

1 Removal of Vegetation and Topsoil

Trees are harvested
Brush is recovered with topsoil
Topsoil is recovered with equipment and stored for later use in reclamation

2 Excavation of Overburden

Loose material below topsoil is removed with excavators, dozers, and trucks
Overburden is used to build dams, backfill mined out pits, or stored outside of the pit

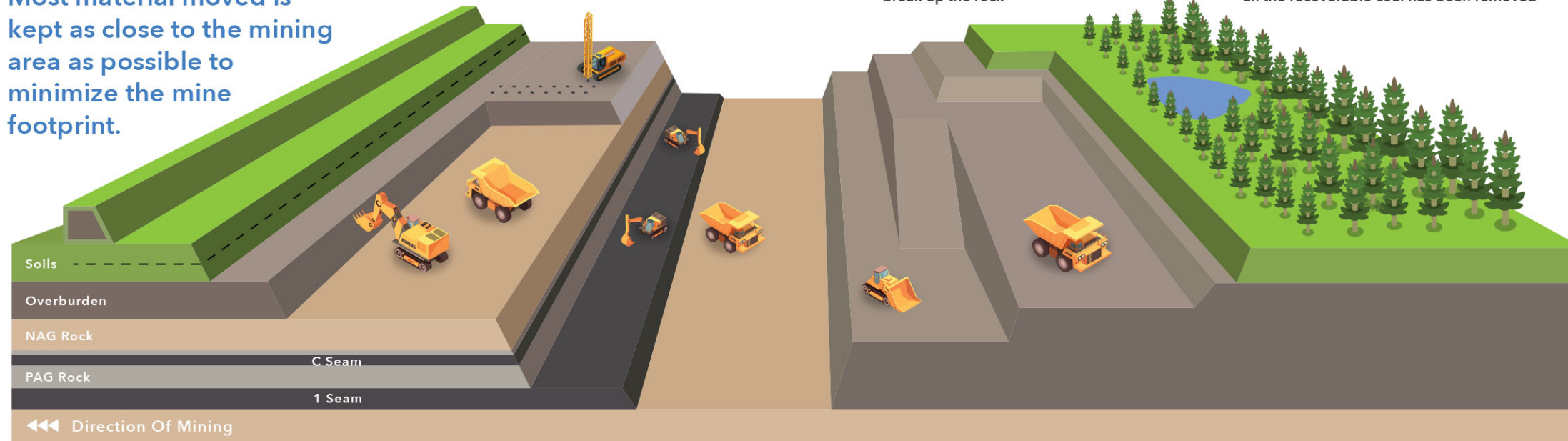
3 Drill and Blasting of Rock

Rock requires blasting to break it into manageable size for loading
A drill creates a series of holes in the rock forming a blast pattern
Explosives are then loaded into this pattern and it is detonated to break up the rock

4 Excavation of Rock

Once the rock is blasted, it is moved out of the way to uncover the coal
Potentially Acid Generating (PAG) rock is placed into the Management Ponds
Non Acid Generating (NAG) rock is used to backfill areas in the pit where all the recoverable coal has been removed

Most material moved is kept as close to the mining area as possible to minimize the mine footprint.



5 Mining of Coal

Coal is mined with excavators, trucks, and other support equipment
Coal is not blasted to reduce the amount of fine particles, and minimize the addition of rock
Coal is hauled to the Coal Processing Plant to separate the coal from the rock

6 Backfill of Completed Mine Areas

Once coal has been removed, the pit area can be used to backfill NAG or Overburden material
This keeps the mine footprint as small as possible, and allows progressive reclamation to occur

7 Reshaping of Backfill

Once the backfill material achieves the desired height, it will be reshaped to smooth out the surface to allow soil placement, which makes it ready for revegetation

8 Replacement of Topsoil and Vegetation

Once the reshaping is complete, the topsoil is placed on top
Native and non-native vegetation species are used to complete the reclamation process

Only COAL is removed from the site for sale.

General Mining Information

- Open Pit Operation
- A Prime Strip Ratio of 3.6 (the number of BCM per tonne of coal recovered)
- Material Movement of between 4,000,000 to 9,000,000 BCM/year (Bank Cubic Metre, 1m x 1m x 1m of undisturbed material)
- Producing 775,000 to 825,000 t/year of metallurgical coal for sale
- Expected Mine Life (construction to completion of reclamation) is 25 years
- Expected Footprint of operation (including rail, powerline, and road) ~1,050 ha
- Water Retaining Structures for water storage and PAG management
- Conventional Excavator/Truck Operation

Materials Moved

Topsoil - Surface soil usually including the organic layer in which plants have most of their roots.

Overburden - Glacial sediment overlaying the bedrock. Other common words are Till, Glacial till, or Unconsolidated Material.

Bedrock or Rock - Any naturally occurring solid mass or aggregation of minerals. 3 main types of Rock exist: Igneous, Metamorphic and Sedimentary. Coal is a sedimentary rock.

Proposed Equipment Types

- Mining Excavators - 12 m³ bucket
- Motorized Graders - 14' blade length (equivalent to a Cat 14M)
- Track Dozers - 435hp size (equivalent to a Cat D8T)
- Rotary Drill - 9 7/8" to 10 5/8" Bit size
- Rigid Frame Dump Trucks - 90-100t size
- Wheel Loaders - 12.5 m³ (15 tonnes)
- Maintenance Support Vehicles
- Crew Busses
- Light Vehicles (Pickup Trucks)



TELKWA COAL
LIMITED

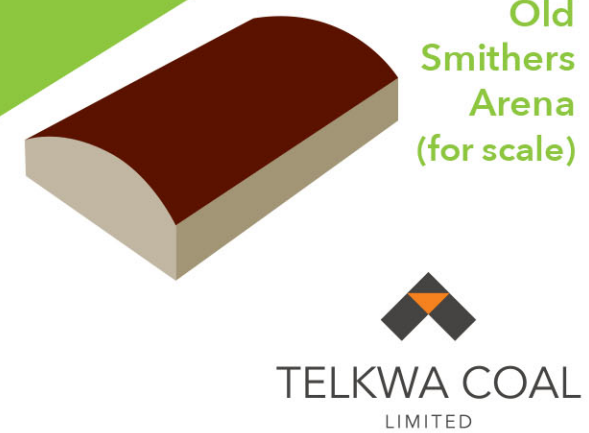
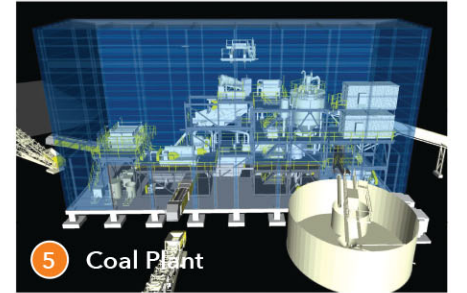


Businesses based in the Bulkley Valley will be invited to bid on the material supply and labour for construction.

Buildings will be constructed with closure in mind. Buildings will be selected to allow for relocation and/or disassembly. Modular design and construction are options to achieve this goal.



TCL will be selecting from existing or commonly used designs to keep construction simple and cost effective. Examples shown are from other mine sites.



Train

- CN proposes 116 car trains with 2 to 3 locomotives
- Rail loop is designed to accommodate trains of this length, while keeping the main line operations free
- Average rail car capacity is 108 tonnes
- 62 and 66 trains per year to move coal to port
 - Based on the train capacity estimates, and the proposed mine production rate
- 1.20 to 1.25 trains per week

Train Loading

- Area for loading will be on a straight section of the loop to allow truck, and loader operations
- Coal is loaded onto trains by loader
- A topping agent is applied to manage dust before the train departs for Prince Rupert
- A release agent will be added in winter to assist with unloading coal cars at Ridley Terminal
- Rail cars are loaded and weighed
- Water from the loading area is collected and sediments are settled before the water is released from the rail control pond to the Bulkley River

