

UNITED STATES DEPARTMENT OF THE INTERIOR
(BUREAU OF MINES)

SUMMARY REPORT

MINERAL INVESTIGATION OF THE GOSPEL-HUMP
WILDERNESS, IDAHO COUNTY, IDAHO

By

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This open file report summarizes the results of a Bureau of Mines wilderness study and will be incorporated in a joint report with the U.S. Geological Survey. The report is preliminary and has not been edited or reviewed for conformity with the U.S. Bureau of Mines standards and nomenclature. Work on this study was conducted by personnel from Western Field Operations Center, East 360 Third Avenue, Spokane, Washington 99202

FOREWORD

Under the Wilderness Act (Public Law 88-577, September 3, 1964) and the Joint Conference Report on Senate Bill 4, 88th Congress, the U.S. Geological Survey and the U.S. Bureau of Mines have been conducting mineral surveys of wilderness and primitive areas. Areas officially designated as "wilderness", "wild", or "canoe" when the act was passed were incorporated into the National Wilderness Preservation System. The act provides that areas under consideration for wilderness designation should be studied for suitability for incorporation into the Wilderness System. The mineral surveys constitute one aspect of the suitability studies. The act directs that the results of such surveys are to be made available to the public and be submitted to the President and to the Congress.

The Gospel-Hump Wilderness was established as a wilderness under the Endangered American Wilderness Act of 1978 (Joint Conference Report 95-626, January 30, 1978). This report discusses the results of a mineral survey of the Gospel-Hump Wilderness, Nez Perce National Forest, Idaho County, Idaho.

CONTENTS

	<u>Page</u>
Summary.....	4
Introduction.....	5
Setting.....	5
Previous studies.....	5
Acknowledgments.....	7
Mineral appraisal.....	7
Methods of evaluation.....	7
Mining history.....	9
Mining production.....	9
Geology of deposits.....	11
Mines, claims and prospects.....	12
Assessment of mineral deposits.....	20
References.....	22

ILLUSTRATIONS

Figure 1. Location of mines, claims, and prospects in and adjacent to the Gospel-Hump Wilderness.....	6
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TABLES

Table 1. Mineral production from mining districts near the Gospel-Hump Wilderness.....	10
2. Mines, claims, and prospects in the Gospel-Hump Wilderness, Idaho County, Idaho.....	13

SUMMARY

A 1981-1983 U.S. Bureau of Mines study of the Gospel-Hump Wilderness identified 25,000 tons of subeconomic gold-silver resources at the Blue Jay Mine (Sterling Silver Claims) and 26,000 tons of subeconomic gold-silver resources at the War Eagle Mine (Little Bear Claims). Accessory copper, lead, and zinc are contained in both deposits. Each has high potential for additional gold-silver resources.

At least low potential for precious metals resources have been identified at 10 other properties. Four of these have gold-silver occurrences; four have lode gold occurrences; one has silver occurrences; and one has placer gold. Extensive iron-oxide staining in an area about 3 mi long and 1.5 mi wide, including the Iron Nos. 1-3 and Bull of the Woods Nos. 1-3 Claims, and the mineralogy at the Iron Nos. 1-3 Claims, suggests this occurrence may be related to an unidentified disseminated copper system.

Stone and sand and gravel deposits in the study area are too distant from major markets to be resources. Occurrences of energy minerals were not identified.

INTRODUCTION

Setting

The Gospel-Hump Wilderness (fig. 1) encompasses an area of about 206,500 acres, approximately 30 mi southeast of Grangeville in north-central Idaho. Roads from Grangeville, Whitebird, and Riggins provide access to the western edge of the area. Gravel roads south from Elk City and west from Dixie area access the Wilderness from the north and east, respectively. Jet boats travel the Salmon River on intermittent schedules and can provide access from the south.

Elevations within the study area range from 8,938 ft at Buffalo Hump to 1,970 ft at Wind River Pack Bridge on the Salmon River. Vegetation consists of ten conifer timber species, two hardwood species, and an understory of forb, mountain forb, brush, bear grass, and grass.

