History of the Yellowjacket Mine, Lemhi County, Idaho

Victoria E. Mitchell

Staff Report 97-21
April 1997

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

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 The information in this report is from a number of published and unpublished sources in the Idaho Geological Survey's mineral property files.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

History of the Yellowjacket Mine, Lemhi County, Idaho

Victoria E. Mitchell[1]

The Yellowjacket Mine is in the Yellowjacket mining district in southwestern Lemhi County (Figure 1). The mine is near the top of Yellowjacket Hill at an elevation of about 7,200 feet (Figure 2). It is about ¾ mile north-northeast of the townsite of Yellowjacket (elevation 6,000 feet), where the Yellowjacket mill and mining camp were located. According to Strahorn (1881), Yellowjacket Creek "takes its name from a nest of yellow jackets which were only too well sampled by an unfortunate prospector."

The orebodies are vein and replacement deposits in a broad zone of complexly shattered quartzite of the Yellowjacket Formation (Figure 3). The main lode at the Yellowjacket was up to several hundred feet wide and at least 1,200 feet long. It contained numerous veins and stringers of ore separated by more or less altered quartzite. The lode trends N. 65°-75° E. and dips steeply northwest. The ore consists of free gold in a limonite-stained quartz gangue. Other minerals present include pyrite, chalcopyrite, and galena; the distribution of copper and lead minerals is very irregular but appeared to increase with depth (Ross, 1934; Anderson, 1953; Carter, 1981). The eluvial (residual) material that caps the lode and covers the slope below the mine for at least 1,500 feet has been worked as a placer at various times; Anderson (1953) gives the grade of this material as about $3 per cubic yard (about 0.9 ounce per yard at a gold price of $35 per ounce) and estimates the volume of the deposit at over 1 million cubic yards.

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

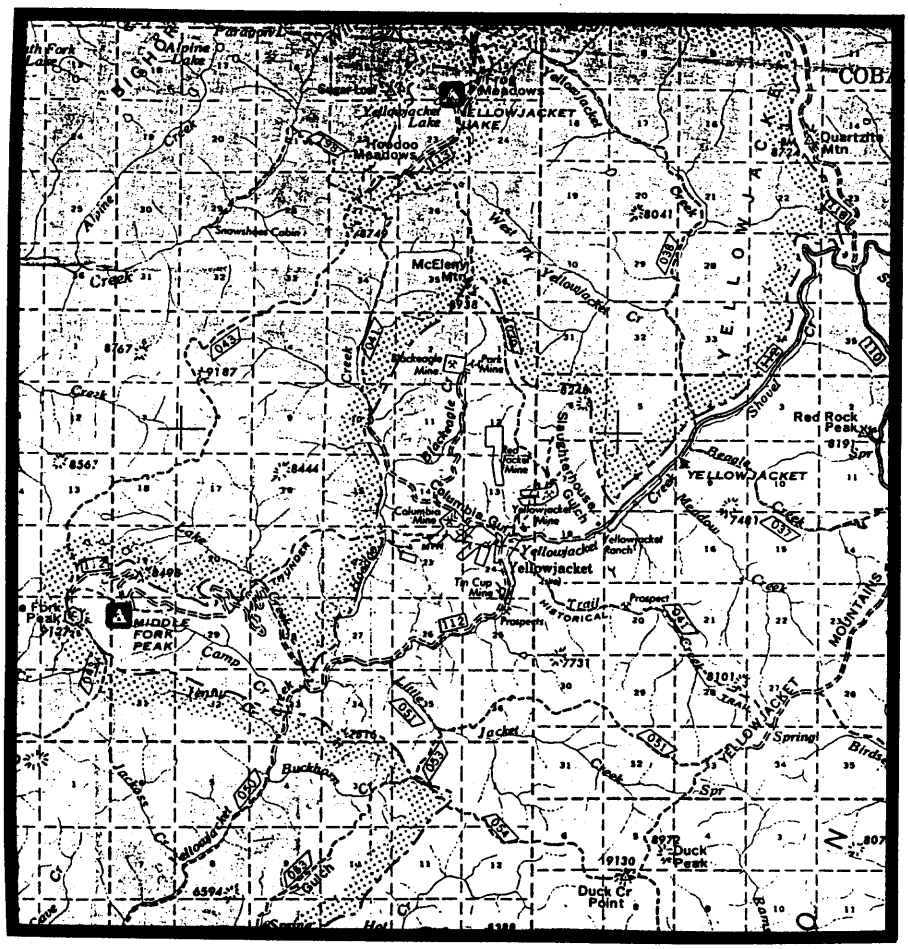

Figure 1. Location of the Yellowjacket Mine and vicinity (U.S. Forest Service Salmon National Forest map, scale ⅜ inch = 1 mile).

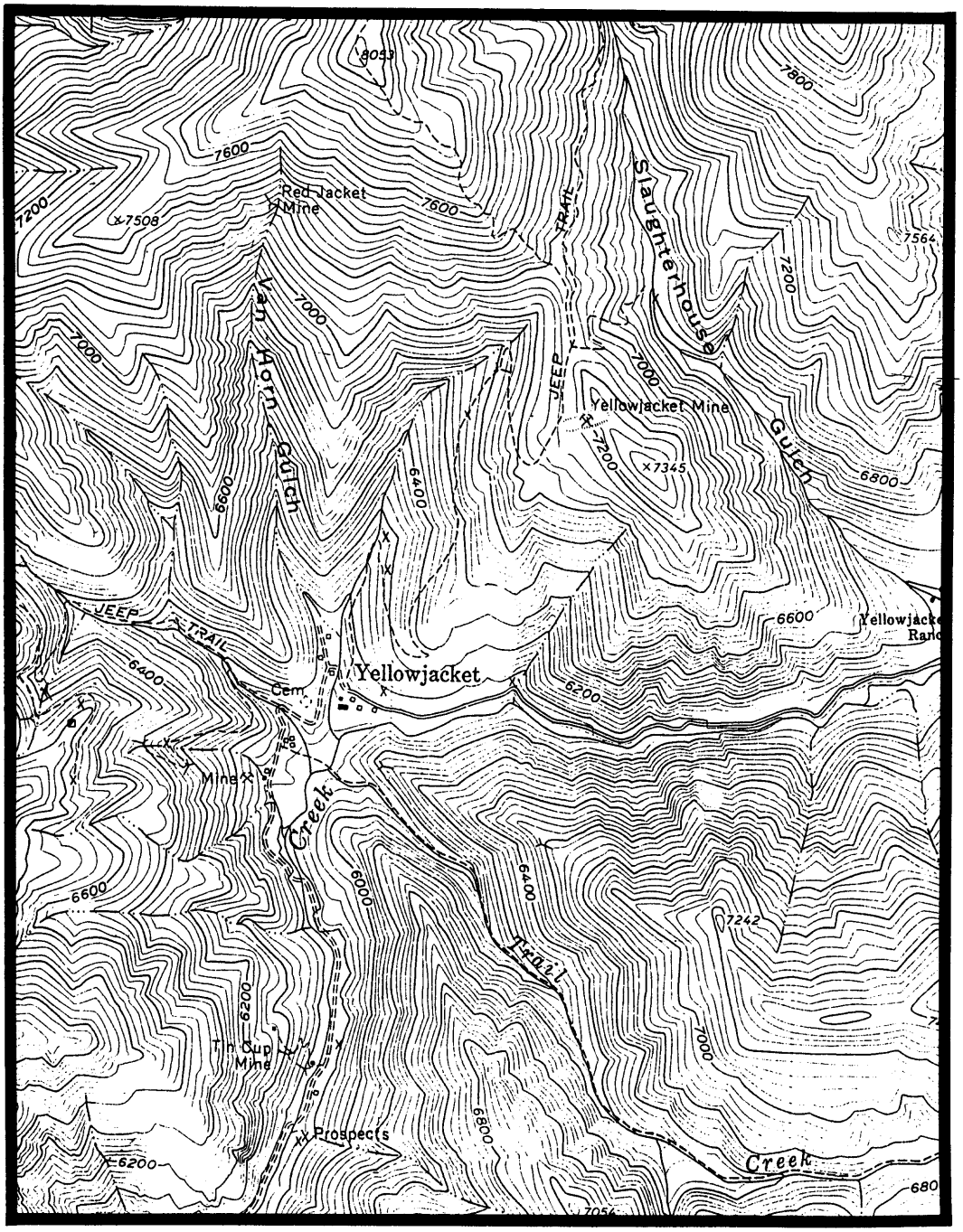

Figure 2. Topographic map of the Yellowjacket Mine and vicinity (U.S. Geological Survey Yellowjacket 7.5-minute topographic map).

