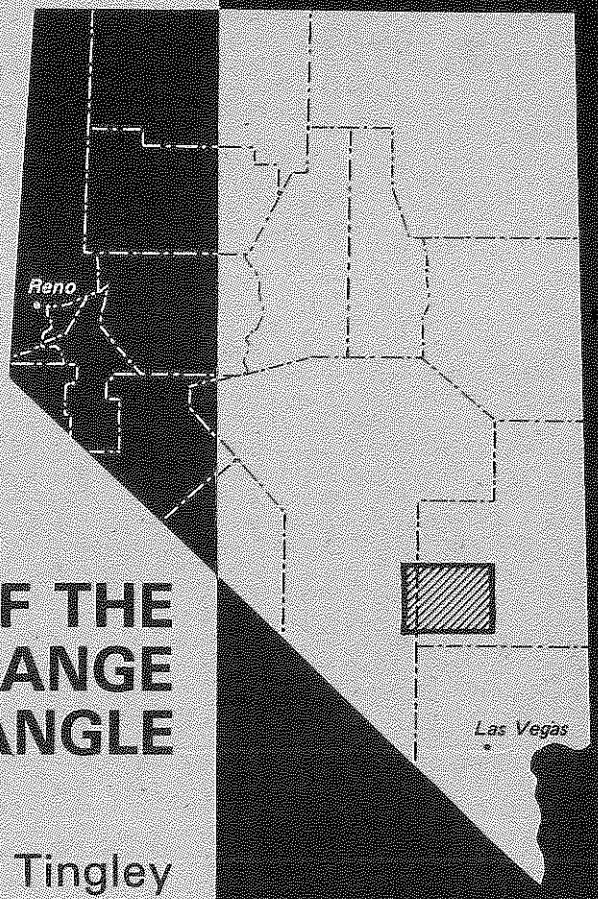
UNIVERSITY OF NEVADA-RENO
MACKAY SCHOOL OF MINES



NEVADA BUREAU OF
MINES AND GEOLOGY
REPORT 44

MINERAL RESOURCES OF THE PAHRANAGAT RANGE 30′ BY 60′ QUADRANGLE

Joseph V. Tingley

Prepared in cooperation with the U.S. Geological Survey

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

1989

nbmg nevada bureau of mines & geology

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: Speckletone French by Zellerbach, Kyoto Stone, 80 lb.
Stock, text: Cascade White Offset, 60 lb.
Ink, cover: Pantone 201
Binding: saddlestitch

For sale by the Nevada Bureau of Mines and Geology, University of Nevada-Reno, Reno, NV 89557-0088. Price ~~$5.00~~

MINERAL RESOURCES OF THE PAHRANAGAT RANGE 30′ BY 60′ QUADRANGLE

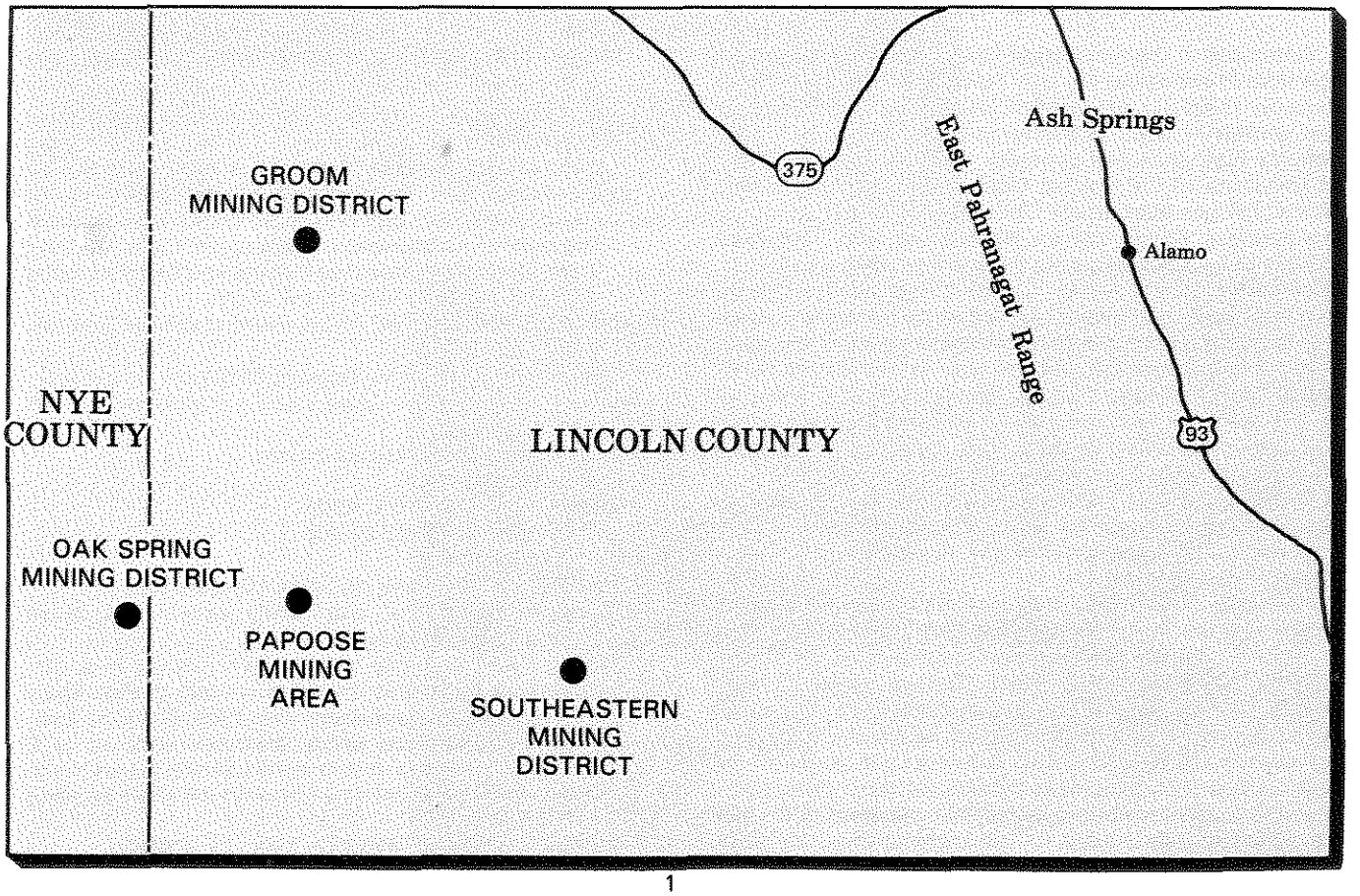
INTRODUCTION

The Pahranagat Range 30′ by 60′ Quadrangle is mostly in southwestern Lincoln County about 60 miles north of Las Vegas. The quadrangle extends from Emigrant Valley on the west to Pahranagat Valley on the east and includes portions of the Hiko, Pahranagat, Desert, Pintwater, Papoose, Groom, and Halfpint Ranges. Essentially all of the southern and western parts of the quadrangle are within the Nellis Air Force Range and the Desert National Wildlife Range and are closed to public entry. All mineral occurrences described in this report, except those in the East Pahranagat Range, are within the Nellis Air Force Range.

Recorded information on the history of this area is sparse. The Death Valley Emigrant Trail of the late 1840's passed through the quadrangle from northeast to southwest. The ill-fated Death Valley party took this shortcut between Salt Lake and California in 1849. After passing southeast through White River Valley, the trail entered the north boundary of the quadrangle near the midpoint of the Pahranagat Range. The route crossed the range at Hancock Summit, touched at Summit Spring on the pass between the Groom Range and the Jumbled Hills, and crossed Emigrant Valley to exit the quadrangle near its southwest corner. From here, the Emigrant Trail continued south to Cane Springs near the camp of Wahmonie, which currently lies within the Nevada Test Site, before descending into Death Valley southwest of present-day Armagosa Valley.

