History of the Bear Top, Ione, and Orofino Mines, Shoshone County, Idaho

Victoria E. Mitchell

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CONTENTS

Introductory Note ........................................... vii

History of the Bear Top, Ione, and Orofino Mines, Shoshone County, Idaho .... 1

Introduction .............................................. 1

Bear Top Mine ........................................... 7

Orofino Mine ........................................... 25

Ione Mine ............................................... 29

References .............................................. 41

ILLUSTRATIONS

Figure 1. Location of the Bear Top, Orofino, and Ione Mines, Shoshone County, Idaho (U.S. Geological Survey Thompson Falls 1:100,000-scale map). .... 2

Figure 2. Topographic map of the Bear Top, Orofino, and Ione Mines, Shoshone County, Idaho (U.S. Geological Survey Thompson Pass 7.5-minute topographic map). ......................................... 3

Figure 3. Claim map of the area around the Bear Top, Orofino, and Ione Mines, Shoshone County, Idaho (Idaho Geological Survey mineral property files). .... 4

Figure 4. Geologic map and sections of the Murray area, Shoshone County, Idaho (Hosterman, 1956, Plate 57). ........................................... 5

Figure 5. Sketch map of the Bear Top Mine (Ransome and Calkins, 1908, Figure 23). .................................................. 10

Figure 6. Underground workings of the Bear Top Mine (Merger Mines Corporation progress report, 1937, p. 4). ...................................... 19
Figure 7. Adit on the No. 1 level of the Bear Top Mine (photograph by Earl H. Bennett, Idaho Geological Survey). ........................................... 21

Figure 8. No. 2 level and adit at the Bear Top Mine (photograph by Earl H. Bennett, Idaho Geological Survey). ........................................... 22

Figure 9. Adit on the No. 3 level of the Bear Top Mine (photograph by Earl H. Bennett, Idaho Geological Survey). ........................................... 23

Figure 10. Stope open to the surface from inside the No. 3 level of the Bear Top Mine (photograph by Earl H. Bennett, Idaho Geological Survey). .......... 24

Figure 11. Main level (the lower of two levels) at the Orofino Mine (photograph by Earl H. Bennett, Idaho Geological Survey). ......................... 27

Figure 12. Upper adit at the Orofino Mine (photograph by Earl H. Bennett, Idaho Geological Survey). ..................................................... 28

Figure 13. Sketch map of the Ione workings (Reed, 1944). .................................. 34

Figure 14. Map of the Ione No. 1 and No. 2 adits, Ione Mining Company, Shoshone County, Idaho (Fryklund and Erickson, 1954a). .................... 37

Figure 15. Lower (No. 2) adit at the Ione Mine (photograph by Earl H. Bennett, Idaho Geological Survey). ........................................... 39

Figure 16. Upper (No. 1) adit at the Ione Mine (photograph by Earl H. Bennett, Idaho Geological Survey). ........................................... 40

TABLES

Table 1. Companies and individuals operating at the Bear Top Mine. ................. 8

Table 2. Mine output and economic data for the Bear Top Mine for selected years, 1920-1924. ......................................................... 12

Table 3. Development work, number of men employed, and operating companies at the Bear Top Mine, by year. ..................................... 12

Table 4. Cumulative development at the Bear Top Mine, by year. ...................... 13
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 the Bear Top, Ione, and Orofino Mines, Shoshone County, Idaho

Victoria E. Mitchell

INTRODUCTION

The Bear Top, Ione, and Orofino mines are located on the south side of Bear Gulch about 7 miles east of Murray (Figures 1 and 2) on the Thompson Pass 7.5-minute quadrangle in secs. 6 and 7, T. 49 N., R. 6 E.. An associated millsite is in sec. 6, T. 49 N., R. 6 E., (Bennett and Mitchell, 1997). Claims in the vicinity of the mines are shown in Figure 3. The mines are in the Prichard Formation near the transition zone with the overlying Burke Formation (Figure 4; Hosterman, 1956; Umpleby and Jones, 1923; Cressman, 1989). The Prichard Formation in the Murray area was described as follows (Hosterman, 1956, p. 728):

In the Murray area the Prichard formation has been divided into two mappable units based on lithology. The two divisions are referred to as the upper part and the lower part of the Prichard formation. The term "lowest part," however, is misleading because the lowest part or base of the Prichard is not exposed in the Murray district. Therefore, the lower part of the Prichard formation includes all of the formation observed except the upper 1,800 feet.

Rocks of the Prichard formation underlie almost the entire drainage basin of Prichard Creek and its tributaries (pl. 57 [Figure 4]). In Bear Gulch about 9,000 feet of the lower part of

1Idaho Geological Survey, Main Office at Moscow, University of Idaho, Moscow.
Figure 1. Location of the Bear Top, Orofino, and Ione Mines, Shoshone County, Idaho (U.S. Geological Survey Thompson Falls 1:100,000-scale map).
Figure 2. Topographic map of the Bear Top, Orofino, and Ione Mines, Shoshone County, Idaho (U.S. Geological Survey Thompson Pass 7.5-minute topographic map).
Figure 3. Claim map of the area around the Bear Top, Oro Fino, and Lone Mines, Shoshone County, Idaho (Idaho Geological Survey mineral property files).
the Prichard formation is exposed in the core of the Trout Creek anticline. This lower part is about 75 to 80 percent dark-gray argillites and 20 to 25 percent light-brownish-gray fine-grained impure quartzites. The bedding is usually regular. Individual beds average 2 to 6 inches thick and are rarely more than 12 inches; but a few quartzite beds are as much as 5 feet thick. In many places argillaceous rocks are laminated, and the visibility of these laminae range from slight to pronounced. The individual laminae range in thickness from 0.01 to 10 millimeters and occur as alternating light-grey coarser grained layers and dark-grey finer grained layers. Pyrite is found along many bedding planes, and the limonite derived from the weathered pyrite coats the rock a moderate-brown color.

The upper part of the Prichard formation forms a transition zone between the lower part and the overlying Burke formation. It is well exposed along the ridge running northwest from Goose Peak, where it is about 1,800 feet thick; it is also exposed near the heads of Bear and Paragon Gulches and along both the East and West Forks of Eagle Creek. The upper part contains quartzite and argillite in roughly a 2 to 1 ratio, which represents almost twice as much quartzite as the lower part and about one-half as much quartzite as the Burke formation. The quartzite ranges in appearance from thin bedded, impure, and greenish gray near the base to thick bedded, pure, and light gray to white near the top. The argillite is thinly laminated; the dark-grey fine-grained material alternates with light-grey coarser grained material. The individual laminae are rarely more than 1 millimeter in thickness. The argillite beds are more abundant near the base and become fewer until they disappear near the top.

Hosterman (1956, p. 745-746) described the mines as follows:

The Bear Top, Ione, and Orofino mines are on the south slope above Bear Gulch, a tributary to Prichard Creek, about 7 miles east of Murray. The country rock at these mines is the lower part of the Prichard formation, which forms part of the east flank of the Trout Creek anticline and here strikes almost due north and dips steeply to the east. Although these mines are close together and are close to the mines in Paragon Gulch, each of them has opened up a different but almost parallel mineralized shear zone.

At the Bear Top mine three levels expose the vein, which strikes N. 45° to 65° W. and has dips ranging from 60° S. to vertical. The level consists of a 2,235-foot crosscut to the vein and 500 feet of drift along the vein. The middle level is 420 feet vertically above the lower level; it consists of a 450-foot crosscut to the vein and about 400 feet of drift along the vein. The upper level is 605 feet vertically above the lower level; it has a 40-foot crosscut to the vein and a drift about 50 feet in length along the vein. Some stoping has been done between levels and above the upper level. The mineralized shear zone is offset on the middle level by a nearly north-striking fault that almost parallels the bedding and displaces the western part of the vein to the north—a displacement that corresponds to apparent reverse faulting. The ore minerals are galena and some sphalerite and chalcopyrite in a gangue of quartz, pyrite, and carbonate minerals. The vein is reported to have had, in places, a seam of pure galena up to 10 inches thick. Production figures for the Bear Top mine are not available, but the mine has been worked periodically since about 1900.