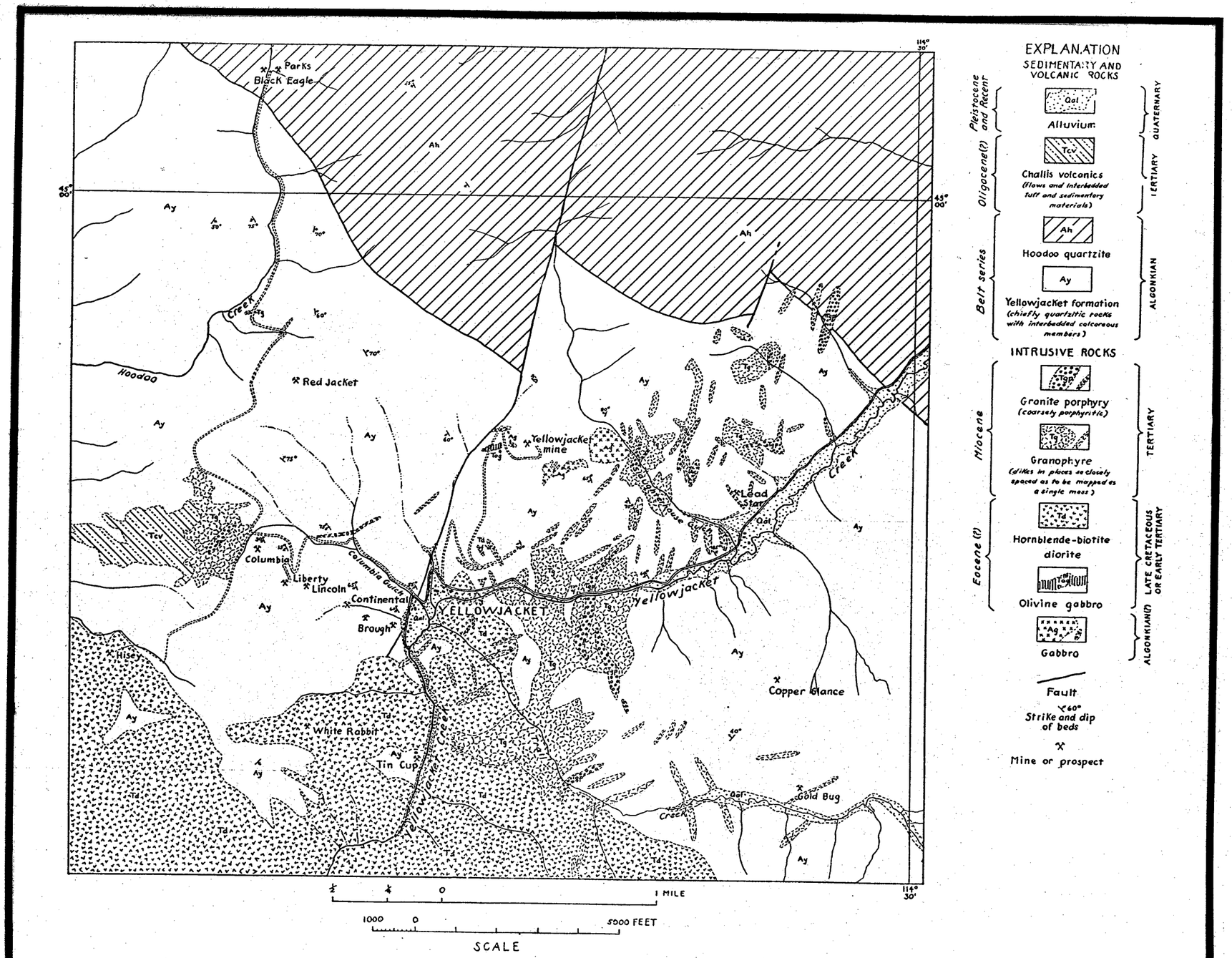

Figure 3. Geologic sketch map of the Yellowjacket district, Lemhi County, Idaho (Figure 2 from Anderson, 1953).

The Yellowjacket district was discovered in 1869. Wells (1983) described the discovery (p. 81-82):

> During the fall of 1869, almost everyone at Loon Creek lost interest in building up that nevertheless promising new mining camp. Nathan Smith, back from another prospecting tour, had another startling discovery to announce -- this time, the Yellow Jacket.
>
> His Yellow Jacket party thought that they had another Boise Basin, and a stampede on September 24 to the new bonanza depopulated Loon Creek. Some four hundred men took off with Nathan Smith, only to find the new district was vastly overrated. In the words of John Ward: "Gold is very scarce in Yellowjacket, but the broken down horses and mules are plentiful along the road." The trouble had been that one of the members of Smith's Yellow Jacket discovery party had heavily salted the prospectors' pans, apparently with California gold, and then had thoughtfully disappeared before the rush to Yellow Jacket revealed his deceit. Smith was as disgusted as everyone else at being the victim of a practical joke, and by the time the stampeders had all got back to Oro Grande, there was "terrible swearing on Loon Creek." An incidental result of the hoax was the immediate discovery of some important Yellow Jacket quartz leads that eventually proved to be productive.

The mine was worked by arrastres in the early 1870s (Umpleby, 1913) and a stamp mill (variously reported as having three or five stamps) was built in 1876 (Wells, 1983). According to Sheldon (1912), the stamp mill was put in by J.B. Haggin (although Sheldon gives a clearly inaccurate date for the construction).

Strahorn (1881) described the workings on the North and South American claims (two of the patented claims in the Yellowjacket Group) as follows (p. 29):

> The North and South American claims are the more prominent of the mines. These ledges run parallel, showing croppings forty to fifty feet wide and traced for two miles. The developments consist of a tunnel on the South American 200 feet, and five shafts, each from twenty to thirty feet deep. The ore throughout is free gold and assays from $12 to $75 per ton. A three-stamp mill, packed in on mules, has been used to prospect the ores. It has worked 120 tons, yielding from $15 to $20 per ton. The quartz is, apparently, inexhaustible.
>
> In an extension of the North American a large body of ore is in sight, assaying from $15 to $25 in gold per ton. Another location near by is called the Hoosier, the quartz averaging $76 per ton. The formation is porphyry; the hills are low and timbered with yellow pine; grass and water abundant; the winters not too severe for stock. Capitalists are considering the matter of building a wagon road to these mines and erecting a large stamp mill. With the initiative once taken, we may reasonably expect soon to see hundreds of stamps crushing quartz on the North and South American veins.

A 10-stamp mill was installed in 1882 or 1883[1]. The mill was powered by a water wheel and could process 30 tons of ore per day (tpd). The mine was purchased by

[1]Anderson (1953) states that the mill was built in 1882. According to Wells (1983), packers hauled the mill into the district in April 1883. The parts were hauled by mules through drifts that were up to 12 feet deep in order to get the mill into operation by June 1.

Morrison & Stein Brothers some time in the 1880s and worked intermittently until 1892 (Sheldon, 1912). Table 1 lists companies and individuals operating at the mine. About thirty men were employed at the mine. During that time, ore was hauled 1½ mile down a steep grade from the mine to the mill. Four-horse teams pulled wagons in the summer and sleighs in the winter at a cost of $2.50 per ton (Wells, 1983).

In October 1892, the mine was sold to a group of Colorado investors. In four days, the new owners cleaned up $3,000 of bullion from the mill. Improvements were soon planned for the mine (Sheldon, 1920, p. 1212):

> It was decided to erect a Swem aërial tramway, the buckets to carry 125 lb. of ore each. No packer would contract to deliver the ⅞-in. wire cable required in its construction. The company's pack train brought in the cable, 8,400 ft. in length, in three trips. Being too stiff to coil for individual coils on each mule, it was strung out upon the main street of Challis, six or seven runs on a side being tied together. The mules were placed in the center, with the cables lashed to each side, the loop at either end swinging clear of the leading and the end mules. Nearly all the inhabitants of the county were on hand to see the pack train start. They had plenty of excitement and fun. It took two men to manage each mule for the first few days. On uneven ground the individual loads would vary in weight. In a hollow the rope would lift the center mule off its feet. On a ridge or knoll one mule took the load of three. One wall-eyed cuss bucked and tore around on a ridge, throwing the whole pack train of twenty-two mules down the mountain 150 ft. into the timber in a tangled, twisted condition. It took two days to cut them out, no serious damage being done.
>
> Owing to the stiffness of the several cables bound together the pack train could not make short turns, and a temporary straight trail, regardless of grades, was therefore made. Eventually the mules became accustomed to the novel loading, and the entire cable was delivered without serious mishap. The tramway reduced the transportation cost for delivery of the ore from mine to mill to seven cents per ton.

Replacing the cam shaft on the stamp mill (probably during the following year) also presented transportation problems (Sheldon, 1920, p. 1212):

> The old cam shaft on the stamp battery had been in use so long that key seats had been cut all over it, and there was room for no more. A new shaft was purchased. This weighed 625 lb. Jesus Urquida, a Mexican, was the only packer who would bring it in. He secured the largest mule in the locality. He then made two tripods the height of the shaft when loaded. These were packed on another mule. The big mule was led with the load, one, two or three hours, depending upon the condition of the trail. Urquida would then stop and set up the tripods just behind the loaded mule. Four men would next slide the shaft back onto the tripods. The mule was then allowed to rest and feed for a short time and the procedure repeated.

It cost 10 cents per pound to ship the new cam shaft from Challis (Sheldon, 1912).

The mine ran into financial difficulties less than a year after the new owners took over (Sheldon, 1920, p. 1212):

> Early in June of '93 (the year of the panic) trouble began over certain checks upon which payment had been protested. I went to the railroad and, by telegraphing,

Table 1. Companies and individuals operating at the Yellowjacket Mine.