The first record of prospecting activity in the quadrangle was in 1864 when lead-silver discoveries were made in the southern Groom Range (Humphrey, 1945, p. 35). Many of the small gold occurrences in the northern Groom Range were, no doubt, also prospected at that time. The copper-silver deposit in the Southeastern district was discovered in 1870 (Thompson and West, 1881, p. 486). In 1869, the Wheeler Survey passed through this area on their first general reconnaissance of the West; the party camped at Summit Spring, southeast of the Groom district, on their way north. The Wheeler party returned in 1871 and the party geologist, G. K. Gilbert, visited the Groom mine and recorded the first observations on the local geology (Wheeler, 1872). F. B. Weeks, of the U.S. Geological Survey made a reconnaissance survey of the geology of the area in 1901; Weeks' information is included in geologic descriptions of the area by J. E. Spurr in 1903. Humphrey (1945) described the geology and mineral deposits of the Groom district and mention is made of the Groom deposits by Tschanz and Pampeyan (1970). Mineral deposits in the Nye County portion of the quadrangle are briefly described by Kral (1951). Descriptions of the general geology of the quadrangle are included in Tschanz and Pampeyan (1970) and Cornwall (1972).

Mineral production within the quadrangle has been principally lead and silver from the Groom mine in the Groom Range and silver from the Kelly mine located in the Pintwater Range south of Groom. At the present time, there is no mineral production from within the quadrangle.



Warm springs at Ash Springs, north of Alamo, are utilized for irrigation and recreational purposes but there has been no geothermal development within the quadrangle.

Seismic exploration for oil has been done but there has been no known drilling.

In 1984 and 1985, the Nevada Bureau of Mines and Geology conducted mineral inventory studies of the Nevada Test Site for the U.S. Department of Energy and of the Groom Range for the U.S. Air Force. As part of those projects, many of the mines and prospects in the Pahranagat Range 30' by 60' Quadrangle were examined and sampled. Field data were collected by J. Quade 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 on a number of 30' by 60' quadrangles in southeastern Nevada. The inventory of the Pahranagat Range Quadrangle is the first 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 sources and is intended to be a compilation of data on mines, prospects, and mineral, geothermal, and oil and gas occurrences within the Pahranagat Range 30' by 60' Quadrangle. When information sources are cited, the first source listed has provided the primary information. The information from literature sources has been adjusted to reflect field observations, when available.

GEOLOGICAL SETTING

Rocks within the Pahranagat Range Quadrangle range in age from Precambrian through Tertiary. Precambrian rocks crop out mainly in the western portion of the quadrangle and consist of shale, siltstone, and silty limestone of the Johnnie Formation and quartzite, siltstone, and thin beds of limestone of the Sterling Quartzite in the Halfpint and Groom Ranges (Barnes and Christiansen, 1967). Rocks in the Papoose Range, shown by Tschanz and Pampeyan (1970) to be Cambrian age, may be Precambrian and correlate with those in the Groom Range to the north. Paleozoic quartzite, shale, and carbonate units are present in most of the ranges within the quadrangle but the most extensive Paleozoic exposures are in the Pahranagat, Desert, and Pintwater Ranges. Tertiary volcanic units, including andesite and basalt flows, welded ash-flow tuffs, and intervolcanic sedimentary units, cover portions of the Hiko, Pahranagat, Groom, and Halfpint Ranges.

The only intrusive rocks mapped within the quadrangle are porphyritic rhyodacite dikes, sills, and stocks in and adjacent to Bald Mountain in the central Groom Range (Ekren and others, 1977).

The major regional structural features exposed within the quadrangle are thrust faults and northeast-striking strike-slip faults. There were at least two periods of thrust faulting, Laramide and probably Cretaceous or Eocene. One-third of the area of pre-Tertiary outcrops in the quadrangle is underlain by major thrust faults (Tschanz and Pampeyan, 1970, p. 80–83). The most prominent structural feature of the area is the Pahranagat shear zone, composed of northeast-striking faults with apparent strike-slip movement. Faults related to this regional structure pass through the Southeastern district at the north end of the Pintwater Range, the south end of the Pahranagat Range, and possibly between the Groom, Papoose, and Desert Ranges (Tschanz and Pampeyan, 1970, p. 83–84). Ekren and others (1977) have defined a caldron centered on Bald Mountain in the Groom Range. Volcanic rocks in the Groom Range and the adjacent Desert Range may have originated from this caldron. The most recent volcanic activity in the quadrangle, a small basalt cinder cone, is on the west side of the caldron.

METALLIC OCCURRENCES

EAST PAHRANAGAT RANGE

The East Pahranagat Range, in the northeastern part of the Pahranagat Range 30' by 60' Quadrangle, includes several small prospects west of the town of Alamo, Lincoln County. There is no recorded mineral production from the area and the prospects are inactive.

Lightner claims (1)

Other names: Kathleen claims and Lucky Linda claims
Commodity: gold(?)
Location: sec. 30, T6S, R60E
UTM[1] 4141040N 651920E
Production: none
History: Unknown, remains of a hand windlass at the shaft collar appear to date from 1900–20.
Development: Workings consist of a 6- by 8-foot shaft about 30 feet deep, a S70°W-bearing adit about 50 to 60 feet long, cuts, and a road to the shaft and adit.
Geology: The adit and shaft explore a gossan zone in a carbonaceous horizon near the top of the Cambrian Pilot Shale. The shaft is sunk on a 10-foot-wide, N10°E-striking, 70°SE-dipping gossan zone along bedding in the shale. There are no visible metallic minerals except yellow-brown and red-brown iron oxides. A gypsum-rich horizon in the shale is exposed at the mouth of the adit. The zone is about 4 feet thick and is composed of iron-oxide gossan laced with clear gypsum veinlets up to 3 inches thick; a 3-foot-thick band of carbonaceous shale and gossan lies below an iron-oxide lense. Bedding in the shale strikes N40°E and dips 40°SE; the rock is contorted and sheared. The layer of carbonaceous shale at the top of the Pilot Shale has been prospected by cuts and trenches along strike for about 2 miles to the south.
Remarks: The Lightner claims were staked in January 1984.
Field examination: J. V. Tingley, 1987

Nevin claims (2)

Other name: Lucky Nelinda claims
Commodity: gold(?)
Location: sec. 32, T6S, R60E
UTM 4138900N 652700E
Production: none
History: bulldozer work not over 10 years old
Development: several cuts along upper Pilot Shale contact and access roads
Geology: An iron-oxide gossan layer occurs in a carbonaceous horizon at the upper contact of Pilot Shale with Guilmette Formation; the Pilot Shale is thin-bedded and contains sandy limestone units up to 2 feet thick. Hematite occurs along bedding planes in the shale and gypsum bands are found both along bedding

[1]Universal Transverse Mercator, zone 11 (meters).

planes and along cross-fractures; bedding exposed in cuts strikes about N50°W and dips 10°SW but is variable. No evidence of metallic mineralization, except for iron oxides, was seen.

Remarks: The Nevin claims were staked in January 1984; no evidence of recent work was seen.

Field examination: J. V. Tingley, 1987

GROOM MINING DISTRICT

The Groom district, on the western border of Lincoln County in the northwestern part of the quadrangle, includes all of the southern Groom Range. Mining properties in the northern Groom Range are in the Don Dale district, north of the quadrangle boundary, and are not discussed in this report.

The first mineral discoveries in the Groom Range were made in 1864 and the Groom mining district was organized in 1869. Early accounts of the district describe mines located on the western slopes of Tempaiute Peak (Bald Mountain) and state that silver chloride ores were being produced in 1870. These mines were worked until about 1874, yielding a small, unrecorded production. Later work in the district was concentrated in the south end of the range at the Groom mine; recorded production from the Groom mine between 1915 and 1956 is about $935,000, mainly in lead and silver.

At the Groom mine, mining has been from replacement deposits of argentiferous galena and sphalerite formed in Cambrian limestone and shale along steep, north-trending faults. Mineralization can be traced by mine workings and outcrops at the surface for over one mile along the eastern margin of a graben. About three miles northwest of the Groom mine, the Kahama mine and several nearby prospects explore precious-metal-bearing veins which have formed in north-trending shear zones in Cambrian quartzite. Prospecting for placer gold was done in the major drainages in the area north of the Groom mine but no information is available on this activity and it is not discussed in this report. On the east side of the Groom Range, there was some prospecting for disseminated gold in an area of minor jasperoid in limestone.

There is no activity in the district at the present time.

