HD Mining International Ltd.

MURRAY RIVER COAL PROJECT
Project Description




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PROJECT DESCRIPTION

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Prepared for:

HD Mining International Ltd.

Prepared by:

Rescan™ Environmental Services Ltd.
Vancouver, British Columbia

Executive Summary

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Engineers and Scientists

Executive Summary

General Information and Contacts

HD Mining International Ltd. (HD Mining) proposes to develop the Murray River Coal Project (the Project) as a six million tonnes per annum (6 Mtpa) underground metallurgical coal mine, with an estimated mine life of 31 years.

HD Mining is a private mineral exploration company with the head office located in Vancouver, BC. The company has two main partners: Huiyong Holdings (BC) Ltd. (55%) and Canadian Dehua International Mines Group Inc. (40%). As the majority investor, Huiyong Holdings (BC) Ltd. is responsible for project investment and guides mine development and operation.

Project Name: Murray River Coal Project

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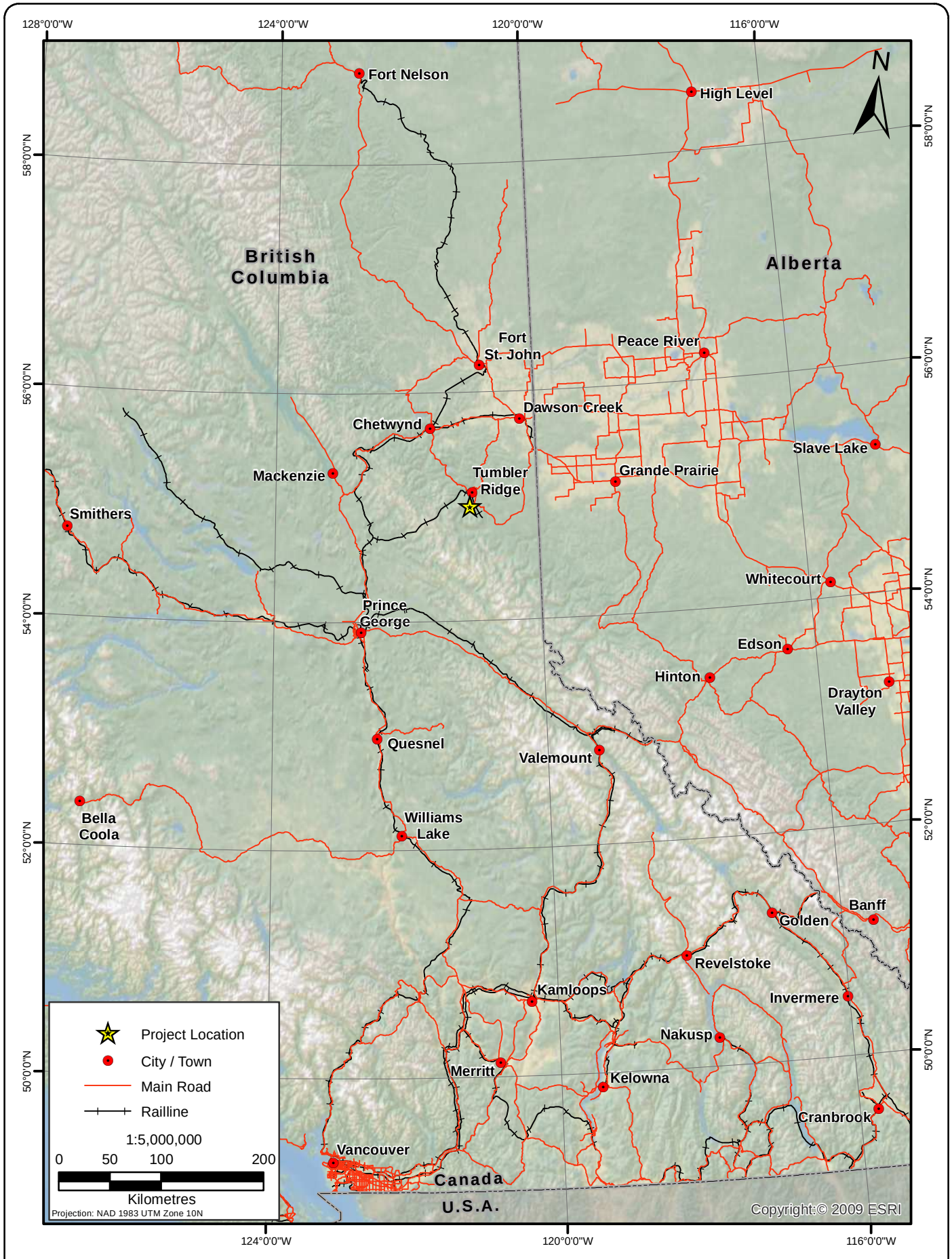
Project Location

The Murray River property is located 12.5 km south of Tumbler Ridge, British Columbia (Figure 1). The property consists of 57 coal licences covering an area of 16,024 hectares and is situated on Crown Land within the Peace River Regional District.



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Project Location

Figure 1

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The coordinates are E 112°54'03"-121°18'07", N 54°56'59'-55°09'59". The Project is accessed from Highway 52 (Heritage Highway), and the existing Quintette Mine and Murray River Forest Service Road. Dawson Creek is the closest city to the Project.

Project Overview

The Project will be an underground metallurgical coal mine. At a production rate of 6 million tonnes per annum (Mtpa), the deposit will support a 31-year mine life. The Project is expected to provide approximately 18,600 person-years of employment and has an estimated capital cost of $300 million Canadian dollars.

The purpose of the Project is to develop HD Mining's core Canadian asset to help meet world metallurgical coal demand in a manner that benefits First Nations, local communities, individuals, and local, provincial, and federal governments without compromising the ability of future generations to meet their own needs.

This document outlines HD Mining's conceptual plan for the responsible resource development of an underground metallurgical coal project to enable the Canadian Environmental Assessment Agency (CEA Agency) to determine whether a federal environmental assessment is required.

As part of exploration of the property, HD Mining has received approvals from the BC Ministry of Energy, Mines and Natural Gas (MENG) to mine a 100,000 tonne bulk sample to test the coal for use as a coking coal and to perform coal washability testing. HD Mining is currently preparing the site to mine the bulk sample in the fall of 2013. Permitted infrastructure associated with the bulk sample is divided between two areas: a shaft area and a decline area.

Provincial and Federal Environmental Assessment Legislative Requirements

Pursuant to section 3(1) of the *Reviewable Projects Regulation* (B.C. Reg. 370/2002), the proposed production capacity for the Project exceeds the criteria of 250,000 tpa of metallurgical coal for a new coal mine and will require a provincial environmental assessment under the British Columbia *Environmental Assessment Act* (BC EAA; 2002a). On June 29, 2012 the British Columbia Environmental Assessment Office (BC EAO) issued a Section 10 order requiring an environmental assessment (EA) for the Project.

Federally, the Project is listed as a "designated project" under section 15(d) of the *Regulations Designating Physical Activities* (RDPA; SOR/2012-147) as the production rate will exceed the threshold for a coal mine of 3,000 tonnes per day (tpd). Additionally, section 8 of the RDPA may apply due to the construction of a facility that results in the extraction of more than 200,000 m^3/a of groundwater. Up to 182,500 m^3/a (500 m^3/day) of this water would be sourced from a groundwater extraction well for sanitary purposes; the remaining water (up to 8,760 m^3/d or 3,197,400 m^3/a) would consist of collecting seepage water from the underground mine workings.

Mineral Resources and Claims

The Murray River property is located within the Peace River Coalfield (PRC), an area with a long history of metallurgical grade coal open pit mining. Previous exploration in the area was conducted by various major oil and gas companies in the 1970s, Quintette Coal Limited (Quintette) and more recently in 2006 and 2007 by Kennecott Coal Exploration Inc. (Kennecott). The exploration programs in the 1970s were generally regional in nature, comprising widely spaced seismic lines and drilling of a small number of primarily oil and gas wells. These programs helped Quintette and Kennecott identify target areas for

more detailed coal exploration and eventual mining. The target seams for the Murray River Project are part of the Gates Formation (Fort Saint John Group).

