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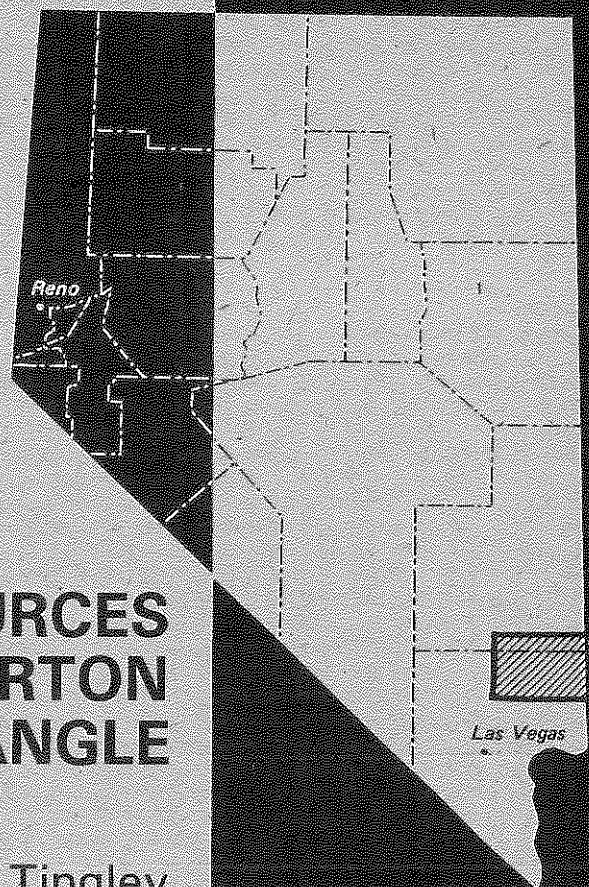
**MINERAL RESOURCES
OF THE OVERTON
30' BY 60' QUADRANGLE**

Joseph V. Tingley

Prepared in cooperation with the U.S. Geological Survey

A summary of the mineral resources of the Overton 30' by 60' Quadrangle including mining history and geologic setting; descriptions of mines, prospects, and occurrences of metallic and nonmetallic minerals and geothermal resources; and results of geochemical analyses. A 1:100,000-scale map showing the locations of the occurrences is included.

1989



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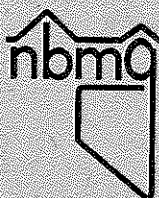
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Editing: Dick Meeuwig
Graphics: Larry Jacox
Typesetting:
By: Rayetta Buckley
At: Nevada Bureau of Mines and Geology
On: Compugraphic EditWriter 7770
Text: Univers Medium II, 9 pt.
Heads: Univers Bold II, 10 pt.
Paste-up: Rayetta Buckley

Printing:

First edition, first printing, 1989
Copies: 1000
By: Cal Central Press
2001 Timber Way, Reno, Nevada
Stock, cover: Speckleton French by Zellerbach, Kyoto Stone, 80 lb.
Stock, text: Cascade White Offset, 60 lb.
Ink, cover: Pantone 201
Binding: saddlestitch

MINERAL RESOURCES OF THE OVERTON 30' BY 60' QUADRANGLE

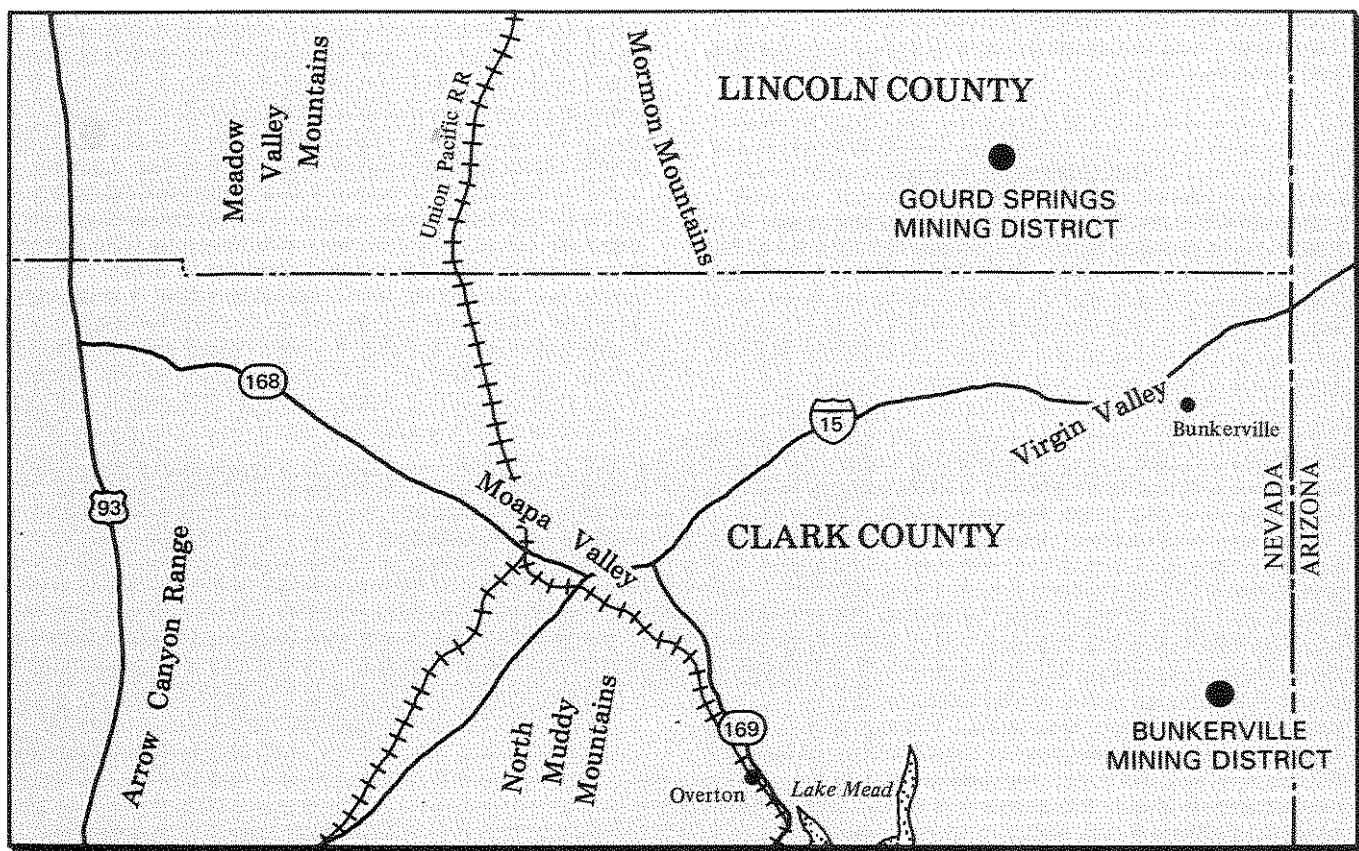
INTRODUCTION

The Overton 30' by 60' Quadrangle is in northeastern Clark County and southeastern Lincoln County about 50 miles northeast of Las Vegas. The quadrangle extends from Coyote Spring Valley past the Arizona state line and includes portions of the Las Vegas and Arrow Canyon Ranges and the Meadow Valley, North Muddy, Mormon, East Mormon, and Virgin Mountains. The east central portion of the quadrangle is occupied by Mormon Mesa and the broad valleys of the Muddy and Virgin Rivers. Lake Mead National Recreational Area extends up the Virgin River into the southern part of the quadrangle. The Moapa River Indian Reservation, extending from the Muddy River southwestward along the front of the Arrow Canyon Range, is mostly within the quadrangle. Part of the Desert National Wildlife Range occupies a narrow strip along the western boundary of the quadrangle.

The valley of the Virgin River, which passes through the southeastern part of the quadrangle, was traveled perhaps as early as 1776 by Spanish missionaries and explorers (Hulse, 1981, p. 31-32). First known as the Spanish Trail, then the San Bernardino-Salt Lake Wagon Road, the route entered what is now Nevada near present-day Mesquite, passed through Las Vegas, and entered California near the southwest end of Pahrump Valley. Jedediah Smith trapped along the Virgin River part of the old trail in 1826-27 and Fremont traveled the route eastward from California in 1844. Mormons settled in the Moapa (Muddy River) Valley

in 1864, were recalled to Salt Lake in 1871 (Thompson and West, 1881, p. 486), but returned to the Moapa Valley in 1880. In the meantime, the town of Bunkerville, on the Virgin River near the east edge of the quadrangle, was settled by farmers in 1877 (Paher, 1970, p. 289).

The first mining activity recorded within the quadrangle was in the late 1890's when the Copper King (Bunkerville) district was organized in the Virgin Mountains south of Bunkerville. Copper discoveries there later developed into the Key West and Great Eastern mines. Shortly after 1900, nickel and platinum were discovered in ores from the Key West mine but production of copper, nickel, and platinum from the district has been minimal. The Whitmore copper deposit in the Mormon Mountains was discovered in 1899 (Shaw and others, 1988, p. 4) and a small amount of copper and silver was produced from this property in 1908. Gypsum deposits near Moapa were worked between 1919 and 1923 by the White Star Plaster Co. (Vanderburg, 1937, p. 56) and gypsum is currently being produced from the same general area for use in wallboard by Georgia-Pacific Co. (S. B. Castor, personal commun., 1988). Silica has been produced from the Tiffany mine in the Arrow Canyon Range but production has been small and intermittent (Longwell and others, 1965, p. 209). Significant amounts of silica have been produced from recent deposits of eolian sand in the Overton area and one of these deposits is currently in production. Large reserves of magnesite are reported in an area west of Overton (Hewett and others, 1936, p. 119) but only small amounts have been mined.



The only known geothermal resources within the quadrangle are several warm springs and wells in Moapa Valley and Virgin Valley.

There has been oil exploration within the quadrangle and several deep test holes have been drilled. No shows of oil and gas have been reported, however.

Descriptions of the geology of the Clark County portion of the quadrangle are found in the publication by Longwell and others (1965). The geology of the part of the quadrangle in Lincoln County is described in Tschanz and Pampeyan (1970).

In 1983, the Nevada Bureau of Mines and Geology completed mineral inventory studies of the Stateline and Caliente Resource Areas for the Bureau of Land Management. As part of these two projects, major mines and prospects in the Overton Quadrangle were examined and sampled. Field data were collected by J. Bentz, P. Smith, and J. V. Tingley. In 1987 a cooperative program was begun with the Branch of Western Regional Geology, U.S. Geological Survey, to complete mineral inventory studies in a number of 30' by 60' quadrangles in southeastern Nevada. The inventory of the Overton Quadrangle is the second of these studies to be completed. Field examinations for this study were carried out by J. V. Tingley in 1987.

Samples were selected from dumps and mineralized outcrops to examine trace element associations. Sample descriptions and results of geochemical analyses are in appendixes A and B. The samples are high grade and do not represent average ore grades. The U.S. Geological Survey Branch of Geochemistry performed the geochemical analyses as part of a cooperative agreement with the Nevada Bureau of Mines and Geology.