Camp buildings at the Groom mine, Groom district. *J. Quade photo.*

Remains of flotation mill, Groom mine, Groom district. *J. Quade photo.*

B. W. claims (3)
Commodity: gold
Location: sec. 21, T5S, R55½E
UTM 4150200N 611680E
Production: none
Development: old prospect pits
Geology: The B. W. claims cover an area of dominately limestone outcrops which contains minor jasperoid and gossan-like mineralization along bedding planes. An old prospect pit in the southeastern part of the claim group was dug in a jaspery, gossan outcrop; some jasper breccia is present. The limestone country rock strikes N30° to 60°E and is thin bedded.
Field examination: J. Quade and J. V. Tingley, 1985

Black Metal mine (4)
Other names: Lane claims, Black Medal claim, Black Medal mine, Lane mine, Lane shaft, and Groom South End mine
Commodities: zinc and lead
Location: sec. 14, T7S, R55E
UTM 4132150N 609110E
Production: small
Development: Inclined shaft; ore was mined from the 110-foot level.
Geology: Sphalerite (both "black jack" and "rosin jack") and galena occur as tabular replacement deposits along a north-trending fault zone in Cambrian Lyndon Limestone. Ore formed on steep fissures related to the main fault; grades were as high as 22 percent zinc and 30 percent lead.
Remarks: Deposit lies along the southern extension of the Groom mine structure.
Sources of information: Humphrey (1945, p. 45); Tschanz and Pampeyan (1970, p. 149)
Field examination: J. Quade and J. V. Tingley, 1985

Boondock claim (5)
Other name: Grey Eagle claims
Commodities: lead and zinc
Location: sec. 6, T7S, R55½E
UTM 4133425ON 608270E
Production: none
Development: none
Geology: A 4- to 6-inch-thick, brecciated quartz vein cutting Cambrian Prospect Mountain Quartzite outcrops on the Boondock claim. The vein is contained within a N65°E-striking, 65°NW-dipping shear zone; the shear is about 15 feet wide. Vein material along the shear zone is brecciated and recemented with quartz; some fine-grained pyrite is present.
Field examination: J. Quade and J. V. Tingley, 1985

Chicago/Illinois/Wisconsin claims (6)
Other name: Hanus claims
Commodities: gold and silver
Location: sec. 24,25, T6S, R55E
UTM 4139000N 606440E
Production: small
History: staked by Charles P. Hanus in 1933
Development: three adits, cuts, and trenches
Geology: A quartz vein, 12 to 18 inches thick, cuts a shaly member of a quartzite unit. The vein strikes north to N30°E and dips 40° to 55°W; the quartzite formation strikes N10°E to N10°W and dips 40° to 50°E. The vein occupies a reverse fault and is brecciated by the fault. Chlorite occurs on both walls of the vein; vein is locally stained by iron and manganese oxides. Galena and pyrite are present in the vein quartz.
Remarks: Workings expose the vein system for about 800 feet along strike; this system is parallel to, but several hundred feet west of, the vein exposed at the Kahama mine to the south.
Field examination: J. Quade and J. V. Tingley, 1985

Copper prospect 1 (7)
Commodity: copper
Location: sec. 5, T6S, R55½E
UTM 4134900N 608800E
Production: none
Development: prospect pit
Geology: Iron oxides, azurite, malachite, pyrite, and chalcopyrite occur with quartz along a N10°E, nearly vertical structure cutting shale.
Field examination: J. Quade and J. V. Tingley, 1985

Gold Butte claims (8)
Commodities: gold and silver
Location: sec. 13, T6S, R55E
UTM 4142000N 606100E
Production: none
Development: several prospect pits
Geology: The prospects expose several veins; the main vein is in a shear zone that can be traced along strike for several hundred feet. Near the eastern end of the shear structure is a knob of partly cemented, silicified fault breccia containing massive magnetite and hematite. The structure strikes N50°E, and dips 60°NW; the vein is up to 2 feet thick. At the eastern exposure, the vein strikes N20°E and dips 45°NW. Botryoidal hematite and manganese oxide cement the fault breccia.
Remarks: An old paper found in a location monument on claims was dated 1933.
Field examination: J. Quade and J. V. Tingley, 1985

Gold occurrence 1 (9)
Commodities: gold and silver
Location: sec. 24, T6S, R55E
UTM 4140200N 606750E
Production: none
Development: none
Geology: A 6- to 8-inch-thick quartz vein crops out on the ridge west of the inclined shaft at the Highgrade mine. The vein, which generally follows a 4- to 5-foot-thick brecciated structure along bedding in the quartzite wall rock, strikes N30°W to north and dips 65° to 75°NW. The vein contains tetrahedrite, galena, manganese oxides, and some green and blue copper oxides. The structure cuts N70° to 75°E-striking quartz veins, possibly veins which project from the Highgrade shaft to east, and a N50°E-striking vein which crops out on the west slope of the ridge. A thin shale unit within the quartzite lies between the outcrop on the ridge and the prospects to the southwest.
Field examination: J. Quade and J. V. Tingley, 1985

Gold occurrence 2 (10)
Commodities: gold and silver
Location: sec. 18, T6S, R55½E
UTM 4142060N 606995E
Production: none
Development: none
Geology: A N20°E-trending iron-oxide-stained, vuggy quartz vein crops out in an area south of a basalt plug. Quartzite in this area is cut by faults and crosscutting quartz veins.
Remarks: Outcrop area is about 150 feet northeast of an

old stone monument; no prospects pits or other workings were found in the area.
Source of information: Humphrey (1945, p. 47)
Field examination: J. Quade, 1985

Gold prospect 1 (11)
Commodities: gold and silver
Location: sec. 24, T6S, R55E
UTM 4140060N 606720E
Production: none
Development: five prospect pits and a 25-foot adit
Geology: Prospects explore several narrow quartz veins in quartzite that crop out between the main ridge and the Tram workings. In the adit, a N70°E-striking, 55°NW-dipping, manganese-oxide-stained quartz vein containing tetrahedrite, galena and pyrite is cut by a N40°W sheeted zone. The sheeted zone is iron- and manganese-oxide stained and contains quartz vein material along it. The vein in the sheeted zone is 6 inches to 1 foot wide; the N70°E vein is about 6 inches wide as exposed at the end of the adit. The quartzite wall rock is sheared and altered along the vein wall.
Remarks: This may be the same vein that is exposed at the Highgrade shaft on the eastern side of the ridge. The vein would, however, be offset across the north-trending shear structure exposed along the crest of the ridge.
Field examination: J. Quade and J. V. Tingley, 1985

Gold prospect 2 (12)
Commodities: gold and silver
County: Lincoln
UTM 4139575N 606750E
Production: none
Development: small prospect pit
Geology: A quartz vein, 2 to 3 feet thick, cuts interbedded shale and quartzite. The vein strikes N50°E and dips 55°NW. The country rock strikes N5°E and dips 40°SE. There is about a 1-foot offset in bedding across the vein structure. Galena and possibly other fine-grained black sulfides are present in the vein quartz; both vein and wall rock are stained with iron and manganese oxides. The vein is frozen to the footwall of the structure.
Field examination: J. Quade and J. V. Tingley, 1985

Groom mine (13)
Commodities: lead, silver, and zinc
Location: sec. 11,14, T7S, R55E
UTM 4133780N 609190E
Production: about $935,000
History: discovered in 1865, first production in 1865, last production 1956, owned by Sheahan family since 1885
Development: several shafts, an adit, an open pit, and underground workings
Geology: Replacement orebodies formed in Cambrian Pioche Shale and Lyndon Limestone near the intersection of the sedimentary rocks by north-trending normal faults, thrust faults, and cross-fractures. The fault/fracture system trends N10° to 20°E, and dips 55° to 60°SE; the limestone is silicified along mineralizing fissures and there are often very thin quartz veinlets in both limestone and shale near the orebodies. Ore minerals include argentiferous galena, sphalerite, cerussite, anglesite, chalcopyrite, and tetrahedrite. Silver consistently averages about ⅓ ounce per percent of the lead at the Groom mine, and gold content is practically nil. Copper, in the form of chalcopyrite, with possible tetrahedrite, averages about 0.35 percent. Pyrite, in minor amounts, is found in intimate association with the galena (Humphrey, 1945).
Remarks: Patented claims are White Lake, White Lake No. 2, Conception, Conception No. 2, South End, South End Fraction, Bride Lode, and Southern Groom Lode.
Sources of information: Humphrey (1945, p. 32–45); Tschanz and Pampeyan (1970, p. 148–149)
Field examination: J. Quade and J. V. Tingley, 1985

Highgrade mine (14)
Commodities: gold and silver
Location: sec. 24, T6S, R55E
UTM 4140260N 606910E
Production: small

Incline, Groom mine, Groom district. *J. Quade photo.*

Inclined shaft at the Highgrade mine, Groom district.
J. Quade photo.

