
Melanie Werdon – Alaska Division of Geological & Geophysical Surveys
www.dggs.alaska.gov – melanie.werdon@alaska.gov
AME Mineral Exploration Roundup – Vancouver, BC, Canada – January 28, 2019
Status of Alaska’s Mineral Industry - 2017

- **Value of Alaska’s Mineral Industry in 2017** (US$3.15 Billion)
- **Exploration Expenditures** (US$120.8 million)
- **Development Expenditures** (US$299.5 Million)
- **Estimated Revenue to Industry**
- **Mining Claims** (16%)
- **New Claims** (230%)
- **Full-Time Employment** (5%)
2018 Alaska Mineral Production

- 5 major lode mines
- 1 coal mine
- ~230 placer Au mines
- ~52 exploration projects

### 2018 Production

<table>
<thead>
<tr>
<th>Commodity</th>
<th>2018 Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zn</td>
<td>~562,000 tonnes</td>
</tr>
<tr>
<td>Pb</td>
<td>~147,000 tonnes</td>
</tr>
<tr>
<td>Au</td>
<td>~625,000 oz.</td>
</tr>
</tbody>
</table>

- **Red Dog**
  - ~545,000 tonnes Zn
  - ~97,000 tonnes Pb
  (Zn & Pb estimated)

- **Fort Knox**
  - 256,000 oz. Au

- **Pogo**
  - 250,000-260,000 oz. Au (estimated)

- **Usibelli**
  - 792,000 tonnes coal

- **Kensington**
  - 113,778 oz. Au

- **Greens Creek**
  - 7,953,003 oz. Ag
  - 51,493 oz. Au
  - ~17,300 tonnes Zn
  - ~50,400 tonnes Pb
  (Zn & Pb estimated)
2018 – Gold

Mine or Advanced Exploration
Drilling ± surface exploration
Surface exploration
Active
Pogo Mine [Northern Star Resources Limited]

Northern Star acquired Pogo for US$260 M

- Underground, shear zone/quartz vein-hosted gold mine

Estimated 2018 Production: 250,000-260,000 oz Au

<table>
<thead>
<tr>
<th></th>
<th>Million Tonnes</th>
<th>Au g/T</th>
<th>Ounces (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserve</td>
<td>1.98</td>
<td>11.9</td>
<td>0.76</td>
</tr>
<tr>
<td>Resource</td>
<td>6.8</td>
<td>15.5</td>
<td>3.39</td>
</tr>
<tr>
<td>Total</td>
<td>8.78</td>
<td>14.7</td>
<td>4.15</td>
</tr>
</tbody>
</table>

Plans through July 2019:
- Invest AUS$15-20 M in exploration/drilling
- 8 drill rigs
- Switch from mining >7 g/T Au to >3 g/T Au
- More ore through mill
- Ramp up exploration

Intersections: Au >7 g/tonne (pink, left) and Au >3 g/tonne (green, right)

Goodpaster Discovery:
17.5 feet @ 54.3 g Au/tonne

Intersections Between 3g/t & 7.6g/t (<Pogo COG)
Fort Knox Mine [Kinross Gold corporation]

Open-pit gold mine; intrusion hosted

- Produced 256,000 oz. Au (2018)

**Gilmore expansion:**
- Added 2.4 M oz. Au to resource; IRR 17%
- Initial production in 2020
- Extends mine life through 2027
- 2019-2027 annual production: 245,000 oz. Au

**Barnes Creek Heap Leach:**
- New 172.4-M-tonne-capacity heap leach pad
- Construction underway; leaching through 2030

<table>
<thead>
<tr>
<th></th>
<th>Million Tonnes</th>
<th>Au g/T</th>
<th>Ounces (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserves</td>
<td>282.2</td>
<td>0.37</td>
<td>3.37</td>
</tr>
<tr>
<td>Measured &amp; Indicated</td>
<td>146.9</td>
<td>0.38</td>
<td>1.8</td>
</tr>
<tr>
<td>Inferred</td>
<td>105.6</td>
<td>0.32</td>
<td>1.09</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>534.7</strong></td>
<td><strong>0.36</strong></td>
<td><strong>6.26</strong></td>
</tr>
</tbody>
</table>
Kensington Mine [Coeur Alaska, Inc.]