At the Ione mine, two levels expose a mineralized shear zone striking N. 70° E. and dipping about 65° SE. The lower level has a 700-foot crosscut to the vein and about 50 feet of drift along the vein. The upper level is 147 feet vertically above the lower level, and its portal is in the gully to the west of the lower level portal. The upper level has a 250-foot crosscut to the vein and about 60 feet of drift along the vein. An inclined raise was driven on the vein from the lower level to the upper level. The mineralized shear zone is offset, the west side to the north, by a north-striking fault on the upper level; the displacement corresponds to apparent reverse faulting. The ore minerals are galena and a little sphalerite in a gangue of
quartz and a carbonate mineral. The vein, as seen in the raise, ranges from about 3 to 10 inches in width. Production from the Lone mine has been very small to date, but some high-grade ore, mainly from the raise, has been carefully sorted on the dump. It has been reported that a small vein containing antimony has been found about 500 feet south of and almost parallel to the Lone shear zone.

The Orofino mine is directly down slope from the Lone mine, and its two levels expose a vein that strikes from N. 60° W. to N. 80° E. and dips 50° to 60° S. The lower level consists of a 950-foot crosscut to the vein and about 400 feet of drift along the vein. The upper level is about 197 vertically above the lower level, it consists of a 300-foot crosscut to the vein and about 150 feet of drift along the vein. Considerable staking has been done between the two levels and above the upper level. Like the Bear Top and Lone shear zones, the Orofino shear zone is offset by a north-striking fault that parallels bedding and displaces the western part of the mine, the displacement indicates reverse faulting. The ore minerals are galena and sphalerite in a gangue of quartz and a carbonate mineral. Production figures for the Orofino mine are not available, but, considering the size of the stopes, this mine was probably the largest producer in Bear Gulch.

**BEAR TOP MINE**

The Bear Top Mine is on a tributary to Bear Gulch at an elevation of about 4,800 feet (Figures 1, 2, and 4). It is the middle in elevation of the three mines in this area.

When the Bear Top was discovered has not been recorded. The first mention of the lead-silver mines in the Murray area noted that railway transportation was needed for these mines to market their ore (1903 IMIR). By 1904, the IMIR (p. 119) noted:

> The north side mines near Murray, especially the Monarch and Bear Top, shipped several cars of crude, high-grade, lead-silver ore during the year. Both of these properties have considerable development, fine ore bodies shown up, and are each installing a concentrating mill at the present time and are likely to furnish an important tonnage of mineral during 1905.

The Bear Top Mining Company (Table 1) developed the mine and turned out a good product through its mill in 1905. According to the 1905 IMIR (p. 129-130):

> The Bear Top and Black Horse also made shipments of high-grade lead-silver mineral and carry the earmarks of greatness, as important sources of this class of ore. A new railway branch has been surveyed to tap this part of the district from the O. R. & N. Ry. at the mouth of the North Fork of the Coeur d'Alene River, and from present indications is likely soon to be built and give this part of the Coeur d'Alenes an outlet that will result in its rapid development in a mineral way, for it certainly has the goods and can produce an important tonnage of railway traffic from the start.

In 1906, the Bear Top Mining Company put in new concentrating machinery and a boiler plant. The capacity of the old mill was increased and a long crosscut tunnel was started near the mill. The 1906 IMIR (p. 149) reported:

> The Bear Top is equipped with a small concentrator and made an important production of shipping mineral during the year. Its management is now pushing some deep
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Officer</th>
<th>Date</th>
<th>Charter</th>
<th>Year(s) at Mine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moses Simmons (original locator)</td>
<td></td>
<td>---</td>
<td>---</td>
<td>unknown</td>
</tr>
<tr>
<td>Bear Top Mining Co.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1905-</td>
</tr>
<tr>
<td>Bear Top &amp; Orofino Consolidated Mining Co.</td>
<td>1</td>
<td>1911</td>
<td>1</td>
<td>1911- (? )</td>
</tr>
<tr>
<td>Henrietta Exploration Co.</td>
<td>C.W. Simmons, President</td>
<td>August 11, 1917</td>
<td>December 1, 1924</td>
<td>1917-1922 (?)</td>
</tr>
<tr>
<td>Bear Creek Mining Co.</td>
<td>L.L. Sweet, President</td>
<td>August 21, 1916</td>
<td>November 30, 1923</td>
<td>1920-1921</td>
</tr>
<tr>
<td>F. Cushing Moore</td>
<td></td>
<td>---</td>
<td>---</td>
<td>1923-1925</td>
</tr>
<tr>
<td>Northwestern Silver &amp; Lead Corporation</td>
<td>O.J. Jordan, President; F. Cushing Moore, Manager</td>
<td>January 16, 1925</td>
<td>December 1, 1925</td>
<td>1925</td>
</tr>
<tr>
<td>Bear Top Lead Mines</td>
<td>Marguerite Schick</td>
<td>August 28, 1928</td>
<td>---</td>
<td>1930</td>
</tr>
<tr>
<td>Ray Simmons (lessee)</td>
<td></td>
<td>---</td>
<td>---</td>
<td>1962-1964</td>
</tr>
<tr>
<td>Silver Crystal Mines, Inc. (lessee)</td>
<td>Marvin E. Darrow, President</td>
<td>August 28, 1968</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

1 Information not available in Idaho Geological Survey's files.
2 Active on last date for which information is available in Idaho Geological Survey's files (1981).
development that is likely to warrant a much larger mill, and with railway transportation into this part of the Coeur d'Alenes, which seems very likely of accomplishment at an early date, it will doubtless contribute a very important output of lead production in the future.

Ransome and Calkins (1908, p. 190-191) described the mine as follows:

The Bear Top mine is about 5 miles east of Murr, on the north side of the ridge that separates the head of Paragon Gulch from Bear Gulch. The principal workings at the time of visit comprised a tunnel of 450 feet to the lode and drifts on the lode aggregating between 200 and 300 feet in length.

The lode is a rather irregular zone of fissuring which cuts the alternating quartzite and silt beds of the upper Prichard at a large angle, the strike of the lode being about N. 70° or 80° W. and the general strike of the beds being north. The beds dip eastward at angles ranging from 70° to 80°. The lode apparently dips to the south. As a rule these beds are sharply flexed and even brecciated close to the fissure zone. This zone is not continuous, but is offset by nearly north-south fissures which in some places probably corresponds to the bedding planes. Some of the movement along these cross fissures is apparently later than the ore deposition, but some may have been earlier. So far as the small extent of the present workings allows generalization, the lode is apparently offset to the right as one goes east, a displacement that would correspond to reverse faulting. In consequence of this structure the ore occurs in bunches, the largest body exposed in 1904 being that where the tunnel cuts the lode. This is roughly triangular in plan, with sides about 30, 40, and 50 feet in length. (See fig. 23 [Figure 5].) On the east this body is apparently cut off by a bedding fault or perhaps by the surface of a bed not favorable to mineralization, and is succeeded by a barren interval of over 100 feet. Beyond this interval a 10-inch vein of nearly solid galena was exposed at the end of the east drift at the time of visit.

The ore occurs partly as the filling of fissures, but largely also as a replacement of the quartzite beds which are abundant in this part of the Prichard. It consists of galena, associated with sphalerite, pyrite, chalcopyrite, and calcite. No siderite was noted. As sorted for shipment it is said to carry up to 72 per cent of lead and 4 to 18 ounces of silver to the ton. A carload shipped in 1904 carried 6 ounces of silver and 72 per cent of lead. As in most of the lead-silver prospects in the Prichard formation, the galena is relatively low in silver.

The mine was equipped in 1904 with a sawmill and compressor, run by water. A concentrating mill of 50 tons capacity, also to be run by water power, was in process of construction. The Bear Top was productive in 1906.

Crude ore and a number of cars of high-grade lead-silver concentrate, processed in the company's 60 tons-per-day (tpd) mill, were shipped to the smelter in 1907. The ore and concentrate had to be hauled by wagon over the divide between the drainages of Prichard Creek and the South Fork of the Coeur d'Alene River. The mine was developed by a level driven from the surface, which crosscut the veins. All of the machinery was run by water power. No ore was shipped the following year, but predictions were made of large output once the railroad was closer to the mine area.

During 1909, the Idaho Northern Railroad was completed to 6 miles east of Murray. The largest shipper from the area was the Bear Top. The mill was overhauled and operated in July. The 1909 IMIR (p. 124-125) noted:

North and east of the Monarch property, about four miles, the Bear Top Mining Company is operating its property and making steady shipments from its mill. The ore occurs
Figure 5. Sketch map of the Bear Top Mine (Ransome and Calkins, 1908, Figure 23).
in a broad but short lenticular deposit, in dark argillaceous shale or slate. The ratio of silver to lead is about the same as that of the Monarch ore [1.07 ounces of silver per ton for the Bear Top ore]. The property is developed by several tunnel workings, the ore from the lower one of which is transmitted to the mill by an aerial tramway. The mill has been operated during the greater portion of the year and has made about a $21,000 production.

