History of the Buckhorn and Related Mines, Lemhi County, Idaho

Victoria E. Mitchell

Staff Report 07-8
August 2007

Idaho Geological Survey
Morrill Hall, Third Floor
University of Idaho
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INTRODUCTORY NOTE

This report was prepared under a cooperative agreement with the U.S. Bureau of Land Management as part of an ongoing project to identify and describe inactive and abandoned mines in Idaho. The information in this report is from a number of published and unpublished sources in the Idaho Geological Survey's mineral property files. Where not otherwise noted, most of the mine production data is drawn from the U.S. Geological Survey’s (USGS) annual volumes on *Mineral Resources of the United States* (1882-1923) and the equivalent volumes produced by the U.S. Bureau of Mines (USBM), *Mineral Resources of the United States*, 1924-1931, and *Minerals Yearbook*, 1932 to 1984; since 1995, the *Minerals Yearbook* has been published by the U.S. Geological Survey. Information on underground workings and mine equipment is generally from the annual reports of the Idaho Inspector of Mines (IMIR) published from 1899 to 1979. After 1974, the Mine Inspector’s office was known as the Mine Safety Bureau, a section of the Idaho Department of Labor and Industrial Services. Detailed accounts of mine operations are, for the most part, drawn from the annual reports prepared by the companies for the State Inspector of Mines; these reports were required by law, and the information contained in them formed the basis of the Mine Inspector’s annual reports. Reports of recent developments are taken from the Idaho Geological Survey’s (IGS) annual reports on the developments in mining and minerals in Idaho (from 1984 to present) or from similar reports produced by the Survey’s predecessor, the Idaho Bureau of Mines and Geology (IBMG) from 1975 to 1984. Other published sources are referenced in the text. A complete bibliography is included at the end of the report. Where direct quotations are taken from source materials, the original spelling and grammar are preserved even in cases where they do not conform to currently accepted usage.

History of the Buckhorn Mine and Related Properties, Lemhi County, Idaho

Victoria E. Mitchell[1]

INTRODUCTION

The Buckhorn Mine is in sec. 22, T. 17 N., R. 25 E (Figures 1, 2, 3, 4, and 5) on an unnamed tributary of Cedar Gulch. Related mines, all in the same township, are the Elmira (Figures 4 and 5) on Cedar Gulch to the west in sec. 15 and the Maryland (Figures 4 and 5) on the West Fork of Little Eightmile to the east in sec. 23. Although little information is available on the Commodore Mine (Figure 5), in sec. 24 one gulch to the east of the Maryland Mine on Little Eightmile Creek, it is believed to be on the same vein system as the other three mines. The Buckhorn millsite (Figures 2, 6, and 7) is in sec. 28, T. 17 N., R. 25 E. While it is not known what mines may have shipped to the Buckhorn mill, the millsite is conveniently located for shipment from all of these mines.

The mines are in rocks mapped by Staatz (1973; Figure 8) as Mississippian Madison Formation and Precambrian Lemhi Quartzite (Unit D) and more recently as Mississippian Scott Peak Formation and Proterozoic Y Gunsight Formation (Evans and Green, 2003; Figure 9). All units are separated by faults, and most of the contacts are major thrust faults. Dacite dikes are present throughout the area, and some have been mapped underground in the Buckhorn Mine (Thune, 1941). Below the mines, alluvial fan deposits extend to the Lemhi River (Staatz, 1973).

Thune (1941, p. 9-11) described the mineralization at the property:

> The lead-silver veins constitute the most important zone of mineralization in the western portion of the Little Eightmile district. These appear to be replacement ore bodies between a quartzite footwall and a limestone hanging wall, with the major mineralization taking place within the limestone. The veins have been exposed in the Maryland and Buckhorn mines for a distance of approximately 900 feet. The width of the mineralized zone is hard to determine because of the highly oxidized nature of the ore, but appears to vary from a few inches to approximately twenty feet. An average width would probably not be far from three feet.
>
> Mineralogically, the lead-silver mineralized zone is interesting, due to the presence of manganiferous siderite as the most important gangue mineral being similar, in this respect, to many of the Leadville [Colorado] deposits. Besides siderite, the important

[1]Idaho Geological Survey, Main Office at Moscow, University of Idaho, Moscow.

Figure 1. Buckhorn Mine, Lemhi County, Idaho (Idaho Geological Survey mineral property files). This picture is from a group of undated slides that were among unpublished materials donated by the Sunshine Mining Company. It is probable the slides were taken during the 1980 site examination by Sunshine, but no markings on the slides or the photographs made from them identify the photographer or the date(s) on which the slides were taken.

