

THE NEVADA MINERAL INDUSTRY 2022

Metals
Industrial
Minerals
Geothermal
Oil and Gas

Exploration
Development
Mining
Processing



NEVADA SYSTEM OF HIGHER EDUCATION 2023

Board of Regents

Joseph C. Arrascada, Vice Chair
Patrick J. Boylan
Susan Brager
Byron Brooks, Chair
Heather Brown
Amy J. Carvalho
Michelee Cruz-Crawford

Carol Del Carlo
Jeffrey S. Downs
Stephanie Goodman
Donald S. McMichael Sr.
Laura E. Perkins
Lois Tarkanian

Patty Charlton, *Chancellor*

University of Nevada, Reno

Brian Sandoval, *President*

College of Science

Louisa Hope-Weeks, *Dean*

Mackay School of Earth Sciences and Engineering

Annie Huhta, *Director*

Nevada Bureau of Mines and Geology

James E. Faulds, *Director/State Geologist*

Scientific Research Staff

Economic Geology, Geologic Mapping, and Geologic Framework

James E. Faulds, *Professor*
Christopher D. Henry, *Research Geologist*
Simon Jowitt, *Associate Professor-Research Economic Geologist*
John Muntean, *Associate Professor-Research Economic Geologist*
Andrew Zuza, *Associate Professor-Structural Geologist*

Geologic Hazards and Engineering Geology

Seth Dee, *Geologic Mapping Program Manager*
Craig M. dePolo, *Research Geologist*
Rich Koehler, *Assistant Professor*

Nevada Geodetic Laboratory

Geoffrey Blewitt, *Research Professor*
William C. Hammond, *Research Professor*
Corné W. Kreemer, *Research Professor*

Great Basin Center for Geothermal Energy

Maria Richards, *Interim Director*
Cary Lindsey, *Geothermal Research Scientist*
Chao Lu, *Geothermal Data Coordinator*
Emmanuel Olvera, *Postdoctoral Scholar*
Colleen Ulibarri, *Administrative Assistant*

Ralph J. Roberts Center for Research in Economic Geology

Simon Jowitt, *Director, Associate Professor-Research Economic Geologist*

Research and Administrative Support Staff

Cartography and Publication Support

Jennifer Vlcan, *Cartographic/GIS Manager*
Christina Clack, *Graphic Designer*
Andrew Hauck, *GIS Analyst*
Seth Dee, *Geologic Mapping Program Manager*
Irene Edgerton, *Geologic Map Production Lead*
Ryan Smith, *GIS Analyst*

Data Management

Eli Mlawsky, *Geoscience Data Manager*

Publication Sales and Information

Rachel Micander, *Geologic Information Specialist*
Charlotte Stock, *Sales Manager*
Bret Pecoraro, *Development Technician*

Administration

Jessica Corey, *Business and Grants Manager*
Joel Ponte, *Administrative Assistant*

Suggested Citation:

Jowitt, S.M., Micander, R., Richards, M., and Reynolds, D., 2023, The Nevada mineral industry 2022: Nevada Bureau of Mines and Geology Special Publication MI-2022, 82 p.

Cover photograph by Rachel Micander.

Nevada Bureau of Mines and Geology
Special Publication MI-2022

The Nevada Mineral Industry **2022**

CONTENTS

3 Overview

by Simon M. Jowitt

12 Metals

by Simon M. Jowitt and Rachel Micander

49 Industrial Minerals

by Rachel Micander

56 Geothermal Energy

by Maria Richards

71 Oil and Gas

by David Reynolds and Rachel Micander

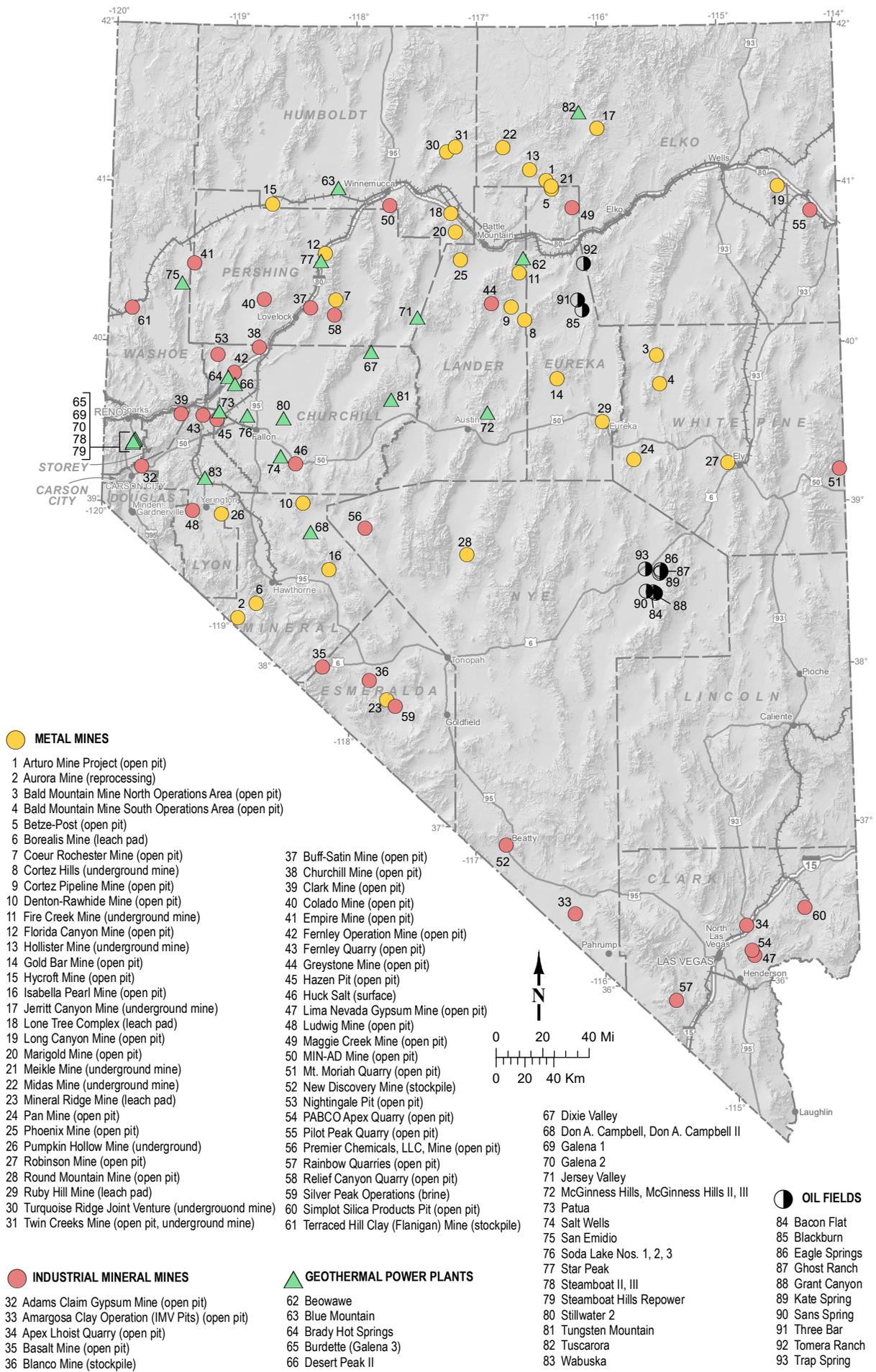


Mackay School of Earth Sciences and Engineering
College of Science
University of Nevada, Reno

2023

Preparation supported by the Nevada Division of Minerals
<https://minerals.nv.gov>

© Copyright 2023 The University of Nevada, Reno.
All Rights Reserved



Major mines, oil fields, and geothermal power plants, 2022.

OVERVIEW

by Simon M. Jowitt

This report highlights activities in 2022 in the exploration and production for metals, industrial minerals, geothermal energy, and petroleum within the state of Nevada. At the time of publication, the 2022 Net Proceeds of Minerals Bulletin had yet to be released by the Nevada Department of Taxation. For this reason, gross proceeds reported in this report should be considered preliminary and are subject to change. Once again Nevada led the nation in the production of gold (\$7.281 billion) and barite (\$35.891 million). It was also the only state that produced lithium compounds from primary extraction (\$104.231 million), magnesite (\$9.405 million), and the specialty clays, sepiolite and saponite (\$15.049 million). Other commodities mined and produced in Nevada in 2022, in order of value, included copper (\$567.076 million), geothermal energy (\$322.617 million), aggregate (sand, gravel, and crushed stone; \$285 million), silver (\$118.854 million), diatomite (\$60.206 million), limestone and dolomite (mainly for cement, \$35.895 million), gypsum (\$48.726 million), silica sand (\$23.320 million), and petroleum (\$19.294 million). The locations of many of the sites mentioned in the text of this report are shown in NBMG Open-File Report 2023-01, Nevada Active Mines and Energy Producers, which is available at <https://pubs.nbmgs.unr.edu/NV-active-mines-and-energy-2023-p/of2023-01.htm>.

Nationwide, Nevada was again second to Arizona in terms of value of overall nonfuel commodities (excluding oil, gas, coal, uranium, and geothermal). The USGS estimated the value of Nevada's nonfuel mineral production in 2022 to be \$8.93 billion. This accounts for 9.09% of the total value of nonfuel mineral production nationwide in 2022, down from 10.3% in 2021 (U.S. Geological Survey, Mineral Commodity Summaries 2023, <https://pubs.usgs.gov/periodicals/mcs2023/mcs2023.pdf>). Arizona was first in nonfuel production, reflecting its dominant position as the main copper producing state within the U.S. Texas was again third, reflecting significant production (and demand) for aggregate and cement; California was fourth as a result of aggregate, diatomite, borate, and rare earth element production; and Minnesota was fifth due mainly to production of iron ore with subsidiary sand and gravel, as well as crushed and dimension stone production. The contributions that mining makes to the economies of Nevada and the U.S. remain significant in terms of jobs, commerce, taxes, improvements to infrastructure, supporting domestic manufacturing and lowering of the U.S. trade deficit.

Gold production in Nevada in 2022 was 4,044,977 ounces (125.8 metric tons; table 1), a -10.2% decrease from 2022. The average gold price remained stable on a year-on-

year basis from \$1798.6/oz in 2021 to \$1800/oz in 2022, (figs. 1, 2, and 3; data from the World Gold Council, <https://www.gold.org/goldhub/data/gold-demand-by-country>). Despite this decrease in production, Nevada still accounted for 73% of U.S. gold production (total of 5,552,434 ounces or 172.7 metric tons) and ~3.5% of global gold production in 2022, which was approximately 116.6 million ounces (3,627.7 metric tons; global gold production data from the World Gold Council, <https://www.gold.org/goldhub/data>). Only the nations of China, Russia, Australia, Canada, and Ghana produced more gold than the state of Nevada.

The section on Metals provides details on exploration, new deposit discoveries, new mine openings, mine closures, additions to reserves, and mine expansions. As has been the case for many years, gold continues to be the leading commodity produced in Nevada. Production of gold in 2022 came mainly from 10 major mining operations that each produced greater than 100,000 ounces (28.3 metric tons). The share of Nevada's gold production from the Carlin trend increased from 16.76% in 2021 to 22.1% in 2022.

The World Gold Council and U.S. Geological Survey estimate that total world gold production, since the beginning of civilization, has been approximately 6.7 billion ounces (208,874 metric tons), two-thirds of which have been mined since 1950. Nevada and the U.S. have produced a significant portion of the world's gold. Cumulative U.S. production, primarily since 1835, is approximately 633.6 million ounces (20,334 metric tons), which is 9.45% of total world production. Nevada's total production of 253 million ounces (7,871 metric tons) accounts for 38.7% of total U.S. production and approximately 3.77% of total world production. Remarkably, 89.2% of Nevada's gold production has been produced since the Carlin Mine began production in 1965. By the end of 2022, cumulative production from the Carlin trend was 98.4 million ounces (3,061 metric tons), assuring its place as one of the most productive gold-mining districts in the world.

Nevada continues to be in the midst of the biggest gold boom in U.S. history, as the graph of historical U.S. gold production illustrates (fig. 2). The recent surge in production in the U.S. is largely the result of discoveries of Carlin-type gold deposits and other deposits that contain gold that is primarily in grains that are too small to be visible to the naked eye. These deposits are particularly common in Nevada. The U.S. production so far in the current boom, namely the period since 1981, has been 314 million ounces (10,766 metric tons). This is significantly greater than the total U.S. production during several past eras, including 1) the California gold rush (1849 to 1859, with 29 million ounces or 902 metric tons), although some estimates of

unreported production may bring that figure up to 70 million ounces (2,177 metric tons); 2) the Comstock (Nevada) era from 1860 to 1875 with 34 million ounces (1,058 metric tons); and 3) the period from 1897 to 1920, when Goldfield (Nevada), the Black Hills (South Dakota), Cripple Creek (Colorado), and byproduct gold production from copper mines in Arizona and Utah contributed to cumulative production of 95 million ounces (2,955 metric tons). Gold production in the U.S. in the last decade from

2010 through 2022 alone was 89.3 million ounces (2607 metric tons). Although US gold production has dipped slightly within the last few years, the persisting current boom is larger than previous booms not only in terms of cumulative production but also in terms of peak annual production and duration. This current boom has also lasted at least 43 years versus no more than 24 years for any of the earlier booms.

Table 1. Quantity and Value of Mineral, Geothermal Power, and Petroleum Production in Nevada.

Commodity	2022		2021 (revised)		% Change 2021 to 2022	
	Quantity	Gross Value	Quantity	Gross Value	Quantity	Gross Value
Gold	4,044,977 troy oz.	\$7,281,322,012	4,502,365 oz	\$8,097,998,713	-10.2%	-10.1%
Copper	141,769,152 lbs	\$567,076,608	163,732,694 lbs	\$687,677,315	-13.4%	-17.5%
Silver	5,473,775 troy oz.	\$118,854,817	6,218,415 oz	\$155,709,112	-12.0%	-23.7%
Molybdenum	275,620 lbs	\$4,950,135	240,000 lbs	\$1,992,000	14.8%	+149%
Aggregate (crushed stone and sand and gravel)	29,600,000 tons	\$285,000,000	32,300,000 tons	\$235,000,000	-8.7%	+21.2%
Geothermal energy (sold)	3,964,419 MWh net	\$322,617,269	3,971,982 MWh net	\$318,747,661	-0.2%	+1.2%
Barite (shipped from mills)	453,746 tons	\$35,890,645	283,779 tons	\$27,288,230	+59.9%	+31.5%
Petroleum (sold)	234,256 barrels	\$19,294,008	288,342 barrels	\$12,759,077	-18.8%	26.8%
Gypsum	2,639,564 tons	\$48,726,481	2,538,598 tons	\$49,643,160	+4.0%	-1.8%
Lithium Compounds (shipped)	8,301,221 lbs	\$104,231,347	12,963,995 lbs	\$41,691,698	-36.0%	+150%
Diatomite	327,293 tons	\$60,206,058	311,700 tons	\$51,282,304	+5.0%	+17.4%
Dolomite	50,510 tons	\$4,606,561	39,175 tons	\$3,917,743	+28.9%	+17.6%
Limestone (quantity and values include dolomite mined by Lhoist).	4,006,902 tons	\$31,288,358	3,241,577 tons	\$32,570,285	+23.6%	-3.9%
Magnesium compounds (Mg oxide, shipped)	122,483 tons	\$9,404,624	129,252 tons	\$8,057,512	-5.24%	+16.7%
Perlite	819 tons	\$81,904	3,728 tons	\$767,906	-78.0%	-89.3%
Specialty clays (shipped)	107,985 tons	\$15,049,337	128,454 tons	\$11,839,493	-10.7%	+27.1%
Salt (shipped)	18,000 tons	\$1,533,473	16,495 tons	\$560,830	+9.1%	+173.4%
Silica sand (mined)	771,800 tons	\$23,320,237	657,796 tons	\$18,173,927	+17.3%	+28.3%
Total value				\$9,755,676,965		

Notes:

*Limestone quantities and values include dolomite from Apex Quarry operated by Lhoist.

**Specialty clays includes bentonite, saponite, sepiolite, smectite, and pozzolan.

\$ values are from preliminary and unpublished data from the Nevada Department of Taxation submitted to the Nevada Division of Minerals in 2022 (subject to change) and 2021 barring the six commodities listed below.

1. Gold = NDOM production multiplied by 2021 avg. price of \$1800/oz.
2. Silver = NDOM production multiplied by 2021 avg. price of \$21.71/oz.
3. Copper = NDOM production multiplied by 2021 avg. price of \$4.00/lb avg
4. Molybdenite = NDOM production times 2021 avg. price \$17.96/lb (USGS)
5. Aggregates = Both tonnages and value are sourced from the quarterly USGS Mineral Industry Survey, <https://www.usgs.gov/centers/national-minerals-information-center/crushed-stone-statistics-and-information>.
6. Geothermal gross revenue as reported from Nevada Department of Taxation.

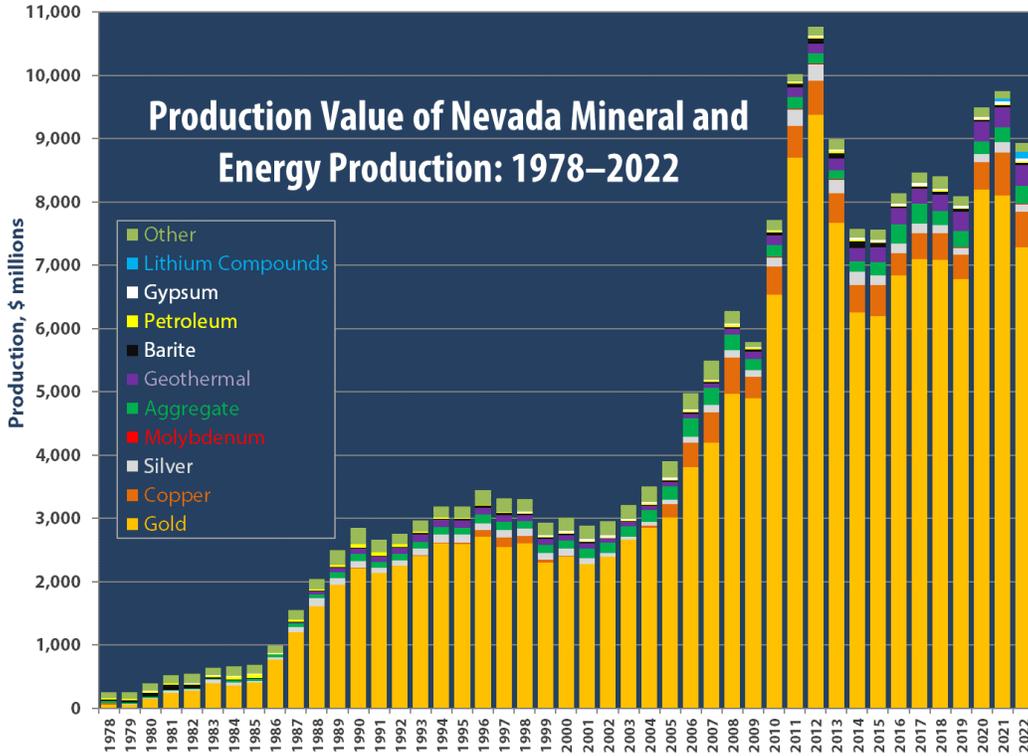


Figure 1. Chart showing relative values of Nevada production of gold, copper, silver, molybdenum, aggregate, geothermal energy, barite, petroleum, gypsum, and other minerals from 1978 to 2022. Molybdenum production is only shown for 2011 to 2022, and lithium compounds production is only shown for 2021 and 2022.

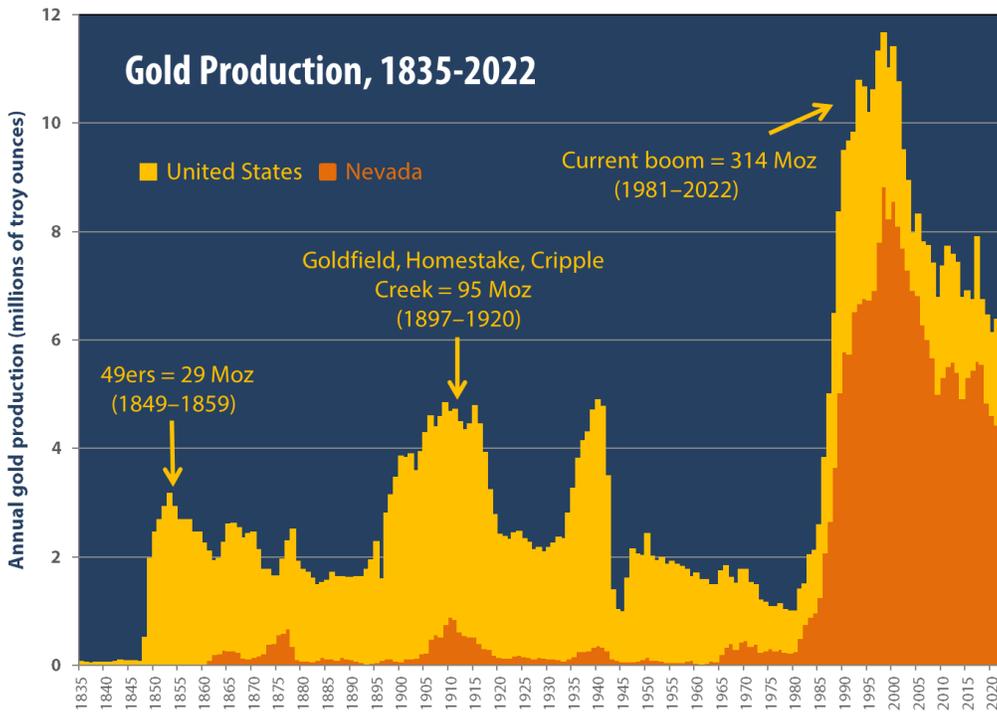


Figure 2. Chart comparing U.S. and Nevada gold production from 1835 to 2022.

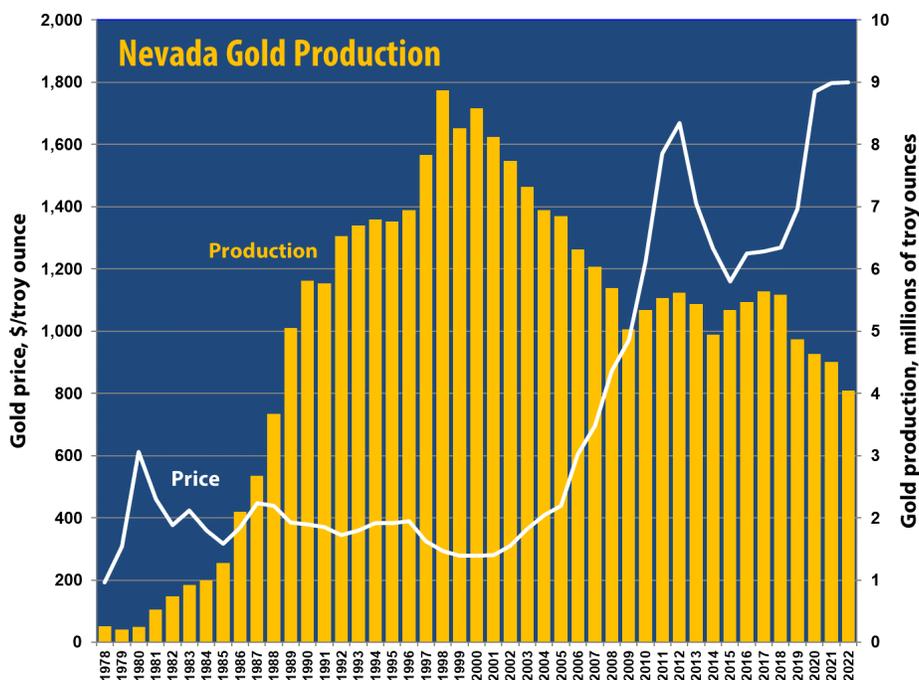


Figure 3. Chart showing Nevada gold production compared to the price of gold from 1978 to 2022.

Barrick Gold Corp. and Newmont Mining Corp. continue to account for the vast majority of Nevada gold production, as has been the case for the last 43 years, with production particularly concentrated around mines in the Carlin trend in northeastern Nevada. The 2019 merger of the majority of the two companies' Nevada operations formed Nevada Gold Mines LLC (NGM), a joint venture where Barrick holds a 61.5% interest and is the operating partner and Newmont holds a 38.5% interest. In all, NGM operates 10 mining operations within northeastern Nevada. The company produced 3,035,337 ounces (94.4 metric tons) of gold in 2022, with 671,103 ounces (20.9 metric tons) of gold produced from underground and open-pit operations at Cortez, including the Cortez Hills open pit and underground mines and the Pipeline open-pit complex. A further 895,299 ounces (27.8 metric tons) was produced from Carlin trend operations that included multiple open pits and underground operations. NGM's Twin Creeks and Turquoise Ridge mines in Humboldt County also produced 458,619 ounces of gold (16.7 metric tons).

Other large gold operations include Kinross Gold Corp.'s Round Mountain and Bald Mountain mines that produced 219,823 ounces (6.8 metric tons) and 213,210 ounces (6.3 metric tons) of gold, respectively, in Nye County and SSR Mining's Marigold Mine in Humboldt County, which produced 194,668 ounces (6.1 metric tons) in 2022.

Nevada silver production in 2022 totaled 5,473,775 ounces (170.1 metric tons), a 12% decrease from 2021 (fig.

4). A total of 44% of silver production in the state was a byproduct of gold and copper-molybdenum mining. With a ratio of value (average price of gold [\$1801 per ounce] to average price of silver [\$21.71 per ounce]) of ~83:1 in 2022, only those deposits with more than 83 times as much silver produced as gold can be truly considered primary silver deposits. Only one such mine operated in Nevada in 2022, Coeur Mining Inc.'s Rochester Mine in Pershing County with a silver:gold ratio of 88:1 and total silver production amounting to 3,061,924 ounces (95.2 metric tons) in 2022, which was 56% of the total silver produced in Nevada during 2022. Other significant silver producers (>100,000 oz) include KGHM International Ltd.'s Robinson in White Pine County (256,312 ounces; 8 metric tons), Kinross Gold Corp.'s Round Mountain (546,047 ounces; 17 metric tons), and NGM's Cortez Hills open pit/Pipeline (100,469 ounces; 3.1 metric tons) and Phoenix (1,032,206 ounces; 32.1 metric tons) mines, which produced silver as a byproduct of copper-gold-molybdenum, gold, gold, and gold-copper, respectively.

Nevada copper production in 2022 was dominated by the Robinson copper-gold-molybdenum mine, operated by KGHM International Ltd. near Ely in White Pine County, which produced 108 million pounds (49,177 metric tons) of copper (fig 5). Copper was also produced at NGM's Phoenix Mine near Battle Mountain in Lander County, where 31,341,857 million pounds (14,216 metric tons) of copper was produced. At Phoenix, copper is produced on site with

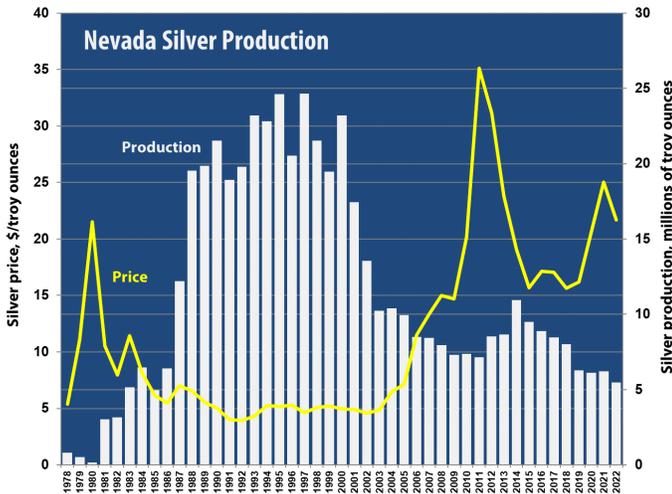


Figure 4. Chart showing Nevada silver production compared to the price of silver from 1978 to 2022.

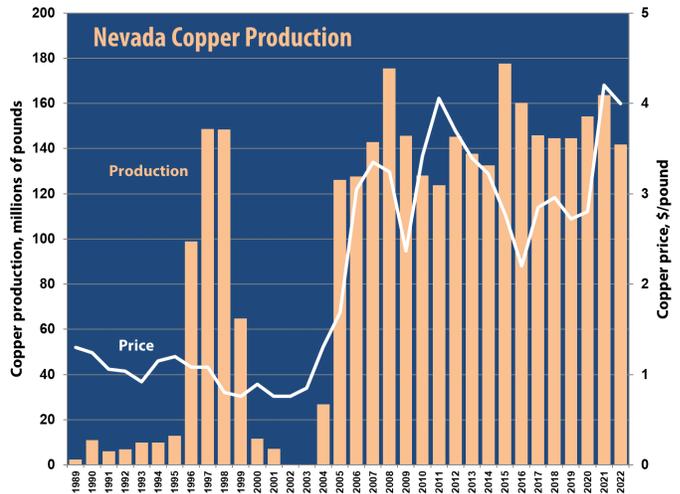


Figure 5. Chart showing Nevada copper production compared to the price of copper from 1989 to 2022.

a solvent extraction-electrowinning (SX-EW) plant, as well as producing concentrates that are shipped to smelters outside Nevada in a similar approach to KGHM’s Robinson Mine. In addition, Nevada Copper’s Pumpkin Hollow Mine outside of Yerington in Lyon County produced 2,011,000 million pounds (912 metric tons) of copper in 2022. KGHM’s Robinson Mine also produced 275,620 pounds (125 metric tons) of byproduct molybdenum from the Robinson Mine, again the only reported molybdenum production in Nevada in 2022.

Mineral exploration activity in 2022 is summarized in the chapters on **Metals** and **Industrial Minerals**. Most exploration focused on gold; however, companies also explored for lithium, copper, silver, and base metals with significant interest in lithium continuing in the state. The exploration outlook for Nevada remains very positive, with the Fraser Institute’s Annual Survey of Mining Companies placing Nevada firmly at the top of their global mining investment attractiveness rankings (up from 3rd place in 2021; available at <https://www.fraserinstitute.org/studies/annual-survey-of-mining-companies-2022>). This in part reflects the strong policy perception index value for the state, a value that reflects the effect of policies on mineral exploration and mining in individual jurisdictions; Nevada topped the global rankings for policy perception in 2022.

In terms of global trends, S&P Global reports that global nonferrous exploration budgets increased ~16% to \$13 billion in 2021 from \$11.24 billion in 2021 (<https://www.spglobal.com/marketintelligence/en/news->

[insights/research/early-2022-optimism-pushes-exploration-budgets-up-16-yoy](#)). Gold accounted for 53.2% or \$6.92 billion of the total nonferrous global mineral exploration budget, an increase of 12% or \$722 million from 2021. This increase reflects the fact that 40% of financing activity within the global nonferrous mineral exploration sector for the second half of 2021 and the entirety of 2022 was focused on gold companies or projects with the bulk of global drilling also focusing on gold projects. Global trends for other metals varied with combined copper, nickel, and lithium exploration spend increases totaling some \$893 million, close to 50% of the total global increase in all nonferrous exploration in 2022. Global copper exploration expenditure jumped 21% to \$2.8 billion, with global lithium exploration spend increasing by 88% from 2021 to \$467 million, the highest level since global exploration expenditure for this commodity began to be tracked in 2010. However, silver exploration expenditure in 2022 globally decreased by \$16 million to \$628 million, reflecting lower exploration spend in Latin America, especially Mexico.

The minimum number of drill projects exploring for metals in 2022 in Nevada increased from 75 projects in 2021 to 115 in 2022 (fig. 6). Advanced exploration projects continued to show promise for major developments, particularly for gold along the Carlin and Battle Mountain-Eureka (Cortez) trends in Eureka, Elko, and Lander counties and within the Walker Lane belt, where the recent significant increase in exploration for epithermal-style mineralization continued throughout the year.

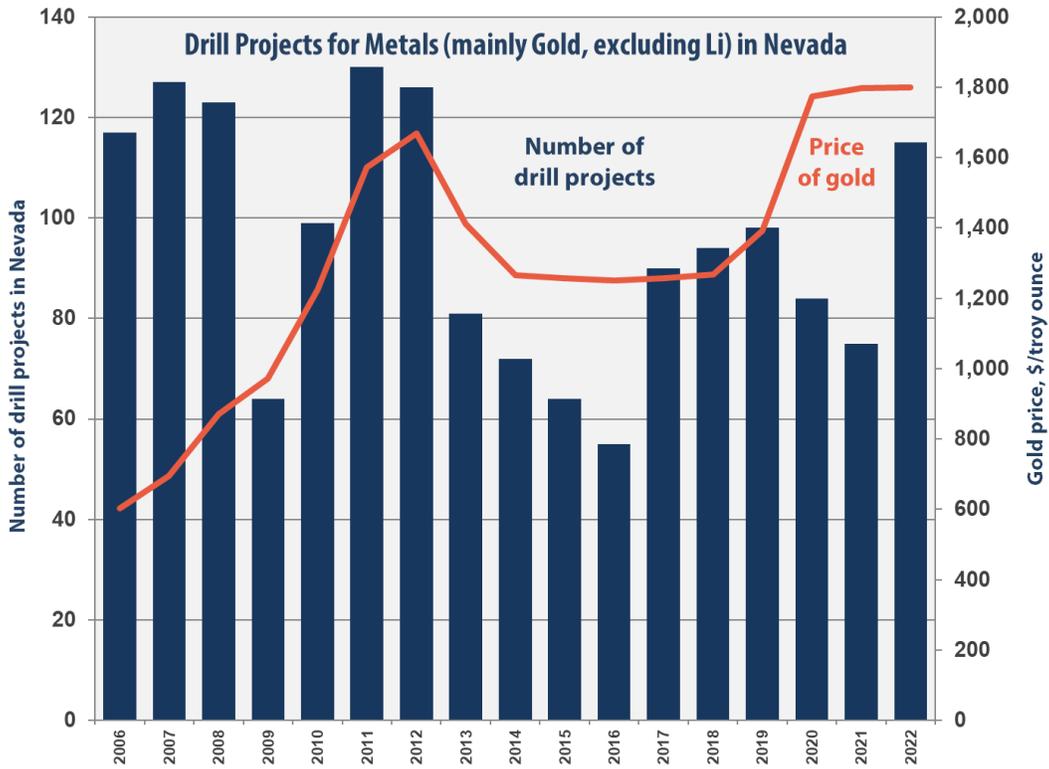


Figure 6. Chart showing number of drill projects targeting metals (excluding lithium and mainly gold), from 2006 to 2022. For comparison, the chart also shows the average annual price of gold during that period. The number of drill projects shown is a minimum, given that mining companies and privately held companies are not required to report whether they drilled.

The section on **Industrial Minerals** covers developments during 2022 and provides details about important commodities produced from or processed in Nevada, including aggregate (fig. 7), barite, cement, clays, diatomite, gemstones (opal, turquoise), gypsum, lime, limestone, dolomite, lithium, magnesia, perlite, pozzolan, salt, silica, and zeolites. Demand for raw materials for construction will likely grow in the future because of Nevada’s increasing population and its need for additional highways and housing. Nevada’s estimated population in 2022 was 3.204 million, a 1.4% increase from 2021 (https://tax.nv.gov/Publications/Population_Statistics_and_Reports/).

Albemarle Corp.’s Silver Peak operation in Clayton Valley in Esmeralda County, where subsurface brines are evaporated on a playa, remains the only primary producer of lithium in the U.S. Most exploration projects for industrial minerals in Nevada were focused on lithium, both in brines and in clay deposits. The majority of this exploration was in southwestern Nevada, mainly in Clayton Valley, Big Smoky Valley, and Sarcobatus Flat. Companies that conducted exploration drilling in 2022 included Belmont Resources, Cruz Battery Metals, Nevada Lithium Corp., Pan American Energy, American Battery Technologies Company, among others. Lithium Americas

Corp. also continued to move forward in the development of its lithium-rich clay resource at Thacker Pass in the sediments of the McDermitt caldera in northern Nevada during the year, near the border with Oregon. In addition, Ioneer Ltd. also continued to move forward with development of its Rhyolite Ridge lithium-rich clay deposit during 2022, which is located 25 km (16 miles) west of Albemarle’s Clayton Valley lithium in brine operation. The Rhyolite Ridge deposit also includes significant borate-bearing beds.

Nevada was also a leader in the production of several other industrial minerals. For example, Nevada was once again the leading domestic producer of barite, of which more than 90% is used as a weighting agent in drilling fluids for oil and gas wells. Production of barite increased by nearly 60% in 2022 (table 1, fig. 8), with barite prices directly tied to the price of oil and gas. A total of 327,293 tons of diatomite were mined by three different companies across five counties in Nevada throughout 2022, second only to California according to the USGS. Nevada was also ranked as the fourth largest gypsum producing state, behind California, Iowa, and Kansas. Premier Magnesia’s Gabbs Mine in Nye County remains the nation’s only hard-rock producer of magnesite, accounting for ~33% of national production.

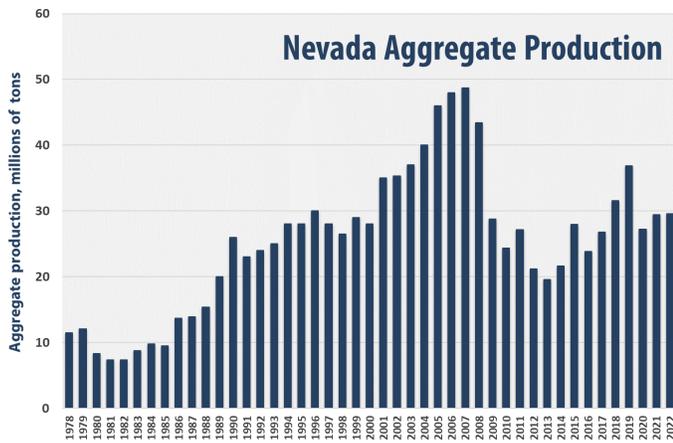


Figure 7. Chart showing Nevada aggregate production from 1978 to 2022.

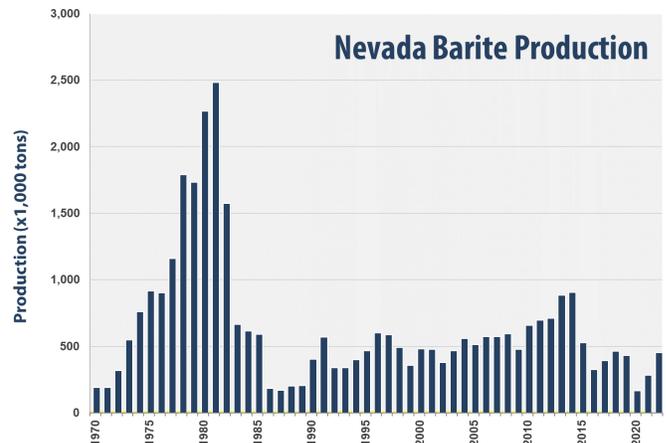


Figure 8. Chart showing Nevada barite production from 1970 to 2022.

The section on **Geothermal Energy** covers updates on exploration, development, and production of geothermal energy in the state in 2022. The total installed nameplate geothermal energy capacity in Nevada grew to ~837.7 MWe (megawatts electric) in 2022, representing a 13.15 MWe increase from ~824.53 MWe in 2021 (fig. 9) as a result of the Star Peak LLC geothermal plant in Pershing County connecting to the grid in August 2022 and Whitegrass Number 1 power plant in Lyon County coming onstream. The total geothermal power generation in Nevada in 2022 was 5,161,481 megawatt-hours (MWh) gross and 3,931,982 MWh net, representing an insignificant change (~-0.2%) from generation in 2021. Data obtained from the Nevada Department of Taxation indicate that the total gross 2022 proceeds from geothermal operators in Nevada were \$322,617,269 (approximately \$3.9 million greater than in 2021). In 2022, the estimated average price for geothermal electricity is 8.14 cents(c)/kilowatt-hour (kWh) (calculated by dividing the total gross proceeds by the annual net electricity production)—slightly above the value in 2021 (8.08 c/kWh). The share of geothermal electricity generation in the state was ~9% in 2022, representing a relative decline compared to ~9.4% in 2021 and likely

associated with the continued rapid annual growth in establishing more solar generation in Nevada.

In August 2022, the U.S. Bureau of Land Management (BLM) again held a geothermal lease sale, with 79 parcels offered equating to 232,484 acres of land. A total of 66 of the parcels received bids, with 192,912 acres sold for a total sum of \$2,977,474 and total receipts of \$3,374,892. In addition to the competitive lease sale, a non-competitive lease sale was held the day after the competitive sale (and is hence known as the ‘day after’ sale), with 13 parcels and a total of 39,571 acres of land nominated for offers. Of these, 8 parcels totaling 25,536 acres of land received offers with one further offer rejected, with total rental of \$30,615 and filing fees of \$4,050 yielding a total deposit for non-competitive leases of \$34,665. Between the competitive and non-competitive lease sales a total of 218,448 acres were taken up for geothermal exploration in the state in 2022, which is just over three times the acreage sold in 2021 (74,260 acres). Despite this increase in exploration drilling activity for geothermal development again remained very low with one geothermal observation well drilled and one injection well shut-in during the year, in addition to six injection wells pending.

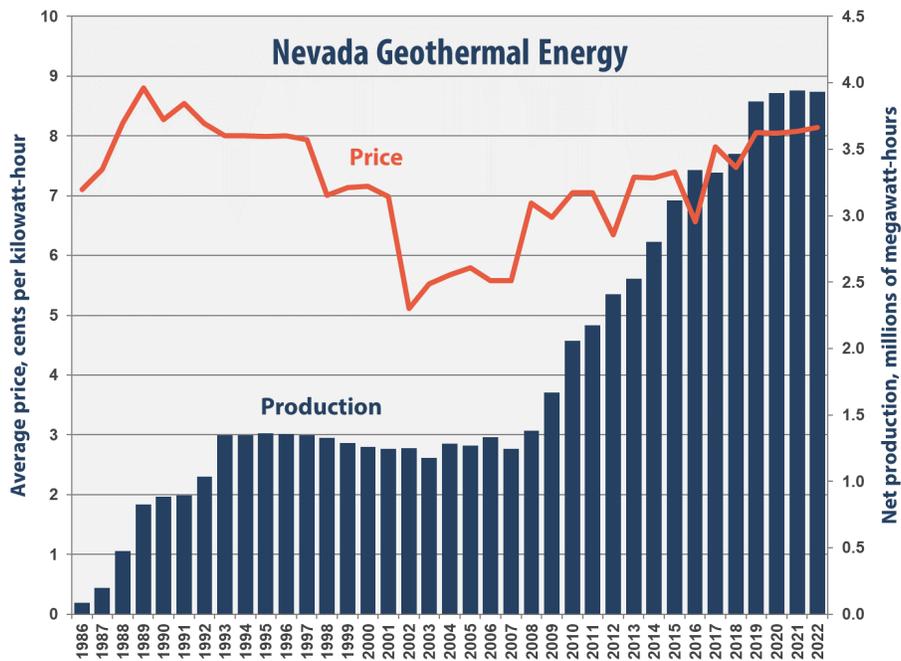


Figure 9. Chart showing net geothermal production in megawatt-hours in comparison to the average price of geothermal power in cents per kilowatt-hour for the period from 1986 to 2022. Note that the average price is based on the total MWh produced and total receipts. Actual price for any individual power plant may vary and is held confidential by the state energy office.

The section on **Oil and Gas**, covers updates on exploration, development, and production of oil and gas in Nevada in 2022. According to the Nevada Division of Minerals, Nevada’s net oil production was 237,632 barrels, which accounted for less than 0.04% of total domestic production. Production increased 6.5% from 223,229 barrels in 2021 (fig. 10). Production came from 57 actively producing wells in seven fields in Railroad Valley, Nye County, which accounted for 91% of the state’s production, and ten wells in three fields in Pine Valley, Eureka County, which accounted for about 9% of the state’s production. Nevada ranked 27th out of the 32 oil-producing states (U.S Energy Information Administration). According to preliminary and unpublished data from the Nevada Division of Taxation, a total of 234,256 barrels of oil were

sold during 2022, totaling \$19,294,008, a 26.8% increase over values reported in 2021.