In 2009, Canadian Dehua International Mines Group Inc. (Canadian Dehua) obtained the Murray River property, which consists of 57 coal licences covering an area of 16,024 hectares. Detailed exploration consisting of 12 drill holes was carried out in 2009 and 2010 focusing on the central part of the property (about 37.45 km^2). On July 17, 2010, Huiyong Holdings Group Ltd. signed a cooperation agreement with Canadian Dehua. From August 2010, additional exploration was performed on the property with a total of 20 holes drilled. On June 9, 2011, HD Mining International Ltd. was registered for incorporation in Canada.

Production Process and Project Components

The Project is an underground metallurgical coal mine. Coal will be mined using longwall mining, a form of underground coal mining where coal is mined in large panels (typically 1 to 3 km long and 200 to 400 m wide). Longwall mining is designed to maximize extraction rates while maintaining worker safety. This contemporary method has been used for many years at mines around the world. Based on current mine planning, the underground workings will roughly correspond to an aboveground footprint of 37 km^2.

Over an estimated 31-year mine life, the mine will produce approximately 185 Mt of metallurgical coal at a rate of up to 6 Mtpa (16,438 tonnes per day (tpd)).

The proposed surface layout for the mine is shown in Figure 2. The Project consists of the following on-site and off-site components:

- underground mine and associated works (e.g., main access shaft, ventilation shaft for return air, ramps, portals, tunnels);
- waste rock storage facilities;
- overburden and soil storage areas;
- explosive and storage facilities;
- coal rejects storage area;
- equipment and fuel storage areas and facilities;
- maintenance, administration and warehouse facilities;
- coal handling and preparation facilities (e.g., washing plant);
- coal conveyor;
- coal stockpiles;
- rail load-out;
- contact water collection ditches, sedimentation pond(s) and water management structures, including a discharge pipeline;
- non-contact water diversion ditch network and sedimentation pond(s);
- water supply facilities (e.g. groundwater extraction well);
- sewage treatment and disposal facilities;
- electric transmission line connecting to the existing BC Hydro grid and related infrastructure; and
- a natural gas pipeline connecting to existing infrastructure and related sub-station infrastructure.

622000 624000 626000 628000 630000 632000

6100000 6098000 6096000

M20 Creek (Camp Creek)
M19 Creek
M19A Creek
M17 Creek
M15 Creek
Twenty Creek
Murray River FSR
52

Natural Gas Line
Coarse Coal Reject Area
Rail Loadout Area
Overland Conveyor Belt
Conveyor Belt
Coal Preparation Plant
Shaft Site
Bulk Sample Wasterock
Discharge Pipe
Power Sub-station
Sedimentation Pond
Decline
Decline Portal
Natural Gas Line
Natural Gas Line
Sedimentation Pond

Potential Future Infrastructure (as of January 2013)
Bulk Sample Site Infrastructure (as of December, 2013)
Teck Conveyor Corridor (Decommissioned)
Gas Pipeline
BC Hydro Transmission Line
Infrastructure Investigation Area
Local Study Area
License Area
Railway

1:30,000
0 500 1,000
Metres

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MURRAY RIVER COAL PROJECT

Figure 2

Preliminary Site Layout

The above listed Project components will be permanent throughout the life of the Project. Accommodation for mine employees (i.e. worker camps at the mine site during all Project phases) will not be required as all employees will live off-site in Tumbler Ridge. Transportation of workers to and from the site, and potential socio-economic effects (e.g., employment, pressure on community infrastructure) will be included in the scope of the EA. No Project components or physical activities related to the development of mine site access roads, including upgrades, is required as the roads currently on site are able to support mine development activities.

Physical Activities

Construction Phase

Activities associated with the construction of Project components is anticipated to occur over a 1 to 2 year period, which are scheduled to commence in June 2015.

Initial site preparation activities will include, but are not limited to:

- the establishment of water management structures (e.g., embankments, sedimentation ponds, water treatment facilities, groundwater wells), and site drainage, including a system of diversion channels to divert contact and non-contact water;
- clearing and grubbing, including soil salvage as appropriate; and
- excavation and foundation preparation.

The installation of infrastructure (e.g., conveyors, coal preparation plant and other buildings, gas pipeline, transmission line, discharge pipeline etc.) will also occur during the construction phase, and construction activities will be timed to avoid sensitive fish and bird breeding periods. In particular, seasonal timing requirements will be adhered to for construction activities associated with the mainline conveyor crossing of the Murray River, and for the construction of any water management infrastructure in or near Murray River. The construction schedule will be optimized to achieve initial coal shipping targets.

BC Hydro has an existing 230 kV power line that runs immediately adjacent to the north (shaft) site. HD Mining is proposing to tie into this system (Figure 2). A surface substation/distribution hub will direct power around the Project site and to an underground substation, where it will be distributed to each working area along roadways/gateways. Power to the coal handling and preparation facilities on the east side of the Murray River would be distributed along the conveyor corridor. The total annual power requirement is estimated to be 31.5 MW.

HD Mining also intends to draw natural gas from the existing Pacific Northern Gas (PNG) network. Two pipelines are being considered: one short line (approximately 800 m) to supply the coal preparation plant; and one approximately 9.5 km line that parallels the Murray FSR to the shaft site in order to supply the underground mine (Figure 2). An option to truck the gas to a storage tank at the shaft site is also being investigated.

The total annual gas requirement is estimated to be 1.5 Mm^3/yr.

Transportation activities during the construction phase will focus on bringing in equipment, materials, supplies, and personnel to facilitate construction activities at the mine site. Materials and equipment will be locally sourced to the extent possible, and travel to the mine site will be routed along Highway 52 and the existing Murray River Forest Service Road (Figure 2). It is estimated that up to 30 vehicles will each make a return trip per day at the peak of the construction phase to support the

delivery of equipment, material, and supplies. Approximately 3 shuttle trips per day will be required to transport personnel to and from the mine site and Tumbler Ridge during construction.

Operations Phase

Underground Mine

As part of the Bulk Sample work currently underway, two accesses will be developed from surface to underground: one decline for coal haulage; and one shaft for transportation of personnel, materials and equipment, and ventilation. These two accesses will also form the main access and secondary egress for the full mine development. In addition, a second shaft for return air only will be constructed for the full mine.

Coal will be mined using longwall mining, a form of underground coal mining where coal is mined in large panels (typically 1 to 3 km long and 200 to 400 m wide). Longwall mining is designed to maximize extraction rates while maintaining worker safety.

Three key pieces of mining equipment that will be used include road headers, shearers and hydraulic shields. Road headers will be used to establish the main tunnel systems and gate roads. The shearer operates at the longwall face and extracts the coal from the seam. Hydraulic shields provide a safe work environment for personnel along the face.

A system of conveyors will be used to transport the run of mine (ROM) coal from the longwall face to the decline and up to the surface. From the mining face, raw coal will be transported via conveyors through the underground workings to the decline, up the decline to the surface on the west side of Murray River, then on an overland conveyor across Murray River to a coal preparation plant located on the east side of the river. Clean coal produced in the plant will be conveyed to a rail loadout facility and then transported by rail to the port at Prince Rupert, BC.

Surface Facilities

The mine portals will consist of a conveyor decline, a man and materials shaft, and a ventilation shaft.

The main conveyor line that will connect the decline portal with the coal handling and preparation plant will cross a fish bearing wetland, M20 Creek, and the Murray River. Specifics of crossing designs are still under consideration; however, the intent is that clear-span crossings will be used with support structures located outside the riparian zones.

ROM coal will enter the coal preparation plant, where it will be crushed, and then transferred through a series of sizing processes, including: vibrating screens, heavy media cyclones, floatation cells, and centrifuges. Three streams are produced through the preparation plant: clean coal, middlings, and rejects. The clean coal and middlings are directed to the rail loadout, while the rejects are directed to the coarse coal rejects pile. The rejects are a co-mingled combination of over-sized material from the screening process and thickened and dewatered underflow from the floatation cells. HD Mining is currently considering the configuration of coal storage options (e.g., piles or covered silos) at the rail loadout.

HD Mining has held initial discussions with CN Rail regarding development of a rail loadout. Unlike the existing looped loadouts, the loadout is planned as a 5,800 m parallel track within the CN Rail right-of-way.

Each train (120 cars) has the capacity to carry 12,000 tonnes of coal. At 6 Mtpa production, this equates to approximately one train per day. The coal will be shipped to the port at Prince Rupert for shipment overseas.

