Iron Mask Project, Kamloops Area

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INTRODUCTION

The Iron Mask batholith is located 10 km southwest of Kamloops. It has been host to past producing Cu-Au-Ag porphyry deposits (Afton, Pothook, Ajax West and Ajax East) and structurally controlled Cu-magnetite veins (Iron Mask). More recently it is being explored for Cu-Au-Ag-Pd mineralization by DRC Resources at the Afton mine property and by Abacus Mining and Exploration Corp. at the Rainbow and Coquihalla East occurrences.

Historically the biggest problem facing exploration in and around the Iron Mask batholith is the lack of bedrock exposure. Much of the geology of the Iron Mask has been established from studies in the northern half of the batholith where exposure is better and the majority of exploration and mining development has taken place (Afton, Pothook, Crescent). The southern half of the batholith is thought to possess equally high mineral potential (personal communication, Graeme Evans, 2002), but is covered by thick glacial till, and well-developed drumlin fields.

PROJECT STATUS

The Iron Mask project is a private-public partnership developed between the Ministry of Energy and Mines and Abacus Mining and Exploration Corp. to produce an up to date regional geological map of the Iron Mask batholith. It is primarily an office-based compilation study that incorporates recent work by the MDRU-Porphyry Cu-Au study (circa 1991), as well as company reports, to update the last published regional map by Kwong (1987).

A one week program of mapping, sampling and deposit studies was carried out in the area west and south of Kamloops, in south central British Columbia, NTS map sheet 921/9 and 92I/10 (Figure 1). Work included field orientation, property visits and discussions with Abacus Minerals staff (Robert Darney, Scott Weekes and Robert Friezen). Drill core from Phase I program on the Rainbow property was viewed and trenches visited. The main rock units comprising the northwestern portion of the batholith were sampled and magnetic susceptibilities measured. A second field component (*i.e.* field testing of the map compilation) is planned for next summer.

The project has moved into the data interpretation and map generation phase. New age dates, and new geological interpretations of the intrusive phases, alteration and mineralization are being compiled. The compilation will utilize the detailed low-level airborne geophysical survey carried out over the Iron Mask batholith by the Geological Survey of Canada (Shives, 1994) to define structures and the distribution of individual intrusive phases, alteration and mineralization in areas of little or no outcrop. In 1993, a multiparameter airborne geophysical survey of the Iron mask Batholith area was flown by Sander Geophysics Limited, under contract to the Geological Survey of Canada. The survey collected quantitative gamma ray spectrometric (K, U, Th), VLF-EM and aeromagnetic data. The data was processed and results presented on 1:150 000 scale coloured maps and stacked profiles (Shives, 1994). Distinctive airborne geophysical signatures for all 20 of the known deposits are apparent (low eTh/K ratio with strong, flanking, high magnetic signature). Even a cursory examination of this data (magnetic data in particular), shows trends that differ from those on the most current geology maps (Kwong, 1987). John Carson of the Geological Survey of Canada, Mineral Deposits and Applied Geophysics Subdivision, has reprocessed components of the 1993 data and is converting it into a format that permits registration with our current geological compilation. Incorporation of this data set forms the second component to updating the geology map of the Iron Mask batholith.

REGIONAL GEOLOGY

The Iron Mask batholith is an earliest Jurassic (207±3 Ma, Ghosh, 1993), northwest trending, alkalic intrusive complex. It consists of two separate bodies: the 22 km long by 5 km wide Iron Mask batholith in the southeast and the smaller, 5 km by 5 km, Cherry Creek pluton in the northwest, that intrude volcanic and sedimentary rocks of the eastern belt of the Upper Triassic Nicola Group (Preto, 1977, 1979; Mortimer, 1987). Emplacement of the batholith and subsequent phases were controlled by deep-seated structures (Preto, 1967; Northcote, 1976).

