

# House Resources Committee Hearing on AMDIAP Presentation April 6, 2018

Advancing the Ambler Mining District in Alaska by Forming Strong Partnerships

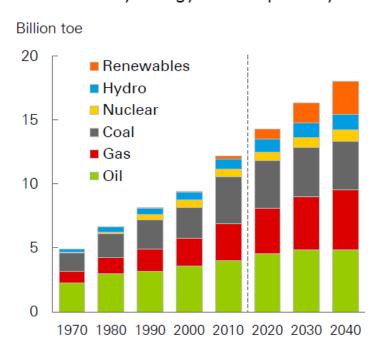


#### **Global Energy Mix**

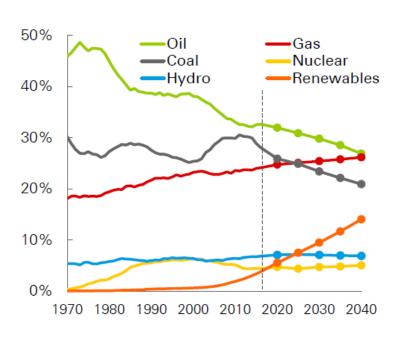


#### Global energy by fuel

#### Primary energy consumption by fuel



#### Shares of primary energy



6 © BP p.l.c. 2018

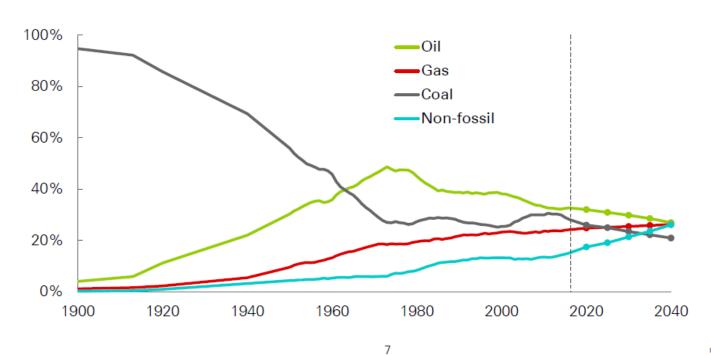
## Where Energy is Headed



#### Diversified fuel mix



#### Shares of primary energy



© BP p.l.c. 2018

#### Copper Usage Intensity (per MW created)



#### **Conventional**



**Off-shore Wind** 

















## Clean Energy = *More Copper*

## **The Hybrid & Electric Vehicle**



#### REQUIRES MORE COPPER, COBALT, GRAPHITE, LITHIUM

....and more energy!

20 Kg of Copper

CHARGE YOUR MODEL S

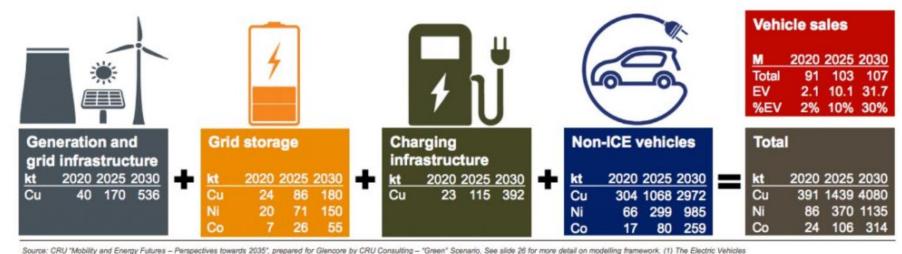
**80 Kg of Copper** 



## **Energy Infrastructure**



## **Build-Out to Support Hybrid & Electric vehicles Electric Vehicle**



Initiative is a multi-government policy forum comprising Canada, China, Finland, France, Germany, India, Japan, Korea, Mexico, Netherlands, Norway, Portugal, South Africa, Sweden, UK and USA. http://www.cleanenergyministerial.org/News/new-cem-campaign-aims-for-goal-of-30-new-electric-vehicle-sales-by-2030-85068.

Source: Glencore

Add to this - over the next 10 to 20 years most vehicles will be autonomous driving.....BIG DATA!