Transportation activities during the operations phase will focus on bringing in equipment, materials, supplies, and personnel to facilitate ongoing operational activity at the mine site. Materials and equipment will be locally sourced to the extent possible, and travel to the mine site will be routed along Highway 52 and the existing Murray River Forest Service Road (Figure 2). It is estimated that up to 20 vehicles will each make a return trip per day at the peak of the operations phase to support the delivery of equipment, material, and supplies. Approximately 6 shuttle trips per day will be required to transport personnel to and from the mine site and Tumbler Ridge during operations.

Waste Management

The rejects from the coal preparation plant will be directed to a Coarse Coal Rejects (CCR) pile. Material will be transported to the pile on an extensible conveyor, and then re-worked by dozers. In general, it is expected that the resulting pile will look similar to the existing Teck tailings pile that is located immediately upslope. Although not labelled, the dimensions of the Teck tailings pile (roughly 500 m x 1,750 m) can be seen on Figure 2 immediately south of the Coal Preparation plant, bounded to the north and west by a mine site road.

Geotechnical planning and investigations are underway to assess the suitability of foundation materials for the CCR pile. Design and analysis will be completed consistent with the Health, Safety and Reclamation Code for Mines in British Columbia (BC MEMPR 2008) to ensure the long-term stability of waste material.

Geochemical investigations are also underway to assess the Metal Leaching/Acid Rock Drainage (ML/ARD) characteristics of the reject material. This information will inform the design of the pile in relation to water management, treatment requirements and closure.

A small waste rock pile has been permitted for the bulk sample work. At this time, no additional storage of waste rock on-surface is planned for the full mine development. Only small volumes of inter-burden waste rock are expected to be generated during Project activities due to the efficiency of the longwall mining process. Any small amounts of waste rock that may be generated when mining between coal seams will be stored underground.

Air emissions will include particulate matter (PM), nitrous oxides (NO_x), sulphur oxides (SO_x), and greenhouse gas emissions from fuel combustion by surface and underground vehicles and equipment, and operation of the coal preparation plant. Fugitive dust emissions will occur due to vehicle traffic along the access roads; however, total traffic to/from site on a daily basis will be relatively low. Point source, mobile, and fugitive air emissions during the construction and operation phases of the Project will be inventoried and assessed using air dispersion modeling techniques.

Non-hazardous and hazardous waste materials, such as spoiled processing reagents and used batteries, will be generated throughout the life of the Project. These materials will be anticipated in advance; they will be segregated, inventoried, and, where necessary, tracked in accordance with federal and provincial legislation and regulations. Secure storage areas will be established with appropriate controls to manage spillages. Wastes will be labeled and stored in appropriate containers for shipment to approved off-site disposal facilities.

Water Management

Underground seepage rates have initially been estimated at up to 8,760 m^3/d. This water will be collected, and used for dust control and fire suppression systems within the mine. Excess water will be pumped to sedimentation ponds at the surface.

The Coal Preparation plant for the Project will require approximately 1,800 m^3/d or 75 m^3/h of water. The majority of water will be provided by collecting excess underground seepage.

Fresh water diversion channels will discharge into small tributaries of Murray River. Any potential changes in annual, peak and low flow periods related to diversion activities will be included in the scope of the effects assessment.

A groundwater well will be established to provide water for sanitary use (up to 500 m^3/d). A small sewage treatment system will be on-site to process sanitary water.

A water treatment system will be required to treat on-site contact water prior to release to the environment. It is anticipated that the water treatment and discharge will follow a similar set-up to what is currently being established for the Bulk Sample work. This includes water treatment with coagulant and flocculent, followed by settling in sedimentation pond(s) prior to release. For the Bulk Sample, the approved discharge points are through infiltration galleries, with infiltration directed to Murray River (south site) and M20 Creek (north site) (the existing discharge pipeline is shown on Figure 2). It is anticipated that for the larger flow rates expected during full mine operation, following treatment, effluent will be discharged to the Murray River via a pipeline. Siting options are currently being evaluated and include a location near the south site where the Teck conveyor right-of-way crosses the Murray River, and near the M20 Creek confluence.

Detailed water balance and water quality models will be completed to support the water management design. The potential for significant adverse environmental effects resulting from discharge to the receiving environment will be analyzed for surface and ground water, fish and aquatic habitat, wildlife, and vegetation.

Access

The Project is accessed from Highway 52 (Heritage Highway), the existing Quintette Mine road and the Murray River Forest Service Road. The roads will be used year-round to mobilize personnel, equipment and supplies to the mine site.

HD Mining is considering coal transportation options, including a rail loadout location (Figure 2). Discussions have been initiated with CN Rail regarding development of this loadout, which is planned as a 5.8 km parallel track within the CN Rail right-of-way.

Each train (approximately 120 cars) has the capacity to carry approximately 12,000 tonnes of coal. At a 6 Mtpa production rate, this equates to approximately one train per day during operations. The coal will be transported to the port at Prince Rupert for shipment overseas.

Closure and Reclamation Phase

HD Mining recognizes that the Project must be planned with closure in mind. Consistent with the requirements of the BC *Mines Act* (1996d) and the Health, Safety and Reclamation Code for Mines in British Columbia (BC MEMPR 2008), a closure plan will be developed for the Project. The objective of a closure plan is to detail the transition of the site from mining to its post-mine productive land use. This includes a requirement for financial assurance from the proponent. The closure plan will be regularly reviewed and updated throughout the mine life to reflect Project development. At this time, a preliminary conceptual closure plan is presented. This will be further developed as new information becomes available through the EA and permitting processes.

Underground Mine

At closure, all mining equipment and materials will be removed from the underground mine and re-purposed, sold or disposed of off-site. Once entry to the mine workings is no longer required, bulkheads will be constructed to seal the workings. It is anticipated that over time, the mine workings will flood with groundwater seepage, and that the groundwater table will return to near pre-mining levels. As part of the EA, estimates will be made of the time required to flood the workings, of water quality within the flooded mine based on geochemical characterization, and of the potential for contaminant transport from the flooded mine workings. It is anticipated that due to the depth of mining and the low hydraulic conductivity of the surrounding rocks, flow paths to any potential receiving environment would be very long and contaminant transport very slow.

A long-term monitoring program would be required to inspect the integrity of the bulkheads.

Surface Facilities

The conveyors, buildings, coal preparation plant equipment, and utilities will be dismantled or demolished as appropriate. Reusable components will be sold along with scrap metal. Waste materials will be disposed of in appropriately permitted facilities. The sites will then be scarified, reclaimed with salvaged topsoil material and re-vegetated.

Coarse Coal Rejects Pile

The CCR pile will be assessed and re-contoured as necessary to ensure long-term stability. The surface will be reclaimed with salvaged topsoil material and re-vegetated. If necessary, based on geochemical characterization, a CCR cover will be designed to minimize groundwater flow paths through the pile.

A long-term monitoring program would be required to inspect the integrity of the pile and reclamation cover and to monitor the groundwater conditions down slope of the pile.

Project Schedule

HD Mining's schedule for the proposed Project is targeting June 2015 for coal production.

The Project will have four defined development phases as summarized below:

- **Construction phase** – approximately one year in length (June 2014 to June 2015);
- **Operations phase** – 31 years in length, approximately from 2015 to 2046;
- **Reclamation and closure phase** – two years in length, approximately 2047 to 2048; and
- **Post-closure phase** – until long-term environmental objectives are achieved.

Regional Setting

Northeastern BC is populated by a number of small, predominantly First Nations' communities and larger centres of Tumbler Ridge, Chetwynd, Dawson Creek, and Fort St. John which provide services and supplies to much of the region. The communities are connected through Highways 97, 29, 2 and 52 (Figure 1).

The regional economic base is supported primarily by resource extraction industries including mining and forestry. Mineral exploration and oil and gas activities have increased in recent years, providing significant employment opportunities which are anticipated to continue while overseas commodity spot prices remain high. Forestry and tourism have fluctuated significantly in response to prevailing economic conditions.

HD Mining is committed to satisfying regional land use objectives within the vicinity of the Project. The Project area is located within the boundaries of the Dawson Creek Land and Resource Management Plan (DC LRMP; Ministry of Forests Lands and Natural Resources Operations 1999). The DC LRMP encompasses 2.9 million hectares of land between Fort St. John and Prince George. The DC LRMP's objectives with respect to coal and minerals are to:

- provide opportunities for environmentally-responsible exploration and development of surface and sub-surface resources; and
- plan and manage coal, mineral, and aggregate exploration and development activities with sensitivity to identified wildlife (e.g., grizzly bear).

