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REPORT ON THE
WHITE STAR PROPERTY
ALBERNI MINING DIVISION
RUPERT LAND DIVISION, BRITISH COLUMBIA

NTS 92L/2W

For

MRS. D. GARRETT
1111 - 7th Avenue
New Westminster, B.C.
V3M 2J6

By

J. PAUL SORBARA, M.Sc., F.G.A.C.
J.P. Sorbara & Associates
6703 Nicholson Road
Delta, B.C.
V4E 2T2

OCTOBER 27, 1986

Exploration

This property is small in area but has an excellent chance for Hi-grade gold reserves. It could be put back into production in a very short time.

MRS. Garnett would like interested parties to deal with me as she is 70+ years old and knows very little about the mining business.

Thanks
A Paul Sorlang

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INTRODUCTION

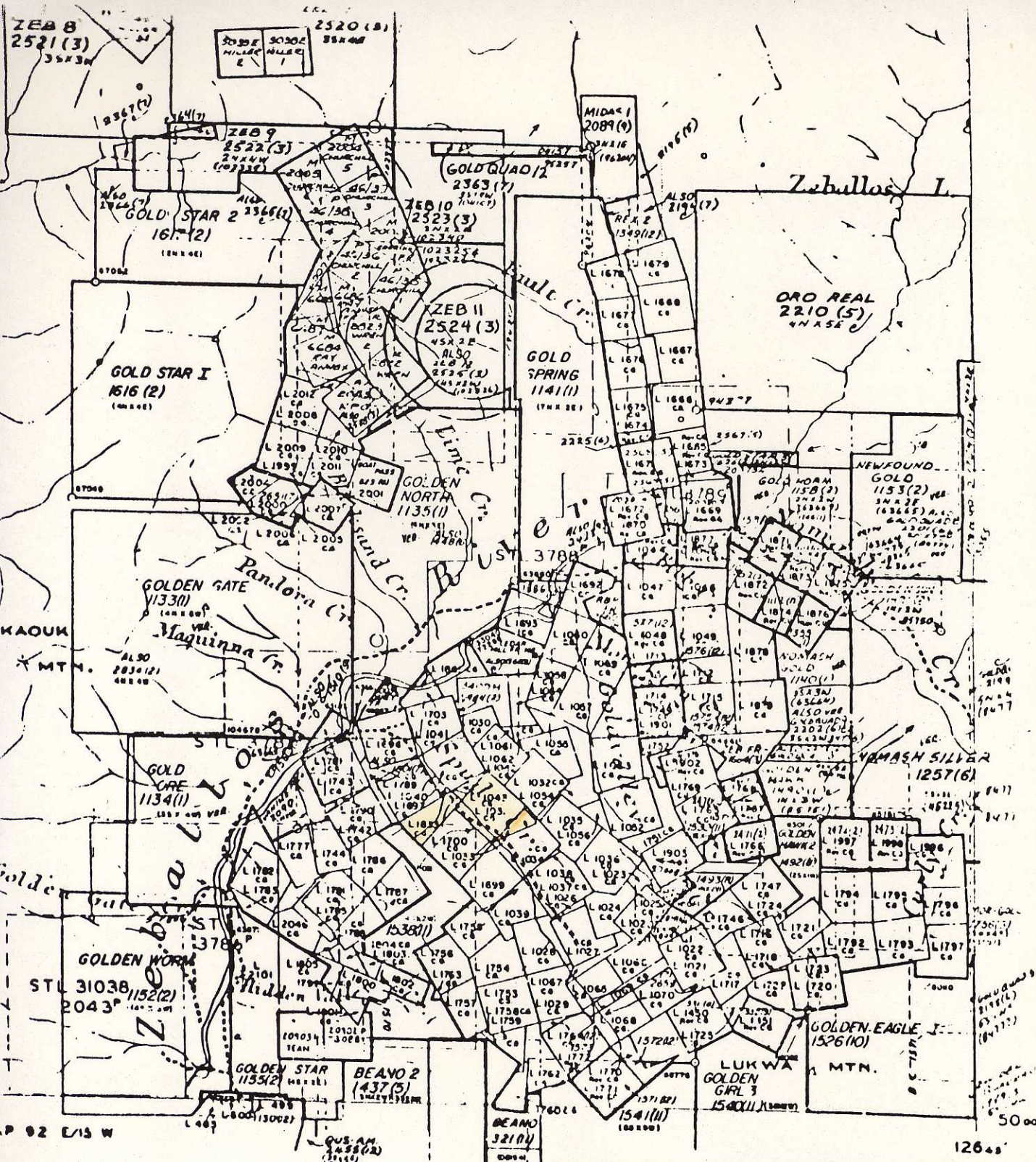
This report on the White Star property is done at the request of Mrs. D. Garrett of New Westminster, B.C. The purpose is to evaluate the potential of the property for hosting additional narrow, but mineable, high grade quartz veins and to advise the owner of the property's possible value. The report is not intended for use in a prospectus or statement of material facts for the purpose of a private or public financing.

The writer and assistant, G. Troscinski, visited the property on October 25 and 26, 1986. During that time, the underground workings of the No. 3 adit level were examined, the White Star (L1031) was traversed, accessibility and setting were evaluated and discussions were held with adjacent and nearby property owners who are currently mining or developing their properties, which also host auriferous quartz veins.

LOCATION AND ACCESS

The White Star property is located on Spud Creek, about 4 kilometers northeast of Zeballos, B.C. and is found on NTS Map Sheet 92L/2W. The property is centered at latitude 50°01'30" north and longitude 126°48'30" west.

Access to the property is excellent. It is gained via paved Highway 19 from Campbell River, B.C. to the Zeballos cut-off and then some 28 miles of good gravel road to the mouth of Spud Creek. A secondary gravel road runs up the Spud Valley and crosses the White Star property. A bridge across Spud Creek lies on the White Star property affording access to the portions of the property on either side of the Creek.



WHITE STAR PROPERTY

CLAIM LOCATION MAP

| | | | |
|---------------------------|--------|--------|---------|
| Scale: | Date: | N.T.S. | Figure: |
| 1:50,000 | Oct/86 | 92L/2W | 1 |
| By: | | | |
| J.P. SORBARA & Associates | | | |

PROPERTY AND OWNERSHIP

The White Star property is owned by Mrs. D. Garrett of 1111 - 7th Avenue, New Westminster, B.C. The property (Figure 1) comprises three Crown-granted mineral claims located in the Rupert Land Division (Alberni Mining Division). The total area of the property is 36.90 hectares and the annual taxes total \$22.87. Pertinent property data are tabulated below:

| <u>CLAIM NAME</u> | <u>LOT NUMBER</u> |
|-------------------|-------------------|
| WHITE STAR | L1031 |
| DON FRACTION | L1033 |
| STAR FRACTION | L1833 |

PROPERTY SETTING AND GEOLOGY

The White Star property is situated in the center of the Zeballos gold mining camp which became famous in 1935 for its rich gold-and silver-bearing quartz veins (Figure 1). Most of these veins are quartz-sulfide fracture and fissure fillings that are rarely more than a foot wide and average about 4 inches. They do, however, maintain a fairly consistent strike and dip for considerable distances. The veins pinch and swell and in places are represented by only a narrow film of fault gouge. Grades vary considerably but in places exceed 14 ounces of gold per ton.

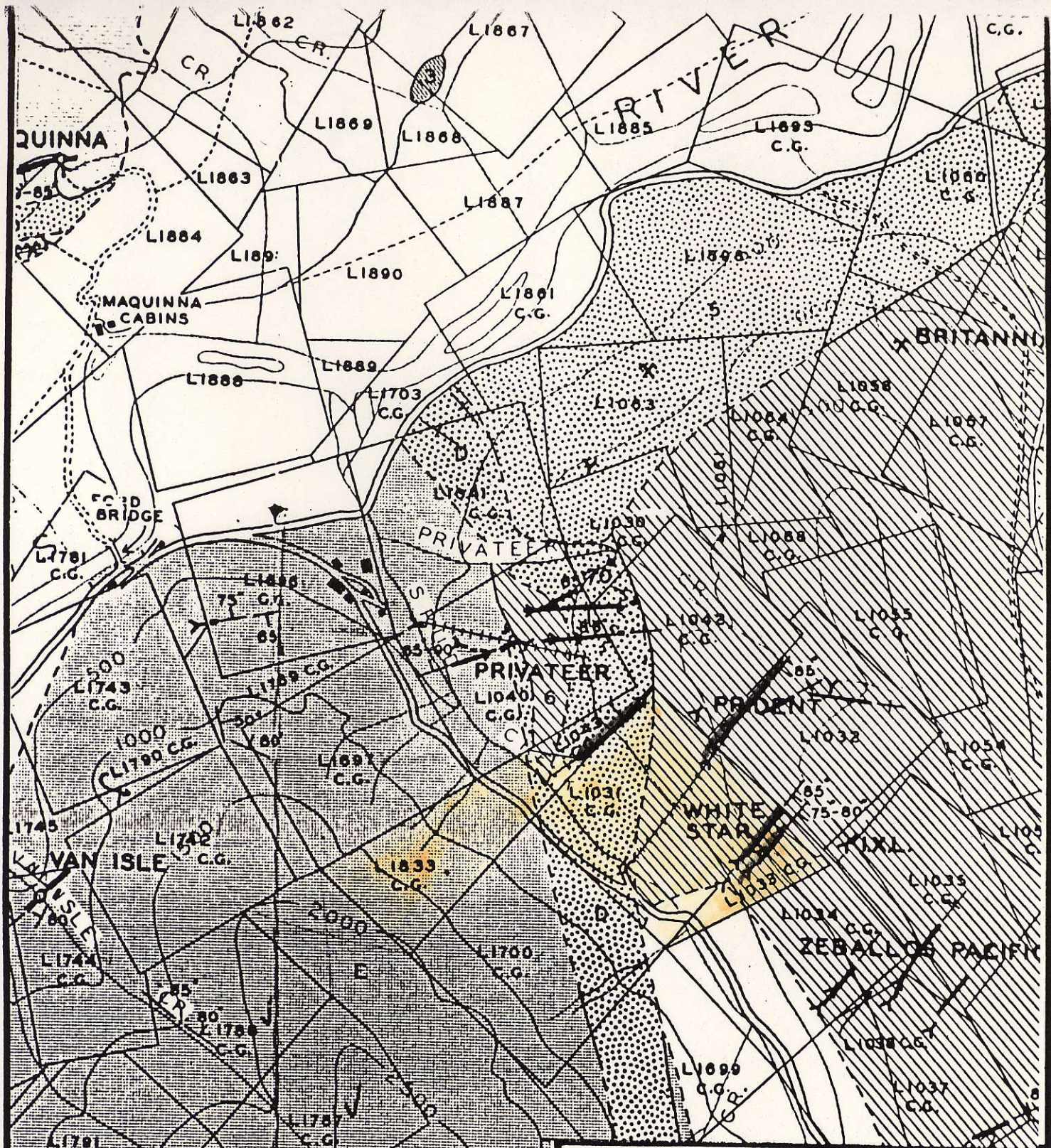
The Zeballos camp is riddled with adits and other underground workings and has been producing gold on and off since the 1930's. The camp and the White Star property are described by Stevenson, 1950, in British Columbia Department of Mines Bulletin No. 27. Parts of this report are re-produced in Appendix II.