Loop Specifications

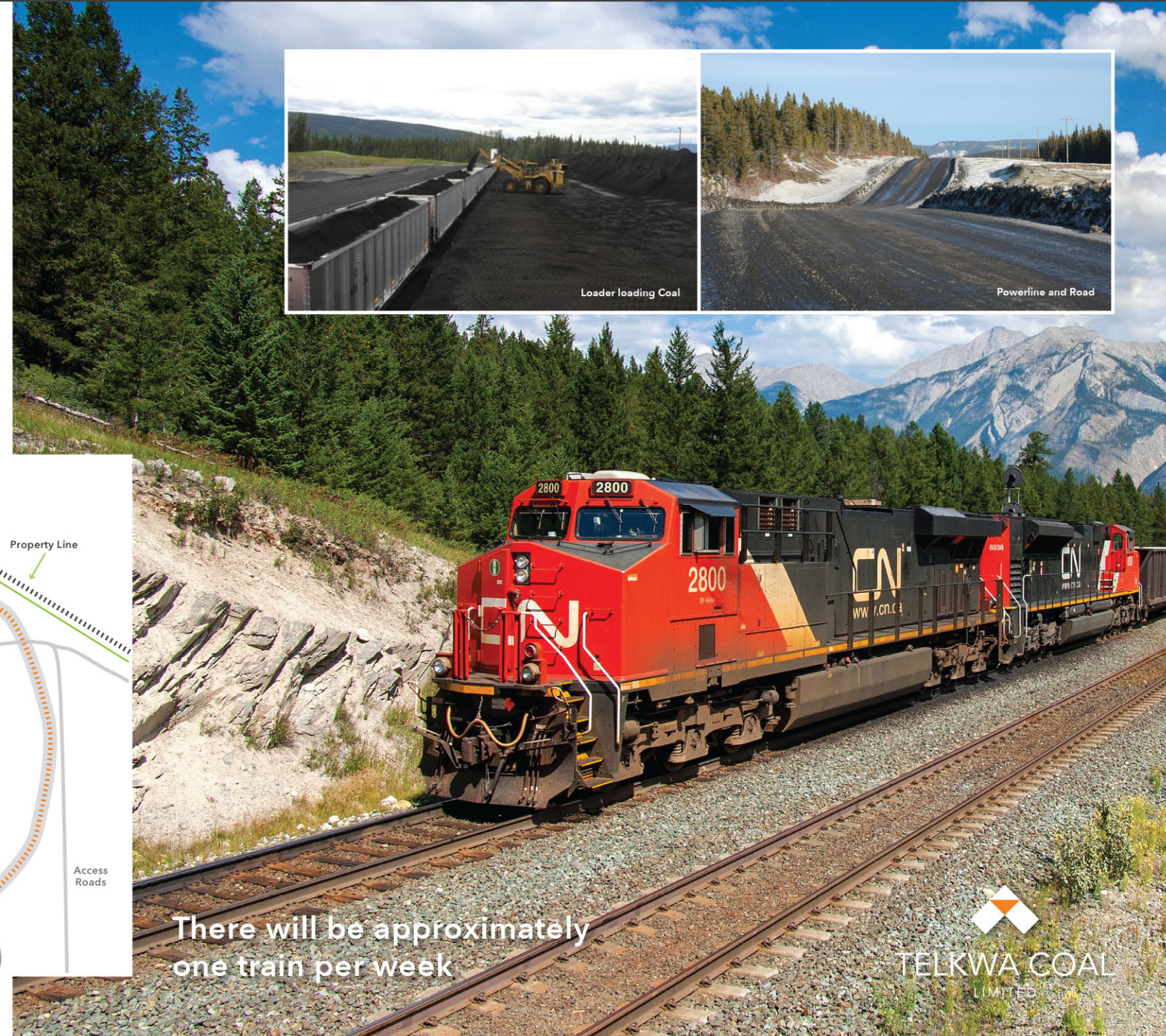
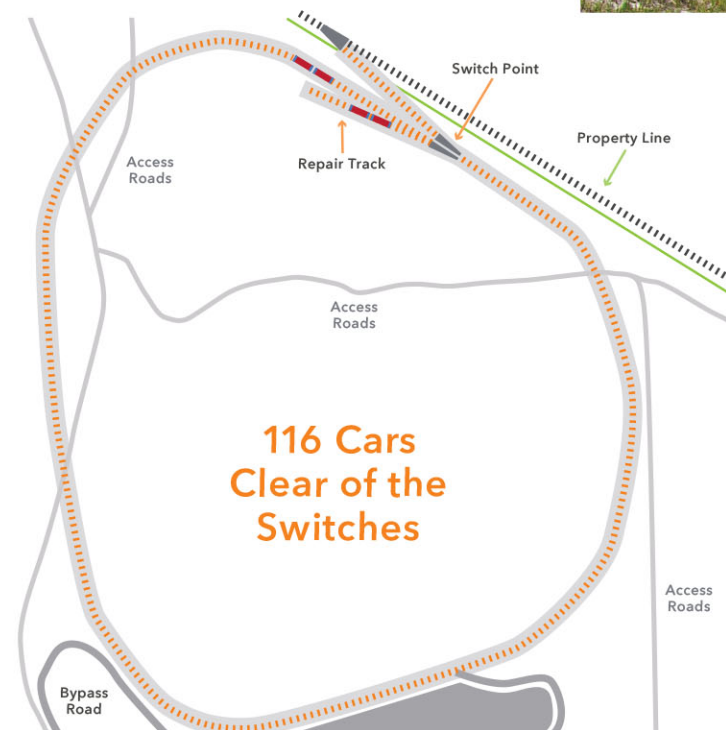
- Maximum Curve of 8%
- Maximum Grade of 0.3%
- Dedicated signals on the main line to enable more efficient main track operation
- Repair track for storing cars that are not in working order
- Length to ensure that loading can be achieved while keeping the main line free of rail cars

Coal Transport

- Transporting coal from the Project site requires both road and rail transport
 - Coal is moved by truck from the mine site over a single lane Bypass road to the rail loop
 - At the rail loop, coal will be loaded on rail cars for the journey to Ridley Terminal in Prince Rupert

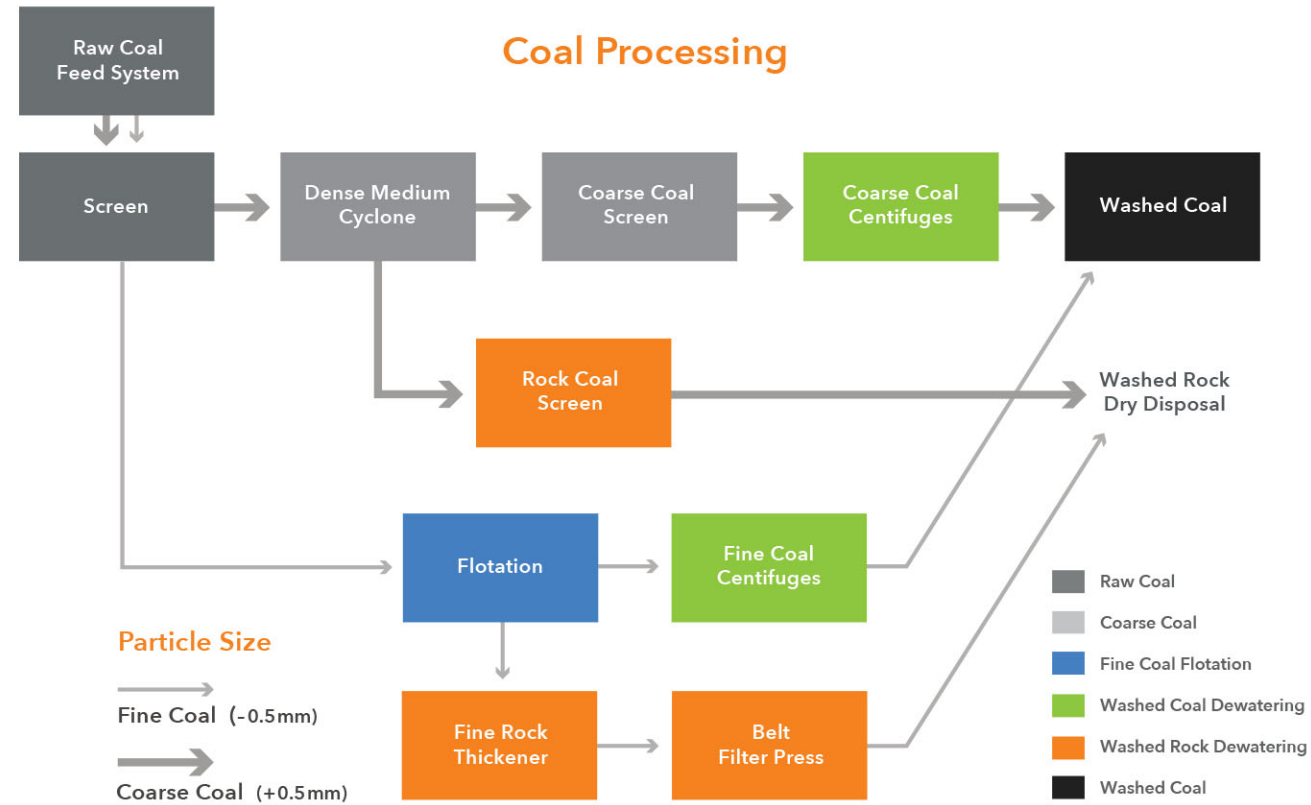
Powerline

- A 3.60-kilometer 25kV powerline is connected to the existing BC Hydro 25kV distribution system located to the North of the Tenas Pit
- Powerline follows existing road and spans across the Goathorn Creek, heading west to the top of the valley and then south to the project's site
- At the rail load out, a 25 kV line will be extended from the existing BC Hydro line
- The powerline follows BC Hydro standards for spans, pole types, power lines, guide wires, and pole materials
- 67 pole structures
- Plant and associated buildings (eg: maintenance shop) require a maximum load of 4,000 kVA, well within both the line's design capacity and 25 kV network
- Periodic monitoring of the power poles will be conducted and maintenance activities carried out as required



