

# Appendix 4-DD

---

Terrestrial Baseline Overview -  
February 22, 2018



# Crown Mountain Coking Coal Project

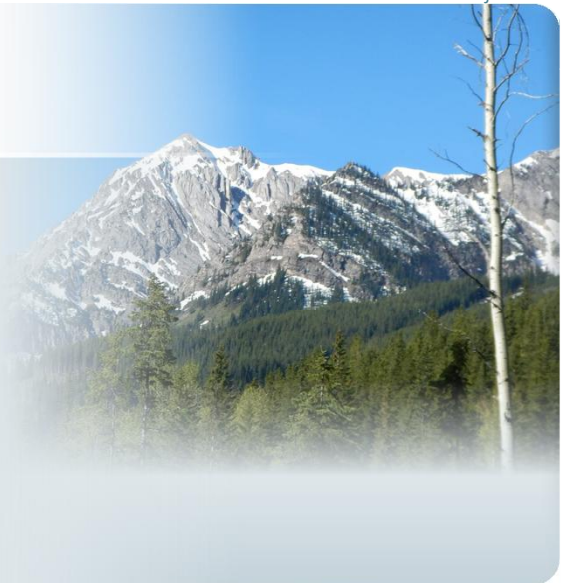
Terrestrial Baseline Overview

February 22, 2018

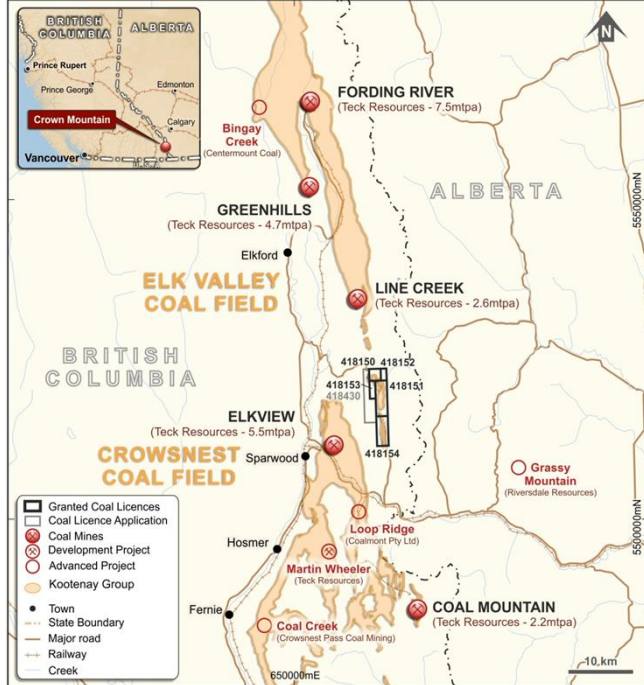
Crown Mountain Project 2

## Presentation

1. Project Overview
2. Terrestrial Valued Components
3. Baseline Programs
4. Outstanding Baseline
5. Questions / Discussion



