Nevada Division of Minerals

2017 NEVADA MINERAL AND OGG PRODUCTION
LITHIUM EXPLORATION ACTIVITY
ABANDONED MINE HAZARD PUBLIC SAFETY PROGRAM
NDOM OPEN-DATA WEB SITE

CFOA CONFERENCE
Minden, NV
September 12, 2018
Rich Perry, Administrator
Nevada Gold

2017 Production
5.64 Moz, +3.2% vs. '16
27 mines, 17 operators

Gold production, millions of troy ounces
Gold price, $/troy ounce

2017 Production
5.64Moz, +3.2% vs. '16
27 mines, 17 operators

Price

Production
PAN MINE PUT BACK INTO PRODUCTION BY FIORE GOLD

AFTER A FEASIBILITY STUDY WAS COMPLETED BY SRK WHICH RECOMMENDED CHANGES IN OPERATING AND SAMPLING PROCEDURES, AND A NEW RESOURCE-RESERVES ESTIMATE

<table>
<thead>
<tr>
<th>Category</th>
<th>Tonnes (000s)</th>
<th>Grade (g/t)</th>
<th>Contained Metal (Au oz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured</td>
<td>8,184</td>
<td>0.62</td>
<td>159,000</td>
</tr>
<tr>
<td>Indicated</td>
<td>19,091</td>
<td>0.45</td>
<td>275,000</td>
</tr>
<tr>
<td>Measured + Indicated</td>
<td>27,275</td>
<td>0.48</td>
<td>434,000</td>
</tr>
<tr>
<td>Inferred</td>
<td>5,144</td>
<td>0.45</td>
<td>72,000</td>
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</tbody>
</table>

15,652 OUNCES Au produced in 2017

From: NI 43-101 Updated Technical Report, SRK 7-7-2017
NEW OPERATION: TWIN CREEKS UNDERGROUND
HUMBOLDT COUNTY

Newmont and SMD team celebrating first round

Twin Underground portal and yard, March, 2018

PORTAL BETWEEN TWIN CREEKS VISTA SURFACE MINE
FIRST PRODUCTION AUGUST, 2017
EXPECTED AVG ANNUAL GOLD PRODUCTION OF 30,000 TO 40,000 ANNUALLY

SOURCE: Newmont annual report, 2017
Photos courtesy of Newmont
New Operation for 2018: McEwan Mining’s Gold Bar Mine, Eureka County
Nevada silver

2017 Production
8.48 Moz, -5.2% vs. '16
24 mines, 15 operators

2017 Production
8.48 Moz, -5.2% vs. '16
24 mines, 15 operators
Nevada’s only Primary Silver Mine: Coeur Rochester

Disseminated silver-gold deposit hosted in the Permian-Triassic Weaver and Rochester formations.

2017 Production: 4,713,574 troy ounces of silver and 51,051 troy ounces of gold.

Rochester celebrated 150 million ounces of silver production in 2017
Nevada copper

Copper production, millions of pounds

Copper price, $/pound

Production

Price

Year:
- 1989
- 1990
- 1991
- 1992
- 1993
- 1994
- 1995
- 1996
- 1997
- 1998
- 1999
- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
Total District Production
1906 - 2014
>5 B lbs. Cu (avg. 1% Cu)
>3.5 M oz. Au

Remaining Reserves
2014 – 2020
112 Mt @ 0.43% Cu
0.006 opt Au
by-product Mo

2017 PRODUCTION:
118,411,099 lb Cu
37,897 ozs Au
NEWMONT’S PHOENIX MINE – Lander County

2017 Production:
- 41,806,950 lbs Cu
- 197,026 ozs Au
- 1,191,630 ozs Ag
Q4 2019: Nevada Copper: Pumpkin Hollow

Located 8 miles southeast of Yerington, Lyon County

• Located within the Yerington Copper District.
• 2 deposits with 5 billion contained pounds of Cu:
  • Deep, high-grade eastern deposit mineable underground
  • Shallower western deposit mineable open-pit
• Currently developing a 5000 tpd underground mine on the eastern deposit with a concentrator
• Main shaft being extended to 2,147 feet
• The mine should employ ~300 people
Nevada Barite Production

2017
391,402 tons shipped
+ 70% vs. '16
4 producers
NEVADA’S BARITE PRODUCTION IS FROM STRATIFORM BEDDED DEPOSITS IN THE ORDOVICIAN-DEVONIAN.

