



***Economic Diversification?
Yes, But We Still Need Mining!”***

*Delivered to: Yellowknife Small Business Week Conference
By: Doug Ashbury – October 17, 2017*

Thank you for very much Paul, and organizers for the invitation to speak to you today. Please accept regrets from Tom Hoefler, who would have liked to have been here. But he has asked me to deliver the presentation today, which of course I'm very pleased to be able to do.

Who is the Chamber of Mines?

- Our Vision: *A vibrant and sustainable exploration and mining industry in the NWT and Nunavut which has the support of the peoples of the North.*
- Our Mission: *To provide leadership on, and advocate for, responsible and sustainable mineral exploration and development in the NWT and Nunavut*
- Represent members with interest in a strong northern minerals industry, including:
 - Mining & exploration
 - Service & supply
 - Consultants
 - Indigenous corporations
 - Individuals
- Offices in Yellowknife, NWT and Iqaluit, NU



2

[don't read all of the text on the slide Doug, just what's below]

Just a very quick message on who we are.

Our Chamber of Mines is the minerals industry association for both the Northwest Territories and Nunavut.

Through our Vision and Mission, we champion on behalf of our members for a strong, robust and beneficial northern minerals industry.

Many of you in the room are likely also members of our Chamber.

We've been around as long as Yellowknife has been the capital, and are also celebrating a 50th Anniversary this year.

While we represent industry in both NWT AND Nunavut, my presentation today will focus mostly on the Northwest Territories, given the Yellowknife connection.

Key Messages

- Why mining is important
- Update on our current benefits
- Opportunities before us
- How we can sustain mining and its benefits



3

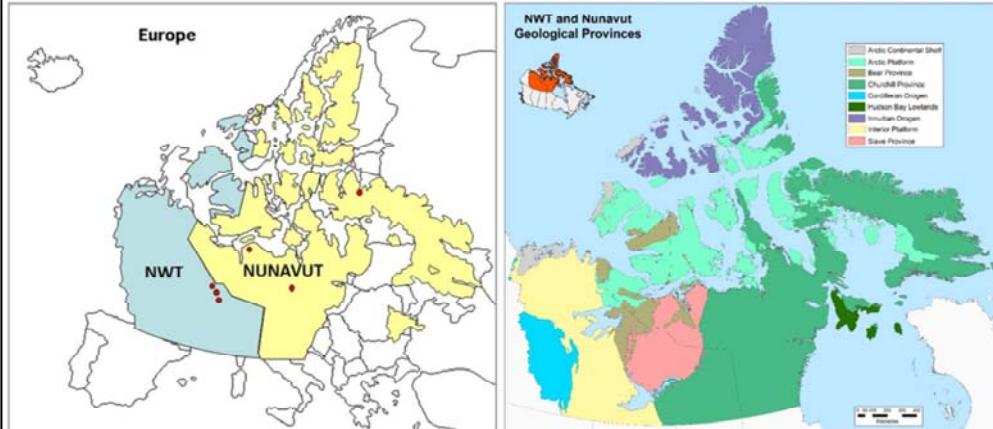
I want to speak to these 4 subjects today.

- Why mining is important
- Update on our current benefits
- Opportunities before us
- How we can sustain mining and its benefits

Why mining? It's our economic advantage!

Geography – huge, remote, cold

Geology – huge, diverse, under-mapped



And limited options compared to southern Canada

- eg, farming, forestry, ranching, urban growth, manufacturing, etc.



4

So let me start with why mining is important.

Why mining? Because it's our economic advantage.

And that's because of these factors.

First, Geography. On the left, you can see how we compare in size to much of Europe. The sheer size and climate of our territories makes this a remote, underdeveloped and expensive place to operate.

Second, we have very attractive geology. The geology map shows we have much diversity in geology and mineral deposits.

But because of our huge size, much of it has not been explored or even mapped in much detail. This means untapped potential.

And, third, our tough geography and climate means we just have fewer economic options than do southern provinces. For example, forestry will be very tough in Nunavut. 😊

That all means that non-renewable resources are our economic advantage, and with oil and gas in a tough situation, mining is it.