The information in this report draws from all known previous sources and is intended to be a compilation of data on mines, prospects, and mineral and geothermal occurrences within the Overton 30' by 60' Quadrangle. When information sources are cited, the first source listed has provided the primary information. The information presented has been adjusted to reflect field observations. This report was reviewed by Gary Dixon, Larry Garside, and Stephen Castor.

GEOLOGIC SETTING

Rocks within the Overton Quadrangle range in age from Precambrian through Quaternary. Metamorphic rocks of Precambrian age crop out along Black Ridge, Bunkerville Ridge, and Whitney Ridge in the Virgin Mountains; along the eastern flank of the East Mormon Mountains; and in isolated patches in the southern and western parts of the Mormon Mountains. These rocks, of Early Proterozoic age (dated at $1,740 \pm 25$ Ma), are the oldest rocks in Nevada (Stewart, 1980, p. 9). They consist of medium- to high-grade meta-sedimentary gneiss and schist and lesser amounts of marble associated with gneissic granite, pyroxenite, hornblendite, migmatite, and pegmatite (Stewart, 1980, p. 9).

Paleozoic sedimentary rocks are present in most of the ranges in the quadrangle and, although complexly folded and faulted in places, most outcrops display north-trending strikes and east or west dips. In the Mormon and East Mormon Mountains the Paleozoic rocks occur as thrust or detachment fault sheets or gravity slides which have over-ridden Precambrian rocks; similar relationships may also be present in the Virgin Mountains. Triassic and Jurassic sedimentary rocks consisting of the Chinle and Moenkopi Formations and the Aztec Sandstone crop out along the north-trending Muddy Mountains and on the southern part of Whitney Ridge in the southern Virgin Mountains.

Tertiary sedimentary rocks form extensive outcrops along the margins of basins in the central part of the quadrangle. The buff-colored beds characteristic of the fine-grained facies of these sediments are widely exposed in badlands along both sides of Moapa Valley, in the high bluffs bounding Mormon Mesa, in outcrops along Meadow Valley Wash, and along both sides of Virgin Valley (Longwell and others, 1965, p. 48-49; Bohannon, 1984, p. 56-58). A thin veneer of Tertiary volcanic rocks caps older rocks in Meadow Valley Wash and portions of the central and northern Meadow Valley Mountains (G. L. Dixon, written commun., 1988).

Older Quaternary gravels cap Mormon Mesa and commonly occupy the area extending from the Tertiary rocks in the lower valleys to pre-Tertiary outcrops on the flanks of the ranges.

With the exception of dikes and sills in the Precambrian rocks of the Virgin Mountains, the only intrusive rock present in the quadrangle is a small granitic body that crops out near the Whitmore mine in the Mormon Mountains. Shaw and others (1988, p. 5) indicate that the granitic rock is of Precambrian age but, on page 1 of the same publication, they state that igneous rocks intruded the core of the Mormon Mountains sometime in Mesozoic to Tertiary time. It is possible, therefore, that the granite in the Mormon Mountains is much younger than the enclosing Precambrian metamorphic rocks.

METALLIC OCCURRENCES

BUNKERVILLE MINING DISTRICT

The Bunkerville mining district, Clark County, is in the southeastern corner of the quadrangle. The district extends from the Virgin River to the Arizona state line on the east and to the quadrangle boundary on the south.

Copper ore was discovered in the western part of the district in the 1890's and the ores were later found to contain nickel and small amounts of platinum. Minor amounts of copper-nickel ore were produced in the district between 1908 and 1916 and again in 1929. Both tungsten ore and mica have been mined from small deposits located in the rough terrain north of Virgin Peak in the eastern part of the district. Beryllium minerals also occur in these deposits.

All of the mineral deposits in this district are related to or occur in Precambrian rocks. Tungsten-beryllium-mica deposits occur in a belt that extends from the Arizona border southwest for approximately $1\frac{1}{2}$ miles. The deposits are associated with pegmatite dikes, hornblendite sills and dikes, and quartz veins that follow the general northeast structural and foliation trend in Precambrian garnet-mica schist. In the western part of the district, copper-nickel-bearing sulfides occur as veinlets and disseminations in hornblendite dikes that cut Precambrian granodiorite gneiss.

Black Ridge prospects (1)

Commodity: copper(?)

Location: sec. 35, T15S, R69E

UTM¹ 4051740N 745680E

Production: none

Development: several bulldozer trenches and cuts

Geology: Bulldozer cuts expose pink orthoclase-quartz pegmatite lenses in gneiss and gneissic schist; lenses strike N20° to 40°W and dip to the southwest. A trench along the top of a northeast-trending ridge exposes an iron-oxide-stained, quartz-rich pegmatite

¹Universal Transverse Mercator, zone 11 (meters)

with minor copper-oxide staining; the copper-stained pegmatite is 1 to 3 inches thick, follows gneissic banding that trends N15° to 20°E and is nearly vertical. The orthoclase-rich pegmatite lenses crosscut the gneissic banding.

Field examination: J. V. Tingley, 1987

Blue Bell prospect (2)

Commodities: copper and nickel

Location: sec. 15, T15S, R70E

UTM 4057350N 754280E

Production: none

Development: a cut and a 40-foot-deep inclined shaft

Geology: A N80°E-striking, 70°SE-dipping white quartz-feldspar pegmatite occurs in amphibolite schist; pegmatite is lenticular, 2 to 3 feet thick, and has green copper-oxide staining near each wall.

Field examination: J. V. Tingley, 1987

Great Eastern mine (3)

Commodities: nickel, copper, and platinum

Location: sec. 14, T15S, R70E

UTM 4056900N 754300E

Production: small

History: The deposits were discovered in about 1902 by S. W. Darling and A. M. Thompson (Averett, 1962), explored in 1936–37 by International Smelting and Refining Co., and investigated by the USBM in 1939–41.

Development: three adits with limited underground workings, all now caved

Geology: The country rock at the Great Eastern mine consists of granodiorite gneiss that has been intruded by hornblende and pegmatite dikes. These dikes and related sulfide mineralization occur along a northeast-trending fault zone that extends onto the property from the nearby Key West mine. This structure, termed the Great Eastern dike, is a normal fault in the upper plate of the Key West thrust fault, a large northeast-trending reverse fault that lies along the northern flank of the Virgin Mountains. Nickel-bearing sulfides are presumably associated mainly with pyrrhotite in hornblende although pyrite and chalcopyrite may also contain some nickel.

Sources of information: Beal (1965, p. 61–63); Averett (1962, p. 48)

Field examination: J. Bentz and P. Smith, 1983; J. V. Tingley, 1987

Hodges-Whorton mine (4)

Commodity: tungsten

Location: sec. 23, T15S, R69E

UTM 4055360N 745590E

Production: several units WO₃

Development: A steep bulldozer road leads to a cut, 30 feet long by 20 feet wide along strike; an adit extends about 5 feet beyond the end of the cut.

Geology: The mine workings follow a 4- to 6-inch-wide quartz vein which has formed along foliation planes in a garnet-biotite gneiss; the vein is lenticular and pod-like, strikes N40°E, and dips 65° to 70°SE. The vein is iron-oxide stained, contains sparse but coarse-grained scheelite; the scheelite is blue-white under fluorescent light. The gneiss is laced with quartz-rich pegmatite dikes up to 2 feet thick; the dikes have euhedral garnet crystals along their contacts with gneiss and also contain some pink orthoclase.

Remarks: The property is at the summit of a northwesterly trending spur of Black Ridge and can be reached only by a steep bulldozer road.

Source of information: Stager and Tingley (1988, p. 43)

Field examination: J. V. Tingley, 1987

Kathleen prospect (5)

Commodities: copper and silver(?)

Location: sec. 17, T16S, R71E

UTM 4047600N 760880E

Production: none

Development: one adit 40 feet long, bearing N80°W

Geology: The adit is collared in Precambrian schist; the schist foliation strikes northerly and dips 10° to 20°W. White quartz lenses, which formed along foliation planes in the schist, show hematite staining but no other obvious mineralization.

Source of information: Hose and others (1981)

Field examination: J. V. Tingley, 1987

Key West mine (6)

Commodities: nickel, copper, and platinum

Location: sec. 21, T15S, R70E

UTM 4056040N 753450E

Production: small tonnage, 1908–1932

History: The mine was discovered in the late 1890's and explored for copper and nickel between 1900 and 1903; most work on the property was done in 1901



Open pit at the Key West mine, Bunkerville district. P. Smith photo.

but some additional work was done between 1903 and 1916, in 1929, and in 1952.

Development: Workings consist of an open pit and numerous adits, drifts, stopes and shafts; most underground workings are now inaccessible.

Geology: Precambrian granodiorite gneiss and schist are intruded by hornblende dikes and plugs and by aplite and pegmatite dikes. Copper-nickel mineralization is associated with a lenticular hornblende body which follows a steeply dipping fault zone that strikes N70° to 75°E; mineralization occurs disseminated in the hornblende, along the fault zone, and in several small pods and lenses northwest of the main fault zone. Ore minerals include chalcopyrite, pyrite, pyrrhotite, magnetite, pentlandite, azurite, malachite, and cuprite. Associated minerals include apatite, epidote, limonite, carbonates, quartz, and clay. The Key West thrust fault underlies the mine area at a depth of approximately 450 feet.

Remarks: 31,000 tons of ore developed at the mine averaged 2.5 percent copper, 1.9 percent nickel, and 0.14 ounces platinum per ton. The deposit has a resource potential of a few thousand ounces of platinum.

Source of information: Beal (1965, p. 63-76)

Field examination: J. Bentz and P. Smith, 1983; J. V. Tingley, 1987.

Ranch View prospects (7)

Commodities: copper and silver(?)

Location: sec. 22, T16S, R71E

UTM 4046300N 763490E

Production: none

Development: Workings consist of several prospect pits: the largest, on the southeast, is 6 by 6 by 10 feet deep; the next largest, 150 feet to the northwest, is 6 by 10 by 4 feet deep.

Geology: Pits are along lenticular quartz veining that strikes N30° to 40°W in a lense of gneissic rocks enclosed in Precambrian granite. Unaltered Paleozoic limestone crops out a few feet up slope northeast of the prospects. The lense of metamorphic rocks and the enclosed veining dip 70° to 80°SW. No mineralization was noted except iron-oxide staining. The vein material is vuggy and the vugs are filled with iron-oxide gossan.

Source of information: Hose and others (1981)

Field examination: J. V. Tingley, 1987

Roadside prospect (8)

Commodities: copper and silver(?)

Location: sec. 17, T16S, R71E

UTM 4047400N 761700E

Production: none

Development: shallow location trenches

Geology: Coarse-grained Precambrian granite with pink orthoclase feldspar is exposed in the trenches; no metallic mineralization was noted.

Source of information: Hose and others (1981)

Field examination: J. V. Tingley, 1987

Silver Leaf mine (9)

Other names: Tri-State mine, Walker mine, Mesquite mine, Deer Trail mine, Cabin Canyon mine, and Silver mine

Commodity: tungsten

Location: secs. 16 and 17, T15S, R71E

UTM 4058155N 761450E

Production: small

History: production period 1953-57

Development: Workings consist of open cuts, trenches, and over 1,000 feet of drifts, raises, and stopes, all now inaccessible.

