

THE GANGUE

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GEOLOGY OF THE ESKAY CREEK #21 DEPOSITS

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INTRODUCTION

The Eskay Creek Project is a joint venture exploration and development project between Calpine Resources Incorporated and Stikine Resources Limited. The project is located in the upper headwaters area of the Unuk River drainage, approximately 80 kilometers north of Stewart, B.C. Access to the area is by helicopter.

Exploration activity at Eskay Creek dates back to 1932, when a syndicate directed by Tom McKay staked the area. Prior to the current Eskay Creek Joint Venture, eleven companies explored the property, undertaking various diamond drill programs totalling over 4000 metres in 84 holes. Underground development was carried out on the #22 and McKay Zones, south of the area of current interest. This latest and most significant discovery, announced by Calpine in November, 1988, is the result of a six-hole drill program based upon a detailed office evaluation of prior exploration results, surface geological mapping and a soil geochemistry program.

GEOLOGY

The Eskay Creek Property is underlain by Lower to Middle Jurassic volcanic and sedimentary rocks of the Hazelton Group. Rock units are west-facing, strike 050°N and dip $15\text{-}50^{\circ}\text{W}$. Dips are steepest in the southern portion of the #21 Zone and become less steep to the north. Metamorphic rank is believed to be subgreenschist.

Well-preserved belemnites and radiolarians are locally abundant in most sedimentary units, including mineralized sediments. Hyaloclastic debris, pillowed flows, perlitic textures and fossiliferous debris-breccias are common within the volcanic units. These features indicate a predominately subaqueous depositional environment.

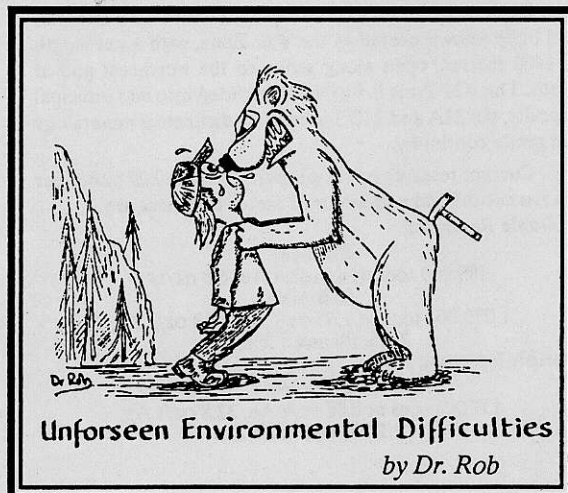
Within the drilled area of the #21 Zone, geology is relatively layercake and predictable. Stratigraphy (Figure 1) is subdivided into a Hangingwall Andesite unit, the Contact unit, the Rhyolite unit and the Footwall Dacite unit. The

The Hangingwall Andesite Unit is a flow and sill complex. The extrusives are fine grained and buff-green coloured; they occur commonly as pillowed flows and flow breccias while intrusive sills are dark green and massive.

Palagonite ash horizons are also present. Intercalated mudstone units are black, pyritic and discontinuous. Some mudstones are particularly fossiliferous and calcareous, and are useful markers within the hangingwall complex. Pillow and pillow breccia units are most frequently cemented by grey calcite or black chert, with heavy impregnations of pyrobitumen, pyrrhotite and white, sparry calcite present locally. Amygdules are filled by dark green chlorite, quartz, calcite or pyrite.

The Contact Unit hosts the most important mineralization. Thickness is variable, up to 60 meters, though generally much less. The unit comprises a spatially extensive, highly carbonaceous upper mudstone overlying a more restricted rhyolite-mudstone breccia. The upper mudstone is a thin to medium bedded, medium to finely laminated carbonaceous mudstone, with tuffaceous, chert and pyritic laminae. The lower subunit of this interval is a debris breccia (Transition Zone) containing rhyolite and mudstone blocks and chips supported by a black, carbonaceous matrix. The breccia is variably foliated and mineralized. In thin section a myriad of clast sizes and compositions, including chert, rhyolite, mineralized and altered fragments, and quartz eyes are observed. The matrix comprises exceedingly fine grained chalcidonic quartz, muscovite, chlorite, pyrobitumen and graphite.

The Rhyolite Unit, which is approximately 80 metres thick, comprises grey to white aphyric breccia, lapilli-breccia, tuff and subordinate massive rhyolite. Local subunits of mudstone and waterlain tuff are present. Rhyolite fragments are massive to flow-banded in a tuffaceous matrix. Subunits