Development: Workings include an inclined shaft, flooded about 30 feet below collar, and an adit below the shaft which crosscuts to the vein structure.
Geology: Development has occurred on a 2-foot-wide quartz vein in quartzite which strikes N70°E and dips 70° to 75°NW. Another parallel quartz vein crops out about 20 feet to the southeast. The quartzite wall rock strikes north and dips 45°SE. The main vein contains tetrahedrite and galena; green and blue copper oxide minerals stain the outcrops of both veins.
Remarks: There is a small ore pile at the cabin site below the shaft. The size of the dump at the shaft collar indicates about 200 to 300 feet of underground workings extending from the shaft.
Field examination: J. Quade and J. V. Tingley, 1985

Horseshoe occurrence (15)
Commodities: gold and silver
Location: sec. 5, T6S, R55½E
UTM 4134800N 609175E
Production: none
Development: none
Geology: The occurrence consists of a brecciated, iron- and manganese-oxide-stained quartz vein that strikes N15°E, dips 60°SW, and is about 10 feet wide.
Remarks: This occurrence is north of Groom mine, probably on Groom patented claim group.
Field examination: J. Quade and J. V. Tingley, 1985

Jumbo claims (16)
Commodities: gold and silver
Location: sec. 12, T6S, R55E
UTM 4142750N 606400E
Production: small
Development: a 40- to 50-foot-deep shaft and a prospect pit
Geology: The workings expose a quartz vein that formed along a shale-quartzite contact. The vein strikes N70° to 75°W and dips 60°SW. The shale exposed on the east edge of the shaft collar is brecciated and laced with limonite-hematite veinlets. There are pods of massive hematite formed along bedding in the shale. The quartz vein is brecciated and recemented by quartz; the breccia matrix contains sulfides and magnetite.
Remarks: The shaft is timbered with hewn juniper logs; the workings appear to be very old and may date to the 1870's.
Field examination: J. Quade and J. V. Tingley, 1985

Kahama mine (17)
Other names: Hanus prospect, Hanus shaft, and New Kahama claims
Commodities: gold and silver
Location: sec. 25, T6S, R55E
UTM 4138100N 606480E
Production: small
History: mined in 1920's and 1930's by Charles P. Hanus
Development: Workings consist of two inclines, trenches, and stopes along about ½ mile of vein outcrop. The southernmost incline is reported to be 60 feet deep. The most recent activity has been on the north end of the claims.
Geology: A N5° to 10°E-striking, 60°NW-dipping quartz vein, up to 2 feet thick, cuts Prospect Mountain Quartzite. The quartzite strikes north to N5°E, dips 50°SE. The old workings were developed where the vein structure intersected shaly, argillaceous beds within the quartzite section. Alteration along the vein is noticeable in the shales; the rock is chloritized, laced with quartz stringers, and is limonite stained on fractures and bedding planes. The vein is stained with iron and manganese oxides.
Remarks: A composite sample of vein material collected by L. H. Beal in 1980 contained 0.245 ounces gold and 0.273 ounces silver per ton. The sample was taken from a number of cuts along the vein; vein width ranged from several inches up to 18 inches.
Source of information: Humphrey (1945, p. 47)
Field examination: J. Quade and J. V. Tingley, 1985

Silver occurrence 1 (18)
Commodities: silver and gold
Location: sec. 20, T6S, R56E
UTM 4140750N 614100E
Production: none
Development: none
Geology: A gossan-like outcrop of limonite-hematite hosted in limestone at base of formational contact.
Remarks: There is no evidence of prospecting at this site.
Field examination: J. Quade and J. V. Tingley, 1985

Tram workings (19)
Commodities: gold and silver
Location: sec. 24, T6S, R55E
UTM 4140180N 606540E
Production: small

Development: Workings consist of cuts and a short adit on outcrop, up slope from main adit; the main adit is 270 feet long with about 60 feet of drift along the vein from end of adit.

Geology: A reddish, iron-oxide-stained quartz vein crops out along a N70°E-striking, 55°NW-dipping structure which cuts quartzite. The wall rock is kaolinized and gouge is present along the vein walls; some brecciation occurs in the vein. This vein is possibly the same vein exposed at gold prospect 1.

Remarks: The adit bears S40°E for 270 feet and intersects the vein at its end. A drift then follows the vein about 60 feet along strike. A tram line extended from the outcrop workings down to the adit level; ore was lowered to the adit level where it could be loaded onto trucks. The wire, drum, and tram poles are still present and are scattered along the slope below the mine workings.

Field examination: J. Quade and J. V. Tingley, 1985

OAK SPRING MINING DISTRICT

The Oak Spring district, Nye County, is centered around Oak Spring in the hills north of Yucca Flat about 3 miles west of the western boundary of the quadrangle. Only a small, outlying part of the district, in the Halfpint Range along the eastern boundary of Nye County, is within the quadrangle.

The only mine with recorded production, the Rainstorm, has produced less than 100 tons of lead-silver-gold ore.

The Rainstorm mine and several nearby prospects explore a series of northwest-trending, nearly vertical quartz veins in Precambrian shale and quartzite.

Rainstorm mine (20)

Commodities: lead, silver, and gold

Location: sec. 11, T9S, R54E
UTM 4113194N 595308E

Production: 80 tons, 55 percent lead, 0.25 ounces silver, and 0.25 ounces gold per ton

History: Production was before World War II.

Development: one 220-foot-deep shaft, a 220-foot-long adit, a 210-foot-long drift from the adit, and four prospect pits

Geology: Rocks in the mine area consist of interbedded siltstones and quartzite of the Precambrian Johnnie Formation. The formation is highly faulted and fractured. The mine workings are aligned along a N70°W, nearly vertical vein system. Wall rocks are commonly brecciated, silicified, and oxidized along the trace of the vein system outcrop. The quartz vein material is brecciated, cemented with silica, and stained with yellow and black oxides. The vein contains anglesite(?), galena, pyrite, and possibly stibnite. The sedimentary rocks near the adit portal strike N5°E and dip about 20°SE.

Source of information: Kral (1951, p. 141)

Field examination: J. Quade, 1983

Rainstorm prospect (21)

Commodities: lead, silver, and gold

Location: sec. 13, T9S, R54E
UTM 4117750N 597350E

Production: none

Development: small caved adit

Geology: Brecciated white vein quartz and quartzite breccia are exposed along a N70°W-striking, 70°NE-dipping fault. The vein structure is crosscut by a north-striking, vertical fault zone; the adit follows the north-striking structure. Some sulfides were noted in vein material found on the adit dump.

Field examination: J. Quade, 1983

Unnamed shaft (22)

Commodities: lead, silver, and gold

Location: sec. 18, T9S, R55E
UTM 4112240N 597550E

Production: small

Development: one shallow shaft and several prospect pits

Geology: The shaft was sunk on a N70°W-striking vein cutting highly fractured and oxidized Precambrian Johnnie Formation. The vein is brecciated and iron-oxide stained; wall-rock alteration is extensive but is most intense within 3 to 4 feet of the vein. The vein has the same strike as the vein at the nearby Rainstorm mine.

Field examination: J. Quade, 1983

PAPOOSE MINING AREA

The Papoose area, Lincoln County, includes the Papoose Range in the central southwest part of the quadrangle. Only one known mineral property, the Kelly mine, is located in this area. A small amount of silver-gold-lead ore was produced from this property in 1936–37.

Kelly mine (23)

Commodities: silver, gold, and lead

Location: sec. 18, T9S, R55½E
UTM 4112800N 607800E

Production: 1,157 ounces silver, 3 ounces gold, 44 pounds lead

History: A small amount of ore was shipped to the Groom mine in 1936–37.

Development: shaft, adit, and prospect pits

Geology: Narrow breccias and fissures cut Prospect Mountain Quartzite

Source of information: Tschanz and Pampeyan (1970, p. 176).

SOUTHEASTERN MINING DISTRICT

The Southeastern district is in the northern Pintwater Range, Lincoln County, in the south-central part of the quadrangle. The only property in the district, the Southeastern mine, is located at the north end of the range. The earliest prospecting in this district was in 1870 but there has been no recorded production. Copper-lead-silver mineralization at the mine is reported to be associated with a fault zone in Paleozoic carbonate rocks.