Economic advantage = 80+ years of history

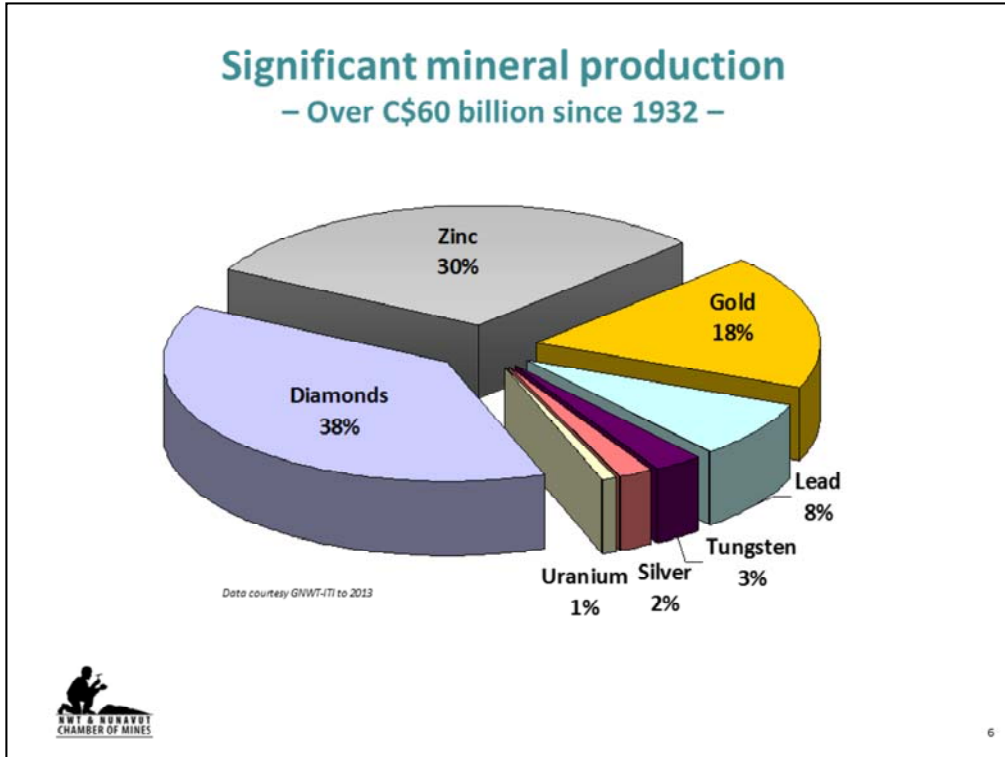
- 1930s – Eldorado (radium, uranium), Con, Negus, Rycon (gold)
- 1940s – Giant, Thompson-Lundmark (gold)
- 1950s – Rankin (nickel), Discovery (gold)
- 1960s – Pine Point (zinc-lead), Cantung (tungsten)
- 1970s – Nanisivik (zinc)
- 1980s – Polaris (zinc-lead), Lupin (gold), Cullaton Lake (gold)
- 1990s – Colomac (gold), Ekati (diamonds)
- 2000s – Diavik, Snap Lake, Jericho (diamonds)
- 2010s – Meadowbank and Hope Bay (gold), Mary River (iron), Gahcho Kué (diamonds)



Our economic advantage shows in our history.

We have over 80 years of mining history in both territories.

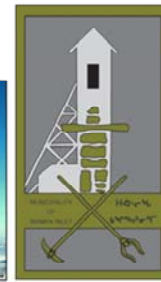
And we saw new mines developed in every decade.



That mining has generated over \$60 billion in wealth for the North and for Canada. And we have produced that from a wide range of commodities from uranium to diamonds.

Mining contributes to legacy infrastructure

- Communities: Yellowknife, Rankin Inlet
- Roads to Resources, eg: highways to Yellowknife, Pine Point & Ft. Resolution
- Railway (to Hay River & Pine Point)
- All 3 NWT hydro-electric facilities
- Marine shipping & ports
- Microwave communications



One thing about mining is that because it's a high value business, it can help contribute to infrastructure.

As shown here, two of our communities reflect their mining history in their crests (crossed picks and shovels, headframes).

Our mines have contributed to resource roads, our only railway, all of our hydro power development, marine shipping, and more recently microwave communications.

And the benefit of infrastructure is that it is still serving the north, long after the mines closed.

And to innovation

- High efficiency diesel power
- Innovative wind energy
- Dikes
- Ice roads



Heat recovery on diesel powerplants



Diavik's wind turbines



National award winning Diavik dikes



Engineered ice road "highways"

Our mines have also brought technical innovation, and I've put a few examples here.