Local economies continue to benefit from the Nevada minerals and geothermal industry. Construction of new homes, hotels, casinos, other businesses, schools, and roads requires local sources of sand, gravel, crushed stone, gypsum, and raw materials for cement, all of which are abundant in Nevada. According to the Nevada Governor’s Office of Economic Development, the Nevada mining sector employed an average of 15,012 people in 2022, down slightly from 15,024 people in 2021. The average pay for mineral industry employees during this time was \$129,255/year.

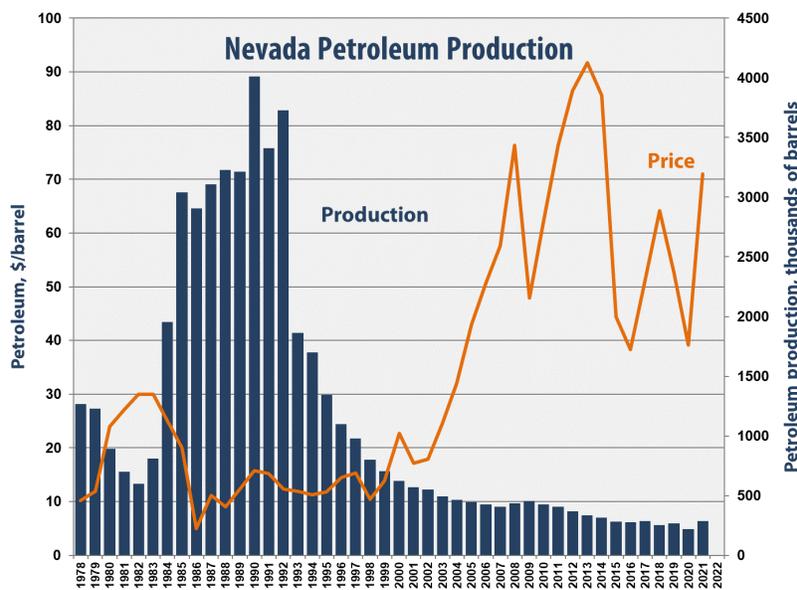


Figure 10. Chart showing Nevada petroleum production from 1978 to 2022.

Additional information about the Nevada mineral industry and the U.S. gold industry, including the contents of selected publications, is readily available on line through the Nevada Bureau of Mines and Geology (www.nbmng.unr.edu/) and the Nevada Division of Minerals (<http://minerals.state.nv.us/>, <https://data-ndom.opendata.arcgis.com/>). Useful national and international data on nonfuel minerals and energy can be obtained from the U.S. Geological Survey (<http://minerals.usgs.gov/minerals/>) and the U.S. Energy

Information Administration (www.eia.doe.gov), which provides data on oil and gas, geothermal, solar, wind, hydroelectric, and other energy sources. The Nevada Bureau of Mines and Geology supports several interactive maps on the Web that are backed by periodically updated databases on mineral and energy resources as well as potential exploration activity, land ownership and restrictions, and other geographic information (<https://data-nbmng.opendata.arcgis.com/>).

CONVERSION FACTORS

- 1 metric ton = 1.1023113 short ton = 1,000 kilograms = 2,204.6226 pounds = 32,150.7 troy ounces.
- 31.1035 metric tons = 1 million troy ounces (31.1035 grams = 1 troy ounce).
- 453.592 grams = 1 pound (avoirdupois) = 16 ounces (avoirdupois) = 14.5833 troy ounces.
- 34.2857 grams per metric ton = 34.2857 parts per million by weight = 1 troy ounce per short ton.

METALS

by Simon M. Jowitt and Rachel Micander

PRODUCTION

In 2022, Nevada produced 4,044,977 troy ounces (125,813 kg) of gold, 5,473,775 troy ounces (170,254 kg) of silver, 141,769,152 pounds (64,305 metric tons) of copper, and 275,620 pounds (125 metric tons) of molybdenum from 30 active mines, with the minor production from residual leaching from inactive mines reported for 2021 ceasing in December 2021. Very small (reported) gold production also continued from a single placer operation. Table 1 shows the production of gold, silver, copper, and molybdenum in 2022 by individual producing companies, and table 2 outlines the production from each of the mines that were active in 2022. These data represent information reported to the Nevada Division of Minerals and/or reported in individual companies' annual reports. Remaining mine reserves at the end of 2022 or at the end of individual company annual reporting periods are shown in table 3 with contained metal in resources shown in table 4. The average price of gold in 2022 was \$1800/oz, essentially the same as 2021 (data from the [World Gold Council, https://www.gold.org/goldhub/data/gold-demand-by-country](https://www.gold.org/goldhub/data/gold-demand-by-country)).

The Nevada Gold Mines joint venture between Barrick and Newmont produced 3,035,337 ounces (94.4 metric tons) of gold, 1,315,547 troy ounces (40.9 metric tons) of silver and 31,341,857 lbs (14,216 metric tons) of copper. Nevada Gold Mines operated 11 (active) gold mines, which accounted for 75% of Nevada's gold production in 2022. The all-in sustaining cost for all of Nevada Gold Mines' production in 2022 was \$1214/oz and the total cash cost for mining was \$435–\$1035/oz.

Operations by Nevada Gold Mines' in the Carlin trend operations (including the Carlin Trend Operations proper of Arturo, Betze Post and Meikle) produced 1,579,256 ounces (49,120 kg) of gold, which accounted for ~34% of Nevada's 2022 gold production. The all-in sustaining cost was \$1212/oz, and the total cash cost was \$877/oz in 2022, compared to approximately 1,511,227 ounces of gold (47,004 kg) at all-in sustaining costs of \$1,087/oz and total cash costs of \$782/oz in 2021. By the end of 2022, cumulative production from the Carlin trend was 98.4 million ounces (3,061 metric tons) since the original Carlin Mine went into production in 1965.

Nevada Gold Mines' production from the Cortez Complex, which includes the Pipeline open pit, the Cortez Hills open pit, the Cortez Hills underground mine and the new Goldrush Mine totaled 730,913 ounces (22,734 kg) of gold, down from 2021 production of 865,688 ounces (26,926 kg) of gold. The all-in sustaining cost for all production from Cortez was \$1258/oz, and the total cash cost was \$815/oz.

Nevada Gold Mines' production from Turquoise Ridge and Twin Creeks Open Pit totaled 458,619 oz (14,265 kg). The all-in sustaining cost was \$1304/oz, and the total cash cost was \$1296/oz. Nevada Gold Mines' gold production from the Phoenix Mine amounted to 176,561 ounces (5,492 kg). The all-in sustaining cost was \$1074/oz (\$1480/oz on a co-product basis), and the total cash cost was \$914/oz (\$1315/oz on a co-product basis).

After Nevada Gold Mines, Nevada's next largest gold producers were Kinross Gold Corp (Round and Bald Mountain operations), SSR Mining (Marigold Mine), and Jerritt Canyon Gold/First Majestic Silver (Jerritt Canyon Mine), which cumulatively produced over 700,112 ounces (19,640 kg) of gold in 2022. All other individual mines produced <50,000 ounces of gold in 2022.

In 2022, Coeur Mining was again the leading silver producer in Nevada at 3,061,924 ounces (95,237 kg), a 3.5% decrease from 2021. All Coeur production came from the low-grade open-pit Rochester Mine, the only primary silver mine in Nevada. Nevada Gold Mines' Phoenix Mine was the second largest producer, mining 1,032,206 ounces (32,105 kg) of silver in 2022. Kinross Gold's Round and Bald Mountain mining operations were the third largest silver producer with combined production of 619,651 ounces (19,273 kg). 2022 silver reserves for deposits with reporting silver in Nevada totaled 221,327,385 ounces (6,884,051 kg), a 9.7% increase over reserves reported in 2021. The average price of silver in 2021 was \$21.71/oz, a 13.3% decrease from the average price of \$25.04 in 2021.

KGHM International's Robinson Mine again produced 76% of Nevada's copper with 2022 production of 108,416,295 pounds (49,177 metric tons) of copper, a decrease of 12.4% from 2021. KGHM International also produced 275,620 pounds (125 metric tons) of molybdenum from Robinson in 2022, a 15% increase from 2021. Nevada Gold Mines' Phoenix Mine and Nevada Copper's underground Pumpkin Hollow Mine made up the balance of Nevada's copper production. The Phoenix Mine produced 31,341,857 pounds of copper (14,216 metric tons), a 15% decrease from 2021. The Pumpkin Hollow Mine produced 2,011,000 pounds of copper (912 metric tons) in 2022.

Table 1. 2022 Metallic Mine Production for Nevada by Operating Company

(Nevada Division of Minerals Annual Status and Companies Annual Reports)

Operator	Gold 2022 ounces (kg)	Silver 2022 ounces (kg)	Copper 2022 pounds (metric tons)	Molybdenite 2022 pounds (metric tons)
Nevada Gold Mines LLC (61.5% Barrick Gold, 38.5% Newmont Mining)	3,035,337 (94,410)	1,315,547 (40,918)	31,341,857 (14,216)	
Kinross Gold	433,033 (13,469)	619,651 (19,273)		
SSR Mining	194,668 (6,055)	2,619 (82)		
Jerritt Canyon Gold/First Majestic Silver	72,441 (2,252)	1,617 (50)		
Florida Canyon Mining/Argonaut Gold	49,440 (1,538)	30,414 (946)		
Calibre Gold	43,186 (1,343)	None Reported		
KGHM International	41,346 (1,286)	256,312 (7,972)	108,416,295 (49,177)	275,620 (125)
Fortitude Gold Corp/Walker Lane Minerals	41,232 (1,283)	57,058 (1,775)		
Coeur Rochester	34,735 (1,080)	3,061,924 (95,237)		
McEwen Mining	26,663 (829)	648 (20)		
I80 Gold	27,236 (847)	9,000 (280)		
Hycroft Mining	15,837 (493)	38,774 (1,205)		
Rawhide Mining	13,441 (418)	56,847 (1,768)		
Borealis Mining	11,957 (372)	19,815 (616)		
Gold Acquisition Corp./Americas Gold and Silver	2,246 (70)	5,193 (162)		
Hecla (Klondex)	2,025 (69)	None Reported		
Geo-Nevada	4 (0.012)	4 (0.12)		
Nevada Copper	None Reported	None Reported	2,011,000 (912)	
Totals	4,044,977 (125,813)	5,473,776 (170,254)	141,769,152 (64,305)	275,620 (125)
Value (\$)	\$7,281 million	\$119 million	\$567 million	\$4.95 million

EXPLORATION

Exploration activity in Nevada for metals (excluding lithium; see the **Industrial Minerals** chapter of this report for more information) in 2022 increased the pace set in 2021, with exploration projects with major activity in 2022 shown in the map in figure 1. The vast majority of exploration projects targeted gold with the sustained level of the gold price around \$1800/troy oz. the most likely cause along with the favorable view of exploration within the state taken by industry. The latter is evidenced by the results of the 2022 Fraser Institute's Annual Survey of Mining Companies, which lists Nevada firmly at the top of global mining investment attractiveness rankings as a result of favorable exploration potential and policy attractiveness; Nevada moved up to 1st from 3rd place in 2021 (<https://www.fraserinstitute.org/studies/annual-survey-of-mining-companies-2022>). Of the 115 projects that reported drilling and associated results in 2022 (i.e., a minimum estimate of drill projects for the year given that major and private companies may not be required to report drilling activity and results), some 89% targeted gold, with a significant increase in drill-focused exploration from 75 projects in 2021 (fig. 2). Of the remaining projects (excluding lithium, which is covered elsewhere in this volume), one focused on vanadium, two focused on polymetallic deposits containing Zn, Pb ±Au, ±Ag, ±Cu, six targeted silver (where silver is more important in value than gold), and six focused on copper. The latter include drilling at Majuba Hill by Majuba Hill Copper, at KGHM's Robinson Mine, at Hudbay's Mason project, at Lion Copper and Gold Corp.'s Mason Valley/MacArthur project, at Nevada Copper's Pumpkin Hollow project, and at Getchell Gold Corp.'s Star Project. Not included in these copper statistics is exploration drilling by Nevada Gold Mines, who continued to target expansion of copper and gold resources and reserves at the Phoenix Mine operations.

The resurgence in silver exploration continued in 2022 with a minimum of nine drilling projects focused primarily on silver. These include exploration and/or expansion drilling by Coeur Mining at the Rochester Mine and the Lincoln and Nevada Packard projects, Electric Metals at the Belmont project, Silver One Resources at the Candelaria

project, Summa Silver at the Hughes project, Hycroft Mining at the Hycroft Mine, Blackrock Silver Corporation at the Tonopah West project, and Tertiary Minerals at the Pyramid project. Exploration drilling for other metals included projects focusing on polymetallic Au-Zn-Pb resources, including at Atoka Gold's Red Rock project and Ridgeline Minerals Selena project. Phenom Resource Corp (formerly First Vanadium) also undertook exploration drilling at their Carlin gold-vanadium project and Global Energy Metals reported the conclusion of their 2021–2022 drilling program at the Lovelock/Treasure Box cobalt-nickel project in early 2022. A number of new resource estimates were also released for a variety of projects during the year, with current known and reported ore reserves and mineral resources summarized in tables 3 and 4.

Overall, exploration activity, including new claims staked, were reported in most of Nevada's 17 counties. As of September 8, 2022, there were 273,477 active, filed, and submitted mining claims within the state. Table 5 shows the breakdown of the 2022 drill projects by size of company and drill program with variations over time shown in figure 2. As mentioned above, at least 115 projects were drilled in 2022, compared to at least 75 projects in 2021. Major to mid-tier companies drilled at least 43 projects in 2022, including exploration or resource/reserve expansion drilling by AngloGold Ashanti, Centerra Gold, Coeur Mining, First Majestic Silver, Hecla Mining, Hudbay, i-80 Gold, KGHM, Kinross, Nevada Gold Mines, Newcrest, and SSR Mining. The remaining 72 individual projects were drilled by at least 52 junior companies. It should be noted that these are minimum numbers as larger major to mid-tier companies are not required to release many of their exploration results because exploration commonly does not have a material impact on their businesses. This means that the 43 projects known to have been drilled by major and mid-tier companies represent a minimum value and there could have been significantly more than these 43 projects drilled by larger companies during 2022.

Exploration projects are summarized below by county and mining district, with an emphasis on projects that were drilled or had updated reserve and/or resource estimates released in 2022.

Nevada Drill Projects 2005–2022

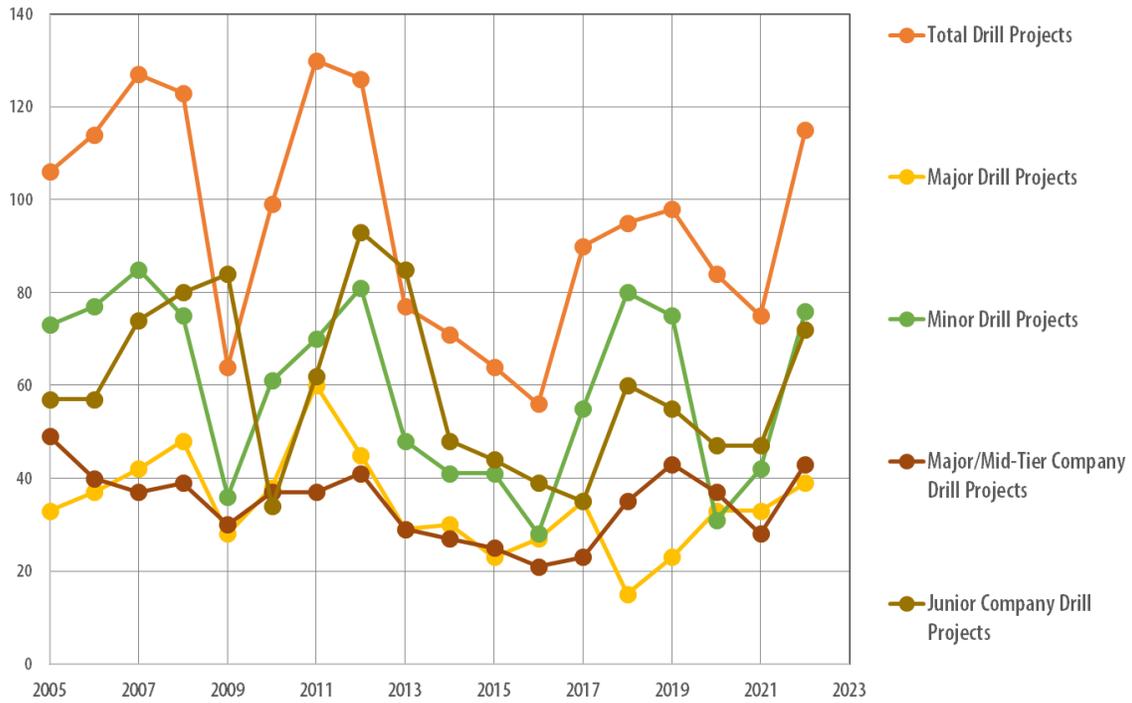


Figure 1. Number of drill projects in Nevada from 2005 to 2022.

The classification of companies into major, mid-tier, or junior in this section of the report is arbitrarily based on gold production and market capitalization. The loose criteria are as follows: 1) major companies produce greater than 1 million ounces of gold worldwide, and have market capitalization of over capitalizations less than \$3 billion but more than \$500, 2) mid-tier companies produce between 50,000 and 1 million ounces of gold worldwide and/or have market capitalizations less than \$500 million, 3) junior companies produce less than 50,000 ounces of gold and/or have market capitalizations less than \$500 million.

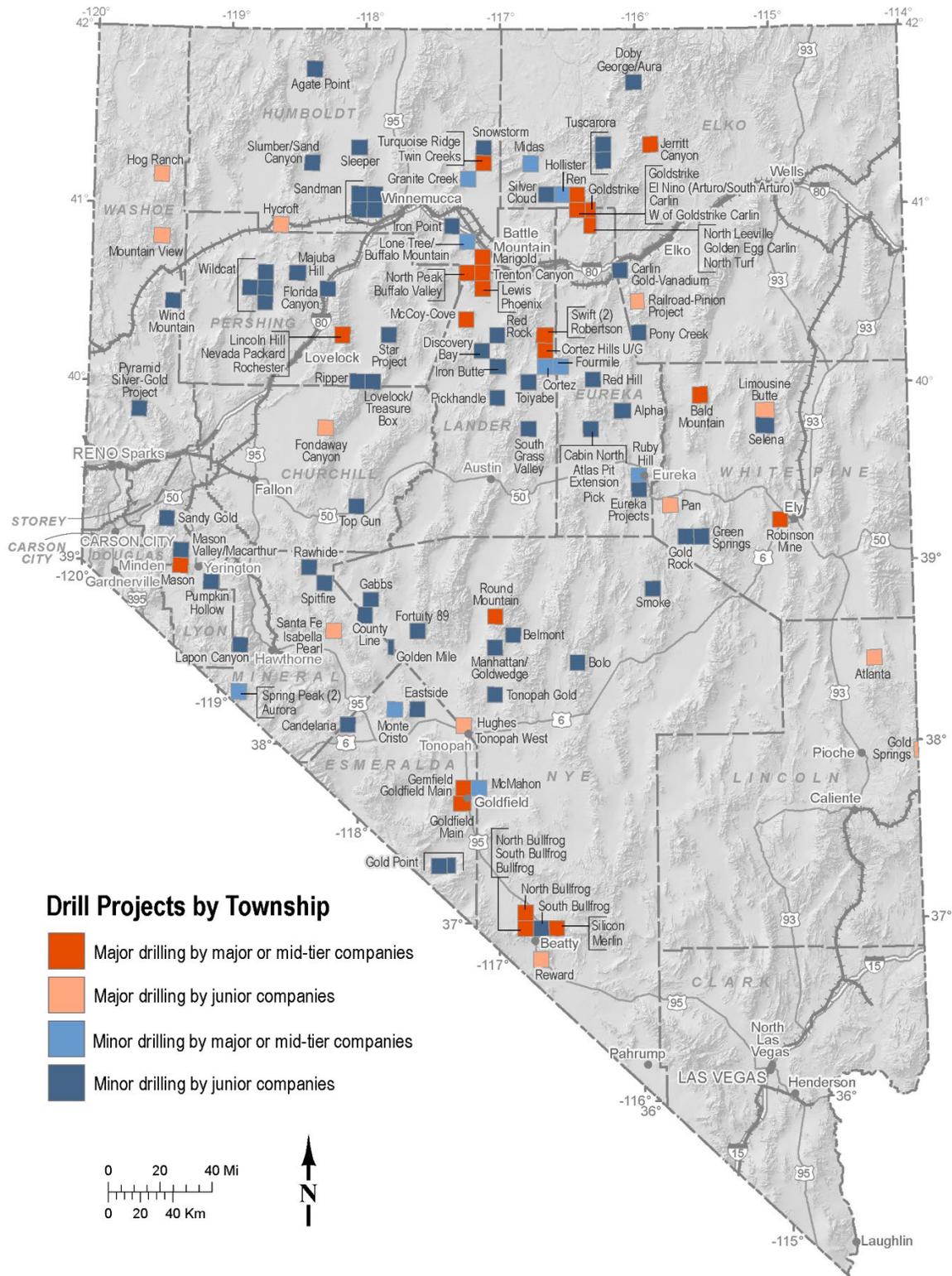


Figure 2. Number of drill projects in Nevada from 2005 to 2022.

Table 2. 2022 Metallic Mine Production by Operating Company for Nevada

(Data from Nevada Division of Minerals Annual Status Reports and Company Annual Reports; YOY = year-on-year)

Operator	Mine	Gold (2021) (ounces)	Gold (2022) (ounces)	Silver (2021) (ounces)	Silver (2022) (ounces)	Copper (2021) (pounds)	Copper (2022) (pounds)	Molybdenite (2021) pounds	Molybdenite (2022) pounds
Borealis Mining	Borealis	3,936	11,957	6,473	19,815				
Calibre	Pan	45,783	43,186	NR	NR				
Coeur Rochester	Rochester	27,985	34,735	3,158,017	3,061,924				
Argonaut Gold/Florida Canyon Mining	Florida Canyon	51,175	49,440	27,681	30,414				
Geo-Nevada	Spring Valley	3	4	4	4				
Americas Gold and Silver/Gold Acquisition	Relief Canyon Mine	5,388	2,246	12,773	5,193				
Fortitude Gold Corp/Walker Lane Minerals	Isabella Pearl	46,459	41,232	44,551	57,058				
Goldcorp DEE/I80 Gold	Lone Tree Complex	8,789	9,200	NR	1,700				
Hecla	Aurora	0	0	0	0				
Hecla	Fire Creek	0	2,205	26,214	NR				
Hecla	Hollister	0	0	0	0				
Hecla	Midas	0	0	0	0				
Hycroft Mining	Hycroft	56,045	15,837	397,546	38,744				
I80 Gold	Granite Creek		3,736		0				
Jerritt Canyon Gold/First Majestic Silver	Jerritt Canyon	98,303	72,411	1,809	1,617				
KGHM International	Robinson	41,050	41,346	NR	256,312	123,700,000	108,416,295	240,000	275,620
Kinross Gold	Bald Mountain	202,905	213,210	141,661	73,554				
Kinross Gold	Round Mountain	247,662	219,823	666,411	546,097				
Manhattan Gulch LLC	Manhattan Gulch	0		0					
McEwen Mining	Gold Bar	43,881	26,663	NR	648				
Mineral Ridge Gold	Mineral Ridge	1,827		1,154					
Nevada Copper	Pumpkin Hollow	NR		NR		3,296,515	2,011,000		
Nevada Gold Mines	Arturo	53,303	35,982	NR	NR				
Nevada Gold Mines	Betze Post	377,082	401,388	28,268	16,259				
Nevada Gold Mines	Carlin Trend Operations	755,016	895,299	7,767	59,301				
Nevada Gold Mines	Cortez Hills OP/Pipeline	451,736	330,684	112,785	100,469				
Nevada Gold Mines	Cortez Hills UG	378,777	340,419	8,841	7,876				
Nevada Gold Mines	Gold Rush	35,175	59,810						
Nevada Gold Mines	Long Canyon	260,924	89,988	531	2,054				
Nevada Gold Mines	Meikle	325,826	246,587	24,425	9,989				

Nevada Gold Mines	Phoenix	173,067	176,561	1,322,700	1,032,206	36,736,179	31,341,857		
Nevada Gold Mines	Turquoise Ridge	543,123	458,619	94,908	87,393				
Nevada Gold Mines	Twin Creeks								
Rawhide Mining	Denton-Rawhide	23,209	13,441	126,510	56,847				
Ruby Hill Mining (180 Gold)	Ruby Hill	8,653	14,300	3,500	7,300				
SSR Mining	Marigold Mine	235,282	194,668	4,285	2,619				
Sunrise Minerals	Sunrise Placer	0		0					
Toquima Gold	East Manhattan	0		0					
Totals		4,502,364	4,044,977	6,218,814	5,475,393	163,732,694	141,769,152	240,000	275,620
			-10.2%		-12.0%		-13.4%		14.8%
			YOY Change		YOY Change		YOY Change		YOY Change

Table 3. Nevada Mine Reserves (Proven and Probable) Reported for End of Year 2022

Company	Mine	Tons (Mt)	Grade (g/t Au)	Contained gold (troy oz)	Tons (Mt)	Grade (g/t Ag)	Contained silver (troy oz)	Tons (Mt)	Grade	Contained copper (lbs)
Argonaut Gold#	Florida Canyon	86.6	0.33	930,000						
Calibre Mining Corp.	Pan	19.79	0.37	234,000						
Calibre Mining Corp.	Pan Leach Pad Inventory			30,000						
Couer	Rochester	420.7	0.003	1,173,000	420.7	0.39	179,975,000			
Fortitude Gold Corp/Walker Lane Minerals^	Isabella Pearl	0.91	2.02	59,400	913,700	22	640,600			
Fortitude Gold Corp/Walker Lane Minerals^	Isabella Pearl Leach Pad Inventory			51,900						
KGHM\$	Robinson	119.4	0.15	579,229				119.4	0.41	1,078,698,000
Kinross	Bald Mountain	36.9	0.5	625,000						
Kinross	Round Mountain	97.56	0.7	2,246,000	13.58	6.8	298,000			
McEwen#	Gold Bar South	1.9	1.05	66,000						
McEwen#	Pick	12.6	0.8	324,000						
McEwen#	Ridge	11	0.87	30,000						
Nevada Copper	Pumpkin Hollow Open Pit	350	0.06	419,000	350	1.7	14,544	350	0.47	3,590,000
Nevada Gold Mines	Carlin Operations (Gold Strike/Arturo; total calculated from Barrick 61.50% share reporting)	146.3	3.5	16,260,163						
Nevada Gold Mines	Cortez (total calculated from Barrick 61.50% share)	212	2.26	15,609,756						
Nevada Gold Mines	Phoenix (total calculated from Barrick 61.50% share)	163	0.59	3,252,033	163	6.34	34,146,341	163	0.16%	1,374,843,016

Coeur	Wilco	531,000	3,346,000		
Contact Gold Corp.	Pony Creek	433,000			
CopAur Minerals	Kinsley Mountain	535,000			
Electric Metals@	Corcoran		39,732,000		
First Majestic Silver Corp.^	Jerritt Canyon	3,161,000			
Fortitude Gold Corp/Walker Lane Minerals	County Line	49,600			
Fortitude Gold Corp/Walker Lane Minerals	Golden Mile	163,000			
Fortitude Gold Corp/Walker Lane Minerals#	Isabella Pearl	101,400	1,156,400		
Getchell Gold Corp.	Fondaway Canyon	2,059,900			
Gold Bull Resources Corp.	Sandman	493,800			
Gold Springs Resource Corp.	Gold Springs	957,000	13,881,000		
Golden Independence Mining Corp.	Independence	1,181,300	15,234,000		
Gunpoint Exploration	Talapoosa	1,246,334	15,822,124		
Hecla	Fire Creek	2,629,000	5,748,000		
Hecla	Hollister	324,000	2,133,000		
Hecla	Midas	648,000	8,167,000		
Hudbay	Mason	2,320,380	45,501,953	15,440,968,977	
Hycroft Mining	Hycroft	13,937,000	456,781,000		
I-80	Granite Creek	2,110,000			
I-80	Lone Tree	3,374,000			
I-80	McCoy-Cove	1,704,000	2,508,000		
I-80	Ruby Hill	7,513,000	176,807,000		
Integra Resources	Mountain View	638,100	3,600,000		
Integra Resources	Wildcat	956,000	8,400,000		
KGHM International#	Robinson	263,000		3,666,007,433	
Kinross	Bald Mountain	4,250,000			
Kinross	Round Mountain	4,919,000	1,373,000		
Lahontan Gold Corp.	Santa Fe	1,547,000	10,779,000		
Lion Copper and Gold Corp.	MacArthur Project			1,472,122,000	
McEwen#	Cabin	10,000			
McEwen#	Gold Bar South	85,000			
McEwen#	New Pass (total calculated from McEwen's 50% share)	314,000	2,652,400		
McEwen#	Pick	395,000			
McEwen#	Ridge	53,000			

MINERAL INDUSTRY REPORT 2022

McEwen#	Tonkin	1,758,000			
McEwen#/NevGold Corp.	Limo	292,000			
Nevada Copper	Pumpkin Hollow Open Pit	916,000	30,866,000	5,197,000,000	
Nevada Copper	Pumpkin Hollow Underground	378,000	8,132,000	2,139,000,000	
Nevada Vanadium	Gibellini				183,640,000
Nevada Vanadium	Louie Hill				41,490,000
NevGold Corp.	Nutmeg Mountain	1,281,000			
NV Gold Mines#	Carlin Operations (Gold Strike/Arturo; total calculated from Barrick 61.50% share reporting)	21,788,618			
NV Gold Mines#	Cortez (total calculated from Barrick 61.50% share)	28,292,683			
NV Gold Mines#	Fourmile underground (100% Barrick)	3,190,000			
NV Gold Mines#	Long Canyon (total calculated from Barrick 61.50% share)	1,626,016			
NV Gold Mines#	Phoenix (total calculated from Barrick 61.50% share)	6,861,789	90,081,301	1,939,837,398	
NV Gold Mines#	Turquoise Ridge (total calculated from Barrick 61.50% share)	20,796,748			
Orla Mining#	South Railroad	2,503,000	7,105,000		
P2 Gold Inc.	Gabbs	1,571,000	3,849,000	304,000,000	
Paramount Gold Corp.	Sleeper	3,111,000	30,725,000		
Phenom Resources	Carlin Gold-Vanadium				378,000,000
Rex Minerals Ltd.	Hog Ranch	2,260,000			
Scorpio Gold Corp. #	Mineral Ridge	238,530			
Scorpio Gold Corp. #	Mineral Ridge Heap Leach Pad	122,900	122,400		
Silver One Resources Inc.	Candelaria (does not include historic resource)	88,700	45,414,000		
SSR	Marigold	1,860,000			
Timberline Resources Corp.	Lookout Mountain	649,000			
Tonogold	Lucerne	519,000	5,852,000		
Viva Gold Corp.	Tonopah Gold	600,000			
Warriedar Resources	Big Springs	1,014,000			
Western Exploration Inc.	Aura	1,185,000	9,284,000		
White Pine Precious Metals Inc.	Taylor		11,658,000		
2022 Totals		184,476,174	1,209,747,918	27,208,928,375	603,130,000

All numbers from 2022 or 2023 annual reports or other regulatory financial filings; data may be incomplete and some of the resources reported above may be historical rather than fully compliant with current reporting codes. Totals may not appear to sum correctly as a result of rounding and/or conversion from short to metric tons and other values. Resource-reserve reporting often differs between those inclusive of reserves to those exclusive of reserves; resources inclusive of reserves are denoted using a # symbol. Turquoise Ridge now includes Twin Creeks. Carlin now includes Goldstrike and South Arturo. * = 2021 data. ^ = reserves retracted in March 2023, resources remain current. \$ = KGHM does not provide updated reserve and resource data; as such these values are current as of the KGHM Mineral Resources and Reserves Report, December 31, 2014. @ = Contained metal reported as Ag equivalent at an approximate Ag:Cu ratio of 1020:2.6. Nevada Gold Mines data are calculated to 100% totals using the 61.50% data provided by Barrick in annual reporting.

Table 5. Breakdown of 2022 Drill Programs for Metals in Nevada

	Total Drill Programs	Major Drill Programs	Minor Drill Programs	Major/Mid-tier Companies Drill Programs	Junior Companies Drill Programs
2005	106	33	73	49	57
2006	114	37	77	40	57
2007	127	42	85	37	74
2008	123	48	75	39	80
2009	64	28	36	30	84
2010	99	38	61	37	34
2011	130	60	70	37	62
2012	126	45	81	41	93
2013	77	29	48	29	85
2014	71	30	41	27	48
2015	64	23	41	25	44
2016	56	27	28	21	39
2017	90	35	55	23	35
2018	95	15	80	35	60
2019	98	23	75	43	55
2020	84	33	31	37	47
2021	75	33	42	28	47
2022	115	39	76	43	72

These drill programs are exclusively for precious and base metals and exclude those undertaken for industrial minerals (including lithium), geothermal and oil and gas exploration, among others. The classification of companies into major, mid-tier, or junior in this section of the report is arbitrarily based on gold production and market capitalization. The loose criteria are as follows: 1) major companies produce greater than 1 million ounces of gold worldwide (or equivalent in silver, copper, or other metals), and have market capitalization of over capitalizations less than \$3 billion but more than \$500 million, 2) mid-tier companies produce between 50,000 and 1 million ounces of gold worldwide (or equivalent in silver, copper, or other metals) and/or have market capitalizations less than \$500 million, 3) junior companies produce less than 50,000 ounces of gold (or equivalent in silver, copper, or other metals) and/or have market capitalizations less than \$500 million.

EXPLORATION SUMMARIES BY COUNTY

(Sourced from public financial filings, press releases, and company websites)

CHURCHILL COUNTY

Shady Run District

Fondaway Canyon. Getchell Gold Corp. undertook significant drilling at Fondaway Canyon in 2022 and reported results from 2021 and 2022 drilling during the year. This included 75.6-89.7 m at 2.1 g/t Au (FCG21-16, drilled in 2021), 82.0-107.8 m at @ 8.8 g/t Au (hole FCG21-11, drilled in 2021), and 3.6-224.4 m at 6.3 g/t Au (FCG21-12, drilled in 2021). Drilling in 2022 included 12 complete drillholes for a total depth of >4,500 m. Significant 2022 drillhole intercepts include 3.4 g/t Au over 31.4 m and 1.3 g/t Au over 17.4 m in drillhole FCG22-25, 3.4 g/t Au over 44.6 m and 1.8 g/t Au over 12.8 m in drillhole FCG22-23, 2.5 g/t Au over 43.4 m, 2.1 g/t Au over 46.9 m, and 1.9 g/t Au over 72.6 m in drillhole FCG22-18, and 3.8 g/t Au over 85.9 m including 17.7 g/t Au over 9.9 m in drillhole FCG22-17. Getchell Gold Corp. also released a resource estimate for Fondaway Canyon including 11 Mt at 1.56 g/t Au in indicated and 38.3 Mt at 1.23 g/t Au in inferred resources, an increase over earlier reported historical resources. The mineralization at Fondaway is hosted by a series of 12 steeply dipping en-echelon quartz-sulfide shear zones that crop out at surface and extend along strike more than 1.2 km, with drilling indicating these zones extend to a depth of at least 400 m. The mineralization is hosted by Mesozoic sediments and minor volcanic units and is thought to be orogenic and mesothermal to epithermal in style. For more information see: <https://getchellgold.com/projects/fondaway-canyon/>.

Table Mountain District

Lovelock/Treasure Box Cobalt Project. Drilling results for 2021 drilling targeting potential iron oxide-copper-gold style mineralization at Lovelock, part of Nevada Sunrise's Lovelock/Treasure Box cobalt-nickel project areas, were released during 2022. These included intercepts of 9.61 m at 166.6 ppm Co, 84.3 ppm Cu, 2114.5 ppm Ni, and 30.3 ppm Sb in drillhole Lco214, and 15.79 m at 875.5 ppm Co, 0.64% Cu, 0.23% Ni, and 0.17% Sb in drillhole Lco215. Field sampling during 2022 at Lovelock also produced some significant results, with grab samples containing up to 108 g/t Ag, 26.3% Cu, 0.55% Co, and 0.3% Ni although these samples targeted areas of known mineralization. For more information see: <https://globalenergymetals.com/>.

Ripper project. Fortitude Gold Corp's Ripper project was acquired by the company in June 2021 and hosts known gold mineralization within a Triassic package of limestones, limestone collapse breccias, and mudstones of the Auld Lang Syne group. The results of surface sampling were released during 2022 with samples grading up to 8.44 g/t Au. Geological mapping was also completed during the year, including detailed lithological, structural and alteration characterization of the Hughes Canyon target area. Select one foot long samples were also taken during the year along a silicified contact, with assays of 2.45 g/t gold returned for one 21 m interval. For more information see: <https://www.fortitudegold.com/>.

Westgate District

Top Gun project. Gold50 drilled their Top Gun prospect within the Westgate mining district of Churchill County in 2022. Drilling at Top Gun focused on exploration for a gold-silver epithermal system and tested a 1,150 m long, ~50 m wide zone of pervasive silicification, argillic alteration and localized zones of vuggy silica. Significant intercepts at Top Gun include 3.05 m at 1.3 g/t Au and 26.5 g/t Ag from a depth of 39.6 m in drillhole TG005 and 10.6 m at 0.4 g/t Au in drillhole TG009. All drillholes intercepted anomalous gold within areas of Ag-Au-Sb enrichment and silica-pyrite alteration with most mineralization identified to date intercepted in an oxide zone. For more information see: <https://www.gold50.com/>.

ELKO COUNTY

Aura District

Aura Project. Drilling at the Western Exploration Inc. Aura project, which includes the Gravel Creek, Wood Gulch, and Doby George targets, in 2022 included nine holes drilled focusing on the Doby George target. This exploration yielded intercepts of 14.78-89.0 m at @ 1.71 g/t Au in drillhole DGC-791, 5.94-46.33 m at 2.48 g/t Au in drillhole DGC-792, 24.99-51.97 m at 2.12 g/t Au in DGC-793, 26.06 m at 6.93 g/t Au and 12.34 m at 4.57 g/t Au in drillhole DGC794, 30.94 m at 2.07 g/t Au in drillhole DGC795, and 16.76 m of 2.12 g/t Au in drillhole DGC796. This drilling focused on exploration for low sulfidation epithermal-style mineralization and Western Exploration Inc. aims to undertake metallurgical testing and potentially a prefeasibility study in 2023. For more information see: <https://westernexploration.com/>.

Carlin Trend (Bootstrap District)

Arturo/South Arturo. Nevada Gold Mines completed a five drillhole program at the El Niño underground mine at Arturo, yielding geological observations that support and expand the newly identified mineral trend north of existing mining. Only one result has

been returned to date, with drillhole SEC-22008 intercepting 20.4 m at 6.51 g/t Au hosted by units of the sheared and stacked lower Devonian Rodeo Creek package and with mineralization remaining open towards the north. A follow-up drill program is planned for 2023. For more information see: <https://www.barrick.com/>.

Ren. Nevada Gold Mines' 2022 drilling program at Ren added to existing reserves and increased understanding of the low-angle controls on mineralization within the sheared package of the Devonian Rodeo Creek Formation, with intercepts including 9.8 m at 5.01 g/t Au in drillhole MRC-22009. The upgraded model for Ren will inform the Nevada Gold Mines 2023 surface step-out exploration program aimed at extending known mineralization in the Corona Corridor further to the north and northeast.

Carlin District

Carlin Gold-Vanadium Project. Phenom Resources Corp. announced recent drill results targeting vanadium mineralization at their Carlin Gold-Vanadium Property, including 16.76-68.58 m at 0.76% V₂O₅ in drillhole RC20-05, 28.96-47.24 m at 0.40% V₂O₅ in drillhole RC21-10, 6.1-16.76 m at 0.57% V₂O₅ in drillhole RC21-11 and 48.77-60.96 m at 0.37% V₂O₅ in drillhole RC21-12. The property is located on the western flank of the Piñon Range and hosts predominantly Paleozoic siliceous sedimentary rocks, shale, siltstone, chert, limestone and conglomerate units that have been transported to lie above the Roberts Mountains thrust. Vanadium mineralization is stratigraphically controlled and follows the strike and dip of the host lithology near the contact between an overlying grey-brown siltstone unit and an underlying brown to black shale unit of the Devonian Woodruff Formation. The mineralization defines stratigraphic subunits or beds within the formation and drilling to date has defined multiple zones of vanadium mineralization (>0.2% V₂O₅) that include a persistent, thick, and highest-grade unit within the brown-black shale unit that averages ~35 m in thickness, strikes N-S over a distance of 1800 m, and is around 600 m in an E-W orientation. A resource estimate was completed for the vanadium mineralization on the property in 2019, including 378,000,000 lbs of V₂O₅ within indicated and inferred resources at a cut-off grade of 0.3% V₂O₅. For more information see: <https://phenomresources.com/>.

Gold Circle District

Midas. Exploration drilling continued at Hecla Mining's Midas project focusing on exploration around the largest known Au-Ag epithermal deposit within the Northern Nevada Rift. The area is a historic mining district with recorded gold and silver production beginning in the early 1900s and continuing intermittently until the late 2010s. Detailed mapping and sampling by Hecla Mining identified the Green Racer Sinter Discovery Outcrop, the

first modern exploration on the East Graben Corridor, with 2022 drilling focusing on two miles of strike length along this corridor. Drilling during 2022 at Midas focused on drill testing the Racer structure within the East Graben Corridor along 1.7 miles of strike length and several other targets in the district including Little Opal, Southern Cross, Silica Ridge, SVI, and Vapor Trail. For more information see: <https://www.hecla.com/>.

Independence Mountains

Big Springs. Warriadar Resources' (formerly Anova Metals) Big Springs project did not undertake any drilling during 2022, with exploration focusing on an induced polarization (IP) geophysical data acquisition, soil and rock chip sampling, and extensive field mapping targeting Carlin-type mineralization. An updated mineral resource estimate for the project was also reported, with a significant (>10,000 m) drilling program to be undertaken during 2023. The updated mineral resource represents an increase of 21% in contained gold, with measured, indicated and inferred resources at Big Springs now containing just over 1 million ounces of gold. For more information see: <https://www.warriadarresources.com.au/>.

Jerritt Canyon. First Majestic Silver Corp., who acquired the Jerritt Canyon Mine property from Jerritt Canyon Gold LLC in 2021, produced 72,441 ounces of gold and 1,617 ounces of silver from mining during 2022, with mining being suspended in March 2023. Exploration in 2022 centered on short-term focused underground core drilling testing the extension of known ore controls near active mining, mid-term focused drilling planned to validate/test the presence of mineralized volumes near historic workings, and long-term focused drilling aiming to make new gold discoveries in the district. A total of 135,000 m of drilling was planned for 2022, focusing on the Smith/SSX mines and the Winters Creek, Waterpipe, Wheeler, and Murray areas.

Major intercepts proximal to the Smith/SSX mines include an intercept of 8.39 g/t Au over 29.7 m in drillhole SMI-LX-1112, 90 m to the SW of the new connection drift developed between the SSX and Smith mines and only 55 m southwest of active underground workings. Early-stage geologic modeling suggested that the gold mineralization discovered is flat-lying, similar to other mineralization within the mine. Subsequent drilling appeared to extend gold mineralization to the northwest of the recently discovered Zone 10 area between the operating SSX and Smith mines. Other significant near-mine drillhole intercepts include 19.35 g/t in 23.1 m in drillhole SMI-LX-1102, 19.97 g/t Au in 20.9 m including 5.12 g/t Au in 7.6 m and 4.25 g/t Au in 13.3 m in drillhole SMI-D10-EXP22-1076 and 7.14g/t Au in 8.2 m and 3.75g/t Au in 7.6 m in drillhole SMI-D10-EXP22-1078. Drillhole SSX-D01-EXP22-0615 also contained intercepts of 6.95 g/t Au in 17.7m, 5.74 g/t

Au in 15.2 m, 4.58 g/t Au in 10.1 m and 4.64 g/t Au in 7.7 m.