# Crown Mountain Project Location

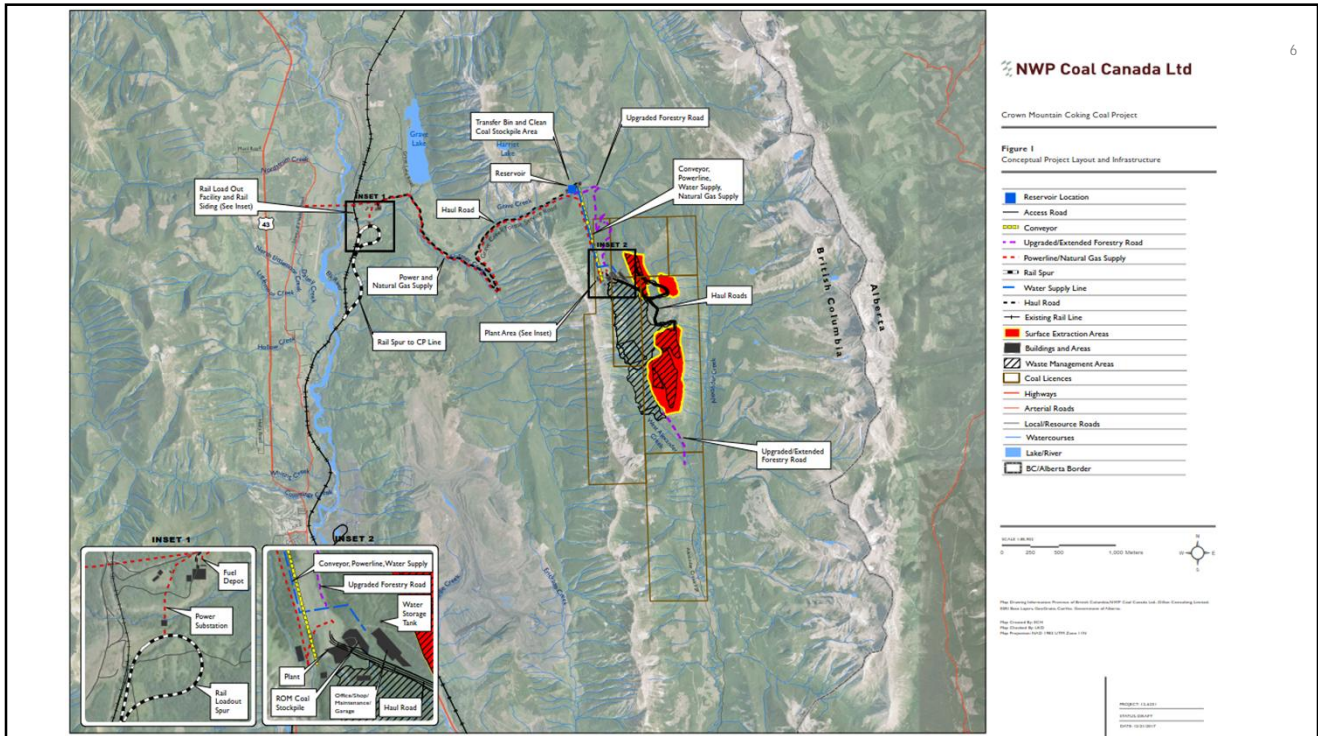


## Project Overview

- Proposed open pit metallurgical coal mine in the Elk Valley
- 5 tenured coal exploration licenses (2,588 ha) and 1 license application (975 ha)
- Other nearby mines in Elk Valley include Teck's Elkview (8 km southwest) and Line Creek mine (12 km north)
- Anticipated production capacity of 3.7 million run-of-mine tonnes (M ROMt) per annum for 16 years (not including site decommissioning)
- Construction estimated at 1.5 years

# Project Overview

- Key project components include:
  - Surface extraction areas (three pits - north pit, east pit, and south pit)
  - Waste rock management areas
  - Plant area (includes raw coal stockpile, processing plant, site support facilities)
  - Clean coal transportation route (overland conveyor and haul road)
  - Rail load out facility and rail siding
  - Power and natural gas supply
  - Explosives and fuel storage
  - Sewage treatment
  - Water supply



## Project Overview

- Currently in Pre-Application phase:
  - Project Description, approved November 2014
  - EIS Guidelines, issued February 2015
  - Valued Components for Environmental Assessment, completed April 2016
  - Application Information Requirements, underway and will be finalized shortly
- Consultation and engagement is on-going:
  - Ktunaxa Nation Council
  - Local municipalities
  - Participation in the Elk Valley Cumulative Effects Management Framework group



## Baseline Programs

Programs to date have included:

- Climate and meteorology
- Hydrology
- Surface water
- Hydrogeology (on-going)
- Noise
- Geohazards and terrain
- Soils
- Birds
- Bats
- Ungulates
- Furbearers
- Terrestrial Ecosystem Mapping
- Rare plants
- Fish and fish habitat (spawner surveys, inventories, sediment, habitat assessments, fish community, bull trout studies)
- Tissue sampling (vegetation, soils, bird eggs, fish)
- Archaeological Impact Assessments
- Social and economic assessment



# Terrestrial Valued Components

- Landscape and ecosystems:
  - Avalanche chutes
  - Grassland ecosystems
  - Wetland ecosystems
  - Riparian habitat
  - Old growth and mature forests



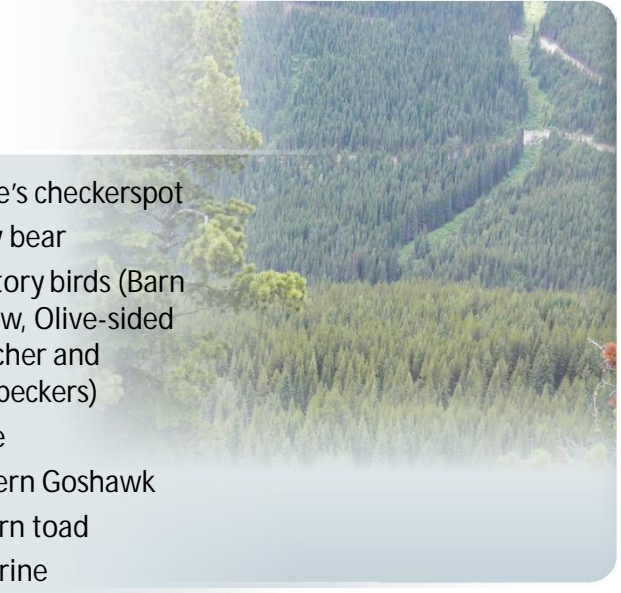
# Terrestrial Valued Components

- Vegetation:
  - Listed and sensitive plant communities and species
  - Limber pine
  - Whitebark
  - Culturally significant plants and ecosystems



# Terrestrial Valued Components

- Wildlife:
  - American badger
  - American Dipper
  - At-risk bat species (Little brown bat, Northern myotis, and Eastern red bat)
  - Bighorn sheep
  - Canada lynx
  - Elk
  - Gillette’s checkerspot
  - Grizzly bear
  - Migratory birds (Barn Swallow, Olive-sided Flycatcher and Woodpeckers)
  - Moose
  - Northern Goshawk
  - Western toad
  - Wolverine



# Terrestrial Valued Components

- Amphibians within the regional area
  - Represented by Columbia spotted frog
- Waterbirds within the regional area
  - Represented by Harlequin duck, Red-winged Blackbird, Spotted Sandpiper, Mallard, and American Dipper
- Wildlife Health Risk Assessment
  - Wildlife

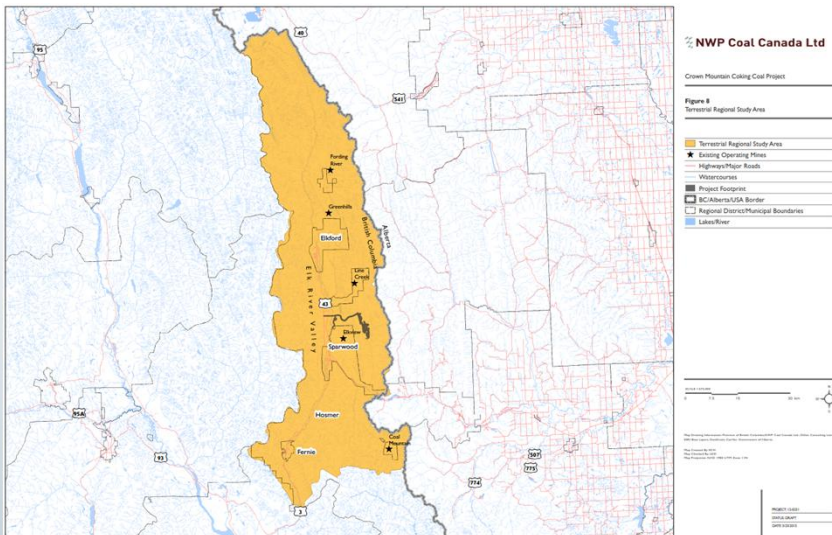


# Baseline Overview

- Study areas
- Overview of approach and methods for terrestrial VCs
- Challenges and constraints
- Key findings and results of baseline programs
- Outstanding baseline programs

