WOLF EPITHERMAL PRECIOUS METAL VEIN PROSPECT CENTRAL BRITISH COLUMBIA (93F/3W)

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INTRODUCTION

The Wolf epithermal precious metal vein prospect (Fig. 48-1) is near latitude 53 degrees 12 minutes north and longitude 125 degrees 26 minutes west in central British Columbia, about 6 kilometres southeast of Entiako Lake approximately 185 kilometres southwest of Prince George. Access is by helicopter or floatplane to one of several nearby lakes. The Wolf claims were located in 1983 by Rio Algom Exploration Inc., Vancouver, as a result of anomalous silver values in lake sediments. Preliminary mapping and sampling of soil and rock in 1983 and 1984 indicated epithermal mineralization within Tertiary Ootsa Lake Group rhyolites (Cann, 1984). A silicified zone was trenched in 1984. Drilling and additional trenching were undertaken in 1985; the main area of drilling is shown on Figure 48-1. Mapping and ongoing studies of the Wolf area by Andrew form the basis for an M Sc. thesis.

REGIONAL GEOLOGY

Duffell (1959) named the Ootsa Lake group and noted that it unconformably overlies Hazelton Group rocks above a basal conglomerate near Whitesail Lake, about 100 kilometres northwest of the Wolf property. In the vicinity of the Wolf prospect, Geological Survey of Canada Map 1424A shows the Eocene (?) Ootsa Lake group to unconformably overlie the Jurassic Hazelton Group. Tipper (1963) postulated that much of the Ootsa Lake Group occupies depressions in pre-Tertiary valleys. He also subdivided the Ootsa Lake volcanics into two units: rhyolite and andesite. The Wolf prospect lies within the rhyolite unit that is composed of rhyolite, trachyte, dacite, with minor andesite and basalt, and related breccias and tuffs. Sedimentary rocks of Ootsa Lake Group are not abundant and generally occur as poorly consolidated, soft, friable stream gravels and sands along major valleys. In the Wolf area outcrops of sedimentary rock are rare. The recessive weathering sedimentary rocks were only encountered in drill core.

LOCAL GEOLOGY

Field relations on the property and petrographic observations define 12 map units within the Ootsa Lake major rhyolite unit. They are shown on Figure 48-1 and described in detail following. The map units can be divided into four assemblages: a basal package (units 1, 2, and possibly 3), a pyroclastic package (units 4 to 7), a dome and vent breccia package (units 8 and 9), and a late-stage and intrusive package (units 10 to 12). Sedimentary rocks underlying unit 8, the rhyolite, do not outcrop and were only intersected in drill holes. The rocks are not described here; they might occur in the valleys — note that outcrop, as shown on Figure 48-1, is sparse. Figure 48-2 schematically illustrates the stratigraphic relationships.

BASAL PACKAGE (1)

Unit 1, volcanic conglomerate, crops out in a creek on the northwest side of the property (Fig. 48-1). It is matrix supported with 30 per cent well-rounded granodiorite clasts (5 to 50 centimetres in diameter), 10 per cent angular andesite clasts (up to 15 centimetres in diameter), and 5 per cent subrounded aplite clasts (20 to 30 centimetres in diameter). The tuffaceous matrix has up to 60 per cent quartz. The quartzose matrix, granodiorite, and aplite clasts indicate a predominantly granitic, as well as a volcanic, provenance.

Unit 2, felsic lapilli tuff, has a pale grey to green aphanitic groundmass which supports various amounts of clasts, 1 to 10 millimetres in size. The unit crops out in the same creek as unit 1 on the northwest side of the property (Fig. 48-1). In two outcrops clay-altered clasts show alignment with an indicated strike of 175 degrees and a steep dip.

