NEVADA BUREAU OF MINES AND GEOLOGY

NEVADA MINERAL AND ENERGY RESOURCE EXPLORATION SURVEY

2023/2024

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FEBRUARY 2025

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nbmg Nevada Bureau of Mines and Geology

NEVADA DIVISION OF MINERALS

NEVADA BUREAU OF MINES AND GEOLOGY
EXPLORATION SURVEY ES-2024

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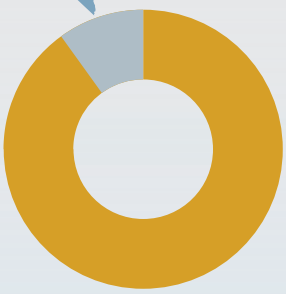
NEVADA EXPLORATION TRENDS 2024

$282.8 Million

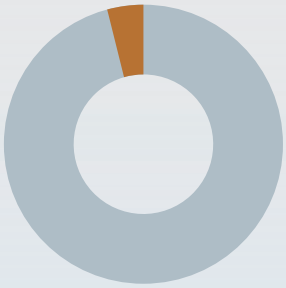
2.3% of the $12.5 Billion global minerals exploration expenditures

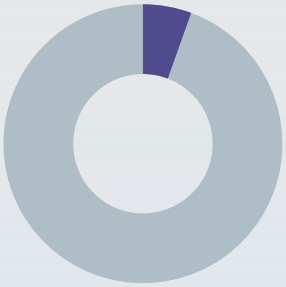


90% targeting precious metals

4% targeting base metals

29 Cu

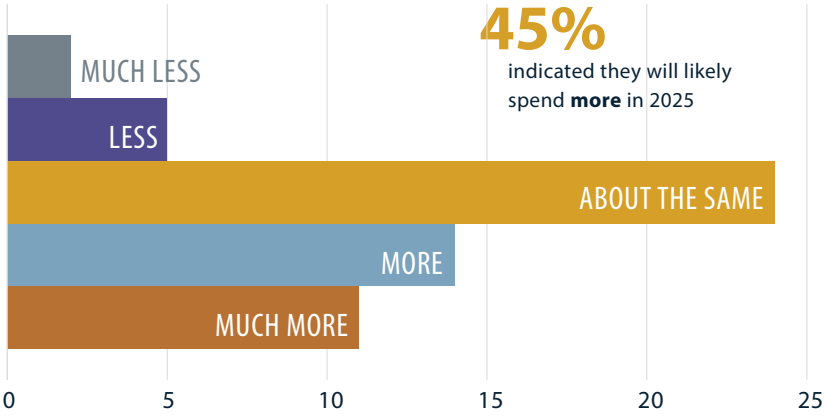




6% targeting lithium

2025 Expenditures Outlook

Survey response is provided to the question: "Do you expect your company to spend more or less in 2025 on Nevada exploration?"*



45% indicated they will likely spend **more** in 2025

**56 respondents*

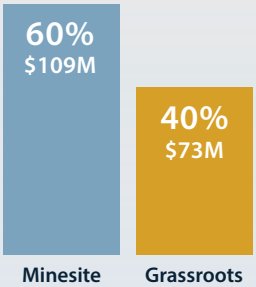
Headquarter Location	U.S. $Billion	Change[1]
Nevada	0.28	–37%
U.S.[2]	1.66*	+2.4%*
Global	12.5	–3%

*[1]change is versus 2023 budget; [2]including Nevada; *estimated (S&P Global Market Intelligence, 2024)*

#3 Fraser Institute

in 2023 Global Investment Attractiveness (Nevada ranked #1 in 2022)

Minesite vs. Grassroots



Amounts given in U.S. $Millions

Factors Affecting Exploration in Nevada

Favorable Geology (4.7)

Potential for New Discoveries (4.4)

Time and Costs Required to Permit (3.8)

Claim Fees/Leases (3.7)

Uncertainty over U.S. Mining Law Reform (3.0)

Respondents rated factors on a scale of 1 to 5. A "5" score represents highest impact, "1" represents the lowest impact.

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NEVADA DIVISION OF MINERALS

EXECUTIVE SUMMARY

This report summarizes the results of the biennial Nevada Bureau of Mines and Geology (NBMG) online survey of companies exploring for new metal, industrial mineral, geothermal, and hydrocarbon resources in Nevada and covering exploration activity in the Silver State in 2023 and 2024. This survey is supported by the Nevada Commission on Mineral Resources and the Nevada Division of Minerals. The positive impact of mineral and energy production on the Nevada economy is well known and has been clearly demonstrated for decades. However, the impact of exploration activities in Nevada, which focus on discovering new resources for future mines and energy extraction and the formal identification of resources and reserves prior to and during extractive activities, remains poorly understood as a result of the relatively limited data available for this sector. This does not mean that exploration is not a major contributor to the Nevada economy. Indeed, exploration activity contrasts with the majority of the sectors that drive the Nevada economy in that it is primarily focused in rural areas and can have a substantial impact on these local economies.

In terms of global and national trends, research undertaken by S&P Global Market Intelligence (2023) indicates that Nevada remains the state with the largest mineral exploration budgets within the entirety of the United States although budget gains stopped outpacing global averages during the survey period. Nevada's share of U.S. exploration expenditure in 2023 was 38% or some $648 million, 1% down from 2022 but still significantly ahead of the next state in the U.S., namely Arizona with 22% of U.S. exploration expenditure in 2023. Coinciding with Nevada's top tier status with regards to exploration budgets, the Fraser Institute's annual survey ranked Nevada as the 3rd best jurisdiction in the world for mineral investment attractiveness in 2023 (Mejia and Aliakbari, 2023). This assessment considers policies and regulations affecting exploration and mining activities alongside a region's geologic potential. Although a positive outcome, this result is lower than the 1st place in the same survey in 2022 (Mejia and Aliakbari, 2022).

Exploration activities are commonly known to be high risk, as investments are not guaranteed to result in success, but can have significant rewards. When companies achieve the rare success of discovering an ore deposit, considerable time and financing is required to put the deposit into production. Despite the unknowns that affect exploration, exploration is a crucial process in sustaining natural resource industries in Nevada and the growing demands of industrial society both nationally and globally. These demands have grown significantly over the last 100+ years and continue to grow, as evidenced by the current record rates of mineral and metal production generated by the mining and extractive sectors and the increase in demand for metals and minerals as a result of the ongoing energy transition and the impact of modern standards of living (Jowitt, 2024).

The goal of this survey is to assess the impact of exploration on Nevada's economy in 2023 and 2024, with the primary focus being on expenditures and employment. The survey asks participants to break down their expenditures by category, helping understand where the money goes, and to rate the external factors that contribute to their exploration company's decision to work in Nevada. Companies surveyed are primarily junior explorers followed by midsize and major miners. The geothermal, oil and gas, and industrial mineral industries are underrepresented in this survey based on response rates.

NBMG contacted 168 companies directly via e-mail or phone, of which 143 explore for metals, 10 for geothermal, and 5 for oil and gas. Of these companies, 60 responded to the survey with 3 duplicates. Another 105 active companies were researched using financial disclosures in the public domain. Thus, the data from 162 companies exploring in Nevada make up the data presented in this report.

The results regarding expenditures and number of employees of the companies surveyed for this study indicate that:

- A minimum of $450,217,728 was spent on exploration by surveyed companies in Nevada in 2023 with year-over-year increases in all the surveyed sectors. The precious metal sector accounted for 85% of the expenditures ($381.9 million), followed by lithium companies at 10% ($45.9 million), the base metal sector at 5% ($22.3 million), and oil and gas with <1% ($30 thousand). The approximately 30% difference between this expenditure and the $648 million expenditure reported by S&P Global Market Intelligence (2024) indicates either a difference in survey methodology, a difference in reporting of exploration and mining activities, or that survey responses and publicly available financial information do not capture the entirety of spending on exploration in the state.
- In 2024, a minimum of $282,811,479 was spent on exploration with decreases in all surveyed sectors, albeit with incomplete information for the calendar year. Precious metals accounted for 82.4% ($254 million) with base metals at 12% ($12.6 million) and lithium at 5.6% of total 2024 expenditures ($15.8 million), with oil and gas again at <1% ($30 thousand).
- Employment data indicate a year-over-year decrease from a minimum of 451 employees in 2023 to a minimum of 423 employees in 2024 employed specifically in mineral exploration. These figures are certainly lower than actuality but reflect survey responses and the fact that employment numbers for researched companies with no survey responses were not estimated as a result of uncertainties over estimated figures.

