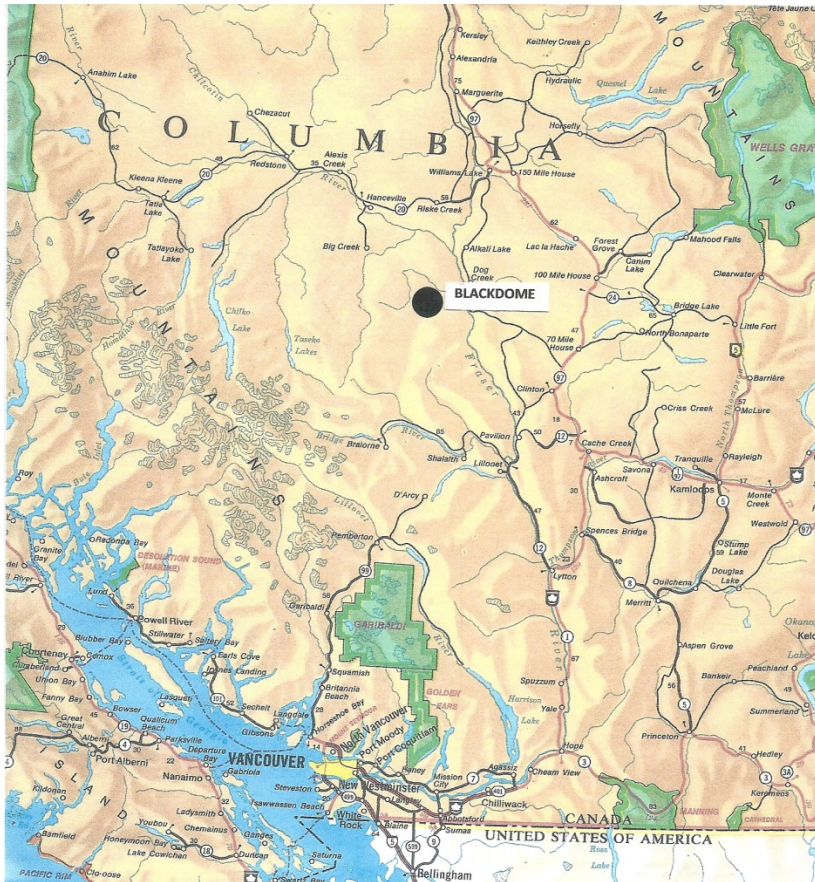


1978 – 1991 The Blackdome Gold Mine

THE BLACKDOME GOLD MINE

By Albert F Reeve

Blackdome Exploration Ltd, a Vancouver based company, was incorporated in 1978, to explore and develop gold prospects located on Blackdome Mountain, at a mean elevation of 1,960 meters above sea level, immediately west of the Fraser River and 70 km west, northwest of the town of Clinton, BC. The company's name was later changed to Blackdome Mining Corporation.



Blackdome Gold Mine Location

All mineral interests covering the gold prospects on Blackdome Mountain were assembled by issuing shares of the company [Blackdome] to: Silver Standard Mines Ltd, Empire Valley Gold Mines Ltd, Castlemaine Explorations Ltd, Consolidated Barrier Reef Resources Ltd and Norman Hilborn. As a result, the consolidated property was royalty free. A block of shares was also issued, as an honorarium, to the widow of Lawrence Frenier, who discovered gold at Blackdome in 1947. All of the subsequent work, up to production, was funded by

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equity financing. Except for an initial working capital loan of \$2,000,000 CAD, at the commencement of mining operations, no debt was required. The total capital issued by Blackdome Mining Corporation during its' lifetime was 8,388,519 common shares.

A total initial investment of \$19,568,000 was made for exploration, mine development and mill construction. This entire amount was recovered from operating margins, in the first 19 months of production.

From May 1986 to January 1991 the mine produced 223,000 ounces of gold and 762,000 ounces of silver, from 332,623 metric tons of ore which had an NSR value of \$114,678,000 CAD. The average grade was 20.85 grams per tonne gold.

The price of gold during the principle mine life averaged approximately \$510 CDN per ounce.

