

Mining = Opportunity for Indigenous Communities in British Columbia

Dave Lefebure, Ph.D., P. Geo.



March 2021 - slide deck

At Your Service – My Role Today

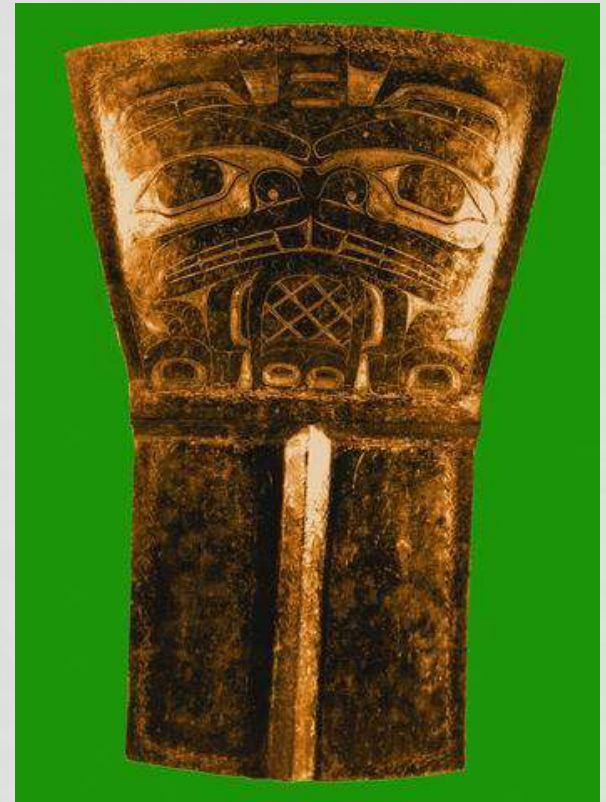
- Share some examples of Indigenous business opportunities related to mining
- Explain mining in everyday language
- Share some insights into this unique sector
 - *“Like forestry, a natural resource sector, but you can count the trees while the new mines are hidden.”*
 - *“Like technology industry, a high risk sector, but activity occurs in challenging, often remote environments.”*
 - *“Very different from the oil and gas sector, the other extractive industry”*

Presentation Outline

1. Opportunities for Indigenous mining jobs, businesses and agreements in British Columbia
question and answer session
2. Life cycle of mining related to British Columbia and potential economic opportunities for indigenous communities
3. End with a few key points relevant to economic development officers related to mining
question and answer session

Indigenous Peoples & Minerals

- Indigenous Peoples have long used and traded rocks, minerals and metals
- The first explorers with keen eye for discovering valuables from the earth
- Stone, obsidian, copper, gold, jade, agate, etc.
- These minerals highly prized and culturally important



Why Talk About Mining?

Four reasons:

1. Jobs and contracts
 - mining is #2 employer of Indigenous people in Canada
2. Numerous agreements with Indigenous communities
 - potential for significant benefits
3. Mines are spread across British Columbia
 - remote, rural and suburban locations
4. Mining sector not well known
 - many people have never visited a mine or learned about them

Don't miss economic development opportunities!

Indigenous Employment in Mining in British Columbia

- High levels of major mine employees are Indigenous
- Total of 38,000 jobs in the mineral sector*
- Many attractive jobs that build work skills
- Jobs exist in all regions of the province, including near northern communities

* PDAC Infographic

Wide Variety Mine Jobs



Excavator Operator



Mill Processing Technician



Chef Apprentices



electrician



Photos courtesy of Jerry Asp⁷

Wide Variety Mine Jobs



Mine Workings
Surveyor`s helper
Miner
Driller
Heavy Equipment Operator
Shift Foreman
Etc.

Mill/Shop
Trades helper/
apprentice
Warehouse assistant
janitor
Technicians
Certified trades
Etc.

Offices
Students
Secretarial
Admin
Engineers
Geologists
Technicians
Accountant
Etc.

Camp
Janitorial
Kitchen
Cook
Admin
Repairs
Safety
Security
Etc.

Roads,
Etc.
Snow removal
Road work
Trucking
Gravel pit
Supplies
Diesel fuel
Explosives
Etc.

Over 160 different mining jobs

Goods and Services Contracts

- Mines require a wide variety of goods
 - Food, lumber, gravel, vehicles and parts, signs, pickets, ...
- Mines often contract out specific services
 - Security, environmental monitoring, snow removal, food services, accounting, road maintenance, transportation, ...
- Companies of various sizes bid on these contracts
 - Many mines prefer to contract local companies and recognize the value of using Indigenous companies

BC Mines Purchase \$2.9 B in Goods and Services Annually

- More than 3,700 suppliers for British Columbia mines based in the province
- \$2.9 Billion worth of goods and services



Indigenous-affiliated Businesses Related to BC Mining Sector

- ~120 Indigenous-affiliated suppliers active in B.C. mines in 2018, representing in \$265 million in procurement
- Associated with more than 25 First Nations or Indigenous Development Corporations
- Mining is a significant employer of Indigenous people
 - at the Brucejack and Red Chris mines in Northern BC, more than 30% of each mine's work force is Indigenous

Tahltan Nation Development Corporation (TNDC)

- Formed in 1985 to build 10 homes in Telegraph Creek
- In 1988 the Tahltan Nation and North American Metals negotiated BC's first Impacts and Benefits Agreement
 - Work on building the 160 km road to mine site with a three-year upgrading and maintenance contract
 - A five-year open-pit mining contract
 - Work building the settling ponds for the mine
 - General camp maintenance
 - A minimum of 20% of the work force at the mine site