The breakdown of expenditures indicates that:

- On a cumulative cash basis in 2023 and 2024, expenditures were broken out by the 70 reporting companies as follows: 69.9% for actual exploration (mostly drilling), 10.2% for land holding, 7.7% for permitting, 10.7% corporate costs, and 1.5% for other costs. These totals are biased by major company budgets that have a higher proportion of exploration costs to land holding costs, in contrast to the larger impact of land holding costs on junior explorers with smaller budgets.
- On a similar cash basis, 60% of expenditures went to resource expansion with the remaining 40% being spent on grassroots exploration.

Responses to the factors influencing exploration indicate that:

- The potential for discovery in Nevada alongside the favorable geology of the Silver State for a variety of different mineral systems as well as geothermal energy remained positive influences on exploration budgets.
- Access to public lands in Nevada and the influence of commodity prices were viewed ambivalently. Several respondents noted growing challenges with land withdrawals and access to public land.
- The cost of claim fees/leases, uncertainty surrounding mining laws and regulations, and the time and/or cost of permitting were viewed as factors with negative impacts on exploration activity in Nevada. The 2024 increase in claim maintenance fees also impacted the budgets of Nevada explorers.

Responding mineral explorer views on exploration expenditures in 2024 indicate that:

- 45% of respondents expected to spend more, with 12% expecting to spend less and 44% expecting to spend about the same. Thus, exploration budgets and employment are expected to improve into 2025.

INTRODUCTION

From September of 2024 to October of 2024, the Nevada Bureau of Mines and Geology (NBMG) conducted the 23rd Nevada Exploration Survey of exploration expenditures in the minerals and energy industries during 2023 and 2024. As in prior surveys, the purpose of this survey was to assess the current and projected levels of exploration activity and to determine factors influencing these levels. The rationale for doing this survey is to provide information to elected officials, government agencies, private companies, and citizens in general, so they better understand the impact of exploration on the Nevada economy and the factors that influence exploration.

The last NBMG-administered survey was for 2021/2022 (Fisher, 2023) and was preceded by surveys in 2019/2020 (Muntean, 2021), 2017/18 (Ressel, 2019), 2015/2016 (Ressel and Davis, 2017), and in 2011 (Muntean et al., 2013). Prior to these surveys, the surveying was undertaken by the Nevada Division of Minerals (NDOM) on an annual basis. A total of 17 surveys had previously been conducted when in 2011 the Nevada Commission on Mineral Resources and NDOM started to provide support to NBMG to conduct the survey, in doing so requiring that NBMG increasedthe population size and the response rate of the survey. In addition to companies exploring for metals and industrial minerals, NBMG was also asked to send the survey to companies exploring for geothermal energy and oil and gas. The survey form was also simplified to emphasize the amount of money companies spent on exploration and the number of people companies employed in exploration.

SURVEY METHODOLOGY

The 2024 exploration survey was administered online; it is included here as Appendix A and is referenced online at https://forms.gle/fU2hSEy4crNc3MCf8. Information requested included 1) company type/size, 2) company exploration expenditures in Nevada for 2023 and 2024, 3) the number of people companies directly employed in 2023 and 2024, 4) an estimated percentage breakdown of the expenditures by category, including actual expenditures (e.g., drilling, geology, geochemistry, geophysics), land holding costs, permitting and compliance, and corporate costs, 5) the percentage of the expenditures spent on the type of exploration being conducted, either grass roots or resource expansions, 6) the relative impact of common factors that influence exploration including the presence of favorable geology, potential for new discoveries, commodity prices, access to land, land holding costs, time and cost of permitting, and uncertainty over U.S. mining laws, with an additional category where companies could write which factors negatively impacted Nevada exploration, and 7) expenditure outlook for 2025. Two additional questions were added into the survey to gauge explorers use of publicly-available, pre-competitive data, namely 1) how aware they are of the available geological, geophysical, and other data (often called precompetitive data) offered by the U.S. Geological Survey (USGS) and NDOM, and 2) the ease of access of those resources.

NBMG contacted 168 companies directly via e-mail or phone, of which 143 explore for metals, 10 for geothermal, and 5 for oil and gas. Industrial minerals were not surveyed in this study. Companies were first e-mailed in September and October of 2024. In October of 2024, an email bulletin inviting responses to the survey was sent out to members of the Geological Society of Nevada (GSN), a scientific society with a significant proportion of its membership working in exploration and mining within Nevada. In total, 57 companies answered the survey, yielding a response rate of 34%. NBMG also researched the corporate

financial filings of 105 exploration companies that operated in Nevada during 2023 and 2024 although employment numbers for researched companies with no survey responses were not estimated. With both researched and self-reported companies, the total number of companies surveyed in this report is 162.

The researched companies are primarily domiciled in Canada and the U.S. with financial filings itemizing expenditures by project location and are publicly accessible on databases such as SEDAR+ and EDGAR. Several Australian companies were researched when their financial filings enabled the identification of expenditures that specifically relate to project locations in Nevada. The expenditures of any international companies that reported in foreign currencies were converted to USD using average exchange rates published by central banks. Financial research was completed in October of 2024, meaning the final quarter of expenditures of 2024 was not included. This also means that cumulative totals for 2024 necessarily underestimate total expenditures.

The fact that researched companies represent 65% of companies surveyed in this report means that the employment numbers for 2023 and 2024 are necessarily underestimated. The surveyed companies were also asked to report their total number of employees, a figure that doesn't include contractors. This again means that the total number of people employed in mineral exploration in Nevada is underestimated here as contractors play a significant role in the exploration industry with roles as geologists, drillers, geotechnicians, geophysicists, and more. Some companies also have projects staffed exclusively by contractors. For this reason, the employment numbers in this report are best understood as the number of staff members working for exploration companies within the state.

The exploration expenditures relating to industrial minerals, geothermal, and oil and gas companies are also underrepresented based on the lower numbers of survey responses received from companies in these sectors. In addition, the fact that the majority of these companies are privately owned means there is a lack of publicly available financial data. This lack of financial data on privately held metal companies also contributed to the underestimation of expenditures and other indicators discussed by this survey, explaining the 30% discrepancy between our survey estimates and the figures reporting by S&P Global Market Intelligence (2024) for 2023. In addition, major publicly listed metal and geothermal companies often report financial information that is not itemized on a state-by-state or project basis, reporting that is required to identify expenditures and other data relating to activity in Nevada. This means that these aggregated data could not be included in this study for companies that did not respond to the survey, again indicating that the figures herein relating to exploration expenditures are minimum values and may well be underestimates.

Table 1. Summary of data acquisition

ACTIVITY	DATES
E-mailed 168 companies and received a total of 60 responses (3 duplicates)	September/October 2024
Researched expenditures in public domain for 105 non-reporting companies	September/October 2024
Assessed a total of 168 companies	November 2024

TRENDS IN NEVADA EXPLORATION: 2011 THROUGH 2024 SURVEY YEARS

Globally, the exploration industry in 2023 was in a downturn with lower amounts of drilling, lower financing, and decreases in a number of metal prices (S&P Global Market Intelligence, 2024). Although metal prices have rebounded in 2024, with gold reaching all-time highs, and a decrease in inflation, the general malaise hanging over the industry had not significantly lifted at the time of writing with many companies operating in Nevada, especially junior companies, struggling to obtain financing. Positive factors that have buoyed the industry over the past two years have been the increased interest in precious metals from central banks and the general population, the critical minerals narrative that has increased awareness and exploration for a range of commodities, and the projected growth in production (and hence metal demand) needed to support a changing economy and the energy transition (e.g., Jowitt, 2024).

Figure 1 shows exploration expenditures in Nevada since the onset of the survey in 2011. Exploration budgets have not reached the zenith seen in the boom from 2011–2012, a relationship also visible in trends relating to global exploration budgets (fig. 2). Nevada saw an overall increase in expenditures from 2022–2023, with lithium companies in 2023 having the second highest cumulative total expenditure in Nevada since the onset of the survey, potentially from carried-over funds raised during the height of the boom in lithium prices in 2022. The exploration expenditures of companies exploring for precious metals, base metals, and lithium dropped from 2023 to 2024, although as mentioned above the values for 2024 do not include the full calendar year.

Figures 3 and 4 show employment trends in the Nevada exploration industry. Surveys completed after 2018 record a decrease in companies with 5–10 employees, with another decrease recorded from 2022–2023. The number of companies with 10–20 and 20–50 employees has largely remained stable, with a few outliers, highlighting the stability of mid- to major-mining companies that either have growing mineral resources or producing mines. From 2020 to 2021, a decrease in companies with employee totals exceeding fifty has been documented by the survey, likely partially influenced by the merger between Barrick and Newmont to form Nevada Gold Mines in 2019.