Unit 3, porphyritic andesite and andesite breccia, is restricted to the eastern edge of the property (Fig. 48-1). It is dark green to black, has plagioclase phenocrysts, and is locally propylitically altered. The andesite breccia contains up to 5 per cent calcite-rich clasts. This unit might be part of the Hazelton Group because of the porphyritic nature of the andesite, its association with calcite-bearing breccias, and its proximity to known Hazelton Group rocks.

PYROCLASTIC PACKAGE (2)

Unit 4, grey-green lithic crystal tuff, has an aphanitic groundmass that supports 10 per cent quartz and orthoclase crystals and 25 per cent lithic fragments ranging in texture from flow-banded to agglomeratic. The tuff crops out in the southwestern part of the property forming the basal unit of a shallowly westward-dipping pyroclastic sequence (Fig. 48-1). Quartz veinlets, 1 to 2 centimetres in width are common.

Unit 5, cream aphanitic ash tuff, is generally massive but locally contains up to 2 per cent smoky quartz crystals, 1 millimetre in size. The unit appears to lie conformably above unit 4 in the southwestern part of the property (Fig. 48-1). Spherulites are seen in thin section. Shallow, southwestwardly dipping quartz veinlets 2 centimetres in width are characteristic in this unit.

Unit 6, maroon K-feldspar-quartz porphyry, is a locally columnar-jointed flow extending over much of the southwestern portion of the property (Fig. 48-1). Quartz and orthoclase phenocrysts, each up to 5 per cent by volume, are suspended in a cryptocrystalline groundmass. No hydrothermal alteration is evident in this unit.

Unit 7, grey-maroon crystal tuff, marks the top of the pyroclastic package and crops out over much of the west-central part of the property (Fig. 48-1). This unit is near map units 9 and 11

British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1985, Paper 1986-1.