Both crude ore and lead concentrates were shipped from the mine in 1910. The following year, the Bear Top was consolidated with the nearby Orofino Mine. The 150-tpd mill produced rich lead concentrates for a short time. The 1911 IMIR (p. 126) commented: "The Bear Top resumed operations in the fall after a shutdown, but suspended its work of milling on account of lack of water power." The Bear Top mill operated in 1912, producing rich lead concentrates, and some ore was shipped in 1913.

The Bear Top made one shipment of ore in 1915. On July 15, 1917, the Henrietta Exploration Company took a five-year lease and bond on the Bear Top, but the company later assigned its interest in the lease to the Bear Creek Mining Company. Henrietta Exploration shipped lead ore from the mine in 1917. A small amount of ore was produced from the mine in 1918, but a washout on the Murray branch of the Oregon-Washington Railroad & Navigation Co. prevented shipments for part of the year.

In 1920, crude ore and concentrate were shipped from the Bear Top Group by the Bear Creek Mining Co. (Table 2). This company owned the Orofino claims and held the Bear Top Group under lease and bond. The purchase price for the Orofino Group was $15,000. The total amount due on the lease on the Bear Top was $80,000 to the original owners and $20,000 to the original lease holders (the Henrietta Mining Company). The capacity of the mill was about 100 tpd. The 1921 IMIR (p. 89) noted: "Considerable ore was developed and extracted during the year, but the cost of transportation prohibited shipment." (Tables 3 and 4 show development at the mine.) According to the September 18, 1922, issue of Mining Truth (p. 15): "Two men are working at the property of Bear Creek Mining Co., north Coeur d'Alenes. A considerable tonnage of ore is reported as being in sight."

Childs described the Bear Top as follows (1923, p. 1-4):

The Bear Top mine was visited by me in company with Mr. F. Cushing Moore, of Spokane and Mr. Wm. Wiley of Murray.

The Bear Top mine is situated about two miles up Bear Gulch and 6½ miles from Murray, Idaho.

It is reached by a wagon road that is in good shape for 4½ miles east of Murray but the road up Bear Gulch is quite steep in order to get to an old hydraulic ditch line, known as the California ditch, which has been converted into a road.

The road where it follows the ditch line is nearly level, but is very narrow and would have to be widened out to make it passable in the winter time. The old road in the bottom of the gulch has been washed out by a cloud burst.

The country has been fire swept, so that the only timber available is dead timber, which is still in fair condition.

Water power has been used to run the mill, but the flume has been broken down in several places by the snow, so that electric power from Murray would be more economical to install.
Table 2. Mine output and economic data for the Bear Top Mine for selected years, 1920-1924.

<table>
<thead>
<tr>
<th>Year</th>
<th>Material Shipped During the Year (tons)</th>
<th>Average Value per Ton</th>
<th>Transportation and Treatment Costs per Ton</th>
<th>Silver Recovered (ounces)</th>
<th>Lead Recovered (pounds)</th>
<th>Gross Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920</td>
<td>262.16</td>
<td>$76.78</td>
<td>$24,188</td>
<td>1,216.74</td>
<td>329,508</td>
<td>$20,127.80</td>
</tr>
<tr>
<td>1924</td>
<td>28.4</td>
<td>$79.59</td>
<td>$19.53</td>
<td>119.3</td>
<td>30,274</td>
<td>$2,259.64</td>
</tr>
</tbody>
</table>

1Data from report to the Idaho Inspector of Mines, dated June 29, 1921.
2Net smelter returns for the year were $1,686.57.

Table 3. Development work, number of men employed, and operating companies at the Bear Top 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>1921</td>
<td>12</td>
<td>11</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>Bear Creek Mining Co.</td>
</tr>
<tr>
<td>1925</td>
<td>6</td>
<td>--</td>
<td>100</td>
<td>165</td>
<td>215</td>
<td>Northwestern Silver &amp; Lead Corporation</td>
</tr>
</tbody>
</table>

1The company noted that it did not keep any accurate record of the work done during the year.

The country rock is Prichard slate, but the mine is near to the contact of the Burke quartzites to the east.

The ore occurs in middle Prichard quartzite, which is a white quartzite with a width of from ten to fifty feet.

The No 1 tunnel runs in on this white quartzite outcrop and small patches of ore are shown for 50 feet. There is a streak of ore that runs nearly east and west 25 feet on both sides of the cross cut, and is near to the hanging wall of the quartzite.

The vein to the east runs into this slate and stops, and to the west the ore has not been explored for more than 25 feet as it is too small to stope, although of a good grade of ore and very little zinc.

The silver content of the Bear Top is very low, being about 6 ounces of silver to 50% lead.

Near to the No. 1 tunnel a raise comes to the surface from the Simmons stope and a small amount of ore is shown in the raise of about one foot of a good grade of ore.

The twelfth floor of the Simmons stope is open except a portion of the west end, and this stope has been worked for 60 feet long and 15 feet wide. A small amount of ore is still left, but it is of rather a low grade and not more than a couple of feet wide in the top of the
Table 4. Cumulative development at the Bear Top 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 Rises</th>
<th>Total Length of Rises (ft)</th>
<th>No. of Crosscuts</th>
<th>No. of Drifts</th>
<th>Length of Principal Tunnels (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1923</td>
<td>4,020</td>
<td>3</td>
<td>5380</td>
<td>--</td>
<td>--</td>
<td>3</td>
<td>600</td>
<td>3</td>
<td>3</td>
<td>40 400 1,400</td>
</tr>
<tr>
<td>1924</td>
<td>1</td>
<td>3</td>
<td>3040</td>
<td>--</td>
<td>--</td>
<td>3</td>
<td>--</td>
<td>3</td>
<td>3</td>
<td>60 400 2,000</td>
</tr>
<tr>
<td>1925</td>
<td>3,640</td>
<td>3</td>
<td>3,040</td>
<td>--</td>
<td>--</td>
<td>3</td>
<td>600</td>
<td>3</td>
<td>3</td>
<td>40 400 1,400</td>
</tr>
<tr>
<td>1926</td>
<td>1</td>
<td>3</td>
<td>3040</td>
<td>--</td>
<td>--</td>
<td>3</td>
<td>--</td>
<td>3</td>
<td>3</td>
<td>60 400 1,400</td>
</tr>
<tr>
<td>1927</td>
<td>4,225</td>
<td>3</td>
<td>3,325</td>
<td>--</td>
<td>--</td>
<td>5</td>
<td>900</td>
<td>10</td>
<td>5</td>
<td>100 625 2,600</td>
</tr>
<tr>
<td>1928</td>
<td>4,225</td>
<td>3</td>
<td>3,325</td>
<td>--</td>
<td>--</td>
<td>5</td>
<td>900</td>
<td>10</td>
<td>5</td>
<td>100 625 2,600</td>
</tr>
<tr>
<td>1929</td>
<td>4,800</td>
<td>3</td>
<td>3,000</td>
<td>--</td>
<td>--</td>
<td>9</td>
<td>1,800</td>
<td>8</td>
<td>3</td>
<td>100 625 2,600</td>
</tr>
</tbody>
</table>

1Information not reported to Idaho Inspector of Mines.
2Report dated January 1, 1925.
3Report dated December 31, 1925.
4The mine also had two intermediate levels. The 100 intermediate level was 100 feet below the No. 1 tunnel and was 150 feet long; the 400 intermediate tunnel was 400 feet below the No. 1 tunnel and was 400 feet long.
5There was one intermediate level, which was 200 feet below the No. 2 tunnel and was 212 feet long.
A cross cut has been run into the foot wall until the slate was encountered and this shows a streak of ore a foot wide of milling grade that is in the quartzite and parallel to the main ore body. No work has been done to prove this ore.

On the east end of the 12 floor there is a fault that cuts the ore body and quartzite in a north west and south east direction, and going east displaces the ore body to the hanging wall or to the south.

A drift on this floor to the east has a small cross cut to the foot wall that shows a little ore. This drift is supposed to almost connect with the Brucker stope, as shown on the accompanying maps².