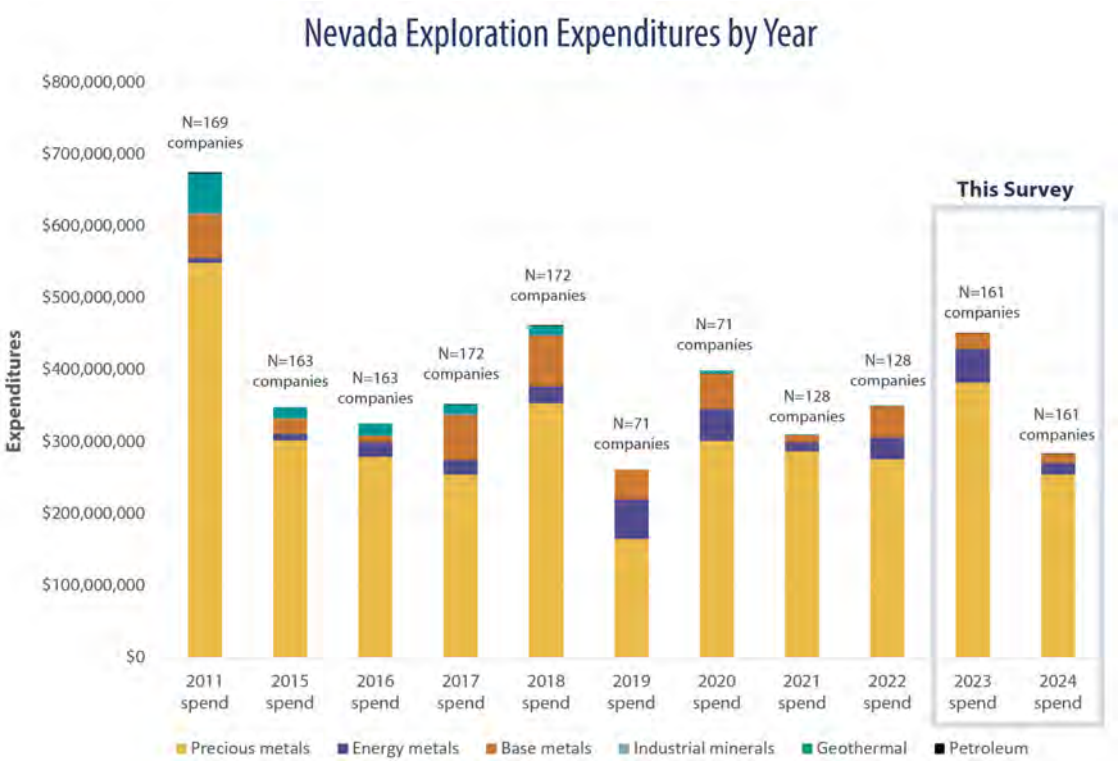

Figure 1. Stacked histogram showing the influence of various sectors on exploration expenditures in Nevada in 2011, and 2015 through 2024.

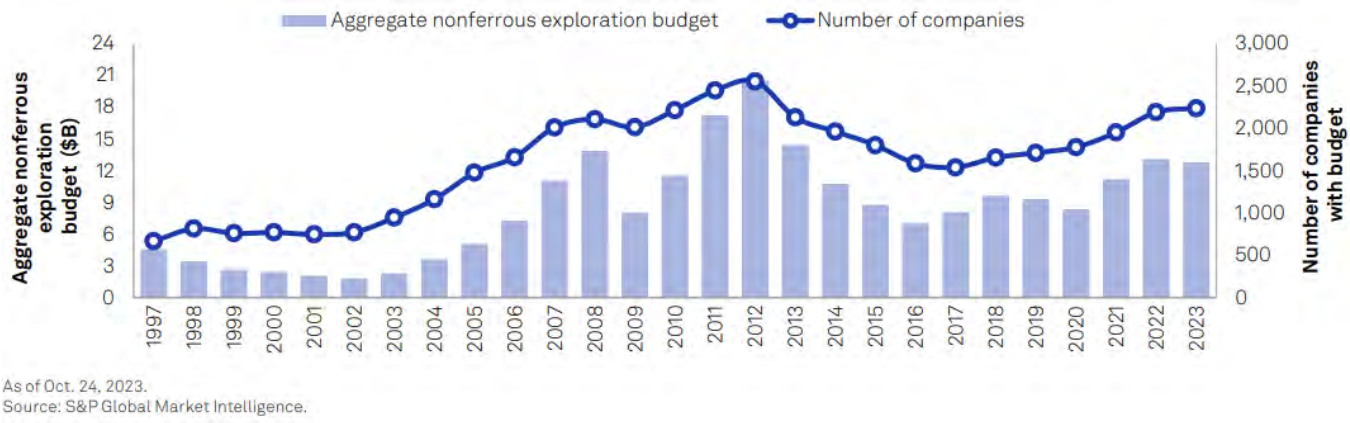

Figure 2. Global nonferrous budgets through 2023. (S&P Global Market Intelligence, 2024)

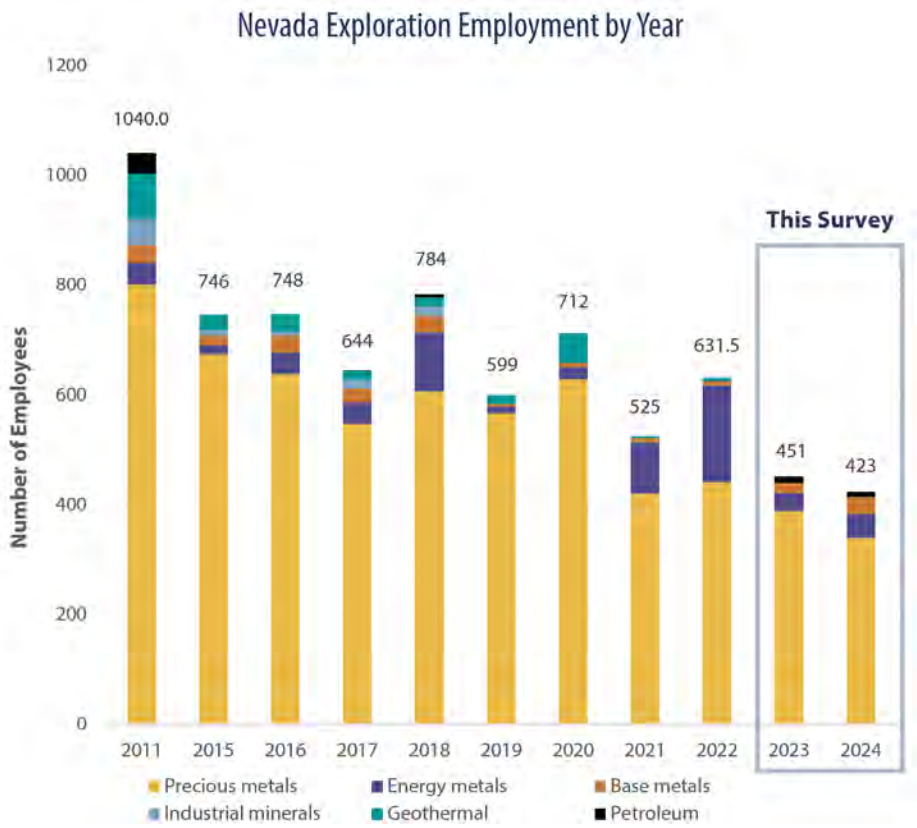

Figure 3. Surveyed number of workers by sector in Nevada exploration during 2011, and for every year between 2015 and 2024. These data reflect direct employment only and do not include third-party contractors or the employees of companies researched via financial documents in the public domain.

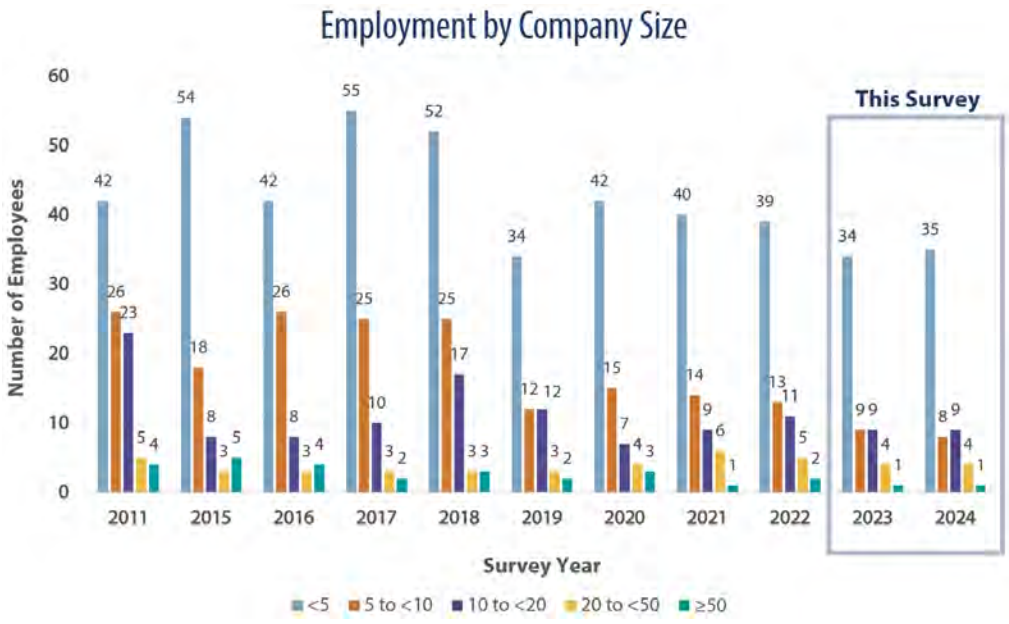

Figure 4. Graph showing the distribution of employees by company size in 2011 and annually from 2015 to 2024. These values are for direct employment only and do not include third-party contractors.

