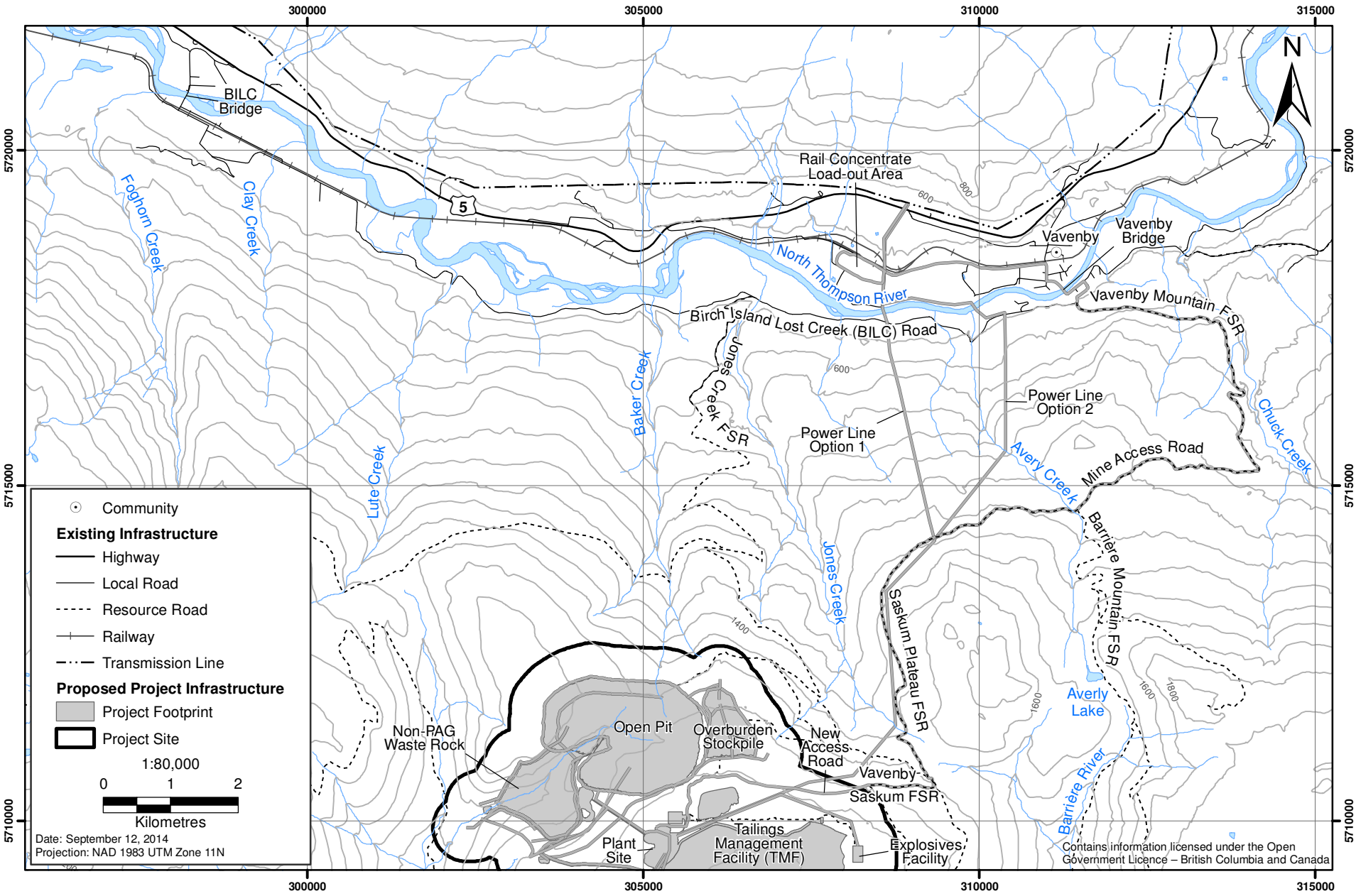
1.5.1 Project Location and Access

The Project is located on provincial Crown land in the Regional District of Thompson-Nicola (Electoral Areas A, B, P, and O) of BC, approximately 150 km northeast of Kamloops along Highway 5, approximately 10 km southwest of the unincorporated municipality of Vavenby, BC (Figure 1.1-1). The Project is located within NTS map sheets 82M/5 and 82M/12, is geographically centred at 51°30'N latitude and 119°48'W longitude, and is situated at approximately 1,800 metres above sea level (masl).

Access to the site from Highway 5 is via the Vavenby Bridge Road through Vavenby and across the North Thompson River to Birch Island Lost Creek Road (BILCR). From there, access to the site is along an existing 18.5-km network of existing Forest Service Roads (FSRs; Vavenby Mountain FSR, Saskum Plateau FSR, and Vavenby-Saskum FSR), which climb up to the Project Site from their junction with the BILCR south of Vavenby (Merit 2014; Figure 1.5-1). The distance from the Project Site to the rail load-out facility is approximately 25 km. The rail load-out facility is situated on 79.3-hectare (ha) of private land owned by HCMC and zoned general industrial, located 2.5 km west of Vavenby.

During Construction, oversized loads (overweight and/or over length/width), will require an alternative access across the North Thompson River as the Vavenby Bridge has not been designed to support loads safely (Merit 2014). This proposed route crosses the North Thompson River at the BILCR Bridge, which has been designed for heavier loads (Figure 1.5-1). Oversized loads will access the Project Site via the BILCR Bridge onto the BILRC and then eastward on the BILRC to the intersection with the Vavenby Mountain FSR.

Figure 1.5-1
Access to Project Site



1.5.2 Project History

Early Exploration (1966 to 1996)

In 1966, separate prospecting and stream sediment sampling campaigns by Noranda Exploration and Quebec Cartier (a subsidiary of US Steel) discovered copper mineralization at the headwaters of Baker Creek and a tributary of Harper Creek. Exploration by the two companies was undertaken independently from 1967 until mid-1970, at which time these companies began a joint exploration program that continued to 1974. Drilling on the main deposit during that period totalled 25,806 metres (m) in 161 holes.

In 1996, American Comstock purchased the Noranda claims and acquired an option on the Quebec Cartier claims (held by Cygnus Mines Limited, a wholly-owned subsidiary of US Steel). American Comstock drilled 2,847 m in eight holes and 686 samples were analyzed for copper, molybdenum, and silver. Subsequently, American Comstock dropped the Cygnus option (Quebec Cartier claims) but maintained ownership of the Noranda claims. Exploration activities then ceased for about a decade.

YMI was formed in 2005 as a private BC company. In 2005 and 2006, five claim groups were acquired or optioned by YMI on the historical drilling area and contiguous parts of the Eagle Bay Assemblage that includes the Harper Creek deposit. In 2006, YMI began the company's first phase of field exploration on the Harper Creek claims.

Yellowhead Mining Inc./Harper Creek Mining Corporation Exploration since 2006

YMI/HCMC has undertaken diamond drilling on the Project property from 2006 until 2013. A total of 217 drill holes totalling 64,989.54 m have been completed. There were four main drilling programs, namely resource, condemnation, metallurgical, and geomechanical/geotechnical. These comprised the following:

- resource drilling between 2006 and 2008 during which 165 holes were drilled through 58,612 m;
- condemnation drilling during 2011, when eight holes were drilled through 1,791 m;
- metallurgical drilling during 2011, when four holes were drilled through 441 m; and
- geomechanical/geotechnical drilling between 2011 and 2012 during which 40 holes were drilled through 4,145 m.

1.5.3 Mineral Tenure

HCMC holds 42,636.48 ha of mineral claims that comprise the Project property (Figure 1.5-2). Table 1.5-1 lists the claim number, area of the mineral claim, mining division, and claim expiry date.

Thirty-one legacy claims were acquired from Cygnus Mines Ltd. (subsidiary of US Steel Corp.) pursuant to an Option Agreement exercised in July 2010 and are subject to a 3% Net Smelter Royalty, capped at $2.5 million, subject to inflation adjustment (Merit 2014).