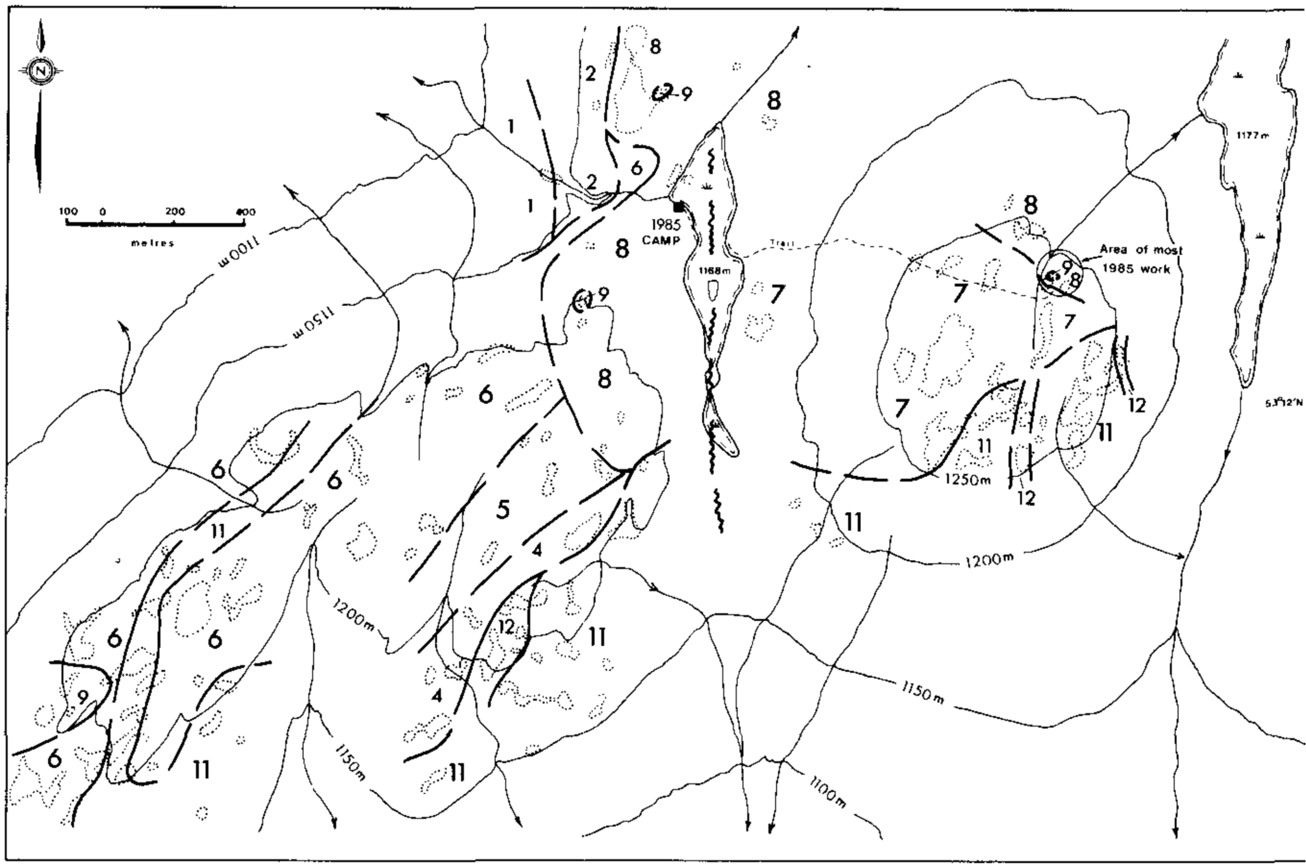


Figure 48-1. Geology of the Wolf epithermal, precious metal prospect, central British Columbia. *Basal package*: 1 = volcanic conglomerate, 2 = felsic lapilli tuff, 3 = porphyritic andesite and andesite breccia; *pyroclastic package*: 4 = grey-green lithic crystal tuff, 5 = cream aphanitic ash tuff, 6 = maroon K-feldspar-quartz porphyry, 7 = grey-maroon crystal tuff; *dome and vent package*: 8 = rhyolite, 9 = volcanic breccia; and *late-stage and intrusive package*: 10 = dark green porphyritic andesite, 11 = rhyolite porphyry, 12 = quartz-eye porphyry.