2023 EXPENDITURES

A total of $450,217,728 was spent on exploration in Nevada in 2023 (fig. 5). This represents a minimum estimate based on the 162 companies that were surveyed and researched. The mean expenditure per company was $2.81 million, and the median was $0.5 million. The precious metals sector accounted for 85% of the expenditures ($381.9 million), followed by lithium companies at 10% ($45.9 million), the base metal sector at 5% ($22.3 million), and oil and gas with <1% ($30 thousand; fig. 5). The top 15 companies with highest expenditures accounted for 72% of total expenditures in 2023 with one exploring for lithium, one exploring primarily for base metals, and the other thirteen primarily exploring for precious metals. As observed in prior surveys, companies with annual budgets between $1.0 and $2.5 million are the second most numerous, reflecting the fact that this appears to be a relatively healthy budget range for the numerous junior exploration companies included in the survey (fig. 6).

A total of 451 employees were reported as being employed in mineral exploration in Nevada in 2023. This is a minimum based on the responses of the 57 companies who responded to the survey (fig. 3) as discussed above. The average number of employees per company was 7.9 and the median was 3, similar to the results of previous surveys. From 2022 to 2023, the survey shows a 12% decrease in employment by precious metal companies and an 82% drop for lithium companies. These decreases are partially explained by changes in the companies that responded to the survey (e.g., splitting of companies by focus region, resulting in a smaller company focused on Nevada) and a decrease in the number of respondents from 70 responses in the 2021/2022 survey to 57 in the current survey. Precious metals explorers continue to employ the majority of exploration staff members (fig. 7).

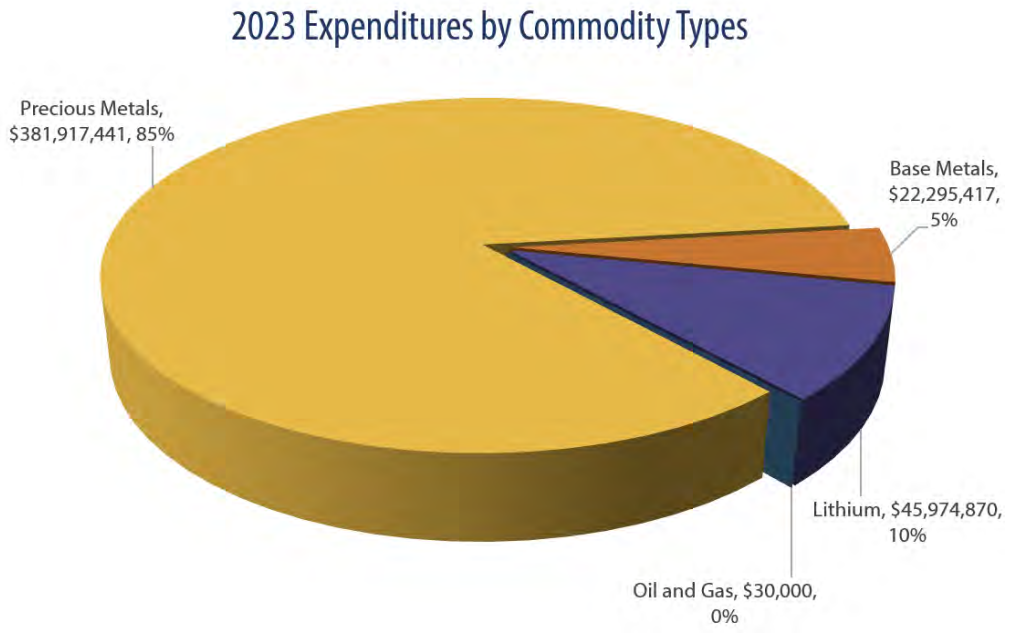

Figure 5. Total 2023 expenditures broken into sectors.

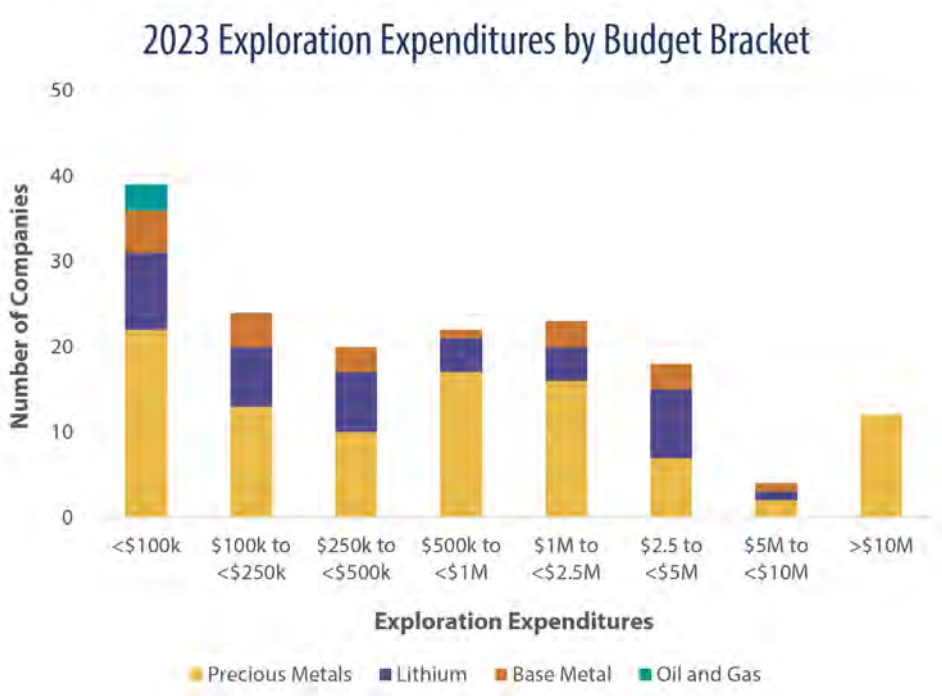

Figure 6. Total 2023 expenditures broken down into budget brackets for individual respondents.

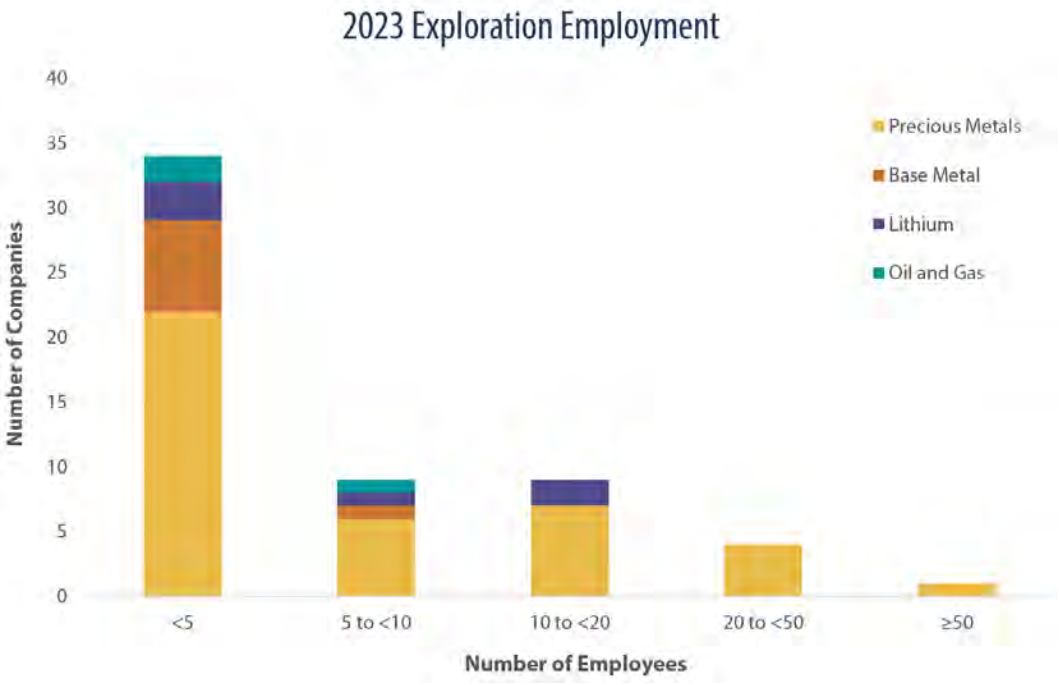

Figure 7. Stacked histogram showing the distribution of employees in 2023 by company size and sector. These data are from the 70 self-reporting companies that responded to the survey. Third-party contractors are not included in these statistics.

