

Nevada Division of Minerals

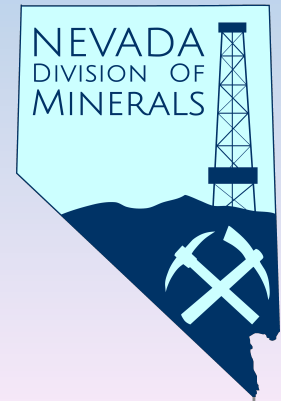
2018 NEVADA MINERAL PRODUCTION, EXPLORATION and DEVELOPMENT AND OTHER FUN FACTS

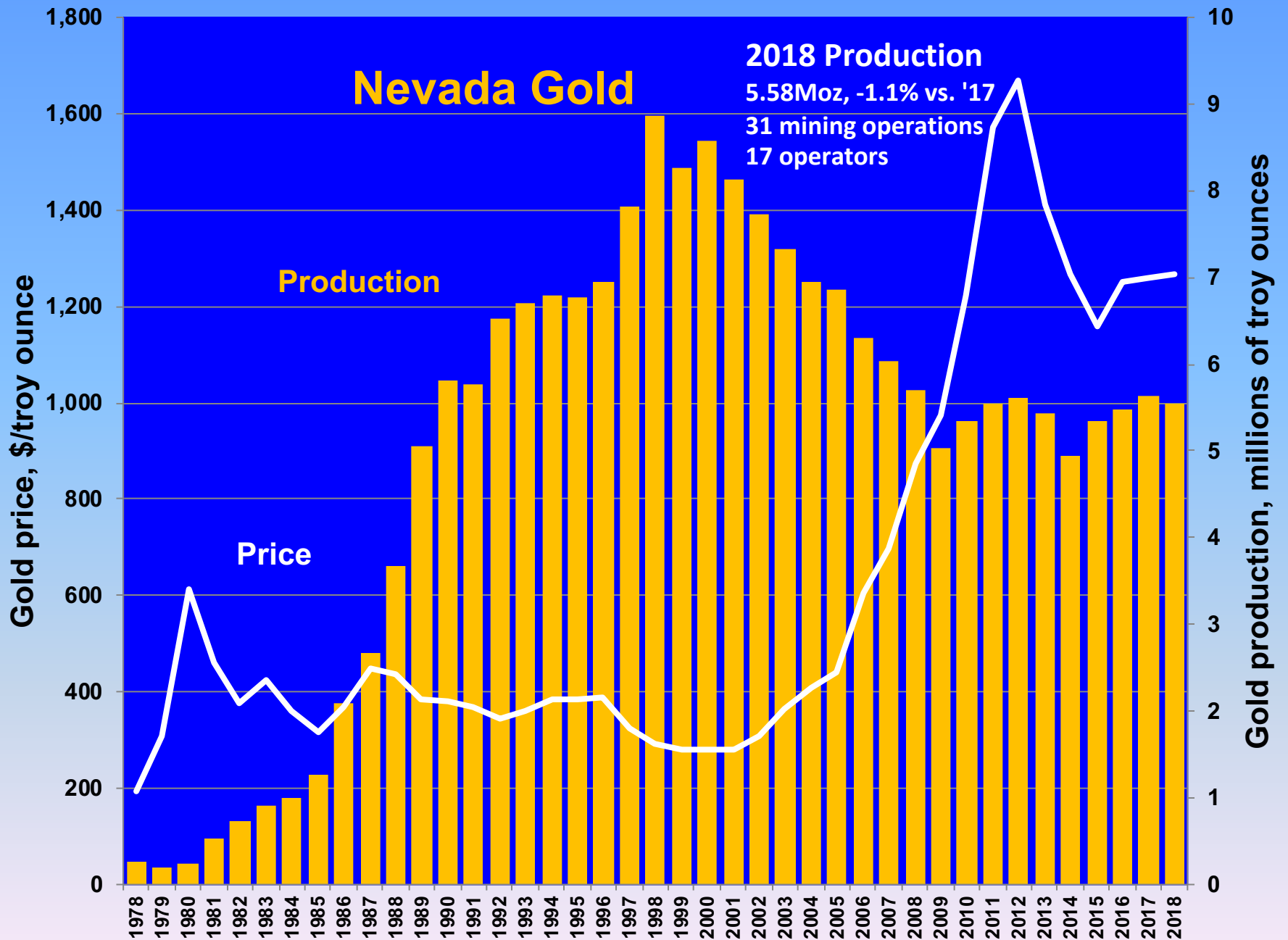
PUBLIC LANDS FOUNDATION

Reno, NV

September 12, 2019

Richard Perry, Administrator





2018 NEVADA METAL PRODUCTION

2018 NEVADA METAL PRODUCTION, BY PRODUCER - Final				
Ranked by gold production				
Operator	Gold (ozs)	Silver (ozs)	Copper (lbs)	Moly (lbs)
Barrick	2,425,512	105,360		
Newmont	1,808,484	1,107,493	32,102,979	
Kinross	660,100	820,042		
SSR Mining	205,161	4,315		
Jerritt Canyon Gold	145,064	NR		
Hecla (Klondex)	109,614	516,312		
Coeur	54,668	5,037,983		
Florida Canyon Mining (Alio Gold)	46,878	31,775		
KGHM International	38,990	171,679	112,552,787	459,959
Fiore Gold	37,403	NR		
Premier Gold (40% of S. Arturo)	20,980	NR		
Rawhide Mining	15,444	208,875		
Mineral Ridge Gold	7,497	3,444		
Ruby Hill Mining	4,648	3,584		
Borealis Mining	420	394		
Sunrise Minerals	268	150		
Geo-Nevada	14	NR		
New Gold Nevada	14	2		
Totals	5,581,160	8,011,408	144,655,766	459,959

The Biggest Export From Every State in 2017

U.S. Exports by Origin (Values in Millions of Dollars)

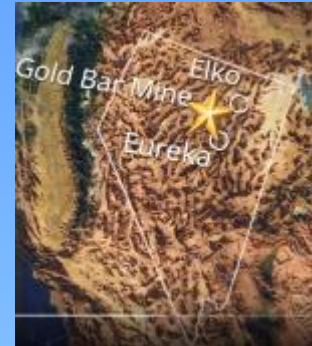


Article & Sources:

<https://howmuch.net/articles/biggest-export-from-each-state>

<https://www.census.gov/foreign-trade/statistics/state/data/index.html>

New Operation for 2019, #1: McEwen Mining – Gold Bar

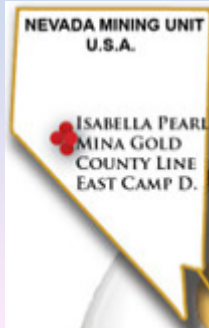


- Groundbreaking – November 2017
- First gold pour – February 2019
- Full Production achieved May, 2019
- Production target – 60,000 Au oz/yr
- Avg. Au grade - 1.0 g/t
- Current mine life – 7 years

New Operation for 2019, #2: Gold Resource Corp. – Isabella Pearl

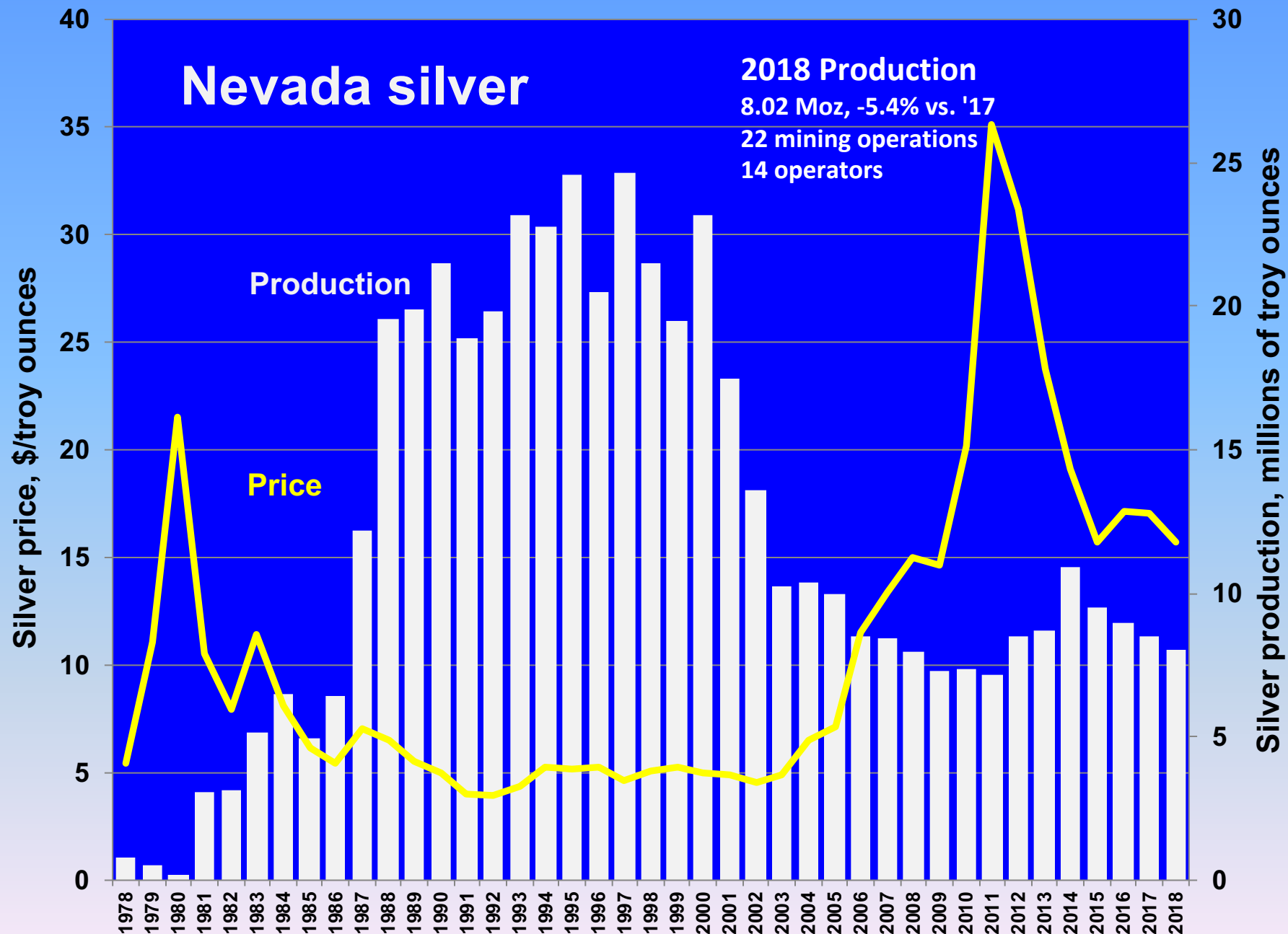


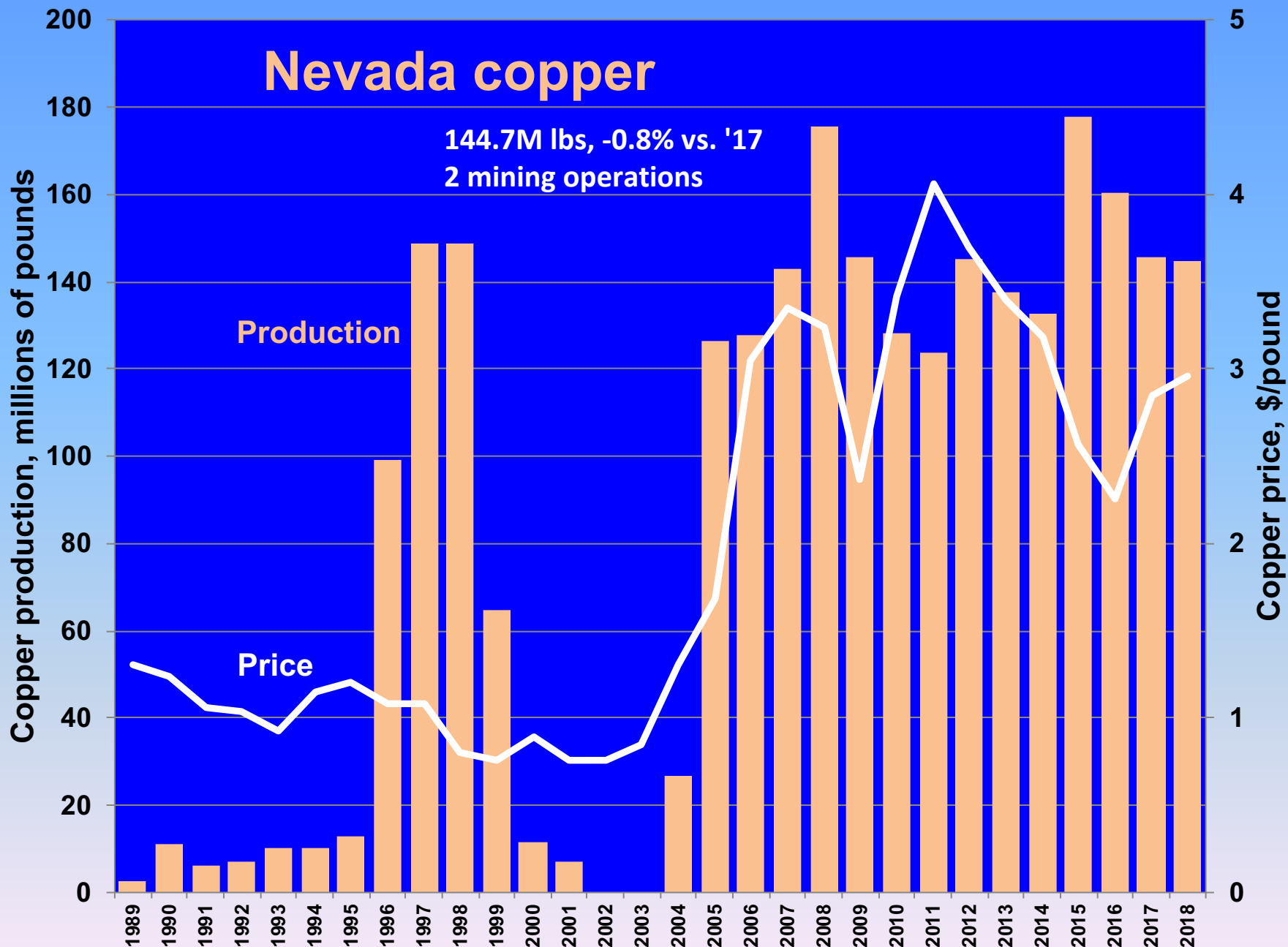
- Groundbreaking – June 2018
- First gold pour – April 2019
- Production target – 40,000 Au oz/yr
- Avg. Au grade - 3.7 g/t
- Current mine life – 5 years