Where mining is at today

NWT – 3 Operating Mines



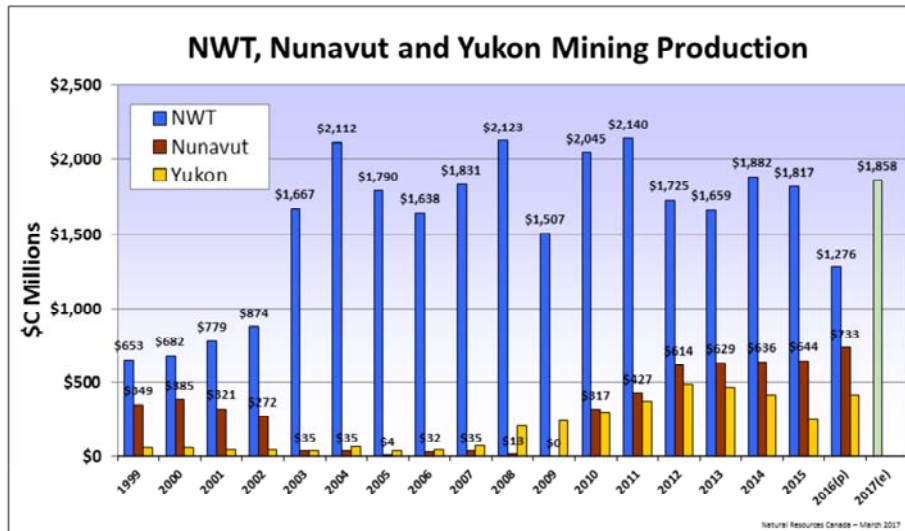
Nunavut – 3 Operating Mines



So, where is mining at today?

Today, we have three operating mines in the NWT, and all three produce diamonds from the same area, called the Slave Geological province.

NWT mines create significant value



- 2016 shows significant drop of \$500 million which one would expect with Snap Lake closure
- NRCAN data for 2016 is still preliminary, and Gahcho Kué and Ekati may have offset losses
- 2017 is an estimate by the Chamber of Mines with full Gahcho Kué production

10

Our mines generate significant wealth, as shown here.

Particularly in the NWT, when for many years our mines produced diamonds worth \$2 billion per year.

There's a huge drop of \$500 million in 2016, which is what we expected with the closure of the Snap Lake and the Cantung mines.

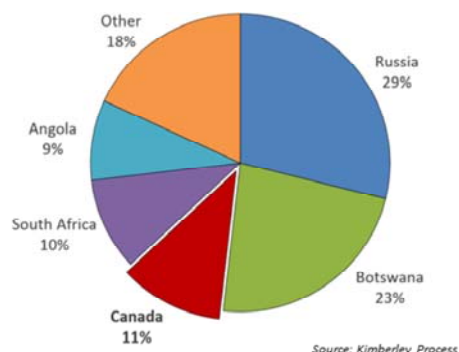
But I do caution that the Federal statistics are still preliminary, and it may turn out that Ekati and Gahcho Kué have helped reduce the loss.

For 2017, we are hoping to see the value recover now that Gahcho Kué mine is in full commercial production.

NWT mines make Canada global diamonds force

- Canada is 3rd most valuable global diamond producer
- Northwest Territories accounts for Canada's global position

2016 Diamond Production by Value



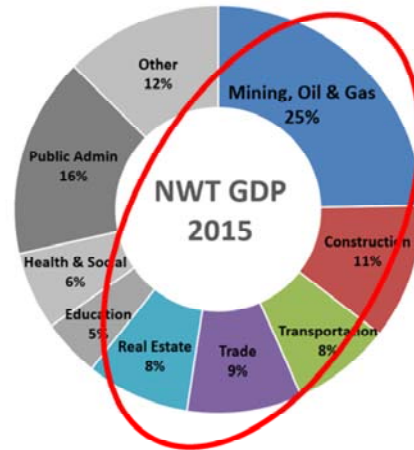
That value of diamond production from the NWT is globally significant.

Most of Canada's diamond production comes from the NWT, and so we continue to keep Canada in third place by value.

Gahcho Kué production should help Canada hold this position.

Mining – NWT’s largest private sector contributor

- Mining is the largest private sector contributor to the NWT economy
- And, contributes more through other sectors of the economy, eg, construction, transportation, trade, real estate



- *“Over the past 3 years, diamond mines contributed 41% of the GNWT’s corporate income, fuel, property and payroll tax revenue”*
... GNWT Spokesperson



12

As a result, mining is the NWT’s largest private sector contributor to the economy.

This is due to its direct contributions, and its indirect ones through construction, transportation, etc.

In a good year, our minerals industry could be as much as 50% of a territory’s economy, and you can see what GNWT reported (this in a lower diamond market).