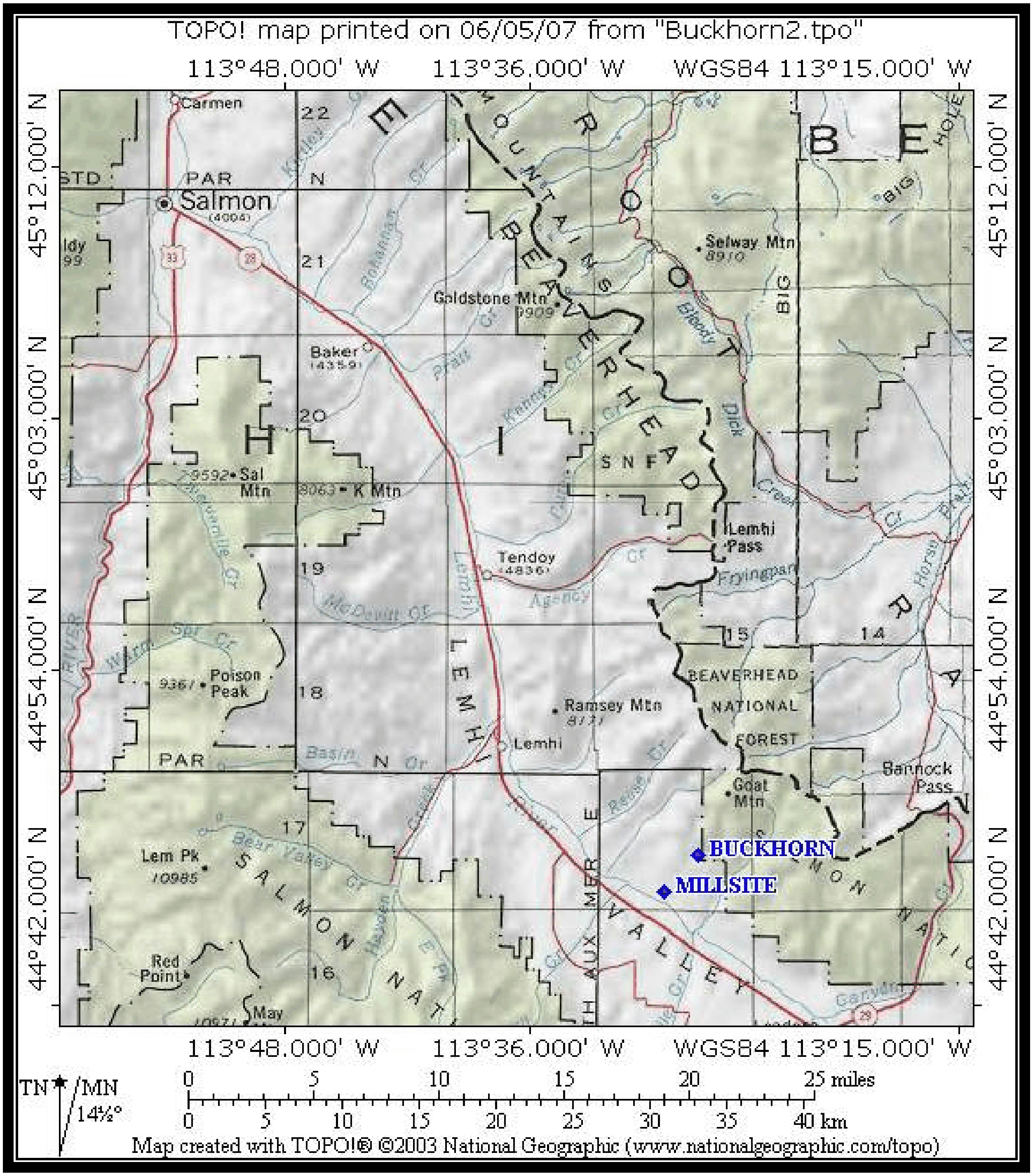

Figure 2. Location map showing relationship of the Buckhorn Mine to surrounding area, particularly Salmon, Idaho. Scale 1:500:000 (National Geographic Society TOPO! map).

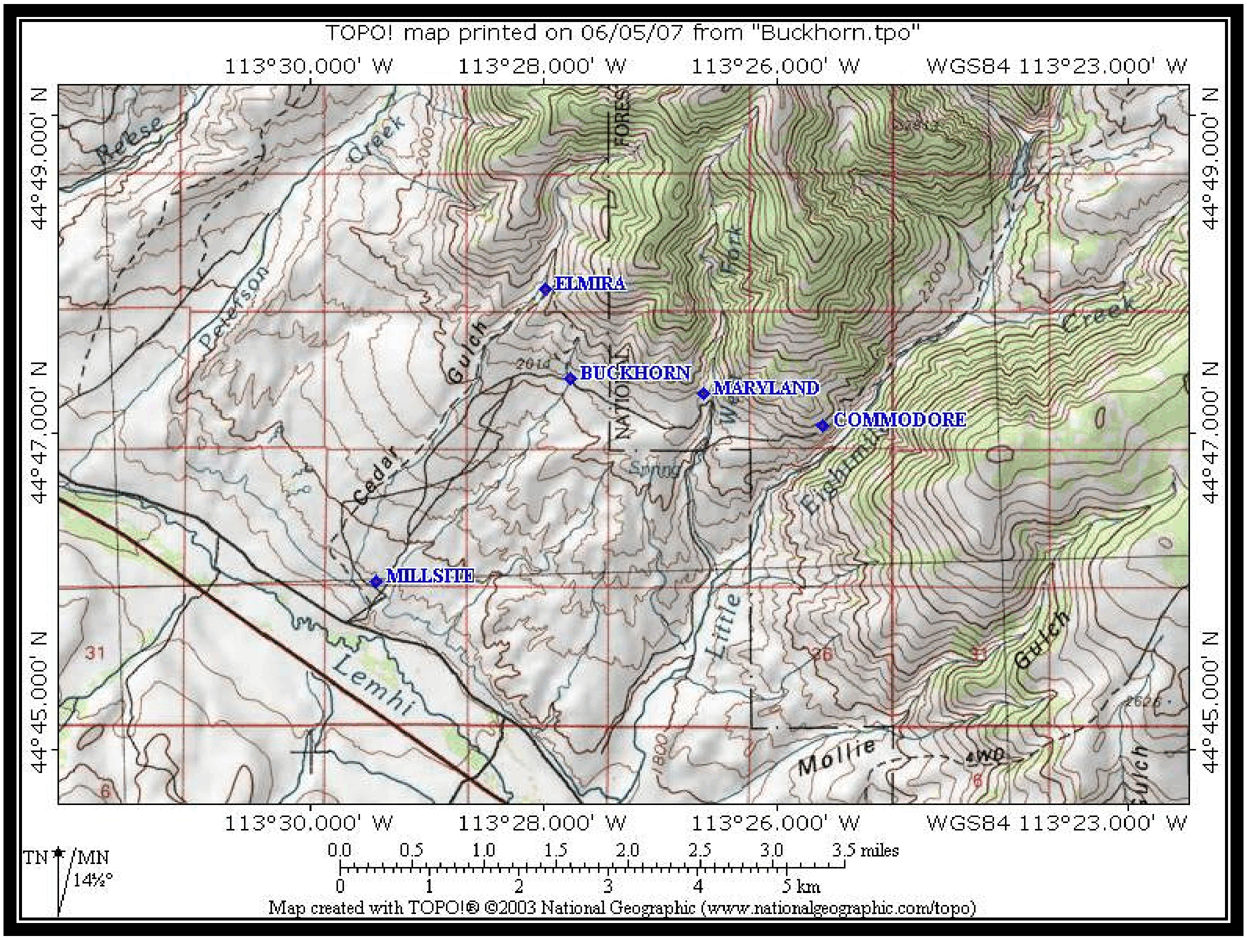

Figure 3. Map showing locations of the Buckhorn Mine and millsite, and the related mines, near Little Eightmile Creek in Lemhi County, Idaho. Scale 1:100,000 (National Geographic Society TOPO! map).