Isabella Pearl Project: First gold dore bar







NEVADA COPPER – PUMPKIN HOLLOW MINE

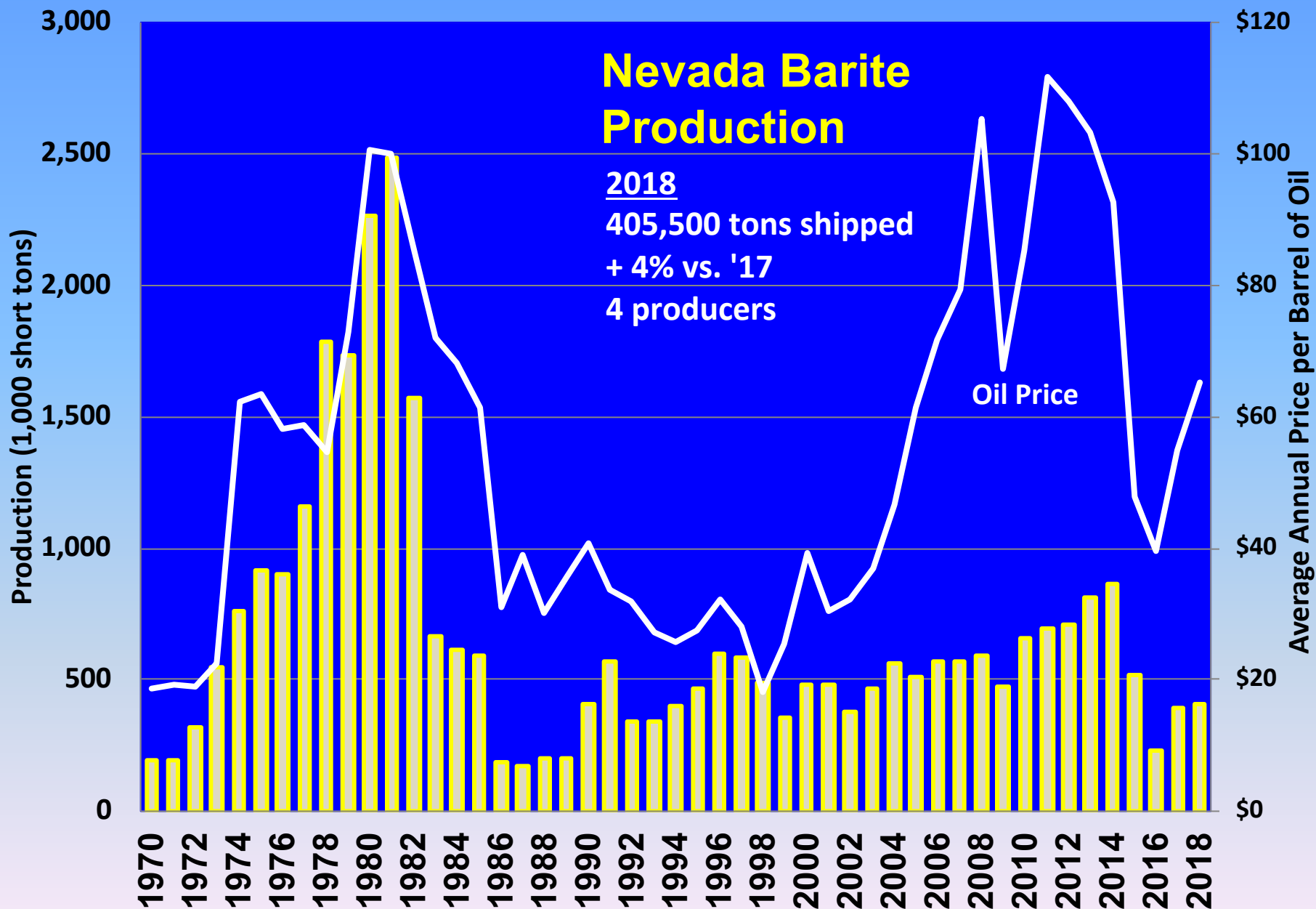
- 2 deposits with 5 billion contained pounds of Cu:
 - Higher grade eastern deposit; underground
 - Shallower western deposit; open-pit
- Currently developing a 5,000 tpd underground mine on the eastern deposit with a concentrator
- Main shaft being extended to 2,147 feet
- First copper production planned for @Q4 2019
- The mine should employ ~300 people
- Nevada's 3rd copper producer in past 20 years



Headframe and stockpiles, July 2019

Concentrator under construction, July 2019



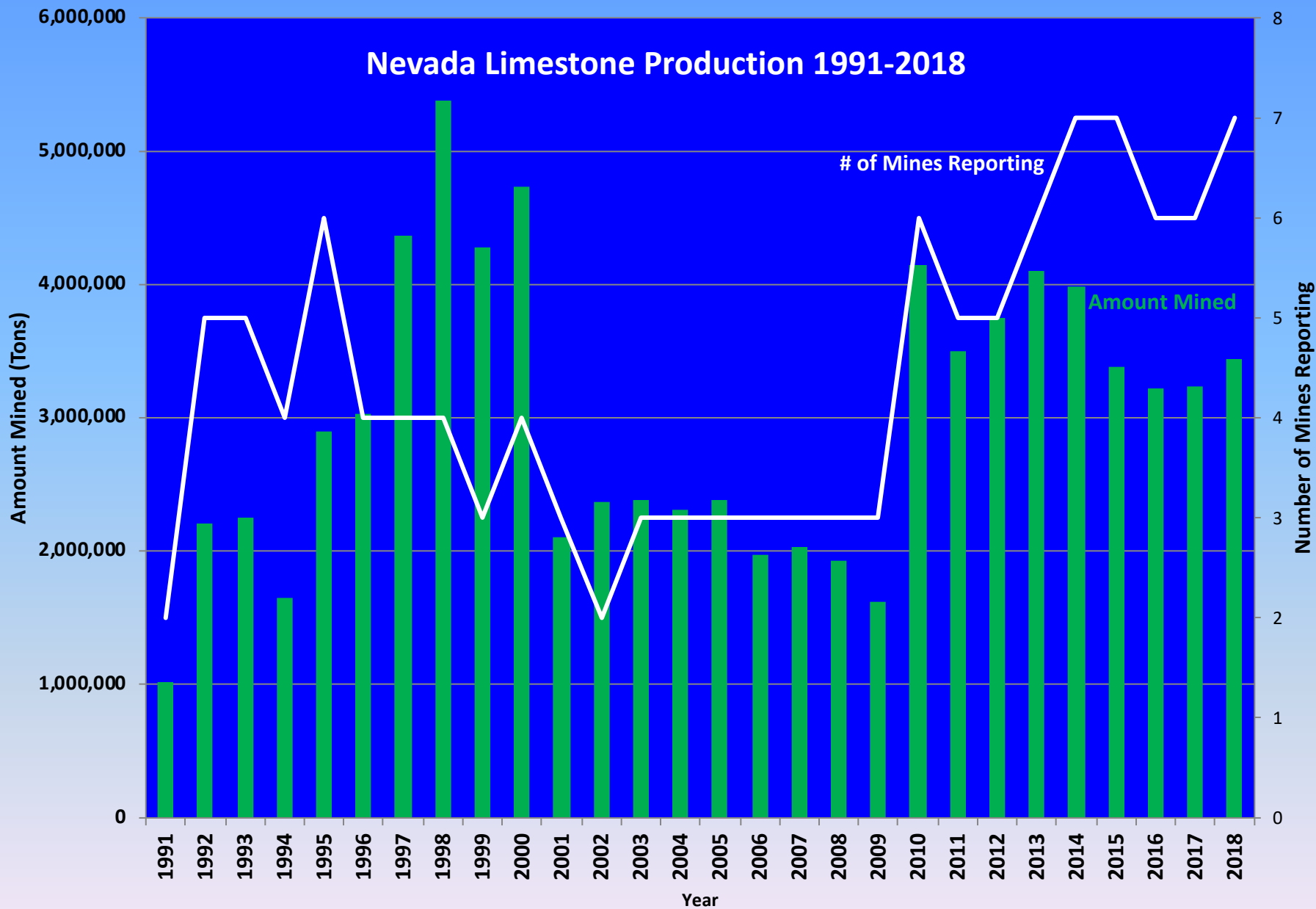


Nevada's Barite Producers

**NEVADA'S BARITE
PRODUCTION
IS FROM STRATIFORM
BEDDED DEPOSITS IN THE
ORDOVICIAN-DEVONIAN.**

- **4 MINES OPERATED IN
2018**
- **5 PROCESSING PLANTS**





Nevada Diatomaceous Earth Production

Diatomite production (tons)

600,000

500,000

400,000

300,000

200,000

100,000

0

1991

1992

1993

1994

1995

1996

1997

1998

1999

2000

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

2013

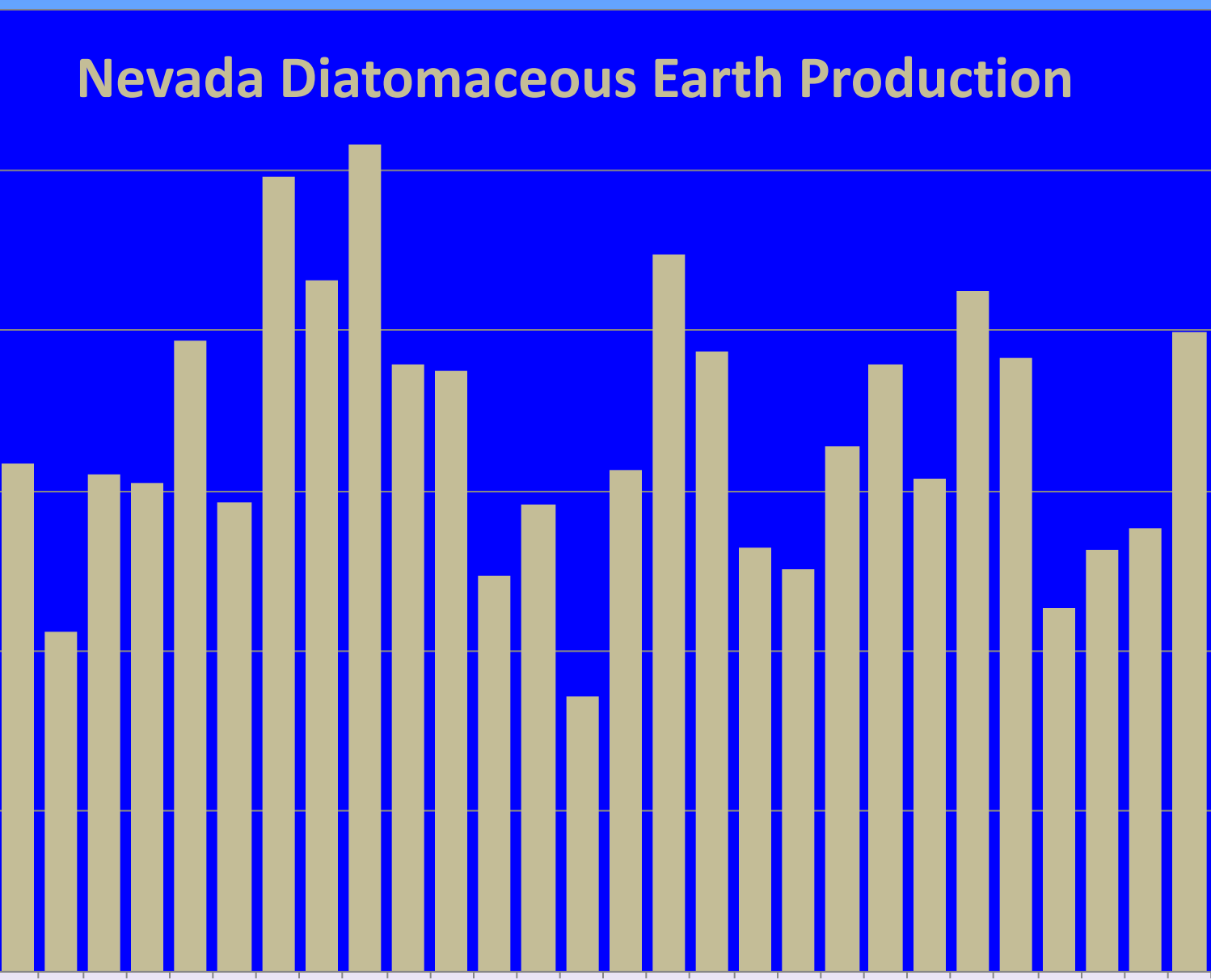
2014

2015

2016

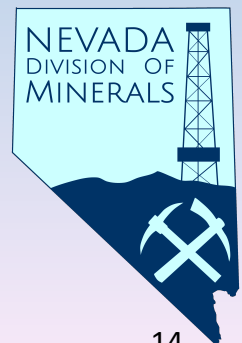
2017

2018



Other Industrial Minerals Produced in 2018

- 12,900,000 lbs of lithium carbonate
- 716,000 tons of silica sand
- 348,600 tons of magnesite
- 19,900 tons of salt
- 17,087 tons of perlite