Geology: The mine workings explore hornblende dikes in Precambrian schist. The dikes contain lenses of quartz containing pyrite and scheelite. The richest concentrations of scheelite occur in quartz lenses, veinlets, and veins in the sheared dikes where they cut garnet-muscovite-chlorite schist. Quartz veinlets range from 1 inch to several feet thick and contain sparse calcite and pyrite as well as scheelite. One scheelite-bearing zone was 8 feet thick and at least 300 feet long. Tungsten content of the ores mined ranged from about 0.2 to 1.0 percent WO₃, averaging about 0.43 percent WO₃. Tourmaline and possibly some beryl are also present in the dikes.

Source of information: Stager and Tingley (1988, p. 43)

Field examination: J. V. Tingley, 1983

South Valley No. 4 claim (10)

Commodity: uranium

Location: sec. 16(?), T15S, R70E

UTM 4057000N 753000E

Production: none

Development: small pit

Geology: Anomalous radioactivity occurs near the contact of a mica schist and a sandy shale in Precambrian metamorphic rocks.

Source of information: Garside (1973, p. 36)

Taglo mine (11)

Other names: Santa Cruz mine, Rising Star mine, and San Jose mine

Commodities: beryllium and mica

Location: secs. 3 and 10, T15S, R71E

UTM 4059950N 763190E

Production: none

Development: three adits and several open pits

Geology: Pegmatite dikes and sills generally follow foliation in Precambrian garnet-mica schist. The pegmatite bodies range in size from narrow lenticular pods a few inches across and several feet long to pods more than 8 feet wide and 350 feet long. Pegmatites occurring with smaller sills generally contain higher percentages of beryllium minerals. Ore minerals are beryl, chrysoberyl, and phenacite associated with muscovite, hematite, tourmaline, limonite, quartz, and albite.

Remarks: By estimate, the total amount of beryl and chrysoberyl in the ore does not exceed 1 percent; several hundred thousand tons of pegmatitic material, containing about 0.25 percent beryllium minerals, is estimated to be present.

Source of information: Beal (1965, p. 81-82)

Thanksgiving prospect (12)

Commodities: nickel, copper, and platinum

Location: sec. 29, T15S, R70E

UTM 4054600N 751750E

Production: none

Development: bulldozer cuts and discovery pit

Geology: Secondary copper and nickel minerals occur in altered and brecciated Precambrian biotite gneiss.

Source of information: Beal (1965, p. 80)

Virgin Mountain chrysoberyl mine (13)

Other names: Mica Notch deposits and Leavitt claims

Commodities: beryllium and mica

Location: secs. 17 and 18, T15S, R71E

UTM 4057600N 760450E

Production: small

History: Earliest work on the property was done for mica in about 1900; some beryllium ore was produced in 1935.

Development: adits (now caved) and trenches

Geology: Beryllium-bearing pegmatite occurs in sills, dikes, and irregularly shaped masses in a northeast-trending area about 3,000 feet by 6,000 feet near Mica Notch. The pegmatite bodies are zoned and consist of quartz-rich sills, dikes, and irregularly shaped masses composed mostly of quartz and microcline with minor sodic plagioclase containing up to 10 percent disseminated chrysoberyl with associated tourmaline, magnetite, and muscovite. Beryl is present as light-green to colorless crystals, up to 4 inches in diameter, closely associated with massive almandine garnet, magnetite, tourmaline, and muscovite in wider dikes. The dikes cut Precambrian garnet-mica schist; the gneiss foliation trends northeast and dips south-east.

Sources of information: Beal (1965, p. 82-86); Holmes (1964, p. 6)

Field examination: J. V. Tingley, 1983

Whitney Pass prospect (14)

Commodities: copper and silver(?)

Location: sec. 21, T16S, R71E

UTM 4046880N 762550E

Production: none

Development: one cut and a 40-foot-deep inclined prospect shaft

Geology: Lenticular quartz veins and veinlets, ¼ to 1 inch thick, occur along planes of schistosity in a N70°W-striking, 60°NE-dipping shear zone in gneiss and schist. Hematite and minor manganese-oxide staining is present in the quartz veins. Unaltered Paleozoic limestone crops out immediately upslope from the prospect, and coarse-grained Precambrian granite crops out downslope. A small amount of copper staining is present but no other signs of metallic mineralization were noted. Clear fluorite crystals are present in vugs in the quartz veins.

Field examination: J. V. Tingley, 1987

GOURD SPRINGS MINING DISTRICT

The Gourd Springs mining district, Lincoln County, is located in the northeastern quarter of the quadrangle and extends from the East Mormon Mountains to the Arizona state line.

A small tonnage of manganese ore is reported to have been produced from this district in 1929 (Tschanz and Pampeyan, 1970, p. 176). This report is felt to be in error, however, and the manganese ore probably came from deposits near the Utah state line, several miles north of the Overton Quadrangle. The district does, however, contain a deposit of tungsten on the east side of the East Mormon Mountains. The tungsten occurrence is associated with tourmaline-bearing pegmatite dikes that cut Precambrian amphibolite schist. Scheelite occurs in a weak skarn zone formed along a dike contact. The dikes generally follow foliation directions in the schist.

Bruson prospect (15)

Other name: Macbruson claims

Commodity: tungsten

Location: sec. 4, T12S, R69E

UTM 4090275N 741700E

Production: none

History: explored in the 1920's

Development: small prospect pits

Geology: Quartz-tourmaline pegmatite dikes intrude Precambrian amphibolite; to the west, the Precambrian rocks are overlain by a thrust sheet of Paleozoic carbonate rocks. The pegmatite dikes have intruded the amphibolite in such a way as to produce a bedded appearance of alternating light pegmatite and dark amphibolite. Black tourmaline crystals up to 2 inches long occur in the pegmatite. Skarn zones associated with the pegmatite-amphibolite contact zones are composed of anhedral to subhedral andradite garnet intergrown with green to brown epidote and idocrase. Clots and stringers of scheelite and powellite also occur in the skarn. The quartz pegmatite also contains fine sprays and clots of molybdenite along with oxidized pyrite crystals. The pegmatite dikes strike N30°E and dip 30°NW.

Source of information: Stager and Tingley (1988, p. 106)

Field examination: J. Bentz and P. Smith, 1983

MEADOW VALLEY MOUNTAINS

The Meadow Valley Mountains, Lincoln County, lie east of U.S. Highway 93 in the northwestern quarter of the quadrangle. This area is distant from other mining areas in the quadrangle and includes only two recorded mineral occurrences, a questionable gold-silver occurrence, and a uranium occurrence. Both occurrences are in Paleozoic limestone.

D and D occurrence (16)

Commodities: gold and silver(?)

Location: sec. 21(?), T11S, R64E

UTM 4093000N 691500E

Production: none

Development: none

Geology: Silicified, iron-stained limestone is exposed in a contact zone beneath a partially eroded, thick, canyon-filling rhyolite ash-flow tuff. Quartz veinlets occur in the silicified limestone. The margin of the rhyolite flow near the contact contains blue labradorite crystals up to ½ inch long.

Remarks: Stream sediment samples taken from drainages in this general area were anomalous in base metals. The occurrence is only approximately located.

Source of information: Campbell (1987, p. 21, 27)

Fry and Jeffers occurrence (17)

Commodity: uranium

Location: secs. 6 and 7, T13S, R64E

UTM 4079000N 690500E

Production: none

Development: none

Geology: Slight radioactivity is associated with black Paleozoic limestone. No veins or geologic structures are associated with the occurrence.

Source of information: Campbell (1987, p. 27)

MORMON MOUNTAINS

The Mormon Mountains area, Lincoln County, located in the north central part of the quadrangle, includes all of the Mormon Mountains lying between the Lincoln County line and the northern boundary of the quadrangle. Most of this area, including the known mineral deposits, is within the proposed Mormon Mountains wilderness area. Known mineral occurrences include a copper-silver deposit at the Whitmore mine and a copper-silver prospect at Hackberry Spring. A few tons of ore was produced from the Whitmore mine in 1908 and is the only recorded production from the area. The copper-silver deposits occur in the lower plate of

a detachment fault that separates Paleozoic limestone from Precambrian granitic rocks.

Hackberry Spring prospect (18)

Commodities: copper and silver(?)

Location: sec. 1, T12S, R67E

UTM 4089600N 726800E

Production: none

Development: one prospect cut that may have been a short adit (now caved)

Geology: The prospect is located at the intersection of a N60°W-striking, 30°NE-dipping, brecciated quartzite and a N40°E-striking, 45°NW-dipping fault zone. The fault contains about 1½ feet of brecciated white quartz; the quartzite wall rock is also brecciated and iron-oxide stained. Cinnamon-brown and yellow-brown iron-oxide coatings are present on fracture surfaces. A massive, gray limestone with thin, shaly partings crops out immediately above the prospect. A trace amount of green copper-oxide minerals is present.

Field examination: J. V. Tingley, 1987

Whitmore mine (19)

Other names: Bradfute copper mine; Anna Laura,

Climax, and Stanley quartz claims

Commodities: copper and silver

Location: sec. 2, T12S, R67E

UTM 4089600N 726800E

Production: 19 tons ore, 4 ounces silver, and 2,621 pounds copper

History: The original three claims were located in 1899; D. Whitmore produced 19 tons ore from this property in 1908.

Development: four shallow shafts, three adits, several cuts, and prospect pits

Geology: Prospect cuts and shafts are along a N20°E-striking, 35°NW-dipping detachment fault that separates Paleozoic limestone (to the northwest in the upper plate) from altered, fractured, iron-stained granitic rock (to the southeast in the lower plate). The intrusive is laced with iron- and manganese-oxide stained fractures, some potassium feldspar, and quartz veining. The limestone above the fault zone is unaltered and unmineralized. The fault zone contains brecciated, recemented white vein quartz. The quartz displays iron-oxide-stained fault surfaces within it and contains angular fragments of pyrite, chalcopryrite, bornite, hematite, and malachite. The shafts and cuts explore about 200 feet of strike length; other small prospects occur about 1,500 feet to the southwest along strike. The intrusive is a medium- to coarse-grained granite with predominantly pink orthoclase. The granite is moderately silicified and is stained with hematite, forming an extensive outcrop of reddish rocks beneath the unaltered limestone. The fault zone is not well exposed but blocks of brecciated quartz up to 3 feet thick crop out along its trend; fragments of copper-mineralized vein up to 4 inches thick can be found on the dumps.

Remarks: Twenty-six samples were taken at the property by the U.S. Bureau of Mines (Shaw and others, 1988). Four samples had trace amounts of gold, eight had 0.1 to 0.6 ounces per ton silver, and all contained minor amounts of copper; one sample contained 3.6 percent copper.