Previous Studies

Studies of specific mining districts and deposits, including descriptions of geology, mineral deposits, mining, and milling within and adjacent to the Gospel-Hump Wilderness are provided by Anderson (1930), Bancroft (1922), Beckwith (1926, 1927, 1928), Capps (1939, 1940), Kline and Carlson (1952), Livingston and Steward (1914), Lorain (1938), Lorain and Metzger (1938), Reed (1934, 1936, 1937, 1939), Roberts (1924), Ross (1941), Shenon and Reed (1934), Staley (1946), Thomson (1924), Thomson and Balard (1924), and Varley and others (1919). Mitchell and others (1982) compiled information on mines and prospects in the Elk City 1° X 2° quadrangle.

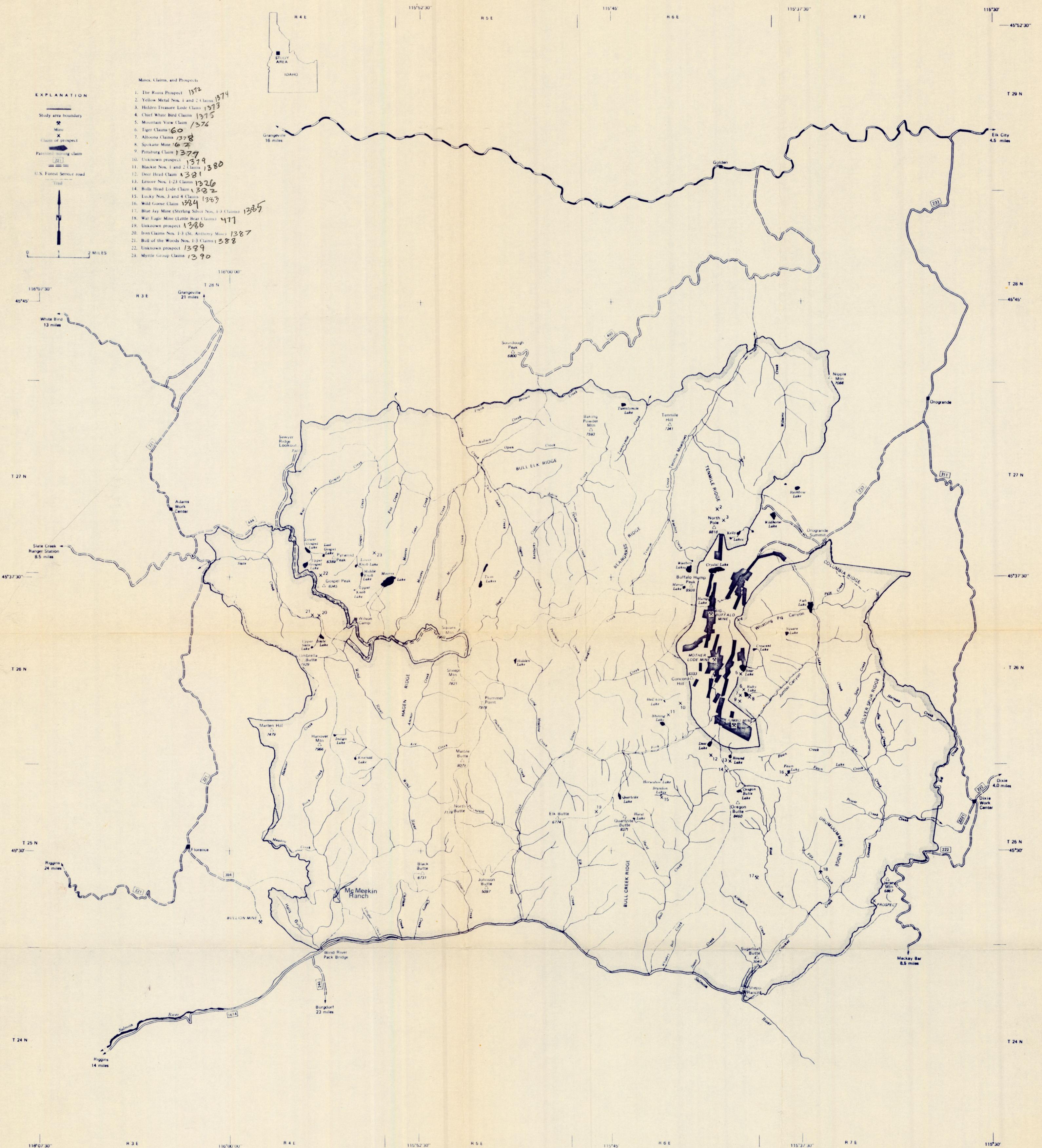


Figure 1. -- Location of mines, claims, and prospects in and adjacent to the Gospel-Hump Wilderness

