

***Nevada's Mining Sector Outlook
Mineral Production, New Mines, Exploration,
Critical Minerals, Trends and Predictions***

**VISION 2021: The Nevada Economic Forecast
College of Business, UNR
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Nevada Mining Summary - 2019

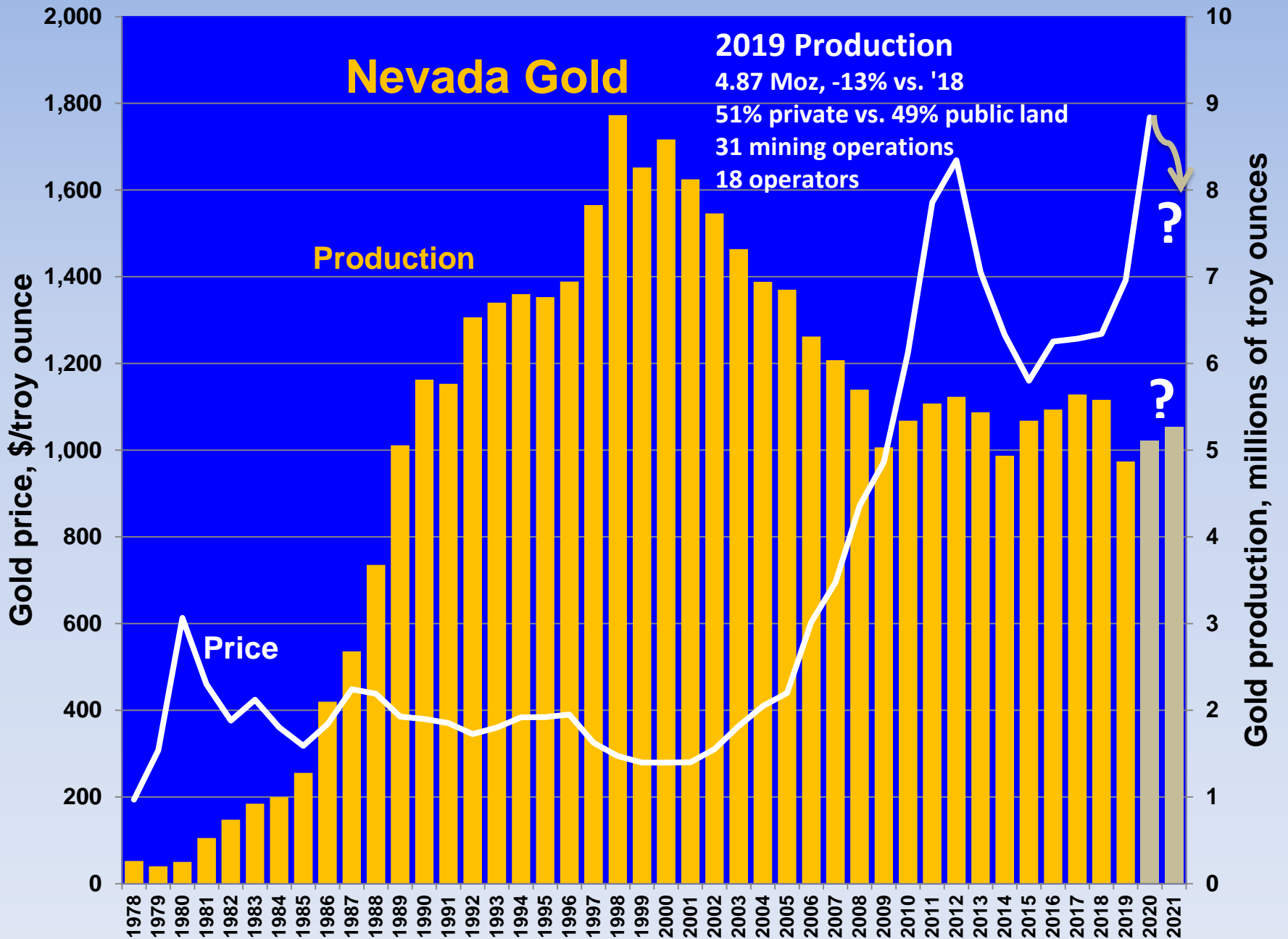
In 2019 Nevada Mining provided
32,976 Nevada Jobs.

\$2.6 Billion in total paid salary

Nevada produced 10% of all U.S.
mineral production

Mines operate on
less than $\frac{1}{4}$ of 1% of
Nevada's 70,798,080
acres

- **5th leading producer of GOLD in the WORLD!**
(Behind China, Australia, Russia, and Canada)
- **20+ minerals are produced in Nevada at over 100 mines**
- **\$12.4B impact to Nevada's economy, representing 3.1% of GDP**
- **Ranked 3rd best mining jurisdiction in the world (Fraser Institute, 2020)**
- **Lots of interest in new lithium (and other critical mineral) production**