Tahltan Nation

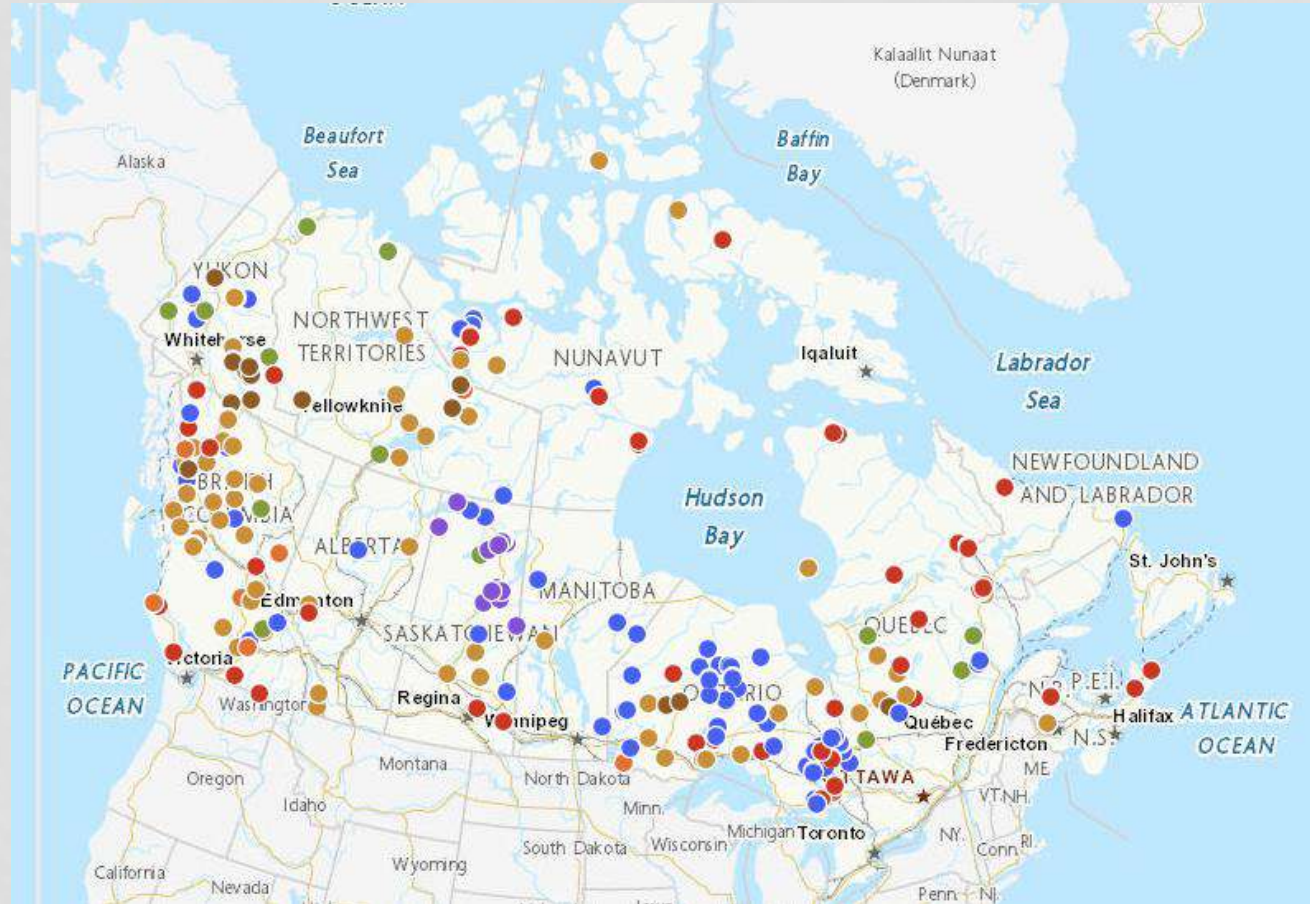
DEVELOPMENT CORPORATION

- Owned by the Tahltan Band, Iskut Band and the Tahltan Central Council
- Initially focused on construction for the mining industry
- Expanded to road construction and maintenance, heavy construction, gravel and mine tailing hauling, remote industrial camp operations
 - Owns and leases a fleet that includes more than 30 bulldozers, excavators, graders, loaders, rock trucks, chippers and service vehicles
- Has developed more than 20 joint venture companies to service the mining industry

Indigenous Community Active Mining Agreements

Active Agreements

- Impact and Benefits Agreement
- Socio- Economic Agreement
- Exploration Agreement
- Participation Agreement
- Cooperation Agreement
- Memorandum of Understanding
- Letter of Intent
- Surface Lease Agreement
- Other Agreement Type



Two Agreements

Tk'emlups Indian Band and Skeetchestn Band

- In 2008, the two bands signed the New Afton Mine Participation Agreement with New Gold
 - employment, education and training, culturally relevant environmental principles, business and contract opportunities and financial considerations for the bands
 - 23% of employees at the New Afton site were Indigenous in 2017
- In 2010, the bands signed the first Economic and Community Development Agreement (ECDA) with the B.C. government to share the direct mineral tax revenue from the New Afton mine
 - The mine started production in 2012; it is estimated that the revenue-sharing deal will generate \$30 million dollars for the bands.



We would like to acknowledge that we are located on the Stk'emlúpsmc te Secwépemc territory, situated within the unceded traditional lands of the Secwepemc Nation. New Afton appreciates the partnership that we have with the Stk'emlúpsmc te Secwépemc Nation and respect the territory and land on which we work, gather and play.

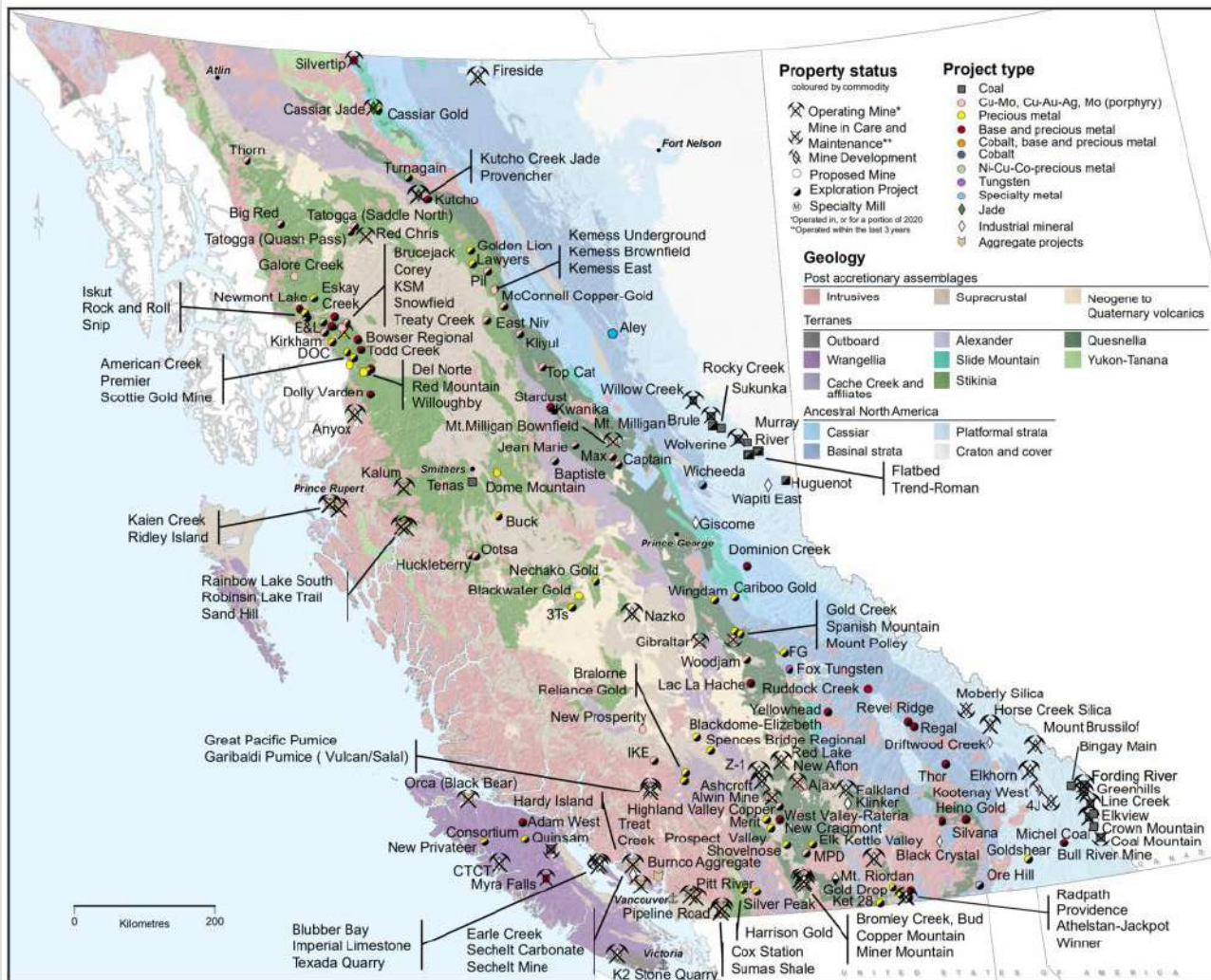
BC Economic and Community Development Mining Agreements (ECDAs)

- ECDAs - Agreements between Government and First Nations for sharing the direct mineral tax revenue on new mines and major mine expansions.