Two provincial parks and a protected area are located in the general vicinity of the Project area; Bearhole Lake Provincial Park and Protected Area is located approximately 17 km east of the Project, and Monkman Provincial Park is located approximately 27 km south of the Project. Neither of these areas is expected to be affected by the Project.

With respect to temporary and permanent residences, the nearest trapline cabin is 1.7 km from the Project, the nearest campground is 9.5 km from the Project, the nearest hunt camp is 26 km from the Project, and the nearest residential area (Tumbler Ridge) is 12.4 km from the Project.

Regional Environmental Studies

HD Mining is not aware of any regional environmental studies within the Project area as described under section 74(1) of the *Canadian Environmental Assessment Act* (2012).

The BC Ministry of Environment (MOE) Omineca-Peace Region is leading a study to determine selenium uptake and general metals content in Murray River Slimy Sculpin (*Cottus cognatus*) and fine bottom sediments tissue (Carmichael and Chapman 2006). The sampling program includes three sample sites upstream of the coal development projects on the Murray River, and three sample sites downstream. HD Mining has not been asked to participate in this study.

To the south of the Project, the BC MOE is leading a Mountain Caribou Recovery Implementation Plan. This plan is described "as a collaborative approach with conservation organizations, First Nations, the forest industry and outdoor recreation groups in restoring the mountain caribou population to pre-1995 levels of more than 2,500 animals throughout their existing range" (ILMB 2007).

Numerous environmental studies have been undertaken in the regional area to satisfy EA information requirements. Table 1 provides a summary of past, existing, and potential future projects that occur within the region that have been, are, or may be subject to the EA process. Some aspects of these projects may have a spatial or temporal linkage with the Project.

Federal Lands, Funding, and Transboundary Effects

There are no federal lands that would be affected by the Project. The nearest federal lands to the Project are the East Moberly Lake Indian Reserve 169 and West Moberly Lake Indian Reserve 168A, which are both located approximately 100 km northwest of the Project.

No federal funding is being sought or provided for the Project. No Project-related effects to federal lands are anticipated.

The Project is not expected to result in any transboundary effects to areas outside of British Columbia, including Alberta and the United States.

Table 1. Current Status of Mine and Energy EA Projects in the Region

Past Projects	Existing Projects	Potential Future Projects
Quintette Coal Mine	Mount Spieker	Mount Reesor
Quintette (Frame)	Bullmoose (Chamberlain)	Perry Creek Coal
Quintette (Shikano)	Monkman	Wolverine Coal Mine
Quintette (Babcock)	Quality Creek Wind	Trend Coal Project
Bullmoose		Tumbler Ridge Wind
Sukunka (Bullmoose)		Roman Coal Project
		Hermann Mine Project
		Horizon Coal Project
		Albright Ridge Wind
		Burnt River Wind
		Bullmoose Creek Wind
		Mt. Bennett Wind
		Mesa Creek Wind
		Mount Collier Wind
		Redwillow River Wind
		Sukunka River Wind
		Thunder Mountain Wind
		Wolverine River Wind

Existing Environment

The Project is located within the Hart Foothills Ecosection of the Sub-Boreal Interior Ecoprovince. It is comprised of low, rounded mountains and wide valleys on the east side of the Rocky Mountains. The area was glaciated by the Cordilleran Ice Sheet that flowed east from the Rocky Mountains in the Late Wisconsonian, producing rounded ridge mountain tops, and depositing thick layers of morainal deposits (often referred to as glacial till). The Murray River valley bottom contains isolated areas of glaciolacustrine sediments from Glacial Lake Peace. A series of glaciofluvial terraces, created during the drainage of Glacial Lake Peace, is evident in the valley cross section. The majority of the area is generally characterized by gentle to moderate slopes, and the area is considered relatively stable. Areas of instability are often associated with small hillslope channels, which exhibit strong gullying and downcutting, resulting from water erosion and other mass movement processes (e.g, debris slides, debris flows, snow avalanches). This has created relatively deep (e.g., 5 to 10 m), canyonized drainage patterns.

The region is characterized by a continental climate with little precipitation, moderately warm summers and cold winters. Vegetation in lowland areas consists of moist grasslands and trembling aspens (*Populus tremuloides*). Upland areas are dominated by white spruce (*Picea glauca*), black spruce (*Picea mariana*) and lodgepole pine (*Pinus contorta*).

The climate of the region is characterized by long cold winters and relatively warm summers. The region is frequently influenced by moist air from the Pacific as well as dryer continental air, as it is very close to the leeward side of the Rocky Mountains' Hart Ranges. The mean daily maximum summer temperatures are above 15°C and the mean daily minimum winter air temperature fall well below -10°C. Maximum air temperatures can reach the high 20s°C and minimum air temperatures can reach below -20°C.

The Project is located within the Murray River watershed. Project infrastructure also are located within portions of the M20 Creek and Twenty Creek sub-watersheds on the west side of the river, and within the M17 and M19 creek sub-watersheds on the east side of the river.

Water and sediment quality sampling data were summarized for the 2010 field season. The Murray River drainage basin naturally experiences high levels of suspended solids and turbidity in May and June during spring freshet as a result of snow melt (both total suspended solids (TSS) and turbidity are > 100 mg/L or NTU) and consequently exceed BC guidelines for the protection of aquatic life. Outside the period of freshet, TSS and turbidity were generally low (below detection limits and < 10 NTU, respectively), although levels at M20 Creek were consistently higher year-round and frequently exceeded turbidity guidelines.

Ammonia, nitrate, and sulphate concentrations were generally low, below BC guidelines; however concentrations at M20 Creek were consistently higher than other sites and the 30-day maximum guideline values (50 mg/L). Baseline concentrations of aluminum (dissolved), cadmium (total), chromium (total), and iron often exceeded maximum BC guidelines in Murray River and M20 Creek.

For sediment quality, cadmium and nickel concentrations exceeded guidelines at all sites, arsenic guidelines were exceeded at M20 Creek and the remaining parameters were well below guideline values.

Fifty two wetlands have been identified within the Project area; all five wetland classes (i.e., bog, fen, marsh, swamp, and shallow open water) were observed. Shallow open water communities were not encountered as a simple wetland community but were observed numerous times as a component of larger wetland complexes.

The primary functions for each observed wetland class were identified following Hanson et.al. (2008); they include:

- groundwater recharge and water storage (hydrological);
- nutrient and organic export, carbon storage, and water quality improvements (biochemical);
- listed or sensitive ecosystems and wetland complexes (ecological); and
- habitat for wetland-dependant species.

Two provincially blue-listed wetlands (Wb09 and Wb06) were identified at 6 sites: black spruce – common horsetail – peat-moss bog, mapped over 5.4 ha; and tamarack – water sedge – fen moss bog, mapped over 13.0 ha.

The most significant feature defining fish distribution within the Murray River is Kinuseo Falls, located 38 km upstream of the Project. This 60 m high waterfall represents the upper limit of distribution for most fish species. Native species present downstream of the falls include:

- Mountain Whitefish (*Prosopium williamsoni*);
- Arctic Grayling (*Thymallus arcticus*);
- Bull Trout (*Salvelinus confluentus*);
- Northern Pike (*Esox lucius*);
- Burbot (*Lota lota*);
- Longnose Sucker (*Catostomus catostomus*);
- Slimy Sculpin (*Cottus cognatus*);
- Longnose Dace (*Rhinichthys cataractae*);
- Finescale Dace (*Phoxinus neogaeus*); and
- Lake Chub (*Couesius plumbeus*).

Bull Trout is BC blue-listed and is listed as a "Candidate" species by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC; i.e., currently short-listed for upcoming assessment).

Three non-native sport-fish species have been introduced to the Murray River system in recent decades, including Rainbow Trout *(Oncorhynchus mykiss)*, Brook Trout (*Salvelinus fontinalis)*, and Westslope Cutthroat Trout (*Oncorhynchus clarkii lewisi*). Although Rainbow Trout are potentially present at very low densities, sampling records indicate the species has failed to establish significant self-sustaining populations in the Murray River or its tributaries. Westslope Cutthroat Trout were stocked in Upper Blue Lake, at the headwaters of the Murray River, in 1983. This species is now abundant in the Upper and Lower Blue lakes complex and its tributaries, but have not been found below Kinuseo falls. Westslope Cutthroat Trout are protected as a Schedule 1 (Special Concern) species under the *Species at Risk Act* (SARA; 2002b), considered a species of "Special Concern" under COSEWIC, and are provincially blue-listed. Brook Trout are now commonly found in several Murray River tributaries in the vicinity of the Project and have established a significant spawning run in Barbour Creek, located approximately 10 km upstream.