Winters Creek exploration drilling results included 11.81 g/t Au over 13.7 m within drillhole WC-588, some 400 m east of the historic Winters Creek open pit. Drilling at the historic Murray Mine included an intercept of 4.74 g/t Au over 12.2 m within drillhole GR-425, confirming gold mineralization some 100 m of the historic workings. The Waterpipe II to Wheeler areas within the southern part of the property identified a new zone of gold mineralization with multiple but generally low grade (typically <2 g/t Au over 15-35 m) intercepts. For more information see: <https://www.firstmajestic.com/>.

Ivanhoe District

Hollister. Exploration drilling by Hecla Mining within the Hollister Mine area, a large and very well preserved low sulfidation epithermal gold-silver deposit in early 2022, focused on the advancement of the development drift within the Hatter Graben exploration area. Mining to date has focused on two open pits but previous drilling led to the discovery of blind, high-grade veins that have produced gold and silver from ore averaging ~34 g/t Au (1.00 oz/ton) and 200 g/t Ag (5.83 oz/ton). The advancement of drift development allowed the completion of drillhole HUC-112 that targeted and confirmed multiple zones of banded quartz veins and veinlets south of the existing resource, focusing on the area around the second drill station of the Hatter Graben decline. However, the drift development within the Hatter Graben exploration area encountered high water flows that at least temporarily stopped further development, also suspending exploration drilling. The exploration that was undertaken during the focused on multiple zones of narrow banded quartz veins and veinlets south of the existing resource, yielding multiple narrow vein zone intercepts that include 0.10 oz/ton gold and 17.6 oz/ton silver over 0.6 feet estimated true thickness and 0.10 oz/ton gold and 3.1 oz/ton silver over 1.5 feet estimated true thickness. For more information see: <https://www.hecla.com/>.

Silver Cloud. Blackrock Silver Corp's Silver Cloud project is located 20 km south of the Midas Mine and 3 km west of the Hollister Mine, along the Northern Nevada Rift in north-central Nevada and focuses on a similar style of low sulfidation gold-silver mineralization. Drilling in 2022 consisted of cored holes focused on two target areas, including a bonanza discovery in drillhole SBC22-23 grading 70 g/t gold and 600 g/t silver over a 1.5 m intercept, with follow up drilling to take place in 2023. Other significant intercepts include 218.85-221.9 m at 0.44 g/t Au in drillhole SBC22-19, 307.54-309.07 m at 52.62 g/t Au in drillhole SBC22-20, and 178.61-187.91 m at 0.40 g/t Au in drillhole SBC22-21. For more information see: <https://blackrocksilver.com/>.

Larrabee District

Pony Creek. Contact Gold Corp.'s Pony Creek project is located to the south of Gold Standard's Railroad-Pinion Project and is focused on a Carlin-type gold system hosting an initial 2022 inferred resource containing 433,000 ounces of Au within 25.72 Mt of resources at an average grade of 0.52 g/t Au. The resource estimate was initially reported during the year and contains mineralization mainly hosted within altered and silicified calcareous clastic rocks of the Moleen Formation and within a rhyolite unit in the Bowl Zone.

Robinson Mountain District

Railroad-Pinion Project. Orla Mining completed the acquisition of Gold Standard Ventures Corp. during 2022, including the latter's Railroad-Pinion project focused on the exploration and development of mining operations targeting Carlin-type mineralization. Orla subsequently reported results for 2021 drilling at the Pinion SB target that included 187.5-202.7 m at 0.68 g/t Au in drillhole PR21-01, 50.3-61.0 m at 0.35 g/t Au PR21-02, 24.4-29.0 mm at 1.25 g/t Au in drillhole PR21-03, and 201.2-227.1 mm at 0.46 g/t Au in drillhole PR21-04. Drilling in 2022 followed Gold Standard Venture Corp.'s planned program of resource expansion and exploration drilling at key targets within the project including an additional 5,000 m RC and core drill program that expanded drilling to a total of 11,370 m. This drilling focused on the upgrading and increasing of existing reported resources at the Pinion SB, LT, POD, Sweet Hollow, Jasperoid Wash, and Dixie targets. For more information see: <https://orlaminig.com>.

Tuscarora District

Tuscarora. American Pacific Mining Corp.'s Tuscarora project is focused on exploration for high-level, low-sulfidation, epithermal gold prospect in the historic Tuscarora mining district of Elko County. Exploration in 2022 included 33 shallow RC drillholes at Tuscarora for a total of 5,515 m of drilling. Some drilling during the year identified potentially Carlin-style mineralization within the property, potentially leading to the development of new exploration targets. Drilling in 2022 included significant intercepts of 82.3-181.36 m at 0.16 g/t Au in drillhole TS22-06, 77.72-80.77 m at 1.39 g/t Au in drillhole TS22-07 57.91-60.96 mm at 1.18 g/t Au in drillhole TS22-23, and 120.39-132.58 m at 2.10 g/t Au in drillhole TS22-32.

ESMERALDA COUNTY

Gilbert District

Eastside. Exploration by Allegiant Gold Ltd. at the Eastside project is targeting low sulfidation epithermal

mineralization hosted by 7.2 Ma rhyolite domes, plugs and related pyroclastic deposits. The deposit has inferred resources containing some 1,404,000 ounces of contained gold and 8,700,000 ounces of contained silver. Drilling during 2022 included significant intercepts of 277.06-287.73 m at 0.65 g/t Au in drillhole ES-280, 407.82-420.01 m at 0.95 g/t Au in drillhole ES-281 423.67-472.44 m at @ 1.0 g/t Au in drillhole ES-282, and 410.26-515.57 m at 0.45 g/t Au in drillhole ES-285. For more information see: <https://allegiantgold.com/>.

Monte Cristo. Exploration at Hecla's Monte Cristo project, including drilling, continued during 2022, focusing on high-grade epithermal gold mineralization. The Monte Cristo trend is six miles long and includes several targets with previously reported drill intercepts of >0.1 oz/ton gold and >5 oz/ton silver. For more information see: <https://www.hecla.com/>.

Gold Point District

Gold Point. GGL Resources Corp.'s Gold Point project is focused on epithermal gold exploration within an area containing four former mine sites in the Gold Point mining district. Exploration in 2022 commenced with helicopter-borne magnetic and radiometric data acquisition and was followed by the commencement of a drilling program from October 2022. This core drilling program targeted a fence of five diamond drill holes, totaling approximately 1500 m of drilling. These holes focused on a 525 m section line that extends through the past-producing Great Western, Grand Central and Hornsilver veins and other nearby targets that GGL Resource Corp. has identified using prospecting and soil geochemistry. For more information see <https://gglresourcescorp.com/>.

Goldfield District

Goldfield. Centerra Gold Inc. acquired the Goldfield properties of Waterton Nevada Splitter Inc. for \$175,000,000 cash during 2022. The project consists of three known deposits, namely Gemfield, Goldfield Main, and McMahan Ridge, forming a conventional open-pit, heap leach project in late-stage development. All of the mineralization within the project is epithermal in style and cluster along the edge of a postulated caldera associated with Oligocene rhyolitic tuff units. Initial development of the Gemfield deposit is expected to be followed by Goldfield Main and McMahan Ridge. Centerra is currently targeting an initial resource estimate for the Goldfield Project by mid-year 2023 followed by an updated resource estimate and a Feasibility Study. Drilling took place on all three targets during 2022 of the property in 2022. For more information see: <https://www.centerragold.com/>.

EUREKA COUNTY

Alpha District

Alpha Project. Sitka Gold's Alpha project is focused on Carlin-type mineralization within an extension of the Cortez trend. Previous drilling intercepted wide zones of highly anomalous gold mineralization within the lower part of a Devonian shale sequence (Horse Canyon equivalent) just above the Devils Gate Limestone, with the shallow nature of this mineralization contrasting with some other deeper-seated high-grade Carlin-type targets elsewhere in Nevada. A total of four drillholes were completed targeting NNW-SSE structures during the summer of 2022 for a total of 1,374.65 mm drilled. Reporting in November 2022 indicated significant intercepts within drillholes AG22-09 and AG22-10, which contained values up to 21.3 m at 1.21 g/t Au including 1.5 m at 4.62 g/t Au and 10.7 m at 0.51 g/t Au. Results were still pending for drillholes AG22-11 and AG22-12 at November 21, 2022 although the 2022 drilling has significantly expanded the known footprint of the Carlin-type mineralized system within the project with step-outs to the SSE from known mineralization of 940 m and 5,600 m. For more information see: <https://www.sitkagoldcorp.com>.

Antelope District

Gold Bar. McEwen Mining's Gold Bar Mine and associated projects continued to produce in addition to developments that enabled a shift to mining of the Gold Bar South deposit in 2023. Exploration within the project included 5,200 m of core and RC drilling focused on near-mine extensional targets such as at Cabin North, Pick, and potential extensions at the Atlas Pit, with total expenditure of \$4.8 million. For more information see: <https://www.mcewenmining.com/>.

Carlin Trend (Lynn District)

North Leeville. Nevada Gold Mines drilling at North Leeville focused on expanding the mineralized footprint of the system to the south and east along identified structures, infilling towards planned development to be undertaken in 2023. Drilling along strike of previously reported drillhole NLX-22013b (intercept of 27.4 m true width at 19.57 g/t Au) intersected sulfide-bearing and altered target lithologies within the Merlin corridor. Geological observations indicate the continued expansion of the maiden inferred resource and with expansion expected to continue through 2023. For more information see <https://www.barrick.com/>.

North Turf. Nevada Gold Mines continued reserve definition drilling at North Turf, targeting the footwall to the prospective Veld fault and yielding significant intercepts, including 24.4 m at 6.79 g/t Au from drillhole NTC-22033 in the western exploration decline. Drilling in

the eastern decline intercepted a narrow, high-grade zone of 5 m of mineralization at a grade of 12.10 g/t Au in drillhole NTC-22027, proximal to the NW-SE trending

Merlin fault that is interpreted to control high-grade mineralization over 700 m away in drillhole NLX-22013b at North Leeville (as described above). Drilling continues to expand the reserve and resource footprint beyond Turf and into North Leeville. Drilling at the Golden Egg target within the Little Boulder Basin intercepted thick brecciated intervals with overprinting hydrothermal sulfide veins in drillhole LBB-22006. Although assays for this drillhole returned only low grade and intermittent results, the presence of sulfides and gold mineralization within a zone of strong brecciation is interpreted by Nevada Gold Mines to be a near miss and defines the eastern limit of the target. Drilling is planned to continue into 2023 initially stepping out along the northeast trending corridor that remains open more than a kilometer along strike. For more information see <https://www.barrick.com/>.

West of Goldstrike. Nevada Gold Mines undertook exploration drilling to the west of Goldstrike that significantly expanded the exploration potential of the East Bounding fault system. Two framework holes were drilled in the fourth quarter of 2022 to test the fault corridor over some two km of strike to the south of the successful drilling at El Niño described elsewhere in this report. Both drill holes encountered significant alteration, structural complexity and breccia development with widespread low-grade mineralization and thin intercepts of higher grades up to 6.85 g/t Au in drillhole WSF-22003. The underexplored East Bounding fault corridor extends for more than seven kilometers of strike length and further wide spaced drilling is planned for 2023 to test and target high-grade opportunities down-dip from outcropping orebodies, including Tara, Bootstrap, and Arturo. For more information see <https://www.barrick.com/>.

Cortez District

Cortez. Exploration drilling by Nevada Gold Mines focused drilling on early-stage targets in the Cortez, Carlin, and Turquoise Ridge camps confirmed the presence of anomalous mineralization with alteration and structural complexity under cover, potentially allowing vectoring toward new orebodies. For more information see <https://www.barrick.com/>.

Cortez Hills. Nevada Gold Mines exploration at the Cortez Hills underground operation allowed the development of an increased understanding of the Hanson Footwall target. Results from the third quarter of 2022 allowed remodeling and subsequent further exploration drilling that yielded promising grades from a series of stacked and repeating layers of the Silurian Roberts Mountains Formation. Results to date include 24.7 m at 6.67

g/t Au from drillhole CMX-22016 and 20.1 m at 9.64 g/t Au from drillhole CMX-22019. Drilling in 2023 will infill the framework program as well as extend the footprint below the existing Cortez Hills underground infrastructure. For more information see <https://www.barrick.com/>.

Fourmile. Exploration during 2022 at Barrick's 100% owned Fourmile project focused on the Dorothy target, some 800 m north of the existing Fourmile resource, successfully intercepted the most continuous zones of mineralization identified to date within the target. In this area, gold mineralization is primarily hosted within a breccia, as identified in historic drilling, but contains a much higher concentration of mineralized clasts with more consistent sulfidation than previously identified. These intercepts greatly increase the potential at Dorothy as the mineralization identified during this recent drilling is at a lower horizon than those previously tested in the target area and remains open in all directions. Significant intercepts include 39.6 m at 12.71 g/t Au and 5.4 m at 17.04 g/t Au in drillhole FM22-180D with similar brecciation within drillhole FM22-179D including an intercept of 31.7 m at 33.67 g/t Au. Follow-up drilling is planned to extend a historic hole that was not drilled deep enough to test the new horizon. Both holes also intercepted shallower gold mineralization along the Sadler Fault, a key structural control within the Fourmile resource to the south. These shallowed intercepts included 18.0 m at 29.67 g/t Au within drillhole FM22-179D and 4.0 m at 13.62 g/t Au in drillhole FM22-180D. These intercepts represent a potentially thicker and more continuous zone of mineralization along this key structure in the Dorothy area. For more information see <https://www.barrick.com/>.

Toiyabe. Westward Gold completed ~3,850 m of RC drilling across 13 vertical holes and 3 main target zones in 2022, all of which were outside of the footprint of the historical resource estimate for the Toiyabe property (~173 koz at 1.2 g Au/t, non-code compliant). Drillhole T2210 intercepted a consistently mineralized zone spanning 50.3 m at 0.34 g/t Au, including 3.1 m at 1.57 g/t Au. This drilling confirmed the presence of a significant gold-bearing structural horizon at the Toiyabe site. A total of seven drillholes now delineate gold mineralization that measures ~150 m by 410 m in lateral extent and up to 50 m in thickness, commonly referred to as the SSD Zone. This mineralization is hosted within the favorable Wenban Formation, a well-known gold host within the nearby Pipeline and Cortez Hills deposits. The mineralization at Toiyabe is associated with a concealed thrust fault, a duplex zone, and a corridor of igneous dikes and sills. Of the 13 drillholes completed to date, eight have encountered significant gold mineralization defined as intervals of 1.5 m or more with a grade of 0.14 g/t Au, with four of these eight drillholes having longer intervals of mineralization >12.2 m. Drilling at the California target included drillhole T2202,

which intersected a zone of 13.7 m at 0.59 g/t Au including 4.6 m at 1.15 g/t Au, with shallow, near-surface gold mineralization remaining open in multiple directions. For more information see <https://westwardgold.com/>.

Eureka District

Eureka project. Timberline Resources Corp.'s Eureka project is located at the southern end of the Battle Mountain–Eureka trend and was acquired as part of the 2010 acquisition of Staccato Gold. The project is focused on exploration for Carlin-type mineralization and includes NI43-101 compliant measured, indicated and inferred resources containing 649,000 ounces of contained gold. Exploration drilling by Timberline Resources Corp. in 2022 focused on the Water Well Zone as well as exploration holes to the north and south of the Lookout trend and at Oswego. The drilling program included 20 drillholes with a total of 6,367 m, some ~65% of which was core drilling rather than RC. The most significant results in 2022 came from the Water Well Zone, including intercepts of 6.1 m at 1.83 g/t gold from a depth of 332.8 m depth including 1.5 m at 3.59 g/t gold from a depth of 335.9 m in drillhole BHSE-221C, 39.0m at 1.71 g/t gold from a depth of 259.7 m including 28.3 m at 1.97 g/t gold from a depth of 259.7 m depth and 5.9 m at 3.71 g/t gold from a depth of 259.7 m in drillhole BHSE-223C, 30.5 m at 2.56 g/t gold at a depth of 317.6 m depth including 18.4 m at 3.80 g/t gold from a depth of 317.6 m and 3.35 m at 13.36 g/t gold from a depth of 331.3 m in drillhole BHSE-224C, 22.8 m at 4.29 g/t gold from a depth of 339.9 m including 7.6 m at 11.56 g/t gold from a depth of 342.9 m in drillhole BHSE-226C, and 3.1 m at 10.88 g/t gold from a depth of 288.6 m in drillhole BHSE-230C.

Two holes in the southern part of the Water Well Zone also encountered significant mineralization, expanding the high grade (>3 g/t) gold mineralization within this zone another 75 m to the south for a total of 475 m, with the system remaining open to the south and southeast. Drilling at the northward end of the Water Well Zone tested the northward extension of mineralization beyond 2021 drilling as well as exploration targets farther north in a younger Silurian-Ordovician terrane. Three drillholes in this area intercepted significant gold mineralization with two holes also intercepting silver-lead-zinc mineralization. Significant silver intercepts within the Water Well Zone include 35.1 m at 10.1 g/t silver at a depth of 329.8 m depth in drillhole BHSE-221C, 79.2 m at 8.2 g/t silver at a depth of 297.8 m in drillhole BHSE-237C, and 30.5 m at 12.2 g/t silver at a depth of 393.8 m in drillhole BHSE-237C. This was the first testing of the major fault zone within the northern part of the Lookout Mountain and Water Well deposits and confirmed the presence of overlapping gold and silver systems in this area. Timberline's Rocky Canyon Target, to the north of the Lookout Mountain resource area, also includes a mix of significant gold and silver intercepts. These overlapping and potentially overprinting occurrences are not isolated within

the Eureka district as i-80's Ruby Hill exploration also included significant silver and Carlin-type gold mineralization as discussed below. The blind intercepts within the Relay Zone appear to suggest the presence of a possible CRD system within the Eureka project area.

The drilling undertaken during 2022 also provided an improved understanding of the structural geology of the Water Well Zone, including the identification of previously unidentified faults that appear in some places to control the location of higher-grade mineralization whereas other faults crosscut and offset mineralization, thus postdating the mineralizing event(s) in this area. For more information see: <https://timberlineresources.co/>.

Ruby Hill project. Exploration at i-80 Gold Corp.'s Ruby Hill project involved a total of 137,210 feet of drilling during 2022, including exploration that focused on the Ruby Deeps and Hilltop zones and intercepted multiple high-grade mineralization intercepts and the texturing of multiple brownfield exploration targets that led to the discovery of polymetallic mineralization. This exploration led i-80 to outline a 2023 drilling program that focuses on the Hilltop Corridor that includes polymetallic carbonate replacement (CRD)-style mineralization, skarn mineralization in the Blackjack and Hilltop Corridor targets, and multiple untested geophysical anomalies. The Ruby Hill property hosts oxide gold, sulfide gold, polymetallic CRD, and skarn base metal mineralization, with all known mineralization in close proximity to the underground infrastructure development planned for 2023. i-80 Gold Corp. also continued to advance permitting in 2022 for the construction of a decline to access the high-grade Ruby Deeps deposit and the Blackjack Zone with the intent of trucking refractory mineralization for processing at Lone Tree. The Company also completed a scoping study during the year for the restart of the existing oxide mill and subsequent conversion to a base metals facility. Significant drill intercepts during 2022 exploration include 591.3-597.4 meters at 5.3 g/t Au in drillhole IRH22-30, 485.7-499.9 m at 14.4 g/t Au in drillhole IRH22-32) 444.6-451.6 meters at 6.5 g/t Au in drillhole IRH22-35, 524.7-530.4 m at 5.8 g/t Au in drillhole IRH22-36, and 399.3-438.9 m at @ 12.3% Zn in drillhole IRH22-61. For more information see: <https://www.i80gold.com>.

Northern Simpson Park Mountains

Red Hill. NuLegacy Gold's Red Hill project is focused on exploration for Carlin-type mineralization, with four of six drillholes completed during 2022. One of these drillholes, MR22-01, focused on the newly developed Mid-Rift target, with the remaining three holes (SR22-01, SR22-02, SR22-04) focusing on the previously drilled Serena/North Zone area. Drillhole MR22-1 intercepted a much thinner section of the favorable Wenban Unit 5 than anticipated, with this unit representing the expected target

for higher grade gold mineralization. This thinning reflects local folding within west dipping, low-angle fault blocks that is difficult to predict, although the drillhole did contain 18.3 m of anomalous to weakly anomalous gold mineralization. Drilling at the Serena Zone target included drillholes SR22-01 and SR22-01 that contained only anomalous to low anomalous gold values despite being within significant alteration. The remaining drillhole, SR22-04, contained low grade gold mineralization within silicified Wenban Units 5 and 4 breccias. For more information see: <https://nulegacygold.com/>.

HUMBOLDT COUNTY

Awakening District

Sleeper. Paramount Gold Nevada Corp. undertook initial exploratory drilling at the Sleeper project, focused on mineralization associated with the former Sleeper Mine and to the east of the Sleeper open pit along the continuation of a range front that is thought to represent faulting that controlled the location and genesis of the previously mined Sleeper deposit. Six holes were drilled in 2022 to test this eastern extension with a further three RC holes drilled from overburden to bedrock in the West Wood zone, a high grade, sulfide-rich occurrence, to prepare for future metallurgical core drilling in this area. This drilling included intercepts of 222.5-231.6 m at 0.41 g/t Au in drillhole PCR21-01, 298.7-303.3 meters at 0.38 g/t Au in drillhole PCR21-04, 175.3-201.2 m at 0.16 g/t Au in drillhole PCR21-05 and 155.4-160.0 m at 0.58 g/t Au in drillhole PCR21-06. As of June, 2023, the deposit has measured, indicated and inferred resources containing some 3,111,000 ounces of gold and 30,725,000 ounces of silver. For more information see: <https://paramountnevada.com/>.

Battle Mountain District

Marigold Mine. Exploration at and around SR Mining's Marigold Mine involved drilling and sampling throughout the Marigold property, including a total of 200 RC drillholes that were completed in 2022 for a total of 55,624 m of drilling. The Marigold Mine has now been in continuous operation for more than 30 years and poured the four millionth ounce in 2020. Mining activities continued at the Marigold Mine proper with the New Millennium target area around the Basalt-Antler open pit, which historically produced approximately 1 million ounces of gold at a grade of 0.75 g/t, representing a low cost and high probability future mining development opportunity. The target area consists of six distinct zones, namely East Basalt, Battle Cry, Antler, Section 6, L'il Gun and North Antler. Gold at Marigold is mined from multiple deposits with mining activity coalesced into the large Mackay open pit. The gold deposits at Marigold define a N-S trending alignment of mineralization that is >8 km long

and are located within a >10 x 1.5 km area, with depths ranging from surface to 250 m for oxide mineralization. The mineralizing fluids that formed the deposit were primarily controlled by fault structure and lithology, with fold geometry having a lesser influence. Gold was deposited within fault zones and quartzite chert dominant horizons within the Valmy Formation as well as high permeability units within the Antler sequence. Gold mineralization was also influenced by fold geometry in the Valmy Formation. For further information see: <https://www.ssrmining.com/>.

Trenton Canyon. Exploration at SSR Mining's Trenton Canyon project to the south of New Millennium included drilling, geophysical, remote sensing and geochemical data acquisition, and geological mapping. This identified that gold mineralization at Trenton Canyon is structurally controlled and is associated with less disseminated mineralization that at the Marigold Mine. This difference yields mineralization with higher gold grades but within a smaller volume of mineralized rock at Trenton Canyon compared to Marigold. A total of 59 RC holes with a total depth of 17,128 m and 10 core drillholes for a total of 4,086 m were completed at the project during 2022. For further information see: <https://www.ssrmining.com/>.

Bilk Creek Mountains

Agate Point. Headwater Gold undertook exploration drilling at the Agate Point project in late 2022, with a total of four RC scout drillholes totaling approximately 1,027 m of depth completed during the year. The project has no known historic drilling and represents an epithermal target associated with significant alteration. The 2022 drilling program focused on four separate structural targets beneath an alteration cap characterized by anomalous concentrations of Hg, Ag, and Sb. The targets tested consist of high angle structures that could be associated with epithermal feeder zones beneath mapped silicified breccias that contain textures characteristic of high-level epithermal-type alteration. Two of the drillholes completed during 2022 encountered significant epithermal alteration at depth. For more information see: <https://headwatergold.com/>.

Buffalo Mountain District

Lone Tree-Buffalo Mountain. The acquisition of the Lone Tree-Buffalo Mountain property by i-80 Gold in 2021 was followed by a drilling program that was completed in late 2022 in order to assess the potential for an open pit mining operation. The Lone Tree property is a past producer of around 4.2 million ounces of gold and contains significant processing infrastructure, including a whole-ore autoclave, leach pad and CIC circuit, and a floatation circuit. The property contains significant gold resources with known mineralized zones remaining open for expansion and the total land package consists of approximately 12,000

acres. Lone Tree is thought to be an Eocene distal-disseminated mineralizing system that is largely structurally controlled along the N-S striking Powerline fault with some mineralization located between the Roberts Mountains and Golconda thrusts in siliciclastic rocks of the Ordovician Valmy Formation, within the Pennsylvanian-Permian Battle Mountain and Edna Mountain formations, and above the Golconda thrust in siliciclastic and carbonate rocks of the Mississippian to Permian Havallah sequence. Mineralization is also hosted by Eocene rhyolitic dikes, although no large intrusive body has been delineated. Gold within this area is associated with sericitic and argillic alteration of siliciclastic rocks and dikes, with decarbonatization and Fe carbonate alteration of carbonate-bearing units, as well as in Fe-As sulfide and fine-grained quartz alteration of all rock types. Oxidation affects 30-45% of the deposit, penetrating into the stratigraphy along numerous steeply dipping north-south, east-west, and north-northeast-south-southwest structures. For more information see: <https://www.i80gold.com>.

Iron Point District

Iron Point (gold). Nevada King Gold Corp. undertook a 23-hole, 6,400 m total depth drilling program, including five deeper holes for a total depth of 4,000 m, at the Iron Point project in 2022. The project is focused on exploration for Carlin-type gold mineralization hosted within lower plate carbonate rocks in the hanging wall and footwall of the Edna Mountain Structural Zone. The deeper holes were targeted on deep, lower plate-hosted gold mineralization whereas the 18 shallow RC holes for a total depth of 2,400 m focused on unexplored areas near the north end of the Iron Point claim block where geophysical data are suggestive of shallow, uplifted blocks of lower plate stratigraphy. Significant intercepts in the deeper drillholes include 6.4 m at 0.16 g/t Au in drillhole IP22-3 and 7.3 m at 0.33 g/t Au, 4.8 m at 5.35 g/t Au, and 9.2 m at 1.04 g/t Au within drillhole IP22-5. For more information see: <https://nevadaking.ca/>.

Jackson Mountains District

Slumber/Sand Canyon. As discussed in the 2022 Nevada Mineral Industry report, NV Gold Corp.'s 2021-2022 drilling campaign focused on the epithermal targets at Slumber provided positive results, with a total of 12 RC drillholes totaling approximately 2,350 m of drilling completed by early March. Most of the 2021-2022 drillholes encountered significant thicknesses of low-grade oxide gold distributed over an area of at least 800 by 350 m with thicknesses of 100-150 meters or more and with most drillholes bottoming out in gold mineralization. The results are indicative of a low grade, bulk-tonnage, oxide gold system that remains open in multiple directions and with drilling that remains widely spaced over the area. Typical gold grades are around 0.2 g/t, although grades of up to 1.5

g/t Au were reached in drillhole SL-27, indicating that higher grades are present within the area. Overall, although the mineralization that has been identified to date is sub-economic under current conditions, the wide spacing of drilling means that further targets and assessment are needed on the property to identify more favorable structural or lithological zones with potential for higher grade mineralization. For more information see: <https://nvgoldcorp.com/>.

Potosi District

Turquoise Ridge. Exploration and drilling at Nevada Gold Mines Turquoise Ridge project continued to provide information on the controls on mineralization within the BBT corridor and the Getchell Fault Zone. Drilling during 2022 continued to upgrade the resource and included intercepts of 10.0 m at 28.00 g/t Au in drillhole TUM-22813 and 10.1 m at 20.77 g/t Au in drillhole TUM-22816. Drilling along the TR Corridor also yielded significant intercepts including 34.2 m at 12.93 g/t Au in drillhole TUM-22219, some 300 m distant from drillhole TUM-22162, which intercepted 34.8 m at 33.11 g/t Au. Infill drilling is planned to test the undrilled continuity between these two high-grade holes and potentially expand the resource in this area. Scout RC drilling of the Fenceline target, an alluvial material covered target straddling a legacy property boundary between the Turquoise Ridge underground mine and the Mega pit at Twin Creeks, also took place during 2022, identifying a corridor of deep oxidation, significant positive geochemistry, and anomalous gold, all of which are coincident with a window through the Roberts Mountains thrust fault. Follow-up core drilling of this target began in January 2023. For more information see: <https://www.barrick.com/>.

Twin Creeks. Exploration and drilling completed within Nevada Gold Mines Twin Creeks Mega Pit has identified a potential high-grade feeder type target at depth below the deposit. Drilling during 2022 confirmed the presence of feeder-like alteration and mineralization that extended along primary ore-controlling structures below the elevation of limited historic drilling. Deep framework drilling is planned to define the geological and structural setting of this new target at depth. For more information see: <https://www.barrick.com/>.

Granite Creek. i-80 Gold Corp.'s Granite Creek (formerly the Pinson Mine) project is located at the intersection of the Getchell and Battle Mountain trends proximal to Nevada Gold Mines' Twin Creeks and Turquoise Ridge mining operations. The project is a past-producer, having produced nearly one million ounces of gold primarily from the CX, Mag, and Range Front Zones, all of which are located in the hanging wall of the east-dipping Range Front fault within the Osgood Mountains.

The property hosts both high-grade open pit and underground mineral resources that remain open for expansion. The underground mine at Granite Creek is permitted and is in development with the intention of ramping up mining into 2024. Both exploration and delineation drilling targeting open pit and underground mineralization were undertaken at Granite Creek during 2022 in advance of an anticipated feasibility study in 2023. Mineralization is hosted in interbedded shale, siltstone, and limestone units of the Ordovician Comus Formation with lesser mineralization in shales and limestones of the underlying Cambrian Preble Formation. The mineralization at Granite Creek is controlled by inverted reverse faults, Cretaceous dikes, and the presence favorable host rocks. Relatively high-grade underground mineralization within the CX and Range Front Zones is preferentially located at intersections between fault zones and favorable portions of the lower Comus Formation. The mineralization itself is primarily sooty, fine-grained pyrite with gold hosted in arsenic-rich rims, all of which is associated with decarbonization, silicification, and argillic alteration. Drilling results released in 2022 included a number of significant intercepts such as 15.8-21.5 m at 8.2 g/t Au in drillhole IGU21-17, 87.8-90.5 m at 5.6 g/t Au in drillhole IGU21-20, 16.8-19.5 m at 14.5 g/t Au in drillhole IGU21-23, 82.9-92.4 m at 10.7 g/t Au in drillhole IGU21-24, 352.0-355.9 m at 17.2 g/t Au in drillhole IGS21-07, 356.2-360.9 m at 8.0 g/t Au in drillhole IGS21-08, 424.6-428.8 m at 17.2 g/t Au in drillhole IGS21-10, and 436.5-442.0 m at 25.5 g/t Au in drillhole IGS21-11. For more information see: <https://www.i80gold.com>.

Snowstorm Mountains District

Snowstorm. Seabridge Gold undertook exploration drilling at the Snowstorm property in 2021 and continuing into 2022 targeting structural zones with anomalous gold identified in previous drilling. The project is focused on exploration for Carlin-type mineralization and the drilling in 2021 and 2022 was aimed to increase the number of intersections of a gold-bearing, structurally controlled intrusion to help vector towards higher grade mineralization. A total of 1,320 m of drilling was undertaken in 2021 and 2022 with the aim of offsetting drilling from 2020, which intercepted altered units with gold, arsenic, and silver concentrations one to two orders of magnitude above background. No assay results were released from either of the drillholes completed by April 2022. For more information see: <https://www.seabridgegold.com/>.

Sulphur District

Hycroft. Hycroft Mining continued significant exploration, with the 2022-2023 exploration drill program at the mine representing the largest exploration program at the Hycroft Mine in nearly a decade. Around 30,000 m of

RC and 7,500 m of core drilling is planned during 2022 and 2023, with a total of 171 holes drilled between 2021 and 2022. This exploration program aims to improve the understanding of higher-grade intercepts identified during the 2021 drill program, better understand controls on mineralization controls, test exploration targets outside currently known deposits, and develop opportunities to mine higher grade ore early in the mine plan, thus enhancing project economics. Phase 1 of the 2022-2023 exploration program was completed by end 2022, with objectives including drilling within the current resource to establish continuity between the higher-grade zones identified in 2021, converting mineralization previously classified as waste in the Camel and Central zones into ore grade mineralization, and upgrading mineralization previously classified as inferred into measured and indicated resources within these zones. This exploration program also aims to expand mineralization to the east at least 150 m beyond the known resource boundary, opening a new target area for near-mine exploration, and further drilling at the Vortex high grade silver deposit to obtain further significant high-grade intercepts. This phase 1 drilling in 2022 involved around 25,000 m of RC drilling and 4,000 m of core drilling. Significant intercepts include 267-360 m at 0.70 g/t Au, 55.9 g/t Ag in drillhole H22R-5670, 26-61 m at 2.83 g/t Au, 35.6 g/t Ag in drillhole H22R-5671, 77-117 meters at 1.40 g/t Au, 48.1 g/t Ag in drillhole H22R-5672, and 70-111 m at 0.58 g/t Au, 9.1 g/t Ag in drillhole H22R-5685. For more information see: <https://hycroftmining.com/>.

Ten Mile District

Sandman. Gold Bull Resources Corp. undertook exploration drilling at the Sandman project in 2022, with a total of 24 holes and 4,954 m of RC drilling during the year. The project is located along the N-S to NW-SE trending eastern margin of the Sleeper or Kings River Rift, part of the regional central Northern Nevada Rift. Mapping, exploration drilling, and extensive shallow auger drilling to date indicate that much of the sand and basalt in the project area are underlain by a section of Tertiary tuffaceous rocks and andesite that in turn overlies Late Triassic to early Jurassic metasedimentary clastic and subordinate carbonate rocks.

The mineralized zones within the Southeast Pediment, Silica Ridge, North Hill, and Abel Knoll targets at Sandman contain low-sulfidation, quartz-adularia, epithermal Au-Ag mineralization that is hosted by Tertiary volcanic rocks (primarily tuffs), porphyritic andesite, tuffaceous sedimentary units, and basalt. Higher grade mineralization appears to be either stratigraphically controlled along contacts between basalt flows, interbedded fluvial conglomerates and tuffaceous rocks, or is structurally controlled and present as lens-shaped pods, with high-continuity, lower-grade disseminated gold hosted by

sedimentary and volcanic units. Gold Bull Resources Corp. released a 2021 mineral resource estimate for the deposit that consists of 493,800 ounces of contained gold in indicated and inferred resources. Significant drilling intercepts during 2022 include 7.6 m at 1.51 g/t Au at a depth of 48.8 m in drillhole SA-0035, 32 m at 1.31 g/t Au from a depth of 42.7 m in drillhole SA-0037, 7.6 m at 2.35 g/t Au from a depth of 83.8 m in drillhole SA-0038, 47.2 m at 1.54 g/t Au from a depth of 1.5 m in drillhole SA-0044m, and 74.7 m at 0.93 g/t Au from surface in drillhole SA-0045. Some of these drillhole intercepts also included higher grade but thinner intervals including grades of >13 g/t Au over 1.5 m in drillhole SA-0044. For more information see: <https://goldbull.ca/>.

LANDER COUNTY

Battle Mountain District

Independence. Golden Independence Mining Corp. undertook surface sampling and resampling of previous drilling at the Independence project located adjacent to Nevada Gold Mines' Phoenix-Fortitude mining operations in the Battle Mountain-Cortez trend of Nevada after the December, 2021 reporting of a mineral resource estimate and associated Preliminary Economic Assessment for the project. No additional drilling was reported in 2022. For more information see: <https://goldenindependence.co/>.

Lewis Project. Nevada King Gold Corp. continued exploration at the Lewis project, focusing on mineralization in a previously producing area that produced 5 million ounces of Ag and 20,000 ounces of Au from underground workings between 1880 and 1928. Exploration at Lewis included the completion of 18 RC holes with a total depth of 3,228 m during 2022. A total of nine holes focused on the Record Target, a high-priority, shallow target associated with anomalous surface gold concentrations and historical long, low grade drill intercepts. A further six drill holes were completed in the Upper Rocky Canyon Target area, where previous historic drilling was widely spaced but identified shallow but significant anomalous gold mineralization. A further two holes were drilled in the Celestine O'Neal target area, serving as 50 and 90 m step outs from 2021 drilling. A final hole was completed approximately 450 m north of the Celestine O'Neal target to test another high-priority IP anomaly within an area devoid of historical drilling. No results have been released from this drilling to date. For more information see: <https://nevadaking.ca/>.

Phoenix. Drilling at the Nevada Gold Mines Phoenix operation in 2022 identified a 65 m thick (true width not determined) zone of intensely-veined and strongly-altered porphyritic intrusion with visible veinlet-hosted and disseminated chalcopyrite and pyrite. Assay results remain

pending but this intercept suggests the presence of an unknown hypogene zone immediately beneath the existing (unmined) resource pit. Follow-up drilling in 2023 will target the extension and increase Nevada Gold Mines' understanding of the potential for this zone. For more information see: <https://www.barrick.com/>.

Buffalo Valley District

Buffalo Valley. Exploration at SSR Mining's Buffalo Valley project to the southwest of New Millennium included drilling, geophysical, remote sensing and geochemical data acquisition, and geological mapping during 2022. A total of 36 RC drillholes for a total depth of 14,426 mm and seven core drillholes for a total depth of 3,315 m were completed during the year, although no results were released. For further information see: <https://www.ssrmining.com/>.

North Peak. SSR Mining continued exploration drilling at the North Peak project, completing 5 RC holes for a total depth of 1,794 m in 2022, although no results were released. For further information see: <https://www.ssrmining.com/>.

Bullion District

Robertson. Exploration at Nevada Gold Mines' Robertson project included drilling continued to confirm geological continuity between the Gold Pan and Porphyry targets. Results released include 4.6 m at 3.28 g/t Au and 3.0 m at 2.38 g/t Au in drillhole PYC-21033, supporting the near-surface continuity of mineralization between the two deposits that should lead to an increase in the resource footprint. Drilling in the western part of the Robertson project within the Distal target confirmed the continuity of grade up-dip of the Distal Fault series and nearer to surface in drillhole DTL-21007 with 12.0 m at 2.17 g/t Au and 13.9 m at 15.57 g/t Au in drillhole DTL-21004. These results continue to improve the Distal resource potential, some 600 meters away from the Gold Pan deposit. Infill and further exploration drilling are planned for 2023 at Distal with maiden reserves and an increased resource declared as part of the Barrick/Nevada Gold Mines 2022 Reserves and Resources Statement. For more information see: <https://www.barrick.com/>.

Swift. The Swift project is currently operated by Nevada Gold Mines under an exploration earn-in agreement executed in September 2021 with Ridgeline Minerals, where Nevada Gold Mines holds an option to spend US \$20 million in qualifying expenditures over five years to earn an initial 60% stake in the project. Nevada Gold Mines had spent a total of US \$4.9 million on the project to February 2023 and satisfied the minimum

guaranteed work commitment of US \$4 million ahead of the scheduled deadline of December 31, 2023.

The project is focused on Carlin-type gold mineralization and is adjacent to the historic Elder Creek open pit mine. Earlier drilling in 2021 included drillhole W21-001, which returned 9.1 m of 0.51 g/t Au and intersecting lower plate rocks at relatively shallow depths that were free of anomalous gold. A further three wide-spaced (~1 km) framework drillholes were completed by January 2023 for a total depth of 3,278 m. Drillholes SW22-002 and SW22-003 intercepted lower plate carbonate host rocks between at depths of 570-830 m depth with widespread intervals of Carlin-type alteration. Anomalous Au mineralization was also intersected in both holes where individual samples contained up to 2.72 g/t Au. Significant intercepts include 37.2 m at 0.29 g/t Au, 2.6 g/t Ag in drillhole SW22-002 and 48.8 m at 0.45 g/t Au, 0.98 g/t Ag in drillhole SW22-003.

Callaghan Ranch District

South Grass Valley. Nevada Exploration Inc.'s South Grass Valley project is located within a covered basin to the south of Nevada Gold Mines' Cortez operations. The project is focused on exploration for Carlin-type mineralization and has exposed Carlin-type alteration within a 700 m thick sequence of lower plate carbonate host rocks immediately below the Roberts Mountains Thrust. Drilling in 2022 was challenging for technical reasons and focused on reaching the Hales Formation at ~1,000 m depth in the southern part of the property. No results were released in 2022, and Nevada Exploration Inc. plans on the next phase of exploration to focus on more deep drilling that will target areas of hydrothermal fluid flow associated with favorable structural and permeability conditions and suitable host rocks for Carlin-type mineralization. For more information see <https://www.nevadaexploration.com/>.

Fire Creek Mine. Exploration drilling was undertaken by Hecla at the Fire Creek Mine, which was placed on care and maintenance during the second quarter of 2021. Exploration strategies are also being developed to advance the Fire Creek district towards new discoveries. For more information see <https://www.hecla.com/>.

McCoy District

Iron Butte. Angold Resources Ltd.'s Iron Butte Project is located within the southwestern periphery of the Caetano Caldera, located to the west of the Cortez Hills mine within the Shoshone Range. The exploration at Iron Butte is focused on low sulfidation epithermal mineralization that extends from surface across an area 2 km wide. A total of 5 drillholes were completed for a total of 2,152 m by Angold Resources Ltd. during 2022. Drilling was distributed across the project area, with three holes into the Red Ridge Zone, one at the North Zone, and the remaining

hole drilled into the newly identified Northern Extension Zone. The drill program was designed to test targets identified through geophysics and geochemical activities outlined by the company earlier in the year, and to define the strike extensions of the mineralized veins within the historic resource areas. A total of 1,501 core samples and RC pulps were submitted for analysis. Results were expected in late October or early November of 2022, though no results have been published. For more information see <https://www.angoldresources.com/>.

Discovery Bay. NV Gold Corp's Discovery Bay Project is situated about 14 kilometers southeast of the McCoy Cove gold deposits of Lander County. The primary objective at Discovery Bay is to explore a largely uncharted geological setting, characterized by Triassic Osobb Mountain Quartzite and Cane Springs Limestone (the same rock types that host the McCoy deposits) and other promising underlying lithologies. Much of this target area is concealed beneath thin layers of Tertiary volcanic rocks, Quaternary gravel deposits and sediments, with limited surface exposure. In 2022, the company announced an initial phase of a drill program that would involve approximately 1500 to 1800 meters of RC drilling in four boreholes. NV Gold has conducted ground gravity and Induced Polarization (IP) surveys to thoroughly assess the extent of this narrow Triassic geological window. Initial drilling will be widely spaced, covering a distance of more than a kilometer, serving the purpose of validating our geophysical models and confirming the presence of host rock types. In addition, a mercury vapor study in early 2022 identified two more potential targets. In late 2022, the company announced future plans for a phase 2 drilling campaign to further evaluate the gravity high and test mercury vapor and chargeability anomalies. For more information see <https://nvgoldcorp.com/>.