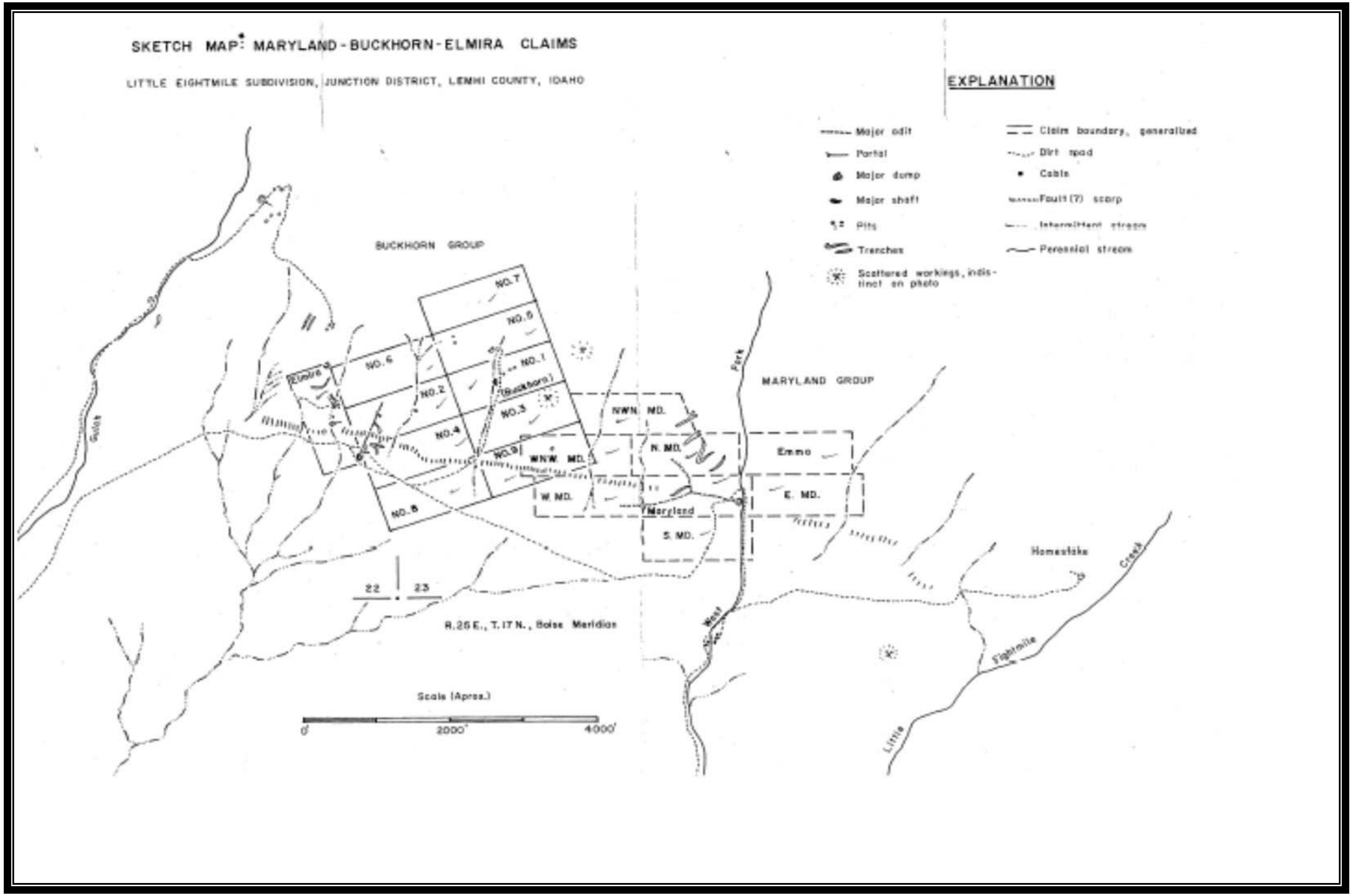

Figure 4. Claim map of the Buckhorn and related mines (Anonymous, 1963).

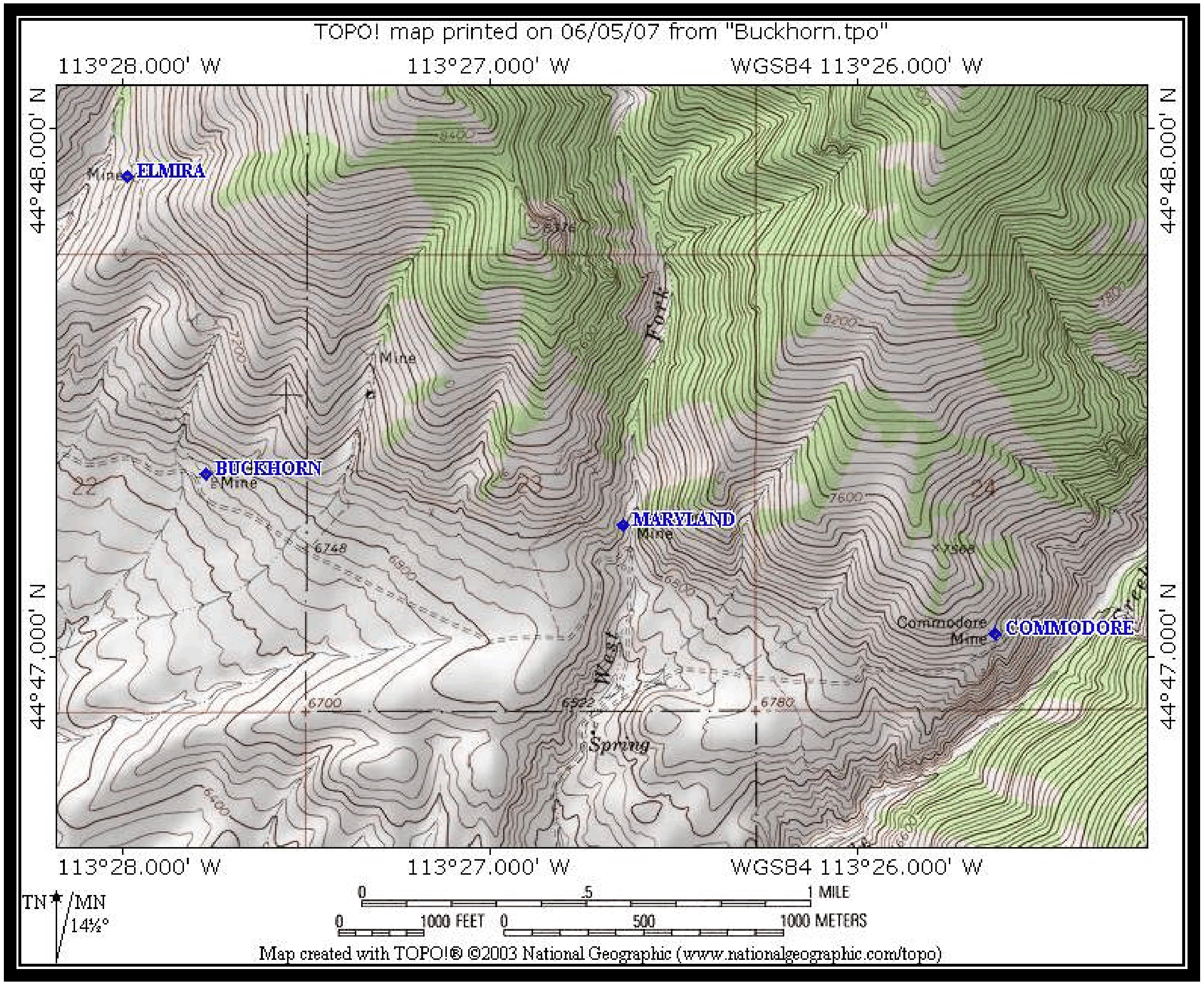

Figure 5. Topographic map of the Buckhorn Mine and related properties (National Geographic Society TOPO! map, scale approximately 1:24,000).