Wildlife resources in region are recognized for their ecological, social, economic, and cultural value. Provincial databases and references were consulted to identify wildlife species that may occur near the Project. A total of four amphibian, 112 bird, and 11 mammal species were identified during baseline studies within the region. The most common wetland migratory birds, as defined under the *Migratory Birds Act* (1994), identified include Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), ring-necked duck (*Aythya collaris*), green-winged teal (*Anas crecca*), Barrow's goldeneye (*Bucephala islandica*), and lesser scaup (*Aythya affinis*). The most common breeding migratory birds identified were cliff swallow (*Petrochelidon pyrrhonota*), yellow-rumped warbler (*Dendroica coronata*), Swainson's thrush (Catharus ustulatus), warbling vireo (*Vireo gilvus*), Wilson's warbler (*Wilsonia pusilla*), and white-throated sparrow (*Zonotrichia albicollis*).

The presence of 11 species of conservation concern, including migratory birds, were confirmed during baseline studies, including species listed under SARA (2002b), COSEWIC, and the BC Conservation Data Centre (BC CDC; Table 2). Species listed by SARA identified during baseline studies were western toad (*Anaxyrus boreas*), olive-sided flycatcher (*Contopus cooperi*), and peregrine falcon, anatum subspecies (*Falco peregrinus anatum*).

Based on criterion such as conservation status, ecological sensitivity, importance to First Nations and local, social, or economic reasons, key species for the region include: moose (*Alces alces*), mountain caribou (*Rangifer tarandus*), mountain goat (*Oreamnos americanus*), grizzly bear (*Ursus arctos*), western toad, furbearers, waterfowl, raptors, and songbirds, including migratory birds.

Potential Environmental Effects

Environmental baseline studies, including a comprehensive ML/ARD characterization study, are currently being undertaken in support of the Project. Potential environmental effects from the Project that are likely to be of concern include the degradation of surface and ground water quality (during the operations and closure phases of the Project) and sensory disturbance to wildlife during the construction and operations phases.

Other environmental effects that may occur include effects on air quality from fugitive dust emissions during construction and operations, and particulate matter and greenhouse gas emissions from fuel combustion by processing equipment, vehicles and generators.

Table 2. Wildlife Species of Conservation Concern, Including Migratory Birds, Likely or Probable to Occur in Project Area

Scientific Name	English Name	Likelihood of Occurring in RSA[1]	Identified During Baseline Studies[2]	BC List	Identified Wildlife	COSEWIC[3]	SARA[4]	Migratory[5]
Aechmorphorus clarkii	Clark's grebe	L	P	Red				Y
Aegolius funereus	boreal owl	L		Yellow		NAR (1995)		
Anaxyrus boreas	western toad	L	Y	Blue		SC (2012)	1-SC (2005)	
Asio flammeus	short-eared owl	L		Blue	Y	SC (2008)	1-SC (2012)	
Botaurus lentiginosus	American bittern	L		Blue				Y
Buteo platypterus	broad-winged hawk	P		Blue				
Canis lupus	grey wolf	L		Yellow		NAR (1999)		
Cardellina canadensis	Canada warbler	P		Blue		T (2008)	1-T (2010)	Y
Chlidonias niger	black tern	L		Yellow		NAR (1996)		Y
Chordeiles minor	common nighthawk	L		Yellow		T (2007)	1-T (2010)	Y
Circus cyaneus	northern harrier	L		Yellow		NAR (1993)		
Contopus cooperi	olive-sided flycatcher	L	Y	Blue		T (2007)	1-T (2010)	Y
Euphagus carolinus	rusty blackbird	L		Blue		SC (2006)	1-SC (2009)	Y
Falco peregrinus anatum	Peregrine falcon, *anatum* subspecies	L	Y	Red		SC (2007)	1-SC (2012)	
Grus canadensis	sandhill crane	L		Yellow	Y	NAR (1979)		Y
Gulo gulo	wolverine	L		No Status		SC (2003)		
Gulo gulo luscus	wolverine, *luscus* subspecies	L		Blue	Y	SC (2003)		
Hirundo rustica	barn swallow	L	Y	Blue		T (2011)		Y
Limnodromus griseus	short-billed dowitcher	P		Blue				Y
Martes pennanti	fisher	L	Y	Blue	Y			
Melanitta perspicillata	surf scoter	L	Y	Blue				Y
Myotis lucifugus	little brown myotis	P		Yellow		E (2012)		
Myotis septentrionalis	northern myotis	P		Blue		E (2012)		
Oporornis agilis	Connecticut warbler	P		Red	Y			Y
Phalaropus lobatus	red-necked phalarope	L	Y	Blue		C (2011)		Y
Podiceps auritus	horned grebe	L	Y	Yellow		SC (2009)		Y
Rana luteiventris	Columbia spotted frog	L		Yellow		NAR (2000)		
Rangifer tarandus	caribou	L	Y	No Status	Y			

(continued)

Table 2. Wildlife Species of Conservation Concern, Including Migratory Birds, Likely or Probable to Occur in Project Area (completed)

Scientific Name	English Name	Likelihood of Occurring in RSA[1]	Identified During Baseline Studies[2]	BC List	Identified Wildlife	COSEWIC[3]	SARA[4]	Migratory[5]
Rangifer tarandus pop. 1	caribou (southern mountain population)	P		Red	Y	T (2000)	1-T (2003)	
Rangifer tarandus pop. 15	caribou (northern mountain population)	L		Blue	Y	T/SC (2002)	1-SC (2005)	
Setophaga castanea	bay-breasted warbler	P		Red	Y			Y
Setophaga tigrina	Cape May warbler	L		Red	Y			Y
Setophaga virens	black-throated green warbler	L	Y	Blue	Y			Y
Ursus arctos	grizzly bear	L	Y	Blue	Y	SC (2002)		

[1] *P - probable to occur in RSA; L - likely to occur in RSA*

[2] *P - possible observation during baseline studies; Y - definite observation during baseline studies*

[3] *E - Endangered; SC - Special Concern; T - Threatened; NAR - Not At Risk; C - Candidate*

[4] *1 - Schedule 1*

[5] *As per the Migratory Birds Convention Act, 1994*

Fish species and fish habitat, as defined by the *Fisheries Act* (1985b), may be affected by the harmful alteration, disruption and destruction of fish habitat (HADD) associated with the construction of the conveyer crossing of the Murray River and adjacent waterbodies. The construction of the conveyor crossing and discharge pipeline may also affect fish and aquatic habitat through the degradation of stream banks, increased erosion and sedimentation, and altered riparian areas. Fish and fish habitat may also be affected by the quality of the effluent discharge from the use of seepage groundwater as a dust and fire suppressant during construction, operation and closure, and from the sedimentation pond(s). A particular contaminant of concern, selenium, is known to bioaccumulate through the aquatic food web, with elevated levels related to mining activity commonly observed in sediment, periphyton, benthos, fish tissue, and aquatic bird tissue. A long-term aquatic effects monitoring program will be implemented to adaptively manage for any potential effects related to selenium. The Project also has the potential to adversely affect fish and fish habitat through direct mortality caused by potential spills associated with the transportation of materials such as fuel and processed coal during construction and operations, and from increased fishing pressure due to enhanced area access, during construction and operations. Increased noise and vibrations from mine activities during construction and operations may also adversely affect fish and fish habitat. These potential effects may also affect aquatic species of conservation concern, including Bull Trout, and western toad.

The Project is located in a relatively unpopulated area, therefore limited noise effects are anticipated for human receptors. Local wildlife species may experience intermittent sensory disturbance due to exposure to increased noise levels in the immediate vicinity of the Project during construction and operations. However, due to the primarily underground operations, surface noise levels are expected to be of minor magnitude.