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MINERAL APPRAISAL

Methods of Evaluation

Work by the U.S. Bureau of Mines entailed several phases that spanned a period of 2.5 years beginning in early 1981, and involved about 6 employee-years. Pre-field studies included library research and collection and perusal of Idaho County and Bureau of Land Management mining and mineral lease records. Bureau of Mines production records were searched and pertinent data compiled. Claim owners and lessees were contacted for permission to examine their properties and publish results of sampling and mapping. Field studies involved searches for all mines, prospects, and claims indicated by the pre-field studies to be within the study area. Those found were mapped and sampled. Mineral deposits in those portions of the Florence, Buffalo Hump, and Dixie mining districts outside but nearby the study area, were also studied for guides to their genesis, and to determine whether results of surveys might indicate similar deposits elsewhere. In addition, ground and air reconnaissance was done along all known trails and in areas of obvious rock alteration.

Samples collected in and surrounding areas of previous mining activity and mineralized features included 309 lode and 90 panned concentrates. Lode samples were fire-assayed for gold and silver. Quantitative values of other visible or suspected minerals of possible economic value were determined by atomic absorption, colorimetric, or X-ray fluorescent methods. At least one sample from each locality was analyzed for 42 elements 1/ by semi-quantitative spectrographic methods; those elements indicated to be in anomalous concentrations were then determined by one of the appropriate quantitative methods given above. Petrographic examinations were performed to determine selected rock types, alteration suites, and mineral assemblages. Reconnaissance samples, collected from selected alluvial deposits, were panned to a rough concentrate and processed on a laboratory-size Wilfley table. The resulting heavy mineral fractions were scanned with a binocular microscope to determine their mineral content and, if necessary, amalgamated to recover fine gold. Panned concentrates were also examined for fluorescence and radioactivity. Site-specific geophysical surveys were conducted using a VLF electromagnetic receiver, a proton magnetometer with 10-gamma resolution, a four-channel gamma-ray spectrometer, and a scintillometer with a sodium iodide crystal. Data collected was interpreted using methods described by Fraser (1969), Breiner (1973, 1980), Hansen (1980), and Stromswold and Kosanke [1980].

Resource classification terminology used for this study is that described by the U.S. Bureau of Mines and U.S. Geological Survey (1980).

1/ Aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, columbium, copper, gallium, gold, hafnium, indium, iron, lanthanum, lead, lithium, magnesium, manganese, molybdenum, nickel, phosphorus, platinum, rhenium, scandium, silicon, silver, sodium, strontium, tantalum, tellurium, thallium, tin, titanium, vanadium, yttrium, zinc, and zirconium.

Mining History

Mining in north-central Idaho began in 1857 with the discovery of placer gold by Jack Lassier along Orofino Creek, about 55 mi north of the study area. However, the discovery of placer gold along Canal Gulch (also near Orofino Creek) by Captain E. D. Pierce and his followers in 1860, is generally cited as the first discovery. By 1862, the initial discoveries of placer gold in districts near the study area were recorded.

Lode gold deposits were first discovered in 1870, near Elk City, north of the study area; within the study area William Boyce discovered lode gold at the War Eagle Mine (fig. 1, no. 18) southwest of Dixie, in 1898. This was the same year a discovery was made by Charles Robbins and Kenneth B. Young southeast of Buffalo Hump Peak. Mining activity throughout the region significantly subsided by about 1910, and has been intermittent since then.

Mining Production

The Gospel-Hump Wilderness is surrounded by twelve mining districts; portions of the Tenmile, Orogrande, Dixie, Buffalo Hump, and Florence districts are within the study area. Most gold production from these twelve districts has been from placer deposits, but the Buffalo Hump district produced mostly lode gold. Total gold production is difficult to determine because of incomplete records, but is estimated to be at least 2.9 million troy ounces. Base and precious metal production is summarized in table 1; data was obtained from U.S. Bureau of Mines files, Thomson and Ballard (1924), and Koschman and Bergendahl (1968). Lode gold ore was crushed in stamp mills followed by plate amalgamation. Recovery by this method was about 60 percent (Reed, 1936, p. 4).

