

Ag, Au, W, Fe, C, Cu,  
Pb, Zn, Hg, Mn, U,  
Na, K, gypsum, pumice,  
limestone, dimension  
stone, barite

Mining District: DELAWARE (SULLIVAN, BRUNSWICK) DISTRICT  
CARSON DISTRICT  
VOLTAIRE (EAGLE VALLEY, WASHOE) DISTRICT  
MOUND HOUSE DISTRICT  
RED MOUNTAIN DISTRICT  
SILVER CITY (CHINATOWN, DAYTON, DEVIL'S GATE, GOLD CANYON)  
DISTRICT  
COMSTOCK LODGE DISTRICT (Includes OCCIDENTAL and FLOWERY  
districts)  
(Silver, Gold, Tungsten, Iron, Graphite, Copper, Lead, Zinc,  
Mercury, Manganese, Uranium, Sodium, Potassium, Gypsum, Pumice,  
Limestone, Dimension Stone, Barite)

T. 14-15-16-17-18 N., R. 19-20-21-22-23 E.  
Carson City, Storey, Douglas, and Lyon Counties, Nevada  
USGS Carson City 15-min. quadrangle (1956), Dayton 15-min.  
quadrangle (1956), Virginia City 15-min. quadrangle (1950),  
and Churchill Butte 15-min. quadrangle (1957)

#### GENERAL BACKGROUND

In the following discussion each area will be treated separately. Refer to the attached location maps for district boundaries used in this report and/or for identification of specific mining properties covered herein.

#### I. Delaware District

The Delaware area is located in Carson City County, Nevada. Approximate boundaries of the area are the Carson River on the north and west, Eldorado Canyon on the east, and McTarnahan Hill on the south. Although there is no recorded production prior to 1940, the district was first prospected in the 1870's, and undoubtedly a minor amount of gold, silver, copper, and iron were produced during this period. After 1940, some tungsten and iron ore were shipped from the area during World War II.

The Bessemer iron mine is located on the west side of Brunswick Canyon in section 29, T. 15 N., R. 21 E. Barite is also reported to be present at this property (5). However, this mineral was not noted when the property was examined. Shipments of iron ore from the Bessemer mine were made in the years 1919-20, 1944, and in 1953. Production through 1953 amounted to less than 1,000 tons. The ore shipped in 1944 was used in the manufacture of high-density concrete ship ballast.



The Capital iron deposit is located in section 36, T. 15 N., R. 20 E., about 1 mile northwest of McTarnahan Hill. There has been no production from this property.

The Valley View mine is situated in section 6, T. 14 N., R. 21 E., on the west slope of McTarnahan Hill in the Pine Nut Mountains. The property was originally located in the 1870's for lead and silver. In 1942 a new exploration program for lead, silver, and tungsten was initiated. During this period of exploration mercury mineralization was discovered. Recorded production from this mine consists of 34 tons of 0.6 percent  $WO_3$  extracted in 1943.

The Dixon manganese-tungsten deposit is located in section 15, T. 15 N., R. 21 E., about  $7\frac{1}{2}$  miles east of the town of New Empire. There has been no production from this prospect.

The Bidwell (Comstock Extension) mine is located in section 28, T. 15 N., R. 21 E., and was first developed as a gold and silver mine in the early 1920's. The property has been owned by various individuals who leased the mine to different operators until cessation of active development in the 1940's. Although no production is recorded, it is likely that some ore was extracted from this mine.

The Bunker Hill mine is located  $\frac{1}{2}$  mile northwest of McTarnahan Hill in section 31, T. 15 N., R. 21 E. This mine has been intermittently worked for gold and copper since the early 1940's. The mine is now apparently inactive, but two "caretakers" reside on the property.

AEC Records (11) indicate an uranium prospect in section 16(?), T. 15 N., R. 21 E. There has been no production.

Numerous other gold, silver, copper, tungsten, and iron prospects are located in the Delaware area. These prospects are all small, and almost without exception exploration and development has been limited to bulldozer cuts and small prospect pits.

#### GEOLOGICAL AND TECHNICAL DATA

The oldest rocks in the Delaware area are metamorphic rocks of Triassic and Jurassic age. These metavolcanic and metasedimentary rocks occur as roof pendants or septa surrounded by younger Cretaceous intrusive rocks of granitic composition. Unconformably overlying these older rocks are tuffs, breccias, and flows of the Tertiary Hartford Hill Rhyolite, Alta Formation, and Kate Peak Formation.

Magnetite and hematite occur along a fault zone in Tertiary andesite flows and breccias at the Bessemer mine. Past mining operations have been confined to a relatively small, lenticular ore body that is



presently exposed in an open pit at the property. Additional trenching in the area has exposed several smaller ore bodies. Reeves (8) reports that many of the prominent iron-bearing outcrops in the area are highly silicious and do not constitute ore; some material extracted from the mine was rejected at the mill because of high silica and low iron content. Iron ore float was noticed during a reconnaissance on the area south of the Bessemer mine (in section 33). Several superficial bulldozer cuts attempt to explore the occurrences, but no appreciable mineralization has as yet been exposed. A geomagnetic map of the Bessemer mine is included as an attachment (8).

Bulldozer cuts expose magnetite and hematite at the Capital mine. The mineralization occurs within fault zones in diorite rocks. Veinlike iron bodies are exposed over a distance of about 200 feet and the veins vary in thickness from several inches to about 18 feet. None of the individual occurrences exceed 75 feet in length. A sample cut across the largest exposure assayed 64.3 percent iron and less than 0.02 percent sulfur and phosphorous combined (8). Several hundred yards west of the mine a small garnet skarn has been exposed in a shallow bulldozer cut. No mineralization of potential economic interest was noted in the skarn.

The rocks in the vicinity of the Valley View mine are slates, phyllites, and hornfels that have been intruded by granitic rocks. Scheelite occurs in a skarn developed along the intrusive contact. Bailey and Phoenix (1) report that cinnabar occurs in a three foot wide fracture zone in the metasedimentary rocks. Malachite and azurite are present on the mine dumps of this property.

The Dixon mine reportedly explores veinlets of tungsten-bearing manganese oxide in brecciated and silicified tuffs of the Hartford Hill Rhyolite (6).

The Bidwell mine explores gold and silver veins in Tertiary andesite. Chalcopyrite, malachite, azurite, magnetite, and specular hematite are present on the mine dumps of this property. Gangue minerals consist of calcite, quartz, and silicified andesite breccia. Reconnaissance immediately north of the mine revealed a local abundance of specular hematite float.

The Bunker Hill mine is located on a north-trending normal fault that cuts metasedimentary rocks of Triassic or Jurassic age. Malachite and azurite are present on the dumps of this mine. No primary sulfides were noted.

Uranium mineralization is reported to occur in a one foot thick zone of kaolinized and brecciated rhyolite. Autunite is the only radioactive mineral identified. One assay indicated 0.05 percent equivalent  $U_3O_8$  (11).



POTENTIAL FOR DEVELOPMENT

Although there are numerous prospects and inactive mines in the Delaware area, the potential for production from these properties is generally remote. To be sure, rapidly increasing prices for gold and other metals will spark renewed interest and exploration at these locations, but the mode and extent of mineralization suggests that subsequent development on anything but a small-scale is unlikely.

For the area as a whole, however, the potential for the occurrence of economic ore is considerably greater. Favorable geology, manifested in the extensive occurrences of basement rocks at the surface and at shallow depths and numerous "showings" throughout the area make an attractive supposition that significant mineralization may exist which heretofore has not been discovered.

Past mining operations in the area consist of numerous prospect pits, shafts, and adits. Future activities are expected to essentially the same. Should low-grade mineralization of minable grade and extent be discovered, it would be worked by open pit methods.