Significant diamond mining benefits

- Employment – over 26,000 person-years of jobs
 - 50% Indigenous
 - 1,663 northern workforce
- \$13 billion plus in northern business (70%)
 - \$5.6 billion with Indigenous business
- Over \$100 million to communities in IBA payments, scholarships, donations
- Significant taxes & royalties to governments

Data from 1996-2016 Socio-economic Monitoring Agreements reporting



So all of that value translates into very important and significant socio-economic benefits.

We have just updated the statistics reported by our diamond mines to the GNWT. These are just the northern benefits, and there significant more that benefit Canada. We will report that in a formal upcoming report.

[Go through the statistics, Doug]

Over 1,500 northerners trained, majority Indigenous. 5% of the NWT's workforce.

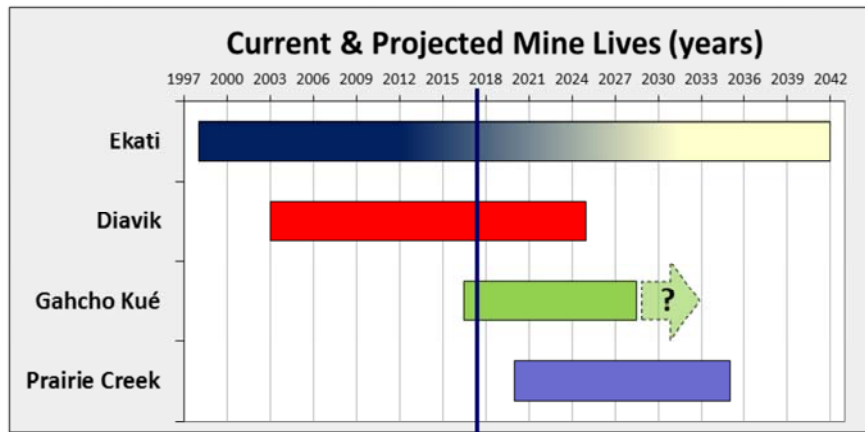
Over \$13 billion in northern business, of which nearly \$6 billion with Indigenous businesses

Over \$100 million to communities in various contributions.

Plus significant taxes and royalties to public and Indigenous governments.

This is a business that must be sustained and even grown.

Mine lives looking forward



- Ekati potential for extension
- Diavik mine life fixed at 2025
- Gahcho Kué may have future underground option
- Prairie Creek is recent addition



14

With this kind of value, we want to always keep our eyes on mine lives, for we all know individual mines don't last forever.

It looks like this:

Ekati is projecting a much longer mine life now.

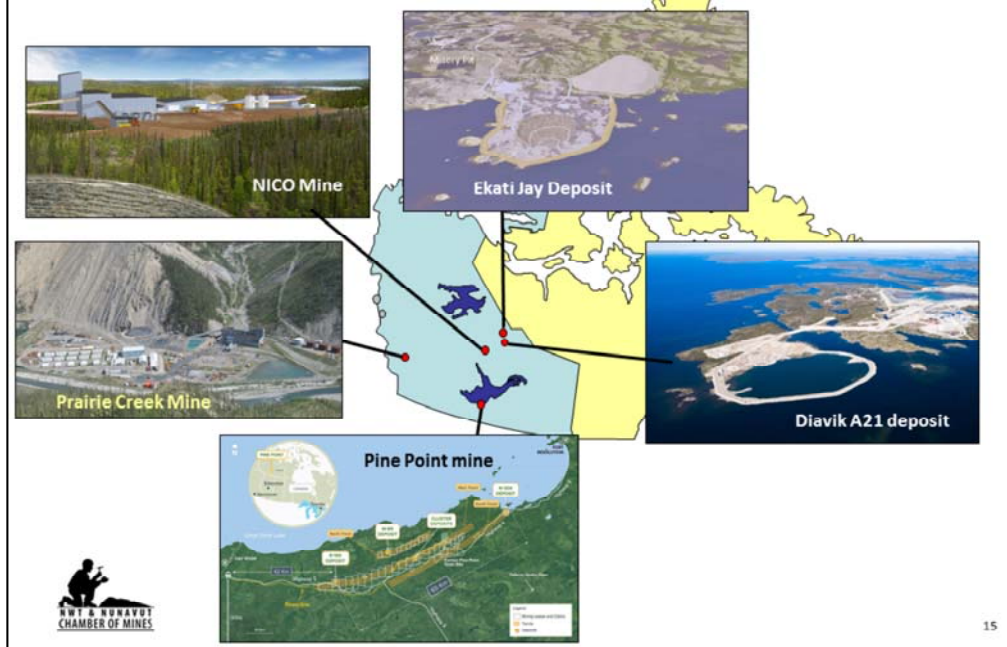
Diavik is still fixed at 2025

Gahcho Kué is our new mine, and there is some potential for an increased mine life from underground.