- [Doig River First Nation](#) - 2017
- [Halfway River First Nation](#) - 2015
- [Ktunaxa Nation](#) - 2017
- [Kwadacha First Nation](#) - 2017
- [Lheidli T'enneh](#) - 2017
- [Lhoosk'uz Dene Nation](#) and [Ulkatcho First Nation](#) - 2020
- [Lower Similkameen Indian Band](#) and [Upper Similkameen Indian Band](#) - 2013
- [McLeod Lake Indian Band](#) - 2010
- [Nak'azdli Band](#) - 2012
- [Nisga'a Nation \(Brucejack Mine\)](#) - 2018
- [Nisga'a Nation \(Kitsault Mine\)](#) - 2014
- [Nlaka'pamux First Nations](#) - 2013
- [Saulteau First Nations](#) - 2015
- [Stk'emlupsemc of the Secwepemc Nation \(Kamloops Band\)](#) - 2010
- [Tahltan Nation](#) - 2018
- [Takla Lake First Nation](#) - 2017
- [Tsay Keh Dene First Nation](#) - 2017
- [West Moberly First Nations](#) - 2015
- [Williams Lake Indian Band](#) - 2013
- [Xatsull First Nation \(Soda Creek\)](#) - 2013

British Columbia

Mines, Mine Development Projects and Exploration Properties (2020)



from Provincial
Overview of
Exploration and Mining
in British Columbia,
2020
Information Circular
2021-01

Large Mines in British Columbia

Copper +/- Gold
+/- Molybdenum



Steel-making
Coal

”moly*” – critical metal



April 6, 2021

* MOLYBDENUM

Many Mine products



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Mines of many Sizes



small

large



3. Mining Wide Spread Over British Columbia

Placer Gold

Industrial Minerals

Sand and gravel in most areas



BC Mineral Resource Products

Metals

Copper, gold, zinc,
silver, molybdenum

Minerals and Rocks

Limestone, gypsum,
magnesite, dolomite,
jade, granite,

Coal

Steel-making coal*

Construction Materials

Gravel, sand, crushed
rock, rip rap

Mining Not Well Known

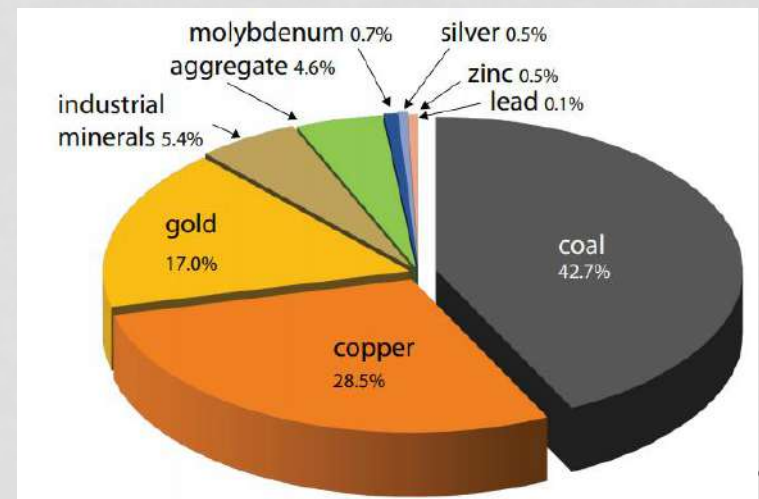
- Why?
 - Not generally taught in schools.
 - Many mines are in remote and rural areas.
 - Access to these industrial sites is restricted for safety reasons.
 - Mining is typically the safest heavy industry in Canada.
 - Mining products are often processed to a metal or mineral product before they reach the consumer.
 - Mining sector focuses on the job at hand.

Do you know the following highlights about the mining sector in British Columbia?

British Columbia Global Mining Leader

- Canada is the world's 4th largest producer of steel-making coal; British Columbia is the key producer
 - 7 coal mines
- Major copper producer with increasing gold production
 - 9 metal mines
- Significant industrial minerals production
 - more than 30 quarries
- Numerous sand and gravel pits
 - Roughly 1,000 operations

\$9.3 billion (2020)



Questions?

Mining Opportunities Can Come with Concerns

B.C. imposes interim ban on resource development to protect caribou



New forestry, mining in South Peace to be curtailed for 2 years as stakeholders work on management plan

CBC News · Posted: Jun 20, 2019 10:50 AM PT | Last Updated: June 20, 2019



Ask questions and learn about mining if you get involved.

Government Role in Exploration and Mining

Provincial and Territorial governments:

- Administer mineral claims & regulate exploration activities
- Generate maps and reports to support exploration
- Permit mine developments and mines
- Enforce safety regulations and assist with mine training
- Require reclamation plans and reclamation bonds for mines

Federal government :

- Administer mineral rights on reserves
- Can participate in environmental assessments of mine proposals
- Helps administer underground exploration, mining, processing and shipping of uranium

Restrictions on Online Claim Staking

No staking

- Indian reserves
- Parks and some special protected areas
- Temporary areas under study by government

Staking Allowed on Private Land

- More regulations apply for claims on private land
- Mineral sector companies often avoid private land

Life Cycle of Mining

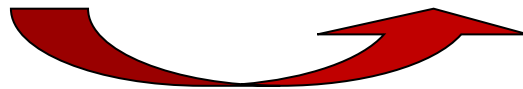
Prospecting & Early Exploration



Mine Closure & Reclamation



Indigenous Business Opportunities



Mineral Exploration



Mine Development



Mining

Mineral Exploration Path



Prospecting



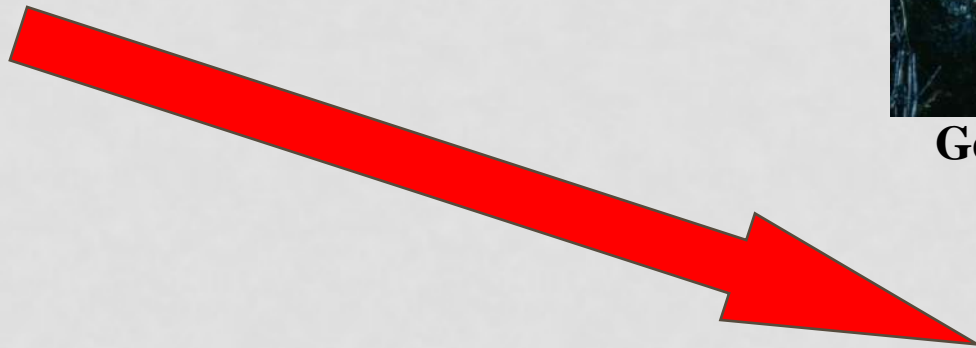
Geochemistry



Geophysics



Drilling



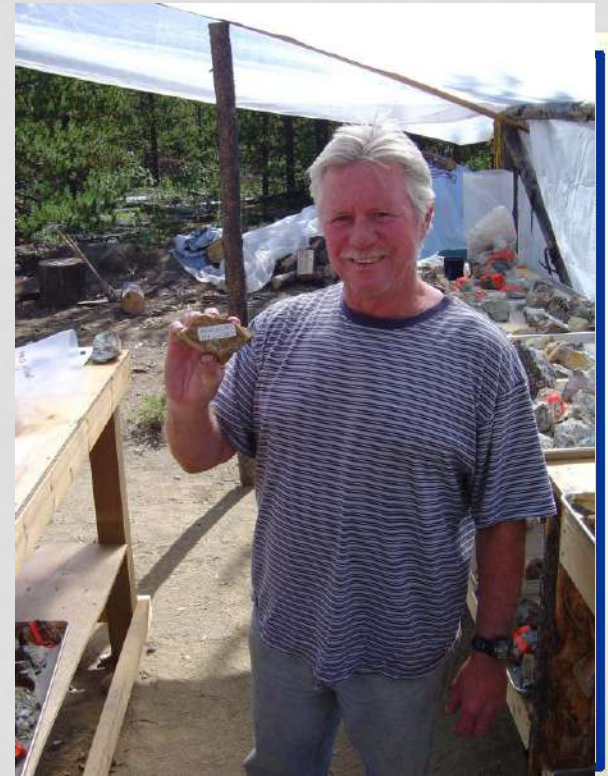


Early
Exploration

Exploration Starts with a Find or idea

Prospecting and preliminary exploration is triggered by:

- a prospector finding an interesting rock
- a company deciding to work near an exploration discovery
- Follow-up of a government survey showing interesting exploration potential
- Etc.