COMPANIES AND CLAIMANTS ACTIVE IN AREA

- |  |  |   |
|--|--|---|
| 1. BENTONITE #1<br>Mel Colgrove<br>1871 N. Lompa<br>Carson City, Nev.<br>April 1973<br>(1 placer claim)                      | 2. B & L Group<br>J. Bunkowski<br>P. O. Box 718<br>Carson City, Nev.<br>April 1968<br>(24 lode claims)                 | 3. ORESTIMBA Group<br>H.A. Chavez, et.al.<br>4 Kimberly Circle<br>Carson City, Nev.<br>Sept. 1967, Apr. 1968<br>(320 acre placer claim) |
| 4. WILDE HORSE Group<br>Tim Dehavens<br>c/o Majid Shokihi<br>770 Mt. Rose, Reno<br>Aug. 1972<br>(29 lode claims)             | 5. RED MOSS Group<br>R.E. Chaney, et.al.<br>2530 Empire Ranch Rd.<br>Carson City, Nev.<br>Oct. 1960<br>(2 lode claims) | 6. MONARCH<br>J.M. Heizer<br>Box 30<br>Reno, Nev.<br>Mar. 1935<br>(1 lode claim)  |
| 7. DISCOVERY MINE<br>J. DeNevi, et.al.<br>330 Boxer Dr.<br>Reno, Nev.<br>May 1970<br>(1 lode claim)                          | 8. DUKE Group<br>R. LaBerteans<br>5251 Ryan Rd.<br>Carson City, Nev.<br>June 1972<br>(12 lode claims)                  | 9. MINI<br>S.C. McAmis, et.al.<br>1150 Pinion Hills Dr.<br>Carson City, Nev.<br>Aug. 1968<br>(placer, millsite)                         |
| 10. SULFIDE BOXER Group<br>S.C. McAmis, et.al.<br>1150 Pinion Hills Dr.<br>Carson City, Nev.<br>Jul. 1968<br>(5 lode claims) | 11. EVENING STAR Group<br>Warren Swanson<br>#3 Savage Circle<br>Carson City, Nev.<br>Jun. 1966<br>(4 lode claims)      | 12. BLUE HILLS Group<br>Majid Shokihi<br>770 Mt. Rose<br>Reno, Nev.<br>Jul. 1972<br>(40+ lode claims)                                   |

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13. MARYSTEAD Group  
A.C. Wilson  
1490 Glendale Rd.  
Sparks, Nev.  
1962, 1965  
(7 lode claims)
14. SILICON Group  
Mary Aragon  
Box 378  
Carson City, Nev.  
(2 lode claims)
15. KEYSTONE Group  
Willie Miller  
Box 94  
Carson City, Nev.  
June 1946  
(6 lode claims)
16. CONTACT Group  
Sam Giurlani  
708 N. Walsh  
Carson City, Nev.  
1963  
(27 lode claims)
17. IRON KING Group  
John Tom Ross  
Box 635  
Carson City, Nev.  
(2 lode claims)
18. NO LODE Group  
L. H. Anderson  
502 E. Caroline  
Carson City, Nev.  
Jun. 1947  
(4 lode claims)
19. BIDWELL Group  
Howard Seeman  
2985 Slater Ave.  
Reno, Nev.  
Jun-Dec 1966  
(30 lode claims)
20. MILLEDGE  
Ray Conner, et.al.  
4 Kimberly Circle  
Carson City, Nev.  
Apr. 1968  
(50 acre placer)
21. BLUESTONE Group  
D.F.H. Dev. Corp.  
Masonic Bldg.  
Carson City, Nev.  
Aug. 1966
22. Capital iron Deposit  
Vincent Modarelli  
Aug. 1966
23. TEA Group  
Ron Morrison  
275 Bret Hart  
Reno, Nev.  
Nov. 1967  
(3+ lode claims)
24. SALLY Group  
Hicla Dev. Co.  
Box 621  
Reno, Nev.  
Mar. 1955  
(10 lode claims)
25. SAGE Group  
Geo. Folsom  
444 - 12th St.  
Sparks, Nev.  
Aug. 1967  
(lode claims)
26. XMAS TREE Group  
Earnest Rink  
302 E. Proctor  
Carson City, Nev.  
Jun. 1967  
(2 lode claims)
27. GLENDALE Group
28. FAITE Group  
E. Rink  
302 E. Proctor  
Carson City, Nev.  
Sept. 1967  
(4 lode claims)
29. YELLOW PINACLE Group  
Earnest Rink  
302 E. Proctor  
Carson City, Nev.  
Sept. 1969  
(6 lode claims)



## II. Carson District

The Carson district encompasses the southern slope of the Virginia Range north of Carson City, Eagle Valley, Prison Hill, and Hot Springs Mountain. The entire district is situated in Carson City County.

Prospecting began in the early 1860's and interest centered on the gold, copper, lead, and silver showings in the Virginia Range. More recently, tungsten and barite occurrences have been prospected.

There is no recorded production for the area prior to 1940. However, dimension stone has been quarried at the Nevada State Prison beginning in 1862. This stone was used in the construction of many of the early Reno and Carson City buildings, as well as the prison itself. Additionally, some gold and silver was produced between 1923 and 1932 from the reworking of mill tailings along a stretch of the Carson River.

In 1890 and again in 1914 attempts were made to recover gold and silver values (also mercury) from Comstock Lode tailings and amalgam discharged into the Carson River. Neither venture was economically successful.

Gypsite (a mixture of gypsum and soil) occurs about two miles east of the Carson City Airport. The gypsite has been used locally as a soil conditioner. The deposit is currently under a minerals patent application.

Red and black cinders are presently being extracted from a deposit southwest of McClellan Peak. Production to date has been moderate.

AEC records (11) indicate three uranium prospects in the Carson area. Two of the prospects are located in section 28, T. 15 N., R. 20 E., and the third prospect is located in section 33, T. 16 N., R. 20 E. There has been no production from these prospects.

### GEOLOGICAL AND TECHNICAL DATA

In the Carson area metamorphic rocks of Triassic-Jurassic age have been intruded by slightly younger granitic rocks. These two rock types probably underlie the heavily alluviated Eagle Valley. Well-cemented, coarse-grained, arkosic sandstone of probable Pleistocene age crops out at the Nevada State Prison. It is this rock that has been quarried for building stone.

In the southern Virginia Range all of the old gold, copper, lead, silver, and tungsten workings are located along the contact of granitic intrusives and metamorphic rocks. At the northern end of Prison Hill barite occurs in small pods in metavolcanic rocks.

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The gypsite occurs in terraces on the floor of Eagle Valley. According to Moore (6) the gypsite was derived from the erosion of a bedrock occurrence of gypsum to the northeast and was subsequently deposited along the shoreline of an ancient lake. The present geographical location of these two deposits leaves this interpretation open to some question.

The cinder deposit is correlated with the McClellan Peak Basalt of Pleistocene age.

Autunite and an unidentified radioactive mineral occurs at the uranium prospects. Mineralization occurs along small fractures and breccia zones in rhyolitic and metamorphic rocks. Assays indicate 0.013, 0.001, and 0.038 percent equivalent  $U_3O_8$  respectively (11).

#### POTENTIAL FOR DEVELOPMENT

The tailings discharged into the Carson River probably represent several millions of dollars in precious metal values. However, dilution by river sediments and the failure of past attempts to recover these values suggest that many problems must be solved before the metals could be recovered at profit. In all likelihood environmental considerations would prohibit any such venture in the future.

Both gypsite and cinders have been marketed from the district in the past and will continue to be extracted in the future. It appears, however, that the gypsite deposit is almost exhausted.

None of the uranium occurrences are of economic interest.

Considering the rest of the Carson district, it is unlikely that there will be any metals production in the future.

