Prepared in cooperation with the Nevada Bureau of Mines and Geology and the University of Nevada Las Vegas

Mineral-Resource Assessment of Northern Nye County, Nevada—A Progress Report

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The U.S. Geological Survey (USGS), University of Nevada, Las Vegas (UNLV), and Nevada Bureau of Mines and Geology (NBMG), which is a part of the University of Nevada, Reno (UNR), have completed the first year of data collection and analysis in preparation for a new mineral- and energy-resource assessment of northern Nye County, Nevada. This report provides information about work completed before October 1, 2009.

Existing data are being compiled, including geology, geochemistry, geophysics, and mineral-deposit information. Field studies are underway, which are primarily designed to address issues raised during the review of existing information. In addition, new geochemical studies are in progress, including reanalyzing existing stream-sediment samples with modern methods, and analyzing metalliferous black shales. Figure 1 shows the general location of the study area and the location of mineral deposits mentioned in this report.

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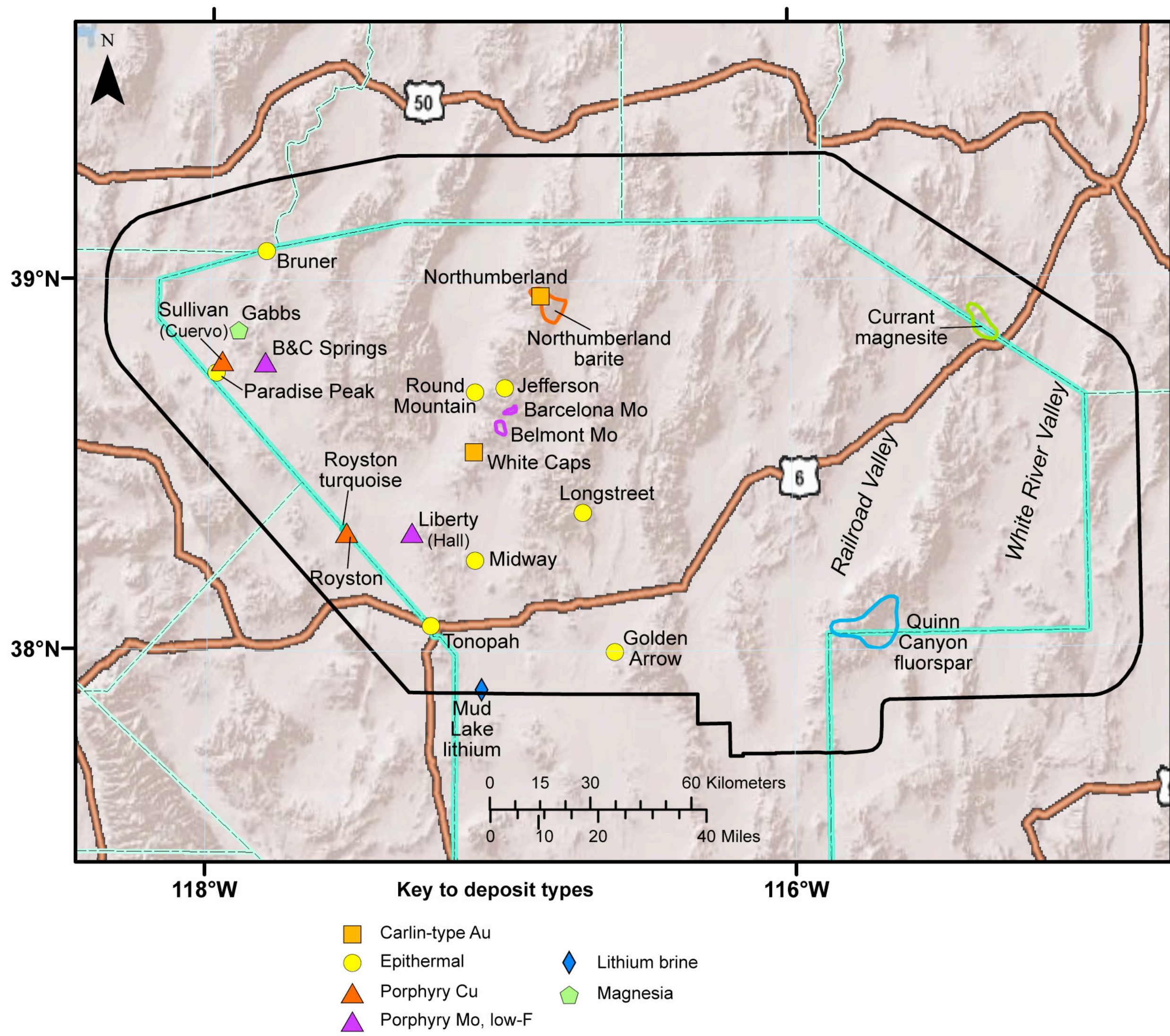

Figure 1. Map showing locations of important known mineral deposits and prospects in northern Nye County, Nevada. Heavy black line designates the study area.