2024 EXPENDITURES

Precious metal prices performed well in 2024 with gold prices reaching all-time highs and silver rising above 2023 prices. Copper and zinc prices were generally above 2023 levels, with lead both increasing and decreasing in price during the year but overall trending towards lower prices. Lithium prices continued to decline during the year since the lithium price boom that reached its zenith in 2022. Despite the rises in precious metals and base metals prices, overall exploration budgets in Nevada decreased in 2024 relative to 2023, with 34 out of the 57 (59.6%) companies that responded to the survey reported a budget decrease between 2023 and 2024 in all sectors of exploration from junior to major mining companies. Research on non-reporting companies was undertaken in October 2024, meaning that the final quarter of expenditures for 2024 is not included in this review. Without projecting budget totals for the full year of 2024, 93 out of the 105 researched companies spent less on exploration in 2024 than in 2023. If a projection for expenditure in the final quarter of 2024 is included in these data, a decrease in exploration expenditures is still evident with 87 out of the 105 companies having exploration budget decreases between 2023 and 2024, as evident by comparing figure 6 and figure 9. In all years since the 2017/2018 survey, the $1–$2.5 million budget bracket was amongst the most frequent exploration expenditures (fig. 6). However, the number of companies with budgets between $1 and $2.5 million decreased in 2024 (fig. 9). Companies with budgets of <$100,000 and $5–$10 million are more common in 2024, with the frequency of companies in all other brackets decreasing.

A minimum of $282,811,479 was spent on exploration in Nevada during 2024, representing the second lowest total since this survey began collecting data in 2011. The mean expenditure was $1.79 million, and the median was $0.12 million. The precious metals sector accounted for $254 million of total expenditures, a year-over-year decrease of 33% (fig. 5 and fig. 8). Base metals accounted for 4% of the total expenditures ($12.6 million), which is in the range of expenditures documented in 2019, 2020, and 2022 but below the recent high in 2023. Lithium totaled some 6% of total expenditure ($15.8 million), a year-over-year decrease of 66% that brought this level of expenditure close to that of 2021 ($12.6 million) before the boom in lithium prices began to have a substantial effect on exploration programs. Oil and gas again represented <1% of exploration expenditures in 2024 ($30 thousand). The top 15 companies with the highest expenditures accounted for 82% of total expenditures in 2024, two of which focused on base metals with the other thirteen primarily exploring for precious metals.

Corresponding with the decrease in budgets, the minimum number of employees within the exploration sector dropped from 447 in 2023 to 419 in 2024. Employment numbers recorded a decrease for two years in a row, the first identified since the start of this survey. The average number of employees per company was 7.48 and the median was 3. In addition to the 33% drop in expenditures for the precious metal sector in Nevada, employment numbers decreased by 12% from 383 in 2023 to 336 in 2024. Although the lithium exploration sector had the largest year-over-year drop in expenditures, companies in the sector reported a 34% increase in employment from 32 to 43 employees. However, it should be noted that the changes in employment numbers between survey years are biased by the companies that respond and the number of responses as discussed above, meaning that the employment changes between years within a single survey are likely more indicative of the wider changes in employment within the sector.

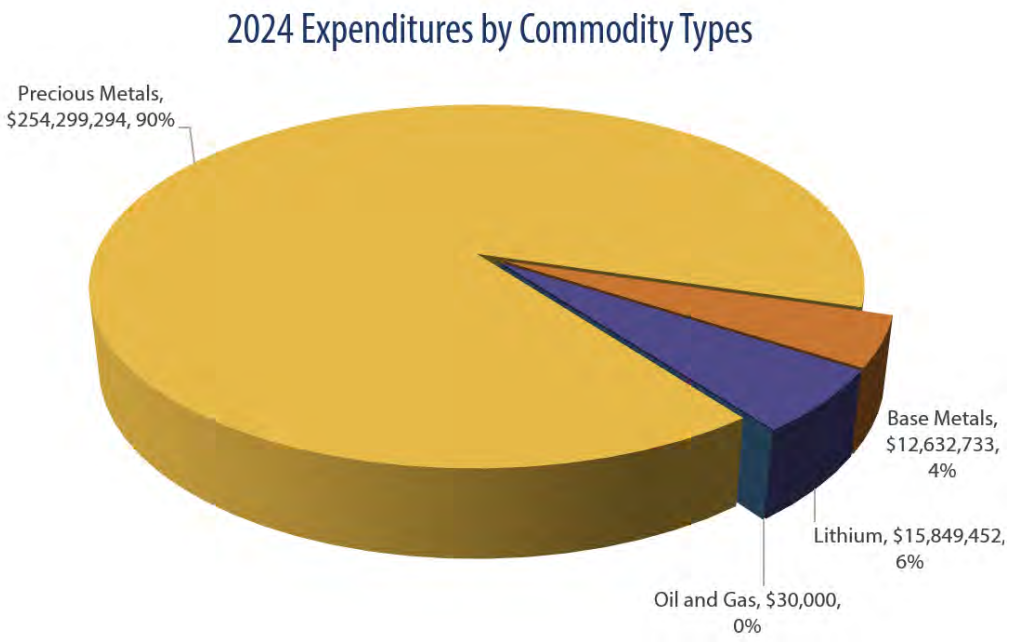

Figure 8. Total 2024 exploration expenditures split by sector.

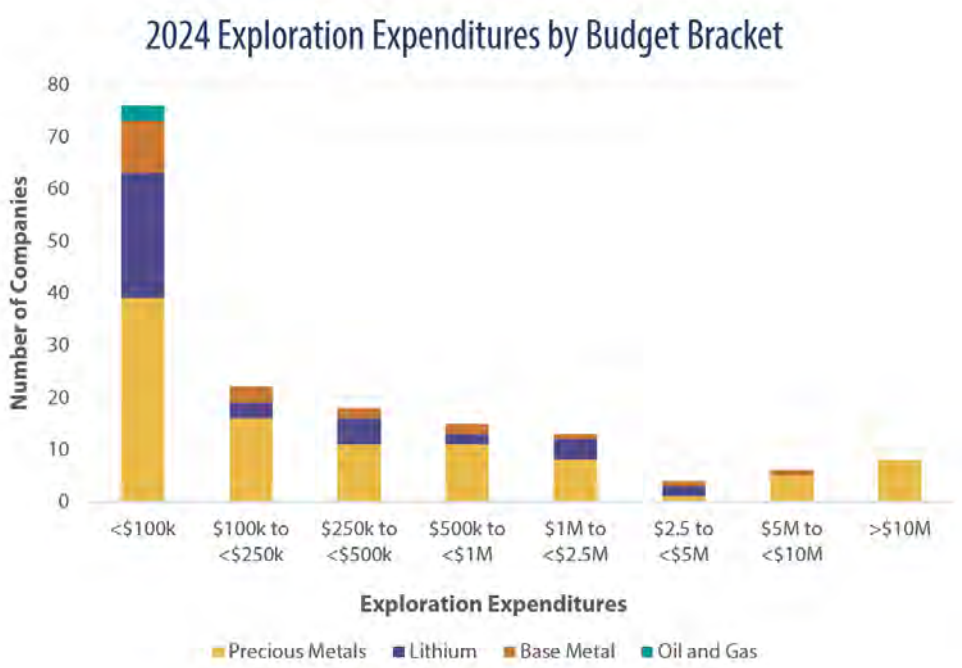

Figure 9. Total 2024 expenditures broken down by the budget brackets of individual respondents.