There will be approximately one train per week

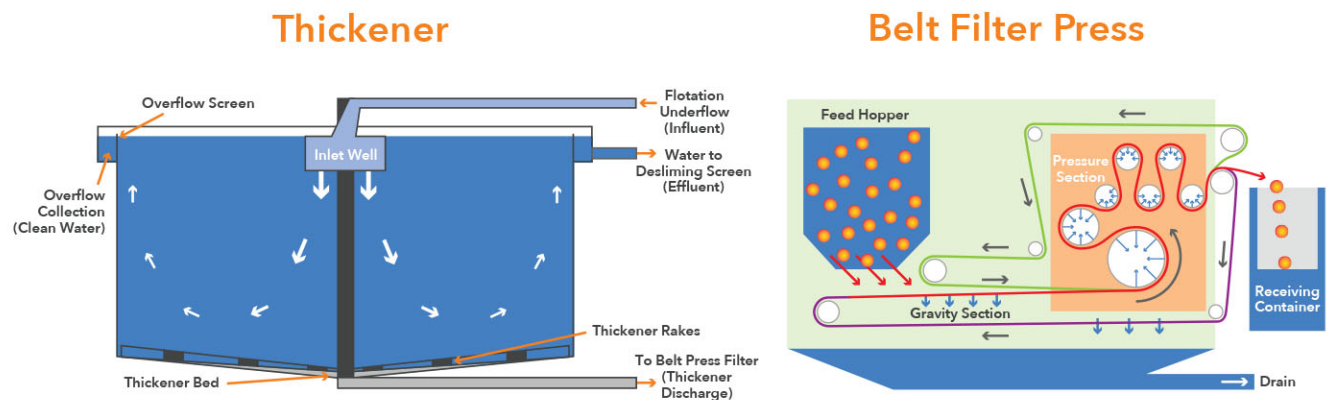


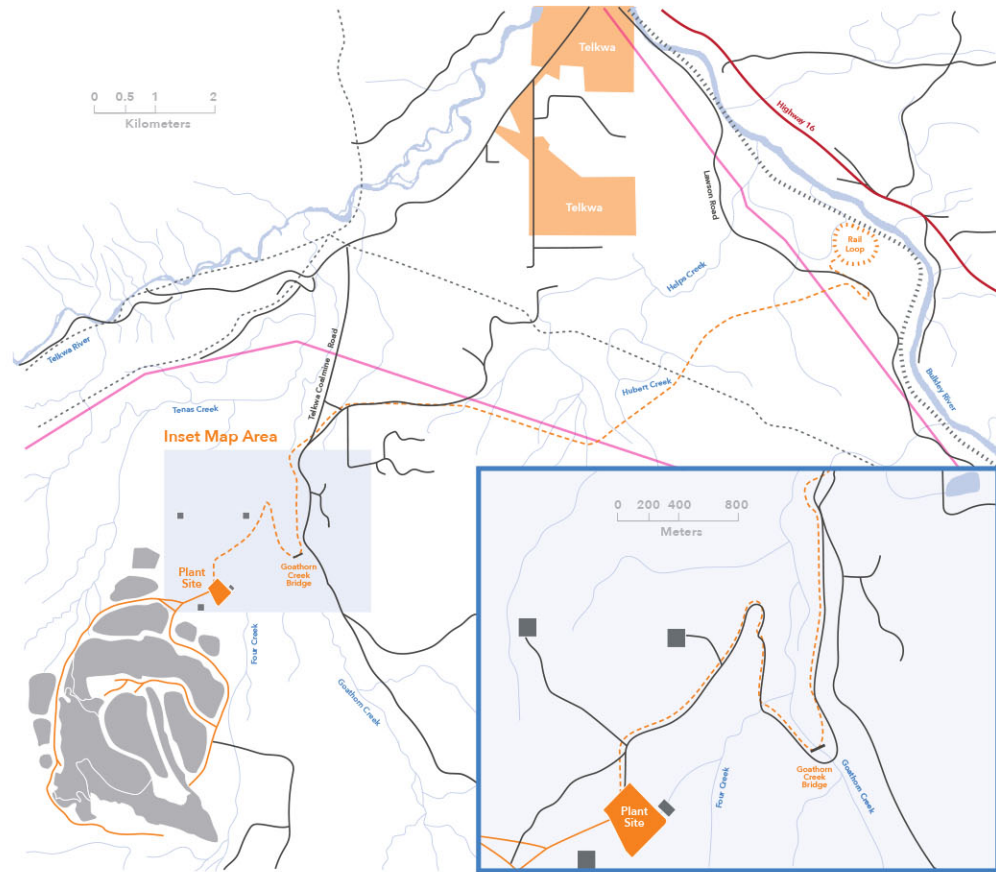


Coal is processed to remove the majority of the rock before it leaves site

- Coal is fed into the plant by a loader feeding the crusher.
- The proposed plant is designed to run at 145 tonnes/hour of feed coal.
- Coal is split into 2 streams (coarse and fine) by use of vibrating screens.
- Coarse coal stream has magnetite added and is put through a dense media cyclone.
- Fine coal stream is fed into a flotation circuit.
- Using diesel and MIBC (Methyl Isobutyl Carbinol), air bubbles stick to the coal/diesel mixture and float the materials out of the non-coal rocks.
- Both coal streams are put through a dewatering cyclone before being combined and stacked for export.
- Coarse rock stream is dewatered over a vibrating screen, with the water being recycled.
- Fine coal stream is dewatered by allowing the rock particles to precipitate in a thickener, then subjecting the thickened discharge to a belt press filter.
- The coal will adsorb some water through processing, requiring water to be added.
- The proposed processing flow sheet uses proven technology, currently used in many other processing plants.
- Dense media magnetite cyclones separate materials based on density. As coal is a low density material, it is freely separated from the higher density rock.
- Flotation cells separate material by how much the material adheres to water. Coal particles are more likely to adhere to air bubbles than other rock, so particles of coal attach to the air bubbles and float to the top of the float cell.
- Dewatering of the coarse coal occurs in centrifuges. These are like large salad spinners where water is spun out of the coal.
- Dewatering of the fine coal occurs in belt filter presses which are like cheese cloth.
- Coarse and Fine Coal are combined and stacked outside the plant by a conveyor.
- Coarse and Fine Washed Rock will be dewatered, combined, and stacked outside the plant by a conveyor.

This coal does not require drying
- reducing our energy use and emissions.





- Road leaving the mine site follows the existing Forest Service Road (FSR) down into the Goathorn Creek valley
- Crosses Goathorn Creek over a new bridge and continues up the FSR toward Telkwa Coal Mine Road
- Moves overland along property boundaries to the 500 kV power line
- Follows the 500 kV power line for 2 km, then continues overland, following the natural grade down to the rail loop
- Crosses Lawson Road approximately 7 km from Telkwa

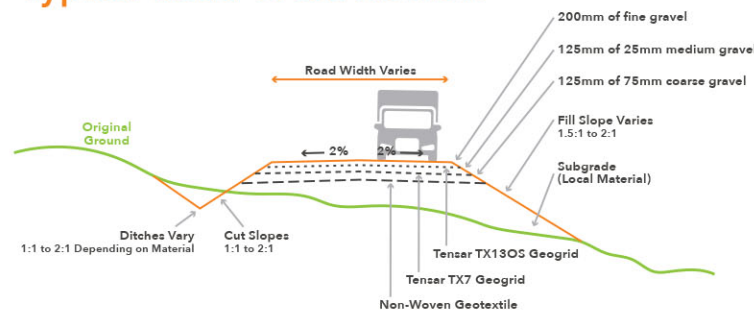
Culvert Details

- There are 118 culverts, ranging in length from 10 m to 25 m and have a diameter between 500 mm to 1800 mm
- Made from Corrugated Steel Pipe
- Designed for heavy flood conditions

Bridge Details

- There is one main bridge, the Goathorn bridge. It will span 30.5 m, with a clearance of 2 m over the high water mark of Goathorn Creek
- In addition, there will be eight clear span crossings, which will be comparable to forestry standard crossings. The average span will be about 15 m, with a clearance of 0.5 m over the high water mark
- Two types of crossings will be used:
 - Concrete slab spans
 - Steel/Concrete composites
- Use either pile or spread concrete footings
- Designed to carry a 110-tonne dynamic load of a B train truck
- Designed for heavy flood conditions