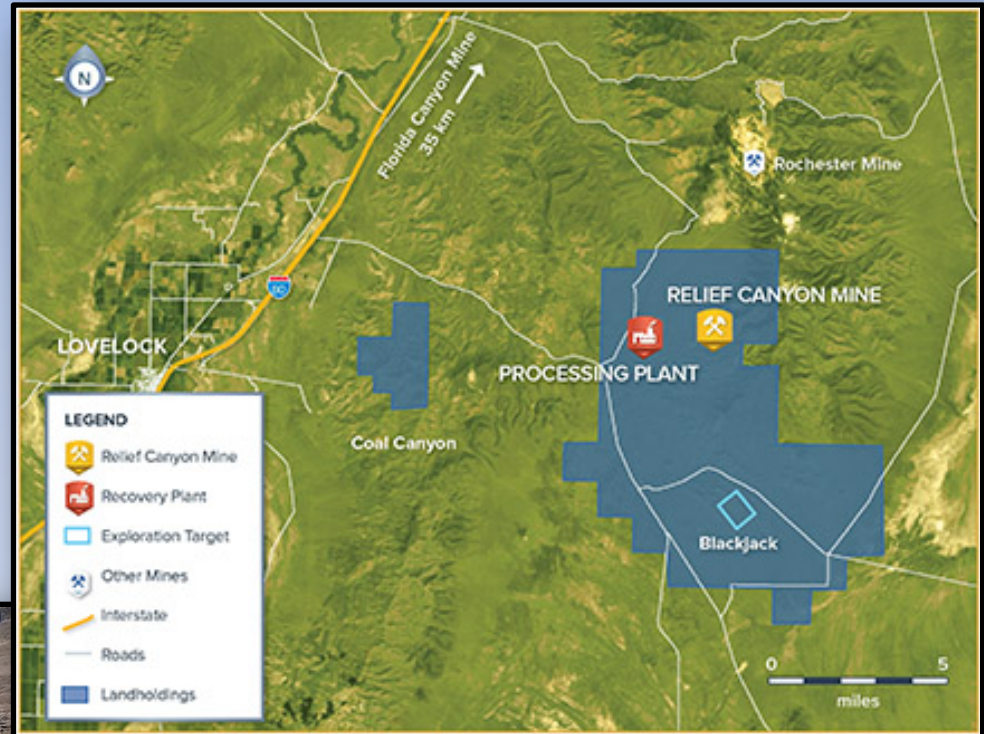


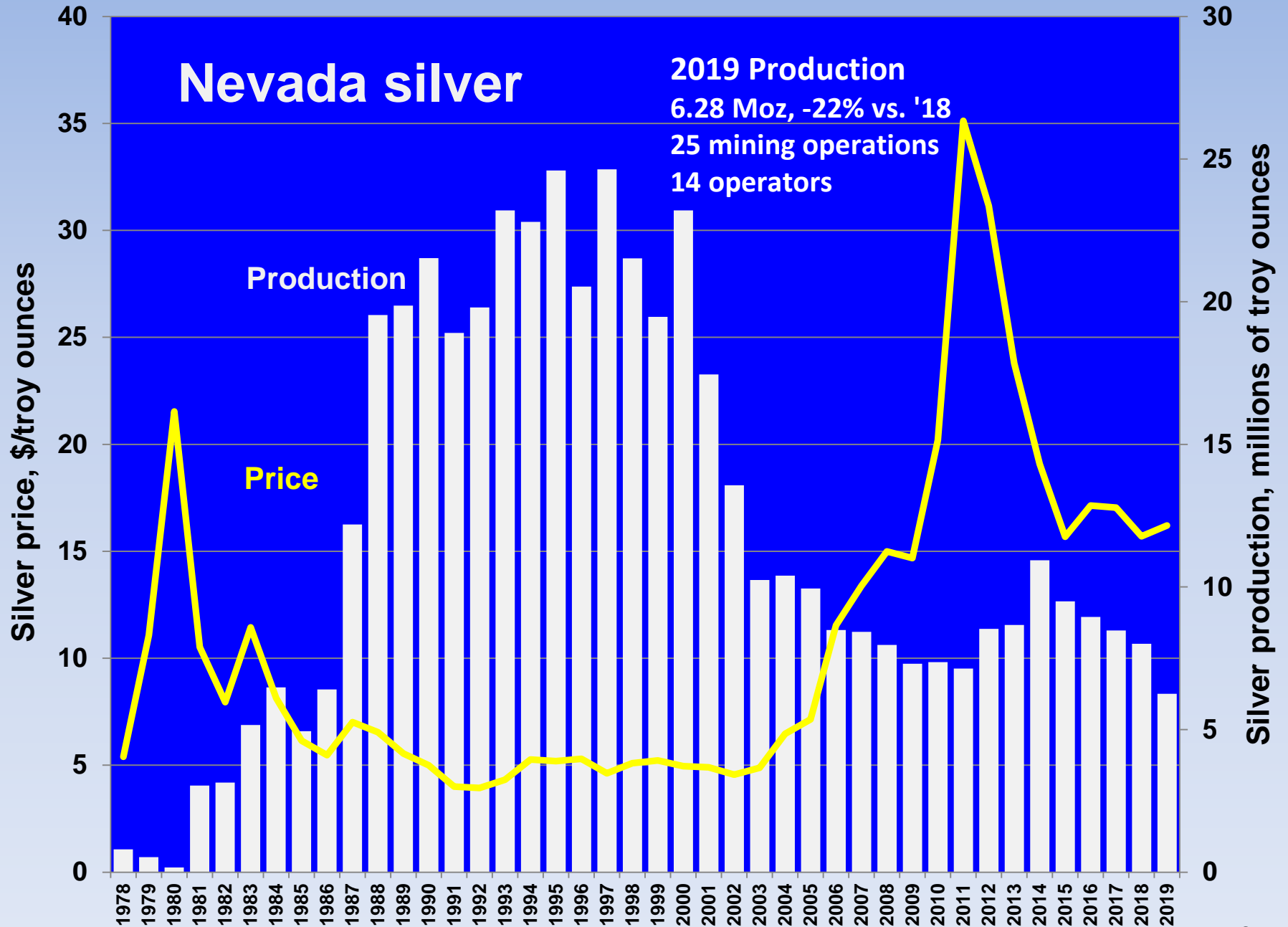
2019 NEVADA METAL PRODUCTION, BY PRODUCER - Final				
Ranked by gold production				
Operator	Gold (ozs)	Silver (ozs)	Copper (lbs)	Moly (lbs)
Nevada Gold Mines	3,673,631	1,070,177	30,585,072	
Kinross	538,528	954,345		
SSR Mining	220,227	4,223		
Jerritt Canyon Gold	117,985	NR		
Hecla (Klondex)	66,166	181,741		
KGHM International	51,277	`	113,132,886	766,699
Florida Canyon Mining (Alio Gold)	43,305	30,877		
Fiore Gold	40,499	NR		
Coeur	35,401	3,761,060		
McEwen Mining	30,709	614		
Rawhide Mining	14,381	140,187		
Gold Resource Corp.	10,810	9,574		
Hycroft Mining	8,916	56,783		
Premier Gold (40% of S. Arturo)	8,412	NR		
Mineral Ridge Gold	3,863	2,324		
Ruby Hill Mining	3,356	2,540		
Borealis Mining	605	387		
Toquima Gold	15	NR		
Totals	4,868,086	6,214,832	143,717,958	766,699

New Mining Operation for 2020

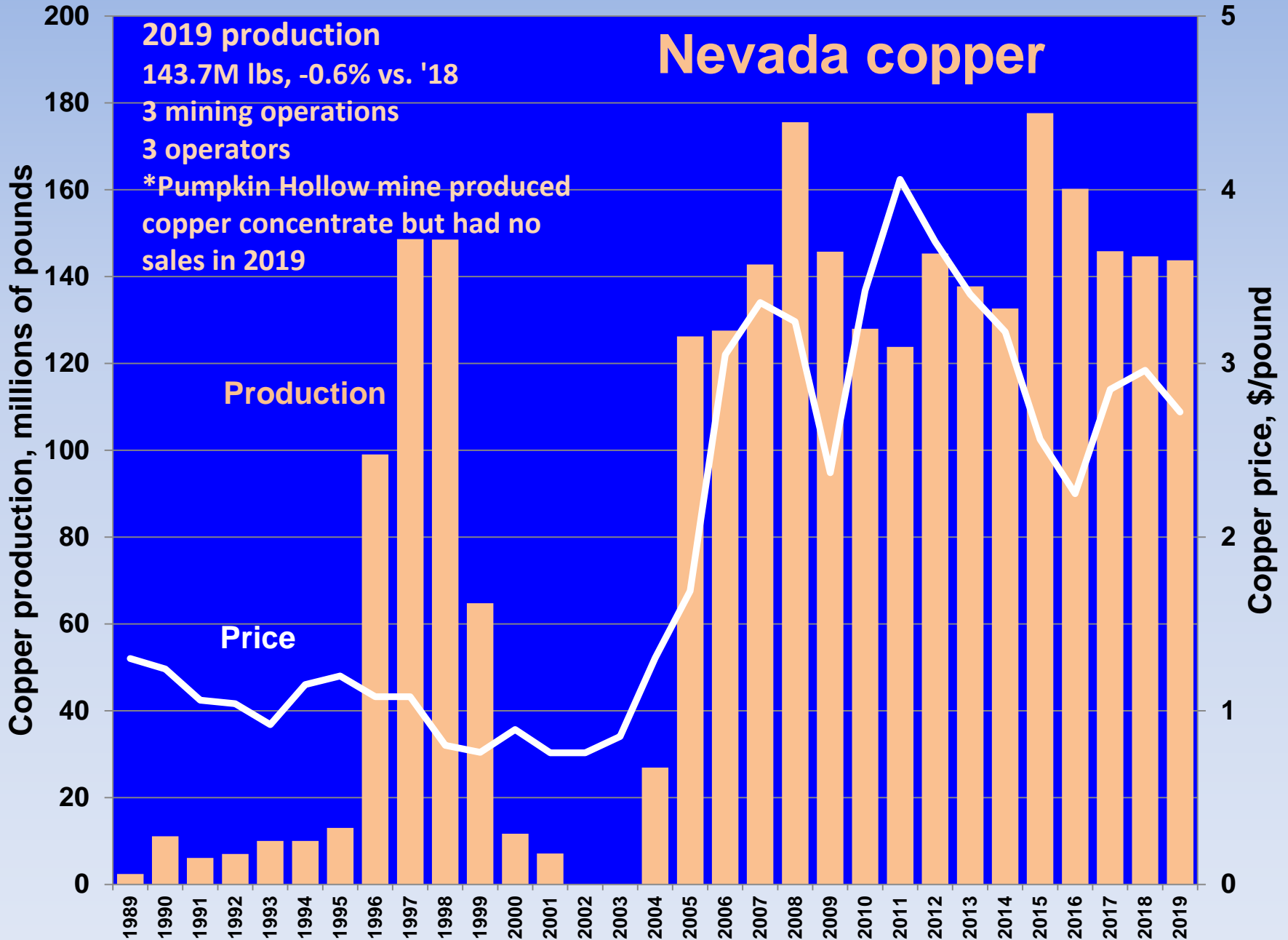
Americas Gold and Silver – Relief Canyon, Pershing County

- Past production – 1986 to 1990
- New construction began – May 2019
- Stockpiled ore placed on heap leach – December 2019
- First gold pour – February 2020
- Full mine production by Q2 2021
- Production target – 80-100 koz/yr
- Avg. Au grade - 0.8 g/t
- Current mine life – 6 years