Status of Work

USGS scientists have

- Submitted more than 1,300 stream-sediment samples for reanalysis of major, minor, and trace elements using a combination of inductively coupled plasma atomic emission spectrometry (ICP-AES) and mass spectrometry (ICP-MS). When complete, these analyses will be instrumental in classifying known mineralized areas and in identifying new ones.
- Created a database of nearly 300 published geologic maps that portray the geology of the study area at various scales and have assembled an archive (both digital and paper) of these maps.
- Begun studies of hydrothermally altered rocks using both Landsat and Advanced Spaceborne Thermal Emission and Reflection (ASTER) imagery.

UNLV faculty and students have

- Initiated a detailed soil-chemistry study of a known metalliferous black shale locality in northeastern Nye County during the summer of 2009. Two continuing UNLV Master's degree students were hired and trained in sample collection; approximately 600 samples were collected and submitted for analysis.
- Collected literature related to oil and gas resources in Nye County; a comprehensive bibliography is being compiled.
- Begun projects focusing on source-rock assessment, correlation of oil with source rocks, and thermal maturation of source rocks.

NBMG scientists have

- Begun to design a new database for Nevada's metallic mineral deposits; the database will be more compatible with modern geographic information systems (GIS) than existing databases. Information about known mineral deposits in northern Nye County will be entered into the new deposit database. Coordinates of known mineral deposits will be checked and corrected if necessary. The new NBMG database will serve as a prototype for a statewide database, which will also inform future land-use decisions throughout the state.
- Compiled data on active mining claims, as of the end of 2008, and data on exploration activity, specifically the locations of projects that were drilled in 2008.

Progress Towards Mineral-Resource Assessment

Land managers, legislators, and planners at all levels of government need unbiased information about the location, nature, and quality of mineral resources, both known and undiscovered. USGS mineral-resource assessment techniques are designed to provide that information. Geologic information is used to delineate tracts that show where resources may occur in a specific deposit type. Mineral-deposit models describe the characteristics of different deposit types and how they are used to classify deposits. When appropriate, probabilistic estimates of numbers of deposits are used to estimate quantities of metal in undiscovered deposits.

Some types of mineral deposits are large, are of sufficient grade to warrant exploitation, and are the subject of repeated exploration efforts. Other types of mineral deposits are no longer sought in the United States, but they are important for historical interest or as indicators of the presence of more important types of deposits. Although we are studying all mineral-deposit types in northern Nye County, a formal assessment will be made only for the more important ones, those that are likely to be the focus of continued exploration and development. The following sections summarize existing information about these important types of mineral deposits and their occurrence in northern Nye County.

Metal Deposits

Metalliferous mineral deposits have played a large part in the history of Nevada and continue to be an important part of the economy. Most of these deposits have a close spatial and temporal association with intrusive centers, and several different types of genetically related deposits can occur in clusters around those centers. Important resources of copper (Cu), molybdenum (Mo), tungsten (W), gold (Au), silver (Ag), lead (Pb), and zinc (Zn) may exist in deposits related to intrusive rocks, including porphyry deposits, skarn deposits, polymetallic vein and replacement deposits, distal disseminated Ag-Au deposits, and some types of epithermal Au-Ag deposits. Deposit types that are likely to be very large and economically significant and are the targets of current exploration are described below.

Porphyry Copper Deposits

Porphyry copper deposits are among the largest and most valuable mineral-deposit types on earth and are the most important source of global copper supply. The deposits typically contain hundreds of millions of tons of mineralized rock and millions of tons of copper, with lesser amounts of molybdenum, gold, and/or silver. Mines that exploit this type of deposit typically support hundreds of jobs and have a mine life measured in decades. Some of the largest mines are approaching a century of continuous activity.