#### COMPANIES AND CLAIMANTS ACTIVE IN AREA

- |  |  |  |
|--|--|--|
| 1. SWEDE Group<br>Warren Swanson<br>P.O. Box 970<br>Carson City, Nev.<br>Jul. 1955<br>(6 lode claims)    | 2. GREY ROCK<br>Jack Taylor Jr.<br>1415 Skyline Blvd.<br>Reno, Nev.<br>(1 lode claim)                    | 3. GOING STRONG Group<br>David Strong<br>P.O. Box 307<br>Lockeford, Calif.<br>Nov. 1962<br>(2 lode claims) |
| 4. RED HILL #2<br>Michael Batesel<br>P.O. Box 559<br>Carson City, Nev.<br>Jul. 1955<br>(160 acre placer) | 5. CINDERLITE MILLSITE<br>Michael Batesel<br>P.O. Box 559<br>Carson City, Nev.<br>May 1958<br>(millsite) | 6. ENTERPRIZE<br>J. Bunkowski<br>P.O. Box 718<br>Carson City, Nev.<br>(placer claim)                       |

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|--|--|--|
| 7. 8 SPOT Group<br>Ernest Stemmer<br>Plaza Motel<br>Carson City, Nev.<br>(8 lode claims)                   | 8. LUCKY BIRD Group<br>Melville Colgrove<br>Box 149<br>Carson City, Nev.<br>(17 lode claims)                   | 9. LUCKY STRIKE Group<br>William Birney<br>Box 190<br>Carson City, Nev.<br>(9 lode claims) |
| 10. MULTIMTEALS Group<br>Am. Enterprises<br>575 Ballentine Way<br>Reno, Nev.<br>Apr. 1968<br>(lode claims) | 11. SMOKY METALS Group<br>George Hunt<br>P. O. Box 443<br>Carson City, Nev.<br>Mar-Apr 1968<br>(4 lode claims) | 12. MATCHES Group<br>Lloyd Layton<br>222 Earl Ave.<br>Roseville, Calif.<br>(6 lode claims) |

### III. Voltaire District

The Voltaire area is located along the east slope of the Carson Range, west and southwest of Carson City. The entire district is situate in Carson City County, Nevada.

In the early history of the area, around the 1860's, and after the turn of the century, several small gold, silver, copper, arsenic, and graphite mines were being actively developed. However, by 1932 all properties were inactive.

No production has been recorded for the district. However, Overton (7) indicates that some gold, silver, copper, zinc, and graphite has been produced.

#### GEOLOGIC AND TECHNICAL DATA

The oldest rocks in the area are Triassic-Jurassic metasedimentary and metavolcanic rocks that have been intruded granitic rocks of Cretaceous age. Gold, silver, and copper mineralization occurs in quartz veins in both the granitic and metamorphic units.

At the Premier mine (section 14, T. 15 N., R. 19 E.) copper mineralization occurs along the contact between the granitic and metamorphic rocks. The Chedic Graphite mine in section 25, T. 15 N., R. 19 E. has been developed on a lense of graphitic shale enclosed by metasedimentary rocks. The graphite has been mined by open pit methods.

#### POTENTIAL FOR DEVELOPMENT

The Voltaire area will undoubtedly continue to be prospected in the future because of its close proximity to Carson City. However, there is only a remote possibility that significant mineralization will be discovered.



COMPANIES AND CLAIMANTS ACTIVE IN AREA

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|---|--|--|
| 1. Premier Group<br>Mrs. A. Brucking<br>98 Mountain View Ave.<br>San Jose, Calif.<br>1926<br>(16 lode claims) | 2. LUCKY 13 Group<br>Leroy Winters<br>608 Jackson Way<br>Carson City, Nev.<br>July 1962<br>(3 lode claims) | 3. ALPHA CARSON Group<br>Geo. McKenzie<br>5259 Sepulveda<br>Sherman Oaks, Calif.<br>(43 lode claims) |
| 4. TYROS Group<br>A. M. Goodwin<br>P. O. Box 108<br>Carson City, Nev.<br>1964, 1966<br>(2 placer claims)      |  |  |

## IV. Mound House

The Mound House district is located in Lyon County and encompasses the area surrounding the old town of Mound House. Both rock gypsum and gypsite have been mined in the area. Couch and Carpenter (3) credit the district with about \$452,000 in production prior to 1940. Since this period probably in excess of several hundred thousand dollars of additional production has occurred.

Rock gypsum and gypsite are now being extracted from the area. The rock gypsum is now being used in the manufacture of Portland cement, but in the past the material was used for making plaster and wallboard. The gypsite is now being mined for use as a soil conditioner.

Dimension stone was at one time quarried in section 6, T. 15 N., R. 21 E.

The AEC reports (11) a uranium prospect in section 34, T. 16 N., R. 20 E. The prospect was probably originally located during the uranium "boom" of the 1950's. There has been no production.

GEOLOGICAL AND TECHNICAL DATA

The gypsum is associated with limestone of Triassic-Jurassic age. The relationship between the gypsum and the surrounding limestone is not well known and several theories have been postulated concerning the origin of the deposit. It has been suggested that the gypsum is syngenetic, epigenetic, or was formed by the diapiric injection of gypsum occurring beneath the present deposit (8).



According to Moore (6) the gypsite was derived from the erosion of the aforementioned rock gypsum occurrence and deposited in terraces along the shorelines of an ancient lake.

The dimension stone was quarried from rhyolitic rock of Tertiary age.

Autunite(?) reportedly occurs along a small fault in Tertiary rhyolitic rocks. Two chip samples assayed 0.046 and 0.34 percent equivalent  $U_3O_8$  (11).

#### POTENTIAL FOR DEVELOPMENT

Rock gypsum and gypsite are being produced from the area today and will continue to be produced in the future.

The dimension stone can be disposed of through mineral material sales. However, the market for dimension stone is sporadic at best and future production will depend upon an entrepreneur developing a market for the stone.

It is unlikely that the uranium prospect will be of economic interest.

#### COMPANIES AND CLAIMANTS ACTIVE IN AREA

- |   |   |   |
|---|---|---|
| 1. GYPSITE Group<br>J. Bunkowski<br>P. O. Box 718<br>Carson City, Nev.<br>1945, 1947, 1949<br>(placer claims) | 2. GLACIER KING Group<br>Clyde Garrett, et.al.<br>Silver City, Nev.<br>(3 lode claims)        | 3. REDROCK Group<br>Randell Wunghema<br>1829 Brown<br>Carson City, Nev.<br>Apr. 1960<br>(2 lode claims) |
| 4. PINENUT Group<br>Norman Pederson<br>316 E. Proctor<br>Carson City, Nev.<br>1967<br>(7 lode claims)         | 5. EXCELLSOR Group<br>J. Bunkowski<br>P. O. Box 718<br>Carson City, Nev.<br>(6 placer claims) |   |

#### V. Red Mountain

The Red Mountain area is north of U. S. Highway 50 in the foothills of the Flowery Range. The district includes a portion of both Storey and Lyon Counties and is situated about 8 miles northeast of Dayton. Prospecting activities have centered around tungsten, iron, copper, uranium, and pumice. Additionally, limestone is present in the area.



Approximately 240 tons of tungsten ore, averaging 0.89 percent  $WO_3$ , has been produced from the Pearl Harbor mine located in section 24, T. 17 N., R. 22 E. Production occurred during the demand for strategic materials in 1943. The property is presently idle.

The Dayton iron deposit in section 6, T. 17 N., R. 23 E. has been the site of considerable exploration activity. Besides numerous prospect pits, over 63,000 feet of core drilling has been accomplished to date on this property. The deposit is presently owned by the Utah Construction and Mining Company.

The Iron Blossom prospect is located in section 10, T. 17 N., R. 22 E. The deposit has been explored by shafts, trenches, and shallow drill holes. There has been no production. Another iron deposit, the Black Eagle prospect, is situated in the  $SE\frac{1}{4}SE\frac{1}{4}$  of section 25, T. 18 N., R. 22 E.

The Blackhawk mine is located in section 36, T. 18 N., R. 22 E., and in section 1, T. 17 N., R. 22 E. This mine has been explored for copper, but there is no recorded production. Some gold has been reportedly produced from the mine (4).

Since 1964 the Naturalite Corporation has been mining pumiceous rhyolite for their patented mining claims in sections 8, 9, 16, and 17, T. 17 N., R. 22 E. The material is crushed and screened at the site and the resulting aggregate used in the manufacture of lightweight cement and building blocks. In the past the company has supplied markets both in Nevada and northern California.

Limestone occurs in the vicinity of the Dayton iron deposit and the Iron Blossom prospect. There has, however, been no production.

AEC records (11) indicate a uranium prospect in section 23, T. 17 N., R. 22 E. Mining activities at this property have only been exploratory in nature, and there has been no production.