A raise through the stope connects with the No. 2 level, 400 feet in from the portal, where the Simmons ore was encountered, which was of a large size and good grade. The ore is still in the white quartzite but faulted by the fault that was shown in the 12 floor of the stope. The development work on this level follows a seam in the slate, which intersects the faulted portion of the vein to the east and where the Brucker stope was opened up.

The importance of the quartzite as carrying the ore does not seem to have been recognized at the time the development work was done, and seams in the slate were followed instead.

The Brucker stope was so caved as to be unsafe to enter, but while narrower than the Simmons stope, has a history of good ore production.

A vertical winze was sunk in the foot wall of the Simmons stope for a distance of 50 feet and then connected to the No. 3 level by a raise. This raise cuts three feet of ore 80 feet below No. 2 level, that is all high grade, but does not follow the ore.

The lower portion of the raise is in the hanging wall of the ore as is the intermediate. The No. 3 level did not encounter the Simmons ore body as the cross cut is too far to the west to cut the ore as it rakes to the east as it comes down. By drifting, the portion of the ore body corresponding to the Brucker stope was found on the other side of the fault mentioned before, and this ore body was called the Keibler stope. The quartzite was not followed in the work done to the east of this stope, and the drift is all in slate and in the foot wall of the vein.

The Simmons ore should be to the north of the present drift and a couple of drifts in that direction did not go far enough to encounter the quartzite or the ore as they are still in the slate.

The work to the west of the main cross cut is all in slate and shows no ore.

In the Lujens intermediate no ore was found except where it broke into the Keibler stope, but at this place for 10 feet long there is first class ore a couple of feet wide. The Keibler stope was not safe to enter, but on a former visit to the stope the ore in the top of the stope had been offset to the hanging wall, but a raise had recovered the ore again, where it showed a foot of high grade ore.

The mill of about 100 tons capacity is in good shape and by installing electric power would be almost in shape to run.

The tramway from the No. 3 level is in good shape except one tower that would need repairing.

The concentrates from the mill would have to be hauled to Delta, a distance of about 13 miles to reach the railroad.

Conclusions:-

The Bear Top mine has some good possibilities, which a little development work should demonstrate. A few feet of cross cutting should open up the Simmons ore body on the No. 3 level, which would have 400 feet vertically of ground on this ore body. Above the

²These maps are not included with the copy of this report in the Idaho Geological Survey's files.
Keibler stope there should be at least 125 feet of ground to the bottom of the Brucker stope, as the raise shows ore above this stope. A good showing on the No 3 level would justify the running the No. 4 level from the top of the mill which would be 500 feet lower than the No. 3 level. The drift to the east on the 12 floor of the Simmons stope should strike the Brucker stope and there is 125 feet above this to the surface.

The plans of Mr. Cushing Moore are to do development work by hand this winter and if the work shows good ore to do more extensive work in the spring and put in power.

In his December 1923 report to the Idaho Mine Inspector, F. Cushing Moore noted:

The Bear Top Mine has just been taken over by me after being idle for several years. Total production to date not available but somewhere between $300,000 and $500,000. Property well developed and equipped outside of repair work and installation of electric power. Much ore available for mining with small amount of development. Property has been poorly managed in the past.

A flume supplied water to the mill under a 420-foot head. Equipment in the mill included a crusher, rolls, four jigs, and three tables. The replacement value in 1923 was given as $50,000, and the construction date for the mill was given as between 1904 and 1911. The aerial tramway from the mine to the mill was 3,000 feet long.

In his report to the Idaho Inspector of Mines, Moore described the 1924 activities at the mine as follows:

During the year we have repaired the surface plant and installed an electric power line from the Washington Water Power Co.'s line to Murray at the mouth of Bear Gulch to the mill 3½ miles. The compressor at the mill is supplying air for underground development. Actual development work underground was started on the first of the year [1925]. During the past year some hand work was done underground and one car of handpicked ore was shipped. No repair work has been done on mill as yet + no power installed in mill [sic].

It should be noted that both the IMIR and the USBM Yearbook chapter for 1924 credit the year's activities to the Northwestern Silver & Lead Corporation. However, this company was not incorporated until January 16, 1925.

The April 6, 1925, issue of Mining Truth (p. 17) noted:

As soon as the conditions of the roads will permit ore shipments will proceed from the Bear Top mine, seven miles from Murray on Bear creek. F. Cushing Moore, a Spokane mining engineer, William Wylie and associates have the property under lease and bond. The work which has blocked out sufficient ore to place the mine in the shipping class has been under the direction of F. Cushing Moore. The ore is lead-silver and large tonnage is said to be available. The property is equipped with compressor and other machinery.

Northwestern Silver & Lead Corporation worked the Bear Top for most of 1925. The company shipped several cars of rich lead ore from Prichard, the terminal of the
Murray branch of the Oregon-Washington Railroad & Navigation Co. Work at the mine was discontinued on December 15, and the lease was forfeited.

A lessee shipped a car of sulfide ore from the Bear Top in 1928. In 1929, a little development was done and the mill was rebuilt, increasing its capacity to 200 tpd. A car of sulfide ore was shipped the following year, and lessees shipped first-class lead ore from the mine in 1931.

The USBM listed Bear Top Mining Co. as the operating company in 1929, but it appears the correct name for the company was Bear Top Lead Mines (1931 IMIR). To further complicate matters, Merger Mines Co. (which took over the mine sometime during the period between 1929 and 1931) was actively selling stocks, but had not filed the appropriate paperwork with the State of Idaho. This provoked the following from the Idaho Inspector of Mines (1930 IMIR, p. 243-244):

Stock salesmen represented that this company's property was located in Evolution district. . . . An active stock-selling campaign has been maintained for two years and stock assessments have been levied during this period, two of 5 mills each having been levied in 1930; one on June 18, the other on October 24. It is not known whether any of the stockholders questioned the legality of the assessments or not. The newspaper notices of the June assessment were signed by George H. Walters, as secretary; notices of the October assessment were signed by L. A. White, as secretary.

The 1931 IMIR (p. 235) expanded on this theme:

[Merger Mines Co.] Has never filed the reports required by law, although many times requested to do so. A stock assessment of 5 mills, which was levied on Jan. 19, 1931, gave the name of L. A. White, Wallace, as secretary. A letter from the president of the Aetna Mines Corporation, addressed to the inspector of mines, stated that this company was a consolidation with the Aetna Mines Corporation and the Bear Top Lead Mines, and that the Aetna Mines Corporation was bringing suit to withdraw from the contract agreement. The records in the secretary of state's office show that a Bear Top Lead Mines was incorporated Aug. 28, 1928, and that its charter was forfeited on Dec. 1, 1930. Bear Top Lead Mines has never filed reports with the inspector of mines as required by law, consequently it is unknown to the inspector. The reason why Merger Mines Corporation has consistently refused to file the reports required by law, yet has actively engaged in the sale of stock and the levying of stock assessments is unknown to the inspector, and it is not known whether any of the stock holders have questioned the legality of the assessments or not.

Concerning work at the mine during 1931, the April 16, 1931, issue of Mining Truth (p. 11) ran the following story:

Merger Mines Corporation plans to install electric drilling and other equipment this summer at the Beartop property, six miles northeast of Murray. Leasers have worked the past winter, and have five carloads of broken ore in the chutes. This is high-grade stuff, running from 65% to 70% lead, according to Ray Simmons, one of the leasers, whose father, the late Moses Simmons, was an original owner. The high-grade occurs in a three-foot shoot out by an upraise connecting the No. 2 and No. 1 tunnels. Shipments will proceed about the middle of May. There is a power line to the Beartop, built several years ago by the Washington Water Power Company, before the Merger Mines became interested in the mine.
The 1932 IMIR (p. 234) noted:

The company reported: "This company holds possessory title to the Aetna group of lode claims and owns the controlling interest in the Bear Top group." ... A letter dated Oct. 18, 1931, from the secretary of Aetna Mines Corporation, addressed to the Inspector of Mines, stated in effect that the Merger Mines Corporation was a consolidation of the Aetna Mines Corporation and the Bear Top Lead Mines, and that the Aetna Mines Corporation was bringing suit to withdraw from the contract agreement. A small amount of work was done and a small tonnage of ore produced and marketed by lessees at the Bear Top group. A stock assessment of 5 mills was levied on June 21.

This stock assessment raised $2,491.77. One car of rich lead ore was produced from the Bear Top in 1933 and two cars of lead ore were shipped the following year. Ore shipments for the year ending May 31, 1934, netted the company $2,209.07.