Figure 1.5-2
Project Mineral Claims

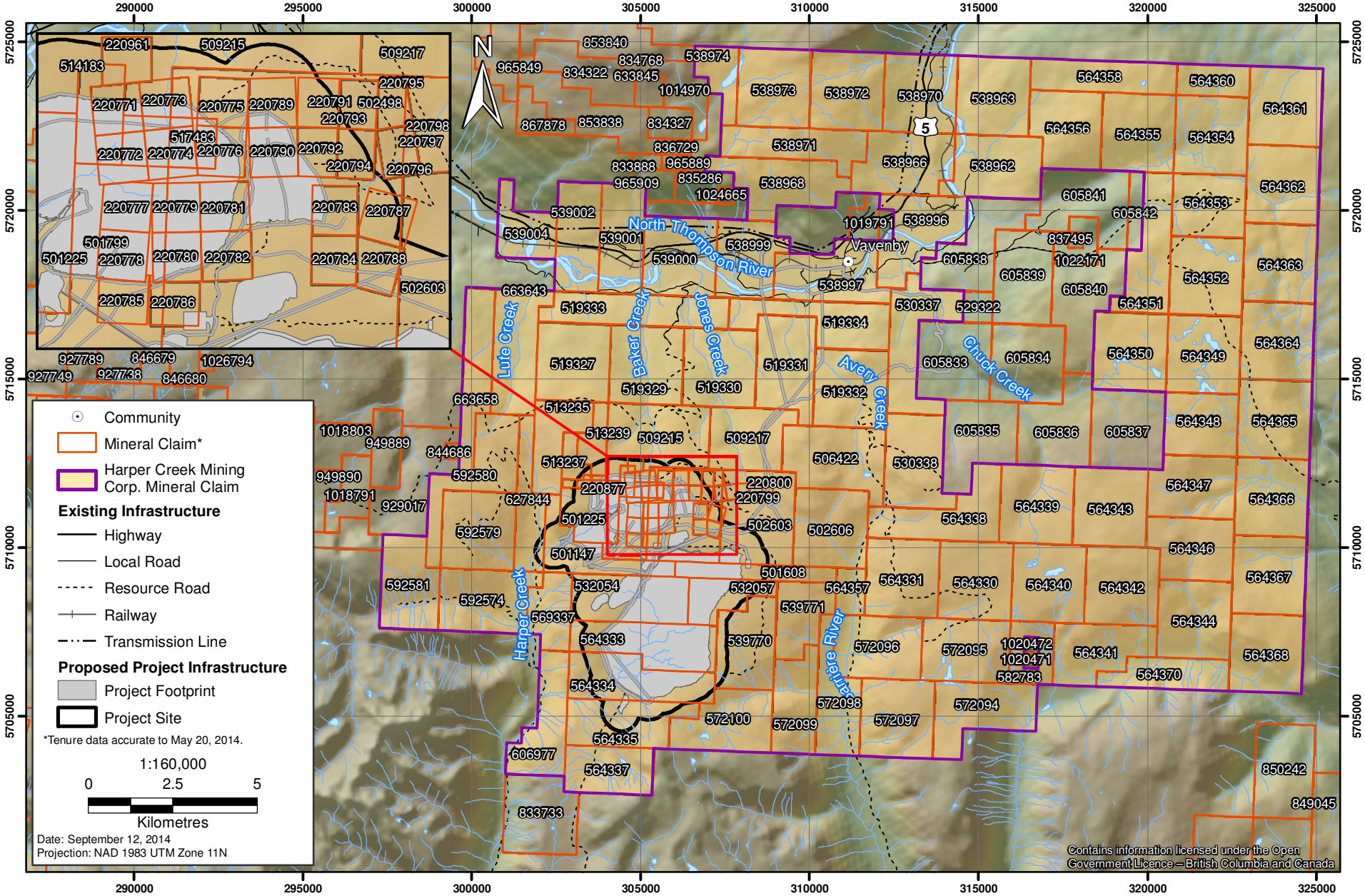


Table 1.5-1. HCMC Mineral Tenure as of July 2014

Claim No.	Area (ha)	Mining Division	Expiry Date
220771	25	Kamloops	2024/Nov/03
220772	25	Kamloops	2024/Nov/03
220773	25	Kamloops	2024/Nov/03
220774	25	Kamloops	2024/Nov/03
220775	25	Kamloops	2024/Nov/03
220776	25	Kamloops	2024/Nov/03
220777	25	Kamloops	2024/Nov/03
220778	25	Kamloops	2024/Nov/03
220779	25	Kamloops	2024/Nov/03
220780	25	Kamloops	2024/Nov/03
220781	25	Kamloops	2024/Nov/03
220782	25	Kamloops	2024/Nov/03
220783	25	Kamloops	2024/Nov/03
220784	25	Kamloops	2024/Nov/03
220785	25	Kamloops	2024/Nov/03
220786	25	Kamloops	2024/Nov/03
220787	25	Kamloops	2024/Nov/03
220788	25	Kamloops	2024/Nov/03
220789	25	Kamloops	2024/Nov/03
220790	25	Kamloops	2024/Nov/03
220791	25	Kamloops	2024/Nov/03
220792	25	Kamloops	2024/Nov/03
220793	25	Kamloops	2024/Nov/03
220794	25	Kamloops	2024/Nov/03
220795	25	Kamloops	2024/Nov/03
220796	25	Kamloops	2024/Nov/03
220797	25	Kamloops	2024/Nov/03
220798	25	Kamloops	2024/Nov/03
220799	25	Kamloops	2024/Nov/03
220800	25	Kamloops	2024/Nov/03
220877	25	Kamloops	2024/Nov/03
220878	25	Kamloops	2024/Nov/03
220879	25	Kamloops	2024/Nov/03
220961	25	Kamloops	2024/Nov/03
501147	342.02	Kamloops	2024/Nov/03
501225	301.71	Kamloops	2024/Nov/03
501608	221.33	Kamloops	2024/Nov/03

(continued)

Table 1.5-1. HCMC Mineral Tenure as of July 2014 (continued)

Claim No.	Area (ha)	Mining Division	Expiry Date
501799	181.05	Kamloops	2024/Nov/03
502498	583.32	Kamloops	2024/Nov/03
502603	603.43	Kamloops	2024/Nov/03
502606	502.87	Kamloops	2024/Nov/03
506422	562.99	Kamloops	2014/Nov/03
509215	603.17	Kamloops	2024/Nov/03
509217	422.21	Kamloops	2024/Nov/03
513235	321.7	Kamloops	2024/Nov/03
513237	80.43	Kamloops	2024/Nov/03
513239	140.75	Kamloops	2024/Nov/03
514183	40.22	Kamloops	2024/Nov/03
517483	20.11	Kamloops	2024/Nov/03
519327	502.43	Kamloops	2024/Nov/03
519329	502.43	Kamloops	2024/Nov/03
519330	502.43	Kamloops	2024/Nov/03
519331	502.41	Kamloops	2024/Nov/03
519332	502.47	Kamloops	2024/Nov/03
519333	502.27	Kamloops	2024/Nov/03
519334	462.09	Kamloops	2024/Nov/03
530337	502.33	Kamloops	2024/Nov/03
530338	502.67	Kamloops	2024/Nov/03
532054	482.98	Kamloops	2024/Nov/03
532057	241.48	Kamloops	2024/Nov/03
538962	501.81	Kamloops	2024/Nov/03
538963	501.61	Kamloops	2024/Nov/03
538966	501.81	Kamloops	2014/Nov/03
538968	501.88	Kamloops	2024/Nov/03
538970	501.61	Kamloops	2024/Nov/03
538971	421.49	Kamloops	2024/Nov/03
538972	501.61	Kamloops	2024/Nov/03
538973	501.61	Kamloops	2024/Nov/03
538974	200.63	Kamloops	2024/Nov/03
538996	502.01	Kamloops	2024/Nov/03
538997	502.14	Kamloops	2024/Nov/03
538999	421.77	Kamloops	2024/Nov/03
539000	502.11	Kamloops	2024/Nov/03
539001	421.73	Kamloops	2024/Nov/03

(continued)

Table 1.5-1. HCMC Mineral Tenure as of July 2014 (continued)

Claim No.	Area (ha)	Mining Division	Expiry Date
539002	421.73	Kamloops	2024/Nov/03
539004	281.14	Kamloops	2024/Nov/03
539770	442.84	Kamloops	2024/Nov/03
539771	322	Kamloops	2024/Nov/03
564330	503.01	Kamloops	2024/Nov/03
564331	503.01	Kamloops	2024/Nov/03
564333	503.23	Kamloops	2024/Nov/03
564334	503.34	Kamloops	2024/Nov/03
564335	463.1833	Kamloops	2024/Nov/03
564337	362.5917	Kamloops	2024/Nov/03
564338	502.8196	Kamloops	2024/Nov/03
564339	502.7818	Kamloops	2024/Nov/03
564340	503.0087	Kamloops	2024/Nov/03
564341	442.8144	Kamloops	2024/Nov/03
564342	503.0083	Kamloops	2024/Nov/03
564343	502.7818	Kamloops	2024/Nov/03
564344	503.1017	Kamloops	2024/Nov/03
564346	442.5459	Kamloops	2024/Nov/03
564347	462.5005	Kamloops	2024/Nov/03
564348	402.0263	Kamloops	2024/Nov/03
564349	502.3277	Kamloops	2024/Nov/03
564350	502.3298	Kamloops	2024/Nov/03
564351	461.8769	Kamloops	2024/Nov/03
564352	502.0996	Kamloops	2024/Nov/03
564353	401.5149	Kamloops	2024/Nov/03
564354	501.6872	Kamloops	2024/Nov/03
564355	501.6924	Kamloops	2024/Nov/03
564356	461.5516	Kamloops	2024/Nov/03
564357	120.7333	Kamloops	2024/Nov/03
564358	401.2258	Kamloops	2024/Nov/03
564360	200.6108	Kamloops	2024/Nov/03
564361	501.5948	Kamloops	2024/Nov/03
564362	501.824	Kamloops	2024/Nov/03
564363	502.0528	Kamloops	2024/Nov/03
564364	502.2816	Kamloops	2024/Nov/03
564365	502.5096	Kamloops	2024/Nov/03
564366	502.7379	Kamloops	2024/Nov/03

(continued)

Table 1.5-1. HCMC Mineral Tenure as of July 2014 (completed)

Claim No.	Area (ha)	Mining Division	Expiry Date
564367	502.9658	Kamloops	2024/Nov/03
564368	503.1923	Kamloops	2024/Nov/03
564370	322.0876	Kamloops	2024/Nov/03
569337	261.6354	Kamloops	2024/Nov/03
572094	503.3905	Kamloops	2024/Nov/03
572095	483.0856	Kamloops	2024/Nov/03
572096	483.0853	Kamloops	2024/Nov/03
572097	503.417	Kamloops	2024/Nov/03
572098	382.5648	Kamloops	2024/Nov/03
572099	382.5738	Kamloops	2024/Nov/03
572100	463.1775	Kamloops	2024/Nov/03
582783	201.2855	Kamloops	2024/Nov/03
592574	503.1198	Kamloops	2024/Nov/03
592579	502.92	Kamloops	2024/Nov/03
592580	462.54	Kamloops	2024/Nov/03
592581	442.72	Kamloops	2024/Nov/03
606977	415.44	Kamloops	2024/Nov/03
627844	301.71	Kamloops	2024/Nov/03
663643	502.4	Kamloops	2024/Nov/03
663658	401.97	Kamloops	2024/Nov/03

1.6 REGIONAL OVERVIEW

1.6.1 Environmental Setting

The Project Site is located in south-central BC, approximately 10 km southwest of Vavenby in the Shuswap Highlands, within the Thompson-Nicola Regional District. It straddles the boundary of the Headwaters Forest District and the Kamloops Forest District.

The terrain within the Project Site varies. Generally the landscape is moderately to steeply sloping down towards two unnamed tributaries of Harper Creek, with small streams and wet meadows located throughout. There are no named hydrological features located within the Project Site; however, the two unnamed tributaries of Harper Creek flow northeast-southwest through the northern and southern halves of the Project Site. The North Thompson River at its closest point is approximately 7 km north of the Project Site and Harper Creek at its closest point is 1.3 km to the west. Elevation within the Project Site ranges from 1,480 to 1,900 masl.

The Project area is composed of the following biogeoclimatic variants: the Thompson Moist Warm Interior Douglas-Fir variant (IDFmw2), the North Thompson Dry Warm Interior Cedar – Hemlock variant (ICHdw3), the Thompson Moist Warm Interior Cedar – Hemlock variant (ICHmw3), the Wells Gray Wet Cool Interior Cedar – Hemlock variant (ICHwk1), the Northern Monashee Wet Cold

Engelmann Spruce – Subalpine Fir variant (ESSFwc2), the Wet Cold Engelmann Spruce – Subalpine Fir Woodland subzone (ESSFwcw), and the Wet Cold Engelmann Spruce – Subalpine Fir Parkland subzone (ESSFwcp).

The Project overlaps the boundary between the Headwaters Forest District and the Kamloops Forest District as shown on Figure 1.6-1. This same boundary is the border between the Vavenby and Barriere Landscape Units. The North Thompson Valley includes land in the Agricultural Land Reserve (ALR), which sets aside land for agriculture use (see Figure 1.6-1). The HCMC power line corridor will cross private land, with ALR zoning, and a woodlot partially located on private land, as described in Chapter 18 (Section 18.5). The majority of the Project Site falls within the Kamloops Forest District.

1.6.2 Administrative Boundaries

The Project is located in the Thompson-Nicola Regional District approximately 150 km northeast of Kamloops by road. The Regional District has a population of approximately 128,473 (Statistics Canada 2011) and a total land area of 44,447 km^2. The rail load-out facility is located within the Vavenby Industrial Area, which is part of the District of Clearwater (see Figure 1.6-2).