Company Name	Officer	Date Incorporated	Charter Forfeited	Year(s) at Mine
Morrison & Stein Brothers	---	---	---	188?-1892
Yellowjacket Gold Mining Co.	1	1	1	1892-1895
Idaho Yellowjacket Gold Mining Co.	1	1	1	1894-1897(?)
John T. McChesney	---	---	---	1897-?
John E. Searles	---	---	---	?-1901
Yellow Jacket Mining Co.	1	1	1	1901-1909
Yellow Jacket Gold Mining Co.	1	1	1	1909(?)-1948(?)
Mandarin Mines Corp. (operator)	1	Aug. 17, 1914	1916	1911-1914
New York-Idaho Exploration Co. (lessee)	Charles Peter, President-Manager	Feb. 21, 1923	1924	1923-1924
United Mace Smelters, Inc. (lessee)	Robert G. Ainesworth, President	Dec. 15, 1930	1933	1930-1933
Buckhorn Gold Corporation (lessee)	H.B. Rigby, President	May 20, 1935	1940	1935-1940
Treasure Gold Mining Co.	W.H. Sweet, President	Jan. 11, 1938	Nov. 30, 1939	1938
Condor Gold Mining Co.	Dudley A. White, President	Jan. 30, 1939	Nov. 30, 1940	1939-1940
Edwin F. and Heber S. Steen; Steen family	---	---	---	1948-1977
Noranda Exploration, Inc.	J.O. Hinds, President	Dec. 24, 1973	active	exploration: 1970
Cyprus Mines Corp.	P.J. McLean, Vice President	Feb. 1, 1967	active	exploration: 1975-1976

Table 1 (continued). Operating companies at the Yellowjacket Mine.

Company Name	Officer	Date Incorporated	Charter Forfeited	Year(s) at Mine
Yellow Jacket Mines, Inc.	[1]	1977	active?	1977-[2]
Noranda, Inc.	[1]	[1]	active	1986
U.S. Antimony Corp.	John C. Lawrence, President	Aug. 27, 1968	active	1987-[2]
Western Gold Exploration and Mining Co.	[1]	[1]	[1]	1989-1990
BumbleBee, Inc.	[1]	[1]	[1]	1991-[2]

[1]Information not available in IGS's files.
[2]Still involved with the mine, according to the most recent information in IGS's files (1993).

> secured by express from New York a few thousand dollars in currency. Under the terms of the purchase contract of the property, all of the gold bullion produced had to be deposited in the Wells Fargo Bank at Salt Lake within a certain time each month, and credited on the balance due upon purchase price of the property. Unless this had been done the property would have been forfeited.
>
> Upon returning to the mill, I found that the superintendent had held the bullion, hoping to make sure of his own and his friends' pay. I paid him in full and discharged him. A man on horseback, together with another horse upon which the bullion was packed, was dispatched with instructions to proceed to Salt Lake without delay. The bullion reached the bank upon the last day of the forfeiture period, after banking hours. The bank being advised by wire, received it, and saved the mine. The owners were wired about the incident and informed me that I was in charge. I remained as superintendent until the mine again changed hands in May, 1895.

Power was supplied to the mill by a Leffel water wheel connected to a 42-foot penstock. A 1,500-foot ditch brought water from a 6-foot dam on Yellowjacket Creek. However, ice in the creek would sometimes break loose and fill the penstock, stopping the water wheel. Other shutdowns were caused when the ditch broke. During the winter of 1893, lumber was cut into 2-inch planks to build a flume. The dam was deepened to about 12 feet, and a plank spillway was constructed to carry off the ice from the pond. The flume was 4 feet high, 6 feet wide, and covered with loose 1-inch

planks; it received water from a gate near the bottom of the dam (Sheldon, 1912; Sheldon, 1920). However, this construction work was not without excitement (Sheldon, 1920, p. 1213):

> The following May the mill was shut down. Part of the mine force was brought down to put in the new flume. The weather was dry and windy. The roof of the mill had been in place twenty-seven years, and the shakes that covered it had become worn and frayed. When it was seen that the flume would be completed within the day, the mill men put on new shoes and dies [on the stamps]. It had been customary to fasten on the shoes with wedges made from hard wood obtained from plug-tobacco boxes. The shavings and refuse from making the wedges were burnt in a large heating stove in the mill, and under the prevailing conditions of wind the sparks resulting set fire to the shakes. The fire spread the length of the roof almost instantly. The mill was lost. The flume at the time lacked two plank lengths of completion. At the suggestion of Tom Kelley, boss carpenter, a force of men was sent to throw in the two plank lengths, weight them down with rocks and place side boards. The water was turned in and the flume and penstock were saved.

Plans began immediately to rebuild the mill, starting with replacement of the sawmill. According to Sheldon (1912, p. 221):

> In August, 1894, a new sawmill was received, and we commenced sawing lumber for the new mill. Logs were obtained from the neighboring mountains 1 to 2½ miles distant and 1000 to 1500 ft. above the mill. In order that the sawmill should be on a level with the upper part of the new mill, so that lumber, lagging, etc., could be delivered on that level to the tramway and thus sent to the mine, the sawmill had to be placed about 100 ft. to one side of the mill, on a side hill, and nearly 100 ft. above the shafting in the penstock, which was in one corner of the new mill site. The main shafting in the sawmill was connected to the shaft in the penstock by ½-in. wire cable, and we were able to cut on an average of 10,000 ft. per day.

With the lumber cut, the project entered the next phase (Sheldon, 1920, p. 1213):

> On Oct. 4, 1894, the plans for the new mill were received. The building was 75 x 150 ft. It was double sheathed with building paper between the boards and battens outside. Twenty new stamps and the ten old ones that went through the fire were used. Some of the stems of the old battery were badly bent, but our mechanic, George Ferguson, made a contrivance and then heated and straightened them in the blacksmith shop. The freight route was changed to Pedrock, on the Butte branch of the O. S. L. R.R., thence by wagon road to Salmon City and Leesburg, over the first divide. This cut the packing over the trail to a distance of about thirty-odd miles. Contracts were made with the packers at 2½c. per lb. They agreed to see the job through, even if it took all of the winter. . . . Snows came the last of November. The trail became icy. Occasionally a mule was lost. Hay for the mules had to be packed in. Feeling that trouble was brewing, we went outside and purchased a pack train of thirty mules, hiring the former owner to handle it. Along in December, all of the packers came to the office and struck for more pay. Asked if their contract required them to pack all of the freight in at the agreed price, even if it took all winter, they replied, "Yes, but we can't do it." "Is this your last word ?" we asked. "Yes," was the reply. Our answer was that the company would pack the freight if

> the contract was broken. We had been constructing additional road, so that the packing distance was then not over twenty-two miles. The packers stuck and delivered the freight.
>
> The twenty new stamps began dropping on ore in 110 days from the time the plans were received, a record when the transportation conditions are taken into consideration. The work was expedited, as the bill of lading showed numbers and exact contents of each box. Box contents were checked at the factory by three separate checkers. We never found a bolt or nut missing, and it often became necessary to send a man and a mule out on the trail until he found a certain numbered box which was needed. The machinery was purchased from Fraser & Chalmers.

It took 106 days to pack in the equipment for the new mill (Wells, 1983). The freight cost was 6½ cents a pound from factory to mill. The hammered-steel shafting cost 1 cent a pound more to manufacture, but saved money in freight costs (Sheldon, 1912).

The excavations for the foundations of the new mill were largely in soil and gravel. Water from the spring that usually supplied the stamp batteries was used to hydraulic the soil and gravel from the mill site and into troughs to carry it down the hill. When riffles were added to the lower sluice boxes, "a substantial saving of placer gold" was made (Sheldon, 1912). In 1920, Sheldon described the operation of the mill (p. 1214):

> The ore was free milling and averaged just under $10 per ton. The original ten-stamp battery that Haggin put in was made by the Union Iron Works, of San Francisco. The battery was a double discharge one, but only one side was used. An extra set of silver-plated copper plates was put in, and both discharges of the battery were used, better results in tonnage and extraction being obtained. In the new mill the plate surface was doubled by placing a full-sized table below the apron plates, a sharp drop being left between the two sets of plates. Small pieces of copper plates were cut and put in the launders clear out to the tailings pond. These were cleaned up once a month, with satisfactory results. With the new mill the tailings assays were cut to between 40 and 50c. per ton.

Milling costs at the new mill were only $2.67 per ton, and the monthly output was about $50,000 of bullion. Electric power for the 200-tpd cyanide plant was supplied by a 6-foot Pelton water wheel operating under 150 feet of pressure (Wells, 1983).

When Eldridge (1895) visited the mine in 1894, he stated (p. 264):

> The ore of the Yellow Jacket mine, or at least of that portion of it visited by the writer, is a free-milling, auriferous quartz, with one or two small local bodies of hematite and an occasional but rare copper stain. . . . The mass of the ore of the Yellow Jacket mine is said to run from $7 to $30 per ton[2], with local values much higher. An ore of common occurrence is one of $18 or $19.
>
> The formation about the summit of the Yellow Jacket Hill has undergone considerable disintegration, and the surface is covered with débris which is reported as carrying free gold from a trace up to $7 per ton. This may be milled at a profit.

---

[2]The price for gold at this time was $20.67 an ounce, and the price for silver was $0.635 an ounce. The ore ran about equal amounts of gold and silver.