The White Star property has roughly 2,570 feet of underground workings in 3 adit levels on the White Star claim and the Don Fraction. Between 1935 and 1942, 1,414 tons of ore were mined from these workings which resulted in the production of 7,081 ounces of gold (average recovered grade 5.0 oz/ton) and 2,956 ounces of silver (average recovered grade 2.09 oz/ton). All of this production came from 2 northeast striking veins on the boundary between the White Star (L1031) and the Don Fraction (L1033) between elevations 950 feet (No. 3 adit level) and surface (Figure 2 and Appendix I). The mining stopped in 1942 because of W.W.II but did not stop due to a lack of ore. The No. 1 and No. 2 veins remain untested down dip and along strike.

Three other veins, parallel to No. 1 and No. 2, were uncovered on surface about 100 feet northwest of the No. 2 adit but have yet to be explored at depth. The rest of the White Star property is covered by West Coast rain forest and has not been extensively stripped or trenched, except for the extreme northern corner of the White Star property where another short adit is reported on another vein which runs northeast along the border with Lot 1043 (Figure 2). The southwest extension of this vein trends onto the Star Fraction.

The veins found to date on the White Star property are hosted in quartz diorite. Higher grade veins are reported in a band of calc-silicate rocks that underlies the western half of the White Star claim and part of the Star Fraction. The remainder of the Star Fraction is underlain by andesitic volcanic rocks which locally also host auriferous quartz veins.

The two productive veins plus the three additional ones found on surface occur over a width of about 260 feet. The northwestern vein lies some 1,300 feet northwest. The productive veins on the Prident property lie immediately uphill from the center of the White Star claim. These veins, which trend



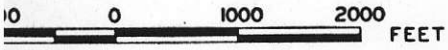
| | | | |
|-------------------------------------|--------------|------|---------|
| WHITE STAR PROPERTY | | | |
| PROPERTY GEOLOGY AND ADIT LOCATIONS | | | |
| Scale: Photo | Date: Oct/86 | NTS. | Figure: |
| Enlargement | 92L/2W | | 2 |
| By: J.P. SORBARA & Associates | | | |

FIG.2

ZEBALLOS MINING CAMP, AREAL GEOLOGY

BRITISH COLUMBIA DEPARTMENT OF MINES
VICTORIA B.C.

LEGEND



DRIFT AND VALLEY-FILL

COAST INTRUSIVES

- QUARTZ DIORITE
- DIORITE AND VOLCANICS BRECCIATED AND CEMENTED BY QUARTZ DIORITE
- GRANODIORITE
- DIORITE CUT BY MANY GRANODIORITE DYKES
- HORNBLLENDE DIORITE
- GABBRO

INTRUDED ROCKS

- ANDESITE CHIEFLY PYROCLASTICS (DARK GREEN, HORNBLLENDE FELDSPAR CRYSTAL TUFFS AND VOLCANIC BRECCIA), SOME LAVA
- LIME-SILICATE ROCKS
- LIGHT-COLOURED VOLCANICS (FELDSPAR CRYSTAL TUFFS AND DACITE TUFFS AND FLOWS)
- LIMESTONE
- ANDESITE CHIEFLY DARK GREEN LAVA (FINE-GRAINED AND AMYGDALOIDAL PHASES)

VEIN



REPLACEMENT BODY

SECONDARY TRIANGULATION STATION, TOPOGRAPHIC SURVEYS, DEPARTMENT OF LANDS, BRITISH COLUMBIA.

PROSPECT

ADIT

GEOLOGICAL CONTACT DEFINED
 GEOLOGICAL CONTACT INFERRED

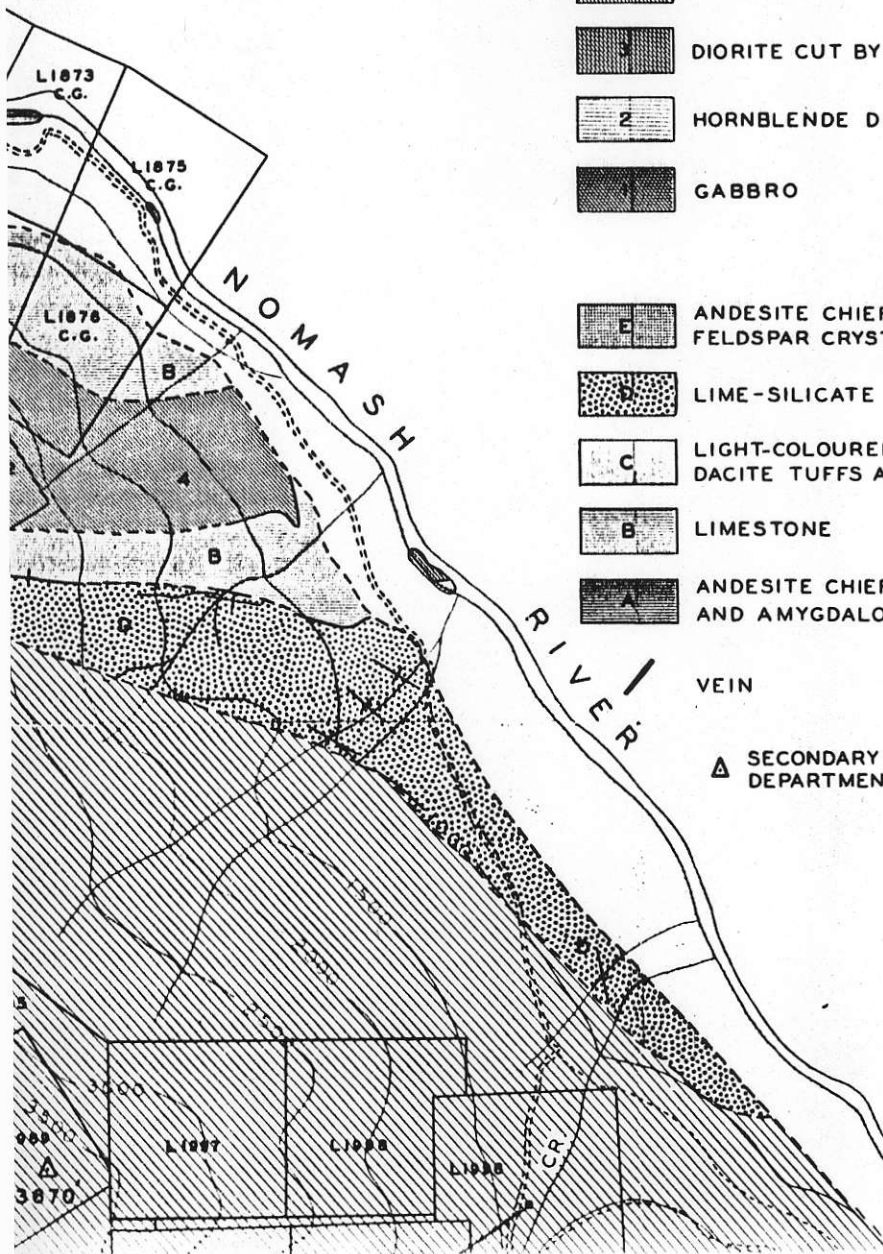
MOTOR ROAD

TRACTOR ROAD

PACK-HORSE TRAIL

FOOT-TRAIL

SURFACE TRAIL




directly onto the White Star (Figure 2) produced 13,937 ounces of gold from 21,981 tons of ore over a 7 year period (average recovered grade .634 oz/ton).

CONCLUSIONS

It is very reasonable to assume that more gold-bearing quartz veins remain to be found on the White Star property. The frequency and grades of known veins, along with the size of the untested areas of the property, leads the writer to believe that the White Star property has an excellent chance to host several times the historical production of the property, or roughly 20,000 ounces of gold.

The accessibility, relative ease of mining by adits and the extremely competent wall rock make this property an excellent target for a small-scale, high-grade mining operation.

Respectfully submitted,



J. PAUL SORBARA, M.Sc., F.G.A.C.

APPENDIX I

STATEMENT OF QUALIFICATIONS

I, J. PAUL SORBARA, of the Municipality of Delta, in the Province of British Columbia, hereby certify:

1. THAT I am a geologist residing at 6703 Nicholson Road, in the Municipality of Delta, in the Province of British Columbia.
2. THAT I graduated with a B.Sc. in geology from the University of Toronto, in the City of Toronto, in the Province of Ontario, in 1976, and with a M.Sc. in geology from the University of Toronto in 1979.
3. THAT I have practiced geology professionally from 1979 to 1986, including 5 years as an exploration geologist for Cominco Ltd.
4. THAT I am a registered Fellow of the Geological Association of Canada.

SIGNED:



J. PAUL SORBARA, M.Sc., F.G.A.C.

October 27, 1986.

OUT OF PRINT
FOR OFFICE USE ONLY

BRITISH COLUMBIA DEPARTMENT OF MINES

HON. R. G. MACDONALD, *Minister*

JOHN F. WATKIN, *Deputy Minister*

BULLETIN NO. 27

GEOLOGY AND MINERAL DEPOSITS

OF THE

ZEBALLOS MINING CAMP

BRITISH COLUMBIA

By John S. Stavenon

1950



ZEBALLOS MINING CAMP, BRITISH COLUMBIA

CHAPTER I.—INTRODUCTION.

GENERAL STATEMENT.

This bulletin presents data obtained from a detailed study of the areal geology of the surface and of the extensive mine workings in the Zeballos camp and presents conclusions concerning the localization of ore in the camp. Conclusions of a general nature are given in the general discussion of ore deposits, and those of a more detailed nature relating to properties are given in the individual descriptions of the properties.