Early
Exploration

Prospectors



- Used to make discoveries of most British Columbia metal, coal and industrial mineral deposits
- Often work alone spending own \$
- Hike through the bush, walk new logging roads, follow creek beds, etc.
- Use a rock hammer and gold pan
- Collect rock and stream silt samples
- Hope to find a property to sell to a company



Prospector to Chief Executive Officer

J. Paul Stevenson



1970s, Duckling Creek,
north of Fort St. James, BC



2000's, CEO Vancouver-
based exploration company



Diamond Jubilee Award winner, 2013



Early
Exploration

Who – Small Companies (“junior companies”)



Advanced
Exploration

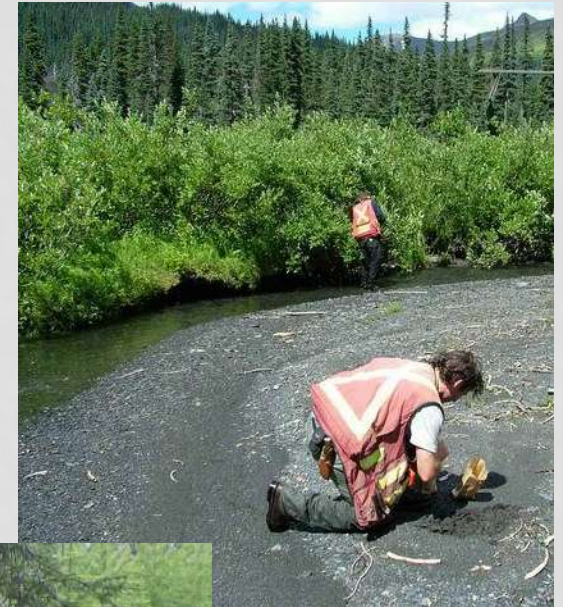
- Several to tens of full time employees
- Often a single office (Vancouver)
- Many do not own a mine
- Stocks trade for cents to dollars
- Many exist for less than five to ten years





Early
Exploration

Collecting Silt Samples from Creeks



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Early
Exploration

Geologist Examination

- Office work - reviewing previous work, reading government publications
- Regional traverses, sampling, visiting known mineral localities, mapping



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Early
Exploration

Trenching to See & Sample bedrock



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Early
Exploration

Airborne Geophysical Survey

- Geophysical Survey – the collection of data from above or below the earth's surface using a sensing instrument to measure a characteristic like magnetism





Early
Exploration

Ground Geophysics IP* survey

Lisa at receiver



Josh setting up IP end poles



* Induced Polarization



Early
Exploration

Early Exploration Jobs

- Prospector
- Line Cutters
- Samplers (soil, etc.)
- Geophysical Crew
- Geologist
- Drillers
- Kitchen Helper
- Cook
- Camp Expediter
- Jack of All Trades
- Camp Set-Up





Advanced
Exploration

Drilling (road access)



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Advanced
Exploration

Helicopter Drill Set-up





Advanced
Exploration

Drill Core

Start of Hole



Removing drill core from tube





Advanced
Exploration

Cutting Drill Core





Advanced
Exploration

Geologist Logging (Describing) Drill Core





Advanced
Exploration

Core Boxes

ChiyoneStar Enterprises

- Constructs wooden core boxes to store core
- Small enterprise
- Probably supplies Tahltan- Blackhawk drilling company

ChiyoneStar Enterprises

Core box business/mining support

Tahltan Reserve, BC
V0J 2X0

Phone: 778-772-6355

Email: chyonestar@gmail.com

Contact

Ann Ball

Owner



Advanced
Exploration

Environmental Studies

- **Environmental sampling and monitoring start on the property**
- **Major focus on studying surface water, fish and wildlife for baseline data**





Advanced
Exploration

Lodge or Local Motel

- In parts of the province with good road access exploration crews will stay in lodges near their property or motels and commute to work





Advanced
Exploration

Smaller Exploration camp



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Advanced
Exploration

Helicopter-Supported Drill Camp in Northern BC



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Advanced
Exploration

Large Exploration Camp Northern BC





Early
Exploration

Exploration Project Characteristics



Advanced
Exploration

Require government permits

Early

- Generally 5 to 50 people in the field
- Junior companies and sometimes larger companies
- \$50,000 to millions of dollars spent annually
- Often summer field programs and sometimes winter drilling
- Opportunity to provide exploration services and derive community benefits
- Generally limited environmental impacts

Advanced

- Generally tens to hundreds of people in the field
- Junior companies and larger companies
- Up to hundreds of millions dollars spent over years
- Field programs for multiple years and often year round
- Significant opportunities to provide exploration services and sign benefit agreements
- Usually have more significant environmental impacts



Advanced
Exploration

SCS Diamond Drilling



[HOME](#) [ABOUT US](#) [SAFETY](#) [FIRST NATIONS](#) [EQUIPMENT](#) [PROJECTS](#) [CAREERS](#) [GALLERY](#) [CONTACT US](#)

FIRST NATIONS

100% First Nations owned and operated.

We have created and sustained a network of working relationships, joint ventures, and achievements across Western Canada with Industry and First Nations bands. We have created work opportunities for skilled and local aboriginal peoples and helped our clients provide sustainable benefits to local F/N communities.

INITIATIVES

We have partnered with some of the largest industry providers and lead community support initiatives with Companies such as Teck, Highland Valley Copper, Kinder Morgan, Trans Mountain, BC Hydro, Northwest Community College, Hunter Dickenson and more. As a result of these partnerships, we have trained hundreds of local F/N members throughout Western Canada.



100 % First Nations
Owned and Operated



Advanced
Exploration

Nazko Economic Development Corporation

Working for the Nazko First Nation



Blackwater Camp Services operates a full service camp service which provides comfortable accommodation and hot, professionally prepared meals to the workforce in the the remote workplaces of Northern British Columbia and Alberta. We supply camps to industries such as logging, mining, oil and gas, and exploration firms.



Advanced
Exploration

GEEL ENTERPRISES INCORPORATED



- Home
- Our Services
- About Us
- Our History
- Contact
- Employment

WILPS GEEL HISTORY

Hereditary Chief Geel comes from the village of Anspayaxw (Kispiox) of the Gitksan Nation (www.kispioxband.com). Geel is the Head Chief of Anspayaxw. Wilps Geel are Gisgaast (Fireweed Clan) and of the Killer Whale crest. Their traditional territories are Lax Di Dax and Luu Andligan which are located in the Kispiox Watershed, and Xai Mliin Anhl Gii located in the Upper Skeena Watershed.

GENERAL SERVICES

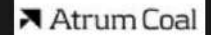
- Remote camp rental
- Full remote camp services
- Expediting services
- Camp maintenance

FIELD SERVICES

- Drilling platform construction
- Helicopter landing pads
- Falling, brushing and line cutting
- Site reclamation



PROJECTS





Advanced
Exploration

Exploration Road Reclamation

Before



After





Advanced
Exploration

Drill Site in Kootenays





Advanced
Exploration

Reclaimed Drill Site in Kootenays



Mining Cycle

Mineral Industry Sequence

Prospecting / Early Exploration



Mineral Exploration



Mine Development

WHO – Larger Companies

- In existence for decades or more, although name may have changed
- Hundreds to tens of thousands of full time employees
- Multiple offices
- Producing mines and sometimes smelters
- Stocks trade for tens of dollars or more

The logo for Teck, featuring the word "Teck" in a bold, blue, sans-serif font.The logo for Taseko, featuring the word "Taseko" in a bold, black, sans-serif font, followed by a blue chevron symbol pointing to the right.The logo for Rio Tinto, featuring the words "Rio Tinto" in a red, serif font, oriented vertically.