Typical Road Cross Section



Road Details

- 6 m wide for single lane
- 10 m wide for double lane sections and pullouts
- Maximum grade of -8% for loaded coal trucks
- Maximum grade of -10% for empty coal trucks
- Water management suitable to the specific terrain

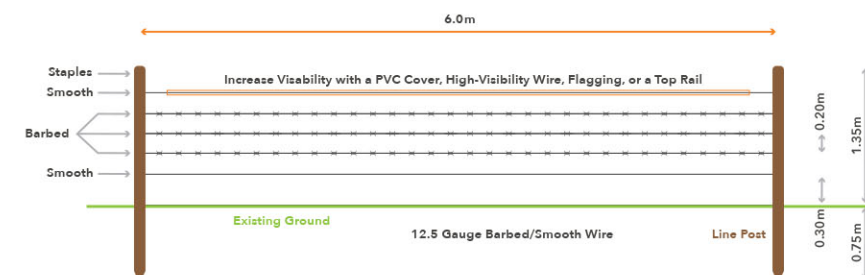
Purpose of Fence

- To reduce potential interactions between livestock and mine traffic on the Tenas Bypass Road within the grazing licenses

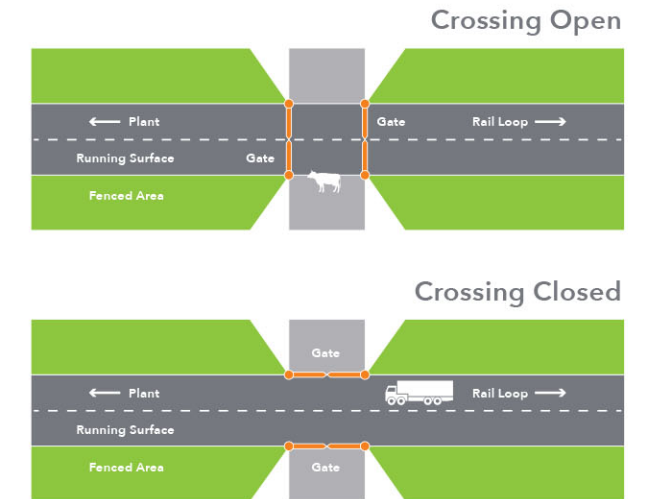
Fence Details

- Uses a combination of barbless and smooth wire to prevent animal injuries
- Treated wood fence posts for long life
- High visibility PVC on top wire to reduce bird impacts

Typical Fence Cross Section



Livestock Crossing



Access Considerations

- Gates at Lawson Road to maintain public safety
- Gates at intersection of Telkwa Coal mine Road and a resident's driveway to maintain public safety

Community feedback from early engagement drove the decision to build the Bypass Road at the outset rather than later in the project life.



We aim to create a positive legacy of mining, collaborating with our neighbours to develop opportunities that will contribute to supporting strong local communities.

Socio-economics

Data is being compiled to understand existing conditions, including:

- Population and demographics
- Local governance and administration
- Economic profile, including labour force and industrial activity
- Employment and income
- Local businesses
- Education and training
- Health and social services, well-being and related issues
- Emergency services
- Housing, infrastructure and utilities
- Community planning and development

Data will be verified through interviews with:

- Economic development officers
- Employment and training officers
- Business Associations
- Chambers of commerce
- Non-governmental and community-based organizations

The baseline program will inform the social effects assessment, which includes consideration of hiring, procurement, training, transportation, and economy

Land and Resource Use

Land and resource use data is being compiled to identify:

- Private land
- Public recreation
- Parks and protected areas
- Crown tenures such as agriculture, forestry, commercial recreation, guide outfitters, trappers, angling guides, water licenses, and utility corridors

Contractors and Suppliers

Telkwa Coal will use local contractors and suppliers where possible to ensure local businesses and the community benefits from the Tenas Project

Telkwa Coal anticipates sourcing the following locally:

- Construction supplies
- Safety supplies
- Plant maintenance
- Equipment maintenance
- Office supplies
- Catering and more...

Tenas Project Workforce

- 160 direct jobs anticipated during peak operations
- 220 indirect jobs anticipated during peak operations
- 230 direct jobs anticipated during construction
- ~25-year mine life

We are committed to sourcing as many jobs locally as possible.

Working at Telkwa Coal

- Day and night shifts, 365 days a year
- 12-hour shifts
- Most positions will follow a tentative shift rotation of 7 days on, 7 days off
- We are seeking the workforce's input on preferred shift rotation
- We will have a designated parking lot in town for employees, who will then be bused to work



Career Opportunities at Telkwa Coal

Operations

- Truck driver
- Track dozer operator
- Shovel/Loader operator
- Grader operator
- Plant operator

Maintenance

- Welder
- Electrician
- Heavy equipment mechanic
- Labourer
- Planner

Management

- Mine foreman
- Maintenance foreman
- Geologist
- Mining and Processing Engineer
- Environment Technician



We will continue to engage with the community with the aim of ensuring local socio-economic priorities and goals are understood and addressed.

Dust Management

Modelling

Air quality modelling will be conducted using data that represents the highest intensity of equipment activity for dust deposition and suspended particulate matter (TSP, PM₁₀ and PM_{2.5}) from the mine site, rail infrastructure and bypass road during the mine's life. This means the model will be conservative. Results will be available in the EA.

Dustfall and particulate matter monitoring will be conducted at several locations during the operations phase to confirm results of air quality modelling.

Mitigation

A number of dust mitigation measures will be employed:

- Covered truck boxes when travelling on the Bypass road
- Speed limits along Bypass road and on the Minesite
- Dust suppressants applied on Bypass road when required
- Maintenance of road surface material
- Topping agent applied to rail cars at the loadout



Noise and Vibration Management

Modelling

Noise modelling will be conducted using data that represents the highest intensity of equipment activity on planned noise from the mine site, rail infrastructure, and bypass road during the mine's life. This means the model will be conservative. Results will be available in the EA.

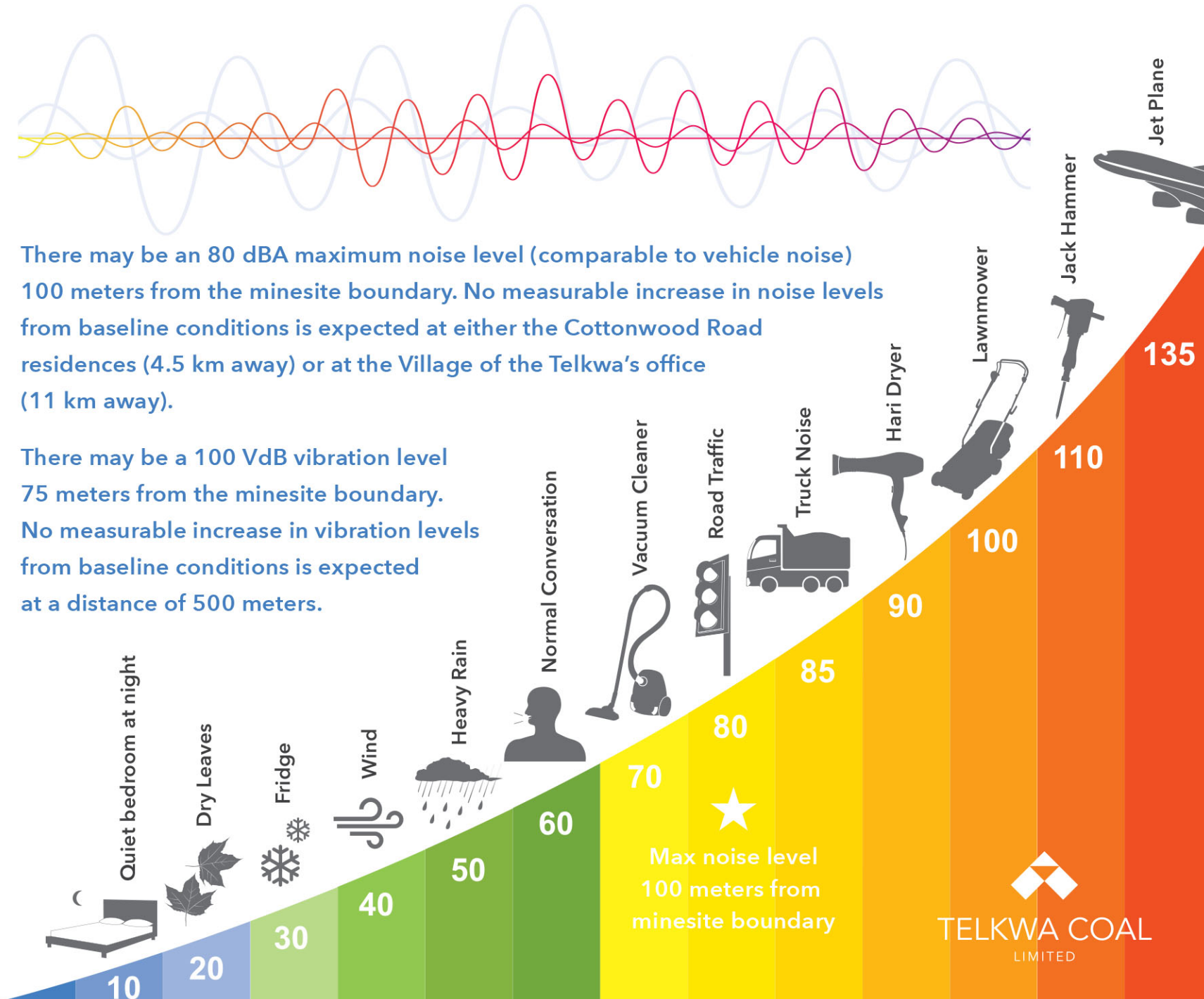
Noise and Vibration monitoring will be conducted at several locations during the operations phase to confirm results of noise modelling.