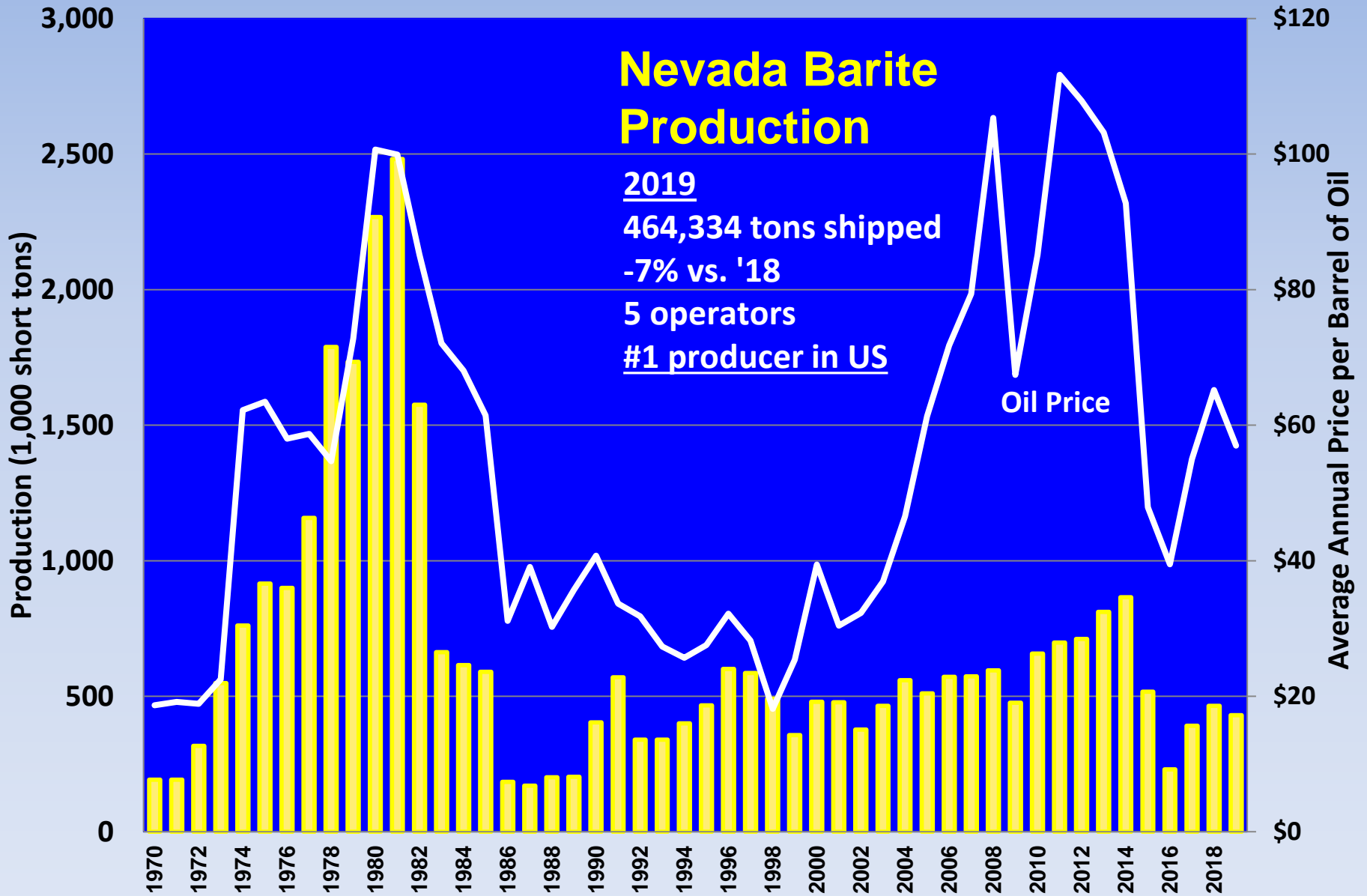
Nevada copper

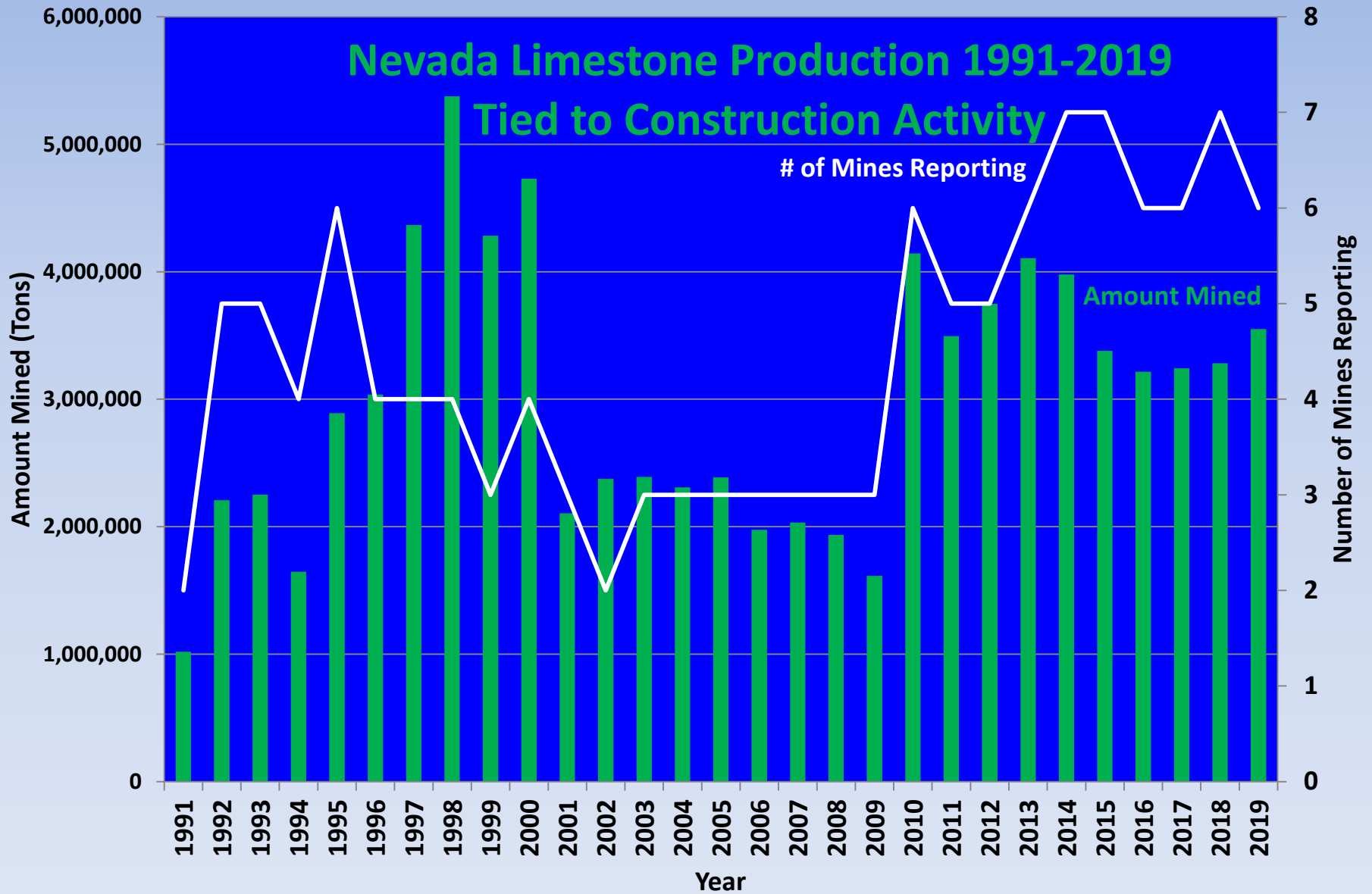


Nevada Copper's Pumpkin Hollow Mine, Lyon County

- 2 deposits with 6 billion contained pounds of Cu
 - Higher grade eastern deposit; underground
 - Shallower western deposit; open-pit
- Main shaft and materials handling system completed Dec. 2020
- First copper production occurred in Q4 2019 with temporary suspension from April to August 2020 due to the pandemic
- The mine will employ ~300 people
- 13.5 year mine life (underground) and 19 year mine life (open pit)
- Becomes Nevada's 3rd copper producer in past 20 years