Kamloops is the principal community in the region and is located approximately 150 km southwest of the Project. The town of Clearwater is located 25 km northwest of the Project and Vavenby is approximately 10 km to the northeast. The smaller community of Birch Island is approximately 15 km to the northwest of the Project. The nearest residences to the Project Site are along the BILCR, over 8 km from the location of the proposed open pit.

First Nations information is included in Chapter 21 of the Application/EIS. The closest Indian reserves are Simpcw First Nation reserves located at Boulder Creek 5, approximately 23 km west of the Project, as illustrated in Figure 1.6-2.

1.6.3 Regional Land Use

Land and Resource Use Management Context

The Project falls in the Kamloops Land and Resource Management Plan (LRMP; Kamloops Interagency Management Committee 1995), which encompasses 2.2 million ha, characterized by transitional mountainous terrain. The objectives of the LRMP are:

- a balanced use of the land and resources which respects and accommodates all interests;
- protection and security of the land and resources for future generations;
- sustainable resource management practices which recognize the biological and physical limitations of the land and resources, and provide the highest and best values from these resources;
- compatibility with natural watershed processes and respect for the intrinsic value of nature;
- social and economic stability and vitality of local communities; and
- communication, education, and awareness of all values, including those of aboriginal peoples.

Figure 1.6-1
Forest Districts, Forest Development Units and Agricultural Land Reserves

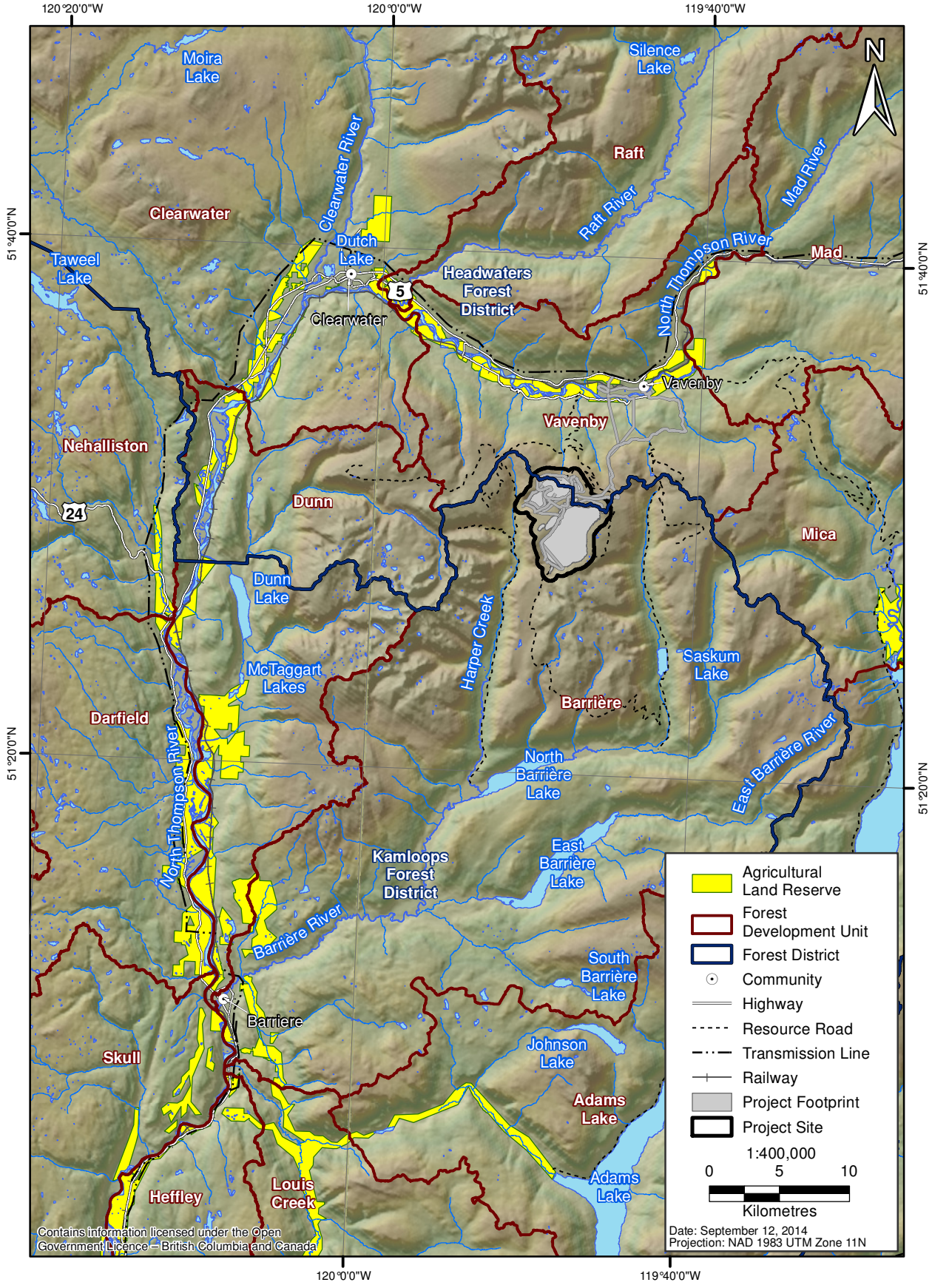
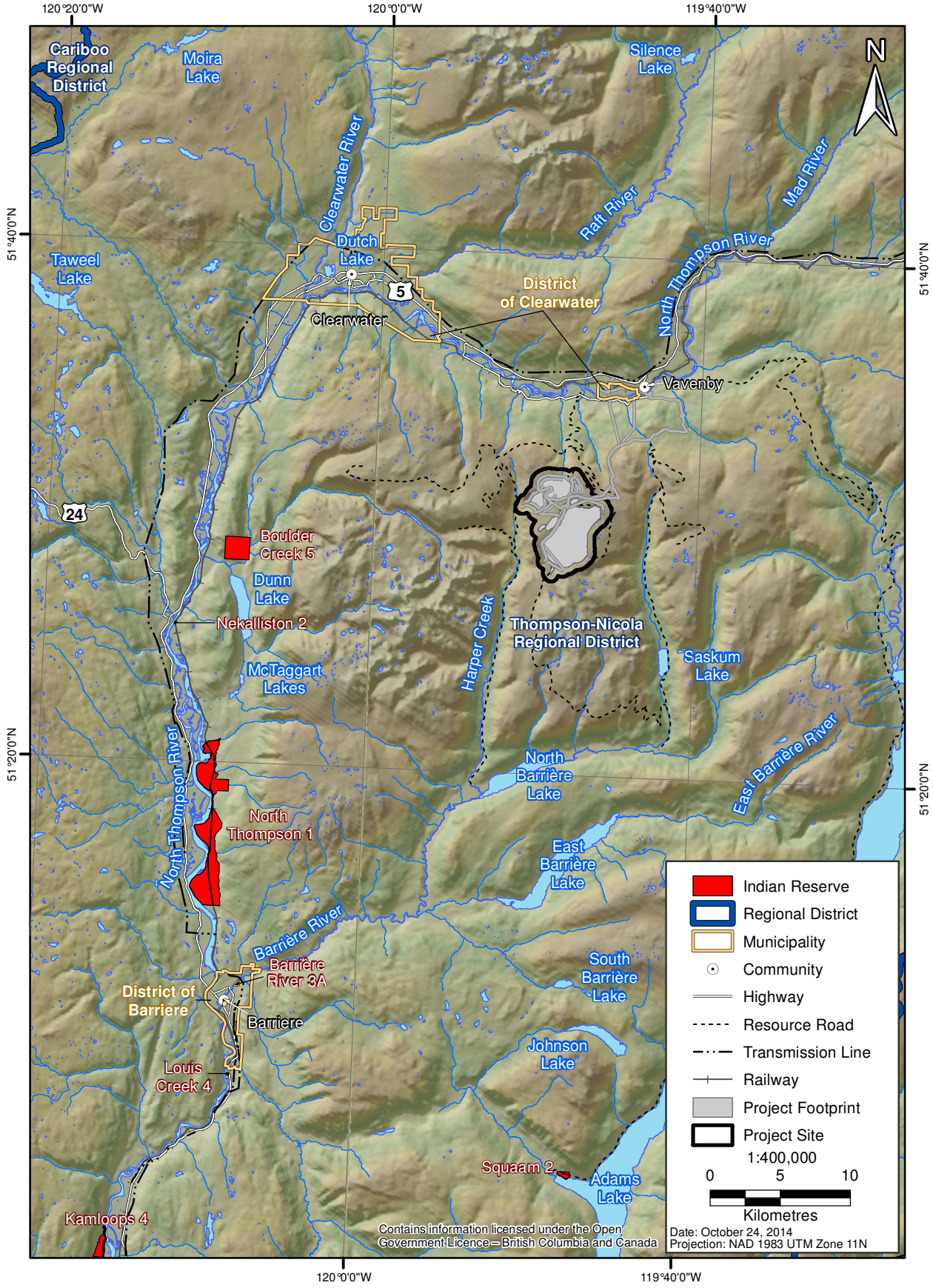


Figure 1.6-2

Municipalities, Regional Districts and Indian Reserves



The Kamloops LRMP area is organized into Resource Management Zones (RMZs), which include: General Resource Management, Settlement, Protection, Community Watershed, Habitat/Wildlife Management Areas, and Recreation and Tourism. A summary of RMZs, their management objectives, and their interaction with the Project footprint are presented in Chapter 18 (Commercial and Non-Commercial Land Use).

Forestry

The Project is located primarily within the Kamloops Timber Supply Area within the Kamloops Forest District. The Kamloops Timber Supply Area covers approximately 2.77 million ha of land in south-central BC, composed inter alia of 30% pine, 33% Douglas fir, 18% spruce, and 9% true fir forests. The Project Site overlaps the boundary between the Headwaters Forest District and the Kamloops Forest District.

Agricultural Land Reserves and Range Tenures

ALRs closest to the Project are located around the community of Vavenby, mostly along the North Thompson River (see Figure 1.6-1), which are discussed in Chapter 18. Due to a lack of arable land and the short frost-free period annually, the majority of agricultural properties are ranches and farming in the area north of the community of Clearwater, outside of the RSA, where there are better soil conditions.

Range tenures (grazing and hay cutting licences and permits) are administered by the British Columbia Ministry of Forests, Lands and Resource Operations (BC MFLNRO). The Project overlaps the Harp Mountain Range Unit, in which there is one range tenure (RAN077435), which takes up approximately 87% of the unit and covers the Project Site (See Section 18.4). The rest of the unit, which lies to the west of Harper Creek, is currently untenured.

Commercial Recreational Land Use

There are 11 commercial recreation tenures in the land use RSA, which include alpine skiing, fishing, and snowmobiling.

Non-commercial Public Recreation

A number of trails, rest sites, recreation areas, and protected areas are located within the regional area. These locations are managed by BC Parks within the British Columbia Ministry of Environment, and are used for non-commercial, public recreation. Within the land use Regional Study Area (RSA) there are a total of 19 parks, rest areas, trails, and recreation areas. Dunn Peak Protected Area is located within this area. Dunn Peak is a large wilderness area managed by BC Parks and subject to the Management Direction Statement for Dunn Peak Park (BC MELP 1999). These Management Direction Statements provide strategic management direction for all protected areas that do not have a full management plan.