Table 1.--Mineral production from mining districts near the
Gospel-Hump Wilderness 1/

District name	Placer gold production (tr oz)	Lode production			
		Gold (tr oz)	Silver (tr oz)	Copper (lb)	Lead (lb)
Buffalo Hump		33,534	33,579	11,118	49,253
Dixie	40,000 to 75,000 (est.)	2,408	1,534	927	2,483
Elk City	550,000 to 800,000 (est.)	27,646	11,315	750	847
Florence 2/	1,000,000 (est.)	738	615		
Newsome 3/	97,000	1,236	298		
Orogrande	32,000 (est.)	20,827	11,698	2,871	20,941
Simpson	9,578	305	55		
Tenmile 4/ (Golden)	128,600	18,866	12,906	4,235	10,302
Warren-Marshall and Resort	906,000	58,234	123,337	12,497	26,585
Total	2,763,000 to 3,048,000	163,794	195,337	32,398	110,411
					1,401

1/ Lode production data obtained from U.S. Bureau of Mines records. Placer gold production from Koschmann and Bergendahl (1968), and Thomson and Ballard (1924).

2/ Reed (1939, fig. 1) shows the Bungalow district to be adjacent and northwest of the Florence district. Lorain and Metzger (1938, p. 49 and figs. 2 and 8) imply that the Bungalow area is part of the Florence district. Production reported here is assumed to include that from Florence, Bungalow, and French Creek. Specific references to production, district boundaries, or mining history could not be found for the French Creek district, although Koschmann and Bergendahl (1968, p. 132) make reference to the "French Creek and Florence districts".

3/ Thomson and Ballard (1924, p. 13) estimate production from the Newsome district to have been worth \$2,000,000. The gold price from 1850 to 1932 was \$20.67 per troy ounce. Production reported herein was derived by dividing the total estimated value of the gold by the unit price.

4/ Koschmann and Bergendahl (1968, p. 133) report a total gold production of 147,000 ounces of which they state an estimated minimum of 18,400 ounces of lode production.

5/ Lorain (1938) and Lorain and Metzger (1938) refer to the composite Marshall Lake and Resort districts (Ross, 1941) as the Burgdorf district.

Geology of Mineral Deposits

The Gospel-Hump Wilderness is on the western flank of the Idaho Batholith, a Laramide intrusion of predominantly acidic igneous rocks. Roof pendants of Precambrian Belt Supergroup or equivalent metasediments crop out over portions of the study area. Structural features generally trend in a northwesterly direction. Precious metal lode deposits within and adjacent to the area are generally associated with northeasterly-trending faults.

Lode deposits within and immediately adjacent to the wilderness frequently occur in quartz veins associated with northward-trending faults and shear zones in granodiorite. Gold and silver constitute the principal metallic values; accessory copper, lead, and zinc are generally present. A few of the veins also contain tungsten and molybdenum.

A subtle zone of altered rock characterized by iron minerals and locally intense gossan development occurs in the granitic-metasedimentary contact zone between Slate Lake, Gospel Peak, and Moores Lake. The zone extends along a northeast trend for about 3.0 mi and is about 1.5 mi wide. It possibly is related to thrust faulting reported by Shenon and Reed (1934, p. 20). Rock types present within the zone include granodiorite, schistose gneiss, hornfels, tremolite schist, marble, fine to medium grained quartzite and quartzite pebble conglomerate. Near Gospel Peak the zone is more intensely developed within gneiss, granodiorite, and hornfels; and near Slate Lake in fine to medium grained quartzite. Disseminated pyrite, pyrrhotite, and copper carbonate minerals were found in mine workings near Slate Lake. Altered rock near Gospel Peak is composed of about 60 percent jarosite, 5 percent hematite, and 35 percent goethite.

Mines, Claims, and Prospects

Table 2 describes mines, claims, and prospects examined at 23 sites (fig. 1) in the Gospel-Hump Wilderness. Gold-silver resources were identified at the Blue Jay (Sterling Silver Claims) and War Eagle (Little Bear Claims) Mines (fig. 1, nos. 17 and 18) which are in the Dixie mining district. Potential for additional precious metal resources was identified at these 2 and 10 other properties.