## Remarkable, Irreplaceable and Infinitely Recyclable



#### Copper plays a significant role in transition to a low-carbon economy











#### More and More...





80% Recycled

#### **Think Green Think Copper**

Plus Zinc and Precious Metals





## **World Copper Production**





## **World Copper Production**

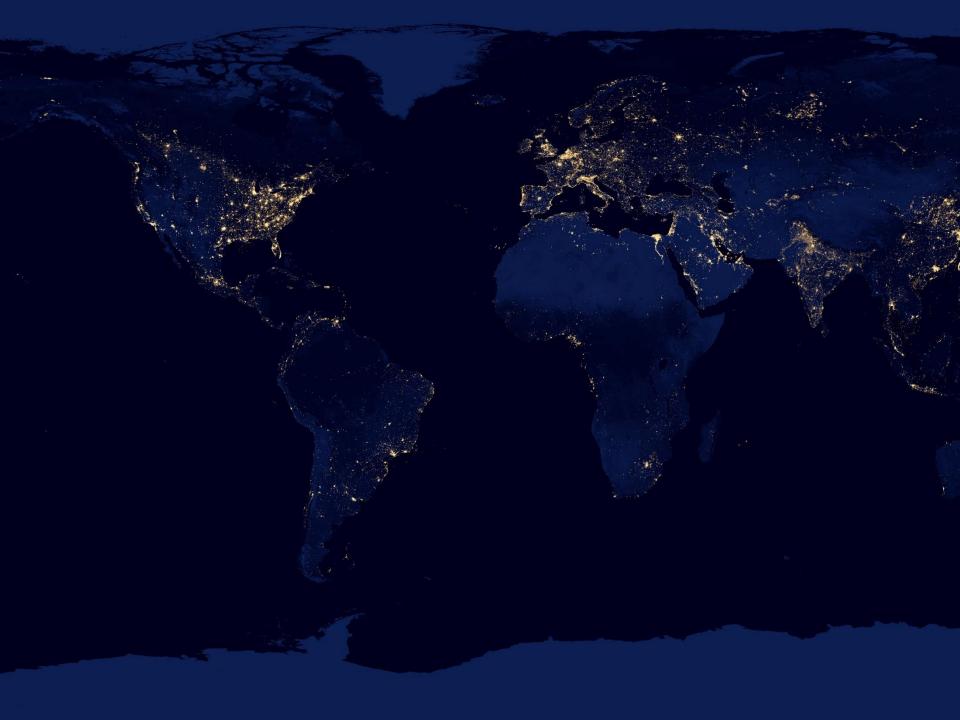












## **Ambler Mining District**



# UPPER KOBUK MINERAL PROJECTS



### **Camp at Bornite**

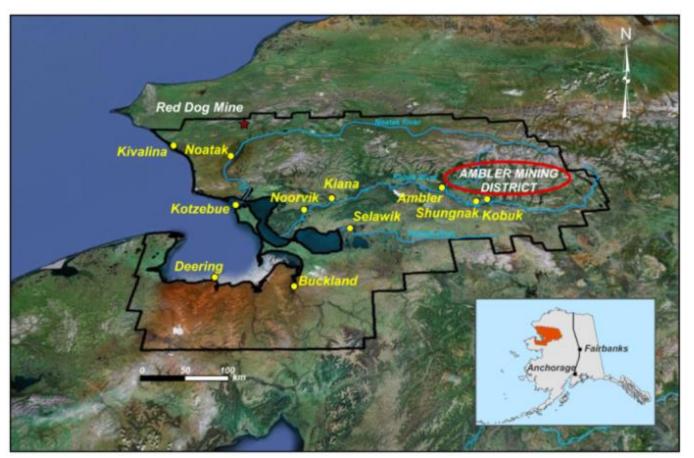




#### **Ambler Mining District - Alaska**



Safe Jurisdiction – mining district hosts deposits rich in copper, zinc, cobalt, lead, gold and silver