Sheldon also described the ore and the mine workings. In 1912, he said (p. 222):

> The ore was mostly a fine red, decomposed quartz, together with boulders of white quartz from a few inches to 10 ft. in diameter. On top of the ridge the vein cut off entirely at the 150-ft. depth. Below the ridge the hill dropped off sharply for 100 ft., then flattened out for nearly 1000 ft. The orebody was from 200 to 300 ft. wide and 40 to 80 ft. thick. About 600 to 800 ft. west of the ridge, down the hill, was a large body of white bull quartz left by previous managements 40 to 50 ft. wide, running nearly parallel with the vein, found on the ridge. Some crosscuts were run through this, and it was found to average from $8 to $9. A tunnel 200 ft. vertically lower on a line with the tramway was started into the hill to cut this ore in depth, but the property changed hands before the vein was reached. The new management never found ore on that level.

Sheldon gave additional details in 1920 (p. 1214):

> The vein was first discovered and worked on the top of a ridge. It was high grade and was stoped 50 ft. wide, 90 ft. deep and about 200 ft. along its course. It was cut by a fault and picked up lower down upon the ridge on rather flat ground. Here the vein material was a hard, white quartz 48 ft. in width. Much of the intervening ground from grass roots down to between 50 and 60 ft. in depth was fine, erosional material containing bunches of white quartz. All of this milled from $7 to $10 per ton. The ground was heavy. Square sets were used, the red fir posts being from 12 to 15 in. in diameter.

The mine and mill were sold in May 1895. According to Sheldon (1912), the new management doubled the size of the mill (to twelve batteries of five stamps each) against his advice. A new pipeline was also installed to increase the power to the mill, and another tram was installed. The cost of these improvements was given as $72,000, but the company recovered only $68,000 of its investment before the vein was lost due to faulting.

However, the mine's troubles were not over. According to Wells (1983, p. 83):

> Yellow Jacket continued to progress for most of a year before a general economic collapse discouraged most miners. On September 1, a wagon road, costing $45,000, was completed from Challis and helped reduced Yellow Jacket's isolation. But just then a smaller Cleveland company went broke, leaving its twenty employees unable to collect their back wages. With 175 miners remaining at work, Yellow Jacket entered 1896 with bright prospects regardless of that failure. At the beginning of May, a million dollar purchase in New York brought in new management and new troubles. A dispute over a nine- or ten-hour work day, optional use of contracting rates instead of hourly pay, and employment of non-union miners led to a strike that shut down operations later that month. Reopened July 8, 1896, after a settlement of these difficulties, Yellow Jacket ran through September before closing again because of failure of the milling system. Effective for free-milling ore that it had been designed to process, Yellow Jacket's large mill could not handle values available after that ore unexpectedly ran out. Considerable exploratory tunneling failed to disclose any more ore, and Yellow Jacket's handsome sixty-stamp mill remained idle from then on.

An extension of the Yellowjacket vein on nearby Silver Creek was discovered in the summer of 1896. After testing several recovery processes to see which would best handle the Yellowjacket ores, the company acquired a 300,000-pound Clareci-Pellitan cyanide plant and shipped it to Yellowjacket. The costs of converting to cyanide, coupled with heavy initial investment and development charges, exhausted the company's financial resources. It defaulted on a $172,792.80 debt to John T. McChesney of New York. McChesney bought the property on August 16, 1897, at a sheriff's sale in Salmon for $172,000. He operated the property for only a month before being forced to shut down until a more effective recovery process was obtained. The mine was next acquired by John E. Searles, who went bankrupt in May 1901 (Wells, 1983).

Between 1893 and 1897 was the most productive period for the mine. Ross (1934), who noted that the records were possibly incomplete, compiled the production for this period from the company books in the Yellowjacket mine office (p. 108):

Bullion produced at the Yellowjacket mine, 1893-97

Dates[a]	Value of bar bullion	Operating company
Nov. 2-Dec. 10, 1893.....	$4,060.03	Yellowjacket Gold Mining Co.
Feb. 3-June 26, 1894.....	12,086.20	
Mar. 1-Dec. 29, 1895.....	60,991.11	Idaho Yellowjacket Gold Mining Co.
Jan. 6-Dec. 15, 1896.....	42,050.76	
June 3-June 11, 1897.....	2,573.46	
	121,761.56	

[a]Earliest and latest dates in each year for which shipments of bullion are recorded.

Umpleby (1913) credited the district with producing $450,000 worth of bullion through 1911. Most of that was from the Yellowjacket. Umpleby noted the average recovery by amalgamation was $5.50 per ton, or about 92 percent of the metals in the ore. At the turn of the century, the Yellowjacket had 1,100 feet of workings and a "very large volume of potential ore averaging around $1 a ton." Equipment at the mine included two trams, two Pelton water wheel electric generating systems, a 60-stamp mill, and a cyanide plant (Wells, 1983).

The mine soon attracted attention from new investors. According to the 1905 IMIR (p. 86):

> It is also reported that a deal is now pending for the old Yellow Jacket Mine. This property is equipped with a 60-stamp mill and represents a monument of mining mismanagement. It has an immense surface showing of pay ore, and its importance has never been fully demonstrated.

> Below this big mill there is a large pile of tailings accumulated from its former operation that is said to average $8 per ton in gold, and to yield admirably to cyanide treatment.
>
> Negotiations are also in progress for the purchase of the Yellow Jacket placers in this district, comprising an extensive tract of gravel that has been partially developed and proven to contain rich values in coarse, high-grade gold.

The only production in the district between 1905 and 1907 was placer gold. The 1905 development work was said to have located some very rich ore. Development work on the Yellowjacket placers continued in 1906, and the claims were worked by hydraulic methods in 1907.

The mine was finally sold in 1909 to the Yellow Jacket Gold Mining Company, composed of New York capitalists, and plans were made to begin active operations in the spring. Most of the work done in 1910 was development work, locating new orebodies and reopening old ones, although the IMIR noted that a reduction in transportation costs made it likely that the mine would soon resume production. When Umpleby (1913) visited the district in 1910, the mine had about 4,000 feet of tunnels, crosscuts, and drifts, and a considerable amount of work in open cuts (Figure 4). The mine had four levels, the most extensive being the No. 2.

More work was done to reopen old tunnels in 1911. According to that year's IMIR (p. 91), "The Yellow Jacket Mine . . . has been operated throughout the year with a small force of men under careful management with a view of determining the extent of its ore bodies and the best method of treatment." The Mine Inspector further noted that the property had been idle for some time "by reason of the rather complex character of the ore, which, while not very high grade occurs on a very large body."

A note by the editor of *Engineering and Mining Journal*, attached to the end of Sheldon's 1912 article, described the new company's operations (p. 222):

> Active operation of the property was resumed by the Yellow Jacket Gold Mining Company under new management, after a careful consideration of reports by E. E. Chase, E. B. Kirby, T. A. Rickard, F. D. Howe and John B. Hastings. We are informed by an officer of the company that at the time these engineers examined the mine, the old workings were either badly caved or were tightly timbered, so detailed study of underground conditions was impossible. The surface of the hill is overlain by a heavy coating of drift, and the difficulty of adequate examination was great. The results of exploration, as reported by the company, are summarized in the following statement: It remained for Mr. Hastings, the present manager, to disclose the actual conditions by proving a north-south fault, which coincides with the lowermost limits of early stoping operations. Mr. Hastings at once bent his efforts toward the location of the vein across this fault and actually entered the vein on a lower level, only to find it again displaced by a diagonal gabbro dike not previously disclosed. All work by the present company has been and still is directed toward opening the vein below the fault and dike. Over the ridge from the mine workings, float from this vein or a similar one is found in quantity, strongly indicating the linear continuity of the ore. Though much might be learned from