A portion of the district encompassing Alkali Flats has been declared prospectively valuable for sodium and potassium by the U.S.G.S.

#### GEOLOGICAL AND TECHNICAL DATA

The oldest rocks in the area are Mesozoic metamorphic rocks that have been intruded by younger rocks of granitic composition. Unconformably overlying these older rocks are Tertiary volcanic flows, tuffs, and breccias.

Scheelite and quartz occurs at the Pearl Harbor mine in a small tactite body in a hornfels intruded by granite.

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Iron mineralization at the Dayton iron deposit and the Iron Blossom prospect occurs in metamorphic roof pendants in granitic rock. Both occurrences of iron are genetically related to the intrusion of the granite. The Iron Blossom prospect is a replacement type deposit wherein mineralization has locally replaced shaley limestone along bedding plants. Three composite chip samples averaged 62.3 percent iron, 0.10 percent sulfur, and 0.25 percent phosphorous. Magnetite is the chief ore mineral. A magnetic map of the Iron Blossom prospect is included as an attachment (8). The Dayton iron deposit is a contact metamorphic occurrence of hematite and magnetite. Limonite and pyrite are also present. The deposit has formed along the contact zone between a granitic intrusive and metamorphosed sedimentary rocks. Assays of five composite drill cores indicate 51.6 percent iron, 7.0 percent silica, and 4.1 percent sulfur (8). At the Black Eagle prospect, magnetite occurs in a granofels adjacent to dioritic rocks. Rose (9) reports a considerable quantity of low-grade iron ore, possibly averaging about 20 percent iron, at this property.

Chalcopyrite and copper oxides occur in granitic and metamorphic rocks at the Blackhawk mine. Mineralization occurs as disseminations of primary sulfides and as stains of secondary copper minerals. Five samples were submitted for analysis in 1959 and showed only traces of gold and silver (4).

At the Naturalite Property pumiceous rhyolite intrudes the Kate Peak Formation, forming two conspicuous domes. Some of the deposit is highly brecciated but grades into more massive material over a distance of several feet. Specific gravity of the rock varies from 1.37 to 1.93. (2).

Mesozoic and Pleistocene limestone crops out within the area of the Dayton iron deposit. The older limestone has been partially metamorphosed and is the host rock for the ores at the iron deposit. Analysis of the limestone gave the following results: CaO 48.84 percent; MgO 0.26 percent; K<sub>2</sub>O 0.024 percent; Na<sub>2</sub>O less than 0.05 percent; Fe 0.71 percent; R<sub>2</sub>O<sub>3</sub> 11.24 percent; and insolubles (mainly SiO<sub>2</sub>) 10.06 percent. The Pleistocene limestone has been formed by the action of hot springs. Analysis of a sample gave the following results: CaO 51-89 percent; MgO 0.44 percent; K<sub>2</sub>O 0.028 percent; NaO less than 0.05 percent; R<sub>2</sub>O<sub>3</sub> 5.68 percent; insolubles (mainly SiO<sub>2</sub>) 8.22 percent (9).

Uranium mineralization reportedly occurs in a fault zone in altered volcanic rock. A two foot chip sample assayed 0.40 percent equivalent U<sub>3</sub>O<sub>8</sub> (11).



On the basis of the existence of an ancient playa lake in Alkali Flats, the USGS has declared the area to be prospectively valuable for the occurrence of sodium and potassium.

#### POTENTIAL FOR DEVELOPMENT

Production of iron from the Dayton iron deposit will occur sometime in the future. The present price structure of iron does not warrant exploitation at this time. However, should premium overseas prices develop (from Japan most likely) or a favorable long-term domestic contract be negotiated, development would be immediate. The ore would be mined from a large open pit and processed on the site. A mine life of at least ten years is anticipated.

Concerning the iron mineralization in section 25, T. 18 N., R. 22 E., Rose (9) reports that this occurrence seems to have economic possibilities. Considering the more advantageous Dayton iron deposit, however, it is unlikely that the Black Eagle prospect or the Iron Blossom prospect will be economically feasible in the near future.

The copper showings at the Blackhawk mine are sporadic and of doubtful economic potential. Gold and silver potential is negligible.

The tungsten occurrences at the Pearl Harbor mine are small and if the property has not been mined out it is unlikely that enough ore is available to warrant any attempts at production in the future.

Available reserves of pumiceous rhyolite at the Naturalite property are large enough to sustain mining operations for many years. Extraction will continue to be by open pit methods.

There is no present market for the limestone in the area and it is doubtful that any material will be extracted in the future.

Although the sample taken at the uranium prospect indicates ore grade material it is not known how representative it is of the prospect as a whole. However, the lack of subsequent development suggests that the property is submarginal. It is unlikely that the prospect will be of interest in the future. The potential for other occurrences in the area, perhaps of greater economic significance, is unknown.

Although Alkali Flats has been declared prospectively valuable for sodium and potassium, there is little significant potential for the occurrence of these "leasing act" minerals and no exploration activities are anticipated.

Bennett, May 1973



COMPANIES AND CLAIMANTS ACTIVE IN AREA

- |  |  |  |
|--|--|--|
| 1. IRON BLOSSOM<br>Melville Colgrove<br>Lucky Lane Mobil<br>Home Park<br>Reno, Nev.<br>July 1959<br>(lode claim) | 2. NATURALITE Group<br>Naturalite Corp.<br>June 1962<br>(placer claims)                            | 3. LAVA CAP Group<br>G. C. Vargioly<br>Box 108<br>Carson City, Nev.<br>(7 lode claims) |
| 4. BLUESTONE Group<br>Larry Kaylor<br>2202 Utah St.<br>Carson City, Nev.<br>(3 lode claims)                      | 5. MURRAY STONE<br>Chet Meyer<br>P.O. Box 245<br>Winnemucca, Nev.<br>1968, 1969<br>(3 lode claims) |  |

## VI. Silver City

The Silver City district is located northwest of Dayton in Lyon County. The lode mineralization in the area is a continuation of that of the Comstock Lode district.

Regarding the history and production of the area, Moore (6) states that:

"The first gold discovered in the Silver City district was panned in 1850 from the south end of Gold Canyon, near Dayton, by members of an immigrant train bound for California. This was the first discovery of gold in what is now the State of Nevada. Placer mining continued in the area for the next 9 years, and in 1859 gold was discovered in place at the outcrop of the Comstock fault near Gold Hill 2 miles north of the Lyon County boundary. This discovery precipitated the rush to the Comstock region, which eventually produced about \$400,000,000 in silver and gold.

"The main north-trending Comstock fault does not extend into Lyon County, but a southern branch, the Silver City fault, and many cross faults have been productive in Lyon County. Two of the most productive mines on the Silver City fault are the Dayton and Daney. The Oest mine is located on the Haywood or Oest fault, which is an east-trending cross fault.

"Large quantities of hot water hampered mining operations in the mines of the Comstock Lode, and enormous volumes of water were pumped to keep the mines open. In 1865 the Nevada



Legislature passed an act giving Adolph Sutro an exclusive franchise to build a tunnel 20,498 feet long to drain the mines. The portal of the tunnel is in Lyon County a few miles north of Dayton at an elevation of 4,479 feet. The tunnel was completed in 1878, at which time the rich ore bodies were already mined out, and several shafts were as much as 1,500 feet deeper than the tunnel level.

"Couch and Carpenter (3) give the recorded production of the district through 1940 as \$12,740,785.

"In addition to the deep lode mining on the Silver City and related faults, large-scale dredging and placer mining have been productive in the Silver City district. The Gold Canyon Dredging Co. produced \$309,750 from 3,000,000 yards of gravel southwest of Gold Canyon in 1920-1923.

"In 1940 the Oro-Neva Dredging Co. Produced \$127,577 in placer gold. From 1941-1943 the Dayton Dredging Co. produced \$1,115,752 from an area 2,000 feet wide and 2,200 feet long on the north side of U.S. Highway 50 within the townsite of Dayton."