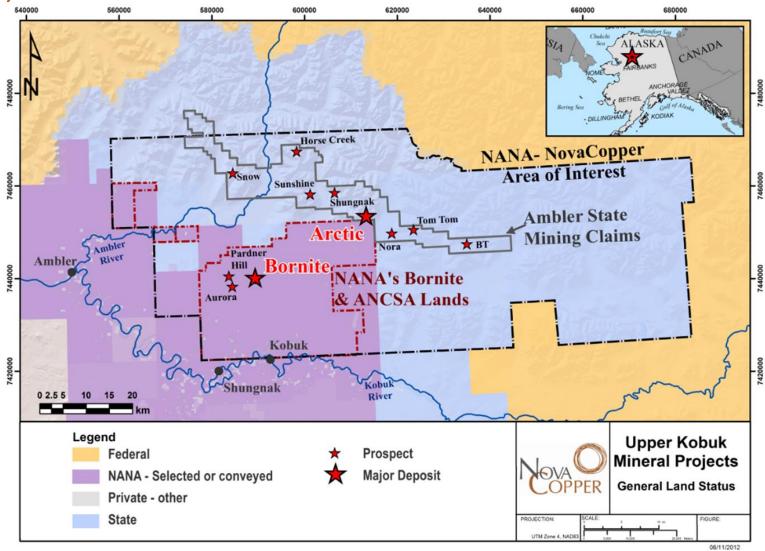


- Politically Stable
- Rule of Law
- Recognized Mineral Potential
- Resource Extractive Industries are the Largest Contributors to Alaska's Economy
- Well Established Permitting Process
- Supportive Borough Gov't – tax base for region
- NANA Agreement
- > NANA Alaskan Regional Native Corporation with 14,000 Iñupiat shareholders
- Land owner and Joint partner with Teck on Red Dog
- > Largest Zinc mine in the world operating for nearly 30 years
- Good jobs and Local taxes from mine supports NW Arctic Borough Government and School District Trust | Respect | Integrity

#### **Area of Exclusive Exploration Rights**



#### 353,000 Acres



## **Community Engagement**





## **Community Engagement**

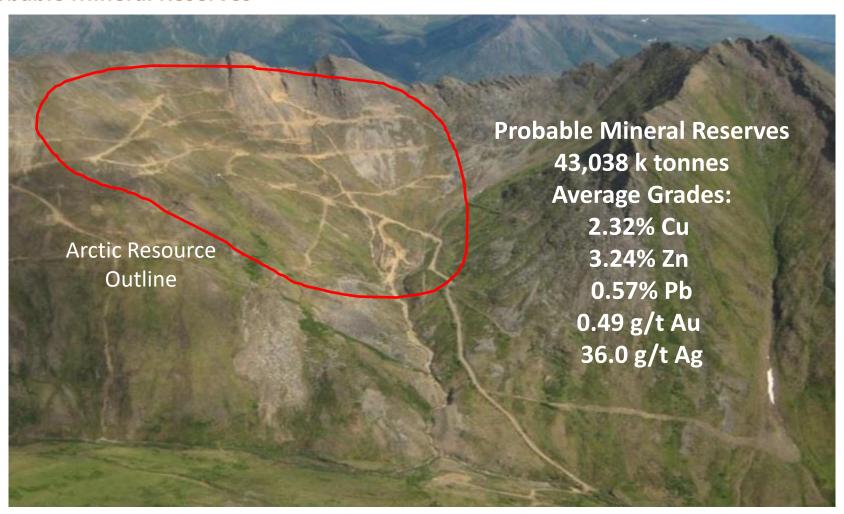




#### Reserves at the Arctic Project



#### **Probable Mineral Reserves**



Additional Inferred Resources of 3.5 Mt, with average grades of 1.71% Cu, 2.72% Zn, 0.60% Pb, 0.36 g/t Au and 28.69 g/t Ag. See Appendix for Reserve Estimate for the Arctic Project.

## **Arctic PFS – Inputs & Economic Results**

TRILOGY
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	2018 PFS
Mine Life	12 years
Mill Capacity	10,000 t/d
Average Annual Production	159M lbs Cu 199M lbs Zn 33M lbs Pb 3.3M oz Ag 30,600 oz Au
Base Case Metal Prices	\$3.00/b Cu \$1.10/lb Zn \$1.00/lb Pb \$18.00/oz Ag \$1,300/oz Au
Pre-Tax NPV (\$ million) at 8%	1,935.2
After-Tax NPV (\$ million) at 8%	1,412.7
Cash Costs, Net of By-product Credits (\$/lb Cu payable)	0.15
All-in Cost (\$/lb of Cu payable)	0.63
Cash Costs, Net of By-product (Au, Ag, Cu, Pb) Credits (\$/lb Zn payable)	-2.63
Capital Intensity Ratio (\$ initial capital / tonne of copper equivalent)	6,203
IRR Post-Tax/Pre-Tax (%)	33/38%
Payback Period Post-Tax (years)	2.0