Nevada Gypsum

2019 Production

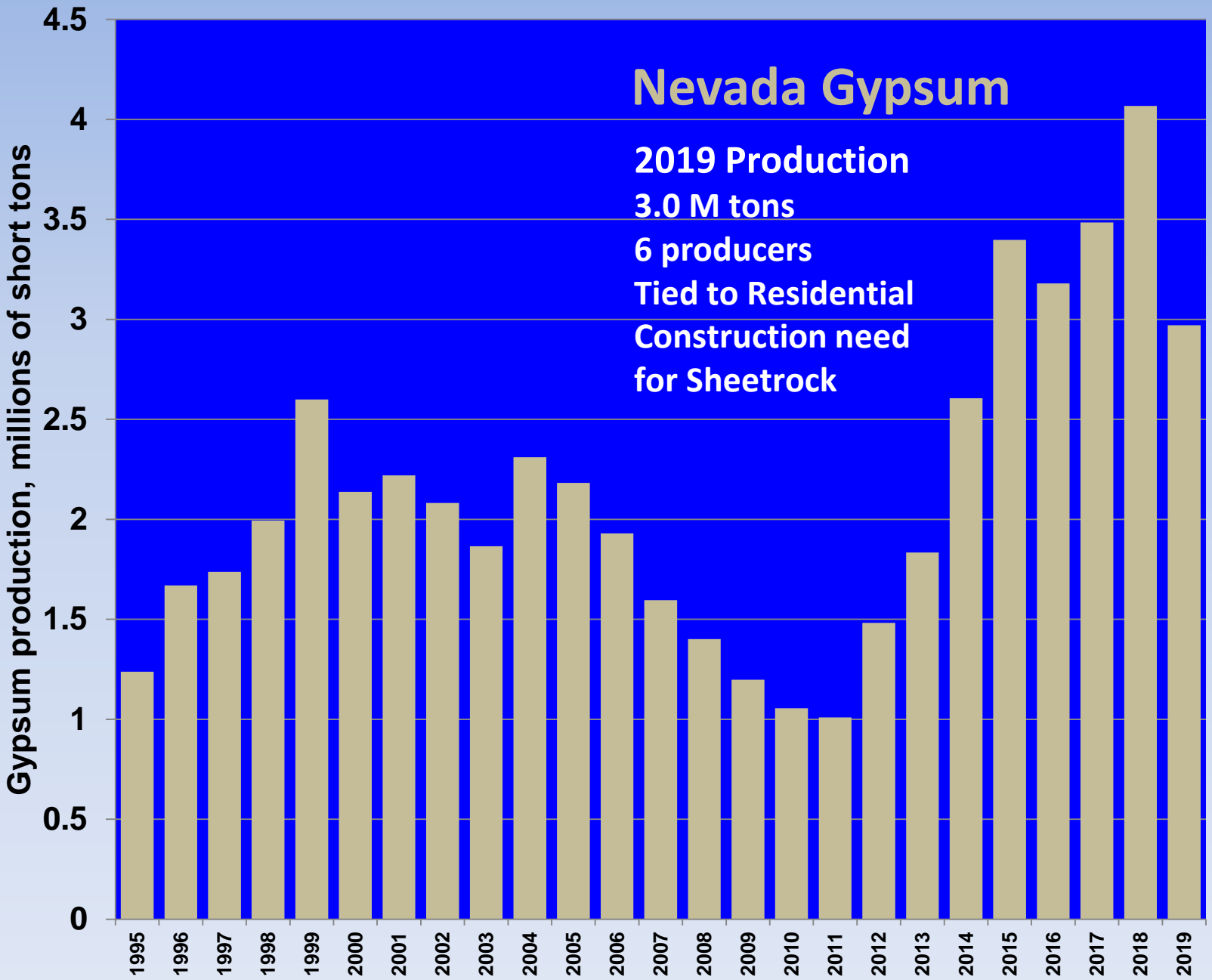
3.0 M tons

6 producers

Tied to Residential

Construction need

for Sheetrock



Other Industrial Minerals Produced in 2019

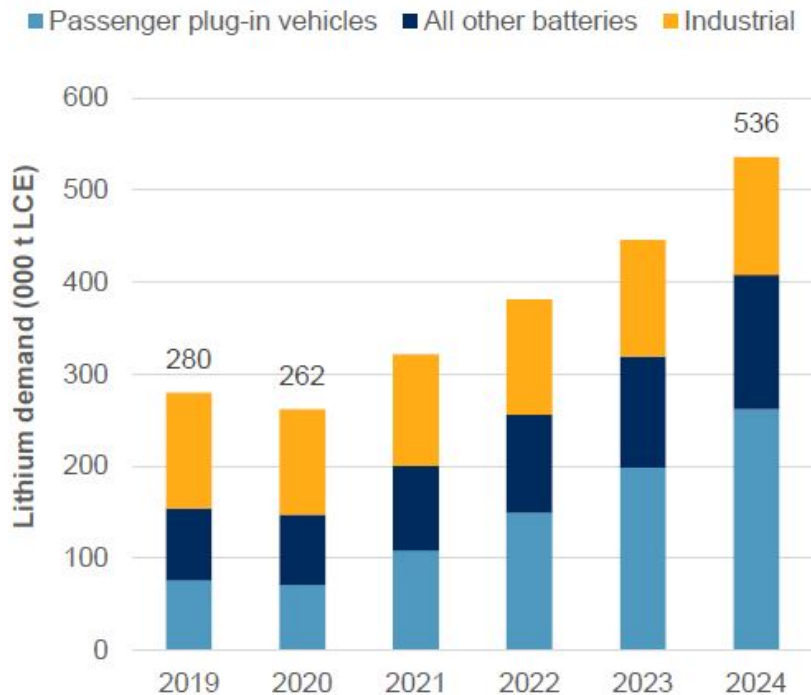
- 7,900,000 lbs of lithium carbonate*
- 1,900,000 tons of gypsum
- 618,000 tons of silica sand
- 119,000 tons of magnesite*
- 276,000 tons of diatomite
- 24,500 tons of salt
- 2,200 tons of perlite

* Only producer in US



The Demand for Lithium

Lithium demand in plug-in vehicles to increase more than 3-fold 2019-24



Data as of July 15, 2020.
Source: S&P Global Market Intelligence

- The Tesla/Panasonic battery factory alone needs 5X the amount of lithium mined annually in Nevada.