#### GEOLOGICAL AND TECHNICAL DATA

The oldest rocks in the Silver City area are Triassic-Jurassic meta-volcanic and metasedimentary rocks. Unconformably overlying these rocks is the oldest Tertiary formation, the Hartford Hill Rhyolite. The Hartford Hill Rhyolite is overlain by the Alta Formation, which consists of andesitic flows and breccias. The Alta Formation is overlain by the Mio-Pliocene Kate Peak Formation, which consists of flows, breccias, tuff breccias, and tuffs of andesitic to rhyodacite composition.

The Silver City fault, a branch of the Comstock fault, is the most important structural feature in the district. The Silver City fault dips about 45° east, trends southeastward, and is extensively mineralized.

Numerous northeast- and southwest-trending faults occur in the area. Several of these cross faults intersect the Silver City fault and contain mineralization.

The veins in the Silver City area consist of quartz and/or calcite containing pyrite, gold, silver, electrum, occasionally argentite, and rarely chalcopyrite. Sulfides constitute 1 to 2 percent of the vein material.



POTENTIAL FOR DEVELOPMENT

The Silver City area will be the site of future exploration activities using modern geological techniques. The area will again be a producer of gold and silver ores should the prices of these precious metals continue to rise. It is anticipated future ore extraction will be by open pit operations and/or underground methods suitable for handling large tonnages of low-grade ores.

COMPANIES AND CLAIMANTS ACTIVE IN AREA

- |   |  |  |
|---|--|--|
| 1. NEVADA DAY Group<br>N. Lamb, et.al.<br>1949, 1952, 1967<br>1969<br>(4 lode claims)   | 2. PO Group<br>Stan Springmeyer<br>P. O. Box 74<br>Minden, Nev.<br>Dec. 1951<br>(lode claim) | 3. GOLD STAR<br>Stan Springmeyer<br>P. O. Box 74<br>Minden, Nev.<br>(placer claim) |
| 4. CONGRESS Group<br>Stan Springmeyer, et.al.<br>P. O. Box 74<br>Minden, Nev.<br>1941, 1953, 1966, 1967,<br>1972<br>(placer claims) |  |  |

## VII. Comstock District (including Flowery and Occidental Lode Districts)

The Comstock Lode district is situated around the town of Virginia City. The area extends from Mt. Davidson on the west to the mouth of Sixmile Canyon on the east, and from Silver City on the south to Orleans Hill on the north.

A voluminous amount of literature has been written on the history and geology of the district. Concerning the history and production of the Lode, Bonham (2) states that:

"The Comstock Lode was discovered in the 1850's, and by 1863 had produced about \$10 million of gold and silver from near-surface ores largely by crude mining and milling methods. This substantial production for high-grade ores aroused great interest in the Comstock Lode and it developed during the late 1860's into a major mining district with a number of large mining companies. Several large, high-grade ore bodies or bonanzas were found in this period, and mining, milling, and transportation facilities were markedly improved. The 1870's saw the discovery of a large high-grade ore body on the 1000-foot level of the Crown Point mine, and the



discovery of the famous "Big Bonanza" in the Consolidated Virginia mine. Nearly \$200 million was produced from 1871 to 1880 from about four million tons of ore for an average value of \$50 per ton.

"Production from the Comstock Lode sharply declined after 1880 and the total production from the district during the years 1880 to 1900 was approximately \$49 million from ore with a grade of less than \$20 per ton in gold and silver.

"During the period 1900 to 1920 deep mining and exploration below the Sutro Tunnel level was carried on by the North End Mines, but excessive pumping costs at the deeper levels finally forced the companies to abandon mining operations below the Sutro Tunnel level. Elsewhere on the Lode, operations during this period were largely confined to mining old stope fills and low-grade ore in the upper levels and the treatment of old dumps. During this period \$12 million in gold and silver was produced from ore averaging less than \$10 per ton.

"The period from 1920 to 1950 was marked by the mining of large tonnages of low-grade ore from open pits and from underground by block-caving and top slicing methods. Approximately \$28 million in gold and silver was produced from the Comstock Lode district in this period. Mining in the Comstock Lode district virtually ceased after 1950....

"Various exploration projects have been carried on in the district in recent years, primarily due to increased economic interest in the precious metals. An exploration program in the Gold Hill area of the Comstock Lode, was initiated in 1968 by the Mineral Resources Division of the Union Pacific Co., with the announced objective of attempting to develop sufficient silver-gold ore for an open pit mining operation.

"The total recorded production for the Comstock Lode from 1859 to the present is \$393,963,725, virtually all of which was gold and silver."

#### GEOLOGICAL AND TECHNICAL DATA

The geology of the Comstock Lode area has been aptly summarized by Bonham (2) who states:

"The oldest rocks exposed on the Comstock Lode district are Triassic(?) metavolcanic and metasedimentary rocks, which



crop out in the southern part of the district around American Flat and Silver City.

"The metamorphic rocks were regionally metamorphosed, folded, and intruded by quartz monzonite of Cretaceous(?) age.

"The oldest Tertiary formation in the area is the Hartford Hill Rhyolite, about 1,000 feet thick, which is extensively exposed in the southern part of the district.

"The Hartford Hill Rhyolite is overlain by the lower and/or middle Miocene Alta Formation, approximately 2,700 feet thick, which consists of pyroxene and hornblende andesite and breccias, and one sedimentary unit, the Sutro Tuff, composed of waterlain tuff, shale, sandstone, and conglomerate. The Alta Formation crops out over about half of the Comstock Lode district, and is the main host rock for the gold-silver deposits of the district. The Alta is pervasively propylitized in the Comstock Lode district and it is also pyritized over large areas. Surficial oxidation of the pyritized rock has given rise to extensive areas of bleached rock within the district.

"A small stock of Davidson Granodiorite forms the summit area of Mount Davidson in the footwall block of the Comstock fault. It intrudes the Alta Formation and is older than at least part of the Kate Peak Formation, since it is cut by andesite dikes of the Kate Peak Formation.

"The Alta Formation is overlain in the Comstock Lode district by the Mio-Pliocene Kate Peak Formation, which consists of more than 2,000 feet of flows, breccias, tuff breccias, and waterlain tuffs and tuffaceous sediments.

"The next younger unit is the Knickerbocker Andesite. It is probably Pliocene in age.

"Remnants of a flow of McClellan Peak Olivine Basalt of Pleistocene age, occur in the American Flat area.

"The most conspicuous structural features in the district and the most important economically, are the Comstock and Silver City faults. The Silver City fault is apparently a branch of the Comstock fault. The bonanza ores of the Comstock Lode occurred in the Comstock fault and its hanging wall branches. The main Comstock fault trends north-northeast and dips about 45° east. The Silver City fault joins the Comstock fault a short distance south of



Gold Hill. It trends southeastward, dips about 45° east, and like the Comstock fault, it is extensively mineralized.

"The Occidental fault, located about 2 miles east of the Comstock fault, is essentially similar to the Comstock fault in strike and dip and is also mineralized although the production for the Occidental lode has been only a small fraction of the production from the Comstock Lode.

"A number of northeast- and northwest-trending faults also occur in the Comstock Lode district. The northeast-trending faults are particularly abundant in the southern part of the district. Several of these faults intersect and displace the Silver City fault. Some mineralization occurs along the northeast-trending faults near the Silver City fault and in the vicinity of Sixmile Canyon.

"The valuable ore deposits of the Comstock Lode are epithermal precious-metal veins that occur in and adjacent to the major faults of the district. Virtually all of the production from the district has come from veins in the Comstock fault, the famed Comstock Lode, and in the Silver City fault.

"The Comstock Lode consists of a large body of brecciated vein quartz and highly altered andesite formed along the Comstock fault and in nearly vertical hanging wall fractures connected with the Comstock fault. Bonanza ore bodies containing abundant silver and gold occurred at irregular intervals along the fault and in the hanging wall fractures.

"The bonanza ores consisted of quartz, with sparse to abundant calcite, containing abundant sphalerite, galena, chalcopyrite, and pyrite accompanied by lesser amounts of argentite, gold, and polybase.