- Underground mine: mesothermal-gold quartz-vein system
- Produced: 113,778 oz. Au
- Infill drilling Upper Kensington Zone 30 resource
- Resource expansion on new Seward, Ophir, and Elmira veins
- First Jualin production December 2018

<table>
<thead>
<tr>
<th></th>
<th>Million Tonnes</th>
<th>Au g/T</th>
<th>Ounces (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserves</td>
<td>2.42</td>
<td>6.09</td>
<td>0.520</td>
</tr>
<tr>
<td>Measured &amp; Indicated</td>
<td>2.61</td>
<td>8.47</td>
<td>0.780</td>
</tr>
<tr>
<td>Inferred</td>
<td>1.33</td>
<td>8.47</td>
<td>0.399</td>
</tr>
<tr>
<td>Total</td>
<td>6.36</td>
<td>7.71</td>
<td>1.699</td>
</tr>
</tbody>
</table>

Map of Kensington area deposits

Elmira vein
Livengood [International Tower Hill Mines]

-Metasediment-hosted, intrusion-related gold system

-Easy access to road and power

<table>
<thead>
<tr>
<th>April 2017</th>
<th>Million Tonnes</th>
<th>Au g/T</th>
<th>Ounces (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proven &amp; Probable</td>
<td>392</td>
<td>0.71</td>
<td>8.9</td>
</tr>
<tr>
<td>Measured, Indicated &amp; Inferred***</td>
<td>578</td>
<td>0.68</td>
<td>12.6</td>
</tr>
</tbody>
</table>

***Inclusive of reserves

2017 Initial PFS:
-6.8 M oz of Au
-23-year mine life
-52,600 tons/day

2018 program:
-US$5.1 million work program
-Metallurgical studies
-4,000 kg of new metallurgical composites
-Ongoing environmental studies
Donlin Gold (Development stage) [50% Barrick Gold Corp./50% NovaGold Resources Inc.]

2018 Milestones:
- Received Final EIS ROD
- Completed federal environmental process

2018 Program (US$28 M):
- Incorporate 2017’s drill data into geologic & resource models
- Project optimization to improve capital efficiencies
- Advance project towards construction/production decision
- Update 2011 feasibility study

Projected production:
1.1 M oz. of Au/year
27-year mine life

<table>
<thead>
<tr>
<th></th>
<th>Million Tonnes</th>
<th>Au g/T</th>
<th>Ounces (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proven &amp; Probable</td>
<td>504.8</td>
<td>2.09</td>
<td>33.9</td>
</tr>
<tr>
<td>Inferred</td>
<td>92.2</td>
<td>2.0</td>
<td>5.9</td>
</tr>
<tr>
<td>Total</td>
<td>541</td>
<td>2.24</td>
<td>39.0</td>
</tr>
</tbody>
</table>

Open pit outline and gold-in-soils showing additional potential
Herbert Gold [Grand Portage Resources]

Mesothermal Au-quartz veins 25 miles SE of Kensington mine
Disseminated Aspy, Py, Gal, Sphal, visible gold in quartz vein

<table>
<thead>
<tr>
<th>July 2018</th>
<th>Million Tonnes</th>
<th>Au g/T</th>
<th>Ounces</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 g/T cut-off</td>
<td>1.107</td>
<td>7.25</td>
<td>257,950</td>
</tr>
<tr>
<td>Indicated</td>
<td>0.423</td>
<td>6.04</td>
<td>82,200</td>
</tr>
<tr>
<td>Inferred</td>
<td>1.53</td>
<td>6.92</td>
<td>360,000</td>
</tr>
<tr>
<td>Total</td>
<td>1.53</td>
<td>6.92</td>
<td>360,000</td>
</tr>
</tbody>
</table>

2018 Work:
- Gravity + flotation = >99% high grade; >97% low grade
- Lidar survey for drill targeting
- Drilled 15 holes from 2 pads

New Discovery: 8.4 m of 1.65 g/T Au

Goat Vein:
DDH 18M-6: 6.3 m of 15.7 g/T Au

Deep Trench Vein:
DDH 18S-2: 9.1 m of 30.24 g/T Au, 40.52 g/T Ag

Visible gold in core

July 2018 2 g/T cut-off Million Tonnes Au g/T Ounces
Indicated 1.107 7.25 257,950
Inferred 0.423 6.04 82,200
Total 1.53 6.92 360,000