No vibration impacts are expected from the mine area or rail infrastructure

Mitigation

A number of noise & vibration mitigation measures will be employed:

- Timing of blasting and packing of charges
- Speed limits along bypass road (50 km/hr) and on mine site (70 km/hr)
- Speed limits for trains on rail loop (15 km/hr)
- No train whistles on site
- No backup alarms
- Use of berms and barriers
- Use of vegetation
- Maintenance of equipment, mufflers, and silencers

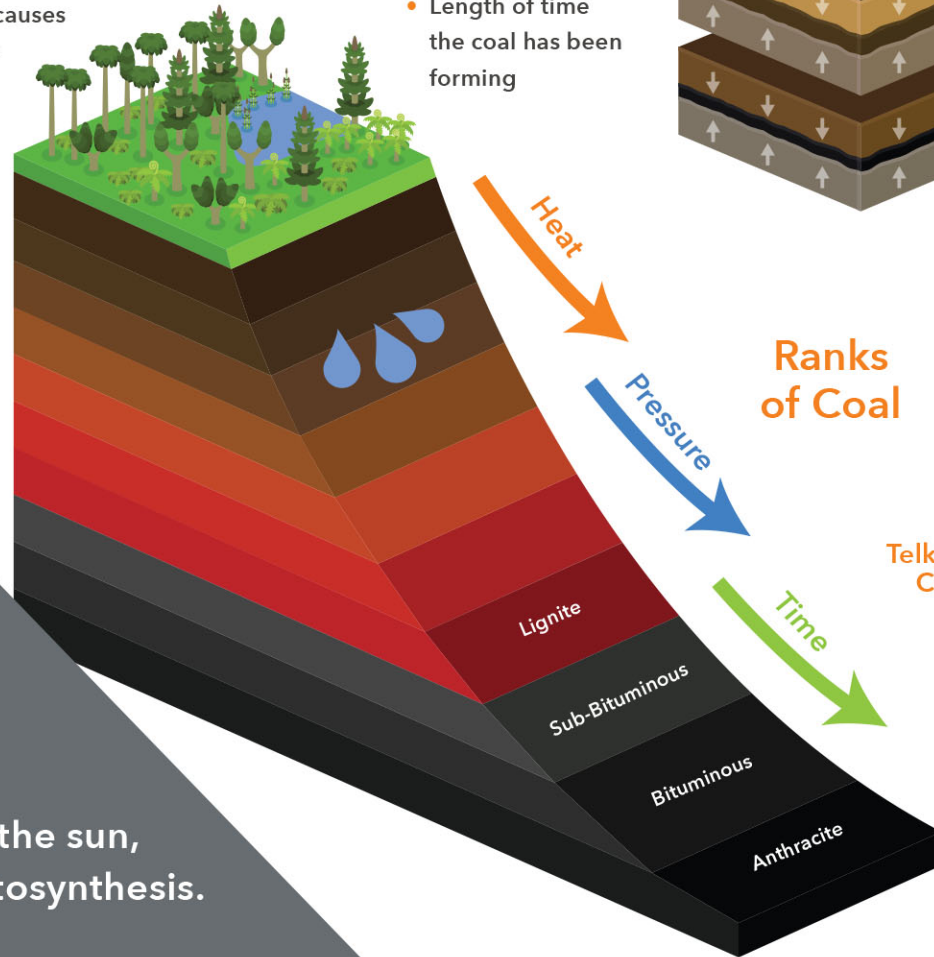
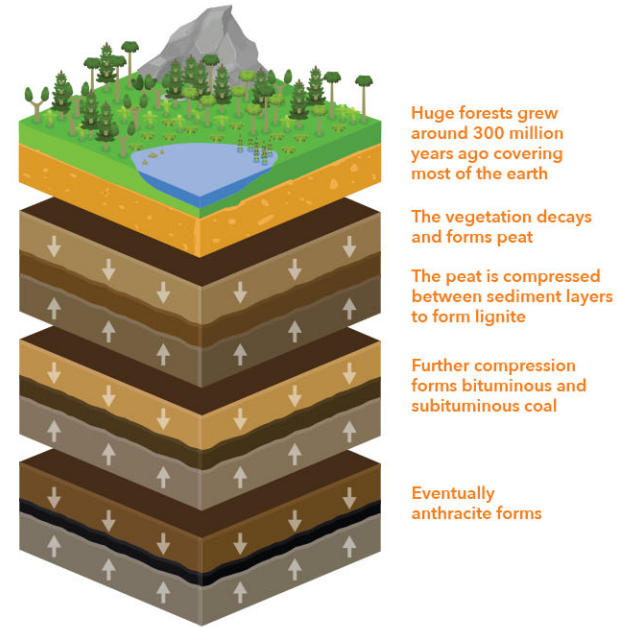


Coal Formation

- Starts when plants store energy from the sun, through photosynthesis
- Build-up of silt and sediments, along with movements of the earth's crust (tectonic movements) buries plants in swamps and peat bogs
- Buried swamps and peat bogs subjected to high temperature and pressure conditions and a lack of oxygen which stops the decay process and causes plant material to be transformed into peat and then coal where energy is locked in

Coal quality is determined by a variety of factors:

- Type of vegetation
- Depth of burial
- Temperature
- Pressure
- Length of time the coal has been forming



Coal formation begins when plants store energy from the sun, through photosynthesis.

Coal Mining

Coal is mined from seams using two methods

- Surface or "open pit" mining
- Underground mining

Excavated coal is separated (processed) from rock material to prepare it for commercial use

The harder the coal is, the higher its energy value and rank

Harder, blacker coal contains more carbon and less moisture and ash than lower grade coal

The grade of coal and its caking ability (coal's ability to be converted into coke which is a pure form of carbon that can be used in basic oxygen furnaces in steel mills) is determined by the coal's rank

- Rank - measure of the amount of volatile matter, degree of metamorphism, mineral impurities and the coal's ability to melt, swell and solidify when heated.

Canada is the third largest exporter of metallurgical coal, after Australia and the US

- Alberta and BC produce 85% of Canada's coal
- Canada produced 62.3 Mt of coal in 2018 with 49% being metallurgical coal for steel manufacturing

Metallurgical Coal

Differs from thermal coal due to its carbon content, ability to swell, and caking ability:

- Fed into ovens and subjected to high temperature conditions without oxygen to prevent combustion
- Heated to approximately 1,100 degrees Celsius
- Removes volatile compounds and impurities to leave pure carbon (coke)
- Coke is then fed into a blast furnace with iron ore and limestone to separate the iron from its ore to create Pig Iron
 - Pig Iron is further refined to make steel

Tenas coal is mid-volatile, semi-soft coking coal:

- Limited global supply of semi-soft coking coal
- Preferred by steel mills since it fits more uniformly into coke oven blends
- Current semi-soft coal market is dominated by high-volatile semi-soft coals from Australia



Canada is the world's third largest exporter of metallurgical coal.

Metallurgical coal differs from thermal coal due to its higher carbon content and the ability to swell.





Telkwa Coal is proposing to develop a surface coal mine called the Tenas Project within the Telkwa coalfield in Northwest British Columbia.

Telkwa Coal Limited, a subsidiary of Australian-based and ASX listed Allegiance Coal, is proposing to develop the Tenas Project, a steelmaking or metallurgical coal mine in British Columbia's northwest region. Telkwa Coal is a joint venture partnership with 90% owned by Allegiance Coal, and 10% by Itochu Corporation of Japan.

The Tenas Project is located in the Bulkley Nechako region, 25 km south of Smithers and 7 km southwest of Telkwa, BC. The area was historically mined between 1918 and 1985.