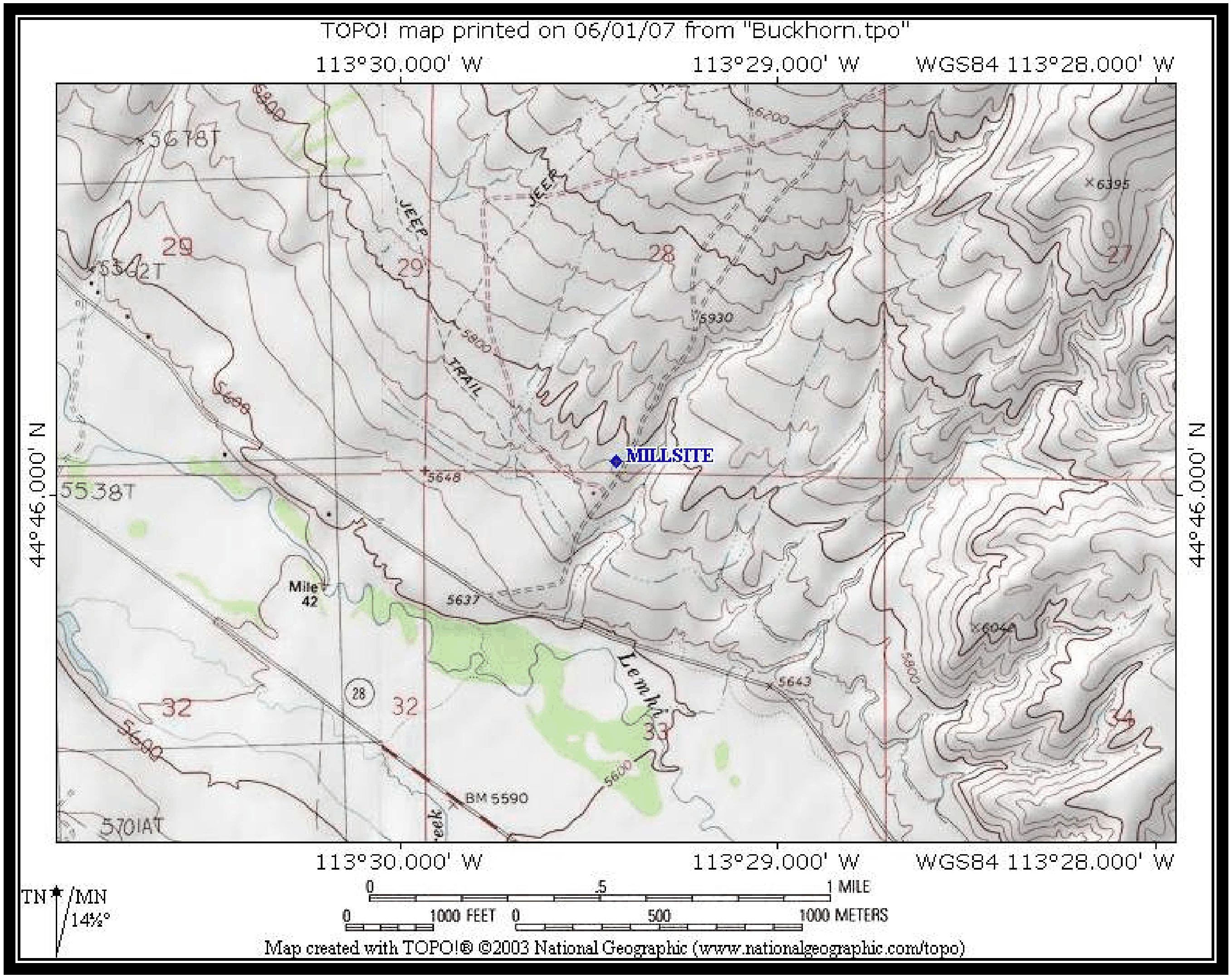

Figure 6. Topographic map of the Buckhorn millsite (National Geographic Society TOPO! map, scale approximately 1:24,000).

Figure 7. Buckhorn Mill, Lemhi County, Idaho (Idaho Geological Survey mineral property files). This picture is from a group of undated slides that were among unpublished materials donated by the Sunshine Mining Company. It is probable the slides were taken during the 1980 site examination by Sunshine, but no markings on the slides or the photographs made from them identify the photographer or the date(s) on which the slides were taken.