Source of information: Shaw and others (1988, p. 4-5)

Field examination: J. V. Tingley, 1987

NORTH MUDDY MOUNTAINS

The North Muddy Mountains area, Clark County, is in the south-central part of the quadrangle and occupies the

area between Interstate Highway 15 and the lower Moapa Valley. Valley of Fire State Park extends through the center of this area; mineral occurrences lie to the east and west of the park along Weiser and Overton Ridges. Several uranium prospects and occurrences are found on Weiser and Overton ridges; one property is reported to have had small production.

The uranium occurrences are in the Jurassic Aztec Sandstone, sandstone of the Shinarump Member of the Triassic Chinle Formation, and limestone and conglomerate of the Tertiary Overton Conglomerate.

Carnotite No. 1 claim (20)

Other name: Perkins Brothers claim

Commodity: uranium

Location: sec. 20, T16S, R67E

UTM 4045200N 722200E

Production: none

Development: several pits and a shallow shaft

Geology: Very fine-grained carnotite occurs with carbonaceous trash as well as along a limestone-sandstone contact. The carnotite occurs in a zone up to 5 feet thick and 300 feet long. The rocks present at the prospect are part of a 58-foot-thick unnamed unit at the top of the Jurassic Aztec Sandstone, which presumably lies unconformably beneath the Cretaceous Willow Tank Formation.

Source of information: Garside (1973, p. 22)

Golden Glow and Carnotite Lode prospect (21)

Other names: Perkins Brothers claims and Overton property

Commodity: uranium

Location: sec. 16, T16S, R67E

UTM 4046800N 737000E

Production: small

Development: about 15 prospect pits

Geology: Carnotite occurs with opal and calcite along fractures in clays, conglomerates, and tuffaceous sandstones of the Overton Conglomerate.

Remarks: Some ore may have been produced but the amount is unknown. Samples from the prospect contained up to 0.045 percent U₃O₈.

Source of information: Garside (1973, p. 22-23)

Last Chance claim (22)

Commodity: uranium

Location: sec. 36, T15S, R66E

UTM 4051000N 719000E

Production: none

Development: many prospect pits

Geology: A shaly, jarosite-stained sandstone containing abundant carbonaceous trash is abnormally radioactive; sandstone is within the Shinarump Member of the Triassic Chinle Formation.

Source of information: Garside (1973, p. 22)

R.A.H. claims (23)

Commodity: uranium

Location: secs. 5 and 8, T15S, R67E

UTM 4058950N 722280E

Production: none

Development: prospect pits

Geology: Anomalous radioactivity is reported present in Tertiary sedimentary rocks, mainly limestones and conglomerates of the Overton Conglomerate.

Source of information: Garside (1973, p. 22)

Weiser anticline uranium occurrences (24)

Commodity: uranium

Location: sec. 35, T15S, R66E

UTM 4052000N 716000E

Production: none

Development: none

Geology: Anomalous high radioactivity occurs in carbonaceous trash beds of the Shinarump Member of the Triassic Chinle Formation; radioactivity is reportedly due to disseminated uranium although no uranium minerals have been recognized. Fragments of silicified wood occur throughout the formation.

Remarks: The occurrences are along the west side of Weiser Ridge and extend for about 4 miles.

Source of information: Garside (1973, p. 22)

NONMETALLIC OCCURRENCES

ARROW CANYON RANGE

The Arrow Canyon Range, Clark County, lies east of U.S. Highway 93 in the southwestern quarter of the Overton 30' by 60' Quadrangle. Deposits of silica and building stone occur in localities along the east and west flanks of the southern part of the Arrow Canyon Range, and a clay prospect is located in Pahranaagat Wash on the north end of



Open pit and remains of the loading facility, Tiffany Minerals Co. quarry, Arrow Canyon Range. J. Quade photo.

the range. Two of the properties have had a small production of silica and quartzite. The deposits in the southern part of the range are in Paleozoic rocks; the clay deposit to the north occurs in Tertiary sedimentary rocks.

Jordan claims (1)

Commodity: limestone

Location: secs. 7 and 17, T16S, R64E
UTM 4047000N 692000E

Production: none

Development: bulldozer roads and prospect cuts

Geology: Paleozoic limestone

Field examination: J. V. Tingley, 1987

Quartzite quarry (2)

Other name: ONCO claims

Commodity: stone

Location: sec. 27, T15S, R63E
UTM 4052000N 687000E

Production: small

Development: quarry

Geology: The quarry is in Ordovician Eureka Quartzite.

Remarks: The material is used as a decorative stone.

Tiffany Minerals Co. quarry (3)

Other name: Tiffany mine

Commodity: silica

Location: sec. 18, T15S, R64E
UTM 4055650N 690840E

Production: small

History: The deposit was mined in the 1940's.

Development: Workings consist of an elliptically shaped bench 250 feet long and 135 feet wide, with a vertical face 35 to 40 feet high.

Geology: Mine workings are restricted to Ordovician Eureka Quartzite; quartzite is overlain on the west by limestone, dolomite, and shale. The formations strike slightly west of north and dip 25°E.

Remarks: Longwell and others (1965) thought the chemical and physical properties of the quartzite made it suitable for low-alumina silica refractories and metallurgical stone. Extreme hardness and abrasiveness of the rock resulted in such high preparation and maintenance costs that the operation was not economic.

Sources of information: Murphy (1954, p. 5, 11-12); Longwell and others (1965, p. 163)

Field examination: J. Quade, 1985

Volcanic ash prospect (4)

Other name: Bentonite clay deposit

Commodity: clay

Location: sec. 33, T13S, R64E
UTM 4070500N 694000E

Production: none

Development: prospect pits

Geology: A bed of white bentonite, about 3 feet thick, is exposed for about 1 mile along strike in a bluff.

Source of information: Vanderburg (1937, p. 57)

BUNKERVILLE MINING DISTRICT

This district is described in the section on metallic occurrences.

Blue Beetle No. 1 lode claim (5)

Other name: Walker prospect

Commodity: fluorite

Location: sec. 24, T15S, R70E
UTM 4056470N 756970E

Production: none

Development: Workings consist of 125 feet of cross-cuts, 120 feet of drifts, and several trenches.

Geology: Minor amounts of fluorite are present in fissures in a pegmatite dike that cuts garnet-sillimanite-mica schist. The pegmatite dike dips steeply and strikes northeast; the fluorite-bearing fissures are up to 4 inches thick.

Sources of information: Beal (1965, p. 80); Papke (1979, p. 68)

Bunkerville Ridge gypsum prospect (6)

Commodity: gypsum

Location: sec. 35, T14S, R70E

UTM 4062980N 755270E

Production: none

Development: minor trenching, one open cut

Geology: Gypsum and thin-bedded dolomite in the Permian Toroweap Formation are exposed for about 200 feet along strike. The beds trend N15° to 35°E and dip 50° to 60°NW. Limited exposures suggest the presence of a lower unit of gypsum and lesser interbedded dolomite, about 35 feet thick. Extensive outcrops of carbonate rocks a short distance southwest suggest that the gypsum-rich rocks terminate against a fault in this direction. The gypsum is white, massive, fine grained, and friable; except for dolomite interbeds, it is relatively pure. Small amounts of quartz and montmorillonite are present.

Source of information: Papke (1987, p. 7)

Mica Queen prospect (7)

Commodity: mica

Location: sec. 34, T15S, R71E

UTM 4052500N 763700EE

Production: none

Development: none

Geology: Quartz-feldspar pegmatite dikes with associated muscovite mica cut Precambrian gneiss.

Remarks: Location is only approximate; the prospect could not be located in the field.

Source of information: Hose and others (1981)

Field examination: J. V. Tingley, 1987

Taglo mine (8)

Other name: Santa Cruz mine

Commodities: mica and beryllium

Location: secs. 3 and 10, T15S, R71E

UTM 4059950N 763190E

Production: none

Development: three adits and several open pits

Geology: Pegmatite dikes and sills follow the foliation direction in Precambrian garnet-mica schist. The pegmatite bodies range in size from narrow lenticular pods a few inches across and several feet long to pods more than 8 feet wide and 350 feet long. Pegmatite occurring as smaller sills generally contains higher percentages of beryllium minerals. Ore minerals are beryl, chrysoberyl, and phenacite associated with muscovite, hematite, tourmaline, limonite, quartz, and albite.

Remarks: By estimate, the total amount of beryl and chrysoberyl in the ore does not exceed 1 percent; several hundred thousand tons of pegmatitic material containing 0.25 percent beryllium minerals is estimated to be present.

Source of information: Beal (1965, p. 81-82)

Virgin Mountain chrysoberyl mine (9)

Other names: Mica Notch deposits and Leavitt claims

Commodities: mica and beryllium

Location: secs. 17 and 18, T15S, R71E

UTM 4057600N 760450E

Production: small

History: Earliest work was done for mica in about 1900; some beryllium ore was produced in 1935.

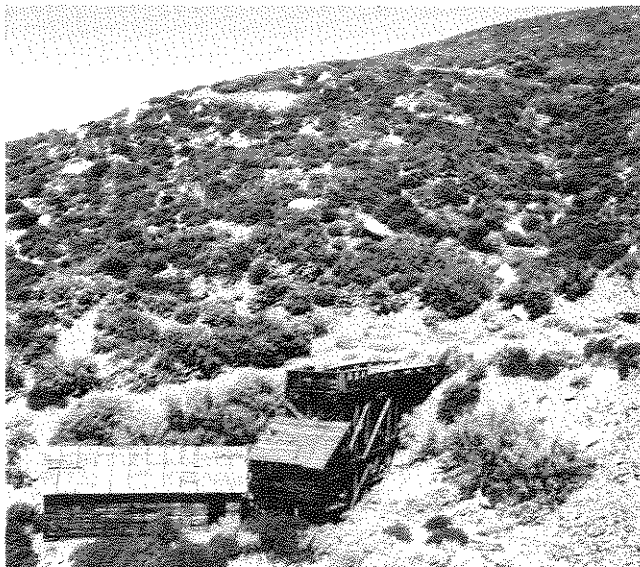
Development: adits (now caved) and trenches

Geology: Muscovite mica occurs in pegmatite dikes associated with chrysoberyl, beryl, garnet, magnetite, and tourmaline. The dikes cut Precambrian garnet-mica schist; gneiss foliation trends northeast and dips southeast. The mica occurs in books up to several inches thick and 6 to 8 inches square. Specks of foreign material are present and it is not cleavable in large sheets (Vanderburg, 1937).

Sources of information: Vanderburg (1937, p. 19);

Holmes (1964, p. 6); Beal (1965, p. 82-86)

Field examination: J. V. Tingley, 1983



Remains of mica screening facility, Mica Notch, Bunkerville district.

Virgin Mountains gypsum occurrence (10)

Commodity: gypsum

Location: sec. 14, T16S, R70E

UTM 4048000N 756000E

Production: none

Development: none

Geology: Gypsum of Pennsylvanian and Permian age in the Pakoon Formation is very poorly exposed for about 1 mile in a northwesterly direction, mostly on the southerly slopes of a series of low hills and ridges. The unit, which strikes N50° to 60°W and dips 30° to 40°SW, has crudely measured thickness of 65 feet. The adjacent and interbedded rock is dolomite, but the extent and thickness of interbeds in the gypsum could not be determined. The gypsum-rich material is white, very fine grained, massive, and nonfriable.