Porphyry copper deposits form in subduction-related magmatic arcs, and northern Nye County contains parts of at least three such arcs, one of Late Triassic to Jurassic age, one of Cretaceous to Paleocene age, and one of Oligocene and Miocene age. An important part of the assessment will be to delineate the parts of northern Nye County that might contain undiscovered deposits related to each of these three ages.

No large porphyry copper deposits are known in the study area, but two sites provide specific analogues to deposits that may exist. Royston is about 40 km northwest of Tonopah, on the Nye-Esmeralda County line. Sullivan is about 12 km south of Gabbs (fig. 1).

The Royston district was recognized as a porphyry copper system in the 1960s and was explored by the Callahan Mining Corporation and by The Anaconda Company between 1963 and the late 1970s. The area is structurally complex. Substantial ore-grade material was never found, but sulfide-bearing quartz veins and hydrothermal alteration minerals typical of porphyry copper deposits indicate the existence of a porphyry system (Seedorff, 1991). The mineralized rock has not been dated, but Seedorff (1991) inferred it to be of Late Triassic or Early Jurassic age by analogy to nearby rocks in Esmeralda County.

The Sullivan deposit, also know as Cuervo, is about 4 km northeast of the Paradise Peak epithermal gold deposit and is exposed beneath a pediment surface where bedrock is mostly concealed by shallow alluvium. The deposit is a vein stockwork hosted in Late Cretaceous quartz monzonite porphyry. The veins contain copper, gold, and silver. Glamis Gold Ltd. mined the deposit for a short time in the late 1980s. The resource announced at the time was about 9 million tons at 0.37 percent Cu, 1.3 g/t gold, and 2.9 g/t Ag (Craig and others, 1992).

Several porphyry copper prospects, both Jurassic and Cretaceous in age, are present to the west of the study area in Mineral and Esmeralda Counties.

Low-fluorine Stockwork Molybdenum Deposits

Low-fluorine stockwork molybdenum deposits are close cousins of porphyry copper deposits and also are formed in subduction-related magmatic arcs. Like porphyry copper deposits, low-fluorine stockwork molybdenum deposits commonly contain as much as 100 million tons or more of mineralized rock and mines that exploit these deposits may operate for many decades. The most valuable commodity is molybdenum, but some of the deposits also contain substantial amounts of copper.

Two previously discovered deposits provide specific analogues to deposits that may exist. Liberty is in western Nye County, about 40 km northwest of Tonopah. B&C Springs is in northwestern Nye County, in the Paradise Range, about 15 km southeast of Gabbs (fig. 1).

The deposit at the Liberty project, which is currently owned by General Moly, Inc., was identified in the 1950s. It also has been known in the past as the Hall, Nevada Moly, and Cyprus Tonopah deposit. Anaconda Minerals Company and later Cyprus Metals Company conducted open-pit mining operations on the property between 1982 and 1991. During that time, about 45,000,000 tons of ore were processed at an average grade of 0.11 percent molybdenum (copper was not recovered during these earlier mining operations). The grade and tonnage of the remaining material is estimated at 607,000,000 tons at 0.064 percent molybdenum and 0.078 percent copper (proven and probable reserves plus measured, indicated, and inferred resources) (M3 Engineering and Technology, 2008).

The deposit is hosted by a multistage Cretaceous quartz monzonite stock (the Hall stock) that intruded Devonian- to Triassic-age metasedimentary rocks. The hydrothermal alteration mineralogy is typical for porphyry deposits and is characterized by K-feldspar and biotite in selvages along ore veins (Shaver, 1984).

The B&C Springs deposit, known in the past as UV Industries and Buzzard Peak and currently under option to Adanac Moly Corporation, is a porphyry prospect in which skarn-type mineralization has been primarily explored in the past. Exploration began here in 1968, and the property was explored intensely by U.V. Industries from 1978 until the early 1980s. Most of the mineralized rock is in the subsurface, but at relatively shallow depths. An indicated mineral resource has been identified of about 96,100,000 tons at 0.048 percent Mo and 0.068 percent Cu (both recoverable). The mineralized rock lies above a buried Cretaceous pluton–the Buzzard Peak stock (Tribe, 2007).

Important prospects of this type are present both in and near the study area. Jurassic-age prospects include the deposits in the Sylvania district on the Nevada-California State line about 85 km southwest of Tonopah. There are also several prospects just west of northern Nye County in Mineral County. Cretaceous-age prospects include some areas in the Belmont and Barcelona districts (fig. 1) in Nye County about 65 km northeast of Tonopah (Kleinhampl and Ziony, 1984). Other areas with characteristics associated with this type of mineralization are present just to the west of Nye County in Churchill, Mineral, and Esmeralda Counties.