Fluid Mineral Resources

- **Geothermal well permitting and compliance NRS 534A**
- **Oil and gas well permitting and compliance NRS 522**
- **Dissolved Mineral Resource Exploration well and borehole permitting NRS 534B**



Ormat Geodrill #1 at Tungsten Mtn, 2018

Geothermal Development 2017-2018



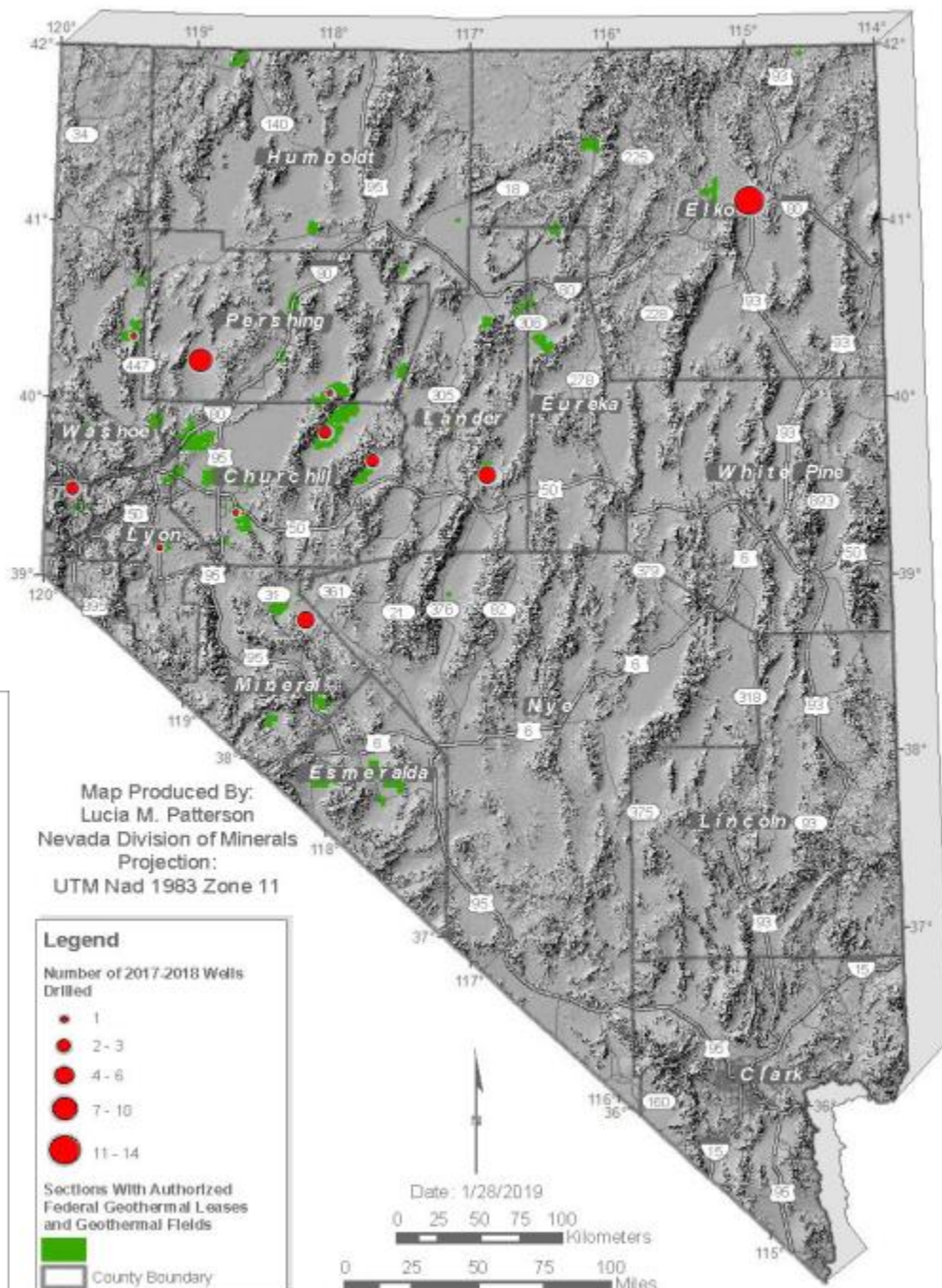
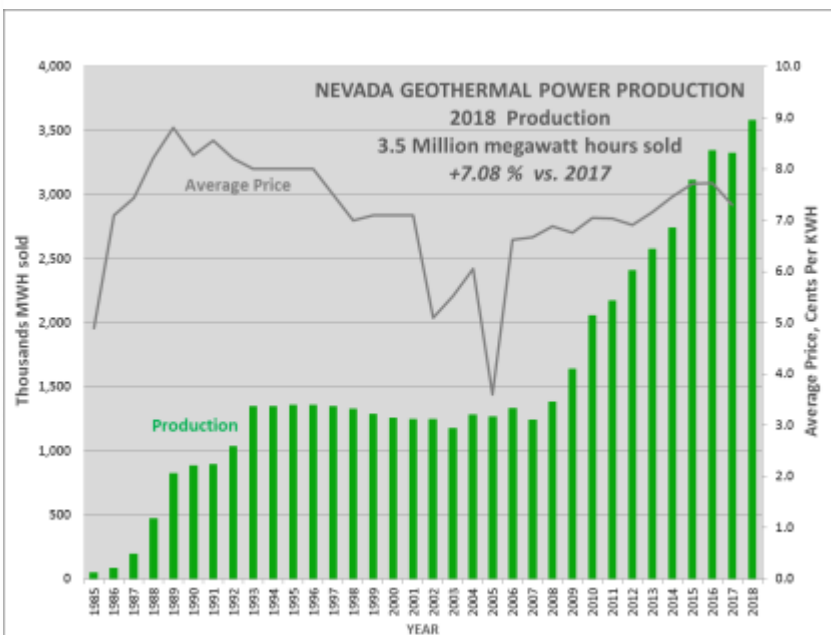
Wells Drilled 2017-2018

- 3** Domestic
- 4** Industrial Injection
- 8** Industrial Production
- 3** Observation
- 31** Temperature Gradient

As of 12/31/2018 there were 459 permitted commercial and industrial wells

There are 25 active geothermal plants in Nevada

There are 727 authorized geothermal leases as of 01/07/2019 which total 334,303 acres

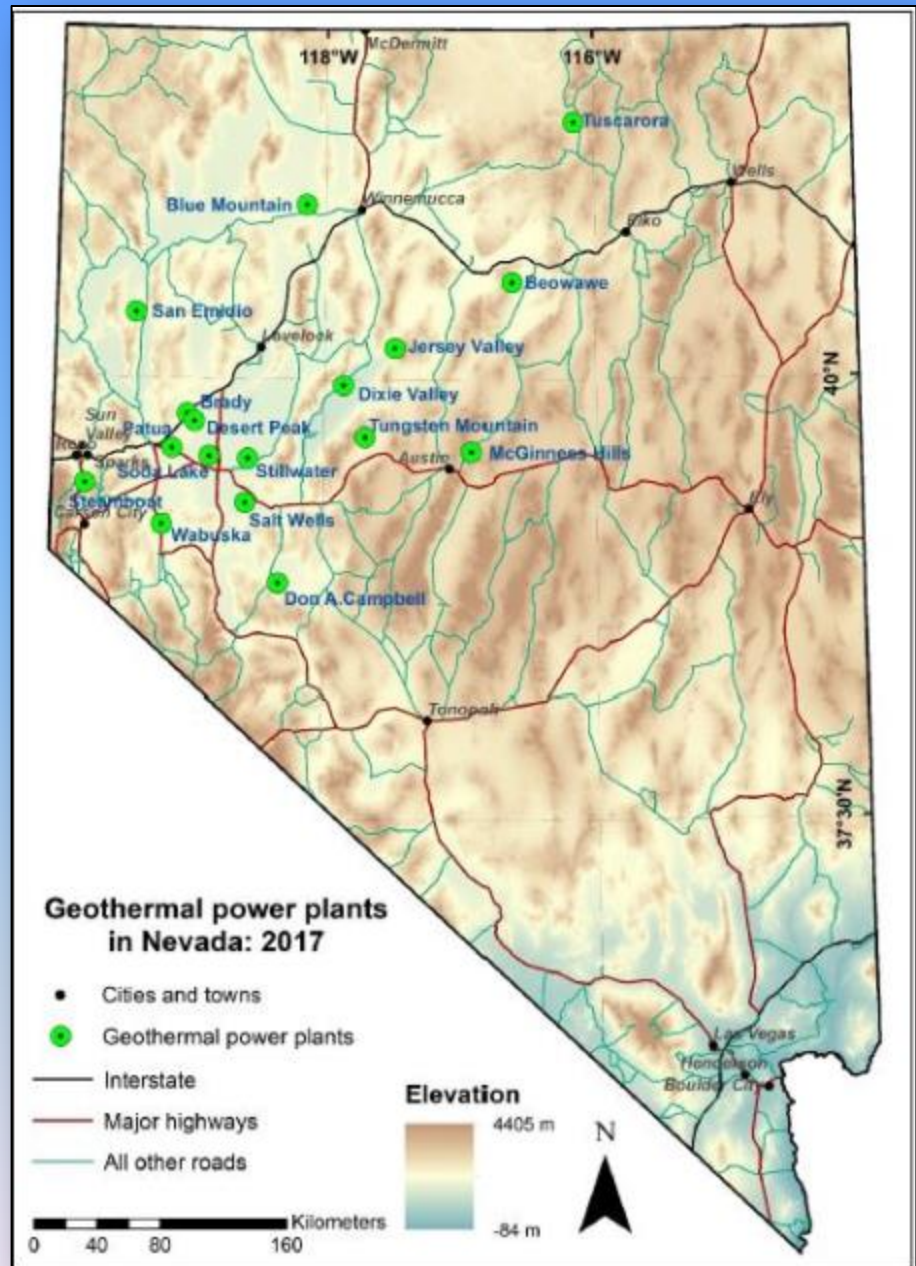


Geothermal Operators

➤ There are currently 17 geothermal fields in Nevada being operated by 5 operators:

- **Ormat Nevada**: Steamboat, McGinness Hills, Brady, Desert Peak, Wild Rose (Don Campbell), Jersey Valley, Tuscarora, and Tungsten Mountain, San Emidio
- **Terra-Gen**: Dixie Valley and Beowawe
- **Cyrq Energy**: Soda Lake, Patua, Blue Mtn
- **Enel North America**: Stillwater and Salt Wells
- **Star Peak Geothermal**: Wabuska

- 458 permitted wells
- 60% on private property
- >334,000 acres in authorized BLM leases



New Geothermal Plant in 2018: Ormat Technologies McGinness Hills Phase III

General

- Phase III plant went on-line in December, 2018
- 48 MW capacity
- 5 Production wells, 1 injection well drilled 2017-2018