The February 1935 issue of Northwest Mining (p. 6) noted:

Merger Mines Corporation, which holds the Bear Top mine on the north side of the Coeur d'Alenes and the Aetna prospect in the dry belt, has a reorganization and refinancing plan before it. ... The Bear Top is primarily a lead mine and cannot be operated at present metal prices.

On November 4, 1936, Merger Mines reduced the par value of its common stock from $1.00 per share to 10¢ per share; the 100,000 shares of preferred stock remained valued at $1.00 per share. This decreased the company's capitalization from $3,000,000 to $490,000.

A "progress report" issued by Merger Mines Corporation on April 1, 1937 (p. 3), contained the following description of the property:

MERGER BEAR TOP LEAD MINE

The lead properties owned by the Corporation consist of the Bear Top mine, located in the Coeur d'Alene mining district, Shoshone County, Idaho, a short distance from the noted Jack Waite mine and only a few miles from the center of one of the most prolific and profitable mineral producing areas of the entire West.

POWER

The mine is most favorably situated with respect to power facilities. A high tension line of the Washington Water Power Company passes directly over the lower end of the property; this provides an unlimited quantity of low cost continuous electric power for mine and mill operations.

GEOLOGY

The Merger Bear Top Lode, an unusually strong, persistent [sic] and well mineralized fissure, traverses the entire length of the group. It lies largely in Burke quartzite, the most favorable ore-bearing formation of the Coeur d'Alene district; it cuts the bedding planes at a high angle with a strike of N. 70 deg. W., to 85 deg. W., dipping 45 to 65 deg. S. Ore bodies occur in the vein as replacement deposits of lead, silver, and zinc sulfides. The content of the high grade ore runs approximately 80% lead.

VALUES

Values in Bear Top ores are far above the average for the Coeur d'Alene district, while size and extent of ore bodies compare more than favorably with those of the largest
producers and dividend payers of the same area at parallel stages of development. Commercial values are in lead, with some accompanying silver and gold. Zinc is present but sorts free in mining from the other ore; and decreases in quantity at lower levels. On the other hand, the more valuable gold and silver association consistently increases at depth.

PRODUCTION RECORD

Many thousands of tons of ore were mined from the old stopes. The smelter settlement sheet for the last car of ore shipped from the mine showed that $2,505.04 was paid the lessees for 43.6 tons of sorted ore assaying 66.85% lead, and 5.2 ounces of silver, per ton. It is reliably estimated that Bear Top output to date has grossed around $500,000.00.

ORE RESERVES

It is estimated that as a result of such early or more recent underground development, ore reserves of the Bear Top mine are at this time at least equal in value to amount of production recorded to date, justifying expectation that a small comparative additional expenditure on development and equipment will in a short time place the mine in shape to produce continuously and profitably over a long period.

DEVELOPMENT

Approximately one mile of underground development work with crosscuts, raises and drifts to date (Figure 6) has reached only 700 feet below surface cropping of the Bear Top vein. That operations to this comparatively shallow depth yielded such profitable returns is a tribute to the great possibilities of the property, more particularly considering the fact that mines of the Coeur d’Alenes do not ordinarily encounter commercial ore at depths of less than 600 to 1,000 feet below vein outcroppings.

PROJECTED DEVELOPMENT

It is expected that operation at the Merger Bear Top property will be resumed around June 1st, 1937. Merger Mines Corporation proposes a campaign of development below No. 3, present lowest working level of the mine, during this Spring and Summer, in addition to some further blocking out of ore bodies above that horizon. This is in accordance with engineering advice to further test out downward continuation of ore bodies already disclosed and as a preliminary to driving of projected No. 4 crosscut designed to intersect the vein at a depth of 600 feet underneath the No. 3, lowest existing level of the mine.

POSSIBILITIES

Geological and other conditions justify expectation that projected development, longitudinally and at depth, will result in a highly profitable mining operation, capable of ultimately yielding most substantial dividends. The management is confident that the project will within a comparatively short time prove one of the most profitable in the great Coeur d’Alene district.

The Merger Bear Top has been closed since 1929—The new market price on lead will make this an interesting producer.

The 1937 IMIR noted in August that operations were proceeding at the mine. A stock assessment of 1 cent per share was levied on September 23, 1937.

According to the 1938 IMIR (p. 219-220):

“A three-mile road has been built from the highway to the portal of the No. 3 tunnel to accommodate heavy trucks. The old tunnels, raises and stopes have been cleaned out and the mine is now open and easily accessible.”

Additions made: Dry house, compressor room; two compressors installed together with electrical equipment.

This quotation is from Merger Mines Corporation’s report to the Idaho Inspector of Mines.
Figure 6. Underground workings of the Bear Top Mine (Merger Mines Corporation progress report, 1937, p. 4). Note that the "Baucher Stope" referred to in the caption box is actually the Brucker stope, the stoped area adjacent to the box and arrow.
Assessments of 5 mills per share were levied on May 2 and October 14, 1938; March 20, 1939; June 24 and October 1st, 1941; January 1, May 20, and September 21, 1942; January 14, April 29, July 22, and October 21, 1943; January 28, May 3, and August 30, 1944; and January 5, 1945. Assessments of 1 cent per share were levied on March 7, 1947, and on January 3 and June 30, 1950. Little or no work was done by the company on the Bear Top during this period; the assessments apparently financed work on the Aetna (Merger Silver) claim group near Osburn.

In 1955, Merger Mines joined with Nabob Silver-Lead Co. and Bismark Mining Co. to explore two promising uranium properties in Utah. One of these properties was dropped the following year. A stock assessment of ½ cent was levied on July 8, 1954, and assessments of 1 cent per share were levied on March 14 and August 10, 1955.

Lessees shipped lead-zinc ore from the Bear Top mine in 1961. It was the only active lode operation in the district.

In 1963, Ray Simmons, operating the Bear Top under a lease from Merger Mines Corp., shipped 25 tons of lead ore from the mine. This ore yielded 78 ounces of silver, 10 tons of lead, and 1 ton of zinc. The following year, Simmons shipped 21 tons of ore to the Bunker Hill lead smelter. This material yielded 66 ounces of silver, 9 tons of lead, and 2 tons of zinc.

In 1965, Merger Mines Corp. reported the discovery of some milling-grade ore at the Bear Top. However, because there was no mill near the mine, no attempt was made to determine the size of the orebody.

Silver Crystal Mines, Inc., reported an ore strike at the Bear Top in 1969. The following year, Silver Crystal developed ore from the No. 1 and No. 3 levels of the Bear Top mine as well as repairing and exploring the adjoining Silver Crystal Mine.

Silver Crystal continued development work on the Bear Top in 1977. Production (curtailed in 1977) resumed in 1978, with the ore being hauled to the Nabob mill near Pinehurst. Ore was also shipped in each of the next two years. The Bear Top was leased to Silver Crystal Mines by Merger Mines on a 50-50 basis. No activity is mentioned at the property after 1980.

The mine was visited by an Idaho Geological Survey field crew in the summer of 1996 as part of a program to evaluate potential hazards from inactive and abandoned mines on U.S. Forest Service land in northern Idaho. Figures 7, 8, 9, and 10 show the mine as it appeared at that time.

Total recorded production for the Bear Top Mine between 1904 and 1973 was 22,070 tons of ore. This material yielded 19 ounces of gold, 23,794 ounces of silver, 7,242 pounds of copper, 6,506,239 pounds of lead, and 237,603 pounds of zinc. Post-1973 production by Silver Crystal Mines is not available, and production by lessees at various times may not have been credited to the mine.

\*This date was reported as October 1, 1942, but was reported in Merger Mines Corporation's report for the period ending May 31, 1942. This suggests that the year was probably typed incorrectly.
Figure 7. Adit on the No. 1 level of the Bear Top Mine (photograph by Earl H. Bennett, Idaho Geological Survey).
Figure 8. No. 2 level and adit at the Bear Top Mine (photograph by Earl H. Bennett, Idaho Geological Survey).
Figure 9. Adit on the No. 3 level of the Bear Top Mine (photograph by Earl H. Bennett, Idaho Geological Survey).
Figure 10. Stope open to the surface from inside the No. 3 level of the Bear Top Mine (photograph by Earl H. Bennett, Idaho Geological Survey).
OROFINO MINE

The Orofino Mine is at an elevation of about 4,000 feet on a north-flowing tributary to Bear Gulch (Figures 1, 2, and 4). It is the lowest in elevation of the three mines in the area.