McCoy-Cove Project. i-80 Gold Corp. completed 3,095 feet of exploration ramp advancement at the McCoy-Cove project as well as undertaking drilling including 5,039 core feet and 4,940 RC feet to expand monitoring of the hydraulic properties at McCoy-Cove. Development continued on plan and additional work on metallurgical and hydrology studies, engineering of de-watering and mining options, and reclamation activities associated with the inactive tailings storage facility at the project is also being advanced. Around 40,000 m of underground definition and expansion drilling began during the year and will continue through to 2023 in addition to an anticipated Feasibility Study that is also expected to be completed in 2023. The mineralization at McCoy-Cove is hosted within the Helen, Gap, CSD, and 2201 zones that are located below and extending ~2000 ft northwest of the historic Cove pit, with a number of other expansion and exploration targets also identified within the project. The area contains four types of mineralization, namely. Three main types of mineralization

occur within the property including (1) Carlin-like Au-Ag mineralization, (2) polymetallic Au-Ag±Pb±Zn sheeted veins, (3) carbonate replacement Ag-Pb-Zn±Au mineralization present as manto-style pods of mineralization, and (4) skarn mineralization at the historic McCoy pit ~1 km southwest of the Cove pit. Although most Carlin-type systems are hosted in Paleozoic slope and shelf carbonates, the host rocks at McCoy-Cove are silty to massive limestones and dolomites of the Triassic Star Peak Group with limestone and silty limestone units of the Favret Formation acting as the main host for Carlin-style mineralization in the project area with the Dixie Valley Formation conglomerates the primary host of polymetallic vein mineralization. For more information see <https://www.i80gold.com/>.

Mountain Springs District

Red Rock Project. Atoka Gold Corp. undertook exploration drilling at their Red Rock property, targeting potential mineralization in Carlin-type host rocks in similar geological settings to the Rain and Railroad deposits. Drilling during 2022 includes intercepts at depths of 341-345 m at 0.22 g/t Au, 0.30% Pb, 0.27% Zn, and 0.02% Cu in drillhole RRC-22C within a broad zone of skarn mineralization on the property. For more information see <https://atokagold.com/>.

Steiner Canyon District

Pickhandle Project. NV Gold Corp.'s Pickhandle project is focused on a small window of Permian Edna Mountain Limestone that is cross-cut by altered and mineralized dikes. The geology, alteration, structural complexity, and geochemical environment within the project area are suggestive of the presence of Carlin-type gold mineralization, including the presence of pervasively silicified jasperoids and silicified breccias, with surface rock sampling having gold concentrations up to 1.5 g/t Au. NV Gold completed 4 RC hold during 2022 for a total of 872.8 m of drilling. All drillholes encountered oxide zones with weakly anomalous gold concentrations although the highest gold concentration obtained during this drilling was 71 ppb. For more information see <https://nvgoldcorp.com/>.

LINCOLN COUNTY

Atlanta District

Atlanta Project. Nevada King Gold followed a successful 2021 exploration program at the Atlanta project with more than 1,800 m of diamond core and 24,260 m of RC drilling undertaken on the project during 2022. This exploration identified number of significant target areas and potential zones for resource growth at Atlanta that expand gold mineralization well beyond the footprint of the existing resource area. The mineralization in these areas is generally

open along strike and to depth and will be the focus of further drilling during 2023. Drilling of a parallel fence of holes to successful 2021 drilling during the year led to oxide intercepts of 3.41 g/t Au over 54.9 m, 2.65 g/t Au over 50.3 m, and 2.23 g/t Au over 51.8 within the Atlanta Pit Zone. Additional drilling to the south of the Atlanta pit intercepted oxide intervals of 1.49 g/t Au over 120.4 m and 1.38 g/t Au over 57.9 m as well as 0.62 g/t Au over 77.7 m, 0.82 g/t Au over 42.7 m, 0.86 g/t Au over 56.4 m, 1.71 g/t Au over 25.9 m, and 1.77 g/t Au over 30.5 m within this South Extension Target. Further exploration drilling focused on expansion to the north of the Atlanta pit, including intercepts of 1.77 g/t Au over 19.8 m, 1.67 g/t Au over 24.4 m, and 0.71 g/t Au over 44.2 m. This North Extension Target has the potential to add to the existing resource footprint at Atlanta. For more information see <https://nevadaking.ca/>.

Eagle Valley District

Gold Springs Project. Gold Springs Resources Corp. completed 77 RC drillholes during the year for a total of 16,226 m of drilling. These include 24 drillholes focused on the South Jumbo resource, 22 holes around the North Jumbo resource, 19 holes around the Charlie Ross resource that was discovered in 2021, two holes on the previously untested Snow target, five holes on the Red Light target, and five holes on the Horseshoe Extension target, with the Horseshoe Extension, Pope, Snow, and Red Light targets all newly tested during the 2022 exploration campaign.

Drilling at the South Jumbo resource extended gold mineralization to the west and north and at depth, with the resource remaining open along the western and eastern margins and to the north. Drilling at the North Jumbo resource extended gold mineralization to the south and into a block parallel and to the west of the existing resource. Significant intercepts at North Jumbo include 1.87 g/t gold equivalent over 29 m with 3.73 g/t over 9.2 m in drillhole J-22-005 and 0.57 g/t gold equivalent over 41.2 m and 1.88 g/t over 6.1 m in , drillhole J-22-004, where all gold equivalent calculations are based on prices of US\$1,800/oz gold, US\$25/oz silver and assuming 50% silver recovery. Drilling at the Snow target resulted in a new discovery in drillhole SN-22-002, which intercepted 1.98 g/t gold equivalent over 3.0 m and 0.70 g/t gold equivalent over 27.4 m. Core drilling undertaken during 2022 tested deeper portions of the systems and collected material for metallurgical testing, with a total of 695.5 m of core drilling completed. Gold Springs Resources Corp. also released a new mineral resource estimate for the project that includes measured, indicated and inferred resources consisting of some 957,000 ounces of contained gold and 13,881,000 ounces of contained silver within the North and South Jumbo, Tremor, Charlie Ross and White Point resources. For more information see <https://goldspringsresource.com/>.

LYON COUNTY

Como District

Sandy Gold Project. NV Gold Corp.'s Sandy Gold project focuses on exploration for epithermal-type mineralization hosted by Tertiary volcanic rocks. The project is in an area of past production within the Walker Lane structural province. Drilling during 2022 involved four RC holes for a total of 487.7 m of depth, although no results have been released from this drilling. For more information see <https://nvgoldcorp.com/>.

Yerington District

Mason Project. Hudbay's Mason project is a large greenfield copper deposit located in the historic Yerington mining district and represents one of the largest undeveloped copper porphyry deposits in North America. The acquisition of Mason by Hudbay in 2018 has been followed by the consolidation of a package of patented and unpatented mining claims contiguous to the project area as well as the completion of a number of technical studies, including a revised resource model and the completion of a preliminary economic assessment (PEA) on the project. The PEA was completed in April 2021 and outlines a 27-year mine life with average annual copper production of approximately 140,000 tonnes over the first ten years of full production. Current measured, indicated and inferred resources for the Mason project include 15,440,969,000 lbs of contained copper, 2,320,380 ounces of contained gold and 45,502,000 ounces of contained silver in around 2.5 billion tonnes of resources. Exploration continues for higher grade satellite deposits within the Mason property and the proximal Mason Valley expansion project that contains known skarn mineralization as well as several historical underground copper mines that were in production in the early 1900s. A conductivity-resistivity IP ground survey conducted in the fourth quarter of 2022 was successful in identifying mineralization associated with historical mining and confirmed the potential for both high-grade skarn targets as well as a large porphyry target below historical mining activities. These results, in combination with a re-interpretation of geological data from past operating mines and previous exploration data, are being used for drill targeting to continue through to late 2023. For more information see <https://hudbayminerals.com/>.

Pumpkin Hollow Mine. Nevada Copper Corp.'s Pumpkin Hollow operations produced 2,011,000 of copper in 2022 although mining activities at the site stopped in June 2022 as a result of operational and geotechnical challenges that began to be addressed during the year. These challenges relate to an unidentified weak rock structure that was encountered in the main ramp to the East South Zone that required additional drilling and geotechnical mitigation

work to reinforce the area prior to proceeding. Development and exploration work continued during 2022 focusing on the two adjacent but unconnected copper-gold-silver systems within the property, the deeper Eastern deposits that are suitable for underground mining and the larger and shallower Western deposits that are suitable for open pit mining. Nevada Copper paused work on the Open Pit Project as it dedicates its management and financial resources to the successful restart of the Underground Project. The mineralization is associated with granodiorite to diorite intrusive rocks of the Jurassic Yerington batholith that have been emplaced into limestones of the Triassic Mason Valley Formation and calcareous argillites and siliceous shales, siltstones and limestones of the Gardnerville Formation. The emplacement of these intrusions is associated with skarn copper-gold-silver mineralization and significant magnetite. The Western area includes the North deposit, which is centered on a subhorizontal, pipe-like, copper-rich, magnetite-poor skarn breccia body hosted by hornfels-altered units of the Gardnerville Formation. The Western area also includes the South deposit, the first discovery in the project and a magnetite-chalcopyrite body closely associated with the emplacement of a granodiorite unit into limestones of the Mason Valley Formation. The third major deposit within the Western area is the Southeast deposit, a 300 ft wide lens of chalcopyrite-magnetite-garnet-actinolite skarn hosted again by limestone units of the Mason Valley Formation that locally contains up to 75% magnetite.

The Eastern area contains the Eastern and E2 deposits, with the former consisting of flat-lying to gently dipping, bedding-controlled, stacked, mineralized zones within limestones of the Mason Valley Formation at depths of 1,400-2,200 ft. The E2 deposit is a steeply NW-dipping lens of high-grade copper-magnetite skarn breccia within the Mason Valley Limestone that contains chalcopyrite-magnetite mineralization that parallels the marble alteration front in a similar style to East deposit.

The majority of work during 2022 focused on underground development, with full establishment and completion of the historically reported dike crossings that provide initial stope top and bottom access into the EN Zone during the year, allowing further development to progress toward stoping areas. Definition drilling of initial stopes to feed the restart of milling operations in Q3 2023 were completed and assayed during 2022 and open pit exploration drilling also commenced during the year. The primary goals of the ~25,000 ft total depth drill program are to upgrade the in-pit inferred mineral resources that are currently considered as waste in the 2019 Technical Report to a minimum of an indicated resource as well as expanding mineral resources previously inaccessible for drilling. This drilling will also advance the geotechnical and metallurgical understanding of the deposit and condemnation drilling will also be completed in areas planned for major infrastructure. Several holes are also planned to follow up

geophysical and surface work and test the nearby Tedeboy porphyry target. For more information see <https://nevadacopper.com/>.

Mason Valley/MacArthur Project. Lion Copper and Gold Corp. undertook an exploration drilling program at the Mason Valley/MacArthur copper project during 2022 consisting of five drillholes totaling 4,752 feet in depth. This exploration drilling included evaluation of the mineralized potential beneath the legacy Yerington pit, the Montana-Yerington prospect located between the Ann Mason project and the Yerington pit, and verification work around the MacArthur Project. Lion Copper and Gold Corp. also undertook surface trenching at the Mason Pass oxide copper prospect, with five trenches completed during the year.

Exploration drilling results include intercepting nearly 1,600 feet of continuous copper mineralization within drillhole YM-046 located beneath the legacy Yerington pit. This drillhole has a total depth of 1,792.5 ft and included both oxide (374 ft of 0.12% TCu) and sulfide (1,222 ft of 0.13% TCu, including 75 ft of 0.23% TCu) mineralization. This drilling was collared on the central portion of the southern pit rim and was angled to the NE to prospect beneath the pit, with some of the sulfide mineralization located beneath the known resource. Drilling at the MacArthur project intercepted near-surface oxide mineralization over 157 ft of drilling at 0.25% TCu including an interval of 58.5 ft of 0.40% TCu within drillhole QM-330. Drilling at the Montana-Yerington prospect between the Yerington pit and the Ann Mason deposit intercepted 8.5 ft of 1.64% TCu and 23.5 ft of 0.49% TCu as well as a lower zone of sulfide mineralization that includes 114 ft of 0.10% TCu within drillhole MY-001. This mineralization may be related to the eastern continuation of the Ann Mason deposit and also appears to remain open to the west on ground held by the Lion Copper and Gold Corp. A total of three core drillholes totaling a depth of 2,291 ft were drilled at the MacArthur project, with drillholes QM-329 and QM-330 focusing on the central portion of the resource shell. Significant intercepts include 371 ft of 0.16% TCu including 76.5 ft of 0.27% TCu within drill hole QM-329 and 157 ft of 0.25% TCu including 58.5 ft of 0.40% TCu within drillhole QM-330, with both drillholes intercepting oxide and chalcocite mineralization. Drillhole QM-329 also intercepted primary sulfide mineralization with 40 ft of intercept at 0.17% TCu. Drillhole QM-331 was focused on the eastern edge of the resource shell and intercepted oxide mineralization, including 10 ft of 1.06% TCu, and a mixture of chalcocite and chalcopyrite mineralization including 16.5 ft at 0.18% TCu.

The trenching program at Mason Pass undertaken in 2022 intercepted at-surface, ore-grade, copper oxide mineralization with mineralization remaining open and untested in most directions. Highlights include 200 ft of 0.28% TCu and 30 ft of 0.22% TCu with an average of 0.14%

TCu over the full length of the trench (568 ft) within Trench 4, 20 ft of 0.70% TCu and 90 ft of 0.34% TCu with an average of 0.14% TCu over 390 ft of the trench (from 50 to 440 ft) in Trench 1, and 50 ft of 0.20% TCu with an average of 0.08% TCu over 358 ft (from 50 to 408 ft) within Trench 2. The four trenches that reached bedrock all encountered copper oxide mineralization within one-inch to five-foot wide flat-lying veins that strike NE-SW and extend out from the Singatse fault to the west and south for undetermined distances. Lion Copper and Gold Corp. are now considering further exploration to evaluate the extent of this mineralization to the west, south, and at depth. The mineralization within these trenches is similar to that exposed in the MacArthur pit where historic benching exposed copper oxide mineralization located primarily within the footwall of the low angle MacArthur fault and ranges between 30 and 250 feet in thickness. Lion Copper and Gold Corp. also released a resource estimate for the MacArthur Project including measured, indicated and inferred resources that contain some 1,472,122,000 lbs of contained copper within more than 400 Mt tonnes of mineralization, a significant increase over previously reported resource estimates. Rio Tinto Ltd. also announced that it had acquired an option to earn a 65% interest in the Mason Valley Properties, comprising the Yerington, MacArthur, and Bear projects, from Lion Copper and Gold Corp. for \$9,000,000 cash over 1.5 years. The aim of this acquisition is to test the ability of Rio Tinto's Nuton Technology to leach low-grade copper sulfide deposits. For more information see <https://www.lioncg.com/>.

MINERAL COUNTY

Aurora District

Aurora. Hecla Mining Co.'s Aurora property is located in the northeastern portion of the Bodie Hills and exploration within the property is focused on epithermal gold-silver mineralization. Historically, the property produced about 1.9 million ounces of gold from an anastomosing system of banded quartz-adularia-sericite epithermal veins. Exploration at the Aurora project in 2022 focused on wide and high-grade vein mineralization along the Martinez-Juniata-Chesco mineral trend in order to test, confirm, and define the character of the mineralization in this area, including high grade areas intercepted by historical RC drilling. The mineralization in this area continues to be open for expansion along strike and dip. Additional exploration was focused on the Sawtooth Ridge target area within the property. Significant intercepts include 0.40 oz/ton gold and 1.8 oz/t silver over 31.1 feet estimated true width, which includes 1.26 oz/ton gold and 4.4 oz/t silver over 6.7 feet estimated true width within the Martinez Zone, 0.43 oz/ton gold and 1.9 oz/ton silver over 14.9 feet estimated true width, which includes 0.76 oz/ton gold, 3.5 oz/ton silver over 8.0 feet estimated true width

within the Juniata Zone, and 0.73 oz/ton gold and 7.7 oz/ton silver over 12.2 feet estimated true width within the Chesco Zone. For more information see <https://www.hecla.com/>.

Spring Peak Project. Headwater Gold Inc.'s Spring Peak project adjoins the past producing Aurora Mine complex and is focused on potential mineralization associated with a large hydrothermal alteration cell that is thought to represent an epithermal precious metal mineralizing system. The core of this cell consists of a 5 m thick silica sinter that extends >500 m along strike and records hydrothermal vent activity. Exploration at the Spring Peak project during 2022 included 3,173 m of drilling split into 993 m of core drilling, 1,076 m of RC pre-collars and 1,104 m of RC exploration drilling. The main focus of exploration efforts during 2022 was the Disco Zone, which was intercepted with oriented diamond core in all four holes designed to test for high-grade veins. The four drillholes that targeted this zone were drilled on a single fence with mineralization remaining open up-dip, down-dip and along strike. The Disco Zone occupies the footwall margin of a broad, northeast-striking fault zone oriented similarly to vein trends at the adjacent past producing Aurora mine complex. An additional six drillholes focused on targets at depths greater than 150 m elsewhere on the property. All holes encountered epithermal alteration and veining, confirming that the exposed epithermal system extends beneath silica alteration mapped at surface. Drillhole SP22-13 within the Disco Zone intercepted two discrete high-grade veins with textures suggestive of boiling, including ginguero banding and silica replacement of lattice-bladed calcite. These veins are associated with a broader mineralized interval that contains additional veins and brecciated intervals associated with fine-grained silica-sulfide flooding and argillic alteration. The opaque, fine-grained character of silica within these veins combined with a lack of coarse crystalline quartz suggests that the 2022 drilling may not have reached the base of the suggested boiling horizon that typically hosts high concentrations of precious metals within epithermal systems.

Headwater Gold Inc. also signed option and earn-in agreements with Newcrest Mining Ltd. during 2022, giving Newcrest the option to acquire up to a 75% interest individually in Headwater's Mahogany Project in Oregon and the Agate Point, Midas North, and Spring Peak projects in Nevada for cumulative earn-in exploration expenditures of US \$145,000,000 and the completion of Pre-Feasibility Studies that include a minimum resource of 1.5 million gold or gold equivalent ounces per project. Newcrest will also acquire a 9.9% equity interest in Headwater Gold Inc. through a non-brokered private placement of common shares. For more information see <https://headwatergold.com/>.

Bell District

Golden Mile Project. Exploration at Fortitude Gold Corp.'s Golden Mile project focuses on intrusion-related primary gold and copper mineralization associated with skarn style alteration of carbonate units. Secondary mineralization at the project is associated with structurally controlled stockwork and breccia zones. The gold-copper skarn mineralization is thought to be associated with a quartz diorite-granodiorite intrusion that is only exposed at surface in three small areas of the project as the majority of the northern part of the intrusion is covered by Tertiary volcanic units. Drilling in 2022 focused on targeting two known areas of mineralization and confirmation, infill, delineation and expansion drilling to build on the 2021 initial mineral resource estimate, which consisted of 163,000 ounces of contained gold in indicated and inferred resources. At least 56 RC holes were drilled at the property in 2022 predominantly focused on the southeast margin of the current phase one pit shell, with high-grade intercepts including 3.05 m at 16.80 g/t gold within 12.19 m grading 4.86 g/t gold. Fortitude Gold Corp. aims to convert and upgrade the existing resource into a reserve with the completion of a maiden Golden Mile prefeasibility study and technical report summary. Mineralization at Golden Mile also remains open along strike and at depth for potential expansion. For more information see <https://www.fortitudegold.com/>.

Candelaria District

Candelaria Project. Exploration at Silver One Resources' Candelaria project in 2022 included 7,500 m of RC drilling over 36 drillholes that aimed to extend knowledge of silver oxide mineralization adjacent to the past producing Mt. Diablo and Northern Belle open pits and filling in areas between step-out holes drilled in 2021 to the west of the Mt. Diablo open pit. Drilling highlights include 1,339 g/t Ag and 1.22 g/t Au over 10.67 m from 68.58 m within a broad interval of 48.77 m at 332 g/t Ag and 0.39 g/t Au from 60.96 m in drillhole SO-C-22-119B, an in-fill hole to the west of the Mt. Diablo pit. Eastern extension drilling at Mt. Diablo in drillhole SO-C-22-106A intercepted 501.5 g/t Ag and 0.76 g/t Au over 3.05 m from 263.65 m within a 22.86 m zone at 0.29 g/t Au and 142 g/t Ag from 252.98 m. The down dip extension drilling at Mt. Diablo in drillhole SO-C-22-125 also intercepted 518.5 g/t Ag and 0.85 g/t Au over 3.05 m from 284.99 m within a 16.76 m zone at 0.48 g/t Au and 252 g/t Ag from 281.94 m. The Northern Belle pit down-dip extension in drillhole SO-C-22-130 at 777 g/t Ag and 1.38 g/t Au over 3.05 m from 289.56 within a 15.24 m zone at 0.33 g/t Au and 182 g/t Ag from 281.94 m. These drilling results indicate that mineralization extends 400 m to the west (to drillhole SO-C-21-96) and 450 m to the east (to drillhole SO-C-22-115) of the Mount Diablo pit. Mineralization also remains open along strike in both directions as well as down-dip from both the Mt. Diablo and

Northern Belle open pits. This also indicates that the Candelaria mineralization extends nearly 2 km along strike, 1 km in a down-dip direction, and remains open in all directions. In addition, the Ag and Au grades encountered in drilling to the west of Mt. Diablo in 2022 and earlier years exceed the average grades (88 g/t Ag and 0.1 g/t Au) mined during earlier open pit operations. Gold grades to the east of the Mt. Diablo pit from drillhole SO-C-22-112 to SO-C-115 also increase relative to grades previously mined by open pit although silver grades decrease in this orientation. Future drilling will focus on testing the continuity of the mineralization down-dip and along strike from both Mt. Diablo and Northern Belle pits.

Core drilling for metallurgical testing focused on the extension of the Mt. Diablo pit mineralization was also undertaken in 2022 using core samples from the 2022 drilling program, six core holes drilled in the 2019-2020 campaign, and three bulk samples excavated with a backhoe from the bottom of the Mt. Diablo pit. This investigation examined potential silver and gold extraction from oxide, mixed (oxide-sulfide), and sulfide mineralization using samples from throughout the deposit that are representative of the grades and major types of Candelaria mineralization. The aim is to use the results from this metallurgical testing in future in-ground resource estimations as well as in economic evaluations. For more information see <https://silverone.com/>.

Mount Grant District

Lapon Canyon Project. Exploration at Walker River Resources' Lapon Canyon project focused on RC drilling to confirm mineralization at Lapon Canyon, to extend the newly discovered Hotspot zone, and an initial RC drilling campaign at the Pikes Peak target, some 4 km north of Lapon Canyon. Of the 17 holes drilled during 2022, ten were drilled at Lapon Canyon with seven targeting at the Hotspot zone. Significant intercepts 1.65 g/t Au over 97.6 m at a depth of 24.4 meters including 26.95 g/t Au over 3 m from a depth of 57.9 m in drillhole LC 22-92, 1.10 g/t Au over 73.2 m at a depth of 32 m in drillhole LC 22-94, 1.25 g/t Au over 24.4 m at a depth of 39.6 m in drillhole LC 22-93, and 1.05 g/t Au over 35.5 m at a depth of 27.4 m in drillhole LC 22-91. The drilling at Hotspot extended the zone laterally along strike as well as identifying further mineralization at depth and widening the target area. The mineralization within the zone is subhorizontal to horizontal has extended the Hotspot zone along strike (laterally), depth, and width. The developments during 2022 mean that exploration at Lapon Canyon in 2023 will focus on systematic drilling along section for use in geological modeling, exploration drilling to discover new gold mineralization, and drilling to extend known gold mineralization in several directions, including at depth.

The mineralization at Lapon Canyon is located within a wide (>300 m), long (>4 km along strike) sericite and iron

oxide altered and sheared NE-SW trending fault zone. Gold mineralization is present throughout an envelope of lower grade mineralization (0.5 to 2.0 g/t Au) that surrounds high-grade structurally controlled mineralization that has been identified along a strike length >850 m and over a vertical extent of >400 m. The high-grade gold mineralization is located within discrete, traceable zones at the intersection of flat lying porphyritic dikes and vertical hydrothermal stockworks.

The initial RC drilling at Pikes Peak focused on geological reconnaissance and the development of targets for drilling in 2023, with seven holes drilled during 2022 although four of these were unable to reach their target depths as a result of technical challenges. Significant gold mineralization was intercepted at the bottom of RC drillhole PP 22-01, which contains 0.946 g/t Au over 10.6 m at depths of 96 to 107 meters. The final 4.5 m of the drillhole contains mineralization at 1.93 g/t Au within an unaltered granite, suggesting the location of a major fault zone. For more information see <https://wrrgold.com/>.

Fairplay District

County Line Project. Fortitude Gold Corp.'s County Line project, located along the boundary of Nye and Mineral counties within the Fairplay mining district, is focused on exploration for high sulfidation epithermal mineralization within the Paradise Peak area, which historically produced around 1.5 million ounces of gold and 38.9 million ounces of silver. A total of 73 RC holes were completed at the project in 2022 for a total depth of 8,231 m, focused on resource delineation in the Main County Line pit area. Drilling highlights during the year include 42.67-51.81 m at 1.24 g/t Au in drillhole CLRC-37, 12.19-25.91 m at 2.59 g/t Au in drillhole CLRC-41, 0-22.86 m at 1.34 g/t Au CLRC-43, and 13.72-22.86 m at 2.02 g/t Au in drillhole CLRC-46. A maiden resource estimate for the project was also released with measured, indicated and inferred resources containing 49,600 ounces of gold. For more information see <https://lahontangoldcorp.com/>.

Poinsettia District

Spitfire project. Gold50 drilled at the Spitfire project within the Fitting district of Mineral County in 2022. Drilling at Spitfire involved 6,660 m of RC drilling in 28 holes and targeted the Lithia, 9 Ledge and Hearst areas. Drilling generally intercepted targeted structures and rock types but did not intercept any multigram gold zones that had been indicated by surface sampling. Anomalous gold values were intercepted over various thicknesses in each area, providing encouragement for future exploration at Spitfire. For more information see: <https://www.gold50.com/>.

Santa Fe District

Isabella Pearl Mine. Production at Fortitude Gold Corp.'s Isabella Pearl Mine in 2022 was 41,232 ounces of gold and 57,058 ounces of silver from high sulfidation-type epithermal mineralization at the site. Exploration at Isabella Pearl focused on the potential addition of mineral reserves and involved 45 RC drillholes for a total depth of 7,309 m, specifically targeting in-fill and step-out drill holes on the Pearl, Scarlet, and Civit Cat targets. The majority of this drilling was conducted within the current permitted mine plan and mineralization intercepted within the bottom and walls of the pit late in 2022 further defined oxide mineralization, oxide transitional mineralization and sulfide mineralized blocks below the permitted pit bottom. Drilling beneath the pit included oxide intercepts of 3.05 m at 15.15 g/t gold within 21.34 m grading 7.21 g/t gold, and 18.29 m at 3.72 g/t gold. Non-oxide intercepts include 6.10 m at 12.17 g/t gold within 41.15 m at 6.25 g/t gold. For more information see <https://www.fortitudegold.com/>.

Santa Fe Project. The 2022 exploration drilling by Lahontan Gold Corp. at the epithermal Santa Fe project was undertaken in three phases. The first of these focused on the Slab-Calvada pit area and a total of seven RC drillholes were drilled to a total depth of 1,710 m. This drilling targeted down-dip extensions of oxidized gold and silver mineralization along the Calvada fault as well as northerly step-out drilling from the Slab pit. Significant intercepts include 25.9 m at 2.55 g/t Au and 3.4 g/t Ag of oxide and transitional mineralization in drillhole CAL22-006R. This drillhole is the most northerly step-out from the Slab pit, with gold mineralization starting at a depth of only 68.6 m downhole. Drillhole CAL22-002R also intercepted 47.2 m at 0.78 g/t Au and 1.3 g/t Ag including 32.0 m at 1.04 g/t Au and 1.4 g/t Ag, all of which is oxidized mineralization down-dip along the Calvada fault. This drilling expanded the envelope of oxide gold mineralization along this structure. The second phase of drilling involved four RC drillholes for a total depth of 883 m, targeting the down-dip extension of oxidized gold and silver mineralization to the east and northeast of the Slab pit. Significant intercepts include 32.0 m at 0.50 g/t Au and 7.9 g/t Ag of oxide and transitional mineralization including 10.7 m at 0.93 g/t Au and 18.7 g/t Ag in drillhole CAL22-010R. This drilling confirmed the presence of an easterly extension of previously mined mineralization within the Slab pit, extending mineralization at least 350 m down dip at shallow levels. The final phase of drilling in 2022 focused on five drillholes for a total depth of 1,111 m again targeting down-dip extensions of oxidized gold and silver mineralization to the east and northeast of the Slab pit. Significant intercepts include 32.0 m at 0.59 g/t Au and 4.4 g/t Ag of oxide and transitional mineralization in drill hole CAL22-016R including 6.1 m at 1.18 g/t Au and 14.4 g/t Ag. This drilling indicates that the easterly extension of mineralization from the Slab pit extends across a post-

mineralization fault, potentially opening a large area for resource expansion. A maiden resource for the project was also released during the year consisting of indicated and inferred resources containing 1,547,000 ounces of contained gold and 10,779,000 ounces of contained silver. For more information see <https://lahontangoldcorp.com/>.

NYE COUNTY

Bare Mountain District

Significant exploration was undertaken in the district by AngloGold Ashanti Ltd, who are targeting production from their Nevada operations by 2025 and 300,000 ounces of gold production per year within a decade for around 20 years, outlining a medium term aim of the development of a low-cost, long-life Nevada production base.

Merlin Project. AngloGold Ashanti Ltd. undertook drilling at the epithermal gold mineralization-focused Merlin project in 2022 although no individual drilling results were released. For more information see <https://www.anglogoldashanti.com/>.

Mother Lode Project. AngloGold Ashanti Ltd.'s Mother Lode project is focused on structurally and stratigraphically controlled disseminated epithermal gold mineralization primarily hosted by porphyritic rhyolite dikes, sedimentary units of the Joshua Hollow Formation, and Paleozoic sedimentary rocks. Structural controls consist of a series of north-trending, 50° to 70° west-dipping rhyolite dike-filled structures and the mineralization at Mother Lode is both semi-tabular and highly irregular, reflecting the ascent of mineralizing fluids through dike-filled structures in the underlying Paleozoic rocks, the Tertiary unconformity and upward into Tertiary units. Mineralizing fluids appear to have spread laterally from mineralized dykes into favorable permeable lithologies and secondary structures. AngloGold Ashanti Ltd. released a maiden resource for the project in 2022 consisting of measured, indicated and inferred resources containing 1,730,000 ounces of gold and 1,910,000 ounces of silver. For more information see <https://www.anglogoldashanti.com/>.

Silicon Project. AngloGold Ashanti Ltd.'s Silicon project is located within the western margin of the overlapping calderas of the Timber Mountain caldera complex within the SWNVF. The project is focused on low to intermediate sulfidation epithermal mineralization within a stack of ignimbrite sheets that are cross-cut by complex listric faulting. The mineralization at Silicon formed at ~11.6 Ma during a hiatus between large scale ignimbrite event but apparently contemporaneous with rhyolitic volcanism. Higher grade mineralization is structurally controlled around the Silicon-Tramway faults with lower grade disseminated mineralization hosted within a rhyolite flow. Drilling at Silicon in 2022 focused on

mineral resource definition and consisted of 262 RC drillholes, 65 diamond cored drillholes, and 40 RC collar/diamond core tail drillholes for a total drilling depth of 146,109 m. The drilling program is continuing to infill and further delineate the deposit as well as collect test work material in support of the planned prefeasibility study. The project has indicated and inferred mineral resources containing 4,220,000 ounces of gold and 17,770,000 ounces of silver, with this resource estimate increasing in size as a result of successful greenfield exploration. For more information see <https://www.anglogoldashanti.com/>.

Sterling Project. AngloGold Ashanti Ltd.'s Sterling deposit was acquired in November 2022 as a result of the acquisition of Coeur Sterling. The mineralization at Sterling is a combination of epithermal and sediment-hosted Carlin-type styles with oxidized gold mineralization controlled by thrusting and steeply dipping north-striking faults within the deposit. Gold at Sterling is hosted by units that span from the basal section of the Bonanza King Formation to the top section of the Carrara Formation. The property also hosts typically 1.5 to 9 m thick Miocene quartz latite dikes of the SWNVF, the majority of which are located along or close to the Reudy Fault zone. These dikes trend N-S and were probably emplaced along faults or fractures. Other mineralization is located within the footwall of the Fluorspar Canyon fault where it intersects a prominent N-S oriented fault system that connects with more mineralization to the south. AngloGold Ashanti Ltd. reported a maiden inferred resource of 910,000 ounces of contained gold after the acquisition of Coeur Sterling in November 2022. For more information see <https://www.anglogoldashanti.com/>.

Reward Project. Augusta Gold Corp.'s Reward project is located to the southeast of Beatty and is focused on exploration for structurally controlled, quartz vein and locally disseminated, sediment-hosted, orogenic-type mesothermal gold mineralization. The project consists of two deposits, namely the Good Hope and Golden Ace deposits, and is hosted within the Bare Mountain Complex that in turn is located within a complex tectonic setting in the Nevadan Basin and Range Province. The project was acquired by Augusta Gold Corp. in 2022 from Waterton Nevada Splitter LLC for US \$12.5 million cash, US \$15.0 million of Augusta Gold Corp. shares, and a further US \$17.5 million cash deferred payment. Augusta also released a new mineral resource estimate for the project during the year, consisting of 453,800 ounces of contained gold within measured, indicated, and inferred resources. Further economic studies on the project are also underway. For more information see <https://www.augustagold.com/>.

Belmont District

Belmont Project. Exploration at Electric Metals' Belmont project included the 2022 drill testing of six targets focused on epithermal silver mineralization. Significant intercepts include 440 g/t silver and 0.99% lead between 27.74-28.47 m in drill hole BS2202, with this high-grade zone located within wider interval between 26.76-30.82 m that averaged 134 g/t Ag. This intercept represents part of a fault/crush zone that appeared to trend at a high angle to the drill core. For more information see <https://electricmetals.com/>.

Bullfrog District

Bullfrog Project. Augusta Gold Corp.'s Bullfrog project focused on the exploration and potential development of mining operations focused on epithermal mineralization within the project area. The project is located in the southern Walker Lane trend within brittle upper plate volcanic host rocks that are significantly fractured and brecciated as a result of detachment faulting and associated dip-slip and strike-slip displacements. Mineralizing epithermal fluids passed through these host rocks and precipitated micron-sized but high-grade concentrations of gold within quartz-calcite veins as well as disseminated gold within associated stockworks. Vein-hosted mineralization is associated with little gangue barring quartz, calcite and manganese oxides, the latter of which are associated with potential byproduct silver (Ag) recovery. The highest grades within the deposit are typically associated with zones of black manganese-rich material, where early manganese calcite has been dissolved to leave brecciated and rubbly zones of quartz, remnant calcite, and wad. Mineralized veins continue up and down dip from the deposit but gold grades and thicknesses diminish rapidly above and below these elevations. The veins and vein breccias associated with the mineralization are generally associated with the MP Fault and the associated proximal hanging wall area with mineralization also present in upper and lower stockwork zones subparallel to high-grade brecciated veins within the main fault structure.

A total of six cored holes were completed during the year for a total depth of 2,596 m although no results from this drilling were released during the year. An updated mineral resource estimate for the project was also released in 2022, with an increase in contained metal in oxide and sulfide mineralization to 1,467,190 ounces of gold and 3,382,340 ounces of silver in measured, indicated and inferred resources. The project also has significant potential for expansion as drilling has indicated that mineralized structures and features continue both laterally and vertically along known mineralized trends. Specific areas for additional exploration drilling and interpretation include the Ladd Mountain and Mystery Hills targets near the Bullfrog open pit, the Polaris vein and related disseminated mineralization near the Montgomery-Shoshone open pit,

along strike and beneath Bonanza Mountain near the Bonanza open pit and in the prospective Gap area within the northern portion of the property. The next stages of project development will focus on de-risking through environmental and engineering studies that will form the foundation for permitting applications. For more information see <https://www.augustagold.com/>.

North Bullfrog Project. AngloGold Ashanti Ltd.'s North Bullfrog project focuses on low sulfidation epithermal mineralization similar to other known systems within the Walker Lane mineral belt. The project is located within the Southwestern Nevada Volcanic Field (SWNVF) in an area with Late Proterozoic to Late Paleozoic metamorphic and sedimentary basement units that are overlain by a thick pile of Miocene volcanic and lesser sedimentary rocks of the 15-7.5 Ma SWNVF. The mineralization at North Bullfrog is hosted by Miocene rhyolitic volcanic tuff and flow units with steeply dipping structures controlling high-grade gold and silver epithermal vein and stockwork mineralization and within pervasively quartz-adularia altered volcanic rocks that also host broad disseminated low grade mineralization. The majority of mineralization is hosted by the middle Miocene Sierra Blanca tuff and the dominant structural features in the area are two district-scale N-S striking normal faults, although several smaller faults located between the two major faults are important controls on hydrothermal alteration and gold mineralization. Drilling by AngloGold Ashanti Ltd. during 2022 build on previous drilling of more than 841 drillholes within the project area. Exploration in 2022 involved the drilling of 60 RC holes for a total depth of 11,950 m in order to upgrade the mineral resource classification of material within the Yellow Jacket vein and Sierra Blanca disseminated mineralized targets although these results were not included within the maiden resource reported at year end 2022. AngloGold Ashanti Ltd. also completed a condemnation drill program for proposed heap leach and mill facilities during the year. The maiden mineral resource estimate for North Bullfrog contains measured, indicated and inferred resources with 1,540,000 ounces of contained gold and 5,960,000 ounces of contained silver. For more information see <https://www.angogoldashanti.com/>.

Cloverdale District

Fortuity 89 Project. Discovery Harbor Resources Fortuity 89 project is focused on exploring for epithermal mineralization within the Walker Lane mineral belt. The property was optioned to Newcrest in 2021 who carried out a multi-phase exploration program in 2021-2022 that included magnetic, gravity and audio band magnetotelluric geophysical data acquisition, geological and alteration mapping, soil geochemical sampling and reverse circulation drilling. The drilling was unsuccessful in intersecting significant gold and Discovery Harbor returned a portion of

the original Fortuity 89 property to the underlying vendors. Discovery Harbor has also retained Fortuity 89 claims for potential future exploration. For more information see <https://discoveryharbour.com/>.

Fairplay

Gabbs Project. P2 Gold Inc.'s Gabbs project is focused on exploration for gold-copper mineralization within three known mineralized zones, namely Sullivan, Lucky Strike, and Gold Ledge. These mineralized zones are located within intrusive sills thought to be associated with an alkaline gold/copper porphyry system, with gold mineralization at a fourth zone called Car Body thought to be formed within a low-sulfidation epithermal mineralizing system. P2 Gold Inc. released a preliminary economic assessment of the project, which includes indicated and inferred resource estimates containing 1,571,000 ounces of gold, 3,849,000 ounces of silver, and 304,000,000 lbs of copper. Future exploration will focus on newly identified targets generated through recent geophysical data acquisitions. For more information see <https://www.p2gold.com/>.

Manhattan District

Manhattan/Goldwedge Project. Scorpio Gold Corp.'s Manhattan/Goldwedge project is located within the Walker Lane belt on the southern periphery of the Manhattan caldera, some 16 kilometers south of the Round Mountain Mine. The area has been mined historically, with hard rock and placer production estimated to be around half a million ounces of gold. Exploration in the area is predominantly targeting epithermal low to intermediate sulfidation mineralization and the Goldwedge area contains several styles of gold mineralization from fault breccia- and vein-hosted to stratabound replacement style mineralization in limestone and mineralization associated with pervasive quart-sericite-pyrite alteration. Scorpio expanded the project area in 2020 with the acquisition of Kinross Gold's Manhattan project area. Drilling plans in 2022 included a total of 59 RC drillholes with a total of 10,800 m of drilling. This exploration targeted the continuity of the northeastern Mustang Hill mineralization along a nearly E-W strike direction, the potential continuity of mineralization down dip of the Reliance Fault zone and the continuity of mineralization to the SE and SW of the Main Trend through the West Pit. Significant intercepts include 3.53g/t Au over 7.6 m including 14.58 g/t Au over 1.5m from 79.3 m and 4.03 g/t Au over 3.1m from 16.8 m depth within drillhole MWRC22-014. Drillhole MWRC22-018 intercepted 4.90g/t Au over 22.9 m including 38.76 g/t Au over 1.5 m from 62.5 m and 5.19 g/t Au over 9.2 m from 112.9 m, with the latter including 20.17g/t Au over 1.5 m. In addition, drillhole MWRC22-021 intercepted 3.89 g/t Au over 41.2 m from 24.4 as well as 1.75 g/t Au over 13.7 m from 266.9 m. Other intercepts include 82.4-88.5 m at 0.96 g/t Au in drillhole MWRC21-012, 13.7-19.8 meters at 1.88

g/t Au in drillhole MWRC21-016, 10.7-22.9 m at 1.31 g/t Au in drillhole MERC21-08 and 15.3-21.4 m at 0.59 g/t Au in drillhole MERC21-09. The gold mineralization within the NE Mustang Hill area of the West Pit is hosted by drusy quartz stockworks and botryoidal veins within Gold Hill quartzite and phyllite units. The mineralization is associated with disseminated pyrite and chalcopyrite as well as with intermittent iron staining. For more information see <https://scorpiogold.com/>.

Portuguese Mountain District

Smoke Project. Exploration at Phenom Resources' Smoke project in 2022 focused on the potential of the property to host Carlin-type mineralization. Drilling at the property included a 5-hole RC program with a total depth of 2,700 ft that identified the presence of a hydrothermal system within the Pilot and Devils Gate formations. Vertical drillhole SRC22-13 drilled 150 feet of gravel before intercepting a 280 ft thick section of oxidized, highly altered, quartz and alunite-bearing, veined, brecciated siltstone, probably of the Pilot Formation, with significantly elevated concentrations of arsenic (100-778 ppm) and antimony (10-38 ppm) and a single sample with an anomalous gold concentration of 88 ppb. This was underlain by altered and oxidized limestones, probably of the Devils Gate (Guilmette) Formation, to the end of the hole at 600 ft. The drilling undertaken during 2022 is widely spaced and was drilled outward from 2021 drilling focused on a prominent quartz-altered, dolomite breccia ridge. The 2022 drilling covered an area of 2.5 km x 1.25 km and was designed to test known gravity and magnetic geophysical anomalies within the predominantly gravel-covered property. The other four holes encountered massive dolomite, probably of mid Devonian age, and Tertiary volcanic units related to block faulting. For more information see <https://phenomresources.com/>.

Round Mountain District

Round Mountain Mine. Kinross Gold Corp.'s Round Mountain operations produced 433,033 ounces of gold and 619,651 ounces of silver from mining of low sulfidation epithermal mineralization during 2022, with the mine producing approximately 16.8 million ounces of gold between initial operations and the end of 2022. Mining uses a conventional open pit approach with the current pit approximately 11,000 feet long in a NW-SE orientation and 8,800 feet wide. The Gold Hill Mine within the Round Mountain operations is a small deposit located near the main Round Mountain Mine. Gold Hill is approximately 3,000 feet long in an E-W direction and up to 2,600 feet in a N-S direction. The mine is operated as an independent operation that also uses conventional open-pit mining methods. The ore at Gold Hill consists of oxide material that is placed directly on a dedicated heap leach pad. Mining at Gold Hill is currently expected to end in 2023 with

exploration around the mine area focusing on targets to the west and south of the current Round Mountain deposit. Kinross Gold Corp. completed an optimization program at Round Mountain during 2022 and will focus on underground opportunities at Phase X and Gold Hill with potentially higher margin and higher return operations compared to open pit expansions outlined in Phases W3 and S. This focus will involve the construction of an underground exploration decline at Phase X beginning in the first half of 2023 with continued mining in Phase W (W1 and W2) while simultaneously progressing underground opportunities. The open pit expansion opportunities at Phase W3 and Phase S remain in reserves and will continue to be optimized and evaluated for potential exploitation with sustained macroeconomic improvements. Recent drilling data released for Round Mountain include 490.4-551.4 m at 3.38 g/t Au in drillhole D-1139, 310.9-389.4 m at 6.90 g/t Au in drillhole D-1154, 296.3-325.5 m at 12.12 g/t Au in drillhole D-1156, and 557.2-560.2 m at 4.18 g/t Au in drillhole D-1158. For more information see <https://www.kinross.com/>.