"The Occidental Lode or vein consists of quartz, calcite, and andularia. Andularia locally constitutes up to 15 percent of the vein matter. The small ore shoots found in the Occidental Lode were apparently similar in mineralogy to those of the Comstock Lode.

"The Flowery Lode in Sixmile Canyon consisted of a stockwork of gold- and silver-bearing veinlets in a shear zone 400 to 500 feet wide, which strikes N. 70°-80° E. and dips 45° southeast. It was mined by open pit methods. The host rock for the Flowery Lode is the Alta Formation.



Based upon K-Ar age determinations, Bonham (2) indicated that "the epithermal precious-metal mineralization in the Comstock Lode district is late Miocene or early Pliocene in age, and that it is apparently younger than at least part of the Kate Peak Formation."

#### POTENTIAL FOR DEVELOPMENT

As the price of precious metals continues to rise the Comstock Lode will be the site of renewed exploration activities. The area will again be a producer of gold and silver ores. However, none of the high-grade bonanzas that contributed the bulk of metals production in the late 1800's are expected to be encountered. Instead, ores will be mined by open pit operations and/or underground methods suitable for handling large tonnages of low-grade ores.

#### COMPANIES AND CLAIMANTS ACTIVE IN AREA

- |  |   |  |
|--|---|--|
| 1. FT KNOX, FEE Group<br>Hughes Tool Co.<br>Sept. 1969<br>(placer claims)  | 2. NEW OPHIR Group<br>Thomas Boness<br>1661 Manzanita<br>Chico, Calif.<br>Nov. 1967<br>(8 lode claims)  | 3. PAM Group<br>Comstock Lode Silver-Copper Mines Inc.<br>239 South Beverly Dr.<br>Beverly Hills, Cal.<br>(10 lode claims) |
| 4. HILLSIDE Group<br>Sutro Tunnel<br>Coalition, Inc.<br>105 Montgomery St<br>San Francisco, CA<br>(lode claims)    | 5. BUTTON-BUTTON Group<br>Russel Button<br>1590 Hillside<br>Reno, Nev.<br>1968, 1969<br>(placer claims) | 6. SILVER STAR Group<br>G. Antonovich<br>345 N. O'Brien<br>Sparks, Nev.<br>1968-70<br>(10 lode, placer claims)             |
| 7. NORTH VIRGINIA Group<br>Joseph A. Ramos<br>29 N. B St.<br>Virginia City, Nev.<br>1964, 1967<br>(17 lode claims) | 8. FORTUNATA Group<br>Ray Kelbch<br>1325 Lander St<br>Reno, Nev.<br>1970<br>(10 lode claims)            | 9. HAPHAZARD<br>William Sparge<br>P.O. Box 34<br>Virginia City, Nev.<br>Aug. 1972<br>(1 lode claim)                        |
| 10. OVERLAND Group<br>R. W. Delamare<br>(lode claims)  | 11. UNDERGROUND Group<br>James Sullivan<br>701 Maplewood Dr.<br>Reno, Nev.<br>(3 lode claims)           | 12. LAST CHANCE FRACTION<br>J. H. S. Stoddard<br>(1 lode claim)  |
| 13. CEDAR HILL Group<br>Arnold Casey, et.al.<br>P. O. Box 43<br>Monaton, Calif.<br>(7 lode claims)                 | 14. LADY BRYAN Group<br>United Mines Co.<br>(lode claims)   | 15. GOLD STRINGER<br>Fred Andreasen<br>Virginia City, Nev.<br>May 1920<br>(lode claim)                                     |

Bennett, May 1973



16. NORTHWIND 1 Group  
Francis D. Gifford  
16631 Charles Ln.  
Huntington Beach, CA  
(lode claims)
17. CCM Group  
Siskon Corp.  
P. O. Box 889  
Reno, Nev.  
(3 lode claims)
18. PYRAMID Group  
Greg, Fred Hess  
Box 314  
Virginia City, Nev.  
1963, 1968  
(3 lode claims)
19. AMERICAN EAGLE  
Amelia Lindersmith  
Box 894  
Babbit, Nev.  
Jan. 1897  
(1 lode claim)
20. MORNING STAR Group  
Edward Borland  
29 N. B St.  
Virginia City, Nev.  
1964  
(10 lode claims)
21. BISHOP Group  
Maybelle Ebey  
5950 Bedford Rd.  
Detroit, Mich.  
1963  
(13 lode claims)
22. UTAH NO 2  
Kathryn Carter  
P.O. Box 394  
Virginia City, Nev.  
Mar. 1962  
(1 lode claim)
23. JOE DANDY Group  
Wm. Tankersley  
P.O. Box 120  
Virginia City, Nev.  
Oct. 1969  
(3 lode claims)
24. MARQUITA  
Don McGuirk  
P.O. Box 444  
Virginia City, Nev.  
May 1947  
(lode claim)
25. SQUARE BOY Group  
Kenneth Rule  
P.O. Box 44  
Virginia City, Nev.  
1958, 1959  
(lode claims)
26. AFTERTHOUGHT Group  
Mervin Gallager  
Virginia City, Nev.  
Jan. 1941  
(2 lode claims)
27. BALD EAGLE  
Albert Evans, et.al.  
Virginia City, Nev.  
Oct. 1938  
(lode claim)
28. DEEP CANYON Group  
Anel Mobley  
160 Hubbard Way  
Reno, Nev.  
(6 lode claims)
29. MIDAS Group  
Emma Bennett Estate  
Box 35  
Silver City, Nev.  
1892, 1912  
(2 lode claims)
30. ROSE QUARTZ  
Fred Andreasen  
Box 427  
Virginia City, Nev.  
1965  
(lode claim)
31. DELTA PLACER  
Donly Grey  
Box 4793  
Elverta, Cal.  
Jul. 1967  
(placer claim)
32. ORO Group  
H. Kiehlbauin  
P.O. Box 398  
Virginia City, Nev.  
Sept. 1972  
(4 lode claims)
33. PHIL SHERIDAN  
Steve Okeefe  
9892 Frederick Circle  
Huntington Beach, CA  
Jul. 1972  
(lode claim)
34. SULPHARINA Group  
Bill, James Obester  
Box 123  
Virginia City, Nev.  
1960-1971  
(13 lode claims)
35. CENTIPEDE Group  
Roy Obester, et.al.  
1961  
(7 lode, placer claims)
36. COMSTOCK VENTURE Group  
Intermountain Expl. Co.  
Box 473  
Boulder City, Nev.  
1961, 1969  
(10 lode claims)



- |   |   |  |
|---|---|--|
| <p>37. NIGGER RAVINE EXT<br/>Charles Stone<br/>Box 492<br/>Virginia City, Nev.<br/>(lode claim)</p>       | <p>38. THREE BROTHERS Group<br/>John Bennetts<br/>Box 35<br/>Silver City, Nev.<br/>1961, 1972<br/>(3 lode claims)</p> | <p>39. RIORDAN Group<br/>William Riordan<br/>1000 W. Washington<br/>Carson City, Nev.<br/>May 1968<br/>(2 lode claims)</p> |
| <p>40. EMMA NEVADA<br/>John Bennetts<br/>Box 35<br/>Silver City, Nev.<br/>Sept. 1972<br/>(lode claim)</p> |   |  |