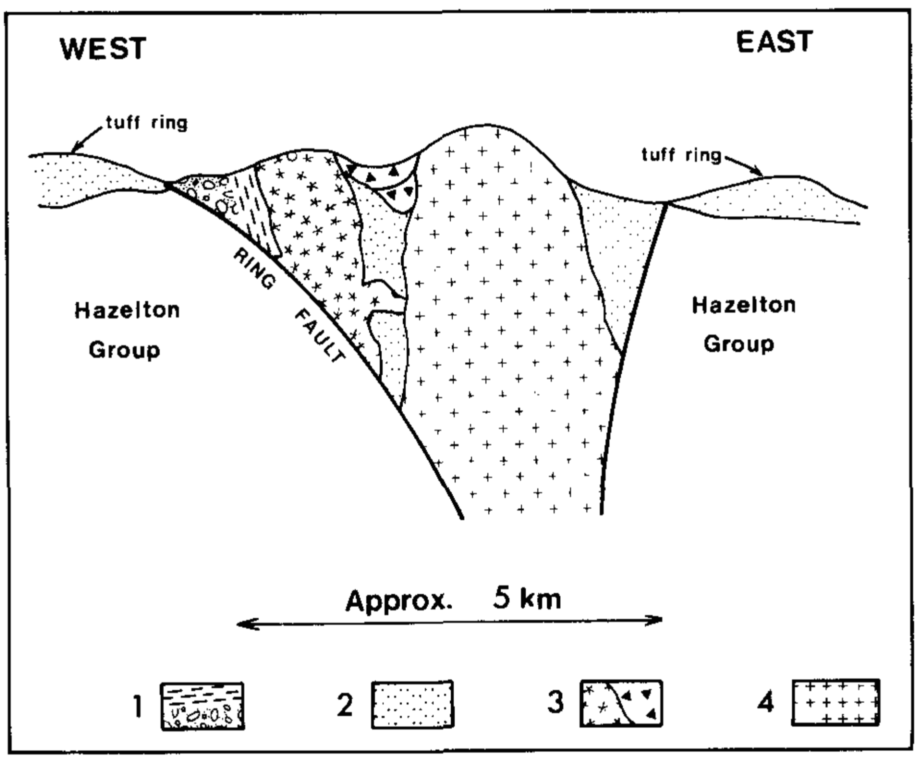
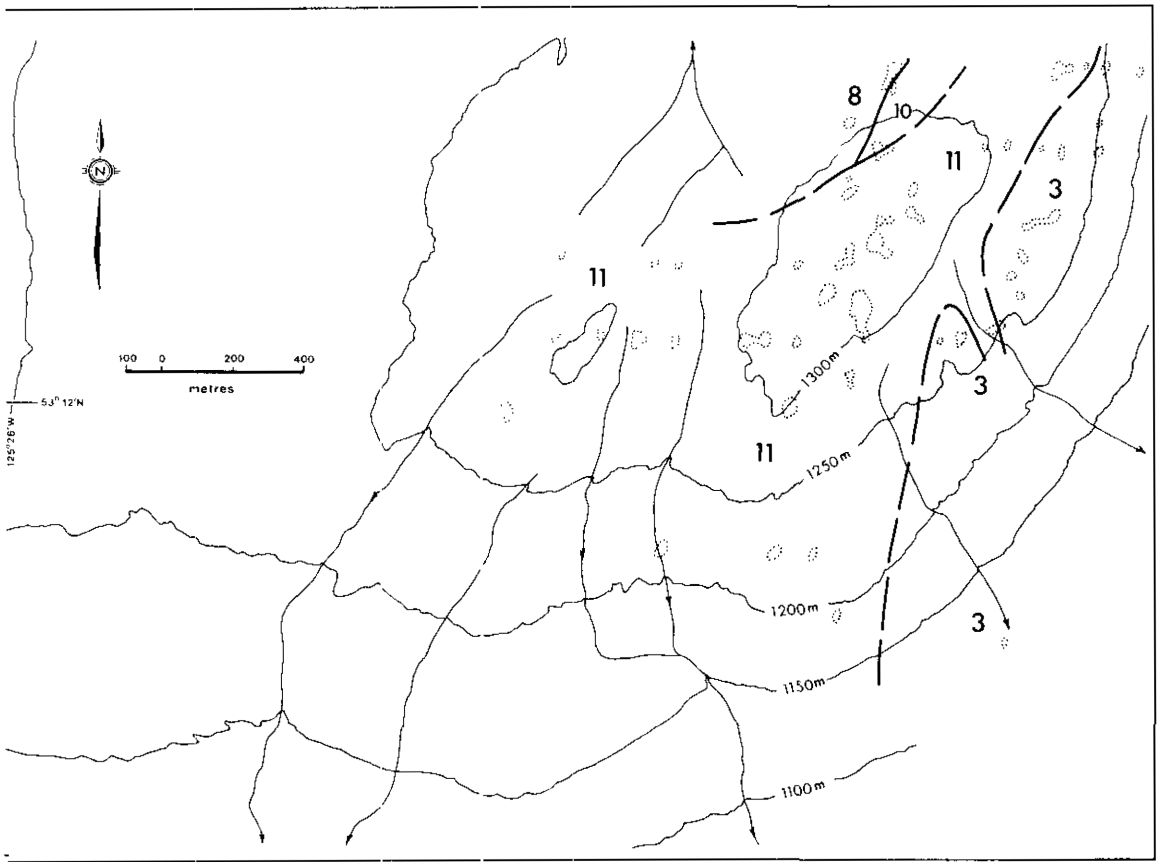


Figure 48-2. Schematic diagram illustrating maar characteristics of the Ootsa Lake Group volcanics near the Wolf prospect area, central British Columbia. 1 = basal package, 2 = pyroclastic package, 3 = dome and vent package, and 4 = late-stage and intrusive package.



which host the most significant mineralization found to date. The unit is a "crowded" porphyry with 30 per cent euhedral orthoclase phenocrysts (1 to 3 millimetres in diameter), and 10 per cent irregular quartz phenocrysts (1 millimetre in diameter). Many of the crystals are broken. Locally argillic alteration is evident. Massive quartz and bladed quartz-carbonate veins occur; they range up to 1 metre in width.