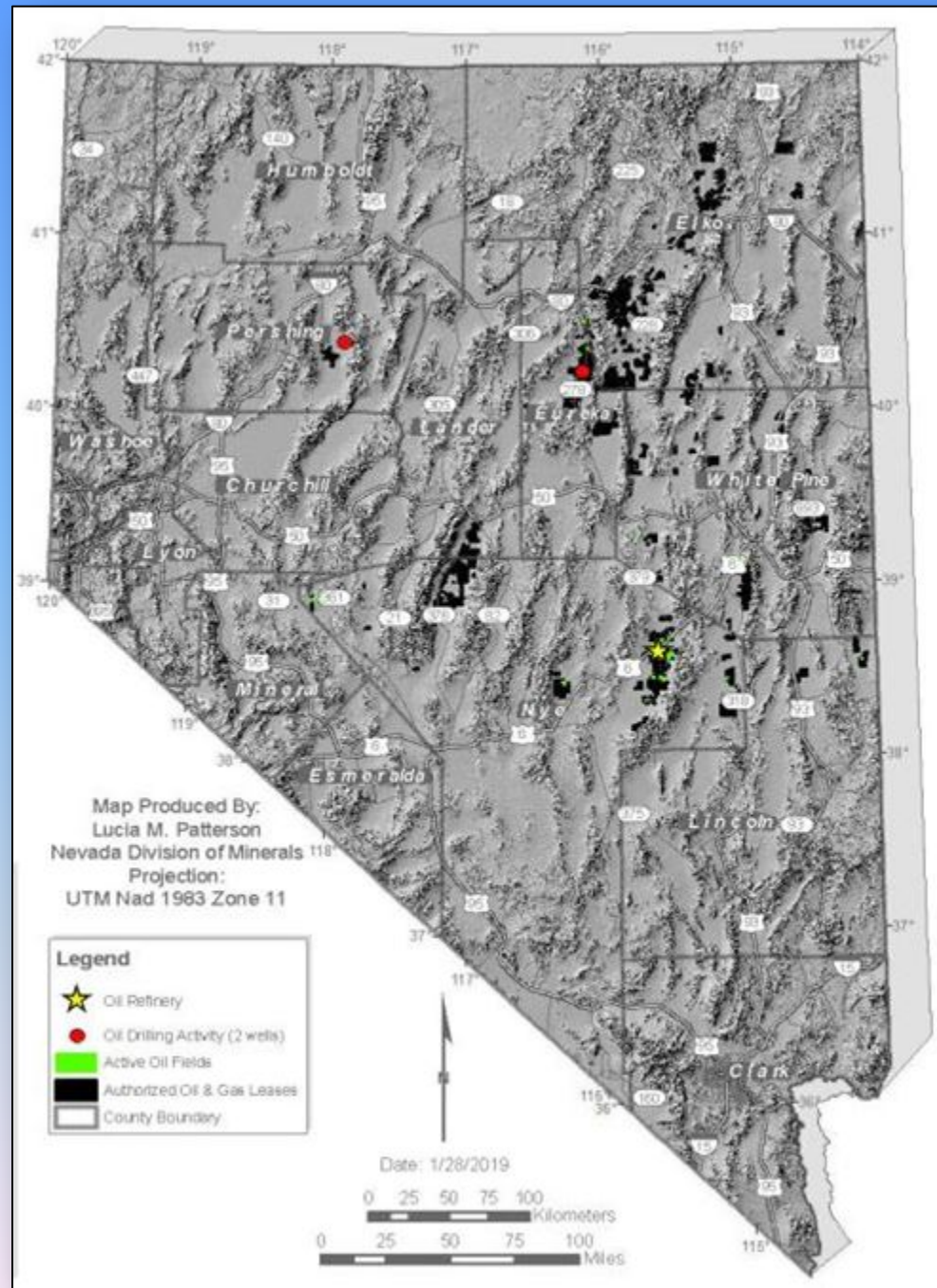


- Phase I at 30 MW (2012)
- Phase 2 increase to 72 MW (2015)
- Phase 3 increase to 138 MW (2018)



2018 Nevada Oil Activity

- 5 oil producers:
 - Makoil
 - Grant Canyon
 - Kirkwood
 - Western General
 - Tomera Ranch
- 60 producing wells in 10 fields
- 119 permitted oil wells
- 99% on Federal land
- 194 authorized oil leases totaling 337,000 acres
- 3 new drilling permits issued in 2018



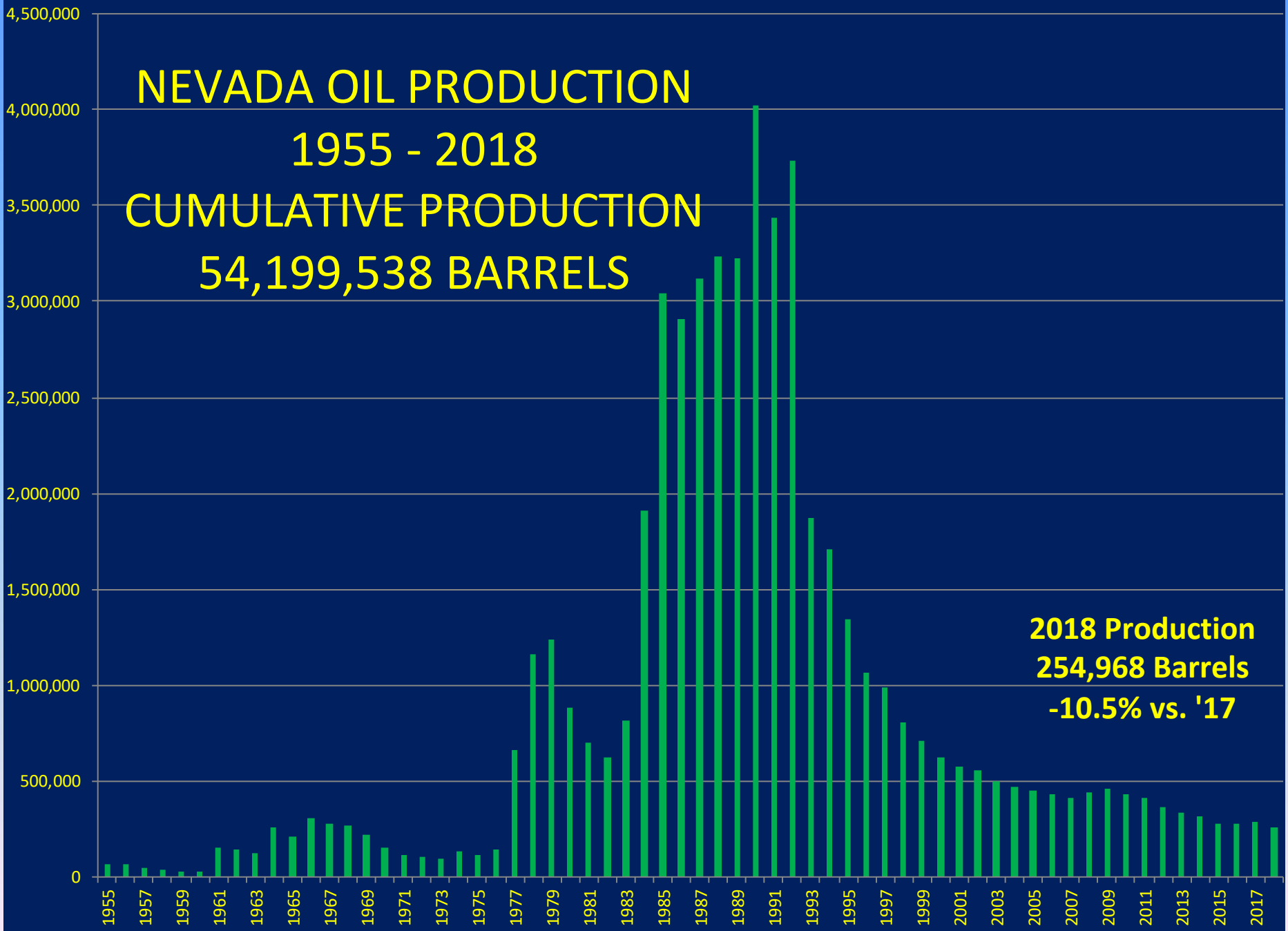
NEVADA OIL PRODUCTION

1955 - 2018

CUMULATIVE PRODUCTION

54,199,538 BARRELS

2018 Production
254,968 Barrels
-10.5% vs. '17



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.**
- **In 2018, only 8.7 percent of “nominated” Federal acreage was actually leased**