Snyder (1994) and Snyder and Russell (1995) revised the previous stratigraphy established for the Iron Mask batholith. They concluded that the batholith consists of three phases, including: Pothook gabbro to diorite, Cherry Creek monzodiorite to monzonite and Sugarloaf diorite, and that a fourth mappeable unit, the Iron Mask hybrid was derived from Pothook diorite and assimilated Nicola volcanic rocks. In addition, the picrite basalt which at various times was considered to be comagmatic (Cockfield, 1948), or intrusive and coeval (Northcote, 1977) with the Iron

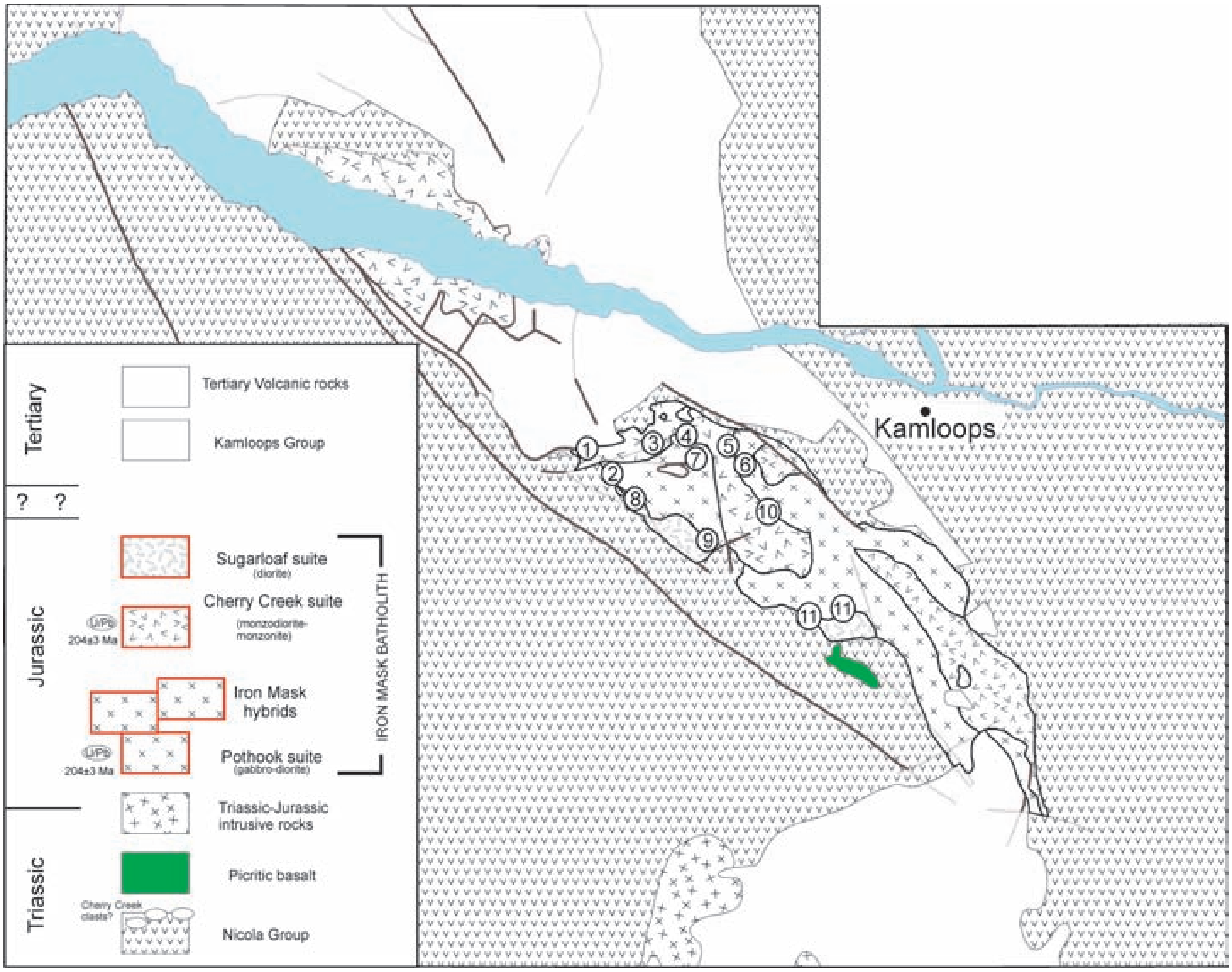

Figure 1. Location of project area, showing geology after Kwong, (1987), Snyder (1994) and this study, Legend is after Snyder (1994). Location of past producing Cu-Au mines (1, Afton; 2, Pothook; 4, Crescent; 11, Ajax West, Ajax East) and Cu-Au mineral occurrences (3, DM; 5, Big Onion; 6, Iron Mask; 7, Iron Cap; 8, Coquihalla East; 9, Rainbow-No.17, -No.2 zones; 10, Galaxy).

Mask batholith was shown to be equivalent to arc-derived ultramafic basalts which regionally overlie the Nicola Group stratigraphy (Snyder and Russell, 1994). Middle Eocene volcanic rocks of the Kamloops Group unconformably overlie the Nicola Group and Iron Mask rocks (Figure 1).

Intrusive phases are separated by “fundamental faults” which control mineralization and alteration, and no significant mineralization has been delineated outside the batholith in the Nicola volcanic rocks. Mineralization consists primarily of fracture-controlled chalcopyrite and bornite associated with pyrite, pyrrhotite and magnetite. Lang *et al.* (1994) show unit specific alteration assemblages comprising: magnetite-apatite±actinolite in the Pothook and hybrid units; potassic in the Cherry Creek monzonite; and sodic alteration of the Sugarloaf diorite.

Evaluation of the geophysical response of these known mineralized and altered assemblages, may provide a predictive geophysical response that can be modeled and applied in covered areas in the southern portion of the batholith.

EXPLORATION ACTIVITY