Early work was done by the writer in 1935, 1937, and 1938, and in 1938 by R. J. Maconachie, who also examined properties for the British Columbia Department of Mines. The results of these examinations were published in the Annual Reports of the British Columbia Minister of Mines for 1935 and 1938. The writer began systematic mapping and detailed study in 1941, spent three months in detailed mapping of underground workings in the winter of 1941-42, and, with one assistant, did areal work and further mapping of surface and underground workings for five weeks in 1944, three and one-half months in 1945, three weeks in 1946, and a week in June, 1949.

The only topographic map available, the Woss Lake sheet,* on a scale of 1 mile to the inch with 100-foot contours, had been compiled several years prior to the development of the area, from surveys made in 1931 by the British Columbia Topographic Surveys Branch. This map, with minor corrections to the drainage and with the addition of the roads, trails, mine workings, other cultural features, and of the boundaries of surveyed mineral claims, was used as the base for Figure 2. The roads and trails and the mine workings, excepting those of the Privateer, Spud Valley, and Central Zeballos mines, were surveyed by stadia and plane table or tape and compass. Company maps of the three mines mentioned were available to the writer.

ACKNOWLEDGMENTS.

The writer gratefully acknowledges the co-operation of residents in the area including those in the town of Zeballos and prospectors and operators at the various properties. The kind assistance of the various mining companies in providing full access to their maps, plans, and other information and in supplying other data was a great help to the writer in his work. Special thanks are due to Messrs. D. S. Tait, N. E. McConnell, C. H. Hewat, and W. Lammers, of Privateer Mine, Limited; Messrs. D. Pitt and W. Elliott, of Spud Valley Gold Mines, Limited; Messrs. O. C. Thompson, S. Ellis, and N. F. Brookes, of Central Zeballos Gold Mines, Limited; and Mr. W. S. Hamilton, of the Mount Zeballos mine. The writer also gladly acknowledges the help of his field assistants, James A. Teevan in 1944, John C. Amy in 1945, and John K. Diebel in 1946.

PREVIOUS GEOLOGICAL WORK.

Mention of activity on and short descriptions of the early properties in the district are made in the Annual Reports of the Minister of Mines for British Columbia, first in 1908, then in 1924, and fairly continuously thereafter. The first systematic geological study of the area was made by H. C. Gunning, who in 1932 mapped the principal

* National Topographical Series, Sheet No. 92½, Woss Lake.

geological formations and correlated them with similar formations to the north in the Quatsino Sound and Nimpkish Lake areas. Gunning's report and a geological map on a scale of 1½ miles to the inch covering an area of about 142 square miles were published in Summary Report of the Geological Survey of Canada for 1932. Work done by Gunning in adjacent areas at about the same time was published in 1938 in five preliminary geological maps: Nimpkish West Half, Nimpkish East Half, Woss Lake West Half, Woss Lake East Half, and Schoen Lake West Half, on a scale of 1 mile to one inch with 1,000-foot contours and with geology shown in pattern.

In 1935 M. F. Bancroft examined mineral deposits along the west coast of Vancouver Island between Esperanza Inlet and Alberni Canal for the Geological Survey of Canada and results were published in Memoir 204.

The maps and reports by Gunning and the reports by Bancroft are a continuing help to prospectors and engineers in the district, and the writer has consulted these references frequently.

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LOCATION AND ACCESS.

Zeballos, on the west coast of Vancouver Island (Fig. 1) about 190 nautical miles northwesterly from Victoria, is a logging and mining community that was founded as a result of a gold rush to that section of the island in 1935.

The Zeballos mining camp includes mainly the drainage area of the Zeballos River. The area in which the most important properties have been found lies in the angle between the main Zeballos River and the Nomash (South Fork) River and is bounded on the south by a line running east from Zeballos River at a point 1½ miles northerly from tidewater, an area which includes the valleys of Van Isle, Spud, and Goldvalley Creeks.

The Canadian Pacific Railway Company maintains a steamship service from Victoria and Port Alberni up the west coast, calling regularly at Zeballos. The service was formerly tri-monthly but is now every eight days from Victoria. In the spring of 1947 Gibson Brothers, Limited, started a twice-weekly service with a converted

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Fig. 1. Index map showing position of Zeballos mining camp.

Fairmile-type naval vessel from Port Alberni to Ceepeece where motor-boats may be obtained for the remaining 12 miles to Zeballos. Queen Charlotte Airlines maintains a daily air service, excepting Sundays, from Vancouver to Zeballos. Motor taxi-service was operated on schedule in 1946 between the town of Zeballos and the mines, 4 to 6 miles away.

Access to the mines is by a motor-road that leads up the main river valley for 4 miles from Zeballos Post Office to Privateer mine and a further 1½ miles to Mount Zeballos and Spud Valley mines. From the Privateer a branch road runs for 2 miles to the Central Zeballos mine, and the road extends for about half a mile farther, beyond which a tractor-road 2¾ miles long leads to the Homeward mine. A tractor-road 1.2 miles long to the C.D. mine leaves the road between Privateer and Central Zeballos mines. A few pack-horse trails and several foot-trails lead to the various smaller properties and prospects in the area.

TOPOGRAPHY.

The country is mountainous and extremely rugged. The altitude within the area mapped (Fig. 2) ranges from about 75 feet above sea-level in the Zeballos River valley

at the south edge of the area to 3,749 feet at the summit of Mount Lukwa towards the eastern edge of the area, and to 4,041 feet, the summit of an unnamed peak in the northwestern corner of the area. The gradient of the Zeballos River within the area is not great, averaging about $4\frac{1}{2}$ feet per mile from the canyon to its junction with the Nomash, a distance of $4\frac{1}{2}$ miles, but the grades of the creeks that join the river are very steep, ranging from 500 feet per mile in many of the creeks to cataracts and waterfalls in others. The creeks come into the main valley on moderately uniform grades without the abrupt changes at the edge of the main valley that are characteristic of hanging valleys.

As the hillsides are steep and bluff, travelling, except along carefully chosen routes, is difficult. The heavy growth of timber on the hillsides hides numerous bluffs and makes the planning of routes of travel for geological traverses difficult. On downhill traverses one is likely to come to unsuspected and unscalable bluffs and be forced to make a detour, usually uphill, around the bluff. Many of the creeks flow down waterfalls in narrow canyons out of which it is impossible to climb, and it is often necessary to return down the creek and follow another route. The writer spaced his traverses as closely as the geology required, except in a few small areas where bluffs and canyons made traversing impossible.

The higher peaks within the area are barely above timberline and the area covered with alpine flora is therefore small. Most of the mountain tops and the higher hillsides are covered with yellow cedar and hemlock, the lower slopes with hemlock and balsam. The main valley of the Zeballos River has much Douglas fir and red cedar, some of which was logged in 1940-41, and the rest is being logged at present (1949). Except for a few small garden plots in open areas or on ground that has been cleared of timber and is sufficiently well exposed to the sun for plant growth, there is no arable land in Zeballos.

CLIMATE.

The climate is wet and mild. Records of precipitation, taken over a three-year period by the bank manager at Zeballos townsite, give the total precipitation as follows: 1939, 223.7 inches; 1940, 196.1 inches; and 1941, 205 inches. As the mines are at higher altitudes, the precipitation at them is considerably greater than that at the townsite. The total precipitation for the area in which the mining properties are found is probably between 230 and 240 inches in most years.* Total snowfall varies considerably from year to year. It is never more than a few inches at the beach but ranges in depth from 1 to 6 feet at Privateer and farther up Spud Creek is much deeper.

No records of temperature are available, but the temperature may be considered moderate. During the winter, frost is sufficiently severe at the mines to freeze exposed water pipes, but rarely the river. During the winter of 1946-47 the harbour at Zeballos had a thin sheet of ice on it for a short period, but this was the first time in the knowledge of local inhabitants that the harbour had frozen. The summers are mild and never exceedingly hot, the air usually being cooled by draughts down the main valleys. Mosquitoes and flies are generally fewer in Zeballos than in many parts of the Province.

MINING HISTORY.

Although small amounts of placer gold had been obtained from the Zeballos River as early as 1907, it was not until 1924 that the first gold vein was staked on the Tagore property. Two years later the King Mines was staked, and by 1929 forty claims had been staked in the valley. In that year the first shipment of ore was made. It consisted of 2 tons of high-grade ore mined from the Tagore.

A period of inactivity followed until 1934, when the first of the rich gold-quartz veins that were to make the Zeballos camp an important producer in a very short time was found. Small pockets of coarse placer gold had been found earlier under the large

* Based on a discussion with an official of the Water Rights Branch, British Columbia Department of Lands and Forests, and on the records for Zeballos townsite.

boulders at the mouth of Spud Creek and in the autumn of 1933 rich gold-quartz float had been found near the mouth of the creek. The float was followed upstream and the rocky beds of the steep creeks coming into Spud Creek were searched. Early in 1934 the veins on the White Star property were found. In 1935 the Goldfield vein on the Spud Valley property was found, and in 1936 the No. 1 vein on the Privateer. Prospecting activity followed quickly, and other veins were found, not only near Spud Creek, but also on other creeks draining into the Zeballos River. During the early days of the camp, high-grade ore was taken in Indian dugouts down the river at times of high water from the mouth of Spud Creek to the head of the canyon about 1 mile from the sea and then back-packed to the beach.

Mining really began in the winter of 1934-35 when high-grade ore was shipped from the property of White Star Gold Mines. In 1937 shipments of high-grade ore were made from No. 1 vein on the Privateer. In 1938 the Privateer mill and Spud Valley Gold Mines mill began operating. That year nearly 400 men were employed at thirty properties in prospecting, development work, and production. In 1939 mills were built at the Mount Zeballos and Central Zeballos mines, and in 1941 a mill was built at the Homeward. About the middle of 1942, the shortage of men and supplies because of World War II forced all but the Privateer and the Prident to close, and in October, 1943, these properties also were forced to close. During the winter of 1945-46, operations were resumed at Privateer, Prident, Central Zeballos, and Spud Valley mines, but owing to the increasing cost of supplies and labour relative to the fixed price of gold, these mines were forced to close again and by the end of 1948 Privateer, the last to operate, had ceased operations.

PRODUCTION.

A summary of the gold produced in the Zeballos camp is given in the table on page 15. This table gives the number of ounces of gold produced each year at individual mines, the total for each mine, and the production in each year for the whole camp.

