

# Alaska Juneau Mine History – Condensed<sup>1</sup>

Note: Ground breaking firsts highlighted in **RED**

1893	5-stamp mill set up at Fuller 1 <sup>st</sup> Mine with surface mined ore (Glory Hole). <b>\$6/ton rock @ \$20.67/oz gold price = low grade ore (0.29oz/t).</b>
1896	Expand to 30 stamp mill and 150 t/d with <b>hand sorting</b>
1900	Ceased hand sorting, equipment added to increase throughput
1903-1905	Exploration adits driven 400 – 500 ft below open pits revealing ore at 90¢/ton. <b>Indicating a sizable ore body &amp; need to mine U/G with mill at tidewater</b>
1911	F.W. Bradley (operator of Treadwell Mines) drives <b>Gold Creek Tunnel</b> 400fmsl, 900' below 30 stamp mill & 1,500' beneath the NOB. Thus, mine is above haulage and haulage is above mill. Tailings emit near the beach.
1912-1914	Treadwell Mines construct Nugget Creek hydro 2.3 MW using timber cribbing dam and 6,900' long wood stave pipeline and penstock
1912	Bart Thane proposes Alaska Gastineau 6,000 t/d mine and mill (SOB) and <b>4.5 MW Sheep Creek hydro project</b>
1912-1914	Alaska Gastineau Mine drives <b>Sheep Creek Adit 10,497' at 544 feet/month – a world record</b>
1913	<b>Salmon Creek dam and reservoir constructed by Gastineau 125' high, 648' crest length, double curvature thin arch</b>
1913	<b>Alaska Gastineau Mine and Mill first application of bulk mining and milling using flint mills from Cu industry in AZ (stamps were industry standard to that time re: Treadwell 960 stamps produced 4,500 t/d).</b> The mill worked spectacularly (stock increased in value 250%) but the SOB could not deliver sufficient ore at suitable grade at that price and the mine eventually closed.
1913-1914	AJ 50 stamp experimental mill built on Gastineau Channel to test milling methods, recovery methods, sorting, and cyanidation (at Treadwell)
1915	AK Gastineau locates and constructs Annex Creek lake tap hydro project within 7 months – <b>first and only lake tap hydro under 150' of head without loss of water from lake</b>
1915	AJ goes public offering 400,000 shares at \$10, based 80 – 100 million tons of ore at \$0.7 to \$1.0/ton (0.041oz/t).  Engr. MacKenzie designed new production 8,000 t/d mill using <b>ball mills for grinding</b> (similar to Gastineau Mill Tube mills from copper industry). No test work done.
1916	<ul style="list-style-type: none"> <li>• 8 MW steam power plant constructed below mill &amp; fired by crude oil</li> <li>• <b>Coyote blasting bulk mining method w/ bulldoze chamber secondary blasting</b></li> <li>• <b>Marine tailings and rock disposal using conveyors and tug/barges</b></li> </ul>
1917	AJ Mill start up, produces 1,200 t/d, far below 8,000 t/d expectation. Crushing too coarse, rock too hard compared to copper ore in AZ.
1917	AJ Mill throughput slowly rises to 3,274 t/d.

<sup>1</sup> Hard Rock Gold, David Stone, 1980.