Indicated 1.107 7.25 257,950
Inferred 0.423 6.04 82,200
Total 1.53 6.92 360,000
Golden Zone [Avidian Gold]

Breccia pipe in Cretaceous porphyry stock, skarn, & sediment-hosted Cu-Au mineralization

<table>
<thead>
<tr>
<th>2016 Breccia Pipe</th>
<th>Million Tonnes</th>
<th>Au g/T</th>
<th>Ag g/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicated</td>
<td>4.2</td>
<td>1.99</td>
<td>10.4</td>
</tr>
<tr>
<td>Inferred</td>
<td>1.4</td>
<td>0.83</td>
<td>2.6</td>
</tr>
<tr>
<td>Total</td>
<td>5.6</td>
<td>1.7</td>
<td>8.5</td>
</tr>
</tbody>
</table>

Breccia Pipe area drilling

Copper King area:
- DDH CK18-01: 9.1 m of 8.71 g/T Au, 80.8 g/T Ag, 3.57% Cu (semi-massive sulfides/skarn)
- Trench T18-09: 30.0 m of 2.24 g/T Au, 67.2 g/T Ag, 2.79% Cu (skarn)
Golden Zone [Avidian Gold]

New exploration targets:

I. Gold in Conglomerate:
- Permian/Triassic Chulitna Terrane
- Ave. clast size: 2 to 5 cm
- Main inter-clast material: sand
- Cement: carbonate
- Ore minerals: arsenopyrite, chalcopyrite, pyrrhotite, pyrite

Golden Zone corridor = Au-dominant
Long Creek corridor = Cu-dominant

- Found over 3 km in multiple horizons
- Highest grade (Au-dominant): 1 m @ 8.86 g/t Au, 23 g/t Ag, 0.11% Cu
- Highest grade (Cu-dominant): 1.51 g/t Au, 67 g/t Ag, 1.05% Cu

II. Porphyry/Stockwork Veins:
- Granite plutons and dikes
- Variable porphyritic
- Stockwork veining
- Molybdenum
**Multiple Gold Models:**

1. **Low-angle structures**
   - (Pogo - Liese, LMS, Naosi)

2. **High-angle structures**
   - (Pogo N. Zone, Fairbanks)

3. **Quartz-Feldspar Porphyry Dikes** (Democrat Lode)

4. **Mineralized plutons** (Fort Knox)

**Naosi Inferred Resource:**

48.4 M tonnes @ 1.85 g Au/tonne (2.88 M oz. Au), 33 g Ag/tonne (51.4 M oz. Ag)

**DGGS Assays:**

Up to 43.3 g Au/tonne
2018 – Base Metals & Polymetallic

Mine or Advanced Exploration
Drilling ± surface exploration
Surface exploration
Active

Base Metal Belts

Red Dog
Aktigirua
Lik
Smucker
Arctic
Bornite
Sun

Red Mountain
Red Dog
Delta
Greens Creek
Palmer
Niblack

Active Base Metal Belts
Greens Creek VMS [Hecla Mining Co.]

- 2018 Production: 7.953 M oz. Ag; 51,493 oz. Au (2018); estimated 50,000 tonnes Zn, 17,000 tonnes lead

- Exploration drilling: East Ore, Upper Plate, Deep 200 South, Deep Southwest, Gallagher

- Expecting increased revenues in 2019 as Hecla accesses East Ore

<table>
<thead>
<tr>
<th></th>
<th>Million Tonnes</th>
<th>Zn %</th>
<th>Pb %</th>
<th>Au g/T</th>
<th>Ag g/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserves</td>
<td>7.55</td>
<td>8.1</td>
<td>3.0</td>
<td>3.11</td>
<td>370.1</td>
</tr>
<tr>
<td>Measured &amp; Indicated</td>
<td>2.81</td>
<td>7.7</td>
<td>2.9</td>
<td>2.80</td>
<td>348.4</td>
</tr>
<tr>
<td>Inferred</td>
<td>2.71</td>
<td>6.9</td>
<td>2.7</td>
<td>2.49</td>
<td>376.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13.07</strong></td>
<td><strong>7.8</strong></td>
<td><strong>2.9</strong></td>
<td><strong>2.91</strong></td>
<td><strong>366.7</strong></td>
</tr>
</tbody>
</table>