Table 2.--Mines, claims, and prospects within the Gospel-Hump Wilderness

[Underlined name indicates identified mineral resources or potential;
placer gold values at \$400 per troy ounce]

Name	Map no.	Workings	Summary
<u>Altoona</u> <u>Claims</u>	7	Two shafts, each 10 ft deep, one 90-ft-long adit and nine prospect pits.	Workings are scattered along a quartz vein which is 1- to 2-ft thick, extends along a northeast strike for about 275 ft and dips 65° to 75° SE. The quartz commonly has boxwork filled with limonite. At one location, the vein is cut by a diorite dike that is about 120 ft long, 4 ft thick, strikes N. 75° E. and dips 80° S. The country rock is predominantly granodiorite with some muscovite schist. Two petrographic, 7 chip and 6 grab samples: one chip sample had 0.028 oz gold per ton and one grab had 0.001 oz gold per ton. Copper, lead, and zinc quantities were no more than 0.003, 0.03, and 0.012 percent, respectively. Potential for mineral resources is low.
Blackie Nos. 1 and 2 Claims	11	One pit.	Audrey Shepler located these claims in October 1935. The area around the claims is glacial till, some of which is composed of massive quartz cobbles with pyrite and iron- oxide staining. One grab sample: no significant mineral values.

Table 2.--Mines, claims, and prospects within the Gospel-Hump Wilderness--Continued

Name	Map no.	Workings	Summary
<u>Blue Jay Mine</u> (Sterling Silver Claims)	17	Two adits, 360 and 46 ft long; several prospect pits; and a trench.	Charlie Shepp made the initial discovery in 1900. He and Pete Klinkhammer periodically worked the claims at least until about 1905. Production records are not available. Mineralized quartz veins occur along shear zones in tonalite country rock. Chalcopyrite, chrysocolla, malachite, azurite, galena, and sphalerite are often associated with quartz and breccia. Gold and silver is found with the quartz, breccia, and gouge. Indicated subeconomic resources are 5,600 tons and inferred subeconomic resources are 19,000 tons. Weighted average gold and silver grades are 0.115 oz per ton and 0.610 oz per ton, respectively. Other commodities have weighted average grades as follows: copper, 0.05 percent; lead, 0.22 percent; zinc, 0.03 percent; also present in trace amounts are molybdenum and tungsten. Proton magnetometer, VLF-electromagnetic receiver, and gamma-ray spectrometer survey data indicates the presence of a conductor which probably horsetails east of the adits. Indications of conductive zones appears to occur north and south of the adits. Potential for additional gold-silver resources is high.
<u>Bull of the Woods Nos. 1-3 Claims</u>	21	None found.	Three claims were located by F. M. Mitchell in October 1898 and June 1900. Quartzite and gossan occur in a shear zone parallel and adjacent to the Iron Claims. One select sample had 0.66 oz gold and 12.0 oz silver per ton, 0.15 percent copper and 0.057 percent zinc. Potential for gold and silver resources is low.
Bulls Head Lode Claim	14	One pit.	Sphalerite-bearing quartz occurs along joints that strike N. 53° E. and dip 60° E. in granitic country rock. The claim was located by C. P. Carlin in June 1900. One grab sample had 0.01 percent zinc.

Table 2.--Mines, claims, and prospects within the Gospel-Hump Wilderness--Continued

Name	Map no.	Workings	Summary
<u>Chief White Bird Claims</u>	4	Two adits, 57 and at least 250 ft long, and several small pits.	B. B. Swarts located the Chief White Bird Claims in 1903. The workings are in locally pyrite-bearing granodiorite country rock. The longer adit cross-cuts faults and shear zones that strike northerly and dip steeply eastward. Above this working, prospect pits are in granodiorite and tactite with garnet and epidote. Twelve grab and nine chip samples: 7 had from 0.005 to 0.052 oz gold per ton, 6 had from 0.2 to 0.5 oz silver per ton; maximum values for copper, lead, zinc, and tungsten were no more than 0.014, 0.010, 0.018, and 0.0022 percent, respectively. Results of VLF-electromagnetic receiver, proton magnetometer, and gamma-ray spectrometer surveys do not provide a clear indication of the presence of a conductor. Potential for gold-silver resources is low.
Deer Head Claim	12	One 30-ft-long adit and three prospect pits.	The claim was located by J. J. Howry in June 1902. An iron-oxide-stained quartz vein, less than 1.0 ft thick strikes N. 15° E. and dips vertically. One grab and three chip samples: the grab sample had 0.0016 percent molybdenum.
<u>Hidden Treasure Lode Claim</u>	3	Four trenches and three pits.	Veinlets of pegmatite and quartz intrude iron-oxide-stained granodiorite along Tenmile Ridge. One grab and four chip samples: one chip sample had 0.052 oz gold per ton and other samples each had a trace. Potential for gold resources is low.