When the Orofino was discovered is not known. It is first mentioned in the 1909 IMIR as a property in the vicinity of the Bear Top that had been extensively developed. The Orofino was consolidated with the Bear Top Mine in 1911 (Table 5), and the two mines were operated together for the next few years.

Records are not available to determine when the two mines again became separate properties. The Bear Creek Mining Company's 1921 report to the Idaho Inspector of Mines noted that the company owned the Orofino Group, having purchased the claims for $15,000. (The Bear Top claims were being leased by Bear Creek.) By 1923, F. Cushing Moore was leasing only the Bear Top property.

The Orofino was operated by Harry L. Day in 1925 and 1926. One car of rich lead ore was shipped to East Helena, Montana, in 1926. In 1928, lessees shipped several cars of lead-zinc ore to a custom flotation plant and a few cars of first-class lead ore were shipped to East Helena for smelting. One car of rich lead ore and several cars of lead-zinc milling ore were marketed from the Orofino property in 1929.

The January 17, 1929, issue of Mining Truth (p. 13) noted:

Orofino Lease on the North Side has suspended ore shipments but it is expected that several cars will be ready as soon as weather permits trucking in the spring. The lease is controlled by Ernest Eusler, E. T. King and William Blaine. Some shipments have run 60% lead.

The Dan Murphy Leasing Co. worked the Orofino mine in 1945, shipping 315 tons of zinc-lead ore to the Hercules custom mill near Wallace. Leasing operations in 1947 produced 3,927 tons of zinc-lead ore and 27 tons of high grade lead ore. The following year, about 500 tons of zinc-lead ore from the Orofino was shipped to the Golconda mill.

In 1954 the Smith & Murphy Lease shipped 336 tons of crude ore to the Golconda custom mill, where lead and zinc concentrates were produced. The following year, lessees reclaimed ore from the dump.

The Orofino was examined by Bunker Hill Co. geologists in 1981. Wallace (1981, p. 1) described the property as follows:

The Orofino Mine is located immediately northwest of the Bear Top Mine (Silver Crystal Mining Company) and on the south side of Bear Gulch. The property consists of seven (7) unpatented claims and four (4) patented claims of the Banner group and is owned by Mr. and Mrs. Richard W. Fields of Fall City, Washington. . . .

Examination of the vein in the accessible portions of the underground workings revealed the vein to be a mineralized shear zone type vein with quartz and carbonate gangue and, galena, sphalerite, and pyrite as the major minerals in the veins. Vein widths range
Table 5. Companies and individuals operating at the Orofino 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>Bear Top &amp; Orofino Consolidated Mining Co.</td>
<td></td>
<td>1 1911</td>
<td>1 1911-?</td>
<td></td>
</tr>
<tr>
<td>Bear Creek Mining Co.</td>
<td>L.L. Sweet, President</td>
<td>August 21, 1916</td>
<td>November 30, 1923</td>
<td>[1921]</td>
</tr>
<tr>
<td>Harry L. Day</td>
<td></td>
<td></td>
<td></td>
<td>1925-1929(?)</td>
</tr>
<tr>
<td>Ernest Eusler, E.T. King, and William Blaine (lessees)</td>
<td></td>
<td></td>
<td></td>
<td>1930(?)</td>
</tr>
<tr>
<td>Dan Murphy Leading Co.</td>
<td>A.F. McFee</td>
<td>1 1945</td>
<td>1 1945-1948(?)</td>
<td></td>
</tr>
<tr>
<td>Smith &amp; Murphy Lease</td>
<td></td>
<td>1 1954</td>
<td>1 1954-1955(?)</td>
<td></td>
</tr>
<tr>
<td>Mr. and Mrs. Richard Fields</td>
<td></td>
<td></td>
<td></td>
<td>[1981]</td>
</tr>
</tbody>
</table>

*Information not available in Idaho Geological Survey's files.*

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between 2 inches to 1.5 feet. A grab sample of vein material off the mine dump assayed 4.0% Pb, 4.1% Zn and 0.4 oz/ton Ag. The mineralization, vein type, country rock, and general geological setting is basically the same as the nearby Silver Crystal properties. However, a thorough evaluation of the potential of the Orofino would require some mine rehabilitation work and some diamond drilling in conjunction with geological mapping.

The proximity of the lower Orofino workings 1000 west and 200 feet below the Bear Top vein makes possible easy access to the downward extensions of the Bear Top vein for exploration and possibly development.

The mine was visited by an Idaho Geological Survey field crew in the summer of 1996 as part of a program to evaluate potential hazards from inactive and abandoned mines on U.S. Forest Service land in northern Idaho. Figures 11 and 12 show the mine as it appeared at that time.

Total recorded production from the Orofino Mine from 1925 to 1955 was 7,924 tons of ore. This material yielded 19.86 ounces of gold, 5,158 ounces of silver, 7,217 pounds of copper, 1,022,005 pounds of lead, and 428,479 pounds of zinc. These numbers
Figure 11. Main level (the lower of two levels) at the Orofino Mine (photograph by Earl H. Bennett, Idaho Geological Survey).
Figure 12. Upper adit at the Orofino Mine (photograph by Earl H. Bennett, Idaho Geological Survey).
should be considered minimums, since it is unknown how much of the Orofino ore was combined with the output from the Bear Top. Also, early production from the mine, if any, is not known.

IONE MINE

The Ione Mine is on a north-flowing tributary to Bear Gulch at an elevation of about 5,000 feet (Figures 1, 2, and 4). It is the uppermost of the three mines in this area.

The Ione was probably discovered in 1908 (Reed, 1944). Nothing more is known about the property until it was leased for $25,000 by the Ione Mining Company in late 1922 or early 1923 (Table 6). (Tables 7 and 8 show development and workings at the mine, by year.)

After extending the tunnels on the property for a couple of years, the company confined its efforts to assessment work. Stock assessments of 2 mills were levied on December 20, 1924, and July 16, 1926. By 1928, Ione Mining Company had relinquished its lease on the Ione claims but retained possession of three adjacent claims staked by the company. For the next five years, the company did surface work on these claims. When Congress waived the requirement for assessment work in the 1930s (1932-1938), the company suspended all work.

In May 1936, the company was negotiating with Merger Mines Corp. for an easement to conduct operations through the No. 3 tunnel on the Bear Top Mine. The Ione Mining Co. stated it was ready to begin operations as soon as it got the easement, but the agreement was apparently not concluded until much later. Reed (1944, p. 1-4) examined the property in August 1943:

Summary

The Ione Group is in the Summit Mining District, Shoshone County, Idaho. Access to the property is over 25.6 miles of county and Forest Service roads from the supply point at Wallace.

The property is on section 7, T 49 N, R 6 E, B.M. Several narrow, discontinuous lead-zinc-antimony veins have been partly explored on the group.

These veins are fillings and replacements in weak tension fractures normal to the strike of the enclosing country rock which is an argillite of the Pre-Cambrian Priehard formation. The “ore-shoots” do not exceed one foot in width; their strike length is probably not over 30 feet . . . .

History

The initial discovery in the Summit Mining District was made in 1879. In 1894 the area reached its maximum production of 17,500 ounces of gold taken from both placer and lode quartz operations. Prospecting led to the discovery of nearby small lead-zinc deposits.

Upon development these attained maximum production in 1911-12. Intermittent operation continued to 1933 when all activity in the district ceased because of depressed metal prices.

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*Pamphlet No. 47, Idaho Bureau of Mines and Geology [Shenon, 1938, footnote in original].

29
Table 6. Companies and individuals operating at the Ione 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>Minnie Otto, Luther Park, and Frank Calhan</td>
<td></td>
<td>---</td>
<td>---</td>
<td>1921(?)</td>
</tr>
<tr>
<td>Ione Mining Co.</td>
<td>H.O. Solum, President; O.M. Nordquist, Manager (later President)</td>
<td>December 19, 1922; reinstated: August 8, 1944; July 31, 1969; June 5, 1972</td>
<td>November 30, 1943; November 30, 1967; 1971; name changed to Southwestern Financial Corporation, August 2, 1972</td>
<td>1922(?) - 1972</td>
</tr>
<tr>
<td>Southwestern Financial Corporation</td>
<td>Ralph Day, President</td>
<td>August 2, 1972 (?)</td>
<td>last info: 1972</td>
<td>1972(?)</td>
</tr>
<tr>
<td>Silver Crystal Mines, Inc.</td>
<td>Marvin E. Darrow, President</td>
<td>August 28, 1968</td>
<td>2</td>
<td>1969(?)</td>
</tr>
</tbody>
</table>

Evidence of mineralization on the now idle Ione Group was probably discovered in 1908, factual data are not available. Operations on the group have never passed the exploration stage. The adjoining Beartop property is reported to have produced a small amount of lead-silver ore from the single mineable ore shoot found. This ore was milled at a loss on the property in a plant now totally dismantled. The Orofino property adjoining the Ione Group on the north reportedly produced a small amount of silver-zinc ore. The underground workings of the Orofino property are totally inaccessible.