Source of information: Papke (1987, p. 9)

GOULD SPRINGS MINING DISTRICT

Occurrences in this district include barite on the east side of the East Mormon Mountains and gypsum on the southwestern tip of these mountains. No production is reported from these occurrences. The barite occurrence is associated with tourmaline-bearing pegmatite dikes that cut

Precambrian amphibolite schist. The gypsum-bearing horizon occurs in a sequence of Permian rocks. More information on this district is given in the section on metallic occurrences.

Buckeye-Pennsylvania prospect (11)

Commodity: gypsum

Location: sec. 26, T12S, R68E

UTM 4083500N 736200E

Production: none

Development: Workings consist of a 70-foot-long cut at the top of the gypsum horizon and a 100-foot-long crosscut down-slope through the horizon.

Geology: The gypsum horizon, estimated to be 40 to 50 feet thick, occurs at the top of a section of Permian red beds. The beds are capped by the Permian Toroweap Formation. The gypsum is friable and is stained red with hematite toward its upper contact; the lower contact is not exposed. The beds strike N60°E and dip 45°SE into the slope of the hill.

Remarks: Cuts extend along strike for about 1,000 feet, and large pads have been built at the foot of the slope below the prospect cuts. This work is several years old.

Field examination: J. V. Tingley, 1987

Perkins barite prospect (12)

Commodity: barite

Location: sec. 20, T11S, R69E

UTM 4095020N 740420E

Production: none

Development: one 10-foot-deep prospect shaft inclined to follow dip of the vein

Geology: An iron-oxide-stained barite vein, approximately 2½ feet thick, occurs as a lenticular pod along the foliation direction of enclosing schist. The vein strikes N15°W, dips 55°SW. A pod of vein material exposed at the shaft collar extends about 3 feet down-dip, then tails out into several smaller veins, each 1 to 2 inches thick. Cross veinlets connect thin veins along both the hanging wall and the footwall of the structure. The small dump at the shaft collar is composed mostly of schist and coarse-grained, quartz-orthoclase-muscovite pegmatite containing some black tourmaline; the barite is associated with this pegmatite.

Source of information: Papke (1984, p. 104)

Field examination: J. V. Tingley, 1987

Snowwhite prospect (13)

Commodity: gypsum

Location: sec. 19, T11S, R70E

UTM 4095000N 740000E

Production: none

Development: shallow cuts and pits

Geology: Gypsite of the Muddy Creek Formation is present at or near the surface in a 2½-square-mile area. The gypsite is flat-lying and caps low mesas dissected by stream beds typically about 20 feet deep. The western border of the area is Toquop Wash, a 100-foot-deep major drainage in this region. Poor exposures suggest a 5- to 6-foot maximum thickness of the gypsite. The gypsite is underlain by clays and silts, and is thin bedded, very friable, and somewhat porous. The material is pale orange, fine grained, and contains variable amounts of quartz, calcite, and montmorillonite.

Source of information: Papke (1987, p. 19)

MORMON MOUNTAINS

A deposit of vermiculite occurs on the west flank of the Mormon Mountains. The vermiculite is related to pegmatite dikes that cut Precambrian schist. Additional information on this area is included in the section on metallic occurrences.

Vermiculite prospect (14)

Commodity: vermiculite

Location: sec. 24, T11S, R66E

UTM 4094465N 718185E

Production: none

Development: Workings consist of prospect pits and cuts that extend for about 100 feet along the out-crop strike.

Geology: Cuts expose a 30- to 40-foot-thick layer of altered biotite schist between two coarse-grained pegmatite dikes; dikes and schist foliation strike N60° to 70°E and dip from vertical to steeply southeast. The pegmatite dikes are composed of quartz, feldspar, and clots of mica; the thickest dike is about 1 foot thick.

Field examination: J. V. Tingley, 1987

NORTH MUDDY MOUNTAINS

Nonmetallic occurrences in this area include gypsum deposits on Weiser Ridge, magnesite deposits on Overton Ridge, and several silica sand pits near the town of Overton.

Sizeable amounts of gypsum and silica sand have been produced from the area. The magnesite deposits, while extensive, have produced only a small amount.

The largest gypsum deposits in the area occur in the Lower Permian Kaibab Formation but deposits have been mined in the Triassic Chinle Formation as well as the Tertiary Muddy Creek Formation. Magnesite in the area of Magnesite Wash on the east side of Overton Ridge occurs in the lower part of the Tertiary Horse Spring Formation. The silica sand deposits in the vicinity of Overton occur in eolian dune sand derived from nearby sandstone outcrops.

More information on this area is given in the section on metallic occurrences.

Anderson gypsum deposit (15)

Other names: Rex deposit and January deposit

Commodity: gypsum

Location: sec. 31, T15S, R67E

UTM 4051160N 720000E

Production: 1,500 tons estimated

History: A small amount of gypsum was mined in 1917 and shipped to Los Angeles.

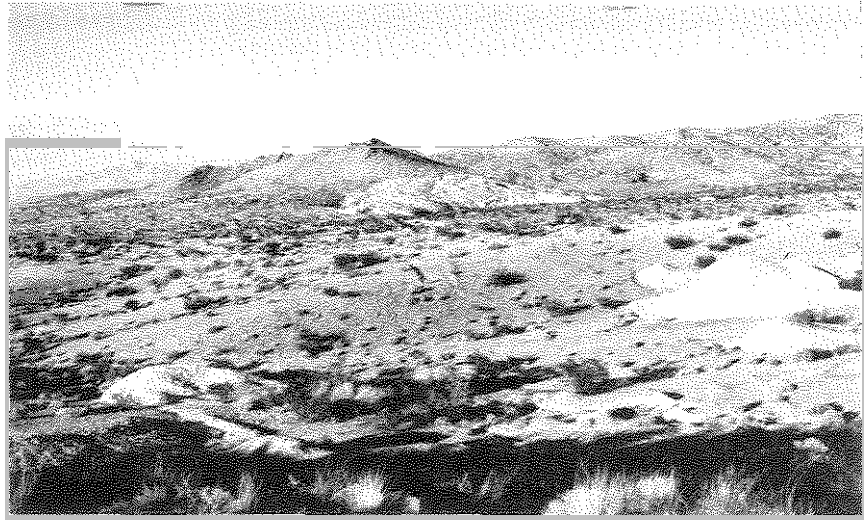
Development: Workings consist of a few shallow pits and an adit; most development is near the north end of the deposit.

Geology: A gypsum unit interbedded with shale crops out for a distance of 3 miles. The gypsum is within the Lower Triassic Chinle Formation. The gypsiferous zone contains little or no anhydrite and contains minor montmorillonite and quartz. Exposures are best in the vicinity of an adit on the east side of a ridge in the SW¼ of section 31 where the gypsiferous zone dips 85°SE and is about 60 feet thick. Elsewhere along strike the unit appears to be thinner—15 to 30 feet thick.

Remarks: The gypsum is of good quality, white with light gray streaks or vuggy pale red patches.

Source of information: Papke (1987, p. 8–9)

Gypsum prospects on the west side of the North Muddy Mountains. J. Quade photo.



Georgia Pacific gypsum quarry (16)

Other names: Weiser Ridge gypsum prospect and Glendale claim

Commodity: gypsum

Location: sec. 14, T15S, R66E

UTM 4046400N 717100E

Production: projected at 200,000 tons/year

History: acquired as a prospect in 1986

Development: open-pit about 500 feet by 200 feet

Geology: A bedded deposit of nearly pure gypsum is at least 50 feet thick and locally up to 100 feet thick; ore material examined is in the upper 20 feet of the deposit. The gypsum is overlain by up to 50 feet of gray limestone (Kaibab Formation). Below the upper 20-foot-thick gypsum horizon is a purple to gray shaly limestone unit up to 4 feet thick. The shaly limestone is reported to be underlain by 22 to 32 feet of high-grade gypsum with less than 1 foot of included clay partings. The gypsum beds are cut off to the east by a moderately west-dipping fault. At the face the upper gypsum bed is seen to be involved in a north-trending anticline with a box-shaped crest. The ore in general trends north-south.

Remarks: This property is in production (1988); the output is sent to a wallboard plant located at Apex on Interstate 15 about 15 miles southwest of the quadrangle boundary. Average grade is about 92 percent gypsum or higher. Developed reserves appear to be sufficient for at least 5 years of production.

Source of information: Papke (1987, p. 9)

Field examination: S. B. Castor, 1988

Gypsum prospect 1 (17)

Commodity: gypsum

Location: sec. 19, T16S, R66E

UTM 4030240N 710520E

Production: none

Development: bulldozer cuts and prospect pits along the range front

Geology: Clusters of translucent gypsum crystals up to several inches in length occur in the upper part of Tertiary Muddy Creek Formation; gypsum appears to be restricted to narrow horizons that are discontinuous along strike.

Field examination: J. Quade, 1985

Overton Ridge magnesite deposits (18)

Other name: Muddy Valley magnesite occurrences

Commodity: magnesite

Location: secs. 27 and 34, T16S, R67E

UTM 4043000N 725000E

Production: small amounts produced by Standard Slag Co.

History: Notable reserves of magnesite have been known here since 1915.

Development: explored by a number of short adits

Geology: The magnesite from this deposit is described by Hewett and others (1936) as being nearly pure white, very fine grained, and strikingly claylike in its physical properties; it occurs interbedded with a unit of white clayey dolomite, 155 to 325 feet thick, which in general appearance is almost indistinguishable from the magnesite. The carbonate unit in which the magnesite occurs is in the lower part of the Horse Spring Formation. The formation in the vicinity strikes northwest and dips 25° to 40°NE, and is overlain with an angular unconformity by nearly flat-lying beds of the Muddy Creek Formation.

Remarks: The reserves of magnesite shown in Hewett and others (1936) are extensive. Vanderburg (1937), however, states that owing to the fine-grained texture of the magnesite, some means of beneficiation other than physical methods must be employed for removing the lime and silica impurities to make the material of commercial grade.

Sources of information: Hewett and others (1936, p. 119–139); Vanderburg (1937, p. 66)

Red Gorge pit (19)

Other name: West Coast Silica Co. pit

Commodity: silica sand

Location: sec. 5, T16S, R67E

UTM 4049300N 721700E

Production: 54,000 tons of dune sand annually (Longwell and others, 1965)

Development: open pit

Geology: The deposit consists of eolian dune sand derived from the Aztec and Baseline Sandstones.