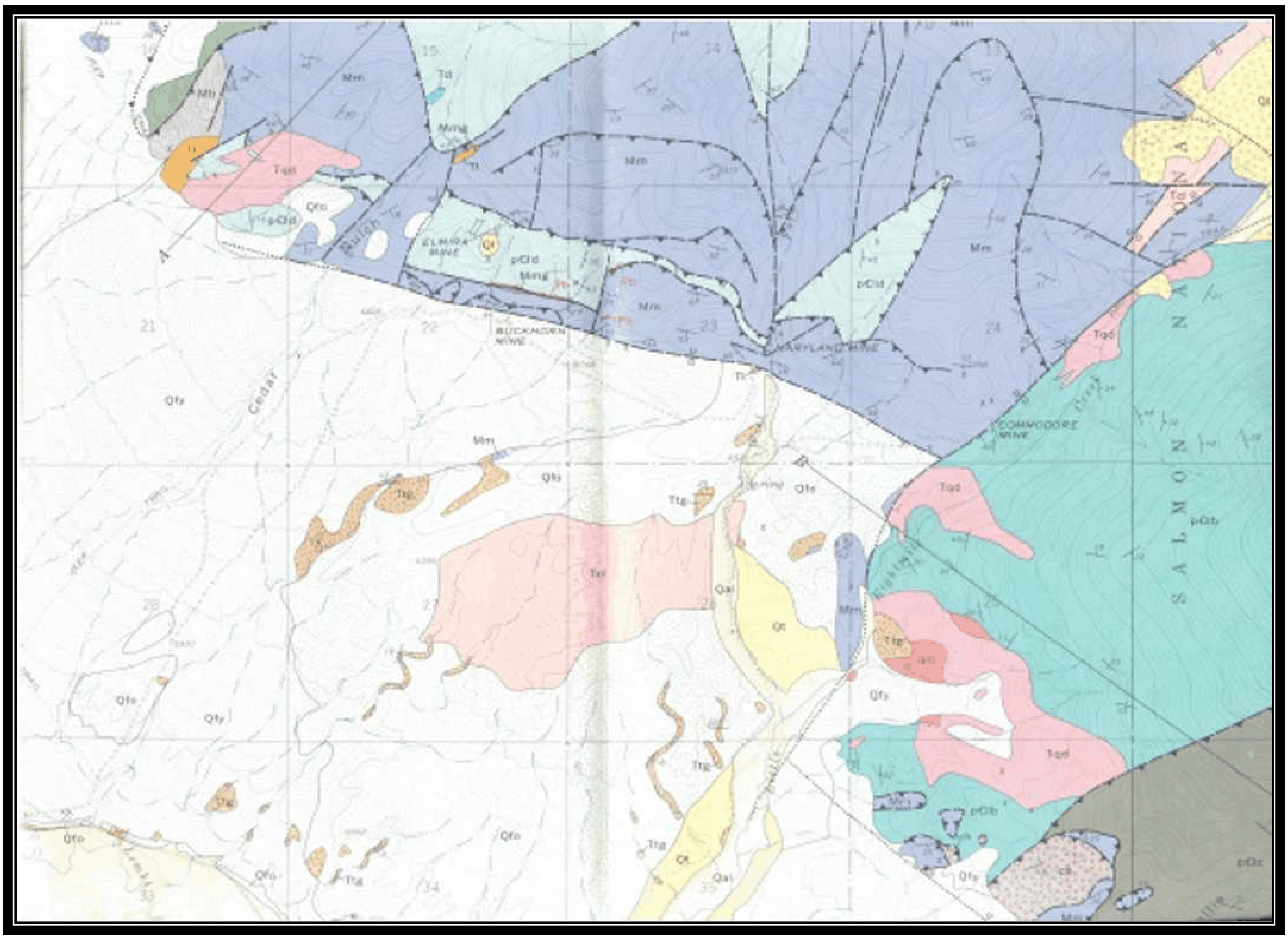

Figure 8. Geologic map of the Buckhorn Mine area, Lemhi County, Idaho (Staatz, 1973). Qal – Quaternary alluvium; Ql – Quaternary landslide deposits; Qr – Quaternary rock glacier; Qfy, Qfo – Quaternary alluvial fans; Qt – Quaternary terrace deposits; Ttg – Miocene tuff and tuffaceous conglomerate; Tcl, Tct – Eocene Challis Volcanics; Td – Tertiary diorite dikes; Tl – Tertiary latite porphyry; Tqd – Tertiary quartz diorite; ch – chert breccia of post-Mississippian age; Mb – Mississippian Big Snowy Formation; Mm – Mississippian Madison Limestone; Mmg – Mississippian McGowan Creek Formation; pЄq (unlabeled tan area in the in the northwest corner of the map) – Precambrian quartzite correlated with the Belt Supergroup; pЄsw – Precambrian Swauger Quartzite; pЄlb, pЄlc, pЄld – Precambrian Lemhi Quartzite; qm – quartz monzonite of unknwn age. Red lines labeled "Pb" are lead-bearing veins. Heavy lines are faults, with U on upthrown side and D on down thrown side; dashed where approximately located; dotted where concealed. Heavy lines with sawteeth are thrust faults, with the sawteeth on the upper plate; dashed where approximately located; dotted where concealed.

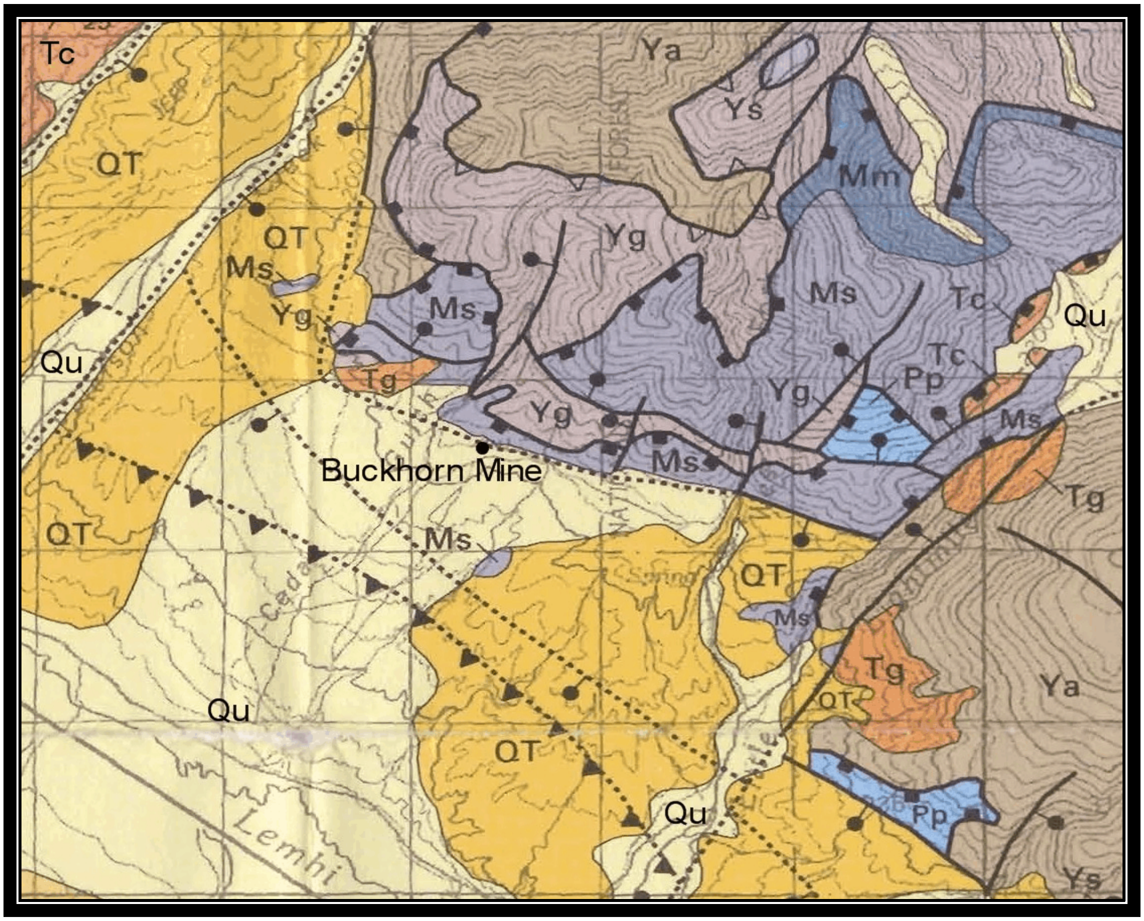

Figure 9. Geologic map of the Buckhorn Mine area, Lemhi County, Idaho (Evans and Green, 2003). Qu – Quaternary alluvium, colluvium, landslide, and glacial deposits, undivided; QT – Holocene to Oligocene (?) gravel limestone, sandstone, and volcaniclastic sediments; Tc – Eocene Challis Volcanic Group, undivided; Tg – Eocene granite; Pp – Permian Phosphoria Formation; Ms – Mississippian Scott Peak Formation; Mm – Mississippian Middle Canyon Formation; Yg – Mesoproterozoic Gunsight Formation; Ya – Mesoproterozoic Apple Creek Formation. Heavy lines are faults; dotted where concealed. Normal faults are shown with the ball and bar on the downthrown side. Heavy lines with solid sawteeth are thrust faults, with the sawteeth on the upper plate; open sawteeth indicate a thrust fault with a younger-on-older relationship and multiple-stage development. Low-angle normal faults are indicated by boxes on the upper plate.