Additionally, a number of recreation clubs are located in local communities that facilitate recreation/outdoor experiences, and provide recreational facilities to area families. These are primarily non-profit organizations established by volunteers, and include cross-country ski

programs, motorized recreation, hiking, and motorcycling clubs (District of Barriere 2011). Many of these organizations utilize available FSRs to access remote wilderness areas.

Non-resident and Resident Hunting

Within the RSA, there are no licensed guide-outfitters. The Project is located within the Thompson Fish and Wildlife Region 3, which includes several Wildlife Management Units (WMUs), two of which (WMU 338 and WMU 341) overlap the Project Site, and two of which are within the large regional area (WMU 337 and WMU 342).

Trapping

There are 13 registered traplines wholly or partially within the land use RSA, three of which are proximal to the Project footprint. The focus of these traplines has predominantly been small furbearing animals such as marten and weasel.

Fishing

Sport fishing is a popular activity in the Lower North Thompson River. In the area around Little Fort, hundreds of quality low- and high-elevation lakes and many rivers offer excellent opportunities for fly fishing. Fishing lodges, resorts, cabins, and camp sites are located at many lakes close to Barriere and Little Fort, such as North Barrière Lake, Bonaparte Lake, and Dunn Lake.

Aboriginal Land Use

Within proximity to the Project Site, members of the Simpcw First Nation have indicated traditional use sites related to the following activities: food gathering, harvesting, transportation, and habitation, as well as sacred places and those related to traditional history (Simpcw First Nation 2012). Particular examples include Harp Mountain and Harper Creek, which have been traditionally used for hunting. The Simpcw have also indicated that medicinal plants such as arnica, paint-brush, rose, cedar, fir, caribou lichens, mosses, and other alpine species can be found around and within the Project Site (Simpcw First Nation 2012).

The Project Site is also of interest to the Métis of British Columbia, who have historical and cultural ties to the area. In letters to HCMC, the Métis Nation British Columbia noted historical use of the region, including at communities such as Kamloops, Barriere, Little Fort, and Tete Jaune Cache. Métis people were actively trapping within the region from the early 1800s, as well as undertaking other subsistence-based, social, and ceremonial activities. Today, the area continues to support a large Métis community and active sustenance harvesting by Métis people (MNBC 2011, 2012, pers. comm.).

1.7 SCOPE OF THE PROJECT

1.7.1 Provincial Scope of the Proposed Project

The provincial scope of the EA is described in the section 11 Order issued by the BC EAO on September 11, 2009. The scope of the Project as defined in the section 11 Order includes on-site and off-site components and activities, as described in Section 1.7.3 below.

The scope of the assessment for the Project, as defined in the section 11 Order, includes consideration of the:

- potential adverse environmental, social, economic, health, and heritage effects, and practical means to prevent or reduce to an acceptable level any such potential adverse effects; and
- potential adverse effects on asserted First Nations' interests, and, to the extent appropriate, ways to avoid, mitigate, or otherwise accommodate such potential adverse effects.

1.7.2 Federal Scope of the Proposed Project

The federal scope of the EA as defined by the CEAA 1992 consists of the factors listed in section 16 of the CEAA 1992, the scope of those factors, the scope of the project, and the scope of potential environmental effects to be included in the EA.

The factors to be considered take into account the definitions of "environment," "environmental effect," and "project." For greater clarity, "environmental effect" as defined by the CEAA 1992 means, in respect of a project:

a) *Any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the* Species at Risk Act*;*

b) *Any effect of any change referred to in paragraph (a) on:*

   i. *Health and socio-economic conditions*

   ii. *Physical and cultural heritage*

   iii. *The current use of lands and resources for traditional purposes by aboriginal persons, or*

   iv. *Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;*

c) *Any change to the project that may be caused by the environment, whether any such change or effect occurs within or outside Canada.*

The following factors must also be considered in a comprehensive study type EA:

- the purpose of the project;
- alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternatives;
- the environmental effects (as defined above) of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;
- measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project;
- the significance of the environmental effects;

- the need for, and the requirements of, any follow-up program in respect of the project;
- comments from the public obtained in accordance with the CEAA 1992;
- the capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future; and
- any other matter relevant to the comprehensive study, such as the need for the project and alternatives to the project that the CEA Agency may require to be considered.

1.7.3 Project Components

The Project consists of the following key components (Figure 1.1-1):

- open pit mine, primary crusher, coarse ore stockpile and mineral processing plant, processing approximately 70,000 tonnes of ore per day;
- mill tailing and waste rock storage facilities including containment dams and associated structures;
- site runoff, diversion and sediment control, and water management structures;
- mine haul roads within the mineral property;
- borrow pits, overburden, and topsoil storage;
- electrical power line from the existing Vavenby substation to the Project Site, access roads, substation(s), and activities associated with constructing or maintaining these facilities;
- infrastructure facilities and services, including a fuel storage facility, and support facilities such as laboratories, safety and environmental control, potable water, sewage treatment facilities and waste disposal, maintenance, staff accommodation, administration offices, communication and fire protection;
- freshwater extraction, transportation and storage facilities;
- concentrate storage facilities;
- bulk explosives storage and manufacture facilities;
- hazardous material storage and/or handling;
- upgrading of the existing FSRs to provide an access road capable of safely accommodating mine traffic;
- rail load-out facility near Vavenby;
- transportation of equipment, supplies, and concentrate by truck from the Project Site to the rail load-out facility; and
- associated off-site facilities or off-site activities related to the Project.

1.8 PROJECT SCHEDULE

The development schedule for the Project is shown in Table 1.8-1, as set out in an updated feasibility study dated July 31, 2014, which was released on August 14, 2014 (Merit 2014). BC Hydro power is assumed to be available by Q2 2018. Below is a brief outline of each phase of the Project:

- Construction phase (2 years; includes pre-construction and construction [all activities conducted and facilities constructed up to commencement of operations]).
- Operation 1 phase (23 years; active mining in the open pit from Year 1 through to Year 23).
- Operation 2 phase (5 years; low-grade ore processing from the end of active mining through to the end of Year 28).
- Closure phase (7 years; active closure and reclamation activities while the open pit and tailings management facility are filling).
- Post-Closure phase (50 years; steady-state long-term closure conditions following active closure, with ongoing monitoring).

Table 1.8-1. Harper Creek Project Development Schedule

Key Project Milestone	Milestone Date
Detailed Engineering Starts	Third Quarter 2015
Mines Act Permit issued: Project released for construction	First Quarter 2016
Start construction	Second Quarter 2016
Mills delivered	Third Quarter 2017
BC Hydro provided power	Second Quarter 2018
Mechanical completion	Second Quarter 2018

1.9 PROJECT BENEFITS

The Project is expected to result in substantial benefits to the region, province, and country. Benefits will be realized through direct and indirect employment and business opportunities to supply goods and services directly and indirectly to the Project, as well as other spin-off economic benefits associated with workers spending their incomes within their communities and elsewhere. In addition, the Project will contribute tax revenues to local, provincial, and federal governments.

The communities in the socio-economic effects assessment area (Chapter 17, Socio-economic Effects Assessment) include incorporated and unincorporated communities as well as First Nation communities. The Project is expected to create direct employment opportunities for local workers. Moreover, direct Project spending on local goods and services will support businesses, enhancing the economic development in the communities. The additional spending will drive job creation by local businesses leading to a higher level of general employment and, consequently, higher personal income.

To fully assess possible direct, indirect, and induced economic benefits of the Project, an economic impact model, the BC Input-Output Model (BCIOM), developed and maintained by BC Stats, was

used (Appendix 1-A). Direct Project impacts relate to Project activities such as direct Project spending and direct Project employment. Direct supplier impacts measure the impacts of the Project on BC industries supplying goods and services directly to the Project. Indirect impacts measure the impacts on BC industries further back in the supply chain. Induced impacts measure the impacts that spending by workers (employed by the Project or by direct/indirect suppliers) will have on the economy.[1]

The BCIOM provides the total extent to which the BC economy will benefit from Project construction and operation. The three indicators are used to assess the economic impacts associated with the Project are:

- Gross Domestic Product (GDP);
- employment; and
- government tax revenue (from personal income tax, corporate profit tax, and sales tax).

GDP measures the value added to the BC economy by Project activities. This includes household income (wages, salaries, and benefits) as well as profits and incomes earned by corporations. The wage component of the labour cost estimate is assumed to include pre-tax wages, salaries, supplementary income, as well as income earned by proprietors of unincorporated businesses (employer's share of Canada Pension Plan and Employment Insurance). However, wage estimation does not take into account circumstances in which the wage could be higher or lower, possibly determined by local labour market characteristics (such as limited supply of labour) or risk premium associated with doing the work. Moreover, wage impacts not directly associated with work at the construction site are expected to be lower as compared to the average supplier wages.

Employment estimates are based on labour requirements for the Construction and Operations phases. Employment represents hours spent on the job by a typical worker in an industry and it is given in person-years; this does not represent full-time equivalent measures. Person-years represents one year of work in the given industry by one person. One year of work usually comprises 2,080 hours, and in many mining industry positions this implies 12-hour days with two weeks on the job and two weeks off the job (or similar shift rotation).

Person-years is used, rather than the number of potential positions, as there is a large number of various shifts, different job requirements, and different positions that would be difficult to categorize and consequently evaluate the impact of the Project on employment (i.e., the total number of hours that individuals may work in different jobs over the year varies substantially). Person-years, consequently, standardizes this approach.

Government tax revenue is a composite of income and commodity taxes generated by the Project. Income taxes include personal and corporate income taxes. Commodity taxes include Provincial Sales Tax, Goods and Services Tax, air transportation taxes, duties, excise taxes, and other. Property taxes are not included in the economic impact modelling. Tax revenue impacts were calculated based on the

[1] For the purpose of the Project it was assumed that 80% of workers' earnings would be used to purchase goods and services in the province (induced effects in the province), and 20% would go to taxes, other payroll deductions and savings.

current tax structure, applied to items subject to the tax (for BC only). The analysis is done at the provincial level with all effects assessed for the province of BC exclusively.

There are several limitations associated with the BCIOM. Most notably, these include the following: the static and linear nature of the model as the model does not take into account the amount of time required for changes to happen or for changes in the economic relationships to occur over time; and it is assumed that there are no capacity constraints and that an increase in the demand for labour will result in employment (rather than re-deployment).

Assumptions made regarding capital and operating expenditures and direct project employment for the economic impact modeling used the Project engineering design information available during the feasibility stage, which is typically the level of information used for effects assessment. These estimates have undergone minor variation as the Project design has developed, although the economic impact modeling results remain valid within the range of uncertainty typical of the feasibility stage.

The BCIOM provides the analysis of the full extent of impacts in the Province of BC as well as for the Regional District of Thompson-Nicola, including Electoral Areas A, B, P, and O. The results of the economic impact modelling are presented throughout the following sections.