Epithermal Gold-Silver deposits

Epithermal gold-silver deposits have been the largest producing deposits in northern Nye County since discovery of silver-rich veins in the Tonopah district in 1900, and numerous exploration programs for epithermal deposits are currently underway. Round Mountain has the largest total production and is the largest current producer in the study area. It has produced more than 373,000 kg of gold and 311,000 kg of silver since 1907; 14,800 kg of gold and 28,900 kg of silver were produced in 2008. Major epithermal deposits and districts in northern Nye County are summarized in table 1 and their locations are shown on figure 1.

Table 1. Epithermal gold-silver deposits in northern Nye County, Nevada.
[Longitude and latitude in decimal degrees, NAD27 datum. n.d., not dated.]

Deposit	Longitude	Latitude	Deposit Type	Age
Round Mountain	-117.079	38.700	Low-sulfidation epithermal	26 Ma
Paradise Peak	-117.969	38.750	High-sulfidation epithermal	19-18 Ma
Tonopah	-117.229	38.070	Low-sulfidation epithermal	19 Ma
Golden Arrow	-116.603	37.999	Low-sulfidation epithermal	n.d.
Bruner	-117.799	39.080	Low-sulfidation epithermal	n.d.
Longstreet	-116.711	38.375	Low-sulfidation epithermal	n.d.
Midway	-117.079	38.247	Low-sulfidation epithermal	17 Ma
Jefferson	-116.978	38.712	Low-sulfidation epithermal	n.d.

Epithermal gold-silver deposits are important sources of gold and silver worldwide (Simmons and others, 2005). They form at less than1.5-km depth and less than 300°C in mainly subaerial hydrothermal systems (Henley and Ellis, 1983; Hedenquist and Lowenstern, 1994). These hydrothermal systems developed in association with calc-alkaline, alkaline, and less frequently, tholeiitic magmatism, most commonly in volcanic arcs at convergent plate margins, but also in intra-arc, back-arc, and post-collisional rift settings. In addition, some non-magmatically heated epithermal deposits that formed by deep circulation of meteoric water along steep extensional faults are present in northern Nevada.

Epithermal gold-silver deposits have highly variable characteristics, including ore and alteration mineralogy and gold, silver, and base metal (Cu, Pb, Zn) contents, and formed in diverse geologic environments (Hedenquist and others, 2000; Sillitoe and Hedenquist, 2003; Simmons and others, 2005). Two principal types of deposits are low-sulfidation (also called quartz-adularia or adularia-sericite) and high-sulfidation (also called quartz-alunite or acid-sulfate). In northern Nye County, isotopically dated epithermal gold-silver deposits range in age from about 26 to 17 Ma (table 1).

High-sulfidation deposits generally form in or near eruptive/intrusive centers and have a larger magmatic component than low-sulfidation deposits. Their formation is related to degassing of shallow, oxidized magma bodies and the circulation of acidic hydrothermal fluids released from these magmas.

In northern Nye County and other parts of the western Great Basin, high-sulfidation deposits are related to calc-alkaline, intermediate composition (dacite/andesite) eruptive centers. Paradise Peak is the only significant high-sulfidation deposit in the study area, but several other large deposits occur nearby in Esmeralda and Mineral Counties. Paradise Peak differs from most high-sulfidation deposits with an unusually low Au to Ag ratio (1:15), a low copper content, and the absence of enargite.

Low-sulfidation deposits are formed at a greater distance from causative magma bodies than high-sulfidation deposits, and their ore fluids generally contain a smaller magmatic component. Low-sulfidation deposits are common in the western half of northern Nye County and are widespread throughout much of the northern Great Basin. Tonopah and Round Mountain are the two largest low-sulfidation epithermal deposits in the study area. Tonopah formed in a large intermediate-composition to silicic volcanic complex that contains ash-flow tuffs, possibly erupted from an underlying caldera-forming magma source (Bonham and Garside, 1979); lava flows and breccias; and shallow intrusions. Because of this complex igneous history the rocks responsible for mineralization are uncertain. The ore at Tonopah is contained mostly in banded and brecciated quartz±calcite±adularia veins, locally with high copper, lead, and zinc contents. In contrast, Round Mountain formed along the margin of a rhyolitic ash-flow caldera, where ore is mostly disseminated in nonwelded tuff, has subequal gold and silver contents, and contains very low concentrations of base metals.

