History of Selected Mines in the Lakeview Mining District, Bonner County, Idaho

Victoria E. Mitchell

Staff Report 00-4
May 2000

Idaho Geological Survey
Morrill Hall, Third Floor
University of Idaho
Moscow, Idaho 83844-3014
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INTRODUCTORY NOTE

This report was prepared under a cooperative agreement with the U.S. Forest Service, Region I, as part of a project to identify and describe inactive and abandoned mines in Idaho. Work on this project included preparing detailed histories of mines in Region I that had significant recorded production. The information in this report is from a number of published and unpublished sources in the Idaho Geological Survey's mineral property files.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 present). 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.

The mines covered in this report were visited by IGS field crews during the summer of 1996. Detailed descriptions of these site inspections, including photographs, are available in Bennett and Mitchell (1997).
History of Selected Mines in the Lakeview Mining District, Bonner County, Idaho

Victoria E. Mitchell

INTRODUCTION

The Lakeview mining district is on the southeast edge of Lake Pend Oreille about 35 miles northwest of the Coeur d’Alene mining district and 30 miles north of the city of Coeur d’Alene (Figures 1 and 2). Most of the mines in the district are in the drainage of Gold Creek or its tributaries (Figure 3). Elevations range from 2,063 feet at Lake Pend Oreille to 5,146 feet at the top of Green Mountain in the northeast corner of the area.

Rocks in the Lakeview district include low-grade metasedimentary rocks of the Precambrian Belt Supergroup and sedimentary rocks of Cambrian age. These rocks have been intruded by a granodiorite stock and lamprophyric dikes. The only unit in the Belt Supergroup that has been mapped in the area is the Wallace Formation, which hosts the major lead-zinc-silver deposits of the district. The Lakeview Limestone of Cambrian age provided raw material for north Idaho’s lime and cement industry in the early part of the century.

Ore was discovered in the district in 1888 by three men on their way home from a summer of prospecting in northern Idaho. The first carload of ore was shipped in January 1889. Intermittent activity has continued in the district to the present.

1Idaho Geological Survey, Main Office at Moscow, University of Idaho, Moscow.
Figure 1. Location map of the Lakeview mining district, Bonner County, Idaho (Kun, 1974, Figure 1).
Figure 2. Lakeview mining district and vicinity, Bonner County, Idaho (U.S. Forest Service Idaho Panhandle National Forests/Coeur d'Alene National Forest map, scale 1:126,720).
Figure 3. Geologic maps of the surface and accessible underground workings at the Westlake Mine (Anderson, 1950, Figure 13).
GEOLOGIC SETTING

Although most of the units in the Belt Supergroup are exposed in nearby areas, only the Wallace Formation is present in the Lakeview area (Figure 4). Kun (1974, p. 11-12) describes these rocks as follows:

The Wallace Formation is about 7,500 feet thick at Lakeview and has been subdivided into three distinct members with gradational contacts. Exposures are few in most of the mapped area and consequently, the details of the stratigraphic succession are poorly known. Several distinctive rock types have been found. They are, in order of decreasing abundance, a) black and green or gray, thinly interlaminated, argillite and siltite, b) green siltite, c) gray, silty dolomite, d) calcareous, greenish-gray, argillitic shale, e) massive, dark gray limestone, f) massive, white or brown quartzite, g) laminated green argillite.

Lower Member The Lower Member of the Wallace Formation consists of limestones and dolomites with interbeds of calcareous, greenish siltites and argillites. The best exposures of this member can be found along the roads in secs. 23 and 26, T. 53 N., R. 1 W. The estimated thickness of this member in the vicinity of the Conjecture Mine is 2,000 feet.

The Lower Member changes from waxy, green argillites and siltites at the base, through limestones, dolomitic limestones, and calcareous siltite in the middle, to calcareous black argillite and green siltite at the top. White dolomitic quartzite forms sparse beds within the carbonate rocks, especially within the limestones and dolomite. Most of the Lower Member is very thinly bedded, varying from thin bedded to laminated.

The dolomitic limestone layers commonly have irregular pockets and veins of calcareous material forming swirls. Differential weathering of these, as well as the stromatolites, produced swirled furrows which have been called "molar tooth" structures by Harrison and Jobin (1963) and Ross and others (1963). "Molar tooth" limestones have been found only in the Lower Member of the Wallace Formation.

The Lower Member differs from the underlying St. Regis Formation in the content of calcareous minerals. Whereas few calcareous minerals have been reported in the St. Regis Formation, they form the bulk of the Lower Member of the Wallace Formation. The contact is transitional and its position varies according to the criteria of different authors (Harrison and Jobin, 1963, and Griggs, 1968). The contact between the Lower and Middle Members of the Wallace Formation is also transitional and quite arbitrary, usually placed where the ratio of carbonate minerals is equal to the silt-sized quartz.

The Lower Member has microcrystalline rounded quartz and calcite, in a clay and calcite matrix. Brown stringers of carbonate material form swirls throughout the matrix.

Middle Member The Middle Member of the Wallace Formation consists of thinly and very thinly laminated black argillite with interbedded green argillitic siltite. Most rocks were found to be slightly dolomitic. The best exposures are on the ridges between Kick Bush Gulch and North Gold Creek in the central part of the quadrangle (Pl. 1 [Figure 5]). The thickness of the Middle Member is 3,000 feet.

In thin section the Middle Member argillite consists of a microcrystalline quartz with clay matrix, crossed by numerous layers of clay and carbonates. Microfracturing is visible on a freshly fractured or cut surface of most argillites. In the vicinity of the Idaho Lakeview Mine, and probably in other mineralized areas as well, relict sulfides can be found along the microfractures and in the quartz matrix.

Due to the lack of continuous, good exposures in the Lakeview area, the contact between the Lower and Middle Members was placed where dark gray and black, very thinly laminated argillites with non-carbonaceous green argillitic siltites, become predominant over calcareous beds. The contact between the Middle and Upper Members was placed at the base
<table>
<thead>
<tr>
<th>THICKNESS</th>
<th>SYMBOL</th>
<th>FORMATION &amp; MEMBER</th>
<th>LITHOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEET</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+2000</td>
<td>ch</td>
<td>Lakeview Limestone Zone:</td>
<td>Thick bedded limestone with interbedded shaly members; fissile shale on bottom.</td>
</tr>
<tr>
<td>500</td>
<td>ggc</td>
<td>RED BEAK WAKEFIELD UNCONFORMATION</td>
<td>Conglomerate &amp; quartzite.</td>
</tr>
<tr>
<td>2500</td>
<td>pcwu</td>
<td>Upper Member</td>
<td>Alternating layers of argillites, siltites &amp; limestones forming units of 30' thickness.</td>
</tr>
<tr>
<td>3000</td>
<td>pcwm</td>
<td>Middle Member</td>
<td>Thinly laminated black argillite with interbedded green argillitic siltite.</td>
</tr>
<tr>
<td>2000</td>
<td>pcw!</td>
<td>Lower Member</td>
<td>Thinly bedded limestones &amp; dolomites with interbedded greenish siltites &amp; argillites.</td>
</tr>
<tr>
<td>1500</td>
<td>pcar</td>
<td>St. Regis Formation</td>
<td>Purple argillitic siltites with interbedded, green argillites. (Griggs, 1968).</td>
</tr>
<tr>
<td>2500</td>
<td>pcR</td>
<td>Revett Formation</td>
<td>Gray and buff quartzites. (Griggs, 1968).</td>
</tr>
<tr>
<td>3000</td>
<td>pcB</td>
<td>Burke Formation</td>
<td>Very thinly interbedded, dark gray siltite and green silty argillite. (Griggs, 1968).</td>
</tr>
<tr>
<td>+10000</td>
<td>pGP</td>
<td>Prichord Formation</td>
<td>Black and gray, very thin-bedded, argillite with some interbedded siltite. (Griggs, 1968).</td>
</tr>
</tbody>
</table>

Figure 4. Stratigraphic section of the Precambrian and Cambrian rocks in the Lakeview quadrangle (Kun, 1974, Figure 3).
GEOLOGY OF THE LAKEVIEW MINING DISTRICT, IDAHO

by

Peter Kun

1929

Figure 5: Geologic map of the Lakeview mining district (Kun, 1929, Plate 1).
of the transitional zone between the two members, where the first limestone beds appear and the first repetition of groups of beds can be seen.

**Upper Member** The Upper Member of the Wallace Formation consists of a sequence of alternating layers of the rock types found in the two lower members. The principal rock types are green calcareous argillite and siltite, green and tan silty limestone, and gray dolomitic siltite. Alternating layers of argillites, siltites, and limestones form units of about 30 ft. thickness, which are repeated throughout this member.

Because of the thin-bedded argillites and siltites, the Upper Member weathered easily and rapidly, with the argillite and siltite fragments covering many outcrops. Most areas underlain by the Upper Member of the Wallace Formation have a thick soil and vegetation cover on the northern slopes and barren, scree and talus-covered slopes on the southern slopes.

The best exposures of the Upper Member are on the east edge of the quadrangle along the Bunno Road roadcuts. The thickness of this member in Lakeview and adjacent areas is estimated to be about 2,000 to 2,500 feet. Total thickness of this member can not be measured in the Lakeview quadrangle because the units are gradational into the Middle Member of the Wallace Formation, and the top is exposed only outside the mapped area (Harrison and Jobin, 1965, Griggs, 1968).

The Cambrian units in the Lakeview area are the Gold Creek Quartzite and the Lakeview Limestone. The Gold Creek Quartzite is a thick-bedded, thinly cross-bedded, fine- to coarse-grained quartzite. The Rennie Shale, a thin transitional unit between the Gold Creek Quartzite and the Lakeview Limestone, is not exposed in the immediate Lakeview area. The Lakeview Limestone is the other stratigraphic unit in the Lakeview area that is of economic interest. Kun (1974, p. 13) described this unit as follows:

The Lakeview Limestone is well exposed in and around the town of Lakeview. It forms prominent cliffs along the lake shore.

The lower part of the formation is light to dark gray or black, very thick bedded with interbedded shaly members. It becomes thin-bedded and mottled towards the center and top of the exposed formation.

In thin section the Lakeview Limestone contains abundant calcite veinlets, invertebrate fossil fragments and some pyrite and possibly chloropyrite. Calcite pods are found in samples from the old limestone mine around the Vulcan Mine, where contact metamorphism is more intense. Some of the Lakeview Limestone is bleached as a result of metamorphism. The limestone is reported (Savage, 1967) to be of commercial quality for lime production. The mine is near the contact with intrusive rocks, and contains abundant calcite veins and black, powdery material.

The top of the Lakeview Limestone is missing because of erosion, but the thickness of the formation is reported (Griggs, 1968) to be over 2,000 feet near Lakeview.

The granodiorite is very coarse grained and highly porphyritic. It is exposed in the northwest part of the Lakeview quadrangle along the lake shore and on Vulcan Hill. The lamprophyric dikes are highly altered and rarely found in outcrops. These dikes occur in faults and shear zones, and they have been reported in the workings of several mines (Kun, 1974).

A number of major faults have been mapped in the Lakeview area by Kun (1974) and by Harrison and Jobin (1965). These faults include the strike-slip Packsaddle
Mountain fault and subsidiary structures such as the Spider fault, the Dan fault, and the Cedar Creek fault. The Hewer, Conjecture, and Weber shear zones control the locations of several major mines (Kun, 1974).

SILVER-LEAD-ZINC DEPOSITS

OVERVIEW

The first claims in the Lakeview district, the East and West Chloride, were staked on September 27, 1888, by William A.D. Bell, Alfred Chamberlain, and Peter Steinmetz on quartz outcrops that are now part of the Weber Mine (Sampson, 1928; Kun, 1974). By winter, a town of 2,000 had sprung up in the area, but after several months, most of the people left the district (Sampson, 1928). The first carload of ore was shipped to Great Falls, Montana, in January 1889. Between 1889 and 1917, the Keep Cool, Idaho Lakeview, and some of the workings that became the Conjecture Mine were discovered (Kun, 1974).

The 1904 IMIR (p. 89-90) described the construction of a smelter at Sandpoint, which was intended to handle ore from the mines in the Idaho panhandle:

A commendable enterprise is being inaugurated at Sand Point, Idaho, whose consummation will greatly stimulate the development of Kootenai County's extensive mineral resources, and deserves all possible encouragement.

This is the Pan Handle Smelting and Refining Company, who have made considerable progress towards the installation of a 200 ton custom smelter at this point which is very centrally located for such an enterprise, and ought to develop a good business as the immediately surrounding and tributary county to the north, south, east and west would afford a combination of ores that would make a very desirable smelting mixture, and the coal fields to the north around Fernie, B. C., could be drawn on for fuel.

The building for this plant, including ample ore bins, sampler and furnace rooms are all completed, and it is expected that the machinery will be installed and ready to blow in early next season.

Inter-related with the above Company, and under the same management, is the Pend d'Oreille Transportation and Development Company, whose steamboat barges, docks and warehouses already handle an important shipping business, and one that is capable of being extensively increased. Another affiliated concern is the Pan Handle Development Company, organized for the purpose of buying mines and ore and the exploitation of a new townsite near Sand Point.

The assets of this last mentioned company consist of a fine water-power, equipped with a four by four foot flume 3,500 feet long, for carrying a volume of water to a drop or head of 270 feet. This is shortly to be equipped with an electric light and power plant capable of

---

3Bonner County was formed from the northern half of Kootenai County in 1907, and Boundary County was split off from Bonner County in 1915.
developing 300 horse-power at the lowest water stage. This company also own and are now developing some very promising mining properties; one of these, the Venezuela group of four claims, is situated near the Keep Cool and Weber mines, in the Lake View District at the south end of Lake Pend d'Orille. They also own a thirty-foot vein of fine fluxing iron ore near the Lake.

The 1907 IMIR (p. 46) carried a follow-up to this story:

The most conspicuous connection with the mineral industry of the State for which this county was noted last year, was the fact that it contains at Sand Point the site of the Panhandle smelter. This is a lead smelter of 200 tons daily capacity, which, after several years of stock jockeying preparation, was finally gotten into a condition of actual bullion production during the past season, but the enterprise went to pieces in the early fall for lack of capital and a number of shippers were badly embarrassed by having their ores tied up and being unable to get a settlement on them. The enterprise has always lacked sufficient capital to put it on a proper independent basis. Recent reports indicate that some very substantial capitalists and practical smelter people have bought control of the stock of this enterprise and will go ahead and enlarge the plant, and the chances are that it may develop into a very important smelting point, as there is not a more ideal situation for a plant of that kind than is afforded at Sand Point, as this rapidly growing city is quite a railway center, having three lines of railway [Figure 6] and an immense tributary mineral territory, including the Coeur d'Alenes nearby.

The mortgage on the company's property was foreclosed in 1922, and the smelter was dismantled.

Metal prices declined from 1925 to 1932, and silver, lead, and zinc all reached historic lows in 1932 (silver, about 28 cents an ounce; lead, 3.2 cents a pound; zinc, 2.9 cents a pound). Many mines closed during the Great Depression (1929-late 1930s), and the large mines in the nearby Coeur d'Alene district that were still in production stockpiled their lead and zinc ore rather than sell it at the prevailing low prices. By 1935, the nation was well on its way to economic recovery, with stockpiled metals being sold and operations restored to a five-day work week. Production rose in response to increased demand for lead and zinc during World War II. Federal incentive programs and price supports contributed to much of this activity and stimulated production through the end of the Korean War (Bennett, 1986).

Kun (1974, p. 27)) described the general characteristics of the Lakeview deposits as follows:

The metallic mineral deposits of Lakeview are similar in their structural setting and mineralogy to the descriptions by Frykhund (1964) of the ores of the Coeur d'Alene mining district. The ores differ in their metal content and size of the orebodies. The silver content per ton of the Lakeview ores is much higher than those from the Coeur d'Alene district (Sampson, 1928) while the size of proven orebodies is much larger in the latter district. Characteristically, the ores in the Lakeview mining district are galena-carbonate-quartz fillings and replacements along shear zones. In addition to argentiferous galena, the deposits contain varying amounts of pyrite, sphalerite, tetrahedrite, and arsenopyrite, and minor and localized stibnite, hübnerite and various silver sulfosalts. Secondary enrichment of silver is of definite importance in most mines, where oxidized ores of high grade were the first and often the only ones to be mined.
Figure 6. Sketch map of northern Idaho in 1907, showing towns and railroads (Bell, 1908, Ninth annual report of the mining industry of Idaho for the year 1907, opposite p. 47).
Most of the ore from the Lakeview mining district was mined from three fracture systems (Pl. 1 [Figure 5] and Fig. 2 [omitted]):
1) the northeast-trending Conjecture Vein,
2) the southeast-trending Weber Vein,
3) the northeast-trending Hewer Shear.

The ore shoots were enclosed in quartz and breccia in the shear zones, and were partly fracture-fillings and partly replacements similar to the orebodies in the Coeur d'Alene mining district. Most of the ores from the Lakeview mines were massive but there are disseminated sulfide minerals visible in the Weber Pit and on the main level of the Idaho Lakeview Mine. The host rock for most of the orebodies was the Middle and Lower Members of the Wallace Formation, as opposed to the Coeur d'Alene district where most orebodies are found in the lower part of the Ravalli Group and Prichard Formation.

In the period from 1901 to 1981, the mines in the Lakeview mining district produced a total of 181,623 tons of ore and at least 230 tons of old tailings (Table 1). This material yielded 4,171 ounces of gold, 1,250,788 ounces of silver, 63,068 pounds of copper, 1,780,890 pounds of lead, and 832,971 pounds of zinc.

CONJECTURE MINE

The Conjecture Mine is on Gold Creek, 6 miles south of Lakeview (Figures 3 and 5). The mine is in N1/2 sec. 26, T. 53 N., R. 1 W., with dumps and workings on both sides of Gold Creek. In the summer of 1996, workings at the property included two shafts and two collapsed adits (Bennett and Mitchell, 1997).

Kun (1974, p. 34) described the mine as follows:

At the property, Gold Creek cuts through the middle part of the Lower Member of the Wallace Formation. Good exposures can be seen in roadcuts north and south of the mine. Most workings in the Conjecture Mine area, which are shown in Plate 4 [Figure 7], are confined to the calcareous part of the Lower Member. The contact between the St. Regis and Wallace Formations is present between the 1,000 and 2,000 ft. levels in the new shaft. Part of the workings on the 2,000 ft. level are in the St. Regis Formation and specimens representative of this formation are present on the dump.

The Conjecture orebody consists of several ore shoots (Pl. 5 [Figure 8]) which apparently merge at depth to form two mineralized zones, which follow the trend of the Conjecture shear zone. The Conjecture shear zone (Pl. 1 [Figure 5]) trends approximately N. 30° E. and dips 65 degrees to the north. The north-south trending, normal, Spider fault offsets the shear zone, with the eastern block uplifted (Pl. 1 [Figure 5] and 5 [Figure 8]). Unpublished assay plans indicate that the ore shoots are not homogeneous in sulfide content. In the upper levels of the inclined shaft, very high-grade ore, possibly supergene-enriched, was mined. In the deeper levels, the ore zones are restricted to vein-type fracture fillings, with erratic width and metal content. The veins often have a gradation into barren shear zones, or are partially displaced by lamprophyre dikes (2,000 ft. level on Pl. 4 [Figure 7]).

Open-space filling textures are characteristic of ore from the Conjecture Mine. Galena, tetrahedrite, rhodochrosite, arsenopyrite and quartz fill fractures in brecciated host rock, early quartz, or later second stage sulfides (Fig. 9 [Figure 9]). Early pyrite is found
Table 1. Cumulative production from the Lakeview district.

<table>
<thead>
<tr>
<th>Year</th>
<th>Ore (t)</th>
<th>Old Tailing (t)</th>
<th>Gold (ounces)</th>
<th>Silver (ounces)</th>
<th>Copper (pounds)</th>
<th>Lead (pounds)</th>
<th>Zinc (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue Slide Lime Placer (1944)</td>
<td>16</td>
<td>—</td>
<td>—</td>
<td>249</td>
<td>93</td>
<td>4,515</td>
<td>3,450</td>
</tr>
<tr>
<td>Blanket Lead (1924-1925)</td>
<td>7</td>
<td>—</td>
<td>0.18</td>
<td>434</td>
<td>53</td>
<td>4,134</td>
<td>—</td>
</tr>
<tr>
<td>Comet (1915)</td>
<td>4</td>
<td>—</td>
<td>320</td>
<td>—</td>
<td>820</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Conjecture (1913-1956)</td>
<td>12,663</td>
<td>—</td>
<td>93.02</td>
<td>81,333</td>
<td>13,825</td>
<td>90,983</td>
<td>53,778</td>
</tr>
<tr>
<td>Hidden Treasure (1907-1912)</td>
<td>51</td>
<td>—</td>
<td>—</td>
<td>1,977</td>
<td>—</td>
<td>364</td>
<td>—</td>
</tr>
<tr>
<td>Idaho Lakeview (1916-1950)</td>
<td>31,042</td>
<td>—</td>
<td>146.39</td>
<td>235,890</td>
<td>13,251</td>
<td>383,934</td>
<td>73,298</td>
</tr>
<tr>
<td>Rainbow (1911-1916)</td>
<td>115</td>
<td>—</td>
<td>0.25</td>
<td>8,227</td>
<td>—</td>
<td>10,171</td>
<td>—</td>
</tr>
<tr>
<td>Silver Leaf (1925)</td>
<td>18</td>
<td>—</td>
<td>1.81</td>
<td>608</td>
<td>—</td>
<td>4,626</td>
<td>—</td>
</tr>
<tr>
<td>Vulcan (1951)</td>
<td>0.53</td>
<td>—</td>
<td>—</td>
<td>14</td>
<td>—</td>
<td>201</td>
<td>109</td>
</tr>
<tr>
<td>Totals</td>
<td>181,622.53</td>
<td>230</td>
<td>4,170.52</td>
<td>1,250,788</td>
<td>63,068</td>
<td>1,780,890</td>
<td>832,971</td>
</tr>
</tbody>
</table>

1No historical information available on this property.

disseminated in the host rock and forming crustifications next to the vein walls. Arsenopyrite is engulfed by early quartz and is visible in fractures of brecciated sililte. Crustifications of galena and tetrahedrite are separated by drusy quartz with some stibnite crystals visible in fractures. . . . An interesting feature of the ores is the presence of rhodochrosite as gangue carbonate instead of siderite, and the lack of sphalerite in the ore. Pyrrargyrite (?) native silver (?) and boulangereite (?) are reported to occur in several places on the 2,000 and 1,000 ft. levels (Pl. 4 [Figure 7]).

The total production from the Conjecture Mine, during the years 1952-1954, is summarized in Table 2 (omitted). A total of over 360 tons of ore was shipped during this time to the Bunker Hill smelter near Kellogg, Idaho. The ore with the highest silver content was apparently mined from the 100 and 200 ft. levels, because it contained only 4 percent iron and 8 percent sulfur, as compared to 35 percent iron and 45 percent sulfur in other ore shipments. The ore probably was taken from the enriched zone where iron and sulfur had been leached out while the base metals had been concentrated. The silica content in the ore from the same origin is 38 percent, but is only 7 to 17 percent in later shipments. Zinc content has a range of from 15 percent in the lower levels. Antimony and arsenic content of the ore remained constant in most assays.

2This is incorrect. The material shipped was concentrate, not ore.
Geologic and composite mine maps of the Conjecture Mine area; Lakeview, Idaho.

EXPLANATION

1. vein with ore
2. ore vein with ore
3. fault with ore
4. geologic section with ore
5. strike and dip of bedding

Figure 7: Composite mine maps of the Conjecture Mine, Lakeview mining district, Idaho (Kael, 1974, Plate 6)
Figure 9. Polished section of the ore from the Conjecture Mine (twice actual size). SL = silicified limestone; Asp = arsenopyrite; EQ = early quartz; EP = early pyrite; Ga = galena; Tt = tetrahedrite; Stb = stibnite; RS = ruby silver; LP = late pyrite; LQ = late quartz (Kun, 1974, Figure 9).
The Conjecture was discovered in 1894 (Kun, 1974). The Spider claim was located on September 23 and the Conjecture claim on September 28 (Cunningham, 1918). Ore shipments by the locators had a gross value of $62,000 (Anderson and Nickelson, 1954). The 1901 IMIR (p. 47) noted: "The Conjector has a force of men at work and is looking well, with proper facilities to treat their ore, a great mining camp will be built up." Two carloads of ore were shipped to the Tacoma smelter in 1900. This material averaged 63.2 ounces of silver and 0.07 ounce of gold per ton; no payments were made for lead or zinc (Anderson and Nickelson, 1954). The 1902 IMIR reported continuing development work.

According to the 1905 IMIR (p. 74):

The Conjecture Mine is another quite extensively developed fissure parallel to the Keep Cool Mine and Weber, a little further north. It has produced a number of shipments of high-grade silver ore and had a carload of rich mineral sacked up ready for shipment at the time of the writer's visit last fall, that was said to average 250 ounces silver per ton.

This is an oxidized, dry silver ore, carrying a good deal of iron and manganese oxide, and is shipped to the Tacoma smelter, where it is handled at a treatment charge of $5.00 per ton.

The Pittsburg Mining Co.'s 1905 report to the Idaho Mine Inspector stated that H.D. Payne had shipped 2 tons of ore that netted $27 and that the mine would ship 125 tons of ore, valued at $125 per ton, during the year. (Table 2 shows companies and individuals operating at the mine.) Total ore shipments from the mine were said to have yielded about $75,000', while one shoot that measured 100 feet by 50 feet produced $60,000. (Table 3 shows selected production data for the mine.) Workings included 3,000 feet of tunnels and a 160-foot inclined shaft (Table 4). MacDonald (1906, p. 46) mentioned, "A free-milling plant was used for the treatment of the rich surface ores."

Where this plant was located is uncertain.

Intermittent work continued at the property for the next two decades. In 1908, the company made preparations to develop the mine. Several mines in the district had ore blocked out in 1909, but no shipments were made. During 1913, a compressor was installed, and the inclined shaft was enlarged and straightened. By 1914 the company had applied for patent on the Conjecture and Spider claims. (Table 5 shows development work and employment at the mine, by year.)

A small shipment of galena was made from the Conjecture in 1915, apparently by a lessee. Ore was also shipped from the adjacent Comet claim, which was later incorporated into the Conjecture holdings. Equipment at the mine included a compressor plant, an engine, a boiler, a hoist, and a pump.

T.C. Cunningham examined the property in 1918. He described the deposit as follows (Cunningham, 1918, p. 2-4):

---

'MacDonald (1906) valued the production of the mine up to that time at $70,000.
Table 2. Companies operating at the Conjecture Mine.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Officer</th>
<th>Date Incorporated</th>
<th>Charter Forfeited</th>
<th>Year(s) at Mine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charles Graham and Archie O'Donnell</td>
<td></td>
<td></td>
<td></td>
<td>1894-</td>
</tr>
<tr>
<td>Col. W.M. Ridpath</td>
<td></td>
<td></td>
<td></td>
<td>unknown</td>
</tr>
<tr>
<td>Pittsburg Mining Co.</td>
<td>C.B. Dunning, President</td>
<td></td>
<td></td>
<td>pre-1905--1919(?)</td>
</tr>
<tr>
<td>Lakeview Silver Mines Co.</td>
<td>Henry Gallant, President</td>
<td>August 7, 1919</td>
<td>1925</td>
<td>1919-1925</td>
</tr>
<tr>
<td>Estate of Gerald M. Fennell</td>
<td></td>
<td></td>
<td></td>
<td>-1951</td>
</tr>
<tr>
<td>Funnell and Major Mining Co. (partnership)</td>
<td>Donald E. Major and Lyle H. Funnell</td>
<td></td>
<td></td>
<td>1951-1955</td>
</tr>
<tr>
<td>Conjecture Mines, Inc.</td>
<td>Donald E. Major, President</td>
<td>December 16, 1954</td>
<td></td>
<td>1955-</td>
</tr>
<tr>
<td>Federal Uranium Corporation (lessee)</td>
<td>R.W. Neyman, President</td>
<td>November 11, 1956</td>
<td>name changed to Federal Resources Corp.</td>
<td>1956-1960</td>
</tr>
<tr>
<td>Federal Resources Corp. (lessee)</td>
<td>Donald V. Peters, Secretary-Treasurer</td>
<td>name changed: May 16, 1960</td>
<td>not mining in Idaho (1975)</td>
<td>1960-1964</td>
</tr>
<tr>
<td>Sunshine Mining Co. (lessee)</td>
<td>Vincent Whelan, Assistant Secretary</td>
<td>January 3, 1921</td>
<td>active</td>
<td>1970-1979(?)</td>
</tr>
<tr>
<td>Minerals Management, Inc. (lessee)</td>
<td></td>
<td></td>
<td></td>
<td>1980-(?)¹</td>
</tr>
<tr>
<td>Royal Silver Mines, Inc. (lessee)</td>
<td></td>
<td></td>
<td></td>
<td>1995-</td>
</tr>
</tbody>
</table>

¹Information not available in Idaho Geological Survey's files.
Table 3. Mine output and economic data for the Conjecture Mine for selected years, 1894-1922.

<table>
<thead>
<tr>
<th>Year</th>
<th>Tons of ore</th>
<th>Average value per ton</th>
<th>Transport and treatment costs per ton</th>
<th>Gold recovered (ounces)</th>
<th>Silver recovered (ounces)</th>
<th>Lead recovered (pounds)</th>
<th>Gross returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>1894-1904</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>$75,000</td>
</tr>
<tr>
<td>1905</td>
<td>20</td>
<td>$125</td>
<td>$11.5  -0.0.13</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>$2,5001</td>
</tr>
<tr>
<td>1914</td>
<td>15</td>
<td>$54</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>$675.15</td>
</tr>
<tr>
<td>1922</td>
<td>5.97</td>
<td>—</td>
<td>—</td>
<td>0.359</td>
<td>389.86</td>
<td>1,034</td>
<td>$311.54</td>
</tr>
</tbody>
</table>

1Estimated from value and tonnage figures.

CHARACTER OF THE DEPOSIT

In the area surrounding the Conjecture, the formation is chiefly slate shale and a little quartzite. Two strong main veins have formed in shear zones, cutting across the stratification planes in the slate. The zone on which the Conjecture mine is located may be termed the Conjecture and the other the Webber.

The Conjecture vein can be traced and is located for about 2 miles along the strike, has a general bearing of N. 50 degrees E. and dip to the West. The Webber is also located for a mile and over and dips to the South with a general course of east and west.

The Conjecture forms a junction with the Webber about ½ mile south-west from the end of the Spider claim of the Conjecture property.

In the Conjecture property the vein has a width of from 3 to 8 feet, and the dip in the lower levels varies from 50 to 60 degrees. The hanging wall is hard and well defined, the foot wall is, in general, irregular.

The zone of oxidation is shallow.

MINERALOGY

Typical ore from the lower levels of the Conjecture Mine consist of a mixture of argentiferous galena, sphalerite, and pyrite. The pyrite also carries a little gold and silver. A little copper sulphide, chiefly chalcopyrite occurs with the lead and zinc sulphides also antimonial silver.

In the upper portion of the vein, near the outcrop, the ores are principally carbonates and oxides of lead, zinc, iron and manganese, with silver chloride, bromide and a little native silver.

The vein shows two distinct bands of mineralization, one on the hanging, the other on the foot wall side of the vein. These bands vary in width from one to three feet and carry the main values.

The foot wall seam as exposed in the lower levels is quartz with ribbon structure, well mineralized with zinc blende, pyrite iron and a little galena. Strong movement and crushing is apparent.

The hanging wall band is a dark shaley material showing very strong movement and crushing with resulting sickenstides. The slips and fractures are coated with a reddish brown oxide. Small lenses and seams of almost clean galena occur in this hanging wall band. A tale gouge accompanies the hanging wall, which is clean out and well defined. The foot wall is irregular.
Table 4. Cumulative development at the Conjecture Mine, by year. Information is from company reports to Idaho Inspector of Mines; discrepancies in numbers reflect inconsistencies in the original data.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Development (ft)</th>
<th>No. of Tunnels</th>
<th>Total Length of Tunnels, Crosscuts, and Drifts (ft)</th>
<th>No. of Shafts</th>
<th>Total Length of Shafts (ft)</th>
<th>No. of Rases</th>
<th>Total Length of Rases (ft)</th>
<th>No. of Crossouts</th>
<th>No. of Drifts</th>
<th>Length of Principal Tunnels (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No. 1</td>
</tr>
<tr>
<td>1905</td>
<td>—</td>
<td>—</td>
<td>3,000</td>
<td>1</td>
<td>160</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1914</td>
<td>800</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1915</td>
<td>1,500</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1916</td>
<td>1,000</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1918</td>
<td>—</td>
<td>—</td>
<td>3,000</td>
<td>—</td>
<td>1,000</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1920</td>
<td>3,600</td>
<td>—</td>
<td>—</td>
<td>3</td>
<td>220</td>
<td>400</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1921</td>
<td>3,600</td>
<td>—</td>
<td>—</td>
<td>3</td>
<td>220</td>
<td>400</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1922</td>
<td>3,720</td>
<td>3</td>
<td>3,000</td>
<td>1</td>
<td>220</td>
<td>3</td>
<td>500</td>
<td>8</td>
<td>2</td>
<td>500</td>
</tr>
<tr>
<td>1923</td>
<td>4,200</td>
<td>2</td>
<td>3,500</td>
<td>1</td>
<td>220</td>
<td>3</td>
<td>400</td>
<td>2</td>
<td>1,150</td>
<td>600</td>
</tr>
<tr>
<td>1924</td>
<td>4,500</td>
<td>2</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1,150</td>
<td>600</td>
</tr>
<tr>
<td>1925</td>
<td>3,000</td>
<td>4</td>
<td>—</td>
<td>2</td>
<td>500</td>
<td>2</td>
<td>3</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1926</td>
<td>3,605</td>
<td>5</td>
<td>2,620</td>
<td>1</td>
<td>515</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>630</td>
<td>330</td>
</tr>
<tr>
<td>1927</td>
<td>&quot;unknown&quot;</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>761</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1928</td>
<td>6,000</td>
<td>7</td>
<td>4,620</td>
<td>1</td>
<td>761</td>
<td>10</td>
<td>619</td>
<td>12</td>
<td>10</td>
<td>630</td>
</tr>
<tr>
<td>1929</td>
<td>7,635</td>
<td>0</td>
<td>4,650</td>
<td>2</td>
<td>1,785</td>
<td>12</td>
<td>1,000</td>
<td>0</td>
<td>6</td>
<td>—</td>
</tr>
<tr>
<td>1960</td>
<td>10,582</td>
<td>6</td>
<td>7,900</td>
<td>2</td>
<td>1,810</td>
<td>8</td>
<td>872</td>
<td>2</td>
<td>7</td>
<td>273</td>
</tr>
<tr>
<td>1961</td>
<td>10,475</td>
<td>0</td>
<td>6,275</td>
<td>2</td>
<td>2,362</td>
<td>12</td>
<td>1,840</td>
<td>0</td>
<td>6</td>
<td>—</td>
</tr>
<tr>
<td>1962</td>
<td>13,225</td>
<td>0</td>
<td>8,600</td>
<td>2</td>
<td>2,785</td>
<td>12</td>
<td>1,840</td>
<td>1</td>
<td>7</td>
<td>—</td>
</tr>
<tr>
<td>1963</td>
<td>17,480</td>
<td>0</td>
<td>12,855</td>
<td>2</td>
<td>2,785</td>
<td>12</td>
<td>1,840</td>
<td>2</td>
<td>7</td>
<td>—</td>
</tr>
</tbody>
</table>
(Footnotes for Table 4)

1. Information not reported to Idaho Inspector of Mines.

2. Tunnel No. 1 is the Graham adit; Tunnel No. 3 is the Spider adit. The inclined shaft had one compartment and gained a vertical depth of 190 feet. The stoped area above the Graham adit measured 200 feet by 100 feet. The No. 1 level was 130 feet below the collar of the shaft; it extended 30 feet to the north and 607 feet to the south. The No. 2 level was 220 feet below the collar of the shaft; it extended 85 feet to the north and 300 feet to the south.

3. Tunnel No. 1 is the Spider adit; Tunnel No. 2 is the Graham adit. The inclined shaft had one compartment and gained a vertical depth of 200 feet.

4. Tunnel No. 1 is the Spider adit; Tunnel No. 2 is the Graham adit.

5. The inclined shaft was 750 feet long and gained a vertical depth of 500 feet. See Table 6 for lengths of levels worked from the shaft.

6. The inclined shaft was 515 feet long and gained a vertical depth of 450 feet. There were three intermediate levels, with a total of 700 feet of workings.

7. The inclined shaft was 761 feet long and gained a vertical depth of 685 feet. No other numbers were reported for the year.

8. Although listed as tunnels, this list appears to include the several internal levels worked from the shaft (compare numbers with those in Table 6). The "No. 7 tunnel" (probably the 700 level) was 1,000 feet long. The inclined shaft was 761 feet long and gained a vertical depth of 684 feet. The total length of intermediate levels was 700 feet.

9. The vertical shaft was 1,032 feet deep. The inclined shaft was 750 feet long and gained a vertical depth of 670 feet. See Table 6 for lengths of internal levels.

10. The vertical shaft was 1,032 feet deep. The inclined shaft was 778 feet long and gained a vertical depth of 690 feet. See Table 6 for lengths of internal levels.


12. Caved.


14. The vertical shaft was 1,607 feet deep. The inclined shaft was 750 feet long and gained a vertical depth of 670 feet. See Table 6 for lengths of internal levels.

15. The vertical shaft was 2,032 feet deep. The inclined shaft was 750 feet long and gained a vertical depth of 670 feet. See Table 6 for lengths of internal levels.
Table 5. Development work, number of men employed, and operating companies at the Conjecture Mine, by year.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Men Employed</th>
<th>Tunnels (feet)</th>
<th>Sinking (feet)</th>
<th>Cross-cutting (feet)</th>
<th>Drifting (feet)</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1914</td>
<td>3</td>
<td>--</td>
<td>150&lt;sup&gt;1&lt;/sup&gt;</td>
<td>40&lt;sup&gt;3&lt;/sup&gt;</td>
<td>--</td>
<td>Pittsburg Mining Company</td>
</tr>
<tr>
<td>1915</td>
<td>3</td>
<td>--</td>
<td>260&lt;sup&gt;3&lt;/sup&gt;</td>
<td>50&lt;sup&gt;2&lt;/sup&gt;</td>
<td>--</td>
<td>Pittsburg Mining Company</td>
</tr>
<tr>
<td>1916</td>
<td>3</td>
<td>--</td>
<td>183</td>
<td>--</td>
<td>15</td>
<td>Pittsburg Mining Company</td>
</tr>
<tr>
<td>1918</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Pittsburg Mining Company</td>
</tr>
<tr>
<td>1920</td>
<td>10</td>
<td>--</td>
<td>200&lt;sup&gt;3&lt;/sup&gt;</td>
<td>1,200&lt;sup&gt;2&lt;/sup&gt;</td>
<td>--</td>
<td>Lakeview Silver Mines Co.</td>
</tr>
<tr>
<td>1921</td>
<td>3</td>
<td>--</td>
<td>0&lt;sup&gt;1&lt;/sup&gt;</td>
<td>60&lt;sup&gt;2&lt;/sup&gt;</td>
<td>--</td>
<td>Lakeview Silver Mines Co.</td>
</tr>
<tr>
<td>1923</td>
<td>5</td>
<td>--</td>
<td>30</td>
<td>--</td>
<td>50</td>
<td>Lakeview Silver Mines Co.</td>
</tr>
<tr>
<td>1924</td>
<td>4&lt;sup&gt;4&lt;/sup&gt;</td>
<td>--</td>
<td>30</td>
<td>20</td>
<td>250</td>
<td>Lakeview Silver Mines Co.</td>
</tr>
<tr>
<td>1955</td>
<td>13</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>Conjecture Mines, Inc.</td>
</tr>
<tr>
<td>1956</td>
<td>11</td>
<td>0</td>
<td>78</td>
<td>200</td>
<td>600</td>
<td>Conjecture Mines, Inc.</td>
</tr>
<tr>
<td>1957</td>
<td>22</td>
<td>--</td>
<td>261</td>
<td>--</td>
<td>--</td>
<td>Federal Uranium Corp.</td>
</tr>
<tr>
<td>1958</td>
<td>4&lt;sup&gt;4&lt;/sup&gt;</td>
<td>--</td>
<td>246</td>
<td>--</td>
<td>1,000</td>
<td>Conjecture Mines, Inc.</td>
</tr>
<tr>
<td>1959</td>
<td>21</td>
<td>--</td>
<td>1,035</td>
<td>--</td>
<td>415</td>
<td>Federal Uranium Corp.</td>
</tr>
<tr>
<td>1960&lt;sup&gt;5&lt;/sup&gt;</td>
<td>20</td>
<td>0</td>
<td>467</td>
<td>200</td>
<td>1,710</td>
<td>Conjecture Mines, Inc.</td>
</tr>
<tr>
<td>1960&lt;sup&gt;6&lt;/sup&gt;</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>104</td>
<td>1,521</td>
<td>Federal Resources Corp.</td>
</tr>
<tr>
<td>1961</td>
<td>12.8</td>
<td>0</td>
<td>575</td>
<td>0</td>
<td>0</td>
<td>Federal Resources Corp.</td>
</tr>
<tr>
<td>1962</td>
<td>17.6</td>
<td>0</td>
<td>425</td>
<td>852</td>
<td>1,737</td>
<td>Federal Resources Corp.</td>
</tr>
<tr>
<td>1963&lt;sup&gt;7&lt;/sup&gt;</td>
<td>27+</td>
<td>0</td>
<td>0</td>
<td>695</td>
<td>3,555</td>
<td>Federal Resources Corp.</td>
</tr>
</tbody>
</table>

<sup>1</sup> Combined figure for sinking and raising.
<sup>2</sup> Combined figure for crosscutting and drifting.
<sup>3</sup>This work was done on the inclined shaft.
<sup>4</sup> Not reported to the Idaho Inspector of Mines.
<sup>7</sup>The U.S. Bureau of Mines reported the following development work for 1963: 171 feet of raising, 2,079 feet of drifting and crosscutting, 6,840 feet of diamond drilling, and 900 feet of long-hole drilling.
Table 6. Lengths of the internal levels at the Conjecture Mine, by year (data from reports filed by the companies with the Idaho Inspector of Mines).

<table>
<thead>
<tr>
<th>Year</th>
<th>No. 1 Level</th>
<th>No. 2 Level</th>
<th>No. 3 Level</th>
<th>No. 4 Level</th>
<th>No. 5 Level</th>
<th>No. 6 Level</th>
<th>No. 7 Level</th>
<th>No. 8 Level</th>
<th>No. 9 Level</th>
<th>No. 10 Level</th>
<th>No. 11 Level</th>
<th>No. 12 Level</th>
<th>No. 13 Level</th>
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</thead>
<tbody>
<tr>
<td>1955</td>
<td>600</td>
<td>400</td>
<td>200</td>
<td>800</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<td>—</td>
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</tr>
<tr>
<td>1959</td>
<td>675</td>
<td>390</td>
<td>—</td>
<td>870</td>
<td>675</td>
<td>1,750</td>
<td>290</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>1960</td>
<td>625</td>
<td>360</td>
<td>100</td>
<td>850</td>
<td>680</td>
<td>1,880</td>
<td>1,510</td>
<td>—</td>
<td>—</td>
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<td>—</td>
</tr>
<tr>
<td>1960</td>
<td>675</td>
<td>390</td>
<td>—</td>
<td>870</td>
<td>675</td>
<td>1,890</td>
<td>1,510</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1961</td>
<td>675</td>
<td>390</td>
<td>—</td>
<td>870</td>
<td>675</td>
<td>1,890</td>
<td>1,510</td>
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</tr>
<tr>
<td>1962</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>675</td>
<td>1,890</td>
<td>1,510</td>
<td>2,590</td>
<td>—</td>
<td>—</td>
<td>—</td>
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</tr>
<tr>
<td>1963</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>675</td>
<td>1,890</td>
<td>2,925</td>
<td>5,425</td>
<td>—</td>
<td>—</td>
<td>—</td>
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</tr>
</tbody>
</table>

2Caved.
3Partially caved.

The wall rock is mineralized with pyrite for several feet on each side of the vein. The filling between the bands is sheared and crushed material, consisting of altered wall rock, quartz, a little lime and calcite. It is comparatively soft, in places talcy, and more or less mineralized throughout. The width varies from 6 inches to 3 feet.

In the bottom level the filling shows a marked decrease in width towards the south face. At greater depth from the outcrop this filling will be probably entirely replaced by ore in extensive sections of the vein. Large lenses and shoots of galena with high silver content will in my judgement be found on the hanging wall side of the vein, when greater depth is obtained.

Cunningham also described the workings and the dumps on the property at that time (1918, p. 3-8):

CONJECTURE CLAIM, Old Workings

In the early working on the vein two adit levels were driven in the Conjecture ground. One on level with the present shaft house, the other about 40 or 50 feet higher up the hill and on level with the wagon road.