#### **Arctic Deposit and TSF Location**

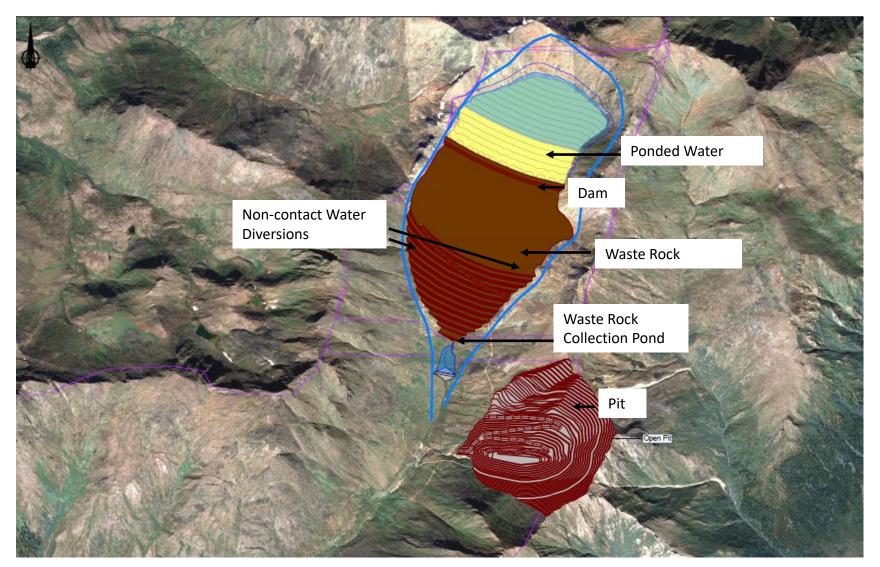


Google Earth View of Site 1 – TSF and Development Rock Location



#### Arctic PFS – Water Management Layout

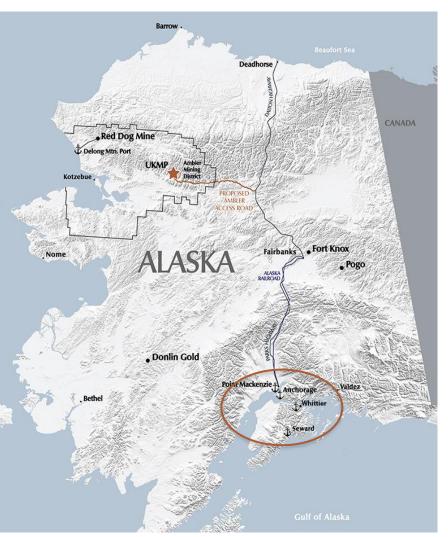




#### **Infrastructure Partnership - AIDEA**



#### **Ambler Mining District Industrial Access Project (AMDIAP)**



- A road connecting the Ambler mining district to 4 ice-free ports; year-round shipping ports at multiple locations (Mackenzie, Anchorage, Seward & Whittier)
- Rail option from Fairbanks to ports cost savings
- Alaska Industrial Development & Export Authority (AIDEA) has begun the permitting process for the road
- Notice of Intent filed in the US federal register on February 28, 2017 – Begins EIS
- Scoping completed Jan 31, 2018 and EIS anticipated to be completed in 1 -2 years
- AIDEA to permit and build AMDIAP (similar to Red Dog road and port – DMTS)
- Finance construction costs with low interest bonds
- Payback over 30+ years with tolls