Mine
Development

Mine Development Path



**Environmental
Assessments**



Bulk Sampling

- Government permits
- Economic feasibility studies
- Raise funds

Evaluation of Potential Value

Factors that determine if a resource is economical include:

- Type of mineral
- Market price of the minerals and metals
- Location, accessibility, size and value of the resource
- Access to infrastructure: roads, airstrips
- Distance from markets and supply points
- Regulatory regime: taxes, royalty taxes
- Environmentally safe and socially responsible mining
- Availability of a qualified work force



Mine
Development

Red Chris Mine Development



**Acquired a
70% interest
in 2019**



April 6, 2021

Started May 2012
Opened 2015





Mine
Development

Water Testing – Red Chris



Daniel Henshaw Photography 2013
Courtesy of Imperial Metals



Mine
Development

Road Building – Red Chris



Curtis Cunningham Photistry 2012
Courtesy of Imperial Metals



Mine
Development

Mine Buildings, Site Under Construction – Red Chris



April 6, 2021

Daniel Henshaw Photography 2013
Courtesy of Imperial Metals



Mine
Development

Preparing Plant Site – Red Chris



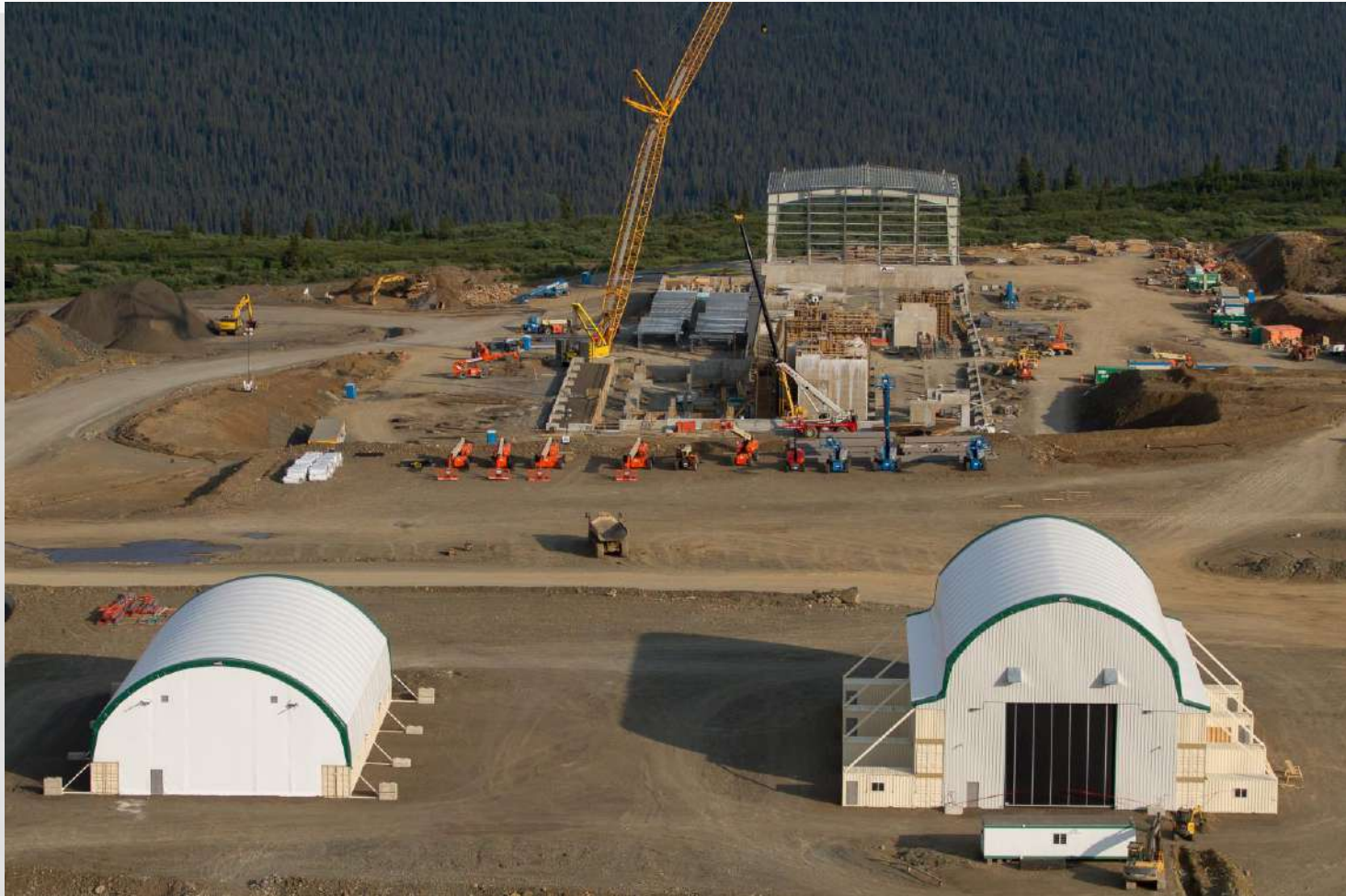
Curtis Cunningham Photistry 2012
Courtesy of Imperial Metals

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Mine
Development

Machine Shop, Stores Building, Mill – Red Chris



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Daniel Henshaw Photography 2013
Courtesy of Imperial Metals



Mine
Development

Onsite Accommodation, Acco Trailers – Red Chris



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Daniel Henshaw Photography 2013
Courtesy of Imperial Metals



Mine
Development

Dining Area – Red Chris



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Daniel Henshaw Photography 2013
Courtesy of Imperial Metals



Mine
Development

Tailings Impoundment Area – Red Chris



April 6, 2021

Daniel Henshaw Photography 2013
Courtesy of Imperial Metals



Mine
Development

Golden Bear Mine IBA Key Initial Support

- Tahltan Nation Development Corp. formed in 1985 to build 10 homes in Telegraph Creek
 - Ownership: Tahltan Band, Iskut Band & Tahltan Central Council
- The Tahltan and North American Metals negotiated BC's first Impacts and Benefits Agreement (IBA) in 1988
 - Work on building the 160 km road to mine site with a three-year upgrading and maintenance contract
 - A minimum of 20% of the work force at the mine site
 - A five-year open-pit mining contract
 - General camp maintenance





Mine
Development

Tahltan Nation Development Corporation

- Eskay Creek mine opened by Barrick Gold in the 1990s with Tahltan Nation agreement
- Expanded activities to:
 - Road construction and maintenance and gravel and mine tailing hauling (Arrow-Tahltan Trucking)
 - Remote industrial camp operations (Spatzizi Remote Site Services)
- Provided growth opportunity for TNDC
 - 34% Tahltan employment in 2004
 - \$93M in income and donations up to 2004
 - Apprenticeship program
 - Quarterly meetings
- TNDC now provides services for the building construction, hydroelectric power, mining and road construction industries





Mine
Development

Nisga'a Pacific Ventures LP

- Mine development building and road construction at the Kitsault project
- Experience with forestry, fishing, construction and road building