Sources of information: Longwell and others (1965, p. 209); Murphy (1954, p. 6)

Simplot Silica Products pit (20)

Commodity: silica sand

Location: sec. 30, T16S, R68E

UTM 4044000N 730000E

Production: major

Development: large open pit, mill, and dryer
Geology: The deposit consists of eolian dune sand derived from the Aztec and Baseline Sandstones.
Sources of information: Murphy (1954, p. 6); Longwell and others (1965, p. 209)

Snoreen & Son Co. pit (21)

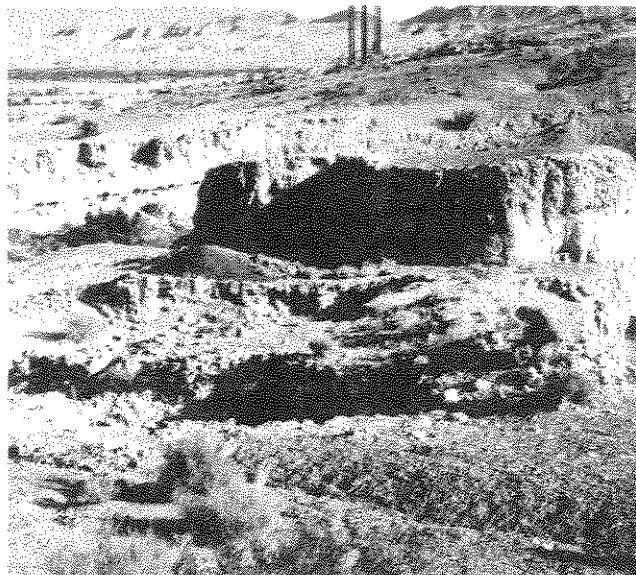
Commodity: silica sand
Location: sec. 36, T16S, R67E
 UTM 4042500N 728850E
Production: 54,000 tons of dune sand annually (Longwell and others, 1965)
Development: open pit
Geology: The deposit consists of eolian dune sand derived from the Aztec and Baseline Sandstones.
Sources of information: Longwell and others (1965, p. 209; Murphy (1954, p. 6)

White Star mine (22)

Commodity: gypsum
Location: sec. 2, T15S, R67E
 UTM 4059400N 716780E
Production: small
History: White Star Plaster Co. produced plaster from 1919 to 1923 at a mill near this deposit, gypsite from this deposit was used for the first two years, then the gypsum supply came from White Star No. 2 mine, 2 miles southeast.
Development: Two small pits are visible; the largest is about 75 feet in diameter.
Geology: Gypsite, presumed to be part of the Muddy Creek Formation, is present in uneroded parts of an old pediment bounded on the west by Interstate 15 and on the east by hills composed of older rocks. The outcrop area has an elongated wedge shape 500 feet wide at the southern base and about 4,000 feet long north-south, extending northward beyond the Union Pacific railroad track. The flat-lying gypsite cap ranges from a few feet to more than 20 feet thick and is underlain by clays and silts. The gypsite is very pale orange, fine grained, and somewhat porous and friable. Varying amounts of montmorillonite, illite, and quartz are the principal impurities.
Source of information: Papke (1987, p. 7)

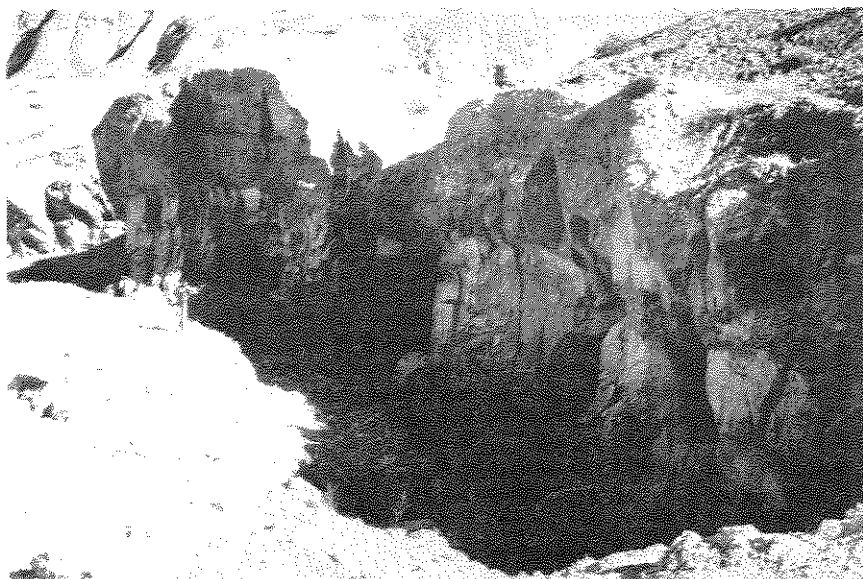
White Star No. 2 mine (23)

Commodity: gypsum
Location: sec. 18, T15S, R67E
 UTM 4056940N 719725E
Production: estimated in excess of 100,000 tons
Development: Surface workings consist of three shallow open pits that cover most of the 1,500-foot exposed strike length of the deposit; inclined open stopes starting from these pits extend about 100 feet down-dip.
Geology: The gypsum apparently is part of the Lower Permian Kaibab Formation. The principal unit, mined in the open-pit and underground workings, is estimated to be 25 to 30 feet thick. Its strike is somewhat varied but overall is nearly north-south; dips are 15° to 30°E. The footwall rock, seldom exposed, is a light-red sandstone with some gypsum veinlets. The immediate hanging wall is a light-brown gypsiferous sandstone; a gypsum bed near the top of this sequence was mined in a few small open stopes. The hanging-wall



Old mill site and loading facility, White Star mine, North Muddy Mountains. J. Quade photo.

Open pit and entrance to stopes, White Star No. 2 mine, North Muddy Mountains. J. Quade photo.



contact of the main gypsum unit generally is sharp and regular to slightly undulating; in many places, however, fractures in the upper part of the gypsum unit change attitude as they approach this contact. This attitude change is possibly due to drag—the contact may be a fault with sandstone moving up-dip over the gypsum. The gypsum is laminated to very thin bedded, it is white to grayish orange pink, often mottled. The material is fairly pure; small amounts of quartz and montmorillonite and a trace of anhydrite are present.

Remarks: Recovery of material from the underground workings was about 50 percent. This deposit was the source of material for the White Star plaster plant, 2 miles to the northwest, from 1921 until the plant closed in 1923.

Source of information: Papke (1987, p. 7–8)

GEOHERMAL OCCURRENCES

Within the Overton 30' by 60' Quadrangle, geothermal water is found in several areas in Moapa Valley and in one area in Virgin Valley. These areas are all within Clark County.

In Moapa Valley, warm water from springs and wells at the head of the Muddy River have been used for bathing and irrigation for many years. One of these occurrences, Muddy River Springs, is the largest thermal spring in Nevada. In the lower Moapa Valley, warm water is reported from wells near the towns of Logandale and Overton.

In Virgin Valley, near the town of Bunkerville, warm water occurs in several irrigation wells.

MOAPA VALLEY

Clarence Lewis well (1)

Location: sec. 8, T14S, R65E

UTM 4067800N 702200E

Development: three wells show on map in this area

Depth: 57.5 feet

Temperature: 27°C

Remarks: flowing well

Source of information: Garside and Schilling (1979, p. 85, no. 25)

Moapa Warm Springs (2)

Other name: Iverson's Warm Springs

Location: sec. 21, T14S, R65E

UTM 4064900N 704150E

Temperature: 32°C

Remarks: several springs, water used for bathing and irrigation

Source of information: Garside and Schilling (1979, p. 86, no. 25)

Muddy River Springs (3)

Location: sec. 16, T14S, R65E

UTM 4066300N 704000E

Temperature: 32°C

Remarks: largest thermal spring in Nevada

Source of information: Garside and Schilling (1979, p. 85, no. 25)

Peterson Spring (4)

Other name: Pederson Spring

Location: sec. 16, T14S, R65E

UTM 4066100N 703000E

Temperature: 32°C

Source of information: Garside and Schilling (1979, p. 86, no. 25)

Unnamed spring 1 (5)

Location: sec. 16, T14S, R65E

UTM 4065900N 703800

Temperature: 32°C

Remarks: several springs, water used for bathing

Source of information: Garside and Schilling (1979, p. 85, no. 25)

Unnamed spring 2 (6)

Location: sec. 1, T16S, R67E

UTM 4049600N 728700E

Temperature: 21°C

Remarks: seep

Source of information: Garside and Schilling (1979, p. 86, no. 29)

Unnamed well 1 (7)

Location: sec. 15, T14S, R65E

UTM 4065100N 704600E

Temperature: 32°C

Source of information: Garside and Schilling (1979, p. 85, no. 25)

Unnamed well 2 (8)

Location: sec. 9, T14S, R65E

UTM 4066800N 704000E

Development: Two wells are shown on the map in this area.

Temperature: 32°C

Source of information: Garside and Schilling (1979, p. 86, no. 25)

Woodruff and Perkins well (9)

Location: sec. 8, T14S, R65E

UTM 4067400N 702100E

Development: Two wells are shown on the map in this area.

Temperature: 28°C

Remarks: open dug well, flowing

Source of information: Garside and Schilling (1979, p. 85, no. 25)

W. Wipple well (10)

Location: sec. 34, T15S, R67E

UTM 4052300N 725400E

Depth: 87 feet

Temperature: 24°C

Remarks: location questionable

Source of information: Garside and Schilling (1979, p. 86, no. 26)

VIRGIN VALLEY

Bruna Biasi well (11)

Location: sec. 34, T13S, R70E

UTM 4071520N 753780E

Depth: 118 feet

Temperature: 21°C

Source of information: Garside and Schilling (1979, p. 85, no. 24)

Bunkerville Water Users Assoc. well (12)

Location: sec. 35, T13S, R70E

UTM 4071220N 755940E

Depth: 300 feet

Temperature: 25°C

Source of information: Garside and Schilling (1979, p. 85, no. 24)

Hafen Dairy well (13)

Location: sec. 13, T13S, R70E

UTM 4076100N 757680E

Depth: 60 feet

Temperature: 21°C

Source of information: Garside and Schilling (1979, p. 85, no. 24)

Mesquite Farmstead Water Assoc. well (14)

Location: sec. 29, T13S, R71E

UTM 4074400N 759620E

Depth: 225 feet

Temperature: 21°C

Source of information: Garside and Schilling (1979, p. 85, no. 24)

Mesquite Farmstead well (15)

Location: sec. 20, T13S, R71E

UTM 4074460N 759660E

Development: two wells shown in this area on map

Depth: 210 feet

Temperature: 23°C

Source of information: Garside and Schilling (1979, p. 85, no. 24)

Unnamed well 1 (16)

Location: sec. 35, T13S, R70E

UTM 4071300N 754860E

Depth: 300 feet

Temperature: 24°C

Source of information: Garside and Schilling (1979, p. 85, no. 24)

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APPENDIX A. — *Sample Descriptions*