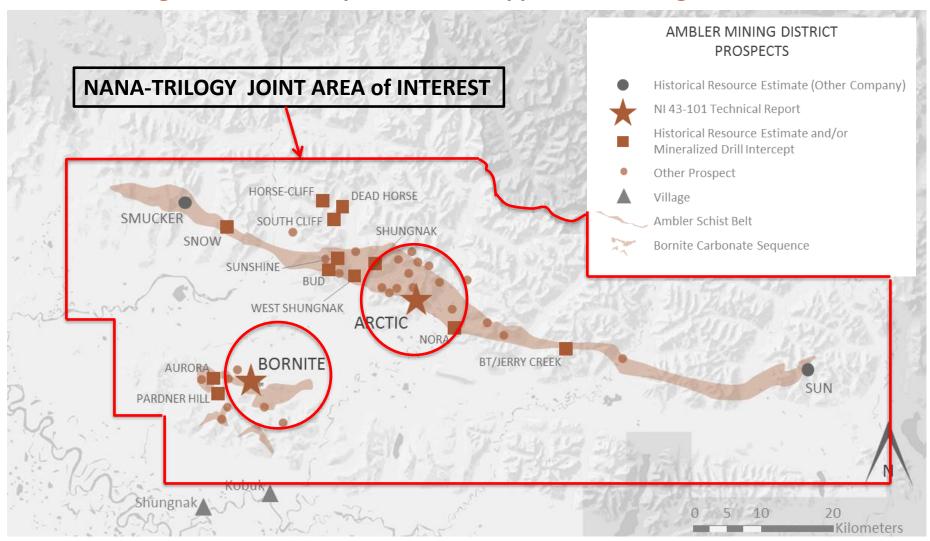




#### **District Exploration Upside**



#### Ambler mining district hosts deposits rich in copper, zinc, lead, gold and silver & cobalt



#### **Bornite – Testing Northern Extension**

Continue with ongoing hydrology, metallurgy & ABA



#### Diamond Drill Holes: New Reef Target

Drilling

Ground gravity survey

9 exploration holes, up to 1,400 meters deep

US\$10 million program for 2018 – funded by South32

In-Pit Mineral Resources
40.5 Mt of 1.02% Cu Indicated
84.1 Mt of 0.95% Cu Inferred

Indicated & Inferred
Open Pit Resource

Inferred
Below-Pit Mineral Resources
57.8 Mt of 2.89% Cu Inferred

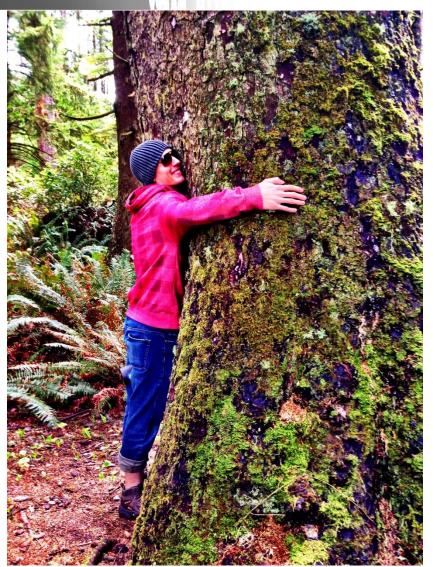
Exploration Upside
Drill Holes

**Drill Target** 



## Think Green

# Think Copper



## Our Home – Let's Take Care of it!













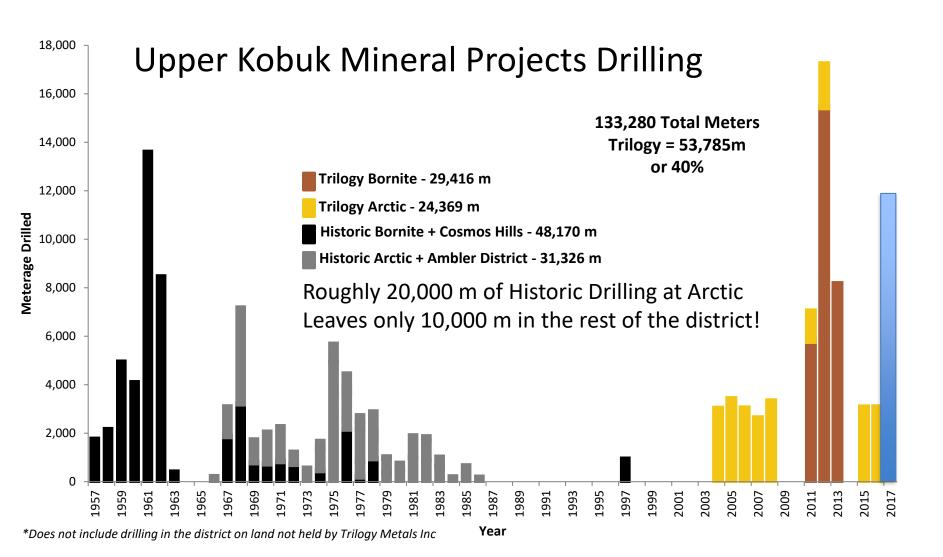
## **Appendix**

Qualified Person: Andrew W. West, Certified Professional Geologist, Exploration Manager for Trilogy Metals Inc., is a Qualified Person as defined by National Instrument 43-101. Mr. West has reviewed and verified the technical information in this presentation and approves the disclosure contained herein.