Lithium in Brine vs. Lithium in Clay/Rock

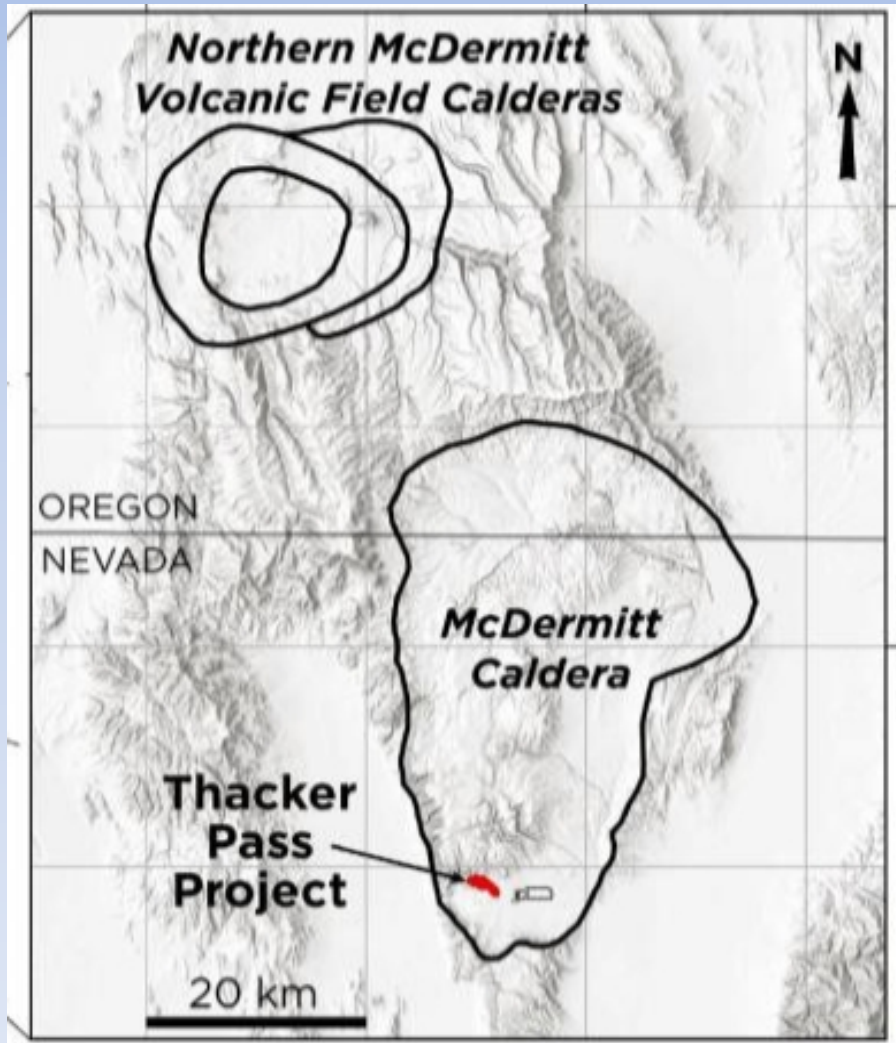
Lithium Brine

- Albemarle's Silver Peak mine is only lithium mine in US, operating since 1966.
- Solar evaporation in ponds over 18-24 months increases concentration of lithium chloride prior to processing into lithium carbonate.
- Cheaper processing costs but lower recovery %s.
- Requires placer mining claims and significant water rights
- Requires significant quicklime consumption
- Newer technologies may not require same timeframe or consumptive water use
- 17 other playa basins in Nevada being explored

Lithium in Clay/Hard Rock

- No current mines, but 3 projects are in various stages of permitting:
 - Thacker Pass, Humboldt Cty
 - Rhyolite Ridge, Esmeralda Cty
 - TLC Project, Nye Cty
- Resources typically very large with long mine-life
- Processing is more expensive but yields higher recovery %s
- Requires location of lode mining claims
- Much less water consumption but high sulfuric acid consumption
- Many additional exploration projects

Lithium Americas – Thacker Pass Project



- Reserves – 3.1M tonnes LCE at 2,358 ppm Li
- Strip ratio – 1.6:1
- Mine life – 46 years
- Processing time - <24 hours
- Lithium recovery – 83%
- Pilot plant operational in Reno
- BLM issued Record of Decision on January 15, 2021
- Production target is Q3 of 2022

ioneer's Rhyolite Ridge Project



Project overview

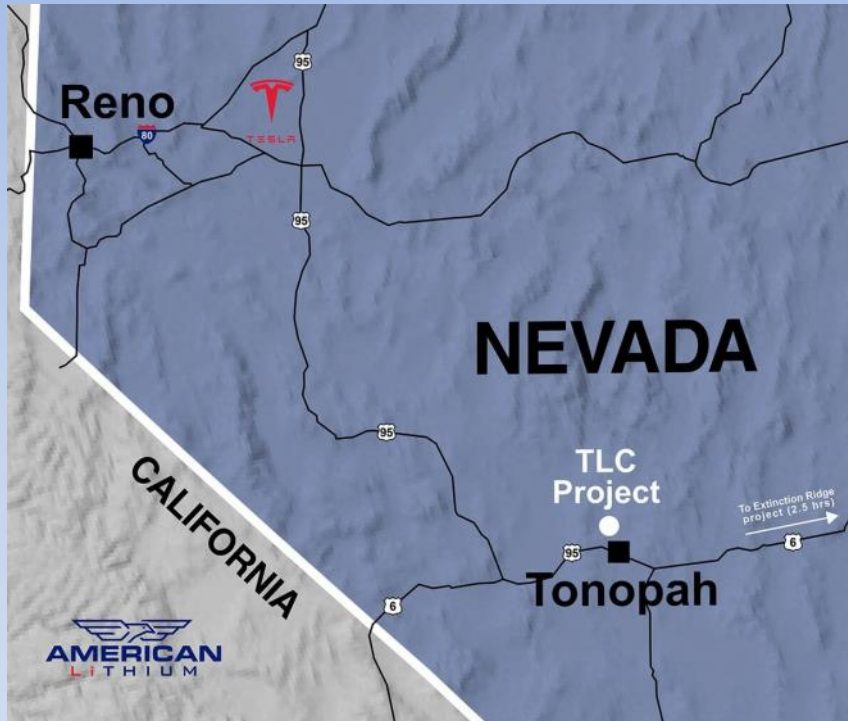


A searlesite resource that is different to other sedimentary lithium deposits - it is suitable for a simple acid leach process

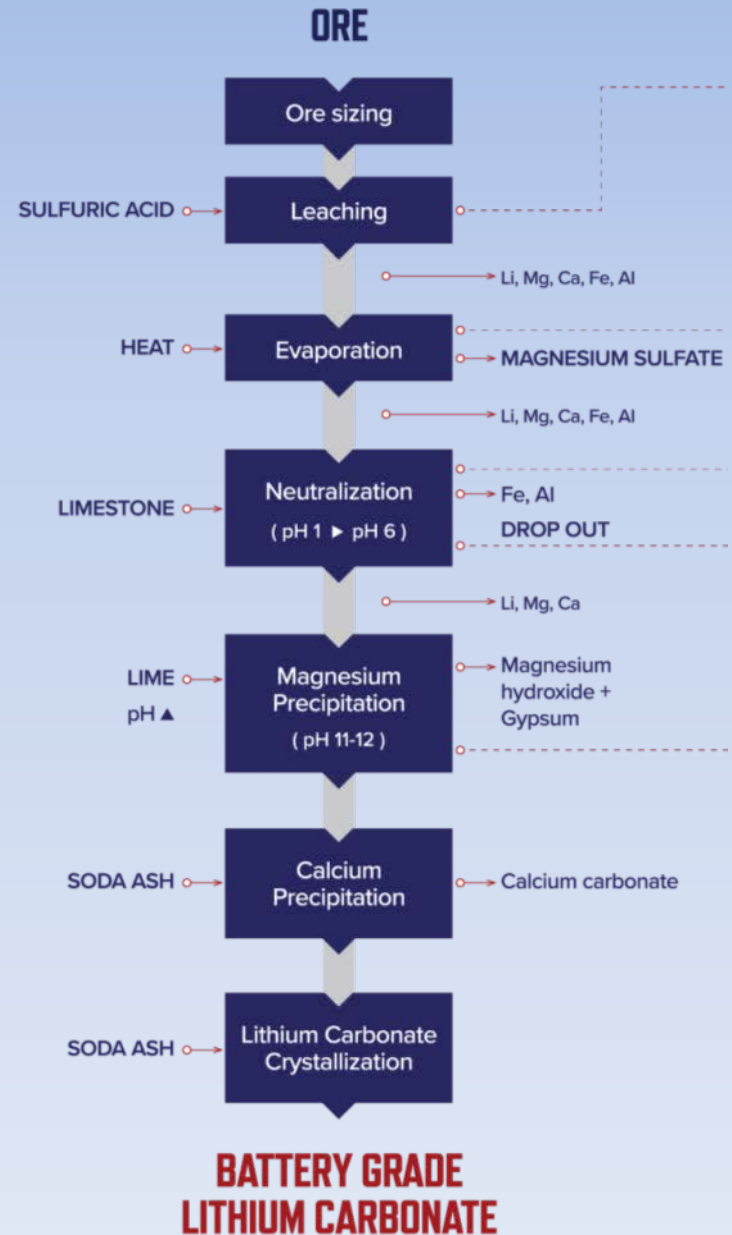


- Total Resource¹ of 4.1 million tonnes lithium carbonate & 10.9 million tonnes boric acid
- Including 121 million tonnes of lithium-boron ore containing:
 - 1.1 million tonnes lithium carbonate
 - 8.6 million tonnes boric acid
- Lithium only clay mineralisation to be stockpiled