District/area	Occurrence (no.)	Sample no.	UTM		Description
Bunkerville	Black Ridge prospects (1)	3195	4051740N	745680E	White pegmatite and vein quartz, clots of iron oxide, minor copper-oxide staining
	Blue Bell prospect (2)	3193	4057350N	754280E	Coarse-grained quartz-feldspar pegmatite; clots of black mica, black tourmaline, copper-oxide staining on quartz
	Great Eastern mine (3)	1167	4056900N	754300E	Basic dike material, magnetic, micaceous, abundant slickensides
	Hodges-Whorton mine (4)	3194	4055360N	745590E	Vitreous white vein quartz, limonite staining, sparse crystals of scheelite
	Key West mine (6)	1166A	4056100N	753550E	Highly altered material from shear zone; surface coatings of chrysocolla, brochantite, malachite, iron and manganese oxides; wall rock highly fractured micaceous schist and hornfels
		1166B	4056100N	753550E	Gossan, earthy iron oxides, boxworks, minor copper-oxide staining on surfaces
	Ranch View prospects (7)	3191	4046300N	763490E	Vuggy, white vein quartz, iron-oxide gossan in vugs, some specular hematite
	Silver Leaf mine (9)	1401	4058200N	761420E	White vein quartz in pegmatite with muscovite, scheelite, huebnerite, pyrite; dump sample from upper adits
		1402	4058420N	761700E	Vein quartz from pegmatite in schist, trace scheelite; dump sample from lower adits
	Whitney Pass prospect (14)	3192	4046880N	762550E	Hematite-stained white vein quartz, malachite crusts on fractures and in vugs, clear fluorite in vugs
Gourd Springs	Bruson prospect (15)	1449	4090275N	741700E	Skarn, anhedral to subhedral andradite garnet intergrown with pale-green to brown epidote, vesuvianite, clots and stringers rose to white quartz, scheelite, surfaces coated with minor calcite and iron and manganese oxides
		1450	4090280N	741685E	Massive white vein quartz, sprays and clots molybdenite, fine pyrite, clots oxidized pyrite, iron-oxide coatings on surfaces
	Perkins barite prospect (12)	3188	4095020N	740420E	Massive white vein barite, bladed barite crystals, black tourmaline present, vein is iron- and copper-oxide stained
Mormon Mountains	Hackberry Spring prospect (18)	3196	4088420N	728160E	Brecciated, milk-white vein quartz, yellow-brown iron-oxide coatings, trace copper-oxide staining
	Whitmore mine (19)	3189	4089600N	726800E	White vein quartz with clots of chalcopyrite, pyrite, bornite, hematite; vein is stained with iron and copper oxides
		3190	4089500N	726800E	Iron-oxide stained, fractured granite, quartz veining, pink K-feldspar, moderately kaolinized

APPENDIX B.—Sample Analyses																			
District/area	Occurrence (no.)	Sample no.	Ca (0.05)	Fe (0.05)	Mg (0.02)	Na (0.2)	P (0.2)	Ti (0.002)	Ag (0.5)	As (200)	Au (10)	B (10)	Ba (20)	Be (1)	Bi (10)	Cd (20)	Co (10)	Cr (10)	Cu (5)
Bunkerville	Black Ridge prospects (1)	3195	0.5	5	0.5	0.7	0.2	0.15	20	N	10	10	1,000	1	10	N	300	70	20,000
	Blue Bell prospect (2)	3193	2	0.5	0.7	5	L	0.1	15	N	N	500	1,000	2	30	N	20	150	> 20,000
	Great Eastern mine (3)	1167	3	10	10	—	—	0.5	0.7	N	N	100	150	L	N	N	70	500	1,000
	Hodges-Whorton mine (4)	3194	0.7	0.2	0.07	0.5	L	0.05	N	N	N	10	100	3	N	N	L	L	20
	Key West mine (6)	1166A	0.7	3	2	—	—	0.07	5	N	N	L	150	L	N	N	300	200	15,000
		1166B	0.07	20	0.15	—	—	0.07	7	N	N	N	20	N	N	N	70	100	3,000
	Ranch View prospects (7)	3191	0.05	0.5	0.15	0.5	L	0.1	15	N	N	30	150	2	30	N	10	10	1,500
	Silver Leaf mine (9)	1401	5	2	1	—	—	0.05	0.5	N	N	200	20	20	N	N	10	30	100
		1402	3	5	2	—	—	0.2	0.5	N	N	100	200	10	L	N	20	50	70
	Whitney Pass prospect (14)	3192	0.3	3	0.5	0.3	L	0.2	10	N	N	50	100	2	N	N	30	30	20,000
Gourd Springs	Bruson prospect (15)	1449	20	10	2	—	—	0.3	L	N	N	100	200	150	50	N	10	10	20
		1450	1	1	0.05	—	—	0.002	100	N	300	L	100	7	10	N	N	N	15
	Perkins barite prospect (12)	3188	0.05	2	0.2	0.5	L	0.02	N	N	N	100	> 5,000	2	N	N	L	10	1,000
Mormon Mountains	Hackberry Spring prospect (18)	3196	2	3	0.2	L	0.2	0.1	1	1,500	N	70	5,000	1	N	N	30	10	700
	Whitmore mine (19)	3189	L	5	0.05	L	L	0.015	50	300	N	20	500	L	15	N	L	L	> 20,000
		3190	0.2	0.2	0.1	3	L	0.05	N	N	N	30	1,000	2	N	N	L	L	70

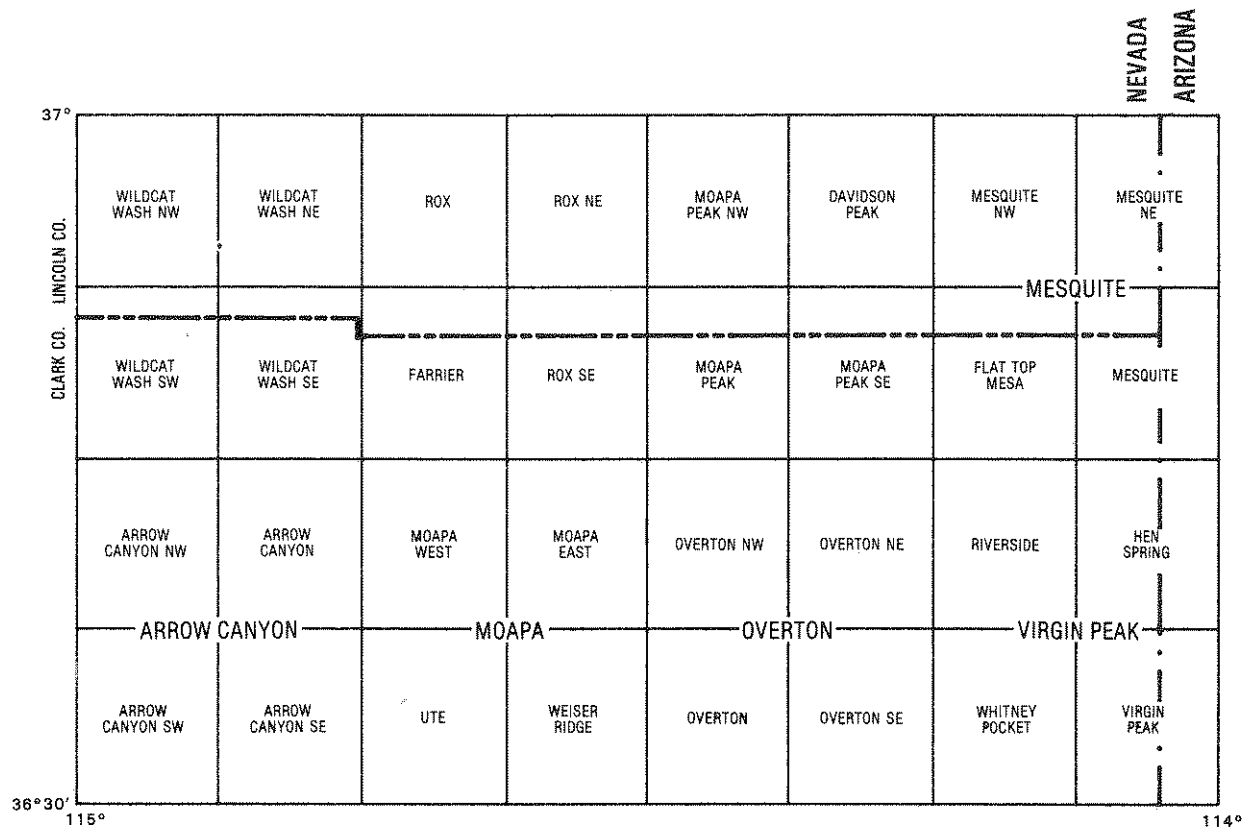
Spectrographic analyses (columns headed by element symbol) and atomic absorption analyses (columns headed by AA + element symbol) by the Branch of Geochemistry, U.S. Geological Survey, Denver, Colorado. Ca, Fe, Mg, Na, and Ti values are in percent; all others are in ppm. Detection limit is under element symbol. L = less than detection limit. N = not detected. — = not tested.

APPENDIX B.—Sample Analyses (continued)																							
Ga (5)	Ge (10)	La (50)	Mn (10)	Mo (5)	Nb (20)	Ni (5)	Pb (10)	Sb (100)	Sc (5)	Sn (10)	Sr (100)	Th (100)	V (10)	W (50)	Y (10)	Zn (200)	Zr (10)	AAAu (0.05)	AAAs (10)	AASb (2)	AAZn (5)	Sample no.	
50	N	N	500	L	N	50	50	N	7	20	500	N	50	N	L	200	50	1.2	N	N	150	3195	
30	N	70	300	L	N	100	70	L	10	20	700	N	50	L	50	N	50	N	N	N	50	3193	
—	—	N	2,000	N	N	1,500	500	N	30	N	100	N	100	N	15	N	50	0.05	10	N	20	1167	
5	N	N	30	L	N	L	L	N	N	L	200	N	15	50	N	N	30	N	N	N	N	3194	
—	—	N	700	5	N	> 5,000	70	N	5	N	200	N	20	N	L	700	30	—	20	N	180	1166A	
—	—	N	100	5	N	5,000	20	N	5	N	N	N	50	N	N	500	15	—	10	N	270	1166B	
10	N	N	100	L	N	5	1,000	N	5	20	L	N	200	L	30	10,000	200	0.05	N	N	> 2,000	3191	
—	—	50	200	N	L	30	20	N	5	N	200	N	100	500	L	N	10	N	N	N	—	1401	
—	—	50	500	N	L	50	50	N	15	N	200	N	100	N	N	N	20	N	N	N	—	1402	
15	N	N	200	L	N	15	3,000	N	10	20	L	N	50	L	20	> 20,000	100	0.05	N	N	> 2,000	3192	
—	—	50	2,000	N	L	20	100	L	10	300	500	N	700	1,000	10	L	N	N	15	L	—	1449	
—	—	50	2,000	200	50	N	70	100	N	N	100	N	L	10,000	N	L	N	25	20	60	—	1450	
7	N	1	70	L	N	5	10	N	L	20	> 5,000	N	10	N	50	N	70	N	N	2	5	3188	
7	N	N	1,500	L	N	15	L	L	7	20	200	N	30	N	30	N	200	N	1,400	14	50	3196	
10	30	N	70	10	N	7	50	N	L	20	L	N	70	N	15	N	50	0.05	400	20	0.05	3189	
15	N	N	150	L	N	L	20	N	L	15	500	N	10	L	N	N	100	N	N	N	N	3190	