> primary minerals are galena, pyrite, and sphalerite. Where found, the primary minerals are usually intimately associated with each other, forming compact masses. However, in the Buckhorn mine an unusual banded and more or less porous primary ore is found.
>
> Widespread supergene alteration developed many secondary minerals, and at present they are the most abundant minerals found in the deposit. Cerussite, limonite, psilomelane, and pyrolusite are the most abundant minerals of the oxidized ores. Cerrusite and limonite are the most important of the minerals formed by the oxidation of the primary sulphides. They form brown, sandy appearing masses within the ore bodies. Oxidation of siderite has formed a low-grade manganese deposit, which, because of its high iron content, should be properly classed as a manganiferous iron ore. The manganiferous portion of the vein is usually found adjacent to the lead-silver ore, and is thought by the writer to have been concentrated by two distinct processes working more or less simultaneously. It is believed that the manganiferous deposits represent both residual and transported supergene oxidation products from a localized zone of primary siderite deposition within the borders of the lead-silver zone of mineralization.
>
> In the Maryland mine the manganiferous iron ores are found in a hard, cherty limestone below the fault which defines the mineralized zone. These ores are usually soft and porous and contain cavities from a few inches to several feet in diameter. It is within fractures and open spaces in this ore that most of the pyrolusite is found. In the Buckhorn mine the manganiferous ore is found in soft, crumbly limestone above the fault. It is believed that the ore-bearing limestone is the same in both mines. The differences in the character of the limestone in the two mines can be satisfactorily explained by the fact that in the Buckhorn mine the tunnel is nearer the surface than in the Maryland mine, and, therefore, has exposed a more weathered part of the limestone formation.

The minerals in the lead-silver veins in the Buckhorn and related mines include galena, sphalerite, chalcopyrite, pyrite, pyrargyrite, hematite, pyrolusite, limonite, psilomelane, siderite, smithsonite, cerussite, malachite, azurite, anglesite, wulfenite, sulfur, quartz, calcite, sepiolite, allophane, barite, anhydrite, gypsum , and felsöbanyite(?). Minerals associated with the dacite dikes in the Buckhorn mine include stibnite, galena, sphalerite, chalcopyrite, arsenopyrite, jamesonite, boulangerite, pyrargyrite, limonite, quartz, calcite, gypsum, and epsomite (Thune, 1941).

BUCKHORN MINE

George Sellers located eight claims of the Buckhorn Mine (Figures 1,2, 3, 4, 5, 8, and 9) on July 12, 1912 (Thune, 1941). Development is reported to have begun in 1914, when the Buckhorn incline was sunk on the Buckhorn No. 1 Claim to a depth of 140 feet on the footwall. At this point, a 60-foot cross-cut was run to the hanging wall. Shipping ore from this zone averaged 3-4 ounces of silver and 2.5-3 percent lead (Anonymous[1], 1927). A test lot of ore was shipped in 1921. The inclined shaft was abandoned in 1920 and was inaccessible by 1927 (Anonymous, 1927). Other workings on the property were described as follows (Anonymous[2], 1927, p. 3-4):

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[1]This report is unsigned, but the two maps accompanying it are signed by “Enoch Stewart.” Stewart is believed to be the author of the report as well as the maps.

[2]The sometimes unique spelling and the grammar of the original document have been preserved in the quotations from this source.

During this same period of time a tunnel was driven along the vein on the Buckhorn claim No. 3, for a distance of 80 feet, giving a depth of approximately 60 feet at the face. This vein averages from four to six feet throughout its length with the high-grade Silver Lead occurring in small bunches and a small percentage of Silver Lead in the gangue.

The Buckhorn tunnel, 4 x 7 feet in the clear, was commenced June 1st, 1921, its portal being about 150 feet East of the West end line of the Buckhorn No. 4 Claim at the extreme foot of the Mountain (see Claim Map [Figure 10]), running due North, and incountered the vein at a distance of 700 feet giving an approximate 300 feet below the apex, it was expanded for 35 feet with the view of determining the foot wall, (which is not fully determined) and thence drifted Easterly 90 feet angling back to the hanging wall at the face. The formation cut by the tunnel includes; First, 240 feet limesonte; Second, 20 feet altered porphyry; Third, 100 feet manganese shale; Fourth, 60 feet granite porphyry, highly mineralized; Fifth, 100 feet blue limesone; Sixth, 150 feet Manganese shale; Seventh, 10 feet crushed quartz. See profile map [Figure 11].

At a distance of 340 feet in the tunnel 60 feet of altered granite has been cut which contains streaks of ore from a knife blade to serveral inches in thickness occurring from 4 inches to 8 inches apart throughout the entire width. A sample of the streaks was taken which gave the following assay; Silver 13 oz., Lead 17%, Antimony 16%. I would judge the entire width will run sufficient to make a mill product and should develop into a high-grade ore body with depth.

At a distance of 640 feet the tunnel cut two feet of heavy iron Manganese, and back of the vein there are fully 2½ to 3 feet of high-grade silver-lead ore which hangs in both East and West faces and in the bottom of the tunnel. No drifting has been done on the high-grade streak. A sample taken across 2½ feet June 5, 1926 and sent to Lewis and Walker, assayers, Butte, Montana, gave the following returns, Silver 29.5 ozs. Lead 60.20% sample sent to Union Assay Office, Salt Lake City UT gave Silver 29.3 ozs., Lead 60.8%.

Lying next to the high-grade there are fully 15 feet continuing metalic specks of silver-lead and it is very possible this is a mill grade of ore. Along the drift of the foot wall to the East bunches of high-grade Silver-lead were frequently cut, I would estimate there are 200 tons of mill ore on the dump and between 18 and 20 tons of sorted ore which will average 65% lead and 30 oz. Silver.

The Buckhorn tunnel is an excellent piece of work equipped partly with [ ][3] lb. rails and partly with 10 lb. rails and one ton car, with a new blacksmith shop about 14 by 16 feet.

The Buckhorn made additional shipments in 1927 and 1929, but was idle in 1930. The Sellers brothers held the property for (at least) most of the 1920s and 1930s. The property was idle for most of the 1930s and 1940s.

Lessees shipped some ore from the mine in 1952 and 1953. In 1954 John and Herb Cole shipped ore that had been produced the previous year. Additional small shipments of ore were made in the mid-1960s.

In 1980, the property was owned by Clare Meeks, Quinton Snook, and Harvey Bell. Ojala (1980, p. 2-3) noted:

In recent years, a closed corporation was formed to explore, develop, and work the Buckhorn and Maryland claims. A mill was either built or renovated at that time, and some ore from several nearby properties was processed. Recovery was just about 50%; the tailings [Figure 12] reportedly carried 2 ounce silver (just a few hundred tons of tailings?). Just a partial shell of the mill building [Figure 7] remains. According to Meeks, who was a main investor and principal, that effort failed and the company abandoned the claims. He and his partners then relocated the claims.

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[3]The brackets mark the location of an illegible single-digit number.