Where do Fluid Mineral Leasing Revenues go? Shared 50% with State

- 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

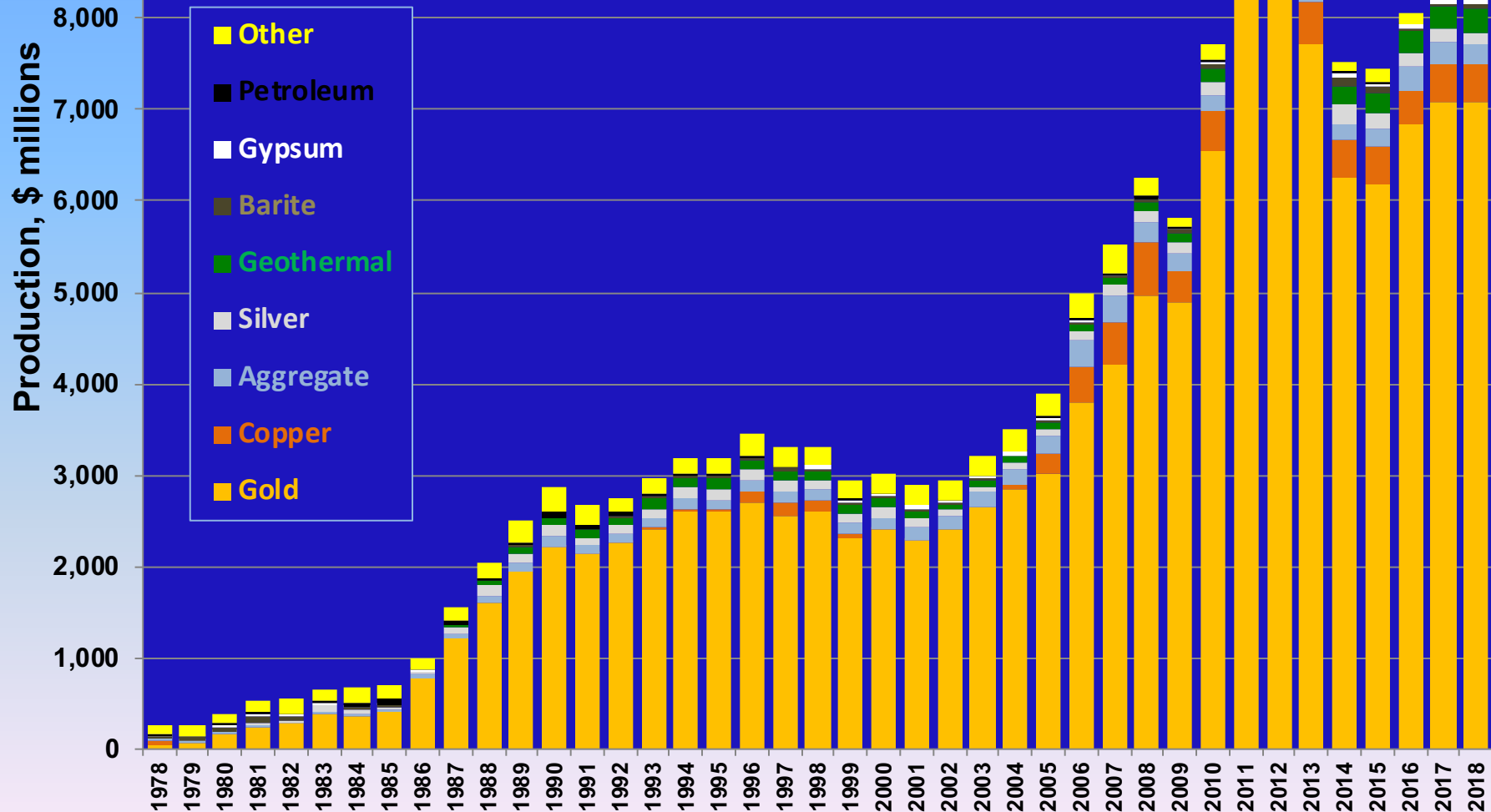
-States do not get revenue

From solar or wind

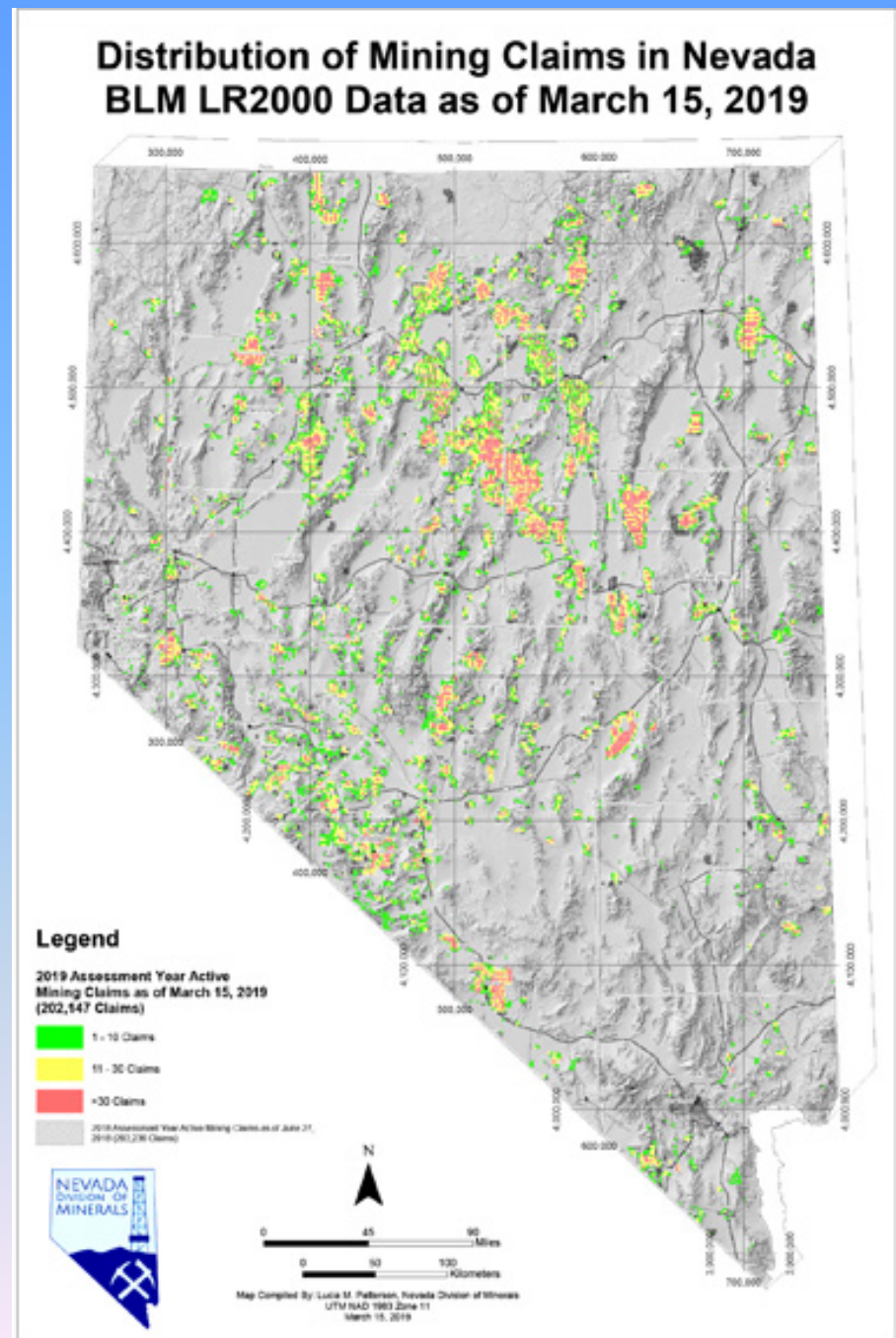
State	Disbursement Type	County or Coastal Political Subdivision (CPS)	2018
Nevada	Geothermal	Churchill County	\$668,908.66
		Elko County	\$8,387.60
		Esmeralda County	\$24,369.59
		Eureka County	\$14,095.37
		Humboldt County	\$46,051.65
		Lander County	\$283,264.18
		Lyon County	\$10,805.38
		Mineral County	\$144,864.87
		Nye County	\$375.30
		Pershing County	\$37,278.68
		Washoe County	\$46,923.61
		White Pine County	\$937.30
	State	Both Oil and Gas and Geothermal	\$4,066,416.81
Total			\$5,352,679.00

Nevada Mineral and Energy Production Values 1978 - 2018

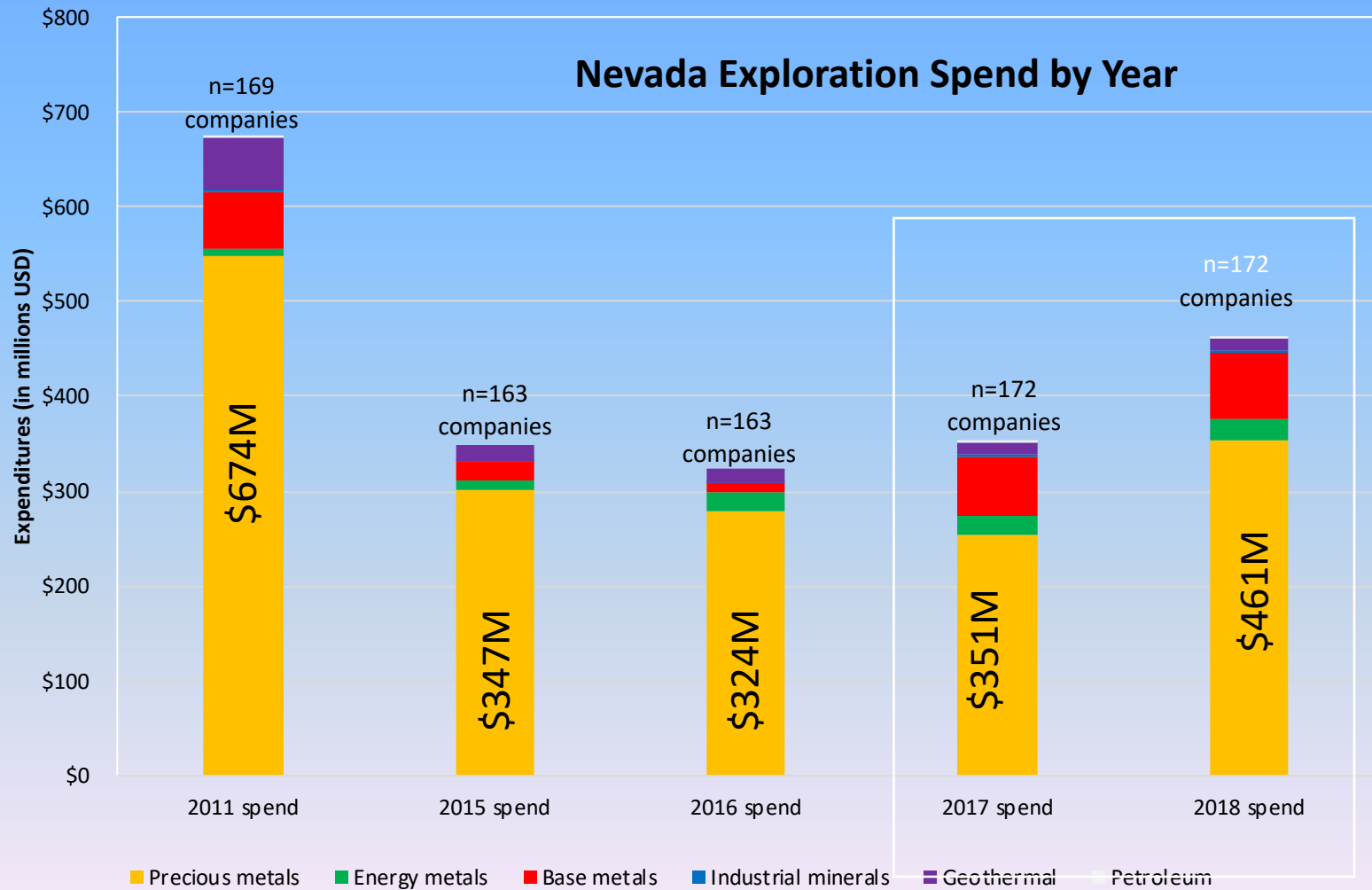
\$8.4 Billion in 2018, same as 2017



202,147 Active
Mining Claims in
Nevada as of
3/15/2019,
an increase of
0.4% from
2/22/2018



Minimum Exploration Expenditures 2011 and 2015 through 2018



Dissolved Minerals Development 2017-2018

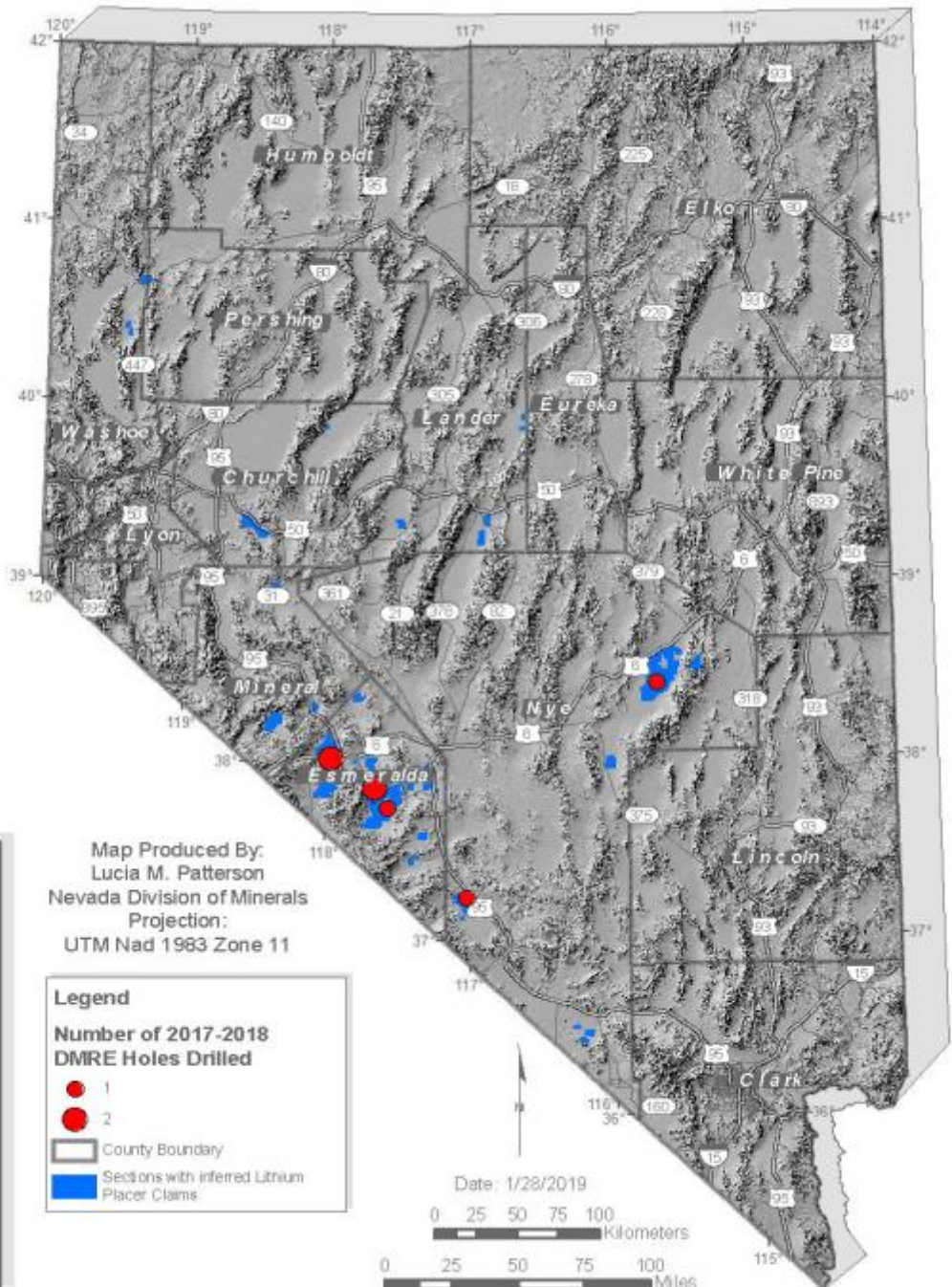
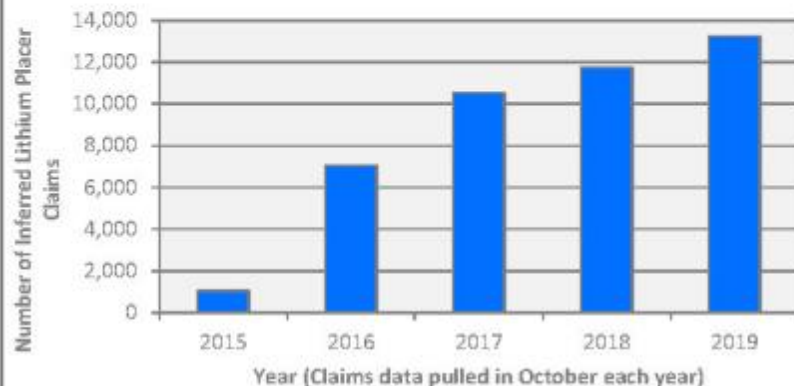


As of 01/22/2019 there were 7 DMRE holes drilled

5 Wells
2 Boreholes

As of 01/04/2019 there were 11,772 inferred lithium placer claims

Lithium Claims Vs. Time



DMRE WELL DRILLED UNDER NEW REGULATIONS IN RAILROAD VALLEY, NYE COUNTY. 3PL Operating, David Gibson Drilling