Tonopah District

Tonopah Gold Project. Viva Gold Corp.'s Tonopah project is focused on exploration for low sulfidation epithermal gold mineralization within near vertical quartz-adularia-gold veins hosted by the Palmetto Formation and overlying Tertiary rhyolitic volcanic units. Significant alteration and mineralization in the project area are localized within a low-angle zone that includes and often parallels the erosion surface of the Palmetto Formation as well as several facies within the Tertiary volcanic units, particularly where veins and mineralized structures intersect the Palmetto-volcanic contact zone. The alteration and mineralization at the property are typical of those associated with other low sulfidation epithermal systems, with low sulfide mineralization associated with quartz-adularia and clay-sericite alteration assemblages. Vein textures within the area are indicative of high level, near surface mineralization and include void fills, crustiform coatings, colloform banding, and comb structures. Recent drilling at the project includes significant intercepts of 32.49 m at 0.20 g/t Au in drillhole TG2207, 87-174 m at 1.3 g/t Au in drillhole TG2209, 18-34 m at 0.8 g/t Au in drillhole TG2210, 40-98 m at 5.0 g/t Au in drillhole TG2211, 43-64 m at 0.5 g/t Au in drillhole TG2212, 41-49 m at 0.4 g/t Au in drillhole TG2214, 76-94 m at 5.0 g/t Au in drillhole TG2217, and 73-91 m at @ 4.1 g/t Au in drillhole TG2219. A 2022 resource estimate for the project was also released, containing measured, indicated and inferred resources of 600,000 ounces of gold. For more information see <https://vivagoldcorp.com/>.

Hughes Project. Summa Silver Corp. continued drilling at the Hughes project close to the past-producing

Belmont Mine. The project is focused on exploration for vein-hosted epithermal-style silver and gold mineralization. Drilling was undertaken at the Belmont Mine and the Murray target in 2022, with drilling at the Belmont Mine widely spaced and focusing on several different veins. Exploration focused on the Rescue veins and significant intercepts include 2,995 g/t silver equivalent over 0.8 m at 378.5 m in drillhole SUM20-19, a 50 m step-out from drillhole SUM20-06. Other drilling intercepted 6,220 g/t silver equivalent (2,910 g/t silver and 33.1 g/t gold) over 0.7 m. Drillhole SUM20-28, 450 m to the north of the Rescue veins, also intercepted 0.7 m of 1,269 g/t silver equivalent (580 g/t silver and 6.89 g/t gold). Drilling 100 m along strike from the core of the stacked and high-grade Rescue veins also intercepted several zones of vein-hosted silver and gold mineralization including 496 g/t silver equivalent (173 g/t Ag and 4.0 g/t Au) over 0.5 m in drillhole SUM22-58. This drilling identified multiple zones of banded to brecciated quartz ± adularia veins with local silver sulfides and associated argillic alteration halos, demonstrating that mineralization in this area is continuous with many of the high-grade Rescue veins along strike to the west. Further drilling and modeling are required to fully evaluate this potential of this new zone for additional higher-grade and plunging mineralized shoots.

Drilling at the Murray target in 2022 intercepted multiple zones of stacked, vein-hosted silver and gold mineralization. These infill and exploration holes aimed to investigate grade continuity and the extension of mineralization up- and down-dip along the Murray vein system. Significant intercepts include 535 g/t silver equivalent (335 g/t Ag and 2.73 g/t Au) over 4.6 m including 1,273 g/t silver equivalent (811 g/t Ag and 6.35 g/t Au) over 1.4 m in drillhole SUM22-57 and 233 g/t silver equivalent (146 g/t Ag and 1.2 g/t Au) over 5.8 m in drillhole SUM22-53. High-grade mineralization at Murray has been intercepted in several stacked structures over an area of 500 x 300 m that remains open for further expansion. Recent geological modeling at Murray suggests that the mineralization is hosted in a series of stacked veins and oblique vein-splays rather than a single complex vein. The silver and gold mineralization is also associated with broad intervals of strong argillic alteration associated with central quartz stockwork vein zones that are up to 30 m wide and local Ag-sulfide bearing, banded quartz veins. This stacked vein interpretation is supported by drilling that intercepted numerous intervals of epithermal-related mineralization and associated veins and vein-breccias in drillholes SUM22-56 and SUM22-57. Further mineralization on the property is present in multiple additional areas over a length of 3.5 km, including the Ruby discovery, a 1.3 km step out from the historic Belmont Mine. For more information see <https://summasilver.com/>.

Tonopah West Project. Blackrock Silver Corp.'s Tonopah West project is focused on exploration for

intermediate sulfidation epithermal silver and gold mineralization within the western half of the Tonopah silver district, within the Walker Lane belt. This area historically produced some 174 million ounces of silver and 1.8 million ounces of gold and the project is the first to focus on the historic workings in the property since final production around 100 years ago. Exploration to date has identified 4 km of vein extensions with the system remaining open for further exploration. A maiden resource estimate was released for the project in 2022 with 19,902,000 ounces of contained silver and 238,000 ounces of contained gold within inferred resources. Recent drilling at the project included intercepts of 565.1-567.1 m at 3.64 g/t Au, 377.3 g/t Ag in drillhole TXC21-045, 428.9-430.1 m at 1.71 g/t Au, 303 g/t Ag in drillhole TXC21-047, 553.2-554.7 m at 2.0 g/t Au, 298 g/t Ag in drillhole TW21-109, and 538-541 m at 1.16 g/t Au, 176.5 g/t Ag in drillhole TW21-116. For more information see <https://blackrocksilver.com/>.

Tybo District

Bolo Project. CopAur Minerals Inc. Bolo project is focused on exploration for Carlin-type mineralization and earlier geophysical and geological data acquisition identified a km-long prospective exploration target northeast of drill confirmed gold mineralization at the South Mine Fault area along strike of the parallel East Fault. Drilling at the project in 2022 included RC and diamond core drilling focused at the South Mine Fault Zone, yielding drill intercepts that include 1.2 g/t Au over 122 m and demonstrate the continuity of mineralization over 350 m. Total drilling depth for 2022 was over 4,000 m and included both expansion drilling at the South Mine Fault area (1,000 m) and exploration drilling of new targets. This drilling completes work expenditures for 2022 that enabled CopAur Minerals Inc. to earn an initial 50.01% ownership interest in the Bolo Project and to have the opportunity to increase ownership to 75% by completing an additional \$4,000,000 of expenditures over the next 2 years. For more information see <https://copaur.com/>.

PERSHING COUNTY

Antelope District

Majuba Hill Project. Majuba Hill Copper Corp.'s Majuba Hill project is focused on exploration for Cu-Au-±Ag mineralization suggestive of both porphyry copper and silver-tin style mineralization. Previous mining in the project area was small scale and focused on the Majuba fault zone and veins in subordinate structures. Previous drilling has identified a body of oxide copper-silver mineralization, but this body has not been fully defined or properly modeled to yield a mineral resource estimate. Exploration on the project in 2022 included significant soil geochemistry, with 1050 additional soil samples significantly increasing the size

of the DeSoto and the Copper Gold target zones. Geochronological analysis indicates that the project area hosts a series of temporally overlapping copper, molybdenum and tin porphyry-style mineralizing events. A total of three core holes for an overall depth of 2,706 m was undertaken during the year, with intercepted porphyry-style veining and alteration zoning indicating that the intensity of porphyry copper mineralization increases towards the northeast. Drilling in 2022 focused on the Majuba target zone in order to complete deeper holes and extend copper mineralization intercepted in 2020 and 2021. Significant intercepts include 346.3 m at 0.25% copper equivalent (CuEQ) starting at 216.4 m in drillhole MHB-27 including 254.2 m at 0.31% CuEQ at 228.6-482.8 m and 36.3 m at 0.14% CuEQ at 526.4-562.7 m. Drillhole MHB-28 also intercepted 392 m at 0.30% CuEQ from a depth of 74.7 m including 198.7 m at 0.33% CuEQ from 595 to 1247 ft, 58.5 m at 0.21% CuEQ from 1340 to 1532 ft, and 32 m at 0.18% CuEQ from 1542 to 1647 ft. For more information see <https://www.majubahillcopper.com/>.

Farrell District

Wildcat project. Integra Resources Corp. acquired the Wildcat project as a result of a merger with Millennial Precious Metals Corp. The property contains gold-dominated low sulfidation quartz-calcite-adularia-illite epithermal vein and disseminated oxide and sulfide mineralization hosted by volcanic and intrusive units of the bimodal basalt-rhyolite assemblage of the northwestern Great Basin. Integra announced that the company was preparing an updated mineral resource estimate to incorporate Millennial's 2021-2022 drill program that involved 1,250 m of drilling at Wildcat. Significant drilling intercepts at Wildcat include 39.2 m of 1.26 g/t oxide Au, 41.4 m of 0.93 g/t oxide Au, and 120.2 m of 0.39 g/t oxide Au. Material from the property was also used for metallurgical testing during the year, and final mining and engineering studies are underway to support a combined maiden PEA for Wildcat and the Mountain View project (discussed elsewhere in this report), expected to be released in late Q2 2023. A resource expansion drill program is also likely to be undertaken at Wildcat in 2023 to test potential extensions of the oxide resource and demonstrate growth potential in previously un-explored areas surrounding the proposed main pit. For more information see <http://www.integrareources.com/>.

Imlay District

Florida Canyon Mine. Argonaut Gold Inc.'s Florida Canyon Mine represents a large epithermal gold deposit adjacent to an active geothermal system. The mine produced 49,440 ounces of gold and 30,414 ounces of silver in 2022. The close spatial association with the active geothermal system has led to a general belief that Florida Canyon is a hot spring-style, epithermal gold deposit. The

hydrothermal alteration assemblages and mineralogy of both oxidized and unoxidized gold mineralization at Florida Canyon are also indicative of a low-sulfidation, epithermal mineralizing system. The mine has been operating continuously barring sporadic periods of interrupted production since 1986. Mineralization and alteration within the Florida Canyon Mine are generally localized where the Midas trench lineament is intercepted by north-south trending Basin and Range frontal faults on the northwest side of the Humboldt Range. The deposit type is a large fault/fracture-controlled gold system with an overall extent defined by alteration and the oxidation of the hosting metasedimentary rocks. Mineralization is preferentially located along major structural trends, within associated adjacent fractures and foliations, and as dissemination mineralization throughout favorable host rock lithologies. The overall extent of mineralization within surface exposures in the pit area is approximately 7500 ft E-W by 6200 ft N-S and up to 800 ft in vertical thickness. Drilling at the mine focused on targeting gold mineralization in sulfides beneath the oxide mineralization, with significant intercepts including 140.2-198.1 m at 2.0 g/t Au in drillhole FCM-0123, 128-201.2 m at 8.8 g/t Au in drillhole FCM-0124, 91.4-160 m at 2.8 g/t Au including 103.6-150.9 m at 3.9 g/t Au in drillhole FCM-0155, and 71.6-164.6 m at 0.9 g/t Au and 172.2-263.7 m at 0.8 g/t Au in drillhole FCM-0118. For more information see <https://www.argonautgold.com/>.

Kennedy District

Star Project. Getchell Gold Corp.'s Star project is focused on two main mineralized occurrences, the formerly producing Star Point copper mine and the Star South Cu-Au-Ag prospect located 2 km to the south. The project area contains three identified targets defined using mapping, sampling and gravity, magnetic, radiometric and induced polarization/resistivity data. Initial drilling at the project began in June 2022 although no results were released from this drilling. For more information see <https://getchellgold.com/>.

Rochester District

Rochester Mine, Lincoln Hill, and Nevada Packard. The Coeur Rochester Mine is an open pit, heap leach silver-gold operation that consists of the main Rochester deposit, the adjacent Nevada Packard deposit southwest of the Rochester Mine, and the Lincoln Hill, Gold Ridge, and Wilco exploration projects. Operations at the Rochester Mine initially began in 1986 and were briefly suspended from 2007 through 2010 before starting of mining that continues to the present day. The mine produced 34,735 ounces of gold and 3,061,924 ounces of silver in 2022 and is currently undergoing the largest expansion project in the mine's history termed Plan of Operations Amendment 11, or POA 11. This project

consists of the development of a Stage VI leach pad, a Merrill-Crowe processing plant, a crushing circuit, and related infrastructure. The POA 11 project is likely to extend Rochester's mine life for 13 years. Drilling in 2022 included validation and infill drilling at Lincoln Hill, expansion drilling at the Rochester and Nevada Packard pits, and condemnation drilling for infrastructure development. For more information see <https://coeur.com/>.

STOREY COUNTY

Comstock District

Comstock Lode Project. Tonogold Resources Inc. undertook exploration in 2022 focused on the Occidental/Brunswick Lode and the Silver City lodes, epithermal vein structure containing gold and silver mineralization east of and parallel to the main Comstock Lode, all of which dip to the east at approximately 45 degrees. The Lucerne deposit is located within the Silver City Lode, one of three mineralized zones of interest within the project area. Tonogold released a mineral resource estimate for the Lucerne deposit during 2022 with indicated and inferred resources containing 519,000 ounces of gold and 5,852,000 ounces of silver. However, Tonogold Resources Inc. declined to exercise the option to acquire the Lucerne property from Comstock Inc. in early January 2023, with the option for the American Flats processing facility and the mineral exploration lease covering the Northern Targets terminated by Comstock Inc. as a result of past-due balances. Tonogold also indicated ongoing negotiations for revised lease terms for the Northern Targets that if executed would allow Tonogold to continue exploration of these areas. These Northern Targets encompass the Gold Hill segment of the world class Comstock Lode and a portion of the subparallel Occidental/Brunswick Lode, although the outcomes of these negotiations remain unclear. For more information see <https://tonogold.com/>.

WASHOE COUNTY

Deephole District

Mountain View Project. Integra Resources Corp. acquired the Mountain View project as a result of a merger with Millennial Precious Metals Corp. Some 7,200 m of exploration drilling was undertaken at the project in 2022, with significant intercepts including 111.5-344.0 m at 0.91 g/t Au in drillhole MVCD-16A, 120.1-309.1 m at 0.46 g/t Au in drillhole MVCD-021, and 185.5 m of 1.48 g/t oxide Au, 128.3 m of 1.73 g/t oxide Au, and 232.5 m of 0.91 g/t oxide Au. Material from the project was also used for metallurgical testing and final mining and engineering studies are underway to support the combined maiden preliminary economic assessment for the Wildcat

(discussed elsewhere in this report) and Mountain View projects, released in late Q2 of 2023. <http://www.integraresources.com/>.

Leadville District

Hog Ranch Project. Rex Minerals Ltd.'s Hog Ranch Property consists of the Bells project area within the southern end of the property and the Krista project area at the northern end of the property. The project also contains a number of other targets that include Cameco, Airport, and Gilliam. Exploration in this area is focused on epithermal hot spring-type gold systems similar to other epithermal gold deposits within this area. Mineralization at Hog Ranch is hosted by a series of relatively flat lying or gently west-dipping welded and often flow banded rhyolite flows and unwelded volcanic tuffs. The property contains a number of regional structures that have NE-SW and NW-SE orientations, crosscut the stratigraphy and are a key control on gold mineralization. The project area contains two styles of gold mineralization. These are extensive shallow and low-grade gold mineralization within 100 m of the paleo water-table, which extends along more porous unwelded volcanic tuff units, and higher grade quartz-adularia vein-hosted gold mineralization within feeder structures underneath the large blanket of disseminated gold mineralization. The latter is likely to have developed at more than 200 m below the present-day surface and is analogous to high-grade vein-hosted gold mineralization elsewhere within this region. Drilling at the property included significant intercepts of 18.3-140.2 m at 0.46 g/t Au in drillhole HR21-021, 4.6-73.2 m at 0.47 g/t Au in drillhole HR21-022, 12.2-141.7 m at 0.55 g/t Au in drillhole HR21-023, and 36.6-114.3 mm at 0.58 g/t Au in drillhole HR21-024. Additional intercepts include 76.7-89.9 m at 0.30 g/t Au in drillhole HR22-07, 88.4-123.4 m at 0.30 g/t Au in drillhole HR22-08, 1.5-29.0 m at 0.43 g/t Au in drillhole HR22-12, and 3.0-35.1 m at 0.71 g/t Au in drillhole HR22-13. For more information see <https://www.rexminerals.com.au/>.

Pyramid District

Pyramid Silver-Gold Project. Tertiary Minerals' Pyramid Silver-Gold Project completed soil, rock chip sampling, and trenching throughout 2022 that established wide intervals of significant silver and gold mineralization in the North Ruth area target area. Additional trenching was undertaken during February 2022 that provided additional evidence for the extent of the mineralization. In addition, the RC drilling of six drillholes totaling 1050 m was completed in March of 2022 in order to explore potential mineralization at the project site. However, drilling results returned were unfavorable and mineralization at depth was not established and the company elected to terminate the project shortly after results were returned. For more information see <https://www.tertiaryminerals.com/>.

San Emidio District

Wind Mountain Project. Bravada Gold Corp.'s Wind Mountain project focuses on exploration in a past-producing area with two former open pits that yielded nearly 300,000 ounces of gold and more than 1.7 million ounces of silver from 1989 to 1999. A new resource estimate and preliminary economic assessment for the project was released in 2022. The resource estimate includes 495,900 ounces of contained gold and 12,304,000 ounces of contained silver in indicated and inferred resources. Drilling in 2022 focused on three deep RC drillholes that explored beneath a previously identified banded vein zone intercepted during drilling in 2022. The 2022 drilling intercepted low-grade disseminated gold and silver within the Truckee Formation, which is the host for the current resource of disseminated oxide gold to the north of the Feeder target. However, the banded quartz vein zone did not persist to the depths tested by this drilling. For more information see <https://bravadagold.com/>.

WHITE PINE COUNTY

Bald Mountain District

Bald Mountain Mine. Kinross Gold Corp.'s Bald Mountain Mine produced 213,210 ounces of gold and 73,554 ounces of silver during 2022. Placer gold with minor amounts of copper, silver, and antimony were initially mined in the area between the 1870s and 1890s, with modern exploration beginning in the 1970s and mining starting in the early 1980s. Current operations are open pit with production from a number of different pits. The two main deposits at the site, Saga and LBM, represent approximately 76% of known reserves with several other deposits scattered over the property. Mining is presently anticipated to continue through to 2024 with gold recovery continuing for several years after this from the heap leach pads at the site. Exploration efforts are underway to identify new resources to extend the life of the mine and in 2022 exploration focused on drilling near-mine targets proximal to current operations and target delineation and early stage drill testing of high-potential targets throughout the large project area. A total of 8,150 m of drilling was completed over six target areas in the year, with a primary focus on building volume for the potential Top high-grade underground resource at the site and further evaluation of the Zed Williams and Wino targets. Drilling at the Top target identified high grade mineralization in a critical area and confirmed that oxide mineralization continues at significant distances beyond previously known intercepts. Significant intercepts include 24.2 m at 19.24 g/t in drillhole TD21-006 and 4.6 m at 6.80 g/t Au in drillhole TD22-008. The Zed Williams target is located southeast of the previously mined Numbers pits and is located within the Bida intrusive-related zone of mineralization. The target is

primarily near-surface and consists of thick intervals of low-grade mineralization over a broad area. Significant intercepts in 2022 include 26.5 m at 1.76 g/t Au and 8.8 m at 4.07 g/t Au in drillhole NAD22-016, 40.9 m at 0.69 g/t Au including 6.4 m at 3.09 g/t Au in drillhole NA22-015, and 56.4 m at 0.64 g/t Au including 13.1 m at 1.79 g/t Au in drillhole ZWD22-016. For more information see <https://www.kinross.com/>.

Butte Valley District

Limousine Butte. NevGold's Limousine (Limo) Butte project is located at the southern end of the Carlin trend and is focused on exploration for Carlin-type mineralization. The area has been explored since the 1940s with some mining occurring between 1988 and 1990. The mineralization in the project area is sediment-hosted and consists of disseminated gold mineralization associated with the hydrothermal alteration and silicification of the carbonate-bearing Mississippian and Devonian calcareous shale host rocks. The area contains NW-SE trending structures that localize mineralization in areas where these structural features intersect the NE-SW trending Black Metals and Exchequer faults, most likely as a result of hydrothermal fluids travelling along the NW-SE structures. Gold mineralization was preceded by a minimum of two episodes of brecciation and silicification with mineralized breccias consisting of silicified fragments in a matrix of massive silica that also contains pyrite, stibnite, stibiconite, and barite. The offsetting of early-formed jasperoids within the NE-SW trending structures by the NW-SE trending faults created channel ways for mineralizing fluids within heavily fractured host rocks.

The 2022 drilling program at Limousine Butte involved 10,000 m of drilling that identified numerous drill targets with the potential to infill and expand the mineralized footprints at the Resurrection Ridge and Cadillac Valley target areas and advance both to potentially updated resource estimates as well as identifying new exploration targets in untested parts of the project. A number of significant intercepts were generated during 2022 drilling, including 0.53 g/t oxide Au over 74.7 m that includes 0.81 g/t oxide Au over 19.9 m within drillhole RR22-001, an important step out from known mineralization. The current mineralized area at Resurrection Ridge is now thought to extend >700 m along strike and >350 m laterally. Drillhole CV22-001 also intercepted 2.13 g/t oxide Au over 58.2 m including 12.32 g/t oxide Au over 5.9 m. The Cadillac Valley South Discovery was also expanded by drilling in 2022 with drillhole CV22-007 intercepting 0.44 g/t oxide Au over 36.6 mm from a drill pad more than 650 meters from CV22-002, which intercepted 0.83 g/t oxide Au over 126.2 mm and expands the known mineralization over 100 m to the northwest of CV22-006, which intercepted 0.51 g/t oxide Au over 73.1 m. The CV22-004 drillhole at Cadillac Valley also intercepted 0.63 g/t oxide Au over 73.2 m, which includes

1.00 g/t oxide Au over 19.8 meters at the top of the mineralized zone. For more information see <https://nev-gold.com/>.

Selena. Ridgeline Minerals Selena project is a shallow oxide, silver-gold-lead-zinc project that is focusing on exploration for zoned Ag-Au-Pb-Zn carbonate replacement deposit-type mineralization. The project contains potentially open-pittable mineralization in the Chinchilla, Juniper, Revival, and Broken Egg areas as well as deeper high-grade potential areas. The project is located close to a known copper-gold porphyry system located ~1 km to the west of the property, which Ridgeline interprets to be the primary source of the hydrothermal fluids that formed the mineralization on the property.

A total of seven drillholes were completed at the property in 2022, two of which focused on the Chinchilla target, four on the Broken Egg target, and a single drillhole at the Juniper carbonate replacement deposit target. Significant intercepts from the Chinchilla target include 1.5 m at 581.0 g/t Ag, 0.2% Zn, and 2.0% W starting at 244 m downhole in drillhole SE22-039A. This drillhole was a 11.7 m wedge that was attempted from original parent drill hole SE22-039, which intercepted 15.9 m at 83.5 g/t Ag, 0.10% Pb, 0.14% Zn, and 0.02 g/t Au including 0.5 m at 1,793 g/t Ag, 2.2% W, 0.08% Pb, 0.15% Zn, and 0.09 g/t Au. This mineralization is vertically continuous over 30 m, is located within a structurally controlled zone of high-grade silver-tungsten mineralization hosted within porphyritic quartz-feldspar dike units, and is atypical of the carbonate replacement mineralization found elsewhere at Selena.

The remaining five cored drillholes at the project included four holes at Broken Egg and one hole at the Juniper target. The drilling at Broken Egg intercepted 4.4 m at 0.68 g/t Au including 0.5m at 2.66 g/t Au starting at 0.6m downhole in drillhole SE22-044. Significant intercepts from the Juniper target include 6.5 m at 0.27 g/t Au and 0.7 m at 34.44 g/t Ag, 0.25% Pb, 0.10% Zn and 0.47 g/t Au in drillhole SE22-040. This carbonate replacement mineralization is located within a fault-controlled breccia zone on the footwall side of the Aurym fault, with future drilling focusing on the hanging wall side of the fault (interpreted as a primary feeder fault to the Juniper target). Future drilling will focus on the hanging wall side of the Aurym fault. For more information see <https://www.ridgelineminerals.com/>.

Pancake District

Pan Project. Calibre Mining Corp.'s Pan project consists of an open pit heap leach operation mining gold from Carlin-type mineralization to the southeast of Eureka. Production in 2022 was 43,186 ounces of gold. The project area contains three main mineralized zones named North, Central, and South. The mineralization at Pan is spatially related to the Devils Gate Limestone–Pilot Shale contact in all three zones and is also controlled by steeply dipping N-S

faults and WNW-ENE trending fold axes. The deposits host Carlin-type mineralization consisting of disseminated gold hosted within sedimentary rock units, the majority of which is present within solution breccias developed in association with faults. Other mineralization is hosted in favorable stratigraphic locations, including within the lower Pilot Shale and the siltier upper portions of the Devils Gate Limestone.

Exploration drilling at Pan in 2022 consisted of a total of 240 RC drillholes for a total depth of 135,330 ft and 21 HQ size core holes for a total depth of 10,310 ft. This program focused on expanding and upgrading the known resource for the project and exploration for new mineralization within and outside the mine area. The drilling in 2022 focused on the Mustang, North Banshee, Palomino, Pegasus, Dynamite, Black Stallion South, Dune, Boulders, Syncline, Black Stallion, Orpiment Alley, Benji, North Dynamite, South Pit, and Limestone Canyon targets, as well as the Happy Valley, Chainman Point, Coyote, and Gattica targets that lie outside of the open pit operation and had not previously been tested. The four RC drillholes at Coyote, some 3 km south to southwest of the Pan South pit, include drillhole PR22-238, which intercepted 1.36 g/t Au over 45 ft including 2.78 g/t Au over 15 ft and drillhole PR22-237, which intercepted 0.61 g/t Au over 60 ft in. The exploration drilling at North Dynamite extended known mineralization down dip and along strike, expanding mineralization north from the Dynamite Pit. Significant intercepts include 0.47 g/t Au over 60 ft in drillhole PR22-210, 1.67 g/t Au over 40 ft including 2.12 g/t Au over 30 ft in drillhole PR22-224, and 0.67 g/t Au over 75 ft including 1.14 g/t Au over 30 ft in drillhole PR22-190. The five RC holes and single core hole drilled at Pegasus, along the eastern margin of the South Pit, intercepted mineralization at depth, including within drillhole PR22-085, which intercepted 1.47 g/t Au over 140 ft including 70 ft at 2.33 g/t Au.

The mineral resources and ore reserves for the Pan project were also updated in late 2022. Proven and probable reserves contain 264,000 ounces of gold, with measured, indicated and inferred resources containing 401,000 ounces of gold. For more information see <https://www.calibremining.com/>.

Robinson District

Robinson Mine. KGHM continued delineation drilling within current porphyry copper-gold mining operations and continued with near mine exploration within the Lane Valley to the northwest of the Robinson Mine. Mining operations at Robinson produced 41,346 ounces of gold, 256,312 ounces of silver, 108,416,295 lbs of copper, and 275,620 lbs of molybdenum in 2022. The mining operations at Robinson are developing a solar farm and adding years to life-of-mine expectations as a result of ongoing exploration and planning. Equipment

commissioning continued during the year, including commissioning of a Caterpillar 7495 electric shovel, a total of 11 new 240-ton Komatsu haul trucks, three autonomous drill rigs for blasting, a new loader, and a new dozer. The solar farm will be developed on 15 acres of waste dump material to provide a portion of the power used in operations, with a total of 4,446 solar panels producing 3 megawatts of electricity, or about 10% of the electricity used by the operation.

White Pine District

Gold Rock project. Calibre Mining Corp. acquired the Gold Rock project from Fiore Gold in 2021 and the project focuses on similar Carlin-type mineralization as that found at Calibre Mining Corp.'s Pan project described above. Drilling in 2022 at Gold Rock focused on the de-risking of the near-surface oxide project through infill and condemnation drilling, geometallurgical classification, and structural modeling. This drill program also intercepted high-grade, sulfide mineralization in areas previously untested by drilling, with this mineralization remaining open to depth. Magnetic geophysical data for the project also indicates the presence of a large, deep-seated magnetic low that may be indicative of a Carlin-style feeder system. Significant intercepts include 93.9-105.0 m at 0.68 g/t Au in drillhole GL20-014, 173.9-199.5 m at 0.80 g/t Au in drillhole GL20-015, 111.0-119.8 m 1.22 g/t Au in drillhole GL20-016, and 85.8-122.8 m at 2.61 g/t Au in drillhole GL20-020, with higher grade but smaller intercepts present in multiple drillholes. Further drilling planned in 2023 with focus on testing the deeper sulfide target at depth. For more information see <https://www.calibremining.com/>.

Green Springs Project. Centerra Gold Inc. announced that it acquired an option to earn a 70% interest in the Green Springs Property from Contact Gold Corp. for \$1,000,000 cash and \$10,000,000 in exploration expenditures over 4 years. The Green Springs project is located near the southern end of the Cortez trend and includes three shallow past producing open pits and multiple discoveries made by Contact Gold, including the high-grade oxide, near surface X-Ray and Tango Zones. The gold mineralization at Green Springs is hosted within the same Chainman Shale and Pilot Shale units that host the Gold Rock and Pan discoveries discussed above. A total of 23 drillholes were completed by Contact Gold Corp. in 2022 for a total depth of 2,123 m, all of which were focused on growing the high-grade Tango, X-Ray, and B-C Gap oxide gold discoveries identified in 2021. Significant intercepts include 1.66 g/t Au over 28.96 m from a depth of 9.14 m in drillhole GS22-01, 0.82 g/t Au over 35.05 m from a depth of 9.14 m in drillhole GS22-02, and 1.95 g/t Au over 41.15 m from a depth of 15.24 m in drillhole GS22-04, all of which contain higher grade but thinner intercepts. Drilling at Tango focused on a partially exposed zone of oxidized gold

mineralization that dips to the west beneath the barren Joana Limestone. Drilling at Tango included intercepts of 0.51 g/t Au over 30.48 m from a depth of 4.57 m in drillhole GS22-09, 0.70 g/t Au over 16.76 mm from a depth of 3.05 m in drillhole GS22-08, and 0.45 g/t Au over 24.38 m from a depth of 19.81 m in drillhole GS22-11. For more information see <https://www.centerragold.com/>.

ACKNOWLEDGMENTS

Mike Brady is thanked for providing significant data relating to Nevada exploration report updates and Lucia Patterson with the Nevada Division of Minerals is thanked for contributing data used in this chapter.

INDUSTRIAL MINERALS

by Rachel Micander

At the time of publication, the 2022 *Net Proceeds of Minerals Bulletin* had yet to be released by the Nevada Department of Taxation. For this reason, gross proceeds reported in this report should be considered preliminary and are subject to change.

According to preliminary and unpublished data from the Nevada Department of Taxation (NDT), the total value of industrial minerals produced in Nevada during 2022 was estimated to be \$619,339,025, not including aggregates. The value of aggregates—sourced from the USGS Mineral Industry Survey—was estimated to be 285,000,000 bringing the total value of industrial minerals produced in Nevada to \$619,339,025. Data used for these estimates, and data reported for individual commodities below were obtained from the Nevada Division of Minerals (NDOM), the Nevada Department of Taxation, and the U.S. Geological Survey (USGS). Data are given in short tons unless otherwise noted. Individual and compiled state production data are from the annual status and production report issued by NDOM. The gross proceeds are from preliminary data from NDT. USGS data (mostly domestic production, consumption, prices, and trends) are from the minerals commodities summaries on the agency’s website located here: <https://www.usgs.gov/centers/nmic/commodity-statistics-and-information>.

Aggregate (Dimension Stone, Sand and Gravel, Crushed Stone, Landscape Rock, and Decomposed Granite)

According to the USGS mineral industry survey, 2.46 billion metric tons of aggregate valued at more than \$31 billion were produced nationwide in 2022. Of the aggregate operations in Nevada that reported annual status and production to NDOM, a total of 9,693,378 tons and 66,941 yards of aggregate were mined in 2022. 587,716 tons of decomposed granite (DG) were mined at the Donovan pit off of Pyramid Way in Sparks, NV. 853,868 tons of sand were mined from various pits in Fallon, Fernley, Sparks, Henderson, Las Vegas, Jean, Ely, and Panaca. 3232 yards of gravel were mined from pits in Pershing County.

Approximately 8,347,902 tons and 2050 yards of aggregate were produced in 2022. DG was produced from a pit in Sparks totaling 459,796 tons. Sand was produced from various pits in Las Vegas, Panaca, Sparks, and Jean totaling 612,391.55 tons.

An approximate total of aggregates shipped in 2022 was 7,217,006 tons and 12,811 yards. A total of 587,716 tons of DG were shipped from an operation in Sparks. A total of approximately 399,100 tons of sand were shipped from operations in Las Vegas, Panaca, Jean, and Sparks.

Approximately 2.5 million tons of dimension stone, valued at \$520 million, was sold or used by U.S. producers in 2022. In Nevada, two operations reported mining, producing, and/or shipping quartzite throughout 2022. Las Vegas Rock mined 483 tons, produced 1053 tons and shipped 1102 tons of quartzite from their Rainbow Quarries facility in Clark County. Mt. Moriah Stone Quarries, LLC mines 2857.35 tons and shipped 4760.23 tons of quartzite from their quarry in White Pine County.

Barite

In 2022, domestic barite mining activities were carried out by three companies in Nevada. Two of these mines, which had been dormant for several years, resumed production; one had been inactive since 2016, while the other had ceased operations in 2020. This led to an increase in mine production, although specific data were not disclosed to protect company proprietary information. Additionally, a gold-mining company in Nevada acquired the barite assets of a fourth company, which included two mines and a grinding plant. The primary motivation behind this acquisition was to secure access to water and rail infrastructure, rather than to resume barite production (USGS, 2022). Throughout the year, approximately 2.1 million metric tons of barite were sold in the United States, sourced from both domestic production and imports. These sales were facilitated by crushers and grinders operating across nine different states. Furthermore, a Turkish-based company made a significant investment of \$10 million to construct a new grinding plant in Moundsville, West Virginia.

According to preliminary and unpublished data from NDT, the gross yield for barite was \$35,890,645 in 2022. More than 90% of the barite sold in the United States is used as a weighting agent in fluids used in the drilling of oil and natural gas wells. Barite also has its uses in the automotive industry, and in paint, plastics, and rubber. Due to barite’s ability to block x-ray and gamma-ray emissions, it is used in high-density concrete for radiation shielding in multiple industries where such radioactive emissions pose a threat to exposure (USGS, 2022).

Barite production came from four properties in Nevada. Those were the Big Ledge Mine/Osino Mill in Elko County, the Rossi Mine and Dunphy Mill also in Elko County, the Battle Mountain Grinding Plant in Lander County, and the Maggie Creek Operation in Eureka County.

The Rossi Mine and Dunphy Mill are operated by Halliburton Energy Services and reported mined a total of 398,569 tons and produced 123,254 tons of barite. A total of 91,806 tons of barite was shipped by this operation. The Big Ledge/Osino Mill owned by Drilling Minerals Industries, LLC produced 56,386 tons and shipped 55,354 tons of barite. The Battle Mountain Grinding Plant, owned by M-I LLC produced and shipped 249,243 tons each of Barite. The Maggie Creek Operation, owned by Progressive

Contracting, Inc. produced 63,740 tons and shipped 57,343 tons of barite in 2022.

Cement

In 2022, the production of Portland cement in the United States experienced a modest uptick, reaching an estimated 95 million metric tons. Simultaneously, masonry cement production also saw an increase, reaching an estimated 2.5 million metric tons. Cement production took place at 96 facilities spread across 34 states, with an additional two plants located in Puerto Rico. The leading cement-producing states, ranked in descending order of production, were Texas, Missouri, California, and Florida. These four states collectively accounted for approximately 43% of the total cement production in the United States.

Nevada Cement Co. is the only producer of cement in Nevada and distributes bulk and sack cement. Nevada Cement mined both limestone and pozzolan from operations in Lyon, Pershing, and Churchill counties. In 2022, the company produced 496,628 tons of cement at their Fernley Limestone Plant. They shipped 504,687 from the same plant. See sections on Lime, Limestone, and Dolomite and Pozzolan for more detailed information and production amounts.

Clay Minerals

Domestic clay production was estimated to be 26 million metric tons valued at \$1.7 billion in 2022. This was an increase 13% from 2021. The USGS divides clay into ball clay, bentonite, common clay, fire clay, fuller's earth, and kaolin. The total gross yield was \$15,049,337 for Nevada operations. This number includes the gross yield for pozzolan as well.

In the past, operations in Nevada have mined and produced alum sulfur, bentonite, hectorite, kaolinite, montmorillonite, saponite, sepiolite, smectite, and mixed clays. According to the annual status and production report, 23,378 tons of bentonite and 42,830 tons of sepiolite were mined by Lhoist North America at their Amargosa Clay Operation. In addition, they produced 12,669 tons of bentonite, 2606 tons of saponite, and 35,646 tons of sepiolite from the same facility. Vanderbilt Minerals, LLC mined 2220 tons and produced 1518 tons of smectite at their Buff/Satin Mine in Pershing County. Vanderbilt Minerals also produced 1870 tons of smectite at their Blanco Mine in Esmeralda County and 220 tons of smectite at the New Discovery Mine and Mill in Nye County. Nevada Cement mined 16,164 tons of unspecified clay materials at their Flanigan Clay Mine in Washoe County.

American Colloid Company shipped 754 tons of bentonite from their Nassau facility in Pershing County. Lhoist North America shipped 10,176 tons of bentonite, 2514 tons of saponite, and 24,851 tons of sepiolite all from the Amargosa Clay Operation in Nye County. Vanderbilt

Minerals shipped 1598 tons of smectite from the Blanco Mine, 220 tons of smectite from the New Discovery Mine and Mill, and 1452 tons of smectite from the Buff/Satin Mine.

Lhoist North America filed surface management notices for 4.8 acres in section 21, T17S, R51E in Nye County. The commodity was listed as "clay, common" and case disposition was listed as pending as of 8/1/2022.

Diatomite

In 2022, the nationwide production of diatomite, also known as diatomaceous earth, amounted to an estimated 1.1 million metric tons, with a processed value estimated at \$450 million (free on board, or f.o.b., at the plant). This production was carried out by six companies operating across 12 mining areas and nine processing facilities located in California, Nevada, Oregon, and Washington. Approximately 55% of the diatomite produced was utilized in the manufacture of filtration products, while the remaining 45% found applications in absorbents, fillers, lightweight aggregates, and various other industrial uses. A relatively small fraction, less than 1%, was dedicated to specialized pharmaceutical and biomedical purposes. Total gross yield of diatomite produced in Nevada was \$60,206,058, a 17.4% increase from 2021.

A total of 327,293 tons of diatomite were mined by three different companies across five counties in Nevada throughout 2022. U.S. Silica mined 51,456 tons from the Fernley Diatomite Operation (Churchill County), 52,836 tons from the Clark Mine in Storey County, and 191,522 tons from the Colado Mine in Pershing County. Grefco Minerals, Inc. mined 7585 tons from the Basalt Diatomite Mine in Mineral and Esmeralda counties. Imerys Minerals of California, Inc. mined 23,894 tons from the Nightingale Pit in Churchill County.

Approximately 270,475 tons of diatomite were produced by the same three companies at six different operations. Grefco Minerals produced 7266 tons from the Basalt Diatomite Mine. Imerys Minerals of California produced 23,375 minerals from the Nightingale pit. U.S. Silica produced 7662 tons from the Hazen Pit in Lyon and Churchill counties, 49,402 tons from the Clark Mill in Storey County, 140,692 tons from the Colado Plant, and 42,118 tons from the Fernley Diatomite Operation.

Shipped diatomite came from the same operations that produced diatomite and totaled 242,971 tons. Grefco Minerals shipped 7636 tons from the Basalt Diatomite Mine, Imerys Minerals of California shipped 23,375 from the Nightingale Pit, and U.S. Silica shipped a combined total of 21,960 tons of diatomite from their Hazen Mine, Clark Mill, Colado Plant, and Fernley Diatomite Operation.

Gemstones

The combined value of domestic production of natural and synthetic gemstones was \$95 million, a 7% increase from the previous year. Domestic production of natural gemstones include agate, beryl, coral, diamond, garnet, jade, jasper, opal, pearl, quartz, sapphire, topaz, tourmaline, and turquoise, among others. Nevada produces opal, petrified wood, and turquoise from a few gemstone mines throughout the state.

Precious opal is produced from several small mines in the Virgin Valley area of northern Humboldt County, a well-known source of gemstones in North America. The best-known mines are the Bonanza, Rainbow Ridge, and Royal Peacock Mines, which are pay-to-dig operations. According to the annual status and production report, Bonanza Opal Mine mined, produced, and shipped 94 pounds (~43 kg) of petrified wood, 2 pounds (0.915 kg) of common opal, and 20 pounds (9.1 kg) of opal potch. Rainbow Ridge Opal Mine mined a total of 50 pounds (22.7 kg) of fire opal. No amounts were reported produced or shipped for this location. A small amount of gem opal (0.19 pounds/~0.09 kg) was mined at the Ren-N-Mine in Humboldt County, though no amounts were reported produced or shipped.

Turquoise is produced from several small operations in Nevada. Lone Mountain Mining, LLC, reportedly mined about 1,000,000 pounds (453,592 kg) of turquoise from the Lone Mountain Mine in sections 7 and 18 of T1N, R41E in the Lone Mountain mining district of Esmeralda County. They produced and shipped 1200 pounds (544 kg) of turquoise.

CP Resources Corporation filed four new surface management notices for non-precious gemstones in sections 23, 24, 25, and 26 of T45N, R32E in Humboldt County. The case disposition was listed as authorized as of 9/9/2022. Five additional notices were filed for semiprecious gemstones by anonymous companies in Churchill, Nye, Esmeralda, and Pershing counties. Total acreage in Churchill county was 0.31 acres in section 11 of T14N, R34E. The case disposition was listed as closed as of 6/8/2022. Three notices were filed in Nye and Esmeralda counties in section 31 of T6N, R40E. The case disposition for all three notices were listed as pending as of 8/23/2022. Finally, an anonymous company filed a notice for 1 acre in section 3 of T31N, R25E in Pershing County. The case disposition was listed as authorized as of 6/3/2022. Silver State Turquoise filed a notice for 1.53 acres in section 7 of T3N, R35E in Esmeralda County. The commodity was listed as “to be defined” and the case disposition was authorized as of 12/22/2022.

Gypsum

Domestic crude gypsum production was estimated to be 21 million metric tons valued at \$250 million. Leading

crude gypsum producing states were California, Iowa, Kansas, Nevada, Oklahoma, and Texas. A total of 47 companies produced or processed gypsum at 52 mines in 16 states. Domestic production is primarily used for agriculture, cement production, and manufacturing of wallboard and plaster products. Total wallboard sales were estimated to be 28 billion square feet during 2022.

Based on data reported in the annual status and production report, total gypsum production in Nevada was 2,562,363 tons, a 22% increase from 2021. The gross proceeds were \$48,726,481, a 1.8% decrease from 2021.

PABCO Building Products, LLC, mined 1,508,626 tons of gypsum from the PABCO Gypsum Plant and Mine in Clark County northeast of Las Vegas, an 8% increase from the previous year. The company also produced 1,491,895 tons and shipped 14,257 tons. PABCO Gypsum processes its gypsum to make wallboard at a plant adjacent to their mining operation (PABCO Gypsum, undated).