Third quarter 2018 drilling activity
Red Dog Mine [Teck]  
Sediment-hosted Zn-Pb-Ag deposits; open-pit mine  
- Projected 540,000 to 550,000 tonnes Zn (2018)  
- Projected 95,000 to 100,000 tonnes Pb (2018)  
- Reserves: 50.9 M tonnes @ 15.0% Zn, 4.2% Pb, 76.4 g/T Ag (Dec. 2017)

At Dec 31 2016

<table>
<thead>
<tr>
<th></th>
<th>Tonnes (Mt)</th>
<th>Zn (%)</th>
<th>Pb (%)</th>
<th>Ag (g/t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past Production</td>
<td>78.3</td>
<td>19.6</td>
<td>5.3</td>
<td>94</td>
</tr>
<tr>
<td>Reserves</td>
<td>50.9</td>
<td>15.0</td>
<td>4.2</td>
<td>76</td>
</tr>
</tbody>
</table>

Currently mining Qanaiyaq and Aqqaluk
Aktigiruq Zn-Pb-Ag [Teck]

Sediment-hosted massive sulfide deposits

Anarraaq resource:
-Inferred: 26 M tonnes @ 13.8% Zn, 4.3% Pb, 84.3 g/T Ag

2018 Aktigiruq program:
-Drilling program
-Ore body is 400 to 1,000 m below surface
-2016 drilling encountered 54.6 m @ 16.8% Zn, 3.63% Pb (DDH1737)

Cross section looking NW through Anarraaq and Aktigiruq deposits
Lik (Su) Zn-Pb-Ag [Solitario Exploration & Royalty Co. & Teck Resources Ltd.]

Sediment-hosted massive sulfide deposit
- New partnership; Teck taking exploration lead

2014 PEA:
- Open-pit mine, initial 9-year life
- Produce 234,000 dry tonnes Zn & 55,800 dry tonnes lead concentrates/year
- IRR = 9.7%; NPV(8%) of $25.0 million
- Assumed constructed as self-contained operation; no benefits from Red Dog infrastructure were considered

<table>
<thead>
<tr>
<th></th>
<th>Million Tonnes</th>
<th>Zn %</th>
<th>Pb %</th>
<th>Ag g/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicated</td>
<td>17.3</td>
<td>8.0</td>
<td>2.7</td>
<td>51</td>
</tr>
<tr>
<td>Inferred</td>
<td>2.9</td>
<td>8.6</td>
<td>2.6</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td><strong>20.2</strong></td>
<td><strong>8.1</strong></td>
<td><strong>2.7</strong></td>
<td><strong>49</strong></td>
</tr>
</tbody>
</table>

Based on 229 drill holes

2018 work:
- Gravity survey over most of the 6,075-acre property, compiling & merging prior IP surveys, geologic mapping for stratigraphy & structure, re-logging existing core
Ambler Mining District Industrial Access Project [AIDEA]

- Arctic Bornite VMS Belt
- State Land with Mineral Potential
- Carbonate-hosted Cu-Co
- Proposed Road

Map showing the Ambler Mining District with key locations and proposed road.
Arctic VMS [Trilogy Metals Inc./South32 Limited]

New PFS:
- 12-year mine life
- Estimated pre-tax & after-tax payback within 2 years
- Pre-tax 38.0% IRR; $1,935.2 million NPV at 8%

Resources: (based on 152 DDH; inclusive of reserves)

<table>
<thead>
<tr>
<th>April 2018</th>
<th>Million Tonnes</th>
<th>Cu %</th>
<th>Zn %</th>
<th>Pb %</th>
<th>Au g/T</th>
<th>Ag g/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probable</td>
<td>43</td>
<td>2.32</td>
<td>3.24</td>
<td>0.57</td>
<td>0.49</td>
<td>36.0</td>
</tr>
</tbody>
</table>

2018 program (US$6.7 million):
- Completed ore-sorting program
- Geotechnical & hydrological studies
- Preparing for feasibility study & starting permitting in 2019
- Working with AIEDA to advance the Ambler Mining District Industrial Access Road Project; BLM working on EIS.
Bornite Carbonate-Hosted Cu-Co [Trilogy Metals Inc./South32 Limited]