In the adit on shaft house level, a small shoot of galena ore was struck about 100 feet from the portal. This ore varied in width up to 12 inches, and was stoped overhead and shipped. A little farther in another small shoot was encountered which did not extend above the tunnel level, but was followed and stoped below to a depth of 15 or 20 feet. About 280 feet in, an extensive shoot of high grade ore was discovered and stoped above this level, and the adit from wagon road was driven to tap and work this shoot, the stopes extending in one place through to the surface. This ore was carbonate of high silver content, a portion of the silver in
native form. The width of the ore in this part of the shoot was about seven feet and yielded 200 ozs. silver per ton.

To extract the ore below the adits, a winze was sunk to a depth of about 60 feet and the high grade stopped down to this depth.

From these old workings Chas. Graham and Archie O'Donnell, the original locators of the claims extracted and shipped ore, to the gross value of $62,000. Smelter returns. Some of this ore netted about $550. per ton.

From the winze stope, one carload was shipped direct to the smelter as broken for the full width of the vein without selecting or sorting, to determine the returns from this mode of operating. This carload averaged 44 ozs. silver per ton. The width stoped was 4 feet. The vein in the winze dipped at an angle of about 62 degrees.

About this time other parties became interested in the property and sunk another winze about 25 feet south from the first.

This second winze finally reached to a depth of about 165 feet below the shaft house adit. From this winze stoping operations were carried out in the shoot and the high grade ore extracted and shipped to the level. In the deeper workings the sulphides were reached.

Altogether from the old stopes and workings ore to the value of over $100,000. was shipped to the smelter.

The adit from wagon road did not extend beyond the ore shoot, but the adit from shaft house level was driven on the vein a total distance of about 600 feet. Beyond the old stope no ore of shipping grade was discovered. No samples were taken or records kept of the low grade ores in these workings. It would probably constitute good mill feed at the present time. The old workings are now caved and inaccessible.

Mr. Graham and his associate carried out the greater part of the work above referred to, and I am indebted to him for most of the above information. Mr. Graham is at present residing in Lakeview.

CONJECTURE CLAIM. Workings.

In the latter months of last year and during January of the present year, a Spokane Company had a lease on the property and pumped out the main shaft workings below the adit levels. Prior to that time the mine had been under water for several years.

I had charge of the operations for two months prior to closing down on January 28th.

This Company failed to finance.

I roughly surveyed, carefully sampled and examined the accessible workings in the property, and am thereby enabled to make the present report.

CONJECTURE CLAIM. Incline Shaft.

This claim is developed in the lower levels through an incline shaft sunk in the hanging wall of the vein to a depth of 220 feet on the slope. From the collar, the shaft is timbered for a distance of about 50 feet, the remainder is in hard slate wall rock and unsupported.

The size is 4 feet by 7 feet in the clear and the inclination 65 degrees to the north west. When extended this shaft will cut the vein at a depth of about 500 feet on the incline.

Two crosscuts have been driven back to the vein from the shaft, one at 128 feet from the collar, distance 37 feet 9 inches. The other at a depth of 215 feet, is 32 feet 9 inches in length.

From these cross cuts, levels are driven on the vein namely the No. 1 and No. 2 respectively.

The depths along the plane of the vein from shaft collar level to No. 1 level is 130 feet and between No. 1 and No. 2 levels 90 feet.

No. 1 LEVEL from shaft.

This level extends for about 700 feet from the shaft cross cut in a southerly direction on the vein and 30 feet in a northerly direction.
At 276 feet south from the station the ground has caved for a distance of 20 feet, beyond the cave the water was backed up to a depth of two or three feet, but just previous to closing down, I made a hurried inspection of this section and succeeded in getting in to the old winze in the high grade shoot, 460 feet from the station (see map [omitted; see instead Figures 7 and 8]) 20 feet beyond this winze the sets have caved, completely shutting off the remainder of the level. All of the workings in the mine are timbered and lagged. . . .

The samples showed very little galena or sphalerite but carried considerable pyrite. The hanging wall seam is slightly oxidized, showing in places oxides and carbonates. The vein is strong and well defined throughout. The north drift face exposes a width of 4 feet, which does not include the hanging wall seam as this has not been broken into in the width of the drift at this point.

On account of the timbering the vein is fully visible in a very few places. In my hurried inspection of the level beyond the first cave, I found the vein where exposed well mineralized chiefly with pyrite. About 380 feet from the station south, considerable ore had sloughed down almost filling the drift. This looked to be of good concentrating grade.

The old winze at 460 feet south is open as far as could be seen above the level and apparently in good shape. This winze extends to a depth of about 35 feet below this No. 1 level. At the bottom, I am informed, drifts extend north and south for a distance on the shoot and the high grade ore stope up to the level. It is reported that good high grade ore remains in the bottom of this old winze and stope.

This shoot should extend down to, and below the No. 2 level, and would be tapped at from 350 to 400 feet beyond the present No. 2 level face.

When the No. 1 level is fully investigated, it will probably be found that stretches of stowing length, aggregating about 50% of the distance driven, or say a total of 300 to 400 feet on the vein, will average ten oz. of silver and over, which, with silver at $.85 per oz., and in the gold values, would mean about Ten dollar ore, the profit from which would be about three dollars per ton.

When extended into the Spider Claim, the backs on the dip of the vein up to the Spider tunnel will be about 290 feet. This area should yield a large tonnage of very profitable concentrating ore and shoots of high grade shipping ore will undoubtedly be discovered.

CONJECTURE, No. 2 Level

Below the No. 1 Level, a vertical distance of 80 or 90 feet on the dip, the No. 2 level enters the vein.

In the work recently carried out, this level was advanced to the south a distance of 50 feet, making the total from the shaft 80 feet. To the north the face is 10 feet from the station. At this depth the vein shows great improvement in width and value.

During the progress of the work I sampled the working faces at 5 foot intervals. . . .

This ore would yield a profit of from three to six dollars per ton, over and above all expenses, with silver at $.85 per oz.

The ore continued to improve as the drift was advanced. Towards the face the vein averaged from 17 to 24 ozs. silver and over One dollar per ton Gold, width sampled from 6 to 7 feet. The foot wall seam in places for 10 inches wide, assayed as high as 50 ozs. silver per ton. . . .

As previously stated, the distance to be driven to bring the No. 2 level under the high grade shoot, stope in the workings above, is from 350 to 400 feet. This shoot will undoubtedly extend to this level and should produce ore of good shipping value, together with very high grade concentrating material.

\*Here, and throughout Cunningham's report, this should read $.85, or 85 cents, per ounce.
On the level above, the ore of good workable value is in the undeveloped section ahead of the No. 2 face.

This and all other conditions point very favorably to the continuity of the satisfactory results already obtained on this level. The indications are that the values in the latter part of the drift will be maintained all the way in to the high grade shoot and would mean that all of the ore between this level and the No. 1 could be very profitably worked for a distance of at least 500 feet.

This block of ground alone would yield 17,000 tons of concentrating ore, and a profit of not less than $50,000, at the price taken for silver throughout this report, namely .85¢ per oz.

**SPIDER CLAIM. Workings.**

The Spider claim is explored by an adit level, starting about 40 feet from the north end line and driven on the vein to the south end, and into the adjoining claim (the Comet) for a short distance.

The greatest depth is attained at the south end, where the vertical distance under the apex is 400 feet.

This work is open and accessible for 589 feet to where one or two of the sets have caved, shutting off the remainder of the level. In the portion open the vein is broken and displaced, lying at a flat angle.

Within the first 400 feet the vein has been stoped in three or four places. These workings are close to the surface and the ore is oxidized. Carbonates and oxides of iron zinc and lead with manganese and a little pyrite.

Some ore was shipped. The silver occurs as chloride and bromide with a little native metal. I do not consider that any of the ore above the level in the part open and accessible is suitable to concentration.

In the south part beyond the caved sets, there is said to be a good shoot of sulphide ore. This ore was discovered in driving for the Comet ground, by parties leasing that claim. Permission had been obtained to drive and work through the Spider adit.

I recently obtained the following information regarding the shoot, from the superintendent of the work. The ore was of the usual character sphalerite, pyrite and a little galena in quartz gangue. In driving through the best portion of the shoot, or for about 100 feet on the vein, grab samples were taken from the carloads as trammed to dump, 5 samples from each car, one from each corner, one from centre. All samples were thrown together making one general sample for the day. The general average for 100 feet in length was determined to be from 19 to 20 ozs. silver per ton.

This shoot did not extend for a great distance above the tunnel level and was apparently the upper part of a body from below.

I have heard of this development from other sources, from men who worked in the level, and see no reason why this ore should not occur as reported.

The width of the vein is said to be from 4 to 5 feet.

**SPIDER AND CONJECTURE DUMPS**

At entrance to Spider adit and at Conjecture shaft, a considerable tonnage of dump material has accumulated from the workings.

**SPIDER DUMP.**

I sampled the outer portion of this dump by cutting several trenches to a depth of about two feet, with the following results:

- Central portion about 1500 tons.
- Average silver 6.2 ozs. @ .85¢ $5.27 per ton
- Gold Trace.
CONJECTURE DUMP.

This dump has not been sampled. It contains roughly about 6000 tons of material, 3000 to 4000 tons of which could be moved, without injury to shaft house, and profitably handled.

Part of the dump from the adit level was shipped some years ago to the old Panhandle Smelter near Sandpoint, the Smelter paying a flat rate of $ 1.00 per ton at the dump. Smelter assay sheets which I have seen, show that this contained 13 to 14 ozs. silver and from 40¢ [$0.40] to $ 1.60 gold per ton.

A large part of the dump is oxidized or slightly oxidized material, and a close saving would not be expected by flotation treatment.

The equipment and buildings on the property were as follows (Cunningham, 1918, p. 10):

**EQUIPMENT.**

The present hoisting and drilling plant at the Conjecture shaft, with a few necessary repairs and additions, will suffice to explore and develop additional ore.

The boiler, 35 horse power with the exception of two leaking tubes, is in good order.

The masonry setting and fire box lining need repairs. These are matters which can be fixed in short time and at little expense.

The hoisting engine, 5x7 double cylinder single drum hoist while small, will meet the requirements while hoisting by bucket, also the present hoisting rope, and with an additional bucket and flat car, the muck can be handled with fair speed.

The compressor, Laidlaw Summ [Dunn] Gordon 8x8x8 steam driven is out of commission, the air cylinder is cracked. This can be repaired and the machine placed at work for a little over $ 100.00.] The compressor will run 2 jackhammer drills. There is one jackhammer drill on the property, unmounted. To make good progress in drilling shell column and arm must be furnished, and the necessary parts to convert the drill from a dry to a water machine, also additional drill steel. This added drilling equipment will cost about $ 175.00.

The Pump, Knowles Sinker, is old and badly worn, but will answer the purpose during prospecting operations. Part of the piping installation is old and leaking and should be renewed in places.

I may point out that the shaft was sunk, and all of the development work in the lower levels carried out with the present equipment.

**BUILDINGS.**

The Shaft House and head frame is in keeping with the present machinery equipment.

Bunk House and boarding house can be remodelled and repaired to accommodate about 12 men, with very small expenditure.

An Assay Office should be built and equipped and room provided for office purposes and accommodation for superintendent.

In 1919, the Conjecture was systematically explored by the Lakeview Silver Mines Company. Under the direction of T.C. Cunningham, a large body of ore was proven

27
between the Graham adit level and the 200-foot level. The headframe and surface plant (Figure 10) burned in November (Sampson, 1928, IGS mineral property files).

Several lots of ore containing lead and considerable silver were shipped from the property in 1921. In the company's annual report to the Idaho Inspector of Mines, Lakeview Silver Mines noted that the purchase price for the Conjecture and Spider claims was $68,000. By June 1921, the company had spent over $30,000 on development, equipment, and operation of the property in fulfillment of the purchase contract. Mining Truth (1921, p. 15) noted:

At this time the hopes of the residents of the district are pinned to the Conjecture, where a large body of good grade ore has already been developed. By a deal made in 1919, the mine was taken over by an engineer from St. Louis, Cecil G. Pennell, in association with T. C. Cunningham, who is now in charge of operations. Lakeview Silver Mines Co. was formed with capital of $1,000,000 in dollar shares, the company taking title from Pittsburg Mining Co., controlled by the Ridpath estate, through an issue of bonds which protects the sellers for the full purchase price. At the same time the Rainbow was secured from the Empire Tungsten Co., of Spokane, the Spider from Charles Graham, and the Comet from Robert Rennie, of Lakeview, and several other claims acquired by location.

Gerlough (1921) tested Lakeview Silver Mines' ore to determine the best processing methods.

The 1922 IMIR (p. 54) reported that "During 1922 the shaft was completed to its present depth," a statement that is not supported by the company's reports to the Idaho Mine Inspector (Table 4). Also questionable is the 500 feet of drifting supposedly conducted on the lower levels in 1922; by June 1, the company had not yet replaced the compressor, hoist, and pumping equipment at the Conjecture shaft. The 1922 IMIR also noted the company was experimenting to determine the proper metallurgical process for its ore and was completing plans for a "fine grinding flotation mill." This mill was never built. The June 16, 1922, issue of Mining Truth (p. 6) carried an article on the mine:

**Plan Lakeview Mill**

**Old Chloride Camp, on Pend Oreille Lake, May Enter Productive Column This Year.—Lakeview Silver Mines Company**

**Plans Flotation Mill.—Large Reserves in Sight.**

There is strong probability that the old camp of Chloride, on the southeast of Pend Oreille Lake, Bonner County, Idaho, scene of a big stampede in the days shortly after discovery of gold on Prichard Creek in the Coeur d'Alenes, almost 40 years ago, will this year witness a revival that will eventually lead to a productive era amply warranted by the large reserves developed in a spasmodic manner in more recent years.

The principal factor contributing to the betterment of conditions in the old picturesque camp is the improvement in milling practice brought about by the flotation process. The ores of the district are refractory in nature under any other treatment, a fact that has cut off in their prime several efforts by responsible interests to bring the district to the production stage upon a large scale.

**Extension Coeur d'Alene System.**

Generally speaking, the district is identical in formation with the Coeur d'Alenes, which lies, as the crow flies, but 35 miles to the southeast, and is in the general mineralized
Figure 10. Remains of the Conjecture headframe and surface plant after the November 1919 fire (Mining Truth, v. vii, no. 9, p. 6).
belt extending southward through British Columbia, through Boundary and Bonner counties Idaho, and finding their greatest productive yield in Shoshone County, made famous by such mines as the Bunker Hill, Hecla, Hercules, Tamarack, Morning, Mammoth, Standard, Last Chance, Callahan, Gold Hunter, Caledonia and others, among the greatest lead-silver mines in the history of the world.

**Shows Large Ore Reserves.**

For the past three years the Lakeview Silver Mines Co., controlled by wealthy St. Louis interests, has been devoting much energy to the development of the Conjecture mine, lying west of the famous Weber mines and about four and a half miles from the town of Lakeview, at the southeast extremity of Pend Oreille Lake. This development has been eminently satisfactory, until at this time it is conservatively estimated that there is 35,000 tons of ore in sight, with conservative gross value of $500,000, and net value of $250,000, after expenses of milling equipment have been met.

**Will Use Flotation.**

The company expects to conclude arrangements shortly for erection of a fine-grinding and flotation plant that will cost around $75,000 and will also provide additional sums for further development at depth, replacement of surface equipment burned over a year ago [Figure 10] and development of hydro-electric power on South Gold Creek, where a permit from the state has been obtained.

It is estimated that the total outlay necessary to bring the property to the productive stage will not be more than $125,000, and milling reserves sufficient to insure capacity operation for two years have already been made available.

**Conjecture and Spider Groups.**

The property owned by the company consists of 10 claims, including the Conjecture and Spider groups, the main claims of which have been patented. The Conjecture mine was formerly owned by the late Col. W. M. Ridpath, of Spokane, who made a fortune out of the Le Roi mine, at Rosland, B. C., and for many years prior to his death development was carried on in a more or less haphazard way. After his death the mine was neglected until three years ago, when it was acquired by St. Louis interests upon recommendation of Cecil G. Fennell, a well-known mining engineer, at one time vice president of Traylor Engineering & Manufacturing Co. and builder of the first smelter at Humboldt, Arizona.

**Developed to 500 Feet.**

Proceeding carefully and without publicity, under direction of T. C. Cunningham, E.M., the company has carried out a comprehensive plan of development, sinking the main shaft to a depth of 220 feet and driving on the vein to a total depth of 500 feet underneath the outcroppings, which are of exceptional promise. By this work the tonnage mentioned above has been placed readily available and extension of the shaft will doubtless largely increase the available reserves.

Extensive sampling shows that the mine-run ore contains an average of 10 ounces silver to the ton, with some values in gold and lead, while other exhaustive tests over a long period and conducted by the Moscow branch of the United States Bureau of Mines show that an extraction of 90 per cent can be economically made by the flotation process.

**To Build This Summer.**

Arrangements have proceeded to such a point that it is practically assured that mill construction will be started some time this summer. Some details remain to be attended to, but it is said ample capital is available for the proposition in New York on the recommendation of engineers who have examined the mine from time to time in the past three years. At the lowest level the ore-shoot shows an average width of four and one half feet and gives assurance of persisting to great additional depth. Occasionally cream running $100 to $300 per ton is encountered. At present prices of silver the past production of the mine has been in excess of $200,000, from workings less than 300 feet from the surface.
The mine was dewatered in 1923 (Sampson, 1928). The company did a little sinking and a large amount of drifting on the property. As a result of this development work, the mine had 30,000 tons of silver ore in reserve for future milling. Equipment at the mine (mostly replacements for that lost in the fire) included an Orr & Sembower double cylinder, single drum, 5x7' hoist; a Lairdaw-Dunn-Gordon 8x8x8' steam driven compressor; and a No. 5 Cameron sinking pump.

Silver prices, which had averaged at least $1.00 an ounce from 1918 to 1922, declined in each of eight years during the following decade. Metal prices hit all-time record lows in 1932, then slowly increased for the next decade. It was 1947 before the average price of silver ($0.905 an ounce) exceeded the 1923 price of $0.820 an ounce. The Conjecture Mine was idle in 1924. Lakeview Silver Mines Co. abandoned the project soon after that because of low silver prices (Anderson and Nickelson, 1954).

U.S. Bureau of Mines records show a small amount of production from the mine in 1936. Other than that, the mine was idle for almost three decades.

In January 1951, D.E. Major and L.H. Funnell acquired a 10-year lease and purchase option (Kun, 1974; Anderson and Nickelson, 1954). In July, McConnel (1951, p. 1) wrote the following about the property:

The property is under option to Ernie Major, Ford dealer for Spokane. The writer was accompanied to the property by Don Major and at the property by Don Berg, an engineer for the Major family.

Lakeview Silver Mines Company" owns the six patented claims; namely, the Rainbow (Survey 2689), Conjecture and Spider (Survey 2682), the Comet (Survey 3071), and the Silver Cord and Lucky Strike (Survey 2744). In addition, D. Major says there are 14 or 15 unpatented claims, located in recent years which adjoin the patented ground, and are held either by the Major family or by Lakeview Silver Mines Company.

The Conjecture was located about 1894 and intermittent activity continued up until about 1922. T. C. Cunningham was in charge of work about 1922. Total production is reported at about $100,000. Tonnage produced is unknown. The Major family began opening tunnels and unwatering the shaft in June, 1951.

Workings [Figure 11]

The Rainbow claim has a shaft which is reportedly 100 feet deep. It has been unwatered and Berg says there is no mineralization in the shaft. Next to the shaft is a caved tunnel reported to be 1000 feet long from which a few small pods of high grade ore are said to have come. Maje"s are presently engaged in opening this tunnel.

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6The diameter and the stroke for the cylinder in the hoist, in inches.

7The diameters of the steam and air cylinders and the stroke of the pistons, in inches.

8Lakeview Silver Mines Co. forfeited its charter in 1925. Anderson and Nickelson (1954) state that the patented claims were the property of the estate of Gerald M. Fennel. Fennel was presumably the heir to the former secretary of Lakeview Silver Mines Co., Cecil G. Fennel.

9i.e., members of the Major family.
Figure 11. Sketch map of the workings at the Conjecture Mine, July 1951 (McConnel, 1951).
The Conjecture claim has a caved tunnel, reported to be upwards of 1000 feet long, from which two small stopees have been mined. The bulk of production came from this tunnel. A 200 foot 65 degree inclined shaft near this tunnel has been watertight by Majers. From this shaft there is a 100 foot level about 600 feet long and a 200 foot level about 400 feet long, each level being essentially a drift on the vein.

On the Spider claim there is a caved tunnel reported to be over 1000 feet long from which a few pod-like shoots of good grade oxidized silver ore are said to have been mined. Majers are trying to reopen this tunnel.

On February 29, 1952, the Funnell and Majer Mining Co. was granted Defense Minerals Exploration Administration (DMEA) contract Idm-E267 for $53,228, with 50 percent government participation. The project ran until October 29, 1953, with the following results (Anderson and Nickelson, 1954, p. 1):

The purpose of the project was to explore the Conjecture vein for lead, zinc, and silver ores by deepening the present inclined shaft 200 feet and drifting 600 feet on the vein. The drifting has exposed a continuous vein structure for 600 feet in which two orebodies were discovered.

No. 1 orebody exposed by the drift is 120 feet long, 4.36 feet wide, and assays 22.24 ounces silver, 0.76 percent lead, and 2.35 percent zinc. It is contiguous with a marginal orebody 78 feet long, 5.91 feet wide and assays 10.29 ounces silver, 0.088 percent lead, and 1.34 percent zinc.

No. 2 orebody exposed by the drift consists of a marginal orebody 60 feet long, 6.17 feet wide assaying 13.19 ounces of silver, 0.096 percent lead, and 1.92 percent zinc, which joins an orebody 30 feet long, 2.25 feet wide, assaying 36.88 ounces silver, 1.763 percent lead, and 3.641 percent zinc.

Because silver was the chief metal present in the mine, further government assistance was not forthcoming.

Silver ore produced as a result of the exploration work was shipped from the mine in 1952. A 60-tons-per-day (tpd) flotation mill was built in 1953. It processed about 2,500 tons of silver ore during the year. Development continued in 1954, and the mine produced 196 tons of concentrate from 4,242 tons of crude ore. This material contained 30 ounces of gold, 17,050 ounces of silver, 4,000 pounds of copper, 22,100 pounds of lead, and 14,000 pounds of zinc.

Majer and Funnell organized Conjecture Mines, Inc., in late 1954. The new company acquired all the assets of the partnership in April 1955. Conjecture Mines continued development at the mine. The June 16, 1955, issue of the Wallace Miner\(^\text{10}\) carried an article in the operation:

Conjecture Mines, Inc., has been organized by Spokane interests to continue the development program they have been carrying on for the past 4 years at the old Conjecture

\(^{10}\)Copies of the newspaper clippings quoted in this section are in the Idaho Geological Survey's property file for the Conjecture Mine. Pertinent information for complete citations (page numbers on which the article appears and, in some cases, the name of the newspaper) were not included with most of the clippings.
mine near Lakeview at the south end of Lake Pend Oreille and bring the property into regular production, it was learned this week.

The new firm, organized by Donald Majer and Lyle Funnell, Spokane businessmen who took over the property in 1951, for 2,500,000 shares of 10-cent-par, non-assessable stock, is now making a public offering of 200,000 shares at 25 cents each to finance the project, according to an offering circular released this week. M. A. Creek, Spokane mining broker, is the underwriter.

Work completed by the Spokane men so far has shown that the Conjecture vein improves in both width and values as gained, the prospectus reveals.

When they took over, the mine had been developed to a depth of 200 feet and had lain idle for years, despite the fact that it had yielded some direct smelter shipments of high-grade silver ore to early-day operators. With the aid of a $26,614 loan from the defense minerals exploration administration they deepened the incline shaft an additional 200 feet to the 400 level and opened two shoots of commercial grade ore averaging 4½ feet wide on that horizon. The shoots averaged about 125 feet in length and were separated by about 90 feet of low-grade vein material.

Ore was also found on the 300-foot level, but the silver content was considerably higher on the bottom level—22 ounces per ton as compared with 14 on the 300 horizon in one ore shoot and 21 ounces against 16.5 in the other, according to the circular.

Some 383 tons of mill concentrates have been shipped from the property to the Bunker Hill smelter at Kellogg and they brought returns of $29,116, it says. The concentrates were made from 3356 tons of ore, about 40 percent of which was development muck, and yielded 33,720 ounces of silver, nearly 19 tons of lead, 22 tons of zinc, almost 4 tons of copper and 53 ounces of gold.

Deepening of the shaft to the 500 level is now in progress, with a crew of seven men on the job, to open sufficient additional stoping ground to permit regular production of 75 tons of ore per day. Mill expansion and improvements, including the installment of a larger classifier, to handle this daily tonnage, is also planned.

According to the circular, Majer, Funnell, Ernie Majer, Inc., and the estate of H. E. Majer have expended more than $300,000 of their own funds to bring the operation to its present stage of development. The two principals, Majer and Funnell, own 1,297,000 shares of the new company's stock.

Majer is president of the firm and Funnell is secretary-treasurer. Fred D. Williamson of Spokane is vice president and Galen Waddell, formerly geologist and engineer for Day Mines, Inc., of Wallace, is mine manager.

According to old engineering reports the Conjecture ore deposit was located in 1890 by Charles Graham and Archie D'onnell and it produced over $350,000 worth of crude silver ore in the early days, some of it bringing as much as $550 a ton, with silver at 60 cents an ounce. Lakeview Silver Mines, headed by Gerald M. Funnell, took it over in 1919, after a long period of idleness, and developed it to a depth of 200 feet, opening what the Idaho Bureau of mines described as a "Very considerable" ore body. The shaft headframe and surface plant was destroyed by fire that same year and little further work was done until Majer and Funnell [Funnell] acquired the property from the Funnell estate.

The Conjecture was the subject of a memorandum written by A.E. Nugent (1955, p. 1-2), geologist for Bunker Hill and Sullivan Mining & Concentrating Co., in October:

During the past three years the Conjecture Mine near Lakeview, Idaho has been making small shipments of high-silver concentrates to our smelter. These shipments total more than 250 tons. Although this production is not large, it has been reported that the ore body on
the new 500 level of the Conjecture is wider and richer than higher levels. Therefore, in order to check the report and to establish friendly relations with the new manager, J. D. Finley, I visited the property on October 21.

The Conjecture Mine is one of several groups of claims located along a shear zone, at least 8,000 to 12,000 feet long, cutting through soft shales of the Wallace formation. In recent years, Major and Funnel, Spokane business men, have deepened the mine from the 200-foot level to the 500-foot level. Present operations are on the 500-foot level.

The mine is developed by several adit drifts and the 500-foot deep inclined shaft. Present work is being done by drifting and the driving of raises between the 400-foot and 500-foot levels. The 500-foot drift to the southwest has progressed about four hundred and fifty feet from the shaft; no drift has been driven to the northeast.

The ground of the 500-foot level is heavy, and the drifts and raises are tightly laggered. The face of the drift exposes five feet of sheared and mineralized country rock. Minerals observed were galena, sphalerite, pyrite, siderite, tetrahedrite and ruby silver in a gangue of quartz, siderite and rhodochrosite. The grade of the rock from this five-foot width is said to average between ten and twenty ounces of silver and about one percent of combined lead and zinc per ton. The strike of the vein is South 55° West, and the dip is approximately 65° to the northwest.

The ore shoot being developed at the present time is said to be approximately one hundred and fifty feet long and four feet wide, indicating a probable reserve close to 10,000 tons developed between the 400-foot and 500-foot levels and carried fifty feet below the 500-foot level. This block should yield 150,000 ounces of silver and fifty tons each of lead and zinc.

The present capacity of the mill is only sixty tons per day. Other possible bottlenecks in achieving greater production are the condition of the road from the mine to the oiled highway twenty miles away, and possibly a need for a larger, faster hoist.

J. D. Finley, former Sunshine geologist, is the new manager replacing G. Wadell. Finley has a crew of fifteen men with which he plans to operate continuously through the winter.

Apparently the financial backing of the company is being aided by Frank Eichelberger, Spokane mining promoter. Mr. Major stated that the backing of the company is assured to the extent that the company is not interested in selling the property at the present time.

Although the production of this company is small and its future uncertain, it seems well that Bunker Hill and Sullivan keep abreast of developments of this property. Our Mill Department is presently running mill tests for the Conjecture.

Plant additions during 1955 included a Deister concentrating table, a diesel pickup truck, drills and stopers, a slusher, a tugger, pumps, and an ore car. About 100 feet of shaft work was done; drifting and raising totaled 650 and 300 feet, respectively. (Table 6 gives the lengths of the internal levels in the mine, by year.)

Development work continued at the mine in 1956. A new headframe, hoist, dry house and compressor building, flotation cells, classifier, crusher, and compressor were added during the year. Also, the diesel-electric power source previously used at the mine was replaced by electric power from the Washington Water Power Co.'s 230,000-volt Cabinet Gorge transmission line. This required the installation of a special 52-ton transformer. On November 16, a lease and operation agreement between Federal Uranium Corporation and Conjecture Mines, Inc., was started. The agreement called for Federal to
spend $200,000 to extend the workings on the Conjecture vein 200 feet and to carry out exploratory drifting on the resulting 700 level. Plans were made to increase output to 300 tpd and to enlarge the one-and-a-half compartment shaft to two compartments.

Work continued in 1957, although no ore was shipped from the mine. Development deepened the inclined shaft from 500 to 700 feet, and about 650 feet of drifting was done on the 700 level. Federal also acquired operating control of the adjoining Keep Cool and Idaho Lakeview mines and made preliminary plans to work them from a shaft on the Conjecture property. The April 24, 1957, *Wallace Miner* carried the following story in the work at the Conjecture:

Federal Uranium corporation has decided to go ahead with the second phase of its big development program at the Conjecture silver-lead mine in Lakeview district of Bonner county, Donald E. Majer, Spokane, president of Conjecture Mines, Inc., advised stockholders in a quarterly report this week.

The new program will include sinking a new, three-compartment shaft to a depth of 1000 feet and putting the mine into production, he said.

By undertaking phase two of the development contract, Federal becomes a 50-50 partner in the property, equipment and profits, Majer stated. The Salt Lake city firm has been exploring and developing the claims since the latter part of 1956 under the contract.

A site for the new shaft has already been cleared about 800 feet down the creek from the present mine camp and plant\(^\text{11}\), stockholders were informed. A culvert has been installed and footings have been dug for the steel head-frame and reinforced concrete ore bins.

Shaft sinking operations are scheduled to be underway by July 1, Majer reported.

He said the new shaft site includes sufficient space for installation of a crushing plant and mill adjacent to the hoisting plant.

All requirements of the first phase of the contract have been satisfactorily met or exceeded, Majer said. This included deepening the exploration shaft from the 500 to the 700 level[,] completing 1000 feet of drift work on the new horizon and spending at least $150,000 in an 18-month period.

During the course of this work several ore shoots of "better than commercial grade" were opened on the 700 level, he said. In addition, diamond drilling disclosed good grade ore on the adjacent Silver Leaf property and proved the existence of the St. Regis formation, a more favorable host rock for ore deposition than the overlying [sic] Wallace, about 180 feet below the 700 level.

Federal continued its exploration and development work at the Conjecture in 1958. Preparations were made for sinking a 1,000-foot, three-compartment vertical shaft. After construction of the headframe and other auxiliary facilities, work on the shaft began in late September. The project was about one-fourth completed by year end. On January 16, 1958, the *Wallace Miner* carried the following story:

Federal Uranium corporation has made a new ore strike on the property of Conjecture Mines, Inc., in the Lakeview district of Bonner county, it was reported this week by Donald E. Majer, Conjecture president, in a letter to stockholders.

\(^{11}\text{i.e., 800 feet down the creek from the inclined shaft.}\)
The discovery was made by drilling in the wall of a tunnel on the Silver Leaf group of claims, he said. The hole was put in about 175 feet from the portal and it intersected about five feet of mineralization at the 45 foot point. Sludge samples assayed 49.99 ounces of silver to the ton, Major reported.

In the Conjecture mine, drift work on the 700-foot shaft level has opened the downward extension of two ore shoots and both are longer, wider and richer than on the level above, he told stockholders. Development ore from the drift is being stockpiled for milling.

In its first year of operation, Federal Uranium has completed 18 months' work requirements on the Conjecture property and has installed a considerable amount of new equipment at a total cost of about $300,000, Major stated.

He pointed out that Federal's recently negotiated 60-40 operating agreement with Idaho Lakeview Mining company, in which Conjecture can participate equally, puts 85 percent of all the Lakeview properties under one management.

On February 13, 1958, the Wallace Miner noted:

Federal Uranium corporation has determined that top of the favorable St. Regis formation lies less than 200 feet below the bottom 700-foot level at the Conjecture silver mine in the Lakeview district of Bonner county, it was learned this week.

A diamond drill hole put down from the bottom level passed from the over-lying Wallace to the St. Regis formation at the 180-foot point and penetrated the latter for a distance of about 200 feet.

Proximity of the more favorable ore-host rock was sought in connection with Federal's plans for deepening the shaft at the property which the company operates under an agreement with Conjecture Mines, Inc., of Spokane. In the nearby Coeur d'Alene district this formation has been found to contain major silver ore deposits, whereas in the overlying Wallace, ore production has been found to be pocketty, narrow and discontinuous.

All Conjecture production so far has come from the Wallace formation.

A story about the new shaft ran in the September 18, 1958, issue of the Wallace Miner:

Shaft-sinking operations are scheduled to get underway next Monday on an around-the-clock, six-day-week basis at the old Conjecture silver mine in Lakeview district of Bonner county near the southern tip of Lake Pend Oreille, according to a Spokane report this week.

Shaft cages, guides, lights and other equipment are being installed this week on the steel headframe which towers 75 feet above the 44-foot-deep "collar" of heavy concrete which has already been completed at the new shaft site, and ample supplies of shaft timbers, ventilation pipe and other items are on hand for an all-winter operation.

The first of next week a 21-man crew, including 12 shaft men and three hoistmen, will start taking rounds out of the bottom on a three-shift schedule.

The deep development program is being carried on by Federal Uranium corporation of Salt Lake City, under a 50-50 profit-sharing agreement concluded early last year with Conjecture Mines, Inc. Lee R. Messerly, former superintendent of the Star mine for Hecla Mining company of Wallace, is general superintendent of mines for Federal Uranium and Walter N. Campbell is superintendent of the Conjecture operation.

The shaft will be put down to a depth of 1025 feet, Messerly told a Spokane reporter this week. One working level will be established at the 624-foot point to connect with the 700 level workings of the old Conjecture inclined shaft some 500 feet up the canyon and another will be driven at the 945-foot horizon, he said.
The project is expected to take about a year to complete and it will increase Federal's investment in the property to approximately $1,000,000.

The Conjecture mine was a highly-regarded early-day producer, but it lay neglected and forgotten for many years until Donald E. Majer and Lyle H. Funnel, Spokane businessmen, acquired it and started rehabilitation in 1951. The two men and their associates, later incorporated as Conjecture Mines, Inc., spent about $250,000 repairing the old 200-foot shaft, deepening it to the 500-foot level, constructing a small mill and taking out some ore.

This development disclosed that the Conjecture vein improved in size and values with additional depth and it was on the strength of this disclosure that Federal Uranium took over the enterprise under the operating agreement.

Federal extended the old shaft to the 700-foot level and found further improvement in the quality and quantity of ore on this horizon. It was also determined that the Wallace formation which encases the vein in present workings would be replaced by the St. Regis formation, a more favorable host rock for ore deposition, less than 200 feet below the 700 level. It was then decided that a new and bigger shaft was warranted.

During the past few months the company has cleared, excavated and leveled the new shaft site, collared the three-compartment shaft and erected the headframe, built a new transformer station and timber-framing shed, and put up a concrete block building to house hoisting equipment and miners' change room.

A September 23, 1958, article in the Inland Empire Miner covering the same work noted, "In a few months, Federal Uranium Corporation of Salt Lake City has cleared trees, filled in a ravine, scooped out a hillside to bedrock, started a three-compartment shaft and erected a steel headframe and other new structures."

The vertical shaft reached the 1,000-foot level in 1959, and exploratory drifting and diamond drilling were begun on several levels. On May 7, 1959, the Wallace Miner reported:

Exploration and development work has started from the newly completed three compartment vertical shaft at the Conjecture mine near Lakeview, Idaho, Donald E. Majer, Spokane, Conjecture Mines, Inc., president stated at Spokane this week. He said crews are at work on both the 700 and 1000-foot levels of the mine.

Drilling has started from the bottom 1000 level to intersect the main Conjecture vein through which the shaft passed at 800 feet, he said. This intersection is expected to be made with about 135 feet of tunneling and the structure will then be followed for 2000 feet to get beneath the old shaft workings and to open new ground.

Majer also stated that miners are driving from the 700 foot level to connect with a drift driven approximately 500 feet from the old incline shaft to within 35 feet of the new shaft. Federal Uranium corporation of Utah is doing the work under a profit-sharing agreement. Federal's expenditures to date are said by Majer to total about $900,000.

The Wallace Miner noted on June 28, 1959:

R. W. Neyman, president and general manager of the Federal Uranium corporation of Salt Lake City, reported to The Miner this week that the company has completed its shaft sinking at the Conjecture property at the south end of Pend Oreille lake in northern Idaho.

"We are now drifting on the 1000-level three shifts per day, six days per week, toward our objective," he wrote.
Connection has already been made on the 700 level and we are commencing raises on two commercial ore shoots opened on that level, he said.

Neyman was general manager of the Hecla Mining company in this district before going with Federal Uranium several years ago.

On July 24, 1959, the Kellogg-Wardner News carried the following information, summarized from Federal's annual report:

At the Conjecture silver mine in Idaho, a 1,000 foot shaft has been sunk and stations and pockets have been completed on both the 700 and 1,000 foot levels. A connection has been made from the shaft with the 700 foot drift, which previously had disclosed two ore shoots. Crews are now raising on both ore shoots from the 700 to the 500 foot level. At the 1,000 foot level, a drift is being advanced toward the area below the projection of these ore shoots. If development work at this level is satisfactory, plans for a mill will go forward this winter so that Federal will be in a position to start mill construction in the spring, the report states.

Federal has an agreement with the Conjecture Mines Inc. (and with the Idaho-Lakeview Mines company on an adjacent property) whereby Federal serves as operator and then shares in profits after recovering its expenditures.

Work during the year proved a substantial quantity of good ore. In December plans were announced to deepen the shaft to 1,400 feet.

The work at the Conjecture continued for the next four years. In January 1961, Federal announced plans to extend the vertical shaft to the 2,000-foot level (Kellogg-Warder News, January 27, 1961). Klobusicky (1961, p. 1-7) evaluated the Conjecture as follows:

Introduction:
The Federal Resources, Inc. began operating the Conjecture Mine in November 1956 under an agreement with Conjecture Mines, Inc., whereby Federal serves as operator, first recovering its expenditures, and then sharing in profits with Conjecture Mines.

Federal first conducted underground exploration through an old incline shaft to the 700 ft. level, as shown on the enclosed map (omitted; see Figures 7 and 8 instead). Work on the 700 ft. level showed some encouraging results, inasmuch as a modest lateral extension of the ore bodies was noted on this level as compared to the upper levels. Mineral values and average width of the vein remained practically unchanged.

Next, Federal sunk a new vertical 3-compartment shaft to the 1000 ft. level and drifted horizontally toward the area of the downward projected position of the ore shoots. This drift encountered two ore shoots which indicated further lateral extension of the mineralization with not much change in the tenor and width of the mineralization.

All the workings between the surface and the 1000 ft. level are in laminated, badly broken argillites of the Wallace formation. Bands of St. Regis quartzite were penetrated 50-100 feet below the 1000 ft. level. The St. Regis formation is the ultimate target of the exploration project.

On the basis of the results obtained, the Federal decided to extend the shaft to the 2000 ft. level. This operation is scheduled to begin shortly on a 3 shift/day basis. A total of 5000 ft. of drifting is being planned on 2000 and on one intermediate level. The total cost of the project will exceed $1,500,000.
Officials of the Federal are of the impression that enough ore has been developed between the 500 ft. and 1000 ft. levels to pay for all the exploration and development work to 1000 ft. level.

There is a 50 t.p.d. flotation mill on the property. In case further exploration work will not meet with success, the company plans to extract the developed ore reserves on a small scale as a salvage operation, as reported to the writer by Mr. Walter Campbell, Mine Superintendent.

Local Geology:
All the old and new workings accomplished to date are in dark grey, laminated argillites of the Wallace formation, having a northeasterly southwesterly strike and dipping from 5 to 22 degrees to the north.

The argillite beds are traversed by a very prominent shear zone cutting the host rock in a sharp angle and dipping at about 60 degrees to the north. The shear zone is sporadically mineralized for a distance of several thousands of feet on the surface.

Since E. Bracken mapped the 500 ft. level and reported on the local geological horizons to that horizon, the writer will limit his observations to the work accomplished by the Federal below the 500 level.

On the 700 ft. level two ore shoots were developed. . . .

The 2 ore shoots are divided by a 200 ft. long section of low grade ore assaying 6-7 oz. silver over an average width of 2 ft. Ore shoot No. 2 terminates on the east side against an almost vertical east-west fault, which is quite prominent and can be identified on a number of levels.

From the east end of the second ore shoot a diamond drill hole was drilled at minus 70 degrees into the footwall to a depth of 300 ft. Most of the hole cut argillites of the Wallace formation. Toward the end of the hole bands of St. Regis quartzite were reported.

Tunneling on the 700 ft. level totals about 1140 feet.

Vertical shaft:

After completion of the work discussed on the 700 ft. level, the company started to sink a 3-compartment shaft in the hanging wall of the explored structure. The shaft went through the vein structure at about 725 ft. below the collar. The shear zone cut by the shaft is about 40 ft. wide. It does not carry commercial values in the vicinity of the shaft.

The total depth of the shaft is 1034 ft. including an 85 ft. deep sump section. The shaft is making about 10 gals. of water per minute.

No commercial values were anticipated on the 1000 ft. level in the vicinity of the shaft; this, after a 140 ft. long crosscut from the shaft reached the shear zone, which is at that location 50 ft. wide, the tunnel was turned into the footwall and ran parallel with the shear zone for about 150 ft. Values in the shear zone were occasionally checked by diamond drilling, but only low grade values were encountered. Silver values started to pick up at about 700 ft. from the shaft. An ore body starting at this point was systematically assayed for a length of 376 ft. in 3 sections from west to east. . . .

No average values were available for the lead and zinc content of the ore shoot, but they were comparable to the values encountered on the upper level, or approximately 0.75% lead and 1.5% zinc per ton.

A 100 ft. long section joining the ore shoot described from the east assays 6-7 oz. in silver over an average width of 2 ft. with mineral values gradually fading toward the east.

Plan for the immediate future:

According to the existing plans, the vertical shaft will be extended from the 1000 ft. to the 2000 ft. level, and about 2500 ft. of tunnel work is being planned on the 2000 ft. level before the geological conditions will be checked on higher levels.

If the present mine pattern persists, about a 700 ft. long crosscut would reach the mineralized shear zone from the shaft on the 2000 ft. level and commercial mineralization could be expected approximately 1000 ft. easterly from the end of the crosscut.
Diamond drilling:

A number of relatively short diamond drill holes were used to probe into the geological conditions from the 700 ft. and 1000 ft. levels. Following three holes drilled from the 1000 ft. level appear to have significance inasmuch as all of them encountered quartzites of the St. Regis formation in shallow depths below the 1000 ft. level. . . .

Ore reserve estimate:

. . . . Probable and possible ore reserves were estimated on the basis of the assumption that the lengthening trend along the lateral extension of the ore shoots will continue to the 2000 ft. level, i.e. that the strike length of the shoots will approximately double within a vertical range of 1000 ft. and on the basis of the assumption that the ore shoots will have an average width of 4.0 ft.

Economical factors:

. . . . Net smelter values: . . . Total $14.36 per ton

The writer estimates that total production costs, including mining, milling, depreciation and taxes will be in the neighborhood of $15 per ton. Thus, the writer doubts that the ore reserves indicated to date can be extracted with a profit.

The change in the geological formation below the 1000 ft. level, however, can create conditions which are drastically different from the ones encountered in upper levels. The upper levels are in badly fractured argillites of the Wallace formation. The St. Regis quartzites, penetrated in diamond holes just below the 1000 ft. level, holds the promise of more extensive mineralization and more favorable mining conditions.

The Federal Resources Co. will have spent in excess of $1,500,000 on this project, including the planned extension of the vertical shaft to the 2000 ft. level and workings on this level.

Conclusions and recommendations:

The writer is of the opinion that exploration results of the Conjecture project were disappointing to the 1000 ft. level.

As mentioned above, diamond drill holes drilled downward from the 1000 ft. level, encountered quartzite bands of the St. Regis formation 50-100 ft. below the 1000 ft. level. This appears to be the single most encouraging factor of this exploration project.

The effects of the change of the formation on the tenor of the mineralization are unpredictable, since the Conjecture Mine will be the first to penetrate the St. Regis horizon in this area. Exploration of this formation may hold, therefore, an element of surprise.

The writer suggests, therefore, that Bunker Hill keep close track of the results of the Conjecture exploration project with the aim of acquiring interests in the surrounding area should the exploration results warrant such a move.

Shaft sinking at the Conjecture Mine is scheduled to start March 1, on a three shift basis. The 2000 foot level should be reached, according to existing plans, around September 1, 1961.