The company paid \$13,977,000 CAD in dividends, to its' shareholders, before being taken over, in 1989, by Minven Gold Corp of Denver Colorado. Thereafter the company operated the mine as a subsidiary of Minven. The plant and property were sold in 1995. In 1998 it produced an additional 1,328 ounces of gold for the new owners.



The first gold bar at Blackdome, May 28 1986. L to R: Bert Reeve, Director; Rod Samuels, Metallurgist; Carl Ashenhurst, President.

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Geography:

The summit elevation of Blackdome Mountain is 2,252 meters above sea level. The tree line is at 1950 meters. The mining property, at the time, was situated on grazing leases of the Empire Valley Cattle Ranch. Access was 80 km by gravel road from the town of Clinton to the Dog Creek, timber framed, cable suspension bridge, which crosses the canyon of the Fraser River; then approximately 20 km on a steep, single lane mountain road to the mine site. The old bridge had a restricted load limit which imposed certain restrictions on mine development. There was no local supply of clean crushed aggregate. It was hauled 100 km to make concrete for construction of the mill and crushing plant. Fully serviced Atco type camp facilities were required on site because commuting from the nearest town was not feasible. A work cycle of approximately 2 weeks on and 1 week off was employed.

Geology:

Gold and silver occurs in a northeast trending, west dipping system of intimately branching [anastomosing] epithermal quartz veins arising from post-volcanic hot spring activity. The veins were emplaced along a zone of normal faulting which outcrops on a ridge that forms the south flank of Blackdome Mountain. The host rocks are a relatively flat lying sequence of Eocene aged volcanic flows and sediments. Most of the ore was mined from high grade “bonanza” lenses: the largest being approximately 50,000 tonnes and the smallest 5,000 tonnes, with an average mineable thickness of about two meters. The mineralized quartz was complexly fractured and contained: electrum, a number of silver sulphides and sulphosalts as well as minor base metal sulphides. A clay seam, representing fault gouge, accompanied by crushed fragments and cobbles of quartz, was always present within or on either wall of the high grade shoots. As a result, up to 25% of the mined ore was mud.

The mineralized fault system has been traced for a distance of 3,750 meters. However, the most productive section was 900 meters in length with a restricted vertical extent of 110 meters. This well-defined height restriction is related to vertical mineral zoning as described in a classic study of 60 epithermal precious metal deposits in the south-western USA by L.J. Buchanan of Fisher Watt Mining Co. Inc., in 1981.

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The zone of high grade lenses, which was referred to as “the south mine”, plunges gently southward so that the northern most ore shoots are terminated by the erosion surface while those at the south end have no direct surface expression. New ore might be found by exploring southward, down plunge, along the mineralized trend.

The principal ore mineral, electrum, which is a metal alloy of gold and silver, was so irregularly distributed that high frequency sampling of trenches and underground workings, at intervals of 2 meters or less, was required to estimate gold grades. At the time of the feasibility study, in 1985, proven and probable reserves defined by high frequency sampling were 119,557 tonnes averaging 20.93 grams gold and 124.6 grams silver per tonne. In contrast to this, the average grade of the same, reserve indicated by diamond drill-hole intersections, was 2.48 grams gold and 14.78 grams silver, or one eighth of the actual grade. By way of example, the first panel of proven ore [120mX40mX2m] had an average grade of 9.3 grams per tonne indicated by 14 drill intersections. Subsequent sampling of drifts, raises and trenches returned an average grade of 51.7 grams per tonne gold from samples taken across the vein at 2 meter intervals in drifts, raises and trenches.

Estimations of grade, at the development stage, recognized and included, pockets of high-grade material. Anomalous, peak assay values for each pocket encountered were cut to the average of the surrounding gold assays. It was observed that the common industry practice of arbitrarily cutting all high assay values to 30 gm. per tonne reduced the calculated resource below its' obvious economic level.

Exploration:

Prior to 1978 Tertiary aged volcanic strata in BC were not generally considered prospective host rocks for gold and silver. However, studies of precious metal deposits in the western USA and the Dusty Mac mine near Okanagan Falls, BC, led the writer and consulting geologist Jim Dawson to investigate the potential of known gold prospects at Blackdome Mountain.