A third type of epithermal gold-silver deposit is non-magmatically heated (extensional) gold deposits that are present elsewhere in northern Nevada (Coolbaugh and others, 2005). Although no known deposits of this type are present in the study area, the geologic environment suitable for their genesis (high heat flow and late Cenozoic faults) may be present in the western part of the study area.

Sedimentary Rock-Hosted (Carlin-type) Precious-Metal Deposits

Carlin-type gold deposits (CTGDs) of mid-Tertiary age in Nevada account for 60 percent of annual U.S. gold production and 6.5 percent of annual worldwide production, making the U.S. the fourth-largest gold producer in the world. CTGDs are hydrothermal replacement bodies hosted primarily by carbonate rocks, in which gold occurs as submicron particles or as a solid solution in pyrite. CTGDs share many features, including the following (Cline and others, 2005).

- Formation during a relatively narrow time interval (42-34 Ma, where dated) that corresponds to a change from compression to extension and renewed magmatism in Nevada. Most CTGDs track the southwestward sweep of magmatism in Nevada during mid-Tertiary time.
- Occurrences in clusters along reactivated basement rift structures.
- Occurrence commonly in Lower Paleozoic carbonaceous, carbonate-bearing host rocks within or adjacent to structural culminations, often in the lower plate of the Roberts Mountain thrust fault.
- Common spatial association with Mesozoic intrusions.
- Very similar hydrothermal alteration mineralogy and ore paragenesis characterized by dissolution and silicification of carbonate, sulfidation of iron in the rock, and formation of gold-bearing arsenian pyrite, followed by open-space deposition of orpiment, realgar, stibnite and other minerals.
- Low concentrations of silver and base metals and an elemental signature of Au-Tl-As-Hg-Sb-(Te).
- Ore-forming fluids that ranged from ~180 to 240ºC during ore deposition, are of low to moderate salinity (mostly ≤6 weight percent NaCl equivalent), are CO_2-bearing (less than 4 mole percent), nonboiling, and acidic, as evidenced by the formation of illite and local kaolinite .
- Depths of formation of less than 3 km.
- Lack of mineral or elemental zoning at the scale of <5-10 km laterally and <2 km vertically that suggests only minor temperature gradients during ore formation, despite the shallow depth of formation.

The last point is important because similar, but generally smaller deposits, known as distal disseminated Au-Ag deposits or Carlin-like gold deposits, form on the edges of zoned magmatic-hydrothermal systems, where metal and alteration types vary noticeably on the scale of kilometers. Whether these deposits and CTGDs form a spectrum or represent distinct deposit types with different origins is a subject of debate.

If there is potential for new trends or clusters of CTGDs in Nye County, the implications are important for the mineral assessment of northern Nye County. There are two likely CTGDs in northern Nye County, the Northumberland and White Caps deposits in the Toquima Range (fig. 1). Research and publications on these two deposits are limited, and to further characterize them will be an important part of this assessment.

Active exploration for Carlin-type deposits is ongoing elsewhere in northern Nye County, primarily in the Hot Creek Range.

The Northumberland deposit produced about 7,100 kg of gold, mostly between 1981 and 1991, and contains a measured and indicated resource of 36,518,000 tons that grades 1.92 g/t gold, amounting to 70,200 kg of gold (Fronteer Development Group, 2009). The ore is preferentially hosted in carbonates of the Ordovician Zanzibar, Ordovician-Silurian Hanson Creek, and Silurian-Devonian Roberts Mountains Formations, which were intruded by a Late Jurassic granodiorite stock (or sill). Local ore controls include anticlines, thrust faults, footwalls of granodiorite sills, and high-angle faults (Lauha and Lanier, 2005). Tertiary dikes and tuffs, ranging in age from 35 to 27 Ma, occur in the area and, where locally altered, contain anomalous gold. On the basis of these relations, the deposit is probably Oligocene in age. Decarbonatization and silicification are the main alteration types, and gold occurs in pyrite, marcasite, and arsenopyrite in unweathered ores and as <100 micron-sized electrum in weathered, oxidized ores. The overall silver to gold ratio is 4:1, high for CTGDs, which typically have a ratio of less than one.