Empire Mining Co., LLC, operates the Empire Quarry Mine and Mill located in Pershing County. They mined 731,880 tons of gypsum, produced 671,410 tons, and shipped 695,955 tons throughout 2022.

The Art Wilson Company of Carson City mined 249,558 tons of gypsum from the Adams Claim Gypsum Mine in Lyon County. 249,558 tons were produced and 245,684 tons of gypsum were shipped from this location.

H. Lima Nevada, LLC mined and produced 149,500 tons of gypsum and shipped 146,000 tons from its Lima Nevada Gypsum Mine in Clark County.

Lime, Limestone, and Dolomite

According to the USGS, an estimated 17 million metric tons of quicklime and hydrated lime were produced nationwide valued at about \$2.3 billion. The USGS rolls its production figures of limestone and dolomite not used in lime production into the figure for crushed stone. Nevada reported limestone production was 1,044,603 tons and dolomite production was 417,495 tons. The gross proceeds were \$31,288,358 for limestone (including dolomite mined from Lhoist), a 3.9% decrease from 2021, and \$4,606,561 for dolomite, a 17.6% increase from 2021.

No lime was reportedly produced from past producers Lhoist North America (Apex Quarry and Plant, Clark County) and Graymont Western US, Inc. (Pilot Peak high calcium lime operation in Elko County). However, Lhoist North America shipped 462,790 tons of lime from the Apex plant. The operation makes high-calcium quicklime used in metallurgical processing, paper manufacturing, and environmental markets. The company also produces dolomitic quicklime and hydrated high calcium lime at Apex, mainly for construction uses.

Lhoist North America mined 442,201 tons of dolomite and 2,124,754 tons of limestone during 2022. They produced 368,521 and 1,043,152 tons of dolomite and limestone respectively. Graymont Western US, Inc. mined

805,000 tons of limestone and did not produce or ship any product during the year.

Nevada Cement Co. mines limestone from three quarries in Churchill, Pershing, and Lyon counties. The company's main production came from its Churchill Limestone Quarry in the Trinity Range, where 491,602 tons of limestone were mined throughout 2022. The company mined 116,012 tons from its Relief Canyon pit (Pershing County) and 25,882 tons from its Fernley Limestone operation (Lyon County).

Min-AD, Inc. mined 50,510 tons of dolomite, produced 48,065 tons, and shipped 48,334 tons of dolomite from their facilities in Winnemucca. Dolomite is mined from the Dun Glen Formation at the MIN-AD Mine located about 6 miles (10 km) south of Winnemucca at the base of the Sonoma Range in Humboldt County.

Nutritional Additives Corp. produces agricultural and nutritional dolomite products from its Sexton Mine along the northwest edge of the Sonoma Range about eight miles (14 km) south of Winnemucca. The company produced 1909 tons of dolomite; however, no amounts were reported mined or shipped for 2022.

Along with gypsum, the Art Wilson Co. mined, produced, and shipped 1451 tons of limestone from the Adams Claim Gypsum Mine.

Infrastructure Materials Corp filed notices for 4.6 acres in section 19, T8S. R69E in Lincoln County. The case disposition was listed as authorized as of 2/26/2022.

Lithium

Nationwide, commercial-scale lithium production primarily occurred through a brine operation situated in Nevada (Albemarle U.S., Inc., Silver Peak Operations in Esmeralda County). Additionally, lithium was commercially extracted from the waste tailings of a magnesium producer based in Utah. Furthermore, two companies in the United States were engaged in the production of various downstream lithium compounds. These compounds were derived from either domestically sourced or imported lithium carbonate, lithium chloride, and lithium hydroxide. Specific details regarding domestic production data were not disclosed to protect the confidentiality of company proprietary information.

According to preliminary data from NDT, the gross yield for Nevada lithium was \$104,231,347. Albemarle U.S., Inc. pumped a total of 4,505,585,124 gallons of brine, produced 8,938,694 pounds of lithium carbonate, 147,820 lithium hydroxide monohydrate, and shipped 8,180,690 pounds of lithium carbonate, 65,415 pounds of lithium hydroxide anhydrous, and 55,116.00 pounds of lithium hydroxide monohydrate.

Lithium exploration in Nevada continues to increase as companies search for the critical mineral. Surface management notices and mining plans were filed

throughout 2022 for several properties across portions of the state, some of which are outlined below.

Alkali Flat

Lone Mountain Resources, LLC filed one surface management notice for 3.3 acres in section 8 of T1S, R41E in Esmeralda County. The commodity was listed as "to be defined". However, Dajin Lithium Corp. was documented to have an earn-in agreement with Lone Mountain Resources as of November, 2020 (Junior Mining Network, 2020). The case disposition was listed as authorized as of 4/18/2022.

Big Smoky Valley

American Battery Technology Company filed 20 mining plans in sections 1, 2, and 10–36 of T3N, R41E and section 19 of T3N, R40E in Nye and Esmeralda counties. The case disposition was listed as pending as of 12/22/2022.

Cruz Battery Metals filed mining plans for sections 20, 29, 31–34 of T4N, R42E and sections 3–8 of T5N, R42E in Nye County. The case disposition was listed as pending as of 1/3/2022. Cruz Battery Metals also filed surface management notices in sections 4, 9, 23, and 33 of T4N, R42E and sections 5–8, and 29–32 of T5N, R42E in Nye County. The case disposition was listed as authorized as of 5/5/2022 and 10/21/2022.

Enertopia Corp. filed surface management notices for sections 17, 19, 20, 25, and 30 of T3N, R42E in Nye and Esmeralda counties. The case disposition was listed as authorized as of 5/19/2022.

Logan Resources USA Inc. filed 19 surface management notices sections 12, 13, and 24 of T6N, R71E, sections 3–10, 15, 16, 18, and 19 of T6N, R42E, and sections 31–34 of T7N, R42E all in Nye County. The case disposition was listed as pending as of 11/28/2022.

Nevada Lithium Corp. filed several surface management notices for varying amounts of acreage across two general locations in Big Smoky Valley. In Nye County, the company filed notices in sections 8 and 17 in T6N, R42E, sections 5–9 of T6N, R43E, sections 21, 22, 25, 27, and 28 of T7N, R42E, and sections 30, 31, and 36 of T7N, R43E. Case disposition for all of these claims was listed as authorized as of 1/5/2023 except for sections 8 and 17 in T6N, R42E and sections 21, 22, 27, and 28 in T7N, R42E, which were listed as closed. In Esmeralda County, the company filed notices in sections 11, 13, and 24 of T2N, R40E, section 6 of T2N, R41E, sections 4–9, 16, 17, 18, 19, and 31 of T3N, R41E, and sections 33 and 34 of T4N, R41E. The case disposition was listed as pending as of 12/14/2022 for section 1 in T2N, R40E, section 6 of T2N, R41E, sections 13 and 24 in T3N, R40E, sections 18, 19, 30, and 31 in T3N, R41E. The remaining notices were listed as authorized as of 1/20/2023.

Pan American Energy filed several surface management notices in Esmeralda County for their Horizon Lithium project west of Tonopah and south of

Highway 95. Notices were filed in sections 1–18 and 24 of T2N, R41E, sections 18 and 19 of T2N, R42E, sections 19–21 and 28–36 of T3N, R41E, and section 31 of T3N, R42E. The case disposition was listed as authorized as of 11/17/2022.

Scotch Creek Ventures filed surface management notices for 5 claims in sections 27, 28, and 33 of T2N, R39E, and sections 5 and 8 of T3N, R39E in the southern extent of Big Smoky Valley in Esmeralda County. The case disposition was listed as authorized as of 10/20/2022.

Zenolith USA, LLC filed surface management notices for 12 claims in the northern part of Big Smoky Valley in Lander County. 1.4 acres each were filed in sections 11–14, 24, 25, 35, and 36 of T17N, R45E, and sections 1, 2, 13, and 14 of T17N, R45.5E. The case disposition was listed as authorized as of 3/15/2022.

Clayton Valley

Mining plans for 18 claims were filed by Authium LLC in sections 23, 24, and 25 of T2S, R40E, sections 6–9, 16–21, 28, 29, and 30 of T2S, R40.5E, and sections 7 and 18 of T2S, R41E. The case disposition was listed as pending as of 12/14/2022.

Centrestone Resources, LLC filed mining plans for several acres across multiple sections in T2S, R40E, R40.5E, and R41E, and T3S, R39E, and R40E. The case disposition was listed as pending as of 4/6/2022. The commodity was listed as “to be defined”. However, given the location of the claims within Clayton Valley, it is assumed the company is exploring for lithium.

Cypress Holdings (Nevada) LTD filed mining plans for 16 claims in sections 14–17, 20–23, 26–28, and 32–35 in T2S, R40E, and section 5 in T3S, R40E. The case disposition was listed as pending as of 12/14/2022. Cypress Holdings also filed surface management notices for 4 claims in sections 14, 22, 27, and 28 of T2S, R40E. The case disposition was listed as authorized as of 4/1/2022.

Columbus Salt Marsh

Pilot Peak, LLC filed 10 surface management notices in sections 2 and 3 of T2N, R36E, and sections 15, 22, 23, 24, 26, 27, 34, and 35 of T3N, R36E. The case disposition was listed as authorized as of 3/24/2022. Pilot Peak LLC (PPL) is a wholly owned subsidiary of Luna Lithium, LLC. PPL submitted a dissolved mineral resource exploration well permit application to the Nevada Division of Minerals for the project name *Columbus Basin Exploration Project* in early 2022.

Dry Lake Valley

Resources Ltd. filed several surface management notices in Dry Lake Valley, east of the Arrow Canyon Range in Clark County. Notices were filed in section 13, 24, and 25 of T17S, R63E, and sections 17–20, 29, and 30 of T17S,

R64E. The case disposition was listed as authorized as of 9/14/2022.

Fish Lake Valley

Morella Corporation filed a surface management notice for 0.22 acres in section 10 of T1S, R35E in Esmeralda County. The commodity was listed as “to be defined”; however, Morella Corporation is described as a battery minerals company. The case disposition was listed as authorized as of 11/28/2022.

Kibby Flat

Two surface management notices were filed by Belmont Resources in sections 30 and 31 of T6N, R37E in Esmeralda County. The notices were listed as authorized as of 6/28/2022.

Nevada North Lithium

Two surface management notices were filed by Surge Battery Metals for sections 13 and 24 in T44N, R65E of Elko County. The case disposition was listed as authorized as of 9/7/2022.

San Emidio

Two surface management notices were filed by Surge Battery Metals in sections 6 and 17 of T29N, R23E in the San Emidio Desert of Washoe County. The case disposition was listed as pending as of 5/3/2022.

Sarcobatus Flat

Mining plans for 19 claims south of Scotty’s Junction in the Bonnie Claire property on Sarcobatus Flat were filed by Bonaventure NV Inc, a wholly owned subsidiary of Iconic Minerals Ltd. The case disposition was listed as pending as of 1/25/2022. An environmental assessment published by the BLM was issued in September of 2022.

Playa Minerals Co. and Nevlith, a US subsidiary of Loyal Lithium, filed surface management notices for several claims around the western and southern periphery of the Bonnie Claire property for their Scotty Lithium Project. The notices were listed as pending as of 8/22/2022.

Magnesia

In 2022, the production of magnesium compounds in the United States came primarily from seawater and natural brines, accounting for approximately 67% of the total production. The total value of shipments for all types of magnesium compounds was estimated to be \$460 million, reflecting a 5% increase compared to the revised figures from 2021. The extraction of magnesium compounds from seawater was carried out by one company in California and another in Delaware. Additionally, one company in

Michigan extracted these compounds from well brines, while two companies in Utah focused on lake brine sources. The remaining 33% of total production came from one company in Nevada. Premier Magnesia, LLC owns and operates the Gabbs magnesia operation in Nye County, which is the only place in the country where magnesite is mined.

Premier Magnesia mined 394,412 tons of magnesite, produced 122,484 tons of magnesium oxide, and shipped 122,483 tons of magnesium oxide. No brucite was mined or produced from the Premier Magnesia Mine in 2022. The gross proceeds increased 16.7% to \$9,404,624 in 2022.

Perlite

Domestic processed crude perlite sold and used in 2022 amounted to 520,000 metric tons valued at \$34 million. Approximately 880,000 metric tons of crude perlite ore were mined from nine operations across six western states. According to the 2022 Mineral Commodity Summary published by the USGS, about 44% of perlite production is used in building and construction products, 19% is used as horticultural aggregate, 15% as fillers, and 14% as a filler aid. The remaining 8% is used for special insulation and other miscellaneous uses.

Statewide, two operations reported perlite production in the annual status and production report. Gross yield in 2022 decreased 89.3% to \$81,904. Wilkin Mining and Trucking, Inc. mined 819 tons from their Tenacity Perlite Mine in Lincoln County. No perlite was reportedly produced or shipped from this operation. The Tenacity Perlite Mine is located in the South Pahroc Range mining district about 25 miles (40 km) west of Caliente, Nevada. Furthermore, Wilkin Mining and Trucking, Inc. filed three mining plans with the BLM on June 9, 2022. The case disposition was listed as pending and the commodity was indicated to be perlite. The mining plans are for sections 22, 23, and 34 in T4S, R62E of Lincoln County.

US Silica produced 8144 tons and shipped 8412 tons of perlite from the Colado plant in Pershing County during 2022. The crude perlite comes from the Popcorn Mine (also known as the Desert Mountains Perlite deposit and Perlite Mine) about 15 miles (24 km) south of Fallon in Churchill County (U.S Silica).

Pozzolan

According to the annual status and production report, Nevada Cement Co. mined 23,393 tons of pozzolan from its Mustache quarry near Fernley, a significant increase from the 8000 tons reported for 2021. Gross proceeds for pozzolan are lumped in with specialty clay minerals.

Salt

Domestic production of salt increased slightly to 42 million metric tons valued at \$2.5 billion. Nevada's only salt producer, the Huck Salt Co., mined 19,994 tons of salt from their mine in Churchill County, nearly a 25% increase from 2021. The gross proceeds for salt shipped in 2022 were \$1,533,473, a 173.4% increase over values reported in 2021. Huck Salt Co. produced 5050 tons and shipped 18,000 tons of salt throughout 2022. The salt is mined from a playa on Fourmile Flat about 25 miles (40 km) southeast of Fallon, Churchill County.

Silica

The total gross yield for silica produced in Nevada was \$23,320,237 for 2022, a 28.3% increase from 2021. According to the annual status and production report, J.R. Simplot mined a total of 771,800 tons from their Simplot Silica Products operation in Clark County, Nevada.

Graymont Western US Inc., filed notices for 4.93 acres in section 24, T34N, R69E of Elko County for the commodity silicon. The case disposition was listed as authorized as of 6/7/2022.

Talcose

While no talc group minerals were mined, produced, or shipped in Nevada during 2022, SR Minerals Inc., filed notices for 4.2 acres each in sections 8, 9, 16, and 17 of T2N, R67E in Lincoln County. The case disposition was listed as authorized as of 10/21/2022. The commodity was listed as "talc group, soapstone".

Zeolites

In 2022, seven companies operated 10 zeolite mines in six states, producing about 86,000 tons of natural zeolites. This marked a slight increase from the previous year. Chabazite was mined in Arizona, and clinoptilolite was mined in California, Idaho, New Mexico, Oregon, and Texas. In 2022, the primary domestic uses of this product were for animal feed, odor control, and water purification, which together accounted for approximately 70% of the total domestic sales tonnage. Other applications included various unspecified purposes, pet litter, fertilizer carriers, wastewater treatment, air filtration, oil and grease absorption, fungicide or pesticide carriers, aquaculture, and desiccant.

Nevada contains large known resources of zeolite; however, production has been small, and no zeolite is currently mined in Nevada. Zeolite minerals (most of which are rare) reportedly found in Nevada include analcime, chabazite, clinoptilolite, epistilbite, erionite, ferrierite, heulandite, mordenite, natrolite, offretite, phillipsite, scolecite, and stilbite. 13,951 and 7711 tons of clinoptilolite

was produced and shipped, respectively, from the Shenandoah Mill in Nye County operated by KMI Zeolite, Inc.

References

- Junior Mining Network, 2020, Dajin Lithium Signs Earn-In Agreement with Lone Mountain Resources, <https://www.juniorminingnetwork.com/junior-miner-news/press-releases/913-tsx-venture/dji/87339-dajin-lithium-signs-earn-in-agreement-with-lone-mountain-resources.html>, accessed October 2022.
- PABCO Gypsum, undated, <https://www.pabcogypsum.com/>, accessed July 2022.
- Papke, K.G., 1970, Montmorillonite, bentonite, and Fuller's Earth deposits in Nevada: Nevada Bureau of Mines and Geology Bulletin 76, 53 p.
- Papke, K.G., 1987, Gypsum deposits in Nevada: Nevada Bureau of Mines and Geology Bulletin 103, 26 p.
- USGS, 2022, Commodity statistics and information—Mineral commodity summaries, <https://www.usgs.gov/centers/national-minerals-information-center/commodity-statistics-and-information>, accessed August and September 2022.

GEOTHERMAL ENERGY

by Maria Richards

OVERVIEW

The state of Nevada in 2022 accounted for approximately 24% of the nation's geothermally sourced electricity generation with only California generating more geothermal power. The total installed geothermal energy nameplate capacity in Nevada was ~837.68 MWe (megawatts electric) in 2022, representing an increase from 2021. This increase resulted from connection of the Star Peak LLC geothermal plant in Pershing County to the grid in August 2022 with 12.5 MW and Whitegrass Number 1 power plant at Wabuska in Lyon County with 3 MW. Both of these plants are operated by Open Mountain Energy (fig. 1; tables 1 and 2).

The total gross geothermal power generation in Nevada from 2021 to 2022 stayed consistent at approximately 590 MWe, and net generation (power to market) reached 450 MWe. The difference between the gross and net generation reflects the parasitic losses associated with running the geothermal plants (e.g., downhole pumps), and this averaged 26% in 2022.

The total geothermal power generation in Nevada in 2022 was 5,161,477 megawatt-hours (MWh) gross, representing an increase of less than 1% from generation in 2021. The Net Proceeds Bulletin by the Nevada Department of Taxation is not finished for 2022, yet the preliminary amount is \$322.617 million. The 2022 estimated average price for geothermal electricity was 8.14 cents(c)/kilowatt-hour (kWh) (fig. 2). The share of electricity from geothermal electricity generation in the state was ~9% in 2022, representing a consistent trend since 2020 (fig. 3). This proportion reflects the generation of geothermal electricity in Nevada, not consumption. Some geothermal power from Nevada is sold to utilities in California and Utah (e.g., Sacramento Municipal Utility District; Southern California Public Power Authority; the University of Utah) under various power purchase agreements (PPAs).

In August 2022, the U.S. Bureau of Land Management (BLM) held a geothermal lease sale, with 79 parcels offered equating to 232,484 acres. Of these parcels 66 were sold for a total acreage of 192,912, more than double the 2021 acreage (fig. 4; table 3a). The high bid per acre was \$111, similar to the high bid in 2021, and highest total bid per parcel was \$204,720. Total monies received by the BLM were an order of magnitude higher than in 2020 or 2021,

with \$3,374,892 received (including the bonus bid, administrative fees, and first year lease rental at \$2/acre). In addition to the competitive lease sale, a non-competitive lease sale was held the day after the competitive sale (and is hence known as the 'day after' sale), with 13 parcels nominated for offers and eight parcels sold totaling 25,536 acres (table 3b) for \$34,665. Thus, between the competitive and non-competitive lease sales, 218,448 acres were taken up for geothermal exploration in the state in 2022—approximately 84% more than the amount in 2020 and three times more than in 2021 (fig. 5).

While the acreage leased in 2022 was again a substantial increase from 2021, drilling activity was low with no new geothermal production wells drilled during 2022. There was one geothermal observation well drilled and one injection well shut-in. Drilling was possibly delayed because of increase in the cost of drilling in 2022. There were 14 geothermal drilling permits approved by the Nevada Division of Minerals (NDOM) in 2021, so it is anticipated that more wells will be drilled soon.

Trends

In 2022, average wellhead fluid production temperatures ranged from 97–189 °C (207–372.2 °F) for electricity generation, and two reported direct-use applications utilized geothermal fluids ranging between 77–95 °C (171–203 °F) (fig. 6). Production flow rates for an individual well averaged 137 liters/second (l/s; ~2171 gallons/minute (gpm)) for electricity generation, with the highest production flow rates measured at the Don A. Campbell geothermal field (328 l/s; 5,199 gpm). The three most recently developed geothermal fields in Nevada (McGinness Hills, Tungsten Mountain, and Don A. Campbell) have the highest production well flow rates and produce an average of 255 l/s (4042 gpm) per well. This represents almost 40% of total fluid production from geothermal plants in Nevada for 2022 and coincidentally, these three fields accounted for ~40% of gross power generation for the year (these numbers could be expected to vary due to different production temperatures for each field).

The 2022 trends show an increase in power production for McGinness Hills III, Salt Wells, Tungsten Mountain, and from the new Star Peak plant (fig. 7). The smallest parasitic loads (difference between gross and net output in generation) were at Steamboat Springs II with 9% and 11% at Dixie Valley, which is the 2nd oldest geothermal plant in Nevada (fig. 8).

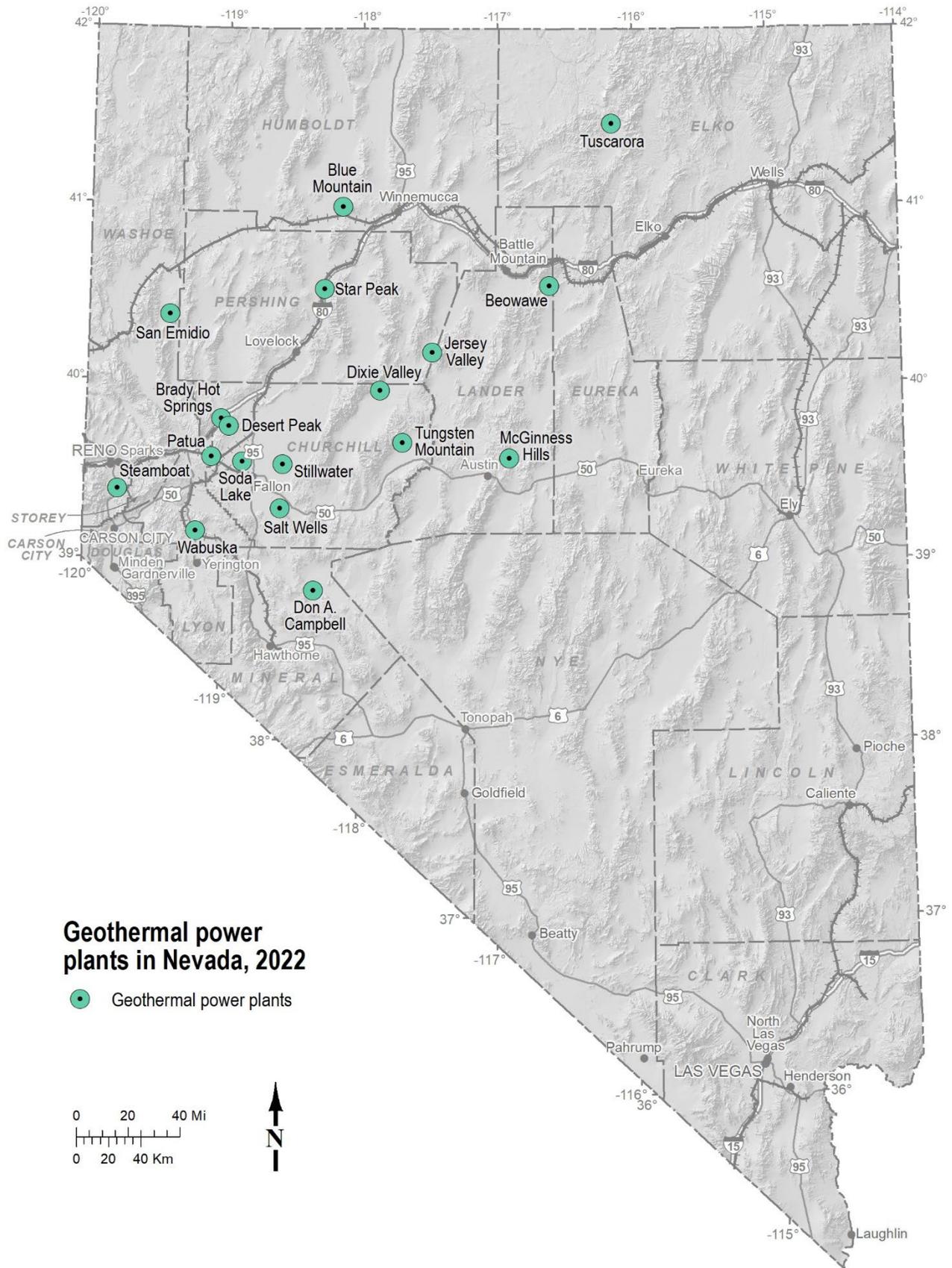


Figure 1. Location of geothermal power plants in Nevada in 2022.

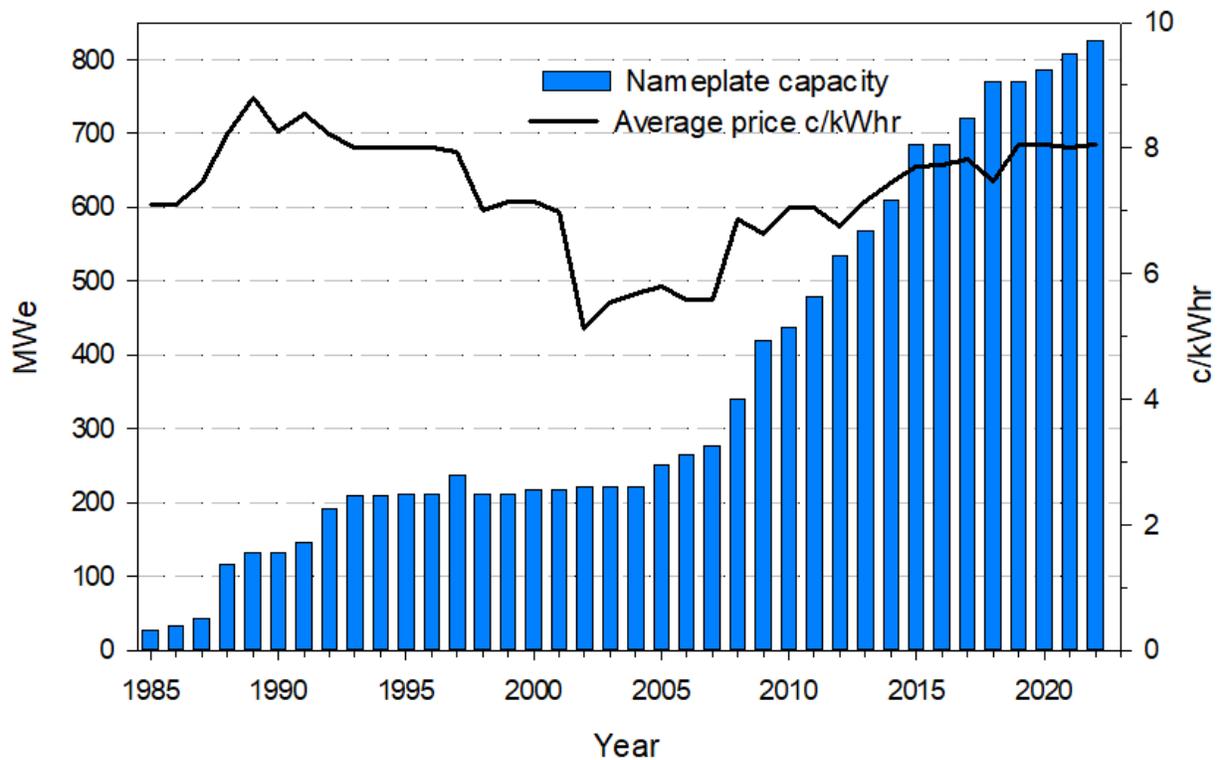


Figure 2. Trends in annual, net geothermal electricity generation and the estimated average price of geothermal electricity (calculated from gross proceeds and reported net production through 2022) in cents per kilowatt hour (c/kWh). The actual price for any individual power plant may be different and is held confidential by the state energy office.

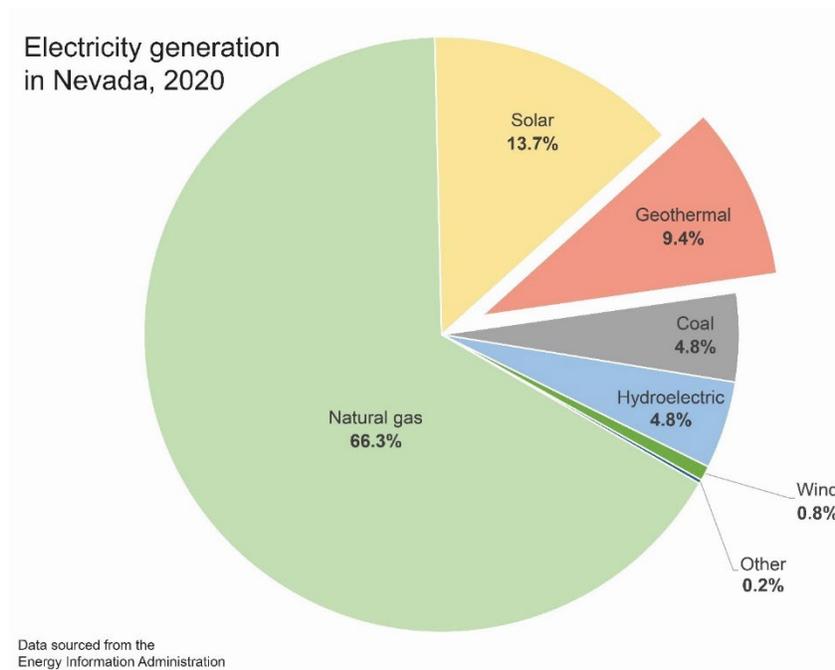


Figure 3. Sources of Nevada's electricity generation in 2020. Data sourced from the U.S. Energy Information Administration (EIA)¹.

¹ <https://www.eia.gov/electricity/state/nevada/>

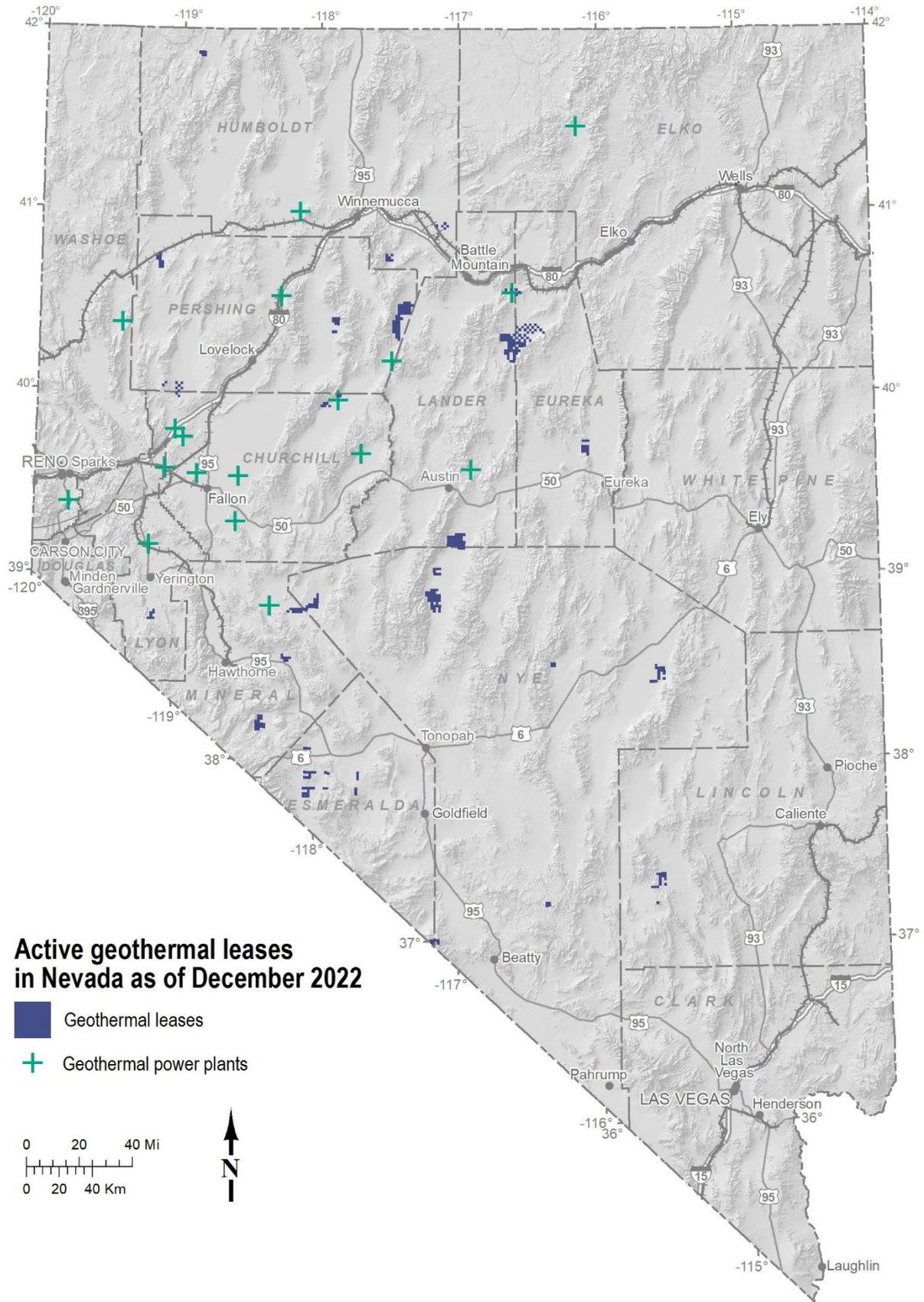


Figure 4. Bureau of Land Management (BLM) Nevada geothermal leases sold in 2022.

Table 1. Nevada geothermal power plants and generation figures, 2022.

Plant name	Nameplate Capacity (MWe) ¹	Flash or Binary	Commission Year	2022 Production (MWhr)		2022 Production (MWe) ²		Operator
				Gross	Net	Gross	Net MWe	
Beowawe	19.7	F/B	1985	111,730	89,730	12.8	10.3	Ormat Technologies Inc.
Blue Mountain	49.5	B	2009	314,150	210,593	35.9	24.0	Cyrq Energy
Brady Hot Springs	25.2	F/B	1992 (2018)	123,119	81,250	14.0	9.2	Ormat Technologies Inc.
Desert Peak II	23.0	B	2006	120,716	88,640	13.8	10.1	Ormat Technologies Inc.
Dixie Valley Dixie Valley Binary Unit	64.7	F B	1988 2012	479,838	427,287	54.8 0.0	48.8 0.0	Ormat Technologies Inc. Ormat Technologies Inc.
Don A. Campbell	20.0	B	2013	158,906	123,649	18.1	14.1	Ormat Technologies Inc.
Don A. Campbell II	20.0	B	2015	144,391	104,977	16.5	12.0	Ormat Technologies Inc.
Jersey Valley	23.5	B	2011	102,371	63,669	11.7	7.3	Ormat Technologies Inc.
McGinness Hills	65.0	B	2012	406,922	323,999	46.5	37.0	Ormat Technologies Inc.
McGinness Hills II	65.0	B	2015	411,250	346,090	47.0	37.0	Ormat Technologies Inc.
McGinness Hills III	65.0	B	2018/21	681,518	548,185	77.8	62.6	Ormat Technologies Inc.
Patua	48.0	B	2012	179,904	99,049	20.5	15.0	Cyrq Energy
Salt Wells	23.6	B	2009	117,634	84,512	13.4	9.6	Enel Green Power
San Emidio	14.7	B	2012	115,276	85,728	13.2	9.8	Ormat Technologies Inc.
Soda Lake No. 3	26.5	B	2019	158,384	121,342	18.0	13.8	Cyrq Energy
Star Peak	12.5	B	2022	34,777	22,850	1.3	0.9	Open Mountain Energy
Steamboat II	23.9	B	1992	77,052	43,990	8.8	5.0	Ormat Technologies Inc.
Steamboat III	23.9	B	1992	75,174	44,030	8.6	5.0	Ormat Technologies Inc.
Galena 1	30.0	B	2005	142,474	115,876	16.3	13.2	Ormat Technologies Inc.
Galena 2	13.5	B	2007	82,034	36,429	9.4	4.1	Ormat Technologies Inc.
Burdette (Galena 3)	30.0	B	2008	138,355	101,124	15.8	11.5	Ormat Technologies Inc.
Steamboat Hills II	30.0	B	2020	253,898	231,733	29.0	26.4	Ormat Technologies Inc.
Total MW at Steamboat	151.3							
Stillwater 2	47.2	B	2009	158,177	94,627	18.1	10.8	Enel Green Power
Tungsten Mountain	37.0	B	2017	354,744	291,655	40.5	33.3	Ormat Technologies Inc.
Tuscarora	30.0	B	2012	191,840	131,937	21.9	15.1	Ormat Technologies Inc.
Wabuska/Whitegrass # 1	6.3	B	2018/22	26,843	19,030	3.1	2.2	Open Mountain Energy
Total:	837.7			5,161,478	3,931,982	586.7	448.1	

¹ Nameplate capacity is the manufacturer's rating of equipment output capacity, as reported to the Nevada Division of Minerals by the plant operators and does not necessarily reflect the capability of the currently developed resource. These nameplate capacities are estimates, and several different values can be found in the literature. Generator nameplate capacity refers to the size of the actual generator, but not to the turbine size or the actual capacity of the power plant. There are no public documents breaking down nameplate capacity of the turbines so these numbers may not adequately reflect actual generation.

² Years in brackets are those in which a plant re-powering occurred but was not associated with a change in plant name.

³ Production values were calculated by dividing annual megawatt hours (MWh) produced by the number of hours in a year.

Table 2. Geothermal power plant operator contact information.

Company Address	Local Contact	Project	Nameplate Capacity (MWe)
Cyrq Energy 15 West South Temple, Suite 1900 Salt Lake City UT 84101 (801) 875 4200 https://cyrqenergy.com/	NGP Blue Mountain 1 15250 Blue Mountain Road Winnemucca, NV 89445 (775) 786-4322	Blue Mountain	49.5
	17388 Patua Road Hazen, NV 89408 (775) 217-2650	Patua	48
	Soda Lake Power Plant 5500 Soda Lake Road Fallon, NV, 89406 (775) 867-5093	Soda Lake No. 1 Soda Lake No. 2	5.1 21
Enel Green Power 1755 East Plumb Lane, Suite 155 Reno, NV 89502 (775) 329 0700 https://www.enelgreenpower.com/countries/north-america/united-states	(775) 423-5374	Salt Wells	23.6
	(775) 423-0322	Stillwater	47.2
Open Mountain Energy 3451 N. Triumph Blvd, Suite 201 Lehi, UT 84043 (385) 352-8858 http://openmountainenergy.com/	21 Julian Lane Yerington, NV 89447 (385) 352-8858	Wabuska/Whitegrass #1	6.3
		Star Peak	12.5
Ormat Technologies, Inc. 6140 Plumas St Reno, NV 89511 (775) 356-9029 https://www.ormat.com/en/home/a/main/	(775) 635-2130	Beowawe	19.7
	(775) 322-7782	Brady Hot Springs	25.2
	(775) 423-5800	Desert Peak	23
	(775) 423-6535	Dixie Valley	64.7
	(775) 852-1444	Jersey Valley	23.5
	(775) 384-7807	McGinness Hills (I, II, III)	195
	(775) 557-2015	San Emidio (Empire)	14.7
	(775) 852-1444	Steamboat	151.3
	(775) 852-1444	Tungsten Mountain	37
(775) 852-1444	Tuscarora	30	
(775) 384-7807	Don A. Campbell (Wild Rose)	40.0	
Total Installed MWe (nameplate capacity)			837.7

Table 3a. Geothermal competitive leasing activity in Nevada, 2007–2022.

Year	Parcels Offered	Acres Offered	Parcels Sold	Acres Sold	Total receipts ¹	Highest bid per acre	Avg. bid per acre	% Acres Sold	% Parcels Sold
2007	43	122,849	43	122,849	\$11,669,821	\$95	\$92.90	100%	100%
2008	35	105,212	35	105,212	\$28,207,806	\$268	\$266	100%	100%
2009	108	323,222	82	243,727	\$8,909,445	\$3,800	\$34.50	75%	76%
2010	114	328,020	75	212,370	\$2,762,292	\$1,000	\$10.90	65%	66%
2011	51	151,119	17	42,627	\$456,353	\$60	\$8.70	28%	33%
2012	33	94,829	8	27,834	\$112,540	\$2	\$2	29%	24%
2013	13	16,284	9	10,373	\$42,870	\$2	\$2	64%	69%
2014	2	3,438	1	40	\$315	\$2	\$2	1%	50%
2015	0	0	-	-	-	-	-	-	-
2016	22	46,976	14	32,075	\$30,552	\$2	\$2	68%	64%
2017	20	38,208	10	19,209	\$78,444	\$2	\$2	50%	50%
2018	10	27,331	2	2,321	\$26,422	\$12	\$9.20	8%	20%
2019	142	387,032	37	102,403	\$637,892	\$20	\$4.20	26%	26%
2020	18	35,232	11	23,351	\$148,009	\$42	\$4.30	65%	61%
2021	32	83,544	26	73,631	\$1,602,207	\$100	\$22	88%	81%
2022	79	232,484	66	192,912	\$3,374,892	\$111	\$17.6	83%	84%
Totals:	722	1,995,780	436	1,202,635	\$58,059,860		\$32		60%

¹ Includes bids, first year lease rental at a price of \$2 per acre and application fee (~\$175 per parcel; this changes year-to-year).

Table 3b. Non-competitive geothermal leasing activity in Nevada, 2018–2022 (‘day-after’ sale).

Year	Parcels Offered	Acres Offered	Parcels Sold	Acres Sold	Total Receipts ²	% Acres Sold	% Parcels Sold
2018	8	24,749	0	0	0	0	0
2019	105	281,967	19	64,420	\$72,875	23%	18%
2020	7	11,881	2	3,335	\$4,225	28%	29%
2021	6	9,913	1	629		6%	17%
2022	13	39,571	8	25,536	\$34,665	64%	62%

² First year lease rental at a price of \$2 per acre and application fee (\$450 per parcel in 2021).

Table 4. Geothermal wells reported as drilled, re-drilled, or completed in 2022.

County	Area	Permit #	Operator Name	Well Number	Well Type	UTM Easting ¹	UTM Northing ¹	Land Type	Permitted depth (m) ²
Humboldt	Blue Mtn	1509	Cyrq Energy	BM 73-22	Observation	403649	4537581	BLM	2441

¹ North American 1983 Datum UTM 11N (in meters).

² Permitted depth for each well obtained from the Nevada Division of Minerals (<https://minerals.nv.gov/Programs/Geo/GeoPermits/>).