American Lithium – TLC Project



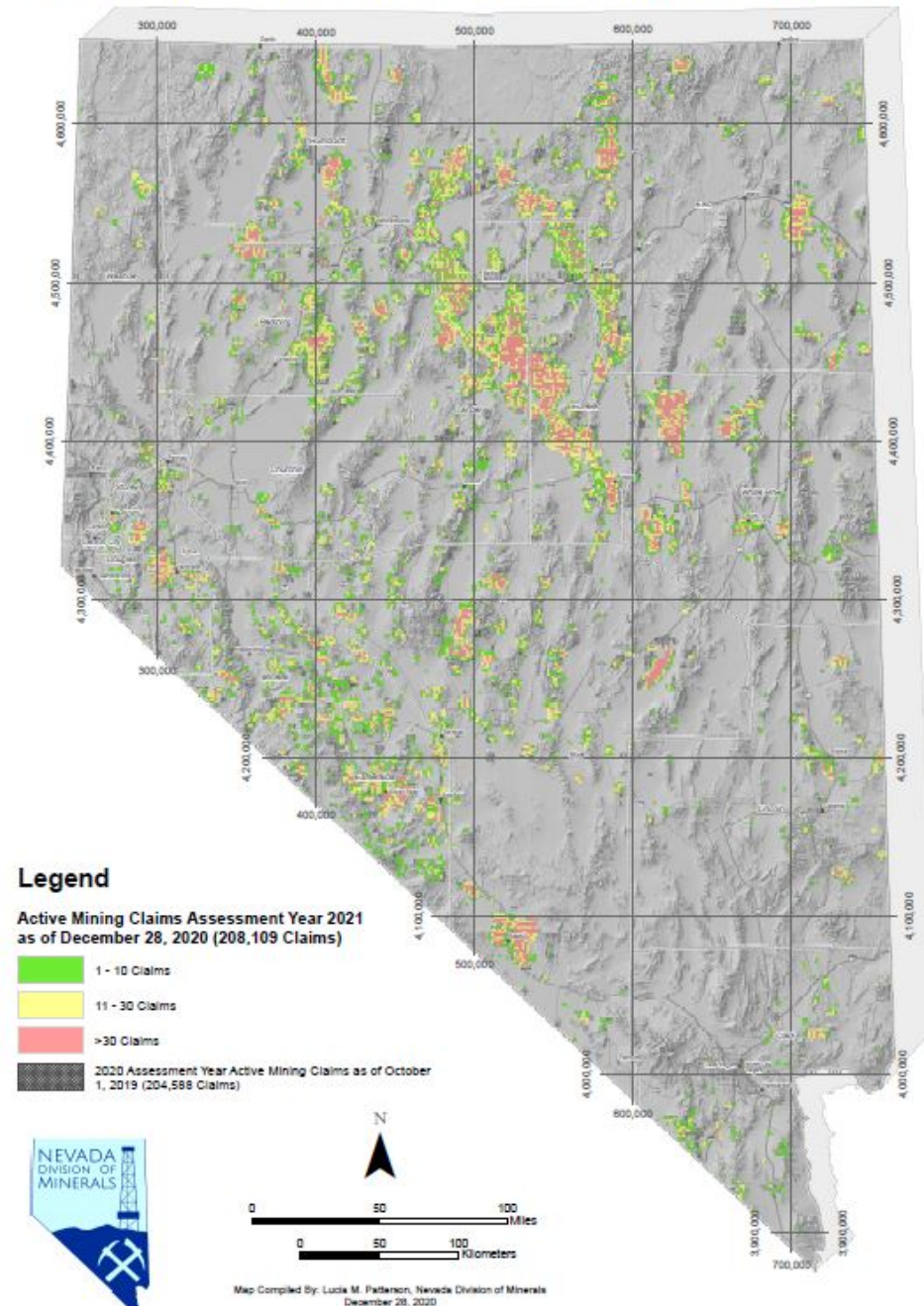
- Measured and indicated resource of 5.4 Mt lithium carbonate equivalent
- Lithium ore at the surface
- Preliminary metallurgical tests indicate >90% recovery in <10 minutes using sulfuric acid leach
- Economic analysis is underway



NEVADA MINING CLAIMS

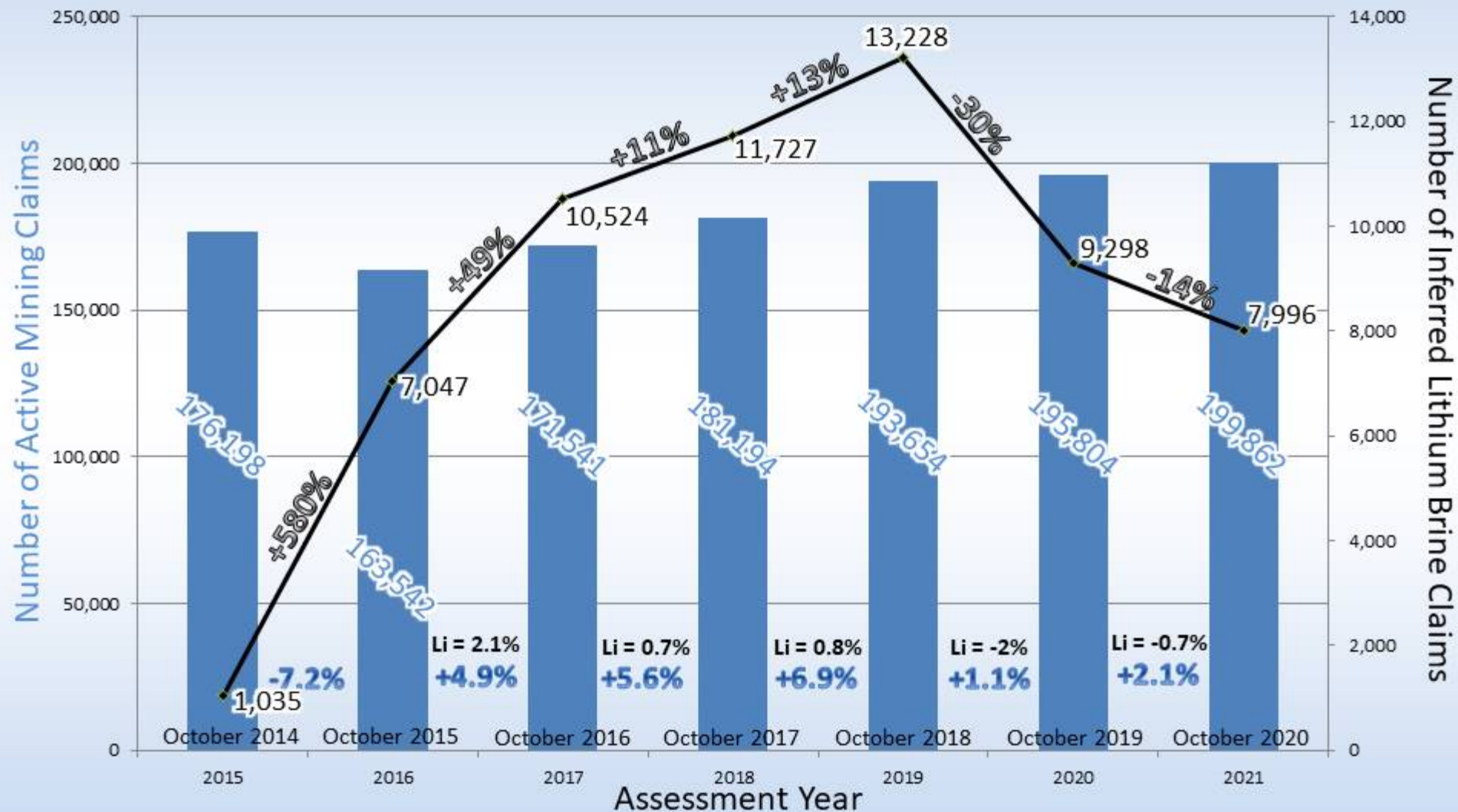
- 208,109 Active Mining Claims (Assessment Year 2021) in Nevada as of 12/28/2020
- Increase of 1.7% from October 2019
- >50% of all US mining claims
- Claims are ~20 acres in size
- Annual maintenance payments of \$165/claim to BLM and \$12/claim to county recorder
 - ~\$34M to BLM
 - ~\$2.6M to Nevada counties

Distribution of Mining Claims in Nevada BLM LR2000 Data as of December 28, 2020





Unpatented Mining Claims By Year



NDOM has been gathering active claim data from LR2000 at the end of October for the last seven years. The purpose of this graph is to show claims data and statistics from the same snapshot in time.