Table 2.--Mines, claims, and prospects within the Gospel-Hump Wilderness--Continued

Name	Map no.	Workings	Summary
Iron Nos. 1-3 Claims (St. Anthony)	20	One 15-ft-long adit and numerous prospect pits.	The claims were originally located by C. Miller in August 1907, and were subsequently re-located by A. A. Oliver and R. F. Groom in September 1953. A gossan zone occurs over an area about 1,500 ft long and about 40 ft wide and is part of a much larger, more subtle iron-oxide staining that encompasses the region between Slate Lake, Gospel Peak, and Moores Lake. The gossan occurs in an angular to subangular, fine to medium grained quartzite with minor amounts of biotite and smoky quartz, and disseminated, pyrite and pyrrhotite. A minor amount of malachite staining also was observed. Tremolite-marble schist occurs in small, isolated outcrops. Seventeen samples: 3 had 0.03 to 0.042 oz gold per ton; 2 had 0.2 oz silver per ton; 4 had 0.01-0.04 percent copper; 1 had 0.06 percent lead; and 4 had 0.01-0.012 percent zinc; average assay values were 0.006 oz gold per ton, and 0.018 oz silver per ton. Potential for gold-silver resources is low.
Lenore Nos. 1-23 Claims	13	One adit 8 ft long.	The claims were located by Bill Russell, in March 1975, south of Round Lake. An iron-oxide-stained quartz vein 3 to 21 in. thick strikes N. 10° E. and dips 68° E. and fills fractures in a granodiorite and pegmatite country rock. One 21-in.-long chip sample had no significant metal values.
Lucky Nos. 3 and 4 Claims	15	None found.	These claims were located by Charles Paul in August 1956 near Brandon Lakes. Disseminated pyrite and chalcopyrite occur in a 30-ft-thick layer of biotite schist. Five chip and one grab samples: three of the chip samples each had 0.2 oz silver per ton.

Table 2.--Mines, claims, and prospects within the Gospel-Hump Wilderness--Continued

Name	Map no.	Workings	Summary
<u>Mountain View Claim</u>	5	Seven adits, all but two of which are caved, and numerous prospect pits and trenches. The two open adits are 12 and 19 ft long.	W. P. Boyle filed this claim in August 1907. A quartz vein and veinlets strike N. 10° W. and dip 50° NE. in granodiorite country rock. The vein, averaging less than 10 ft thick, is locally iron-oxide stained, and contains pyrite, arsenopyrite, galena, and covellite (?). The staining is predominantly limonite with subordinate amounts of hematite. The vein may be part of the system described as the Tiger vein by Shenon and Reed (1934, p. 65). Six chip and eight grab samples: six samples had 0.005 to 0.896 oz gold per ton; one also had 0.8 oz silver per ton, a 0.075 percent copper, 0.37 percent lead, and 0.42 percent zinc; other samples had substantially less. Potential for mineral resources is low.
<u>Myrtle Group Claims</u>	23	One pit.	Greg Stanley located the Myrtle, Marian, Marcee, and Madaline Claims in August 1908. Country rock is slightly iron-oxide-stained quartzite and granodiorite and fine- to medium-grained dolomite with sericite and traces of chlorite, zircon, sphene, magnetite, and pyrrhotite. A shear zone strikes N. 20° E., dips 60° E., and is about 100 ft wide. Six samples: three grab samples had 0.7, 2.5, and 2.7 oz silver per ton; one other grab sample had 0.012 percent copper, and two others had 0.024 percent and 0.012 percent zinc. Potential for silver resources is low.
<u>Pittsburg Claim</u>	9	One 10-ft-long adit, two collapsed adits, one trench, and numerous prospect pits.	This claim was located by H. Williams in August 1902. An iron-oxide-stained quartz vein with limonite-filled boxwork strikes N. 23° E., dips 72° SE., and averages 2.5 ft thick. Five grab and four chip samples: one grab sample of weathered granodiorite had 0.166 oz gold and 2.8 oz silver per ton, and another of iron-oxide-stained quartz had 0.058 oz gold and 1.6 oz silver per ton. Iron-oxide-stained quartz was found to have copper, lead, zinc, and molybdenum in quantities up to 0.014, 0.084, 0.0033 and 0.03 percent, respectively. Potential for mineral resources is low.