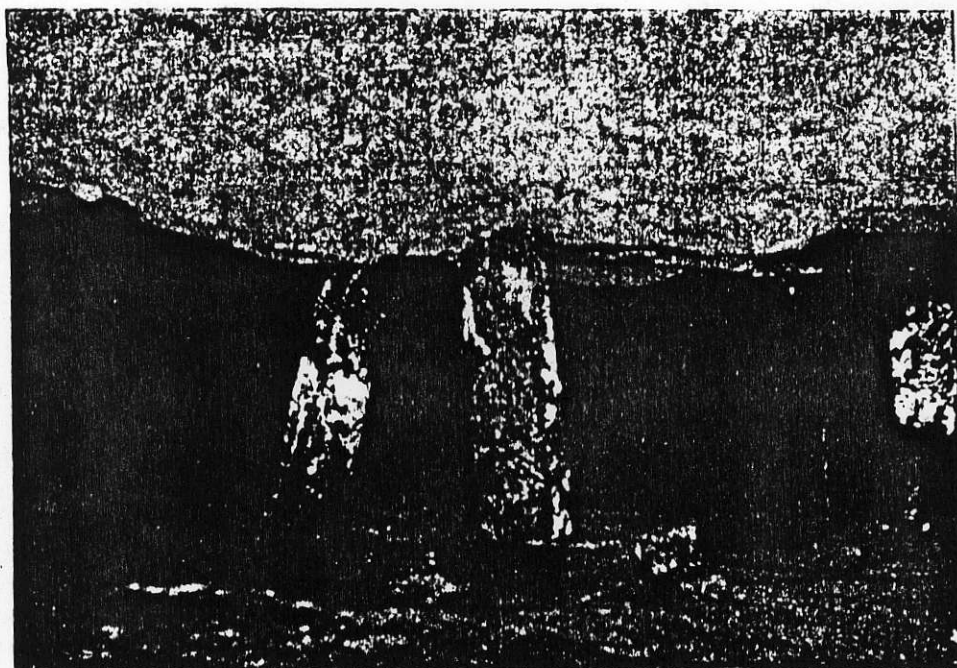


Plate II. Shrinkage stope, about 2½ feet wide, on No. 2 vein, 1100 level, Privateer mine, looking up from floor of level.

The total production of gold amounts to 287,511 ounces and the total silver to 124,700 ounces. The total quantity of ore mined in the camp amounted to approximately 651,000 tons. The quantity milled amounted to approximately 570,000 tons and the remainder, except for a small quantity of crude ore shipped to the smelter, was sent out as waste. The over-all grade for the camp was approximately 0.44 ounce of gold per ton mined; or, based on a yield of 280,623 ounces from the ore milled, an average of 0.75 ounce of gold per ton milled.

The over-all grade of 0.44 ounce of gold per ton mined is not truly representative of the Zeballos ore because the vein matter prior to dilution in mining was much higher than this. The veins were much narrower than the usual stoping widths and in places were accompanied by highly sheared wallrock. Both cut-and-fill and shrinkage methods were used in stoping (Plate II). With the latter it was necessary to mine a considerable tonnage of waste rock with the vein matter, which reduced the grade of ore. It should also be noted that at Privateer, the largest producer and responsible for nearly half the total production of the camp, the average grade based on a total production of 154,381 ounces of gold from 285,771 tons mined and 153,332 tons milled was 0.54 ounce of gold per ton mined and 1.01 ounces of gold per ton milled.

Most of the gold ores in the Zeballos camp contain the lead sulphide, galena. The lead content of mine-run ore generally was less than 1 per cent. and much of the lead was not recovered in milling. Except for the shipments from the King Midas and the Golden Gate properties, the raw ore and concentrates shipped to the Tacoma smelter from the Zeballos camp usually contained some lead. However, as the shipments were all made to a copper smelter, no payment was made for the lead.

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Zeballos Gold Production, 1934 to 1948.*

| | 1934. | 1935. | 1936. | 1937. | 1938. | 1939. | 1940. | 1941. | 1942. | 1943. | 1944. | 1945. | 1946. | 1947. | 1948. | Total. |
|---------------------------------------|-----------|-----------|------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------|--------------|--------------|---------------|---------------|----------------|
| | Oz. | Oz. | Oz. | Oz. | Oz. | Oz. | Oz. | Oz. | Oz. | Oz. | Oz. | Oz. | Oz. | Oz. | Oz. | Oz. |
| ✓Privateer..... | 85 | 55 | 53 | 2,805 | 16,023 | 32,987 | 23,416 | 24,328 | 17,219 | 9,727 | 22 | ..... | 1,801 | 10,822 | 10,033 | 154,381 |
| Spud Valley (including Big Star)..... | | | 47 | ..... | 473 | 15,369 | 18,099 | 14,081 | 6,020 | ..... | ..... | ..... | ..... | ..... | ..... | 54,039 |
| Mount Zeballos..... | | | | | | 3,277 | 14,716 | 9,744 | 2,665 | 123 | ..... | ..... | ..... | ..... | ..... | 30,525 |
| Central Zeballos..... | | | | | 152 | 33 | 6,610 | 6,568 | 4,610 | ..... | ..... | ..... | 872 | 1,627 | ..... | 20,472 |
| ✓Prident..... | | | | | | | | 3,803 | 5,141 | 3,758 | ..... | ..... | ..... | 687 | 548 | 13,937 |
| White Star..... | | 82 | 150 | 359 | 42 | 2,122 | 2,345 | 1,531 | 500 | ..... | ..... | ..... | ..... | ..... | ..... | 7,081 |
| C.D. (Rey Oro)..... | | | | | 1,102 | 843 | 1,319 | 1,336 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 4,600 |
| Homeward..... | | | | | | | | 897 | 594 | ..... | ..... | ..... | ..... | ..... | ..... | 1,491 |
| Van Isle..... | | | | | | | 1,178 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,178 |
| Rimy..... | | | | | 44 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 44 |
| Tagore..... | | | | | | 8 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 38† |
| Golden Portal..... | | | | | | 8 | 12 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 20 |
| King Midas..... | | | | | | | 5 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 5 |
| Totals..... | 85 | 87 | 255 | 3,164 | 17,836 | 54,647 | 72,700 | 62,238 | 36,749 | 13,608 | 22 | ..... | 2,673 | 13,136 | 10,581 | 287,811 |

* Data in part from Yearly Summary Reviews of the Gold Mining Industry in Canada, published by Dominion Bureau of Statistics, Ottawa, and in part from British Columbia Bureau of Economics and Statistics and Department of Mines.
 † Includes 38 oz. produced in 1930 and 1932.

15

PROPERTIES ON SPUD CREEK.

Privateer.* This mine on Spud Creek is owned by Privateer Mine, Limited; company office, 602 Stock Exchange Building, Vancouver; mine office, Zeballos; D. S. Tait, president; N. E. McConnell, managing director; C. Harry Hewat, manager. The property consists of the following Crown-granted mineral claims: Privateer (L. 1040), Privateer No. 2 (L. 1697), Privateer No. 3 (L. 1041), Privateer No. 4 (L. 1696), Privateer No. 5 (L. 1742), Privateer No. 6 (L. 1743), Privateer No. 7 (L. 1042), Progress No. 1 (L. 1061), Progress No. 2 (L. 1062), Progress No. 4 (L. 1064), Pilgrim Extension (L. 1043), Riverside (L. 1781), Jay Fraction (L. 1789), and the Small Fraction (L. 1790).

History and Production.—The original company was incorporated in January, 1937, as the private company known as Nootka-Zeballos Gold Mines, Limited, but late in that year the name was changed to Privateer Mine, Limited, and in September, 1938, it was changed from a private to a public company. Later that year a one-quarter interest was acquired by Conwest Exploration Company, Limited.

No. 1 vein, found in 1936, is reported to have given "returns from bronzy pyrite of 55 ounces gold to the ton" (Bancroft, 1940, p. 10). In 1936 and 1937 the vein was opened by strippings and open-cuts and several tons of high-grade ore was shipped to Tacoma from these surface workings. Underground work was started in 1937, first on the 900 level and then on the 1000, and by the end of 1938 work had been started on all the levels above the 1100. The three-compartment shaft from the 1100 level started in 1939 had reached 128 feet by the end of the year and was completed to the 1300 level in 1941. In 1939 work was started on the 800 adit on No. 2 vein, which had been developed originally by the crosscut from the 900 level, and in 1940 further work was done on the No. 2 vein on Nos. 1000, 1100, 1200, and 1300 levels.

* See Figures 7 to 10, inclusive, in pocket and Figures 11 and 12 in text.

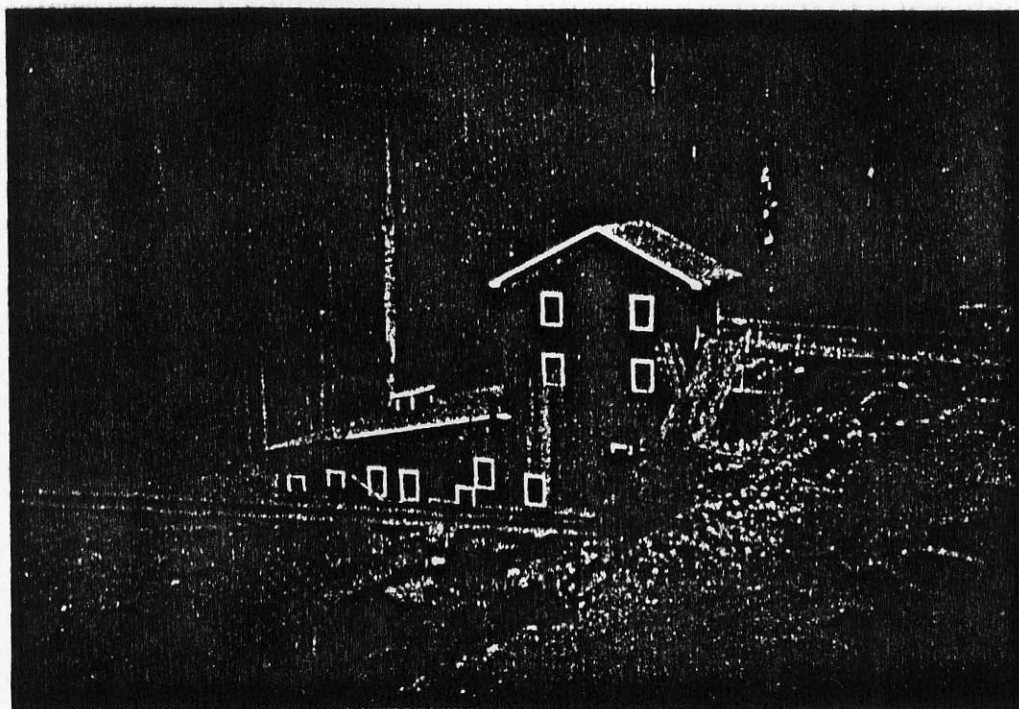


Plate XIII. Privateer mill—track on right leads from 1100 level to coarse-ore bin, track on left carries waste from picking belt to dump.