The Tenas Project entered the British Columbia Environmental Assessment process in November 2018, with the submission of the Project Description. The Project will produce approximately 775,000 to 825,000 tonnes of steelmaking coal annually, with a mine life of about 25 years including construction, operations, and reclamation phases. Project details are being further refined. The Project is undergoing a comprehensive regulatory review.

The steelmaking coal would be shipped on the CN rail line to Prince Rupert's Ridley Terminal for export to steel mills - most likely in Asia.

Any material changes to the Project's planned activities in the future will require additional Wet'suwet'en, community, and regulatory reviews.

We look forward to continuing the open dialogue with our neighbours to address community questions, and developing the Tenas Project responsibly, and respectfully.

Telkwa Coal has retained many local experts for environmental, socio-economic, cultural, and exploration programs.



Our Commitments

Health And Safety

We believe that all activities can be completed with zero harm to personnel and that all incidents and injuries are preventable. We will provide resources to manage health and safety and expect all employees and contractors to share in the responsibility.

Indigenous People

We acknowledge and respect the unceded rights, title, interests, culture and aspirations of the Wet'suwet'en to 22,000 square km of traditional territory. In April 2017, we signed a Communications and Engagement Agreement as an initial, formal step in our commitment to the Wet'suwet'en.

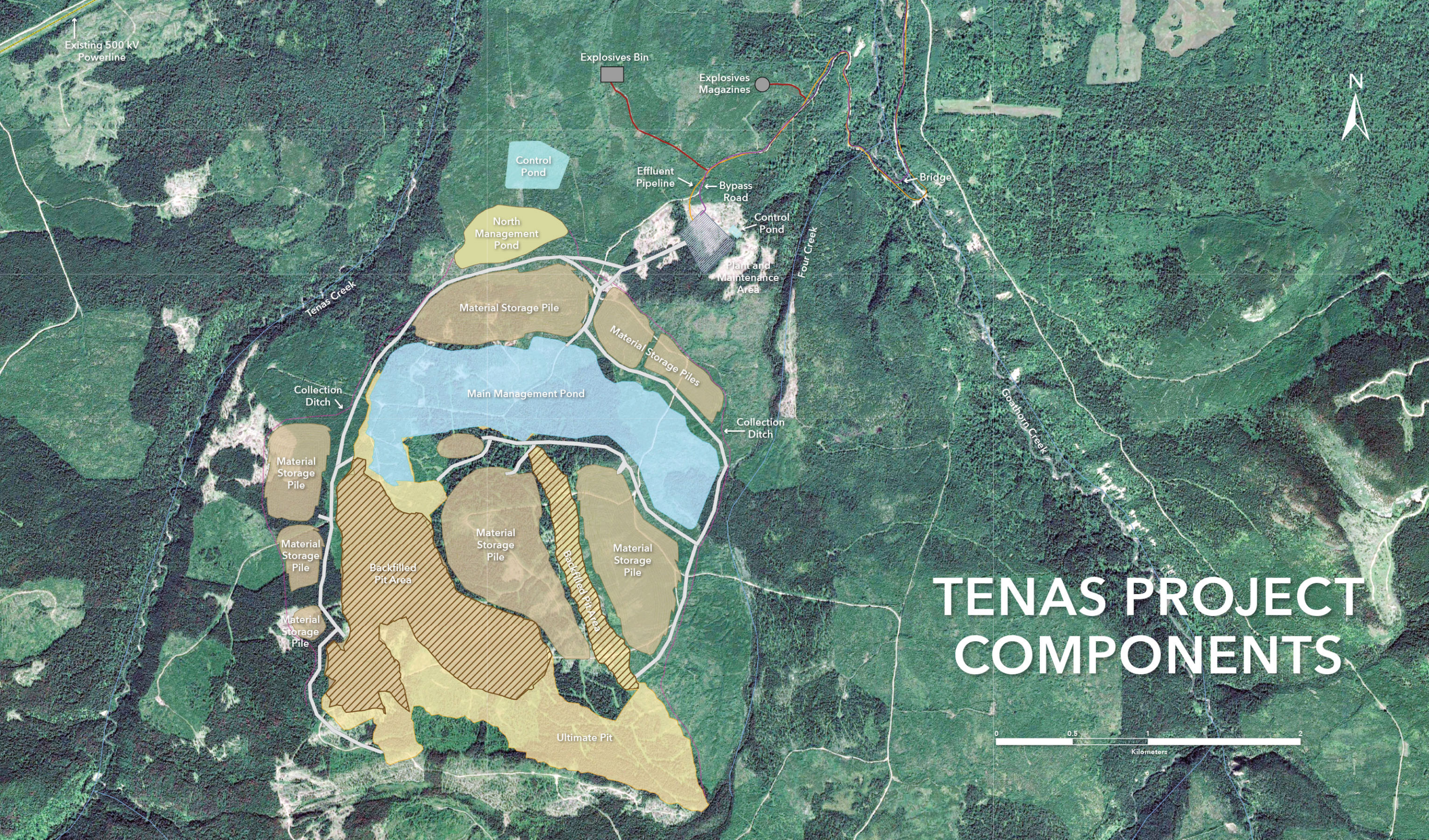
Environment

We will ensure that our activities are responsible and protective of the environment. Our design and operational activities adhere to the mitigation hierarchy to avoid and minimize impacts, restore on-site and offset, where necessary.

Community







We will continue to engage with the community with the aim of ensuring socio-economic priorities and goals are understood and addressed.

















TENAS PROJECT COMPONENTS

Existing

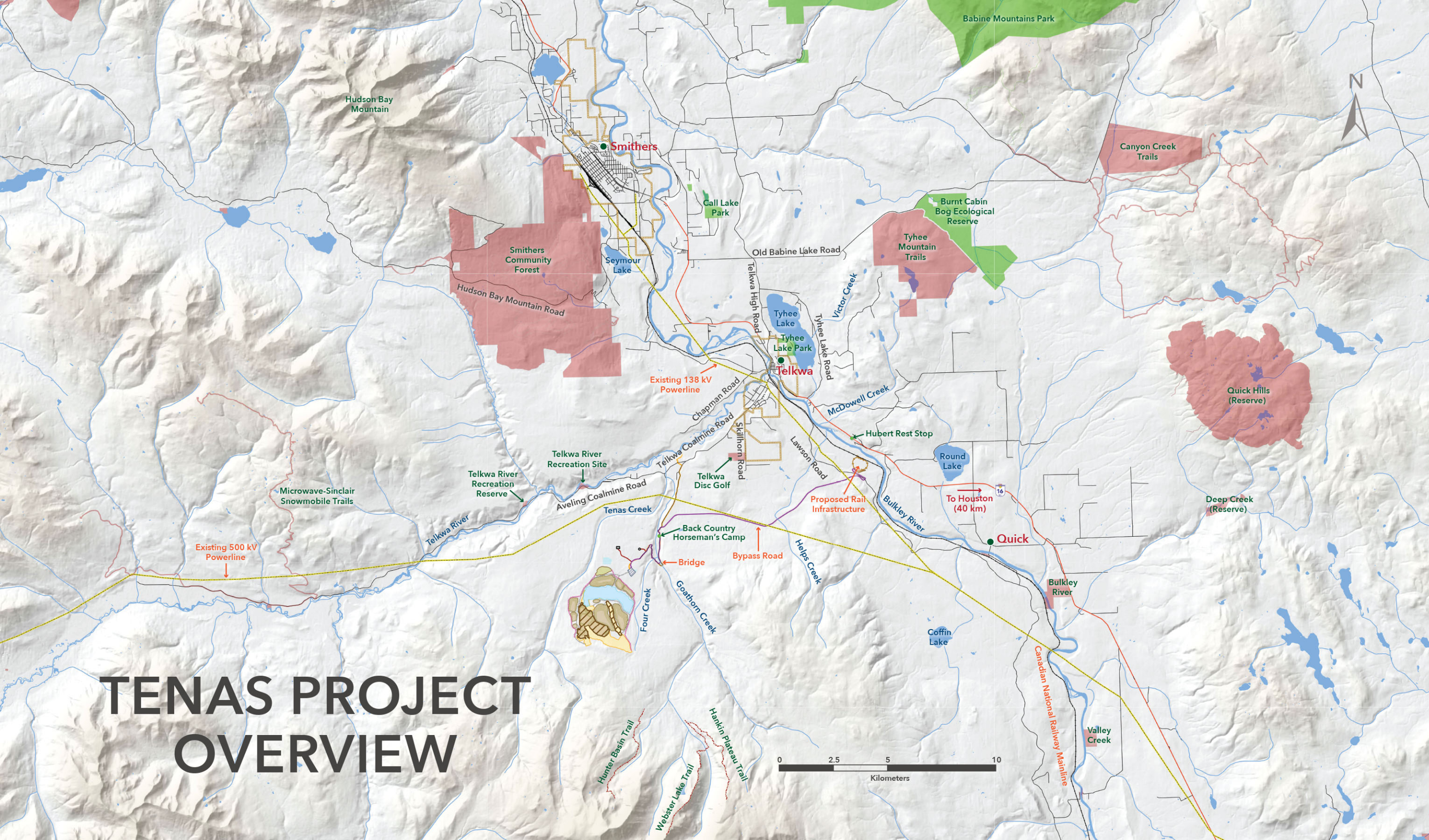
-  Power Lines
-  Highway
-  Secondary Roads
-  Municipal Boundaries
-  Rail Line
-  Explosives Roads (FSRs)