On March 30, 1961, the Wallace Miner carried a story on the Conjecture project:

Work on deepening the Conjecture mine shaft is being pushed on a three-shift basis and is averaging eight feet daily, Donald E. Majer, president of Conjecture Mines, Inc., reported in Spokane this week.

He said more than 100 feet of progress has been made in extending the three-compartment shaft from the 1000-foot level to a depth of 2000 feet.

The work is being done by Federal Resources corporation of Salt Lake City under a profit sharing agreement.

Majer said Federal has opened an engineer's office at Bayview, across Pend Oreille lake from the mine and that R. W. Neyman, president of Federal, is spending a good deal of time at the mine.

Neyman formerly was general manager of Hecla Mining company in Wallace.
In an article in the April 2, 1961, Salt Lake Tribune, Robert W. Bernick described Federal’s Conjecture project in some detail:

In a day of increasing interest in silver, a Salt Lake mining firm has come up with what may be an important program that will add to reserves of this metal in the West.

The firm is Federal Resources Corp., with 3,000 shareholders in Utah and most of its background in the Intermountain uranium business.

Federal is headed, however, by Salt Lake Ralph W. Neyman a veteran of mining in Idaho's Panhandle and a former general manager of Huela Mining Co., Wallace, Idaho.

Both Mr. Neyman and Federal now look toward a major extension of production in the St. Regis formation in mining areas north of the Coeur d'Alene in Idaho.

For it is largely production in the postwar years from the St. Regis in the Coeur d'Alene which has kept the Gem State number one in America in the output of silver.

Thus, success by this firm may have meaning not only to Federal, but to the Western mining industry in general.

Mr. Neyman himself participated in these early postwar developments in the Coeur d'Alenes. And while working in Utah, he retained his conviction, as did certain others despite some negative opinion by major mining firms, that the St. Regis could be the host for silver in such mining areas as the Lake View and the Pend Oreille districts.

Interest riveted on the Lake View District in part because claim ownership and other factors appeared to offer opportunities to "independents."

Group of Claims Developed From Wallace

The old Conjecture group of claims had been developed as producers from the Wallace formation in 1919 by the Lake View Silver Mines Co. But for a subsequent 30 years, these and adjacent properties were tied up in an estate. It was not until 1951 that Major [Major] and Funnell extended an old incline shaft to the 400-foot-level under a government assistance program.

Money was exhausted, Mr. Neyman relates, and the promoters raised new funds by formation of the Conjecture Mining Co. for exploration in the 500-foot level.

This work, in one of the frequent "ironies" of mining, narrowly missed intersection of several major fingers, or ore shoots, which apparently carry values up from the St. Regis formation into the Wallace section.

Development Work Drew 'Interest'

Mr. Neyman recalls that the development work by Major [sic] and Funnell was watched with "considerable interest" by himself and others familiar with the geology and ore occurrences in the Coeur d'Alenes—largely because of the similarity of the two districts.

Among the hopefuls, was the late Frank Eichelberger, mining engineer and geologist, whose work for the Sunshine Mining Co. in the Coeur d'Alenses resulted in major silver discoveries for that firm.

Other geologists were of the opinion, however, that because the St. Regis was not exposed anywhere on the surface in the Lake View area that (if present at all) it would be so deep—and possibly so wet—that it would not provide an economic prospect.

(Sound reasons can always [sic] be advanced for not taking a risk.)

Constant Advocate of Productivity

Mr. Eichelberger, however, backed his opinion with investment in the Conjecture and was a constant advocate of producivity of the St. Regis formation at Lake View until his death in 1956.

Federal entered the picture in 1956 on a 50-50 net profits basis and extended the workings to the 700-foot level, encountering the St. Regis formation. In subsequent years, the company started its present 1,900-foot, three-compartment shaft 500 feet northeast of the old
Major [sic] and Funnell workings. In driving across on the 1,000-foot level, Federal has encountered and defined six major ore shoots in the St. Regis.

Thickness and posture of these ore shoots in this section of the St. Regis, as compared with their apex in the Wallace, demonstrates that at depth greater ore reserves of silver-lead-zinc ore will be encountered.

Federal is now engaged in spending $400,000 in sinking the shaft to the 1,600 level, and ultimately to the 2,000-foot level.

100,000 Ore Tons, 20 Ounces of Silver

The company has now developed along the 1,000-foot level some 100,000 tons of ore averaging 20 ounces of silver to the ton and running three percent each of lead and zinc. It is Mr. Neyman's view that the lead and zinc values alone should cover the cost of all mining and development and a portion of milling charges. Federal plans a 250 to 500 ton per day mill.

By extrapolation, Mr. Neyman believes that an added 250,000 tons of new ore will be developed in extending the 1,600-foot drift out from the shaft. This is a conservative view, according to some, as it doesn't take into account the discovery of new ore shoots.

Further, the 1,600-foot drift work will intersect to the west a major down-faulted zone of the St. Regis [Figure 12]. This latter area was not reachable in driving across on the 1,000-foot drift. The expectation to the west, of course, is that numerous new ore zones will be discovered in the St. Regis.

An estimated $7,000,000 in silver ore in place between the 700-foot and the 1,600-foot zone guarantees that work now projected by Federal will be profitable in and of itself, without the plus factors ahead, says Mr. Neyman. Cash flow is expected to start from the Conjecture silver properties in late 1962.

Federal Resources report to stockholders for the six months ending October 31, 1961, carried the following information on the Conjecture (no page number given):

Drifting operations in the Conjecture mine on the 2,000-foot level had encountered encouraging showings of ore when the work program was changed by management because of timbering problems in the drift. At this point the drift was less than 200 feet from the point where a good commercial ore body had been discovered on the higher 1,000-foot level. As reported in the letter to shareholders on the preceding page, crews are now engaged in making a new drift and haulage way beginning 112 feet from the shaft and proceeding on a direct line to the projected ore zone. In addition, a by-pass drift is underway to miss the difficult area. (See map above [Figure 13].) The work is now proceeding on schedule, and shareholders will be advised of important developments.

Studies are being made as to the capacity of a mill to be constructed at the mine to concentrate ore. The size and construction schedule of this mill will not be determined finally until underground work opens multiple faces for mining operations. The mine is located in heavily-forested mountains above Lake Pend d'Oreille near Lakeview, Idaho. Winters are severe and will be a factor in determining dates of construction of the mill.

Your company plans to probe the ore body on the 2,000-foot level throughout its length and also to open a drift on the 1,600-foot level and possibly on other levels so that mining can be carried on at the same time at several levels for most economical results.

Federal is operator of this property and receives 50% of profits after first recovering its investment in developing the property. This recoverable investment is now approximately $1,831,430, of which $1,193,342 has been charged to operating expenses.

The accompanying letter, dated February 20, 1962, contained more information on the Conjecture project:
Figure 12. Cross-section of the Conjecture Mine, April 1961 (Salt Lake Tribune, April 2, 1961).
Figure 13. Sketch map of the 2000-foot level of the Conjecture Mine, 1961 (Federal Resources Corp. Report to Stockholders for the period ending October 31, 1961).
Of major importance as bearing on your company's future are the constructive
findings to date during underground development on the 2,000-foot level at the Company's
Conjecture silver mine in northern Idaho. If the ore body found previously on the 1,000-foot
level had carried straight downward on the dip to the 2,000-foot level, without extension of its
length, it could be expected to be first encountered approximately 1,280 feet from the shaft. In
fact, a stringer of rich silver ore was found 112 feet from the shaft, and good commercial ore
was found about 1,000 feet from the shaft. That ore was encountered well ahead of any ore
found on the 1,000-foot level is of considerable significance. Management considers
indications favorable that the ore body has extended its length on the downward dip from the
higher level.

The drift on the 2,000-foot level encountered serious timbering problems beyond
1,000 feet from the shaft. This slowed to a minimum the forward progress and also made it
obvious that this drift would not be entirely serviceable as a main permanent haulage way for
continuous mining operations. More important, these timbering problems created real and
increasing hazards for the miners. Therefore, management stopped work on this drift and
crews are now conducting two separate work programs on the 2,000-foot level to further
underground exploration and development work. In one work program, a new drift was started
from the 112-foot point where the stringer of ore was encountered and will move on a direct
to the projected ore zone. This drift, which will reach the target area within two months,
will provide a shorter and permanent haulage way in firm ground from the ore body to the
shaft. This direct drift is feasible now that the original drift has indicated the location and
direction of the ore vein and further supporting data has been obtained by sidewall core
drilling operations back of the difficult area in the present drift. With this core drilling
completed, management started the second work program which is to by-pass the hazardous
and troublesome area in the present drift and to move forward to the target area. This by-pass
drift should encounter this target before it is reached by the new direct haulage way. This drift
will also permit exploration of that portion of the vein from the point where work was stopped
to the projected ore zone. Thus, while the timbering difficulties have brought some delay in
reaching the main target area, crews have been able to perform helpful underground
development work. Shareholders will be advised by special bulletin of any new and significant
developments.

The November 2, 1961, issue of the Wallace Miner described the Conjecture work as
follows:

Current development work could reach the silver vein of the Conjecture Mine on
Lake Pend Oreille by January, shareholders of the operating firm, Federal Resources Corp. of
Salt Lake City, Utah, were told Monday.

The three-compartment shaft has been deepened to the 2,000-foot level and
underground development work to reach projected ore zones 1,200 feet from the shaft are well
underway, said R. W. Neyman, retired Federal president and now a consultant on the
Conjecture property.

President Floyd Odlum told stockholders management felt fortunate that the
company had a sizable interest in silver because of the growing demand for that metal in the
face of declining domestic production.

"Even if there should be no further silver ore found at the Conjecture, the company
already has a commercial ore body [body] that will return most of the funds spent to date,"
Odlum said.

He said the firm had "high hopes for a big mine at the Conjecture, and perhaps this
can come about as a Christmas present."
Assay of a "grab sample" taken from the mine dump indicates the ore cut last week in a crosscut from the 200 level of the mine may be worth about $78 a ton at current prices.

The assay shows 17.4 per cent zinc, 10.6 per cent lead, 45.8 ounces of silver and .2 of an ounce gold, C. H. Hunter of Hunter Securities said Tuesday at Coeur d'Alene. He took the sample from the mine dump last week and said it was not the richest sample available.

The ore is about 18 inches wide where it was cut and was contained in about 40 feet of quartz, it is understood. It was found about 200 feet from the shaft and apparently represents a widening of a vein found near the 1800 level in shaft sinking. Three rounds were drilled on the vein, and the face still was strong, it was understood, before the crosscut was resumed.

The new structure may be parallel to the main structure toward which the crosscut is being driven. A spur of the main vein is expected to be hit about 450 feet from the shaft, and crews will drift on it until it merges with the main vein. This structure was about four feet wide when it was opened at about the 1000 level in sinking the shaft.

Federal Resources continued exploration and development at the Conjecture in 1962. On February 9, 1962, the Kellogg Evening News reported:

Miners working on the new 2,000 foot level of the Conjecture mine have been delayed in reaching their objective, R. W. Neyman said yesterday.

Neyman is consulting engineer for Federal Resources Corp. of Salt Lake City, which is developing the silver-lead mine in Idaho's Lakeview Mining District near the southern end of Lake Pend Oreille.

The objective — the downward extension of the main Conjecture ore shoot — lies an estimated 175 feet ahead of the present face, he said.

"The Conjecture vein has been drifted on for several hundred feet from the shaft and looks better than it did on the 1,000 foot level directly above," Neyman said. "It has more mineral filling."

Drilling has been temporarily suspended to permit timber repairs in a faulted area of the vein, he said. Meanwhile, the crews are cutting a sump below the drift at a point about 100 feet from the shaft, extending the main 2,300 volt power line down the shaft from the 1,000 level and diamond drilling the footwall.

A pump with a capacity of 300 gallons per minute will be installed at the sump to lift water to the main pumping station on the 1,000 level, he said.

Tunneling work is expected to be resumed in the latter part of this month, Neyman said, and development of a "good-looking" vein cut 100 feet from the shaft may be carried on concurrently with the main drift. He described the structure as a "true fissure vein, narrow but highly mineralized."

A follow-up story ran in the May 31, 1962, edition of the Wallace Miner:

Crews at a Conjecture mine near Lake Pend Oreille are working along a widening vein on the 2,000 foot level, according to a shareholders' report issued at Spokane Monday by the operating company, Federal Resources Corp. of Salt Lake City.

The silver-bearing vein is now three feet wide, "part of which is commercial grade," the report said.

1From the context of the article, this probably should have read "2,000-foot level," not "200 level."

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On July 5, 1962, the **Wallace Miner** noted:

Federal Resources Corp. mining crews have reached a silver ore zone of commercial grade on the 2,000-foot level of the Conjecture mine near Lakeview, Idaho, stockholders were advised last weekend.

In a letter issued at Salt Lake City, Floyd B. Odum, chairman, and Nels W. Stalheim, president, reported that crews reached commercial ore several days ago and since then have advanced more than 70 feet in ore of mineable width and having an average grade of more than 20 ounces of silver per ton.

Stalheim said the strike appears to confirm the extension to lower levels of a silver ore body found previously on upper levels at comparable points.

Crews are continuing to drift along the strike of the ore vein to determine the length of the ore body, he said. When dimensions of the ore body on this level are better known, he said, management will be able to plan the size and type of a mill required to treat the ore and to determine the most economical mining procedures.

The discovery on the bottom level of the mine, 1,000 feet below the previous deepest operating level, climaxes a five-year development project by Federal Resources.

The mine near the southern end of Lake Pend Oreille is operated by the Salt Lake firm under a profit-sharing agreement with Conjecture Mines, Inc., headed by Donald E. Major, Spokane new car dealer and mining engineer.

The **Kellogg Evening News** ran the following story on August 3, 1962:

Grade of ore is higher on the new 2000-foot level at the Conjecture mine in the Lake Pend Oreille district than that found at comparable points on the upper levels, the annual report of Federal Resources Corp., operator of the property, said this week.

"High silver content minerals, known as ruby silver and native silver, have been encountered in the present drift," the report said. "These particular minerals were not found on higher levels. Geologists consider presence of these minerals on this level an indication that silver mineralization in the Conjecture fissure is deep-rooted and will continue well below the 2,000 foot level, the report continued.

Federal said the drift had penetrated more than 70 feet of ore of mineable width and having an average grade of more than 20 ounces of silver per ton. In addition, there are recoverable values of lead and gold which will be concentrated with the silver to increase the total value of the ore.

**Mill Being Studied**

Federal said additional and extensive underground drifting and raising on this level will now be undertaken to fully assess the grade, size and value of this deposit. This information is necessary in determining the size and type of mill required to treat the ore, as well as to enable engineers to plan the most efficient mining procedures, the report said.

Federal said it has engaged outside consultants to assist its staff in formulating plans and specifications for the mill. It said weather will also be a factor in determining the timing of mill construction because of the severe winters in this area.
"However, this project will be expedited as soon as necessary information is assembled and sufficient ore reserves developed to place the mine in production."

Federal serves as operator at Conjecture and will first recover its investment in development. After this amount has been received, Federal will receive 50 per cent of the profits and Conjecture the other half. Because a large part of Federal's expenditures in development work has been charged as expense this portion, as returned, will accrue to the company as income, it was explained.

"Federal management continues to be optimistic about the Conjecture potential, particularly in view of the growing demand and increasing price of silver on the world market. The outlook for this metal is extremely bright."

Plans were made to reactivate the 100-tpd mill on the property, providing sufficient reserves were developed. According to the September 27, 1962, issue of the Wallace Miner:

Starting up of the existing 100-ton mill at the Conjecture mine near Lakeview is "contemplated," Federal Resources Corp. told stockholders this week in announcing a semi-annual dividend of 5 cents a share.

The Salt Lake City firm, which is developing the property of Conjecture Mines, Inc., of Spokane on a profit-sharing basis, has been studying a new and larger mill.

The old mill could be used to concentrate ore from upper levels of the mine while development work continues on the bottom 2,000-foot level, the letter to stockholders said.

"This could save maintenance, utilize development waste material for backfill and provide funds for future development," it said.

Drills are being extended on the 1,000-foot level as well as on the 2,000 level, it said.

Federal Resources continued exploration and development of the Conjecture mine in 1963. Work consisted of 171 feet of raising, 2,079 feet of drifting and crosscutting, 6,840 feet of diamond drilling, and 900 feet of long-hole drilling.

In 1964, Federal Resources terminated exploration at the Conjecture mine after spending $2.75 million on the project. According to a newspaper account that appeared on July 9, 196413:

Federal Resources Corp. has confirmed reports that it has terminated its operations at the Conjecture Silver Mine near Lakeview, Idaho, 66 miles northeast of Spokane.

"Because the Conjecture mine prospecting work was not developing continuous bodies of ore of grade and thickness to justify the construction of a mill and because of the potential of new properties, operations were terminated," Federal said in its annual report for the year ended April 30.

Except for equipment installed at the Conjecture that is being used by Federal in exploration of the old Simon Silver Mine in Nevada, the report said, all costs and expenses of the Conjecture project have been charged off. This amounted to $719,197, the report's balance sheet said.

Savage (1967, p. 91-93) described the property soon after it had been abandoned by Federal Resources:

13A photocopy of this article in the Conjecture file does not identify the newspaper which ran the story.
By 1956, the Conjecture was owned by D. E. Major and L. H. Funnel (McDowell, 1956, p. 88). At this time, the mine included 4 tunnels and an inclined 500-ft shaft and included a total development of about 3,000 ft of workings. The property consisted of 6 patented claims and over 49 unpatented claims.

In 1956, Federal Resources Corporation contracted with Conjecture Mines, Inc. to develop the mine on a 50-50 net profits basis. By 1961, the property had been expanded to 15 patented and more than 100 unpatented claims, and losses had been taken on the Keep Cool, Idaho Lakeview, and Silver Leaf mines in adjacent areas. Federal Resources soon brought the total mine development up to 13,225 ft, including 2,785 ft of shafts, 1,840 ft of raises, and 8,600 ft of tunnels, crosscuts and drifts (Fletcher, 1963, p. 48). The plant included an 80-ton selective flotation mill, a new office building, 2 hoist houses, camphouse, assay house, timber shed, cookhouse, etc. At the mine was a Vulcan hoist, with 250 h.p. electric motor; an Ingersoll Rand, Type 10 compressor; a Titan A battery locomotive; cars, dozer, and Michigan loader.

By 1963, a new three compartment shaft, located 500 ft northeast of the original shaft, had been sunk 2,000 ft (Fig. 40 [Figure 14]). At this time the following work had been completed: at the 700-ft level—1,000 ft of exploratory work; at the 1,000 ft level—approximately 2,000 ft of drifts; and at the 2,000-ft level—about 3,000 ft of drifts. However, in 1964, Federal Resources decided to end their exploration work at the site and the mine was returned to Major and Funnel, owners of Conjecture Mines, Inc.

Rocks and structures. Early work at the Conjecture was confined essentially to development of mineralized zones in the liny Wallace Formation; later, Federal Resources' new shaft was driven through the Wallace and to a reported distance of 700 ft into the silties and argillites of the St. Regis Formation. Preliminary diamond drilling suggested that the more brittle, shattered and faulted St. Regis might be a better host rock than the Wallace Formation, and assays of rock from this formation promised higher grade silver ore. Most of the information relative to the more recent work at the Conjecture mine has been made available through the courtesy of Walter Campbell, mine superintendent from Federal Resources Corporation.

Although penetration to a depth of about 2,000 ft has provided much new information on the mineralized area, there is still some question as to whether or not the St. Regis-Revett Formations have been thoroughly investigated.

The general strike of the Belt rocks in this area ranges from slightly east to slightly west of north, and the dip is toward the east. Locally, faulting has disrupted the general attitude of the rocks. A major fault, probably the Pack saddle-Johnson fault, is located between the Conjecture mine and the Idaho Lakeview mine, for there is a marked difference in the strike and dip of rocks to the west of the Conjecture in the vicinity of the Idaho Lakeview property.

A major fault, called the Spider fault, was found on three different levels as a result of the recent exploratory work conducted from Conjecture's new shaft. This is apparently a normal fault trending roughly southwest through the property and dipping about 65° toward the west. The fault has an estimated displacement of about 800 ft. Broken and shattered rock, associated with the vein and the main fault, produces bad ground on the 2,000-ft level of the new shaft. Serious caving here makes tunneling dangerous.

Ore deposits. Mineralization occurs largely in quartz and is in the form of fissure vein and fissure vein replacement deposits. The Conjecture-Keep Cool vein has been traced for over 8,000 and may be as much as 12,000 ft long, extending to the Silver Leaf property to the northeast (Sampson, 1928, p. 22). There is some disseminated replacement ore in the Conjecture mine, but locally the ore may be massive or have ribbon structure. Commonly
Figure 14. Headframe for the 2,000-foot shaft at the Conjecture Mine (Savage, 1967, Figure 40).
galaena, tetrahedrite, argentite, sphalerite, and chalcopyrite are present, less commonly the ore may include wire silver, sulpharsenides and sulphantimoniades. Some ore samples contain a little cubanite and wulfenite. Some of the silver seems to be present in tetrahedrite in the higher-grade ore. Gangue consists of pyrite, siderite, rhodochrosite, and quartz. Rhodocrosite, on the basis of experience, is considered to be a good indicator of the presence of better-grade ore.

The following assays are the results of some of Federal Resources’ development work at the 700-ft level (Walter Campbell, personal communication):

(1) 70-ft shoot, 3 ft wide: Ag 7.93 oz/ton
(2) 60-ft shoot, 2.1 ft wide: Ag 11.41 oz/ton
(3) 50-ft shoot, 2.1 ft wide: Ag 12.02 oz/ton
(4) 240-ft shoot, 3.26 ft wide: 15.13 oz/ton
(5) 245-ft shoot, 5.49 ft wide:
   Ag 17.30 oz/ton Pb 0.165%
   Au 0.04 oz/ton Zn 0.65%
(6) Ag 399 oz/ton Pb 33.9% Zn 14.4% (high grade ore shoot)

According to reports, a drift southwest toward the main vein from the 1,000-ft level through the Wallace-St. Regis transition zone revealed at least “six major veins” in the St. Regis Formation. The work here suggested that better ore might lie deeper, however, actual volume of ore on the 1,000-ft level was not a high as expected. Average grade ore, when encountered, ranged from 20 to 40 ozAg/ton across veins up to 5 ft in width. A few high-grade shoots were encountered here; for example (Walter Campbell, personal communication):

(1) Ag 890.02 oz/ton Zn 5.5% Pb 35.2%
(2) Au 0.06 oz/ton Cu 3.3% Fe 6.3%
(3) 480-ft shoot, 4 ft wide: Ag-Au 13.03 oz/ton
(4) 260-ft shoot, 1.64 ft wide: Ag 44.41 oz/ton Au 0.83 oz/ton
(5) 240-ft shoot, 2.5 ft wide: Ag 26.26 oz/ton Au 0.02 oz/ton

(One hundred feet above the 1,000-ft level)

At the 2,000-ft level, again the volume of potential ore of economic grade was disappointing, although, similar to the 1,000-ft level, some high-grade ore pockets were also encountered here. Lead and zinc values appear to increase at this level. About 150 to 200 ft of ore-grade mineralization was found, but much of the vein material is quartz with only low-grade mineralization. Also this vein material exhibits the pinching and swelling characteristic of the region. At the 2,000-ft level, lamprophyre (essexite) dikes occupy the main fissure zone instead of quartz and ore. The lamprophyre intrusion apparently occurred in pre-, contemporary-, and post-mineralization phases, according to Campbell. One exploratory hole was drilled to the 2,553-ft level (465 ft in elevation), but information on this hole was not made available.

Outlook. The amount of exploration that has been conducted at the Conjecture mine is important to this whole metallogenic province. In general, experience in the Bonner County area leads one to conclude that the better mineralized zones are in shattered and broken fissure vein replacement bodies, where the rock is silicified instead of limy. If this conclusion is correct, then where shattered, the St. Regis, Revett, and Burke siltites and quartzites; all should be more favorable host rocks than the Wallace Formation. Siltites and quartzites within the older Frichard Formation might be favorable locally, although the Frichard as a whole has never been regarded as a good ore-producing formation.

Although, apparently Federal Resources officials considered the results of their exploration a disappointment, the Conjecture mine could provide one of the best opportunities for still deeper probing in an area which I consider merits more exploration. Abandonment of the Conjecture mine by Federal Resources will dampen enthusiasm for exploration in the area as a whole; however, upon the basis of experience to the south in the Coeur d’Alene region,
higher grade, deeper-seated ore deposits could be present in Bonner County. Whether such is
the case at the Conjecture may be open to question. There is a possibility that the 2,000 to
2,500-ft levels at the property are in a "barren zone" not unlike that which was discovered in
the Coeur d'Alene region; if such is the case, ore of economic value may occur below 2,500 ft
or deeper, at one or more of the Bonner County properties.

In 1966, Duval Corp. started a surface exploration program at the Conjecture. A
newspaper article on August 2, 1967\(^4\), noted:

Donald E. Majer, president of Conjecture Mines, Inc., told the Chronicle today that
an understanding has been reached for Duval Corp. of Houston, Texas, to explore and develop
the Conjecture Silver Mine near Lakeview, Idaho.

"Papers are being drawn and we expect a written agreement to be signed in about
two weeks," said Majer, a Spokane automobile dealer and mining engineer.

The understanding calls for a profit-sharing operating agreement, with Duval
furnishing the capital and management, he said.

The Texas firm would spend a substantial sum, but the amount has not yet been
determined, he said.

Work would start immediately after the contract is signed, he said.

Majer said recent increases in the price of silver have substantially increased ore
reserves at the Conjecture Mine just south of Lake Pend Oreille.

He declined to estimate present ore reserves but said that Federal Resources Corp. of
Salt Lake City in 1961 reported it had developed on the 1,000-foot level about 100,000 tons of
ore averaging 20 ounces of silver per ton. Federal dropped its operating agreement in 1964.

Duval carried out preliminary surface exploration work at the 92-claim Conjecture
property last fall, including bulldozing and soil sampling, but no results were disclosed.

Controlled by United Gas Corp., Duval Corp. mines and refines potash and produces
sulfur, copper, molybdenum, silver and gold, mostly in New Mexico, Texas and Nevada.

Official notice of the 70-30 profit-sharing agreement between Duval Corp. and Conjecture
Mines was released in November (IGS mineral property files).

On May 23, 1968, a news article noted\(^5\):

Conjecture Mines, Inc., said today that Duval Corp. of Houston, Tex., began work
May 1 on the 92-claim Conjecture property and plans to expedite exploration and development
as much as possible.

The work on the silver property in the Lakeview Mining District near the southern
end of Lake Pend Oreille, Idaho, is being done under a profit-sharing and operating agreement
finalized last November.

"All services have been connected and are in operation," the Conjecture board of
directors said in a letter to stockholders. "A hoist has been installed, the shaft is being
dewatered and necessary supplies and equipment for full-scale operation are being moved onto
the property.

"It is Duval's plan to expedite the exploration and development program as rapidly as
possible. Drifting on the 700 and 1,000-foot levels should commence the first week in June."

\(^4\)A photocopy of this article in the Conjecture file does not identify the newspaper which ran the story.

\(^5\)A photocopy of this article in the Conjecture file does not identify the newspaper which ran the story.
Work Done

Before the signing of the agreement giving Conjecture 30 per cent of net profits, Duval did extensive surface prospecting, including geophysical and geochemical work, over a period of about two years.

On June 24, a follow-up story\textsuperscript{16} stated:

Conjecture Mines, Inc., said today that Duval Corp. of Houston, Texas, now is working around-the-clock seven days a week at Conjecture's silver mine near Lakeview, Idaho.

The mine camp has been rehabilitated, the hoist returned to operation, the shaft dewatered to below the 700-foot level and cleanup work on the 700-foot level is being completed preparatory to drifting, the announcement said.

The shaft will be dewatered to the bottom 2,000-foot level, it said.

Duval recently purchased the neighboring Bloody Shirt group of six claims which had some early-day silver production, it said. Conjecture has a 30 per cent interest in the purchase.

An announcement late in the year contained the following information (Spokane Weekly Chronicle, December 5, 1968)\textsuperscript{17}:

Conjecture Mines, Inc., reported today that the operator of its silver mine near Lakeview, Idaho, Duval Corp., has completed preliminary work and is preparing a comprehensive work plan.

The work program will consist of drifting on the lower mine levels, diamond drilling and general exploration of the entire property which now totals 96 mining claims since the acquisition of additional ground this year, Donald E. Majer, Conjecture president, said.

The Houston, Tex., firm recently completed installing a larger hoist that will allow access to the 2,000-foot level, he said. The first hoist installed was found to be inadequate for the work planned.

Shaft Drained

The main 2,000-foot Conjecture shaft was dewatered to the 1,000-foot level and repaired where needed, he said. Work was done on the 700-foot level and the 1,000 level was found to be open 1,000 feet from the station, allowing access to the Conjecture vein.

The old inclined shaft that goes down to the 700-foot level was rehabilitated for ventilation and a second exit. A building was erected near the main shaft. The hoist house, miners' quarters and storage areas were prepared for use and road building and repair work completed.

Duval conducted a diamond-drilling program at the Conjecture in 1969. In April 1970, Ford (1970, p. 9-10) evaluated the results of Duval's project in detail and concluded:

I do not, at this time, recommend the negotiating of a participating agreement between the Bunker Hill Company and Duval Corporation for the following reasons:

\textsuperscript{16}A photocopy of this article in the Conjecture file does not identify the newspaper which ran the story.

\textsuperscript{17}This article also appeared on November 29, 1968, in an unidentified newspaper.
(1) As I have mentioned previously in this report, the Federal geologists felt that the lamprophyre dykes intruded in and along the vein zone were pre-mineral, or rather pre-mineral in the sense that they were intruded prior to the main stage of ore bearing mineralization. Other writers who have written papers on the Lake View area have described these basic dykes as being post-mineral in character. However, they also describe these dykes, in almost every case, as being intricately associated with the shear and vein zones and following very closely the final stages of mineralization. However, in reviewing the geological mapping done by the Federal geologists, I feel that good arguments could be constructed on either side. I feel that the lamprophyre dykes and the mineralization were deposited, or at least consolidated, at the same time, while movement was taking place on the Conjecture shear. Another reason for the above statement is that in the core from the deep hole drilled by Duval, the lamprophyre dyke zone showed well-defined stringers of rhodochrosite cutting through this zone; the rhodochrosite being part of the mineral assemblage belonging to the first stage of mineralization. Therefore, I conclude that these basic dykes, where deposited in and around the shear zone, provided a barrier to the deposition of ore-bearing solutions, for no sulfides were found deposited in the dyke material. Also, evidence gleaned from deep diamond drill holes indicates that this condition continues at depth in the more competent rocks and, therefore, an increase in grade could not be hoped for.

(2) This intricate intrusion of basic dykes continues laterally both east and west on the Conjecture and Weber Vein system, as seen in the surface holes drilled by Duval and in literature describing both the Silver Leaf and Keep Cool areas.

(3) Even if the grade of the vein zone did increase with depth, the character of the dykes is such that bad ground conditions would prevail, thereby increasing mining costs.

(4) The grade of ore in the ore shoots exposed to date is not commercial, at present prices or at best marginal with the predicted increase in the price of silver.

(5) Future exploration would require expensive shaft sinking and drifting and/or deep surface drilling.

Ford (1970, p. 10-11) also discussed Duval's plans for the future:

Assessment work requirements have been completed for the year 1970. It is the feeling of Fred Howell, vice president in charge of geological operations for Duval, that any future work would necessarily be in the form of an underground exploration venture, with which the Duval Corporation has had no experience. Therefore, they are looking for a company experienced in underground operations to participate in a joint effort. Any company entering into this agreement would have to equal Duval's investment (in the neighborhood of $250,000) and thereafter on a 50-50 net profit-sharing basis, with Duval supplying the property.

Droste (1970, p. 1-2) reviewed Bunker Hill's reaction to the Conjecture project:

We have reviewed the Conjecture Mine information, including maps supplied by Mr. Shearer and R. A. Ford's report of observations. Bunker Hill must decline the opportunity to participate with Duval Corporation in further exploration of the Conjecture property. A summary of our thinking follows:

The property was considered as 1. an exploration bet having a modest ore reserve and 2. solely as an exploration project.

1. Ore reserves were considered only between the 500 level and 1000 level, and tonnage estimates, considered as proven and probable ore, ranged from a conservative 20,000 tons to a less conservative 40,000 tons available at a minimum 4% mining width. It is our
opinion that the available ore grade would not cover operating costs and the added requirements of redeveloping the reserves further negate this consideration.

Difficult ground conditions are assumed because of argillaceous wall rocks and the frequent basic dike exposure. Ground support in the stopes would be required for safety and dilution control. Filling may also be required.

Stopes production of less than 100 tons per day is indicated because of the limited number of faces.

The rather substantial amount of development work done above the 1000 level does not leave much room for additions to the reserves and the distance from the shaft probably requiring redevelopment does not make an experimental stoping attempt attractive.

2. The disappointing results obtained by Federal from their 2000 level drive and associated diamond drilling and no real encouragement in grade or vein character in Duval's deep drilling effort leaves Bunker Hill with very little to add. The dike frequency and weaker metal values in the Conjecture vein zone on 2000 level and below invite a negative appraisal. It appears that any additional work in the St. Regis and Revett environment must be done by crosscutting and down hole drilling or by sinking and drifting.

The Shaft vein is an interesting feature, although it only contains marginal values for approximately 50 feet west of the 2000 level crosscut. The higher relative lead and zinc assays along with high-grade silver and the lack of dike interference and strong shearing may be favorable characteristics in the more brittle rocks. The significant improvement required to make an ore body forces too much optimism for us, however. We do not have the logs of Federal holes 199, 2003 and 2007 and have assumed that there was no dramatic improvement in the Shaft vein.

Using hindsight, we wonder if the assumption, based in CDA district criteria, that lower St. Regis and Revett are more favorable is correct. Certainly the bulk of the metal near Conjecture and in the not too distant Clark Fork district has been in the Wallace formation. This, of course, may be a function of exposure, but no similar number of showings exists in the CDA district Wallace rocks.

Additional surface drilling below showings in the adit levels may be productive, but the expectation of results would have to be tempered by history. Extensions of the vein toward the Silver Leaf area could also be prospected from the surface.

In summary, we recognize a persistent, but locally discontinuous, dike localizing the vein zone with numerous sections of sub-commercial silver, lead and zinc sulfides that has shown no improvement in quartzitic rocks of the lower St. Regis and Revett formations and may be in its best environment on the middle Wallace rocks.

The Shaft vein may be a worthy target, but the magnitude of improvement required is considered unlikely. The "reserves" will not allow a viable operation. The mineral assemblage is not considered amenable to the Bunker Hill Smelter, and no specific attraction exists from the feed standpoint.

Duval's efforts included drilling over 4,000 feet of core. They dropped the property in 1970, sometime after Bunker Hill's evaluation of the mine. It was picked up soon afterwards by Sunshine Mining Co., which did the assessment work on the property for the next several years (Kauffman, 1975a).

In 1976, the Spokesman-Review noted that Conjecture Mining Co. and Lakeview Consolidated Silver Mines, Inc., owner of the nearby Idaho Lakeview Mine, had agreed to unitize the two properties. Sunshine renewed its exploration agreement with the two companies in 1978.

Conjecture signed an operating agreement in 1980 with Minerals Management, Inc., to evaluate the silver-lead potential of the mine. In 1981, Conjecture considered the
feasibility of sinking an incline shaft at the mine. Royal Silver Mines, Inc., held a lease on the Conjecture mine in 1995. Royal was seeking financing for an aggressive exploration program in 1996.

The Conjecture Mine was visited by an IGS field crew during the summer of 1996 as part of a program to evaluate inactive and abandoned mines on U.S. Forest Service lands in northern Idaho. Bennett and Mitchell (1997) contains a detailed description of the mine at that time. Figure 15 shows the headframe foundation and the hoist house at the site of Federal's 2,000-foot shaft.

Recorded production from the Conjecture Mine between 1913 and 1956 was 12,663 tons of ore. This material yielded 93 ounces of gold, 81,333 ounces of silver, 13,825 pounds of copper, 90,983 pounds of lead, and 53,778 pounds of zinc.

Rainbow Claim (Empire Tungsten Mining Co.)

The Rainbow claim (for many years owned by the Empire Tungsten Mining Company and later purchased by Conjecture Mines, Inc.) is located about 4 miles southeast of Lakeview on the South Fork of Gold Creek (Figures 3, 5, 7, and 8). The Empire Tungsten Mining Co. (W.M. Luther, president) was incorporated in Idaho on March 20, 1914.

It is not known when the Empire claim was located. A small shipment of ore was made from the property in 1911. In 1913, the company reported doing 150 feet of development by hand and shipping 2½ tons of ore, for which the gross returns were $143.71: (Tables 7 and 8 show development at the mine.) The company's plans for the next year called for installing a hoist and pump and sinking a winze 150 feet.

In 1914 the company reported to the Idaho Inspector of Mines:

Considerable ore has been developed but none shipped or treated during the current year. Ore is for the most part, Antimonial Silver, carrying some zinc. The "pay streak" averages about 10 to 12 inches, of high grade on the foot wall. Average values about 200 oz in Silver $2, in gold. Balance of vein (about six feet) carries a good grade of milling ore, averaging 15 oz. in silver. Property has been developed with tunnel driven on lead and having vertical depth of about 350 feet. A shaft is now being sunk at portal of tunnel. Improvements contemplated and under way consist of completion of shaft to a depth of 150 feet and installation of hoist and pump.[]

By 1922 the workings were filled with water. The company's 1923 report to the Idaho Inspector of Mines noted that the property had been in receivership pending the outcome of a lawsuit. According to the report, "When the case was decided by the Court, the present officers were elected and no work has been done in the way of development or operating in recent years." The company apparently was reorganized as a result of settling the litigation. Empire Tungsten Mining Co.'s corporate charter expired on March 20, 1939, and was not renewed. The assets of the company were sold to Gerald Fennell of New York City on an unspecified date.
Figure 15. Hoist house and foundation for the headframe of Federal Resources Corporation's 2,000-foot shaft at the Conjecture Mine (Idaho Geological Survey photograph).
Table 7. Development work, number of men employed, and operating companies at the Rainbow claim, by year.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Men Employed</th>
<th>Tunnels (feet)</th>
<th>Sinking (feet)</th>
<th>Cross-cutting (feet)</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913</td>
<td>2</td>
<td>150(^1)</td>
<td>35(^2)</td>
<td>115(^3)</td>
<td>Empire tungsten mining company</td>
</tr>
<tr>
<td>1914</td>
<td>3</td>
<td>200(^1)</td>
<td>50(^2)</td>
<td>150(^3)</td>
<td>Empire tungsten mining company</td>
</tr>
<tr>
<td>1915</td>
<td>4</td>
<td>125(^1)</td>
<td>75</td>
<td>50(^3)</td>
<td>Empire tungsten mining company</td>
</tr>
<tr>
<td>1916</td>
<td>4</td>
<td>250(^1)</td>
<td>110</td>
<td>150(^3)</td>
<td>Empire tungsten mining company</td>
</tr>
</tbody>
</table>

\(^1\) Total development work for the year.  
\(^2\) Combined figure for sinking and raising.  
\(^3\) Combined figure for crosscutting and drifting.

Table 8. Cumulative development at the Rainbow claim (Empire tungsten mining Co.), by year. Information is from company reports to Idaho inspector of mines; discrepancies in numbers reflect inconsistencies in the original data.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Development (ft)</th>
<th>No. of Tunnels</th>
<th>Total Length of Tunnels, Crosscuts, and Drifts (ft)</th>
<th>No. of Shafts</th>
<th>Total Length of Shafts (ft)</th>
<th>No. of Drifts</th>
<th>Length of Principal Tunnels (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1915</td>
<td>500</td>
<td>4</td>
<td>—</td>
<td>2</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1916</td>
<td>1,500</td>
<td>3</td>
<td>1,100</td>
<td>2</td>
<td>160</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1922-1944</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>607</td>
<td>1</td>
<td>400</td>
</tr>
</tbody>
</table>

\(^1\) Information not reported to Idaho inspector of mines.
Between 1902 and 1916, the Rainbow claim produced 115 tons of ore. This material yielded 0.25 ounce of gold, 8,227 ounces of silver, and 10,171 pounds of lead.

IDAHO LAKEVIEW (HEWER) MINE

The Idaho Lakeview Mine is about 5 miles south of Lakeview. The mine is in Chloride Gulch in the NW¼ sec. 28, T. 53 N., R. 1 W. (Figures 3 and 5). In the summer of 1996, the site had one open adit, a waste dump, a mill, and a mill tailings disposal site (Bennett and Mitchell, 1997). The mine has been known at various times by a number of names, including the Great Adventure Mine, the Venzuela Mine (also spelled Venzuela or Vensuela), the Hewer Mine, the Idaho Hewer Mine, and the Idaho Lakeview Mine. Kun (1974, p. 36-38) described the geology of the mine as follows:

The Idaho Lakeview Mine is located entirely in the siltites and argillites of the Middle Member of the Wallace Formation. The geology of the lower levels, which are driven from an inclined internal shaft, is not known, except for the information presented in Plate 3 (Figure 16). The orebody is contained within the Hewer shear and appears to be similar to the Conjecture Mine, with massive ore shoots, separated by very low grade sulfide zones. Stopes more than 100 ft. in height indicate that the shoots were continuous for a considerable distance in the dip direction.

Ore specimens found on the Idaho Lakeview dumps have massive sulfides including blebs of pyrite, galena, and tetrahedrite (Fig. 19 [omitted]). Exsolution of pyrite from tetrahedrite along cleavage planes can be observed in one specimen. Replacement textures between galena and tetrahedrite are characteristic of these specimens more than elsewhere in the district. Another characteristic is that large zones of late quartz occupy as much as half the width of the Hewer shear.

Examination of smelter returns obtained on shipments made in 1935-36 show that the ore contained about 12 to 15 oz/ton silver, and 2 percent lead and 2 percent zinc. This ore originated from the main and 100 ft. levels, and was mostly oxidized.

The following information was noted by Sampson (1928, p. 23):

The Hewer vein is one of the most striking examples of a shear-zone on record. It attains a maximum thickness of 120 feet in the Quickstep claim of the Wiberg group. Throughout the thickness of the shear zone the rock is largely of the consistency of gouge and can be picked down at nearly any spot. The shear zone has been followed from the Quickstep claim at Chloride to the Hewer mine, and the Gloria claim south of the Hewer mine is probably on the same shear zone. This makes a total length of 8,000 feet.

The ore in the shear zone is very closely associated with quartz filling. In the extremely sheared state of the lode it is difficult to distinguish crushed rock from crushed quartz filling. In a portion of the mine the quartz filling was mapped with great care and this map compared with an assay map. This showed conclusively that the ore accompanies the quartz. The quartz and consequently the ore are in the form of lenses no one of which has great continuity, but in the aggregate they form a fairly consistent proportion of the vein.

The Hewer shear zone is thought to be a part of the Packsaddle fault, although the evidence in the immediate vicinity of the Hewer mine is not entirely conclusive. If this be so it...
Geologic mine and composite maps of the main 100, 200, 700, 1200 and 1400 levels, Idaho-Lakeview mine, Lakeview mining district.

EXPLANATION

Vein with dip
Shear zone with dip
Fault with dip
Strike and dip of bedding

Figure 16. Composite map of the Idaho-Lakeview Mine, Bonner County, Idaho (Kun, 1974, Plate 3).
is significant that although the ore is in a shear zone on which much movement has taken place, the quartz filling is in the form of clearly defined lenses. The crushing, although sufficient to shatter the quartz, did not mix the quartz with the gouge of crushed rock. It is evident, therefore, that the ore minerals were formed after the main fault movement had taken place.

It is not known exactly when the mine was discovered, but by 1904 it was owned by the Pan Handle Development Co. (Table 9), the company in charge of buying mines to supply ore to the Pan Handle Smelting Co.'s smelter at Sandpoint. About the property, the 1904 IMIR (p. 90) noted: “The Venezuela group carries a wide fissured vein or zone, forty feet between walls, that samples sixteen ounces silver and $1 gold per ton across its full width. The country rock of this district is limestone and quartzite.” The mine was said to have large bodies of both siliceous and iron ores of excellent fluxing quality. The mine had about 600 feet of workings.

The 1905 IMIR (p. 74-74) described the property as follows:

The Venezuela is another big mineral vein, 45 feet wide on still another parallel vein to the south and carries some streaks of good silver ore. It is being developed by a long cross-cut tunnel which will tap the ore body at several hundreds feet in depth where, it is anticipated, important lead values will be encountered.

The formations of the larger portions of the Lakeview District are identical with and a part of the Coeur d'Alene series. They consist of thin, bedded quartzites and slaty graywackes that are folded at various angles from the horizontal to the vertical. They carry some pronounced fissures, whose extensive exploration seem justified with the anticipation of revealing large bodies of concentrating lead-silver ore and shipping ore.

Several shipments of silver ore were made from the Venezuela in 1916. There was little activity at the mine for the next few years.