2018 program (US$10.8 M):
- 12 holes; total 10,123 m of infill & off-set drilling
- Seismic survey
- Metallurgical testing: produce Cu concentrates of 24% - 33% Cu; & no deleterious metals

2019 program: Anticipated ~US$9.2 million budget

<table>
<thead>
<tr>
<th></th>
<th>Million Tonnes</th>
<th>Cu %</th>
<th>Co %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicated</td>
<td>40.5</td>
<td>1.02</td>
<td>0.017</td>
</tr>
<tr>
<td>Inferred</td>
<td>141.9</td>
<td>1.74</td>
<td>0.025</td>
</tr>
<tr>
<td>Total</td>
<td>182.4</td>
<td>1.24</td>
<td>0.019</td>
</tr>
</tbody>
</table>

Contained metal: 77 M lbs. Co; 5,450 M lbs. Cu

20.1m @ 4.55 % Cu, 0.17% Co
Red Mountain VMS District [White Rock Minerals Ltd./Sandfire Resources NL]

Resource (3% Zn cut-off):

<table>
<thead>
<tr>
<th>April 2017</th>
<th>Million Tonnes</th>
<th>Cu %</th>
<th>Zn %</th>
<th>Pb %</th>
<th>Ag g/T</th>
<th>Au g/T</th>
<th>Zn Eq %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Creek</td>
<td>2.4</td>
<td>0.2</td>
<td>4.7</td>
<td>1.9</td>
<td>69</td>
<td>0.4</td>
<td>8.7</td>
</tr>
<tr>
<td>West Tundra Flats</td>
<td>6.7</td>
<td>0.1</td>
<td>6.2</td>
<td>2.8</td>
<td>189</td>
<td>1.1</td>
<td>14.4</td>
</tr>
<tr>
<td>Total Inferred</td>
<td>10.0</td>
<td>0.13</td>
<td>5.8</td>
<td>2.6</td>
<td>157</td>
<td>0.9</td>
<td>9.1</td>
</tr>
</tbody>
</table>

2018 program:
- 24 holes; total 4,111 m; down-hole EM surveying
- CSAMT surveying, geologic mapping, stream-sediment sampling
- Dry Creek: 4.7m @ 19.5% Zn, 7.8% Pb, 466 g/T Ag, 6.9 g/T Au, 1.5% Cu

NEW DISCOVERY:
Hunter: 1.4 m @ 17.4% Zn, 3.9% Pb, 90g/T Ag, 1.6% Cu
Palmer VMS District

2018 Program:
- Approval to extend access road to future portal
- Evaluating exploration drift for drilling
- 29 DDH’s, 10,000 m
- Barite metallurgical program
- Updated NI43-101 report
- Launched PEA

<table>
<thead>
<tr>
<th></th>
<th>Million Tonnes</th>
<th>Cu %</th>
<th>Zn %</th>
<th>Ag g/T</th>
<th>Au g/T</th>
<th>Barite %</th>
<th>Zn Eq %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicated</td>
<td>4.7</td>
<td>1.49</td>
<td>5.23</td>
<td>30.8</td>
<td>0.30</td>
<td>23.9</td>
<td>11.67</td>
</tr>
<tr>
<td>Inferred</td>
<td>5.3</td>
<td>0.96</td>
<td>5.2</td>
<td>29.2</td>
<td>0.28</td>
<td>22.0</td>
<td>9.9</td>
</tr>
<tr>
<td>Total</td>
<td>10.1</td>
<td>1.21</td>
<td>5.21</td>
<td>29.9</td>
<td>0.29</td>
<td>22.9</td>
<td>10.72</td>
</tr>
</tbody>
</table>

Based on 108 DDH’s totaling 44,900 m, $75 NSR cutoff

Property map:
- VMS horizon (red line) & prospects (stars)
- South Wall Resource
- Access Road

South Wall and RW Zone geology
Nunatak – AG Zone [Constantine Metal Resources Ltd. (51%) & Dowa Metals & Mining Alaska Ltd. (49%)]

Maiden Resource (5% ZnEq cut-off grade):