<b>1919</b>	Added more crushing capacity & added ore surge storage
<b>1919-1928</b>	Net operating losses & continuous improvement in AJ mine & mill (re-adding <b>hand sorting @ 46 – 48% reject</b> used as valuable construction material) until in 1928 showed profit
<b>1928</b>	AJ acquired the Treadwell mines with Foundry, Sheep Creek hydro, 240 powerhouse (Treadwell Ditch hydro), Nugget Creek powerhouse hydro. AJ steam plant only operates in winter
<b>1929</b>	F.W. Bradley named president of America Institute of Mining and Metallurgical Engrs due to success with low grade mining at AJ and Treadwell
<b>Early 1930's</b>	Deep exploration 1,000' below 4 level (400fmsl) showed higher grade ore
<b>1933</b>	Gold price increased from \$20.67 to \$35.00/oz
<b>1934</b>	AJ acquired Alaska Gastineau interests <ul style="list-style-type: none"> <li>• Salmon Creek hydro</li> <li>• South ore body</li> <li>• Sheep Creek Adit</li> </ul>
<b>1934</b>	Unionization achieves 1 day off per week
<b>1938</b>	New union obtains safety program
<b>1930's</b>	Peak output achieved <ul style="list-style-type: none"> <li>• 12,000 t/d</li> <li>• 1,000 men</li> <li>• 24 hr – 363 day/yr (July 4 and Christmas shutdowns)</li> </ul>
<b>1941</b>	Last profitable year w/ WWII outbreak employment fell to 350 men
<b>1944</b>	Operations closed, total of 90 million tons mined
<b>1972</b>	CBJ and AELP purchase AJ holdings
<b>1979-1980</b>	Unitization agreement
<b>1984</b>	CBJ seeks and obtains leases with mining company, assigned to Echo Bay in 1985
<b>1985-1997</b>	Echo Bay conducts explorations and attempts to permit project. <ul style="list-style-type: none"> <li>• 15,000 t/d production rate</li> <li>• <b>Underground mill.</b></li> <li>• <b>Sea level adit</b></li> <li>• <b>LNG power plant</b></li> <li>• Long hole open stoping mining method</li> <li>• Mostly new U/G development</li> <li>• Sheep Creek tailings impoundment and subsequently marine tailings placement</li> <li>• Rock Dump surface facility</li> </ul>
<b>1997</b>	Drilling suggests bulk mining method would not produce needed gold output. Gold price drops toward \$200/oz where it remains for roughly six years during dotcom bubble. Permit applications withdrawn.
<b>1997-2002</b>	Kvaerner contracted to close mine <ul style="list-style-type: none"> <li>• Pump down water in NOB</li> <li>• CBJ obtains NPDES permit for historic water discharges from mine</li> </ul>

## **1. Factors which helped contribute to past success of the AJ Mine**

1. Low grade ore in volume (90 million tons mined) that could be processed at low cost at a profit
2. Competent rock suitable for underground mining in high volumes by bulk methods and infrastructure required minimal ground control
3. Application of high volume rotating mill technology from copper mining industry
4. Mill feed upgrading by hand sorting
5. Abundant hydro-electric energy opportunities developed with state-of-the-art technology
  - a. Lake taps
  - b. Dam and reservoir
  - c. Run of river
6. Marine tailing disposal by pipeline and barge
7. Availability of labor and ability to acquire labor

## **2. Factors in place which could contribute to successful redevelopment**

1. Consolidated fee simple ownership
2. No uncontrolled federal or state lands
3. Sizable ore resource at attractive grade by industry standards
4. High gold price
5. Free milling rock / low cost of recovery / ability to sort out gangue
6. Tailings and development rock have been shown to be non-acid generating and environmentally friendly
7. Voids remaining from removal of 90 million tons during past mining
8. Stability of openings that can be safely accessed and observed
9. Existing underground infrastructure is available for reuse
10. Sea level haulage
11. Sufficient hydro energy available in planning stage
12. Excellent and competitive marine supply and shipping services and facilities - concentrates
13. Development rock could be a valuable construction material
14. Existing stable state regulatory framework
15. Steady to declining school population
16. Housing adequate – no pressure on “affordable” housing
17. Regional un- and underemployment = labor pool
18. Current in-migration of Southeast residents to Juneau
19. P. 2 Unitization Agreement: “It shall be the duty of said agents to solicit interested parties to investigate the feasibility of mining locatable minerals on said properties and to make recommendations to the governing bodies of the parties regarding terms and conditions upon which the parties should sell or lease said property interests or portions thereof.”

### 3. Proposed Schedule of Discussion Topics

#### Ownership and Ore

1. Consolidated fee simple ownership
2. No uncontrolled federal or state lands
3. Sizable ore resource at attractive grade by industry standards
4. High gold price

#### Mine and Mill

1. Free milling rock / low cost of recovery / ability to sort out gangue
2. Tailings and development rock have been shown to be non-acid generating and environmentally friendly
3. Voids remaining from removal of 90 million tons during past mining
4. Stability of openings that can be safely accessed and observed
5. Existing underground infrastructure is available for reuse
6. Sea level haulage

#### Infrastructure

1. Sufficient hydro energy available in planning stage
2. Excellent and competitive marine supply and shipping services and facilities - concentrates
3. Development rock could be a valuable construction material
4. Existing stable state regulatory framework

#### Community

1. Steady to declining school population
2. Housing adequate – no pressure on “affordable” housing
3. Regional un- and underemployment = labor pool
4. Current in-migration of Southeast residents to Juneau
5. P. 2 Unitization Agreement: “It shall be the duty of said agents to solicit interested parties to investigate the feasibility of mining locatable minerals on said properties and to make recommendations to the governing bodies of the parties regarding terms and conditions upon which the parties should sell or lease said property interests or portions thereof.”