The mortgage on Ponderay Mining & Smelting Co.'s property was foreclosed in September 1922. The Hewer Mining Co. took over operation of the mine the following year. The new company did 900 feet of development work, ran milling tests, and shipped several test lots of ore. (Tables 10 and 11 show the development work done at the mine, by year.) Reserves were estimated at 100,000 tons containing approximately 14 ounces of silver to the ton. Ore minerals were pyrrhotite, tetrahedrite, and galena. An article in the October 17, 1923, issue of Mining Truth discussed developments at the property (Mining Truth, 1923, p. 1-2):

Old Chloride Takes On Life
Successful Development of Venezuela Mine by Hewer Mining Company
Turns Attention Once More to Pend Oreille District.—Large Tonnage Placed in Sight in Six Months.—Flotation Plant to be Provided in Spring.

Old Chloride camp, at the south-east extremity of Pend Oreille lake, scene of a memorable stampede in the fall of 1888, three years after discovery of the great Bunker Hill mine at Wardner,—which lies about 30 miles to the south as the crow flies,—has lately taken a new lease on active life through very important developments at what is locally known as the Venezuela mine, now under operation by Hewer Mining Co., organized by Dan Drumbeller,
Table 9. Companies operating at the Idaho Lakeview Mine.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Officer</th>
<th>Date Incorporated</th>
<th>Charter Forfeited</th>
<th>Year(s) at Mine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pan Handle Smelting Co.</td>
<td>D.W. Casseday</td>
<td></td>
<td></td>
<td>(1905)</td>
</tr>
<tr>
<td>Ponderay Mining &amp; Smelting Co.</td>
<td>G.H. Martin, President</td>
<td>April 29, 1914</td>
<td></td>
<td>1914-1922</td>
</tr>
<tr>
<td>Tom L. Greenough</td>
<td></td>
<td></td>
<td></td>
<td>1922-1923?</td>
</tr>
<tr>
<td>Union Trust Co. of Spokane</td>
<td></td>
<td></td>
<td></td>
<td>1923-1928</td>
</tr>
<tr>
<td>Hewer Mining Co.</td>
<td>D.M. Drumheller, Jr., President-Manager</td>
<td>May 26, 1923</td>
<td>reorganized as Idaho Hewer Mines, Inc.</td>
<td>1923-1926</td>
</tr>
<tr>
<td>Idaho Hewer Mines, Inc.</td>
<td>D.M. Drumheller, Jr., President-Manager</td>
<td>April 10, 1926</td>
<td></td>
<td>1926-1928</td>
</tr>
<tr>
<td>Revis Company (lessee)</td>
<td></td>
<td></td>
<td></td>
<td>1935-1936</td>
</tr>
<tr>
<td>Federal Uranium Corp. (lessee)</td>
<td>R.W. Neyman, President</td>
<td>November 11, 1956</td>
<td>name changed to Federal Resources Corp.</td>
<td>1957-1960</td>
</tr>
<tr>
<td>Federal Resources Corp. (lessee)</td>
<td>Donald V. Peters, Secretary-Treasurer</td>
<td>name changed: May 16, 1960</td>
<td>not mining in Idaho (1975)</td>
<td>1960-1964</td>
</tr>
<tr>
<td>Sunshine Mining Co. (lessee)</td>
<td>Vincent Whelan, Asst. Secretary</td>
<td>January 3, 1921</td>
<td></td>
<td>active</td>
</tr>
<tr>
<td>Lakeview Consolidated Silver Mines, Inc.</td>
<td>Clinton L. Miller, President</td>
<td>March 19, 1971</td>
<td></td>
<td>1976-</td>
</tr>
<tr>
<td>Shoshone Silver Mining Co.</td>
<td>H.E. Daugherty, Secretary</td>
<td>January 22, 1970</td>
<td></td>
<td>active</td>
</tr>
</tbody>
</table>

1Information not available in Idaho Geological Survey's files.
Table 10. Cumulative development at the Idaho Lakeview Mine, by year. Information is from company reports to Idaho Inspector of Mines; discrepancies in numbers reflect inconsistencies in the original data.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Development (ft)</th>
<th>No. of Tunnels</th>
<th>Total Length of Tunnels, Shafts, Crosscuts, and Drifts (ft)</th>
<th>No. of Shafts</th>
<th>Total Length of Shafts (ft)</th>
<th>No. of Raisings</th>
<th>Total Length of Raisings (ft)</th>
<th>No. of Crosscuts</th>
<th>No. of Drifts</th>
<th>Length of Principal Tunnels (feet)</th>
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</thead>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
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<td>900</td>
<td>1</td>
<td>900</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
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<tr>
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<td>8</td>
<td>3,230</td>
<td>0</td>
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<td>250</td>
<td>10</td>
<td>3</td>
<td>700 800 200 150 100</td>
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<td>6,000</td>
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<td>25</td>
<td>4</td>
<td>700 200</td>
<td>800</td>
<td></td>
</tr>
<tr>
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<td>1</td>
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<td>24</td>
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<td>1</td>
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<td>1</td>
<td>2,200 250 200 900</td>
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<td>1930</td>
<td>13,539</td>
<td>14</td>
<td>10,067</td>
<td>1</td>
<td>1,372</td>
<td>2,100</td>
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<td>2,200</td>
<td>2,200 250 900</td>
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<td>2,200</td>
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<td>2,200 250 900</td>
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<td>2,200 250 900</td>
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<td>1,372</td>
<td>2,200</td>
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<td>2,200 250 900</td>
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<tr>
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<td>1,372</td>
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<td>2,970</td>
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</tr>
<tr>
<td>1938</td>
<td>14,371</td>
<td>14</td>
<td>10,837</td>
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<td>1,372</td>
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<td>2,970</td>
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<td>1,372</td>
<td>2,970</td>
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<td>2,970</td>
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<td>3,470</td>
<td>3,470</td>
<td>3,470 430 600</td>
<td></td>
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</table>
Table 10 (continued). Cumulative development at the Idaho Lakeview Mine, by year.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Development (ft)</th>
<th>No. of Tunnels</th>
<th>Total Length of Tunnels, Cross-outs, and Drifts (ft)</th>
<th>No. of Shafts</th>
<th>Total Length of Shafts (ft)</th>
<th>No. of Raisers</th>
<th>Total Length of Raisers (ft)</th>
<th>No. of Cross-cuts</th>
<th>No. of Drifts</th>
<th>Length of Principal Tunnels (feet)</th>
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</thead>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No. 1    No. 2  No. 3  No. 4  No. 5  No. 6</td>
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<tr>
<td>1945</td>
<td>16,160</td>
<td>14</td>
<td>14,388</td>
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<td>1,372</td>
<td>3</td>
<td>400</td>
<td>5</td>
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<td>3,470    390   790   600   1,200   200</td>
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<td>1946</td>
<td>16,160</td>
<td>14</td>
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<td>1</td>
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<td>400</td>
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<td>10</td>
<td>3,470    390   790   600   1,200   200</td>
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<td>14</td>
<td>14,388</td>
<td>1</td>
<td>1,372</td>
<td>3</td>
<td>400</td>
<td>5</td>
<td>10</td>
<td>390      790   600   1,200   200   —</td>
</tr>
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<td>8,500</td>
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<td>1,400</td>
<td>4</td>
<td>500</td>
<td>7</td>
<td>7</td>
<td>60       50    2,600  2,700  600    1,000</td>
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<tr>
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<td>4</td>
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<td>1</td>
<td>1,450</td>
<td>4</td>
<td>500</td>
<td>7</td>
<td>7</td>
<td>50       400   700    300   —      —</td>
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</tbody>
</table>

1Information not reported to Idaho Inspector of Mines.
2The company reported "3 principal tunnels—several minor ones."
3Raisers were included in this total.
4This report was filed on June 25, 1926.
5This report was filed on November 1, 1926. The two-compartment, inclined shaft was 235 feet long and gained a vertical depth of 225 feet. In order, the tunnels were the Main Tunnel, the Wiberg Tunnel, the Hewer Upper Tunnel, and the Hewer #1 Cross-cut Tunnel.
6The two-compartment, inclined shaft was 1,372 feet long and gained a vertical depth of 1,289 feet.
7The two-compartment, inclined shaft was 1,372 feet long and gained a vertical depth of 1,295 feet. Other workings included 2,500 yards of surface prospecting cuts. The "tunnels" were identified as: "Adit level; No. 1; No. 2; No. 7; No. 12; and No. 14," which would appear to be mine levels rather than tunnels.
8The two-compartment, inclined shaft was 1,372 feet long and gained a vertical depth of 1,295 feet. The "tunnels" were identified as: "No. 1; No. 2; No. 12; and No. 14."
9The inclined shaft was 1,400 feet long and gained a vertical depth of 1,300 feet. The length of the "No. 7 tunnel" was given as 250 feet. The intermediate levels in the mine were: Adit, 2,700 feet; 100 level, 500 feet; 200 level, 600 feet; 700 level, 1,000 feet; and 1,200 level, 1,000 feet.
10The inclined shaft was 1,450 feet long and gained a vertical depth of 1,400 feet.
Table 11. Development work, number of men employed, and operating companies at the Idaho Lakeview Mine, by year.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Men Employed</th>
<th>Tunnels (feet)</th>
<th>Sinking (feet)</th>
<th>Crosscutting (feet)</th>
<th>Drifting (feet)</th>
<th>Raising (feet)</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1924</td>
<td>10-12</td>
<td>50</td>
<td>none</td>
<td>260</td>
<td>580</td>
<td>250</td>
<td>Hewer Mining Co.</td>
</tr>
<tr>
<td>1925</td>
<td>30</td>
<td>--</td>
<td>55</td>
<td>1,000</td>
<td>500</td>
<td>--</td>
<td>Hewer Mining Co.</td>
</tr>
<tr>
<td>1926¹</td>
<td>25</td>
<td>--</td>
<td>200</td>
<td>500</td>
<td>1,000</td>
<td>--</td>
<td>Idaho Hewer Mines, Inc.</td>
</tr>
<tr>
<td>1926²</td>
<td>25</td>
<td>--</td>
<td>200</td>
<td>500</td>
<td>1,000</td>
<td>--</td>
<td>Idaho Hewer Mines, Inc.</td>
</tr>
<tr>
<td>1928</td>
<td>20</td>
<td>--</td>
<td>205</td>
<td>1,215.5</td>
<td>1,318.5</td>
<td>--</td>
<td>Idaho Lakeview Mines Co.</td>
</tr>
<tr>
<td>1930</td>
<td>28</td>
<td>--</td>
<td>181</td>
<td>589</td>
<td>262</td>
<td>--</td>
<td>Idaho Lakeview Mines Co./Revis Co.</td>
</tr>
<tr>
<td>1937</td>
<td>3</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>900</td>
<td>100</td>
<td>Idaho Lakeview Mines Co.</td>
</tr>
<tr>
<td>1938</td>
<td>12³</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>Idaho Lakeview Mines Co.</td>
</tr>
<tr>
<td>1941</td>
<td>3</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>900</td>
<td>100</td>
<td>Idaho Lakeview Mines Co.</td>
</tr>
<tr>
<td>1942</td>
<td>4</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>900</td>
<td>100</td>
<td>Idaho Lakeview Mines Co.</td>
</tr>
<tr>
<td>1943</td>
<td>5</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>Idaho Lakeview Mines Co.</td>
</tr>
<tr>
<td>1944</td>
<td>7</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>160</td>
<td>--</td>
<td>Idaho Lakeview Mines Co.</td>
</tr>
<tr>
<td>1945</td>
<td>7</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>160</td>
<td>--</td>
<td>Idaho Lakeview Mines Co.</td>
</tr>
<tr>
<td>1946</td>
<td>4</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>250</td>
<td>88</td>
<td>Idaho Lakeview Mines Co.</td>
</tr>
<tr>
<td>1947</td>
<td>6</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>250</td>
<td>100</td>
<td>Idaho Lakeview Mines Co.</td>
</tr>
<tr>
<td>1949</td>
<td>10</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>95</td>
<td>--</td>
<td>Idaho Lakeview Mines Co.</td>
</tr>
</tbody>
</table>

¹This report was filed on June 25, 1926.
²This report was filed on November 1, 1926.
³Information on men employed by Jesse (Revis Co.) not provided to Idaho Inspector of Mines.
⁴These men were employed from August 6 to November 10. The work consisted of dewatering the shaft and reining below the 700-foot level.
⁵This work was done by contract labor.
⁶Information not reported to the Idaho Inspector of Mines.
Jr., the well-known local mining engineer and member of a pioneer family and Harry Hewer, formerly superintendent of the Florence mine at Ainsworth, United Silver-Copper at Chewelah and Red Monarch in the Coeur d'Alenes.

**Large Tonnage Developed.**

Operations were only started last April with modest capital subscribed by the promoters and a few of their close friends, but in the six months that have elapsed the property has been converted from a mere prospect into a mine that gives almost certain promise of profitable operation. It may with reasonable assurance be said that the ore already in sight has reached at least 50,000 tons, averaging possibly 15 ounces silver, 2% lead, 60 cents gold and from 3 to 5% zinc per ton. The outlook is such that the company has already made arrangements for erection of a flotation plant at the mine next spring and by that time should have largely augmented reserves for extraction. Experiments made by the General Engineering Co., of Salt Lake, prove that the ore is readily amenable to the flotation process upon an economical basis.

**Holdings are Extensive.**

While the property is generally referred to as the Venzuela mine, the ore-bodies have been found in the adjoining Western Adventure claim. The property lies 5 1-2 miles southwest of Lakeview, on Pend Oreille lake, and consists of the original Venzuela group of four claims and millsite, held under lease and option, and three claims and millsite located by the present company. The ground covers approximately 4,500 feet on the strike of the vein, and lies at the head of South Gold creek, at and above its confluence with Swastika creek, at an elevation of 3,200 feet above sea level, or about 1,150 feet above the lake. It is reached by a good automobile road from Lakeview.

**Vein 33 Feet Wide.**

The vein, which has a bold outcrop on the east side of the creek and can be traced for at least 7,000 feet, is over 30 feet wide, where cut by an upper crosscut tunnel run in the early days. A lower crosscut tunnel, also run in earlier days, strikes the vein, at a further vertical depth of 200 feet, 490 feet from the portal, and it is through this opening that the present development is being carried on. The vein where crosscut by this work, and by a series of crosscuts run every 50 feet, shows an average width of 33 feet. The vein is reached from the footwall side through Wallace quartzite, which is the ore-bearing formation of the district. The hanging wall is a diabase dike of width of 4 feet and peculiarly uniform strike of N. 30 degrees east, dipping 64 degrees to the southeast. The vein cuts the formation at an angle of about 30 degrees on both dip and strike, while the formation strikes N. 25 degrees west and has a dip of 37 degrees to the northeast.

**Characteristics of Vein.**

The vein is a replacement in a sheared zone, bounded on the east by the diabase dike, the filling being shattered quartzite, with quartz and siderite replacing some of the quartzite. An ideal section of the vein would show a succession of periods of mineralization and movements, the pay ore consisting of both sheared and unshaped vein matter in overlapping lenses like fish scales. These lenses are individually small, but taken en masse make continuous ore-bodies of varying sizes. Silver values occur in the forms of argentiferous tetrahedrite, dark ruby silver or pyrargyrite, galena and sphalerite. The high grade streaks invariably show dark red-brown pyrargyrite—the antimonial ruby silver. The ore is friable and gritty, particularly so where values run highest.

**Ore Show and Values.**

From the point where the lower crosscut reaches the vein, drifts were run both ways, the north drift being 210 feet long, while the south drift was in 220 feet to face on October 6, when the writer visited the mine. This work has demonstrated an ore-body 250 feet long, of which 140 feet was exposed by earlier operators. At that time, however, no economical method
of treatment was known, so work was abandoned and the property remained idle for possibly twenty years. The shoot runs from 10 to 15 feet in width. Several hundred assays taken by the present management have established an average content of at least 14.6 ounces silver, .03 ounce gold, 2% lead and 4.1% zinc.

**Carries High Grade Streaks.**

After passing out of the main ore-shoot, the south drift was carried by the present company for 60 feet in lean ground, but at the time of the writer's visit the heading had been in pay ore for 15 feet, with values running higher than theretofore encountered. On that date the face showed six feet of pay ore, from which an average sample gave 23 ounces silver and the usual values in lead and gold. A six-inch streak of high grade on the left or east side gave returns of 216 ounces silver. The following day the average mine samples ran 14 ounces for the entire face and 84 ounces for the high grade streak. The high grade streaks appear to occur frequently, but apparently have no sustained continuity on the strike of the vein. Frequent crosscutting is therefore necessary to thoroughly test the ground. The management is adhering to the policy of running crosscuts to each wall every 50 feet and in this way will closely delimit the pay shoots.

**Depth of 250 Feet.**

The average backs on the ore shoot already developed are around 250 feet. A raise in pay ore was put up 60 feet in in the south drift at a point 110 feet from the turn and according to extensive sampling by the management, showed an average content of 21.6 ounces silver, with the usual lead and gold values. Figuring the shoot as 250 feet long, 250 feet in depth and 10 feet wide, the amount of ore in sight above No. 2 level may be placed at around 60,000 tons. As the ore-body is strong in the floor of the drift, it would be reasonable to assume that it goes at least 100 feet deeper. In that event, the total reserves would be increased to around 100,000 tons.

The company plans to continue development throughout the winter, drifting both ways on the vein and blocking out further reserves. The newly located milleite, lying on the east side of the creek just below the mine and at the elevation of the lower crosscut tunnel, has already been cleared and, if development continues satisfactory, a mill of capacity of from 75 to 100 tons will be erected in the spring.

Mr. Drumheller, who is in charge of engineering and metallurgical details, is laying his plans upon the assumption that mill feed can be kept up to a minimum average of 14.5 ounces silver, 60 cents gold and 2% lead. Upon that basis he figures mining costs at $1.50 per ton, and milling at $2, with concentration ratio of about 10 tons into one. Freight and treatment charges on concentrate have been figured at $24 per ton. By increasing capacity it is believed that milling costs can be brought down to at least $1 per ton. It is estimated that 90% of the values in lead, silver and gold can be recovered.

**Flotation Tests Satisfactory.**

Exhaustive tests upon the ore have already been made by General Engineering Co., of Salt Lake, which constructed the Talache Mines mill at the other end of Pend Oreille lake generally considered one of the most efficient flotation plants in the entire Northwest. The company's report on Venzwela ores says "this ore is very amenable to a simple method of flotation and from the experience we gained on the Talache ores, we feel quite safe in advising you that you will obtain better results in the mill than we have shown from the tests."

**On Co-operative Plan.**

Hewer Mining Co. has a capital of 1,500,000 shares and has been conducted so far upon a co-operative plan by which every share issued has been earned by services of some kind rendered in securing or developing the ground. The project had its inception at the Talache Mines, where Dan Drumheller occupied the position of superintendent and Harry Hewer, Jack Benson, Harry Wilson and Oscar Williams figured on the payroll in different
capacities. It was agreed that if a likely property could be found, the nucleus of a development fund should be raised at Talache and with that idea in view several Pend Oreille properties, including the Venzwela, were examined. The Venzwela formerly belonged to the now defunct Ponderoy Smelting and Refining Co., which passed away in a financial sense almost twenty years ago. Its assets found their way into the hands of the late Tom L. Greenough via the foreclosure route and at the time negotiations were opened by Hewer, were in the hands of the Union Trust Co., of Spokane. After some dickering a bond and lease was secured at $25,000, with nothing due for two years from last January, when $5,000 is to be paid, and the balance spread over the remaining three years. A royalty of 10 per cent of the net smelter returns is to apply upon the bond price.

Miners Back Their Faith.

The negotiations leading up to the bond and lease consumed three months and were conducted by Drumheller and Hewer. For their services in that connection a small block of stock was apportioned to each and the following subscribed cash to the initial development fund: Jack Benson, A. J. Beckwith and J. M. Hector, all employed by Talache Mines; Jack Abrams, Mr. Drumheller’s successor as general superintendent of Tidewater Copper Co., Chester H. Harvey and Walter J. Nicholls, Spokane brokers, and Jerome L. Drumheller, well-known local mining operator and a brother of Dan. Services at the mine in various capacities were performed in exchange for stock by Drumheller, Harry Wilson and Wm. P. White. This carried the work up to August 1, 1923, Jerome L. Drumheller, believing in the future of the property, undertook an issue of 100,000 shares to be paid for as required monthly, so that from a modest beginning development is fully financed until next March and capital assured for the new milling plant. Every man working at the mine is directly interested in some way in its success, and a good part of their earnings have been invested in stock, with the result that a spirit of loyal co-operation works wonders in the rate of daily progress.

Original Chloride Location.

There is good reason to believe that what is now known as the Venzwela mine is the honest-to-goodness, original location of the Chloride camp. “Bob” Rennie, a pioneer of Lakeview, who coyly confesses to 78 perpetual summers of life, says that his recollection is that the property was located as the “Jumbo” by the first party that found its way over from the Coeur d’Alenes via the north fork of the Coeur d’Alene river, early in the summer of 1888, before the big excitement was started by the discovery of the Weber mine, which lies on the north fork of Gold creek, about a mile to the east. The first camp was at the confluence of Venzwela and Swastika creeks, but after the Weber strike the crowd flocked to Chloride townsite, about a mile and half below. There a mushroom town of around 2,000 intrepid souls sprang up over night, boasting as many as sixteen saloons, a dancehall of generous proportions and care-free atmosphere, with all the other trimmings of the wild and woolly West. To-day there are but two of the original Chloride log cabins left—one the former residence of “Bob” Rennie himself, now used as a chicken roost by the farmer whose ground covers the old boom camp. If Rennie is correct, the Jumbo property was developed for some time after location by “Dutch Jake” Geitz and his partner, Harry Baer, who had just sold their interest in the Bunker Hill & Sullivan mine for a round sum. Later, the property was tackled by Preusse, a local architect. The two crosscut tunnels and some drifting both ways on the Venzwela vein was done by these pioneer operators back in the days of 35 years ago, when Chloride boomed.

Mining Talent a Plenty.

Hewer Mining Company certainly will not fail for lack of competent engineers or practical mining experience. In fact, its payroll has every appearance of a “who’s who” roster of retired superintendents and bosses from all parts of the Northwest.

Dan Drumheller, Jr., as everyone heretofore knows, is the son of one of the grandest old pioneers of them all—"Uncle Dan" Drumheller, one of the few remaining survivors of the
Pony Express riders and who knows the West from one end to the other. Young Dan was educated in Spokane and graduated from the University of California with high mining honors. Since then his experience has been varied and he has successively been in charge of operations at the San Poil, Republic; the Rio, Sloan; Tidewater Copper Co., Sidney Inlet, and Talache Mines, and was recently elected president of Northwest Mining Association. He has made a specialty of ore dressing and secured better results in old Republic camp than any man who ever tackled the job.

Some Superintendents.

Harry Hewer, who is superintendent, gained his first mining assignment in New Zealand and came to this country in 1905, his first job being with the Rathmullen Co., at Elliot, B. C. He then took charge of the Sunset mine, Greenwood, for Dominion Copper Co. and later joined Conrad Wolfe, the well-known former operator of Spokane, being in charge of the United Silver-Copper property, at Chewelah, for three years, the Red Monarch, in the Coeur d'Alenes, for two years and spending another two years in scouting expeditions throughout the West. He then became superintendent of the Florence Silver on Kootenay lake for Ferdinand Wolfe and remained there for three years. In 1921 he became associated with Talache Mines and remained there until Hewer Mining Co. was launched.

William P. White, who is also financially interested, is a graduate of the Royal School of Mines, London, a veteran of the Boer war and for several years occupied the position of superintendent of the St. Eugene mine, Moyie, B. C., under James Cronin, of Spokane.

Jack Benson, another stockholder of the company, is a pioneer of the Coeur d'Alenes, Sloan, Rossland and Boundary districts, and in the latter camp held the first contract for development of the Old Ironsides claim, later the nucleus of the Granby consolidation. From 1911 to 1915 he was superintendent of Ben Hur, at Republic and later occupied a similar position with Tidewater Copper Co. under Dan Drumheller.

Hard-Rock Miners.

Other old-timers of the practical, hard-rock school on the Hewer payroll are Bert Campbell, who ran the first tunnel at the Monitor mine, in the Sloan; was superintendent of the Surprise mine in the same district for two years under Alex Smith and more recently in charge of the Gwynn mine of Hall Creek Mining Co., near Inchelium, in this state; Walter Allen, formerly foreman at the Conjecture mine a mile east over the hill from the Venzuela, and a pioneer of the Eastern Oregon fields; Oscar Williams and Harry G. Wilson, formerly of Talache Mines and William Baptiste, for 20 years a confidant "booster" of the Chloride camp and a resident of Lakeview.

That, we contend, is a galaxy of mining talent that would be hard to beat in any other camp of the size in the West.

Development Is Important.

The success which has attended the efforts of the company is of great importance to the future of Chloride and to the whole mining situation in these parts. There has never been any doubt as to the amount of ore in sight in the old camp, but for one reason or another former efforts to revive it seem to have failed. The Weber mine erected an unsuccessful milling plant many years ago, but for the last ten years has been tied up in all kinds of litigation. During the recent period of high silver prices several efforts were made to round the project into shape once more, but invariably failed. Some years ago the Conjecture mine, owned by the Ridpath estate, was secured under option by Cecil Fernell, of St. Louis, who organized the Lakeview Silver Mines Co. Efforts to raise the necessary development capital seem to have failed and matters were not improved by a fire that destroyed the surface equipment three years ago. Another property of acknowledged value is the Keep Cool, where large reserves of fair grade were developed by Spokane interests in earlier days. There are other properties just as promising as the Venzuela, but somehow capital seems to have avoided the district and gone
further afield with results that might have been better in the old camp. Old-timers of the
district, residents of the peaceful town of Lakeview, on Pend Oreille lake, have never wavered
in their faith and that very faith has in part been responsible for the stagnation of twenty years.
Properties have been held at boom prices, perhaps through a mistaken sense of loyalty to boom
ideals, and many a seeker after likely property has passed on to other camps where better
prices prevail. It seems likely that the lead of Hewer Mining Co. will bring back Chloride's
faded glories. There is no more beautiful mining country in the Northwest and certainly there
are few that offer such possibilities in view of the perfection of flotation process and other
advances in metallurgy.

Work in the early part of 1923 consisted of repairing the roads and rehabilitating the
camp. Hewer Mining Co. shipped test lots of ore during the year. In December,
Drumheller described the property as follows (Drumheller, 1923, p. 1):

The following is a Summary Report of Conditions at the Hewer Mine.
Surface equipment and improvements consist of the usual mine buildings and
accommodations for 20 men. Mill site cleared for 100 ton mill.
Underground workings confined principally to Main Tunnel level where vein has
been drifted upon for over 600 ft. and at an average depth on the vein of 250 ft. Width of vein
as determined by drifting and crosscutting, 30 to 40 ft. As drill is advanced maximum depth of
1400 ft. will be obtained on the vein.

Two orebodies at this time have been opened in the Main Tunnel Level one of which
is 265 feet long by 10 feet wide and averaging 14.7 oz. Silver, .03 oz. Gold, 2% Lead and
4.1% Zinc. This is estimated to contain within 125 feet of the level 60,000 tons of Probable
Ore. The other orebody has been followed for 92 feet with an average of 4 feet and contains
17.0 oz. Silver and proportionate amounts of the other metals. This orebody is estimated to
contain within 45 feet of the level a tonnage of 3400 tons. This last orebody is still being
drifted upon and further proven by raises and cross-cuts.

Milling tests by General Engineering Co. Salt Lake City show recoveries by flotation
of 90% of Silver and Lead values. One ton of Concentrate representing 10 tons of the ore from
the first orebody would give at present metal prices a Net Smelter Return of $83.64 or $8.36
per ton crude ore. Estimated cost of operation on 100 ton per day basis are: Mining, $1.75;
Milling, $1.50; Overhead, .30; Total $3.55. Smelter returns of $8.36 less operating cost of
$3.55 leaves an Operating Profit of $4.81 or an Operating Profit from the estimated 60,000
tons of $288,000.

Net returns from the smaller orebody would be about $9.65 per ton leaving an
operating profit of $6.10 per ton or a total for the 3,400 tons of over $20,000 making a total net
value of Probable Ore in excess of $308,000.

In addition to the above orebodies there is a large tonnage of material which could be
considered as ore when possible to take advantage of the economies of a large scale operation,
or under higher metal prices could be treated at a profit with the smaller plant. In fact the
whole drift, a distance of 620 feet, has an average silver content of about 11.0 oz. and should
this be taken into consideration at present assuming the values to continue to the surface above
the drift and also to a depth below the level to half the length of the drift it would make a
tonnage of approximately 250,000 tons, with a gross silver content of 2,750,000 ounces. This
is not an unreasonable assumption as many mines in the same general formation and within a
radius of 35 miles are now mining at a depth of over 2,500 feet.

In 1924, the company moved a 100-tpd flotation mill to the property from the
Loon Lake Mine in Washington, establishing a record for the time required to get the mill
set up. The mill operated for 30 days and treated several hundred tons of silver-lead ore. The mine had estimated reserves of 30,000 tons of milling ore, and the main ore shoot, which was described as 10 feet wide, had been followed on the adit level for 275 feet. Company president and manager D.M. Drumheller, Jr., submitted the following account of the operation to the Idaho Inspector of Mines on June 14, 1924:

It is impossible to cover our operations for the past year and conform to the questions asked for in this form as our work has not been the same as it would have been for an established operation. Having examined this property in 1922 and thought it worthy of further development the 4 patented claims were taken on a lease and bond and neighboring vacant ground located. A Company was organized and first operations financed by a few sports that were willing to take a chance. After a few months work it was evident that we had a prospect with real merit and a program was outlined which is now being put into effect. Segregated unit costs are not available as our records are not complete enough to accurately furnish same.

Our plant is now in the course of erection and we hope to be operating within the next 60 days.

During the past year we have developed a tonnage of 1 to 3 side ore that can be reasonable estimated at something over 100,000 tons which from our assays should contain approx 15 oz. Ag, 1/6% Pb, 4% Zn and .03 oz. Au.

Ore dressing tests made by Callow of Salt Lake assure us a recovery by flotation of 90% of both lead and silver with a ratio of concentration of approx 10 to 1.

Our most difficult problem has been financing.

If there is any further information desired we shall be glad to supply it so far as we are able.

As to the value of our shares. This is most difficult to answer as we have sold shares at prices ranging from 10¢ to as high as 10¢ the latter being on underwriting contract. The underwriter has sold some of the underwritten stock at prices as high as 25¢. Our further financing will be by the offering of treasury stock at a price of 20¢ net to the company. About $20,000 will be required to put us on the list of producers.

Oscar Hershey (1924, p. 1-4) described the geology of the mine (which he referred to as the Western Adventure) in March:

From a geological standpoint the Western Adventure is a magnificent vein. It cuts dark gray slates and light-colored sericite quartzites that belong to an upper member of the Belt series, but whether the Wallace or Stiped Peak formation remains in doubt and in any case is of no importance. These rocks strike a little west of north and dip eastward 40°. The vein strikes N 35° E and dips S 55° E 60° to 70°, thus cutting the beds at an acute angle. A sheeted and otherwise fractured zone from 25 to 35 feet in width has been in large part replaced by quartz, siderite and sulphides. The zone is bordered by fault gouges and has other gouges within it. The quartz has a beautiful ribbon structure. The sulphides are fine grained and pyrite is chiefly visible. A small quantity of fine-grained galena and about twice as much sphalerite are present in certain bands that are mostly ribbon quartz and that constitute the ore steaks [strands], but underground they cannot be often distinguished because of fine grain and of being obscured by the pyrite. Drumheller reports tetrahedrite and pyrrhotite present, but if so they are difficult to see and in the hasty examination that I gave the ore were not detected with certainty. Stibnite may occur locally.

The vein is usually bordered on the hanging-wall by a 3 to 5-foot dark gray, fine-grained basaltic dike, probably a lamprophyre. This is barren and was intruded into and along along
the vein, some of which occurs above it in places. A thick, tough, dark gray fault gouge usually intervenes between the dike and the vein and has been formed by crushing of a portion of the dike. In one cross-cut all of the dike has been crushed. In places the gouge is within the vein. It is post-mineral in age. Usually the ore-streak is found at some distance below the big tough gouge and dike, so that they will not appear in stopes and have no particular economic significance.

Because of the gossipy character of the vein, the oxidized zone is relatively shallow and secondary enrichment probably not extensive. The sulphides on the main tunnel level which is from 100 to 200 feet below the surface are doubtless primary.

The vein has been driven upon for 770 feet and frequent cross-cuts driven toward foot and hanging. Running lengthwise for the entire distance there is a slightly sinuous band of ribbon quartz stained dark gray by sulphides all of which one would judge by its appearance to be ore, but it seems that frequent sampling shows that in some sections the silver content is low and in others the width is only a foot or two and thus the band is divided into ore-shoots. The north shoot is described in Drumheller's report as 265 feet long, 10 feet in average width, with an average content of 14.7 ozs. silver. A 2-ton sample sent to the Bunker Hill Smelter assayed 15.1 ozs. silver, 0.3 oz gold, 2% lead and 4.1% zinc. Very few samples have been assayed for anything but silver. Drumheller now thinks that the ore will average between 1.75 and 2% lead and nearly 5% zinc. The truth could be determined only by resampling the ore-streak at 5-foot intervals and having the samples assayed for lead and zinc.

Mr. Hewer claimed that after a low-grade interval of 60 feet, a second ore-shoot extends thence to the north face, 270 feet, with an average width of 4 feet and average silver content between 17 and 18 ozs. Mr. Drumheller arrived just before I left and he cut this down to two shoots, one 90 feet in length, 4 feet in width of 17-oz. ore and the other 100 feet in length, 3.7 feet in width of 12.5 oz. ore. At the south face 4 feet of sulphide ore assays 15 ozs. silver per ton.

As showing the possibilities, it is stated that at one place a lens of solid galena appeared and attained a thickness of 18 inches at the floor. It assayed 463 ozs. silver. In places widths of 12 to 15 feet are said to assay 14 ozs. silver per ton. Some cross-cuts show a second band of ore near the hanging wall.

Near the south end a raise goes up 115 feet to the surface, in ore practically all the way. Southwest from it snow prevented our climbing the mountain along the course of the vein, but Hewer says the vein is buried under thick debris for about 1000 feet to half way up the mountain, then float appears and leads about 1000 feet to the beginning of an outcrop on top of the mountain, 1200 feet higher than the main tunnel. This is developed by cuts and short tunnels and runs down on the Little North Fork side 600 or 800 feet to the property line. He got assays of 6, 8, 12 and up to 52 ozs. silver from the oxidized and probably partially leached material. In a northeast direction we could not follow the vein on account of snow and thick brush, but it seems to appear at intervals near the old town of Chloride where a Swede is running a tunnel in it. Drumheller says here the vein zone is 100 feet wide, but ore occurs only in narrow streaks.

Although the metal contents are low enough to require close figuring to arrive at a fair working profit per ton, I secretly became enthusiastic over the prospect for the following reasons: The vein is strong and doubtless runs in the property the 4500 feet claimed. Of this distance 770 feet has been explored and has apparently yielded 455 feet length of ore. The vein is not of a nature to make good outcrops and is largely buried under debris. There may be clear across the property, a succession of similar ore-shoots and some may be much better than those found. The vein and ore may extend to great depth. The only thing that menaces it is a fault that the United States Geological Survey maps to the east of it, the dip of which is not known. It is far enough distant so as not to be a serious matter at the present time.

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If we had a bond on this property under the conditions the Hewer company has, per Drumbheller's report, namely, no payment until January, 1925, then $25,000 over a period of three years, we would, I think, be delighted to install a compressor and drive along the vein southwest from the face with 4 feet of 15-oz. ore, under the mountain where we would get, it is said, 1200 feet of backs. But it seems the lease and bond is not for sale except at what Mr. Drumbheller considers a fancy price (he mentions $250,000) which nobody would entertain in the mine's present undeveloped condition. It seems to me the possibilities are of such a nature that in course of time $250,000 may appear a small price for it, but I am not recommending it at that price at present, even under long time for development. That is because of the comparatively low grade of the ore. The proposal may reach the company of lending money to build a mill. In that case, several men should be sent over to thoroughly sample the alleged ore at 5-foot intervals and then an engineer should figure on it from a working standpoint. Mr. Harold Childs, who accompanied me is favorably impressed. The ore will break easily and the chief trouble will be to keep too much rock from coming. It will mill easy, but will have to be ground fine and floated. Alleged mill tests indicate a 90% saving and a 10 to 1 concentration making concentrate relatively high in silver.

The mine was the largest producer in the district in 1925. Development work was maintained throughout the year, consisting of sinking a 200-foot inclined shaft and running 1,000 feet of drifts from the bottom of the shaft. The flotation plant operated several months, and silver-lead concentrate was shipped to the Bunker Hill smelter at Bradley. The April 16, 1925, issue of Mining Truth (p. 14) carried the following story about the mine:

Ore three to five feet in width is being developed in a drift that is being run southward in the Hewer mine, five miles south of Lakewide, Idaho, according to O. M. Drumbheller, manager of the property. The vein in this section of ground is 50 feet wide and, according to Mr. Drumbheller, as drifting proceeds a depth of foot for foot is being obtained.

"Drifting has proceeded ahead 400 feet in this section and at present a depth of 400 feet has been obtained," said Mr. Drumbheller. "The maximum drift is 1,400 feet. An important feature of this part of the development is that, as drifting proceeds on the ore, there is an increase in the lead content with no decrease in the silver content. A recent sample, taken across a foot of the face, gave 69 per cent lead. The average of the ore now is from three to 20 per cent lead and 20 ounces in silver to the ton. Back in the drift where the depth was less the lead content was only from 1 to 1½ per cent."

In speaking of the ore reserves at the Hewer Mr. Drumbheller [sic] said that, in addition to the development in the southern section of the mine, eight raises in other places are proceeding in ore and that the tonnage now in sight was sufficient to supply the mill continuously for a year without further development of ore.

Shipping has been resumed at the Hewer and concentrates are moving to the Bunker Hill smelter at the rate of about a carload a week. The ore is netting about $2,000 a car after freight and treatment deductions are made.

Mr. Drumbheller announced that an option had been taken on the Wiberg group of four claims which adjoin the Hewer claims on the north. He states that the acquisition of the Wiberg group will give an additional 3,000 feet of the Hewer vein and will increase the Hewer holdings on the vein to 7,500 feet.

Pending the installation of a compressor sinking at the Hewer has been suspended. The condition of the roads to the mine have improved so that hauling over them is proceeding without difficulty.
In April 1926, the company reorganized as Idaho Hewer Mines, Inc., with 2,000,000 shares of assessable stock. (The 1,500,000 shares of stock in the Hewer Mining Company had not been assessable.) Money from stock assessments was used to continue development work during the rest of the year. The shaft was extended about 300 feet, and about 1,000 feet of drifting was done. This work exposed two new orebodies, and silver ore was cut at several points in the crosscut from the 500-foot level. One car of lead concentrate, produced from ore mined during development, was shipped. Hershey made a second, more detailed report on the property in the early part of the year (Hershey, 1926, p. 1-10):

Under date of March 18th, 1924, I made a preliminary geological report on the Western Adventure mine in the Lakeview Mining District of Idaho. Since then a mill of a capacity of 100 tons per day has been erected and the known ore stopped out above the main tunnel or No. 1 level. The concentrate has been shipped to the Bunker Hill smelter. From the smelter office in Spokane I secured the following table [omitted]. It will be noted that the averages are not weighted because the office is not equipped with the calculating machinery necessary to multiply except at such great labor and time that I did not wish to impose on the office man when mere arithmetical averages are sufficiently accurate for my purpose which is to show that the average content of the concentrate was about 98.0 ozs. silver, 6.4% lead, 6.6% zinc, 1.9% antimony and 2.66% arsenic.

The information at the mine office had not been tabulated and was scattered in various books. I did not feel it necessary to spend an extra day at the mine going through the books, so I accepted Mr. D. M. Drumheller’s statement that 6248 tons were milled in 1925 and probably 1000 tons before, that the recovery was 80% and the concentration was about 13 to 1. He thinks the ore as mined averaged about 11 ozs. silver, 0.75% lead and 0.75% zinc. Formerly, he had expected the ore to average between 1.75 and 2.0% lead and nearly 5% zinc. This was based upon too small a number of assays and has not been supported by the mill results. In the matter of the silver contents his guess was not so bad. In a report he described a north shoot as 265 feet long, 10 feet in average width, with an average content of 14.7 ozs. silver per ton. This has been mined in the Big stope 175 feet in length, up to 20 feet in width, probably averaging 8 feet per Mr. Drumheller. It has yielded the bulk of the ore milled. The first month the ore averaged 14.1 ozs., the second month 13.52 ozs., the third month 11.84 ozs. and the fourth month about 10 ozs. silver per ton. This indicates that the content gradually became leaner going up. The ore was becoming oxidized and stoping was discontinued.

The second ore-shoot was described by Mr. Drumheller at the time of my first visit as 90 feet in length, 4 feet in width of 17-oz. ore. A stope was started 80 feet in length on ore that averaged better than 20 ozs. per Drumheller but it gave out at 20 to 30 feet height, with the width of quartz the same in the back, but the values not present. I could see the top of the stope for some distance and my impression is that the grey ribbon quartz that carries the values has pinched to such narrow width that the stope was no longer payable.

The third ore-shoot was to be 100 feet in length, 3.7 feet in width, of 12.5-oz. ore. A stope was started 100 feet in length. The central portion went up to within 30 feet or so of the surface, about 100 feet above the level. Drumheller says the ore-streak averaged about 20 inches thick and probably better than 15 ozs. per ton.

Thus it appears that in all cases there was a pinching of the ore upward, though some went to the zone of oxidation. This I attribute to a tendency of the ore to occur in lenses vertically as well as horizontally.

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Since my first visit the vein has been developed about 930 farther in a southwesterward direction. The vein is from 30 to 50 feet in width, but the ore streak averages narrow and finally is much broken by small faults and difficult to follow. I mapped this new section in detail. The drift follows the ribbon quartz streak for about 180 feet. I have been furnished with a list of assays. They show that if a streak 2 to 8 inches thick only is sampled, very high assays up to 140 ozs. silver are obtained, but sampled 1 to 6 feet in width, only short sections are of commercial grade.

Then the ribbon quartz streak splits and the drift follows the left hand and weaker branch for 140 feet. The streak sampled was too narrow to stope, only running over 10 ozs. when sampled 4 to 8 inches wide, except that one sample across 4.5 feet assayed 38.2 ozs. per ton.

Then the two branches unite and the ribbon quartz streak remains fairly strong for 200 feet. The drift is largely in its footwall for 80 feet. At a cross-cut there is 4 feet of ribbon quartz that has the appearance of ore. Drumheller says there was a bunch of galena ore 6 feet long and up to 1 foot thick. At 110 feet beyond this galena bunch there was a bunch of ore, one sample across 3.3 feet assaying 31.25 ozs. and nearly 4 inches assaying 471.25 ozs. per ton. Drumheller raised up three sets and the vein became poor.

Then the quartz goes into the southeast wall of the drift but is exposed in a short cross-cut where 3.5 feet of gray ribbon quartz goes about 17 ozs., Drumheller thinks. In 30 feet the quartz returns to the drift but the assays average low for 150 feet. Thence for 46 feet per Drumheller there was ore 3 to 7 feet thick, averaging 3.5 feet that was good mill feed, probably close to 10% lead, 10% zinc and 15 to 20 ozs. silver per ton. He raised up one round and the ore terminated. He raised up to 50 feet and cross-cut but did not find the ore band. It may have flattened going up and was not reached in the cross-cut.

On the No. 1 level the ore seems cut off by a small fault that dips northeast 50°. Beyond it for 60 feet there is vein matter but no definite quartz band was seen. Thence for 75 feet the drift follows a gougy zone several feet thick with considerable quartz and fine-grained sulphides which should be the ore-streak, but assays low. Thence for 30 or 40 feet there is a 4-inch ribbon seam that yielded one assay of 19 ozs. silver and 15.1% lead per Drumheller. It terminates against a small fault and thence to the face, 25 feet, there is vein matter much contorted and crushed, but no definite quartz seam. It is a question whether the main ore band is exposed anywhere beyond the fault that cuts off the 46-foot ocebody. The general appearance is of a decrease in amount of ribbon quartz toward the face, but the vein here is at least 50 feet wide and broken by small cross-faults, so that the main ore-streak may not be exposed in certain sections.

The vein has now been pretty thoroughly investigated on the No. 1 or main tunnel level for a length of 1700 feet. It is from 30 to 60 feet wide. But most of this width is simply country rock, largely thin-beded impure quartzite, crushed, somewhat altered, with pyrite impregnating the rock and distributed along the seams. This material yields very low assays and is never ore. Running through it, generally near the footwall, is a persistent band of ribbon quartz made dark gray by abundant sulphides, chiefly fine-grained pyrite, which masks smaller quantities of fine-grained galena, sphalerite, tetrahedrite and locally pyrargyrite. The quantity of these sulphides varies from section to section, but I believe that if all the dark gray ribbon quartz in this streak could be removed separate from the other vein material it would average a good commercial grade, that is much above the 10 ozs. silver and usual amount of lead that Drumheller says will pay its way. But a large quantity of the ribbon quartz streak is too narrow to mine profitably. Toward the southwest the portions of mineable width become very short lenses or bunches. Drumheller does not consider any ground beyond the third stope as mineable at a profit.