#### **Drilling in the Ambler Mining District**

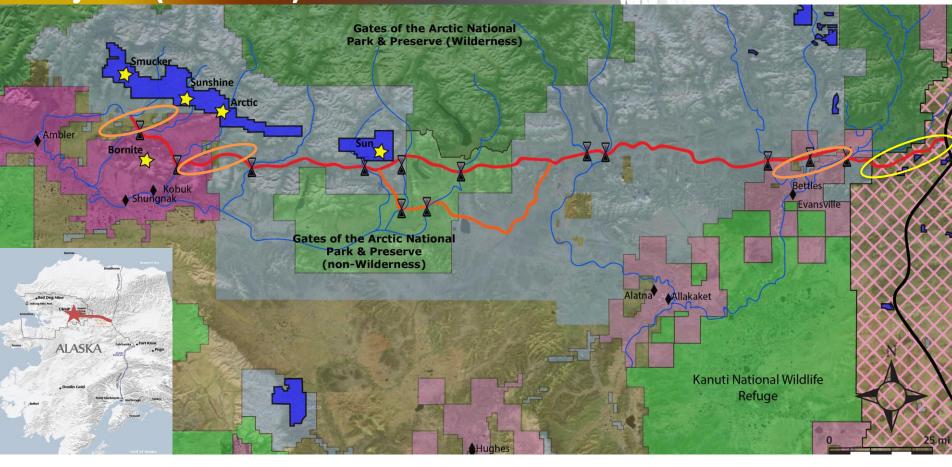
Significantly under-explored





## **Ambler Mining District Industrial Access Project (AMDIAP) Gates of the Arctic National**







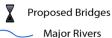
Bureau of Land Management (Federal Lands)

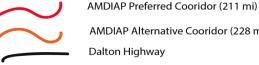
State Land (State of Alaska)

State Mining Claims (State of Alaska)



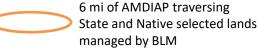
Villages Major Mineral Deposit





AMDIAP Alternative Cooridor (228 mi)

Industrial Corridor defined in 1991 BLM EIS ROD





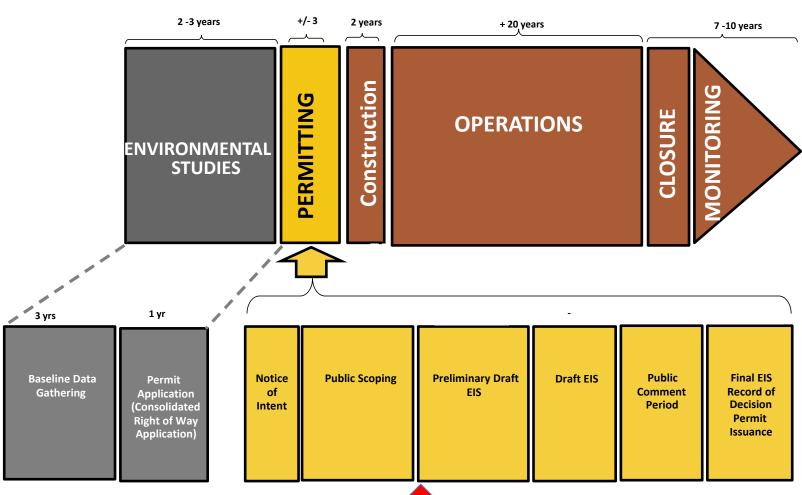
18 mi of AMDIAP traversing BLM managed land





#### **AMDIAP NEPA Permitting Process (EIS)**





Expect 1 to 2 year process from today





Trust | Respect | Integrity

Corporate Office
Suite 1150 – 609 Granville Street, Vancouver, British Columbia, V7Y 1G5 Canada
Toll Free 1.855.638.8088

NYSE American, TSX: **TMQ** www.trilogymetals.com