Southeastern mine (24)

Other name: Arrowhead mine

Commodities: copper, lead, and silver

Location: sec. 4, T10S, R57E
UTM 4108180N 625840E

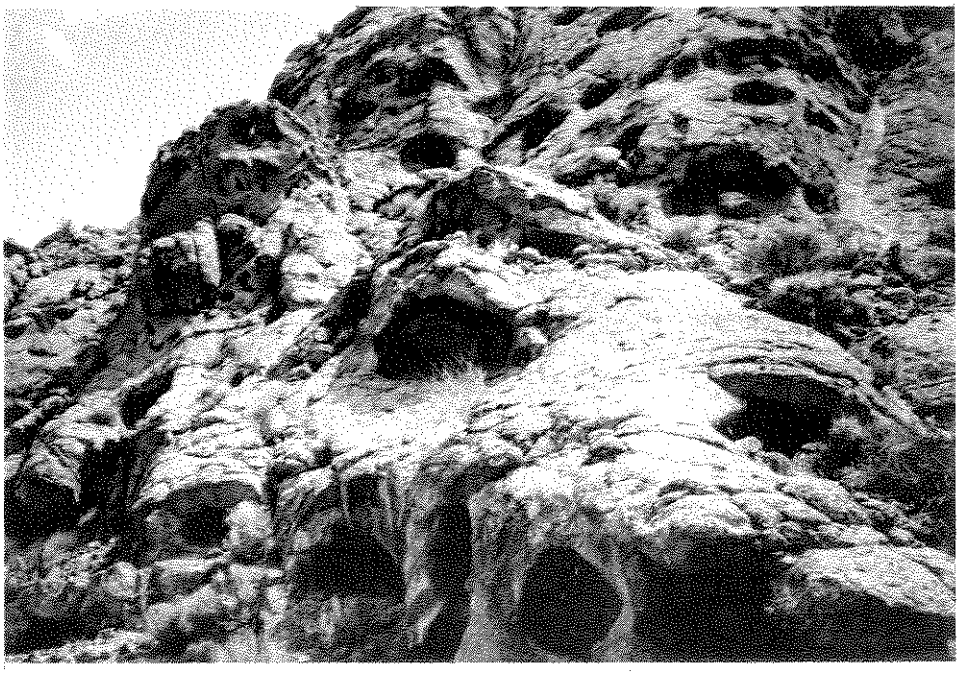
Production: small

History: Ore was discovered in this area in September 1870 and a district was organized at that time.

Development: inclined shaft (60 feet deep), adits, and prospect pits

Geology: The mine is in a silicified fault zone near the top of the Pogonip Group, copper-lead-silver(?) minerals crop out along this zone for 100 feet. It is likely that the deposit is just below a thrust sheet of Ordovician, Silurian, and Devonian dolomite.

Remarks: Thompson and West (1881, p. 486) reported that only assessment work had been done in the



Cavities weathered in welded tuff, near pumice prospect, East Pahranagat Range.

district after 1871; the ore was reported to assay between $30 and $180 per ton and specimens of native copper were frequently found.
Source of information: Tschanz and Pampeyan (1970, p. 176–178).

NONMETALLIC OCCURRENCES

EAST PAHRANAGAT RANGE

This area is described in the section on metallic occurrences.

Pumice prospect 1 (1)
Commodity: pumice(?)
Location: sec. 24, T7S, R60E
UTM 4132700N 659250E
Production: small
History: Camp remains indicate activity in 1940's and 1950's.
Development: small cuts, remains of hand screening equipment
Geology: The prospect is within a soft, nonwelded tuff composed mainly of pumice and pumice fragments. The flow weathers to a cavernous surface with caverns up to 3 by 6 feet.
Remarks: A very small pile of hand-screened pumice remains at the camp site.
Field examination: J. V. Tingley, 1987

GEOTHERMAL OCCURRENCES

ASH SPRINGS

Several springs near Ash Springs north of the town of Alamo in Lincoln County provide warm water used mainly for swimming and irrigation.

Ash Springs (1)
Location: sec. 6, T6S, R61E
UTM 4147800N 659850E
Temperature: 32°C
Source of information: Garside and Schilling (1979, p. 108, no. 175)

Little Ash Spring (2)
Location: sec. 36, T5S, R60E
UTM 4147600N 659800E
Temperature: 36°C
Remarks: 9,000 gal/min discharge
Source of information: Garside and Schilling (1979, p. 108, no. 175)

Unnamed spring 1 (3)
Location: sec. 18, T6S, R61E
UTM 4143500N 661000E
Temperature: warm
Source of information: Garside and Schilling (1979, p. 108, no. 175)

BIBLIOGRAPHY

Barnes, H., and Christiansen, R. L., 1967, Cambrian and Precambrian rocks of the Groom district Nevada, southern Great Basin: U.S. Geological Survey Bulletin 1244-G, 34 p.

Cornwall, H. R., 1972, Geology and mineral resources of southern Nye County, Nevada: Nevada Bureau of Mines and Geology Bulletin 77, 49 p.

Cornwall H. R., and Norberg, J. R., 1978, Mineral resources of the Nellis Air Force Base and the Nellis Bombing and Gunnery Range, Clark, Lincoln, and Nye Counties, Nevada: U. S. Bureau of Mines unpublished administrative report, 118 p.

Ekren, E. B., Orkild, P. P., and Dixon, G. L., 1977, Geologic map of Tertiary rocks, Lincoln County, Nevada: U.S. Geological Survey Map I-1041.

Garside, L. J., and Schilling, J. H., 1979, Thermal waters of Nevada: Nevada Bureau of Mines and Geology Bulletin 91, 163 p.

Humphrey, F. L., 1945, Geology of the Groom district, Lincoln County, Nevada: Nevada Bureau of Mines and Geology Bulletin 42, 53 p.
Kral, V. E., 1951, Mineral resources of Nye County, Nevada: Nevada Bureau of Mines and Geology Bulletin 50, 223 p.
Norberg, J. R., 1977, Mineral resources in the vicinity of the Nellis Air Force Base and the Nellis Bombing and Gunnery Range, Clark, Lincoln, and Nye Counties, Nevada: U. S. Bureau of Mines unpublished report, 112 p.
Quade, J., and Tingley, J. V., 1984, A mineral inventory of the Nevada Test Site and portions of Nellis Bombing and Gunnery Range, southern Nye County, Nevada: Nevada Bureau of Mines and Geology Open-File Report 84-2, 113 p.
Spurr, J. E., 1903, Descriptive geology of Nevada south of the fortieth parallel and adjacent portions of California: U.S. Geological Survey Bulletin 208, 229 p.
Thompson, T. H., and West, A. A., 1881, History of Nevada [reprinted 1958]: Berkeley, California, Howell-North Books, p. 476–492.
Tingley, J. V., 1984, A mineral inventory of the Caliente resource area, Caliente district, Lincoln County, Nevada: Nevada Bureau of Mines and Geology Open-File Report 84-1, 163 p.
Tingley, J. V. , and Quade, J., 1986, A mineral inventory and geochemical survey, Groom Range area, Lincoln County, Nevada: Nevada Bureau of Mines and Geology Open-File Report 86-9, 125 p.
Tschanz, C. M., and Pampeyan, E. H., 1970, Geology and mineral deposits of Lincoln County, Nevada: Nevada Bureau of Mines and Geology Bulletin 73, 188 p.
Wheeler, G. M., 1872, Preliminary report concerning explorations and surveys principally in Nevada and Arizona *in* Wheeler **Survey Progress Report 1872: Washington, DC, U.S. Government Printing Office, 96 p.**