And Prairie Creek is a new and welcome addition.

Let me speak to that in more detail in the following slides.

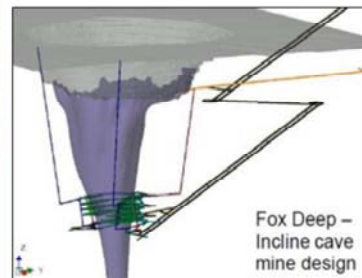
Looking forward: near-term opportunities



Looking forward, we have a number of near term mining opportunities before us. I will speak to these 5 in more detail in the following slides.

Ekati Mine – Jay and Fox Deep ore bodies

- EKATI is important as NWT's largest mine
 - 1,800 workers and \$400 million annual spending
- Jay deposit will add 11 years
 - \$690 million to build = jobs, business opportunities
- Fox Deep offers further mine life opportunity to 2042
 - \$628 million initial capital cost for underground operation



Our largest mine, EKATI is proceeding to develop another ore deposit called Jay which will extend their mine life by 11 years. In addition, they have released news that another underground project called Fox Deep can help the mine continue until 2042. That would be fantastic given Ekati is a large mine with 1,800 workers. Constructing these projects is expensive, and will also contribute to our economy.

Diavik Mine – A21 ore body

- A21 strengthens Diavik's mine life
 - US\$350 million to develop A21 deposit over 4 years
 - Dike and open pit similar to first two dikes
 - Makes production more robust to mine closure in 2025
 - Brings construction jobs and business spending
 - Diamond production planned to begin late 2018



Diavik A-21 dike before de-watering and open pit construction

Our largest diamond producer, Diavik is developing a fourth ore body called A21.

While it won't extend the mine's life, it will make the mine's production more robust until closure in 2025.

Construction of the A21 dike has already been contributing to the economy, and we are looking forward to open pit mining later this year from A21.

Proposed Prairie Creek Mine (zinc, silver, lead)

- Pre-production cost – \$279 million
- Annual operating costs ~ \$90 million
- 15 year mine life with opportunity to extend
- Workforce ~ 220
- 2.5 years construction; production to begin mid-2020
- 184 km all-season road to Liard Highway
 - Enables use of Liquefied Natural Gas
 - MOU with Power Corp re diesel/LNG power supply



New news is from Canadian Zinc, who have released an updated feasibility study that would see the mine begin production in mid-2020.

This is a smaller investment than some of the mines, as much of the mine was already constructed back in the 1980s. (although it never operated)

The company projects a healthy mine life with opportunity to be even longer.

The mine requires an all-season road and that allows greener energy like LNG to be used, and Canadian Zinc is working with the Power Corp to investigate this.

Proposed NICO Mine (cobalt, gold, bismuth, copper)

- Cobalt market is strong – green energy
- 21 year mine life
- Capital cost ~\$600 million
- Workforce: 220 in NWT & 85 in SK
- 150 km all-season road to Mackenzie Highway
 - Tlicho road portion is advancing; mine will build spur road



Rendering of proposed NICO pit, mill and camp site in the Northwest Territories



NICO is an interesting poly-metallic mine in the Tlicho region.

The sexy product is cobalt, which is needed for lithium batteries, and that demand is great for the market price. And there's rapidly expanding demand for cobalt for rechargeable batteries.

They are looking at a 21-year mine life.

Not a big mine like Ekati or Diavik, but a valuable addition to our mining portfolio.

The mine needs to ship bulk product and needs an all-season road. The project can now move forward because the Tlicho Road is advancing.

This means they will also have LNG fuel potential.

Mine and concentrator in NWT, refinery in SK

New Pine Point Mine (lead, zinc)

- Capital cost \$154 million
 - Existing infrastructure (road, rail, power) saves \$100 million
- 10 open pit deposits mined in sequence
 - Underground potential too
- 13 year preliminary mine life, average 321 jobs
- Project size is expected to grow