SELECTED REFERENCES

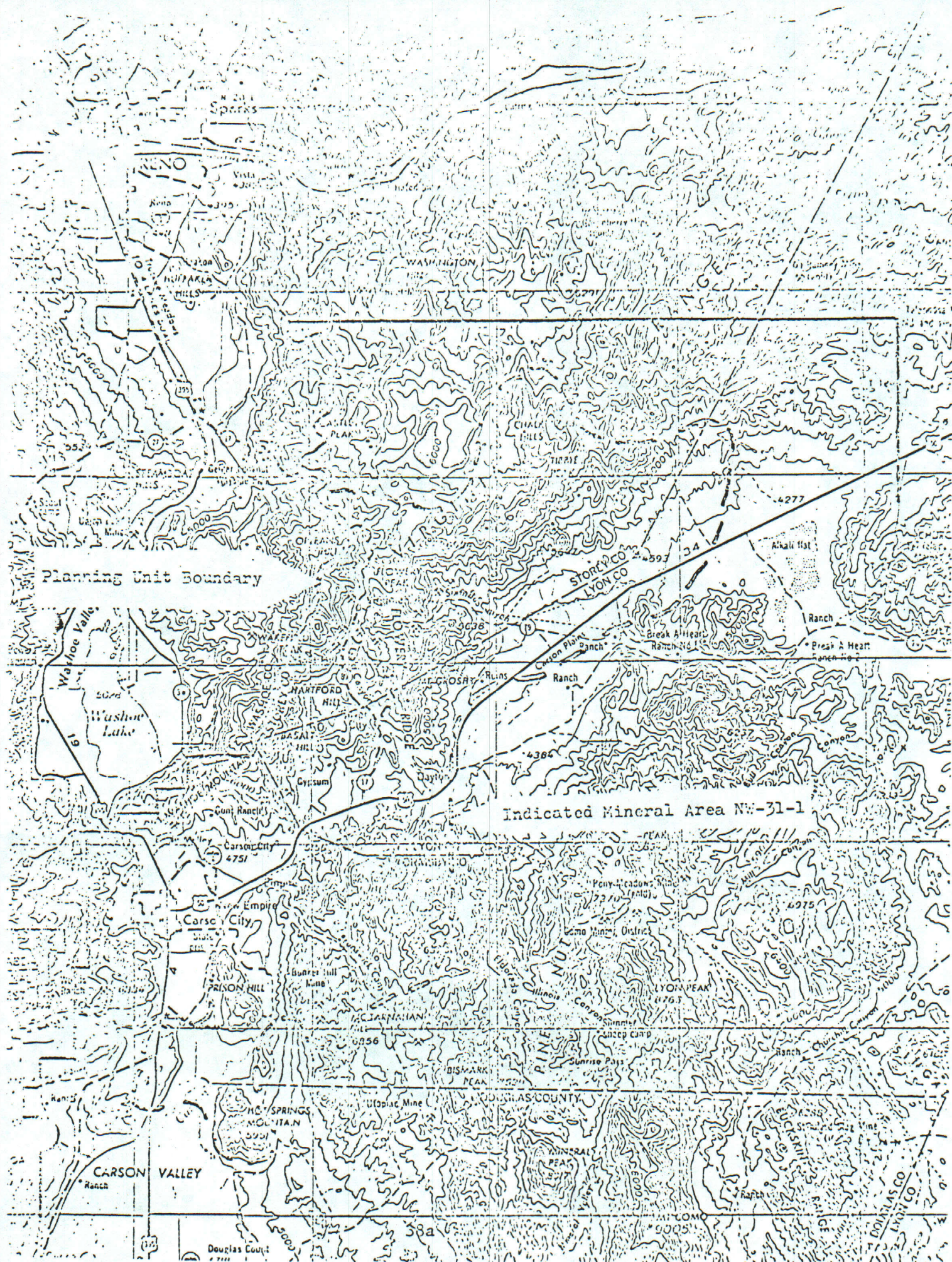
1. Bailey and Phoenix: Quicksilver Deposits in Nevada; Univ. Nev. Bull. 5, 1944.
2. Bonham and Papke: Geology and Mineral Resources of Washoe and Storey Counties, Nevada; Nev. Bur. Mines Bull. 70, 1969. (Includes geologic map of a portion of the resource area)
3. Couch and Carpenter: Nevada's Metal and Mineral Production; Univ. Nev. Bull. 4, 1943.
4. Lovejoy: Validity Determination and Mineral Appraisal of Curtis-Wright exchange; BLM T & R File, 1959 (unpublished).
5. Horton: An Inventory of Barite Occurrences in Nevada; Nev. Bur. Mines Report 4, 1963.
6. Moore: Geology and Mineral Deposits of Lyon, Douglas, and Ormsby Counties, Nevada; Nev. Bur. Mines Bull. 75, 1969. (Includes geologic map of a portion of the resource area).
7. Overton: Mineral Resources of Douglas, Ormsby, and Washoe Counties; Univ. Nev. Bull. 9, 1947.
8. Reeves, et.al.: Iron Ore Deposits of Nevada, Part B; Nev. Bur. Mines Bull. 53, 1958.
9. Rose: Geology of Parts of the Wadsworth and Churchill Buttes Quadrangles, Nevada; Nev. Bur. Mines and Geol. Bull. 71, 1969.
10. Stoddard and Carpenter: Mineral Resources of Storey and Lyon Counties, Nevada; Univ. Nev. Bull. 1, 1950.
11. US AEC: Reports of Uranium Investigations, 1955 (unpublished).

FIELD EXAMINATION

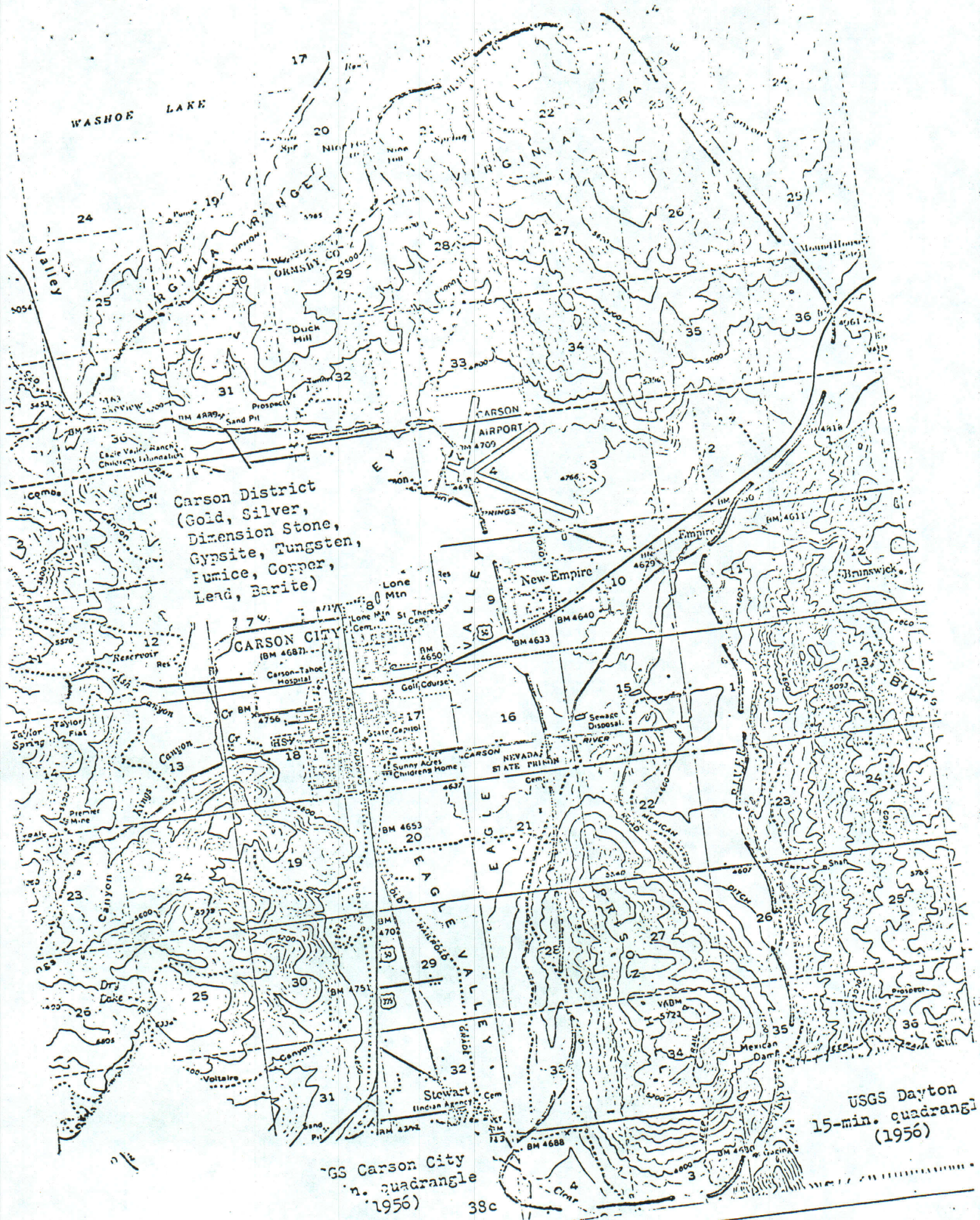
Bennett, Apr., May 1973

Bennett, May 1973









Carson District  
(Gold, Silver,  
Dimension Stone,  
Gypsite, Tungsten,  
Pumice, Copper,  
Lead, Barite)

