Alaska Department of Natural Resources Update

The Alaska Support Industry Alliance

Presented by Corri Feige
Commissioner, Department of Natural Resources

January 10, 2019
State of Alaska - Land Base & Ownership

Land Base
- 586,412 sq. miles—more than twice the size of Texas
- Larger than all but 18 sovereign nations
- More coastline than all other 49 states combined
- More than 3 million lakes; half of world’s glaciers

Land Ownership
- Federal Land: (~60.3%) more than 200 million acres
- State Land: (~27.4%) Approx. 100 million acres of uplands
- Native Corporation Land: (~12%) 44 million acres
- Private: (<1%) Approx. 1 million acres
North Slope

- More undiscovered, potentially recoverable oil than any other Arctic nation
  - **OIL:** Est. 40 billion barrels of conventional oil
  - **GAS:** Est. over 200 trillion cubic feet of conventional natural gas
- Untapped unconventional resource potential, including tens of billions of barrels of heavy oil, shale oil, and viscous oil, and hundreds of trillions of cubic feet of shale gas, tight gas, and gas hydrates

Cook Inlet

- Significant undiscovered resources remain
  - 19 trillion cubic feet of natural gas
  - 600 million barrels of oil
  - 46 million barrels of natural gas liquids

*Sources: USGS & BOEM*

**Compared to most basins, Alaska is relatively underexplored, with 500 exploration wells on the North Slope, compared to Wyoming’s 19,000.**
2018 Fall Lease Sale brought the 3rd highest amount of winning bids since 1998

Total Bonus Bid: $29,234,028.10

Highest Bid Per Acre: $586.00

Total Leased Acres: 243,950
2019 is expected to be the busiest year in the last 10 years for exploration and production rig activity.

- Pikka, Mustang, and Placer finds demonstrate great potential.
- New data suggests enormous potential in Nanushuk and Torok formations.
- Legacy fields including Prudhoe and Kuparuk have exceeded internal expectations through infield work.
- Smaller companies, like Caelus, Great Bear & Armstrong, are engaging in exploration plans that will help maximize TAPS throughput into the future.
- New players, like Oil Search, indicate industry acknowledgment of large, viable fields that were unknown.
- Continuous work with North Slope communities, presidential administration, and Congressional delegation on Arctic energy policy and decision making that support responsible development (ANWR Coastal Plain, OCS, NPR-A)
State of Alaska - Royalty Rate -

**NPR-A**
- Royalty Rate: 12.5% or 16.67%
- SOA Royalty: 0% (Mitigation Fund)

**State Lands**
- Royalty Rate: 12.5% or 16.67%
- SOA Royalty: 83% - 100%

**ANWR**
- Royalty Rate: 16.67%
- SOA Royalty: 50%

**Offshore**
- Royalty Rate: 16.67%
- SOA Royalty: 0 - 3 Miles 100%, 3 - 6 Miles 27%, Greater than 6 Miles 0%
Value of Alaska’s Mineral Industry ($3.15 Billion)
Exploration Expenditures ($120.8 million)
Development Expenditures ($299.5 Million)
Estimated Revenue to Industry

State Mining Claims
New Claims
Full-Time Employment
State of Alaska
- 2017 Mineral Production -

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

<table>
<thead>
<tr>
<th>2017 Production</th>
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<tbody>
<tr>
<td>Zinc</td>
</tr>
<tr>
<td>Lead</td>
</tr>
<tr>
<td>Gold</td>
</tr>
<tr>
<td>Silver</td>
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<tr>
<td>Coal</td>
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</table>

- Red Dog
  597,342 tons Zn
  122,687 tons Pb
  7.7 million oz. Ag
- Fort Knox
  381,115 oz. Au
- Pogo
  271,273 oz. Au
- Usibelli
  873,000 tons coal
- Kensington
  115,094 oz. Au
- Greens Creek
  8.3 million oz. Ag
  50,854 oz. Au
  52,547 tons Zn
  17,996 tons Pb
Sediment-hosted massive sulfide deposit

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)

Figures courtesy of Teck Alaska
State of Alaska

Ambler Mining District Industrial Access Project [AIDEA]

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

Cross section looking NW through Anarraaq and Aktigiruq deposits

Proposed Road

State Land with Mineral Potential

Borneite

Sun

Smucker

Carbonate-hosted Cu-Co

AMS Belt

Gates of the Arctic National Park & Preserve (Wilderness)
New PFS:
- 12-year mine life
- Estimated pre-tax & after-tax payback of 2 years
- Converted indicated mineral resources to probable reserves
- Pre-tax 38.0% IRR; $1,935 million NPV at 8%

Resource: (based on 152 DDH)

<table>
<thead>
<tr>
<th></th>
<th>Oct 2017</th>
<th>Million Tonnes</th>
<th>Cu %</th>
<th>Zn %</th>
<th>Pb %</th>
<th>Au g/T</th>
<th>Ag g/T</th>
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<tbody>
<tr>
<td>Indicated</td>
<td>36</td>
<td>3.07</td>
<td>4.23</td>
<td>0.73</td>
<td>0.63</td>
<td>47.6</td>
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<tr>
<td>Inferred</td>
<td>3.5</td>
<td>1.71</td>
<td>2.72</td>
<td>0.6</td>
<td>0.36</td>
<td>28.7</td>
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<tr>
<td>Total</td>
<td>39.5</td>
<td>2.95</td>
<td>4.09</td>
<td>0.73</td>
<td>0.61</td>
<td>45.9</td>
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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.
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

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<thead>
<tr>
<th></th>
<th>Million Tonnes</th>
<th>Cu %</th>
<th>Co %</th>
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<tbody>
<tr>
<td>Indicated</td>
<td>40.5</td>
<td>1.02</td>
<td>0.017</td>
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<tr>
<td>Inferred</td>
<td>141.9</td>
<td>1.74</td>
<td>0.025</td>
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<td>Total</td>
<td>182.4</td>
<td>1.24</td>
<td>0.019</td>
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20.1m @ 4.55 % Cu, 0.17% Co

Contained metal: 77 M lbs. Co & 5.45 B lbs. Cu
Taurus Porphyry Cu-Mo-Au Deposit

Unofficial resource: 75.2 M tons @ 0.275% Cu, 0.032 Mo, 0.166 g/T Au

Notable intercepts (2008) East Taurus:
-772 feet of 0.309% Cu, 0.036% Mo, 0.245 g/T Au
-179 feet of 0.258% Cu, 0.026% Mo, 0.149 g/T Au

Pika-Fishhook
Andesite (66 Ma?)
Hbl porphyry (66.3 Ma)
Taurus-Bluff
Quartz Monzonite
Hbl-Feldspar Porphyry (68-70 Ma)

Potassic Alteration with Cu-Mo-Au
Quartz-sericite-pyrite
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.

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<thead>
<tr>
<th>Cut-off</th>
<th>Million Tonnes</th>
<th>Cg %</th>
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<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>
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<tr>
<td>Total</td>
<td>81.5</td>
<td>7.0</td>
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Secure lands and access from Federal Government.

Identify minerals and oil and gas prospectivity via Best Interest Findings.

Lease lands for exploration and development.

Permit programs to ensure conservation of resources and protection of state’s lands and interests.

Approve and monitor reclamation and closure operation.

Manage production units and mines to protect state’s royalty interests.
THANK YOU!