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In 1941-42 the long crosscut on the 600 level between Privateer and Prident was driven, and a raise was driven to the 600 level of the Prident mine.

An amalgamation-cyanide mill with a daily capacity of 90 tons was built in 1938, and milling was started in September of that year.

In October, 1943, Privateer closed, but in November, 1945, the company resumed mining and milling until the cessation of operations late in 1948. In May, 1946, the power-house burned, which suspended mining and milling for several weeks during the summer until it could be rebuilt and machinery installed.

Production and operation data for the entire life of the mine are set forth in the following table. Of the ore mined, 25 to 48 per cent. was sorted to waste before going through the mill.

Production and Operating Data, Privateer Mine.¹

| | Ore mined. | Ore treated. | Gold. Gross. ² | Silver. Gross. ^{2,3} | Daily Tonnage milled. ⁴ | See Footnotes. | OPERATING COSTS PER TON OF ORE MILLED. ⁵ | | |
|--------------------------------------|---------------------|--------------|---------------------------|-------------------------------|------------------------------------|----------------|---|-------------------|-------------------|
| | | | | | | | Development and Exploration. ⁶ | Mining. | Milling. |
| | Tons. | Tons. | Oz. | Oz. | | | \$ | \$ | \$ |
| 1934..... | 87 | ..... | 85 | 43 | ..... | 3 | ..... | ..... | ..... |
| 1935..... | 47 | ..... | 55 | 14 | ..... | 3 | ..... | ..... | ..... |
| 1936..... | 27 | ..... | 58 | 19 | ..... | 3 | ..... | ..... | ..... |
| 1937..... | 4227 | ..... | 2,805 | 1,288 | ..... | 3 | ..... | ..... | ..... |
| 1938..... | 45,389 ⁷ | 9,214 | 16,023 | 5,777 | 75 | ..... | 1.62 | 3.32 | 2.73 |
| 1939..... | 38,262 ⁸ | 26,820 | 32,987 | 12,065 | 76 | ..... | 2.698 | 4.27 | 2.69 |
| 1940..... | 46,148 ⁹ | 28,104 | 25,416 | 11,989 | 83 | 10 | ..... | ..... | ..... |
| 1941..... | 51,831 ⁹ | 29,181 | 24,328 | 9,271 | 86 | 11 | 2.92 | 5.88 | 2.09 |
| 1942..... | 41,208 ⁹ | 21,402 | 17,219 | 5,980 | 70 | 11 | 0.98 ⁴ | 5.68 ⁴ | 2.80 ⁴ |
| 1943..... | 12,397 ⁹ | 8,850 | 9,727 | 3,254 | 44 | 11 | 1.05 | 6.35 | 4.96 |
| 1944..... | 12 | 12 | 22 | 74 | ..... | 3 13 | ..... | ..... | ..... |
| 1945 (no production)..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1946..... | 7,048 ⁹ | 3,661 | 1,801 | 898 | 34 | ..... | ..... | ..... | ..... |
| 1947..... | 21,138 ⁹ | 12,800 | 10,822 | 5,298 | 40 | 3 11 | 2.53 ⁴ | 7.19 ⁴ | 2.86 ⁴ |
| 1948..... | 21,920 ⁹ | 13,300 | 10,033 | 4,913 | 12 | 11 14 | ..... | ..... | ..... |
| Weighted average ¹⁰..... | ..... | ..... | ..... | ..... | ..... | ..... | 2.11 | 5.48 | 2.36 |
| Totals..... | 285,771 | 153,382 | 154,381 | 60,878 | ..... | ..... | ..... | ..... | ..... |

¹ Information, except where noted, from Yearly Summary Reviews of the Gold Mining Industry of Canada, published by Dominion Bureau of Statistics, Ottawa.

² Total metal content in crude ore and bullion as determined by settlement assay.

³ Information from British Columbia Bureau of Economics and Statistics and British Columbia Department of Mines.

⁴ Data from annual report of company to shareholders, and includes tonnage from Van Isle operation in 1940 and from Prident operation in 1941-1943 and 1947.

⁵ Figures do not include taxes or marketing, head office, depreciation, and depletion charges but do include costs for Privateer, Van Isle, and Prident operations.

⁶ Exclusive of outside operations.

⁷ Crude ore shipped to smelter, figures for amount of sorting not available.

⁸ As milling did not start until September, 1938, part of this ore was sorted and shipped to the smelter, and the remainder sorted to 9,214 tons and milled.

⁹ Mine-run ore, includes waste discarded on picking-belt.

¹⁰ Deduction made in production for ore trammed to Privateer mill from Van Isle or Man-of-War operation.

¹¹ Deduction made in production for ore trammed to Privateer mill from Prident operation.

¹² Data not available.

¹³ Precipitates and residues.

¹⁴ Data from correspondence, Privateer Mine, Limited, figures do not include amounts of gold and silver to be realized from clean-up of mill.

¹⁵ Weighted for variation in yearly tonnage, including Van Isle and Prident.

Workings and Plant.—The mine has been developed by seven adits (Fig. 7), 600, 700, a southern 800 on No. 1 vein, a northern 800 on No. 2 vein, 900, 1000, and 1100, and by two other levels, the 1200 and 1300, which are connected to the 1100 adit by a three-compartment internal shaft. The 1100 adit is the main haulage level, ore being deliv-

| | Gold. | Silver. | Copper. | Lead. | Zinc. |
|---|--------------|--------------|-----------|-----------|-----------|
| | Oz. per Ton. | Oz. per Ton. | Per Cent. | Per Cent. | Per Cent. |
| Massive pyrrhotite..... | 0.27 | 0.3 | 0.11 | 0.22 | 2.17 |
| Massive pyrite..... | 0.58 | 0.7 | 0.10 | 0.91 | 1.10 |
| Quartz and sphalerite..... | 0.02 | 0.6 | 0.15 | 0.12 | 3.99 |
| Pyrite with considerable galena and sphalerite in crustiform quartz..... | 1.82 | 5.2 | 0.14 | 5.36 | 2.77 |

The P-3D vein, strike north 25 degrees east and dip 64 degrees northwestward, is on the Progress No. 3 claim (L. 1063), where it has been prospected by a drift 25 feet long at an elevation of 1,100 feet. The vein, 4 inches wide, consists of massive quartz containing small patches of chalcopyrite. It lacks the pyrite-galena-sphalerite mineralization typical of most of the veins in the productive area. The wallrock is mainly quartz diorite, cut in places by small dykes of light-coloured granodiorite.

Structural Control of Ore Deposition.—The principal veins at Privateer appear to have been localized along the axial plane of a trough at a sharp bend in the contact of the main mass of quartz diorite. This feature is exemplified in Figure 2, where it may be seen that the veins are at a sharp bend in the otherwise straight contact of the quartz diorite. At this bend, the sediments and volcanics have been deformed into a fold in the form of a trough plunging steeply southwestward. The veins strike approximately parallel to, and are very close to, the axial plane of this trough or fold; it is probable that they formed here, rather than elsewhere along the contact of the quartz diorite, because of local tension along the axial portion of the fold.

Localization of ore within the veins appears to be related in part to the heterogeneity of rock types and complexity of folding at the mine and in part to the degree to which the veins or parts of them follow the favourable direction of tension established for the producing area of the camp as discussed on pages 43 to 45.

In the stoped sections the veins cut through a heterogeneous assemblage of rock types that includes lenticular bodies and dykes of quartz diorite and lime-silicate and interbedded volcanic rocks. Beyond the stoped areas, the veins enter relatively homogeneous, massive volcanic tuff on the west and relatively homogeneous, massive lime-silicate rock towards the east. This suggests a correlation between ore and heterogeneity of rock types.

A relation between high-grade ore and dragfolding appears to hold for the western part of No. 1 vein. The dragfolds have vertical axial planes that strike north 15 degrees west to north 10 degrees east and the crest lines are horizontal. They are developed best where the west ends of the levels between 800 and 1100 intersect the surface (Fig. 10). The most continuous and highest grade oreshoots were mined from this section of No. 1 vein.

A correlation exists between the deposition of ore and the strike of the veins; this is illustrated by the fact that the relatively high-grade No. 3 vein and the high-grade western part of No. 1 vein follow closely the direction of tension in the fracture pattern (p. 45).

Prident Gold Mines, Limited, 521 Metropolitan Building, Vancouver, owns controlling interest in the Golden Peak No. 4 Crown-granted claim (L. 1032), staked in 1934 by Joe Doyle. From 1937 to 1938 the property was developed by Western Holdings, Limited, of Vancouver, who did surface work and drove the 500 level 140 feet. In July, 1938, Dentonia Mines, Limited, acquired the property, started and drove about 100 feet of drift on an easterly striking vein at elevation 2,010 feet close to the northeastern boundary of the property and appears to have driven the 200 level on the western continuation of the same vein. This company

* See Figure 13 in pocket and Figures 14, 15, and 16 in text.

also started work on the 400 level. Early in 1939 the property was acquired by Prident Gold Mines, Limited, in which Privateer Mine, Limited, held controlling interest and Dentonia the remainder; later, Privateer acquired full interest in Prident and has done all subsequent work on the property.

Prior to 1939 high-grade ore from Prident was shipped to Tacoma, but since then it has been put through the Privateer mill. In 1942 the long crosscut from the Privateer on the 600 level was completed, and a raise 290 feet long was driven to the 600 level of the Prident. Since then all Prident ore has been passed through the raise, trammed along the Privateer 600 crosscut, and dropped through ore-chutes of the Privateer mine to the 1100 or mill level. Shortly after acquiring the property, the Privateer company built an inclined surface tramway to connect the Prident with ore-bunkers on Spud Creek, but it is now used only as a service tramway.