In addition to the main ribbon quartz streak there are other quartz seams and lenses of similar character in the vein. One above the third stope has been developed for 75 feet, but

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averages one foot only of 10 or 11-oz. rock per Drumheller. In certain cross-cuts there is found over dark greenish gray gouge or crushed basic dike a considerable thickness of quartz with pyrite and some galena, but these lenses seem to have little length. On the whole, it may be said that in 1700 feet of length on the vein only one ore-shoot of respectable size has been found, that mined in the Big stope.

Mr. Drumheller talks frequently about a leaching of the vein and an expected increase in values below the zone now explored. I find a similar idea elaborated in a report by Mr. L. J. Tefft, a mining engineer of Spokane, Washington. It seems to be purely theoretical and not based upon a knowledge of the mineralogy of the vein in question. By this I mean that field investigation of the vein fails to furnish evidence of such leaching in the upper part of the sulphide zone as Tefft and Drumheller assume. The mine workings should now be in the zone of secondary sulphide enrichment if such zone exists and further depth should bring a decrease instead of increase in silver content. As a matter of fact, as stated in my first report, "because of the goosy character of the vein, the oxidized zone is relatively shallow and secondary enrichment probably not extensive. The sulphides on the main tunnel level which is from 100 to 200 feet below the surface are doubtless primary."

A winze has been sunk and No. 2 level has been driven nearly 200 feet deeper than No. 1 level. There was no map of it but Mr. Drumheller sketched it from memory. The sketch shows a southwest drift 95 feet in length that follows a streak of very good appearing ribbon quartz with pyrite, fine-grained galena, dark brown sphalerite and some ruby silver. A pinkish carbonate may have some rhodochrosite with calcite or siderite. It is easier to see the different minerals than usual on the No. 1 level, which suggests to me primary mineralization unobscured by a possible later sulphide deposition. Immediately opposite the "shaft" 22 inches assayed 56 oz. silver per Drumheller and the entire quartz band to near the face of the southwest drift is supposed to be commercial and chutes are being put in to stope it, but I anticipate that it will average thin and patchy. There is a pinch at the face. This is supposed to represent a footwall searn on No. 1 vein. Going northeast on No. 2 level it is in the left wall of the drift for 75 feet and in this distance it is reduced to a thin searn of quartz with galena and sphalerite. After following it 30 feet, the northeast drift obliquely cross-cuts to the so-called main vein which it follows for 220 feet. This is a zone of badly crushed quartz, altered quartzite and gouges that is supposed to represent the Big stope ore-shoot, but it averages much lower in grade. I could not get a list of assays to represent it. I gained the impression that a few test assays ran so low that Drumheller and Hewer got afraid to sample it systematically. However, I was told that in places the full face of the drift went 12 to 15 ozs., but that taking 6.5 or 7 feet average thickness the entire body will not average over 7 ozs. per ton. The zone in places is 18 or 20 feet wide, as it was in the Big stope. Drumheller says the streak is as wide and appears the same as on No. 1 level, but the silver content is lower. He and Tefft both talk about a leached condition of the material on No. 2 as well as No. 1 level. What I see is a badly crushed condition of the material. The ribbon quartz may carry as much metal as on No. 1 level per volume, but I suspect that the quartz streak was narrower in No. 2 level and has been diluted with a greater quantity of nearly barren vein matter in making the crushed zone that has to be mined if any is mined. A puzzling feature is that the zone terminates against the big gouge about 80 feet northeast of the "shaft". That led me for a time to suspect that it is not the same streak as in the Big stope, but a hanging-wall streak and that the Big stope ore might be found by a footwall cross-cut on No. 2 level. However, it is probable that Drumheller is right that they are on the same band. He is putting in chutes on No. 2 level and intends to put up raises until ore is reached and then open a stope. This will clear up the uncertainty.

At the present stage of the investigation the future of the property does not appear very promising, certainly much less so than it did at the time of my first visit. I was inadvertently misled as to the lead and zinc contents of the ore-streak. Moreover, additional
development on No. 1 level and downward has not supported the early promise that the
operation presented.

Both of my visits have been made under disadvantageous conditions in that snow
prevented me from studying the surface along the vein. There may be surface indications of
other and better ore-shoots in the 7000 feet of the vein that Drumheller now claims his
company has bonded. Before expressing a final conclusion regarding the proposition I should
have an opportunity of visiting the property in the summer when there is no snow there and
make a thorough study of the locality.

A map furnished Mr. Drumheller by Mr. Edward Sampson of the United States
Geological Survey represents the vein as outcropping in the Striped Peak formation northeast
of the mountain summit and in Wallace southwest of the summit. The prevailing dips are
northeastward 34° to 74°. He maps a fault running north-northeast through the old town of
Chloride, but shows no dip on it and Drumheller says he did not know its dip. The downward
is on the west side of the fault and the apparent displacement is large. But the vein itself may
represent this fault and hence there is no certainty that the vein is cut off at Chloride.

It appears therefore that the vein as far as developed is near the top of the Wallace
formation. Going southwestward and downward lower formations should be reached.
Theoretically, the lead and zinc contents should increase southwestward and downward, but
this might be more than offset by a decrease in the silver content. At any rate, to reach the
most favorable formation, the Revett quartzite, by developing southwest or downward seems
out of the question.

I have pointed out to Mr. Drumheller that the ore lenses seem to become smaller
toward the southwest and that on that basis going northeast they may become larger and
richer. Hewer says that some rich float has been found in that direction and Drumheller says
they have 4000 feet of unexplored vein left in that direction.

Then there is the 600 or 800 feet of outcrop next to the southwest end of the property
that was described to me by Hewer on my first visit and which I have not seen. So the idea of
finding one or more ore lenses larger and richer than those developed does not seem hopeless.
At present, however, I can base my judgement only on what I can see underground. If
Drumheller is correct in saying that 10-oz. ore with the usual lead content will pay its way
(and the cost figures that he has given me indicate it will except that there has not been
sufficient allowance for exploration and development), he may get by, with a little financial
help, but the chances do not appear to me sufficiently certain or attractive to warrant the
Bunker Hill & Sullivan company in advancing the Hewer company money either against
shipments of concentrate from ore not yet mined or as a loan secured by mortgage on the
property.

The December 1, 1926, issue of Mining Truth (p. 12) noted:

The most important strike in the history of the property was made recently at the
Idaho Hewer mine, near Lakeview, Idaho, according to D. M. Drumheller Jr., president and
manager. The scene of the strike is a crosscut being driven across the vein at the 500-foot
level.

"Two ore bodies have been cut," said Mr. Drumheller. "The first is 39 feet from the
shaft and shows a width of three feet. It assays 23.2 ounces in silver to the ton and 1.1 per cent
lead. The second ore body is four and one-half feet wide and contains both high-grade and mill
feed.

"The property is equipped with a 100-ton flotation concentrator, in which $40,000
worth of concentrate has been made on ore taken from the upper level. The company will sink
the shaft an additional 200 feet and do considerable drifts on the lower levels before
operation of the mill is resumed. It is estimated that [sic] several months will be passed in this work and that the mill will be started in the spring."

Besides Mr. Drumheller, the officers and directors of the Idaho Hewer Mining Company are Frank T. McCollough, vice president, H. O. Kent, secretary-treasurer; H. C. Sandahl and C. W. Waters.

Idaho Hewer Mines continued active development work throughout 1927, extending the shaft almost 300 feet to the 900 level and running about 2,000 feet of drifts on the intermediate levels. This work was funded by stock assessments, which were levied at the rate of ½ cent per share per month. The mill operated for a few days, and the resulting concentrate was marketed. Bradbury (1928) analyzed the ore from the mine and proposed a flow sheet for the mill. The February 1, 1927, issue of Mining Truth (p. 4) reported:

Word comes from Lakeview, Idaho, that the showing in the shaft pocket at the No. 5 or 650-foot level of the Idaho Hewer is very good. One seam approximately three feet wide carries good lead and zinc values. Manager Dan Drumheller estimates the values at 20 to 30 ounces silver, 6 percent lead and 6 percent zinc. "There are small seams that will run much higher than this in lead and silver," he said. This disclosure is said to indicate a certainty of a large tonnage of pay ore on the 650 level below the leached territory. Drifting from the point of discovery will start this week.

A story in the March 1, 1927, issue of Mining Truth (p. 3) noted:

Idaho-Hewer in the Lake Pend Oreille district is the scene of an important strike of good galena, samples of which were brought to Spokane by President-Manager Dan Drumheller. The crosscut on the No. 5 level, which is 700 feet below the tunnel and 900 feet below the surface, entered the ore body on February 26 and the drift was just being started when Drumheller came away. There appears to be two feet of the better grade ore and three feet of fair mill feed. The location is north of the shaft.

On March 16, 1928, Mining Truth reported that Idaho Hewer Mines was negotiating with "one of the largest mining companies in the Northwest" to take over the financing and development of the mine. A month later, engineers from a large mining company (presumably the same unnamed company as in the previous story) were examining the property. The October 18, 1928, issue of Mining Truth (p. 4) announced the following:

Control of the well known Hewer mine at Lakeview, Idaho, has passed into Canadian hands, and F. A. Fortier of Kimberley, B. C., has been installed as general manager, according to announcement made in Spokane this week. Mr. Fortier has been with the Consolidated Mining & Smelting Company for some years.

The new corporation, organization of which was announced some months ago in Mining Truth, is Idaho-Lakeview Mines Company, successor to Idaho-Hewer Mines Company, which was in turn a successor to Hewer Mining Company, long controlled by Jerome and D. M. Drumheller Jr. of Spokane.

Idaho-Lakeview is an Idaho corporation, capitalized for 2,100,000 shares, par value 20 cents, and of this capitalization 1,529,578 shares are paid to the old company for the
property. The remaining 570,416 shares of the new capitalization goes to Solar Development Company, which picks up approximately $115,000 for development. Solar Development Company is backed by important Canadian mining interests and has its head office in Toronto.


Jerome L. and D. M. Drumheller Jr., organized, financed and developed the Hewer, along with a group of other Spokane men. They have expended about $350,000 in development of the property.

There is a 100-ton flotation plant at the property and it has been developed by shaft and tunnel to a depth of 200 feet. The new corporation will continue the development program by sinking the shaft 500 feet deeper and exploring the ore zone at that horizon. Important lead-silver ore showings already have been developed.

General Manager Fortier and Superintendent John Benson were in Spokane this week consulting on the details of the extensive development program which has been outlined. The force will be increased immediately and development continued from the point where the Idaho-Hewer Company left off a year ago.

The Idaho Lakeview Mines Co. took over the mine in October. The shaft was dewatered and enlarged with a view to sinking it to a depth of 1,200 feet. Also, a new hoist was installed.

The mine was worked throughout 1929. Development work, totaling about 513 feet of sinking and 1,620 feet of lateral work, opened much new ore. The 100-tpd mill (Figure 17) was idle. In addition to the development work, the company rehabilitated the mine camp and installed a new hoist and electric generator. On May 17, 1929, Mining Truth (p. 14) noted:

> Idaho-Lakeview Mines Company, formerly the Hewer, and now controlled by Consolidated, has bought the four claims adjoining owned by Charles Viberg. Principal work at present consists of sinking the shaft, preparatory to ore development at greater depths.

Starmont (1929, p. 7) described the property as follows:

> The largest investment among the operating companies [in the Clark Fork and Lake Pend Oreille areas] is represented by the Idaho-Lakeview near the head of Chloride Gulch. This property, formerly known as the Venzweila or Hewer, is only 2000 feet from the divide which separates the Pend Oreille drainage from that of the Little North Fork of the Coeur d'Alene. Under the direction of E. F. Knowles, with John Benson as assistant superintendent, the shaft is being extended and has reached the 1200-foot level. Near the 1200 level a well mineralized shoot with galena and ruby silver was encountered. Decision as to whether this level will be explored before proceeding with the shaft to the 1400 level rests with General Manager F. A. Fortier, of Trail, B. C., representing the Consolidated interests, which are conducting the present development. Mr. Fortier was expected at the property last week but had not arrived at the time of the writer's visit in company with President D. M. Drumheller Jr.

> ... The Consolidated people have quietly added some additional ground to their holdings in the Lakeview section.

During the first half of 1930, the inclined shaft was extended 200 feet and a large amount of lateral development was done. The mine was shut down on May 31. According to the June 5, 1930, issue of Mining Truth (p. 1):

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Figure 17. Idaho Lakeview mill in Chloride Gulch (Starmont, 1929, p. 7).
Consolidated Mining & Smelting Company has withdrawn its crew from the Idaho-Hewer property at Lakeview, Idaho, marking the cessation for the time being of all its operations in the United States. Jack Benson remains at the property with a small crew to keep it in shape until the Idaho-Hewer company, organized by the Drumheller interests, decides on a future course. During the two years in which Consolidated has been operating, the shaft was deepened from 700 to 1400 feet, but very little crosscutting or other exploratory work was done on the lower levels. The mill has not been operated under the Consolidated regime and no effort has been made to develop ore at points where the vein was cut.

Only assessment work was done at the mine for the next five years. The November 6, 1930, issue of Mining Truth (p. 12) noted:

Idaho-Lakeview Mines Company will make no effort to resume operations on the Hewer until metal prices improve. While the Consolidated Mining & Smelting Company of Trail did not furnish funds sufficient to give it control of the company, it retains a large interest and is willing when conditions improve to finance further work either through purchase of treasury stock or loan to the operating company, according to Jerome Drumheller, one of the larger stockholders.

According to the December 1, 1931, issue of Mining Truth (p. 19):

Idaho-Lakeview Mining Company has reelected officers, including D. M. Drumheller, Jr., president, H. B. Sandahl of Spokane, vice president, with Martin Woldson of Spokane, W. Shelledy, Spokane Representative of Lon Johnson of Colville, and A. B. Solar Development Company, of Trail, B. C., as directors. The property, the old Venzuela or Hewer, five miles from Lakeview, Idaho, is idle pending better metal prices.

A stock assessment of 2 mills was levied on June 8, 1933, and an assessment of ¼ cent per share was levied on May 27, 1935. On August 1, 1935, the mine was leased for three years to the Revlis Company of Wallace. The mine was reopened in July, and several thousand tons of silver ore was treated in the mill. The mine continued to operate until July 1936. Revlis relinquished their lease on November 19, 1936.

Between August 6 and November 10, 1937, the mine was pumped out to the 700-foot level, at which point the shaft was caved. The timbering was replaced below the 700 level before work was discontinued. An assessment of 4 mills per share was levied on June 21, 1937.

On March 16, 1940, a stock assessment of ¾ mills was levied. Additional assessments of 1 mill were levied on June 25, August 27, and October 29. The mill was operated during the latter half of the year on custom ores, and Earl McDaniel was given a contract for 250 feet of tunnel work. In November, the discovery of a high-grade shoot of ore was reported.

The mine was the only producer in the Lakeview district in 1941. Several hundred tons of silver ore was treated in the mill. Sale of this ore yielded $383.49. Concentrates sold to the smelter in the latter half of the year netted $2,097.78 for the company. Stock assessments of 1 mill were levied on January 7, March 11, April 29, June 17, August 5, September 30, November 12, and December 23.
The mine was operated during 1942, but the ore was not shipped until the following year. Stock assessments of 1 mill were levied on February 10, March 24, May 5, June 30, August 25, October 20, and December 8.

The output of the mine in 1943 was 300 tons of silver ore containing appreciable quantities of lead and zinc. The company levied stock assessments of 1 mill on February 10, March 24, May 5, September 7, October 26, and December 14. During the year, flotation cells, a conditioner, a 130-horsepower diesel engine, and a 500-ton ore bin were added to the property.

The mine produced about 180 tons of silver-lead-zinc ore in 1944. Sale of the concentrate to the Bunker Hill Smelter yielded $2,157.75. The flotation mill also treated some ore for the Knapp Refractory Ore Processing Co., presumably from the Keep Cool Mine. This earned the company $1,052.91. Additional operating funds came from stock assessments of 1 mill levied on February 9, March 30, June 15, September 7, October 26, and December 14.

The Idaho-Lakeview was worked throughout 1945, with the company's efforts focused on development. However, 600 tons of silver ore was treated in the mill, and sale of the concentrates to the Bunker Hill Smelter netted the company $1,301.44. Other operating capital was raised by stock assessments of 1 mill levied on January 25, April 25, June 6, August 1, September 12, and October 21. A new bunkhouse, started the previous year, was completed in 1945.

The mine continued to operate throughout 1946. The mill treated 2,000 tons of silver ore by flotation, and the resulting concentrates were sold to the Bunker Hill Smelter for $2,522.59. Stock assessments for the year totaled 7 mills, with assessments of 1 mill being levied on January 2, March 13, May 15, June 26, August 21, October 2, and November 20.

The company continued to develop the mine in 1947 and milled about 1,400 tons of silver ore. Sale of the concentrate to the Bunker Hill Smelter netted the company $10,027.32. Stock assessments of 1 mill were levied on January 15, March 5, May 7, June 25, August 6, September 24, and November 15.

In 1948, the mine produced 1,200 tons of silver ore. Stock assessments in the latter half of the year were levied on May 11, June 29, August 24, October 19, and December 7, each for 1 mill. The following year, 800 tons of zinc-lead-silver ore was produced from the property. Ore sales, which probably included most of the production for both years, netted the company $10,889.59. In 1949, stock assessments of 1 mill were levied on January 25, March 1, April 19, and May 31. The Idaho Lakeview produced approximately 240 tons of silver ore in 1950, after which the mine was apparently closed.

In 1955, the Idaho Lakeview mill processed some ore from the Weber Mine. Federal Uranium Corp., which had leased the Conjecture Mine in late 1956, acquired operating control of the Idaho Lakeview and Keep Cool Mines in 1957. Federal made preliminary plans to work all three mines from a shaft on the Conjecture property. In 1957, Idaho Lakeview Mines Company levied stock assessments of 1 mill each on
February 26, June 11, August 27, and November 5. Stock assessments for 1958 totaled 5,896.56. The company also received an advance on earnings from Federal of $12,000.

From 1959 to 1961, the Idaho Lakeview Mines Company announced each year that it expected Federal to bring the mine into production in the coming year. An advance on earnings of $12,000 was paid to Idaho Lakeview in late 1959 or early 1960. In addition to sinking the shaft at the Conjecture, Federal also conducted diamond drilling at the Idaho Lakeview. Idaho Lakeview Mines Company's annual report to the Idaho Inspector of Mines for 1960 noted:

The Federal Uranium Corporation of Salt Lake City are doing extensive development work and expect to get into commercial production within the next year.

When production is attained it will be on a large scale. All installations are of a very permanent nature and large scale operation is anticipated.

Federal continued its work at the Conjecture until April 1964, but no further mention is made of work at the Idaho Lakeview. Idaho Lakeview Mines Company's 1963 report to the Idaho Inspector of Mines noted that the hoist and compressor had been removed from the mine, repaired, and stored for future use; the buildings were in need of repair and remodeling; and most of the equipment was "of old design" and needed to be replaced for a "modern" operation. Savage (1967) stated the mine showed signs of having been idle for some time when he visited the property in 1963.

Sunshine Mining Co. leased the property in 1967 and conducted bulldozer trenching and geologic mapping (Kun, 1974). A newspaper article dated October 10, 1967, noted:

Sunshine has completed about 2,700 feet of deep trenching on the Hewer vein in the adjoining property of Idaho Lakeview Mines Co., he said. Lead-silver-zinc sulphides were observed in some of the trenching and a diamond drilling program is planned for next year, he said.

Idaho Lakeview owns the Keep Cool property and Sunshine has a half interest in both properties south of Lake Pend Oreille.

Kauffman (1975b) stated that Sunshine was still leasing the property and performing the assessment work on the property. An article in the June 16, 1976, edition of The Spokesman-Review (p. 26) reported:

Shareholders of Idaho Lakeview Mining Co. have been requested to exchange their stock certificates for stock in the newly formed Lakeview Consolidated Silver Mines, Inc., announced Frederick Drumheller, president of Idaho Lakeview.

The organization of Lakeview Consolidated, Drumheller explained, completes terms of the 1969 agreement between Idh [sic] Idaho Lakeview and Sunshine Mining Co. Each will have an equal interest in the new company.

18A photocopy of this article in the Keep Cool file does not identify the newspaper which ran the story.
Idaho Lakeview's mining claims are in the old Chloride District at the southeastern end of Pend Oreille Lake in Idaho.

Lakeview Consolidated and Conjecture Mining Co., which has a mine in the same area, have agreed to unitize their properties. Together they hold 116 claims.

Clinton L. Miller, vice president of Sunshine, is the new president of Lakeview Consolidated.

In 1980, Shoshone Silver Mining Company reopened the Idaho Lakeview Mine and planned to complete 700 feet of new tunnel during the year. Shoshone Silver was conducting this work through an operating agreement with Sunshine. In 1982, Shoshone Silver rehabilitated about 200 feet of old tunnel at the Idaho Lakeview. Six men were employed at the property, and plans called for mining to resume when metal prices recovered.

Shoshone Silver crushed and stockpiled ore at its Lakeview operation in 1984. The company also planned to do surface work on the Weil claims, which are on an extension of the Hewer vein.

In 1987, Shoshone Silver drove a 500-foot-long exploration tunnel at the Idaho Lakeview. The tunnel was looking for a mineralized target found by drilling. The company did some trenching at the mine the following year, but was still waiting for better silver prices to resume mining activities.

The Idaho Lakeview Mine was visited by an IGS field crew during the summer of 1996 as part of a program to evaluate inactive and abandoned mines on U.S. Forest Service lands in northern Idaho. Bennett and Mitchell (1997) contains a detailed description of the mine at that time. Figure 18 shows the remains of the Idaho Lakeview mill.

Total recorded production for the Idaho Lakeview Mine from 1916 to 1950 was 31,042 tons of ore. This material yielded 146.39 ounces of gold, 235,890 ounces of silver, 13,251 pounds of copper, 383,934 pounds of lead, and 73,298 pounds of zinc.

WEBER AND NEW RAINBOW MINES

The Weber and New Rainbow Mines are about 5 miles south of Lakeview in the NW¼ sec. 35, T. 35 N., R. 1 W. (Figures 3 and 5). This area has been worked at various times as both an underground and an open pit mine. In the summer of 1996, the combined sites had an open pit, one partially caved adit, and two collapsed adits (Bennett and Mitchell, 1997).

Sampson (1928, p. 22) described the geology of the Weber mine as follows:

The Weber vein has been followed intermittently for 8,000 feet but by far the greatest showing of mineralization yet exposed is in the Weber mine. In the Weber mine the geology is unusually complex but it is sufficient here to consider briefly three principal features: a strong shear zone, the different modes of occurrence of quartz, and the presence of lamprophyre dikes. Mineralization is localized along a strong shear zone in places 80 feet wide. Much of the rock...
Figure 18. Idaho Lakeview mill in 1996 (Idaho Geological Survey photograph). Compare this view with Figure 17.
in this shear zone has been so crushed that it may readily be picked down and mine workings require heavy lagging. Irregularly distributed in the shear zone are masses of vein quartz with which the sulfide ore is associated. The principal mass of this quartz is a great chimney traceable from the striking outcrop at the surface to the fifth level. Some of the shear zone rock has been intensely silicified so that it strongly resembles vein quartz, particularly when seen underground, but this silicified rock is barren. The dikes of lamprophyre cut the shear zone and ore in the most intricate manner. These dikes have, for the most part, been strongly altered by hydrothermal agencies so that many of them are of the consistency of gouge.

Savage (1967, p. 94-95) described the geology of the open pit:

The geology at the Weber open pit is very complex and the ore shoots are well shattered and siliceous. The crumpled and sheared quartzite and siliceous host rock is probably the Striped Peak Formation. In some respects, the Weber ore resembles the siliceous ore at the Big Step prospect south of Priest Lake. A major fault zone was exposed in the Weber pit in 1962; it trended N 40° W and dipped 46° NE. Reportedly, a strong fault zone was originally traceable over a distance of 8,000 ft (Sampson, 1928, p. 22). This may be the same fault zone that is exposed at the more recent open-pit operation.

The ore in the Weber open-pit contains abundant gouge and quartz, with finely disseminated replacement grains of sulfides including galena and pyrite. Mr. Otto Meyer reported (oral) that the ore is considered desirable at the Tacoma smelter because of both its silica and silver content. Assays average about 0.02 to 0.04 oz of gold, 7 to 8 ozs of silver, and 0.5% lead and zinc per ton of ore.

Figure 19 shows a map and cross-sections of the mine.

The Weber was the first mine located in the Lakeview area (Savage, 1967; Kun, 1974). According to Sampson (1928, p. 3):

The first discovery of ore in the Pend Oreille district was made about September 20, 1888, by Wm. A.D. Bell, Alfred Chamberlain and Peter Steinmetz. These prospectors were grub-staked by Frederic A. Weber and S.P. Donnelly, all of them living in Eagle City. The first claims, East and West Chloride, were staked on September 27, 1888, in the names of Weber and Donnelly and included the large quartz cropping of what is now the Weber Mine. Fifty pounds of ore was sent to Weber at Eagle City. Mr. Weber reports that this assayed 180 ounces silver and $1.80 gold a ton. Weber then went to Pend Oreille and shortly after returned to Eagle City to close up his affairs there. At this time news of the discovery got out and there was a general exodus from Wallace, Burke, Murray, and Eagle City, the last three towns being nearly emptied. By winter 2,000 people were living in the town of Chloride but after several months of riotous living most of them left the district. The Smith ranch now marks the site of the former town, nearly every vestige of which is gone.

Kun (1974) noted that the gossan outcrop was near the headwaters of Gold Creek (which was known as East Chloride Gulch at that time), where the Weber Pit is now. (Table 12 shows individuals and companies operating at the mine.)

Ore shipments from the mine began almost immediately (Kun, 1974, p. 4):

The first carload of 40 tons of ore was shipped to Great Falls, Montana, in January, 1889, and averaged 47 oz/ton in silver and $1.80 in gold. Later ore shipments were made to
Geologic, composite mine, and cross-section maps of the open pit, Nos. 2, 2½, 3 and 4 adits, Weber mine, Lakeview mining district.

Figure 19: Mine map and cross-sections of the Weber Mine and open pit, Bonner County, Idaho (Krin, 1974, Plate 6).
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Officer</th>
<th>Date Incorporated</th>
<th>Charter Forfeited</th>
<th>Year(s) at Mine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frederic A. Weber and S.P. Donnelly</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1888-</td>
</tr>
<tr>
<td>Pend d'Oreille Mining &amp; Reduction Co., Ltd.</td>
<td>(no officers listed)</td>
<td>January 14, 1903</td>
<td>December 1, 1912</td>
<td>1903(?)–1912(?)</td>
</tr>
<tr>
<td>Standard Development Co.</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1907-1919</td>
</tr>
<tr>
<td>Weber Mine</td>
<td>Fred A. Weber, Manager</td>
<td>—</td>
<td>—</td>
<td>(1921)</td>
</tr>
<tr>
<td>Lakeview Mining &amp; Milling Co.</td>
<td>S.P. Donnelly</td>
<td>September 30, 1896</td>
<td>1920</td>
<td>(1922)</td>
</tr>
<tr>
<td>Pend Oreille Silver Lease, Inc.</td>
<td>Harold Drummond, President-Manager</td>
<td>April 21, 1934</td>
<td>1935</td>
<td>1934</td>
</tr>
<tr>
<td>Lakeview Lease (lessee — upper workings)</td>
<td>Robert B. Austin, owner</td>
<td>—</td>
<td>—</td>
<td>1949-1950</td>
</tr>
<tr>
<td>New Rainbow Mining Co. (lessee — lower workings)</td>
<td>Robert B. Austin, Vice President and Manager</td>
<td>October 1, 1947</td>
<td>no property in Idaho — 1970</td>
<td>1951-1970(?)</td>
</tr>
<tr>
<td>Austin-Weber Corp. (lessee — upper workings)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1954-1956</td>
</tr>
<tr>
<td>Austin-Meyer Corp. (lessee — upper workings)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1957-1965</td>
</tr>
<tr>
<td>Shoshone Silver Mining Co.</td>
<td>H.E. Daugherty, Secretary</td>
<td>January 22, 1970</td>
<td>—</td>
<td>1977-</td>
</tr>
</tbody>
</table>

1Information not available in Idaho Geological Survey's files.
the Molton Mill, Butte, Montana, until 1895 when a 30-ton capacity stamp mill was built in Lakeview. The mill proved to be a failure because the silver and gold were floated off with the antimony and lead, yielding only 33 percent of the total precious metal content (private report, 1925). In 1896, a forest fire destroyed all the building and timbering, and thereafter ore from the Weber Mine was shipped to Tacoma, Washington, for processing.

Production for 1890 totaled 280 tons which averaged 40 ounces of silver per ton and 8 to 10 percent lead and zinc (Kauffmann, 1975c).

Roberts (1889, p. 1-4) described the property as follows:

This group of mines consists of ten locations aggregating fifty thousand feet of lode and covering 200 acres in the Pend Oreille mining district Kootenai County, State of Idaho, U. S. A. (Note — Kootenai County is now changed to Bonner County)\(^{1}\)

They are easily accessible from Hope, a station on the Northern Pacific Railway, and distant from the place about thirty miles the route being across Lake Pend Oreille 25 miles, then by wagon road about five miles. A small steamboat travels the lake each day towing barges with freight as offered.

The mountains rise perpendicularly from the lake for a distance of a mile reaching a plateau thence rise gradually until an elevation of 3750 feet above sea level is reached at the mines. The formation of these mountains and forming the walls of the vein is a blue stratified slate cutting north at right angles to the strike of the lode which is ten degrees north of east.

The mountains are covered with a heavy growth of timber and similar vegetation in many places entirely covering the outcrop.

The accompanying map (not attached to this copy of the report) shows the position of the mines comprising the group with the names of each.

**DEVELOPMENT**

A large sum of money has been expended in opening and prospecting on this property but the principal development work has been done on the East Chloride Mine, and consists of three tunnels, two of which have been run directly on the vein.

The upper one commencing near the summit of the mountain, where a large open cut, directly in the ore body, terminates in a tunnel about 40 feet in length. The open cut exposing a large body of good-grade chloride ore is in the same grade of ore. From this point to the foot of the mountain the outcrop is enormous. No positive conclusion can be reached as to its width.

**One hundred twenty-five feet** perpendicularly down the mountain side a second or middle tunnel has been driven in 152 feet: 110 feet of which is ore. The accompanying map [omitted] shows the position of this tunnel, and its crosscuts, with reference to the strike of the lode.

**Forty-eight feet** (48) from the entrance or mouth of this tunnel a crosscut has been driven into the ore body a distance of thirty feet. This ore body was sampled continuously on both sides and through the roof, its entire length.

**One-hundred two feet** from the entrance, crosscuts have been made south 100 ft., 30 ft. of which is ore and north 104 ft., 60 ft. of which is ore, making the width on the lode ore body at this point, 90 ft., and was sampled the same as the first crosscut for a distance of over 100 ft., and beyond the limits of the vein. These crosscuts have been driven entirely through

\(^{1}\)This note was placed into the manuscript when it was retyped from the original. It would have been more accurate to say that the area that made up Kootenai County in 1889 now forms three counties — Kootenai, Bonner, and Boundary.
the vein, exposing the walls and showing a fine clay gouge several feet in thickness, and allowing a determination of the depth of the vein to be taken where from surface disturbances had ceased, and showing it to be 40' to the south.

In this tunnel, and within a few feet from where the long crosscut has penetrated the ore body a winze has been sunk also in ore, to a depth of 25', the ore showing the same grade as in the crosscut.

From the crosscut named above the tunnel has been further extended 50', cutting entirely through the ore body and some distance into the solid formation.

Tunnel #3, or lower tunnel: This tunnel is in 145° perpendicularly below the middle tunnel, and has been run 300', almost parallel with, and under the ore body.

The crosscut 70' long is expected to cut the vein near the face of this tunnel an upraise of 50' is just approaching the footwall vein. This upraise is to connect with a winze, already referred to in Tunnel #2, and the space now remaining to be completed is about 70'.

This upraise shaft is being run for more thoroughly ventilating the mine.

The drift to crosscut the vein, and the remaining portion of the upraise, would be completed at an early day and therefore could be no question as to the result of this work. The immense size of the vein, as shown in Tunnel #2 the heavy gouge on both walls and the kindly nature of the formation leave no doubt in my mind, that this great lode will reach unknown depths.

All of the mines of this group have been sufficiently prospected; some by shafts, others by tunnel and open cuts, to show the continuity of the great lode, or parallel ones, and to justify further development by an outlay of the necessary capital which has been lacking by the present owners.

CHARACTER OF ORES

In the East Chloride vein, the surface ores and those exposed in the open cut, and the upper tunnel: are a free-milling chloride ore; changing in tunnel #2 a sulphide and brittle silver ore and some chloride.

TREATMENT

The treatment of these ores has received careful consideration of the owners. Over 250 samples have been submitted to the various works through the country, for the purpose of arriving at the best method of treatment and concentrating, roasting and amalgamation. Samples of these ores were taken from all the openings, as noted herein, which I submitted to Professor Louis Falkneu of San Francisco, Calif. State Assayer. These samples were carefully tested by him, and his returns show an average of $27.30 per ton.

COST OF MINING & MILLING

All these mines have so far been opened and worked through tunnels and can be so worked to great depth, the cost of mining is very light. The owners of the property who, from their extensive experience in the district are perhaps the most competent judges, state that the entire cost of extracting the ore and putting it into bullion will not exceed $10.00 per ton: and judging from the unsurpassed facilities and observable, I should consider that sum as rather underestimated than otherwise.

ORE RESERVES

In estimating the ore reserves in this mine I shall take the ground above the middle tunnel to the summit of the hill, above the open cut, a block of ground measuring: 110 x 125 x 13 = 95,192 tons, and shall consider it my privilege to estimate 50' below the floor of the middle tunnel giving a block of ground:

11' x 50 x 90 x 13 = 38,076 tons
Total ore reserves 133,268 Tons

VALUE OF ORE RESERVES

The value of this ore, as shown by the assays, made by Professor Falkneu is $27.30 per ton, making a total valuation of $3,638,236.40.

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COST OF PRODUCTION

Deducting the cost of mining and milling: 133,268 tons of ore at $10.00 = $1,332,280.00

Net value of reserves $2,305,556.40

CONCLUSION

I am [can] only arrive at one conclusion regarding this property, after considering the great advantages offered for the cheap mining of the ores. No expensive hoisting and pumping plant is required. Tunnels could be run . . . within the . . . now operated. The owners have secured mill sites and water rights, to which, if tramways are constructed, concentrating mills of large capacity can be operated with free water as a motive power.

Forests of timber will afford fuel for may [many] years if required with an abundant surplus for lumber and mining purposes.

The climate is not severe and operations can be carried on at all seasons and when the enormous size of the lode is considered, as shown by crossties in Tunnel #2, and the almost absolute certainty that it will develop an equal size to the lower tunnel, carrying as it does the grade of ore worth $27.30 per ton, I cannot conceive of a more profitable investment than in this property.

According to the January 17, 1929, issue of Mining Truth (p. 9):

The Weber mines were bonded in 1894 to an eastern company that included as "angel" the late General Russell A. Alger, secretary of war in the first cabinet of President McKinley. A milling plant costing around $50,000 was built on South Gold Creek about half a mile up from Lakeview and the camp experienced another soul-boom. The mill was unsuccessful, however, and operations ceased a little later when General Alger got into financial difficulties.

The 1901 IMIR (p. 47) noted, "At Lake View, S. P. Donley, general manager of the Weber mine, has been shipping quite heavily this year to the Tacoma smelter. They have a mountain of ore, and with proper facilities to treat the ores they would be able to work a large force of men." A similar mention of the mine was made the following year.

The 1903 IMIR (p. 93) described the mines in the Lakeview area:

For the natural beauty of its setting and surroundings, one could look the world over in vain to find a more charming situation for a mining camp than that presented by the Lake View Mining District, on the southern shores of Idaho's most beautiful sheet of water, Lake Pend d'Oreille [sic].

The principal mining development at this charming spot is on the property of the Pend d'Oreille Mining & Reduction Company, and the Keep Cool mine, adjoining it.

Both of these properties are opened on the same great contact fissure vein, yet they carry distinctly different classes of ore. The Pend d'Oreille Co.'s mine carries three thousand feet of tunnel development, which has gained a face depth of two hundred and fifty feet at one point and exposes enormous shoots of silicious [sic] silver ore ten to sixty feet wide between perfect walls of slate and quartzite and carrying an average value of twenty ounces silver and one and a half dollars gold per ton, while the Keep Cool mine, with even more extensive development, carries similar enormous shoots of fine concentrating lead-silver ores.

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20 These ellipses are included in the copy of the report from which this was copied. Presumably the original report was illegible at this point.

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Here is an opportunity for some wandering capitalist looking for a desirable place to live. The combination of these two great mines would form the basis of a smelting enterprise of big caliber, for this district affords every element necessary for a successful smelter charge, including, besides extraordinary reserve of ore, abundance of pure limestone, iron and silica, together with an unlimited source of charcoal fuel. This in practical hands with sufficient means to put the venture on its feet, success would be assured and is worthy the serious attention of investors in this line.

In 1904, the Idaho Mine Inspector (p. 90) noted, "The Weber mine is a similar great zone of siliceous ore to the Venzuela that carries $9 average values in gold and silver and is more extensively developed. This property has been subject to a close investigation and sampling by a well-known and capable expert who found the ore susceptible to treatment with the cyanide process and promising high results of extraction."

The 1905 IMIR (p. 74) added the following details: "Among these [extensive deposits of good ore] is the Weber Mine, with a vein of gold and silver-bearing quartz 40 feet wide that has been developed extensively with adit tunnels and is said to carry average values of $10.00 per ton in gold and silver, and a brecciated white quartz of this vein contains some beautiful native silver specimen ore that occurs in scales and flecks in the joints of the rock." MacDonald (1906, p. 46) described the property as follows:

The Webber group of claims lies about 6 miles south of Lakeview, from which place it is reached by a wagon road. The vein is a fault fissure in which the walls have been somewhat replaced by vein material. The fissure runs about east and west, and gives evidence of a considerable displacement. It is associated with a diabasic dike and cuts a country rock of Wallace shale.

On the surface, in the weathered zone, the ore carried free silver to a reported value of about 400 ounces per ton. This led to the acquisition by a company and the installation of a complete free-milling plant. Soon, however, the lead and silver appeared in the sulphide form, and the values could not be saved by such a process. Some shipments were then made to a smelter, but the ores were not of high enough grade to return a profit, and accordingly operations at the mine and mill were suspended.21

Kun (1974) states that Frank Weber sold a three-quarter interest in the mine to the Standard Development Co. of Chicago in 1906 and that the resulting litigation continued until 1920. The actual situation appears to have been more complex, involving the transfer of 982,000 shares of Pend d'Oreille Mining & Reduction Co., Ltd., stock to Standard Development Company and its stockholders, without compensation to the owners of the Pend d'Oreille Mining Reduction Co. stock (Dunn, 1919).

Parker (1907, p. 1-7) examined the mine for Standard Development Co.:

This mine is located about 5-½ miles east of south of the village of Lakeview, Bonner County, Idaho, and consists of four patented claims, known as East Chloride, West

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21A table on p. 47 of MacDonald (1906) lists shipments from the mine of: 2,000 tons of concentrates and 11,000 tons of crude ore, with 6,000 tons of ore still on the dump. The value of the ore was given as $2 in lead, $1.50 in gold, and 24 to 50 ounces of silver per ton.
Chloride, Eagle Town and Iron Dollar, containing approximately 75 acres; the wagon road connecting the village with the mine is in good order; the latter is about 1300 feet higher than the former. Lakeview is situated on Lake Pend Oreille at an elevation of 2300 feet, as determined by the U.S. Geological Survey. Lakeview is reached by a boat about 25 miles south of Hope, a station on the Northern Pacific Railroad; a mail boat making tri-weekly trips around the lake, stopping at this point. Sandpoint is a station upon the Northern Pacific Railroad about 11 miles west of Hope and also situated upon the lake near its outlet. Two other railroads pass through Sandpoint. A smelter has been erected here, but has never had a successful career.

Spokane is the natural source of mining supplies, and mining labor may be drawn from the Coeur d'Alene district, which lies about 25 miles to the southwest of the Weber Mine. The large smelting interests located at Butte and in the Salt Lake Valley would doubtless make better terms for the treatment of ores than could the local plant at Sandpoint. Lack of mine development in vicinity and want of continuous supply of various types of ores has hitherto prevented the smelter from operating to a success. As I understand it, the smelter has never been in the hands of persons financially able and equipped with metallurgical knowledge to successfully carry the project forward.

**GEOLOGY**

A few miles south of Lakeview on the Lake shore is seen an abrupt uplift of granite, which has elevated the overlying sedimentary rocks so that the exposures made clearly show the sequence from the basal granite upwards. The rocks lie in the following ascending order: Granite, quartzite, shale, limestone, and overlying quartzite; the ore bodies so far developed are confined to the shales overlying the quartzite which in [as] in contact with the granite; this is plainly seen by the section developed on the road leading to the Keeppool mine. The Weber Mine outcrop is a metamorphosed shale carrying a very large percentage of silica. The shale dips to the south and east and is cut by a fissure having a course practically east and west, dipping to the south at an angle of 35 degrees from the horizon. The outcrop of the Weber Mine is bold, and owing to intense plutonic action, is badly broken near the surface. The shales dip in various directions and are faulted for a short distance. Also in the mine as seen in tunnel #3, small dikes and frequent breaks occur, while the strike and dip become more regular.

In the vicinity of the Weber Mine there are several other fissures which have been exploited by other owners, and from which more or less high grade material, take from or at the surface, has been shipped. The Conjecture is a parallel vein located about a quarter of a mile to the north, while the Rainey and Keeppool properties are the western extensions of the Weber. These veins are quite parallel and occur in the same type of calcareous shale as that in which the Weber mine is found.

**MINERALOGY**

The minerals found on the surface are essentially oxidized ores of lead, iron, and silver. Lower down these oxides carry a slightly increased proportion of sulphur, as shown upon the second level, while still lower the oxide character almost entirely disappears and the ores are of a true sulphide nature. Zinc and antimony sulphide occurs also in the unaltered zone. The mine is essentially a silver mine carrying very small gold values (rarely exceeding $1.00 per ton), increasing in lead percentage as depth is attained.

**EQUIPMENT**

At the mine there is a small blacksmith shop, with storehouse, ore pocket capable of holding about 100 tons, and boarding house. At Lakeview there is a 10-stamp mill built by the Union Iron Works of San Francisco, having a small Gates crusher, 10 850-lb. stamps, copper plates, four (4) Frue Vanners, three Johnson Concentrators, four pans and two settlers, together with an assay office partly equipped; one 80-H.P. boiler and a water power having
24" pipe capable of developing 150 H.P. as claimed by the present management. While at this moment I am not prepared to state what the correct systems of treatment for the ore are, I am quite well assured that there has never been a time when the erection of the 10-stamp mill plant could be sanctioned by me. It is wholly unfitted for the treatment of ores of the type found or to be found in this property.

PROPOSED RAILWAY

Until the mine is better developed in depth and a larger tonnage of ore developed, I can see no reason of considering this project, as there is nothing at present in the property to warrant it.

MINE DEVELOPMENT

OPEN PIT. This was the discovery point of the mine by reason of the fact that a very large quartz blowout or outcrop was distinctly visible. Seams of yellow lead oxide carrying high value in silver, that is, value ranging from 50 to 300 ounces per ton, were found and led to the early and prompt development of this property. The values so found undoubtedly warranted all the work that was required to prove the continuity of the ore body downward, and the high grade seams, which have been so closely followed by the various owners and lessees, account for the apparently unsystematic showing made immediately below this pit. Undoubtedly there will be other small seams of ore of similar grade found by further work, but there is practically no high grade ore in quantity in sight. It is idle to attempt to locate either a foot or hanging wall in reference to this quartz outcrop, as the whole mass of the mountain in this vicinity has been so disturbed as to obliterate the so-called foot and hanging walls, but in depth they are more clearly defined.

Samples #50 to #55 taken from various points around the edge of the open cut, which is today filled with debris which has fallen in, shows the average grade of the material left. #51 was taken from a trench cut, under my direction, leading south-westward from the mouth of the small shaft which leads down to the #1 level. This shows 34.9 oz. of silver, for a distance of 15 feet. Sample #55 was taken about 10 ft. below the level of the open pit at intervals of 5 ft. apart entirely around the waste dump. Small pits were dug in hillside and showed that the material thrown over the dump and presumably from the last faces of the open cut, while high grade was being extracted, ran 18 ozs. silver to the ton.

Average value assays #51 to #55, inclusive, showed 20-1/2 oz. of silver, 40¢ in gold, and .8 of 1% lead.

#1 TUNNEL. No. 1 tunnel leads from the point indicated on the sketch plan of #2 level23, where samples #111 and #112 were taken, outward as indicated as leading to the surface. This could not be inspected further than where sample #112 was taken. The drift to the northeast from this connects with ore chute and incline leading down to the #2 tunnel level.

#2 TUNNEL. The main tunnel is about 230 feet in length, but the disposition of the ore body in reference to it is clearly shown by the assays as taken. The sample numbers are enclosed in a circle, while opposite to them is given the figure representing the ounce of silver per ton that such sample yields. There has been more or less stopping done in this level and connections made both with the surface through #1 level and downward through the winze located on the right hand side of #2 about 35 feet from its mouth. This winze leads to #2-1/2 level, and thence by vertical connections to #3 tunnel level. In looking at this plant, it must be borne in mind that the ground slopes and the ore body dips toward the bottom of the map from the little drift connecting the point marked "Ore Chute" through samples #105 to #111.