Property
The Ione Group, the adjoining Sunshine, Beartop, and Orofino properties are in sections 6 and 7, T 49 N, R 6 E, B.M. The Ione holdings include the unpatented Climax, Firste, and Ione claims. They were last located in 1921 by Luther M. Park of Wallace, Idaho. The Sunshine group consists of three unpatented claims located in 1923 by the Ione Mining Company. This company is negotiating a lease on the Ione claim and an easement through the Beartop No. 3 adit. Structure exposed on the Ione claim is presumed to extend into the Sunshine group. The downward extension of this projection may supposedly be reached by extending the Beartop No. 3 adit 600 feet to the south.

The Ione Mining Company was incorporated in 1922 under the laws of the state of Idaho. Capitalized for 1,500,000 shares at a par value of 10 cents, 200,000 shares outstanding. Mr. O. M. Nordquist is president and Mr. L. L. Brinard, business man of Wallace, Idaho is secretary - treasurer of the company.

Physical Features and Communications
The properties are on the north slope of Bear Ouch, a drainage channel tributary to Prichard Creek and the Coeur d'Ale River. The camp is reached over 6.9 miles of mountain
Table 7. Development work, number of men employed, and operating companies at the Ione 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>Diamond Drilling (feet)</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1924</td>
<td>1</td>
<td>52</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Ione Mining Co.</td>
</tr>
<tr>
<td>1925</td>
<td>2</td>
<td>22</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Ione Mining Co.</td>
</tr>
<tr>
<td>1945</td>
<td>2</td>
<td>—</td>
<td>300</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Ione Mining Co.</td>
</tr>
<tr>
<td>1946</td>
<td>2</td>
<td>1,080</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>940</td>
<td>Ione Mining Co.</td>
</tr>
<tr>
<td>1947</td>
<td>3</td>
<td>320</td>
<td>320</td>
<td>—</td>
<td>—</td>
<td>400</td>
<td>Ione Mining Co.</td>
</tr>
<tr>
<td>1948</td>
<td>2</td>
<td>—</td>
<td>310</td>
<td>—</td>
<td>—</td>
<td>520</td>
<td>Ione Mining Co.</td>
</tr>
<tr>
<td>1949</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>300</td>
<td>Ione Mining Co.</td>
</tr>
<tr>
<td>1951</td>
<td>2</td>
<td>—</td>
<td>320</td>
<td>—</td>
<td>—</td>
<td>600</td>
<td>Ione Mining Co.</td>
</tr>
<tr>
<td>1952</td>
<td>1</td>
<td>—</td>
<td>290</td>
<td>60</td>
<td>—</td>
<td>—</td>
<td>Ione Mining Co.</td>
</tr>
<tr>
<td>1953</td>
<td>2</td>
<td>—</td>
<td>—</td>
<td>100</td>
<td>60</td>
<td>672</td>
<td>Ione Mining Co.</td>
</tr>
<tr>
<td>1954</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>70</td>
<td>165</td>
<td>—</td>
<td>Ione Mining Co.</td>
</tr>
</tbody>
</table>

1Contract workers were used to do this work.
2The number of workers was not reported to the Idaho Inspector of Mines.
3Development work for the year also included the construction of 1 mile of road.

road from the abandoned mining settlement of Murray. The last 3.4 miles of road up Bear Gulch is badly eroded by the stream and consequently almost impassible. Murray is 18.7 miles north over maintained county roads from the supply point at Wallace. The claims, at elevations ranging from 4000 to 5600 feet are reached by steep pack trails from the camp. Snowfall in the areas is heavy and snowslides are not uncommon. The lower slopes are forested with moderate stands of timber suitable for mine support and general construction. Bear Creek has a normal flow of at least 1000 gallons per minute.

Mine Workings

No workings other than shallow “discovery” cuts exist on the Sunshine group. These cuts are devoid of mineralization. The Ione Group has two prospect adits totaling 1700 feet together with a shallow prospect shaft. As the ground requires little or no support for exploration openings the adits are in good condition.

Description of the Deposit

The rocks in the area are of the Prichard formation, an argillite of the Pre-Cambrian Belt Series. They strike to the north and dip steeply to the east where they grade into the younger Burke quartzite. This indicates that the area is on the east flank of the large fold. The nearest granitic rocks are one mile to the west where a small stock had penetrated the slates on
Table 8. Cumulative development at the Ione 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 Raises</th>
<th>Total Length of Raises (ft)</th>
<th>No. of Crosscuts</th>
<th>No. of Drifts</th>
<th>Length of Principal Tunnels (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1924</td>
<td>1</td>
<td>2</td>
<td>---</td>
<td>1</td>
<td>37&lt;sup&gt;2&lt;/sup&gt;</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>360 1,386</td>
</tr>
<tr>
<td>1925</td>
<td>1</td>
<td>2</td>
<td>---</td>
<td>1</td>
<td>37&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0</td>
<td>---</td>
<td>5</td>
<td>2</td>
<td>340 1,386</td>
</tr>
<tr>
<td>1934&lt;sup&gt;3&lt;/sup&gt;</td>
<td>1,771</td>
<td>2</td>
<td>---</td>
<td>1</td>
<td>37&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>386 1,386</td>
</tr>
<tr>
<td>1936</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>37&lt;sup&gt;2&lt;/sup&gt;</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>410 ---</td>
</tr>
<tr>
<td>1945</td>
<td>1</td>
<td>3</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>1 ---</td>
</tr>
<tr>
<td>1946</td>
<td>1</td>
<td>1</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>2,830 ---</td>
</tr>
<tr>
<td>1947</td>
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<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>---</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1 1</td>
</tr>
</tbody>
</table>

<sup>1</sup>Information not reported to Idaho Inspector of Mines.

<sup>2</sup>The shaft was vertical.

<sup>3</sup>These workings are believed to be on the Ione claim group, which was not under company control at this time.
the crest of the hill. A single narrow dike of monzonite cuts the bedding of the Prichard formation at a small angle 630 feet north of the shaft on the Ione Group. If projected on strike to the south this dike should intersect the Ione workings. However, no intrusive rocks have been disclosed in any of the exploration openings (see geological sketch map [Figure 13]).

The veins explored on the Ione Group are weak tension fractures roughly normal to the strike of the argillites. Evidence of slight lateral movement along the fractures is occasionally found and where determinable, the footwall has relatively moved to the east. These fractures, where mineralized, contain stringer quartz, limonite, and residual pyrite. Galena, marmatite, and jamesonite occasionally form short and narrow ore lenses in the fractures. These lenses average one foot or less in width and appear not to exceed 20 feet in length. The fractures exposed by the outcrop, shaft, and adit form a zone 90 feet wide. Mineralization is confined to those openings nearest the hanging wall of the structure. These fractures and fracture zones average 12° and range from 1° to 40° in width.

Reed (1944) noted that the easement on the Bear Top No. 3 adit was obtained after he examined the property. The company’s report to the Idaho Inspector of Mines for 1943 noted that the company had done 350 feet of work on a claim that was later abandoned.

Active development proceeded on the property for the next six years. In its 1946 report to the Idaho Inspector of Mines, the company described its activities for the year as follows:

Extended lower tunnel 1080 feet in effort to intersect vein. We crossed it but it was so narrow that we did not recognize it. Then we diamond drilled ahead but did not cut it. We then backed up and diamond drilled westward and out vein and 18 inches of vein matter.

In 1947, the company staked the Pirate Chief Nos. 1-5 claims. In addition to these claims, the property consisted of the Sunshine and the Lela Nos. 1-2 claims (the “Sunshine group”). In 1950, the company did only surface work, but underground development and diamond drilling resumed the following year.