The production data for Prident for 1941 and subsequent years are given in the following table:—

*Production Data, Prident Operation of Privateer Mine, Limited.**

| | Tons trammed to Mill. | Gold, Gross. | Silver, Gross. |
|--------------------|-----------------------|---------------|----------------|
| | | Oz. | Oz. |
| 1941..... | 3,822 | 3,803 | 2,104 |
| 1942..... | 7,075 | 5,141 | 2,879 |
| 1943..... | 7,055 | 3,758 | 2,098 |
| 1947†..... | 2,106 | 687 | 349 |
| 1948†..... | 1,923 | 548 | 281 |
| Totals..... | 21,981 | 18,937 | 7,711 |

* Data from annual reports to shareholders of Privateer Mine, Limited.

† Personal correspondence, Privateer Mine, Limited.

To September, 1946, seventeen diamond-drill holes, totalling 860 feet, had been drilled. They are distributed as follows: On the 400 level, one hole, 68 feet long; on the 500 level, six holes, totalling 269 feet; on the 600 level, five holes, totalling 180 feet; on the 750 level, two holes, totalling 71 feet; and on the 900 level, three holes, totalling 272 feet.

The property is within the main area of quartz diorite, which is the principal rock type on the property. However, there is a large inclusion of granitized volcanic rock in the most eastern drift on the 400 level at the 407 stope (Fig. 15), and feldspar porphyry dykes cut the quartz diorite at several places in the workings.

The rock in the inclusion is similar mineralogically to the enclosing quartz diorite but differs in having a darker colour, a finer grain-size, and a general blotchy appearance caused by small clusters of hornblende. The contact between the two rocks is gradational over a couple of inches and is irregular in detail, but, in general, trends northerly to northeasterly and dips steeply eastward (Fig. 15). Along the drift below 407 stope and the sublevel above the 400 level, the continuity of the inclusion is interrupted by two intervening lenses of quartz diorite. Outcrops are few on the surface close to 407 stope, and it was not possible to identify the inclusion, but Bancroft (1940, p. 14) notes that volcanic remnants of the Bonanza formation outcrop on the Blackbird claim (L. 1055) directly northeast of the Golden Peak No. 4 claim (L. 1032). It is possible that the granitized volcanic inclusions in 407 stope belong to the volcanic remnants referred to by Bancroft.

Feldspar porphyry dykes, with dark groundmass and conspicuous light-coloured feldspar phenocrysts, cut the quartz diorite on all the levels. These dykes range in width from a few inches to 8 feet, strike from northwesterly to northeasterly, and dip, at 60 degrees or more, steeply in both an eastward and westward direction.

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Veins.—Three major veins that strike north 40 degrees east, north 80 degrees west, and north 72 degrees east, and three minor veins of intermediate strikes have been developed by several adits (Fig. 13). Two small veins, the "K" and "L" veins, are on Prident ground but have been explored from the 600 drift of the Privateer and have been described on page 69 of this report.

North 40 Degrees East Vein.—This vein has been followed by drifts on the 400, 500, and 600 levels and stoped on the 400 and 500 levels (Fig. 14).

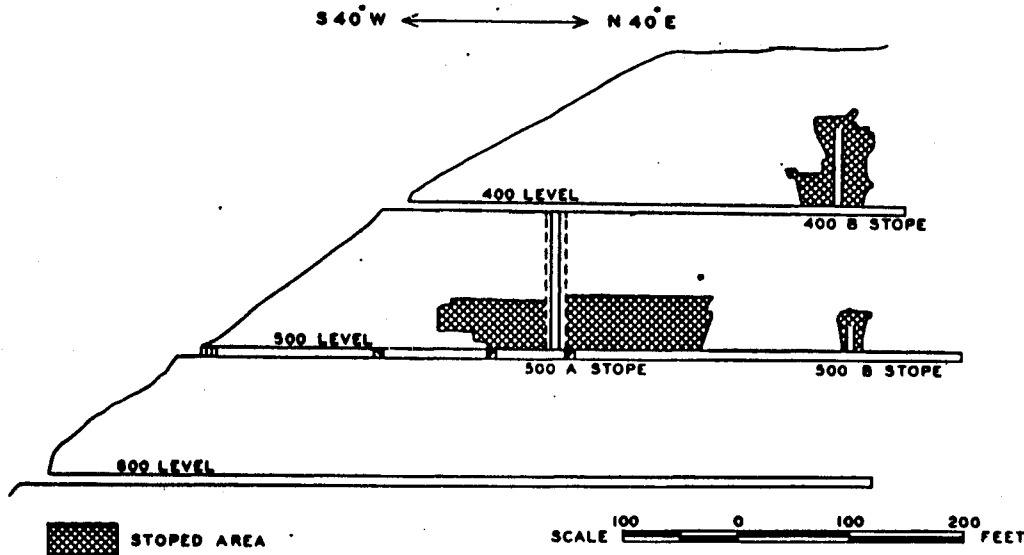


Fig. 14. Prident: Longitudinal section through 500-A and 500-B stopes on the north 40 degrees east vein.

The vein, half an inch to 5 inches wide, follows a series of parallel joints, strike north 40 to 42 degrees east and dip steeply southeastward, and passes from the one to a second parallel joint by way of diagonal shears, strike north 70 to 90 degrees east and dip 55 to 60 degrees northward. This structural feature will account for the fact that although the vein, a single quartz-filled joint, dips southeastward, the different levels on the north 40 degrees east vein are vertically above each other. The quartz in the vein is ribboned with layers of fine-grained pyrite and arsenopyrite. In the diagonal portions of the vein, the quartz is white, lency, vuggy, and crystalline. In the northeastern face the vein disappears as the joint weakens to a paper-thin slip.

The 500 level follows a quartz stringer 1 inch wide for 390 feet from the portal. As this was apparently not the north 40 degrees east vein, as found in the 400 level above, a crosscut was driven 20 feet northwesterly from a point 260 feet from the portal that encountered a stronger vein of well-ribboned quartz from 2 to 8 inches wide with abundant pyrite. This vein appeared to be the downward extension of the vein in the 400 level and was followed northeasterly by a drift for about 420 feet.

On the 600 level, what appears to be the downward continuation of the main north 40 degrees east vein is tighter and narrower than in the upper two levels. However, it is a fairly continuous quartz-sulphide ribbon, which ranges in width from one-quarter of an inch to 3 inches. Heavy pyrite, sphalerite, and a little galena are seen in places in the roof of the drift. The vein in the northeastern face consists of 1 inch of quartz and calcite in a tight fracture. Where first seen in the 600 adit, at a point 220 feet from the portal, the vein, local strike north 32 degrees east and dip 80 degrees southeastward, is only one-quarter of an inch wide and follows a crush zone 5 inches wide. Within 100 feet the quartz widens to 2 inches.

The downward extension of the north 40 degrees east vein on the 900 level 290 feet below is probably the weaker vein found in the northeastern section of the "K" drift (Fig. 13).

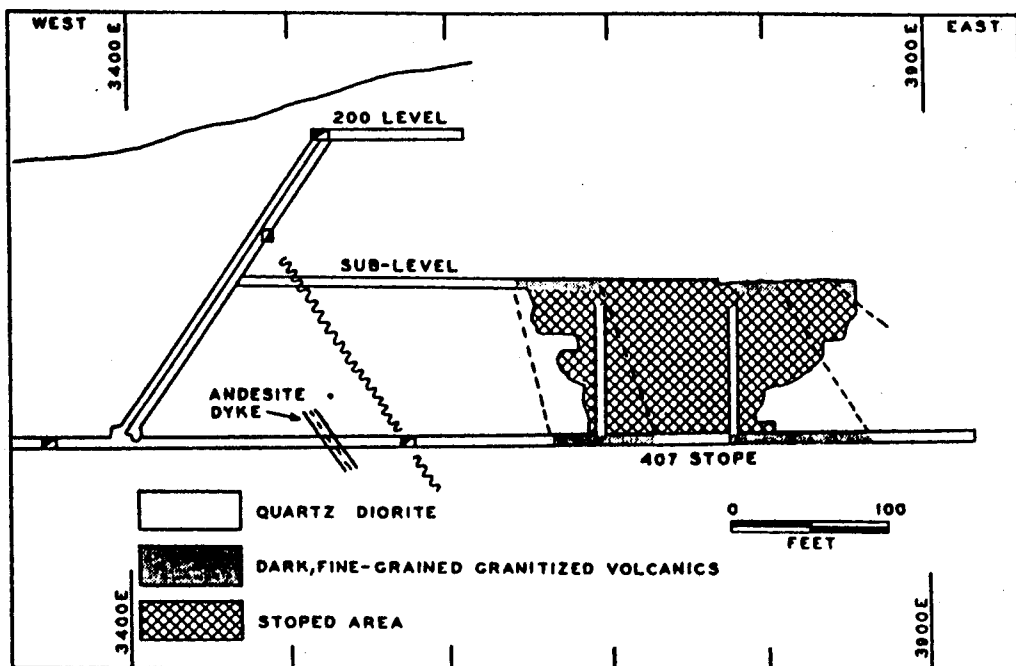


Fig. 15. Prident: Longitudinal section through 407 stope on north 80 degrees west vein, showing geology and stoped area.

North 80 Degrees West Vein.—This vein, which ranges in strike from north 75 to 80 degrees west and dips about vertical, has been followed by drifts on the 200 and 400 levels and by an intermediate sublevel (Figs. 13 and 15). It has been stoped between the 400 level and the sublevels (Fig. 15). It is understood that during 1947 and 1948 this vein was intersected on two of the lower levels, on the 500 level where it was followed for 100 feet, and on the 600 level where it was followed for 360 feet; during this time a raise was driven on the vein between the two levels. The writer has not had an opportunity to see this work. On the 200 level the vein was crosscut 70 feet from the portal and was then followed for 97 feet easterly. On the 400 level a crosscut driven easterly from a point on the north 40 degrees east vein 350 feet from the portal intersected the north 80 degrees west vein at 405 feet; a drift follows the vein easterly 590 feet to the face (Fig. 15). The first part of the crosscut follows some narrow stringers.