National impacts were assessed based on provincial and national input-output multipliers provided by Statistics Canada (2014). The input-output multipliers are derived from input-output tables and are used to assess the impacts on the economy of an exogenous change in final demand for the output of a given industry. The multipliers provide a measure of the interdependence between an industry and the rest of the economy. In order to avoid double counting, direct impacts were not calculated as the BCIOM assumes that all direct impacts would take place in BC exclusively. Similarly, indirect and induced multipliers were adjusted accordingly to account for indirect and induced impacts estimated for the Province of BC. Consequently, to estimate GDP and job impacts in the rest of Canada (excluding BC), the multipliers presented in Table 1.9-1 were used (Statistics Canada 2014). [2]

Table 1.9-1. National Input-Output Multipliers, 2014

	Construction		Operation	
Project Impact on:	Indirect Effect	Induced Effect	Indirect Effect	Induced Effect
GDP	0.13	0.09	0.14	0.07
Employment	1.22	0.82	1.16	0.69

Other sources of information include input data provided by the Project's proponent and information included in the *Technical Report & Feasibility Study for the Harper Creek Copper Project* (Merit 2014) such as Capital Expenditures, Operation Expenditures, direct Project employment, and wages by year and job category.

[2] Industry category used for construction is BS23C500 (Other engineering construction). Industry category used for Operation is BS212230 (Copper, nickel, lead and zinc ore mining).

1.9.1 Capital Construction Costs

Pre-construction and construction activities of the Project are expected to take two years. The initial capital construction cost for the Project, including Provincial Sales Tax and bonding, is estimated at $1,025.8 million (Table 1.9-2). All costs are estimated in current Canadian dollars. The construction cost includes costs associated with mine pre-production development, Project Site infrastructure, site services and utilities, process, ancillaries, power supply and distribution, tailings and water reclamation, as well as indirect costs, owner's costs, and contingency. Of the indirect costs ($162.1 million), the cost of construction of temporary facilities and services is estimated at $18.2 million, the cost of camp construction is estimated at $10.1 million, and the construction of accommodation and catering is an estimated $13.9 million.

Table 1.9-2. Harper Creek Mine Construction Costs ($M)

Expenditure Category	Labour	Material	Equipment	Sub-contractor	Other	Total
Mining and Pre-production Development	$2.2	$0.2	$190.1	$88.2	$17.2	$298.0
Plant Site Infrastructure	$3.7	$0.2	$0.0	$5.6	$0.0	$9.5
Site Services and Utilities	$4.0	$3.2	$5.8	$0.3	$0.0	$13.4
Process	$66.0	$57.3	$153.5	$2.8	$0.0	$279.6
Ancillaries	$8.8	$12.9	$5.4	$0.2	$0.1	$27.4
Power Supply and Distribution	$5.4	$8.6	$33.6	$0.0	$0.0	$47.7
Tailings and Water Reclaim	$19.4	$9.4	$12.2	$13.0	$0.0	$54.0
Indirect Costs	$12.3	$1.1	$0.6	$10.1	$137.9	$162.1
Owner's Costs	$0.0	$0.0	$0.0	$0.0	$25.6	$25.6
Contingency	$0.0	$0.0	$0.0	$0.0	$90.7	$90.7
Total Directs and Indirects (with Contingency)	**$122.0**	**$92.9**	**$401.2**	**$120.2**	**$271.5**	**$1,007.9**
Bonding						$7.9
Provincial Sales Tax						$10.0
Grand Total						**$1,025.8**

Source: This information was provided to ERM Rescan by Yellowhead Mining Inc.

Project construction is anticipated to require some local infrastructure and local facilities such as power and public roads. For the Construction phase, a temporary construction camp will be established at the Project Site. The camp will gradually be expanded from approximately 100-person capacity at the start of construction to accommodate the peak force of approximately 600 persons sometime in the second year of construction. The majority of temporary construction workers will not reside in nearby communities because an on-site camp facility will be provided and temporary housing facilities at sufficient capacity for construction workers are not available in nearby communities. The camp will be dismantled before the beginning of the Operations phase.

Further, during the Construction phase of the Project, existing access corridors will be used to transport heavy machinery, equipment, and construction personnel from the rail load-out area to the

Project Site. Rail load-out facilities will be developed. The power supply will be delivered through the use of an electrical transmission line connection via a site power line from the Project Site to the BC Hydro switchyard at Vavenby.

Current road access to the Project is via Highway 5 from the City of Kamloops to the Town of Birch Island, then across the North Thompson River and eastward along the BILCR for approximately 6 km east to the Jones Creek FSR. On Highway 5, traffic volume data were collected around the community of Little Fort. The collected data indicate that the average annual daily traffic on that highway (Little Fort South) decreased by 7.3% between 2010 (3,527) and 2013 (3,269), whereas the summer average daily traffic decreased by 10.4% over the same period (BC MOTI 2014). It is expected that there will be some increase in traffic along Highway 5 that will affect the communities on that highway. However, roads in the study area are projected to operate adequately through to 2045 with minimal increases in delay (Appendix 5-E). A Traffic and Access Management Plan for the project is included in Section 24.16, and places an emphasis on the use of the BILCR for the transport of oversized and heavy loads.

1.9.2 Operations Costs

There will be two Operations phases. The first phase will take place over 23 years and will consist of active mining in the open pit. Following the first phase, the second phase will take five years and will focus on low-grade ore processing from the end of active mining. The total cost of operating activities is estimated at $5,887.1 million, of which $766.0 million will be required for the second phase (Table 1.9-3). The operating expenditures, exclusive of the cost of labour, include expenditures on mining ($2,000.8 million), processing ($2,318.3 million), site services ($157.2 million), general and administrative services ($265.4 million) and royalties ($27.5 million). The total expenditures are expected to peak in the thirteenth year of Operations at $250.1 million. The average annual expenditures are $71.5 million for mining, $82.8 million for processing, $5.6 million for site services and $9.5 million for general and administrative expenses. All costs are measured in current Canadian dollars.

Table 1.9-3. Harper Creek Mine Operating Costs ($M)

Year	Mining	Processing	Site Services	General and Admin	Royalties	Labour	Total
1	$75.5	$73.4	$4.7	$8.5	$2.7	$42.5	$207.3
2	$81.2	$82.7	$5.6	$9.5	$0.0	$43.1	$222.1
3	$91.2	$82.7	$5.6	$9.5	$0.0	$43.6	$232.6
4	$84.5	$82.7	$5.6	$9.5	$0.0	$42.4	$224.7
5	$89.9	$82.7	$5.6	$9.5	$0.0	$44.4	$232.1
6	$96.4	$82.7	$5.6	$9.5	$0.0	$45.4	$239.6
7	$98.0	$82.7	$5.6	$9.5	$0.0	$44.4	$240.2
8	$90.7	$82.7	$5.6	$9.5	$0.0	$44.0	$232.5
9	$96.2	$82.7	$5.6	$9.5	$0.0	$45.9	$239.8
10	$90.8	$82.7	$5.6	$9.5	$0.0	$44.9	$233.4
11	$90.4	$82.7	$5.6	$9.5	$0.0	$45.0	$233.1

(continued)

Table 1.9-3. Harper Creek Mine Operating Costs ($M; completed)

Year	Mining	Processing	Site Services	General and Admin	Royalties	Labour	Total
12	$91.8	$82.7	$5.6	$9.5	$0.0	$44.9	$234.4
13	$105.8	$82.7	$5.6	$9.5	$0.0	$46.5	$250.1
14	$85.8	$82.7	$5.6	$9.5	$0.0	$44.4	$228.0
15	$82.2	$82.7	$5.6	$9.5	$0.0	$45.5	$225.5
16	$84.0	$82.7	$5.6	$9.5	$4.7	$46.1	$232.6
17	$70.2	$82.7	$5.6	$9.5	$5.0	$41.8	$214.7
18	$69.0	$82.7	$5.6	$9.5	$13.6	$41.2	$221.5
19	$66.6	$82.7	$5.6	$9.5	$0.0	$40.7	$205.1
20	$61.6	$82.7	$5.6	$9.5	$0.0	$39.3	$198.7
21	$57.9	$82.7	$5.6	$9.5	$0.0	$38.6	$194.3
22	$57.4	$82.7	$5.6	$9.5	$0.0	$37.6	$192.7
23	$52.1	$82.7	$5.6	$9.5	$0.0	$36.1	$186.0
24	$42.6	$86.6	$6.0	$9.9	$0.0	$29.7	$174.7
25	$23.1	$86.6	$6.0	$9.9	$1.5	$24.9	$152.0
26	$23.0	$86.6	$6.0	$9.9	$0.0	$25.1	$150.5
27	$22.5	$86.6	$6.0	$9.9	$0.0	$25.1	$150.0
28	$20.4	$79.3	$5.3	$9.1	$0.0	$24.7	$138.9
Total	**$2,000.8**	**$2,318.3**	**$157.2**	**$265.4**	**$27.5**	**$1,117.9**	**$5,887.1**

Source: This information was provided to ERM Rescan by Yellowhead Mining Inc.

Expenditures related to decommissioning, closure, and reclamation are not yet known, as these activities will take place some distance in the future (i.e., 30 years - 2 years for Construction and 28 years for Operations phases) and detailed engineering costing information was not yet available at the time of this report. It is, however, expected that the decommissioning, closure, and reclamation costs will be notably less compared to the Operations phase.

1.9.3 Employment Opportunities

1.9.3.1 Hiring Strategy

HCMC will aim to maximize employment benefits within local communities (including First Nation communities), the region (Regional District of Thompson-Nicola Electoral Areas A, B, P, and O), and the province as a whole. Activities to achieve this goal will include communication of the Project development schedule, including timing of major activities and key milestones, workforce requirements, and the hiring schedule, including types of experience and qualifications required to work at the Project (in particular once it enters the Operations phase).

HCMC will prepare and implement a local hiring and training policy—along with the labour requirements, broken out by trade/competency, and minimum educational qualifications—prior to commencement of hiring of operations personnel, other than senior staff positions.

Prior consideration for employment will be afforded to residents of the Thompson-Nicola Regional District, Electoral Areas A, B, P, and O, followed by the province, subject to availability of appropriately skilled persons. Hiring practices will follow BC and federal legislation and regulations with a focus on hiring local and regional residents, where possible, including local Aboriginal groups and local communities. Additionally, training and skill development, including on-the-job training, will be offered to Project employees across departments in order to support ongoing enhancement of worker skillsets and internal job advancement.

1.9.3.2 Construction

Direct Employment

HCMC predicts a total maximum of 600 construction jobs. Construction jobs will be primarily filled by independent contracting companies hired by and reporting to the Construction Manager. Of the projected 600 construction jobs, approximately 180 (30%) construction jobs are estimated to be from local communities[3] in the Regional District of Thompson-Nicola (Electoral Areas A, B, P and O). Construction jobs will be associated with mining and pre-production development, construction of the plant infrastructure, construction of site services and utilities, milling facilities, and other (Table 1.9-4). Other jobs will be associated with the construction of temporary facilities and services including the temporary camp for workers.