The White Caps deposit is south of Northumberland in the Manhattan mining district. Records are incomplete, but production was likely around 900 kg of gold from ore that had an average grade of about 30 g/t (Ferguson, 1924; Kleinhampl and Ziony, 1984). Most of the gold occurs in pyrite in irregular replacement bodies of decarbonatized, silicified limestone of the Cambrian Gold Hill Formation. The silver to gold ratio is about 1:17, more typical of a CTGD. Abundant late-stage realgar, orpiment, stibnite and cinnabar are common. The deposit occurs along a west-northwest-trending, district-scale, high-angle fault-fold system that is cut by numerous small-displacement northeast-striking faults (Ferguson, 1921, 1924; Kleinhampl and Ziony, 1984).

Industrial Minerals

The most important industrial minerals in northern Nye County are barite, magnesium minerals, lithium, and fluorspar. Other industrial minerals, such as zeolite, are of limited economic interest because of low demand. Low-value industrial mineral deposits, such as building aggregate and dolomite, are present in large amounts in northern Nye County but are too far from markets to be of current interest.

Barite

Nevada is the most important source of barite in the U.S. Mines in northern Nye County have produced nearly 2 million tons of barite, most of which came from mines in the Northumberland district (fig. 1) between 1974 and 1984. Other mines in northern Nye County produced only minor amounts of barite.

All productive northern Nye County barite deposits are bedded (Papke, 1984). Bedded barite deposits vary in thickness and areal distribution, but they can be more than 300 m across and 30 m thick (Mills, 2006). Deposits in the Northumberland district, which were dismembered by faulting, are as much as 9 m thick and extend as much as 50 m along strike (Papke, 1984). Most geologists believe that bedded barite deposits are of submarine-exhalative origin, formed when barium from submarine hydrothermal activity combined with seawater sulfate to form barite (Mills, 2006). Bedded barite deposits are largely stratiform and part of the sedimentary sequence in which they occur. According to Papke (1984), about 70 percent of Nevada barite production came from Devonian rocks and the remaining 30 percent came mostly from Ordovician rocks.

Nevada mines produced more than 500,000 tons of barite annually between 2004 and 2007 (Castor, 2006; Davis, 2008). About 95 percent of this barite is used as a weighting agent in oil and gas well-drilling fluids. Barite reserves at operating Nevada mines are being depleted and resources such as those in northern Nye County are likely to be important in the future.

Magnesium Minerals

Magnesium minerals have been mined since 1935 at the Gabbs magnesia operation (fig. 1). During World War II, ore from Gabbs was used to make magnesium metal. From the 1950s to the 1980s, mining and processing at the site produced refractory magnesia. In the 1990s, the availability of cheap Chinese refractory magnesia caused production at Gabbs to be switched to light-burned magnesia that is mainly marketed for wastewater treatment and agricultural use.

About 60 percent of domestic magnesia production comes from seawater and natural brines, and the remainder comes from deposits of magnesite, brucite, and olivine. The mine at Gabbs is currently the only place in the U.S. where magnesite and brucite are mined. The magnesite and lesser amounts of brucite occur in replacement bodies in Triassic dolomite (Vitaliano and Callaghan, 1956), and they are thought to have formed by hydrothermal activity related to emplacement of Mesozoic granitic intrusions (Schilling, 1968). Deposits of sedimentary magnesite that have been evaluated for magnesia production but never mined in significant amounts occur near Currant in northeastern Nye County.

Lithium and Other Saline Minerals

Playas in northern Nye County may contain saline commodities, particularly lithium, for which demand may increase substantially due to use in batteries for electric vehicles. Lithium is extracted from subsurface playa brines at Clayton Valley, which is about 40 km west of northern Nye County. There are at least two current lithium exploration projects in Nevada, including one at Mud Lake (fig. 1) in northern Nye County. Some playas in northern Nye County have been evaluated for lithium in the past, and evaluation of data from such work will be part of this assessment.

Other saline minerals have been produced and explored for in northern Nye County. Drilling in a playa in Railroad Valley in northeastern Nye County showed the presence of a deposit of gaylussite ($Na_2Ca[CO_3]_2 \cdot 5H_2O$) as much as 40 m thick at a depth of more than 200 m (Papke, 1976). The gaylussite is of little commercial interest at this time. Surface salt mined here in the past contained as much as 12 percent K_2O, but potash deposits were not found at depth.