The ground is level from Sample #57 around to sample #93, the incline beginning about where #94 has been taken. An inspection of these assays shows wide variety of values

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23This sketch map is not with the copy of Parker's report in IG's files. See Figure 17 instead. The exact locations where the samples were taken are not known.
and they are relatively low and extremely irregular, but some seams of ore are a good grade, while the whole ore body shows ore of the following averages:

**AVERAGE OF ASSAYS ABOVE #2 TUNNEL**

<table>
<thead>
<tr>
<th>Numbers</th>
<th>Location</th>
<th>Gold</th>
<th>Silver</th>
</tr>
</thead>
<tbody>
<tr>
<td>57 to 69, inc.</td>
<td>Opposite stope in S. side</td>
<td>$1.00</td>
<td>$6.78</td>
</tr>
<tr>
<td>70 to 77, inc.</td>
<td>Bet. switch and S. drift</td>
<td>1.00</td>
<td>4.38</td>
</tr>
<tr>
<td>78 to 95, inc.</td>
<td>R.H. Branch to upraise</td>
<td>1.00</td>
<td>12.60</td>
</tr>
<tr>
<td>96 to 106, inc.</td>
<td>Upraise</td>
<td>1.00</td>
<td>5.16</td>
</tr>
<tr>
<td>107 to 112, inc.</td>
<td>S. drift from upraise [sic]</td>
<td>1.00</td>
<td>21.24</td>
</tr>
</tbody>
</table>

Taking all the values as between samples #51 and #112, inc., I find the following:

Silver 17.3 per ton, gold .045, and lead .55%.

**#2½ TUNNEL.** Passing down the winze shown upon the plan of #2 Level by a vertical drop of 13 feet, then passing to the eastward and then down the incline on the floor of the ore body, a series of samples were taken from #115 to #123, inclusive; a small stope had been made from which samples #114, #115, and #116 and #117 were taken. The ore bodies here could only be sampled for about 10 feet in height, but it is my belief that the ore continues upward in the roof. Passing down to the 2½ ft. level, which is approximately 60 feet below #2, we find a main drift running westward, which very quickly passes out of the ore body; a small drift to the east is in low grade ore, and several upraises on the so-called foot wall make connection with the bottom of the winze; and running off the northeast is what is known as the *Antimony* raise. In looking at the plan of this level one would imagine that the westward drift at sample #128 had gone too much into the hanging wall, leaving the ore behind in the foot, but such is not the case, as I believe that the ore limit is reached in the vicinity of #129, and that it occupies a position between the outcrop at the surface and the dotted line shown upon the vertical section of the East Chloride claim; in other words, that the ore is largely confined to the surface and does not as yet extend in dense form downward, but rather remains close to the surface. Assays taken north of the winze and on the floor of the upraise, indicate an ore body of more than average value, though limited in extent. For instance, samples #138, #139, #142, and #144 show that there is still a body of ore of excellent grade to be mined. The *Antimony* raise to the northeast was sampled in three places, but only one assay of value found. The ore in this raise is quite base and contains considerable zinc and less antimony than appearances indicated. The lead percentage is quite low:

**AVERAGE OF ASSAYS ABOVE 2½ TUNNEL**

<table>
<thead>
<tr>
<th>Numbers</th>
<th>Location</th>
<th>Gold</th>
<th>Silver</th>
</tr>
</thead>
<tbody>
<tr>
<td>114 to 119, inc.</td>
<td>Winze 13 ft. down</td>
<td>80¢</td>
<td>$13.98</td>
</tr>
<tr>
<td>120 to 123, inc.</td>
<td>Winze to top of ladder</td>
<td>40¢</td>
<td>3.60</td>
</tr>
<tr>
<td>124 to 128, inc.</td>
<td>In country rock</td>
<td>Values</td>
<td>Omitted</td>
</tr>
<tr>
<td>129 to 134, inc.</td>
<td>West end ore to east face</td>
<td>60¢</td>
<td>15.84</td>
</tr>
<tr>
<td>135 to 137, inc.</td>
<td><em>Antimony</em> raise</td>
<td>60¢</td>
<td>15.62</td>
</tr>
<tr>
<td>138 to 144, inc.</td>
<td>Upraise near #2 raise</td>
<td>80¢</td>
<td>25.56</td>
</tr>
</tbody>
</table>

The total average assay value of the ore lying between 2 and 2½ levels may be assumed to be 30 oz. silver, .035 gold, 2.1% lead, 1.38% antimony.

**#3 TUNNEL.** No. 3 tunnel level shows very clearly that the shales in which the fissure occurs have been, generally speaking, but little disturbed. In local places small dikes cut across and at their intersections the shales have more or less twisted and folded, but not materially interfering with the general course of the vein as developed. The uprise to 2½ level for 54 feet vertically is in the so-called foot-wall, that is, at the upper point it just enters into the ore. The downward continuation of the 2½ level ore, has not yet been developed on #3 level, and judging by the conditions as indicated by the sampling, it is my belief that that ore body should be developed in the ground lying between the east cross-cut and the mouth of
the #3 tunnel. Passing beyond the upraise in a more or less meandering direction to the southeast at a point indicated by a square and cross samples #14, #15, #16, and #17 a small drift body of ore was encountered. The foot wall is developed in the westward drift and is largely in oxidized material as yet, showing that the surface waters have infiltrated and it is possible that some of the silver values have been leached and carried downward. The diagonal cross-cut noted on map as the west cross-cut was carefully sampled, but showed nothing of commercial value and only at samples #14, #15, #16 and #17 was any encouragement found; even these samples failed to be of commercial grade.

Going back to the drift leading southwest from the point "G", we find a small drift to the east, which work I consider wholly wasted; passing to the west, at the point indicated by sample #35, a small body of sulphide ore was encountered; in fact, this is the only point at which anything approaching commercial value was reached. This upraise is about 6 feet above the roof of the drift and showed about 4 feet of siliceous material. The lower 18 inches assayed 16 oz. silver, while the 4 feet averaged 11. From this upraise about 20 tons of ore has been taken and is stored close to the mouth of the tunnel. This was carefully sampled #113 and showed 158 ounces of silver, 16 ounces gold (gold), 10.9% lead, and 3.56% antimony. This would indicate that the top of a lens of excellent grade had been cut and that in the prosecution of work downward this ore body may fairly be expected to lengthen; whether it will widen or not is more problematic. Westward from this upraise and approaching the winze, the ore seems to improve somewhat, but is still far from a commercial grade. For the sake of development and air, this connection will be made. South of this drift the east cross-cut was sampled, which sampling resulted in the development of but one assay showing value. Owing to the timbering, the ground could not be sampled between it and the drift, but the location of this sample might be taken as the vicinity of a possible ore body, and a little development might show the downward continuation of the ore chute shown upon the 2% level.

**AVERAGE OF ASSAYS ABOVE THE #3 TUNNEL**

<table>
<thead>
<tr>
<th>Numbers</th>
<th>Location</th>
<th>Gold</th>
<th>Silver</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 12, inc.</td>
<td>West cross-cut</td>
<td>20¢</td>
<td>$ .90</td>
</tr>
<tr>
<td>13 to 17, inc.</td>
<td>Winze</td>
<td>20¢</td>
<td>3.72</td>
</tr>
<tr>
<td>18 to 27, inc.</td>
<td>Main foot wall drift</td>
<td>40¢</td>
<td>1.14</td>
</tr>
<tr>
<td>28 to 38, inc.</td>
<td>East cross-cut</td>
<td>20¢</td>
<td>1.98</td>
</tr>
<tr>
<td>39 to 49, inc.</td>
<td></td>
<td>00</td>
<td>3.36</td>
</tr>
</tbody>
</table>

As the above is of no commercial grade, no summation is necessary.

**TONNAGE**

**OPEN PIT TO #2 TUNNEL.** Between the surface of the open pit and #2 tunnel I have assumed that the ore body is more or less elliptical, having limits of 75 feet in width by 90 feet in breadth by 150 feet in inclined length. Assuming 12 cu. ft. to the ton and making allowances for the 3500 tons claimed to be shipped, and the amount extracted from the drifts, upraises, etc., I would assume that there is approximately 78,000 tons of siliceous ore, from which I would again deduct 8000 tons on account of intrusive dikes and other unforeseen mining contingencies, which would prevent the actual mining of this theoretical volume, thus giving an assumed estimate of 70,000 tons of ore available, which would have the following general composition, namely, 17.3 oz. of silver, 0.045 oz. gold, and .55 of 1% of lead.

If we assume a value of 60¢ per oz. for the silver and $2.00 per oz. for the gold, the silver would have a value of $10.38 and the gold 90¢ per ton, total $11.28. The only method of treatment for ore of this type, in my judgment, is that of cyaniding. It cannot be shipped to a smelter, nor can it be successfully concentrated in any form of concentrator with which I am familiar. If the ore will not cyanide to a 75% extraction, I know of no method today which can be successfully applied. It is impossible to say by mere inspection and limited assays whether
or not an ore can be successfully cyanided. I incline to the belief that it can. If so, I would assume that at least a 75% extraction should be made upon the silver, which would yield a value per ton of $7.78, and 90% of the gold, or $8.81, giving a total extraction of $8.59. If from this we deduct the mining and milling costs, together with a fund for amortization of the plant it is necessary to install, there will probably be a profit of $4.00 per ton, or a total of $280,000.

**#2 TUNNEL TO 2¼ LEVEL.** I have assumed this ore body to average 67 feet in width by 68 feet in breadth with an inclined length of 90 feet; upon the same cubic foot basis, and making allowance for mining losses and intrusive dikes, it may fairly be assumed that this volume would yield 30,000 tons of ore having the following average composition, namely, 30.3 oz. silver, 035 gold, 2.1% lead, and 1.38% antimony.

It is more questionable in my mind whether this type of ore can be cyanided than the ore that lies above it, as the ore is decidedly basic. I do not believe this type of ore can be successfully concentrated, as I believe the silver losses will be excessive. Again, as there is a little over half as much antimony as there is lead, and as it will be saved in the same proportion as the lead is, a very deleterious amount of antimony is to be expected in the concentrate, which would be very seriously penalized by any smelter. It is not high enough grade to pay costs and ship to any smelter. It might possibly be cyanided; if so, and assuming a 75% extraction of the silver, this would yield a value of $13.62 and if 80% of the gold could be extracted, would yield $5.36 per ton, or a total of $14.18 per ton. Mining and other costs upon this body of ore would be much higher that upon the surface ores, and if it is assumed that a margin of $7.00 per ton can be made, it would show a potential value for this body of ore, of $210,000. Combining these two values and giving a small allowance for the ore that may lie below the 2¼ level, it may be assumed that there is $500,000 of value in the property, all provided that a method of successful treatment can be determined upon.

**CONCLUSIONS**

**FIRST.** The surface showing at this mine was undoubtedly very attractive and was sufficient to warrant intelligent exploration and handling. The mine has not been, in my opinion, well managed, though this may be largely due to the fact that it has at various times been placed in the hands of lessees who endeavored to follow and extract the seams of high-grade ore. It cannot be said that all of the high grade ores are confined to the surface, because of the finding of this small body of heavy sulphide in #3 tunnel level, which, if found in quantity, would make the property a valuable one. I would recommend that a systematic scheme of treatment be entered upon, having in view the possibilities of cyaniding this ore, which will determine the percentage which will be available for extraction.

**SECOND.** An effort should be made to develop the ore below the main foot wall drift #3 level, beneath the so-called upraise, by means of a winze. This should be carried down as far as practical until water, foul air, or loss of ore preclude further work.

**THIRD.** I think a drift should be run east of the location of sample #49 about 60 feet, and cross-cut north and south made to determine the possibility of the eastward continuance of the ore shown by that sample. If these two developments namely, the sinking of a winze below sample #35 and the drift east of sample #48, prove ore of value and quantity, I would then advise that the long tunnel proposed by the present management, which would probably be 1200 feet in length, be started to develop this vein at lower depth.

The 1909 IMIR noted the Weber was idle because the property was tied up in litigation. According to the 1910 IMIR (p. 9), "During the summer, the Weber group owned by the Standard Development Company has done a little more than assessment work on its property, which has been in litigation for a number of years."

In 1911, the Idaho Inspector of Mines stated (1911 IMIR, p. 26):
At Lakeview the Keep Cool and Weber Mines carry quite extensive development. The latter has a very large body of silicious silver ore containing 12 to 14 ounces silver and about $1.50 gold per ton, which ought to be handled by cyaniding at a good margin of profit, but for various reasons has remained practically dormant for a number of years.

The 1912 IMIR (p. 60-61) continued the story:

At Lakeview, the further development of the Webber Mines was successfully financed during the year, and a long cross-cut tunnel is in progress at this property which will tap it at a depth of 1,000 feet below the cropping.

This is one of the most attractive surface showings in the Pend d'Oreille District, by reason of its large size and strong surface outcrops of quartzite.

Its values run in gold and silver, particularly silver, and it is believed that its ores can be successfully treated by cyanide method to a relatively high extraction, and when the present deep tunnel is completed the enterprise is likely to warrant the erection of a mill of large capacity of this or some other method that the deeper ore horizon may require.

In 1913, the Idaho Inspector of Mines (p. 111) noted:

At Lakeview, in this same county, the Webber Mine, now controlled by Chicago capitalists, has been undergoing systematic development at considerable depth throughout the year through a long crosscut tunnel and drifts.

This property carries an interesting resource of oxidized quartz in some shallow upper tunnels that is estimated by competent experts to aggregate 100,000 tons and to contain an average value of about 20 ounces in silver and $1.50 gold per ton and is believed to be susceptible of successful treatment by modern cyanide methods.

The newer and deeper developments have penetrated this ore course several hundred feet below the oxidized upper showings, and at the time of my visit were commencing to find an encouraging amount of true galena ore carrying high values in silver and promising a resource of profitable shipping and concentrating material.

Table 13 shows a partial list of the development work conducted at the mine. There were four tunnels on the property. In 1916, a shipment of silver ore was made from the Weber.

On June 9, 1919, the Idaho District Court handed down its decision on the lawsuit concerning the Weber Mine. The decision was as follows (Dunn, 1919, p. 1-5):

IT IS ORDERED, ADJUDGED AND DECREED, That the 870,425 shares of the capital stock of Pend d'Oreille Mining & Reduction Co., Ltd., distributed among the stockholders of the Standard Development Company in proportion to the stock held by each of said stockholders in said Standard Development Company was issued, delivered and distributed without any consideration whatsoever and the distribution thereof was wholly without authority, willful, unlawful and void.

IT IS FURTHER ORDERED, ADJUDGED AND DECREED, That the assessment of 26 per share upon the capital stock of said Pend d'Oreille Mining & Reduction Co., Ltd., attempted to be levied by the Board of Directors of the Pend d'Oreille Mining & Reduction Co., Ltd., on or about the 2nd day of January, 1912, was and is wholly void and of no force or effect.

IT IS FURTHER ORDERED, ADJUDGED AND DECREED That that certain deed and agreement made on or about the 10th day of September 1907 in pursuance of and in
Table 13. Development work, number of men employed, and operating companies at the Weber Mine, by year.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Men Employed</th>
<th>Tunnels (feet)</th>
<th>Sinking (feet)</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913</td>
<td>10</td>
<td>1400</td>
<td></td>
<td>Pend d'Oreille Mining &amp; Reduction Co., Ltd.</td>
</tr>
<tr>
<td>1934</td>
<td>10</td>
<td></td>
<td></td>
<td>Pend Oreille Silver Lease, Inc.</td>
</tr>
<tr>
<td>1954</td>
<td>3</td>
<td></td>
<td></td>
<td>New Rainbow Mining Co.</td>
</tr>
<tr>
<td>1955</td>
<td>4</td>
<td></td>
<td></td>
<td>New Rainbow Mining Co.</td>
</tr>
<tr>
<td>1956</td>
<td>3</td>
<td>555</td>
<td>0</td>
<td>New Rainbow Mining Co.</td>
</tr>
</tbody>
</table>

1This number is the total development work performed during the year. The company gave cost estimates for crosscutting and drifting but did not break down the total into categories.
2The company apparently did no development work during the year.
3The company did not report any development work for the year.

performance of the agreement attached to plaintiff's complaint and designated Exhibit "A" executed by Pend d'Oreille Mining & Reduction Co., Ltd., in favor of Standard Development Company conveying all of the property set forth, named and described in said Exhibit "A" and recorded in the office of the County Recorder of Bonner County, Idaho, in Book One (1) of Mining Deeds at Page 15, was and is wholly void and of no force or effect.

IT IS FURTHER ORDERED, ADJUDGED AND DECREED That at the time of the commencement of this action plaintiff [Fred A. Weber] was the owner and holder of record of 18,000 shares of capital stock of defendant Pend d'Oreille Mining & Reduction Co., Ltd., which had been, prior to the commencement of this action, advertised for sale, and unless enjoined and restrained by an order of this Court, duly and regularly made, would have been by said defendant sold on April 13th, 1912, with other stock of said corporation aggregating about 305,695 shares of capital stock of said corporation, to meet the assessment hereinabove referred to and determined to be void and included in said 305,695 shares of said capital stock, in addition to said 18,000 were 92,714 shares of the capital stock of said corporation pretended to be redistributed to the plaintiff by the Standard Development Company. That there are advertised as the names of owners of said stock to be sold at said sale approximately Two hundred forty-six (246) names, and the sale of said stock or any portion thereof will work a great and irreparable injury to the plaintiff, and that the plaintiff is without a plain or speedy or adequate or any remedy at law.

IT IS FURTHER ORDERED, ADJUDGED AND DECREED, That the defendant, Standard Development Company, has acquired stock of plaintiff in the Pend d'Oreille Mining & Reduction Co., Ltd., in fraud of the plaintiff, and has placed upon the Board of Directors of said Pend d'Oreille Mining & Reduction Co., Ltd., members of the Directors and stockholders of the defendant, Standard Development Company, with the object and intent to defraud the plaintiff, and are carrying on a pretended development of the property in the name of the defendant, Pend d'Oreille Mining & Reduction Co., Ltd., for the purpose of defrauding the plaintiff.
IT IS FURTHER ORDERED, ADJUDGED AND DECREEd that upon the filing of this decree the Clerk of this Court issue under the seal of said Court a permanent injunction perpetually restraining the Pend d'Oreille Mining & Reduction Co., Ltd., its directors, officers, agents and representatives from selling or disposing of any part of said 305,695 shares of the capital stock of said corporation in any matter or at all, or attempting to transfer on the record books of said corporation any part of said stock by virtue of any sale attempted to be made by reason of the failure to pay the assessment above referred to attempted to be levied on or about the 2nd day of January, 1912.

IT IS FURTHER ORDERED, ADJUDGED AND DECREEd, that the transfer and assignment by the plaintiff and defendant Simon P. Donnelly of 982,000 shares of the capital stock of the Pend d'Oreille Mining & Reduction Co., Ltd., to the Standard Development Company, was and is wholly void and of no force or effect and no rights in and to said capital stock were acquired by said Standard Development Company, and no rights were ever acquired in or to any part of said stock by any of the stockholders of the Standard Development Company by the attempted distribution of said capital stock of the Pend d'Oreille Mining & Reduction Co., Ltd., among stockholders of the Standard Development Company, and such attempted transfer was wholly without consideration as between the Standard Development Company and its stockholders; and it is further ordered, adjudged, and decreed that the Standard Development Company and its assigns and all persons claiming or to claim any part of said 982,000 shares of the capital stock of the Pend d'Oreille Mining & Reduction Co., Ltd., transferred to said Standard Development Company be forever enjoined and debarred from asserting any right, title or interest in or to any of said 982,000 shares of the capital stock of the Pend d'Oreille Mining & Reduction Co., Ltd., transferred by the plaintiff and defendant Simon P. Donnelly to said Standard Development Company.

IT IS FURTHER ORDERED, ADJUDGED AND DECREEd That the plaintiff and defendant Simon P. Donnelly is each the owner of 491,000 shares of the capital stock of Pend d'Oreille Mining & Reduction Co., Ltd., originally delivered to Standard Development Company under contract Exhibit "A" attached to plaintiff's complaint, and the delivery thereof and the attempted transfer thereof is void; and it is further ordered, adjudged and decreed that the original stock certificates representing said shares be surrendered and delivered to the plaintiff, and in case any of said original stock certificates have been lost, or cannot be produced, that in lieu thereof the Pend d'Oreille Mining & Reduction Co., Ltd., issue additional certificates of stock for such number of shares as may be necessary to reach a total of 982,000 shares of said capital stock, said 982,000 shares of capital stock to be equally divided between the plaintiff and defendant Simon P. Donnelly.

IT IS FURTHER ORDERED, ADJUDGED AND DECREEd, That the books, records, accounts and all other property of Pend d'Oreille Mining & Reduction Co., Ltd., be delivered to the plaintiff for the use and benefit of the plaintiff and defendant Simon P. Donnelly and the Pend d'Oreille Mining and Reduction Co., Ltd.

An undated note from F.A. Weber, which was attached to a copy of the judge's decree, states that Donnelly died after the decision was handed down, leaving the mine's legal ownership still in doubt. Weber (1920, p. 1-2) described the property at about this time:

The Weber group of mines, consisting of four patented claims, a plot of ground 3000 feet on the ore body by 1200 feet in width; two mill sites - one at the lake and one at the mine, with all the water power thereto.

The mine development consists of some two miles of workings, namely: tunnels, crosscuts and raises. There are four tunnels the lowest of these is about 3,000 feet, 1500 feet of this is a crosscut tunnel. When the ore body was reached, 1500 feet was run along the course
of the ore. The minimum depth is 350 feet on the dip of the ore body and the maximum depth 1,100 feet, the whole having an average of 700 feet overhead and ready for stoping. The mine is open so as to drop all the ores overhead to the lowest tunnel and into the chute, from there, 8-ton cars will carry the same to the lake six miles, all downgrade, where the ores are dumped into chutes at the lake and the ore is drawn off into 50-ton cars on barges. One 100-ton barge and one 300-ton barge, six cars, already installed for this purpose - thus, the ore from the mine for the reduction plants in practically one handling.

The ore in sight and thoroughly developed is a siliceous, classed as dry ores, carrying about 80% silica - has a value of 20 ounces of silver, one dollar in gold. 2½% lead, about 3,000 tons have been shipped from the openings in this portion of the property, running all the way from 30% ounces of silver to 190 and from one to six dollars in gold. Only one car of the latter.

There are some seven reports available which credits this ore in sight from 100,000 to 150,000 tons - average value 22 ounces. This block of ore is 200 feet in length, 70 feet wide, 150 feet deep. We estimate 14 cubic feet to the ton. I credit this portion of the mine with two million ounces of silver, upon an estimate of seven to eight dollars per ton for freight and treatment, about 40 cents per ounce will be the production cost under present conditions. The ore broken down and on the dump about 6,000 tons that carry 130,000 ounces of silver.

Below the oxidized zone the ore takes the form of shoots from two to five feet wide and carries silver values from twenty-five to forty-five ounces, ten per cent lead and about two dollars in gold.

Only one complete raise is made connecting with the upper tunnels - no correct estimate can be made of the sulphide ore in sight in this body, until some 2000 feet of raises are made but I think it will go well into seven figures. Two raises are necessary before any of the oxidized ores can be economically mined.

The 1921 IMIR (p. 36) noted: "The litigation in which this property has been involved for a number of years was terminated during 1921. On account of this litigation the mine had not been kept in repair, and production had ceased; but during 1921 the mine was restored and production resumed, and this famous old producer of Bonner county will soon be on its feet."

The Lakeview Mining & Milling Co. shipped several cars of rich silver ore from the mine in 1922. The Idaho Inspector of Mines (p. 52) reported, "After many years of litigation the Idaho Supreme Court has returned the Webber property to its original status. This property is now under investigation and in all probability 1923 will show this old producer again on the active list." The November 17, 1922, issue of Mining Truth (p. 3) ran the following story on the mine:

A small group of Talache mining men recently visited the famous "Chloride" or Weber property and inspected it with a view to organizing a stock company for the purchase and operation of the mine. The Chloride is the oldest property in that district, and one of the best. A large amount of ore was blocked out years ago and it is believed that much larger bodies remain to be uncovered, but litigation tied up the property until one of the principals died a short time ago.

The January 17, 1929, issue of Mining Truth (p. 9) noted:

Nearly two decades ago the Weber property was taken over by a Chicago company under the name of Pend d'Oreille Mining & Milling Company, but little capital was expended
and eventually the project reached the courts and litigation is still undecided. Weber at times had men cleaning out his mines, but no extensive operations could be undertaken in the condition of litigation.

The Weber mine contains some remarkably fine silver-bearing ores, and if properly developed could be placed on a sound producing basis, many believe.

In June, Starmont (1929) reported an unconfirmed rumor that "Portland people" were about to reopen the mine.

Pend Oreille Silver Lease, Inc., shipped one car of rich silver concentrates from the Weber Mine in 1934. The company added a 200-foot tramway to the property. Capacity of the flotation mill was rated at 15 tpd. (Table 14 shows total workings at the mine for selected years.)

The Lakeview Lease operated the Weber for the last half of 1949 and shipped 5,793 tons of silicous silver ore to the smelter at Tacoma, Washington. The Weber mine operated for most of 1950 and shipped 8,062 tons of silver ore to the Tacoma smelter. The mine was worked from July to October 1951, producing 7,893 tons of silver ore containing 72,854 ounces of recoverable silver. The May 31, 1951, issue of the Wallace Miner noted:

Terms of a "favorable operating agreement" under which New Rainbow Mining company can acquire the old Weber mine near Lakeview, Idaho, will be presented the New Rainbow stockholders at a special meeting to be held on June 7 at 8 p. m. at the office of the company, 601 Empire State Bldg., Spokane.

The management is recommending approval of the proposed agreement, which would require payments to the owners on a reasonable royalty basis, because "this property has a potential ore body that should be determined at a relatively small expense," according to a letter to stockholders accompanying the notice of the meeting.

The Weber property, now comprises 4 patented and 8 unpatented mining claims, was discovered in 1886. Encouraging results of development led to the installation of a stamp mill in the 1890's, the letter states.

Early recoveries from surface ore were poor because of its oxidized nature, it is stated. Between 1910 and 1917 a 1700-foot crosscut tunnel was driven and a considerable amount of drifting and crosscutting from it was done. Primary interest at that time was in the silver and gold values because the lead and zinc content was closely associated and, since selective flotation had not been developed to its present stage at that time, the latter metals did not constitute and appreciable recoverable values, the letter relates. Transportation was also a problem.

Last known shipment made by the owner was in 1921 and 1922. Five carloads of sulphide ore totaling 182 4 tons shipped to the Bunker Hill smelter at that time had an average assay value of $51 per ton at present metal prices.

The property is now held under lease by Robert B. Austin, director of New Rainbow and son of George H. Austin, company president.

Also accompanying the letter is notice of the company's fifth assessment, a half-cent levy payable by June 19.

The company has levied only one half-cent assessment each year since its organization in 1947. It is probable that two will be levied this year, the letter says.

If stockholders approve the proposal for acquisition of the Weber mine, proceeds of the assessment will be used to reopen and develop it. If not, the money will be used to
Table 14. Cumulative development at the Weber Mine, by year. Information is from company reports to Idaho Inspector of Mines; discrepancies in numbers reflect inconsistencies in the original data.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Development (ft)</th>
<th>No. of Tunnels</th>
<th>Total Length of Tunnels, Crosscuts, and Drifts (ft)</th>
<th>No. of Shafts</th>
<th>Total Length of Shafts (ft)</th>
<th>No. of Raisings</th>
<th>Total Length of Raisings (ft)</th>
<th>No. of Crosscuts</th>
<th>No. of Drifts</th>
<th>Length of Principal Tunnels (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>No. 1</td>
</tr>
<tr>
<td>1934</td>
<td>2,000</td>
<td>2</td>
<td>1,800</td>
<td>–</td>
<td>4</td>
<td>200</td>
<td>2</td>
<td>2</td>
<td>50</td>
<td>230</td>
</tr>
<tr>
<td>1954</td>
<td>4,200</td>
<td>4</td>
<td>3,850</td>
<td>–</td>
<td>1</td>
<td>350</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>1955</td>
<td>1,857</td>
<td>4</td>
<td>942</td>
<td>–</td>
<td>2</td>
<td>915</td>
<td>2</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>1956</td>
<td>2,412</td>
<td>4</td>
<td>1,497</td>
<td>–</td>
<td>3</td>
<td>1,497</td>
<td>3</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

1 Other workings included a glory hole.
2 Removed by the open-pit operation.
3 The mine had one intermediate level 50 feet long.
continue the development program on the Rainbow No. 4 property on Evans Creek, near Medimont, Idaho.

A Kellogg, Idaho, newspaper ran the following story on December 28, 1951:

New Rainbow Mining company may build a 100-ton mill at the Weber mine, six miles south of Lakeview, Idaho. President George Austin has informed stockholders.

He said surface ore in the Weber, under lease to Austin’s son, Robert B. Austin, had proved encouraging enough to justify an extensive probe of the underground area. New Rainbow has acquired all underground mineral rights below the No. 3 level.

Only a small portion of the Weber vein system is represented in his son’s reservation, Austin said.

New Rainbow has established a camp at the mine, installed a water line, installed equipment brought over from the No. 4 Rainbow property, and cleaned out the first cave in the crosscut tunnel, Austin said.

Will Work Two Shifts

A second cave was found about 1000 feet in, the New Rainbow president said.

"It is expected that two shifts of miners will be at work in April or the first part of May, cleaning up the tunnel," he said.

"When the tunnel and drift is opened, the vein will be sampled, and estimates made to determine the extent and values of the ore. It is my opinion that enough milling ore will be found to justify the erection [erection] of a 100-ton mill."

Austin’s son, who has been mining the surface workings for the last three years, now has the operation on a debt-free basis, and is shipping 100 tons a day to the Tacoma smelter, Austin said.

It had been necessary to build a 1½-mile mountain road, purchase a power shovel, compressor, bulldozer, truck and other equipment before the surface operation could begin. This is now all paid for, and “from now on out the surface operation should continue to show a reasonable profit,” he said.

Robert B. Austin acquired the original lease on the Weber mine three years ago, and has reserved the portion of the mine above the No. 3 level. Ore in the upper portion [sic] is mined by cutting 10-foot benches into the vein. Each round of holes blasted breaks out from 100 to 200 tons, George Austin said.

The New Rainbow Mining Co. operated the Weber mine from June through December 1952 and produced silver ore from the lower workings of the mine. The company again shipped ore from the mine in 1953. The September 10, 1953, edition of the Wallace Miner noted:

New Rainbow Mining company has completed drifting around a substantial caved area in the main adit tunnel at its Weber mine operation in the Lakeview district of Pend Oreille county but access to the long drift on the vein which produced rich silver-lead-zinc-gold ore in 1921 and 1922 is still blocked by a smaller cave-in at what appears to be the footwall of the vein, Robert B. Austin, vice president, informed stockholders in a letter this week.

Clearing of the new caved area is now in progress under the direction of Alex Pugh, well-known Coeur d’Alene district mining operator, and it is estimated that from 30 to 60 days work will be required by a crew of three men to complete the job, he says.

A photocopy of this article in the Weber file does not identify the newspaper that ran the story.
While the condition of the workings beyond the cave are not known, company officials are hopeful that no serious ground conditions will be encountered, he adds.

Since the company had only enough money to carry the rehabilitation program for about 30 days, the directors met on July 31 and levied an assessment of one-half cent a share on outstanding stock to provide additional funds for meeting the expenses of reopening the old mine workings, stockholders are advised.

"It is hoped that this assessment will accomplish the objective of reaching the orebody from which ore was shipped to the Bunker Hill smelter by Frank Weber," Austin states. Additional levies will probably be required to fully reopen the mine workings, develop and block out ore reserves, and build up a mine plan suitable for extracting and processing any ore so developed, he adds.

This letter announces the appointment of David E. Watson of Spokane to fill the vacancy on the board of directors created by the death of the late George Austin.

Other directors are Austin, Orland A. Scott, Coeur d'Alene, who serves as secretary; Fulton Cook, St. Maries; and E. H. Pelworth, Arthur E. Peterson and Robert L. LaValley, all of Spokane.

In 1954, Austin-Meyer Corp. shipped 7,745 tons of crude ore from the area above the No. 3 level at the Weber mine. The New Rainbow Mining Co. shipped 108 tons from the underground workings. A news article in March 1954 reported:

New Rainbow Mining Co. has encountered mineable ore in the process of cleaning out and rehabilitating old workings on the No. 4 level at the old Weber Mine in the Lakeview District of Bonner County. A cave-in of the tunnel roof exposed the ore along the hanging-wall of the vein. Old timers who drove the original drift evidently missed it by staying along the footwall of the structure.

One channel sample over a 3-ft width assayed 32.6 oz of silver per ton and another taken 8 ft farther along the vein across a 5-ft width, assayed 57.6 oz.

The drift has now been turned to get on the ore and is being continued east toward an orebody which, according to old maps, lies 75 ft ahead.

The May 27, 1954, issue of the Wallace Miner carried the following story:

Despite adverse weather and underground conditions, New Rainbow Mining company has completed 327 feet of drift work since the first of this year at its Weber property in the Lakeview district of Bonner county, exposing one small ore shoot averaging about $25 per ton in lead-zinc and gold-silver values in the old workings, according to Robert B. Austin, vice president and manager of the company.

Much of the drift progress was retimbering and widening of old openings driven as much as 40 years ago, but in some cases it was necessary to run new headings in order to bypass areas so badly caved that it was too dangerous to attempt to reclaim them, he reported in a letter to the stockholders this week.

In the drift east of the main adit crosscut, 162 feet of progress has been made and the west drift was reopened for approximately 140 feet and then advanced for 55 feet to within a few feet of an old crosscut which, according to old maps, showed some good ore values, he stated.

24A photocopy of this article in the Weber file does not identify the newspaper that ran the story nor the date on which the article appeared.
The east work has exposed a mineralized zone approximately 130 feet long and still going ahead in the east face. The zone contains about 60 feet of ore averaging 17 ounces of silver, 0.04 of an ounce of gold, 2 per cent lead and 2 per cent zinc across a mining width of from three to six feet, Austin reported.

Plans are to continue the east drift an additional 40 feet to virgin ground and then extend it farther along the vein structure in search of the downward extension of the open-pit ore body which since 1949 has yielded $344,830 gross production under operation by Austin-Meyers corporation. It is also planned to extend the west drift to the old workings just ahead and then continue on another 75 feet to connect with other old workings in which one, and possibly two ore shoots are indicated on old maps of the mine.

To carry on this additional development work the company recently levied an assessment of one-half cent per share, payable by June 18. The present ore showings are not large enough to sustain sufficient profitable production to put the mine on a self-sufficient basis, Austin said.

Work at the property was continued throughout the winter despite heavy snows, he said. The road was kept open as far as the Conjecture mine, a mile below the Weber, but from mid-January to about April 15, the last mile had to be negotiated on [word missing from photocopy].

The New Rainbow Mining Co. continued its development program at the Weber in 1955. Ore shipments were made to the Idaho Lakeview mill or direct to smelters. The Austin-Meyer Corp. continued to produce ore from its open-pit operation. The ore was shipped to the Tacoma smelter, where the high silica content of the material made it desirable as a flux for copper smelting. The following article on the mine appeared in June 1955:

New Rainbow Mining Company has stockpiled about 700 tons of lead-silver-zinc-gold ore from its Weber mine operation in Kootenai county near Lakeview and is now making arrangements to have it milled at one of the concentrating plants in the area, President R. B. Austin reported to stockholders in a letter this week.

The east drift from the No. 4 tunnel has entered an unexplored area in which quartz predominates and geological conditions appear to be quite favorable, he said. It is believed that this heading is nearing the downward extension of the silver ore zone which is being mined at the surface by Austin-Meyers corporation.

On October 13, a longer article noted:

Some 700 tons of ore are now being milled for New Rainbow Mining Co. at the Idaho Lakeview Mining company's nearby plant, according to a letter to Rainbow stockholders this week.

President Robert B. Austin said substantial progress has been made during the past two years in developing the Weber property in Bonner county near Lakeview.

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25 A photocopy of this article in the Weber file does not identify the newspaper that ran the story nor the date on which the article appeared.

26 A photocopy of this article in the Weber file does not identify the newspaper that ran the story.
Stoping operations are still in progress and will continue as long as weather conditions permit hauling and milling, Austin said.

The ore is being taken from the first ore shoot exposed east of the main adit crosscut, and, although results of current milling are not yet available, is expected to yield satisfactory returns, he stated. Two earloads of ore totaling 108 dry tons, taken from the development raise on this shoot last November, averaged 21.72 ounces of silver and .055 ounces of gold per ton, netting the company $1416 after payment of rail freight, smelter charges and 5 per cent net smelter royalty to the owners of the mine, he pointed out.

Austin described recent developments at the old property as "interesting" but "somewhat perplexing." He said, however, that the geological pattern is gradually being unfolded by exposures in new drifts and crosscuts.

Eight drill holes totaling 292 feet have been completed along the vein structure and several of them indicated the presence of mineral values, but further work will have to be done before the results can be accurately evaluated, he reported.

Recapitulating exploration and development progress during the past two years, Austin reported that, in addition to the production the company had completed 915 feet of drift and crosscut rehabilitation, 1043 feet of new drift and 140 feet of raising during the period. In addition, the company has considerably improved its plant and facilities by purchasing an air compressor, a 315 cubic foot portable air compressor, a rock drill and two stopers, a double drum hoist with scraper bucket, and by constructing a change and dry room for the miners and 130 feet of snow shed to facilitate winter operations. Expenditures since August 13, 1953, have totaled $89,062, according to a statement of receipts [receipts] and expenditures accompanying the letter.

The program for the coming months will include continued mining from the No. 5 east stope and extension of the hanging wall raise, now up 40 feet, to the 65 foot point to crosscut the Weber shear zone, Austin told stockholders. Further prospecting of the East vein area for the downward projection of the open-pit ore body will be carried on pending results of raise project.

Included with the letter was a notice of a one-half cent assessment to help finance the winter exploration program.

In 1956, both the New Rainbow and Austin Meyer companies reported production. The Austin-Meyer Corp. operated its open-pit from June to December, recovering 5,696 tons of silver ore. The ore was shipped directly to the Tacoma smelter. New Rainbow Mining Co. operated the underground workings from June through September, producing a small quantity of ore. The company completed 1,079 feet of drifting, 70 feet of diamond drilling, and 25 feet of raises. The January 26, 1956, issue of the Wallace Miner ran the following story on the mine:

New Rainbow Mining company has turned its attention to the old West workings on the No. 4 adit level of its Weber property in the Lakeview district of Bonner county, according to a letter to stockholders this week.

A new west drift in the firmer footwall ground of the vein structure is now in progress toward an area where exposed ore is indicated on old maps of inaccessible workings, Robert B. Austin, president and manager, reported. Dog-hole raises will be run toward the hanging wall at intervals to prospect the entire vein zone, he said.

Development work in the East workings during recent months failed to disclose any new ore shoots and it was found that the ore previously found in the vicinity of the No. 5 East raise diminished in grade and quantity as it was followed upward, Austin told stockholders.
"From this information it would appear that the better ore was at the tunnel level and quite possibly beneath," he stated.

Recent shipments from this ore shoot totaled 26.56 dry tons of concentrates, milled from 316 tons of ore, which yielded smelter returns of $3,311, and 243.9 tons shipped [sic] direct to the Tacoma smelter which brought $1,122, according to the letter. An additional two carloads of ore, about 100 tons, is at the railroad siding at Athol ready for shipment when weather conditions permit, and there remains an estimated 100 tons or more in the stockpile at the mine.

"While the results of the past few months operations have not been as satisfactory as was hoped for, they have, nevertheless, indicated what might be anticipated from further underground exploration," Austin declared. "This information together with the recent successes as reported by the Conjecture Mining company, a property adjoining the Weber to the north, has encouraged your directors to continue the exploration program."

Opening of a new 500 level at the Conjecture mine, according to reliable reports, has disclosed a consolidation of the several small ore bodies on upper levels into a continuous 500-foot ore shoot on the lower horizon, he said. The ore is said to be exceptionally good grade, although "not too wide."

Also of significance to the Weber operation is the report that a new power line is to be run from a substation near Lakeview to the Conjecture mine which is only a mile from the Weber No. 4 portal, the letter indicated.

A statement of receipts and disbursements accompanying the letter shows that approximately $95,000 has been spent in exploration and development of the Weber property in the past two years. The work has included about 128 feet of drifting, 140 feet of raising, 292 feet of long-hole drilling and stoping of 895 tons of ore. Substantial improvements in plant and equipment have also been made.

Collection of a one-cent assessment on outstanding stock, levied on January 6, is now in progress to provide funds for continuing the exploration program. Receipts from assessments during the past two years have totaled about $88,900. An additional $3849 was received from ore sales.

More information appeared in the March 22, 1956, edition of the *Wallace Miner*:

New Rainbow Mining company's Weber mine operation in the Lakeview district of Bonner county is entering another "very interesting" stage of development, President Robert B. Austin informed stockholders in a letter this week.

The new west footwall lateral around old caved workings is now in 269 feet from the main crosscut and has intersected the footwall of the vein structure, exposing ore assaying 28.2 ounces of silver, 0.65 per cent lead and 1.9 per cent zinc over an 18-inch width, he said. A picked specimen three inches wide ran 66 ounces of silver, he added.

These "very encouraging" results, Austin noted, tend to establish the accuracy of old maps which indicated the presence of ore at this point.

Plans are to extend the drift westerly into what appears to be unexplored ground, he reported.

"Indications are that the work that was done more than 40 years ago might have followed a lesser structure and left the main structure untouched for the next 250 feet, at which point it was again intersected and revealed an ore zone," he said.

An article in the May 31, 1956, *Wallace Miner* noted:

New Rainbow Mining company's new west footwall [footwall] drift at the old Weber mine in the Lakeview area of Bonner county has exposed a small ore shoot measuring about
35 feet long and averaging 18.6 ounces of silver per ton over a width of about 2½ feet, President Robert B. Austin told stockholders in a letter this week.

The drift, which is being driven to by-pass old saved workings, is progressing at a "quite satisfactory" rate and is now within approximately 200 feet of its objective, he said. According to old mine maps, there is an ore zone ahead which "should be of greater length and better grade" than the one already opened.

Several mines are also projected to intersect other known ore zones all of which should be completed within the next four or five months, he added.

During the past two and a half years the company has completed approximately 1079 feet of drifting, 165 feet of raising and 362 feet of long-hole drilling at the property and has substantially improved the operating facilities, at a cost of about $110,000. Nearly 900 tons of ore have been mined, and receipts from ore sales have totaled $3849.

The letter includes notice of an assessment levied May 3 in the amount of 1 cent per share. Payment is due on or before July 6 and the sale of stock delinquent in payment is set for August 3.

Another article about the Austin Meyer's open-pit operation appeared on October 18, 1956:

Austin-Meyer corporation's open-pit mining operation at the old Weber silver mine in the Lakeview district of Bonner county has yielded nearly $450,000 worth of silver and gold since it was started back in 1949, it was learned this week.

The company, now concluding its eighth consecutive season of operation, has shipped a total of 61,312 tons of ore, working an average of only about 5½ months each year, according to Manager Otto Meyer of Athol. Production has averaged about 10,000 ounces of silver and 37 ounces of gold per month.

Because of its high silica content, averaging 85 per cent, the ore is shipped directly to American Smelting and Refining company's smelter at Tacoma, thus eliminating the expense of milling, he said. Freight and smelter charges, however, together with lease royalty payments, have absorbed nearly half of the gross value.

Production this year since June 1 has totaled 85 carloads, or 4760 tons of ore, with operations on a one-shift basis, Meyer stated. He estimated that between 15,000 and 20,000 tons of overburden had to be stripped from the ore body before it could be drilled and blasted for loading.

The stripping problem becomes more and more serious as depth is gained in the pit, he said, and it appears that the economic limit for this type of operation may be near. Underground methods will then have to be considered, he added.

Total depth of the pit is now about 150 feet, measured from the surface outcrop of the ore body, which was discovered in 1888, and the mineable zone is approximately 150 feet long by 50 feet wide. Much of the high-grade ore was extracted by early-day prospectors through tunnel workings, Meyer said, but occasionally the pit work uncovers a high-grade streak that was missed. Recently, such a streak was found beyond the end of the old No. 2½ level, he stated. It ranged from 18 inches to 2½ feet in width and was worth about $180 a ton.

The corporation is also engaged in the pulpwood business and makes regular shipments of eight-foot logs from northern Idaho and Washington to Scott Paper company at Everett, Wash., from loading facilities at Priest River, Ione, Newport and Penrith. Shipments for the week ended October 6 totaled 56 carloads.

27 A photocopy of this article in the Weber file does not identify the newspaper that ran the story.
The company is headed by Robert B. Austin, assistant manager of the Coeur d’Alene Hardware and Foundry company of Wallace.

The New Rainbow Mining Co. discontinued operations at the Weber on October 1, 1956. The Austin-Meyer Corp. continued to operate its part of the mine and to ship silver ore to the Tacoma smelter until 1965. Annual production increased from 1956 to 1958. Production dropped sharply in 1959 and, although output rose in succeeding years, it never returned to previous levels. When the mine closed in 1965, production was only slightly more than half that of 1958.