MINERALS ESSENTIAL TO ADVANCED ENERGY TECHNOLOGY



INFRASTRUCTURE
Copper, Iron Ore,
Molybdenum



PUBLIC TRANSIT
Aluminum, Titanium,
Magnesium

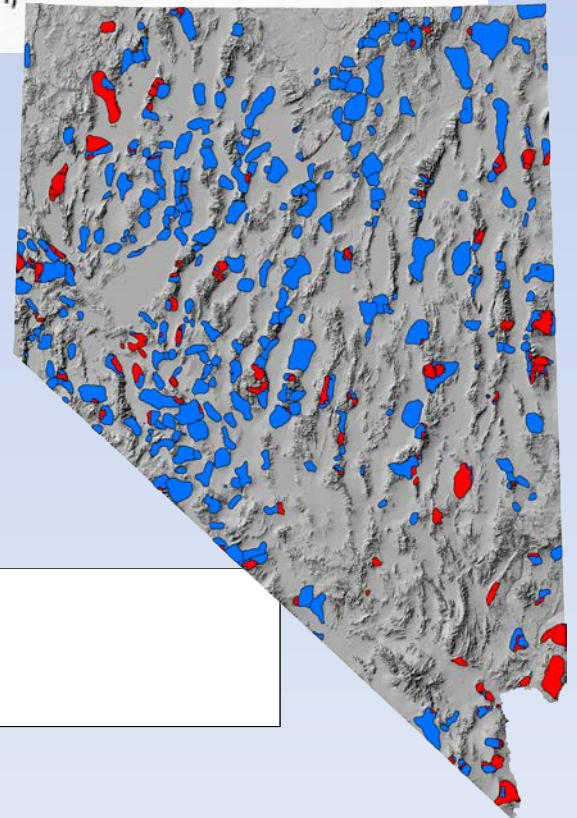


**AUTOMOBILES/
ELECTRIC VEHICLES**
Copper, Nickel, Lithium,
Cobalt



RENEWABLE ENERGY
Gold, Silver, Zinc

- 35 minerals identified as “Critical Minerals” by D.O.I. in May, 2018.
- Minerals selected are deemed “vital to the Nation's security and economic prosperity.”
- Nevada contains known occurrences or deposits of **20 of the 35** critical minerals²
- Exploration for cobalt, graphite, REE, Tungsten, Vanadium in progress.



Geothermal Development 2019-2020



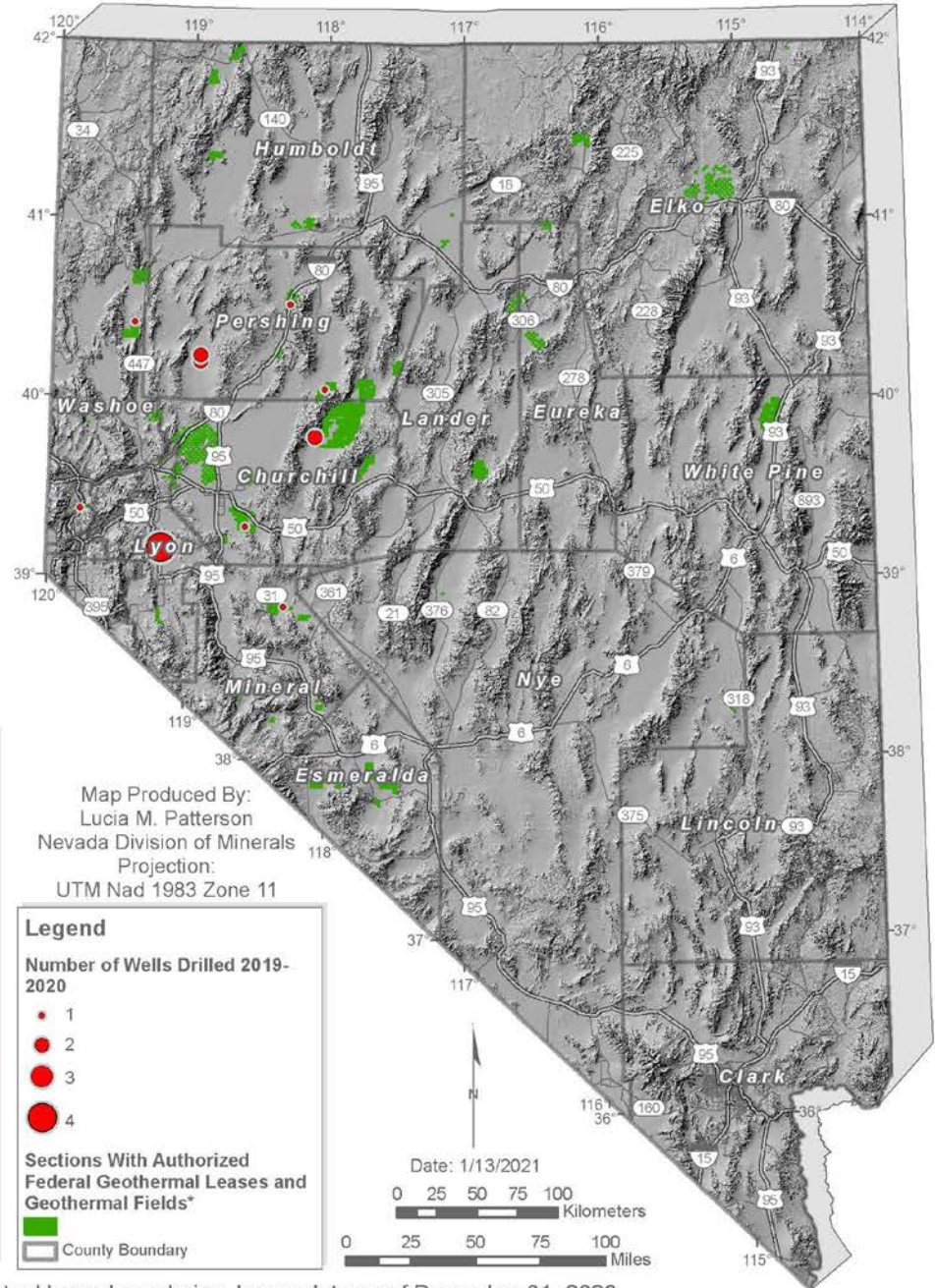
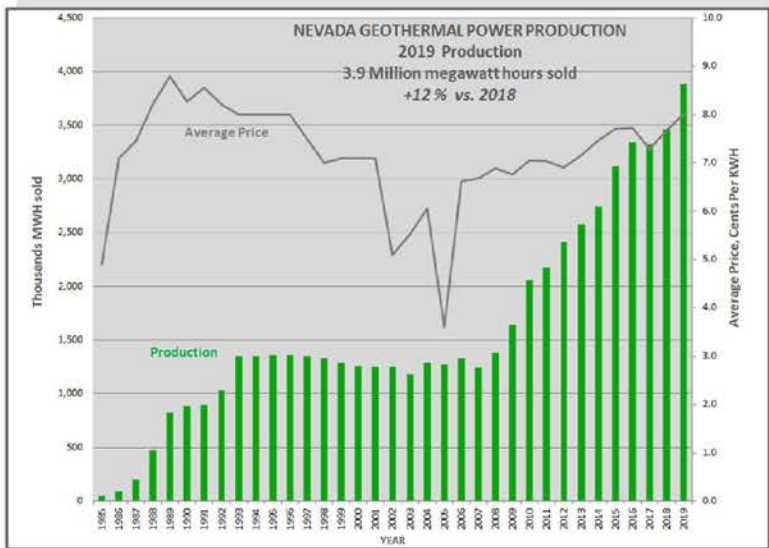
**Wells Completed
2019-2020**

- 3** Industrial Injection
- 3** Industrial Production
- 1** Observation
- 7** Temperature Gradient

As of 1/13/2021 there were 455 permitted commercial and industrial wells

There are 25 active geothermal plants in Nevada

There are 285 authorized geothermal leases as of 12/31/2020 which total 569,542 acres



*Authorized leases are plotted by section and do not necessarily depict actual lease boundaries. Lease data as of December 31, 2020