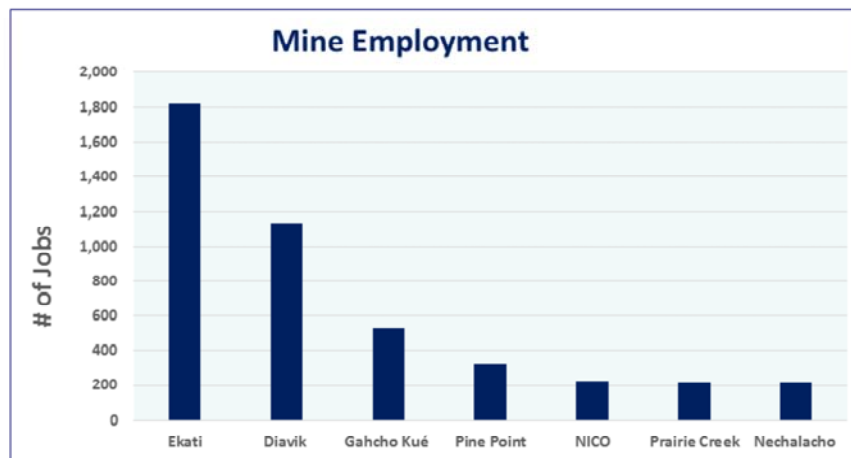


The Phoenix rising from the ashes is the new Pine Point lead-zinc mine.

The original Pine Point mine produced from 1964 to 1987, and has been closed since.

But with better prices and different technologies, Pine Point Mining has made a preliminary mine life estimate of 13 years, with optimism it will grow.

Remember, not all mines are equal, eg, Jobs



- Future NWT mines like Pine Point, NICO and Prairie Creek are smaller & deliver lower government revenues & community benefits. Jobs and business spending are lower.
- Many small mines needed to replace impact of just 1 diamond mine
- **We need to find more new mines**



21

Yes, we have some other projects before us, like NICO, Prairie Creek, and Pine Point.

But remember that not all mines are equal. These projects, once financed, permitted and built – are smaller mines.

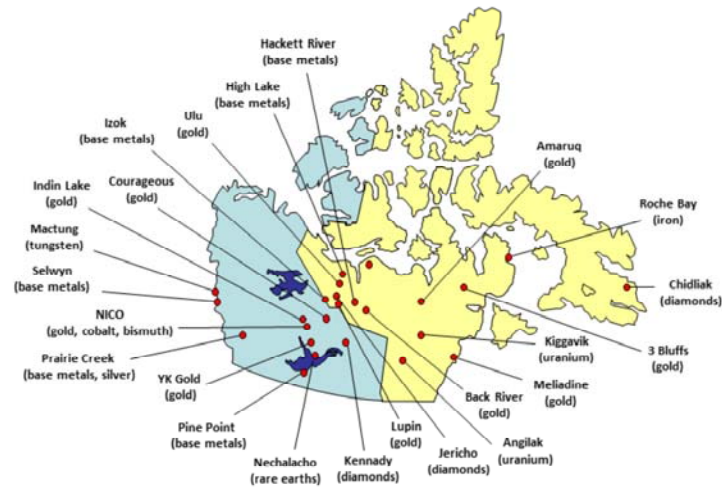
We need to be finding more mines to sustain the strong benefits of our industry.

While we're pleased to see more new mines advancing, they are not Diaviks, and it will take many with their smaller workforces to replace an 1150 person operation.

That's another reason why we need to attract more exploration investment, and supply more infrastructure, etc., in order to increase the odds we can discover more.

We are surrounded by even more potential

Known deposits that might become mines



- Many held back by high northern costs, infrastructure deficit

22

We are surrounded in the North by even more potential.

This map shows already known deposits. Many were discovered many years ago, but held back from production by high northern costs, by the lack of infrastructure, and / or poor markets.

And, don't forget our neighbours

Yukon Opportunities

- Selwyn – base metals
- MacTung – tungsten

Kitikmeot Opportunities

- Hope Bay – new gold mine
- Back River – advancing gold & silver mine
- Izok, High Lake, Hackett River – future base metals mines

Significant "Neighbourhood" Opportunities

- \$ billions in capital investment and annual expenditures
- Thousands of potential jobs
- Can YK be a service community? ... how about a business supply community?
- IS THERE A PLAN?

23

I know I said I'd focus on the NWT at the start of my talk, but we need to look to our neighbours too.

There are future projects on or close to our borders, in Yukon and Nunavut. The Kitikmeot Region is like family to us. They travel here for medical aid, for shopping, and to do business. Mining there can be good for Yellowknife and the NWT. We might take advantage of that opportunity.

I know Paul can attest to his company Det'on Cho Logistics doing business on the Back River Project. There is money flowing through here and some workers residing here from the new Hope Bay mines too. And the future Grays Bay Road and Port development would create huge opportunity for mining, with spinoffs to the NWT and Yellowknife.