- 3 MINES OPERATED IN 2017
- 3 PROCESSING PLANTS
Nevada Gypsum

2017 Production
3.5 M tons
+9% vs. '16
6 producers

Gypsum production, millions of short tons
EMPIRE GYPSUM MINE RE-OPENS

- Empire Mining Company purchased the mine from US Gypsum in 2016
- Produces gypsum for agricultural and fertilizer use
- Processed 588,000 tons of gypsum in 2017
- 50 direct employees and 5 employees by contractors
2 ORES MINED:

- High-Calcium lime from the Crystal Pass member of the Devonian Sultan Limestone
- Dolomitic lime from the Bullion dolomite member of the Mississippian Monte Cristo Limestone
LHOIST PRODUCES 3 PRODUCTS AT APEX:

- High purity lime (95-97% CaO) used in environmental & metallurgical applications
- Type-S hydrated dolomitic lime used in construction
- Crushed limestone used in gas scrubbing

- 100+ year ore reserve
- Expanded to four operating calcining kilns
- Rail and truck delivery from plant
- 2017 : 1.25 M. tons
Nevada Diatomaceous Earth Production

Diatomite production, millions of short tons

Other Industrial Minerals
Produced, 2017

• 10,233,000 lbs of lithium compounds
• 112,634 tons of magnesium oxide
• 727,088 tons of silica sand
• 24,855 tons of salt
• 2,530 tons of perlite
194,348 Active Mining Claims in Nevada as of 2/22/2018 an increase of 9.1% from January, 2017

12,498 Inferred Lithium Placer Claims in Nevada as of 2/22/2018 a decrease of 5.7% from January, 2017
NEVADA GEOTHERMAL POWER PRODUCTION

2017 Production
3.3 Million megawatt hours sold
-0.6% vs. '16
NEW GEOTHERMAL FIELD AND PLANT: ORMAT TUNGSTEN MOUNTAIN
Churchill County

• 22 MW OUTPUT
• 4 PROD WELLS
• On-Line October, 2017
Ormat Technologies Inc: McGinness Hills
Located in Lander County northeast of Austin
*Largest Geothermal Field in Nevada*

General
• First explored for gold in the 1980’s due to exposure of high-sulfidation and low-sulfidation hydrothermal alteration products
• In 2004 Newcrest Resources encountered hot water during exploration drilling
• Each 300 meter exploration hole punctured the sinter cap and intercepted near-boiling waters

• Geysering action was observed in one hole
• Ormat leased the McGinness Hills Property in 2009
• Phase I at 30 MW (2012)
• Phase 2 increase to 72 MW (2015)
• Phase 3 increase to 120 MW (late 2018)
Geothermal Operators

There are currently seventeen geothermal fields in Nevada being operated by five operators:

- **Ormat Nevada**: Steamboat, McGinness Hills, Brady, Desert Peak, Wild Rose (Don Campbell), Jersey Valley, Tuscarora, and Tungsten Mountain.

- **Terra-Gen**: Dixie Valley and Beowawe.

- **Cyrq Energy**: Soda Lake and Patua

- **Enel North America**: Stillwater and Salt Wells.