<table>
<thead>
<tr>
<th>Dec. 2018</th>
<th>Million Tonnes</th>
<th>Cu %</th>
<th>Zn %</th>
<th>Ag g/T</th>
<th>Au g/T</th>
<th>Barite %</th>
<th>Zn Eq %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inferred</td>
<td>4.256</td>
<td>0.12</td>
<td>4.64</td>
<td>119.5</td>
<td>0.53</td>
<td>34.8</td>
<td>9.04</td>
</tr>
</tbody>
</table>

DDH CMR18-130:
33.5 m @ 98 g/T Ag, 0.4 g/T Au, 5.0% Zn, 1.1% Pb, 0.2% Cu, 41.5% BaSO4
2018 – Porphyry + Skarn

Mine or Advanced Exploration
Drilling ± surface exploration
Surface exploration
Active

New DGGS mapping

Porphyry belt

Zackly
Round Top
Nixon Fork
San Diego Bay
Pyramid
Shumigan (Unga)

Pebble

Liberty
Bell

Shorty Creek

Taurus
Oreo
Northway
Peak Gold (Tetlin)

Pebble

Porphyry Cu-Au-Mo

Project
Prospect
**Pebble Porphyry Cu-Mo-Au** (Permitting phase) [The Pebble Partnership (PLP)]

**2018 Work:**
- Jan. 6, 2018: Corps of Engineers accepted PLP’s permit application
- Initiated NEPA review process
- Geotechnical drilling

**New proposed development plans:**
- Footprint <1/2 of prior envisioned size
- Single drainage for site infrastructure
- Open-pit mine
- Tailings storage facility designed for maximum safety
- Separation of potentially acid generating tailings from non-acid generating; fully lined tailings storage facility
- No permanent waste-rock piles or cyanide usage
- Annual production: 287 M lbs. Cu, 321,000 oz Au, 1.6 M oz Ag, ~13 M lbs. Mo

<table>
<thead>
<tr>
<th>Resource</th>
<th>Million Tonnes</th>
<th>Cu (%)</th>
<th>Au (g/t)</th>
<th>Mo (ppm)</th>
<th>Ag (g/t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured</td>
<td>527</td>
<td>0.33</td>
<td>0.35</td>
<td>178</td>
<td>1.66</td>
</tr>
<tr>
<td>Indicated</td>
<td>5,912</td>
<td>0.41</td>
<td>0.34</td>
<td>245</td>
<td>1.66</td>
</tr>
<tr>
<td>Inferred</td>
<td>4,460</td>
<td>0.25</td>
<td>0.26</td>
<td>222</td>
<td>1.19</td>
</tr>
</tbody>
</table>

Photo credit: Jason Sear & PLP Oct. 5, 2017 presentation

Mine plan submitted to U.S. Corps of Engineers
**2018 program:**
- Airborne magnetic survey; 50-m line spacing
- 18 drill holes; 3,754 m
- Surface exploration at Mars Porphyry Cu-Au, Gold Boulder Skarn, & Moonwalk reduced intrusion-related Au targets
- New skarn zone: ZX-18024; 46.7 m @ 3.1 g/T Au, 0.6% Cu

**JORC Inferred Resources**

<table>
<thead>
<tr>
<th>JORC Inferred Resources</th>
<th>Million Tonnes</th>
<th>Cu %</th>
<th>Au g/T</th>
<th>Aug g/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zackly Skarn</td>
<td>3.4</td>
<td>1.2</td>
<td>2.0</td>
<td>14.0</td>
</tr>
<tr>
<td>Caribou Dome</td>
<td>2.8</td>
<td>3.1</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*ZX-18020: 55m @ 2.8 g/T Au, 0.6% Cu*
**Peak (Tetlin) Cu-Au Skarn** [Peak Gold, LLC]

**PEA Highlights (Sept. 2018):**
- 1.1 M oz. Au production
- 2 M oz. Ag production
- 8-year mine life
- 3,500 tonnes/day throughput
- 91.6% Au, 57.0% Ag recovery
- 3.9:1 strip ratio
- US$294 M initial capital
- US$428/oz. Au recovered, total cash cost
- ~2-year, after-tax payback for initial development capital
- 29% post-tax IRR