Fluorspar

Fluorspar deposits occur widely in northern Nye County, and about 27,000 tons (of approximately 550,000 tons produced historically in Nevada) were produced from deposits that occur in Paleozoic limestone and Tertiary volcanic rocks in the Quinn Canyon district (fig. 1). At least one relatively large unmined deposit has been identified in the district (Papke, 1979).

For many years, fluorspar prices declined and domestic production decreased to the point that no U.S. fluorspar mines remained active. However, prices for the highest grade of fluorspar reached historic highs in 2008, and although prices have retreated since then due to the international economic slowdown, fluorite mining may begin again.

Other Industrial Mineral Deposits

Small amounts of other industrial minerals have been mined or explored in northern Nye County, including diatomite, talc, chlorite, building stone, pumice, volcanic cinders, and clay minerals (Kral, 1951; Olson, 1964; Papke, 1975; Kleinhampl and Ziony, 1984). Most of these are of limited importance because of small size, poor quality, the distance from building markets, or transportation costs to other markets.

Turquoise mined at eight sites in northern Nye County was reported by Morrissey (1968) to be worth millions of dollars. Deposits in the Royston district were the most productive. Most northern Nye County turquoise deposits are now exploited by a single family-owned business in Tonopah.

Petroleum Resources

The formation of petroleum resources (oil and natural gas) is dependent upon all components of a petroleum system being present. Essential components include source rock(s), reservoir(s), seal(s) and overburden. In addition, essential processes, including generation, migration, accumulation, trap formation, critical moment and preservation, must occur.

Known areas within northern Nye County in which all components and processes of the petroleum system took place are located in Railroad Valley (RRV) in northeastern Nye County (fig. 1). Exploration and production have been ongoing in Railroad Valley since the 1950s, and total production as of 2004 was approximately 42 million barrels of oil (Anna and others, 2007). Hydrocarbons within RRV fields most likely are derived from either the Mississippian Chainman Shale or the latest Cretaceous to Paleogene Member B of the Sheep Pass Formation (or both). Reservoirs include Tertiary volcanic tuffs, slide blocks within the Sheep Pass Formation and karsted horizons at the top of the older Paleozoic section. Seals are poorly known, but include Tertiary fine-grained lithologies within the overlying valley fill, altered tuffs, and unconformities. Overburden, which is highly variable in thickness across Railroad Valley, consists of the Sheep Pass Formation, Oligocene tuffs, and Tertiary and Quaternary unconsolidated sediment. Several investigators have modeled the timing of generation (Anna and others, 2007; Poole and others, 1979; Inan and Davis, 1994) but significant uncertainty has resulted in estimates of timing of generation that vary greatly (from 2 to 267 Ma). Similar uncertainties exist in the timing of migration. These uncertainties directly impact understanding of the timing of the critical moment, which also varies depending on which source rock is being considered. Traps are both stratigraphic and structural. Stratigraphic traps are large slide blocks of Paleozoic carbonates encased within fine-grained portions of the Sheep Pass Formation, and structural traps include faults, fault blocks, folds, horsts, and buried hills. Preservation is directly related to the critical moment, so significant uncertainties exist with regard to this component of the petroleum system.

Exploration has focused on Railroad Valley, where hundreds of wells have been drilled in several fields. Several unsuccessful wells have been drilled in the White River Valley Basin to the east of RRV. As of 1996 fewer than 10 exploratory wells had been drilled in other basins within northern Nye County, and no wells had been drilled in the mountain ranges in Nye County (Hess, 1996). Some wells in the White River Valley and two wells within the Hot Creek Valley Basin west of Railroad Valley had oil and gas shows. Reported gas occurrences at the surface suggest the existence of undocumented resources within Monitor Valley in central northern Nye County.

Summary

The U.S. Geological Survey, in collaboration with the Nevada Bureau of Mines and Geology and the University of Nevada, Las Vegas, has completed the first year of work required to conduct a new mineral- and energy-resource assessment of northern Nye County, Nevada. Porphyry copper and molybdenum deposits, epithermal precious-metal deposits, and Carlin-type gold deposits are the most important types of undiscovered metallic mineral deposits in northern Nye County and are the primary focus of the assessment. Barite, magnesia, lithium, and fluorspar are the most important types of industrial minerals that may exist in undiscovered deposits. Undiscovered oil and gas resources are also important in the region. Most of these, with the exception of fluorspar and oil and gas, are presently known primarily in the western part of the study area; an important part of the assessment will be to evaluate the possibilities for resources of these types in the eastern part of the county.

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Glossary

ton metric ton (1,000 kilograms)