The initial discovery of new high grade ore shoots along the mineralized structural trend, at Blackdome, was achieved by: prospecting, soil and rock sampling, geological mapping, trenching and diamond drilling. Drilling only provided evidence of prospective ore. In cases where two or more drill intersections returned more than 2 grams of gold in core lengths of 1.5 meters, or greater, a target for trenching or underground exploration was indicated. In a twelve year

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period, from 1979, 855 exploratory diamond drill holes were bored. Only fifty of these, or 6%, returned assays that exceeded the initial cut-off grade of 8 grams per tonne gold over a 1.5 meter core length.

Underground exploration and development was carried out by driving three self-draining cross-cut tunnels and drifting along the veins at mine elevations of 1960, 1920 and 1870 meters. Where ore class material was encountered, raises were driven up the vein, to surface or the next level above. There were, up to 1991, 20.98 kilometers of lateral mine workings.

Mining:

A trackless mining system was employed. Diesel powered, two cubic yard scoop trams were used for development work and 10 ton trucks were employed for ore and waste haulage. Stopping was by cut and fill on timber sills. Dry granular and cemented hydraulic back fill was used. The ore was scraped into steel lined mill holes and drawn from timber chutes. The crown pillars were mined from surface. In the case of one ore-shoot there was sufficient wall rock stability to mine by shrinkage stoping. A propane fired furnace heated the mine air to prevent ice build-up in the haulage ways during the coldest months.

Milling:

A mill site, as close as possible to the mine openings, was selected to minimize ore haulage distances during the capital recovery period. An earth fill tailings dam was constructed immediately below, in the headwaters of Fairless Creek. Water supply for the mill, mine and 100 person camp complex was drawn from wells that tapped water bearing fault structures beneath the mine. A diesel electric generating set was installed in the mill building and supplied waste heat for the plant.

The mill operated at an average rate of 200 metric tonnes per day during the mine's life. Gold and silver were extracted by a gravity / flotation process. Ninety-two percent of the gold and 85% of the silver was recovered. Muddy crude ore from the mine was washed in a trommel and the fines by-passed to flotation. The mud free material was then crushed and ground with two thirds of the gold being recovered by gravity separation in a jig and on shaking tables. The metallic gravity concentrate was fused into bars for shipment to the mint. The fine gold along with silver minerals was recovered in a flotation concentrate which was shipped in one tonne bags for smelting. The concentrate grade was approximately 900 grams/tonne gold.

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The Blackdome mill, shop, lab and power-house complex

Conclusion:

Today, in 2013, as this is written, the price of gold exceeds \$1500CAD per ounce and the approach to gold mining in Canada is changing. Bulk mineable deposits, often centered on old high-grade mining districts, with average grades in the order of one gram per metric tonne are being developed. [ie: Osisko and Detour] These mining projects are capital cost intensive with thin, full cost, operating margins, relying on rising gold prices to provide a profit commensurate with the risk of mining.

In a survey by the British Columbia Department of Energy Mines and Natural Gas the Blackdome Mine was ranked 25th, in ounces produced, amongst BC mines in the past 119 years. It earned a 24% rate of return on invested capital during a short mine life of 56 months. This is a superior performance exceeded by very few mining projects.

However, these days investor appetite for small, high grade gold mines, in North America is not great and people with relevant underground operating experience are becoming an endangered species. As well, the increased influence and complexity of the permitting process bears most heavily on the development of small mines.

Albert F Reeve, February 2013

The writer is a retired Professional Engineer who served as President of the company [Blackdome] from incorporation in 1978, to 1985, then as a director

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until the mine closed in 1991. He supervised: property acquisition, exploration, mine development and feasibility studies of the Blackdome mine.

REFERENCES:

A collection of fifty five file items consisting of: private and published reports, maps, photographs and transactions of the board of directors of Blackdome Exploration Ltd and Blackdome Mining Corporation as well as a gold bar cast from the 200,000th ounce of gold produced at the mine in July 1990 are kept in the Rare Books & Special Collections repository at the University of British Columbia, Vancouver, BC. The collection is referenced as “Albert F Reeve fonds”.

Not included in the UBC collection: A Technical Report on the Blackdome Mine Property, BC; prepared for J-Pacific Gold Inc., by David W Rennie, P. Eng. Dated April 12, 2005. [NI 43-101 standard] Mr. Rennie is the former chief geologist of the Blackdome mine.