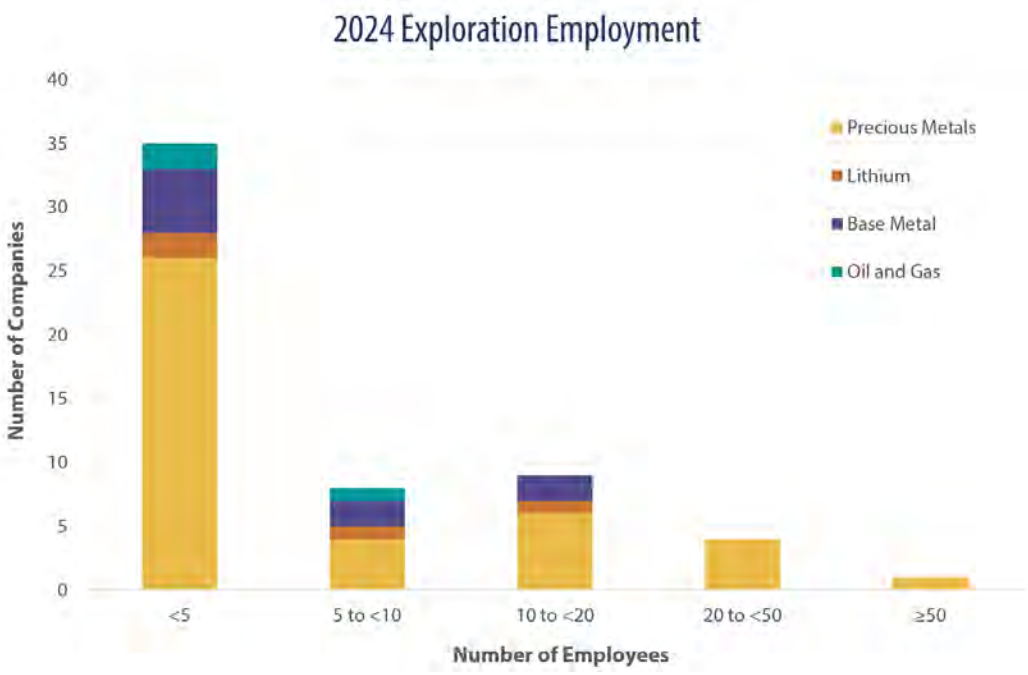

Figure 10. Stacked histogram showing the distribution of employees in 2024 by company size and sector. These data are from the 70 self-reporting companies that responded to the survey, and third-party contractors are not included in these statistics.

RELATIONSHIP BETWEEN EXPENDITURES AND EMPLOYEES

A weakly positive relationship is present between exploration expenditures in 2023 and 2024 and their respective number of employees (fig. 11). An average of $489,862 was spent per employee with a median of $120,000. Companies with annual budgets from $0 to $1,000,000 spent an average of $72,477 per employee, whereas companies with budgets from $1,000,000 to $5,000,000 spent $267,244 per employee, and companies who spent more than $5,000,000 on exploration spent $746,994 per employee. Although this survey does not account for the numerous contractors that are used in exploration, these relationships suggest a potential economy of scale for staffed exploration departments.

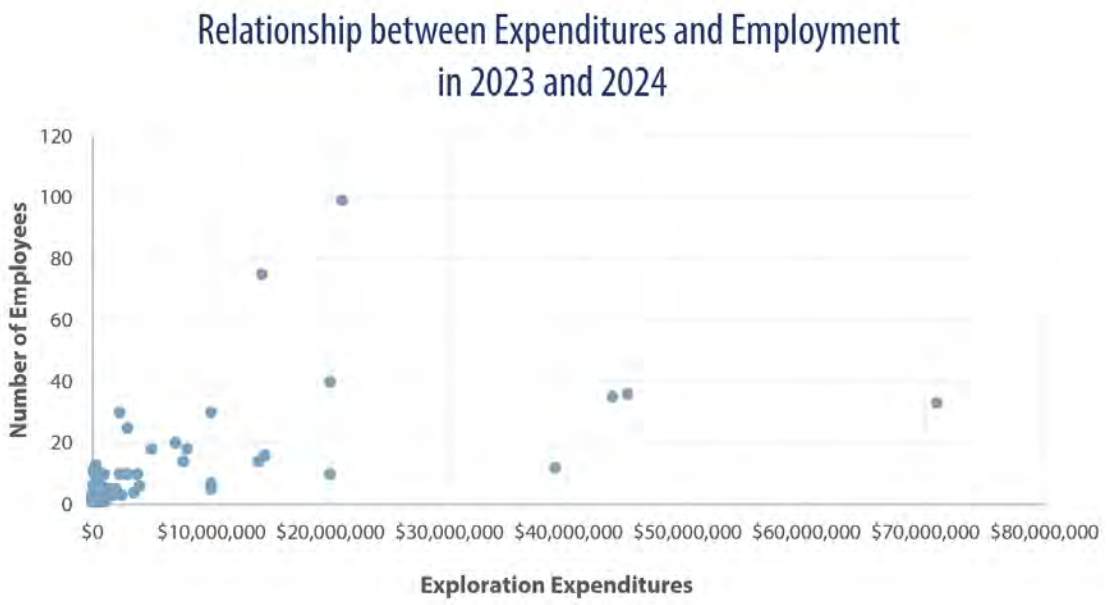

Figure 11. Chart showing the relationship between survey respondent exploration expenditures and corresponding employee data. Data from both 2023 and 2024 are included.

2025 OUTLOOK

The survey asked participants whether they expected to spend more, less, or about the same in 2025 compared to 2024. Of the 56 responses to this question, 45% of respondents expected to spend more or much more in 2025, with 12% expecting to spend less or much less and 43% expecting to spend about the same (fig.12). The fact that these data indicate that the majority of explorers are estimating future expenditures optimistically or neutrally suggests that companies operating in exploration are also neutral or optimistic about the availability of financing and commodity price stability or increases.

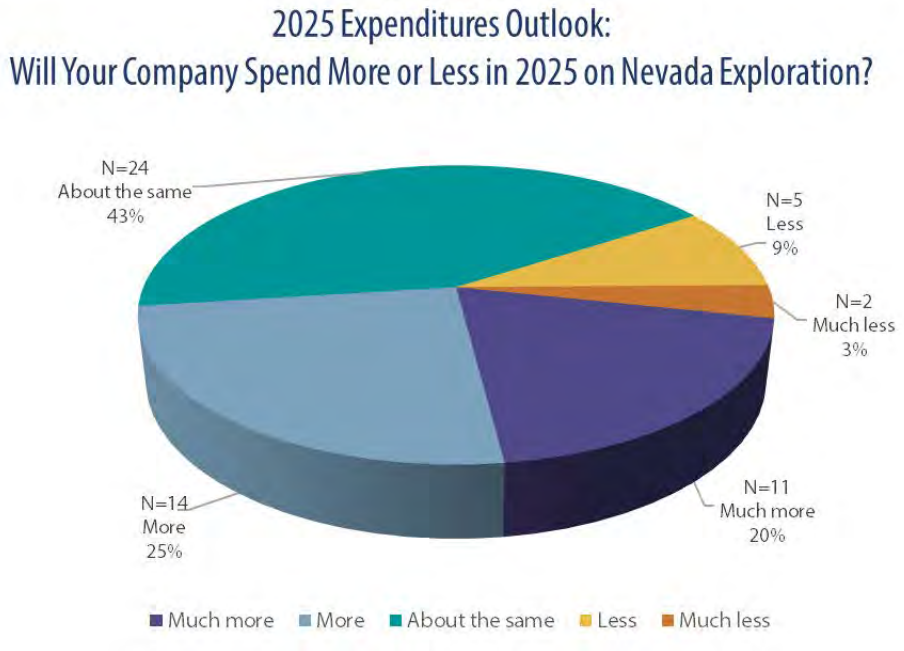

Figure 12. Pie chart indicating the outlook of respondents for mineral exploration expenditure in 2025.

EXPENDITURES BY CATEGORY

To better understand where exploration expenditures are encumbered, companies were asked to break down their expenditures into the following categories: (1) actual exploration that includes drilling, geology, geochemistry, and geophysics, (2) land costs, including claim staking, maintenance fees, and lease payments, (3) permitting and compliance, including environmental studies, bonding, and reclamation, (4) corporate overhead costs, which includes overhead, legal expenses, and taxes, and (5) other costs. The 47 reporting companies have average expenditures of 51.3% on actual exploration, 22.7% on land holding costs, 9.9% on permitting costs, 11.4% on corporate costs, and 4.7% on other costs.

When the individual reported percentages are multiplied by the respective company's expenditures, the monetarily weighted averages are 69.9% for actual exploration, 10.2% for land holding, 7.7% for permitting, 10.7% corporate costs, and 1.5% for other costs. The monetarily weighted percentages for exploration costs and landholdings are significantly different than the average figures above, reflecting differences in budget sizes and the relatively fixed nature of land holding costs. Companies with larger budgets also tend to spend much more money on exploration relative to land holding costs. On top of this, financing or market factors mean that some junior companies will not perform exploration on their property in a given year, leading to land costs taking up a significant portion of their Nevada budget without any exploration expenditure in other categories. This is reflected by the fact that junior exploration companies and prospect generators have averages of 49.35% for actual exploration and 27.35% for land holding, whereas major- and mid-tier mining companies have averages of 69.22% for actual exploration and 7.22% for land-holding costs. This difference highlights the impact of land-holding costs on the early stages of the mineral exploration cycle, especially in the junior sector.