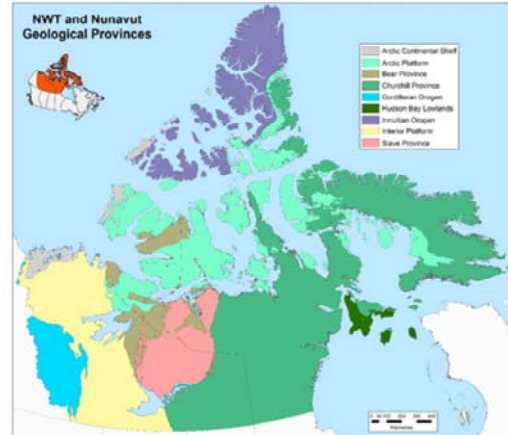
Even projects on our Yukon border might help us too.

Yellowknife might consider planning to grow those opportunities.

Huge untapped opportunity “in the bank”

High mineral potential

- 9 geological provinces
- Diverse mineralogy
 - Gold, silver, diamonds, lead, zinc, uranium, tungsten, rare earths, cobalt, bismuth, nickel, copper, iron, etc.
- But, under-mapped & remote means under-explored
- This equals tremendous mining opportunity
- But costs are higher



24

From the highest altitude view, we have a huge bank of untapped opportunity. We are one third of Canada, and we have rich geological diversity. Remote means under mapped and under explored. It also means higher costs. But it spells future opportunity.

Industry cannot do it alone: we need more government partnership & support

- **Governments need the mining industry**
- **Mining does what governments cannot do**
 - Turns rock into opportunity: jobs, business, training, taxes
 - Takes on big risk – exploration and mining are not easy
 - Brings \$ millions to \$ billions to Canada
 - Brings expertise to share and build capacity & wealth
- **Industry needs governments too**
 - To recognize that mining is a tool to opportunity
 - To provide support, reduce costs and risk
 - To shift attitude from defensive to supportive of industry



25

I said mining is our economic advantage, but that doesn't mean it will happen by itself. Industry cannot do it alone.

We need more help from Governments.

And when I say governments, I mean all levels of public and Indigenous.

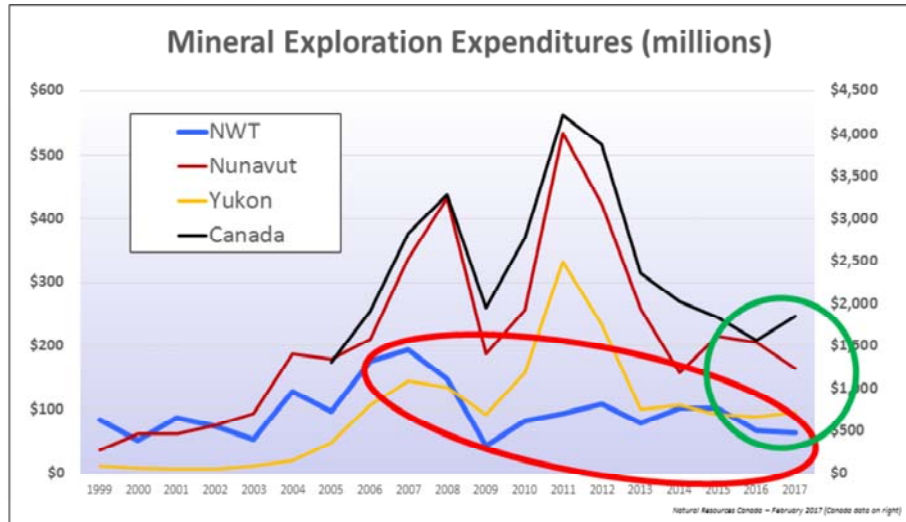
Governments need the mining industry to do what they cannot do.

- That is to squeeze opportunity out of rock.
- To turn rock into jobs, businesses, training, community benefits, and revenues.
- To take on the risks associated with exploration and mining.
- To bring millions and even billions of dollars to invest in our back yard.
- And to bring expertise that is free for the sharing.

Industry needs governments to provide support, to reduce costs and risks.

Let's have a quick look at some of the areas where governments can help.

We need government help: the state of exploration



- Canada is increasing, while NWT and Nunavut are decreasing
- NWT exploration has been languishing



26

Finding new mines to sustain our industry requires exploration.

That takes money, and it takes lots of exploration projects, since the odds of success are against us.

But, we have problems. Actually, the statistics for the NWT show it.

- Our investment is declining.
- And it's been doing that for over 10 years.

The reason is related to unresolved land claims, land access challenges, and regulatory issues.

These are areas where we need governments' help.