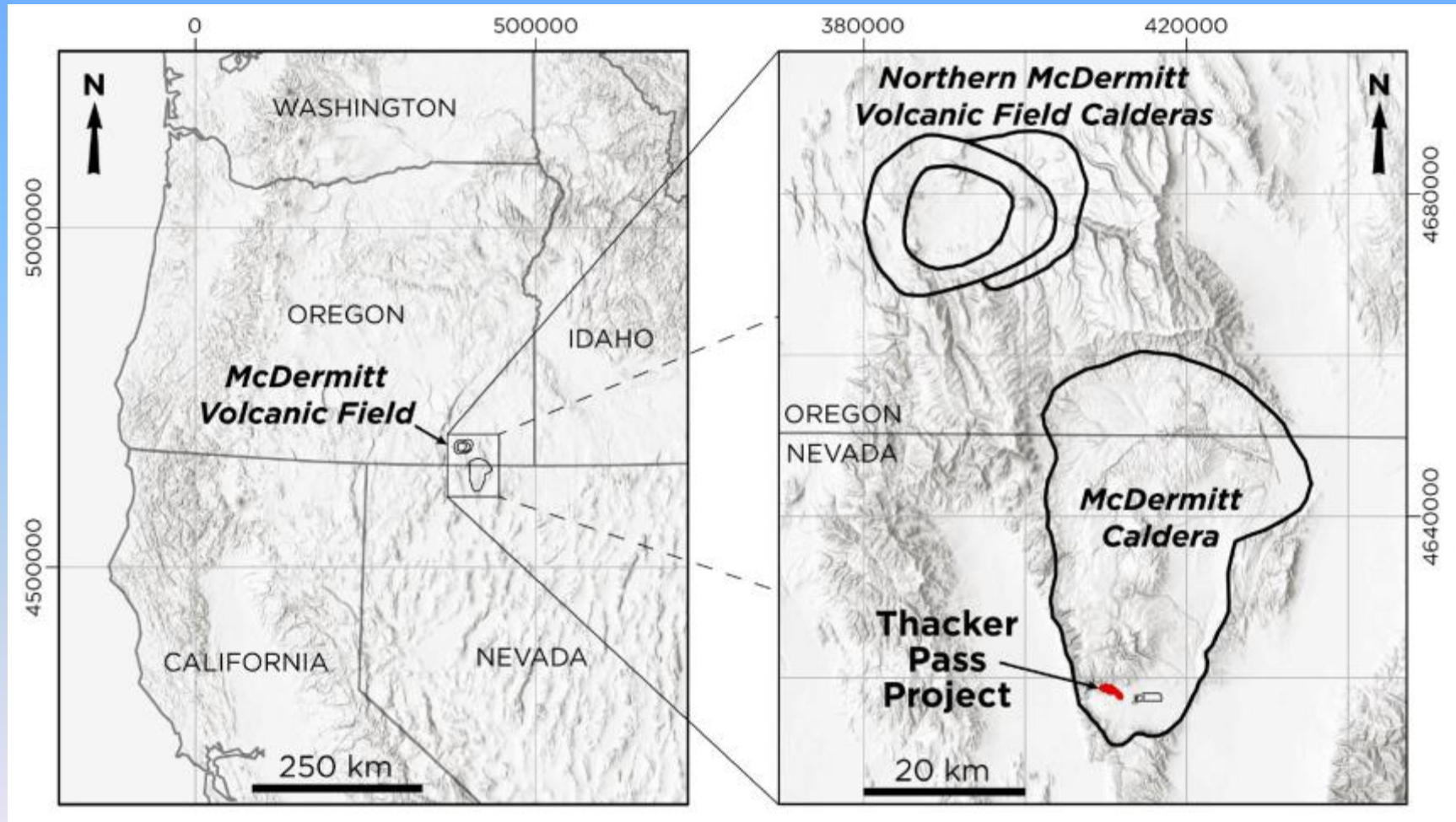


Photo taken May 13, 2018

Lithium Clay Projects

- Exploration regulations same as hard rock
 - Notice of plan-level under BLM
 - No permitting of boreholes needed as no water pumped
- Mine permitting same as any mining project
 - On Federal lands, BLM or USFS lead agency
 - On Private lands, NDEP-BMRR is lead agency
- Two projects which have done PFS reports, metallurgical studies, and proposed flowsheets:
 - Lithium Americas - Thacker Pass Project in Humboldt County
 - Loneer Ltd. - Rhyolite Ridge Project in Esmeralda County

Lithium Americas – Thacker Pass Project

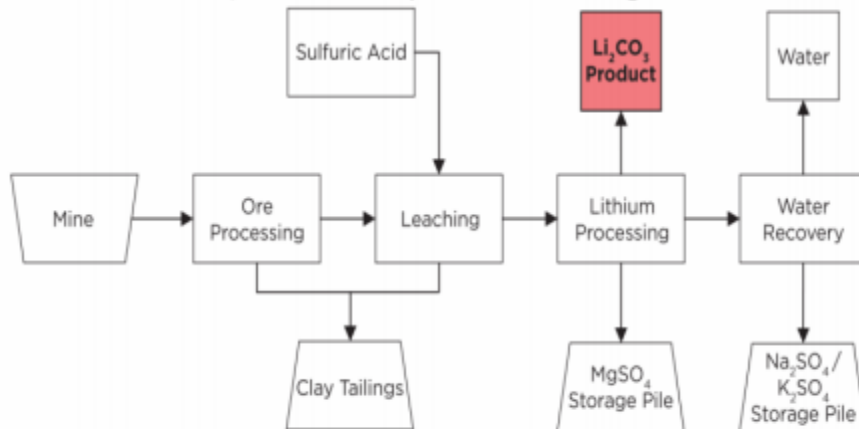


Lithium Americas – Thacker Pass Project

PLANT

- Process is comprised of 3 functional areas: Ore Preparation & Leaching, Sulfuric Acid Plant, & Lithium Processing Plant
- No new process technology, only traditional chemical processing equipment used in unique ways, specific to the LNC extraction process:

- Tanks (stirred reactors)
- Vacuum Belt Filters
- Single and Double-Effect Crystallizers
- Double Contact / Double Absorption Sulfur-Burning Acid Plant



- 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
- Final Mine PoO to be submitted to BLM later this year

Ioneer's Rhyolite Ridge Project



Project overview

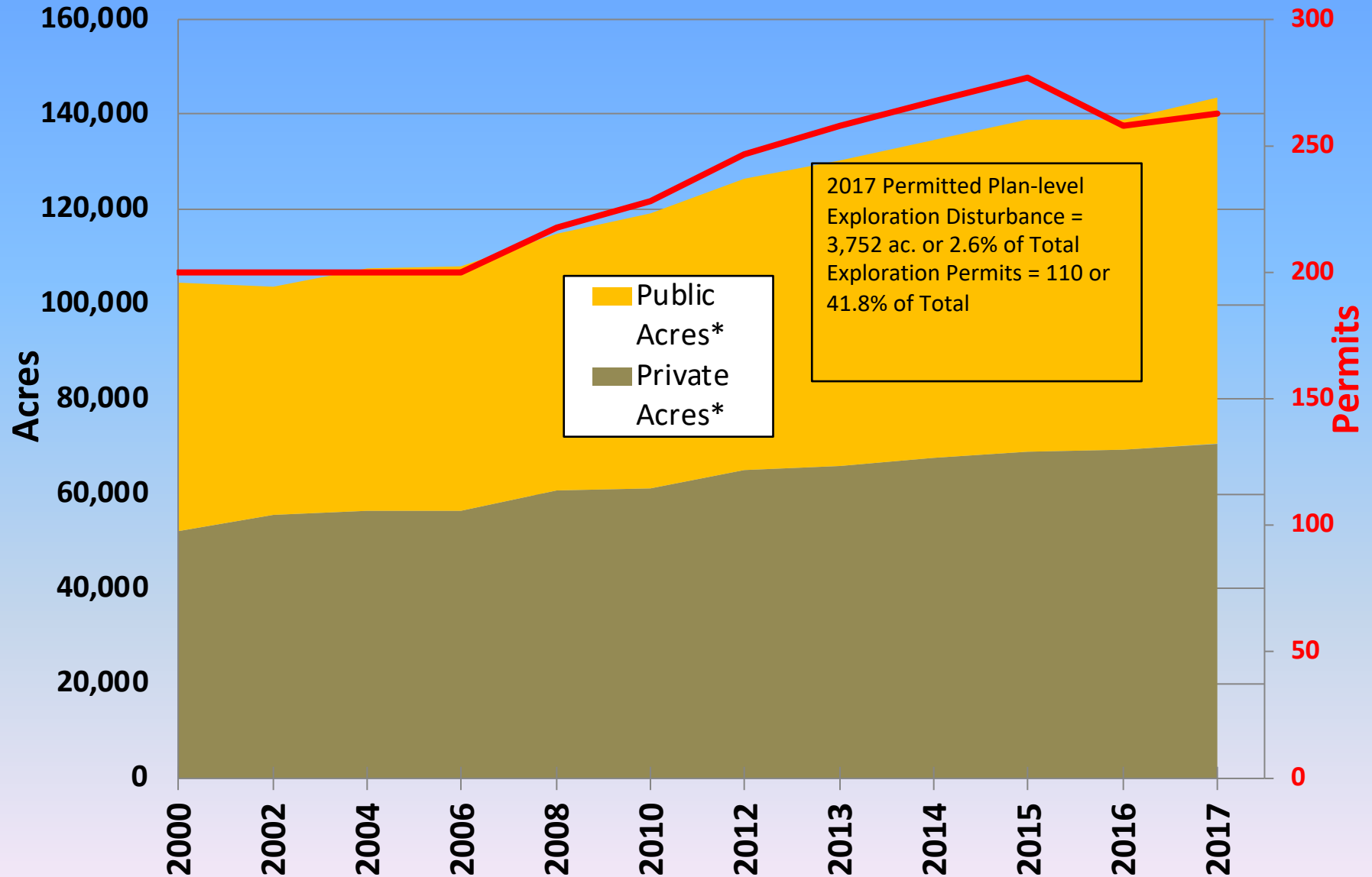


A searlesite resource that is different to other sedimentary lithium deposits - it is suitable for a simple acid leach process

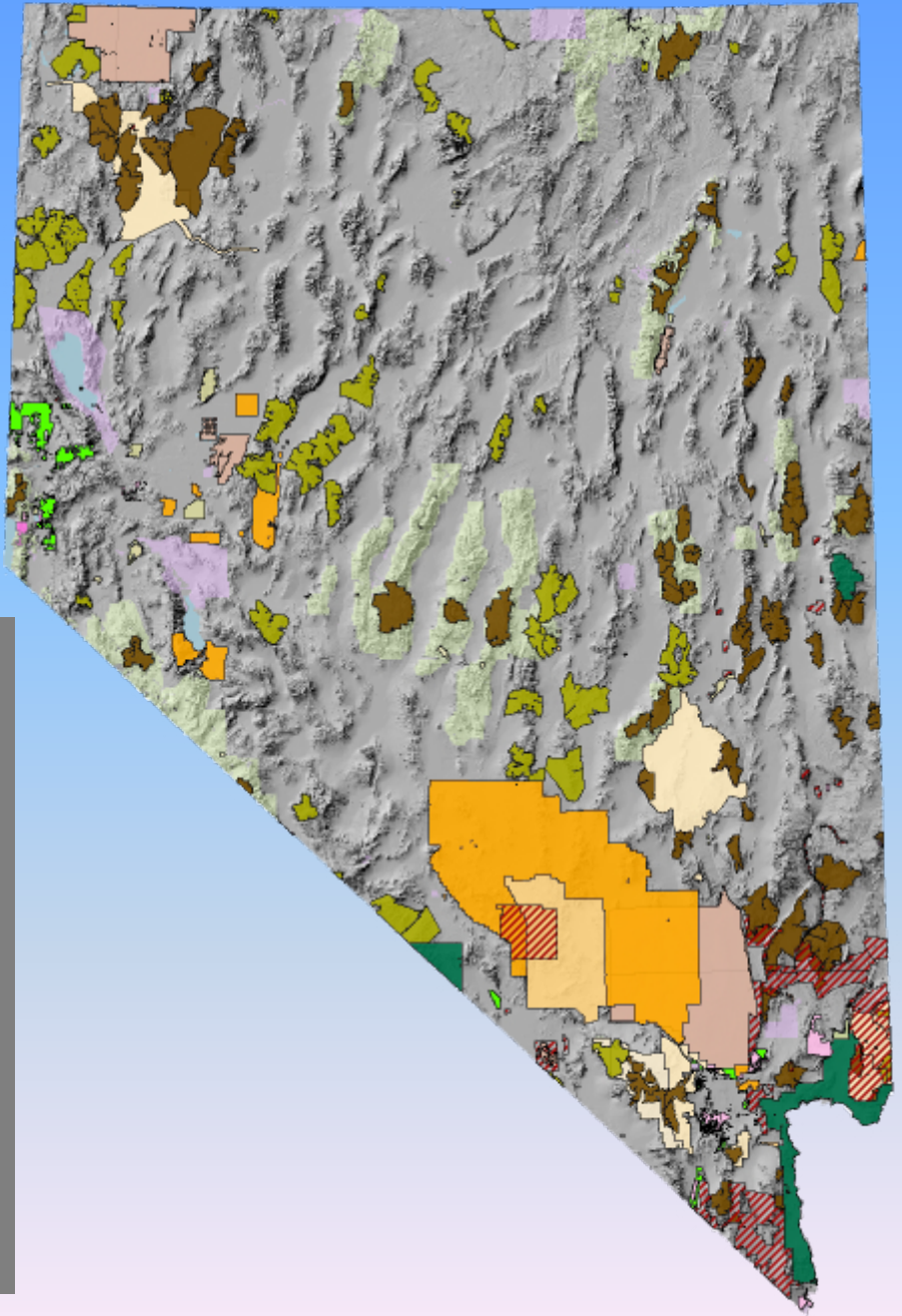
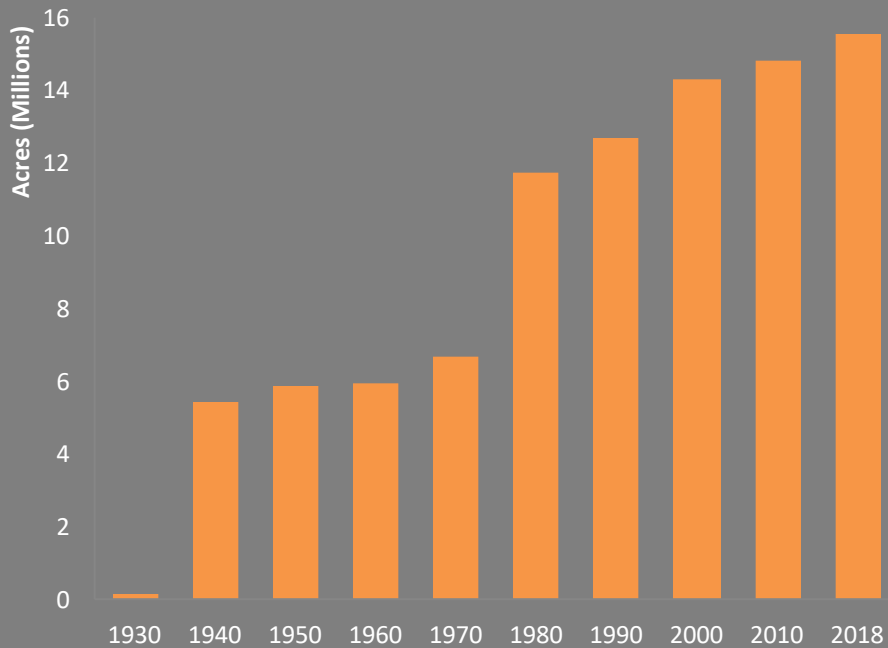