Table 1.9-4. Direct Construction Employment and Earnings by Job Category

Employment Category	Average Annual Earnings Estimate ($)	Labour Hours	Employment (Person-Years)	Total Labour Cost
Mining and Pre-production Development	$81,681	57,171	27	$2,245,082
Plant Site Infrastructure	$197,800	39,148	19	$3,722,816
Site Services and Utilities	$196,094	42,933	21	$4,047,543
Process	$204,485	671,426	323	$66,007,947
Ancillaries	$231,927	79,253	38	$8,836,978
Power Supply and Distribution	$203,843	55,087	26	$5,398,609
Tailings and Water Reclaim	$197,644	204,402	98	$19,422,543
Employment associated with indirect costs	$46,500	551,661	265	$12,332,814
Total		**1,701,081**	**818**	**$122,014,333**

Source: This information was provided to ERM Rescan by Yellowhead Mining Inc.
Notes:
Earnings estimate is based on the total labour cost divided by the total labour hours required during Construction phase times the 2,080 hours worked in a full-time position in one year by one employee. Therefore, estimates include income burden (mainly costs of benefits and mandatory employer remittances to government) in addition to income paid to the worker. The estimate of income paid to workers also includes any overtime pay and productivity bonuses.

[3] Regional and local study communities are listed in Chapter 17, Socio-economic Effects Assessment.

Wages associated with the Construction phase are expected to be relatively high compared to regional averages. In 2010, the median annual employment income in Thompson-Nicola Electoral Area A was $47,682; it was $50,070 in Electoral Area P. Income data are not available for Electoral Areas B and O. For comparison, average employment income was $49,143 in BC (Statistics Canada 2013b). As shown in Table 1.9-4, wages associated with the Construction phase are expected to be up to four times the median annual employment income in the region. The total labour cost is estimated at $122.0 million, comprising 12.1% of the total construction costs; this is what is expected to be spent on wages (and related labour expenses) paid to workers directly employed on the Construction phase of the Project.

Employment in Supplier Industries

Over the Construction phase, total indirect and induced employment is estimated at 6,268 person-years; this includes 2,137 person-years of employment in direct supplier industries, with the remaining employment predicted for indirect suppliers and induced activities (Table 1.9-5). These represent impacts in BC and other Canadian provinces. The average individual earning in supplier industries is estimated at approximately $57,820 (Table 1.9-5).

Table 1.9-5. Estimated Indirect and Induced Employment and Earnings Impacts, Construction Phase

	Direct Suppliers (Person-years)	Other Suppliers (Person-years)	Total Indirect Impact (All Suppliers; Person-years)	Induced (Person-years)	Total Indirect and Induced (Person-years)
Annual Average					
Annual Employment in the RDTN* (Electoral Areas A, B, P, and O)	220	47	267	50	317
Annual Employment in rest of BC	848	553	1,401	388	1,789
Impacts in rest of Canada[1]	-	617	617	411	1,028
Total	**1,069**	**1,217**	**2,285**	**849**	**3,134**
Construction Phase (2 Years)					
Total Employment in the RDTN (Electoral Areas A, B, P, and O)	441	94	535	100	634
Total Employment in rest of BC	1,696	1,105	2,801	776	3,578
Impacts in rest of Canada[1]	-	1,234	1,234	822	2,056
Total	**2,137**	**2,433**	**4,570**	**1,698**	**6,268**
Annual Earnings ($ per person)					
Earning Estimate	**$61, 680**	**$56,160**	**$59,695**	**$50,675**	**$57,820**

Source: BC Stats (2014), [1]Provided by ERM Rescan.
** Regional District of Thompson-Nicola*

In BC, Project-related employment impacts associated with supplier industries are expected to be mostly felt in: professional, scientific, and technical professions; wholesale trade; construction; accommodation and food services; and manufacturing (Table 1.9-6). Regional employment impacts are estimated at 634 person-years of employment and are expected to be most notable in: construction; accommodation and food services; mining and oil and gas extraction; crop and animal production; and forestry and logging (Table 1.9-7).

Table 1.9-6. Employment Impacts in Top Five Supplier Industries in British Columbia, Construction Phase

Supplier Industries	Employment (Person-years)
Direct Suppliers	**2,137**
Wholesale trade	554
Professional, scientific, and technical	479
Construction	422
Manufacturing	230
Accommodation and food services	208
Top five industries as a % of total direct supplier impact	***88.6***
Other Suppliers	**1,199**
Professional, scientific, and technical	321
Transportation and warehousing	122
Administrative and other support services	108
Finance, insurance, and real estate	102
Manufacturing	100
Top five industries as a % of total impact in other supplier industries	***62.7***
Induced Impact	**876**
Retail trade	208
Accommodation and food services	120
Non-profit institutions serving households	73
Other services (except public administration)	71
Finance, insurance, and real estate	67
Top five industries as a % of total induced impact	***61.4***
Total, Indirect, and Induced	**4,212**
Professional, scientific, and technical	831
Wholesale trade	664
Construction	462
Accommodation and food services	403
Manufacturing	351
Top five industries as a % of total indirect and induced impact	***64.4***

Source: BC Stats (2014)
Note: Numbers may not add up due to rounding.

Table 1.9-7. Regional Employment Impacts in Top Five Supplier Industries in Thompson-Nicola Areas A, B, P, and O, Construction Phase

Supplier Industries	Employment (Person-years)
Construction	314
Accommodation and Food Services	274
Mining and Oil And Gas Extraction	26
Crop and Animal Production	6
Forestry and Logging	4
Other	10
Total	**364**

Source: BC Stats (2014)
Note: Numbers may not add up due to rounding.

1.9.3.3 Operations

Direct Employment

The Operations phase of the Project is expected to create a total of 11,248 person-years of direct Project employment over the life of the mine (28 years). Of that, 6,936 person-years of employment will be in mining (average of 272, up to 319 jobs), 2,856 person-years (approximately 102 jobs) in milling, and 1,036 person-years (approximately 37 jobs) in site services. An estimated 15 jobs will be created in administration (Table 1.9-8). In the ninth year of the Operations phase, employment will peak at 466 positions. The total number of positions (including salaried and hourly positions) is summarized in Table 1.9-8. Further, HCMC predicts that approximately 12 to 15% of all direct jobs will be held by local workers.

Earnings for workers directly employed at the Project during the Operations phase are expected to be high as compared to the regional and provincial averages. Wages associated with mining positions are expected to be on average $99,336 per annum, wages for workers in processing are estimated at $102,931 per annum, whereas average wages associated with site services will be approximately $88,162. Positions related to general and administrative tasks will have an average annual wage of $119,333 (Table 1.9-9).

Employment in Suppliers Industries

The Operations phase of the Project is further expected to create 28,647 person-years of direct and indirect supplier and induced employment (Table 1.9-10). The Regional District of Thompson-Nicola's Electoral Areas A, B, P, and O are expected to benefit from an average of 24 jobs, whereas the rest of BC will benefit with 613 new jobs. Other Canadian provinces are expected to gain an average of 431 new jobs (Table 1.9-10). The typical average annual earnings expected for workers in the supplier industries and associated with induced activity is estimated at $62,125, ranging from a high of $73,885 for direct suppliers to $50,675 for earnings associated with induced activities.

The top five industries in BC to experience Project-induced employment include utilities, manufacturing, wholesale, retail trade, and construction (Table 1.9-11). In Electoral Areas A, B, P, and O employment

impacts are estimated at 678 person-years with impacts in construction, accommodation and foods services, mining and oil and gas extraction, manufacturing, and other (Table 1.9-12).

1.9.4 Business Opportunities and Government Revenues

1.9.4.1 Local Purchasing Strategy

The Project will encourage the involvement of local and regional businesses interested in opportunities to directly and indirectly supply the Project to maximize the benefits within the region. Suppliers will be selected based on location, quality, price, delivery, and support services with the standards for purchasing determined during the initial stages of the Project. The Procurement Strategy to be developed by HCMC is expected to encourage the procurement of goods and services from both local and Aboriginal-owned suppliers, where such goods and services are competitive in quality and price.

A plan for expediting will be prepared based on the Project schedule and equipment lists. The extent to which purchase orders are expedited will be based on complexity, manufacturing cycle time, and schedule criticality. Equipment, materials not provided by contractors, certain facility and equipment rentals, and consumables will be purchased by the procurement group on behalf of HCMC using HCMC's standard terms and conditions, modified as necessary to meet Project-specific requirements. Pre-engineered buildings will be tendered on a lump sum design, fabricate, and erect basis including crane rails, doors, windows, and insulation.

Companies located in nearby communities including the District of Barriere, District of Clearwater, and the City of Kamloops are expected to benefit most notably from the Project's procurement of goods and services. However, the exact type of businesses/contractors and the potential value of contracts are not yet known. Project-induced GDP impacts during the Construction and Operations phases are estimated for the top five affected industries (Sections 1.10.4.2 and 1.10.4.3).

The provision of business contracts will be based on the following principles (Merit 2014):

- fixed-price contracts will be preferred, requiring design engineering to be complete before tendering;
- incentive-based, open-book contracts will be used when a contract must be let before engineering is substantially completed;
- fixed-unit prices will be established at the time of tender for undefined work or changes;
- normally invite tenders from among three to five contractors;
- let design-supply-and-erect contracts where it makes sense to do so;
- minimize the number of contractors and sub-contractors to minimize administrative costs, interfaces, and field overheads; and
- offer incentives for early completion of Project-critical tasks.

Table 1.9-8. Direct Operation Employment (Number of Persons) by Job Category and Year

Project Year	Mining					Milling				Site Services		Administration	Total
	Salaried Employees			Hourly Employees		Salaried Employees		Hourly Employees					
	Mine Supervision	Mine Maintenance	Engineering and Geology	Operations	Maintenance	Mill Supervision	Mill Maintenance	Operations	Maintenance	Salaried Employees	Hourly Employees	Salaried Employees	
1	8	9	12	171	76	18	2	40	42	1	36	15	**430**
2	8	9	12	173	80	18	2	40	42	1	36	15	**436**
3	8	9	12	177	81	18	2	40	42	1	36	15	**441**
4	8	9	12	163	81	18	2	40	42	1	36	15	**427**
5	8	9	12	184	83	18	2	40	42	1	36	15	**450**
6	8	9	12	194	84	18	2	40	42	1	36	15	**461**
7	8	9	12	184	83	18	2	40	42	1	36	15	**450**
8	8	9	12	179	83	18	2	40	42	1	36	15	**445**
9	8	9	12	194	89	18	2	40	42	1	36	15	**466**
10	8	9	12	182	89	18	2	40	42	1	36	15	**454**
11	8	9	12	183	89	18	2	40	42	1	36	15	**455**
12	8	9	12	182	89	18	2	40	42	1	36	15	**454**
13	8	9	12	201	89	18	2	40	42	1	36	15	**473**
14	8	9	12	177	89	18	2	40	42	1	36	15	**449**
15	8	9	12	191	88	18	2	40	42	1	36	15	**462**
16	8	9	12	198	88	18	2	40	42	1	36	15	**469**
17	8	9	12	163	76	18	2	40	42	1	36	15	**422**
18	8	9	11	157	76	18	2	40	42	1	36	15	**415**
19	8	9	11	154	74	18	2	40	42	1	36	15	**410**
20	8	9	11	143	69	18	2	40	42	1	36	15	**394**
21	8	9	11	139	66	18	2	40	42	1	36	15	**387**
22	8	9	11	132	63	18	2	40	42	1	36	15	**377**
23	8	9	11	121	58	18	2	40	42	1	36	15	**361**
24	7	7	4	79	40	18	2	40	42	1	36	15	**291**
25	5	5	2	49	26	18	2	40	42	1	36	15	**241**
26	5	5	2	49	29	18	2	40	42	1	36	15	**244**
27	5	5	2	49	29	18	2	40	42	1	36	15	**244**
28	5	5	2	46	28	18	2	40	42	1	36	15	**240**
Total	**211**	**234**	**282**	**4,214**	**1,995**	**504**	**56**	**1,120**	**1,176**	**28**	**1,008**	**420**	**11,248**

Source: This information was provided to ERM Rescan by Yellowhead Mining Inc.