DOME AND VENT PACKAGE (3)

Unit 8, rhyolite, is commonly flow banded and spherulitic. The map unit crops out along both the west and east in the northern part of the map-area (Fig. 48-1). The unit appears to unconformably overlie units 1 to 7. The rock generally contains 10 per cent euhedral orthoclase phenocrysts (1 to 2 millimetres in diameter) and 5 per cent irregular quartz crystals (1 millimetre in diameter). Field relations suggest that the rhyolite may have been emplaced as a dome. Areas of silicification as well as 5-centimetre-wide, steeply dipping chalcedonic veinlets are common. Trenched areas expose highly brecciated and silicified zones within this map unit in which some of the highest gold values found on the property occur.

Unit 9, volcanic breccia, occurs as small, irregular and pod-shaped bodies within units 7 and 8. The breccia consists of 35 per cent lithic fragments (generally felsic but of varying compositions and sizes) and 5 per cent subhedral orthoclase crystals, in an aphanitic black groundmass. The pod-like occurrence of the breccia and variable sizes of the fragments, combined with the proximity of the unit to silicified zones, indicate that it might be a hydrothermal breccia.

LATE-STAGE AND INTRUSIVE PACKAGE (4)

Unit 10, dark green porphyritic andesite, occurs on the eastern part of the property (Fig. 48-1). An aphanitic matrix hosts phenocrysts of grey plagioclase or dark green to black augite. Hornfels in this unit is apparent within 20 metres of the contact with unit 11.

Intrusive Package

Unit 11, rhyolite porphyry, is coarse grained and porphyritic; it crops out over most of the southern part of the property (Fig. 48-1). It contains up to 60 per cent euhedral orthoclase crystals and 10 per cent quartz crystals. Field relations indicate that the unit is intrusive. Zones of silicification with vuggy and bladed quartz veins up to 50 centimetres in width host mineralization.

Unit 12, quartz-eye rhyolite, occurs within unit 11, but is distinguished from it by the presence of up to 10 per cent stubby commonly embayed, smoky quartz phenocrysts, and several per cent of euhedral orthoclase crystals. The unit is locally flow banded. This map unit may represent a late dyke-like stage of the magma which formed unit 11. The unit is locally silicified and has slight argillic alteration.

DISCUSSION

Limited outcrop and drill information make interpretations of the geology of the Wolf prospect difficult. Preliminary evidence indicates that the Wolf epithermal, precious metal mineralization might be genetically related to a maar (Williams and McBirney, 1979

Best, 1982; Sillitoe and Bonham, 1984; and Sillitoe, *et al.*, 1984) within volcanics of the Tertiary Ootsa Lake Group. Figure 48-2 illustrates some preliminary interpretations. In the figure, package 1, steeply dipping conglomeratic and tuffaceous units, might reflect proximity to a major, ring fault that could define the boundary of the maar with Hazelton and Takla volcanics. Package 2, mainly flat-lying pyroclastic units, represents a tuff ring and deposits within a crater. Package 3, consisting of domes, hydrothermal breccias and associated precious metal mineralization, might represent resurgent domes and associated hydrothermal products related to volcanic activity within a caldera. Package 4, which consists of late-stage intrusive phases, appears to have welled up within or through the maar and is locally mineralized. Detailed analysis of the drill core and a better understanding of sedimentary rocks encountered in drilling are expected to modify Figure 48-2.

ACKNOWLEDGMENTS

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