Exploration activities in the area of the Iron Mask Batholith includes work around the Afton pit, where DRC Resources is currently drilling deep holes to test the continuity and geometry of the remaining resources of the Afton deposit. The company is evaluating a possible underground operation for the remaining southwest plunging, higher-grade Cu-Au-Pd-Ag mineralization. Indicated mineral resources for the main zone are 34.3 Mt of 1.55% Cu, 1.14 g/t Au, 0.125 g/t Pd and 3.42 g/t Ag (DRC corporate website, 2002).

Abacus completed 3,300 meters of drilling on its Rainbow property in June. Results from this first phase drill program extends the known zones and has intersected mineralized sections of copper-gold and in places palladium mineralization. Mapping and sampling between the #2 Zone (Rainbow) and the Pothook pit has recognized structures, alteration and copper mineralization that will refine drill target selection for the second phase of drilling. Along strike, and within the northwest-trending structural corridor that hosts Afton, Pothook and the Rainbow showing, is the Coquihalla East zone. This gold-rich, copper-poor style of mineralization was first recognized by Teck Cominco in the 1990's. Surface sampling of the Coquihalla East and the Iron Cap zone (located south of the Crescent deposit), returned gold-rich assays of 6.36 g/t Au, 0.83 g/t Pd and 1.0% Cu (Abacus News release, Dec 17, 2002) and as high as 30.8 g/t Au over 2.0 m (Abacus News release, Nov 7, 2002) respectively.

SUMMARY

The initial phase of geological compilation and a brief field orientation for the Iron Mask Project has been completed. Incorporation of the digital geophysical data and refining the geology map remains to be done. The ultimate product is envisioned to be an interactive, web-based map showing the geology and mineral occurrences with separate geophysical overlays and marginal interpretive notes. This will provide exploration geologist with the spatial distribution of some of the important controls for copper-gold and platinium-palladium mineralization in the Iron Mask Pluton.

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