CARSON CITY  
(BM 4687)

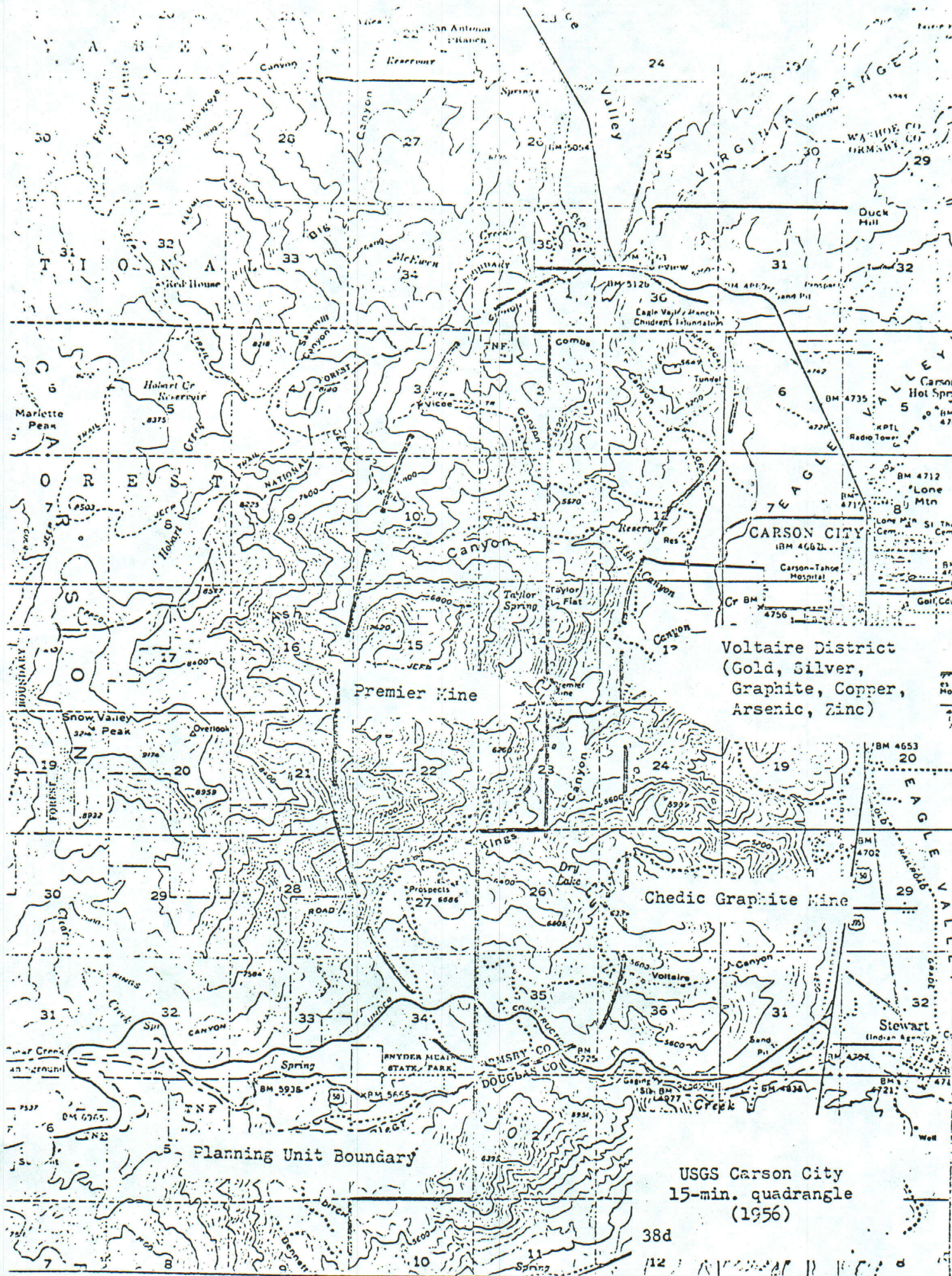
CARSON  
AIRPORT  
(BM 4709)

USGS Dayton  
15-min. quadrangle  
(1956)

USGS Carson City  
n. quadrangle  
(1956)

38c





USGS Carson City  
15-min. quadrangle  
(1956)

38d



Found House District  
(Gypsum, Gypsite,  
Dimension Stone,  
Uranium)

USGS Dayton  
15-min. quadrangle  
(1956)



Red Mountain District  
(Pumice, Tungsten, Iron,  
Gold, Copper, Uranium,  
Limestone, Sodium and  
Potassium)

Blackhawk Mine

Farrel Spring

Dayton Iron Deposit

Iron Blossom Prospect

Naturalite Pumice Deposit

Pearl Harbor Mine

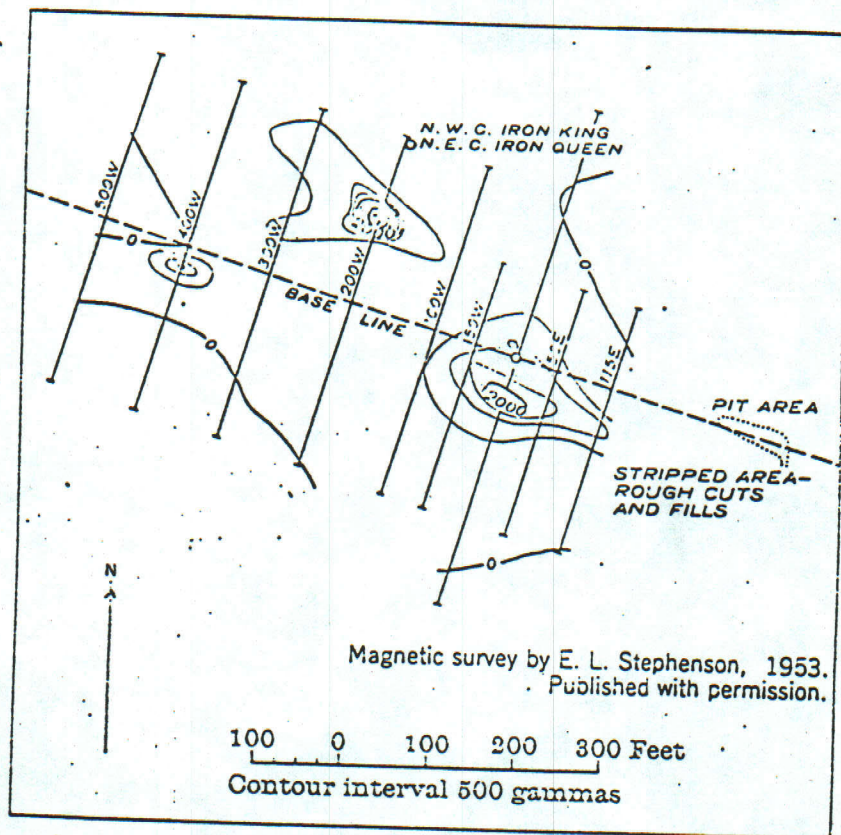
Planning Unit Boundary

USGS Virginia City  
15-min. quadrangle  
(1950)

USGS Churchill Butte  
15-min. quadrangle  
(1957)

38f





Magnetic map of the Bessemer iron prospect, Ormsby County,  
Nev.





USGS Virginia City  
15-min. quadrangle  
(1950)

38g







*Taken from:*

Mineral Resources Inventory and Analysis  
of the  
Pine Nut Planning Unit

Carson City District  
Nevada and California

By  
R. E. Bennett  
1973

~~see~~ Douglas County - general

Item 15

for preface & general  
background information

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