Howland (1965, p. 1-3) described the open-pit operation for The Bunker Hill Company:

Location
The Austin-Meyer open pit silver mine is located about 10 miles east of Athol, Idaho in the Pend Oreille District. It lies at an elevation of about 4000’ in mountainous country. There is a good truck road into the property. The property consists of two patented claims and nine unpatented claims and are under long term lease to Mr. Otto Meyer.

Summary & Recommendation
The property has been operated on a seasonal basis for the past eighteen years by the present operator. The mining has been done by open pit with a total production of about 180,000 tons averaging 7-8 oz. of silver per ton with minor amounts of zinc and lead. Previous to this period an unknown amount of ore was mined underground, however, it is reported that over 2000’ of underground development was done under and ahead of the present surface workings.

The ore is found in irregular quartz veins and shoots along a shear zone which in places is up to 80’ wide but probably averages 20’. Ore is also found in a mafic dike of unknown width which adjoins and may cut the shear zone. The shear zone has been followed intermittently for 8000’. Numerous randomly oriented lamprophyre dikes which are unmineralized cut through the ore and shear zone making selective mining mandatory.

The open pit has nearly reached its economic limit under present conditions. Any further extension of the pit either along strike or down dip will encounter excessive stripping ratios. Any possible underground operation would have to be based on limited selectivity with the ore averaging about 4 to 5 oz. of silver as mined. The ground is also reported to be very heavy. It is recommended that no further interest be taken in this property at this time.

History
The mine was the discovery mine of the district and was found in 1888 and named the Weber mine. The mine produced a small tonnage of high grade silver ore from a shoot that was mined near the surface. It is reported to have a depth of “five levels” and over 2000’ of underground development. The present leases has operated the property seasonally for the past eighteen years. The total productions during this period including some old dumps is about 180,000 tons of ore averaging 7-8 oz. of silver per ton with minor amounts of zinc and lead. The ore is shipped to AS & R at Tacoma where it is in demand for silica flux. The lease reports that he has had a profit of about $2.00 per ton.

Geology & Mining
The ore is found principally in a steeply dipping shear zone in the Wallace and Striped Peak fms. The shear zone dips about 45° and has been mined along strike for about 300’ to a depth of 250’. The principal minerals are thought to be tetrahedrite and ruby silver associated in quartz fissure veins in and near the shear zone. Some sphalerite and galena are also found in places but are of minor importance. Some zones run up to 1% Zn and 1% Pb.
The shear zone had been found intermittently over a distance of 8000'. The width varies from about 15' to 80' with 20' being about the average. Adjoining the shear zone on the hangingwall side is a steeply dipping mafic dike of unknown width which appears to be striking across the shear zone. The dike is partially mineralized near the shear zone but seems to be weaker than the adjoining rock.

The shear zone is cut by numerous randomly oriented lamprophyre dikes which are unmineralized. These dikes are mined separately where possible. None of these dikes or any other structure was observed to cross the footwall of the zone.

The country rock on the hangingwall side appears to be a highly crushed quartzite with pieces larger than 1" to 2" being uncommon. It is quite easily stripped by blading or loaded with a front end loader. The underlying mafic dike and ore must be drilled and blasted although these zones are also crushed and fractured.

The quartz veins within the shear zone vary in width 1" to 5" or 6" in zones fifteen to twenty feet wide interbedded with argillaceous zones. They are discontinuous over several feet and boundaries are indistinct. In several places they seem to be bounded by crosscutting lamprophyre dikes. The grades are quite variable in short distances and the ore could best be described as pods. Quite possibly as much ore has gone over the dump as has been shipped.

A large shoot of unknown grade has been described from the literature that extended from the surface down to the fifth level. It is thought to be located near the area mapped as "slide area" although no direct evidence was seen. No other large shoot has been found by the operator.

It is believed that the mineralization will persist to the west along the shear zone for several hundreds of feet although it could be reduced in grade or cut off for some distance by the mafic dike which is striking into it. The depth of the deposit is unknown but is probably consistent over several hundred feet down dip judging by reports of other mines in the district.

Any extension of the pit along strike or down dip will be faced with adverse stripping ratios immediately because of topography.

An underground operation would be difficult because of the inherent lack of selectivity, low grade of the ore and heavy ground which was reported. It is recommended that no further interest be taken in this property at this time.

By 1967 the underground workings at the Weber were inaccessible because of caving 400 feet from the portal (Kun, 1974). The property was inactive for over a decade.

Shoshone Silver Mining Company leased the Weber Mine in late 1976 or early 1977 and conducted intermittent operations at the open pit. The property was explored for the next two years, and 600 tons of ore was produced from the mine in 1980. The company did no mining in 1981 or 1982.

Oxidized ore was mined from the Weber open pit in 1983 and processed in the company's mill. The silver was sold to Sunshine for refining. Ore was crushed and stockpiled in 1984. Development work continued the following year. By 1987, Shoshone Silver had a 100 percent interest in the Weber group. No activity has been reported at the mine since that date.

The Weber and New Rainbow Mines were visited by an IGS field crew during the summer of 1996 as part of a program to evaluate inactive and abandoned mines on U.S. Forest Service lands in northern Idaho. Bennett and Mitchell (1997) contains a detailed description of the mines at that time. Figure 20 shows a picture of the Weber open pit.

Between 1890 and 1981, the Weber Mine (including the Austin-Weber and New Rainbow operations) has produced at least 127,291 tons of ore. This material has yielded
Figure 20. Weber open pit in 1996, looking west (Idaho Geological Survey photograph).
3,455 ounces of gold, 886,556 ounces of silver, 6,596 pounds of copper, 801,403 pounds of lead, and 86,209 pounds of zinc. These amounts are minimums, because the early production from the property does not appear to have been well documented.

KEEP COOL MINE

The Keep Cool Mine is about 5½ miles south of Lakeview on the East Branch of Chloride Gulch (Figures 3 and 5). The mine is in the SE¼ sec. 27, T. 53 N., R. 1 W. In the summer of 1996, the site had one open adit, one partially caved adit, and two caved adits (Bennett and Mitchell, 1997).

Kotschevar (1938, p. 30-31) described the ore as follows:

The polished sections of the ore examined under the petrographic microscope . . . show intimate intergrowths of galena, sphalerite, chalcopyrite, pyrite, and quartz. The lead sulphide occurs mainly as specular or steel galena, with the gneissic grain and the highly veined slickensided surfaces being formed by post-mineral fault movements. The sphalerite, commonly referred to as zinc blende or blende, is intimately associated with galena. The replacement of the sphalerite by the galena has proceeded at a differential rate, therefore, the resulting embayments are very irregular. . . . During the crushing operation fracturing takes place across these embayments, and the resulting break between the two minerals is not clean because the particles of galena are captured between the two embayments of sphalerite, and vice versa.

The chalcopyrite and pyrite are disseminated throughout the galena, sphalerite, and quartz. The quartz is intimately interlocked with the sulphides which in the process of grinding are difficult to unlock from the quartz gangue. However, the gouge material is not intimately interlocked with the sulphides and the quartz. Both the quartz as well as the sulphides is [are] easily crushed, and produces a large amount of fines which seriously interfere in the flotation operation by producing dirty concentrate. These fines vary from plus 200 mesh to a minus 400, and it is important to note that it is extremely difficult to float sulphide particles finer than 400-mesh.

Figure 21 shows a picture of the Keep Cool ore.

When the Keep Cool was located is not known. In 1901, the Idaho Inspector of Mines reported that the Keep Cool had been developing its orebodies for several years and had a large amount of ore in sight. The 1902 IMIR (p. 19) stated:

The Keep Cool and the Conjecture have continued development work the past season, with flattering prospects. A movement is now on foot by the owners of the Keep Cool to erect large reduction works, which would insure the prosperity of the camp.

In 1903 the Idaho Mine Inspector noted (1903 IMIR, p. 93) that "the Keep Cool mine, with even more extensive development [than the Weber], carries similar enormous shoots of fine concentrating lead-silver ore." The 1904 IMIR (p. 90) stated: "In sharp contrast with the Weber, the Keep Cool mine, on the same great vein or zone, and
Figure 21. Ore from the Keep Cool Mine. Massive sphalerite is partially replacing early quartz, with galena and tetrahedrite filling fractures in the quartz. This picture is approximately $3\frac{1}{6}$ times actual size (Kun, 1974, Figure 13).
extensively developed, carries a galena silver-lead concentrating ore of fair grade." The 1905 IMIR (p. 74) continued the description: "The Keep Cool, on the same vein as the Weber to the south, has also been developed by a succession of short adit tunnels which disclose a large and continued ore shoot of silver-bearing lead-zinc ore, that with the proper kind of treatment should be made to yield valuable shipping products." MacDonald (1906) credits the mine with $15,000 in production through 1905. The extensive development at the Keep Cool was again mentioned in 1911. Table 15 shows the companies and individuals operating at the mine.

The mine was mostly inactive for the next twenty-five years. Idaho Lakeview Mines Co. had the mine under option in 1929 and 1930, but apparently little or no work was done.

A letter dated May 21, 1934, from L. DeKonig (manager of the Northwestern and Pacific Hypotheekbank and the DeTweede Northwestern and Pacific Hypotheekbank) to the Idaho Inspector of Mines explained why the annual report for the Keep Cool could not be filed in a timely manner:

We received your form for annual report on the above [the Keep Cool]. I regret very much that at the present time we cannot be of any assistance to you since this property is handled by Mr. R. Insinger who is now on the high seas on his way to Europe.

Mr. Insinger's secretary however informs me that Mr. Harry O. Kent is also interested in the property, and I am sending the forms to him today. Should Mr. Kent not be able to give the desired information you will have to wait until Mr. Insinger returns.

There is another Director in this Company [sic] who might be acquainted with the situation, namely Mr. Thos. J. Griffith. Mr. Griffith however is in a very poor state mentally, and I understand that he is in a sanitarium.

Insinger was the general manager of the above-mentioned banks and the secretary of the Keep Cool Mining Company. Thomas J. Griffith was the president of the Keep Cool Mining Company. The following day (May 22, 1934), DeKonig sent another letter:

We confirm our letter of yesterday in regard to the Keep Cool Mining Company.

Mr. H. O. Kent, to whom I forwarded the statement to be filled out, was in this morning, and informs me that he cannot give you the information required. All Mr. Kent knows is that the Mine has not been operating for a great many years, and at the present time seems to be more or less of a dead issue.

This being the case, we will ask you to take this matter up again when Mr. Insinger returns from Europe some time during the middle part of August, unless the above information gives you what you want.

The Keep Cool Mining Company's form, filed with the Idaho Mine Inspector's office on September 17, 1934, noted that T.S. Griffith was deceased.

The Keep Cool was leased to the Silver Leaf Mines Corporation in 1937. During the year, Silver Leaf cleaned out the old tunnels and did some new stoping. (Tables 16 and 17 show development at the mine.) During 1936 and 1937, the Keep Cool Mining Company had built a 50-tpd mill (Figure 22), which the company was planning to expand
Table 15. Companies operating at the Keep Cool Mine.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Officer</th>
<th>Date Incorporated</th>
<th>Charter Forfeited</th>
<th>Year(s) at Mine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep Cool Mining Co.</td>
<td>T.S. Griffith, President</td>
<td>June 16, 1922</td>
<td>November 30, 1949</td>
<td>1922-1949(?)</td>
</tr>
<tr>
<td>Idaho Lakeview Mines (option)</td>
<td>D.M. Drumheller, Jr., President</td>
<td>June 28, 1928</td>
<td>August 5, 1976</td>
<td>1929-1930</td>
</tr>
<tr>
<td>Silver Leaf Mines Corporation</td>
<td>W.H. Latta, President-Manager</td>
<td>July 2, 1931</td>
<td></td>
<td>1937-1946 or 1947</td>
</tr>
<tr>
<td>Knapp Refractory Ore Processing Co.</td>
<td>Walter R. Alexander, President</td>
<td>December 9, 1942; reinstated: July 31, 1944</td>
<td>November 30, 1943; November 30, 1946</td>
<td>1942-1946</td>
</tr>
<tr>
<td>Federal Uranium Corporation/</td>
<td>R.W. Neyman, President</td>
<td>November 11, 1956</td>
<td>not mining in Idaho (1975)</td>
<td>1957-1964</td>
</tr>
<tr>
<td>Federal Resources Corporation (lessee)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunshine Mining Co.</td>
<td>Vincent Whelan, Assistant Secretary</td>
<td>January 3, 1921</td>
<td>active</td>
<td>1967-</td>
</tr>
<tr>
<td>Shoshone Silver Mining Co.</td>
<td>H.E. Daugherty, Secretary</td>
<td>January 22, 1970</td>
<td>active</td>
<td>1980-</td>
</tr>
</tbody>
</table>

1Information not available in Idaho Geological Survey's files.
Table 16. Development work, number of men employed, and operating companies at the Keep Cool Mine, by year.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Men Employed</th>
<th>Tunnels (feet)</th>
<th>Cross-cutting (feet)</th>
<th>Drifting (feet)</th>
<th>Raising (feet)</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1937</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silver Leaf Mines Corp./ Keep Cool Mining Co.</td>
</tr>
<tr>
<td>1938</td>
<td>11</td>
<td>50</td>
<td>30</td>
<td>20</td>
<td>360</td>
<td>Silver Leaf Mines Corp./ Keep Cool Mining Co.</td>
</tr>
<tr>
<td>1939</td>
<td>2</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td>Silver Leaf Mines Corp./ Keep Cool Mining Co.</td>
</tr>
<tr>
<td>1940</td>
<td>4</td>
<td>268</td>
<td></td>
<td></td>
<td>38</td>
<td>Silver Leaf Mines Corp./ Keep Cool Mining Co.</td>
</tr>
<tr>
<td>1943</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td>200</td>
<td>Knapp Refractory Ore Processing Co./Keep Cool Mining Co.</td>
</tr>
</tbody>
</table>

1Work during the year consisted of rehabilitating old workings and an unspecified amount of stoping.  
2Work also included cleaning out and retimbering about 600 feet of tunnels.

to 100 tpd. In 1937, the mill, which was operated around the clock, treated several thousand tons of zinc-lead-silver ore. The mine was the only producer in the district. An article on the property ran in the November 4, 1937, issue of *Northwest Mining* (page unknown):

The Silver Leaf Mines Corporation, with properties in the Lakeview mining district, near Sandpoint in Bonner County, Idaho, has placed in production its Keep Cool Mine and has been a constant shipper of gold, silver, lead and zinc concentrates to the Bunker Hill smelter at Kellogg since last April, according to W. H. Latta, president and manager, of Spokane, Washington.

Since April, Twenty-one cars of concentrate were shipped showing net returns of approximately $30,000.00. The concentrates averaged $22.95 in gold, $51.74 in silver, $38.94 in lead and $48.66 in zinc per ton. A small amount of copper was also produced.

Ore Blocked Out

The vein which outcrops on the surface along the length of the Keep Cool claim for 1500 feet has been opened up 500 feet below the outcrop by five tunnels which are connected underground through a raise along the ore shoot towards the surface. At its lowest depth, in tunnel number five, the vein is approximately 35 feet wide, heavily mineralized with silver, lead, zinc and gold, with traces of copper. There are approximately 50,000 tons of ore blocked out, according to Mr. Latta, and with additional development to lower depths below the present workings, richer and larger ore-bodies should be opened up, as is characteristic of all large producers in the nearby Coeur d'Alene district, as the rock and ore occurrences are almost identical.
Table 17. Cumulative development at the Keep Cool Mine, by year. Information is from company reports to Idaho Inspector of Mines; discrepancies in numbers reflect inconsistencies in the original data.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Development (ft)</th>
<th>No. of Tunnels</th>
<th>Total Length of Tunnels, Crosscuts, and Drifts (ft)</th>
<th>No. of Shafts</th>
<th>Total Length of Shafts (R)</th>
<th>No. of Raises</th>
<th>Total Length of Raises (R)</th>
<th>No. of Crosscuts</th>
<th>No. of Drifts</th>
<th>Length of Principal Tunnels (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No. 1 No. 2 No. 3 No. 4 No. 5 No. 6 No. 7</td>
</tr>
<tr>
<td>1937</td>
<td>2,200(7)</td>
<td>5</td>
<td>2,000</td>
<td>--</td>
<td>--</td>
<td>2</td>
<td>200</td>
<td>--</td>
<td>--</td>
<td>1 1 1 1 1 1 --</td>
</tr>
<tr>
<td>1938</td>
<td>2,456</td>
<td>5</td>
<td>1,960</td>
<td>1</td>
<td>35</td>
<td>6</td>
<td>371</td>
<td>3 6</td>
<td>100 225</td>
<td>520 530 585 --</td>
</tr>
<tr>
<td>1939</td>
<td>2,480</td>
<td>6</td>
<td>1,983</td>
<td>1</td>
<td>35</td>
<td>6</td>
<td>371</td>
<td>3 6</td>
<td>100 225</td>
<td>520 530 585 23</td>
</tr>
<tr>
<td>1940</td>
<td>2,785</td>
<td>6</td>
<td>2,251</td>
<td>2</td>
<td>35</td>
<td>12</td>
<td>499</td>
<td>3 6</td>
<td>100 225</td>
<td>520 530 730 146 --</td>
</tr>
<tr>
<td>1941</td>
<td>2,785</td>
<td>6</td>
<td>2,551</td>
<td>2</td>
<td>35</td>
<td>12</td>
<td>499</td>
<td>3 6</td>
<td>100 225</td>
<td>520 530 730 146 --</td>
</tr>
<tr>
<td>1942</td>
<td>2,785</td>
<td>6</td>
<td>2,251</td>
<td>2</td>
<td>35</td>
<td>12</td>
<td>499</td>
<td>3 6</td>
<td>100 225</td>
<td>520 530 730 146 --</td>
</tr>
<tr>
<td>1943</td>
<td>2,345</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>190 300</td>
<td>815 350 150 150</td>
</tr>
<tr>
<td>1944</td>
<td>2,345</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>190 300</td>
<td>815 350 150 150</td>
</tr>
<tr>
<td>1945</td>
<td>2,345</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>190 300</td>
<td>815 350 150 150</td>
</tr>
<tr>
<td>1946</td>
<td>2,785</td>
<td>6</td>
<td>2,251</td>
<td>2</td>
<td>35</td>
<td>12</td>
<td>499</td>
<td>3 6</td>
<td>100 225</td>
<td>520 530 730 146 --</td>
</tr>
</tbody>
</table>

1 Information not reported to Idaho Inspector of Mines.

2 The principal vertical shaft was 90 feet deep.
Figure 22. The 50-tpd mill at the Keep Cool Mine (*Northwest Mining*, v. 3, no. 20, p. 1).
The 50-ton mill now on the property is of modern construction, equipped with a crusher, ball mill, flotation cells, classifiers and is powered with a 100 h. p. Diesel engine. The company is planning on enlarging the mill to handle 100 tons daily.

The concentrates are trucked to the smelter at Kellogg, 86 miles distant.

Four Claims Patented

The Keep Cool property consists of four patented claims on Gold Creek in Chloride Gulch and is two miles distant from the Hewer Mine, owned by the Consolidated Mining Company of Trail, B. C.

The company also owns the Silver Leaf group of ten unpatented claims, about one mile distant from the Keep Cool property upon which more than 2,345 feet of work has been completed, through seven tunnels. Further development of this property is to be started next year.

Twenty-one men are employed at the Keep Cool Mine. Melvin Sprinkle is the mine superintendent, with Walter Mottie in charge of the mill, which is of selective flotation design.

Mr. W. H. Latta, of Spokane, is president and managing director. H. G. Loop is vice-president, A. H. Pier, of Sandpoint, Idaho, secretary. James S. Ramage of Spokane and W. S. Webber of Hanford, Washington, are also directors.

The Keep Cool mill did not operate in 1938, and the entire output for the district was mill cleanings from former operations. Silver Leaf conducted 460 feet of development work at the mine. Production for 1939 consisted of several cars of silver-lead ore from the Keep Cool dump and a small lot of zinc concentrates that had been milled previously.

Development at the property continued in 1940. According to the 1940 IMIR, the mine was placed on a "production basis" during the latter half of the year. The mine was idle for the next two years, except for keeping the stopes and tunnels clear. Silver Leaf resold its lease and option to the Knapp Refractory Ore Processing Co. The Keep Cool received the first Reconstruction Finance Corporation loan in the district, according to Anderson (1942):

Negotiations here have been completed for what is averred to be the first RFC loan granted in this district in behalf of ore production and concentration. The beneficiary is the Knapp Refractory Ore Processing company of Seattle, Walter R. Alexander, president, and H. A. O'Neill, secretary and attorney for the company. Mr. Alexander has revealed:

"That with Walter Mottie will reopen the Keep Cool zinc-lead-silver-gold mine in the Lakeview district, near Lakeview and near the southern part of Pend Oreille lake, Bonner county, Idaho," he reports. "The superintendent will be Earl McDaniel, superintendent of the Idaho Lakeview mine.

"We have negotiated an ore milling contract," said President Alexander at the Spokane recently, "with the Idaho Lakeview Mines of which Jerome L. Drumheller is president and Martin Woldson, a director, both of Spokane.

"The Idaho Lakeview mill is being rehabilitated and equipped with additional Diesel power and flotation cells, as recommended by the Knapp Refractory Ore Process company. Ore will be hauled 4½ miles from the Keep Cool mine to the Idaho Lakeview mill.

"W. H. Marquette, chief metallurgist of the Knapp company, will be in charge of the mill operation. We are increasing the capacity of the mill from 0 to 100 tons in 24 hours.

"We are building a road to the mill and erecting a 500-ton bunker, restoring other bunkers, track and mine at the Keep Cool and we expect to be milling ore at the rate of 60 tons a day at the end of 20 days."

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"The size of the loan is sufficient to restore the mine for operation and install the additional equipment. We will start work on the plant Tuesday. Of the Keep Kool ore, 90 per cent is zinc and the lead, of which zinc is the major part.

"The loan has been approved by Howard P. Sherman, supervising engineer of the RFC in the Spokane district."

An internal report by the U.S. Bureau of Mines described the property at about this time (U.S. Bureau of Mines, n.d., p. 1-4):

**History**

The Lakeview district was originally prospected by gold miners who had gone to Murray, Idaho in the rush of 1883. Outcropping containing high silver values and some gold attracted considerable attention. In the late 1880's the town of Chloride had a population of several thousand. However, as the ores required shipment to smelters and because of the remoteness of the district, interest soon dwindled. Total shipments, consisting of high grade silver, yielded about $500,000 up to 1920. Metallurgical difficulties in the recovery of oxidized silver ores presented a problem and nothing in the way of steady output was ever attained. The zinc & lead ores were completely neglected until recent years, when two of the properties, the Hewer & the Keep Cool, installed flotation mills. Production has been intermittent by these companies, because of low metal prices. During 1937, 1938 and 1939 the Keep Cool mine shipped lead & zinc concentrates valued at $67,000 gross.

**Physical Features & Communications**

The Keep Cool Mine is located on one of the forks of South Gold Creek, about five miles from Lakeview, Bonner County, Idaho. The elevation at this property is 3940 feet above sea level. A Forest Service road which connects Athol, Idaho, on U. S. highway 95, and Heron, Montana runs by the property. A mile of company road forms the connecting link between the mine and Forest road. The distance from the Keep Cool to Athol is 19 miles and the highest elevation reached is 4500 feet above sea level. Local reports state that in the past this road has not been kept open during the winter months, because of the heavy snowfall. The climate in this locality is quite severe during the winter months. Sandpoint, Idaho, 44 miles from the mine, is the principal source of supplies. Mining equipment can be obtained in Spokane, Washington, 85 miles from Athol, the Northern Pacific railroad station. U. S. highway 95 and U. S. highway No. 10 affords paved highway from Athol to Spokane. Concentrates can be shipped by truck or rail to the Bunker Hill plant at Kellogg, Idaho, 80 miles away.

**Labor & Living Conditions**

At present labor is difficult to obtain. The construction of a Naval Training Station at Bayview, only 20 miles away, has attracted most available labor, because of the high wages paid. This condition is only temporary, though, and by March, 1943 should be much improved. The Keep Cool camp has a bunk house & boarding house capable of accommodating fifteen or twenty men. No houses are available for miner's families. Timber for mining purposes & fuel is abundant. Sufficient water for camp use only, is present. However, several years ago a twenty ton mill was operated some of the time by pumping water back from down stream.

**Property of the Keep Cool Mining Co. & Silver Leaf Mines Corp.**

The following outline represents the corporate arrangement of this property: Property consisting of four patented mining claims is owned by the Keep Cool Mining Company, 120 N. Wall Street, Spokane, Washington. Incorporated June 16, 1922 for 1,500,000 shares par value five cents per share of which 1,018,167 shares have been issued. Officers are C. A. Bartleson, President and R. S. Gorrell, Secretary, both of Spokane and Pasco, B. Carter,
Statutory Agent of Boise, Idaho. From the Keep Cool company, the Silver Leaf Mines Corporation now holds the property under lease & bond on a three year contract. Among other things, this lease calls for the payment of a ten percent royalty on all net smelter returns. The Silver Leaf Mines Corp., 407 Empire State Bldg., Spokane, Washington, was incorporated July 2, 1931 for 2,000,000 shares par value five cents per share of which 1,331,354 shares have been issued. Officers are W. M. Cady, President, Sandpoint, Idaho and Lester Valiquette, Secretary, Spokane, Washington. This company owns sixteen claims, one-half interest in five others, and an option on one-half interest in five others. All of these claims either adjoin the Keep Cool or are in the vicinity.

A recent change in ownership of a controlling interest in Silver Leaf stock has placed the property under the direction of the Knapp Refractory Ore Processing Co. of Seattle, Washington. Walter R. Alexander, President and H. A. O'Neill, Secretary, both of Seattle, Washington are its officers.

Description of Deposits

The Keep Cool vein, which strikes about S. 65 degrees E. and dips 45 degrees S. W., occurs in a large shear zone about 30' to 50' wide. The surrounding country rock is the Wallace formation of the Belt series. The ore shoots are found throughout this zone in thickness up to six feet and apparently rake from south-east to north-west. A large lamprophyre dike is exposed near the end of No. 5 tunnel, but not enough work has been done to show it's relation to the vein or shear zone. The Keep Cool vein is also exposed in the Weber Mine adjoinging to the Southeast & the Wilberg & Tuttle group adjoinging to the northwest. However, neither of these properties are open to the extent that a study can be made. Dike material is present in both properties.

The Conjecture vein, which strikes about N. 54 degrees E. and dips to the northwest can be traced into Keep Cool ground at about the vicinity of the Keep Cool camp site. More work will have to be done to determine the exact location of this vein. The Keep Cool No. 6 tunnel, which has been driven with this objective in view for 100 feet, should be pushed ahead. Another vein exposure, which has been opened by a short tunnel 100 feet above & 250 feet south of No. 6 tunnel, shows a vein striking about N. 57 degrees West & dipping 57 degrees south-west.

Mine Workings

The Keep Cool vein has been opened on five levels. Tunnels No. 1, 2 and 3 are caved. Tunnel No. 4 consists of a cross-cut which enters the vein at 125 feet and 300 feet of drift now open. Other workings on this level are caved. Level No. 5, 89 feet below No. 4, consists of a cross-cut which cuts the vein at 275 feet and 600 feet of drift all on the vein. The principal ore shoot exposed on this level is about 500 feet long. A winze started from this level is down 15 feet, but is caved. Tunnel No. 6, now caved at the portal, has been driven 100 feet in the direction of the Keep Cool vein, but lacks several hundred feet of reaching it's objective.

The mine camp consists of a bunk-house, boarding house, assay office, storage sheds, blacksmith shop and the building, that houses the mill. Most of the milling equipment has been removed. A small gas driven compressor furnishes air for drilling. All power must be either gas or diesel as electricity is not available.

Ore

The Keep Cool ore minerals are sphalerite, galena and tetrahedrite. Zinc, lead and silver are the metals recovered, in that order of importance. Recent samples show values of 6 percent zinc, 3 percent lead and 25 ounces of silver per ton. High grade shoots show much higher values. Antimony and copper are present in minor amounts, apparently as constituents of the tetrahedrite silver ore, which occurs in both the galena and sphalerite. Pyrite, chalcopyrite and arsenopyrite are present, while quartz and a little siderite are the gangue minerals.
Ore Reserves

No calculations of ore reserves have been made. Several hundred tons of ore are found on the mine dumps and can be taken as mill feed, while the mine workings are being put into shape. As no stoping has been done below the No. 5 level, and as the ore on the sill appears to be of the same grade as that mined above, this ore will probably become the most important source of production. Some ore remains above No. 5 level as pillars and little mining has been done in the vicinity of No. 11 raise, which has been driven entirely in ore for nearly 80 feet.

Plans for Company Operations

The company has obtained an R. F. C. loan for $20,000 on present ore showings. Their plans call for the immediate reopening of parts of the mine, known to contain ore and the blocking out of further reserves on and below the No. 5 level. Milling is to be done under contract, by the Idaho Lakeview Mines Co., which has a 100 ton differential flotation mill, 4.5 miles by road from the Keep Cool. This mill is being reconditioned, and extra diesel power is being added. E. A. McDaniel of the Idaho Lakeview is to have charge of mining operations.

Exploration proposed to be performed (sic) by the Bureau of Mines

Exploration of the downward extension of the Keep Cool vein system can be most easily made by diamond drilling from the surface at station No. 5, as indicated on the map [omitted]. Three holes, one vertical and two at angles of forty five degrees, will explore the vein to a depth of about 630' on its dip from tunnel No. 5, and on its strike for about 780'. If good ore is encountered, more holes can be put down in this locality. Underground exploration can be carried on by diamond drilling from the end of No. 5 tunnel, which is about 50' beyond the point at which the vein is lost in a large dike. As ore shoots have been found in and on both sides of dikes in this locality, these holes should be long enough to go out of the dike and well into the country rock. Distances can not be accurately determined, but 100 foot holes should prove adequate. Two holes, one down at thirty degrees from the horizontal into the foot wall and the other up at thirty degrees into the hanging wall, should show the existence of any possible included or parallel ore shoots.

In 1943, 200 tons of zinc-lead ore was shipped from an old waste dump at the Keep Cool property. The 1943 IMIR (p. 150) noted:

Development during the year: From No. 5 level to No. 4 level a raise of 200 ft. was completed; a 200 ft. caved portion of No. 4 cleaned out and retimbered and 500 ft. of No. 5 level retimbered.
A 100 h.p. diesel engine and 500 cu. ft. p.m. air compressor were purchased during the year. Rehabilitated the bunker and increased the capacity to 200 tons. Also rehabilitated the road for transporting the ore, and at the Lakeview completed a 500-ton bunker, also 3500 ft. of new road construction.

Due to the severe winter and the early snows in this particular district and the late spring we have been delayed in transporting the ore to the mill and milling the ore, but we anticipate by the 15th of July we should be milling 35 tons of ore per day for the first 30 days, and expect the following 30 days to be up to 100 tons. We also have blocked out 6,000 tons of lead and zinc ore averaging 4% lead and 7% zinc and anticipate within the next four months an additional block of ore of 15,000 tons.

The ore was milled at the Idaho Lakeview Mining Company mill. In reference to activities in late 1943, the 1944 IMIR (p. 121) stated:
Approximately 775 tons of ore were delivered to the mill during the summer. Milling did not begin until last part of September. Concentrates from about 200 tons of ore went to the smelter by the middle of November, at which times snows blocked the roads and prevented further shipments of ore or concentrates.

Silver Leaf's lease on the property was canceled in late 1946 or early 1947. The mine was idle until 1950.

The Keep Cool produced 7 tons of silver smelting ore in 1950. In 1951, the mine was operated by the Idaho Lakeview Mines and output totaled 750 tons of zinc-lead ore. Production was recorded from the mine for the next three years. In 1954, 14 tons of lead-zinc concentrate was produced from 80 tons of crude ore.

Federal Uranium Corp. acquired operating control of the Keep Cool in 1957 and made plans to work the property from the Conjecture shaft. Federal dug trenches between the Keep Cool, Silver Leaf, and Conjecture mines (Kun, 1974), but the company's efforts were concentrated on the Conjecture shaft. In 1964, Federal ended its Lakeview exploration program and returned the Conjecture and other leased properties to their owners (Kun, 1974).

Sunshine Mining Co. leased the Keep Cool in 1967. According to Kun (1974), the mine was partially reopened in the summer of 1967 for exploration work (Figure 23). A newspaper article dated October 10, 1967, noted:

The old Keep Cool silver-lead-zinc mine near Lakeview, Idaho, will be the site of a new underground exploration program by Sunshine Mining Co., according to a company official.

James B. Colson, Sunshine's vice president in charge of mining operations, said 250 feet of new crosscut will be driven into the hanging wall of the Keep Cool vein and a drill station cut for three down-holes which will probe the structure from 350 to 500 feet below the tunnel level. The drilling will total about 1,200 feet.

The work will be done in the No. 5 tunnel which has been cleaned out and retimbered, he said . . .

Idaho Lakeview owns the Keep Cool property and Sunshine has a half interest in both properties south of Lake Pend Oreille.

In 1980, Shoshone Silver Mining Company milled ore from the Keep Cool Mine. The company had an operating agreement with Sunshine on the property. In 1983, Shoshone Silver produced oxidized ore from the Keep Cool. By 1987, Shoshone Silver had a 98 percent interest in the Keep Cool group. In 1989, Shoshone Silver, employing three men, drove about 350 feet of new drift at the Keep Cool. The lead-silver ore was stockpiled, waiting for more favorable prices. A two- to three-man crew drove 200 feet of exploration drift during the summer of 1991.

The Keep Cool Mine was visited by an IGS field crew during the summer of 1996 as part of a program to evaluate inactive and abandoned mines on U.S. Forest Service

A photocopy of this article in the Keep Cool file does not identify the newspaper that ran the story.
Figure 20. Plan and cross-section maps of the Keep Cool Mine.

Figure 23. Plan and cross-section of the Keep Cool Mine (Figure 20 from Kun, 1974).

Between 1937 and 1954, the total recorded production for the Keep Cool Mine is 10,415 tons of ore and 230 tons of reprocessed tailings. This material yielded 474 ounces of gold, 35,180 ounces of silver, 29,250 pounds of copper, 479,739 pounds of lead, and 616,127 pounds of zinc. Output for more recent operations, in particular those by Shoshone Silver, have not been recorded with the rest of the production for the Keep Cool.

**VULCAN MINE**

The Vulcan Mine is about 3½ miles north of Lakeview in the S¼ sec. 35, T. 54 N., R. 1 W. (Figures 3 and 5). In the summer of 1996, the site near the area marked on the Lakeview 7.5-minute topographic map as "Vulcan Mine" consisted of one partially caved and two caved adits (Bennett and Mitchell, 1997). Adits in the NE¼ sec. 2, T. 53 N., R. 1 W., and the S¼ sec. 36, T. 54 N., R. 1 W., are also part of the Vulcan Mine (Figure 26). Based on this map, Site SP-7 (S½ sec. 36, T. 54 N., R. 1 W.; Bennett and Mitchell, 1997) corresponds to the lower cross-cut on the Vulcan Silver claim. This adit was open, dry, and in excellent shape in the summer of 1996. Intermediate between these two locations was another open adit and a shaft (Bennett and Mitchell, 1997).

Kun (1974, p. 38-40) described the property (under the heading of "The Glasscock Properties") as follows:

North of Lakeview (S½, sec. 35, T. 54 N., R. 1 W.) about three miles up the main road, R. Glasscock of Lakeview has developed several small, high-grade ore shoots along a vein on what is locally called, Vulcan Hill. The development consists of about five adits driven along the vein, which cuts the Lakeview Limestone (Pl. 1 [Figure 5]), granodiorite, and schists and argillites of the Wallace Formation. The limestone is highly contact-metamorphosed in certain zones and is altered to a green hornfels or a white marble. The east-trending vein is filled with quartz, and galena, pyrite and tetrahedrite stringers, some of which form pockets rich enough to mine. Brecciation, fracture-filling and replacement textures can be noted in the ore specimen from the Vulcan Mine (Fig. 11 [Figure 27]). The main ore mineral is galena (Fig. 22 [omitted]), which forms massive blebs and replaces early quartz and pyrite. It is surrounded and partially replaced by tetrahedrite penetrating fractures. Late pyrite and quartz fill fractures, but are seldom seen replacing older minerals.

The Vulcan Mine portal had caved by 1967, but some ore from it and the other Glasscock properties had been shipped to the Conjecture mill (Glasscock, oral communication, 1967). No assay or production statistics are available from any of the mines.

The early history of the property is not known for certain. Fennell (1942) states that some ore was shipped from the upper workings about 190720 and that a Dr. Myers

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20MacDonald (1905) states that 50 tons of ore had been shipped from the property by 1905. The mine was not being worked at the time.
Figure 24. Keep Cool Adit No. 1 in 1996 (Idaho Geological Survey photograph).
Figure 25. Keep Cool Adit No. 2 in 1996, looking southeast (Idaho Geological Survey photograph).
Figure 26. Sketch map of the Vulcan Mine (Boel, 1952).
Figure 27. Breccia of early quartz partially replaced by galena and tetrahedrite. This specimen is from the Vulcan Mine. This picture is about $2\frac{1}{3}$ times actual size (Kun, 1974, Figure 11).
started the Vulcan tunnel about 1912. Neither Dr. Myers' full name nor the names of the original claims are listed; however, a Daniel Myers was president of the Argus Mining Company\(^{30}\), which controlled five claims that were being developed during that period (Table 18). In addition, the Argus Mining Co.'s 1922 statement to the Idaho Mine Inspector gives the name of the mine as "Vulcan," although all other reports from the company either refer to the mine as the "Argus" or do not supply any name for the property.

The first mention of the property is in the 1909 IMIR (p. 44), which noted, "Another property, owned by Dr. Myers, has been developed in a limited way and produced some ore."

The Argus Mining Co.'s 1921 report to the Idaho Inspector of Mines stated that over $50,000 had been expended in the previous ten years to explore the property and extend several tunnels. A cross-cut tunnel was being driven to cut across all five of the company's claims. Equipment on the property included a 10-horsepower engine and a 10-horsepower compressor, as well as "all necessary pipes and mining tools." The company had five claims, variously listed as the Keno Nos. 1 and 3 and the McDonnough Nos. 1-3; the Keno Nos. 1-2 and the McDonnough (or McDermot) Nos. 1-3; or the Keno No. 1 and the McDonnough Nos. 1-4.

In 1922, the company reported that the workings consisted of four tunnels and one raise (Table 19). From 1922 to 1926, the company reported doing only assessment work. Daniel Myers, who said he was 83 at the beginning of June 1925, repeatedly emphasized that the Argus Mining Co. was (as he phrased it in a letter to Stewart Campbell, the Idaho Inspector of Mines, written on June 1, 1925) "not a mining corporation — only a prospecting corporation."

In August 1928, lessees started development work at the mine. The extent of this work is not known, but it is believed to have been small. The 1929 and 1930 IMIRs noted that the company had done its annual assessment work on the property. In the IMIRs from 1931 to 1937, the "Keno et at." claims were listed as the property of Dr. H.C. Myers. (After 1937, the IMIRs no longer contained lists of mines and claimants, concentrating instead on corporate summaries.)

An article in the July 2, 1929, issue of *Mining Truth* (p. 14) contained the following information on the mine:

Argus Mining Company, with the old Vulcan and some additional claims in the Lakeview district, is having its annual assessment work done, and because of the interest created by the Howser's operations it is possible that extensive development will be undertaken.

The work is in charge of Prof. Henry C. Meyers of Pacific University, Forest Grove, Oregon,

\(^{30}\)The Argus Mine was previously correlated with the Blanket Lead property, based in a U.S. Bureau of Mines production record showing production for both properties on the same sheet. However, IMIRs from 1928 to 1938 list as separate properties both the Blanket Lodge group (owned by O.L. McNall) and the Keno et al. claims (owned by Dr. H.C. Meyers), which apparently were the claims owned by the Argus Mining Co. This suggests that the Argus Mine and the Blanket Lead/Blanket Lodge Mine were not the same.
Table 18. Companies and individuals operating at the Vulcan Mine.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Officer</th>
<th>Date Incorporated</th>
<th>Charter Forfeited</th>
<th>Year(s) at Mine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Myers</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>(1912)(^1)</td>
</tr>
<tr>
<td>Argus Mining Co.</td>
<td>Daniel Myers,</td>
<td>April 20, 1917</td>
<td>1931</td>
<td>1917-1931</td>
</tr>
<tr>
<td></td>
<td>President</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. H.C. Myers</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1931-1937(^+)</td>
</tr>
<tr>
<td>T.M. Graney, E.J. Lannen,</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>(1952)(^2)</td>
</tr>
<tr>
<td>and H.C. Lannen</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>William Baptist and Ray</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>(1967)(^3)</td>
</tr>
<tr>
<td>Glasscock</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\)Duration of ownership is not known.
\(^2\)Information from Buel (1952). How long these men owned the property is not known.
\(^3\)Names listed Savage (1967), Appendix, in column headed “Present or Former Owners and/or Operators.”
Duration of ownership is not known. Kun (1974) lists the owner of the property as “R. Glasscock.”

who spends his summers in Lakeview. Rich silver-lead ore was shipped from this property during the Chloride boom about 35 years ago, with some shipments since from the Vulcan. Mr. Meyers reports molybdenum has been encountered in the long tunnel, with showings of arsenic and antimony. There are also values, he states, in gray copper and zine.

Fennell (1942, p. 1-14) described the property at length:

Note: The survey of this property both surface and underground was made with a Brunton compass (without the use of a tripod) and with an aneroid barometer. Distances and measurements with the exception of the Vulcan tunnel were estimated. The data embodied in this report should be accepted as but approximate. The lines were checked by first running North and then projected over the same area running South.

Only one of the upper tunnels was open for about one-half of its length. Lengths of these tunnels are estimated both from the size of the dump with due allowance being made for certain stoping and from "hear-say" of local miners and prospectors.

Sampling was done with extreme care, 50 lb. samples being taken and quartered down. See key to samples which accompanies this report.

LOCATION AND TOPOGRAPHY [TOPOGRAPHY]

This property is located two miles North of Lakeview, Idaho, upon Vulaan Hill. Lakeview and Vulcan Hill are separated by North Gold Creek. The terrane is rugged, covered with timber, and in most places dense underbrush. A narrow, partially graded and partially hard surface road which serves the Cedar Creek, Fall Creek, Granite Creek and Whiskey Rock areas, extends through the property for a distance of about fifteen miles North from Lakeview and there ends. This road winds up the mountain through the Vulcan Claims.
Table 19. Cumulative development at the Argus Mine, by year. Information is from company reports to Idaho Inspector of Mines; discrepancies in numbers reflect inconsistencies in the original data.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Tunnels</th>
<th>No. of Shafts</th>
<th>No. of Rises</th>
<th>No. of Cross-cuts</th>
<th>No. of Drifts</th>
<th>Length of Principal Tunnels (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No. 1</td>
<td>No. 2</td>
</tr>
<tr>
<td>1922</td>
<td>4</td>
<td>--</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>125</td>
</tr>
<tr>
<td>1923</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>125</td>
</tr>
<tr>
<td>1924</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1925*</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>125</td>
</tr>
<tr>
<td>1924*</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>125</td>
</tr>
<tr>
<td>1926</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>125</td>
</tr>
<tr>
<td>1928</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>125</td>
</tr>
<tr>
<td>1930</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>125</td>
</tr>
</tbody>
</table>

1Information not reported to Idaho Inspector of Mines.
2This report was filed on February 12, 1925.
3This number appears to have originally been "276," but was later modified to read "376."
4This report was filed on June 17, 1925.

HISTORY

Lead ore high up on the mountain was discovered about 1899. Some shipments, probably not more than two or three carloads, were made from the upper workings about 1907. Ore was packed by mules over a trail about one mile long to the shore of Lake Pend O'Reille, then six miles by boat to Bayview on the West side of the Lake, then by wagon, eight miles over a rough road to Athol on the Northern Pacific R. R. and shipped to one of the West coast smelters, to Trail, Canada, or one of the smelters in Montana or Colorado. The cost of transportation and smelting charges were so high that the tendency was to discourage further development of the property.

About 1912 a Dr. Myers — at that time Prof. of Chemistry in the State University at Moscow, Idaho — started to open the property by means of the Vulcan tunnel. This tunnel is the lowest and principal development on, or of the property. He extended this tunnel about 440 ft.

Upon his demise all work ceased. This tunnel has within the last two years been extended to a length of 470 ft.

Immediately prior to Dr. Myers death the property was surveyed for a patent, but due to his demise, the patenting of the property was not perfected.

In the last two years local prospectors have extended the tunnel about 30 ft. The machinery used by Dr. Myers having been removed, the last 30 ft. was driven by hand drilling, which became so slow and expensive that work ceased.

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TITLE

After Dr. Myer's demise the annual assessment work was omitted for several years and the claims became open for relocation. The claims were then relocated and were named the North Gold (upon which the portal of the Vulcan tunnel is located though the tunnel is now extended into the Vulcan claim); Vulcan; Punjab; Vulcan No. Two; and Punjab No. Two. Relocations have been properly recorded, as also affidavits of the annual assessment work up to June 30, 1942. The records appear to be in good shape.