Table 2.--Mines, claims, and prospects within the Gospel-Hump Wilderness--Continued

Name	Map no.	Workings	Summary
The Ruins Prospect	1	At least 1,000 ft of trenching with less than 30 cu yd of hydraulic workings.	Alluvial placer accumulations of unknown thickness overlay granodiorite county rock. Seven placer samples had from \$0.03 to \$3.60 (0.00007 to 0.009 oz) gold per cu yd, one had \$32 (0.08 oz) gold per cu yd. One grab sample had 0.2 oz silver per ton. Potential for placer gold resources is low.
Spokane Mine	8	One adit at least 240 ft long, and five prospect pits or possible caved shafts.	A 3.0-ft-thick quartz vein that strikes N. 10° E. and dips 62° S: is exposed in the adit. According to Shanon and Reed (1934, p. 65), the mine was developed on three levels and a vein with at least a 30 ft maximum thickness was exposed. Two grab and seven chip samples: one grab sample had 0.27 oz gold per ton. Potential for gold resources is low.
Tiger Claims	6	Two collapsed adits and numerous prospect pits and trenches.	The North and South Tiger Claims were located by L. J. Anderson in January 1903. Workings are on a quartz vein and veinlets that trend about N. 12° W. and dip 70° NE. The quartz is locally pyrite-bearing and frequently stained by limonite. Shanon and Reed (1934, p. 65) report the vein is about 10 ft thick in the Anderson Tunnel. The vein does not crop out and, because the underground workings are not accessible, confirmation could not be made. Four samples: one chip sample had 0.001 oz gold per ton and 0.0025 percent molybdenum. Three grab samples contained copper and molybdenum. One had 0.007 percent copper and one had 0.001 percent molybdenum.
Unknown prospect	10	One pit.	Quartz pegmatite and fine-grained schistose gneiss. One grab sample: no significant metal values.
Unknown prospect	19	One pit.	A pit penetrates a pink feldspar-, quartz-, muscovite-bearing pegmatite, and quartz veinlets, which are heavily iron-oxide stained. One grab sample had 0.0008 percent molybdenum.

Table 2.--Mines, claims, and prospects within the Gospel-Hump Wilderness--Continued

Name	Map no.	Workings	Summary
Unknown prospect	22	None found.	A gossan zone occurs about 2,000 ft north of Gospel Peak in schistose gneiss, hornfels, and fine- to medium-grained granite. About 800 ft north of the peak and along the cirque rim is a gray, sucrosic, biotite, quartzite-pebble conglomerate. Eleven samples: one grab sample of the conglomerate had 0.018 oz gold and 3.4 oz silver per ton. Some samples of iron-oxide-stained quartzite and granodiorite had silver, copper, lead, zinc, molybdenum, and tungsten in anomalous concentrations, but none were high enough to identify resources or potential. Visual inspection and VLF-electromagnetic receiver, proton magnetometer, and gamma-ray spectrometer surveys show the oxidation occurs in granodiorite, pegmatite, and foliated schistose gneiss. Some of the iron-oxide staining is the result of decomposition of biotite. Other oxidation features may be the result of the intrusion of granitic rocks along a thrust fault reported by Shenen and Reed (1934, p. 20).
<u>War Eagle Mine</u> (Little Bear Claims)	18	Nine adits, only one of which is open, one shaft, numerous prospect pits, and remnants of a 25-ton per day flotation mill.	William Boyce made the initial discovery of the War Eagle Mine on the Blue Bell Claim in 1898. From 1934-1937, at least 11,896 tons of ore yielded 2,230 oz gold, 8,838 oz silver, 18,216 lb lead and 5,374 lb copper. Granodiorite and quartz monzonite are cut by dacite porphyry dikes, quartz veins, the War Eagle fault, and shear zones. Tolman identified propylitic and silicic alteration in rocks at and near the mine, and pyrite, sphalerite, chalcopyrite, tetrahedrite, galena, argentite, gold and silver telluride (?), covellite, chalcocite, native silver, native gold (?), iron and copper oxides in quartz at the mine. Inferred subeconomic resources for the War Eagle Mine are 26,000 tons, averaging 0.2 oz gold and 0.7 oz silver per ton. This grade is based on production records from 1934-1937. VLF-electromagnetic receiver, proton magnetometer, and gamma-ray spectrometer surveys indicate the presence of a conductor along the War Eagle Fault zone. Seven conductive zones are identified within 300 ft of the adits and prospect pits. Potential for additional gold and silver resources is high.