Proposed Project Components

-  Ultimate Pit
-  Main Management Pond
-  North Management Pond
-  Control Pond
-  Material Storage Piles
-  Collection Ditches
-  Backfill
-  Effluent Pipeline
-  Plant and Maintenance Area
-  Bypass Road
-  Mining Haul Roads
-  Explosives Facility



TENAS PROJECT OVERVIEW



Existing

- Power Lines
- Highway
- Secondary Roads
- Municipal Boundaries
- Rail Line
- Explosives Roads (FSRs)
- Recreation Sites
- Parks

Proposed Project Components

- Ultimate Pit
- Main Management Pond
- North Management Pond
- Control Pond
- Material Storage Piles
- Collection Ditches
- Coal Stockpiles
- Backfill
- Effluent Pipeline
- Plant and Maintenance Area
- Rail Loadout
- Bypass Road
- Mining Haul Roads
- Explosives Facility



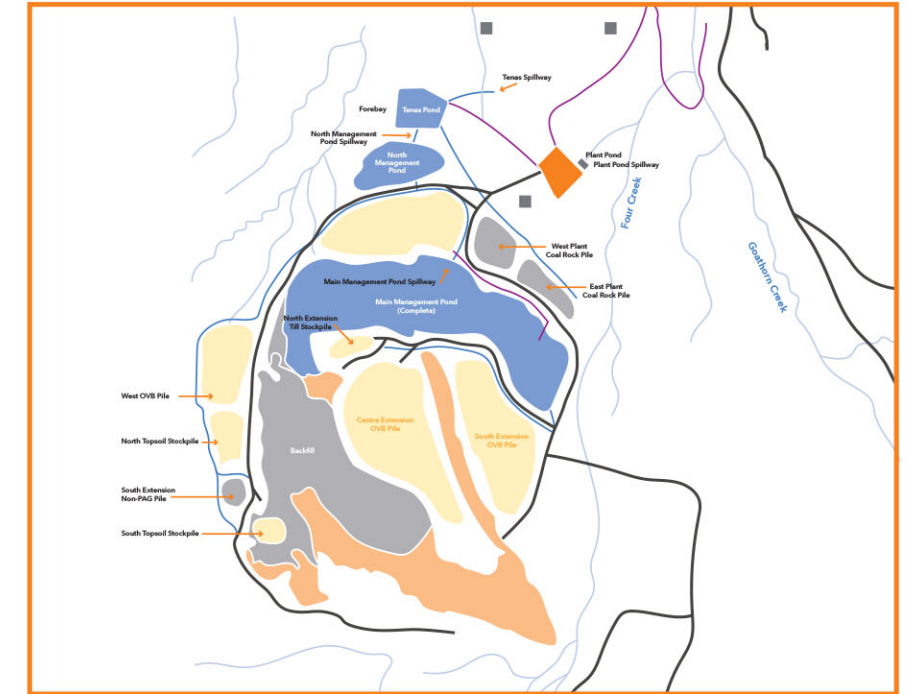
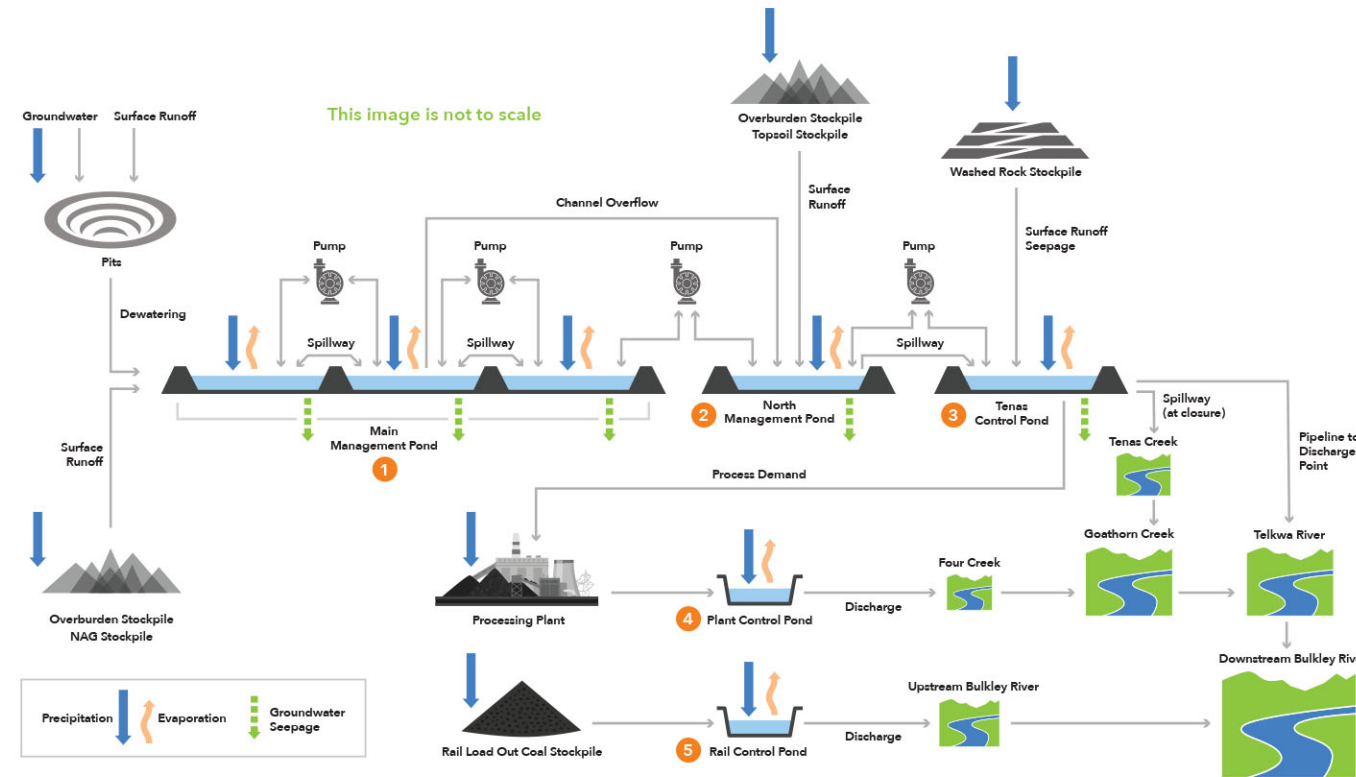
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Water Management Plan

- Water collected on site moves through multiple ponds, from the Main Management Pond, to North Management Pond to the Tenas Control Pond
 - This process allows suspended sediment to settle in the ponds
- Water deposited in the Pit will move, by gravity or pumping, to the Main Management Pond
 - Water in the Main Management Pond can flow to or be pumped to the North Management Pond
 - Water in the North Management Pond can flow to or be pumped to the Tenas Control Pond
- The Tenas Control Pond is the lowest elevation water management facility in the proposed mine development
 - Used as a water storage facility and the last sedimentation pond for water that is to be discharged or is pumped for use in the plant and maintenance shop
 - Water in the Tenas Control Pond is tested regularly to monitor water quality when necessary, even when there is no discharge
 - Water is released through a pipeline down to a discharge point. The current plan is to have this discharge point in the Telkwa River
- Water in the Plant Control Pond is recycled into the plant process water before drawing from the Tenas Control Pond
 - The Plant Control Pond is not forecast to discharge during operations
- The Rail Control Pond collects contact water from the coal stockpile and discharges into the Bulkley River
 - Water in the Rail Control Pond is tested regularly to monitor water quality, even when there is no discharge

Water Sourcing

- Water for the project will be primarily sourced from precipitation that falls within the project boundaries (on site)



Non-Contact Water

- From areas that have not been affected by mining activities
- This water will be diverted around the Tenas Project site

Water Movement On Site

- Depending on where precipitation falls on site, the water is directed and collected in one of five locations:
 - 1 Main Management Pond
 - 2 North Management Pond
 - 3 Tenas Control Pond
 - 4 Plant Control Pond
 - 5 Rail Control Pond