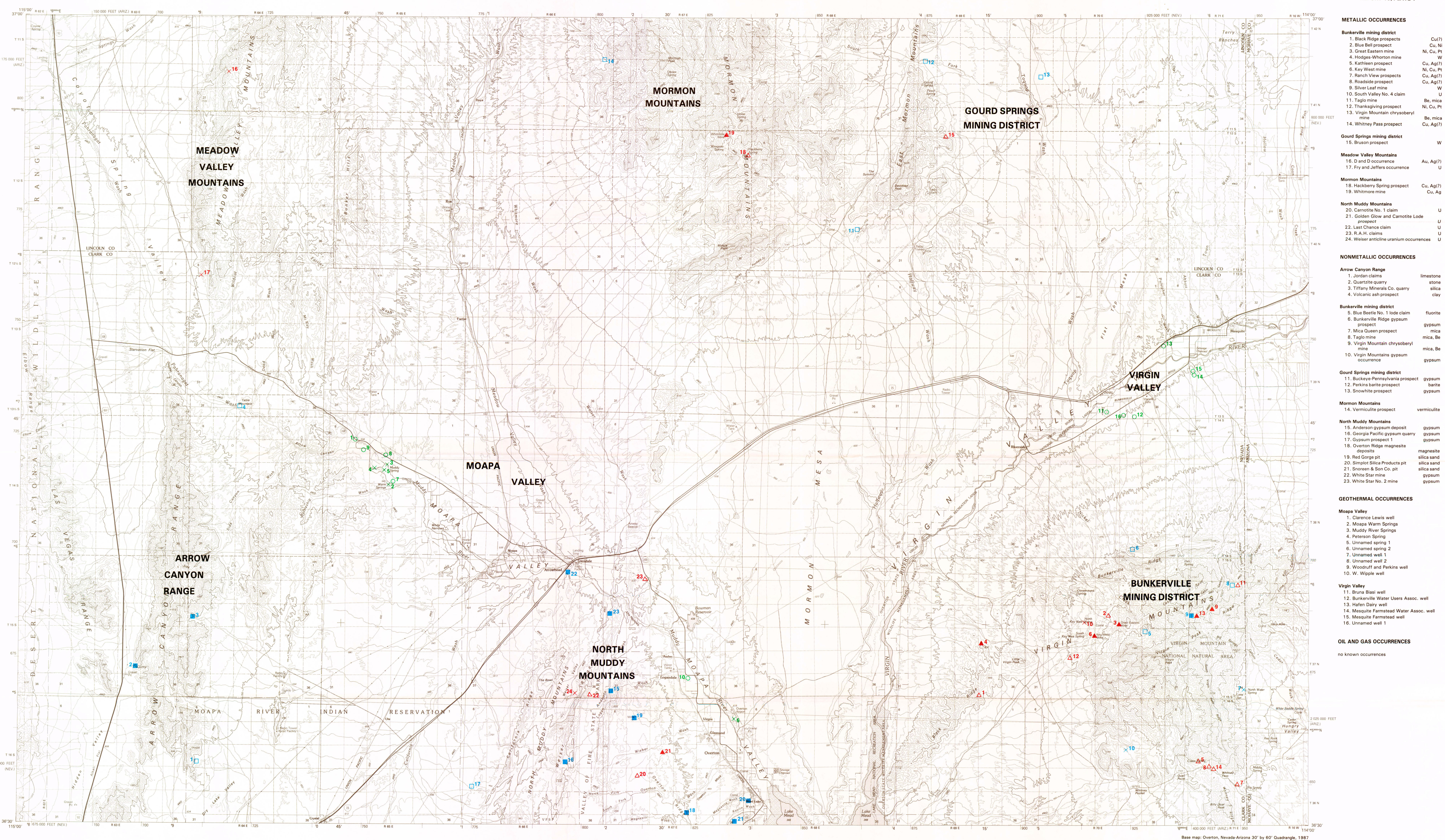
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Index of USGS 7½' and 15' quadrangle maps within the Overton 30' by 60' Quadrangle.



MINERAL RESOURCES OF THE
OVERTON 30' BY 60' QUADRANGLE

METALLIC OCCURRENCES

- Bunkerville mining district**
- | | |
|--------------------------------------|------------|
| 1. Black Ridge prospects | Cu(?) |
| 2. Blue Bell prospect | Cu, Ni |
| 3. Great Eastern mine | Ni, Cu, Pt |
| 4. Hodges-Whorton mine | Ni, Cu, W |
| 5. Kathleen prospect | Cu, Ag(?) |
| 6. Key West mine | Ni, Cu, Pt |
| 7. Ranch View prospects | Cu, Ag(?) |
| 8. Roadside prospect | Cu, Ag(?) |
| 9. Silver Leaf mine | W |
| 10. South Valley No. 4 claim | U |
| 11. Taglio mine | Be, mica |
| 12. Thanksgiving prospect | Ni, Cu, Pt |
| 13. Virgin Mountain chrysoberyl mine | Be, mica |
| 14. Whitney Pass prospect | Cu, Ag(?) |
- Gourd Springs mining district**
- | | |
|---------------------|---|
| 15. Bruson prospect | W |
|---------------------|---|

Meadow Valley Mountains

- | | |
|--------------------------------|-----------|
| 16. D and D occurrence | Au, Ag(?) |
| 17. Fry and Jeffers occurrence | U |

Mormon Mountains

- | | |
|-------------------------------|-----------|
| 18. Hackberry Spring prospect | Cu, Ag(?) |
| 19. Whitmore mine | Cu, Ag |

North Muddy Mountains

- | | |
|--|---|
| 20. Carnotte No. 1 claim | U |
| 21. Golden Glow and Carnotte Lode prospect | U |
| 22. Last Chance claim | U |
| 23. R.A.H. claims | U |
| 24. Weiser anticline uranium occurrences | U |

NONMETALLIC OCCURRENCES

- Arrow Canyon Range**
- | | |
|--------------------------------|-----------|
| 1. Jordan claims | limestone |
| 2. Quartzite quarry | stone |
| 3. Tiffany Minerals Co. quarry | silica |
| 4. Volcanic ash prospect | clay |

Bunkerville mining district

- | | |
|--|----------|
| 5. Blue Beetle No. 1 lode claim | fluorite |
| 6. Bunkerville Ridge gypsum prospect | gypsum |
| 7. Mica Queen prospect | mica |
| 8. Taglio mine | mica, Be |
| 9. Virgin Mountain chrysoberyl mine | mica, Be |
| 10. Virgin Mountains gypsum occurrence | gypsum |

Gourd Springs mining district

- | | |
|-----------------------------------|--------|
| 11. Buckeye-Pennsylvania prospect | gypsum |
| 12. Perkins barite prospect | barite |
| 13. Snowwhite prospect | gypsum |

Mormon Mountains

- | | |
|--------------------------|-------------|
| 14. Vermiculite prospect | vermiculite |
|--------------------------|-------------|

North Muddy Mountains

- | | |
|--------------------------------------|-------------|
| 15. Anderson gypsum deposit | gypsum |
| 16. Georgia Pacific gypsum quarry | gypsum |
| 17. Gypsum prospect 1 | gypsum |
| 18. Overton Ridge magnesite deposits | magnesite |
| 19. Red Gorge pit | silica sand |
| 20. Simplot Silica Products pit | silica sand |
| 21. Snoreen & Son Co. pit | silica sand |
| 22. White Star mine | gypsum |
| 23. White Star No. 2 mine | gypsum |

GEO THERMAL OCCURRENCES

Moapa Valley

- | |
|------------------------------|
| 1. Clarence Lewis well |
| 2. Moapa Warm Springs |
| 3. Muddy River Springs |
| 4. Peterson Spring |
| 5. Unnamed spring 1 |
| 6. Unnamed spring 2 |
| 7. Unnamed well 1 |
| 8. Unnamed well 2 |
| 9. Woodruff and Perkins well |
| 10. W. Wipple well |

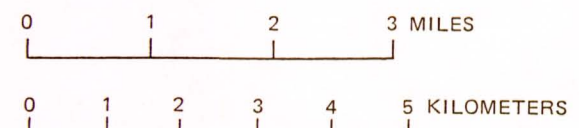
Virgin Valley

- | |
|--|
| 11. Bruna Biasi well |
| 12. Bunkerville Water Users Assoc. well |
| 13. Hafen Dairy well |
| 14. Mesquite Farmstead Water Assoc. well |
| 15. Mesquite Farmstead well |
| 16. Unnamed well 1 |

OIL AND GAS OCCURRENCES

no known occurrences

SCALE 1:100,000



METALLIC OCCURRENCES

- ▲ Mine, recorded production
- △ Prospect, no known production
- × Occurrence

NONMETALLIC OCCURRENCES

- Mine, recorded production
- Prospect, no known production
- × Occurrence

GEO THERMAL

- Well, production
- Well, no production
- × Hot spring or other occurrence

OIL AND GAS

- Well, past or present production
- Well, no past or present production
- × Seep or other occurrence

The Nevada Bureau of Mines and Geology is part of the Mackay School of Mines at the University of Nevada-Reno and is the state geological survey. Scientists at the Nevada Bureau of Mines and Geology conduct research and publish reports on mineral resources and various aspects of general, environmental, and engineering geology.

Current activities in mineral resources and general geology include detailed geologic mapping and stratigraphic studies in Nevada, comparative studies of bulk mineable precious-metal deposits, geochemical investigations of mining districts, resource assessments, igneous petrologic studies, hydrothermal experiments, research on the origin of hydrothermal platinum-group-element occurrences, and examination of the origin and distribution of borate deposits in Nevada.

Environmental, engineering, and urban geology projects include investigations of earthquake hazards and related aspects of neotectonics, examination of issues involved in siting nuclear and hazardous wastes, mapping of geomorphic features, radon hazard studies, and studies of landslide hazards.

Geologic information activities include creating and updating databases on mining districts, active mines and prospects, and geothermal and petroleum exploration and production; implementation and development of statewide geographic information systems; and maintenance of core and cuttings facilities, rock and mineral collections for research, aerial photographic imagery and maps, and extensive files on Nevada geology and resources.

The Nevada Bureau of Mines and Geology cooperates with numerous state and federal agencies in providing geologic and resource information and in conducting research. Research results are published as Nevada Bureau of Mines and Geology bulletins, reports, maps, and special publications as well as in federal publications and scientific journals. In addition to addressing the needs for geologic information by conducting research, publishing reports and maps, and creating computer databases, staff members assist the public, industry, and government agencies by answering specific questions regarding Nevada geology and resources and by providing some chemical and mineralogical analyses.

Individuals interested in the state's geology are encouraged to visit or write the Nevada Bureau of Mines and Geology or call (702) 784-6691. NBMG offices are located in the west wing of the Scrugham Engineering-Mines Building on the University of Nevada-Reno campus. When visiting NBMG by car please stop at the information booth just inside the Center Street entrance on the south end of the UNR campus. The attendant will issue you a temporary parking permit and give you directions to parking areas and the NBMG offices. Address mail to: Director/State Geologist, Nevada Bureau of Mines and Geology, University of Nevada-Reno, Reno, NV 89557-0088. A publication list will be sent upon request.