Table 1.9-9. Earnings by Employment Category, Operations Phase

Employment Category	Average Annual Earnings Estimate
Mining	$99,336
Processing (Milling)	$102,931
Site Services	$88,162
General and Administrative Services	$119,333

Source: This information was provided to ERM Rescan by Yellowhead Mining Inc.
Notes:
Wage estimate is based on the total labour cost divided by the total labour required during the Operations phase (for each category) times the 2,080 hours worked in a full-time position in one year by one employee. Therefore, estimates include income burden (mainly costs of benefits and mandatory employer remittances to government) in addition to income paid to the worker. The estimate of income paid to workers also includes any overtime pay and productivity bonuses.

Table 1.9-10. Estimated Indirect and Induced Employment and Earnings Impacts, Operations Phase

	Direct Suppliers (Person-years)	Other Suppliers (Person-years)	Total Indirect Impact (All Suppliers; Person-years)	Induced (Person-years)	Total Indirect and Induced (Person-years)
Annual Average					
Annual Employment in the RDTN* (Electoral Areas A, B, P, and O)	4	13	17	7	24
Annual Employment in Rest of BC	283	172	454	159	613
Impacts in Rest of Canada[1]	-	271	271	160	431
Total	287	456	742	326	1,068
Construction Phase (2 Years)					
Total Employment in the RDTN (Electoral Areas A, B, P, and O)	115	364	479	202	678
Total Employment in Rest of BC	7,912	4,807	12,718	4,455	17,177
Impacts in rest of Canada[1]	-	6,786	6,786	4,006	10,792
Total	**8,027**	**11,957**	**19,983**	**8,663**	**28,647**
Annual Wage ($ per person)					
Wage Estimate	**$73,885**	**$54,180**	**$66,165**	**$50,675**	**$62,125**

Source: BC Stats (2014), [1]Provided by ERM Rescan
** Regional District of Thompson-Nicola*

Table 1.9-11. Employment Impacts in Top Five Supplier Industries in British Columbia, Operations Phase

Supplier Industries	Employment (Person-years)
Direct Suppliers	**8,027**
Utilities	2,461
Manufacturing	2,138
Wholesale trade	1,726
Administrative and other support services	526

(continued)

Table 1.9-11. Employment Impacts in Top Five Supplier Industries in British Columbia, Operations Phase (completed)

Supplier Industries	Employment (Person-years)
Professional, scientific, and technical	395
Top five industries as a % of total direct supplier impact	***90.3***
Other Suppliers	**5,171**
Construction	1,065
Transportation and warehousing	664
Administrative and other support services	591
Professional, scientific, and technical	533
Finance, insurance, and real estate	524
Top five industries as a % of total impact in other supplier industries	***65.3***
Induced impact	**4,657**
Retail trade	1,104
Accommodation and food services	636
Non-profit institutions serving household	388
Other services (except public administration)	375
Finance, insurance, and real estate	356
Top five industries as a % of total induced impact	***61.4***
Total, indirect, and induced	**17,855**
Utilities	2,518
Manufacturing	2,428
Wholesale trade	2,291
Retail trade	1,604
Construction	1,355
Top five industries as a % of total indirect and induced impact	***57.1***

Source: BC Stats (2014)
Note: Numbers may not add up due to rounding.

Table 1.9-12. Regional Employment Impacts in Top Five Supplier Industries in Thompson-Nicola Areas A, B, P, and O, Operations Phase

Supplier Industries	Employment (Person-years)
Construction	336
Accommodation and Food Services	224
Mining And Oil and Gas Extraction	56
Manufacturing	28
Other	28
Total	678

Source: BC Stats (2014)
Note: Numbers may not add up due to rounding.

1.9.4.2 Construction

Gross Domestic Product

Direct Project activities are expected to contribute $148.2 million to BC's GDP during the Construction phase. Increases in the provincial GDP as a result of the Project's indirect (including direct and indirect suppliers) and induced activities are expected to contribute another $363.6 million (Table 1.9-13). Top industries to benefit from the Project Construction activities include finance, insurance, real estate and rental and leasing; professional, scientific, and technical services; wholesale trade; construction; and manufacturing (Table 1.9-13).

Table 1.9-13. GDP Impacts in Top Five Supplier Industries in British Columbia, Construction Phase

Supplier Industries	$M
Direct Suppliers	**187.8**
Wholesale trade	45.6
Construction	44.9
Professional, scientific, and technical services	36.9
Manufacturing	25.7
Finance, insurance, real estate, and rental and leasing	10.8
Top five industries as a % of total direct supplier impact	***87.3***
Other Suppliers	**98.2**
Professional, scientific, and technical services	22.7
Finance, insurance, real estate, and rental and leasing	16.7
Manufacturing	10.7
Transportation and warehousing	9.2
Wholesale trade	6.5
Top five industries as a % of total impact in other supplier industries	***67.0***
Induced Impact	**77.5**
Finance, insurance, real estate, and rental and leasing	34.2
Retail trade	9.1
Information and cultural industries	3.4
Accommodation and food services	3.4
Non-profit institutions serving households	3.2
Top five industries as a % of total induced impact	***68.8***
Total, Indirect and Induced	**363.6**
Finance, insurance, real estate, and rental and leasing	61.7
Professional, scientific, and technical services	61.7
Wholesale trade	54.7
Construction	47.6
Manufacturing	38.3
Top five industries as a % of total indirect and induced impact	***72.6***

Source: BC Stats (2014)

In Electoral Areas A, B, P, and O, the GDP impacts during the Construction phase are estimated at $39.0 million from direct Project suppliers, $7.4 million from indirect suppliers, and an additional $4.2 million from Project-induced activities (BC Stats 2014).

In other Canadian provinces, excluding BC, the Project is expected to contribute an additional $221.3 million in GDP during the Construction phase.

Taxes

Tax revenue is used as a key measure of the economic impacts of the Project. Tax revenues derived from direct activities during the Construction phase are expected to benefit federal, provincial, and local governments. The taxes are expected to be collected on factors of production, products, and personal and corporate income. The total tax revenue from direct Project expenditures during construction is estimated at $60.2 million, of which $16.0 million will benefit the federal government and $44.2 million will be paid to the provincial government. The remaining $16,000 will be paid to the local governments as municipal tax revenue primarily related to accommodation taxes (Table 1.9-14).

Table 1.9-14. Tax Revenue Derived from Direct Project Expenditures, Construction Phase

Tax Source	Federal ($M)	Provincial ($M)	Local ($M)	Total ($M)
Total, all sources	16.023	44.195	0.016	60.234
Taxes on products ($M)	1.537	38.584	0.000	40.121
Taxes on factors of production ($M)	0.000	0.008	0.016	0.024
Personal income taxes ($M)	13.158	5.016	0.000	18.174
Corporate income taxes ($M)	1.328	0.586	0.000	1.914

Source: BC Stats (2014)

Project-related indirect and induced activities are also expected to contribute to the federal, provincial, and local tax revenue. The federal and provincial tax revenue is derived from personal and corporation income tax as well as from net taxes on products. The total tax revenue derived from indirect (including direct and indirect suppliers) and induced activities is estimated at $56.3 million, with $26.8 million in federal, $22.0 million in provincial, and $7.6 million in local taxes (Table 1.9-15).

Table 1.9-15. Tax Revenue Derived from Indirect and Induced Activities, Construction Phase

Tax Source	Direct Suppliers	Other Suppliers	Total Indirect Impact (All Suppliers)	Induced Impact	Total Indirect and Induced Impacts
Total tax revenue ($M)	**31.225**	**14.929**	**46.154**	**10.176**	**56.330**
Federal ($M)	16.211	7.296	23.507	3.264	26.770
Personal income tax	*11.118*	*5.373*	*16.491*	*2.474*	*18.965*
Corporation income tax	*4.504*	*1.976*	*6.480*	*1.318*	*7.797*
Net taxes on products	*0.588*	*-0.053*	*0.536*	*-0.528*	*0.007*

(continued)

Table 1.9-15. Tax Revenue Derived from Indirect and Induced Activities, Construction Phase (completed)

Tax Source	Direct Suppliers	Other Suppliers	Total Indirect Impact (All Suppliers)	Induced Impact	Total Indirect and Induced Impacts
Provincial ($M)	12.468	5.624	18.092	3.899	21.991
Personal income tax	*4.204*	*2.047*	*6.251*	*0.950*	*7.201*
Corporation income tax	*2.019*	*0.891*	*2.910*	*0.586*	*3.497*
Net taxes on products	*6.245*	*2.686*	*8.931*	*2.362*	*11.293*
Local ($M)	2.546	2.008	4.555	3.014	7.569

Source: BC Stats (2014)

Overall, the total tax revenue to be derived from direct, indirect, and induced economic activity as a result of the construction of the Project is estimated at $116.7 million: $42.8 million in federal, $66.2 million in provincial, and $7.7 million in municipal taxes.

1.9.4.3 Operations

Gross Domestic Product

Direct Project activities are expected to contribute $1,152.4 million to BC's GDP during the Operations phase. Increases in the provincial GDP as a result of the Project's indirect (including direct and indirect suppliers) and induced activities are expect to contribute another $2,465.2 million (Table 1.9-16). Top industries to benefit from the Project operation activities include utilities; manufacturing; finance, insurance, real estate, and rental and leasing; wholesale trade; and mining and oil and gas extraction (Table 1.9-16).

In Electoral Areas A, B, P, and O, GDP impacts over the life of the mine are estimated at $14.0 million from direct Project suppliers, $36.4 million from indirect suppliers, and an additional $8.4 million from Project-induced activities (BC Stats 2014).

In other Canadian provinces, excluding BC, the Project is expected to contribute an additional $1,269.9 million in GDP during the life of the mine.