- Total Resource¹ of 4.1 million tonnes lithium carbonate & 10.9 million tonnes boric acid
- Including 121 million tonnes of lithium-boron ore containing:
 - 1.1 million tonnes lithium carbonate
 - 8.6 million tonnes boric acid
- Lithium only clay mineralisation to be stockpiled

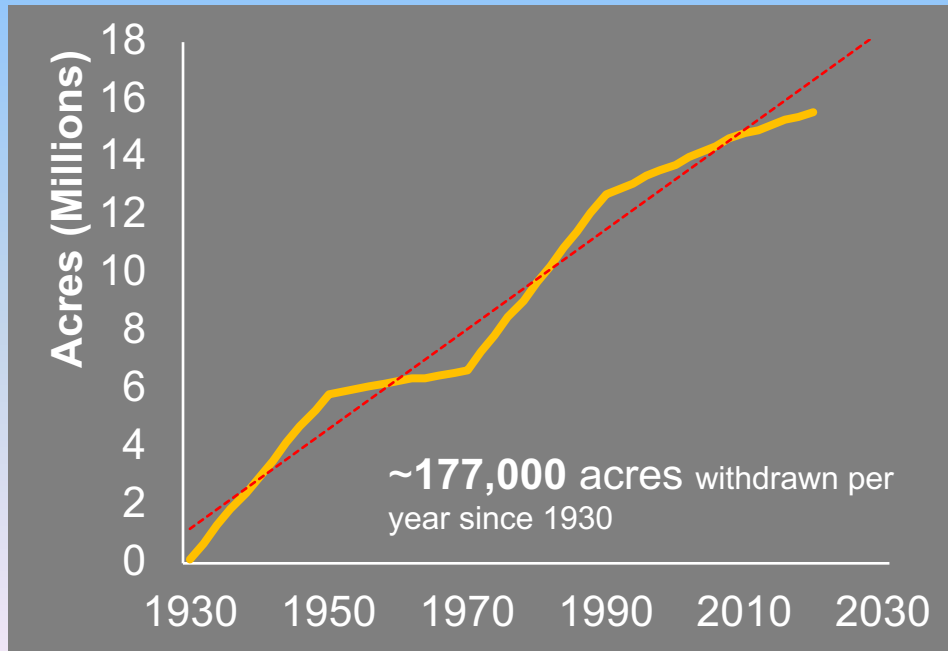
CUMULATIVE MINING PERMITS AND PERMITTED DISTURBANCE IN NEVADA



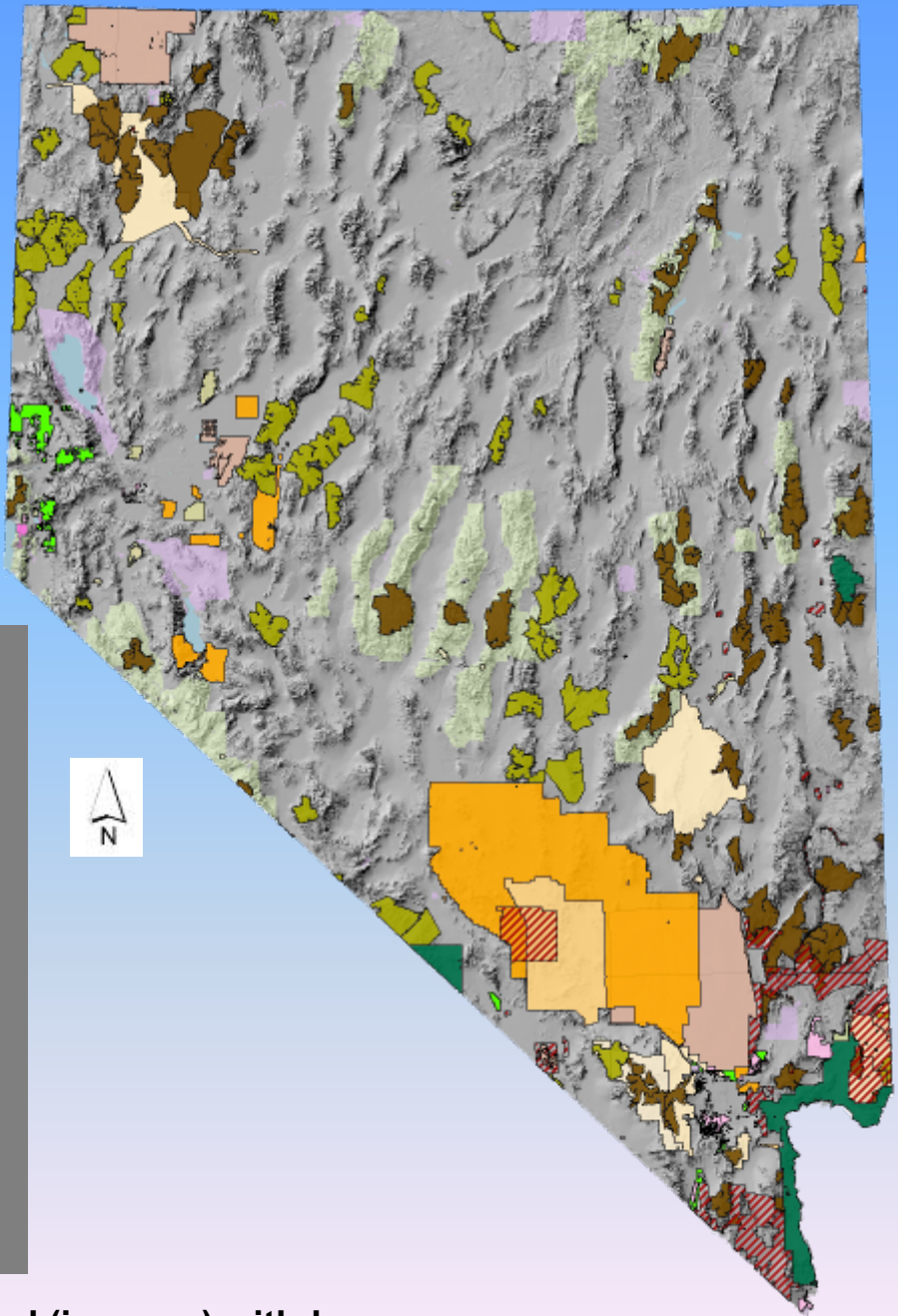
Nevada Land Withdrawals as of May, 2018



Nevada Land Withdrawals as of May, 2018



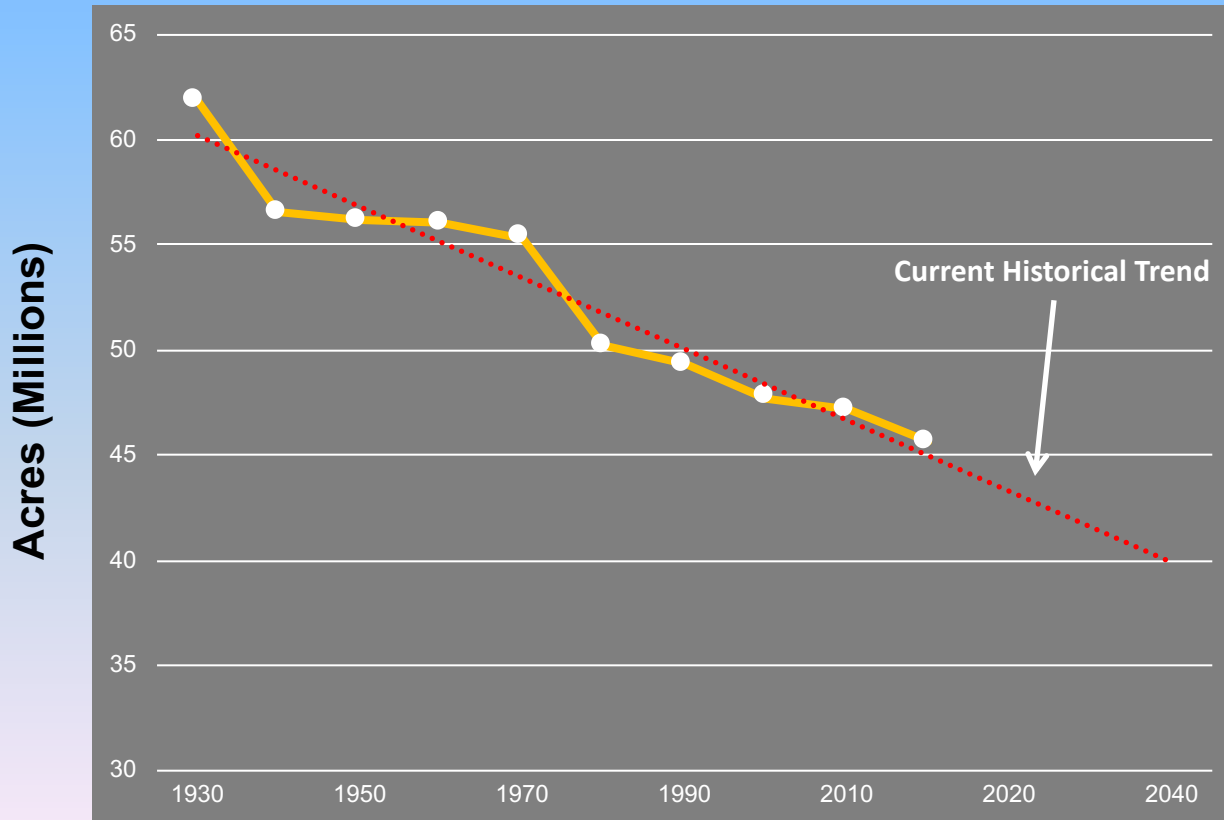
Line graph displaying the trend in the amount of land (in acres) withdrawn per year.