The vein, as seen on the several levels, ranges in width from a knife-edge to 12 inches and where stoped is usually 4 to 5 inches wide. Most of the vein matter is quartz with patches of abundant sulphide, but in places it contains angular inclusions of wallrock, some of which are replaced by quartz. It follows a well-defined shear zone 1 to 3 feet wide. The intensity of the shearing in this zone induces sloughing of the backs at many places, and considerable timbering is required. Although the ground is badly sheared in the vein shear, the displacement along it has amounted only to about 8 feet, the north side having been displaced westerly. Only one cross-fault has been noticed. At a point on the 400 level, 125 feet west of the 407 raise, a fault zone 15 feet wide, strike north 20 degrees east and dip 58 degrees southeastward, offsets the eastern continuation of the vein about 15 feet southerly.



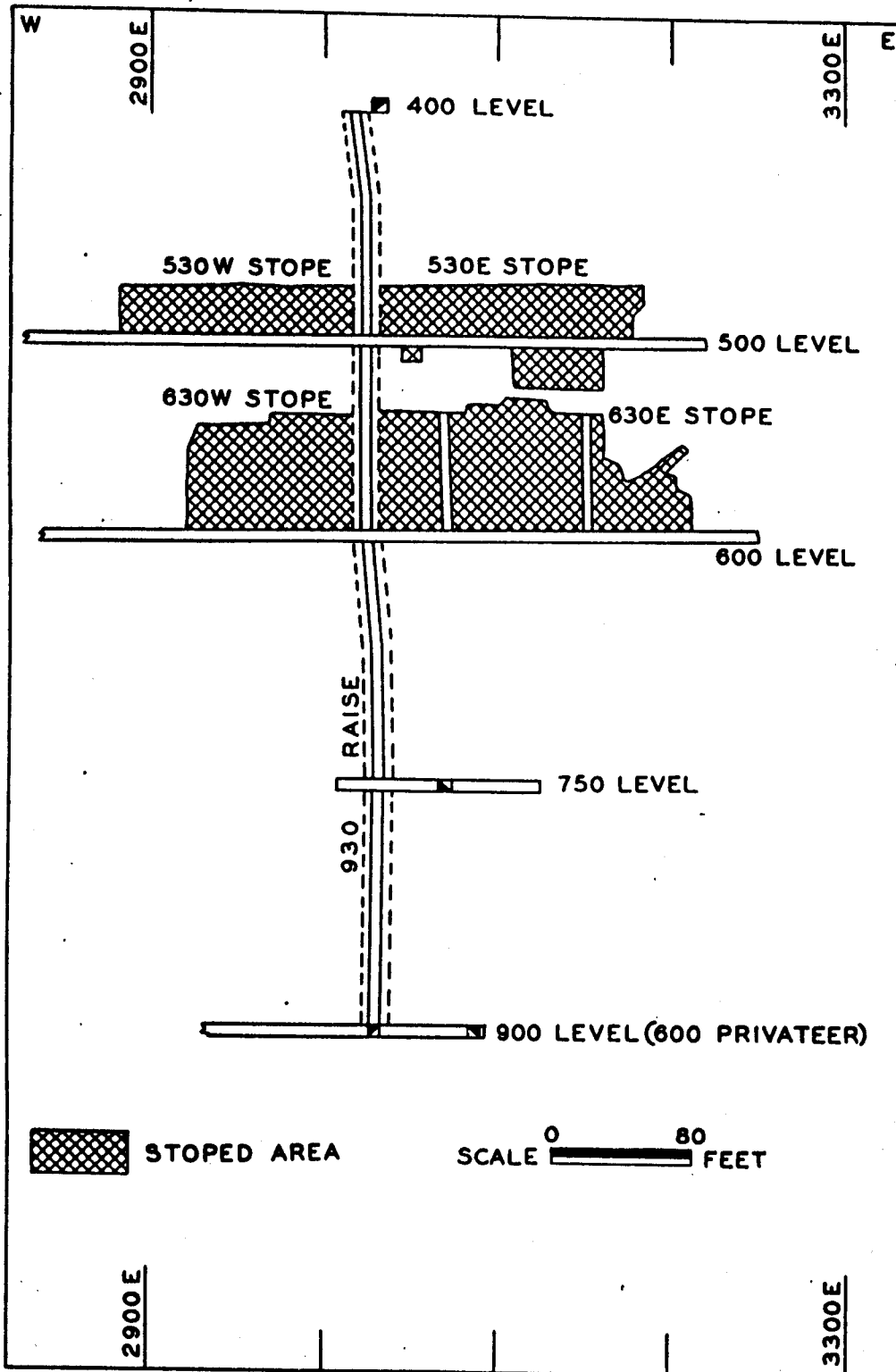


Fig. 16. Prident: Longitudinal section through raise and the 530 and 630 stopes on the north 72 degrees east vein.

Branch or gash veins are not numerous and are found mainly east of 407 raise. Between points 90 and 130 feet east of the raise, a group of closely spaced, diagonal stringers of quartz, strike north 55 degrees east and dip 60 degrees northwestward and one-half to three-quarters of an inch wide, join the main vein on the south side, and about 40 feet west of the fault a group of stringers of similar strike join the vein on the north side.

At 407 stope (Fig. 15), for a length of about 200 feet, the vein shear cuts an inclusion of granitized volcanics, and in this part, although the vein shear is about 2 feet wide, its usual width, the quartz, here 1 to 2 feet wide, is wider than usual. The shear does not change its strike in passing from one rock to the other, but the composition of the granitized inclusion may have been sufficiently different to induce the greater precipitation of quartz there.

North 72 Degrees East Vein.—This vein has been followed by drifts on the 500, 600, 750, and 900 levels (Fig. 13) and has been stoped above the 500 and 600 levels (Fig. 16).

On the 500 and 600 levels the vein ranges in width from 2 to 6 inches and follows a well-defined shear 1 to 2 feet wide.

On the 750 and 900 levels the vein and accompanying shear are much narrower than in the upper levels, being only 0 to 1 inch wide in a vein shear, 2 inches wide on the 750 level, and consisting of a few lenses of quartz less than an inch wide on the 900 level. The amount of shearing accompanying this vein is much more than that accompanying the north 40 degrees east vein but is less than that accompanying the north 80 degrees west vein.

Three shorter veins have been followed by 3w, 3w-A, and 4w drifts on the 400 level and by the northern drift on the 750 level (see Fig. 13). The vein in 3w is a few inches wide and follows one of a set of joints which, 20 feet southwesterly from the main drift, becomes a shear 3 feet wide for several feet but towards the southwest face it narrows to 6 inches. The vein in 3w-A and in the northern drift on the 750 level is 1 to 5 inches wide and follows one of a set of parallel joints along which there has been considerable alteration of the wallrock. The vein in 4w, ranging in width from 1 to 5 inches, is similar to the one in 3w, in that it follows a clean-cut joint that passes into a crush zone 1 foot wide along its strike. All these veins are short and the vein matter in them narrows to merely a film of gouge towards the drift faces.

Fracture Pattern.—In the pattern of fractures at the Prident mine, the north 72 degrees east and north 80 degrees west veins appear to belong to one major direction of shearing and the north 40 degrees east vein to another. The displacement, as measured by offsets on dykes, is 5 to 10 feet along the north 72 degrees east and north 80 degrees west vein shears but is not more than 18 inches on the north 40 degrees east vein. As the displacement is in the same direction in both shears—namely, the north side of the shear displaced westerly—it is probable that the north 72 degrees east and north 80 degrees west vein shears, though differing by 28 degrees in strike, belong to the same general direction of shearing. The displacement along the vein in 3w-A on the 400 level has also been in the same direction, and it is probable that this vein shear also belongs to the general east-west direction of shear. The displacement along the north 40 degrees east vein shear has been in the opposite direction, the northwest side having moved northeast. It may be recalled that these are the general directions of the maximum shearing stress for the district as a whole (Fig. 3), and that the direction of displacement along the shears is also similar for the district as a whole.

The gash veins that branch from the veins in many places generally strike from north 50 to 70 degrees east, the most persistent of them striking about north 65 degrees east. The gash veins both from the easterly striking and from the north 40 degrees east vein shears strike in the same direction, thus indicating that they all belong to the same general direction of tension, which is also the general direction for the district as a whole (Fig. 3 and p. 45).

This property, on Spud Creek, consists of three Crown-granted claims: **White Star**, White Star (L. 1031), staked in 1933, and Don Fraction (L. 1033), staked in 1937 by A. Donaldson, and the Star Fraction (L. 1833), staked in 1937 by P. M. Monckton. The claims were brought to Crown grant in 1937 and 1939 and are now owned by Mr. Donaldson, 1333 Edmonds Street, New Westminster.

Between September, 1934, and June, 1935, the owners mined 15 tons of high-grade ore from open-cuts at about the level of the present No. 1 adit and 2½ tons of ore from an open-cut at about the same elevation on No. 2 vein. This ore was mined by hand, back-packed to tidewater, and shipped to the Tacoma smelter.

By 1938, 47 tons of ore, mostly from the original open-cut on No. 1 vein and averaging 14.5 ounces gold per ton, had been hand-mined and shipped by owners or lessees. By that time the transportation of ore had been improved by the building of a light jig-back tram-line from the camp, at the elevation of No. 1 adit, to Spud Creek, whence the ore was back-packed about half a mile to the end of the road at Privateer and thence hauled by truck to tidewater.

In 1939 the property was operated by White Star Mine, Ltd. This company installed machinery, extended Nos. 1 and 2 adits and started No. 3 adit, and by the latter part of the year had commenced shipping high-grade ore to Tacoma.

The mine was closed in 1942 and the mining plant dismantled. Since then no further work has been done.

Production data for the entire life of the mine are given in the following table:—

*Production Data, White Star Mine.**

| | Ore mined. | Gold, Gross. | Silver, Gross. |
|----------------------------|------------|--------------|----------------|
| | Tons. | Oz. | Oz. |
| Two months, 1935..... | 2 | 32 | 9 |
| To November 3rd, 1936..... | 12 | 150 | 46 |
| 1937..... | 21 | 359 | 104 |
| 1938..... | 13 | 42 | 14 |
| 1939..... | 358 | 2,122 | 710 |
| 1940..... | 508 | 2,345 | 987 |
| 1941..... | 400 | 1,531 | 830 |
| To March 31st, 1942..... | 100 | 500 | 256 |
| Totals..... | 1,414 | 7,051 | 2,956 |

* Data from British Columbia Bureau of Economics and Statistics and British Columbia Department of Mines.

The showings are entirely within quartz diorite, although the ground covered by the claims extends outside the contact. Several feldspar porphyry dykes from 1 to 10 feet wide are found on the property; some strike northerly, but the wider dykes strike north-northeasterly, and all are vertical or have steep dips.