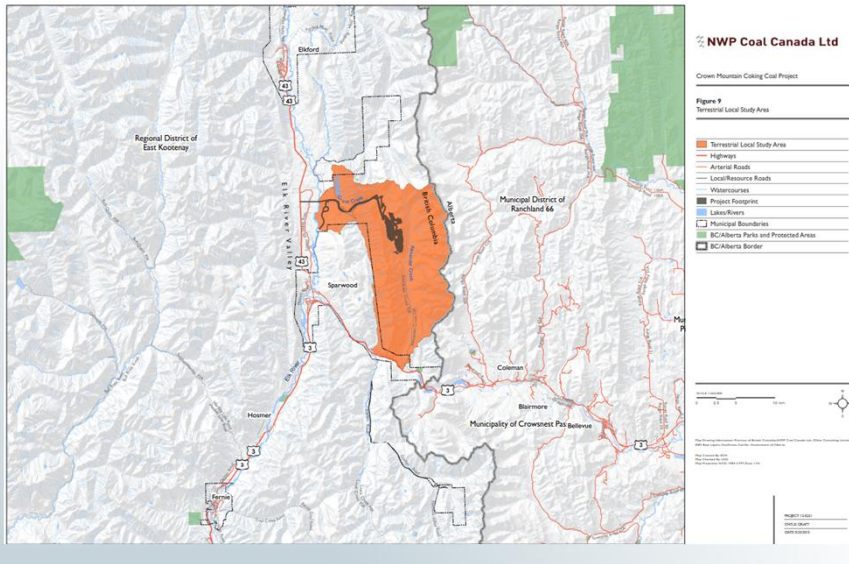


# Terrestrial Resources – Regional Study Area





## Terrestrial Resources – Local Study Area



## Vegetation

- Terrestrial Ecosystem Mapping:
  - Baseline TEM classified ecosystems with the LSA in 2014
  - 167 field plots were established, including 80 full SIVI plots and 87 visual plots
  - The BC Biogeoclimatic (BEC) system was used to classify subzones and site series within the LSA
  - Range of terrestrial landscapes across the Local Study Area (LSA)



Crown Mountain Project 17

## Vegetation

- Rare plants:
  - Surveys completed in 2014 and 2015, concurrent with TEM
  - Several provincially-listed plant species observed
  - Several listed forbs species have been found at the mouth of Alexander Creek and in the Grave Creek area
  - Mature whitebark pine observed showed signs of blister rust, seedlings did not (based on 2014/2015 surveys; additional surveys to be completed 2018)
- Metal and PAH data collection:
  - Vegetation and associated soils assessed in 2017
  - Info to be used in risk assessments

## Culturally Significant Plants

- Culturally Significant Plants and Ecosystems:
  - Culturally significant plants and ecosystems include those species and ecosystems that have consumption/food, medicinal, and cultural and/or social importance
  - Baseline studies to date conducted as part of TEM
  - Trees, shrubs, and forbs and graminoids were assessed for their use as medicine, food, technology, dyes, or other.