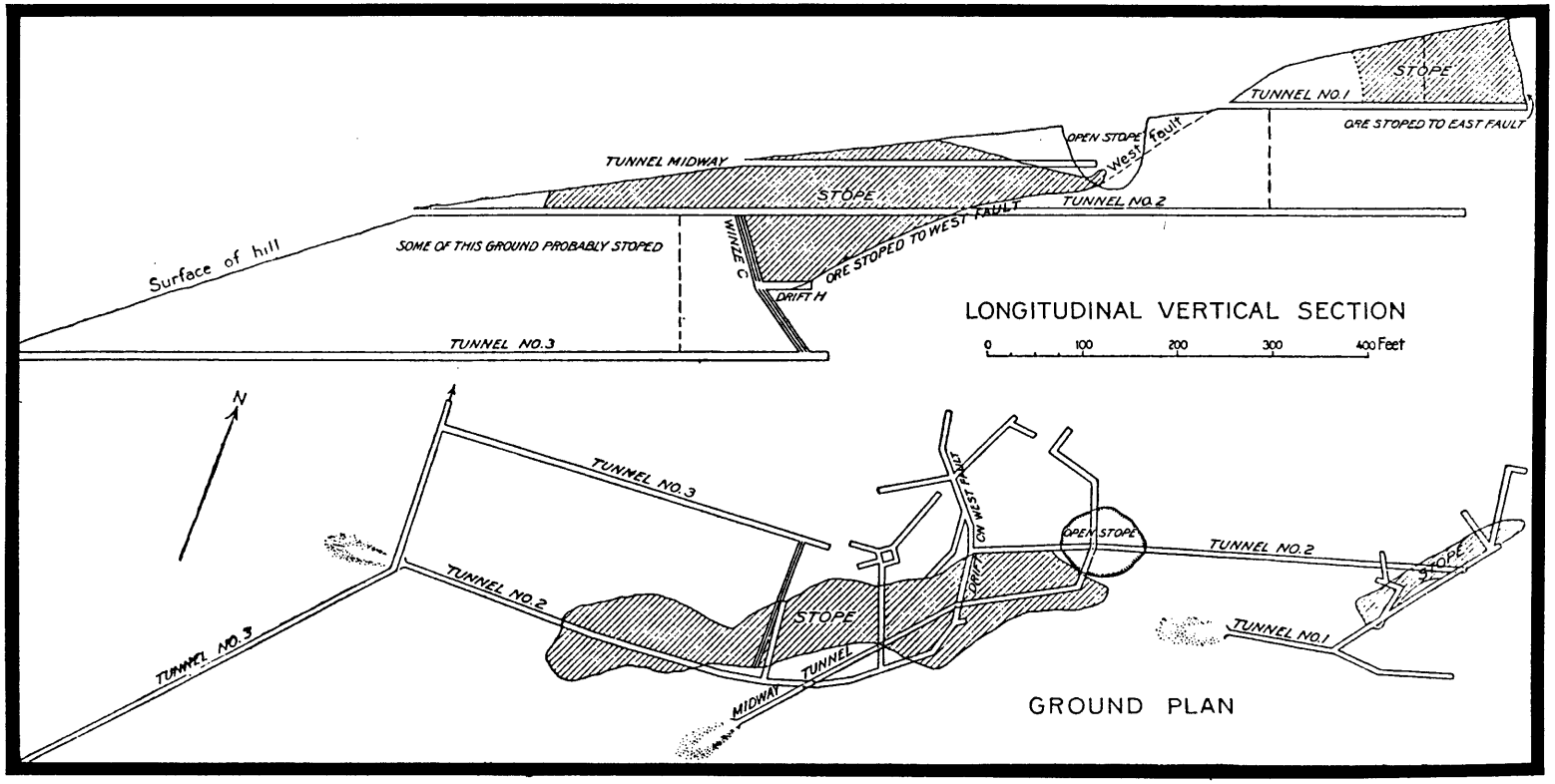

Figure 4. Plan and cross-section of the Yellowjacket Mine (c. 1911). This map was copied from the company's files (page 171 from Umpleby, 1913).

> prospecting in this direction, this course has not been adopted, as the depth of overburden would necessitate tunneling rather than trenching, and, furthermore, expensive equipment would be necessary to bring any ores opened there to the mill. At the main workings, everything is in readiness for production immediately upon the finding of the displaced oreshoot, the 60-stamp mill, ditches, flumes and all machinery having been kept constantly in repair.

Most of the work done at the Yellowjacket during 1912 was development. The 1912 IMIR stated (p. 135):

> [T]he old Yellow Jacket Mine has been undergoing further development with a limited crew of men for several years past. This property was equipped with a 60-stamp mill and formed the basis of quite a big operation over 15 years ago, since which time the mill has been idle. The ore formerly treated ran ten or twelve dollars per ton but showed quite a loss in the tailings to the simple amalgamation method of treatment then employed, and a small plant has recently been under consideration for the treatment of several thousand tons of tailings that were saved from the former milling operation by cyaniding, and an effort is being made to finance the property through a stock selling campaign to revive the main milling plant and treat a large reserve of low grade ore that has been developed in the mine.

Ross (1934) states that the property was acquired by the Mandarin Mines Corporation about 1910; according to the 1923 USGS Yearbook, Mandarin Mines operated the property for Yellow Jacket Gold Mining Co. from 1911 to 1914. Between June and October 1913, old tailings treated by cyanide were shipped from the mine. Lessees treated 1,000 tons of tailings at a cost of $3.25 per ton and with a recovery rate of 60 percent. The gross value of the material was $5 per ton, and 112.05 ounces of gold and 178.4 ounces of silver were recovered. Total development at the mine was about 6,000 feet of workings. (Table 2 shows development work done at the mine.)

In 1914, Mandarin Mines again used cyanide to treat old tailings from the Yellowjacket, and the product was shipped east. The mill, which had a capacity of 150 tpd, was now equipped with a Blake and a Gates crusher, 60 stamps weighing 850 pounds each, and 6 vats with a capacity of 45 tons each. Some placer work was also done during the year.

The mine was idle until 1923, when it was leased by the New York-Idaho Exploration Co. The company cleaned out old tunnels, built a new boarding and bunk house (Figure 5), and constructed roads. The Peter tunnel was started near the mill with the object of intersecting the vein at depth, but only 105 feet was driven during the year (Ross, 1934; Olson, 1985). No ore was treated or shipped. The mine had four tunnels, one raise, and eleven drifts. Workings totalled about 5,000 feet, including 4,440 feet of tunnels, crosscuts, and drifts, and 150 feet of raises. However, the company noted that some areas of the mine were caved. The lengths of the principal tunnels were: No. 1, 675 feet; No. 2, 1,475 feet; No. 3, 1,055 feet; and

Table 2. Development, employment, and operating companies at the Yellowjacket Mine, by year.

Year	No. of Men employed	Tunnels (feet)	Sinking (feet)	Cross-cutting (feet)	Drifting (feet)	Operator
1913	20	250[1]	90[2]	160[3]	---	Yellow Jacket Gold Mining Co.
1914	6	145[1]	70[2]	75[3]	---	Yellow Jacket Gold Mining Co.
1937	6	85	55	45	20	Buckhorn Gold Corporation
1938	5	200	---	130	100	Buckhorn Gold Corporation
1939	30	[4]	---	630	166	Condor Gold Mining Co.

[1]Figure is for total development during the year.
[2]Combined figure for sinking and raising.
[3]Combined figure for crosscutting and drifting.
[4]Work on the tunnels consisted of cleaning and repairs. The company also did 2,478 feet of trenching during the year.

Midway, 585 feet. The mine had a 40-horsepower Chicago-Pneumatic gas-driven compressor.

New York-Idaho suspended operations at the Yellowjacket on January 15, 1924, without finding any ore (Ross, 1934). In 1928, a small quantity of gold bullion was recovered by cleaning up around the mill. It was shipped to the mint at Denver.

Promoters investigated most of the properties in the Yellowjacket district in 1929. United Mace Smelters, Inc., had a lease and option on the Yellowjacket in 1930 and did a small amount of work to reopen the caved tunnels. The company stated to the press that it was planning to install a Mace smelter on the property.

In 1931, the company cleaned out and retimbered 1,700 feet of tunnels. A small amount of placer mining using three hydraulic giants and a hydraulic elevator was done. United Mace did a small amount of placering in the early part of 1932. Both development work and placer activity took place at the Yellowjacket during 1933, and some placer work was done in 1934. (Figure 6 shows the mine workings at this time.)

Buckhorn Gold Corporation leased the mine in 1935 and began preliminary cleanup work. The company noted that most of the workings were caved and inaccessible.

During 1936, Buckhorn treated low-grade gold ore from the Yellowjacket Mine by flotation-concentration. The company described its mill operation as "Jaw crusher to 1½", stamps to 65 mesh, gold cloth to recover approximately 50% of gold values, followed by flotation to give an overall recovery of 90 to 95%." During the

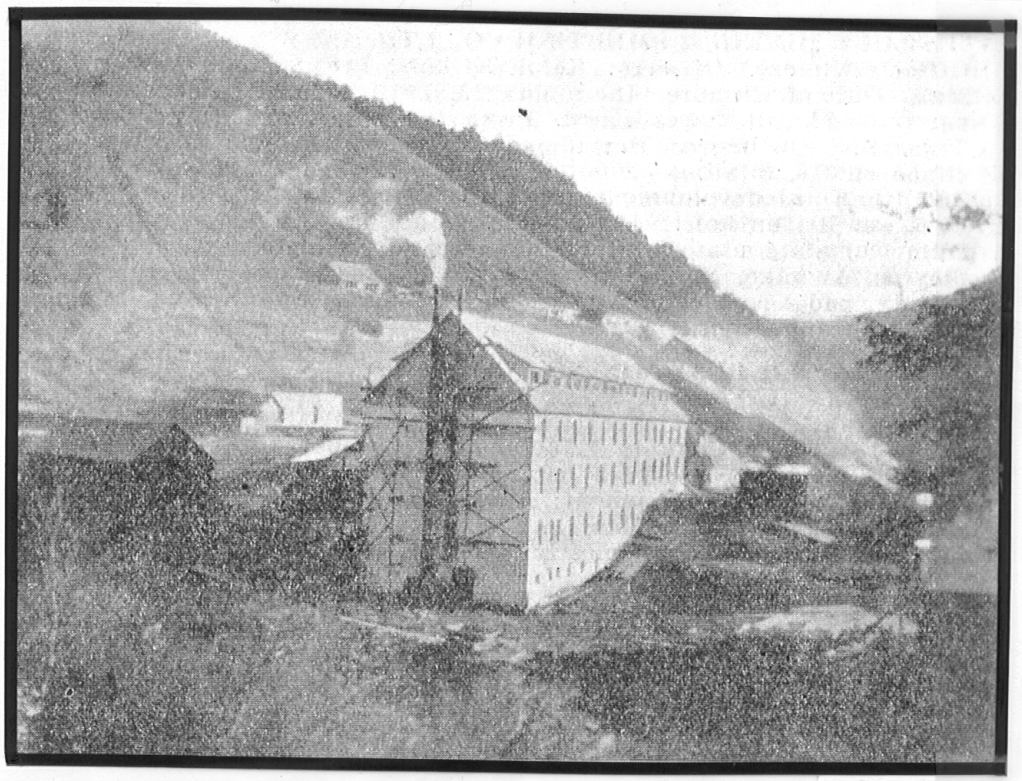

Figure 5. New boarding house at the Yellowjacket Mine (page 122 from Campbell, Stewart, 1924, Twenty-fifth Annual Report of the Mining Industry of Idaho for the Year 1923).