Metal Mine Marathon

Mineral Industry Sequence

Prospecting / Early Exploration

1,000 properties
staked



hundreds of mineral
exploration
properties



Mineral Exploration



Several mine
development
projects

Mine Development



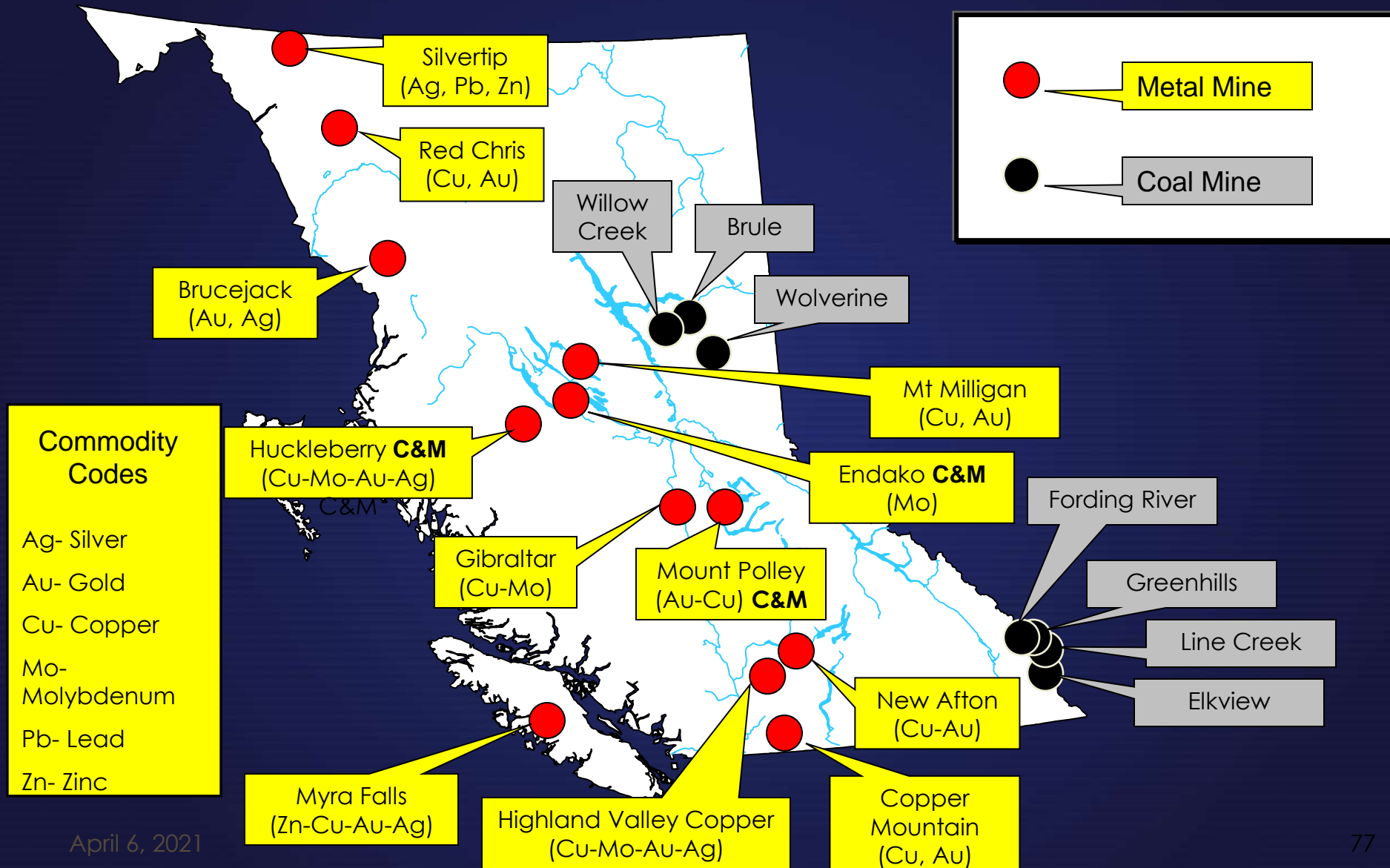
Results in one or
more
metal mines



Mining

Major Operating Metal and Coal Mines

January 2021





Mine
Production

Gibraltar Mine

Taseko Mines Ltd & Sojitz Corp.





Mine
Production

The Taba Group

Indigenous Entrepreneurs

Mining Division: 250-996-0080
Logging Division: 250-996-7324

Of the Land

The Taba Group is a highly respected, independently owned First Nations company located in Fort St. James, British Columbia. We are proud of our safety, environmental and performance record in mine site infrastructure construction and services. Our values of hard work, perseverance, integrity, respect and collaboration have been the foundation of Taba's success.

Full Fleet of Modern Equipment

Taba's modern and well-maintained fleet of equipment means we can take care of all your site requirements. Our equipment includes:

- Dozers from D10Ts to D3s
- Excavators from 850s to Minis
- Haul Trucks from 80 Tonne Rigid Frame to 30 Tonne Wiggles
- Graders
- Front End Loaders
- Rubber Tire Backhoes
- Vibratory Packers
- Fusing Machines
- Lowbeds
- Hydrovac and Water Trucks
- Sand and Plow Trucks
- Belly, Clam and End Dumps
- Full Complement of Logging Equipment
- Fuel & Service Trucks
- Gen Sets, Light Towers, Water Pump



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The Taba Group

transforming people and places



Mine
Production

Saulteau First Nation

Project: WOLVERINE MINE CLEARING 2013

Client: Walter Energy

Approx. Value: \$2.0 Million

SCOPE: The scope of the Project was the Logging and Clearing a 98ha Site. Project commenced in March 2013 and was successfully completed in June 2013.



Saulteau Camp Services

Saulteau Camp Services provides accommodation, food services and housekeeping for mining camps in the area.

April 6, 2021



British Columbia First Nation, Coeur, sign Silvertip mine agreement

[MINING.com Editor](#) | January 26, 2021

The Tahltan Nation and Coeur Silvertip Holdings, a wholly-owned subsidiary of Coeur Mining, (NYSE: CDE), have signed an Impact-Benefit Agreement (IBA) related to the company's Silvertip mine



April 6, 2021

Coeur bought the Silvertip mine in 2017. (Image courtesy of [Coeur Mining](#).)



Mine
Production

Kitsumkalum Quarry



April 6, 2021



Mine
Production

Kalum Quarry Ltd. Partnership

- Produces various sizes of aggregate and gravel
- Owned by the Kitsumkalum First Nation's Economic Development Group
- Started as a deal reached years ago between CN Rail and Kitsumkalum to provide high quality rock as the rail bed for the company's railways
- The rock could also be used for making cement aggregate and road base material





Mine
Production

Pavilion Limestone Quarry Ts'kw'aylaxw First Nation Reserve



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Mine
Production

Pavilion Limestone Quarry

- Limestone quarry and processing plant which produces 235,000 tonnes of lime annually
- Located on the Ts'kw'aylaxw First Nation (TFN) (Pavilion Indian Band) Reserve
 - Operated since 1974
 - Community members are most of the operation's workforce
- TFN has signed leases with Graymont Western Canada Inc. to continue its operations on the reserve until 2045
- TFN awarded the first arms-length commercial leases granted in British Columbia under the First Nations Land Management Act, which confers land management powers to opt out of land management provisions of the Indian Act





Mine
Production

Westhills Aggregates

- Owned by the Penticton Indian Band
- Large gravel pit and crusher
- Provides construction sand and gravel
- Also carries out road maintenance, site preparation, excavation, snow removal and plowing, water line installations and septic system installations



See the Alberta mining webinar for more detail on aggregate operations



Mine
Production

Huu-ay-aht First Nations Gravel Company

HFN Gravel LP

HFN Gravel LP runs a sand and gravel pit located on Provincial Crown Land and operated under a provincial tenure. The business also operates out of a rock quarry that supplies crush and other products.