APPENDIX A.—*Sample Descriptions*

District/area	Occurrence (no.)	Sample no.	UTM		Description
East Pahranagat Range	Lightner claims (1)	3259	4141040N	651920E	Iron-oxide rich gossan in weakly silicified, brecciated Pilot Shale; clear gypsum cementing breccia and as crystals in open spaces in breccia
	Nevin claims (2)	3260	4138900N	652700E	Gossan in limy, sandy Pilot Shale; clear gypsum along bedding and fracture surfaces; iron oxide in gossan; some carbonaceous material.
Groom	B. W. claims (3)	3026	4150600N	611300E	Outcrop of jaspery gossan, silicified lense along bedding in limestone; sample is mostly massive hematite
		3027	4150200N	611680E	Jasperoid-limonite outcrop exposed in prospect pit in limestone, some jasperoid breccia
	Black Metal mine (4)	3006	4132150N	609110E	Fine-grained, steely galena with fault gouge in shaly limestone
	Boondock claim (5)	2397-A	4134250N	608270E	Select, high-grade sample of massive galena; sample taken by claim owner
		3047	4134250N	608270E	White quartz with minor sulfides, brecciated; chipped from narrow vein outcrop at the Boondock claim location monument
	Chicago/Illinois/Wisconsin claims (6)	3055	4139130N	606480E	Manganese-stained white vein quartz containing some galena; vein is vuggy and brecciated; sample from dump and vein outcrop
		3056	4139040N	606440E	Vein quartz containing galena, iron and manganese oxides; sample taken from the "Wheelbarrow adit"
		3057	4138960N	606390E	3-foot-wide quartz vein containing galena and pyrite
	Copper prospect 1 (7)	3007	4134900N	608800E	Quartz vein containing azurite, malachite, chalcopyrite, and bornite; sample selected from dump and vein outcrop
	Gold Butte claims (8)	3035	4141950N	606050E	Vein quartz with hematite, 12- to 18-inch-thick vein cuts shale; sample taken from exposure in location pit
		3036	4142000N	606100E	Brecciated quartz with magnetite; sample taken from outcrop where quartz vein fills fault zone
		3037	4142000N	606100E	Vein quartz stained with iron oxides, rock silicified and brecciated, vein outcrop is 2 to 3 feet thick and can be traced for several hundred feet along strike

continued

District/area	Occurrence (no.)	Sample no.	UTM		Description
Groom (continued)	Gold occurrence 1 (9)	3015	4140060N	606620E	Vuggy quartz vein with manganese- and copper-oxide staining, galena, and tetrahedrite; sample taken from 6- to 12-inch-wide vein outcrop
		3028	4140200N	606750E	Vuggy quartz vein with manganese- and copper-oxide staining, galena, and tetrahedrite; sample taken from 6- to 12-inch-wide vein outcrop
	Gold occurrence 2 (10)	3018	4142060N	606995E	Iron-stained, vuggy quartz vein; sample chipped from outcrop near monument
	Gold prospect 1 (11)	3029	4140060N	606720E	Quartz vein material from shear zone, contains manganese oxides, pyrite, galena, and tetrahedrite
	Gold prospect 2 (12)	3054	4139575N	606750E	Quartz vein with iron and manganese oxides, galena, and other sulfides; sample taken from 2- to 3-foot-wide vein outcrop in small prospect pit, vein cuts interbedded shale and quartzite
	Groom mine (13)	3008	4133820N	609180E	Replacement ore containing copper-oxide minerals, argentiferous galena, and other sulfides
		3009	4133800N	609190E	Replacement ore in limestone, massive limonite, and argentiferous galena
		3039	4133100N	609100E	Ore from dump; galena, sphalerite, and pyrite
		3040	4133350N	609000E	Sample of ore from stockpile at main adit, replacement ore in limestone, contains argentiferous galena
		3041	4133450N	609000E	Jarosite and limonite fracture coatings chipped from limestone outcrop, some calcite veining
		3042	4133400N	609200E	Oxidized replacement ore in limestone; contains cerussite, galena, and other sulfides
		3043	4133600N	609250E	Sample taken from outcrop of vein containing galena; vein up to 2 feet thick
		3044	4133780N	609190E	High-grade vein material from dump, contains galena, other sulfides, and copper-oxide minerals
		3045	4134250N	609175E	Brecciated quartzite outcrop north of old mine
	Highgrade mine (14)	3016	4140260N	606910E	Vein quartz, strong manganese-oxide staining, minor copper oxides, galena, tetrahedrite; sample taken from dump
		3017	4140260N	606910E	Quartz vein with manganese-oxide staining, galena, tetrahedrite; sample taken from from stockpile below mine workings
	Horseshoe occurrence (15)	3046	4134800N	609175E	Quartz vein, 10 feet wide, brecciated and stained with manganese and iron oxides; sample chipped from vein outcrop
	Jumbo claims (16)	3031	4142750N	606400E	Partly brecciated quartz vein in quartzite, vein contains pyrite; wall rock is silicified
		3032	4142750N	606400E	Silicified breccia containing magnetite and pyrite; sample taken from dump and the adjacent prospect pit
	Kahama mine (17)	3010	4138120N	606480E	White vein quartz, vuggy, cockade structures, minor iron-oxide staining; vein 2 feet wide, partly brecciated
		3011	4138100N	606480E	Channel sample cut across 12- to 14-inch-thick quartz vein, vein highly stained with iron oxides
		3012	4138150N	606480E	White vein quartz, highly iron-oxide stained; sample cut from vein crosscutting main vein

APPENDIX A.—*Sample Descriptions (continued)*

District/area	Occurrence (no.)	Sample no.	UTM		Description
Groom (continued)	Kahama mine (17) (continued)	3013	4138250N	606460E	Manganese- and iron-oxide stained vein, sample cut from vein exposed in main trench
		3033	4138100N	606480E	Brecciated, vuggy, vein quartz, some cockade structure, iron-oxide stained, vein cuts quartzite; sample from dump
		3034	4138360N	606460E	Vuggy, iron-oxide-stained quartz vein, minor brecciation, unidentified sulfides present; sample taken from prospect south of upper trenches
		3058	4138470N	606440E	Quartz vein containing pyrite, galena; quartzite wall rock; sample taken from dump of incline shaft on north-facing slope north of upper Kahama workings
	Silver occurrence 1 (18)	3002	4140750N	614100E	Gossan in limestone; limonite and hematite
	Tram workings (19)	3014	4140180N	606540E	Partly brecciated quartz vein with manganese oxides, pyrite, tetrahedrite; vein cuts shale interbeds; sample taken from dump of 270-foot-long adit
		3030	4140140N	606520E	Vein quartz and gouge material, brecciated and stained with hematite, some unidentified sulfides present; sample chipped from vein exposed in prospect pit
Oak Spring	Rainstorm mine (20)	1939	4113210N	595280E	Brecciated vein with galena, anglesite; sample from sidewall of shaft at 40-foot level
		1940	4113210N	595280E	Small stringer veinlets, silicified, brecciated, with galena, anglesite, stibnite, and copper oxides; sample taken from sidewall of shaft between 100 and 110 feet
		1941	4113210N	595280E	Brecciated quartz vein material, oxidized, silicified, with galena, anglesite, blue and yellow oxide coatings (copper and antimony?); sample from mine dump
		1942	4113210N	595280E	Oxidized vein material and replacement ore, galena, anglesite; sample from shaft dump
		1943	4113160N	595220E	Silicified quartz breccia from vein system, iron-oxides present; sample from vein exposed in pit
		1944	4113200N	595220E	Quartz vein with copper and iron oxides, fine stringers of dark sulfides; sample chipped from face 225 feet into main adit
		1945	4113200N	595220E	Brecciated vein material with yellow and black oxide coatings; vein contains galena, pyrite, and anglesite
		1946	4113200N	595220E	Quartz breccia with iron oxides, galena; almost all of matrix is composed of quartz and pyrite
	Rainstorm prospect (21)	1918	4412720N	597410E	Brecciated white quartz vein and quartzite breccia with iron oxides and pyrite; sample taken from 3- to 4-foot-wide vein
	Unnamed shaft (22)	1900	4112400N	597540E	Highly iron-oxide-stained quartz vein, brecciated; sample taken from dump