Title can be held to July 1, 1943 by filling an "exemption of assessment work" for the year 1942-1943 under the recently enacted war measure law permitting of preserving title up to July 1943 without performing such assessment work.

Though only a rough survey was made it is apparent that there are at least two fractions of ground lying between the side or end lines of the above claims which should be located in order to form a solid block.

More than enough work has been done on the claims to make them eligible for patent at any time.

GEOLOGY

The regional geology of the Lakeview Mining District resembles in many respects that of the Coeur d'Alene District (one of the largest producers of silver-lead-zinc in the world) 30 miles to the southeast; there being however in the Lakeview District a greater abundance of igneous rocks of the pre-Cambrian (Paleozoic) time and Algonkian and Archeozoic eras.

The minerals of the Lakeview District are also similar to those of the Coeur d'Alenes, though the ore bodies differ considerably in that in the Lakeview region fissures and shear zones appear rather than the replacements deposits which characterize the Coeur d'Alene Districts.

The pre-Cambrian rocks are overlaid by a pebbly quartzite shale and thick limestone measures. These rocks are a distinctive feature of the District. Granodiorite stocks intrude the sedimentary rocks. Granophyre and porphyritic granite in considerable evidence.

The Vulcan property lies between the Pend O'Reille and Cedar Creek faults, both of these being major fault zones and trending North and South. The major Pack Saddle Fault with a trend Northeast and Southwest, lies to the South of the property and between it and the principal mines of the Lakeview District.

In the immediate vicinity of the Vulcan property but little local faulting was observed. The Vulcan vein with possible veins to the Northwest and Northeast paralleling the strike of the Vulcan vein constitutes the principal fissuring.

Formations. The Wallace and Striped Peak formations are much in evidence and constitute the "country" rock for the Vulcan as well as other mines in the district.

MINERALOGY

There is good reason to believe that a contact area between one or more of the formations will be reached by the extension of the Vulcan tunnel for a distance of 100 ft. or more. Though this is a cross-cut tunnel there may be encountered, as is so frequently the case in such contact area, a marked mineral enrichment.

Attention is called to the quartz and iron outcrops and to the contact of the lime -- and probably quartzite -- with the granodiorite.

Attention is also directed to the occurrence of the high grade lead ore -- galena with some carbonate of lead -- in the upper workings.

It is true that no graphite -- one of the ores of molybdenum [?] -- was observed in the dumps at the portals of the upper workings but it is possible that at this horizon one of the ores of molybdenum in another form, which would scarcely be distinguished from the carbonate ores and iron oxides, may be found.
The Vulcan tunnel — total length 470 ft. — was projected as a cross-cut tunnel through the granodiorite and granite formation with the object of piercing under the "quartz cliff" and "iron ledge" and to come under the upper tunnels. It is expected that the lime — and possibly quartzite — contact with the granite will be reached in the neighborhood of the quartz and iron ledges. The upper tunnels are driven in lime.

In several places the Vulcan tunnel is crossed with narrow seams of quartz in which specks of molybdnite appear. Commencing at about 400 ft. in from the portal knife-blade thickness seams of graphite appear with apparently a slight increase of the same toward the present breast. These knife-blade seams of graphite appear both in the laminations of the granite and quartz but are extremely disseminated and are not likely to form any ore body until a zone of mineral enrichment is reached.

DEVELOPMENT

In all about 1,100 lineal feet of tunnels have been driven. Due to caved ground and broken timbers all of the upper tunnels are inaccessible.

The main and important tunnel: The Vulcan was surveyed to cross-cut the formation and stands as well with one or two minor exceptions as when first opened, and is now opened to the breast.

Elevation at portal of Vulcan tunnel is 2,525 ft.

Towards the top of Vulcan Hill five or six adit tunnels have been driven on the vein to tap the silver-lead ore elsewhere mentioned.

All of the upper tunnels show more or less carbonate or sulphide lead-silver ore and three of them have been stopped to a greater or lesser degree.

At the time of this examination only one of them was accessible and that with difficulty. The other tunnels were caved with the timbers down either at their portals or at different points of their length. Two or more of these tunnels probably demonstrate the lime and granite contact mentioned elsewhere.

A number of shallow open cuts and quite short tunnels for prospecting purposes have been made along and up the slope of the mountain in the "iron" vein previously referred to, and at other points. These open cuts were closed at the time of this examination and inaccessible due to the surface alluvia and wash falling into the cuts.

The upper tunnels were driven as adit tunnels.

Ascending the mountain in a Northerly direction the first of these is found at an elevation of 3,100 ft.

Above this tunnel, and extending to an elevation of 3,325 ft., four adit tunnels have been driven on the vein.

It will be noted that within a vertical elevation of but 225 ft. five tunnels have been driven. The reason for the limited distance vertically between the upper tunnels was that the prospector and miner of former days avoided, in behalf of economy and to facilitate prospecting and extraction, high stopes.

These tunnels vary from 50 ft. or 60 ft. to 150 ft. or 175 ft. in length.

Vulcan Hill rises to an elevation of about 3,900 ft.

The cleavage planes of the quartz showing in the "cliff" exposures dip at an angle of about 80° toward the breast of the tunnel, hence a minimum distance for driving would be required.

This quartz exposure stands almost vertically and is so abrupt and well defined that locally it is termed the "quartz cliff".

ECONOMIC CONDITIONS

Transportation. A fair to good wagon road permitting of heavy truck haulage from the mine to the railroad can be operated for seven to eight months of the year. Total distance, 25 miles. This road is mountainous with three or four steep grades in places. All but a few
miles of it is hard surfaced, graded and ditched. Present trucking charges to the railroad are about $2.00 per ton.

Heavy machinery can be brought in without much difficulty, though at the inception of operations a construction type air compressor and engine coupled in one unit, would no doubt be used.

Housing and boarding for miners would be obtained in the small community of Lakeview -- two miles distant from the property.

Underground work can be carried on throughout the year and surface work for seven or eight months of the year. Winters are not severe though in some years there is considerable snowfall, especially at the higher elevations.

The two-mile stretch of road between Lakeview and the property, though steep in places can be kept open without difficulty the year round. Water by gravity can be brought a distance of about one-mile to the lower workings. The Vulcan tunnel makes some water. If an attempt were made to operate the upper workings, water would have to be pumped against a head of 100 ft. to 150 ft. for a distance of one-quarter to one-half mile.

Mining supplies are brought in from the town of Coeur d'Alene, Idaho about 40 miles distant or from Spokane, Wash. about 65 miles distant. The Northern Pacific R.R. runs westerly parallel with the Lakeview Mining District. Nearest point on the railroad is 24 miles.

RECOMMENDATIONS

The extension of the Vulcan tunnel for some 50 ft. to 100 ft. should bring it beneath the "quartz cliff" and yield valuable information as to the contact zone. Further extension of the tunnel should bring it to the contact zone between the granodiorite and lime north of the "quartz cliff". It is estimated that the extension of this tunnel, the breast of which is still in the granite, for from 50 ft. to 100 ft. should bring it 300 ft. vertically under this "cliff" outcrop.

This would give much information now unobtainable pertaining to the mineralization of the ground and information from which could be determined the warrant for extending the tunnel on for the purpose of further development.

The strike of the vein in the upper workings as nearly as can be determined is North 75° East. The course of the Vulcan (main) tunnel is North 20° West. Though this does not make it a true right angle cross-cut tunnel it is the belief of the writer that the original survey upon which this tunnel was projected was the best that could be done in order to take advantage of the topography (topography) for the purpose of getting depth and shortest distance in which to come under the showing in the upper tunnels and contact zones as above.

As the work progresses a careful accurate survey should be made of the surface salient features and after further study of the ground it might prove desirable to slightly vary the course of the tunnel to the Northwest or Northeast.

Currently with the above or after the "cliff" has been reached two or more of the upper tunnels might be opened with the object of determining whether sufficient silver-lead ore could be extracted at a profit sufficient to meet the cost of further development or from the investment standpoint. The opening of these tunnels would be a minor operation both as to expense and time consumed.

To open these tunnels no machinery would be required and no drilling called for. The only requirements would be timbers, lagging, rail and an ore car and hand tools. Two men could do the work.

Timbers can be cut above the tunnel and snaked in. Considerable advantage would accrue from this particular work in that a more accurate determination could be made as to the strike and dip of the vein, its uniformity and of the formation itself. If ore in quantity were found a side hill road upon easy grade, of from one-quarter of a mile to one-half mile in length could be constructed inexpensively from the workings to the road previously mentioned.

CONCLUSIONS

The particular purpose for the investigation and survey of this property was to determine the presence of and occurrence of a sufficient tonnage of molybdenite to warrant
opening the property i.e. of proving the presence of one or more of the ores of molybdenum in commercial quantities.

Though there is evidence in the upper workings to warrant the assumption that a silver-lead ore, under modern conditions of transportation and mining, could be developed and extracted at a good profit — especially in view of the current high price of lead and silver — but little attention has been paid to this aspect of the Vulcan Hill property.

The fact that one of the principal ores of molybdenum is graphite and the fact of the increase of specks of molybdenite and graphite as the Vulcan cross-cut tunnel is extended toward the previously mentioned quartz and iron outcrop and contacts between two or more formations as also toward the lead in the upper tunnels yields encouragement to the prognosis for the development of more or less a body of molybdenite.

It at least warrants and calls for the extension of the Vulcan tunnel for not less than 100 ft. and probably 200 ft. It would require an extension of about 1,000 ft. to bring it under the lead ores showing in the upper tunnels.

The elevation of the lowest of the upper tunnels is 3,100 ft. and that of the Vulcan tunnel 2,525; a difference vertically of 575 ft. would be gained by driving 1,000 ft. more or less. Then would be gained one foot in depth for each two feet driven horizontally — an ideal set-up for economical exploratory mining. The extension of the Vulcan tunnel for 1,000 ft. is considered as highly desirable — especially so should the first 100 ft. give the expected encouragement above indicated.

In view of the favorable mineralogical and geological conditions outlined under captions "Geology" and "Mineralogy" should a body of molybdenite ore carrying around 1.50% to 2% MoS₂, equivalent to .785% to 1.18% Mo -- molybdenum -- be developed, an operation here would prove extremely profitable.

(signed) Cecil G. Fennell, E.M. B.M.
Spokane, Washington
July 17, 1942.

ORE VALUES. ASSAYS.37

The key to the nine samples taken on this property (key and assay certificates attached) is self-explanatory.37

Sample #3, assay certificate dated June 4th, was taken in the Vulcan tunnel in order to ascertain whether there was any molybdenite in the 50 ft. back from the tunnel breast. It will be noted that nearly 1% molybdenite, equivalent to nearly half of 1% of molybdenum was found.

On this account Sample #5, assay certificate of July 14th, was taken by means of a special selection of graphite ore as explained in the key.

Both these showings may be considered as quite good, but it should be recognized that these were obtained from graphite knife-blade thick seams of which there is no commercial body in sight at the present time.

It was not to be expected that Sample #3, assay certificate of July 14th, or that Sample #2, assay certificate of June 4th, would show any values. These samples were taken, as explained in the key, as character samples to determine particularly whether the so-called "iron" showing carried any values or the "cliff" quartz carried any values at the surface.

It will be noted that the other samples taken were quite satisfactory as regards values as indicated in the key.

July 17, 1942

37This section was moved from the last page. It appears before the "Key To Samples" in one of the two copies of this document in IGS's Vulcan Mine file.

37The key describes only six samples. Copies of the assay certificates are not present in IGS's files.
VULCAN HILL MINE
KEY TO SAMPLES
taken July 8, 9, 12, 1942

The value of the base and precious metals in the following samples are gauged as follows:

Pb. 6¢ lb.
Zn. 8¢ lb.
Ag. $ .71 oz
Au. 35.00 oz

PUNJAB CLAIM
SAMPLE #1

This is a grab sample taken from pile of ore on the dump extracted in the last thirty days from tunnel #5 (the lowest in elevation of the upper tunnels) in the endeavor made to open this tunnel for examination. New caves occurred which prevented getting in beyond 50 ft. from the portal.

Pb. 6.2%
Zn. 1.1%
Ag. 12.5 oz
Au. None
Total value $18.07

SAMPLE #2

This sample was taken from the surface to determine whether or not the "iron capping" ledge carried a predominance in iron and if such iron carried any values.

Fe. 32.3%
Ag. None
Au. None

SAMPLE #3

This sample was taken from the surface along the quartz "cliff" to determine whether any values existed in the quartz at the surface.

Ag. None
Au. Trace

VULCAN CLAIM
SAMPLE #4

This sample was taken toward the breast of the Vulcan tunnel, mainly of narrow seams of iron pyrite to determine whether such iron pyrite carried any values.

Pb. None
Zn. 1.2%
Ag. .2 oz.
Au. None
Total value $ 2.06

SAMPLE #5

This was assayed for molybdenum only. It does not represent any body of ore, either molybdenite or graphite. The only way in which a sample could be obtained was by chipping knife-blade thickness of graphite plastered on the granite and quartz cleavage planes to yield sufficient graphite ore for assay purposes.

This sample gave molybdenite (MoS₂) 5.1%. Molybdenite carries approximately 59% of the metallic element molybdenum (Mo), hence this sample actually runs: Mo. 3%
MoS₂ 5.1%
Mo. 3 %
(No determination made for other values.)

139
SAMPLE #6

This is a grab sample from a few broken sacks and around a small dump and represents the ore shipped out over 30 years ago, referred to in the accompanying report. This ore was probably extracted from several of the "upper" tunnels.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pb</td>
<td>44.6%</td>
</tr>
<tr>
<td>Zn</td>
<td>7.7%</td>
</tr>
<tr>
<td>Ag</td>
<td>52.2 oz.</td>
</tr>
<tr>
<td>Au</td>
<td>None</td>
</tr>
<tr>
<td>Total Value</td>
<td>$102.90</td>
</tr>
</tbody>
</table>

Buel (1952, p. 1-2) examined the property for the U.S. Bureau of Mines:

The Vulcan-Silver (formerly the Vulcan) mine was examined last week in conjunction with preliminary examinations. All of the surface workings were not examined. Only workings in the immediate vicinity of the "intermediate level" and lower crosscut were examined. Most of the workings above the "intermediate level" are reported caved. One adit some distance from the "intermediate level" portal is said to be accessible.

The Vulcan-Silver is situated in T. 53-54 N., R. 1 W., and Secs. 35-2 respectively. Any ore shipped from the property would probably have to be trucked a distance of over 22 miles to Athol, Idaho, over well graded U. S. Forest Service roads with several long, moderate grades.

The property is believed to have been discovered and worked before the turn of the century. A shipment of fifty tons of concentrates, believed to be lead and silver, is reported in the literature.²⁵

The mine consists of 9 unpatented claims. T. M. Graney, the current operator, owns 3/4 interest. E. J. and H. C. Lannen each own a 1/8 share.

The property is thought to be in and near a limestone and granodiorite contact. The contact was not observed; however, its presence is evident from the limestone dump of one of the upper adits. A general structure section of the area shows a granodiorite fault block to be contiguous with limestone²⁴.

The geology of the district resembles in many respects that of the Coeur d'Alene district 30 miles to the southeast. The primary differences of the districts are the presence of greater abundance of igneous rocks and the development of massive faulting in the Lakeview district.

The veins of the district are mainly fillings of fissures and shear zones. Those of the mine are fissure fillings and replacement veins. The fissure filling veins are primarily quartz-calcite with pyrite, sphalerite, (marmatite) and very small amounts of galena. One quartz-calcite vein in addition to the above metallic minerals contained disseminated scheelite crystals. The scheelite was found along the entire strike of this 2'-4' vein. The average grade of the scheelite probably is below 0.1 percent. The replacement veins are in the form of seamlets and disseminations in the granodiorite. These veins are principally composed of pyrite.

The principal owner intends to try and interest some large mining company into buying or leasing the property. In the meantime, he is extending the present workings of the "intermediate level".

²⁴Contributions to Economic Geology, 1905. [Footnote in original. The article referenced is MacDonald (1906). The table cited lists ore (not concentrates) shipped from the various Lakeview mines.]

It is my opinion that the operator should continue to drift along the vein containing the scheelite in hopes of encountering the limestone contact. It is probable that this contact area may show favorable accumulations of scheelite in and along the limestone body. A few trenches placed normal to the structural trend (see map [Figure 21]) above the "intermediate level" may prove valuable in uncovering structural information relating to the deposit.

The October 9, 1952, edition of the *Wallace Miner* contained the following article on the mine:

Discovery of an important deposit of high-grade tungsten in the old Vulcan property in the Pend Oreille district of Bonner county was reported last week by Tom Graney, veteran Kellogg miner and prospector.

Graney said he opened the rich tungsten while prospecting for silver-lead ore and was unaware of the importance of his discovery until just recently. Bureau of Mines engineers have now confirmed the discovery and have also found tungsten ore on old dumps at the property, indicating that early day operators, who shipped high-grade silver-lead ore before the turn of the century, did not recognize the tungsten ore.

Development work has exposed the tungsten vein for over a quarter of a mile on the surface, Graney said. The faces of four different tunnels show good ore, and one drift, now in over 100 feet, has a full face of ore five feet wide, he reported.

Plans for mining and shipping the tungsten are now being worked out, he said.

Graney has been prospecting at the old property for the past seven years. In that time he has driven more than 1000 feet of prospect tunnels by hand-mining methods, he stated.

Kun (1974) noted that R. Glasscock worked the mine intermittently in the 1950s and 1960s and that the mine, which was caved at the portal in 1967, was reopened in 1968. No mention of the mine has been made since then.

The Vulcan Mine was visited by an IGS field crew during the summer of 1996 as part of a program to evaluate inactive and abandoned mines on U.S. Forest Service lands in northern Idaho. Bennett and Mitchell (1997) contains a detailed description of the mine at that time. Figures 28 and 29 show two of the adits at the mine.

The U.S. Bureau of Mines recorded production of half a ton of ore in 1951. This material yielded 14 ounces of silver, 201 pounds of lead, and 109 pounds of zinc. Metals produced from the pre-1905 production have not been recorded, nor is there a record of any ore produced at other times.

**HIDDEN TREASURE MINE**

The Hidden Treasure Mine (Figures 3 and 5) is southeast of the confluence of Kick Bush Creek and Gold Creek in the W½ sec. 11, T. 53 N., R. 1 W. In the summer of 1996, there were four adits and numerous prospect pits at the site. One adit was completely closed and the other three were caved an estimated 50 to 75 feet from the portals (Bennett and Mitchell, 1997).

The exact date when the Hidden Treasure was located is not known. In his report to the Idaho Inspector of Mines in 1905, owner John Cheer (Table 20) puts the date of the
Figure 28. Portal for the Vulcan tunnel, or lower crosscut, at the Vulcan Mine (Idaho Geological Survey photograph).
Figure 29. Partially caved upper adit at the Vulcan Mine (Idaho Geological Survey photograph). This is probably the adit labeled "intermediate level" on Figure 26.
Table 20. Companies operating at the Hidden Treasure Mine.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Officer</th>
<th>Date Incorporated</th>
<th>Charter Forfeited</th>
<th>Year(s) at Mine</th>
</tr>
</thead>
<tbody>
<tr>
<td>John W. Cheer</td>
<td>Sole Owner</td>
<td>---</td>
<td>---</td>
<td>(1905)-1911</td>
</tr>
<tr>
<td>Sandpoint Mining &amp; Development Co.</td>
<td>W.H. Brown, President and Manager</td>
<td>1</td>
<td>1</td>
<td>1911-1916(?)</td>
</tr>
</tbody>
</table>

1Information not available in Idaho Geological Survey's files.

original location as "about 1888"; a note on the U.S. Bureau of Mines production records stated the mine was located in 1903.

MacDonald (1906, p. 46) noted: "The Hidden Treasure claim is located on a fissure in limestone which is characterized by a fault of considerable displacement. It is being worked by an open cut which reveals galena of good quality." The mine had shipped 50 tons of ore and had another 50 on the dump. The average assay of the ore was $40 per ton (MacDonald, 1906). The owner reported gross receipts of $616.59 for the ore sold during the year. The 1905 IMIR (p. 78-79) stated: "the Hidden Treasure Mine made a shipment of a carload of rich ore during the past year and is undergoing development this winter. The mine produced a dry silver ore from a well defined quartz fissure in blue limestone near a contact with metamorphic sediments."

Silver-bearing lead ore was shipped from the mine in 1907. The Sandpoint Mining & Development Co. purchased the mine on February 1, 1911. A small shipment was also made in 1911.

During the year ending May 31, 1913, the mine shipped 55,321 pounds of ore to the ASARCO smelter in East Helena, Montana. The average value of the ore was $16.28 per ton. The company's costs per ton were about $10.00 for mining, $6.00 for treatment, and $2.25 for freight. Cash received for the sale of the ore was $387.44. Development at the mine included 40 feet of work on one tunnel and 60 feet of raising.

A fire in September 1915 consumed the buildings and tools at the mine. There is no further record of activity at the property.

The Hidden Treasure was visited by an IGS field crew during the summer of 1996 as part of a program to evaluate inactive and abandoned mines on U.S. Forest Service lands in northern Idaho. Bennett and Mitchell (1997) contains a detailed description of the mine at that time.

Between 1907 and 1912, the mine produced 51 tons of ore. This material yielded 1,977 ounces of silver and 364 pounds of lead. U.S. Bureau of Mines records note that an addition 65 tons of ore was shipped prior to 1907.
MAX DUNN PROSPECT (BLOODY SHIRT CLAIMS)

The Max Dunn Mine (Figures 3 and 5) is in Chloride Gulch in sec. 27, T. 53 N., R. 1 W. Based on information in IGS's mineral property files, this prospect appears to also have been known as the Bloody Shirt. In the summer of 1996, there were two adits at the site. One adit was open, and the other was caved at the portal (Bennett and Mitchell, 1997).

Depew (n.d., p. 1) wrote the following about the Bloody Shirt claims:

Consisting of five unpatented claims along the strike of the vein (N45°W) in Bonner County, Idaho. The claims were originally staked by a man who was later killed in an explosion at the mine, hence the name Bloody Shirt. After the claims had been idle for a number of years and had reverted back to public domain, Earl McDaniel staked and recorded the claims in his name. Since his death they have been in the possession of his widow Kathryn who has had the assessment work done each year as required by law.

The claims are situated in the Lakeview mining district and lay between the Keep Cool Mine and the Hewer Mine. Both of these properties are controlled by the Idaho Lakeview Mines Co. and Sunshine Mining Co.. Sunshine bought into the mines during recent years.

The workings, as near as this examination shows, consist of a winze, which has filled in and is now located within the confines of a dozer cut, and a horizontal adit which appears to be into or almost into the bottom of the winze. Lower on the hill there are two or three small tunnels all of which are closed.

The muck pile at the top of the hill seems to have been extracted from the winze and has considerable high grade material in it. The dump at the adit has a good showing of high grade ore also. The oxidized zone in the cut appears to be about five and one half to six feet in width while the width at the adit, sixty feet or so lower in elevation, is a measured seventeen feet.

Mrs. McDaniel's son and I spent the better part of two days at the claims with a dozer this past weekend (Sept 26-27) deepening the cut and attempting to reopen the adit which appears to be completely full. We also cut samples from the vein at the bottom of the cut and took a cross section grab sample from the rock on the winze dump. These samples are now at the mill met lab and will be assayed for silver, lead and antimony at least.

Mrs. McDaniel is quite willing to work out a suitable arrangement with Bunker Hill if the company is satisfied with the results of the assays. When Federal Resources were operating the Conjecture Mine which is in the vicinity of the Bloody Shirt claims, an assay sample was taken in the cut with values of twelve ounces of silver and seven plus percent of lead. No record of these assays were given to the McDaniels but were noted on the plat of the claims. These samples were taken over a five foot width of vein.

Figure 30 shows a sketch of the claims. There is no recorded production from this property.

SILVER LEAF MINE

The Silver Leaf Mine (Figures 3 and 5) is on the east branch of Gold Creek in the SE1/4 sec. 24, T. 53 N., R. 1 W. The mine is about 8 miles southeast of Lakeview. In the
summer of 1996, the site had three (or possibly four) adits, all of which were caved (Bennett and Mitchell, 1997). According to Kun (1974, p. 40), "The mine is located within chloritized silites and argillites of the Middle Member of the Wallace Formation."

It is not known when the Silver Leaf property was located. The original claims in the group (the Moonlight 1 and 2 claims) were under the control of the Silver Leaf Mining Co. in 1918 (Table 21). (Tables 22 and 23 show development at the property.) After the demise of the company, the claims were under the control of the company's statutory agent, Lee L. Smith, for at least the next decade.

Lessees shipped some silver-lead ore from the mine in 1925. The lease expired on January 1 of the following year.

The Silver Leaf Mines Corporation, which was organized in 1931, purchased a half interest in four claims of the Silver Leaf Group for 600,000 shares of stock, $500 in cash, and $9,500 payable in eight years; the company owned an additional six claims. After constructing camp buildings and installing a compressor and complete mining equipment, the company started underground work. A small amount of development work was done during the early part of 1932. Some development was also conducted in 1933.

The company leased the Keep Cool Mine in 1937 and concentrated its efforts on that property for the next decade. In 1940, the company staked an additional eleven claims between the Silver Leaf and Keep Cool properties. The lease in the Keep Cool was canceled in late 1946 or early 1947.

In 1951 the company did about 100 feet of development on the Silver Leaf property. The company retimbered the No. 3 tunnel and did a small amount of tunneling and bulldozer work in 1952.

Silver Leaf Mines Corporation's 1953 report to the Idaho Inspector of Mines noted:

Litigation was started by Mrs. Mary Smith of Lakeview, Idaho during the latter part of 1952 for non-payment of her one-half interest in several of the first mentioned mining claims [the company variously reported owning a half interest in either five or ten of the sixteen claims in the Silver Leaf Group]; the settlement of this litigation has not yet been fully decided, and therefore the Affiant sets forth the present facts, and makes no claims that these claims are wholly held by the corporation in accordance with the U. S. Mining laws and the laws of the State of Idaho.

The company lost its property in 1953. According to the company's report to the Idaho Inspector of Mines:

Litigation was started by Mrs. Mary Smith of Lakeview, Idaho during the latter part of 1952 of non-payment of her half interest in several of the first mining claims set forth, no settlement of this litigation could not be made due to the fact that relocation of the premises was made before a settlement could be made: therefore the holdings were lost to the company and its shareholders.

In its 1956 report to the Idaho Inspector of Mines, the company stated:

147
Table 21. Companies operating at the Silver Leaf Mine.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Officer</th>
<th>Date Incorporated</th>
<th>Charter Forfeited</th>
<th>Year(s) at Mine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver Leaf Mining Company</td>
<td>Lee L. Smith, Statutory Agent</td>
<td>January 12, 1918</td>
<td>December 1, 1919</td>
<td>1918-1919</td>
</tr>
<tr>
<td>Lee L. Smith</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>1923-1928²</td>
</tr>
<tr>
<td>Silver Leaf Mines Corporation</td>
<td>W.H. Latta, President</td>
<td>July 2, 1931; reinstated: July 2, 1934; charter amended: February 14, 1939</td>
<td>1933; no property: 1963</td>
<td>1931-1953</td>
</tr>
<tr>
<td>Mrs. Mary Smith</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>1953 (?)</td>
</tr>
<tr>
<td>Conjecture Mining Company</td>
<td>Donald E. Major, President</td>
<td>December 16, 1954</td>
<td>active: 1981</td>
<td>1956-</td>
</tr>
</tbody>
</table>

¹Information not available in Idaho Geological Survey's files.
²Information as listed in the IMIRs for the appropriate years; however, not all years may have been reported.

Table 22. Development work, number of men employed, and operating companies at the Silver Leaf Mine, by year.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Men Employed</th>
<th>Tunnels (feet)</th>
<th>Cross-cutting (feet)</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1918</td>
<td>2-3</td>
<td>---</td>
<td>200¹</td>
<td>Silver Leaf Mining Company</td>
</tr>
<tr>
<td>1931</td>
<td>2</td>
<td>100</td>
<td>---</td>
<td>Silver Leaf Mines Corporation</td>
</tr>
<tr>
<td>1951</td>
<td>2</td>
<td>70</td>
<td>30</td>
<td>Silver Leaf Mines Corporation</td>
</tr>
<tr>
<td>1952</td>
<td>2</td>
<td>25</td>
<td>---</td>
<td>Silver Leaf Mines Corporation</td>
</tr>
</tbody>
</table>

¹Combined figure for crosscutting and drifting.

The property was lost to Mrs. Mary Smith through failure [to] pay balance due on claims purchased from her, the other mining claims belonging to the company were also located and taken over by her, therefore all property was lost to shareholders.


148
Table 23. Cumulative development at the Silver Leaf Mine, by year. Information is from company reports to Idaho Inspector of Mines; discrepancies in numbers reflect inconsistencies in the original data.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Development (ft)</th>
<th>No of Tunnels</th>
<th>Total Length of Tunnels, Crossouts, and Drifts (ft)</th>
<th>No of Shafts</th>
<th>Total Length of Shafts (ft)</th>
<th>No of Raisas</th>
<th>Total Length of Raisas (ft)</th>
<th>No of Crossouts</th>
<th>Total Length of Crossouts (ft)</th>
<th>No of Drifts</th>
<th>Length of Principal Tunnels (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No. 1  No. 2  No. 3  No. 4  No. 5  No. 6  No. 7</td>
</tr>
<tr>
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<td>600</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
<td>- 300  - 300  - 300  - 350  - 350  -</td>
</tr>
<tr>
<td>1931</td>
<td>2,000</td>
<td>5</td>
<td>2,000</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
<td>120</td>
<td>300  820  300  300  350  -</td>
</tr>
<tr>
<td>1934</td>
<td>1,385</td>
<td>3</td>
<td>1,385</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td></td>
<td>300</td>
<td>300  785  -  -  -  -</td>
</tr>
<tr>
<td>1935</td>
<td>2,344</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>190</td>
<td>300  730  350  350  350  150  150</td>
</tr>
<tr>
<td>1937</td>
<td>4,500</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>190</td>
<td>300  730  350  350  350  150  150</td>
</tr>
<tr>
<td>1938</td>
<td>2,355</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>190</td>
<td>300  815  350  350  350  150  150</td>
</tr>
<tr>
<td>1939</td>
<td>2,345</td>
<td>12</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td></td>
<td>190</td>
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</tr>
<tr>
<td>1940</td>
<td>2,345</td>
<td>12</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td></td>
<td>190</td>
<td>300  815  350  350  350  150  150</td>
</tr>
<tr>
<td>1941</td>
<td>2,345</td>
<td>12</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td></td>
<td>190</td>
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</tr>
<tr>
<td>1942</td>
<td>2,345</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td></td>
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</tr>
<tr>
<td>1943</td>
<td>2,345</td>
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<td>1</td>
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<td>1</td>
<td>1</td>
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<td>1</td>
<td></td>
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</tr>
<tr>
<td>1944</td>
<td>2,345</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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</tr>
<tr>
<td>1946</td>
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<td>1</td>
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<td>1</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td>190</td>
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</tr>
<tr>
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<td>2,345</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td>-</td>
<td>- 300  - 300  - 300  - 350  - 350  - 190  300  815</td>
</tr>
<tr>
<td>1948</td>
<td>2,345</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>190</td>
<td>300  815  350  350  350  150  150</td>
</tr>
<tr>
<td>Year</td>
<td>Total Development (ft)</td>
<td>No. of Tunnels</td>
<td>Total Length of Tunnels, Crosscuts, and Drifts (ft)</td>
<td>No. of Shafts</td>
<td>Total Length of Shafts (ft)</td>
<td>No. of Raisers</td>
<td>Total Length of Raisers (ft)</td>
<td>No. of Crosscuts</td>
<td>No. of Drifts</td>
<td>Length of Principal Tunnels (feet)</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------------------------</td>
<td>----------------</td>
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<td></td>
<td></td>
<td></td>
<td>No. 1  No. 2  No. 3  No. 4  No. 5  No. 6  No. 7</td>
<td></td>
</tr>
<tr>
<td>1949</td>
<td>2,435</td>
<td>10</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>190 300 815 350 350 150 —</td>
<td></td>
</tr>
<tr>
<td>1950</td>
<td>2,500</td>
<td>10</td>
<td>—</td>
<td>0</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>190 300 815 350 350 150 —</td>
<td></td>
</tr>
<tr>
<td>1961</td>
<td>2,500</td>
<td>10</td>
<td>—</td>
<td>0</td>
<td>0</td>
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<td>190 300 815 400 350 150 —</td>
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<tr>
<td>1952</td>
<td>2,500</td>
<td>10</td>
<td>—</td>
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<td>1953</td>
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<td>—</td>
<td>190 300 815 350 350 150 —</td>
<td></td>
</tr>
</tbody>
</table>

1. Information not reported to Idaho Inspector of Mines.
2. This number probably includes information for the Keep Cool Mine as well as the Silver Leaf Mine.
The Silver Leaf Mine was visited by an IGS field crew during the summer of 1996 as part of a program to evaluate inactive and abandoned mines on U.S. Forest Service lands in northern Idaho. Bennett and Mitchell (1997) contains a detailed description of the mine at that time.

The only recorded production from the mine was in 1925. The mine shipped 18 tons of ore which yielded 608 ounces of silver, 4,626 pounds of lead, and less than 2 ounces of gold.

SHOSHONE SILVER MILL

The Shoshone Silver Mining Co. (Figures 3 and 5) began development work at the Weber Mine in 1976. Work continued the following three years at the Weber and Bloody Shirt properties, with the ore being milled at the site. The commodities of interest were silver and byproduct antimony.

In 1980, Shoshone Silver built a 100-tpd mill about 1 mile south of the Conjecture. During the year, the mill processed 600 tons of ore from the Weber and Keep Cool mines. The company also had an operating agreement with Lakeview Consolidated Silver Mines, Inc., and reopened the Idaho Lakeview Mine. Plans called for the completion of 700 feet of new tunnel at the Idaho Lakeview.

The company closed its mill and mining operations in 1981 because of declining metal prices. The mill had processed $54,000 worth of ore before this closure. In 1982 Shoshone Silver opened up and rehabilitated about 200 feet of old tunnel at the Idaho Lakeview Mine. A new leach circuit was installed at the mill (Figure 31). Mill feed was to come from the Weber, Keep Cool, and Idaho Lakeview mines. Six men were employed at the property, and mining was to resume when metal prices recovered. Shoshone Silver had an operating agreement with the Sunshine Mining Company on the Keep Cool and Idaho Lakeview mines.

Full operations were under way by June 1983 at Shoshone Silver's mill and mines. Oxidized ore from open pits at the Weber and Keep Cool mines was processed at the carbon-in-pulp leaching plant. The company sold 10,757 ounces of silver to Sunshine for refining by October. The company applied for a patent on the mill site during the year.

In 1984, the company crushed and stockpiled ore. The leach plant, completed in 1983, was not operated. The company planned surface work on the Weil group of claims, which are on an extension of the Hewer vein in the Idaho-Lakeview vein system.

Shoshone Silver Mining Co. continued development work and mill construction in 1985. Some new buildings were constructed, and a 200-tpd ball mill, purchased from the Galena mill, was installed. No active mining was conducted during the year because the company was waiting for an improvement in metal prices. There was a 10,000-ton stockpile of ore near the mill.

In 1987, Shoshone Silver Mining Co. drove a 500-foot-long exploration tunnel at the Idaho Lakeview, looking for a mineralized target found by drilling. The company had a
Figure 31. Shoshone Silver Mining Company's 100-tpd mill in the Lakeview mining district in 1982 (Idaho Geological Survey photograph).
98 percent interest in the Keep Cool group and a 100 percent interest in the Weber and Weil (Drumheller) group. The company did some trenching at the Idaho Lakeview mine in 1988, but was still waiting for better silver prices before resuming full operations.

Although still active, the millsite visited briefly by an IGS field crew during the summer of 1996 as part of a program to evaluate inactive and abandoned mines on U.S. Forest Service lands in northern Idaho. Bennett and Mitchell (1997) contains a detailed description of the site at that time (Figure 32).

LIME AND CEMENT OPERATIONS

Limestone was probably the first mineral commodity to be commercially exploited in the Lake Pend Oreille area. Prospectors staked a series of limestone claims on the east side of the lake in the fall of 1881. In the mid-1880s, A.S., G.R., and Robert Gray staked a number of claims near the mouth of Gold Creek (Table 24) and built several lime kilns. The Washington Brick and Lime Company purchased several of the Gray brothers' most productive claims in 1889 but concentrated its operations on the lime plant at Bayview (Renk, 1995).

In 1912 the International Portland Cement Company built a crushing plant at the Blue Slide lime placer. The 1913 IMIR (p. 192) noted, "Portland cement rock is now mined to the extent of several hundred tons a day in Idaho from extensive sources along the shores of Lake Pend d'Oreille, from where it is transported to Spokane, Washington, to be manufactured into the finished product." International opened another quarry west of town in 1919 and constructed a second crushing plant farther south along the lake shore. Both plants were operating at full capacity by September 1920, turning out 500 tons of limestone a day and employing 100 men (Renk, 1995).

International mined a large tonnage of limestone in 1924. The company was one of the two principal operators in the Lakeview district and one of the largest operations of its kind in the state. The company operated throughout 1925 and mined a large tonnage of rock, which was shipped to Spokane to manufacture cement. International's was the largest cement-rock producer in the state, a distinction the company retained for the next five years. The company's report to the Idaho Inspector of Mines noted that plans called for discontinuing underground operations and mining from a glory hole instead.

Operations continued at about the same level the following year.

In 1927 International greatly enlarged its mine plant and equipment. The company's production for 1928 was the largest tonnage of limestone it had ever produced in a year. This material apparently came from the claims south of Lakeview; the company did not list the northern claims as part of its holdings. The 1929 IMIR again reported record production for the year, but employment dropped to 23 (compared to 48 the previous year). In 1930, as a result of the collapse of the construction industry at the start of the Great Depression (Renk, 1995), the mine was closed. The equipment was removed and the operation completely abandoned by the following June.
Figure 32. Shoshone Silver Mining Company's mill in 1996 (Idaho Geological Survey photograph).
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Officer</th>
<th>Date Incorporated</th>
<th>Charter Forfeited</th>
<th>Year(s) at Mine</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.S., G.R., and Robert Gray</td>
<td></td>
<td></td>
<td></td>
<td>1884-1889</td>
</tr>
<tr>
<td>Washington Brick and Lime Company</td>
<td></td>
<td></td>
<td></td>
<td>1889-1912(?)</td>
</tr>
<tr>
<td>Spokane Portland Cement Company</td>
<td>G.M. Bell, Secretary</td>
<td>April 15, 1937</td>
<td>merged with Ideal Cement Co: October 1, 1954; charter forfeited: December 1, 1954</td>
<td>1943(?)-1954</td>
</tr>
<tr>
<td>Ideal Cement Co.</td>
<td></td>
<td></td>
<td></td>
<td>1954</td>
</tr>
<tr>
<td>Great Western Aggregates, Inc. (wholly owned subsidiary of Ideal Cement Co.)</td>
<td>C.B. Flick, Secretary</td>
<td>January 14, 1963</td>
<td>inactive: 1972</td>
<td>1963-1970²</td>
</tr>
</tbody>
</table>

¹Information not available in Idaho Geological Survey's files.
²Last date of record for company's involvement with this property.

In April 1943, the Spokane Portland Cement reported to the Idaho Inspector of Mines:

The company now owns the following lime placer mining claims in Bonner County, State of Idaho: Blue Peter, Wooden Lime, Big Buck and Big Ledge. These claims have not been operated in any way since the year 1930 and in fact all salvageable [sic] equipment and plant was removed from the property during that year. The company's activities in the State of Idaho consist of property holding only and it does not conduct operations of any kind within the State.

Concerning the same four claims, Great Western Aggregates, Inc., told the Idaho Inspector of Mines in 1963:

The four patented mining claims listed on page one of this report were originally acquired by the Spokane Portland Cement Co. This company was merged into Ideal Cement Co. on Oct. 1, 1954, and these claims have been transferred to Great Western Aggregates, Inc., which is a wholly owned subsidiary of Ideal Cement Co. Material for the manufacturing of cement was removed from this land by the Spokane Portland Cement Co. some years before it was dissolved. At the present time, this land is considered to be largely depleted. Distance and transportation facilities also make it difficult to use this land for a source of raw material in manufacturing cement, and for these reasons, there is little likelihood of any mining operations in this land in the foreseeable future.
Great Western apparently never operated the claims, and no mention of the company is made by the Idaho Inspector of Mines after 1970.

**BLUE SLIDE LIME PLACER (INTERNATIONAL PORTLAND CEMENT COMPANY PLANT #1)**

The Blue Slide Lime Placer (Figures 3 and 5) is on the shore of Lake Pend Oreille in sec. 34, T. 54 N., R. 1 W. It is identified as the Squaw Bay Limestone Deposit in Bennett and Mitchell (1997); however, this name is incorrect because "Squaw Bay" is the original name for what is now called "Scenic Bay" (Renk, 1995; Sampson, 1928). This confusion in the property name apparently originated in the U.S. Geological Survey's Computerized Resources Information Bank (CRIB) database.

Renk (1995) described the site as follows:

The cement plant north of Lakeview also was a major processing operation, as seen in a photograph from c. 1920s. Frame mill buildings moved down the hillside above what appears to be a large open bin at the lake's edge. Chutes extended out from this bin, over the water, to fill the railroad cars on the barges. Since the buildings and machinery have been removed, all that remains of this plant now are the extensive concrete foundations [Figure 33], along with some log supports, possibly used in a wharf. A large adit with timber and log cribbing is located immediately north of the plant foundations, although the entrance is partially blocked with a slide. The large limestone quarry remains as a visible scar about a quarter of a mile north of the plant, but most of the road connecting the quarry to the mill site has been lost due to rock slides and slumpage. . .

International established this crushing plant north of Lakeview in 1912, quarrying limestone just north of the plant and shipping processed stone via barge and railroad to the cement plant at Irvin near Spokane, Washington. A large frame building, c. three stories in height, housed the crushing mill which apparently moved materials with a gravity process from the upper levels to the lake shore. The plant was abandoned in 1931 and the buildings were removed sometime later, but the extensive concrete foundations and footings for the mill remain. The adit, with log and timber cribbing, is located immediately north of the foundations, and the quarry remains unaltered.

In addition to the early limestone production, 16 tons of zinc-lead-silver ore was shipped direct to a smelter from this mine in 1944. This yielded 249 ounces of silver, 93 pounds of copper, 4,515 pounds of lead, and 3,450 pounds of zinc.

In June 1995, two young men died in a pocket of bad air (carbon monoxide) in the adit. The U.S. Forest Service gated the entrance to the mine in September (Figure 34).

**LAKEVIEW LIMESTONE QUARRIES (INTERNATIONAL PORTLAND CEMENT COMPANY QUARRY)**

The Lakeview Limestone Quarries (Figures 3 and 5) are near the boundary of sec. 3 and 4, T. 53 N., R. 1 W. In the summer of 1996, there were three funnel-shaped pits in
Figure 33. Concrete foundations for International Portland Cement Company's crushing plant at the Blue Slide Lime Placer in 1996 (Idaho Geological Survey photograph).
Figure 34. Grated main adit at the Blue Slide Limestone Placer in 1996 (Idaho Geological Survey photograph).
the area (Figure 35). Each was about 80 feet deep and 100 feet in diameter (Bennett and Mitchell, 1997).

Renk (1995) described this site as follows:

When International expanded its quarrying and crushing operations in 1919, this quarry to the west of Lakeview was opened. The open pit operation contains two deep holes separated by a ridge of dark limestone. The quarries are dug into a north-facing hillside so that the south end is considerably higher than the north. The original access road enters the quarry area from the north but is now overgrown. The quarry operations were permanently abandoned in 1931 when the company shut down its Lakeview plants. There may be other quarries in the same area.

The plant associated with the southern quarries was described as follows (Renk, 1995):

Photos of the cement processing plant south of Lakeview show the large concrete bin topped with a frame gabled roof that has since collapsed. The crushing plant itself was a cluster of one and two-story frame buildings. A conveyor carried crushed rock from the plant to the top of the bin. Log cribbing along the lakeshore protected the plant from erosion. All that remains of this second plant is the large bin, a one-story concrete building, the large adit, and foundations and slabs from the processing plant. Rock slides have covered much of the road connecting the quarries above with the lakeside plant, and parts of the road have slid into the lake. . . .

By 1919, International's operations were successful enough to encourage the company to expand. Crews opened up a new quarry west of town and built a second crushing plant southwest of Lakeview along the shore. This plant, like the other, was abandoned in 1931 and only two structures remain. The first is a one-story poured concrete building with a concrete shed roof, four windows along the west wall, and a large opening with tracks bending toward the adit. The second is a large concrete holding bin, set right on the water's edge. Poured concrete walls rise two-thirds of the height, with wood cribbed walls above. The framework for what appears to be three chutes is attached to the north wall above the water. A large adit with log and timbered cribbing is dug into the hillside along the southeastern edge of the site, and concrete foundations and slabs from the crushing plant remain in the southwestern corner.
Figure 35. West lower pit of the Lakeview Limestone Quarries in 1996. This pit is 80 to 100 feet deep and is one of three such quarries at this site (Idaho Geological Survey photograph).
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