Table 2.--Mines, claims, and prospects within the Gospel-Hump Wilderness--Continued

Name	Map no.	Workings	Summary
Wild Goose Claim	16	None found.	Auriferous gravel more than one ft thick occurs along a 100- to 200-ft wide section of Fawn Creek south of Fawn Lake. Two placer samples from Fawn Creek had \$0.02 (0.000058 and 0.000048 oz) gold per cu yd.
Yellow Metal Nos. 1 and 2 Claims	2	Two trenches and nine pits.	Quartz veinlets and pegmatite intrude granodiorite and are locally iron-oxide stained. Magnetite-bearing quartzite also crops out. Four grab and two chip samples: one had 0.010 oz gold per ton.

ASSESSMENT OF MINERAL DEPOSITS

About 25,000 tons of indicated and inferred subeconomic resources estimated at the Blue Jay Mine (Sterling Silver Claims) occur in quartz veins with an average thickness of 3.0 ft. Average gold and silver grades are 0.12 oz per ton and 0.16 oz per ton, respectively, and accessory copper, lead, and zinc values are present. The resources are classed as subeconomic (U.S. Bureau of Mines and U.S. Geological Survey, 1980) because, at current gold and silver prices, grades are insufficient to return production expenditures and a reasonable return on invested capital. Potential for the discovery of additional gold-silver resources is rated high.

Inferred subeconomic resources totaling about 26,000 tons and averaging about 0.2 oz gold and 0.7 oz silver per ton are estimated at the War Eagle Mine (Little Bear Claims). This tonnage was based on reports by Bancroft [1925] and Tolman [1918], because the mine workings are mostly inaccessible. Average grade is based on production records for the mine. Assay results cited by Bancroft [1925] are up to 10.04 oz gold per ton and 32.44 oz silver per ton. Accessory lead, zinc, and copper are present. Thicknesses of two mineralized veins average 3 to 5 ft. The resources are classed as subeconomic for the same reasons as those at the Blue Jay Mine. Geophysical surveys show six previously unreported anomalies. Potential for the discovery of additional gold-silver resources is high.

At least low potential for gold-silver resources has been identified at the Chief White Bird, Pittsburg, Iron Nos. 1-3, and Bull of the Woods Nos. 1-3 Claims. Low potential for gold resources was identified at the Altoona Claims, Hidden Treasure Lode Claim, Mountain View Claim, and Spokane Mine. Low potential for silver resources is estimated at the Myrtle Group Claims. Potential for placer gold resources is believed to be low at The Ruins Prospect.

In the area between Slate Lake, Gospel Peak, and Moores Lake, an extensive zone of iron-oxide staining in granodiorite, pegmatite, and schistose gneiss includes the Iron Nos. 1-3 and Bull of the Woods Nos. 1-3 Claims. The part of the zone within the Iron Claims exhibits magnetite, pyrite, and pyrrhotite, and some copper carbonate staining; this may be indicative of a buried disseminated copper system, the potential for which is rated low.

Stone and sand and gravel deposits in the study area are suitable for construction uses. However, they are not considered to be resources because transportation costs to major markets would be several times the value of these materials.

During this study, no occurrences of coal, uranium, oil and gas or geothermal energy were identified.

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