HFN GRAVEL LP

Huu-ay-aht First Nations entered into the gravel business in 2009.



Mine
Production

Kaska Alliance / Procon Joint Venture

- The Kaska Nation is a treaty group made up of the Kaska Dena Council, Liard First Nation and Ross River Dena Council
- Procon has capability to finance, build and operate even the most complex open pit or underground mining developments and civil infrastructures
- Wolverine Mine joint venture with Kaska Nation
- Procon also has had a number of joint ventures
 - Including KeTe Whii (Ekati mine), Kitsaki (La Ronge gold deposit), Na-Cho Nyak Dun (several projects) and Tahltan (Forest Kerr hydroelectric project)



Life Cycle of Mining

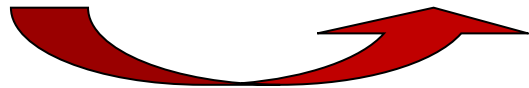
Prospecting & Early Exploration



Mine Closure & Reclamation



Indigenous Business Opportunities



Mineral Exploration



Mine Development



Mining

Reclamation Key to Mining and Exploration

Provincial legislation regards mining as a temporary use of the land and requires upon mine closure, the land and watercourses are returned to a safe and environmentally sound state and to an acceptable, productive end use, such as forestry, grazing, wildlife or ongoing industrial site

11 7 2005

What do these pictures have in common?



All are reclaimed BC mines



Mine Closure
Reclamation

Modern Mine Closure and Final Reclamation

- Modern mine closure includes:
 - Removing all mine buildings
 - Ensuring the site is safe
 - Completing reclamation
 - Meeting environmental conditions for site
 - Meeting land use objectives
 - Satisfying all government regulators
 - Monitoring site post-closure
 - Ongoing remediation if necessary

The following slides show examples of effective mine reclamation.



Mine Closure
Reclamation

Sechelt Gravel Pit Wetland Establishment



April 6, 2021



Mine Closure
Reclamation

Reclaimed Gravel Pit – Agriculture end use



VINEYARD



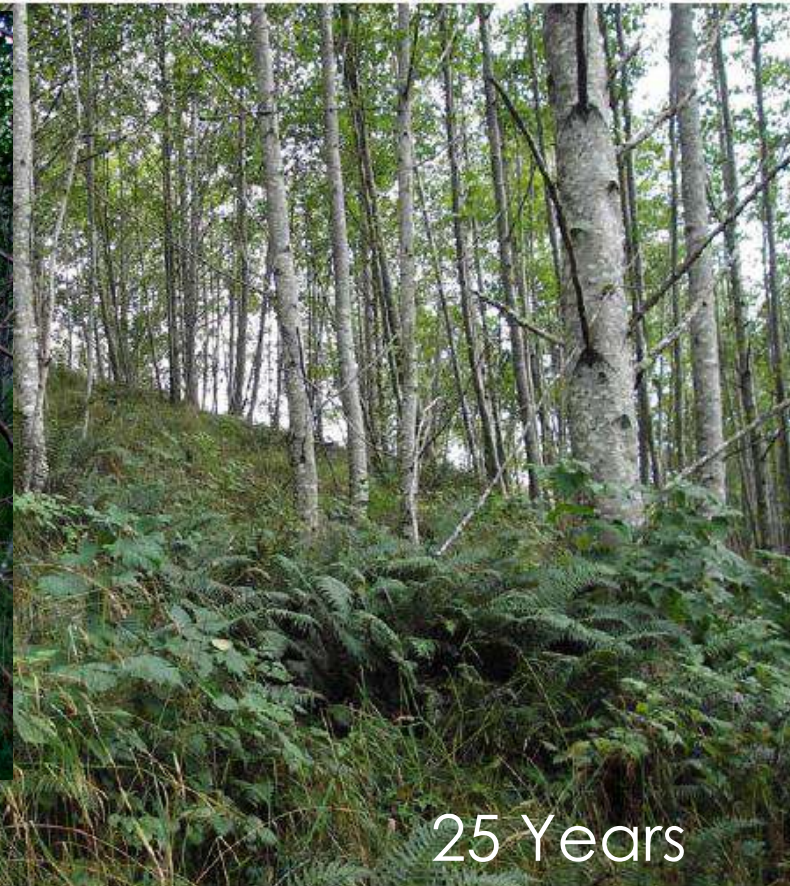
Mine Closure
Reclamation

Reclaimed Waste Rock



12 Years

2 8 2007



25 Years

Island Copper

April 6, 2021



Mine Closure
Reclamation

Highland Valley Copper



Biosolids Enhanced Tailings
Reclamation



Native Species Colonization



Tree and Shrub Plantings



Hybrid Poplar Plantings



Mine Closure
Reclamation

Highland Valley Copper 2003

- Resloped and returned to grasslands on waste dumps





Mine Closure
Reclamation

Progressive Reclamation

Active mine

- Bullmoose mine, northeast British Columbia
- Mining up above and reclaiming down below where finished extracting coal





Mine Closure
Reclamation

Bullmoose coal mine closed 2003





Mine Closure
Reclamation

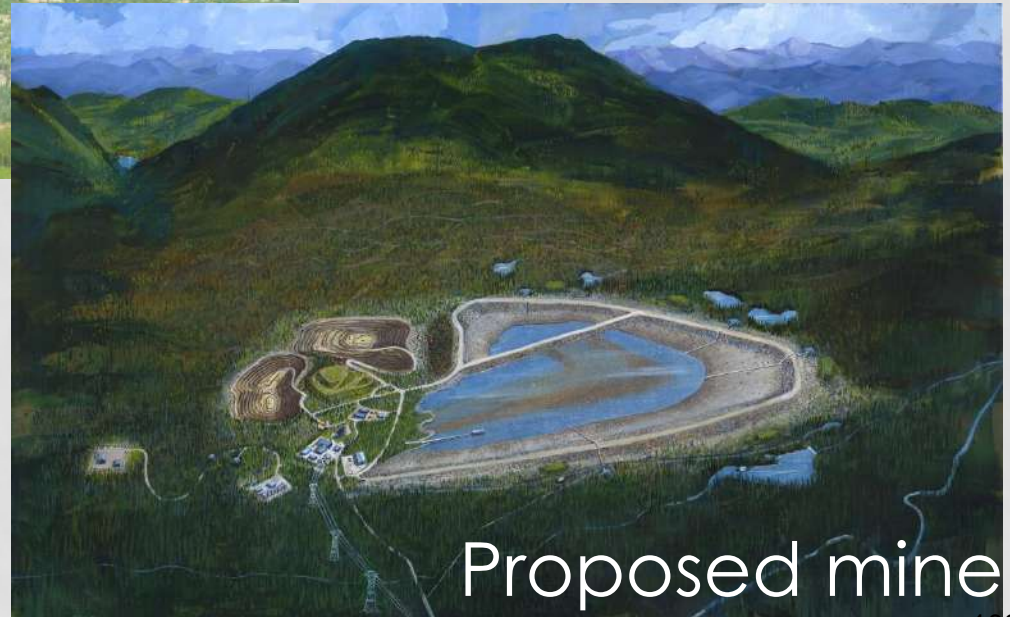
Designing Modern Mines for Reclamation



2007

Mt. Milligan
Terrane Metals Corp.

- Smaller footprint
- Pit design to reduce high wall
- Tailings impoundment planned for wetlands



Proposed mine



Mine Closure
Reclamation

Designing Mines for Reclamation



2007

Mt. Milligan
Terrane Metals Corp.