- **Homestretch Geothermal / Star Peak Geothermal**: Wabuska

From: NBMG MI-2016
Nevada has produced oil since 1954 from Paleozoic and Mesozoic host rocks. 64 wells pumped in 2016.
NEVADA OIL PRODUCTION
1955 - 2017
CUMULATIVE PRODUCTION
53,945,378 BARRELS

2017 Production
286,619 Barrels
SOME FACTS ABOUT OIL LEASING IN NEVADA

• 99% of historic production is on Federal leases
• Anyone can file an “expression of interest” (EOI) to BLM for certain lands to be included in a competitive lease sale. There is no fee for this.
• BLM conducts on-line competitive lease sales quarterly, after environmental review.
• A lease allows for exploration, but actual permits to drill are required from both BLM and NDOM. Nevada is a dual-permitting State by Statute and MOU.
SOME FACTS ON HYDRAULIC FRACTURING IN NEVADA

• Nevada Developed comprehensive regulations for Hydraulic Fracturing in Nevada in 2013-14.
• Nevada regulations are some of the most stringent in the US for protection of groundwater.
• The BLM has not adopted regulations for HF
• Operators must adhere to more stringent Nevada regulations when drilling on Federal (and non-Federal) lands in Nevada.
• Six wells were hydraulically fractured in NV, all in 2014: 4 in Elko County, 1 in Nye, 1 in Eureka
• HF Chemical disclosures and details can be found on https://fracfocus.org/
Where do Fluid Mineral Leasing Revenues go?

• See the production and revenues by County at: https://www.onrr.gov/

NRS 328.450-.470
Disposition of Revenue Received by State From Lease on Federal Lands

<table>
<thead>
<tr>
<th>County</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>State of Nevada - 2017</td>
<td>3,850,164.97</td>
</tr>
<tr>
<td>Churchill</td>
<td>521,710.63</td>
</tr>
<tr>
<td>Elko County</td>
<td>24,697.69</td>
</tr>
<tr>
<td>Esmeralda County</td>
<td>38,510.65</td>
</tr>
<tr>
<td>Eureka County</td>
<td>13,474.79</td>
</tr>
<tr>
<td>Humboldt County</td>
<td>46,478.91</td>
</tr>
<tr>
<td>Lander County</td>
<td>303,731.34</td>
</tr>
<tr>
<td>Lyon County</td>
<td>9,391.41</td>
</tr>
<tr>
<td>Mineral County</td>
<td>153,707.60</td>
</tr>
<tr>
<td>Nye County</td>
<td>159.84</td>
</tr>
<tr>
<td>Pershing County</td>
<td>34,669.23</td>
</tr>
<tr>
<td>Washoe County</td>
<td>72,609.68</td>
</tr>
<tr>
<td>White Pine County</td>
<td>933.57</td>
</tr>
</tbody>
</table>
The Biggest Export From Every State in 2017
U.S. Exports by Origin (Values in Millions of Dollars)

Article & Sources:
https://howmuch.net/articles/biggest-export-from-each-state
https://www.census.gov/foreign-trade/statistics/state/data/index.html
Not Just Gold: Worldwide Lithium Exploration Boom

Lithium exploration budgets, 2009-2017

Source: S&P Global Market Intelligence
LITHIUM EXPLORATION ACTIVITY IN NEVADA

- Lithium targets:
  - **Brines**: in playas, locatable on Federal land with placer claims
  - **Clays**: sediment-hosted, locatable on Federal lands with lode claims.
Lithium Brine Production and Exploration in NV

- Nevada has the only operating lithium mine in the U.S. – located in Clayton Valley, Esmeralda County
  - Operated since 1967, employs 85 people
  - Produces lithium carbonate
  - Uses surface evaporation ponds to concentrate lithium pumped from brine aquifers in valley

- Geologic Model for a lithium brine deposit:
  - Salar deposits – a salt flat that may represent the basin of a salt lake
  - Accumulations of saline groundwater that are enriched in dissolved lithium.
  - Exploration by drilling and sampling of brine aquifers
Dajin Resources: Brine Exploration Model

- Brines form in arid closed basins.
- Volcanism and geothermal waters important.
- Large diameters wells drilled.
- Brines with Lithium concentration pumped from the subsurface.
- Direct extraction technologies removes Lithium in under 24 hours.
- Spent brine is re-injected.