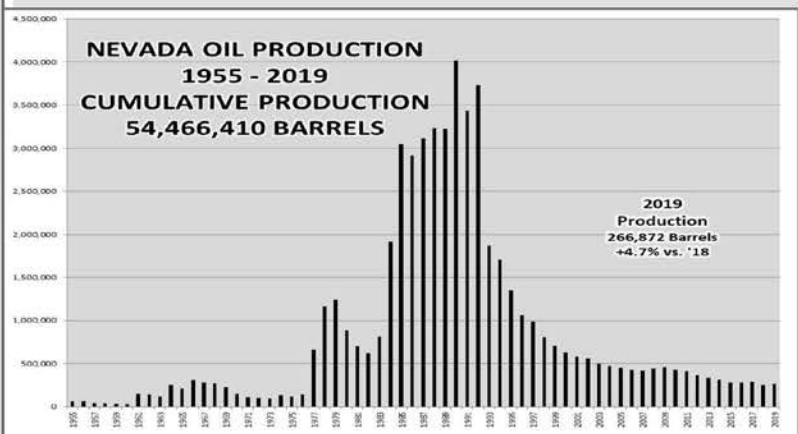
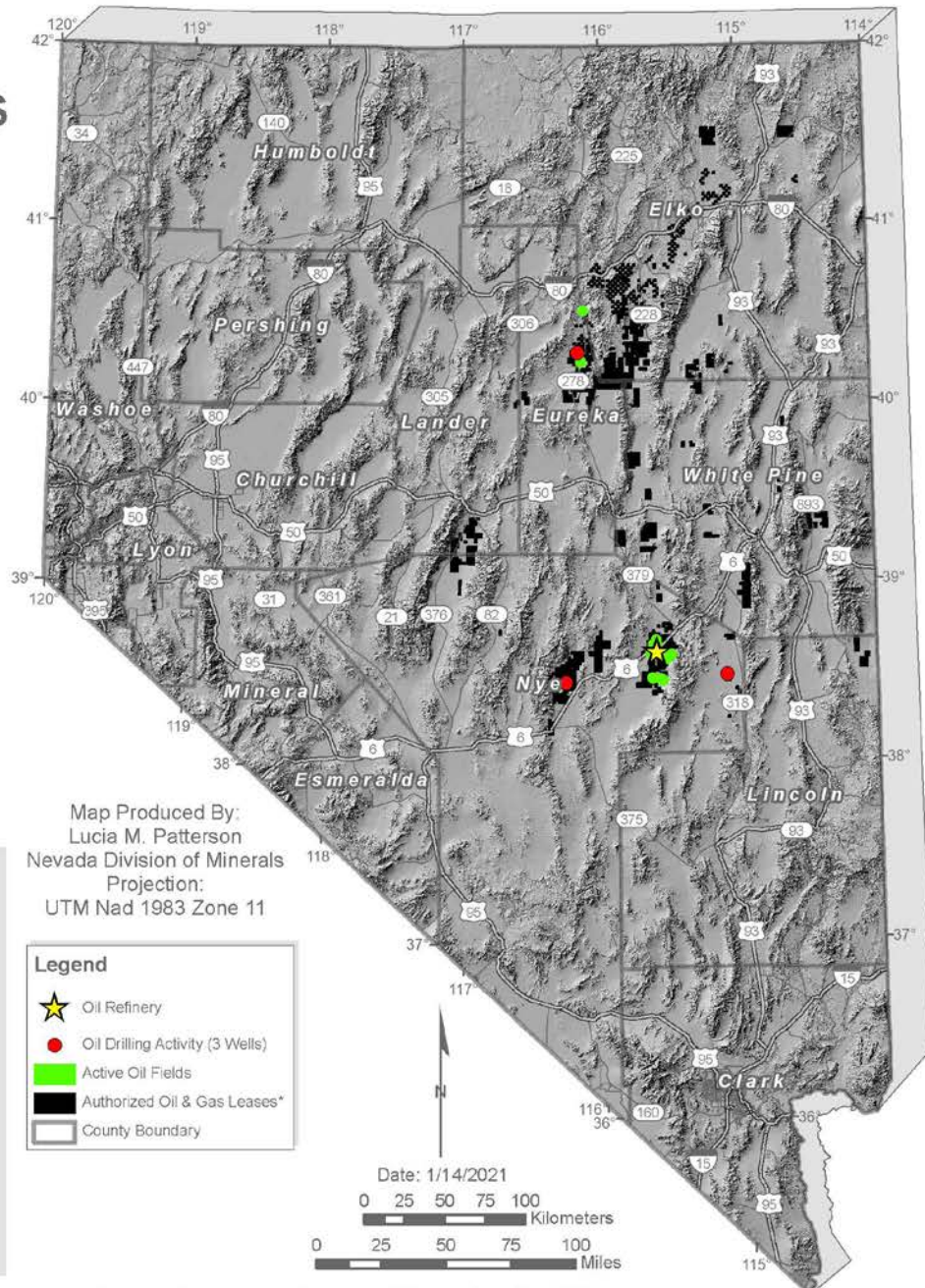
Nevada Oil-Gas Drilling, Production & Federal Leases 2019-2020

As of January 14, 2020 there were 120 permitted oil wells

There are currently 10 active oil fields in Nevada

As of December 31, 2020 there were 487 authorized oil leases which total 882,948 acres

There is one oil refinery in Nevada



*Authorized leases are plotted by section and do not necessarily depict actual lease boundaries. Lease data as of December 31, 2020

TRENDS & PREDICTIONS

- **Metals mining is increasingly underground, >30% now.**
- **Copper is #2 in gross value and increasing**
 - **Limitation is lack of downstream smelting and refining**
 - **Electric vehicles vs. gas require 5-8X more copper**
- **Industrial mineral production in NV likely to increase as it is easier to put into operation than in other western states**
- **Increase in # of projects being permitted largely due to increased gold price but also in relation to increased demand for commodities needed for renewable energy and batteries (Co, Li, Ni, V, Zn)**
- **If one or more Li clay project progresses, NV will produce >10% of world production, would then expect vertical integration with a cathode plant built in NV.**
- **Increasing geothermal energy production**
- **Escalation in investor interest on the value of environmental, social and corporate governance (ESG)**

For More Info:

- Agency Homepage:
minerals.nv.gov
- “Mining” program page
 - Production summaries and stats
 - Numerous free publications and maps
- “Current Information”
 - Links to our Distance Learning Educational Videos
 - Recent Presentations
- “Important Links - Open Data Site”
 - Interactive web mapping application to display and download information related to the minerals industry.
 - Location of mining claims, current and historical exploration activity and mineral production.
 - Public lands issues
 - New “Mining in Nevada” page

The screenshot shows the official website of the Nevada Division of Minerals. At the top, there is a navigation bar with links for HOME, ABOUT US, COMMISSION, PROGRAMS, NEWS, FAQs, and CONTACT US. The main content area features a large photograph of a mining site with a caption: "Visual effects staging at recent shoot for 'Stay Out Stay Alive' film update, coming in 2021!!!". To the right of the photo is a "Current Information" sidebar with several bullet points: "Release of New 'Stay Out and Stay Alive' Video", "BLM releasing replacement to LR2000 with new Mineral & Land Records System (MLRS)", "2020 Excellence in Mining Reclamation Awards Presentation", "Distance Learning - Educational Videos", "Recent Presentations page", and "Information Related to Proposed Land Use Plans and Withdrawals". Below the photo, there is a section titled "***Emergency Measures Relating to COVID-19***" with text explaining office closures and the Governor's health directives. This is followed by an "Employment Announcement(s)" section for a Public Service Intern 1 position. Next is an "Education Workshop(s)" section for a cancelled 36th Annual Northern Nevada Earth Science Education Workshop. Below that is a "Request for Information and Public Records" section with links to NDOM forms. The "Important Links, Nevada Division of Minerals" section includes links to Open Data Site-GIS files, State and Federal Permits, and the YouTube Channel. The "Other Important Links" section lists the Comparison of Federal and State Small Exploration and Small Mining Project Authorities, Nevada Bureau of Mines and Geology, and Governor's Office of Energy. At the bottom, there is a "Programs" section with six icons representing different areas: Dissolved Mineral Resource Exploration, Education & Outreach, Geothermal, Mining, Oil and Gas, and Abandoned Mine Lands.