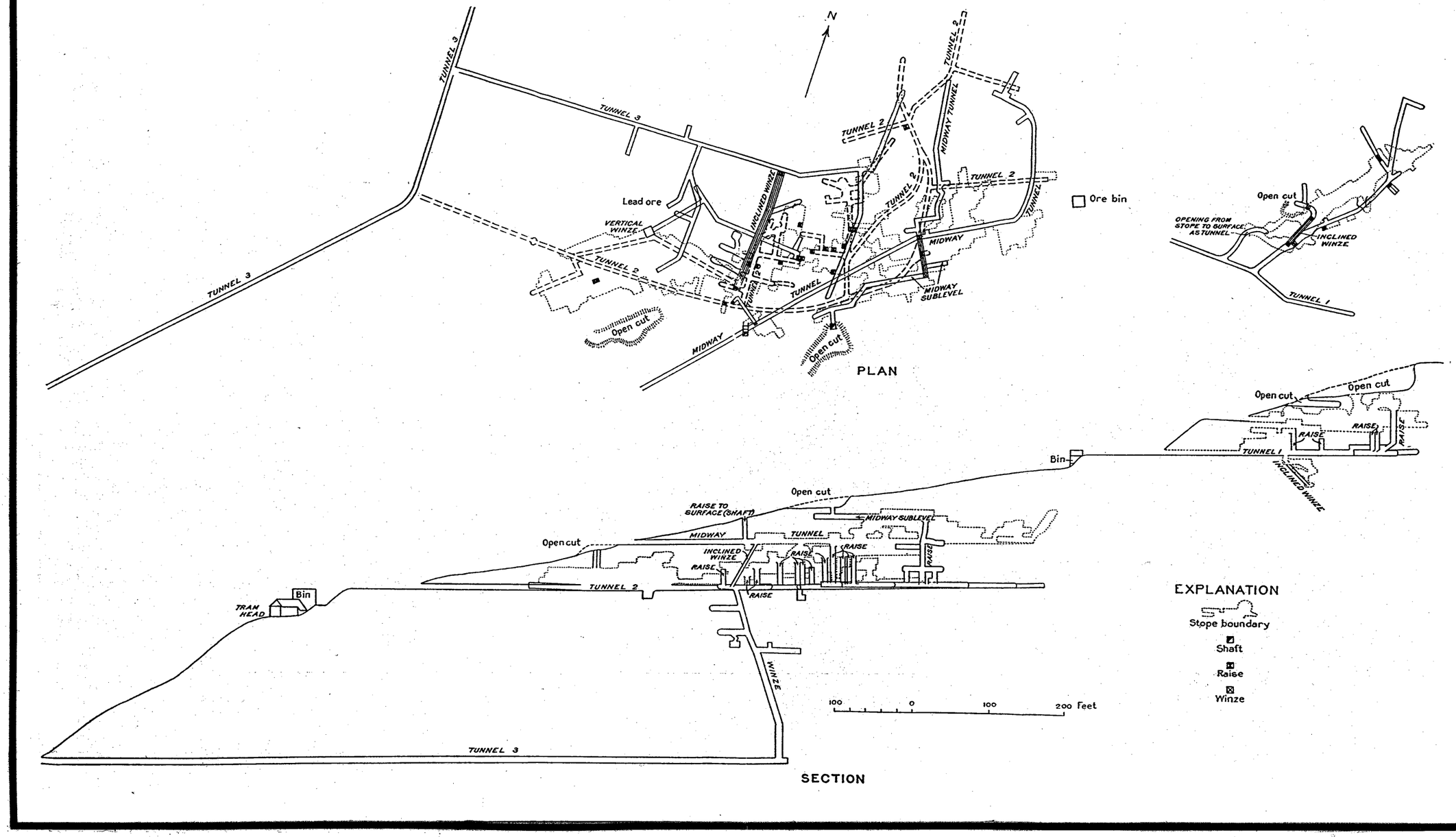

Figure 6. Plan and section of the Yellowjacket Mine (c. 1930) (Plate 6 from Ross, 1934).

year, the company reconditioned thirty stamps in the stamp mill. New equipment for the mill included a 300-horsepower hydroelectric plant, a jaw crusher, two gold cloth tables, a conditioner, an amalgamation barrel, a 4-cell flotation unit, reagent feeders, and a dryer. The additions brought the capacity of the mill up to 125 tpd. The mine was served by a 265-cubic-foot Gardner-Denver compressor. The company retimbered about 200 feet of tunnels. Placer gold recovered from Yellowjacket Creek was valued at $1,176.

The company continued development in 1937. Some high-grade ore was located, and a jaw crusher, ball mill, and classifier were added to the mill. Most of the output from the district in 1938 was gold ore from the Yellowjacket, which was treated by concentration. During the year, Buckhorn Gold turned the mine over to Treasure Gold Mining Co. in exchange for stock. Late in the year, the mine was taken over by the Condor Gold Mining Co., which was controlled by the International Smelting & Refining Co.

Condor Gold operated the Yellowjacket in 1939 and treated several hundred tons of gold ore in the flotation plant. Accessible workings at the mine included 576 feet of raises and 4,531 feet of tunnels, crosscuts, and drifts. Four tunnels, three raises, thirty-five crosscuts, and ten drifts were accessible. The lengths of the tunnels were: No. 1, 498 feet; No. 2, 593 feet; and No. 3, 2,757 feet. The Midway Tunnel was inaccessible. Surface workings included 2,478 feet of trenches averaging 12 feet wide at the bottom and over 5½ feet deep on the upper sides. The company described the intermediate levels as follows (from the Condor Gold Mining Company's 1939 annual report to the Idaho Inspector of Mines):

> [Number of intermediate levels and distances between levels] 3 - Upper Intermediate is 40 ft. below No. 2 Tunnel. Lower Intermediate is 100' below No. 2 Tunnel & 720 Intermediate is 120' above No. 3 Tunnel.
> [Length of intermediate levels] Upper Intermediate is 220'; Lower Inter. is 582'; 720 Inter. is 200'. Besides the old glory-hole workings, there are extensive underground workings on or connected with 4 principal tunnel levels. A large part of the old workings are caved and their exact footage unknown. The accessible workings amount to a total of 5,107 feet.

Gold was also produced from the Yellowjacket Placers during the year.

Condor Gold worked a crew of 30 men during 1940 and shipped gold ore treated by concentration. The company forfeited its charter in November. Lessees operated the Yellowjacket in 1941. About 700 tons of gold ore was treated by flotation and 21 tons of rich gold ore was shipped to a smelter. The mine was shut down in 1942 in accordance with War Production Board Order L-208, which closed all nonessential (gold) mines for the duration of World War II.

In 1948, the mine was purchased by Edwin F. and Heber S. Steen, whose father had owned and operated the mine between 1888 and 1892 (Anderson, 1953; Olson, 1985). The Steen brothers rehabilitated the mill to work the residual placer

material that covered the main deposit. Output in 1949 was 70 tons of material[3] containing gold and silver. Anderson (1953) states the 1949 production was small because weather conditions were unfavorable for screening and milling operations.

The outbreak of the Korean War in 1950 interfered with work at the mine (Anderson, 1953). Nothing more was done for several years. (Figure 7 shows the Yellowjacket bunkhouse in 1952.) In 1956, Herb S. Steen worked the Yellowjacket placer claim and recovered a small quantity of gold. A sizable tonnage of ore was shipped from the Yellowjacket in 1960.

U.S. Geological Survey records show that Heber S. Steen applied for a Defense Minerals Exploration Administration loan on the Yellowjacket property. However, the application was apparently not successful, and no contract was awarded.

In 1970, Noranda Exploration, Inc., conducted a brief geophysical program in the area. An induced polarization survey located an anomalous zone that is probably associated with pyrite and/or copper and lead sulfides. Cyprus Mines Corp. drilled 211 shallow air-track holes and three diamond-drill holes at the Yellowjacket and the nearby Columbia-Continental mines during the 1975 and 1976 field seasons. Anomalous gold values were located during this program, but much more drilling was needed to adequately evaluate the deposit (Carter, 1981).