Table 5. Geothermal drilling activity in Nevada, 2007–2022

Year	Number of permits issued	Number of wells drilled	Number of production wells drilled
2007	71	41	5
2008	130	53	16
2009	195	71	16
2010	119	74	19
2011	85	37	19
2012	49	24	12
2013	21	23	8
2014	27	14	6
2015	26	17	7
2016	14	16	9
2017	35	31	5
2018	23	25	3
2019	7	6	1
2020	21	9	2
2021	14		0
2022	7	1	0

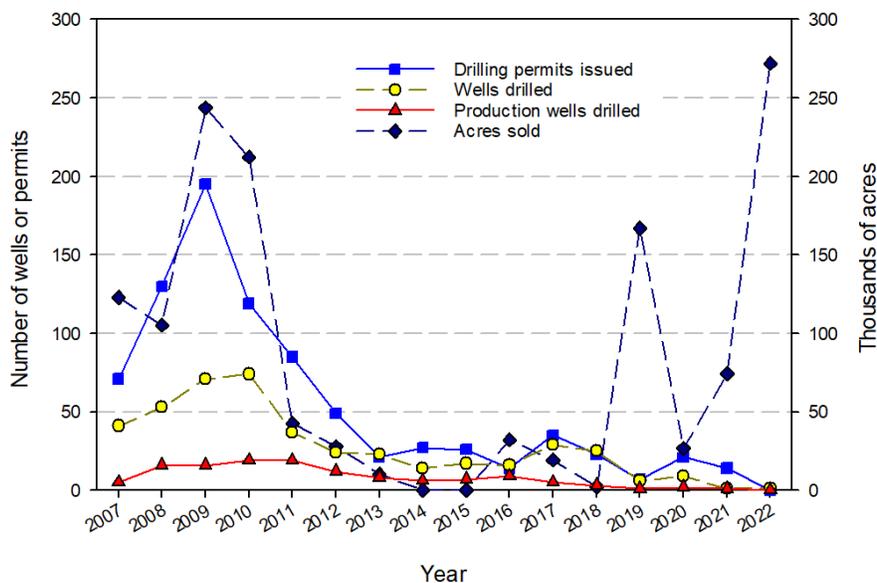


Figure 5. Trends in geothermal leasing and drilling activities in Nevada from 2007 to 2022. Note: acreage for 2019–2022 includes parcels sold through both competitive and non-competitive ('day-after') lease sales.

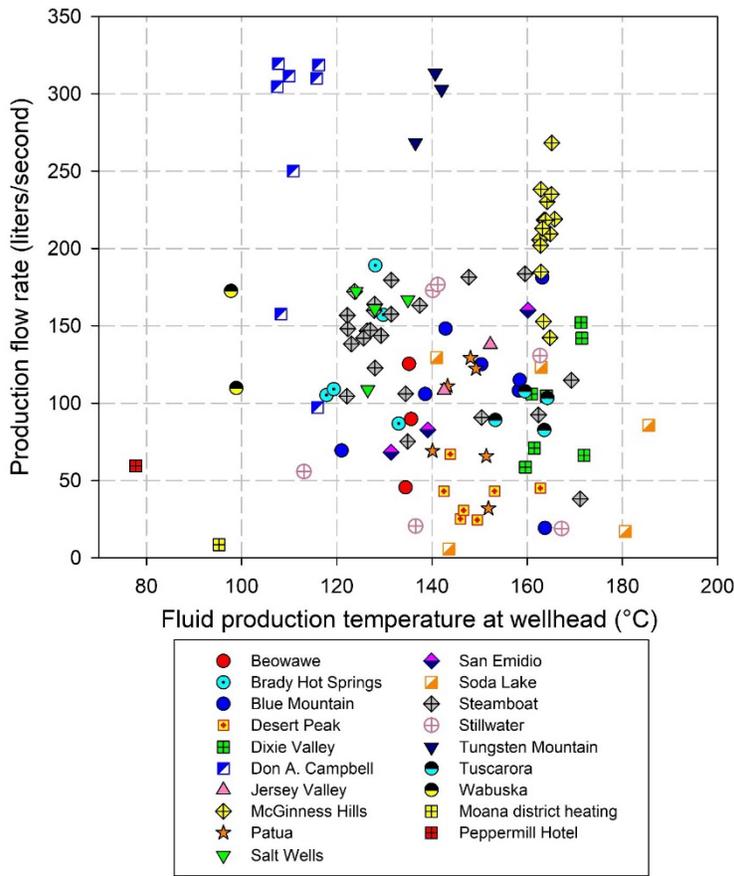


Figure 6. Average production flow rates of geothermal wells in Nevada in 2022 and their associated temperatures as measured at the wellhead. Data based on information provided to the Nevada Division of Minerals, 2022. Note that temperatures reported for wells in Dixie Valley and Beowawe represent post-flash temperatures.

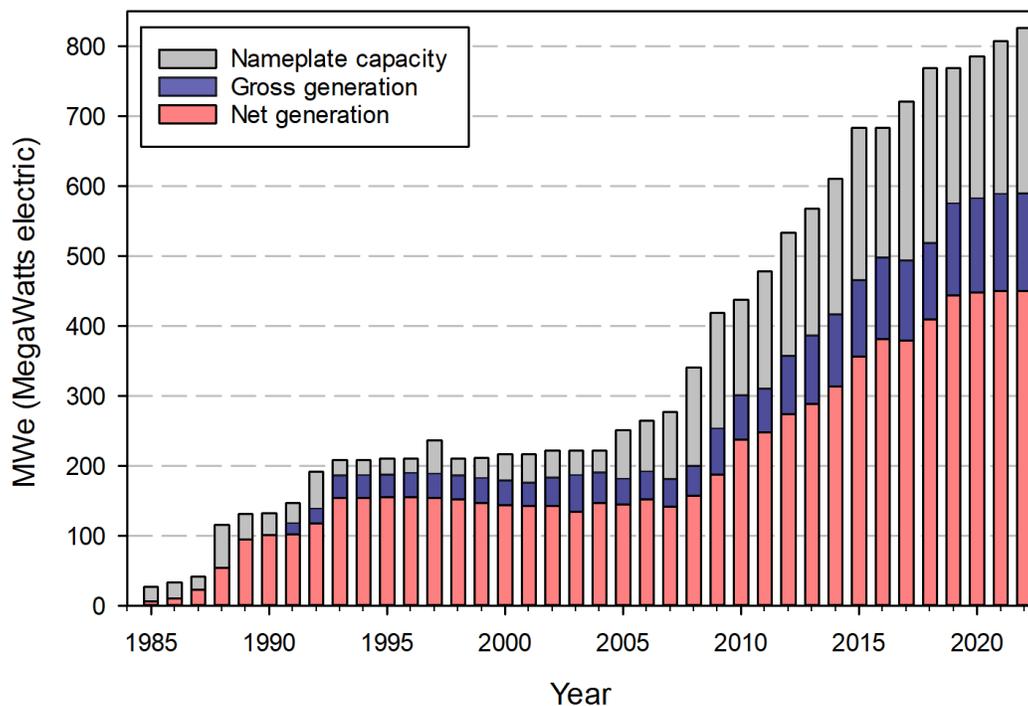


Figure 7. Growth in installed nameplate capacity, and net and gross geothermal power production in Nevada between 1985 and 2022, as reported to the Nevada Division of Minerals. Gross and net generation are calculated by dividing annual net generation in megawatt-hours by the number of hours in a year.

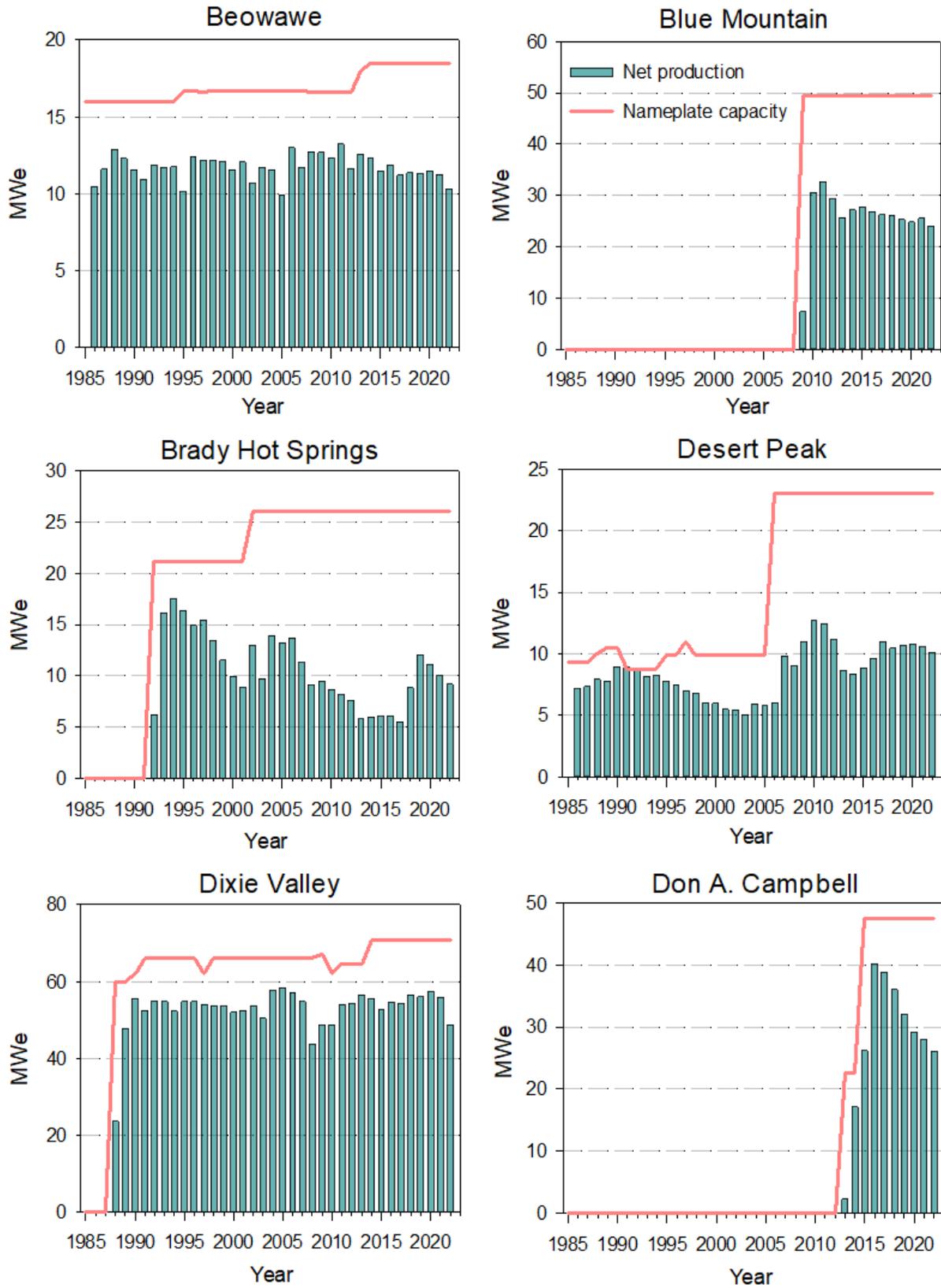


Figure 8a. Evolution of nameplate capacity (MWe) and net power generation (MWe) for geothermal power plants in Nevada (legend is the same for all plots). Note: Dixie Valley nameplate includes the 6.2 MWe binary plant.

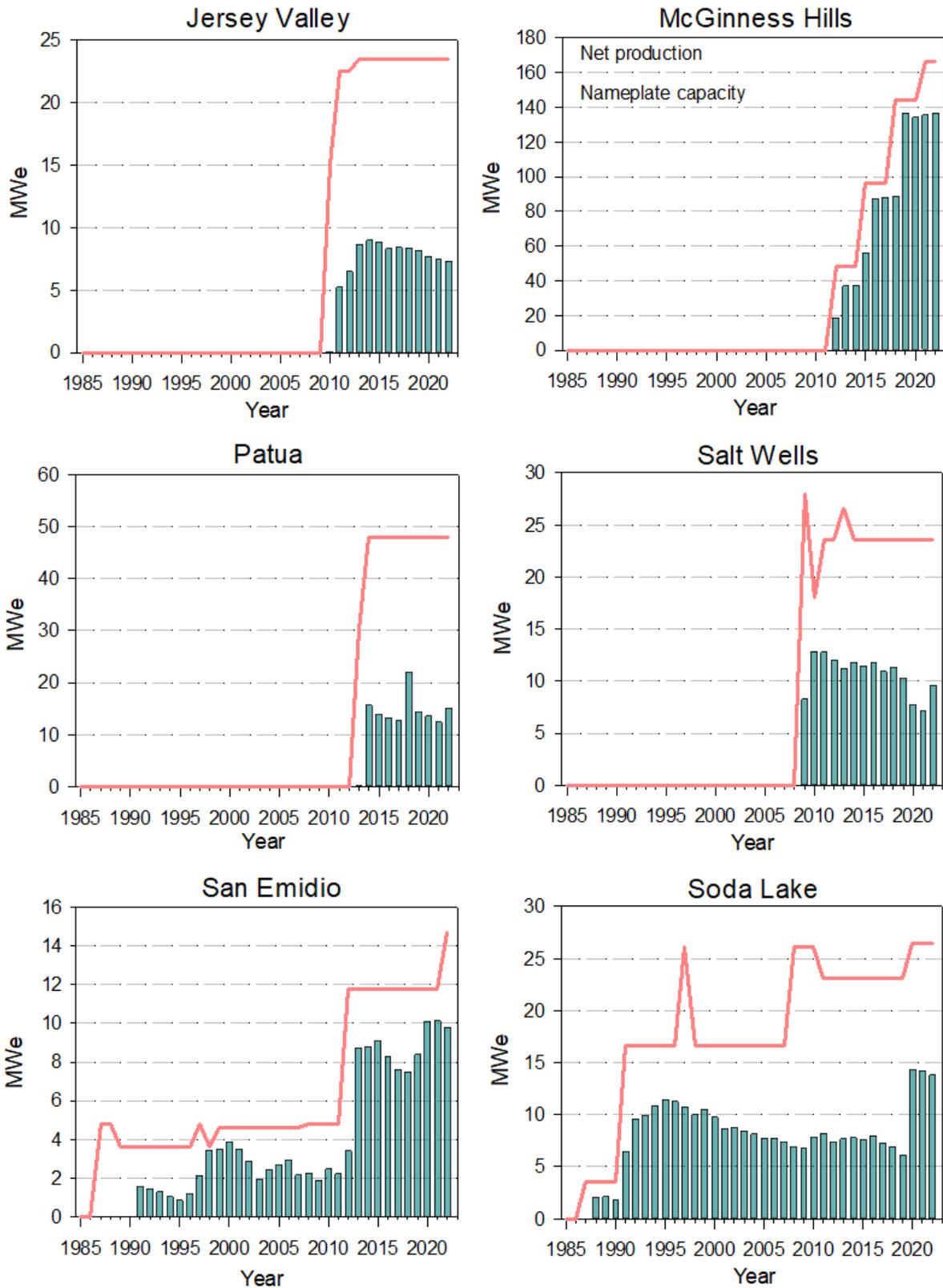


Figure 8b. Evolution of nameplate capacity (MWe) and net power generation (MWe) for geothermal power plants in Nevada (legend is the same for all plots).

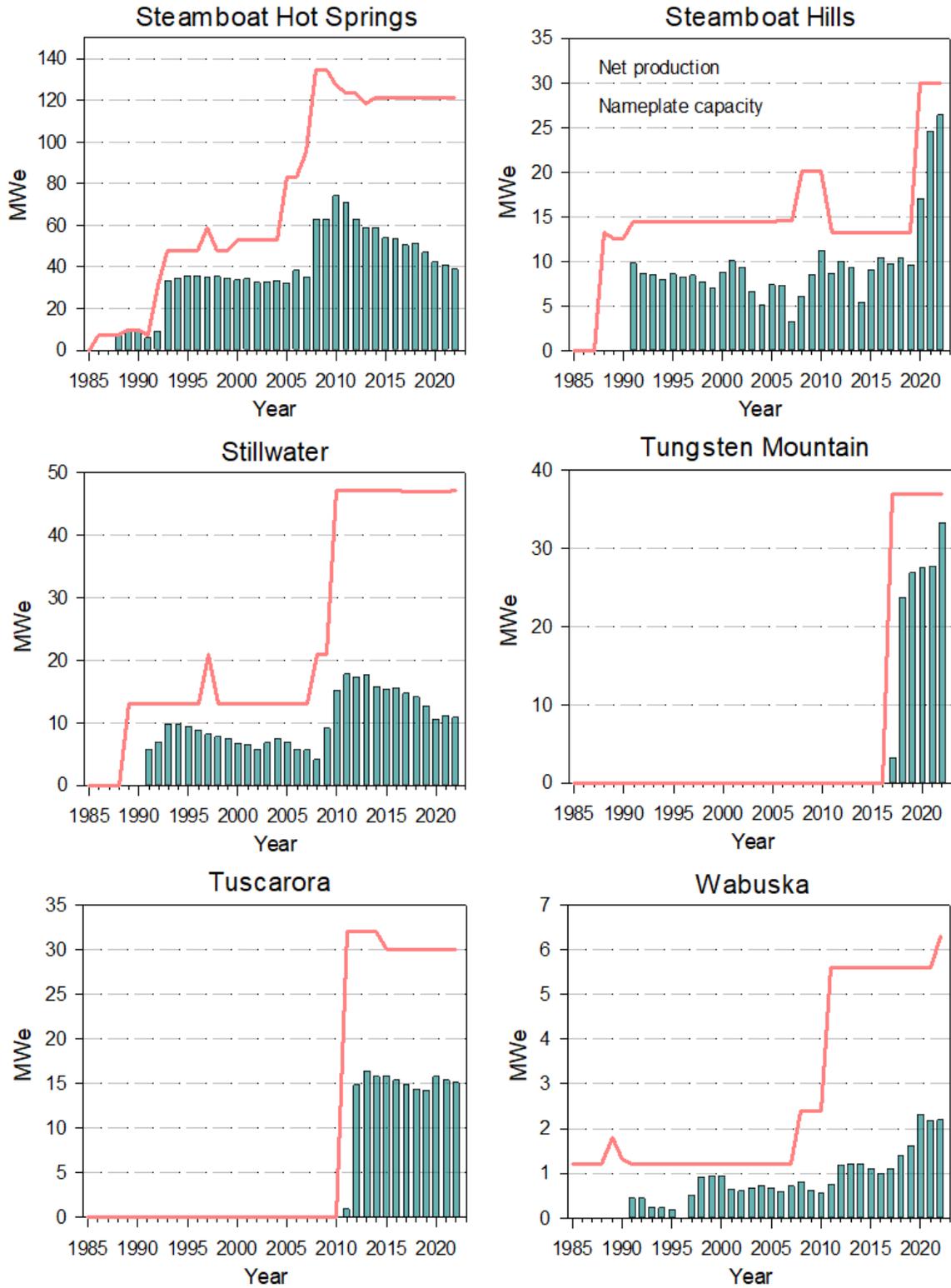


Figure 8c. Evolution of nameplate capacity (MWe) and net power generation (MWe) for geothermal power plants in Nevada (legend is the same for all plots).

Significant Federally Funded Geothermal Research Projects in Nevada in 2022

In 2022, there were four active geothermal research projects in Nevada that were supported by federal funds from the U.S. Department of Energy's (DOE) Geothermal Technologies Office (GTO) and the USGS's National Geological and Geophysical Data Preservation Program (NGGDPP). These projects are briefly reviewed as follows:

1. INGENIOUS

- **Project PI:** James Faulds, Great Basin Center for Geothermal Energy, Nevada Bureau of Mines and Geology (NBMG), UNR.
- **Project partners:** USGS, Utah Geological Survey, Idaho Geological Survey, Raser Power Systems LLC, Geothermal Resource Group, National Renewable Energy Laboratory, Lawrence Berkeley National Laboratory, Innovate Geothermal Ltd., Hi-Q Geophysical, Teverra LLC, Aprovechar Lab L3C
- **Project duration:** 4.5 years: February 2021–July 2025.
- **Total project funding:** \$10,332,968 (DOE-GTO)
- **Project goal:** Accelerate discoveries of new, commercially viable hidden geothermal systems in the Great Basin region (GBR) in the Basin and Range Province of the western USA, while significantly reducing the exploration and development risks for all geothermal resources to identify prospective geothermal resources and reduce exploration risk. This ambitious 4.5-year-long project proposes to fully integrate play fairway analysis (PFA), 3D and conceptual modeling, resource capacity estimation, machine learning (ML), the application of advanced geostatistics, and value-of-information (VOI) analysis to develop a comprehensive exploration workflow toolkit for the GBR. This toolkit will include predictive geothermal play fairway (PF) maps at both the regional-and prospect-scale, updated regional geoscience data compilations for much of the GBR, detailed 3D maps and conceptual models, software tools to facilitate practical use of the refined exploration workflows, and a developers' playbook. Building on geothermal PF efforts in central Nevada, NE California/NW Nevada, and western Utah, the INGENIOUS project is expanding these study areas to the broader GBR for early-stage prospect identification. Concurrently, several blind prospects are being analyzed through detailed geological and geophysical investigations followed by drilling thermal-gradient holes (TGH).

2. Understanding a Stratigraphic Hydrothermal Resource – Geophysical Imaging at Steptoe Valley, Nevada

- **Project PI:** Sandia National Laboratories with subawards and co-PI's at several institutions, including the Nevada Bureau of Mines and Geology at UNR (co-PI James Faulds).
- **Project duration:** 2.5 years: 1 October 2020 to 31 December 2023.
- **Total project funding:** \$1,500,000 (DOE-GTO)
- **Project goal:** Advance the understanding of the nature and extent of the hidden, stratigraphic hydrothermal geothermal resource in Steptoe Valley, Nevada and recommend an optimized strategy for subsequent exploration and development for this resource and analogous resources. This will be achieved by supplementing legacy geophysical and well information with new gravity, magnetics, and CSEM-MT surveys, conducting joint inversion modeling to inform a revised 3D geological model of the basin, and using these data to develop thermal-hydrologic models of the inferred stratigraphic resource in Steptoe Valley.

3. Nevada Geothermal Machine Learning Project

- **Project PI:** James Faulds, Nevada Bureau of Mines and Geology, UNR
- **Project duration:** 36 months: 1 August 2019 to 28 August 2022.
- **Total project funding:** \$526,000 (DOE-GTO)
- **Project goal:** Apply machine learning (ML) techniques to develop an algorithmic approach to identify new geothermal systems in the Great Basin region and build on the successes of the Nevada geothermal play fairway project. An algorithmic approach that empirically learns to estimate weights of influence for diverse parameters may scale and perform better than the play fairway analysis. Project activities included augmenting the number of training sites (positive and negative) that are needed to train the ML algorithms, transforming the data into formats suitable for ML, and development and testing of the ML techniques and outputs (Brown et al., 2020; Smith et al., 2023).

4. National Geophysical Geological Data Preservation Program Award 1:

Increasing the Utility and Accessibility of Nevada's Digital Geologic Libraries: Digitization of Geothermal Well Logs, GeMS Geologic Map Conversions, and Great Basin Science Sample and Records Library Data Preservation

- **Project PI:** Elijah Mlawsky, Nevada Bureau of Mines and Geology, UNR
- **Project duration:** September 2022 – January 2024.
- **Total project funding:** \$150,091 (USGS-NGGDPP)

- **Project goal:** Enhance the machine readability and accessibility of geothermal well logs (including temperature, pressure, resistivity, density and porosity) through digitization of existing paper-to-pdf scans by NBMG personnel trained on specialized software. Resulting tabular and .las datasets are quality assured, ascribed detailed metadata, and keyed to additional well datasets in the GBCGE Subsurface Database for increased discoverability via filter and query on the Subsurface Database Explorer web application (<https://www.gbcge.org/subsurface>). The proposed sites for geothermal well log digitization included the Dixie Valley/McCoy geothermal fields, Winnemucca and Paradise Valley, Beowawe, Ruby Valley, and Fish Lake Valley. At these sites, approximately 300 temperature and pressure logs are available in scanned pdf format and will be digitized to create tabular data. Capturing tabular log data will bolster important functionality of the subsurface geothermal database managed by the NBMG allowing for improved geothermal resource evaluation and inclusion in machine learning algorithms to reduce geothermal exploration risk.
- NBMG will also rescue valuable geothermal core under the NGGDPP 2022 award. The core is from the Blue Mountain geothermal system in north-central Nevada. Two stratigraphic test holes (DB-1 and DB-2) were drilled to approximately 1524 m (5000 ft) depth at the site between 2002 and 2004 to evaluate geothermal potential. The core will be archived and curated at the Great Basin Science Sample and Records Library, which is operated and managed by NBMG.

ACKNOWLEDGMENTS

Lucia Patterson, Valerie Kneefel, Robert Ghiglieri, and Dustin Holcomb at the Nevada Division of Minerals are thanked for providing updated information on geothermal leases, gross proceeds, drilling permits, and geothermal production information. Elijah Mlawsky at NBMG is thanked for help in extracting annual production statistics from the Great Basin Center for Geothermal Energy database. James Faulds is thanked for his comments and review of the draft document.

REFERENCES

- Brown, S., Coolbaugh, M., DeAngelo, J., Faulds, J., Fehler, M., Gu, C., Queen, J., Treitel, S., Smith, C., and Mlawsky, E., 2020, Machine learning for natural resource assessment—an application to the blind geothermal systems of Nevada: Geothermal Resources Council Transactions, v. 44, 14 p.
- Muntean, J.L., Micander, R., and Ayling, B., 2022, The Nevada Mineral Industry 2021: Nevada Bureau of Mines and Geology Special Publication MI-2021, 81 p.

<https://pubs.nbmng.unr.edu/The-NV-mineral-industry-2021-p/mi2021.htm>.

- Smith, C.M., Faulds, J.E., Brown, S., Coolbaugh, M., DeAngelo, J., Glen, J.M., Burns, E., Siler, D.L., Treitel, S., Mlawsky, E., Fehler, M., Gu, C., and Ayling, B.F., 2023, Exploratory analysis of machine learning techniques in the Nevada geothermal play fairway analysis: *Geothermics*, v. 111, <https://doi.org/10.1016/j.geothermics.2023.102693>.

WEB LINKS TO OTHER GEOTHERMAL INFORMATION

For further information on geothermal resources in Nevada check the following websites:

- The Nevada Bureau of Mines and Geology ARC-GIS Open Data website: <https://data-nbmng.opendata.arcgis.com/>
- The Great Basin Center for Geothermal Energy <https://gbcge.org/>
- Map of geothermal resources in Nevada, NBMG Map 161, available online in PDF format: <http://www.nbmng.unr.edu/Geothermal/Published/Maps.html> (includes zipped file of GIS layers)
- Nevada Bureau of Mines and Geology Geothermal Resources of Nevada website at <http://www.nbmng.unr.edu/Geothermal/> This site contains geothermal exploration data, interactive maps, lease and information, and numerous geothermal digital data sets. These data are increasingly made available through the National Geothermal Data System (<https://www.geothermaldata.org>) and the Department of Energy's Geothermal Data Repository (<https://gdr.openei.org/>).
- Nevada Commission on Minerals, Nevada Division of Minerals at <http://minerals.state.nv.us/> and <http://minerals.nv.gov/Programs/Geo/Geo/>.
- National Renewable Energy Laboratory Geothermal Data Repository, <https://www.nrel.gov/geothermal/data-tools.html>
- United States Energy Information Administration, Nevada State Energy Profile online <https://www.eia.gov/state/print.php?sid=NV>.
- Summary of supporting data for USGS regional heat-flow studies of the Great Basin, 1970–1990, by John H. Sass, Susan S. Priest, Arthur H. Lachenbruch, S. Peter Galanis, Jr., Thomas H. Moses, Jr., John P. Kennelly, Jr., Robert J. Munroe, Eugene P. Smith, Frederick V. Grubb, Robert H. Husk, Jr., and Charles W. Mase; USGS Open-File Report 2005-1207 online version 1.0 on the Web at <http://pubs.usgs.gov/of/2005/1207/>.

- Geothermal industry temperature profiles from the Great Basin, by John H. Sass, Susan S. Priest, Arnold J. Blanton, Penelope C. Sackett, Stephanie L. Welch, and Mark A. Walters; USGS Open-File Report 99-425 online version 1.0 on the Web at <http://pubs.usgs.gov/of/1999/of99-425/webmaps/home.htm>.
- The Bureau of Land Management Land and Mineral Records-LR2000 system website, <https://www.blm.gov/services/land-records>. Provides reports on BLM land and mineral use authorizations for oil, gas, and geothermal leasing, rights-of-ways, coal and other mineral development, land and mineral title, mining claims, withdrawals, classifications, and more on federal lands or on federal mineral estate.
- The U.S. Department of Energy (DOE) Geothermal Technologies Office (GTO)'s (<https://energy.gov/eere/geothermal/geothermal-energy-us-department-energy>) Office of Scientific and Technical Information (OSTI) have scanned approximately 3,300 agency and national lab technical reports. These files are in a PDF, full-text-searchable format and accessible online at <http://www.osti.gov/scitech/> and <https://www.osti.gov/home/collections>.

OIL AND GAS

by David Reynolds and Rachel Micander

PRODUCTION

According to the Nevada Division of Minerals, Nevada's net oil production was 237,632 barrels, which accounted for less than 0.04% of total domestic production. Production increased 6.5% from 223,229 barrels in 2021 marking the second annual increase in several years. Production came from 57 actively producing wells in seven fields in Railroad Valley, Nye County, which accounted for 91% of the state's production, and ten wells in three fields in Pine Valley, Eureka County, which accounted for about 9% of the state's production. Nevada ranked 27th out of the 32 oil-producing states (U.S Energy Information Administration). According to preliminary and unpublished data from the Nevada Division of Taxation, a total of 234,256 barrels of oil were sold during 2022, totaling \$19,294,008, a 26.8% increase over values reported in 2021. Unless otherwise noted, production comes from the oil patch reports and oil and gas production and well data provided by the Nevada Division of Minerals.

Production from Nevada's 67 actively producing wells ranged up to 142 barrels of oil per day and up to 3871 barrels of water per day. The daily averages were 13.6 barrels of oil, a 52.8% increase from 8.9 barrels per day in 2021, and 298 barrels of water per day for the 66 water producers, a 71% increase from 174 barrels per day in 2021. Eleven wells were shut-in for up to three months, and 13 were shut-in for between 4 and 11 months. Twenty-five wells produced less than 300 days. Of those, 15 produced less than 100 days during the year.

At 75 barrels of oil and 803 barrels of water per day over a full year of production, Grant Canyon 10 was Nevada's most productive well. Trap Spring 9 was Nevada's second most productive well at ~48 barrels of oil and 1080 barrels of water per day over 364 days of production. Munson Ranch 12-32 was Nevada's third most productive well at 59 barrels of oil and 262 barrels of water per day over 267 days of production.

Bacon Flat Field

The Bacon Flat Field produces from dolomite in the Devonian Guilmette Formation (Garside et al., 1988) between about 4960–5350 feet (1512 and 1634 m). The field's one producer, which has been active since 1994, produced 4794 barrels of oil and 34,552 barrels of water during 328 production days in 2022 and accounted for 2.02% of Nevada's total oil production. Oil production decreased 41% and water production increased 8% from 2021. The average oil gravity (or API gravity) serves as another attribute to compare fields—in the Bacon Flat Field average oil gravity was 26.33 in 2022.

Blackburn Field

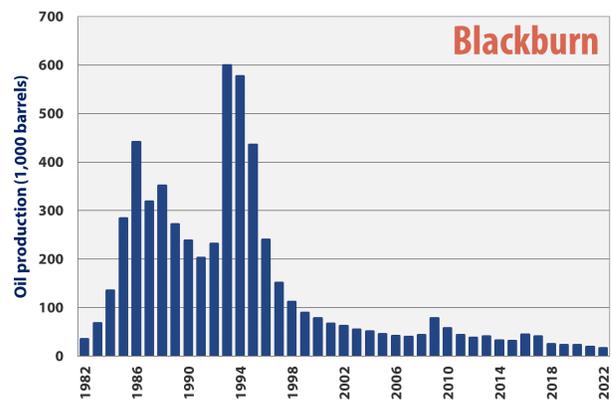


Figure 1. Chart showing oil production from the Blackburn Field in Pine Valley, Eureka County, from 1982 to 2022.

The Blackburn Field produces from the Oligocene Indian Well Formation (tuff and tuffaceous sandstone), Mississippian Chainman Shale (sandstone), and Devonian Nevada group (dolomite) (Garside et al., 1988) between about 6700 and 6750 feet (2043 and 2058 m). The field had six active wells in 2022 and production totaled 15,920 barrels of oil and 1,551,934 barrels of water over 1,435 well production days. This field produced the most water per barrel of oil of all Nevada oil fields at almost 97.5 barrels of water per barrel of oil. Water from the Blackburn 18 well (permit 660) was the highest and had a water to oil ratio of 296 barrels of water per barrel of oil. Blackburn Field accounted for 6.7% of Nevada's total oil production. Oil production decreased 21%, and water production increased almost 2% from 2021.

Historically, the first production for this field was from the Blackburn 3 well in April, 1982. Production had a first peak during 1986 at 440,485 barrels for the year from 4 wells. Two more wells were added by 1995 when production peaked at 459,005 barrels. Following the peak, production declined fairly steadily despite the addition of 2 more wells bringing the total to 8. The average oil gravity for the Blackburn Field was 28.13 during 2022.

Eagle Springs Field

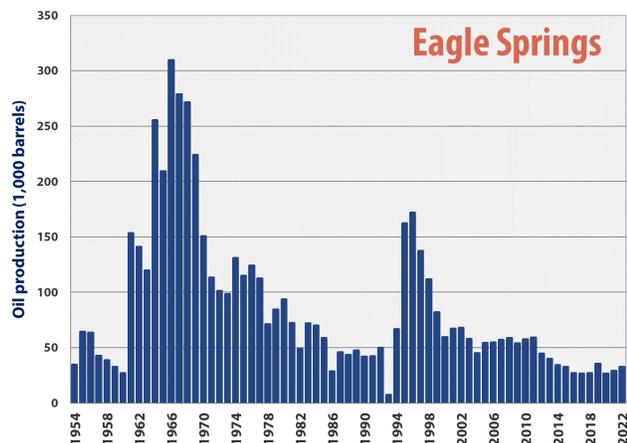


Figure 2. Chart showing oil production from the Eagle Springs Field in Railroad Valley, Nye County, which has produced from 1954 to present. It is the first commercial oil field in Nevada.

The Eagle Springs Field produces from Oligocene ignimbrites, the Eocene Sheep Pass Formation (lacustrine carbonates), and the Pennsylvanian Ely Limestone (Garside et al., 1988) between about 5780 and 7360 feet (1762 and 2244 m). The field had 12 active producers in 2022. Production for the field was 32,544 barrels of oil and 291,557 barrels of water, which accounted for about 13.7% of Nevada's total oil production. Oil production increased 2% from 2021 and water production decreased 11%.

This field was the first commercial oil field in the state of Nevada with first production recorded in June of 1954. Historically, 10 new wells were drilled in this field during the 1960s and by 1966, it achieved peak annual production of 295,227 barrels. Several more wells were drilled in the 1990s. By 1996, there were 15 active wells and production peaked at 165,264 barrels. Water production increased with the increased drilling starting in 1995, and reaching a peak of 842,435 in 2008, where the water to oil ratio rose to 14.36. While production has declined since 1999, water production has remained high. Since 2005 the average water to oil ratio has been 12.5, while prior to 1998 the ratio was less than 4.0. The average API gravity of oil from Eagle Springs Field was 26.74. However, the 12 wells ranged from 25.73 to 27.66 API gravity across the field.

Ghost Ranch Field

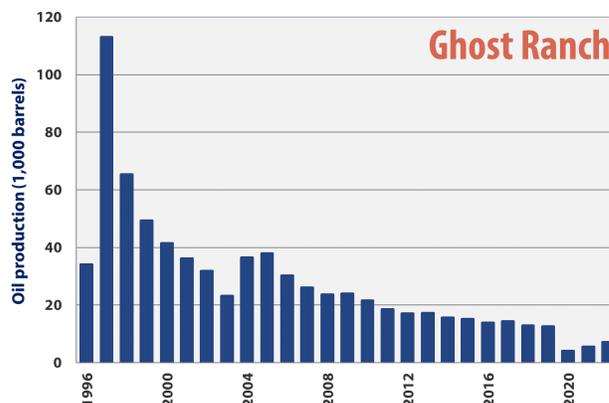


Figure 3. Chart showing oil production from the Ghost Ranch Field in Railroad Valley, Nye County, from 1996 to 2022.

The Ghost Ranch Field produces from late tertiary landslide breccia blocks of Devonian Guilmette Limestone and dolomite (LaPointe et al., 2007) between about 4350 and 4620 feet (1326 and 1409 m). The field had four active producers in 2022, producing 7085 barrels of oil and 283,187 barrels of water. It was the second largest ratio of water to oil at 38.04 barrels of water per barrel of oil. Oil production increased 17% from 2021 and water increased 23%. The Ghost Ranch Field accounted for 2.98% of the oil production for Nevada in 2022.

Historically, the first production of oil from this field was in April, 1996. All wells in this field were drilled between 1996 and 1997, but one was plugged and abandoned. Peak production for this field was reached in 1998 at 175,075 barrels oil per year. Water production increased rapidly to 1998, but there are no records for years 1999 through 2004. The oil production dropped to 49,348 in 1999 and continued to generally decline through 2022, where production was 7085 barrels. Water production over the period between 2005 and 2022 varied widely from a peak water production of 711,865 in 2008 to 283,187 in 2022. The ratio of Water to Oil showed a steadier increase from 15.04 in 2005 to 39.97 in 2022. The average oil gravity was 16.79 for this field.

Grant Canyon Field

The Grant Canyon Field also produces from dolomitic rocks of the Devonian Guilmette Formation (Garside et al., 1988) between about 2160 and 4300 feet (659 and 1333 m). The field had three active producers in 2022 that produced 15,920 barrels of oil yielding 13.86% of NV oil production. Water production was 537,349 barrels in 2022. Change from 2021 to 2022 showed a decrease of 6.05% in oil production and a decrease of 5.90% in water production. The Grant Canyon No 7 (permit 625) produced over 200 barrels of water per barrel of oil in 2022. Average oil gravity of the field was 26.27.

Historically, 12 wells were drilled in this field with the earliest (Grant Canyon 1) producing first oil in September 1983. Between 1983 and 1985, a total of 7 wells were drilled and annual oil production increased to over 2 million barrels for 5 of 6 years between 1987 and 1992. In 1993 oil production fell to 495,934 barrels. There were 2 more wells drilled in 1993 and 1994 and another 2 wells in 2007, but they made little impact on the oil production. In 2014, 2 existing wells were converted to injection wells.

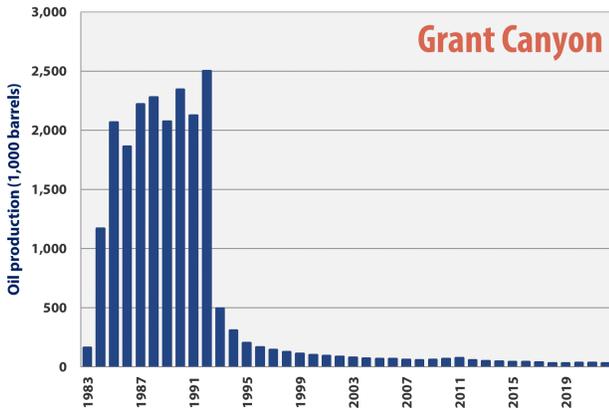


Figure 4. Chart showing oil production from the Grant Canyon Field in Railroad Valley, Nye County, from 1983 to 2022.

Kate Spring Field

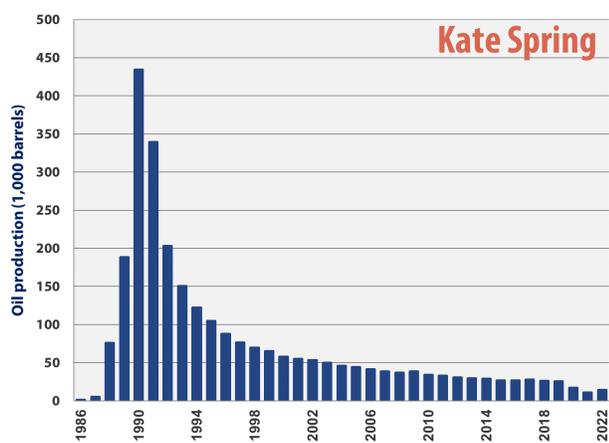


Figure 5. Chart showing oil production from the Kate Spring Field in Railroad Valley, Nye County, from 1986 to 2022.

The Kate Spring Field produces from the Tertiary Horse Camp Formation (breccia) and the Devonian Guilmette Formation (Garside et al., 1988) between about 4450 and 4820 feet (1357 and 1470 m). In 2022, 4 wells combined produced 14,643 barrels of oil—6.16% of NV oil production. Water production was 37,393 barrels in 2022. Oil production increased from 2021 levels by 2.37% but water production declined by 62.88%. The overall trend in oil production has steadily decreased starting around 1993, but water production took a steep decline from 2020 to 2022. Total oil production through 2022 has been 2,675,016

barrels. This field is unique in Nevada as it has the heaviest oil gravity at 10.5.

Historically, this field recorded first production in January of 1986, and 8 wells were drilled between 1986 and 1991. Presently, 3 of these wells are shut in and one was converted to an injection well in 1990. Peak annual oil production was reached in 1991 at a combined total of 452,527 barrels of oil. Water production was not always reported for this field, but the greatest water production was in 1996 at 565,183 barrels. The Water to Oil ratio of this field has fairly steadily increased from a ratio of 3.64 in 1994 to 14.47 in 2022, but it does not show a sudden increase that is common in other oil fields.

Sans Spring Field

The Sans Spring Field produces from the Oligocene Garrett Ranch Group (volcaniclastic rocks and ignimbrites) (LaPointe et al., 2007) between about 5640 and 5770 feet (1720 and 1759 m). Only the Sans Springs 5-14A well was active during 2022 between April and September. This well produced a total of 715 barrels of oil over a 22-day period, averaging 32.5 barrels per day of production. There was no reported water production from this well during 2022. Production increased 1.6% from 2021 and accounted for about 0.3% of Nevada’s total oil production. The field also contains two inactive producers. The average oil gravity of this field was reported at 27.05.

Three Bar Field

The Three Bar Field produces from sandstone and volcanic rock of the Miocene Humboldt Formation, the Oligocene Indian Well Formation, and sandstone and carbonate rocks from the Cretaceous Newark Formation (LaPointe et al., 2007). There were 2 producing wells in 2022 that totaled 6002 barrels of oil and 8049 barrels of water. This production showed a decrease of 15% from 2021 oil production (7054 barrels) and a 22% decrease in water production from 2021 (10,360). This represented 2.52% of Nevada state oil production. Two wells produced gas from this field in 2022 and production totaled 4059 thousand cubic feet (MCF), which was in increase of 37% from the 2021 production of 2970 MCF.

Historically, a total of 8 wells were drilled in this field. The Three Bar Federal 25-A first recorded oil production in March 1990 and produced until May 1992 totaling 18,419 barrels of oil and 54,192 barrels of water. The Three Bar 5 well only produced from July 1993 to November 1994 and totaled 2,090 barrels of oil and 18,693 barrels of water. Finally, in September 2019 a new well started producing and another well was added in October 2021, substantially increasing production. However, compared to 2021 production figures, both oil and water production decreased 15% and 22%, respectively. The average oil gravity of this field was 25.86.

Trap Spring Field

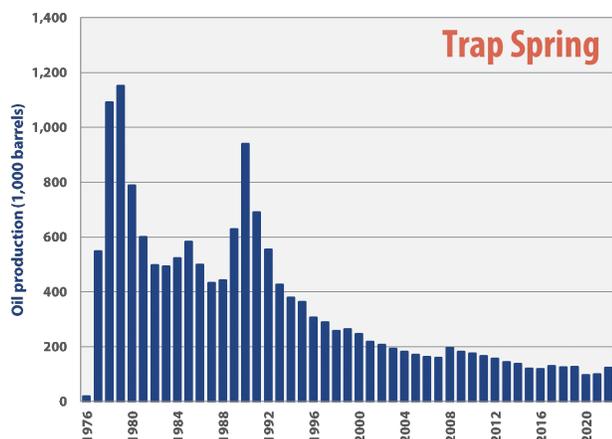


Figure 6. Chart showing oil production from the Trap Spring Field in Railroad Valley, Nye County, from 1976 to 2022.