The construction of the Project facilities will result in removal of soil and vegetation within the footprint of the mine infrastructure; as well, potential subsidence from the underground mine workings may further disturb soil and vegetation, or facilitate increased geohazard risk. Land clearing activities may affect species at risk and their habitat. Any potential effects on species at risk and their habitat, and on unique ecosystems will be minimized through appropriate site selection, and further mitigated to the extent possible. Reclamation activities throughout the mine life, and particularly during the closure phase of the Project will work towards re-establishing pre-disturbance conditions and ensure the productive use of land.

Wildlife-vehicle collisions (including with rail cars) and hunting pressure due to increased access near the Project may result in wildlife mortality, primarily during construction and operations when transportation and staffing requirements are at their greatest. The species most vulnerable to road-kill mortality are small, slow-moving species which are difficult for drivers to see, and large ungulates who utilize roads (e.g., moose). A species of particular concern is the western toad due to its conservation status.

The uptake of contaminants and heavy metals by wildlife may result in effects to the particular population and may result in food chain effects. Wildlife may be exposed to contaminants and metals through deposition of fugitive dust on vegetation and in waterbodies.

The potential for wildlife to become habituated to human presence and food sources exists due to the presence of mining facilities. Animals may be injured, or may cause damage to property or injure humans as a result of long-term exposure to human activity. Animals most at risk include black and grizzly bears, and small carnivores. Some waterfowl species may also be attracted to surface water with poor water quality (e.g., sedimentation ponds) or to lights on towers, and become injured as a result.

Other potential effects to migratory birds may include direct mortality from collisions with transmission lines, buildings, or vehicles, removal or disruption of nests, loss of habitat due to

vegetation clearing for construction and maintenance of right-of-ways and mine site components. Effects on migratory birds may also include interference from Project lighting and noise, and effects to health from the potential degradation of air and water quality related to air emissions from generators and other mining equipment, and from increased fugitive dust. Finally, discharge of treated water into the Murray River may affect migratory water bird habitat through an increased risk of bioaccumulation of metals/metalloids in sediments or lentic environments (e.g., selenium).

Potential Socio-Economic and Land-use Effects

The Project falls within the Peace River Regional District (PRRD) and the closest communities to the Project are the District of Tumbler Ridge and Town of Dawson Creek, which is a service centre for PRRD southern communities. These communities are expected to be a source of labour, goods and services for the Project. Chetwynd is located at the junction of Highway 97 (Alaska Highway) and Highway 29 and the CN Rail mainline. Fort St. John is the largest city in the north-east region and is the main government services, logistical and supply centre for the PRRD. Given its central role in the region, Fort St. John is also expected to be a source of labour, supplies and service contracts for the Project. These four communities will be included in the scope of the effects assessment because of their proximity to the Project site and their reliance on resource-based industries.

The construction and operation of the Project is likely to have direct and indirect social and economic effects on local and regional communities. It will provide approximately 18,600 person-years of direct employment. HD Mining expects to require the use of Temporary Foreign Workers (TFWs) who are experienced in underground longwall mining to mine the Bulk Sample and to help start the mine. HD Mining is working with the District of Tumbler Ridge to develop appropriate housing for workers, and with Northern Lights College to develop a training program so that, over time, the underground mining jobs could be transferred from TFWs to local workers.

Increased economic development opportunities will result through the provision of locally sourced materials, supplies, and equipment. The Project will provide local, provincial and federal tax revenues annually throughout construction and operations. Increased pressure on community infrastructure and emergency services will result from housing TFW in Tumbler Ridge. The Project may affect land and resource use for both Aboriginal and non-Aboriginal users through Project-related restricted or altered access and land modification. Guide outfitter territories and registered trap lines exist locally, and recreational hunting and fishing activities are common land uses that could be adversely affected by mining activities.

HD Mining is committed to developing the Project in a manner that minimizes potential effects, while maximizing benefits for Aboriginal and non-Aboriginal communities in the region, as well as the company.

Potential Human Health Effects

Due to the lack of industrial emission sources and low level of mobile emission sources in the Project area, ambient air quality in the area is good, and ambient noise levels are low.

There are no known users who draw drinking water from within the immediate area around the Project. Downstream of the Project, the District of Tumbler Ridge holds a water licence for the Murray River; however, this is not currently active - the town's water supply is drawn from groundwater.

The Project is located approximately 12 km south of the nearest permanent residence at Tumbler Ridge, and 1.7 km from the nearest temporary residence (a trapline cabin). Regional air quality and noise effects are expected to be minimal due to the majority of the mining activities occurring underground.

Effects on downstream water quality may affect human health through the consumption of country foods where there is the potential for bioaccumulation of contaminants of concern in the food chain (e.g., fish, birds and wildlife) and through effects on drinking water quality. Changes to soil quality and vegetation in the vicinity of Project components also have the potential to affect human health through the harvesting and consumption of traditional plants for nutritional and medicinal purposes.

Potential Heritage Effects

A review of available archaeological information identified multiple previously recorded archaeological sites within 5 km of the proposed Project infrastructure. All of the sites are pre-contact lithic scatters.

Archaeological Impact Assessments (AIA) for the Project have been conducted under Heritage Inspection Permits 2010-0279 and 2012-0099, issued by the Archaeology Branch, Ministry of Forests, Lands and Natural Resource Operations. The AIAs focused on areas of proposed infrastructure. No archaeological sites or other heritage resources were identified in conflict with proposed infrastructure on the west side of Murray River. However, archaeological site GgRg-9 (lithic scatter and trail) was identified along the proposed Conveyor Belt alignment east of the Murray River.

Site GgRg-9 is protected under the BC *Heritage Conservation Act* (1996h). However, as it is located immediately underneath the proposed conveyer belt, HD Mining is currently reviewing options related to conveyor alignment and design. If the trail cannot be avoided, then appropriate mitigation measures will be identified and implemented, and a Section 12 Site Alteration Permit issued by the Archaeology Branch will be acquired if necessary.

Aboriginal Groups

The Project is located within the boundaries of Treaty 8. The federal Crown negotiated Treaty 8 in 1899 with Cree, Beaver, Chipewyan and other Indians, for an area that encompasses northeast British Columbia, northern Alberta, the northwest corner of Saskatchewan, and part of the Northwest Territories. Seven of the original 40 Treaty 8 First Nation communities are located in British Columbia. The McLeod Lake Indian Band adhered to Treaty 8 in 2000, in accordance with the McLeod Lake Indian Band Treaty 8 Adhesion and Settlement Agreement (British Columbia Environmental Assessment Office 2012).

The elements of Treaty 8 included provisions to maintain a livelihood for the native populations in this 840,000 km^2 (84,000,000 ha) region, such as entitlements to land, ongoing financial support, annual shipments of hunting supplies, and hunting rights on ceded lands unless those ceded lands were used for forestry, mining, settlement, or other purposes (Madill 1986).

In exchange for surrendering their lands, signatory First Nations would receive Indian Reserves based on 640 acres for each family of five; families or individuals who wished to live off reserve would receive “land in severalty to the extent of 160 acres to each Indian”. Treaty 8 also included provisions for education, farm stock, farm implements, ammunition, twine, and clothing (Madill 1986). Treaty 8 promises its signatories the right to “pursue their usual vocations of hunting, trapping, and fishing throughout the tract surrendered heretofore described, subject to such regulations as may from time to time be made by the Government of the country, acting under the authority of Her Majesty, and saving and excepting such tracts as may be required or taken up from time to time for settlement, mining, lumbering, trading, or other purposes”.

BC Treaty 8 First Nations include the Saulteau First Nations, West Moberly First Nations, McLeod Lake Indian Band (TseK’hene First Nation), Blueberry River First Nations, Doig River First Nation, Halfway River First Nation, Prophet River First Nation and Fort Nelson First Nation. The Project lies in the vicinity of the West Moberley First Nations (WMFN), Saulteau First Nations (SFN) and McLeod Lake Indian Band (MLIB) which is concordant with the terms of the Section 11 Order issued by the BC EAO.

The Kelly Lake Cree/Métis community is located 65 km northeast of the Project.

HD Mining is currently working to engage WMFN, SFN and MLIB to better understand their individual traditional use/knowledge as well as their current use of the local and regional area. The following summary information has been derived from available public sources.

West Moberly First Nations

West Moberley First Nations is a historic signatory to Treaty 8 and a member of the Treaty 8 Tribal Association (T8TA). The community of West Moberly Lake is approximately 30 km north of the town of Chetwynd and approximately 105 km northwest of the Project. Their 2,033.6 ha reserve is at the west end of Moberly Lake. As early treaty signatories, the WMFN have not defined a distinct traditional territory within Treaty 8 lands.