Contact Water

- Water that flows through the active mine area is called contact water
- Contact water is collected and quality tested before it is released
- Contact water is recycled and is used to cover rock material and to separate coal from the rock in the processing plant

Watersheds

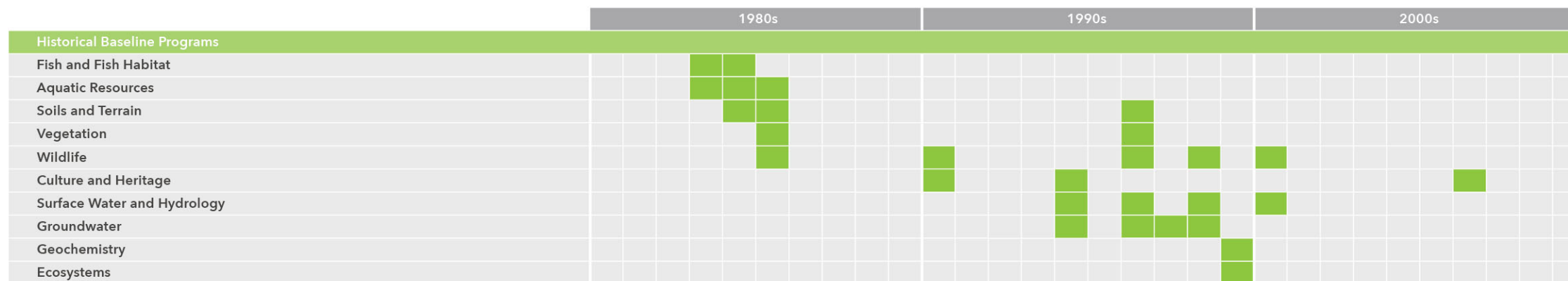
- The mine straddles two creek watersheds
 - half of the site is in the Tenas Creek watershed, and half of the site is in the Four Creek watershed
- Water modelling and historical records show that there is sufficient water levels even in low water years to supply the site for both water needed to cover rock material and to process coal
- Precipitation that falls outside of the project is diverted to prevent it from becoming contact water



Example of water pipeline

REGULATORY SCHEDULE

TENAS PROJECT



1 Dates shown are Telkwa Coal's best estimates only.

2 Progressive reclamation at specific sites may begin during the Operation Phase. Post-closure reclamation activities are anticipated to require two to three years, with continued monitoring beyond this time frame.



The History of Coal Mining in Telkwa



Miners of Telkwa River Coal Mine 1920 (Image B-01748 courtesy of the Royal BC Museum and Archives)



Telkwa Coal Mine 1947 (Image I-26278 courtesy of the Royal BC Museum and Archives)



Prospectors with Minnie Goodwill outside of a cabin. (BV Museum)



Telkwa Coal Mine 1920 (BV Museum)



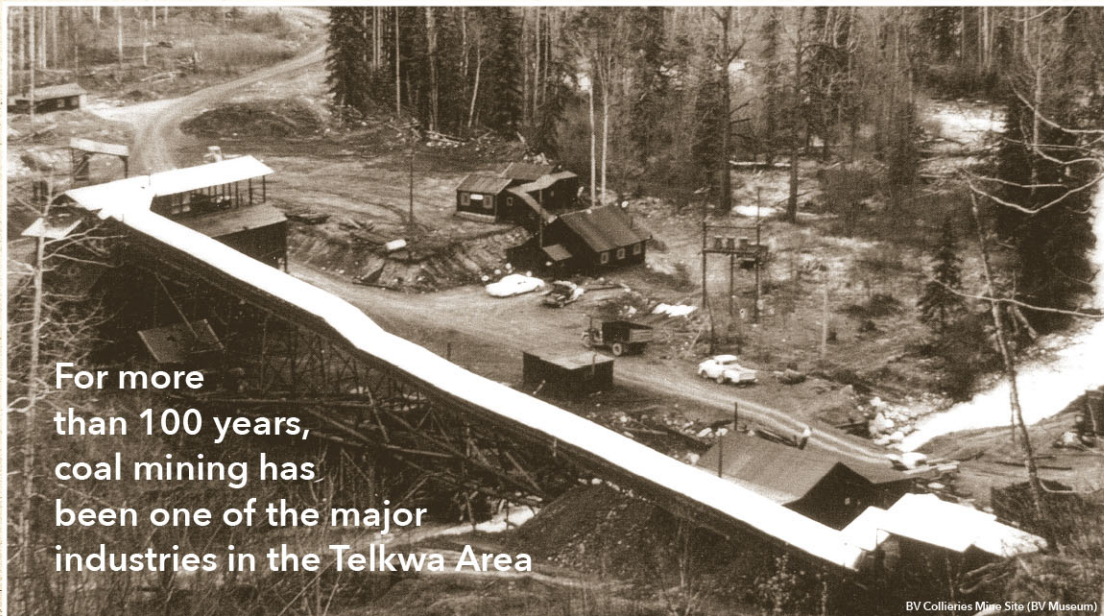
Monk Family at Telkwa Coal Mine (BV Museum)



Betty Coal Mine Shaft 1925-35 (BV Museum)

For more than 100 years, coal mining has been one of the major industries in the Telkwa area - from the optimistic days of mineral exploration in the early 1900s, to the peak of coal exporting with Bulkley Valley Collieries in the late 1950s, and ongoing exploration throughout the 1980s and 1990s.

The industry has provided full time work to some and critical seasonal work to many. Today, the coal industry's rich history is embedded in the Telkwa community.



For more than 100 years, coal mining has been one of the major industries in the Telkwa Area

BV Collieries Mine Site (BV Museum)

1800 - 1910

In the late 1860s, the telegraph crews that traveled the Bulkley Valley remarked on the agricultural and mineral potential of the lands. In 1901, the first coal leases were staked at the Telkwa River.

The main focus of exploration and development was the Goathorn Creek area, five miles up the Telkwa River from its confluence with the Bulkley River.

1910 - 1920

Due to the 1914 completion of the Grand Trunk Pacific Railway, there was reliable transportation for people, equipment, agricultural products, and importantly, for coal. In addition to the railway, the road networks were improved and the bridges over the Bulkley and the Telkwa Rivers allowed ease of access to the coal mines up the Telkwa River.

The McNeil Mine, was founded in 1914 and operated on the south side of the Telkwa River. Coal for heating was common at this time, not only for residential use, but also for Telkwa's school, churches, and the nursing station.

1920 - 1940

By the mid-1920s, mining became Telkwa's steadiest employer. Goat Creek Colliery was operated from 1920 to 1925 by Messrs John M. Gillespie and J. Wilson of Major Aveling and Partners. The Aveling Coal property, along with the Betty Mine, supplied both domestic heating coal and coking coal.

In 1930, Frank Dockrill began mining at Goathorn Creek. In 1937, he purchased the mining rights. Bulkley Valley Collieries became a main employer in Telkwa.

**BULKLEY VALLEY
COAL**

-- The Better Coal --

In buying Bulkley Valley Coal you get the highest grade of coal on the market. You keep your fuel dollar in Central British Columbia. You help solve the local unemployment situation. You help develop a basic industry in your own sections of the province.

F. M. DOCKRILL, Operator.
Telkwa, B.C.

1940 - 1960

During the Second World War, demand for coal greatly increased and Bulkley Valley Collieries experienced a boom. To help ensure a steady supply of coal, soldiers were assigned to work at the mines.

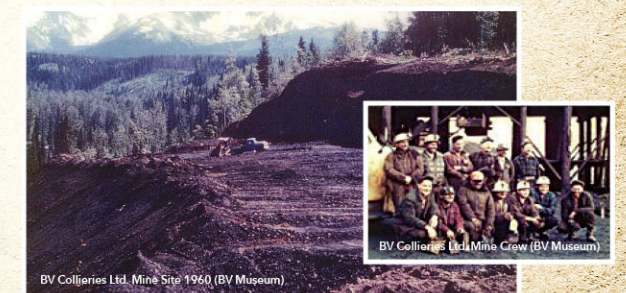
From 1943 to 1952, about 9,000 tons of coal were sold per year. Shortly after, in 1953, No. 4 Mine opened, and employed over 40 people.

Bulkley Valley Collieries supplied coal to all markets, shipping by rail to industries such as the pulp mill and transporting heating coal to homes and businesses.

1960 and on...

Over time, coal production dwindled as other fuel sources became more prominent. The Telkwa River area saw limited mining activity due to ever-changing ownership, including Crowsnest Resources in the 1980s and Manalta in the 1990s.

Exploration continued, extending up Tenas Creek; at this time thought to have the largest coal deposit in the Telkwa coal fields.



BV Collieries Ltd. Mine Site 1960 (BV Museum)

BV Collieries Ltd. Mine Crew (BV Museum)