## Wildlife and Wildlife Habitat

- Completed surveys:
  - Furbearer studies (2014, 2015, work underway for 2017/2018)
  - Ungulate aerial surveys (winter 2013, fall 2014, and spring 2015)
  - Breeding bird and raptor surveys (2014 and 2017)
  - Waterbird surveys (2017, and planned for 2018)



## Wildlife and Wildlife Habitat

- Completed surveys:
  - Badger surveys (2014)
  - Gillett's checkerspot (2014)
  - Amphibian surveys (preliminary, 2014 and 2018)
  - Bats (2017)
  - Discussions/meetings with MOE on grizzly bear and ungulate habitat modelling and reports



# Furbearers

- Baseline:
  - Snow tracking to determine presence, distribution, and relative abundance of key carnivore and primary prey species
  - Bait/scent hair-snag stations coupled with remote motion cameras (2014 and 2015)
  - Hair samples were collected for MFLNRO for DNA work
  - Results documented a variety of species in the LSA
  - Camera study underway in the Grave Creek corridor to assess movement



# Ungulates

- Baseline:
  - Aerial flights were completed in winter and autumn 2014 and spring 2015
  - Broad-scale distribution patterns of ungulates within the study area were assessed
  - Ungulate species in LSA varies seasonally
  - Species diversity greatest in spring, distribution also broader
  - Camera study underway in the Grave Creek corridor



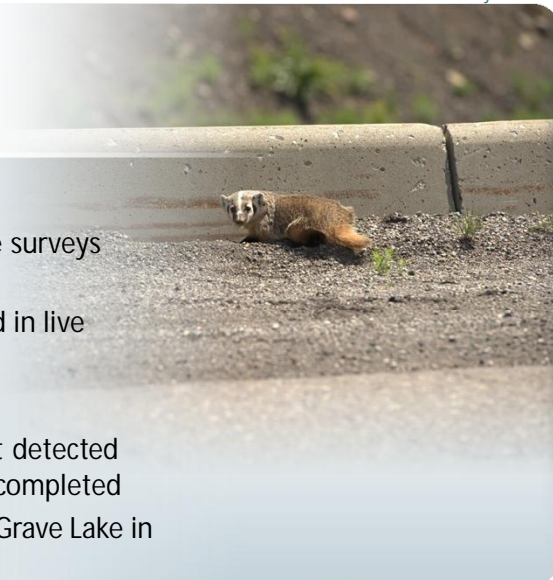
## Birds

- Baseline:
  - Breeding bird surveys conducted across LSA
  - Raptor surveys conducted concurrent with BB surveys, Northern Goshawk observed
  - Wildlife trees incidentally observed were recorded
  - Waterbirds surveys conducted in Harmer, Grave, Alexander, and West Alexander Creeks
  - Egg collection (Spotted Sandpiper) completed in 2017 for tissues analysis, planned for 2018
  - 3 species listed under SARA as Threatened observed: Common Nighthawk, Northern Goshawk, and Olive-sided Flycatcher



## Other Baseline

- Bats:
  - Acoustic surveys and follow-up live capture surveys completed in LSA (2017)
  - Little Brown Myotis (endangered) observed in live capture and genetic analysis
- Badger:
  - Burrow surveys completed at presence/not detected level across LSA, habitat stratification also completed
  - Highest concentrations observed south of Grave Lake in low elevation open habitats



## Other Baseline

- Gillett's Checkerspot:
  - Potential habitat identified as forest openings and open canopy forest, preferably in riparian or valley bottom locations
  - No adults or egg masses of checkerspot observed
- Amphibians:
  - Wetland classification, systematic pond surveys, tadpole collection for tissues and metal analysis
  - Additional work to be completed in 2018



## Outstanding Baseline

- Camera study in Grave Creek corridor (on-going since 2017)
- Additional bird surveys, egg collection for tissue analysis (2018)
- Whitebark pine survey (summer 2018)
- Amphibian surveys, including western toad surveys and egg mass or tadpoles collection for tissue analysis (summer 2018)
- Spring and fall bird migration surveys (to be discussed)
- Habitat suitability mapping and analysis for key terrestrial VCs (bats, ungulates, furbearers, birds, etc.)





# Questions?