A newspaper article in July 1952 described activities at the mine as follows:

Ione Mining company’s new lower tunnel has been advanced about 170 feet since work was resumed this summer and appears to be nearing its objective, Otto M. Nordquist, president and manager, reported this week.

The lower tunnel on the northside property east of Murray, started and driven 530 feet last year, is headed toward the downward extension of a vein which shows up to a foot of high-grade lead ore over a strike length of about 200 feet in the No. 1 tunnel about 200 feet above the present work.

About 140 feet of the advance this year has been in an extremely hard, dry light-colored quartzite, Nordquist said. Recent rounds, however, have been in a softer, dark quartzite from which there is a substantial flow of water, he added, indicating that the face may be nearing the vein fissure. The face of the tunnel is now approximately [sic] at the point where the vein was estimated to be, based on dip information obtained in the upper level.

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6The copy of this article in Idaho Geological Survey’s files does not identify the paper in which the article ran nor the date and page on which the article appeared.
Figure 13. Sketch map of the Ione workings (Reed, 1944).
Resumption of crosscutting was delayed this year, Nordquist said, due to failure of the county to plow out the road to the portal. The road was plowed to the mine camp at the Orofino mine, he said, but the remaining distance to the tunnel site had to be shoveled by hand.

The mine manager said he has only one miner employed this year to help him with the work. Seven-hundred feet of hand-tramming is now proving a bottleneck in maintaining the previous rate of progress, and purchase of a trammer is now being considered, he stated.

An article in the June 18, 1953, issue of the Wallace Miner contained additional information on activities at the mine.5

Ione Mining company has opened a two-foot width of good lead ore on the main tunnel level at its property on the north side of the Coeur d'Alene district east of Murray. President Otto Nordquist reported yesterday.

The new ore was encountered unexpectedly last Friday, he said, in running a short crosscut northerly from the main vein to improve loading facilities under the ore chute which is used to handle production from the raise stope. Similar ore was opened in a raise on the main vein last fall and mining operations were started in the raise just a few weeks ago when work was resumed after a short winter shutdown on the property.

When the . . . [words illegible] with ore, it was found the access road to the property was still too soft for the big ore trucks which had been engaged to haul it, Nordquist said. It was then decided to take advantage of the delay to make room for a larger train of cars under the chute lip. Discovery of the new ore resulted.

The newly-opened structure has a northeasterly strike and appears to be a "cross-break" angling off the main east-west vein, he said. Drifts in both directions on the new ore are being started as rapidly as possible, Nordquist stated, adding that he had come [some] into Wallace to hire one or two more miners so that the work could be pushed.

Company plans are to sort out high-grade for direct shipment to the smelter and stockpile the balance of production for later milling at the Goloonda custom mill east of Wallace.

A follow-up story ran in the September 18, 1953, edition of the Kellogg News.6

Ione Mining Co., operating in the Murray district of the Coeur d'Alenes, is now extracting good silver-lead high grade ore along with millfeed quality ore from workings west of the raise, according to President Otto M. Nordquist.

The high-grade is being sorted for direct shipment to the Bunker Hill smelter at Kellogg and the mill run will go to the Goloonda custom mill above Wallace.

Company directors have levied an assessment of 1 cent a share on outstanding stock to provide funds to finance operations pending receipts from ore sales, the letter states. Payments are due by October 16.

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5The copy of this article in Idaho Geological Survey's files does not identify the page on which the story appeared.

6The copy of this article in Idaho Geological Survey's files does not identify the page on which the story appeared.
On November 19, 1953, the *Wallace Miner* ran the following story:

Ione Mining company has been forced to abandon plans for starting production this fall at its property on the "north side" of the district east of Murray, Otto Nordquist, president and manager, informed the Miner this week.

Fall rains—and snow at the mine elevation—have made the mine road impassable for large ore trucks and the use of smaller trucks would be impractical and uneconomic, he stated. The company has no alternative but to shut down until spring, he added.

Preparation of the mine workings for stopeing operations has been completed, Nordquist reported. Headings have been readied for production of about 25 tons of ore daily and a slusher has been installed. About 80 tons of ore had been broken and the ore bin filled when it was found that the big truck which has been hired to trans-... [words missing] the mine road.

The use of lighter trucks was then considered, he said, but after some study it was decided that the small loads which they could handle would hardly be worth while and transportation costs would be prohibitive.

Some or all of this ore was shipped the following year. According to Ione Mining Company’s annual report to the Idaho Inspector of Mines for 1955:

We did no development work in 1954.
We did ship ore that we had stockpiled and some of which we broke down in stopes, some 35 tons for which we received $3204.92. The expenses of hauling, milling, labor, supplies, etc., amounted to $4280.91, showing a loss of $1055.99. The bills for the loss was paid off by levying an assessment.

The property was examined by U.S. Government personnel on November 10, 1954, in connection with the Ione Mining Company’s application for a DMEA (Defense Minerals Exploration Administration) loan. Fryklund and Erickson (1954a, p. 1) described the workings at the mine:

No. 1 and No. 2 adit levels, comprising about 400 feet and 1500 feet respectively, and connected by a combination raise and stope. A small amount of stoping (about 800 tons) above the No. 1 adit.
All workings are accessible [Figure 14].

The appearance of the Ione vein in the workings was as follows (Fryklund and Erickson, 1954b, p. 1-2):

The Ione vein strikes about N. 70° E. in the No. 1 adit, and more irregularly, northeast in the No. 2 adit. The dip varies from 60° to 85° south. The vein is thus roughly parallel to the other veins of the Coeur d'Alene region. Widths range from less than 1 to 14 inches. The vein was stoped to perhaps 20 feet above the No. 1 adit where the vein averaged about 8 inches in width over a distance of 40 feet. There is a second small stope between the

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9The copy of this article in Idaho Geological Survey’s files does not identify the page on which the story appeared.
Geologic map of No. 1 and No. 2 Ione adits
Ione Mining Company, Shoshone Co., Idaho
two levels. Most of the visible portion of the vein averages less than 5 inches in width. The
vein was examined on the surface, in the No. 1 adit, in a stope between No. 1 and 2 adits, and
in the No. 2 adit.

The vein is a replacement vein, and the quartz noted is probably recrystallized
country rock quartz. This quartz has been replaced by carbonate, probablyankerite, sphalerite,
and galena. In several places the vein material was composed entirely of galena; however,
such portions of the vein were exceptional.

Assays of two samples taken over richest accessible portions of the vein are as
follows:

<table>
<thead>
<tr>
<th>Sample</th>
<th>Assay</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.G.E.-176</td>
<td>8\textsuperscript{t}, Tr. Ag, Tr. Pb, 23.5% Zn</td>
</tr>
<tr>
<td>E.G.E.-177</td>
<td>5\textsuperscript{t}, 3.4 ozs. Ag, 39.4% Pb, 16.3% Zn</td>
</tr>
</tbody>
</table>

The DMEA project was not approved.

For the next several years, most of the activity was assessment work. In 1957, the
company did a few feet of drifting in addition to stockpiling ore at the mouth of the tunnel.
Similar work was done by lessees the following year. After that, citing low metal prices,
the company confined its efforts to surface work.

The Ione Mining Company’s officers changed in late 1963 or early 1964. This
occurrence suggests the death of the company’s president and manager, O.M. Nordquist,
who would have been in his eighties. (Frykland and Erickson, 1954b, noted that he was 74
at the time they examined the mine.)

Crystal completed repair work and explored the veins on the No. 3 level of the mine. The
company had men working in this area for the next decade. No mention is made of the
mine after 1980.

The mine was visited by an Idaho Geological Survey field crew in the summer of
1996 as part of a program to evaluate potential hazards at inactive and abandoned mines
on U.S. Forest Service land in northern Idaho. Figures 15 and 16 show the mine as it
appeared at that time.

No production records are available for the Ione Mine. However, from the
available facts, it would appear that the output from this property was small.
Figure 15. Lower (No. 2) adit at the Ione Mine (photograph by Earl H. Bennett, Idaho Geological Survey).
Figure 16. Upper (No. 1) adit at the Ione Mine (photograph by Earl H. Bennett, Idaho Geological Survey).
REFERENCES


Childs, H.M., 1923, Report on the Bear Top Mine, Murray, Idaho: unpublished report, 4 p. (Childs's manuscript report contains many irregularities in spacing after punctuation marks. These have been corrected to make the text easier to read.)


Idaho Geological Survey's mineral property files (includes copies of company reports to the Idaho Inspector of Mines).