We need government help: infrastructure

- We suffer Canada's largest infrastructure deficit
- Higher mining capital costs
 - Up to 2.5 times higher for base metal mines
- Higher exploration costs
 - Up to 6 times that of the least remote project
- We need help to "Level the playing field"



Industry Study: Levelling the Playing Field, May 2015



Mines must supply their own expensive transportation and power infrastructure.

Infrastructure is another area where we need governments' help.

Here is why, and this comes from an industry study we participated in in 2015 and referenced here.

Because we suffer Canada's largest infrastructure deficit, it costs more to do business in the large North.

- Building a mine can be as much as 2.5 times more expensive than in the south.
- Exploration can be 6 times more expensive.

Mines today are forced to supply their own expensive transportation and power infrastructure.

This makes us less competitive.

We need help to level that playing field.

Address a 40-year infrastructure gap

- Strong historical northern mining support from Canada
 - 1940s – Snare Hydro Power for Giant mine
 - 1950-60s – Roads to Resources – YK, Ft. Res, Wrigley, Inuvik
 - 1960s – Taltson Hydro Power for Pine Point mine
 - 1960s – Great Slave Lake Railway for Pine Point mine
 - 1970s – Nanisivik mine port, town site and airport
 - 1970s – M.V. Arctic ice breaking cargo ship for Nanisivik, Polaris mines
- Since 1980, little government infrastructure support for mining
 - Mines must now supply their own roads, ports, power, airports, communications, rail, accommodations, etc.
 - Significant extra costs create competitive disadvantage
- Renewed government support/partnership is needed to catch-up on a 40 year gap in infrastructure investment



28

To emphasize the infrastructure need, we have seen a 40 year gap in investment.

- From the 1940s through the 1970s, we saw much Federal Government support of resource development.
- In the 1940s, the Federal Government built the Snare System to feed the second gold mine in Yellowknife and the growing community needs
- In the 1950-60s, we saw the Federal Roads to Resources program which saw roads built to various communities to help with resource development.
- In the 1960s, Canada built the Taltson Hydro Power plant, and the Great Slave Lake railway to help support the Pine Point mine.
- As the last of this support, in the 1970s, Canada invested directly in the Nanisivik mine, and in the world's first ice breaking cargo ship, the MV Arctic.

Since then, mines have been on their own to supply all their own infrastructure, at significant cost.

We really need government to help now catch up to fill this 40-year gap in infrastructure investment for resource development.

Thankfully, we believe the tide is turning.

Where we need government help

Actions needed	Status	Government
Cost pressures	Regulatory cost recovery	Canada
	Small projects unnecessarily undergo EA	Canada
	Carbon Tax	Canada
	Costs of New NWT Air Quality Reg's	NWT
	Yellowknife Airport Improvement tax	NWT
Access to Land	Unsettled NWT Indigenous Land Claims and land withdrawals	NWT
	Nunavut Land Use Plan threatens land access	NU
	Land conservation initiatives – federal, territorial	Canada, NWT
	Caribou protection plans	NWT, NU
Infrastructure	NWT: Ticho Road funding & construction	NWT, Canada
	Nunavut's Grays Bay Road & Port (Slave Province) advancing	NU
	NWT Slave Province road concept study underway	NWT
Exploration Incentives	Double MIP (Mining Incentive Program)	NWT
	Extend the 150% assessment credit	NWT
	Invest in Geoscience	All
	Federal 15% Mineral Exploration Tax Credit	Canada
Public Awareness & Support for Mining	Mining in school curriculum	NWT
	Launch Public Awareness Program	NU, NWT
	NWT Regional (Indigenous) Mineral Development Strategies	NWT
	Prospector & mine training funding	NWT, NU
Marketing	"Unlocking Our Potential" messaging	NWT
	Indigenous participation at conferences	NWT

Red bad, Green good and Yellow somewhere between.

29

You'll be glad to know that I'm not going into this in detail. 😊

But this is a To Do list, or report card, that we have created to look at all the areas where we need governments' support.

This is the kind of work that our Chamber of Mines is focused on.

If I might be brash, it's a way to tell all of our current members in the audience that we are busy, and perhaps to even solicit some new members to support us in all of these efforts. 😊

This is why it matters!



Photos courtesy Diavik Diamond Mines Inc.

30

Let me conclude with this slide.

At the end of the day, this is why mining matters.

It's all about people success!

And our mining industry is creating much of that.

People success leads to community success and then territorial success.

These are tremendous success stories, and we must sustain and grow them.

With your help, we can do that.

Thank you for your time today.