Credit: Courtesy of John Muntean, NBMG
FIRST DMRE WELL BEING DRILLED UNDER NEW REGULATIONS
SIERRA LITHIUM, COLUMBUS SALT MARSH, ESMERALDA COUNTY

Photo taken March, 2018
Lithium Americas: Kings Valley

100 km north-northwest of Winnemucca, NV and 40 km west-northwest of Orovada, NV

Lithium/Organoclay Drilling Additive Supplier

- Hectorite clay deposit in the moat deposits of the McDermitt Caldera

- It is a near surface clay exposure that is right next to a major highway

- Hectorite is an effective additive to drilling muds and has emerged as the enabling mineral with thermal stability superior to bentonite clays to perform in challenging environments i.e. High Pressure & High Temperature

- Developing process to remove the Li from clay.
DISSOLVED MINERAL RESOURCE EXPLORATION REGULATIONS

- A.B. 52 from 2017 session
- Will be Chapter 534B
- Addresses sampling of brines in exploration boreholes and wells
- Replaces NDWR MM well waivers
- NDEP, NDWR and NDOM jointly developed regs.
- Statute became effective 1/1/2018
- Regulations approved by Commission on Mineral Resources 4/27/18
- 5 DMRE wells have been issued permits
AML Program - 2018 Ranking
Hard Closure Projects - 210 closures in 2017

- Backfills
- Bat Compatible Closures
- Polyurethane Foam Plugs
2017 Emergency Closures

Carnation

• A Jeep was parked on the road when the back right tire collapsed into a “ballroom” style working below and almost took the Jeep with it
• Hazard was fenced and road closed the following day after being reported
• 14 hazards in the immediate area were closed, including five wildlife compatible closures, for $46,038.68

Monte Cristo

• A collapse of a “ballroom” style working along a the Virginia City Grand Prix race route.
• NDOM staff and County Firefighter constructed a fence the same day it was reported.
• Site was backfilled for $3,000
Location and Proximity to Population
Arden Mine Closure, Ridge Area, April, 2018
Arden Mine Closure, East knob final slope, April 2018

Cooperative effort between Clark County and the NDOM
Broken Hills

- Mineral & Nye Counties
- 40 hazards
- Multiple stopes over 40’ long x 20’ wide x 150’ deep and vehicle access only feet away
- Public (family with small children) seen using the ladder on the headframe and entering the mine
- 19 Bat Compatible Closures
- Total cost of $155,072.33
Gold Butte

- Clark County
- 42 hazards within the entire Gold Butte National Monument
  - Managed by LV BLM
- Interlocal contract with Clark County Desert Conservation
  - $193,000 total funding available
    - $150,000 obligated to the Gold Butte Project
  - Must be used for wildlife compatible closures only in Clark County
  - 18 hazards determined to have significant wildlife habitat
    - 3 hazards including tortoise habitat
- Anticipated construction 9/10/2018 – 10/31/2018
- Project estimate $220,000
Future Closure Projects

- Gunmetal Mine
  - Mineral County
  - 10 Hazards
- Nevada Eagle
  - Esmeralda County
  - 43 Hazards
- Double O
  - Humboldt County
  - 81 Hazards
- Walker River State Park
  - Lyon & Mineral Counties
  - 107 Hazards
- VC Grand Prix
  - Lyon & Storey Counties
  - 21 Hazards
- Mullen Pass
  - Washoe County
  - 30 Hazards
- Como
  - Lyon County
  - 26
NRS 517: Mining Claim, Mill Sites and Tunnel Rights

Division Web Site: http://minerals.nv.gov

All 14 types of Certificates and Notices are form-fillable on-line for Printing.
Thank You for collecting the fees that make this program work!

- NRS 513.094 = $4 per claim filing for operation of the abandoned mine land program
- NRS 517.185 = $6 per filing for operation of the Commission and Division
- Call us or direct people to us if we can help answer questions on claims, the AML Program, mine production numbers, oil or geothermal wells and production, or need an educational presentation on any of these topics.