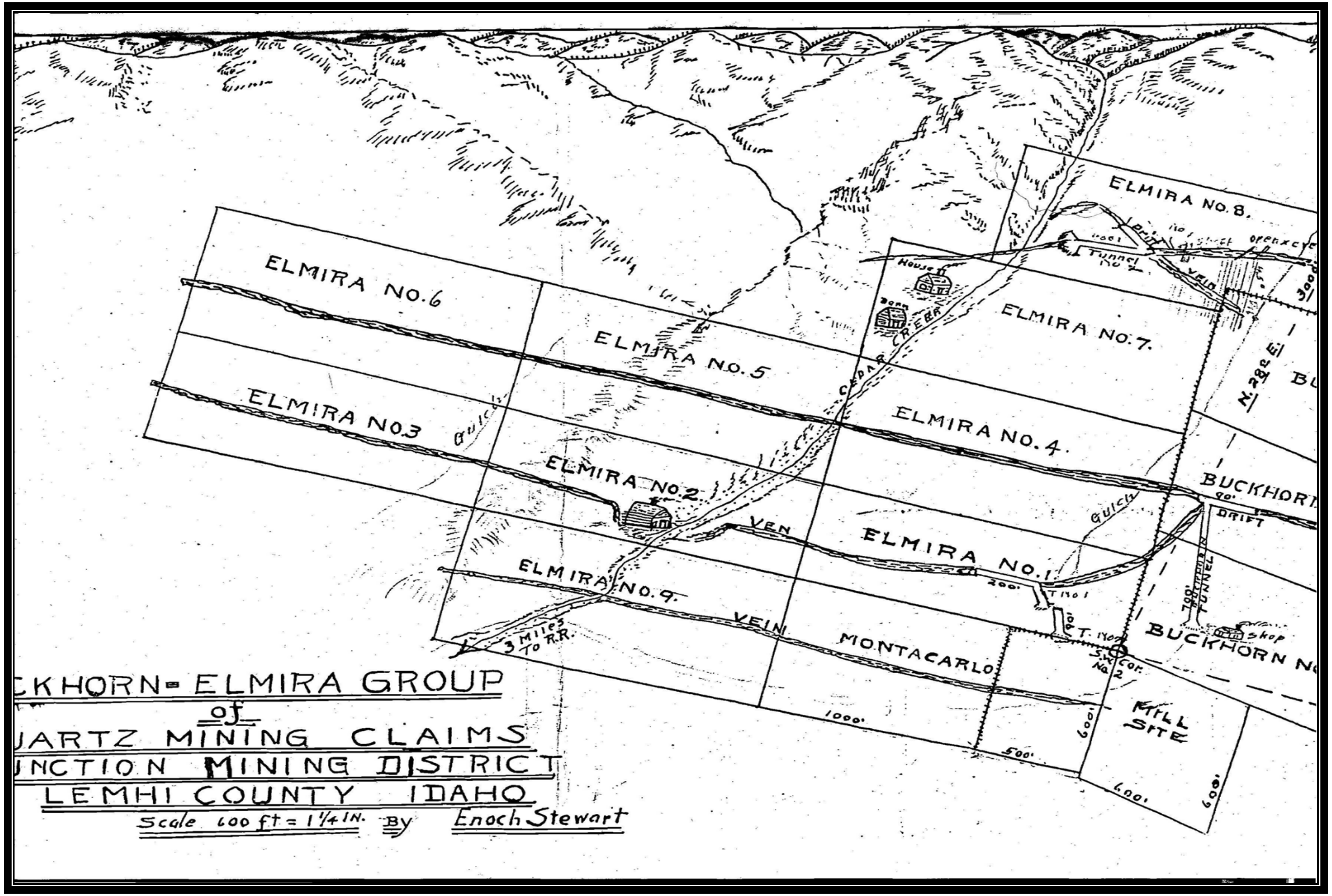

Figure 10. Claim map of the Buckhorn and Elmira mines (Enoch Stewart *in* Anonymous, 1927).

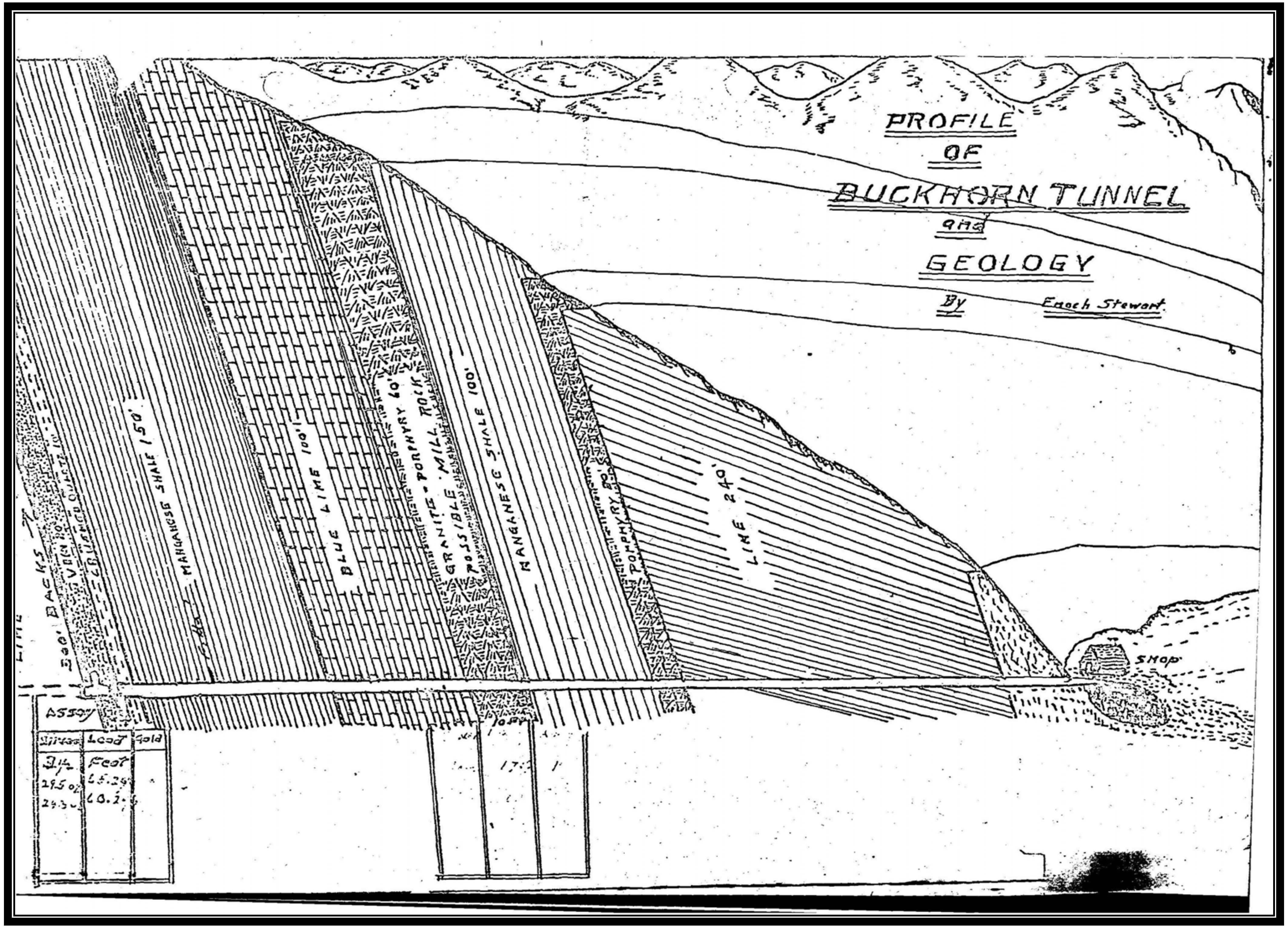

Figure 11. Cross-section along the strike of the main Buckhorn tunnel (Enoch Stewart *in* Anonymous, 1927).