Hunting, trapping and fishing remain culturally and economically significant activities for the WMFN (PMT SRMP 2006). The traditional hunting and trapping territories of the WMFN are the foothills and mountains of the Rockies. Hunting and trapping occurred as far westward as the Ospika River, located on the western slope of the Rockies in the Rocky Mountain Trench. Ice-fishing was traditionally done at Moberly Lake in the winter, and in the late spring, goose eggs were collected and muskrats were trapped along the shore (Mokakioyis 2008).

The area lying between Moberly Lake and the Peace River comprises approximately 1,090 km^2 of land and is known as the Peace Moberly Tract (PMT; BC, SFN, and WMFN 2006; MNRO 2012). The PMT is a key supply area for traditional foods for the WMFN. The area provides medicinal plants, as well as products used in cultural ceremonies, crafts, and the fabrication of items such as canoes, drums and snowshoes (PMT SRMP 2006).

Indigenous burning was common in the PMT prior to the arrival of settlers and promoted the maintenance and improvement of berry producing areas, the production of horse pasture, and for fuel management. Blueberries and huckleberries (*Vaccinium* spp.), raspberries (*Rubus* spp.), highbush cranberry (*Viburnum edule*), saskatoon berries (*Amelanchier alnifolia*), soopollalie (*Shepherdia canadensis*) and other commonly used berry species show a strong affinity for young forests, and some ecosystems within the PMT are considered fire dependent (PMT SRMP 2006).

Saulteau First Nations

SFN is a historic signatory to Treaty 8 and a member of the T8TA. The Saulteau community at East Moberly Lake is approximately 25 km north of the town of Chetwynd and approximately 105 km northwest of the Project. Their 3,025.8 ha reserve is located at the east end of Moberly Lake. As early treaty signatories, the SFN have not defined a distinct traditional territory within Treaty 8 lands.

Hunting, trapping and fishing remain culturally and economically significant activities for the SFN (PMT SRMP 2006). A vigorous hunting economy currently exists within the Saulteau community (PMT SRMP 2006; Finavera 2011). Moose is the mainstay of the hunting economy, although deer, mountain goat and caribou are also hunted. The SFN have historically hunted and trapped the lands south of the Peace River, and east of the Rocky Mountains since their arrival in the region in the late 19th century (Leonard 1995). This area includes lands within the Murray and Sukunka River watersheds, as well as northward within the Kiskatinaw River watershed to the Peace River (TMW 2009). Presently, the core of SFN hunting territory is located north of the present-day reserve, centered around the Moberly and Pine rivers, as well as Cameron and Boucher Lakes.

Moberly Lake has populations of whitefish, pike, lake trout, greyling, burbot, and suckers that the SFN have harvested in a net fishery, although this technology has declined in recent times (Weinstein 1979). Many places around the Moberly River were highly used berry-picking areas (PMT SRMP 2006).

A number of traplines are registered to SFN families. Trapping played a very significant role in the Saulteau economy, but due to declines in fur bearing animals in recent years, as well as a general decline in the prices for furs, the importance of trapping has significantly declined.

Sundance Lake, located approximately 20 km east of Chetwynd, was a place used by Cree and Saulteau groups for the annual sun dance. Sundance Lake was also used for trapping (Mokakioyis 2008).

McLeod Lake Indian Band

The main community of MLIB is at McLeod Lake, BC, 145 km north of Prince George and approximately 125 km west of the Project. In contrast to other Treaty 8 First Nations, the MLIB only recently adhered to Treaty 8, in April 2000, giving the band provisions to expand its operations in forestry, mining, oil and gas, construction, and pipelines (Golder Associates 2009).

The MLIB continue to hunt and trap along the rivers and lakes that drain to the east into the Parsnip River, including Carp Lake and the Nation River and Lakes (Ridington 2008). Nation Lakes and Carp Lake are noted as productive hunting areas, and were the location of numerous MLIB traplines, while Carp Lake is also a well-known berry-picking area. Elk are harvested around Summit Lake and north of Hoglund Lake (Terrane 2008).

Fish are harvested in the spring and summer at a number of locales, but primarily at the head of the Parsnip River and at Tabor Lake, Philip Lakes, Nation Lakes, Summit Lake, and McLeod Lake. Birds were harvested along the Crooked and Pack rivers (Terrane 2008).

MLIB Elders indicate that saskatoon berries are found north and west along McLeod Lake and Pack River areas. In summer, MLIB Elders often travel along logging roads to pick berries (Terrane 2008).

Métis

The Kelly Lake Métis are descendants of the unions of Cree speaking women and French Canadian fur traders who resided in the Red River settlements of Manitoba and moved west with the fur trade in the early 1800's. They have unresolved land claims filed with the Supreme Court of BC. The community of Kelly Lake currently consists of 109 people who claim Cree, Saulteau or Métis ancestry. The Métis of Kelly Lake are represented by the Kelly Lake Métis Settlement Society. At a provincial level, the Kelly Lake Métis are represented by the British Columbia Métis Federation. The community is occupied year-round and continues to be an important hub for residents to access their traplines, hunting and fishing sites, trails, camps, and sacred sites.

Potential Effects to Aboriginal Groups

The current use of lands and resources by Aboriginal groups for traditional purposes in the region includes fishing within the Murray River, trapping and hunting, and harvesting of country foods. HD Mining is working to engage the Aboriginal groups to gather traditional knowledge and traditional land use information to inform the EA process and to minimize the potential for impacts on Treaty Nations and Métis. During construction and operations, the Project may adversely affect Aboriginal groups through direct and indirect effects on lands and resources, including: direct loss or degradation of wildlife habitat and movement corridors; direct mortality of wildlife from vehicle collisions; sensory disturbances created by Project activities including roads; and Project-induced changes to hydrology and water quality that may have the potential to adversely affect fish and fish habitat due to uptake of contaminants of concern (e.g., selenium). Dust deposition from Project activities, particularly during construction on soil and vegetation may also affect traditional harvesting activities of plants, berries, and mushrooms. The Project may also affect traditional land and resource use through Project related restricted or altered access and land modification.

The Project may also have adverse social, economic, and cultural effects on Aboriginal groups. Economic growth can lead to a number of potential negative outcomes due to increased income disparity, potential for greater access to drugs in communities, and domestic issues arising from family members partaking in mine employment that takes them away from traditional family and community roles and responsibilities.

Aboriginal Engagement and Consultation

HD Mining initiated engagement activities with Aboriginal groups in 2009 (described in detail in Section 9 of the Project Description) related to exploration drilling activities; engagement continued through the Bulk Sample application process, and will continue throughout the Project's planning and regulatory review, construction, and operations phases. Specific to the EA process, Aboriginal consultation activities will follow the requirements in the Project's Section 11 Order issued by the BC EAO, and First Nations Consultation Plan (also required by the Section 11 Order).

The Section 11 Order identifies consultation requirements for the WMFN, MLIB, and SFN. HD Mining has initiated consultation activities with these three groups, and HD Mining's draft First Nations Consultation Plan is based on engagement with these groups. The objectives of the consultation efforts is to provide information about the Project, to facilitate participation during the scoping phase of the EA process, to identify and document potential concerns and issues, and to adequately respond to issues raised by these groups.

The primary issues identified through First Nations consultation efforts to date include the following:

- EA capacity funding;
- early input into Project design and planning;
- lack of confidence in the EA process;
- notice for meetings;
- employment during baseline studies;
- potential impacts to caribou and other wildlife;
- water use and water quality;
- hunting, trapping and fishing;
- human health;
- safety;
- selecting Valued Components;
- cumulative effects;
- opportunities for employment, training, and apprenticeships;
- confidentiality; and
- revenue sharing.

Government Agency, and Local Government Consultations

A key mechanism for consulting government agencies and local governments about the Project during the EA process is the BC EAO and CEA Agency EA working group meetings. Issues raised during EA working group meetings, public comment periods, and throughout the EA review process will be documented and responded to by HD Mining.

HD Mining will engage with federal, provincial, regional, and local governments, the public, tenure holders near the Project, economic development organizations; businesses and contractors (e.g., suppliers and service providers); and special interest groups (e.g., environmental, labour, social, health, and recreation groups). Communities to be consulted about the Project include:

- Tumbler Ridge;
- Chetwynd;
- Dawson Creek; and
- Fort St. John.