In 1977, the Steen family incorporated their holdings (which included the Yellowjacket and the Columbia-Continental mines) under the name of Yellow Jacket Mines, Inc. The company carried out a pilot heap leach test on 3,000 tons of gold ore at the Yellowjacket in 1981. The company made plans to start full-scale production the next year with an annual production of 50,000 tons of ore. Reserves were approximately 400,000 tons of ore, averaging 0.1 ounce of gold per ton. (Figure 8 shows the Yellowjacket mill in 1981.) However, in 1982 the company ran a pilot test on 1,000 tons of ore and only did assessment work during the next three years. Noranda, Inc., drilled 3,600 feet at the Yellowjacket in 1986.

In 1987, U.S. Antimony Corporation (USAC) acquired a 50 percent interest in the mine. Three test runs were made from the Yellowjacket open pit. Ore grades averaged 0.025 ounce of gold per ton from a mineralized zone about 1,200 feet long and 500 feet wide. The ore was processed at USAC's 350-tpd mill at Preachers Cove on the Yankee Fork in Custer County.

To eliminate the 110-mile truck haul to Preachers Cove, the company applied for a permit in 1988 to construct a mill at the Yellowjacket. About 6,000 tons of gold ore, averaging 0.14 ounce of gold per ton, was mined during the year.

USAC signed an exploration agreement in 1989 with Western Gold Exploration and Mining Company (WestGold) for work at the Yellowjacket. The terms allowed WestGold to earn a 51 percent interest in the project by investing

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[3]According to the USBM Yearbook, old tailings were processed during the year; Anderson (1953) states that it was from the eluvial placers on Yellowjacket Hill.

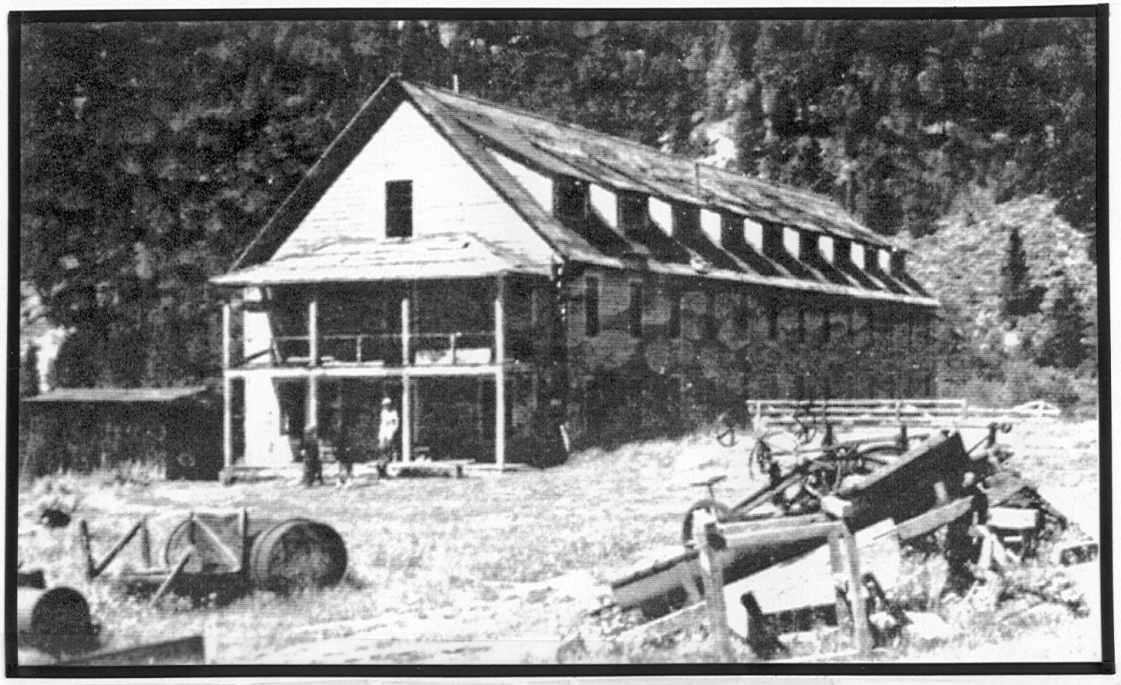

Figure 7. Yellowjacket bunkhouse in 1952 (page 84 from Wells, 1983).

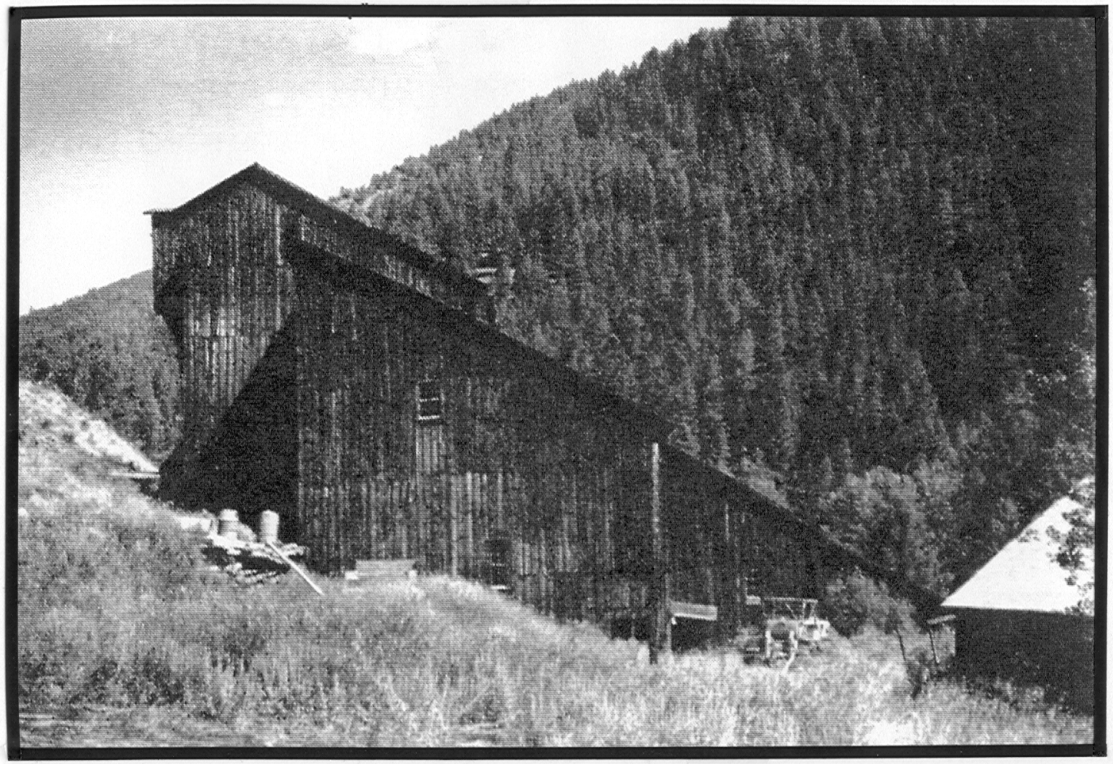

Figure 8. Yellowjacket mill in 1981 (page 83 from Wells, 1983).

$2 million. Initial work outlined a shallow orebody containing 407,122 tons of ore which averaged 0.1 ounce of gold per ton. The orebody was faulted off at depth, and WestGold planned to drill fifteen 600-foot holes to look for the extension. The company also conducted an extensive surface geophysics program to locate drill targets and drilled 59 reverse circulation holes. USAC filed plans with the U.S. Forest Service to build a flotation mill at the mine.

Development work continued on the open pit in 1990 (Figure 9). USAC continued work on the flotation mill, with leaching of the concentrates to be done at the Preachers Cove mill. Projected output for the mine and mill was about 250 tpd. Reserves were given as 312,277 tons of ore averaging 0.14 ounce of gold per ton, for a total of 41,279 ounces. After evaluating its drilling program, WestGold returned the mine to USAC.

USAC tested the mill in May 1991 and then started production from the mine. The mill was constructed and the mine opened in a joint venture with BumbleBee, Inc. Near-surface resources were about 300,000 tons of 0.1 ounce-per-ton gold, with reserves of 41,279 ounces of gold. Mine life was estimated at 10 years, and the operation employed fifteen people. About 2,000 ounces of gold was produced during the year. Mill feed averaged 150 tpd, with USAC's custom mill at Preachers Cove processing the concentrate. A lawsuit curtailed custom milling at Preachers Cove, and the mill was closed until very late in the year except for processing concentrate from the Yellowjacket. At year's end, officials announced that USAC was near bankruptcy. The company lost $1.2 million from the lawsuit and also suffered losses due to a fire late in 1990 that burned the company's main office and laboratory in Thompson Falls, Montana.

Work continued at the Yellowjacket in 1992. BumbleBee invested $800,000 in the venture for a 40 percent share. The mine had startup problems with the tailings pond and had a shortage of grinding capacity. A second grinding mill was installed, boosting production to 250 tpd (60 percent of the originally projected mill feed). The Yellowjacket mill is a straight flotation circuit which processes oxidized ore containing free gold. Production in 1992 was estimated at 3,500 ounces of gold from 40,000 tons of ore. The average grade was 0.08 ounce of gold per ton. Fifteen to twenty men worked at the mine, which operated throughout the winter. Exploration extended the reserves significantly, and an unproven resource was located which may continue down-dip from the main Yellowjacket pit across the valley to the Continental-Columbia area.

USAC operated the Yellowjacket in 1993 and produced 2 to 3 tons of gold concentrate a week. The concentrate was sold to Cominco's smelter in Trail, British Columbia, because environmental problems with cyanide severely curtailed operations at the Preachers Cove mill. Twelve people worked at the mine.