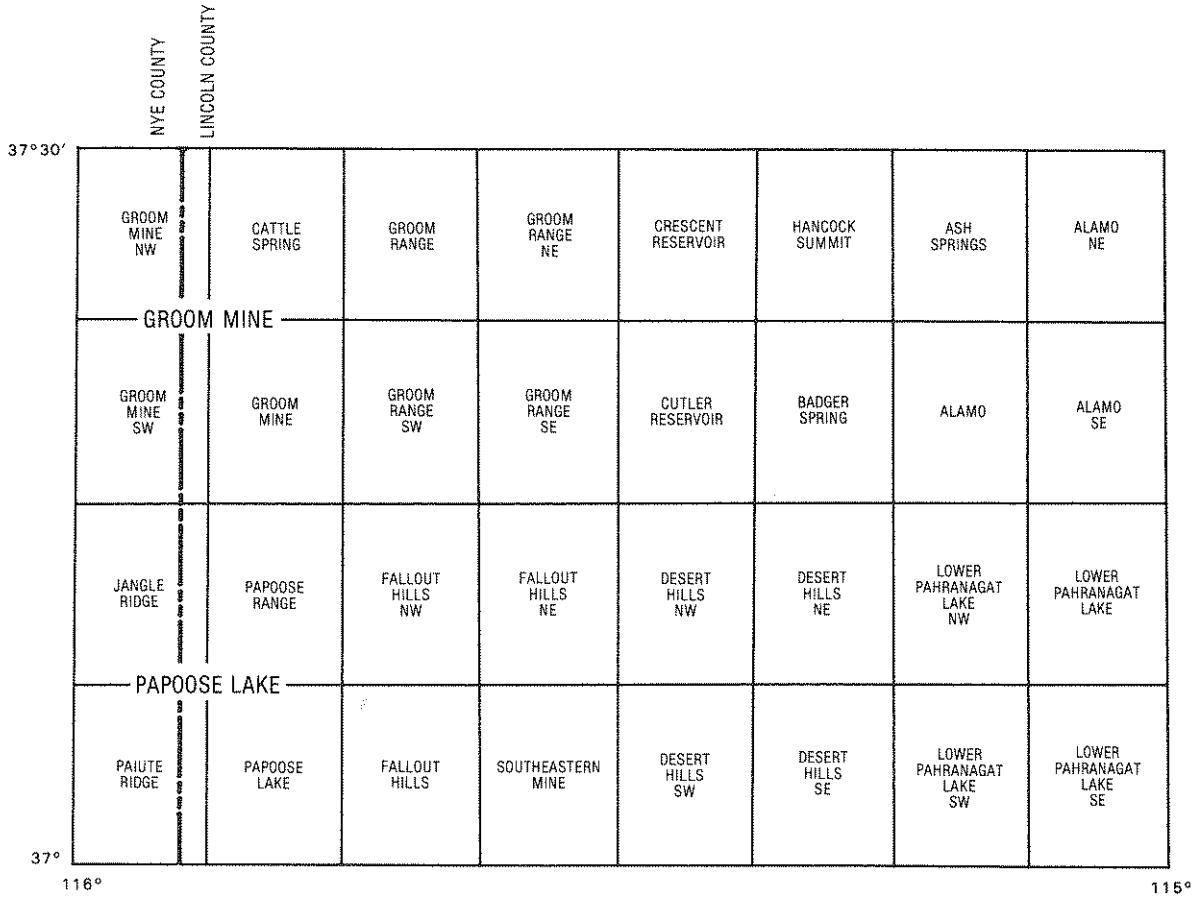
District/area	Occurrence (no.)	Sample no.	Ca (0.05)	Fe (0.05)	Mg (0.02)	Ti (0.002)	Ag (0.05)	As (200)	Au (10)	B (10)	Ba (20)	Be (1)	Bi (10)	Cd (20)	Co (5)	Cu (5)	La (20)	Mn (10)
E. Pahranagat Range	Lightner claims (1)	3259	10	20	0.15	0.2	1.5	200	N	100	200	L	N	N	N	50	150	100
	Nevin claims (2)	3260	7	20	0.5	0.2	2	L	N	150	1,500	L	N	N	N	20	200	150
Groom	B. W. claims (3)	3026	1	10	0.03	0.02	L	L	N	30	70	3	N	N	10	7	L	5,000
		3027	1	15	0.03	0.015	N	300	N	30	150	1	N	N	L	20	20	200
	Black Metal mine (4)	3006	5	2	1	0.015	300	300	N	15	700	L	N	>500	L	200	20	200
	Boondock claim (5)	2397-A	2	1	0.7	0.05	700	L	N	50	50	L	N	N	15	3,000	L	1,000
		3047	0.05	1	L	0.02	N	L	N	15	1,000	L	N	N	7	7	L	30
	Chicago/Illinois/Wisconsin claims (6)	3055	L	0.3	0.02	0.05	10	N	N	20	200	L	20	N	5	200	L	300
		3056	L	2	L	0.02	15	200	N	15	300	2	50	N	N	300	20	30
		3057	L	0.5	L	0.07	3	L	N	70	150	1	N	N	N	700	20	10
	Copper prospect 1 (7)	3007	1	3	0.07	0.15	2	1,000	N	100	>5,000	1	N	N	5	N	30	500
	Gold Butte claims (8)	3035	N	0.3	0.02	0.03	N	N	N	L	70	N	N	N	N	N	30	10
		3036	0.05	7	0.02	0.02	N	N	N	10	50	5	N	N	N	20	30	100
		3037	0.05	>20	0.03	0.05	N	N	N	20	200	2	N	N	5	>2,000	20	70
	Gold occurrence 1 (9)	3015	0.05	1	0.05	0.02	700	300	N	50	500	L	N	30	N	1,000	L	15
		3028	L	0.5	0.02	0.05	100	L	N	20	100	N	N	N	5	2,000	N	500
	Gold occurrence 2 (10)	3018	L	0.2	0.02	0.015	N	N	N	N	50	N	N	N	N	700	30	20
	Gold prospect 1 (11)	3029	L	0.5	0.02	0.03	70	N	N	15	200	L	N	N	N	3,000	20	500
	Gold prospect 2 (12)	3054	L	0.3	L	0.02	20	200	1	15	100	L	N	N	5	15	L	200
	Groom mine (13)	3008	1.5	3	0.3	0.05	200	700	N	150	1,000	L	N	N	100	1,000	N	500
		3009	10	5	1	0.05	50	200	N	50	100	N	N	N	50	>2,000	L	5,000
		3039	7	10	5	0.015	50	500	N	N	30	N	N	N	100	200	50	1,000
		3040	3	1	1.5	0.015	500	300	N	10	20	N	N	L	7	3,000	20	700
		3041	>20	5	2	0.015	0.7	N	N	N	200	N	N	N	5	700	30	2,000
		3042	2	2	1	0.05	100	N	N	70	300	N	N	500	L	50	20	300
		3043	2	15	1	0.02	100	2,000	N	30	70	N	N	N	20	10	30	300
		3044	1	3	0.1	0.03	200	700	N	100	200	L	N	N	150	100	30	700
		3045	0.3	3	0.05	0.2	L	N	N	70	500	1	N	N	7	7	L	500
	Highgrade mine (14)	3016	N	0.3	L	0.01	70	500	N	L	200	N	15	L	N	7	30	20
		3017	L	2	L	0.02	150	700	N	10	300	L	30	20	N	N	30	30
	Horseshoe occurrence (15)	3046	0.15	1.5	0.02	0.07	N	N	N	30	3,000	1	N	N	L	30	30	500
	Jumbo claims (16)	3031	N	3	0.03	0.07	0.5	L	N	70	200	1	N	N	7	5	50	2,000
		3032	L	5	0.03	0.07	2	500	1	50	200	L	N	N	L	150	50	300
	Kahama mine (17)	3010	L	0.3	L	0.015	N	N	N	20	100	N	N	N	N	300	30	15
		3011	0.07	2	0.05	0.07	N	N	N	30	300	L	N	N	N	500	20	15
		3012	L	1	0.05	0.05	N	N	N	30	500	L	N	N	N	15,000	30	10
		3013	L	2	0.15	0.2	1.5	L	N	70	300	1	N	N	5	500	20	15
		3033	N	0.5	0.03	0.05	N	N	N	30	150	N	N	N	N	100	30	L
		3034	N	0.7	0.05	0.07	7	200	N	50	200	L	10	N	N	200	30	15
		3058	N	0.7	L	0.02	1	N	N	20	2,000	L	N	N	L	20	20	20
	Silver occurrence 1 (18)	3002	0.3	15	0.1	0.07	1.5	1,500	N	70	70	N	N	N	N	300	20	70
	Tram workings (19)	3014	L	0.7	0.03	0.05	20	200	N	50	150	2	L	N	7	L	30	5,000
		3030	N	1.5	0.03	0.07	70	200	L	20	100	1	N	N	L	10	N	700
Oak Spring	Rainstorm mine (20)	1939	L	0.07	L	0.02	1,000		N	N	N	200	N	500	N	N	1,500	N	100
		1940	L	0.1	L	0.002	2,000		N	N	N	1,000	L	50	N	N	7,000	L	15
		1941	L	0.05	L	L	1,000		N	N	N	700	N	10	N	N	2,000	L	15
		1942	L	1	L	0.05	700		N	N	N	150	N	200	N	N	300	L	L
		1943	L	3	0.02	0.1	50		N	N	10	100	N	N	N	L	5,000	L	20
		1944	L	3	0.05	0.2	10		L	N	20	2,000	N	10	N	L	700	L	15
		1945	L	0.7	0.02	0.03	150		N	N	10	150	N	100	100	N	1,500	L	10
		1946	L	0.7	0.03	0.05	70		N	N	10	300	N	50	N	N	2,000	L	50
	Rainstorm prospect (21)	1918	0.2	0.2	0.07	0.3	N		N	N	20	150	N	N	N	N	10	50	20
	Unnamed shaft (22)	1900	0.2	5	0.07	0.3	1.5	700	N	50	200	L	L	N	7	300	L	100

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, 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.