Public Consultation

The objectives of HD Mining's public consultation program is to inform the public about the Project, to identify any potential concerns or issues, and to adequately address concerns, if appropriate.

A public consultation plan has been developed and approved by the BC EAO, and is available on the BC EAO's Project Information Centre (e-PIC; http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_home.html). This plan identifies:

- the different target regions and organizations for effective engagement;
- informational and consultation tools and actions during the various phases of the EA process and the key responsibilities, and summarizes what HD Mining has heard to date; and
- HD Mining's public consultation principles and information sharing objectives to achieve a broader understanding of the proposed Project, and describes the technology that will be utilized for underground long wall mining.

The public consultation audience includes:

- local and regional government and community leaders (e.g., District of Tumbler Ridge, City of Chetwynd, City of Dawson Creek, and Peace River Regional District);
- crown tenure holders (commercial recreation, guide outfitters, trappers, forestry, mining and gas, agriculture, wind power);
- energy and resource industry (e.g., Teck, Peace River Coal, Tumbler Ridge Wind Energy);
- non-government organizations (e.g., United Steelworkers Association, Industry Training Authority); and
- interest groups or citizens associations (e.g., Tumbler Ridge Museum Foundation, Tumbler Ridge Chamber of Commerce) .

The primary issues identified by the public and stakeholders through consultation efforts to date (listed in detail in Section 9 of the Project Description) include the following:

- maximize local infrastructure benefits to the Tumbler Ridge community;
- maximize local contractual service opportunities;
- provide opportunities for employment, training, and apprenticeships;
- concern over the potential for adverse effects on wildlife, water quality, air quality, or other environmental effects;

- safety within the underground environment and at the surface;
- human health; and
- English language capability of staff.

Authorizations, Permits, and Licenses

Provincial permitting, licensing, and approval processes (statutory permit processes) may proceed concurrently with an Environmental Assessment Certificate (EAC) application or follow after an EAC decision. However, no statutory permit approvals may be issued before an EAC is obtained. Multiple provincial permits, licenses and authorizations are anticipated, including permits, certificates, and approvals under the *BC Environmental Assessment Act (2002a)*, *BC Environmental Management Act (2003)*, *BC Drinking Water Protection Act (2001)*, *BC Transportation Act (2004b)*, the *BC Public Health Act (2008)*, *BC Mines Act (1996d)*, and *BC Land Act (1996c)*.

Like the provincial EA process, no federal approvals may be issued until an EA Decision Statement is issued.

Table 3 presents a list of federal authorizations, licences, and permits that may be required to develop the Project. Other federal legislation (e.g., *Species at Risk Act* (2002b), *Migratory Birds Convention Act* (1994)), may be relevant in terms of evaluating potential effects of the Project, but specific permit requirements under those acts are not anticipated to be required. There are potential requirements for permits under Section 35(2) of the *Fisheries Act* (1985b)[1] and section 5 of the *Navigable Waters Protection Act* (1985c)[2] associated with the conveyer crossing of the Murray River and the installation of treated water discharge infrastructure (e.g., pipeline, outfall) in Murray River.

Table 3. Federal Authorizations, Licenses, and Permits that May Be Required for the Project

Federal Government Approvals and Licenses	Enabling Legislation
CEAA Decision Statement	*Canadian Environmental Assessment Act* (2012)
Section 35(2) authorization for the harmful alteration, disruption or destruction of fish habitat[1]	*Fisheries Act* (1985b)
Section 5 approval of works in a navigable water	*Navigable Waters Protection Act* (1985c)
Explosives Magazine License	*Explosives Act* (1985a)
Ammonium Nitrate Storage Facilities	*Canada Transportation Act* (1996g)
Radio Licenses	*Radiocommunications Act* (1985d)

[1] Amendments to the Fisheries Act that were tabled in the *Jobs, Growth, and Long-term Prosperity Act* (Bill C-38), and further revised in Bill C-45 received Royal Assent but have not yet been brought into force. It is anticipated that the amendments will come into force during the EA review process for the Murray River project and that the current legislative requirements under the 1985 *Fisheries Act* will no longer apply. Further, it is acknowledged that the proposed expansion of the Metal Mining Effluents Regulation to include coal mines may also affect the Murray River Project with respect to the need to obtain an amendment to Schedule 2 of the MMER. The information presented in this Project Description reflects the statutory requirements as currently prescribed under the 1985 *Fisheries Act*.

[2] Amendments to the *Navigable Waters Protection Act* that were tabled in the *Jobs, Growth, and Long-term Prosperity Act* (Bill C-38), and further revised in Bill C-45 received Royal Assent but have not yet been brought into force. It is anticipated that the amendments will come into force during the EA review process for the Murray River project and that the current legislative requirements under the 1985 *Navigable Waters Protection Act* will no longer apply. The information presented in this Project Description reflects the statutory requirements as currently prescribed under the 1985 *Navigable Waters Protection Act*.

Glossary and Abbreviations

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Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

3D	Three-dimensional
µ	Micro (10^{-6})
AANDC	Aboriginal Affairs and Northern Development Canada
AIA	Archaeological Impact Assessment
BC	British Columbia
BC CDC	British Columbia Conservation Data Centre
BC EAO	British Columbia Environmental Assessment Office
BC *EAA*	British Columbia *Environmental Assessment Act* (2002)
BC ILMB	British Columbia Integrated Land Management Bureau
BC MENG	British Columbia Ministry of Mines, Energy and Natural Gas
BC MOE	British Columbia Ministry of Environment
BEC	Biogeoclimatic Ecosystem Classification
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
CEA Agency	Canadian Environmental Assessment Agency
CCME	Canadian Council of Ministers of the Environment
CCR	Coarse Coal Rejects
CN Rail	Canadian National Railway
CNSC	Canadian Nuclear Safety Commission
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Department of Fisheries and Oceans
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EADS	Environmental Assessment Decision Statement
EC	Environment Canada
EIS	Environmental Impact Statement
EPCM	Engineering, procurement, construction, and maintenance
e-PIC	BC EAO's Project Information Centre; http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_home.html
EPT	Ephemeroptera, Trichoptera, and Plecoptera (benthos communities)

FN	First Nation
GHG	Greenhouse Gas
GJ	Gigajoule
ha	hectare
HD Mining	HD Mining International Inc.
Hwy	Highway
ISQG	Interim Sediment Quality Guidelines
k	Kilo (10^3)
Kennecott	Kennecott Coal Exploration Inc.
LOM	Life of Mine
LRMP	Land and Resource Management Plan
LSA	Local Study Area
m	milli (10^{-3}) or metre
m^3/a	Cubic metres per annum
m^3/d	Cubic metres per day
m^3/h	Cubic metres per hour
M	Million or Mega (10^6)
masl	Metres above sea level
mbgs	Metres below ground surface
MSC	Meteorological Service of Canada
MSDA	Mine Site Development Area
MFLNRO	Ministry of Forests, Land and Natural Resource Operations
ML/ARD	Metal leaching/acid rock drainage
MLIB	McLeod Lake Indian Band
MMER	Metal Mining Effluent Regulations
MNBC	Métis Nation of British Columbia
MOTI	Ministry of Transportation and Infrastructure
MPMO	Major Projects Management Office
Mt	Million tonnes
NLG	Nisga'a Lisims Government
NRCan	Natural Resources Canada
NTU	Nephelometric turbidity units
PMT	Peace Moberly Tract
PNG	Pacific Northern Gas

PRC	Peace River Coalfield
Quintette	Quintette Coal Limited
RDPA	*Regulations Designating Physical Activities*
RIC	Resource Inventory Committee (currently known as the Resource Information Standards Committee)
RISC	Resource Information Standards Committee (previously known as the Resource Inventory Committee)
ROM	Run-of-mine
RSA	Regional Study Area
SARA	*Species at Risk Act* (2002)
SFN	Saulteau First Nation
T8	Treaty 8
TFW	Temporary Foreign Worker
the Project	The Murray River Coal Project
tpa	Tonnes per annum
tpd	Tonnes per day
TC	Transport Canada
TEM	Terrestrial Ecosystem Mapping
TSS	Total suspended solids
WMFN	West Moberly First Nation

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