Current Historical Trend

(Summary Result)

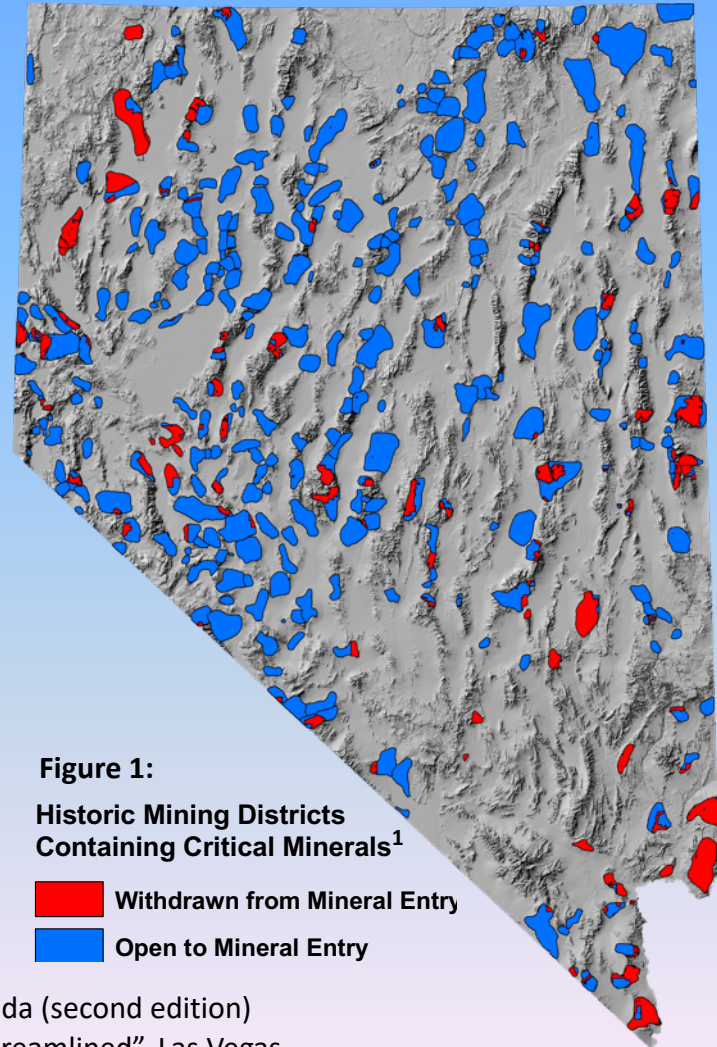
Available Federal Lands Open to Mineral Entry



The chart to the left depicts the decrease in federal lands open to locatable mineral entry by decade. Since 1930, approximately 1,770,000 acres of land are withdrawn each decade.

Critical Minerals Affected by Mineral Entry Withdrawals

- 35 minerals identified as “Critical Minerals” by the U.S. Department of the Interior 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
- More than 330 historic mining districts contain occurrences of one or more critical minerals¹



¹Tingley, Joseph V. (1998). NBMG Report 47, Mining districts of Nevada (second edition)

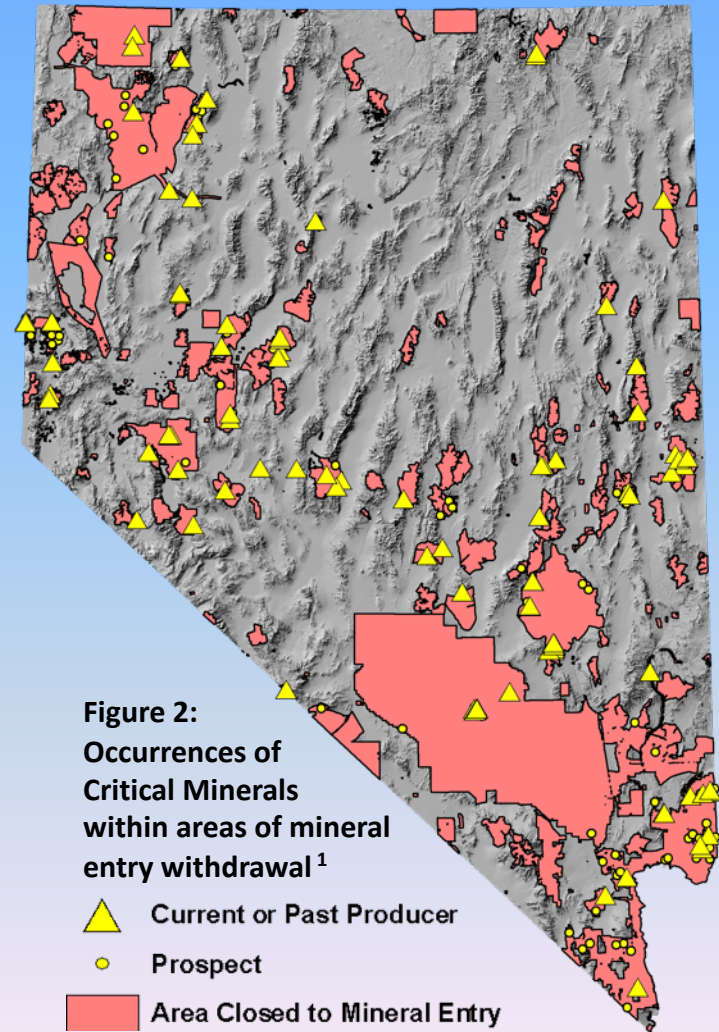
² Martin, Gary. “Mining of 20 ‘critical’ minerals in Nevada could be streamlined”, Las Vegas Review-Journal, 21 May, 2018. Accessed 9 August, 2019.

Critical Minerals Affected by Mineral Entry Withdrawals

➤ Aluminum	➤ Manganese*
➤ Antimony*	➤ Niobium
➤ Arsenic*	➤ PGM
➤ Barite*	➤ Potash
➤ Beryllium*	➤ REE
➤ Bismuth	➤ Rhenium
➤ Cesium & Rubidium	➤ Scandium
➤ Chromium	➤ Strontium
➤ Cobalt	➤ Tantalum
➤ Fluorspar*	➤ Tellurium
➤ Gallium	➤ Tin
➤ Germanium	➤ Titanium
➤ Graphite	➤ Tungsten*
➤ Helium	➤ Uranium*
➤ Indium	➤ Vanadium
➤ Lithium*	➤ Zirconium & Hafnium
➤ Magnesium*	

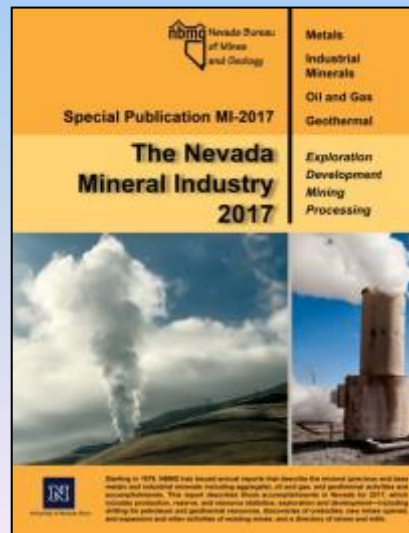
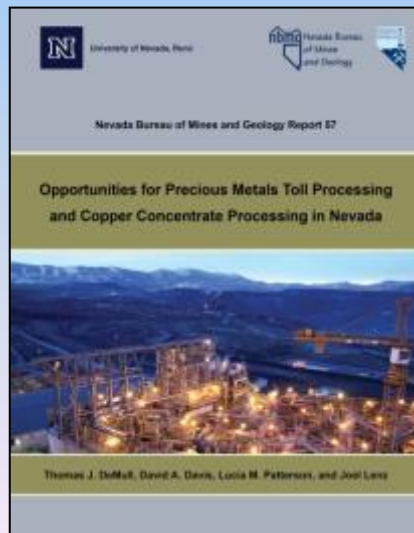
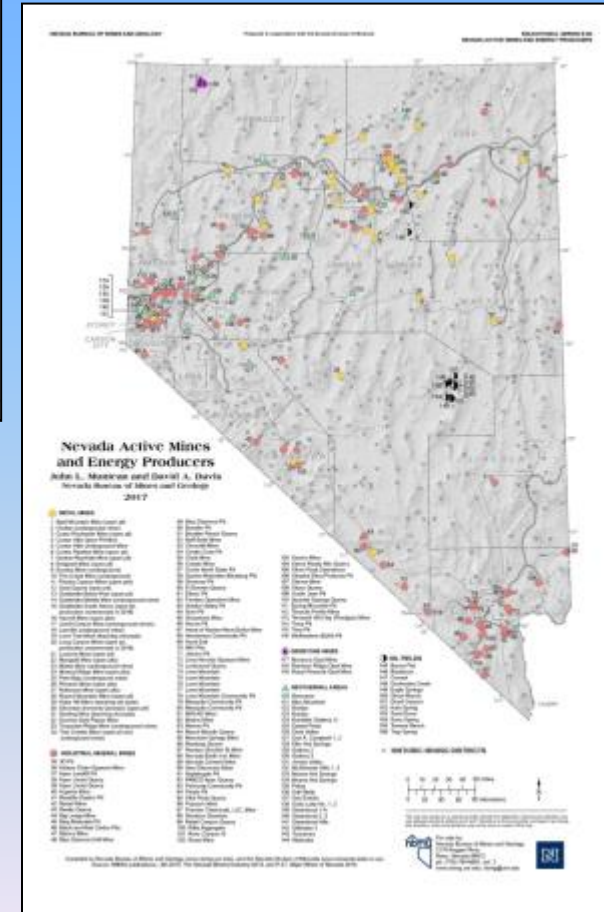
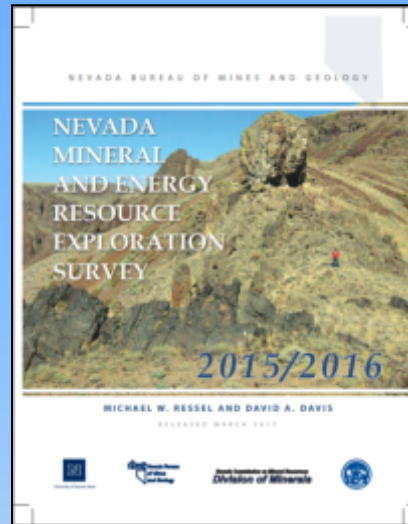
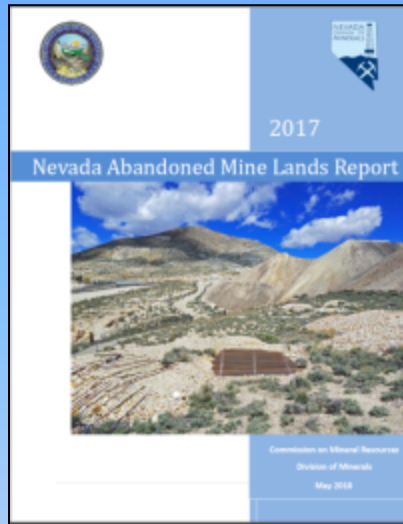
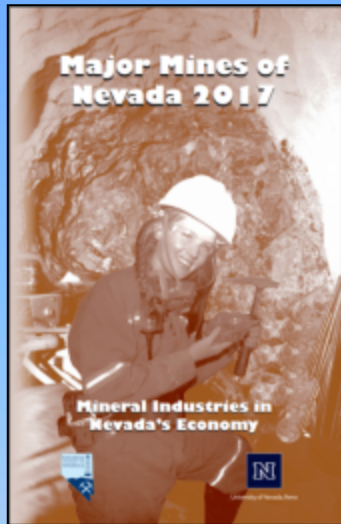
Bold indicates known occurrences

***** indicates past or present production




¹ USGS Mineral Resources Data System, (2016). <https://mrdata.usgs.gov/mrds/>


Publications



Questions?



State of Nevada
Commission on Mineral Resources
Division of Minerals




NV^{gov} Agencies Jobs About Nevada

Google Custom Search

ADA Americans with Disabilities Act

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AML: Division of Minerals complete AML hard closures at the Arden Mine near Las Vegas, Nevada, April 26, 2019.

Current Information

- Dissolved Mineral Resources permitting page
- 2017 Nevada Excellence in Mine Reclamation Award
- 2015/2016 NV Mineral and Energy Resource Exploration Survey (NBMG)
- Recent Presentations
- Information Related to Proposed Land Use Plans and Withdrawals

Public Workshop(s) and Hearings(s)

- Dissolved Mineral Resource Exploration Regulation Adoption Hearing
- Response to Summary Comments on Proposed Regulations, April 25, 2018

Employment Announcement(s)

- None at this time.
- How To Apply for a State Job


Education Workshop(s)

- 34th Annual Northern Nevada Earth Science Education Workshop 2018
 - July 17 and 18, 2018
 - Tentative Location: Wooster High School, Reno, Nevada.
 - Register at:
 - Direct Link: (Website Registration URL Pending)
 - NVMA Link from their Mineral Education Workshops page: <https://www.nevadamining.org/mineral-education-workshops/>


Important Links

- Nevada Division of Minerals Open Data Site-GIS files
- State and Federal Permits Required Before Mining or Milling Can Begin - February 2015
- NIDOM YouTube Channel
- NIDOM Request for Public Records form
- Nevada Bureau of Mines and Geology


Programs




MINING



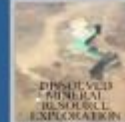
OIL AND GAS




ABANDONED MINE LANDS



BOND POOL



DISSOLVED MINERAL RESOURCE EXPLORATION



EDUCATION & OUTREACH