Table 1.9-16. Gross Domestic Product Impacts in Top Five Supplier Industries in British Columbia, Operations Phase

Supplier Industries	$M
Direct Suppliers	**1,596.7**
Utilities	1,011.0
Manufacturing	318.0
Wholesale trade	142.1
Mining and oil and gas extraction	27.5
Professional, scientific, and technical services	23.6
Top five industries as a % of total direct supplier impact	***95.3***

(continued)

Table 1.9-16. Gross Domestic Product Impacts in Top Five Supplier Industries in British Columbia, Operations Phase (completed)

Supplier Industries	$M
Other Suppliers	**456.5**
Finance, insurance, real estate, and rental and leasing	81.8
Construction	67.8
Mining and oil and gas extraction	66.0
Transportation and warehousing	55.5
Professional, scientific, and technical services	35.1
Top five industries as a % of total impact in other supplier industries	***67.1***
Induced Impact	**412.1**
Finance, insurance, real estate, and rental and leasing	181.7
Retail trade	48.6
Information and cultural industries	18.3
Accommodation and food services	17.8
Non-profit institutions serving households	17.1
Top five industries as a % of total induced impact	***68.8***
Total, Indirect and Induced	**2,465.2**
Utilities	1,034.8
Manufacturing	343.5
Finance, insurance, real estate, and rental and leasing	272.4
Wholesale trade	188.6
Mining and oil and gas extraction	99.2
Top five industries as a % of total indirect and induced impact	***78.6***

Source: BC Stats (2014)

Taxes

Tax revenue derived from direct activities during the Operations phase is estimated at $435.4 million, of which $131.4 million will benefit the federal government, $281.4 million will be paid to the provincial government, and the remaining $22.6 million will be paid in municipal taxes (Table 1.9-17).

Table 1.9-17. Tax Revenue Derived from Direct Project Expenditures, Operations Phase

Tax Source	Federal ($M)	Provincial ($M)	Local ($M)	Total ($M)
Total, all sources	**131.424**	**281.358**	**22.573**	**435.355**
Taxes on products ($M)	39.641	234.469	0.000	274.110
Taxes on factors of production ($M)	0.250	11.764	22.573	34.587
Personal income taxes ($M)	91.533	35.125	0.000	126.658
Corporate income taxes ($M)	0.000	0.000	0.000	0.000

Source: BC Stats (2014)

Project-related indirect and induced activities are further expected to contribute to the federal, provincial, and local tax revenue. The total tax revenue derived from indirect and induced activities is estimated at $407.6 million, with $183.8 million in federal, $146.3 million in provincial and $77.5 million in local taxes (Table 1.9-18).

Table 1.9-18. Tax Revenue Derived from Indirect and Induced Activities, Operations Phase

Tax Source	Direct Suppliers	Other Suppliers	Total Indirect Impact (All Suppliers)	Induced Impact	Total Indirect and Induced Impacts
Total tax revenue ($M)	**283.064**	**70.385**	**353.449**	**54.108**	**407.557**
Federal ($M)	132.917	33.541	166.458	17.354	183.812
Personal income tax	*47.716*	*22.001*	*69.717*	*13.156*	*82.873*
Corporation income tax	*84.784*	*10.938*	*95.722*	*7.006*	*102.728*
Net taxes on products	*0.417*	*0.603*	*1.020*	*-2.808*	*-1.789*
Provincial ($M)	97.549	27.989	125.538	20.729	146.267
Personal income tax	*18.218*	*8.392*	*26.610*	*5.052*	*31.662*
Corporation income tax	*35.677*	*5.015*	*40.692*	*3.118*	*43.810*
Net taxes on products	*43.654*	*14.582*	*58.236*	*12.559*	*70.795*
Local ($M)	52.597	8.855	61.453	16.026	77.478

Source: BC Stats (2014)

Overall, the total tax revenue to be derived from direct Project activities, and indirect and induced activities during operations is estimated at $842.9 million: $315.2 million in federal, $427.6 million in provincial, and $100.1 million in municipal taxes.

Property taxes are estimated at $75,000 per year (Canadian dollars). Tax revenue to be derived directly from the Project will amount to: 15% Canadian federal corporate income tax, 10% British Columbia corporate income tax, 2% Net Current Proceeds tax, 13% Net Revenue tax, and British Columbia Mineral tax[4] (Merit 2014). Based on these rates, the *Technical Report and Feasibility Study for Harper Creek* estimates the federal income tax at $401.6 million, the provincial income tax at $295.2 million and the BC Mining Tax at $404.2 million as payable over the operating period.

1.9.5 Project Contribution to Community Development

A mine development in the interior of BC has the potential to create significant numbers of direct and indirect jobs in the region, as well as result in considerable capital investment. The inflow of new jobs will increase personal and household income, and new spending will contribute to business revenue and regional taxes. The Project, consequently, has the potential to contribute to the economic development of nearby communities and support the economic prosperity in the region.

[4] British Columbia Mineral tax is applied to an amount different than taxable income, as defined for federal and provincial income tax purposes, and is assumed deductible in arriving at taxable income.

The Project is located in the North Thompson within the Regional District of Thompson-Nicola. The nearest communities to the Project are Vavenby, Birch Island, Clearwater, and the Simpcw Boulder Creek 5 reserve. Some of the mine-related infrastructure, including the rail load-out facility, will be located in Vavenby. Local communities expected to benefit from the Project include the communities of Clearwater, Barriere, Simpcw First Nation, Wells Gray Country, and Lower North Thompson (Chapter 17, Socio-economic Effects Assessment). Additionally, regional communities that may also expect to experience benefits from the Project include: Sun Peaks Mountain Village, Chase Village, City of Kamloops, Thompson Headwaters Electoral Area, Adams Lake First Nation, Little Shuswap First Nation, Neskonlith Indian Band, and the Rivers and the Peaks Electoral Area. Overall, these communities are expected to benefit directly and indirectly from the Project.

In general, forestry has been a driving force for many decades; however, recently the sector has been experiencing a downturn accompanied by the closing of several mills in the North Thompson. Currently tourism, agricultural activity, energy, construction, and the public sector are important contributors to the regional economy. Mining development is on the increase in the North Thompson Valley, and it is predicted that many forestry workers will transfer from forestry to mining as these new developments begin production. Economic development in the region is needed to offset the economic downturn of the forestry sector. In 2011, approximately 5% of the workforce in the Regional District of Thompson-Nicola was in agriculture, forestry, fishing, and hunting; 8% was in construction; and 4% was in mining, quarrying, and oil and gas extraction (Statistics Canada 2013a). Clearwater is one of the larger communities closest to the proposed Project. Clearwater's economy is primarily based in forestry and agriculture, with tourism becoming increasingly important (Rural Coordination Centre of BC 2014). Barriere is also driven by the forestry industry as well as tourism and agriculture. New businesses are starting to migrate to Barriere as the town grows with independent and sustainable resources coming to the region, including new mining opportunities (Government of British Columbia 2014). More detailed information for each community is provided in Chapter 17, Socio-economic Effects Assessment.

In 2011, there were 67,413 people in the labour force in the Regional District of Thompson-Nicola, with an unemployment rate of 9.6%. The labour force in the communities of Barriere, Clearwater, Simpcw First Nation, Wells Gray Country, and Lower North Thompson was estimated at less than 3,000, with the unemployment rate ranging between 14 to 24% (Statistics Canada 2013a).

HCMC is committed to hiring local people. The contracting approach will optimize the use of the local labour force where practical and create a responsible and sustainable relationship with communities. During the Construction phase, the Project is expected to employ a peak workforce of 600 people. When fully operational, the Project will support up to 473 jobs. The provision of employment will have a positive impact on the skills and experience of the labour market, and personal and household income. Higher household incomes will contribute to workers' savings and spending that, in turn, will increase the purchases of goods and services. New jobs will increase the demand for local goods and services and contribute to local business revenue as workers increase their spending. Businesses that notice an increase in demand for goods and services will seek to hire new workers to meet the higher demand; consequently, indirect and induced job opportunities will be created.

HCMC is committed to promoting local business opportunities that contribute to overall regional economic development. The Project spending during construction, excluding Provincial Sales Tax and bonding, is estimated at $1,007.9 million and $5,888.1 million during operations. Project spending is expected to increase demand for business goods and services through the provision of business contracts. Direct suppliers who experience an increase in demand for goods and services will in turn induce positive impacts in other industries.

Further, with respect to First Nations communities in the region, HCMC has initiated a range of consultation activities (Merit 2014). HCMC continues to work closely with First Nations on the development of working agreements and has signed a Negotiation Agreement with Simpcw First Nation, and a General Services Agreement with both the Simpcw and Adams Lake Indian Band. First Nation communities had members involved in the baseline studies and field work, and are conducting some assessment work for the Project (Merit 2014).

1.9.6 Summary of Economic Benefits

Direct Project spending and the provision of direct Project employment will have a beneficial impact on personal income, GDP, and government revenues. Supplier industries are further expected to directly and indirectly benefit from Project activities.

The Project is expected to be constructed over two years. During that time, up to 600 direct jobs will be created with an estimated 180 workers from local communities. Additionally, indirect and induced benefits are expected with 317 new jobs in the Regional District of Thompson-Nicola, 1,789 jobs in the rest of BC, and 1,028 jobs in the rest of Canada. The average annual earning for direct Project employees is estimated at $170,000, whereas in indirect and induced jobs the average earning is estimated at $57,000.

During Construction, total capital expenditures are estimated at $1,007.9 million, excluding Provincial Sales Tax and bonding. Direct Project activities are expected to contribute $148.2 million to BC's GDP during the Construction phase. Project-related indirect and induced activities are expected to contribute another $363.6 million to BC's GDP and $221.3 million in GDP in the rest of Canada. The total tax revenue from direct Project activities is estimated at $60.2 million, whereas the total tax revenue derived from indirect and induced activities is estimated at $56.3 million.

The Project lifespan is estimated at 28 years. Over that time, the Project will create 11,248 person-years of direct employment or up to 473 positions; of that, 12 to 15% have been estimated to be made up of local workers. Estimated indirect and induced employment impacts are predicted at 28,247 person-years of employment, with up to 24 positions estimated in the Regional District of Thompson-Nicola, 613 jobs in other parts of BC, and 431 jobs in the rest of Canada. Wages during the Operations phase are expected to be an average of $99,000 per annum for direct jobs and an average of $62,000 in indirect and induced jobs.

During Operations, the total Project spending is predicted at $5,888.1 million. Direct Project activities are expected to contribute $1,152.4 million to BC's GDP; an additional $2,465.2 million in BC's GDP and $1,269.9 million to GDP across Canada are expected to result from indirect and induced activities. Tax revenue derived from direct activities during the Operations phase is estimated at $435.4 million; Project-related indirect and induced activities are further expected to contribute $407.6 million.

Overall, the Project is expected to contribute to the local and regional economic development through the provision of direct, indirect, and induced employment; direct Project spending; and Project-related indirect and induced economic activity.

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