Five quartz veins, Nos. 1 to 5 (Fig. 17), have been found, but Nos. 1 and 2 have produced all the ore mined. The veins contain moderate amounts of pyrite, galena, sphalerite, arsenopyrite, and free gold. In the wider sections the veins are drusy and the quartz so well developed in crystals perpendicular to the vein walls that a comb texture results. The sulphides are usually concentrated in bands towards the walls of the vein.

No. 1 vein, formerly known as the Donaldson vein, has been developed by No. 1 adit and the southeastern drifts on Nos. 2 and 3 adits, and part of the vein has been stoped from No. 2 level to the surface (see longitudinal section, Fig. 17). These workings extend for a total length of 460 feet along the strike of the vein and for a distance of 340 feet down the dip. The vein, strike north 35 to 40 degrees east and dip 70 to 80 degrees southeastward, follows a well-defined shear, 1 to 6 inches wide, in which the vein matter ranges in width from a knife-edge to 6 inches and, where stoped, is

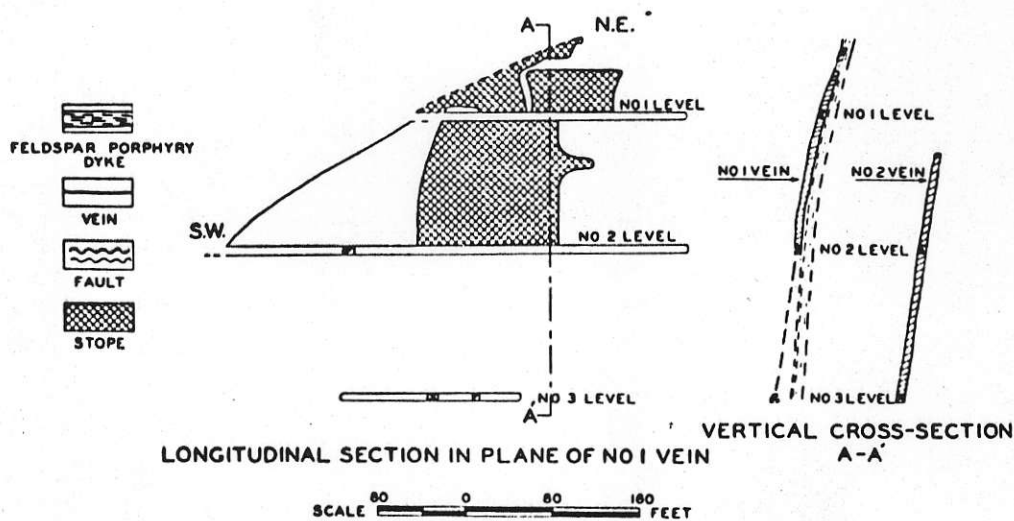
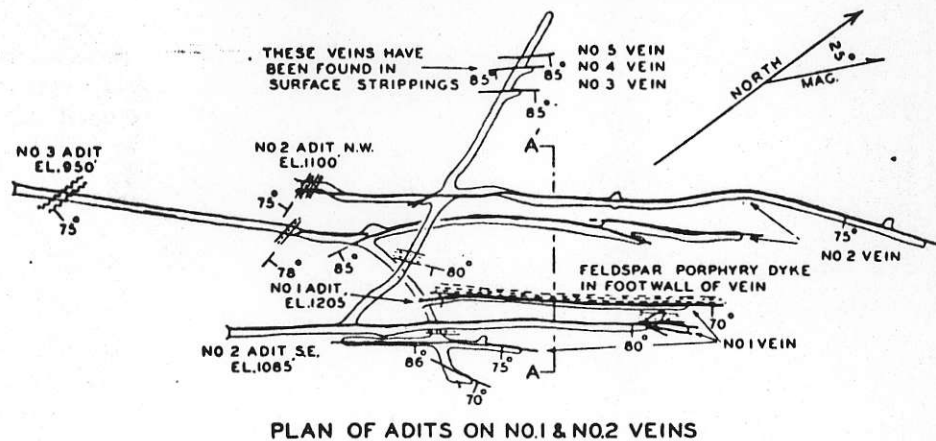
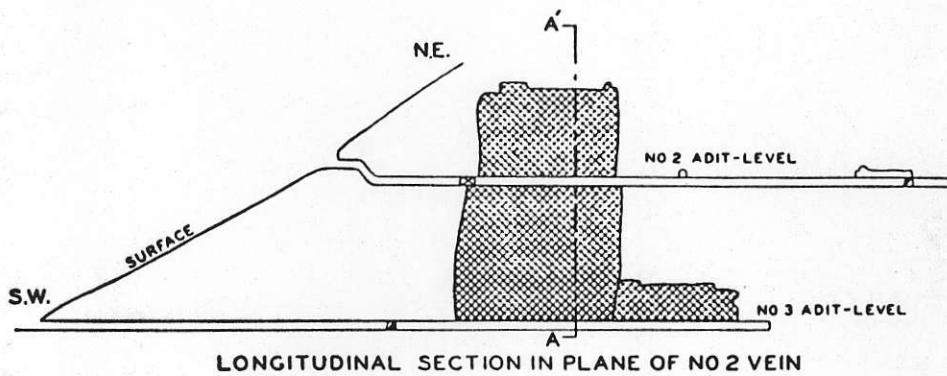


Fig. 17. White Star: Plan and sections of underground workings.

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usually about 4 inches wide. In Nos. 1 and 2 adits, the vein, following a course of north 40 degrees east, comes to a feldspar porphyry dyke, 6 feet wide, strike north 35 degrees east and dip 70 to 80 degrees southeastward, and follows the dyke; the southeast drift in No. 3 adit is not far enough northeasterly to reach the intersection of the dyke and the vein.

No. 2 vein has been developed by the northwestern drifts on Nos. 2 and 3 adits, and part of it has been stoped from No. 3 level to near the surface (*see* longitudinal section, Fig. 17). This vein, dipping steeply southeastward, varies in strike more than No. 1 vein. It follows a well-defined shear, about 6 inches wide, in which the vein matter has the same range of width as in No. 1 vein, but averages narrower, being usually about 2 inches wide.

Nos. 3, 4, and 5 veins are exposed in the northwestern crosscut in No. 2 adit. On visits to the property in 1935 and 1938 the writer noted these veins on the surface in three trenches, since caved, above the adit. These veins are, in general, parallel to Nos. 1 and 2 veins in strike and dip but are narrower and follow narrower shears. The veins range in width from a knife-edge to 1½ inches, and the vein shears are of similar widths.

As with other north-northeastern vein shears in the camp, the vein shears on the White Star are accompanied by diagonal breaks, many of them filled with comb quartz. A zone of diagonal quartz veins, strike north 65 degrees east and dip vertical, was seen in the back of the stope on No. 2 vein above No. 2 adit for a length of 25 feet. The diagonal veins are 1 inch wide, strike northeasterly, and dip steeply. A zone of similar diagonal veins, strike north 68 degrees east and dip vertical, was seen in a stripping, now largely obscured, 60 feet westerly from the cabin. These northeasterly diagonal quartz veins indicate that the northwestern or hangingwall of the vein shear moved northeasterly and down with respect to the footwall, in accordance with the movement of other vein shears of similar strike in the camp.

Five feldspar porphyry dykes have been found underground (Fig. 17), and most of them outcrop. The hangingwall of one dyke has been followed by No. 1 adit where it is in the footwall of the vein, and again by the southeastern drifts in Nos. 2 and 3 adits (Fig. 17). A second dyke, 10 feet wide and parallel to the first, is found in No. 2 level in the crosscut between Nos. 1 and 2 veins. Two smaller parallel dykes, strike northerly and dip steeply westward, are found near the portal of the northeastern drift on No. 2 level. One, 10 feet beyond the portal, is 2 feet wide and the other, at the portal, is 3 feet wide. A fifth dyke, strike northerly and dip steeply eastward, was found in the northeastern drift on No. 3 level 250 feet from the portal and may be the downward continuation of the third and fourth dykes mentioned above. The dyke at the portal of No. 2 adit northwest is cut and slightly displaced by the vein shear, and it is probable that the other dykes are also cut by the vein shears.

The principal fault movements at the White Star have occurred within the vein shears. The walls of all the veins are free and marked by films of gouge. Where the vein is absent from the shear, crushed rock and abundant fault gouge are present. Although the strike of No. 2 vein changes slightly, neither this vein nor No. 1 vein have been offset by transverse faults. However, a transverse fault zone, strike northerly and dip 75 degrees eastward, is found in the northeastern drift in No. 3 adit, 40 feet from the portal, where it consists of a zone of indefinite shearing 6 feet wide and a footwall streak of intense shearing 3 inches wide.

This property consists of ground on the B-2 Fraction (L. 1054) that
I.X.L. lies between the Golden Peak No. 4 (L. 1032) and the Golden Peak
(L. 1035) (*see* Fig. 2). Britannia Mining and Smelting Co., Limited,
owns the B-2 Fraction but is reported to have transferred the part between the Golden
Peak claims to V. Davies, of Zeballos.

The workings consist of one adit and some strippings above it. There are no camp buildings. A blacksmith-shop and ore-shed, built near the portal of the adit, are

Report by J Paul Barbara Delta BC on
 White Star Property, Alberni Mining Div 92 L/2W
 for Mrs D Harrett 1111 - 7th Ave New Westminster BC
 V3M 2J6

Dated Oct 27 1986

- 1) Examined No 3 adit level
- 2) 3 Crown Grants White Star L1031, Don Fr L1033, Star Fr 21833
 36.90 ha
- 3) Produced 1414 tons @ 5.0 oz Au 2.0903 Ag
- 4) Host quartz diorite

From included published material: - BCDM Stevenson 1950
 Adjoining Prudent workings connected underground to
 Swanton mine.

White Star produced 15 tons in 1934/35 + 2 1/2 tons
 47 tons in 1938

Veins No 1 + 2 produced all ore = 1414 tons 7081 oz Au 2956 oz Ag
 No 1 vein 0-6 inches wide
 No 2 vein averages 2 inches wide

3995' 4995' 3 2495' purchase
 79.50/m. 2" @ 5.00 \$ 10.00
 50 x 42. 46" @ 0 0
 200 min/month 48 46) 10.2
 96

FIGURE 6 (EAST)

CHINOOK RESEARCH LTD
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 NEW WESTMINSTER BC
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