During 1994, the mine was visited by an Idaho Geological Survey geologist as part of a project to study abandoned and inactive mines in southern Idaho. Figures 10 and 11 show the Yellowjacket townsite as they appeared at that time.

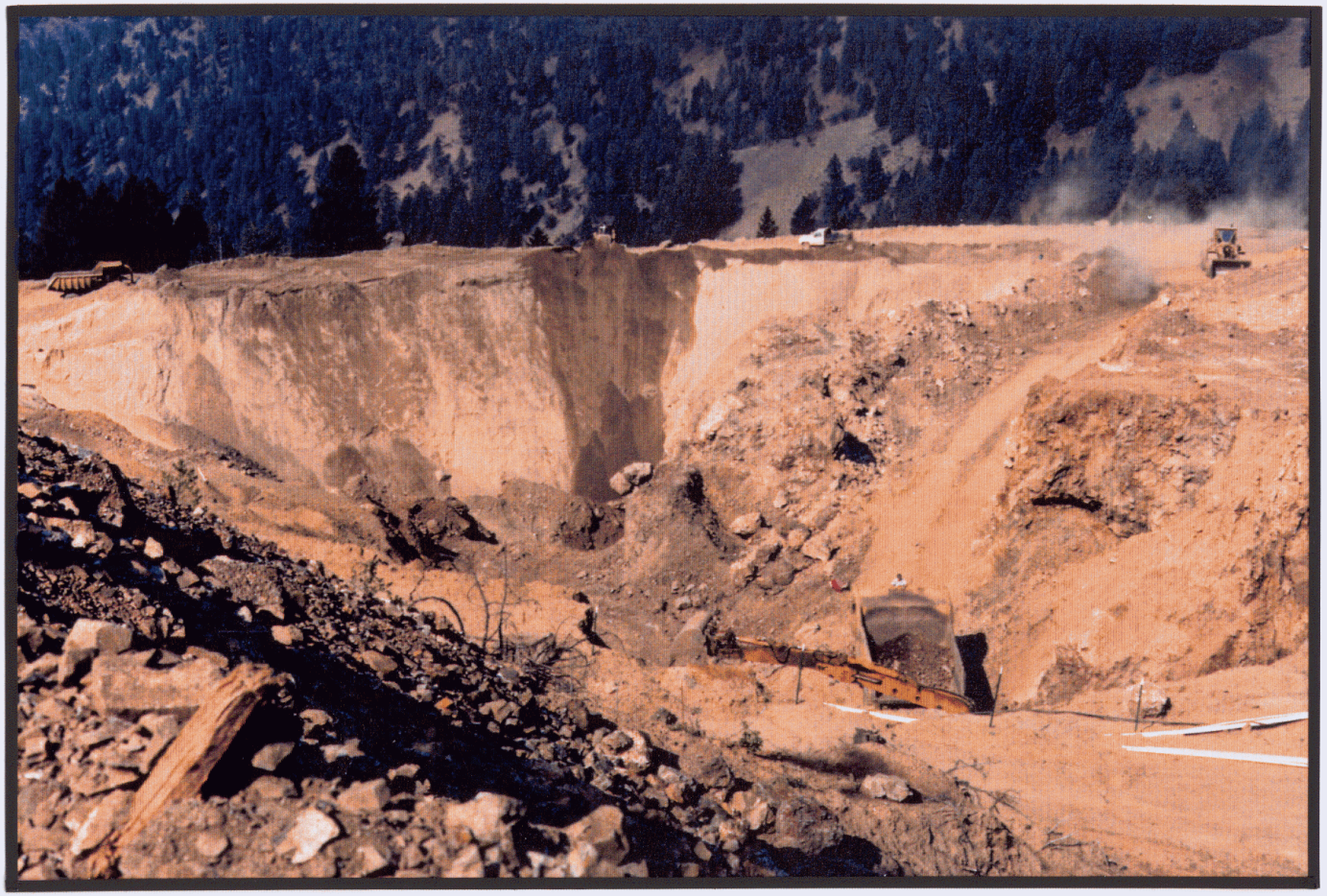

Figure 9. Open pit at the Yellowjacket Mine in 1994 (Idaho Geological Survey photograph by Falma J. Moye).

Figure 10. Townsite and old mill building at Yellowjacket (1994) (Idaho Geological Survey photograph by Falma J. Moye).

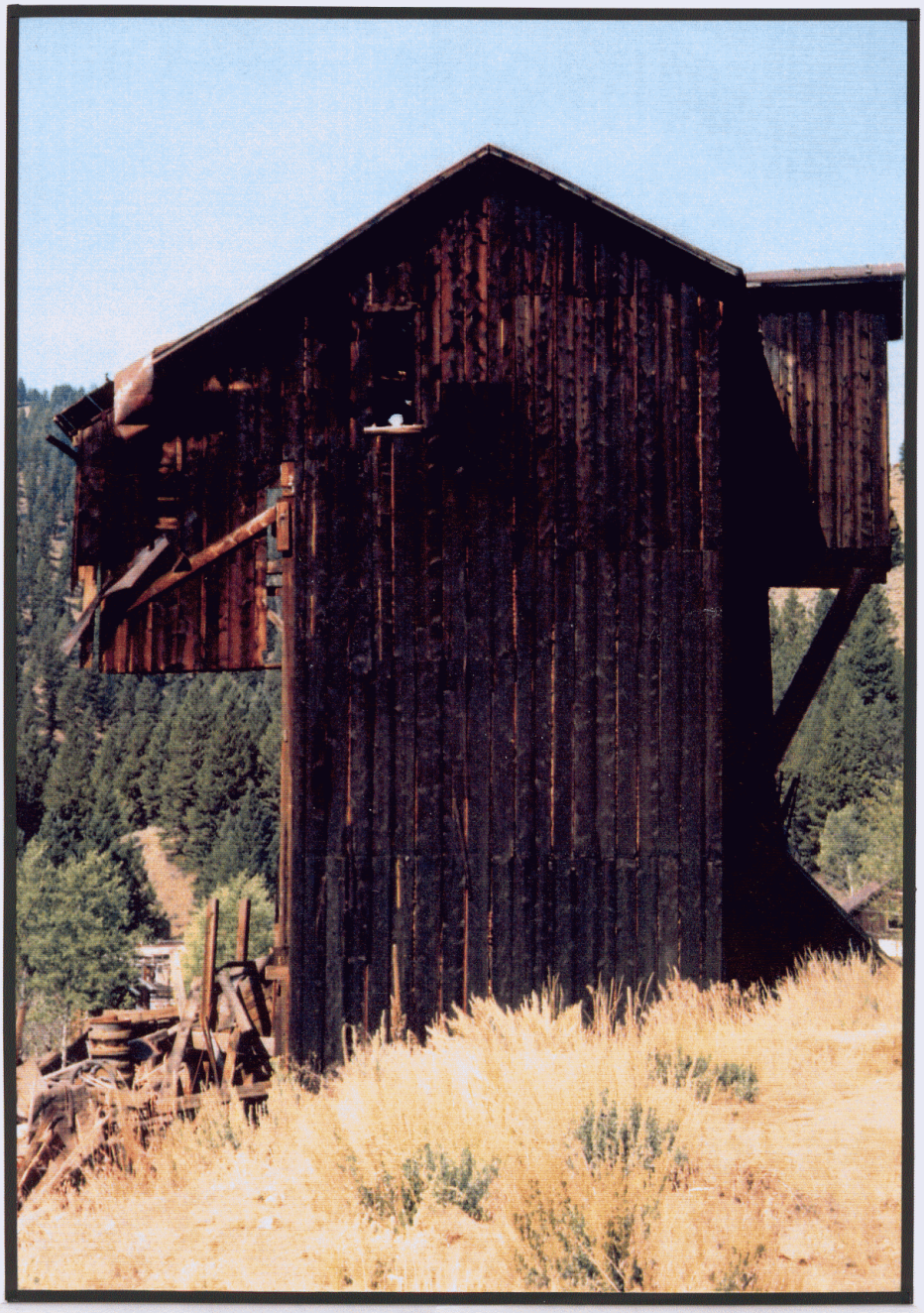

Figure 11. Old mill building at the Yellowjacket Mine (Idaho Geological Survey photograph by Falma J. Moye).

Total recorded production from the Yellowjacket between 1910 and 1969 was 7,368 tons of ore and 2,279 tons of reprocessed tailings. In addition, 2,750 yards of gravel (a gross underestimate) was placered. This material yielded 3,149 ounces of gold, 3,578 ounces of silver, 3,112 pounds of copper, 9,050 pounds of lead, and 100 pounds of zinc. Anderson (1953) cited production between 1902 and 1949 as 8,547 tons of ore, which yielded 3,003 ounces of gold, 3,397 ounces of silver, 3,285 pounds of copper, and 3,050 pounds of lead. Both sets of numbers must be taken as the barest minimums for the Yellowjacket, since they contain no data for ore produced before 1900. This amount was undoubtedly large, since Ross (1934) obtained a value of $121,761.56 from the company's books for production between 1893 and 1897, and Umpleby (1913) credited the Yellowjacket with most of the $450,000 of ore that came from the district before 1910.

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