Figure 12. Buckhorn mill tailings, Lemhi County, Idaho (Idaho Geological Survey mineral property files). This picture is from a group of undated slides that were among unpublished materials donated by the Sunshine Mining Company. It is probable the slides were taken during the 1980 site examination by Sunshine, but no markings on the slides or the photographs made from them identify the photographer or the date(s) on which the slides were taken.

Between 1921 and 1968, recorded production from the Buckhorn was 107 tons. This material yielded 1,023 ounces of silver, 163 pounds of copper, 57,285 pounds of lead, and 500 pounds of zinc (USBM records).

ELMIRA MINE

The Elmira Claims (Figures 2, 3, 4, 5, 8, and 9) are to the west of the Buckhorn Mine and on extensions of the Buckhorn veins. The Elmira was located in 1920 by James Corcoran (Thune, 1941). Anonymous (1927, p. 5-6) described the Elmira workings:

> About 200 feet West of the East end line of the Elmira Claim No. 1 a small amount of high-grade, Silver-lead ore shows on the surface and this included the owners to drive tunnel No. 1 which cut the vein at a distance of 100 feet and was drifted on for 100 feet. The vein in the drift averages from 8 to 15 feet in width and contains perhaps 2½% lead and 2 oz. silver per ton oweing to the extensive leasing which has taken place. Tunnel No. 2 commenced 100 feet under tunnel No. 1, it's in 60 feet and just hit the iron Manganese and should cut the ore within the next 15 or 20 feet, however, all the ground can be covered from the Buckhorn tunnel which has 50 feet more depth.
>
> On the Elmira No. 9 Claim Cedar Creek has cut an extensive quartz ledge only exposing it in the immediate vicinity of the Creek. This ledge has a thickness of perhaps 50 feet but has a flatter dip than the other formations. Samples taken from the surface quartz gave a value of 2½ oz. and 3 oz. Silver, and shows every indication of developing into a big Silver deposit.
>
> It is my opinion that if this body of quartz is properly developed it will prove to be the great bedding plane of the surface ores.
>
> On the Elmira No. 8 and Buckhorn No. 6 Claims there is an exceptional surface showing of Silver-copper ore along the contact of granitic porphyry and quartzite. This vein strikes West 20º North and dips 40º South. Near the top of the ridge on the East side of Cedar Creek a shaft was sunk to a depth of 35 feet, but on account of the timbers being badly decayed I was unable to sample the ledge, however the dump shows a few tons of Silver-copper ore. Tunnel No. 1 was driven lower down the hill and cut the vein at a distance of 200 feet and drifted on for 100 feet, samples taken from the face gave the following values; Copper 22%, Silver 18 ozs., Gold $4.00 and $6.00 per ton.
>
> One hundred feed above the Creek level Tunnel No. 2 was run for a distance of 400 feet with the view of cutting the Copper deposit at a depth of 175 feet, it was run in a straight line for the working above, but as they had not figured on the dip of the vein at that depth they found they were running parallel with it and would have to cross-cut at least 100 feet South to catch the dip.
>
> However, at the face they were fortunate in cutting a blind ledge having a North-South strike; this vein was drifted on for 60 feet to the North and is fully 10 feet in width at the face, it is an Iron Sulphide and gave an assay return of Gold $10.00, Copper 4%. These are 150 feet of backs from this level. It is my opinion this will connect with the Copper vein about 100 feet to the South.
>
> Five hundred feet West of the end line there are a series of shallow open cross trenches which were run with the view of cutting the high-grade chute but so far never reached a depth sufficient to cut through the over burden. All along the trenches numerous pieces of float of Copper-Silver ore (Chalecite - Copper Glance and Silver Chloride) which is evidnece of a big deposit.
>
> By extending the Buckhorn tunnel a distance of 800 feet, the vein can be cut at a depth of approximately 700 feet and there is every reason to believe that other leads will be cut from indications on the surface.

Corcoran was listed as the owner of the mine at least through 1937 (IMIR). No production is reported for the Elmira. Presumably any ore that came from the workings was shipped with the production from the Buckhorn Mine.

MARYLAND MINE

The Maryland Mine (Figures 2, 3, 4, 5, 8, and 9) was discovered in 1902 by Albert C. Amonson, and the main workings were opened in the winter of 1906. By 1941, A. C. Amonson and E. S. Edwards jointly owned the mine. The Maryland was operated sporadically throughout that time period (Thune, 1941). It is to the east of the Buckhorn and is on the same veins.

A new discovery of lead-silver ore at the Maryland was reported in 1925 (IMIR), and a carload of ore was shipped the following year (USBM). A. C. Amonson held the property, apparently as sole owner, until at least 1937 (IMIR). He was still connected with the mine in 1947 (Anonymous, 1947). Continued development work was reported in 1931. In the 1940s and early 1950s, Bradley Mining Company and Bunker Hill and Sullivan Mining and Concentrating Company were each offered chances to explore the Maryland and related properties for lead-silver, manganese, or antimony (McConnel, 1942; Anonymous, 1947; Shoup, 1952).

Between 1926 and 1979, the Maryland had a recorded production of 49 tons of ore. This material produced 2,935 ounces of silver, 960 pounds of copper, 27,188 pounds of lead, and 429 pounds of zinc (USBM records). In contrast to these numbers, Thune (1941) notes that about 70 tons of ore had been shipped from the Maryland by 1941.

COMMODORE MINE

The Commodore Mining Company was incorporated on March 6, 1911, and the mine (Figures 2, 3, 4, 5, 8, and 9) made a shipment of rich silver ore that year (USBM). Commodore Mining forfeited its corporate charter on December 1, 1919. In the 1920s, the property was apparently restaked as the Homestake and the property shipped additional ore. From 1929 through 1937, the IMIRs listed Mrs. Minnie Rasmason as the owner of the “Rasmason” claims; Mrs. Rasmason was the owner of record for the property in the 1929 USBM production report. Total production from the mine under both names (Commodore and Homestake) for the period from 1911 to 1965 was 32 tons of ore. This material yielded 4,129 ounces of silver, 19 pounds of copper, 275 pounds of lead, and 200 pounds of zinc. Eighty percent of the silver produced from the mine came from the 1911 shipment.

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