Mo (5)	Nb (20)	Ni (5)	Pb (10)	Sb (100)	Sc (5)	Sn (5)	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.
20	N	30	30	N	10	N	1,500	N	1,000	N	200	200	100	N	400	2	30	3259
30	N	20	100	N	15	N	5,000	N	500	N	200	N	100	N	190	4	60	3260
7	N	10	10	L	5	N	N	N	100	N	15	700	20	N	500	50	900	3026
N	N	7	10	100	N	N	300	N	70	N	L	L	15	N	250	100	120	3027
N	N	L	>20,000	5,000	N	N	N	N	L	N	N	>10,000	N	N	100	>500	>1,000	3006
N	N	7	>20,000	5,000	5	N	100	N	10	N	15	200	100	L	90	2,100	25	2397-A
N	N	7	15	N	N	N	150	N	L	N	L	N	70	0.02	150	4	20	3047
N	N	5	7,000	L	N	N	N	N	10	N	L	N	70	0.05	30	82	5	3055
5	N	10	3,000	500	L	N	N	N	10	N	10	N	70	2.3	350	300	75	3056
N	N	7	1,500	300	L	N	500	N	10	N	10	N	150	0.20	210	430	70	3057
N	N	10	500	100	7	N	2,000	N	20	N	20	500	150	N	>1,000	90	310	3007
N	N	N	L	N	N	N	N	N	10	N	N	N	50	0.30	10	L	N	3035
N	N	5	L	N	N	N	100	N	10	N	L	N	70	N	50	10	35	3036
N	N	20	L	N	L	N	N	N	50	N	15	L	200	N	120	2	100	3037
10	N	N	20,000	2,000	N	N	N	N	70	N	N	L	100	0.15	350	500	110	3015
10	N	N	2,000	1,000	N	N	N	N	10	N	N	N	70	N	L	450	25	3028
N	N	N	50	N	N	N	N	N	L	N	N	N	30	N	N	8	N	3018
L	N	L	3,000	500	N	N	N	N	30	N	L	N	100	0.05	40	180	30	3029
10	N	15	700	300	N	N	N	N	L	N	N	200	70	0.05	320	270	310	3054
30	N	200	>20,000	2,000	5	N	700	N	L	N	15	L	50	N	700	>500	35	3008
10	N	50	>20,000	100	5	N	200	N	L	N	20	N	20	N	500	96	N	3009
N	N	50	20,000	2,000	L	N	L	N	L	N	15	700	10	0.05	560	>500	>1,000	3039
N	N	10	>20,000	5,000	L	N	100	N	N	N	10	1,500	30	0.05	400	>500	>1,000	3040
N	N	15	200	N	N	N	200	N	N	N	15	L	L	N	45	10	160	3041
N	N	20	>20,000	300	5	N	150	N	10	N	L	>10,000	15	0.15	60	230	>1,000	3042
5	N	30	>20,000	100	L	N	200	N	L	N	L	2,000	L	N	>1,000	850	>1,000	3043
50	N	150	>20,000	2,000	5	N	200	N	N	N	20	L	70	N	>1,000	>500	130	3044
N	N	10	200	N	10	N	100	N	30	N	50	N	200	L	40	8	90	3045
10	N	N	15,000	1,500	N	N	N	N	L	N	N	N	20	0.25	500	1,000	90	3016
50	N	7	>20,000	3,000	N	N	N	N	L	N	N	N	70	2.9	750	>1,000	50	3017
N	N	10	30	N	5	N	L	N	10	N	L	N	50	L	60	22	65	3046
10	N	20	50	L	L	N	N	N	10	N	15	200	200	0.10	50	16	190	3031
15	N	7	500	300	L	N	L	N	10	N	L	N	50	0.05	450	220	50	3032
N	N	N	70	L	N	N	N	N	L	N	N	N	50	0.80	80	20	10	3010
N	N	5	15	100	L	N	L	N	30	N	10	N	150	2.7	140	60	35	3011
N	N	L	15	N	L	N	100	N	20	N	L	N	100	0.05	60	2	N	3012
L	N	10	100	L	5	N	150	N	50	N	30	N	200	0.40	200	42	N	3013
N	N	L	20	100	N	N	N	N	20	N	10	N	70	0.50	70	30	N	3033
N	N	L	300	700	L	N	N	N	20	N	15	N	300	1.7	250	250	10	3034
N	N	5	70	N	N	N	200	N	10	N	L	N	50	1.5	100	6	L	3058
20	N	15	L	100	L	N	N	N	15	N	L	200	50	N	>1,000	70	110	3002
10	N	L	10,000	300	N	N	N	N	50	N	L	N	70	2.0	190	170	25	3014
7	N	5	1,000	700	L	N	N	N	20	N	L	N	50	4.7	200	150	50	3030
N	N	5	>20,000	150	N	15	N	N	10	N	N	N	20	—	10	42	L	1939
N	N	5	>20,000	700	N	20	L	N	10	N	N	N	N	—	N	270	L	1940
N	N	L	>20,000	500	N	15	N	N	15	N	N	N	N	—	N	210	L	1941
N	N	L	>20,000	700	N	50	N	N	50	N	N	1,500	50	—	40	16	30	1942
N	N	5	>20,000	150	L	N	N	N	50	N	N	N	70	—	90	16	70	1943
N	L	5	1,500	200	L	20	N	N	50	N	30	N	150	—	170	50	100	1944
N	N	5	>20,000	L	N	N	N	N	15	N	N	N	70	—	40	30	100	1945
N	N	5	10,000	300	N	1	N	N	20	N	N	700	50	—	85	150	190	1946
N	N	5	15	N	L	N	N	N	20	N	10	N	100	0.30	15	2	5	1918
N	L	15	100	N	5	N	1,000	N	100	L	20	N	300	—	600	22	60	1900

INDEX

(mining districts, mining areas, mines, prospects, and occurrences)



Index of USGS 7½′ and 15′ quadrangle maps within the Pahranagat Range 30′ by 60′ Quadrangle.

NEVADA BUREAU OF MINES AND GEOLOGY

PREPARED IN COOPERATION WITH THE U.S. GEOLOGICAL SURVEY

REPORT 44, PLATE 1

Base map: Pahranagat Range, Nevada, 30′ by 60′ Quadrangle, 1985

SCALE 1:100,000

0 1 2 3 MILES

0 1 2 3 4 5 KILOMETERS

METALLIC OCCURRENCES

East Pahranagat Range

1.	Lightner claims	Au(?)
2.	Nevin claims	Au(?)

Groom mining district

3.	B. W. claims	Au
4.	Black Metal mine	Zn, Pb
5.	Boondock claim	Pb, Zn
6.	Chicago/Illinois/Wisconsin claims	Au, Ag
7.	Copper prospect 1	Cu
8.	Gold Butte claims	Au, Ag
9.	Gold occurrence 1	Au, Ag
10.	Gold occurrence 2	Au, Ag
11.	Gold prospect 1	Au, Ag
12.	Gold prospect 2	Au, Ag
13.	Groom mine	Pb, Ag, Zn
14.	Highgrade mine	Au, Ag
15.	Horseshoe occurrence	Au, Ag
16.	Jumbo claims	Au, Ag
17.	Kahama mine	Au, Ag
18.	Silver occurrence 1	Ag, Au
19.	Tram workings	Au, Ag

Oak Spring mining district

20.	Rainstorm mine	Pb, Ag, Au
21.	Rainstorm prospect	Pb, Ag, Au
22.	Unnamed shaft	Pb, Ag, Au

Papoose mining area

23.	Kelly mine	Ag, Au, Pb

Southeastern mining district

24.	Southeastern mine	Cu, Pb, Ag

NONMETALLIC OCCURRENCES

East Pahranagat Range

1.	Pumice prospect 1	pumice(?)

GEOTHERMAL OCCURRENCES

Ash Springs

1. Ash Springs
2. Little Ash Spring
3. Unnamed spring 1

OIL AND GAS OCCURRENCES

no known occurrences

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

NONMETALLIC OCCURRENCES
- ■ Mine, recorded production
- □ Prospect, no known production
- × Occurrence

GEOTHERMAL
- ● 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

MINERAL RESOURCES OF THE PAHRANAGAT RANGE 30′ BY 60′ QUADRANGLE

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 attendent 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.