- Returned to wilderness site with logging potential
- Pits become lakes
- Tailings impoundment becomes wetlands



Proposed Reclamation



Mine Closure
Reclamation

De-Commissioning a Road Eskay Creek Mine Closure



photos from Jerry Asp

April 6, 2021



Mine Closure
Reclamation

Rescan Tahltan Environmental Consultants

- Partnership between the Tahltan Nation and Rescan, an environmental consulting firm
- RTEC conducts environmental assessments of projects in Tahltan territory
- Services include environmental consulting (fisheries, terrestrial, atmospheric), ecological risk assessments, environmental effects monitoring, reclamation, water treatment, social and economic sciences





Mine Closure
Reclamation

Eskay Creek Mine Water Monitoring by Tahltan

- Started during mine operation as a joint venture with experienced company (Rescan)
- Continued since mine closure in 2008 by two Tahltan teams
- Companies generally prefer competent, local businesses
 - Provides greater transparency
 - As keepers of the land, Indigenous people are very suitable
- Hiring locally is cost effective, particularly for intermittent work



Photo from Jerry Asp

Learn Your **ABC's** of Mining for Economic Development

Three important ones are:

I = increasing Indigenous involvement in mining

P = promotion required to develop new resources

T = time to find/permit/build a major mine

I. Increasing Indigenous Involvement in Mining



Shared Benefits or Ownership

Infrastructure Co-operation

Various Agreements with Companies

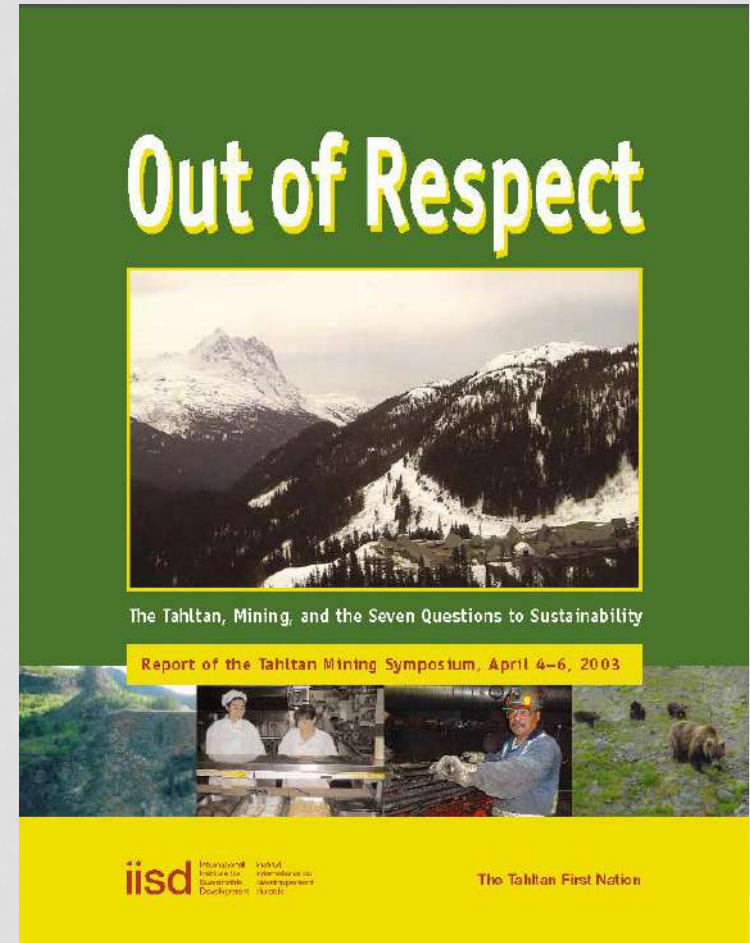
Indigenous Company Contracts

Approvals for Exploration & Mine Development

Employment

Out of Respect –Two Way Street

There were no written laws in our history. The rules we lived by were taught to us from childhood and were based on respect. We were expected to respect ourselves, to show respect for others, to show respect for all things in our world, and to show respect for our environment. In this way we believed that our world would be in harmony and we would live a long and healthy life. - Tahltan belief



P. Promotion Required to Develop New Resources

- Modern mine developments in Canada require support from all those concerned
 - Governments profile potential resources and permitting/taxation policies
 - Companies explore and develop resources
 - Investors are prepared to risk their money on exploration and mine construction
 - Indigenous and other communities support project plans



T. Takes Time to Find/Permit/Build a Major Mine



mine developed
and opens

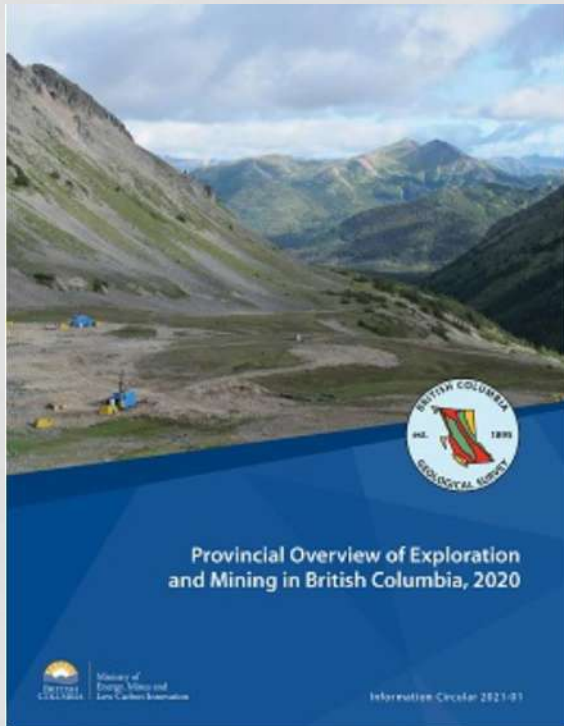
T. Takes Time to Find/Permit/Build a Major Mine



mine development project
a) can slow down
or
b) can stall
or
c) can stop and not restart



British Columbia Industry Overviews



- Summarizes exploration, mine development and mining activities of companies
 - Less promotional than most online info summarizing mining activities
- Staff of British Columbia Geological Survey a good source of free advice and expertise

Available on line

Mining Information Sources

British Columbia

<https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/british-columbia-geological-survey/publications/informationcirculares>

Provincial Overview of Exploration and Mining in British Columbia 2020

British Columbia Coal Industry Overview 2020

B.C. Mine Information Website: <https://mines.nrs.gov.bc.ca/>

Mineral Exploration & Mining: <https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining>

British Columbia Mineral Titles: <https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/mineral-titles>

Association for Exploration British Columbia: <https://members.amebc.ca/>

Centre of Training Excellence in Mining: <https://www.bc-ctem.ca/>

Indigenous Business and Investment Council: <https://www.bcibic.ca>

Mineral Resource Education Program of BC: <https://www.mineralsed.ca/>

Mining Association of BC: <https://www.mining.bc.ca/>

National

<https://www.nrcan.gc.ca/our-natural-resources/indigenous-natural-resources/indigenous-participation-mining/indigenous-participation-mining-information-products/7817>

Interactive map of Indigenous mining agreements

Guide to exploration and mining for Aboriginal communities

Mining essentials: training for Aboriginal Peoples

Partnership agreements

Other useful links

The Atlas of Canada - Minerals and Mining: <https://atlas.gc.ca/mins/en/index.html>

Minerals and Metals Facts: <https://www.nrcan.gc.ca/our-natural-resources/minerals-mining/minerals-metals-facts/20507>

Minerals and Mining Publications: <https://www.nrcan.gc.ca/maps-tools-and-publications/publications/minerals-mining-publications/18733>

Mining Association of Canada: <https://mining.ca/>

Mining Industry Human Resources Council: <https://mihrc.ca/>