EXPANSION VERSUS GRASSROOTS EXPLORATION

Respondents were also asked to estimate the percentage of their exploration expenditures spent on resource expansion (sometimes called brownfield exploration) versus grassroots exploration (exploration away from areas of known resources). Based on a total of 53 responses, the average percentage expenditure was 28.8% on resource expansion and 71.2% on grassroots exploration. When the individual company's percentages are multiplied by their respective expenditures, the cumulative cash proportions shift to 57.5% on resource expansion and 42.5% on grassroots exploration. These percentages are consistent with the results of the biennial surveys dating back to 2015/2016, indicating that the relative importance of these different locations of exploration remain relatively unchanged. The favoring of the weighted percentages towards resource expansion highlights a few factors that include a) the fact that resource expansion is generally performed by major companies with stable financing and larger budgets, b) expansion has a higher success rate compared to grassroot exploration, and c) expansion can have significantly positive economic impacts such as life-of-mine expansion and improving the economic outlook for non-producing mineral resources and reserves. The fact that the unweighted average percentage shows a higher weight towards grassroots exploration also reflects the fact that the majority of junior exploration companies without producing mines dedicate 100% of their expenditure to grassroots exploration.

FACTORS THAT IMPACT EXPLORATION

The survey asked companies to rate (on a scale from 1 to 5) how seven factors influenced their approach to exploration and exploration success. The averages for the 55 companies that responded were 4.73 for favorable geology, 4.4 for potential for new discoveries, 4.36 for access to public lands, 3.80 for time and costs required to permit, 3.67 for commodity prices, 3.70 for claim fees/leases, and 3.00 for uncertainty over U.S. mining laws (fig. 13). Higher ratings are indicative of more important factors that have a larger impact on decision making but do not imply whether these factors are positive or negative. To help further gauge explorer's views, participants were asked to clarify what factors negatively affected decisions to explore in Nevada relative to other regions globally. Positive factors include the presence of large producing mines, large areas of federally managed public lands, and a history of mineral wealth and discovery. Favorable geology also continues to have major positive influence on exploration expenditures in Nevada with ratings that are consistent with the 2019/2020, and 2021/2022 surveys, as also indicated by the results of the Fraser Institute survey (Mejía and Aliakbari, 2023, 2024). Explorers also continue to be optimistic about the potential for new discoveries in Nevada.

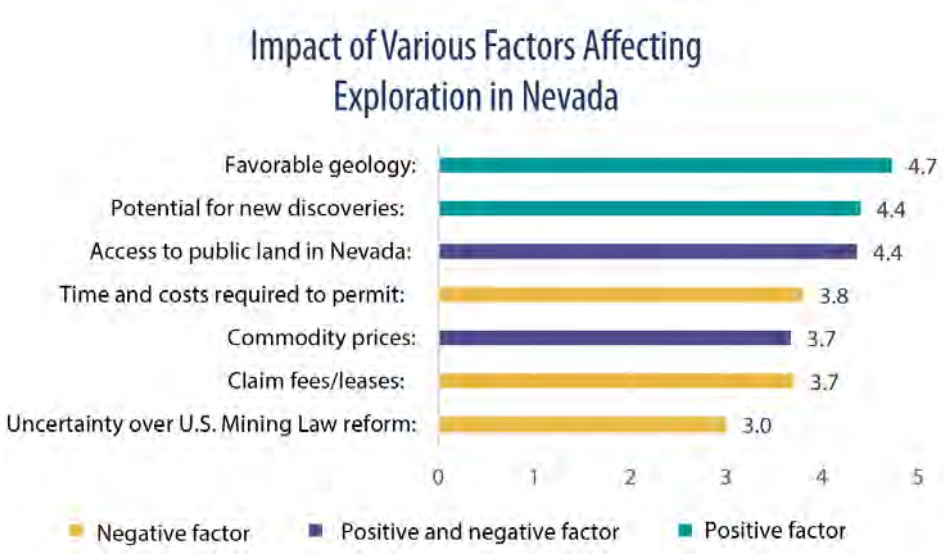

Figure 13. Graph showing the impact of six factors influencing exploration in Nevada. A "5" score represents the highest impact, "1" represents the lowest impact. Yellow bars illustrate the factors with negative influence, purple bars can be both positive and negative, and green bars are viewed as positive factors.

However, some factors are more ambiguous. Commodity prices and forecasts impact investor sentiment in ways that either facilitate or hamper exploration programs with the 2024 score (3.67) suggesting this has a larger impact on decision making than was the case in 2021/2022 (3.46). Access to large tracts of public lands and the U.S. Mining Law remain important factors leading to Nevada being ranked as one of the top jurisdictions for mineral exploration and mining in the world, and proposed changes are often viewed negatively. In this survey, one respondent mentioned concern with changes in the U.S. Mining Law, whereas five respondents said access to public land in Nevada, including land withdrawals, negatively affected their views on exploring in Nevada.

The time and costs required to permit projects can also have negative impacts on whether explorers decide to explore in Nevada. Federally managed public land in Nevada are often administered by either the U.S. Forest Service or the Bureau of Land Management. Both agencies have different permitting processes, potentially leading to different perceptions by explorers working in these jurisdictions. In addition, these two agencies have individual offices that are responsible for certain domains of land, which can lead to perceptions specific to intra-agency offices. Out of 24 responses that specifically noted the negative impact of permitting costs and timelines, four respondents particularly noted challenges in permitting and working within the jurisdiction of the U.S. Forest Service, with one respondent noting challenges with the Bureau of Land Management.

Claim fees can have significant impacts on exploration by increasing holding costs for mineral exploration properties, an issue of particular importance when budgets are tight. The past exploration surveys show a steady increase in explorers view of the importance of this issue with ratings increasing from 2.95 (2017/2018), to 3.32 (2019/2020), 3.41 (2021/2022), and to 3.7 (2023/2024). In 2024, the Bureau of Land Management raised the annual claim maintenance fee from $165 to $200 per unpatented mining claim. Ten respondents to this survey mentioned that the cost of holding claims negatively impacted their exploration decisions, with three specifically noting the recent increase in the maintenance fee. Two respondents also indicated that the cost of claim fees is relatively high in comparison to other jurisdictions. One respondent further noted that the recent increase in claim holding costs led the company to layoff a staff member in order to maintain their property position.

Outside of the factors measured in this survey, respondents also mentioned several other factors that negatively impact their decisions to explore in Nevada. These include increases in the cost of geologic labor and exploration costs (1 response), the fact that Nevada is far away from oil and gas infrastructure and supplies (1 response), and the limitations on activity in sage grouse habitat (1 response). One respondent also mentioned that the lack of a U.S. corollary to flow-through financing, a tax-based financing incentive in Canada, negatively impacts the ability to finance Nevada properties and mineral exploration.

The two new questions relating to precompetitive data and the availability and accessibility of these data for Nevada from organizations such as the USGS and NBMG also provided some interesting insight into the importance of these data for mineral exploration success. Precompetitive data acquisition is the collection of geological, geochemical, and geophysical data that is made publicly available and is often utilized by companies working in mineral exploration. Globally, precompetitive data has formed the basis of numerous mineral deposit discoveries, with recent research in Australia indicating that precompetitive geoscience data and analysis supported $76 billion of value add to the Australian economy, equivalent to 3.5 per cent of GDP and with every dollar spent on precompetitive data typically generating a return on investment of >$50, if not much more (Deloitte Access Economics, 2023). Respondents to the survey are typically aware of the geological, geophysical and geochemical precompetitive data available for Nevada (fig. 14), but the accessibility of these data could seemingly be improved, with respondents having a generally lower value response for this specific question (fig. 15).