**2018 Program (~US$9.1 million):**
- 6,189 m of drilling
- Geophysical surveys

<table>
<thead>
<tr>
<th>Million Tonnes</th>
<th>Cu %</th>
<th>Au g/T</th>
<th>Ag g/T</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measured &amp; Indicated</strong></td>
<td>9.2</td>
<td>0.153</td>
<td>4.08</td>
</tr>
<tr>
<td><strong>Inferred</strong></td>
<td>1.34</td>
<td>0.151</td>
<td>2.69</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>10.54</td>
<td>0.153</td>
<td>3.9</td>
</tr>
</tbody>
</table>

0.5 g/T Au shells (gold) within $1,400-Au pit shells (gray)
New DGGS Mapping – Tanacross Porphyry District

Taurus Porphyry Cu-Mo-Au-Re Deposit

Unofficial resource: 68.2 M tonnes @ 0.275% Cu, 0.032 Mo, 0.166 g/T Au

Notable intercepts (2008) East Taurus:
-235 m of 0.309% Cu, 0.036% Mo, 0.245 g/T Au
-54.6 m of 0.258% Cu, 0.026% Mo, 0.149 g/T Au

Pika-Fishhook

Hbl porphyry (66.3 Ma)
Taurus-Bluff

Andesite (66 Ma?)

Taurus

Qtz-Feldspar Porphyry (70-72 Ma)

Qtz Monzonite Hbl-Feldspar Porphyry (68-70 Ma)

Sericite-tourmaline alteration; anomalous Ag
Potassic Alteration with Cu-Mo-Au
Quartz-sericite-pyrite
Alaska’s Mineral Belts
- Gold
- Base Metal
- Porphyry

Alaska’s Criticality-Score-Weighted Critical Minerals Potential

Graphite Creek
Lost River Sn
Genesis (Tonsina) PGE, Ni
Bokan Mountain REEs
Icy Cape Au, industrial minerals

Drilling ± surface exploration
Surface exploration
Active
Graphite Creek [Graphite One Resources]

USA’s largest, large-flake graphite deposit

2018 Program:
- 6 holes, 800 m of in-fill drilling
- Additional metallurgical testing
- Alternative access routes
- Initiate environmental surveys
- Collect data for future PFS

2017 PEA:
- Open-pit: 1.11 M tonnes graphite-bearing material/year
- 40-year mine life
- 41,850 tonnes of high-grade coated spherical graphite/year for lithium-ion battery applications
- 13,500 tonnes of refined, sub-20-micron graphite powder/year for various end-uses.

<table>
<thead>
<tr>
<th>6% cutoff</th>
<th>Million Tonnes</th>
<th>Cg %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicated</td>
<td>10.3</td>
<td>7.2</td>
</tr>
<tr>
<td>Inferred</td>
<td>71.2</td>
<td>7.0</td>
</tr>
<tr>
<td>Total</td>
<td>81.5</td>
<td>7.0</td>
</tr>
</tbody>
</table>
Bokan REE [Ucore Rare Metals, Inc.]

Heavy REE-enriched Bokan Mountain intrusive suite

2018 Milestones:
- Ketchikan, Alaska → New Strategic Metals Complex (SMC)
- Purchased REE-separation plant’s development site
- Process Bokan & REE ore from deposits worldwide
- US$145 million proposed AIDEA financing package for Bokan mine & processing facilities
- Initiated engineering & design of SMC
- FY2019 National Defense Authorization Act - U.S. DoD banned from acquiring Rare Earth magnets from China
- Ucore intends to exercise its option to purchase IBC Advanced Technologies (developer of Molecular-Recognition Technology [MRT]); Notice of Commencement due March 2019

Separation purity for REEs using Molecular-Recognition Technology
Usibelli Coal Mine – Celebrating 75 Years of Production

Usibelli Coal Mine:
- 2018 Production 997,903 tonnes
- Regional electrical generation
- 75-year operation
Alaska’s Mineral Resource Information

Division of Geological & Geophysical Surveys
http://dggs.alaska.gov/

- Geochemistry
- Geophysics
- Geologic Maps
- Elevation Data
- Minerals Report
- Mineral Occurrences
- GMC

Division of Mining, Land & Water
http://dnr.alaska.gov/mlw/

- Land status
- Mining claims
- Mine Permitting
- Mine Regulation

Geologic Materials Center
http://dggs.alaska.gov/gmc/index.php

- Core Repository
- Indoor core viewing and storage
- Surface samples
- Geochemistry pulps
- Online Inventory
- Confidential storage and viewing