The Trap Spring Field produces from the Oligocene tuff of Pritchards Station (Garside et al., 1988) between about 3210 and 4950 feet (979 and 1509 m). The field had 32 active producers in 2022 which, when combined, produced 122,998 barrels of oil. This accounted for 51.70% of Nevada oil production during 2022. 2,463,469 barrels of water were produced across the field during the same time frame. Oil production increased 23.75% and water increased 48.18% from 2021.

Peak annual production occurred in 1979 at 1,056,507 barrels from just 11 wells. Further development from 1984 through 1991 reached a second peak of 924,781 barrels of oil in 1990. More wells were added by 1999, but only a small increase in production was observed in 1999 and 2008.

The oil gravity shows two distinct reservoirs in this field. One group of wells has an average gravity of 22.05 and includes 8 of the Trap Spring wells (permits 185, 188, 196,

197, 219, 231, 232, and 574). The other group of 31 wells has an average gravity of 27.11. The East Inselberg 36-33 well has heavier oil (lower gravity) than either of these groups—measuring 16.10—which may indicate a separate reservoir.

Minor Fields

Five minor fields were shut-in throughout 2022 opposed to the six fields in 2021. One well in the Tomera Ranch field produced 110 barrels of oil and 110 barrels of water during the month of July. The wells were shut in for the remainder of the year. Production in the Tomera Ranch Field is from an unnamed conglomerate unit. Past production from three now plugged and abandoned wells in the Tomera Ranch field were from the Oligocene Indian Well Formation (tuffaceous sandstone) between about 1150 and 1950 feet (351 and 595 m) (LaPointe et al., 2007).

The North Willow Creek Field—which produced from the Mississippian Chainman Shale (LaPointe et al., 2007) between about 6290–6470 feet (1917 to 1972 m)—contains two wells and has been shut in since 2008. The remaining four fields contain one well each. The Sand Dune Field produced from Permian and Pennsylvanian limestones (LaPointe et al., 2007) between about 5970 and 6200 feet (1820 and 1890 m). This well has been shut in since August, 2021. The Currant Field produced from the Eocene Sheep Pass Formation (LaPointe et al., 2007) between about 6850 and 7080 feet (2088 and 2159 m). The Duckwater Creek Field produced from the tuffs of the Oligocene Garrett Ranch Group (LaPointe et al., 2007) between about 5680 and 5830 feet (1732 and 1777 m). The East Inselberg Field, produced from the Devonian Guilmette Formation between about 1046–1171 feet (319 and 357 m). The Currant, Duckwater Creek, and East Inselberg fields have all been shut-in since 2015.

Production from Nevada's oil fields (barrels of oil)

Compiled from producers' reports filed with the Nevada Division of Minerals

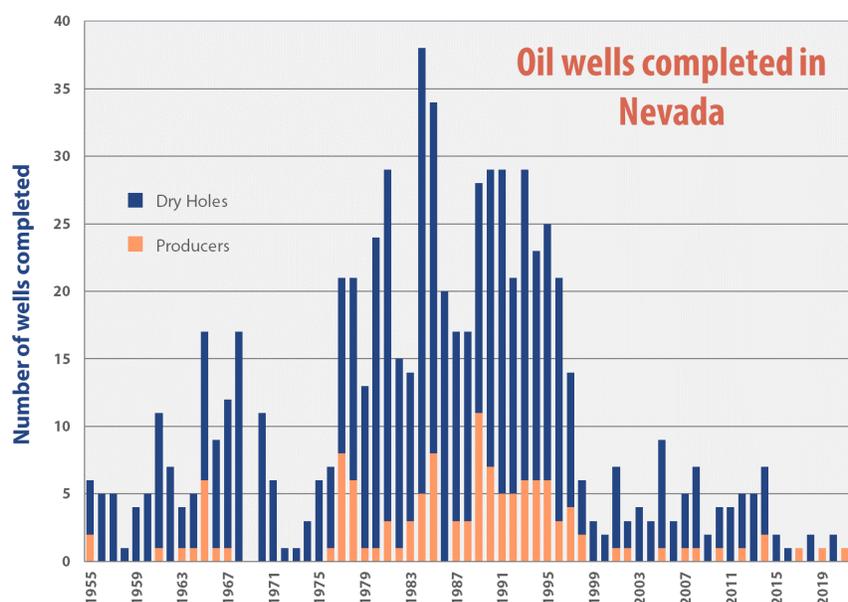
Field (year discovered)	1994-2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Eagle Springs (1954) (Railroad Valley)	8,097,846	644,703	361,101	375,711	429,749	557,326	377,316	474,199	611,335	465,346	242,519	302,062	291,557	13,230,770
Trap Spring (1976) (Railroad Valley)	39,125,155	2,450,044	2,460,099	2,429,108	2,382,353	2,325,601	2,394,821	2,386,266	2,299,045	2,320,594	1,346,868	1,965,462	2,463,496	66,348,912
Currant (1979) (Railroad Valley)	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Bacon Flat (1981) (Railroad Valley)	427,823	1,810	1,765	1,685	1,825	1,625	4,152	56,319	83,590	54,717	48,070	31,983	34,552	749,916
Blackburn (1982) (Pine Valley)	30,543,822	1,334,105	1,418,780	1,284,774	1,117,893	1,373,509	1,601,484	2,022,722	1,602,479	1,416,358	1,322,443	1,010,938	1,551,934	47,601,241
Grant Canyon (1983) (Railroad Valley)	7,166,873	644,303	640,311	637,840	621,172	547,166	572,710	534,650	803,463	687,952	648,672	571,057	537,349	14,613,518
Kate Spring (1986) (Railroad Valley)	8,042,980	450,155	426,896	337,981	368,722	398,138	343,883	449,919	496,998	400,474	250,438	85,712	36,993	12,089,289
Spencer Lease (1986) (Railroad Valley)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tomera Ranch (1987) (Pine Valley)	505,881	0	0	0	0	0	0	7	0	0	0	0	0	505,888
North Willow Creek (1988) (Pine Valley)	3,983	0	773	360	0	0	0	0	0	0	0	0	0	5,116
Three Bar (1990) (Pine Valley)	5,958	0	0	0	0	0	0	0	0	1,530	12,429	10,360	8,049	38,326
Duckwater Creek (1990) (Railroad Valley)	72,081	1,080	1,080	1,080	990	0	0	0	0	0	0	0	0	76,311
Sans Spring (1993) (Railroad Valley)	4,205,523	0	0	0	0	0	0	0	0	0	0	0	0	4,205,523
Ghost Ranch (1996) (Railroad Valley)	1,025,976	514,379	479,013	600,429	537,388	561,107	452,521	518,688	442,673	505,623	159,221	204,390	283,187	6,284,595
Deadman Creek (1996) (Elko County)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sand Dune (1998) (Railroad Valley)	420,827	50,857	55,225	49,525	14,308	5,211	365	135	102	0	0	138	0	596,693
East Inselberg (2005) (Railroad Valley)	4,200	698	0	0	0	0	0	0	0	0	0	0	0	4,898
Toano Draw (2007) (Elko County)	29,121	0	0	0	0	0	0	0	0	0	0	0	0	29,121
Humboldt (2014) (Elko County)					0	0	0	0	0	0	0	0	0	0
Huntington (2014) (Elko County)					0	4,589	0	0	4,589	0	0	0	0	9,178
Total	99,678,051	6,092,134	5,845,043	5,718,493	5,474,400	5,774,272	5,747,252	6,442,905	6,344,274	5,852,594	4,030,660	4,182,102	5,207,117	166,389,297
Change from previous year		-4.0%	-4.1%	-2.2%	-4.3%	5.5%	-0.5%	12.1%	-1.5%	-7.7%	-31.1%	3.8%	24.5%	

Production of water from Nevada's oil fields (barrels of water)

Compiled from producers' reports filed with the Nevada Division of Minerals

Field (year discovered)	1994-2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Eagle Springs (1954) (Railroad Valley)	8,097,846	644,703	361,101	375,711	429,749	557,326	377,316	474,199	611,335	465,346	242,519	302,062	291,557	13,230,770
Trap Spring (1976) (Railroad Valley)	39,125,155	2,450,044	2,460,099	2,429,108	2,382,353	2,325,601	2,394,821	2,386,266	2,299,045	2,320,594	1,346,868	1,965,462	2,463,496	66,348,912
Currant (1979) (Railroad Valley)	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Bacon Flat (1981) (Railroad Valley)	427,823	1,810	1,765	1,685	1,825	1,625	4,152	56,319	83,590	54,717	48,070	31,983	34,552	749,916
Blackburn (1982) (Pine Valley)	30,543,822	1,334,105	1,418,780	1,284,774	1,117,893	1,373,509	1,601,484	2,022,722	1,602,479	1,416,358	1,322,443	1,010,938	1,551,934	47,601,241
Grant Canyon (1983) (Railroad Valley)	7,166,873	644,303	640,311	637,840	621,172	547,166	572,710	534,650	803,463	687,952	648,672	571,057	537,349	14,613,518
Kate Spring (1986) (Railroad Valley)	8,042,980	450,155	426,896	337,981	368,722	398,138	343,883	449,919	496,998	400,474	250,438	85,712	36,993	12,089,289
Spencer Lease (1986) (Railroad Valley)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tomera Ranch (1987) (Pine Valley)	505,881	0	0	0	0	0	0	7	0	0	0	0	0	505,888
North Willow Creek (1988) (Pine Valley)	3,983	0	773	360	0	0	0	0	0	0	0	0	0	5,116
Three Bar (1990) (Pine Valley)	5,958	0	0	0	0	0	0	0	0	1,530	12,429	10,360	8,049	38,326
Duckwater Creek (1990) (Railroad Valley)	72,081	1,080	1,080	1,080	990	0	0	0	0	0	0	0	0	76,311
Sans Spring (1993) (Railroad Valley)	4,205,523	0	0	0	0	0	0	0	0	0	0	0	0	4,205,523
Ghost Ranch (1996) (Railroad Valley)	1,025,976	514,379	479,013	600,429	537,388	561,107	452,521	518,688	442,673	505,623	159,221	204,390	283,187	6,284,595
Deadman Creek (1996) (Elko County)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sand Dune (1998) (Railroad Valley)	420,827	50,857	55,225	49,525	14,308	5,211	365	135	102	0	0	138	0	596,693
East Inselberg (2005) (Railroad Valley)	4,200	698	0	0	0	0	0	0	0	0	0	0	0	4,898
Toano Draw (2007) (Elko County)	29,121	0	0	0	0	0	0	0	0	0	0	0	0	29,121
Humboldt (2014) (Elko County)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Huntington (2014) (Elko County)	0	0	0	0	0	4,589	0	0	4,589	0	0	0	0	9,178
Total	99,678,051	6,092,134	5,845,043	5,718,493	5,474,400	5,774,272	5,747,252	6,442,905	6,344,274	5,852,594	4,030,660	4,182,102	5,207,117	166,389,297
Change from previous year		-4.0%	-4.1%	-2.2%	-4.3%	5.5%	-0.5%	12.1%	-1.5%	-7.7%	-31.1%	3.8%	24.5%	

Figure 7. Chart showing number of wells completed and how many were producers in Nevada from 1955 to 2022.



The following four minor fields produced in the past, but are all now plugged and abandoned. Deadman Creek had only one well that produced briefly from the Humboldt Formation between 8165 and 8850 feet (2489 and 2698 m). Toano Draw had only one well that produced from the Humboldt Formation between 8250 and 8950 feet (2515 and 2729 m). The Humboldt Field, produced from the Elko Formation between 7906 feet and 8210 feet (2410 and 2503 m). The Huntington Field also produced from the Eocene Sheep Pass Formation between 8924 and 9290 feet (2721 and 2832 m) (LaPointe et al., 2007). The Humboldt and Huntington Fields were plugged and abandoned in 2017.

Most of Nevada’s oil is used to make such products as No. 1 and No. 2 diesel fuel, kerosene, stove oil, and asphalt. Nevada crude oil was transported in batches by trucks to the 8000-barrel-per-day capacity refinery near Currant in Railroad Valley, which is now owned by Sky Quarry Inc., who acquired it from Foreland Refining Corporation on October 3, 2022.

NEW PRODUCERS

No new producers came online in 2022. However, several wells that had previously been shut in produced in 2022.

EXPLORATION

Over the past several years, exploration has been limited to only two wells per year, at most. One well was permitted for oil and gas in 2022, which was the same number approved in 2021. The application for permit to drill an oil or gas well was filed by Great Basin Operating, LLC and was approved by the Nevada Division of Minerals on July 15, 2022. This permit is for a wildcat well, located in Elko County. No wells were hydraulically fractured in Nevada in 2022, but a table of wells hydraulically fractured in the past is provided.

TRANSFERS

No transfers occurred during this year.

U.S. VS NEVADA OIL PRODUCTION

Domestic crude oil production averaged 11,910,573 barrels per day in 2022, a 5.7% increase from 11,267,633 barrels per day in 2021. The ratio of Nevada to the rest of the Nation was 0.005472% in 2022. The average barrels produced per day in Nevada during 2022 was 651.7. Figure 8 shows the comparison of Nevada oil production contrasted with average oil price from 1954 (when oil production first began in Nevada) through 2022.

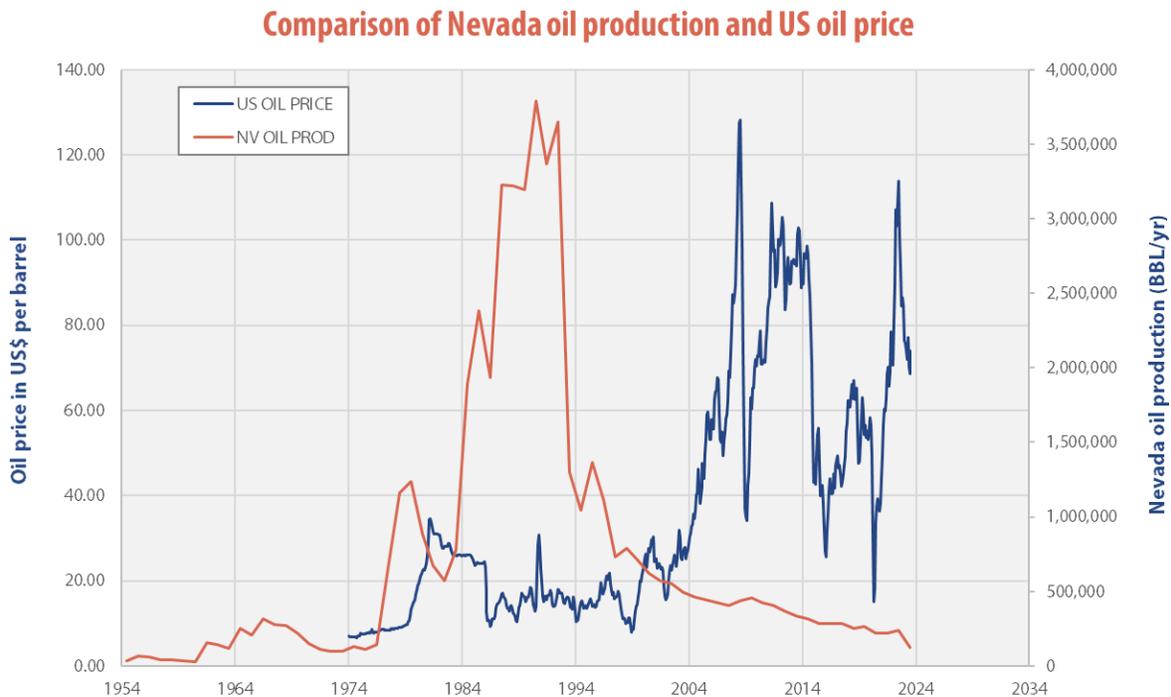


Figure 8. Chart showing comparison of Nevada oil production and average US oil price from 1954 to 2022.

Partial list of Nevada oil wells that were stimulated in the past

Modified and compiled from well records and data from consultant Jerry Walker

Permit	Company	Well Name	Year Completed	Perfs (gross)	Fluid	Proppant	Date Fracked	Present Status	Formation
3	Gulf Refining Co.	Wilkins Ranch No. 1	1954	6510'-6740'	4,000 gal. oil; 500 gal. mud acid	sand	5/25-30/1954	P&A	Oligocene volcanic tuff
203	Northwest Exploration Co.	Trap Spring No. 13	1977	4976'-5078'	10,122 gal. lease oil	55,000 lbs. 8/12 sand	6/21/1977	WD	Garrett Ranch Volcanics
189	Northwest Exploration Co.	Trap Spring No. 4	1977	4018'-4389'	53,000 gal. oil	37,000 lbs. 8/12 sand	8/19/1977	P&A	Garrett Ranch Volcanics
196	Northwest Exploration Co.	Trap Spring No. 8	1977	4408'-4575'	72,300 gal. lease oil	100,000 lbs. 10/20 sand	9/11/1977	Producer	Tertiary volcanic rock
233	Northwest Exploration Co.	Trap Spring No. 20	1978	3932'-3987'	62,000 gal. lease oil	75,000 lbs. 10/20 sand	8/4/1978	WD	Pritchards Station Volcanics
196	Northwest Exploration Co.	Trap Spring No. 8	1979	4408'-4575'	1,795 gal. lease oil	100,000 lbs. 10/20, 8/12, 4/8 sand	6/23/1979	Producer	Tertiary volcanic rock
263	Wexpro Co.	Jiggs 10-1	1980	10,060'-10,080'	Hy-gel	1.5 ppg 100 mesh sand	3/6/1980	P&A	Paleozoic rock
324	Amoco Production Co.	Blackburn No. 3	1982	6274'-6345'	Jellied lease crude	30,000 lbs. 20/40 sand	1982	Shut in	Indian Well Formation
342	Sun Exploration and Production Co.	Southern Pacific No. 3-13	1983	8386'-8432'	53,090 gal. diesel; 1500 SCF CO ₂	53,620 lbs. 20/40 sand	1/28/1983	P&A	Humboldt Formation
350	Amoco Production Co.	Blackburn No. 10	1983	5660'-5870'	87,500 gallons foamed oil	120,000 lbs. 20/40 sand	9/22/1983	Producer	Indian Well Formation
210	MAPCO Oil and Gas Co.	Trap Spring No. 17	1985	3570'-3610'	10,000 gal. foam	12/20 sand	1985	P&A	Horse Camp Volcanics
856	DY Exploration	Toano Draw 15-19	2005	8800'-8950'	75,000 gal. gel; 6,400 gal. slickwater	115,000 lbs. 20/40 PR6000 sand	8/30/2005	P&A	Humboldt Formation
856	DY Exploration	Toano Draw 15-19	2006	8800'-8950'	61,967 gal. water, solvents, gels, and other additives	30,900 lbs. 20/40 PR6000 sand	6/1/2006	P&A	Humboldt Formation
942	Noble Energy, Inc.	M2C-M2-21B	2014	7906'-8210'	250,057 gal. water; 2% by mass solvents, gels, and other additives	9% by mass PRC Sand; 0.7% by mass Premium white sand	3/17-24/2014	Shut in	Elko Formation
946	Noble Energy, Inc.	M10C-M10-11B	2014	8620'-8889'	343,919 gal. water; 2.5% by mass solvents, gels, and other additives	10% by mass PRC Sand; 0.6% by mass Premium white sand	6/3-4/2014	Shut in	Elko Formation
458	Grant Canyon Oil and Gas	Blackburn No. 16	1985	6959'-7012'	209,600 gal. water; 2.4% by mass solvents, gels, and other additives	12% by mass Premium white sand; 2.4% by mass PRC Sand	6/5/2014	Producer	Nevada Formation
928	Makoil, Inc.	Portuguese Mtn. 14A-2	2014	N/A	29,949 gal. water; 14% by mass solvents, gels, and other additives	32% by mass Premium white sand	11/23/2014	P&A	N/A
960	Noble Energy, Inc.	K1L-1V	2014	N/A	300,537 gal. water; 0.3% by mass solvents, gels, and other additives	7% by mass Premium white sand; 1.5% by mass SSA-2	12/5/2014	Producer	N/A

Abbreviations: Perf (gross) - larger interval containing one or more smaller perforated intervals; P&A - plugged and abandoned; gal. - gallons; WD - water disposal

NEVADA OIL PRODUCERS AND REFINERY

(Nevada Oil Patch; unpublished well files)

Company	Field / Refinery	Contact	Address, Phone and FAX Numbers, and Websites
Grant Canyon Oil and Gas, LLC	Bacon Flat	Michael O'Neal	717 17th Street, No. 1400
	Blackburn	Rod Prosceno	Denver, CO 80202
	Grant Canyon	Steve Barnes	Phone: 303-297-2777
	Sans Spring		FAX: 303-298-0049
	Three Bar		E-mail: michael@onealrc.com E-mail: rod@4arocket.com E-mail: steve@breckenergy.com
Kirkwood Oil and Gas, LLC / Wesco Operating, Inc.	Eagle Springs	Robert Kirkwood	120 South Durbin Street
	Ghost Ranch		P. O. Box 2850
	North Willow Creek		Casper, WY 82602
	Sand Dune		Phone: 307-265-5178 FAX: 307-265-1791 E-mail: bradl@kirkwoodcompanies.com E-mail: kog@kirkwoodcompanies.com Website: http://www.kirkwoodcompanies.com
Makoil, Inc.	Currant	Gregg Kozlowski	209 Avenida Fabricante #100
	Duckwater Creek		San Clemente, CA 92672
	Ghost Ranch		Phone: 949-462-9010
	Kate Spring		FAX: 949-462-9012
	Trap Spring		E-mail: makoil@msm.com Website: http://www.makoil.com
Tomera Oil Fields, LLC	Tomera Ranch	Patsy S Tomera	Rural Route 65 Box 11
		Thomas Tomera	Carlin, NV 89822 Phone: 775-754-2333 E-mail: nvladycat@live.com
Western General, Inc.	Kate Spring	Richard Taylor	HC 34 Box 34830 Ely, NV 89301 Phone: 775-863-0105 Duckwater, NV 89314 FAX: 702 228 9689 E-mail: richardtaylor@cox.net https://westerngeneralinc.com/
Sky Quarry Inc. acquired from Foreland Refining Corporation on Oct 3, 2022	Currant Refinery		707 W. 700 S, Suite 101 Woods Cross, UT 84087 Location: 60 miles southwest of Ely on US 6 Phone: 424-394-1090 https://skyquarry.com/
		CEO David Sealock EVP Marcus Laun	E-mail: dsealock@skyquarry.com E-mail: marcus@skyquarry.com

Status of Nevada oil and gas production wells in 2022

This table gives the amount of oil and water produced and the number of production days in 2022. The sources of information include well records and statistics from the Nevada Division of Minerals. Status abbreviations with dates of the action where applicable: BBL-barrels; ex-except; MCF-thousand cubic feet; PA-plugged and abandoned; Prod-production; SI-shut-in; WD-water disposal

FIELD/OPERATOR/WELL	NEVADA		STATUS	LOCATION	PRODUCTION OIL (BBL)	PRODUCTION WATER (BBL)	PRODUCTION GAS (MCF)	PRODUCTION DAYS
	PERMIT	DATE COMPLETED						
EAGLE SPRINGS (Nye Co., 1954)								
Kirkwood Oil and Gas, LLC								
Eagle Springs Federal No. 44-35	813	05/98	SI 08/04-06/11; SI 02/12	SE, NW, S35, T9N, R57E	0	0		0
Eagle Springs Federal No. 54-35	726	10/94	Prod; SI 3/21-4/21	SW, NE, S35, T9N, R57E	3,425	67,909		308
Eagle Springs Unit No. 1-34	107	07/67	SI 07/86	SE, NE, S34, T9N, R57E	0	0		0
Eagle Springs Unit No. 1-35	4	05/54	WD 1978; no production since 4/70	NE, NW, S35, T9N, R57E	0	0		0
Eagle Springs Unit No. 1-36	76	02/65	SI 05/08	SW, NE, S36, T9N, R57E	0	0		0
Eagle Springs Unit No. 2-36	80	07/65	Prod	NW, SE, S36, T9N, R57E	3,600	40,764		219
Eagle Springs Unit No. 4-36	86	10/65	SI 06/97	NW, SE, S36, T9N, R57E	0	0		0
Eagle Springs Unit No. 5-36	94	04/66	Prod	NW, NE, S36, T9N, R57E	10,124	5,293		356
Eagle Springs Unit No. 15-35	21	07/55	Prod; SI 1/21; 3/21-4/21; 12/21	NW, SW, S35, T9N, R57E	67	1,481		13
Eagle Springs Unit No. 35-35	17	03/55	Prod; SI 3/21-4/21; 10/21	NE, SW, S35, T9N, R57E	1,976	29,058		328
Eagle Springs Unit No. 43-36	83	08/65	Prod; SI 1/21-11/21	NE, SE, S36, T9N, R57E	62	199		56
Eagle Springs Unit No. 62-35	46	01/60	SI 01/12	NW, NE, S35, T9N, R57E	0	0		0
Eagle Springs Unit No. 73-35	69	10/63	Prod	SE, NE, S35, T9N, R57E	3,088	94,890		327
Eagle Springs Unit No. 74-35	71	04/64	Prod; SI 2/21; 4/21-5/21	SE, NE, S35, T9N, R57E	362	13,962		72
Eagle Springs Unit No. 84-35	77	01/65	SI 10/97	SE, NE, S35, T9N, R57E	0	0		0
Eagle Springs/Plains Petroleum No. 13-36	744	02/96	SI 01/21-12/21	SW, NW, S36, T9N, R57E	11	292		1
Eagle Springs/Plains Petroleum No. 23-36	733	10/95	Prod; SI 9/21 & 11/21	SW, NW, S36, T9N, R57E	9,649	21,165		362
Eagle Springs/Plains Petroleum No. 24-36	737	11/94	Prod; SI 1/21-3/21; 7/21-10/21	SW, NW, S36, T9N, R57E	35	1,350		62
Eagle Springs/Plains Petroleum No. 55-35	761	11/95	Prod; SI 1/21-8/21; 10/21; 12/21	SW, NE, S35, T9N, R57E	0	0		0
Eagle Springs/Plains Petroleum No. 64-35	755	09/95	SI 01/12	SW, NE, S35, T9N, R57E	0	0		0
Eagle Springs/Plains Petroleum No. 82-35	734	10/94	Prod; SI 11/21	NE, NE, S35, T9N, R57E	145	15,194		22
Eagle Springs/Plains Petroleum No. 83-35	754	07/95	Prod; SI 1/21-5/21; 8/21-12/31	SE, NE, S35, T9N, R57E	0	0		0
TRAP SPRING (Nye Co., 1976)								
J. N. Oil and Gas Federal No. 1	449	09/85	PA 01/99	NE, NW, S34, T9N, R56E				
Munson Ranch No. 12-42	572	06/90	PA 08/08	SE, NE, S12, T9N, R56E				
Munson Ranch No. 12-44X	445	07/85	PA 08/08	SE, SE, S12, T9N, R56E				
Trap Spring No. 4	189	03/77	PA 07/95	SE, NE, S27, T9N, R56E				
Makoil, Inc.								
Britton No. 13-21	224	04/78	SI 12/91	NE, NW, S13, T9N, R56E	0	0		0
Munson Ranch No. 11-23X	346	10/82	SI 11/82	NE, SW, S11, T9N, R56E	0	0		0
Munson Ranch No. 12-14	688	05/95	Prod	SW, SW, S12, T9N, R56E	822	290		165
Munson Ranch No. 12-23	596	11/90	SI 04/98	NE, SW, S12, T9N, R56E	0	0		0
Munson Ranch No. 12-24	432	04/85	Prod	SE, SW, S12, T9N, R56E	2,299	16,042		364
Munson Ranch No. 12-32	559	12/89	Prod	SW, NE, S12, T9N, R56E	15,795	69,994		267
Munson Ranch No. 12-33	423	03/85	SI 04/96	NW, SE, S12, T9N, R56E				
Munson Ranch No. 12-34	406	10/84	Prod	SW, SE, S12, T9N, R56E	2,123	4,659		365
Munson Ranch No. 12-43	880	03/08	Prod	NE, SE, S12, T9N, R56E	6,205	18,089		365
Munson Ranch No. 13-1	435	08/85	Prod	SE, NW, S13, T9N, R56E	3,206	159		365
Munson Ranch No. 13-11	622	11/91	SI 01/18	NW, NW, S13, T9N, R56E	27	1,400		3
Munson Ranch No. 13-11R	840	11/01	Prod	NW, NW, S13, T9N, R56E	1,610	27,170		346
Munson Ranch No. 13-12	537	07/89	SI 07/89	SW, NW, S13, T9N, R56E	0	0		0
Munson Ranch No. 13-14	623	09/91	ame	SW, SW, S13, T9N, R56E	7,557	106,517		344
Munson Ranch No. 13-21X	640	05/92	Prod	NE, NW, S13, T9N, R56E	3,779	18,344		365
Munson Ranch No. 13-24	218	08/79	SI 12/18	SE, SW, S13, T9N, R56E	0	0		0
Munson Ranch No. 13-31	382	07/84	Prod	NW, NE, S13, T9N, R56E	2,186	22,448		365
Munson Ranch No. 13-32	373	08/84	Prod	SW, NE, S13, T9N, R56E	4,199	45,233		365
Munson Ranch No. 13-33	211	11/78	Prod	NW, SE, S13, T9N, R56E	1,489	5,378		344
Munson Ranch No. 13-41X	448	09/85	Prod	NE, NE, S13, T9N, R56E	10,096	96,791		364
Munson Ranch No. 13-42	222	11/78	Prod; SI 4/21-12/21	SE, NE, S13, T9N, R56E	126	22,266		93
Munson Ranch No. 13-45	547	08/89	Prod	NW, SW, S13, T9N, R56E	1,054	194		351
Munson Ranch No. 13-46	548	07/89	Prod	NE, SW, S13, T9N, R56E	1,337	254		362
Munson Ranch No. 14-23	313	08/81	Prod	NE, SW, S14, T9N, R56E	2,681	20,978		365
Munson Ranch No. 14-24	354	10/83	SI 06/96	SE, SW, S14, T9N, R56E	0	0		0
Munson Ranch No. 14-32	455	09/87	Prod	SW, NE, S14, T9N, R56E	2,793	78,820		365
Munson Ranch No. 14-33	513	07/89	Prod; 1/21-2/21; 4/21-5/21	NW, SE, S14, T9N, R56E	1,193	4,783		318
Munson Ranch No. 14-34	287	11/80	SI 07/15	SW, SE, S14, T9N, R56E	441	3,045		78
Munson Ranch No. 14-34X	522	08/88	Prod	SW, SE, S14, T9N, R56E	1,273	8,650		365
Munson Ranch No. 14-41	538	07/89	SI 12/20	NE, NE, S14, T9N, R56E	0	0		0
Munson Ranch No. 14-44	528	08/89	Prod; SI 5/21-6/21	SE, SE, S14, T9N, R56E	1,236	90,849		199
Munson Ranch No. 14-49	550	08/89	Prod	NE, SE, S14, T9N, R56E	1,329	3,569		364
Munson Ranch No. 14-49X	562	02/90	Prod; SI 1/21, 4/21, 12/21	NE, SE, S14, T9N, R56E	152	41		15
Trap Spring No. 2	185	02/77	Prod; SI 3/21-5/21	SE, SW, S27, T9N, R56E	5,206	1,487		360
Trap Spring No. 3	188	04/77	Prod; SI 1/21-2/21	NW, NE, S34, T9N, R56E	8,918	1,262,465		347
Trap Spring No. 8	196	09/77	SI 12/19	SE, SW, S23, T9N, R56E	0	0		0
Trap Spring No. 9	197	09/78	Prod	NW, NW, S26, T9N, R56E	17,495	393,154		364
Trap Spring No. 14-42	523	10/88	Prod ex 10/21	SE, NE, S14, T9N, R56E	1,143	19,160		325
Trap Spring No. 16	232	09/78	Prod	NW, SE, S23, T9N, R56E	3,940	116,933		364
Trap Spring No. 19	219	12/77	Prod	SE, NW, S23, T9N, R56E	10,571	3,748		363
Trap Spring No. 23-41	574	06/90	Prod	NE, NE, S23, T9N, R56E	717	559		53
Trap Spring No. 27-41	899	01/09	SI 01/09	NE, NE, S27, T9N, R56E	0	0		0
Zuspann No. 24-1	198	06/77	SI 07/86	NW, SW, S24, T9N, R56E	0	0		0
Zuspann No. 24-3	208	09/77	SI 12/19	NE, NW, S24, T9N, R56E	0	0		0
EAST INSELBERG (Nye Co., 2005)								
Makoil, Inc.								
East Inselberg No. 36-33	860	04/05	SI 12/06-06/10; SI 08/15	NW, SE, S36, T10N, R56E	0	0		0
CURRENT (Nye Co., 1979)								
Makoil, Inc.								
Current No. 1	241	10/78	SI 07/05-05/07; SI 08/15	SE, SW, S26, T10N, R57E	0	0		0

Status of Nevada oil and gas production wells in 2022 (continued)

FIELD/OPERATOR/WELL	NEVADA PERMIT	DATE COMPLETED	STATUS	LOCATION	PRODUCTION OIL (BBL)	PRODUCTION WATER (BBL)	PRODUCTION GAS (MCF)	PRODUCTION DAYS
BACON FLAT (Nye Co., 1981)								
Grant Canyon Oil and Gas, LLC								
Bacon Flat No. 1	316	07/81	SI 10/88	C, SW, S17, T7N, R57E	0	0		0
Bacon Flat Federal No. 23-17	657	09/92	SI 12/93 ex 10/19	NE, SW, S17, T7N, R57E	0	0		0
Bacon Flat Federal No. 23-17A	710	01/94	Prod	NE, SW, S17, T7N, R57E	4,794	34,552		328
BLACKBURN (Eureka Co., 1982)								
Grant Canyon Oil and Gas, LLC								
Blackburn No. 3	324	03/82	SI 12/98 ex 11/05	SW, SW, S8, T27N, R52E	0	0		0
Blackburn No. 10	350	09/83	Prod	SW, NW, S8, T27N, R52E	6,378	40,995		320
Blackburn No. 14	442	07/85	Prod; SI 01/01-10/08	NE, SE, S7, T27N, R52E	4,620	7,447		328
Blackburn No. 16	458	12/85	Prod; SI 4/21-6/21	SE, NE, S7, T27N, R52E	848	24,058		139
Blackburn No. 18	660	11/92	Prod	NE, SE, S7, T27N, R52E	3,718	1,102,202		347
Blackburn No. 19	724	06/94	SI ex 1/21 & 4/21	NW, SW, S8, T27N, R52E	110	144,040		78
Blackburn No. 21	802	09/97	Prod	NE, SE, S7, T27N, R52E	246	233,192		223
Grant Canyon Oil and Gas, LLC								
Blackburn No. 22	971	05/16	SI 08/19	NW, SW, S8, T27N, R52E	0	0		0
GRANT CANYON (Nye Co., 1983)								
Grant Canyon Oil and Gas, LLC								
Grant Canyon No. 4	376	07/84	PA 04/92	NE, NW, S21, T7N, R57E				
Grant Canyon No. 5	400	08/84	PA 07/95	E/2, NE, S20, T7N, R57E				
Grant Canyon No. 3	375	08/84	SI 06/92	SW, SW, S16, T7N, R57E	0	0		0
Grant Canyon No. 7	625	08/91	Prod	NW, NW, S21, T7N, R57E	466	93,400		365
Grant Canyon No. 9	642	04/92	SI 03/18	NW, NW, S21, T7N, R57E	0	0		0
Grant Canyon No. 10	706	07/11	Prod; PA 11/93-01/10	NW, NW, S21, T7N, R57E	27,228	293,245		365
Grant Canyon No. 22-21	705	01/94	Prod	SE, NW, S21, T7N, R57E	5,272	150,704		344
KATE SPRING (Nye Co., 1986)								
Makoil, Inc.								
Kate Spring No. 12-2	544	08/89	SI 1/21-12/22	NW, NW, S2, T8N, R57E	0	0	0	0
Western General, Inc.								
Kate Spring No. 1	436	01/86	Prod ex 9/21	W/2, SW, S2, T8N, R57E	3,123	5,780	247	365
Kate Spring No. 1A	560	12/89	Prod ex 9/21	NW, SW, S2, T8N, R57E	8,050	23,280	554	334
Kate Spring No. 1B	567	08/90	Inj 10/90	NE, SW, S2, T8N, R57E	0	0	0	0
Kate Spring No. 1C	592	09/91	Prod ex 9/21	SW, SW, S2, T8N, R57E	2,524	5,467	169	334
Taylor Federal No. 1	497	10/87	Prod; SI 4/21 & 9/21-12/21	NE, SE, S3, T8N, R57E	946	2,866	110	139
Taylor Federal No. 2	536	06/89	SI 09/93 ex 06/17	SE, NE, S3, T8N, R57E	0	0	0	0
SPENCER LEASE (Nye Co., 1986)								
Spencer Federal No. 32-29	446	12/85	PA 06/86	SW, NE, S29, T9N, R57E				
TOMERA RANCH (Eureka Co., 1987)								
Tomera Ranch No. 33-1	591	10/90	PA 09/07	SW, SW, S33, T31N, R52E				
Southern Pacific Land Co. No. 1-5R	647	05/92	PA 06/97	NE, NE, S5, T30N, R52E				
Tomera Ranch No. 33-2RR	841	01/02	PA 09/07	SW, SW, S33, T31N, R52E				
Tomera Oil Fields, LLC								
Tomera Ranch No. 3	923	02/12	SI 1/21	SE, SW, S33, T31N, R52E	110	110		61
Tomera Ranch No. 33-1B	962	11/14	SI 09/19	SW, SW, S33, T31N, R52E	110	110		61
Foreland Corp.								
Southern Pacific Land Co. No. 1-5	492	08/87	WD 1992	NE, NE, S5, T30N, R52E				
NORTH WILLOW CREEK (Eureka Co., 1988)								
North Willow Creek No. 5-27	646	06/93	PA 10/98	SE, NW, S27, T29N, R52E				
Kirkwood Oil and Gas, LLC								
North Willow Creek No. 6-27	648	09/93	SI 04/02	NE, SW, S27, T29N, R52E	0	0		0
Southern Pacific Land Co. No. 1-27	633	01/92	SI 02/97-04/02; SI 06/08	NW, SE, S27, T29N, R52E	0	0		0
THREE BAR (Eureka Co., 1990)								
Three Bar Federal No. 24-13A	566	09/90	PA 01/01	SW, SW, S24, T28N, R51E				
Three Bar Federal No. 5	679	07/93	PA 12/00	SE, NE, S25, T28N, R51E				
Three Bar Federal No. 25-A	556	10/90	PA 01/01	C, NE, S25, T28N, R51E				
Grant Canyon Oil and Gas, LLC								
Three Bar 6R	983	10/21	Prod ex 12/21	SE, NE, S25, T28N, R51E	1,435	2,094	1974	226
Three Bar Federal No. 25-2	977	06/19	Prod	C, NE, S25, T28N, R51E	4,567	5,955	1,653	275
DUCKWATER CREEK (Nye Co., 1990)								
Makoil, Inc.								
Duckwater Creek No. 19-11	542	03/90	SI 06/15	NW, NW, S19, T9N, R57E	0	0		0
SANS SPRING (Nye Co., 1993)								
Grant Canyon Oil and Gas, LLC								
Federal No. 5-14	635	02/93	SI 03/98	SW, NW, S14, T7N, R56E				
Sans Springs No. 5-14A	792	05/97	Prod; SI 1/21-4/21 & 11/21-12/21	SW, NW, S14, T7N, R56E	715	0		22
Federal No. 12-14	673	06/93	SI 10/93	SW, SW, S14, T7N, R56E				
GHOST RANCH (Nye Co., 1996)								
Makoil, Inc.								
Ghost Ranch Springs No. 2-21X	800	08/97	SI ex 7/21-9/21	NE, NW, S2, T8N, R57E	758	172		150
Kirkwood Oil and Gas, LLC								
Ghost Ranch Springs No. 38-35	793	01/97	Prod	SE, SW, S35, T9N, R57E	1,981	101,182		363
Ghost Ranch Springs No. 47-35	799	03/97	Prod ex 3/21-4/21	SE, SW, S35, T9N, R57E	2,515	84,436		363
Ghost Ranch Springs No. 48-35	779	07/96	Prod ex 3/21-4/21	SE, SW, S35, T9N, R57E	1,831	97,397		363
DEADMAN CREEK (Elko Co., 1996)								
Deadman Creek No. 44-13	342	01/96	PA 09/98	SE, SE, S13, T39N, R65E				
SAND DUNE (Nye Co., 1998)								
Kirkwood Oil and Gas, LLC								
Sand Dune Federal No. 88-35	816	07/98	SI ex 7/21	SE, SE, S35, T9N, R57E	0	0		0
TOANO DRAW (Elko Co., 2007)								
Toano Draw No. 15-19	856	12/06	PA 10/08	NW, SW, S19, T39N, R66E				
HUMBOLDT (Elko Co., 2013)								
M2C-M2-21B	942	10/13	PA 08/17	NE, NW, S2, T34N, R58E	0	0		0
HUNTINGTON (Elko Co., 2014)								
K1L-1V	960	11/14	PA 09/17	SW, SW, S1, T29N, R55E	0	0		0

REFERENCES

- Garside, L.J., Hess, R.H., Flemming, K.L., and Weimer, B.S., 1988, Oil and gas developments in Nevada: Nevada Bureau of Mines and Geology Bulletin 104, 136 p.
- LaPointe, D.D., Price, J.G., and Hess, R.H., 2007, Assessment of the potential for carbon dioxide sequestration with enhanced oil recovery in Nevada: Nevada Bureau of Mines and Geology Open-File Report 2007-07, 24 p.
- Nevada Division of Minerals, Nevada Oil Patch: Online, <https://minerals.nv.gov/Programs/OG/OGForms/>, accessed 12 Aug. 2023.
- Nevada Division of Minerals, Open Data Site: Online, <https://data-ndom.opendata.arcgis.com/maps/fb95d850185b4977b2bb221da7a4fe37/about>, accessed 12 Aug. 2023.
- U.S. Energy Information Administration (EIA), undated: Online, <http://www.eia.gov/>, accessed 5 October 2023.

The Nevada Bureau of Mines and Geology (NBMG) is a research and public service unit of the University of Nevada and is the state geological survey. NBMG is part of the Mackay School of Earth Sciences and Engineering within the College of Science at the University of Nevada, Reno. NBMG scientists conduct research and publish reports on mineral resources, engineering geology, environmental geology, hydrogeology, and geologic mapping. Individuals interested in Nevada geology are encouraged to visit, call, or write NBMG or visit our home page at:

www.nbmgs.unr.edu

Director, Research Faculty, Cartographic, and Administrative Staff

NBMG offices on the main campus of the University of Nevada are located in the west wing of the Scroggins Engineering/Mines building.

Phone: (775) 784-6691
Fax: (775) 784-1709
E-mail: nbmg@unr.edu

U.S. Mail:
Nevada Bureau of Mines and Geology
Mail Stop 178
University of Nevada
Reno, NV 89557-0178

UPS or Federal Express:
Nevada Bureau of Mines and Geology
Mail Stop 178
University of Nevada
1664 N. Virginia Street
Reno, NV 89503

Great Basin Science Sample and Records Library/Publication Sales & Information Office

2175 Raggio Parkway
Reno, NV 89512

Contact our Publications Sales and Information Office to purchase or obtain additional information about NBMG geologic maps and reports; U.S. Geological Survey geologic maps and publications; U.S. Geological Survey topographic maps; aerial photographs; cuttings, core, and well records for oil, gas, and geothermal; and general geological and mining information.

Phone: (775) 682-8766
E-mail: nbmg@unr.edu

Please check the NBMG website for hours of operation.

The University of Nevada, Reno is an Equal Opportunity/Affirmative Action employer and does not discriminate on the basis of race, color, religion, sex, age, creed, national origin, veteran status, physical or mental disability, and in accordance with university policy, sexual orientation, in any program or activity it operates. The University of Nevada, Reno employs only United States citizens and aliens lawfully authorized to work in the United States.