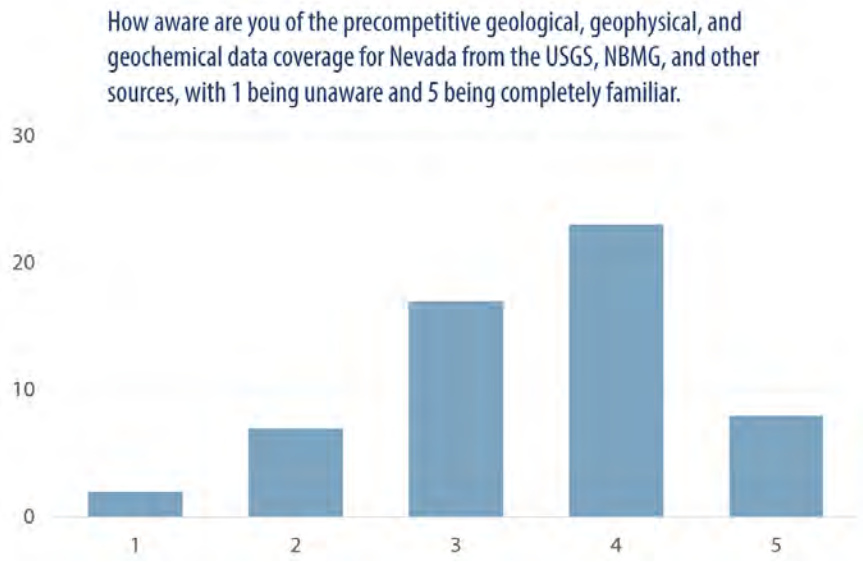

Figure 14. Respondents opinions on the awareness of precompetitive data for use in mineral exploration in Nevada from organizations such as the USGS, NBMG, and other sources, with 1 being unaware and 5 being completely familiar.

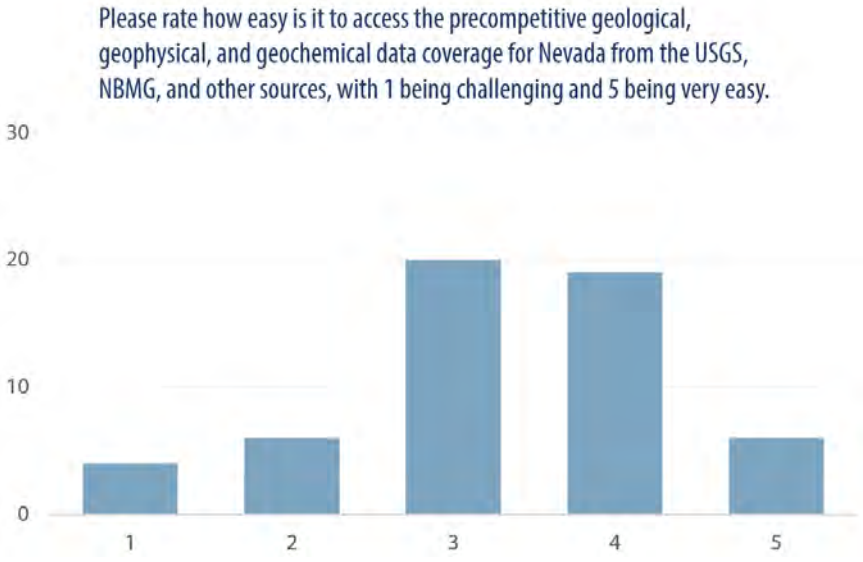

Figure 15. Respondents opinions on the ease of accessibility of precompetitive data for use in mineral exploration in Nevada from organizations such as the USGS, NBMG, and other sources, with 1 being unaware and 5 being completely familiar.

ACKNOWLEDGMENTS

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REFERENCES

Deloitte Access Economics, 2023, The economic value of government precompetitive geoscience data and analysis for Australia's resources industry, https://ecat.ga.gov.au/geonetwork/srv/eng/catalog.search#/metadata/148640.

Fisher, T.D., 2023, Nevada mineral and energy resource exploration survey 2021/2022: Nevada Bureau of Mines and Geology Exploration Survey ES-2022, 19 p.

Mejía, J. and Aliakbari, E., 2024, Fraser Institute annual survey of mining companies: Fraser Institute, https://www.fraserinstitute.org/studies/annual-survey-of-mining-companies-2023.

Mejía J. and Aliakbari, E., 2023, Fraser Institute annual survey of mining companies: Fraser Institute, https://www.fraserinstitute.org/studies/annual-survey-of-mining-companies-2022.

Jowitt, S.M., 2024, Renewable energy and associated technologies and the scarcity of metal, *in* Letcher, T., (editor), Living with climate change, Elsevier, Amsterdam, The Netherlands, p. 45–63.

Muntean, J.L., Garside, L.J., and Davis, D.A., 2013, Nevada mineral and energy resource exploration survey 2011: Nevada Bureau of Mines and Geology Exploration Survey ES-2011, 22 p.

Muntean, J.L., 2021, Nevada mineral and energy resource exploration survey 2019/2020: Nevada Bureau of Mines and Geology Exploration Survey ES-2020, 16 p.

Ressel, M.W., and Davis, D.A., 2017, Nevada mineral and energy resource exploration survey 2015/2016: Nevada Bureau of Mines and Geology Exploration Survey ES-2016, 19 p.

Ressel, M.W., 2019, Nevada mineral and energy resource exploration survey 2017/2018: Nevada Bureau of Mines and Geology Exploration Survey ES-2018, 19 p.

S&P Global Market Intelligence, 2023, World exploration trends 2022—a special report from S&P Global Market Intelligence for the PDAC international convention, published for the Prospectors and Developers Association of Canada international convention, Toronto, Ontario, Canada, March 2023, 16 p.

S&P Global Market Intelligence, 2024, CES 2023—US budgets flat as critical minerals offset precious metals decline, https://www.spglobal.com/market-intelligence/en/news-insights/research/ces-2023-us-budgets-flat-as-critical-minerals-offset-precious-metals-decline.

APPENDIX

Nevada Division of Minerals
Nevada Bureau of Mines and Geology
2023–2024 Minerals Exploration Survey

Company Name: _____

Contact Person: _____

Email: _____ **Phone:** _____

What category best describes the company you represent?

- **Major mining company**
- **Mid-tier mining company**
- **Junior mining company**
- **Mining services provider**
- **Prospect generator**
- **Consultant (individual)**
- **Consultancy**

The first two questions are critical. Please answer the rest if you can.

1. **What were your company's approximate exploration expenditures in Nevada in 2023, and what do you expect them to be in 2024 in U.S. dollars? (Do not enter "$" or "," in your response as it will cause an error).**

   2023 exploration expenditures in Nevada: $_____

   2024 exploration expenditures in Nevada: $_____

2. **How many people did your company directly employ in exploration in Nevada in 2023, and in 2024? Include full- and part-time professional and support staff, both company employees and consultants.**

   2023 number of employees involved in Nevada exploration: _____

   2024 number of employees involved in Nevada exploration: _____

3. **If you can, please ESTIMATE the percentage of your company's total Nevada expenditures in 2023 and 2024 that went toward the following categories, including salaries and benefits.**

   Actual exploration (drilling, geology, geochemistry, geophysics, etc.): _____%

   Land holding costs (claims staking and maintenance, property acquisition, lease payments, etc.): _____%

Permitting and compliance (environmental studies, bonding, reclamation, etc.): _____%

Corporate costs (overhead, legal, taxes, etc.): _____%

Other (please specify_____): _____%

4. Please ESTIMATE the percentage of your Nevada exploration expenditures dedicated to expansion around existing operations (i.e., brownfield) and to grassroots efforts.

Expansions: _____% Grassroots exploration: _____%

5. Pertaining to Nevada, please rate how the following factors impact your exploration activity, with 1 being insignificant and 5 being very significant.

Favorable geology:	1	2	3	4	5
Potential for new discoveries:	1	2	3	4	5
Commodity prices:	1	2	3	4	5
Access to public land in Nevada:	1	2	3	4	5
Claim/lease fees:	1	2	3	4	5
Time and costs required to permit:	1	2	3	4	5
Uncertainty over U.S. Mining Law reform:	1	2	3	4	5
Other (please specify): _____	1	2	3	4	5

6. Which, if any, of the factors in item 5 above negatively impact Nevada's attractiveness for exploration relative to other regions in which your company explores?

7. Compared to 2024, do you expect your company to spend more or less in 2025 on Nevada exploration?

Much more More About the same Less Much less

8. **How aware are you of the precompetitive geological, geophysical and geochemical data coverage for Nevada from the USGS, NBMG, and other sources, with 1 being unaware and 5 being completely familiar.**
    a. Please rate how easy is it to access the precompetitive geological, geophysical and geochemical data coverage for Nevada from the USGS, NBMG and other sources, with 1 being challenging and 5 being very easy.
9. **Are you familiar with the NBMG/NDOM Nevada Mineral Explorer system** (https://www.arcgis.com/apps/webappviewer/index.html?id=e279fb2d805945b59dea1cf661f5b4e6)**?**
    a. If you have used the Nevada Mineral Explorer System, how useful do you find it, with 1 being not very useful and 5 being very useful.
    b. NDOM and NBMG are looking to develop the Nevada Mineral Explorer system further. If you have any comments on how this could be improved, please provide these below:

Thank you. All individual responses will be kept strictly confidential.

Link to Google Form: https://forms.gle/KJuEAexFGTRdoXW96