STRATIGRAPHIC COLUMN - 21 ZONE

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VERTICAL SCALE 1 : 1000

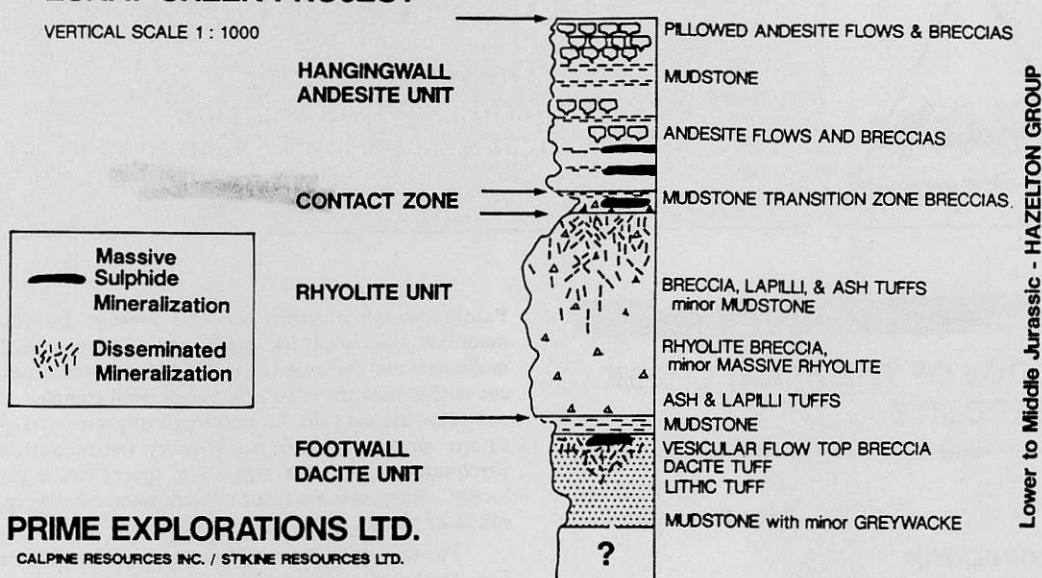


Figure 1.

of highly altered vitrophyre (or perhaps hyaloclastite) are present, often displaying perlitic or lithophysal textures. These rocks may appear massive to schistose and are mineralogically simple: quartz, muscovite and chlorite. Alteration effects are most dramatic within the matrix, however, clasts are also strongly altered. The base of the rhyolite is frequently massive, aphanitic and weakly brecciated.

Footwall to the rhyolite is an unknown thickness of fossiliferous mudstone, wacke and dacite tuff. Epiclastic units are medium to thick bedded, medium laminated, tuffaceous and pyritic. Dacitic pyroclastic units comprise a relatively continuous sequence of feldspar-phyric dacite tuff, lapilli-tuff and ash tuff.

MINERALIZATION

Exploration diamond drilling has delineated a mineralized body known overall as the #21 Zone, with a net length of 1400 metres, open along strike to the northeast and at depth. The #21 Zone is further subdivided into two principal deposits, the 21A and 21B, based upon distinctive mineralogy and grade continuity.

Current reserves on the property, using a 0.25 ounce per ton Au cut-off and a minimum 2 meter thickness are:

Probable Reserves:

21A zone
183 000 tons at 0.71oz/t Au, 6.8 oz/t Ag
21B zone
1 073 000 tons at 1.66 oz/t Au, 43.3 oz/t Ag,
2.1% Pb and 5.2% Zn;

Possible Reserves:

21B zone
437 000 tons at 0.88 oz/t Au, 32.8 oz/t Ag,
2.1 Pb, and 4.8% Zn.

The 21A Deposit (previously known as the "South Zone") is hosted within Contact Unit carbonaceous mudstone and breccia, as well as the underlying Rhyolite breccia. Two styles of mineralization are present. The first is dominated by a visually striking assemblage of disseminated to near-massive stibnite and realgar within the Contact Unit. The second style occurs in the adjacent footwall rhyolite, and features a stockwork-style quartz-muscovite-chlorite breccia mineralized with disseminated sphalerite, tetrahedrite and pyrite. Highest gold and silver grades and widths are encountered where the Contact Unit is thickest and the immediately underlying rhyolite breccia is highly fractured and altered. Initial drilling in the 21A area has outlined a mineralized zone approximately 280 metres long and up to 100 metres wide. Thickness is variable, 10 metres on average, with locally much greater thicknesses indicated (e.g. CA89-23 returned a core length of 34.51 metres grading 14.93 g/t Au and 103.1 g/t Ag).

Exploration drilling on the 21A Deposit is currently suspended in favour of an accelerated drill program on the 21B Deposit, where initial results suggest the presence of a major mineralized body of high grade gold and silver mineralization associated with base metals. The change from a complex antimony and arsenic-dominated association in the 21A Deposit to a more conventional zinc, lead and copper sulphide association in the 21B Deposit is regarded as being of major significance to the overall mining economics of the project. The two deposits are separated by a 140-metre long segment of weakly-mineralized mudstone and rhyolite.








The 21B Deposit (formerly the "Central" and "North" Zones, now linked by drilling), is approximately 900 metres long, from 60 to 200 metres wide and locally in excess of 40 metres thick. The southernmost 600 metre segment possesses the greatest grade and geological continuity, the northern 300 metres appears to contain mineralized intervals at several stratigraphic positions. Disruption of the deposit by post-

3+00W

2+00W

SECTION 5+50N

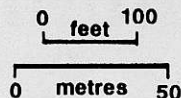
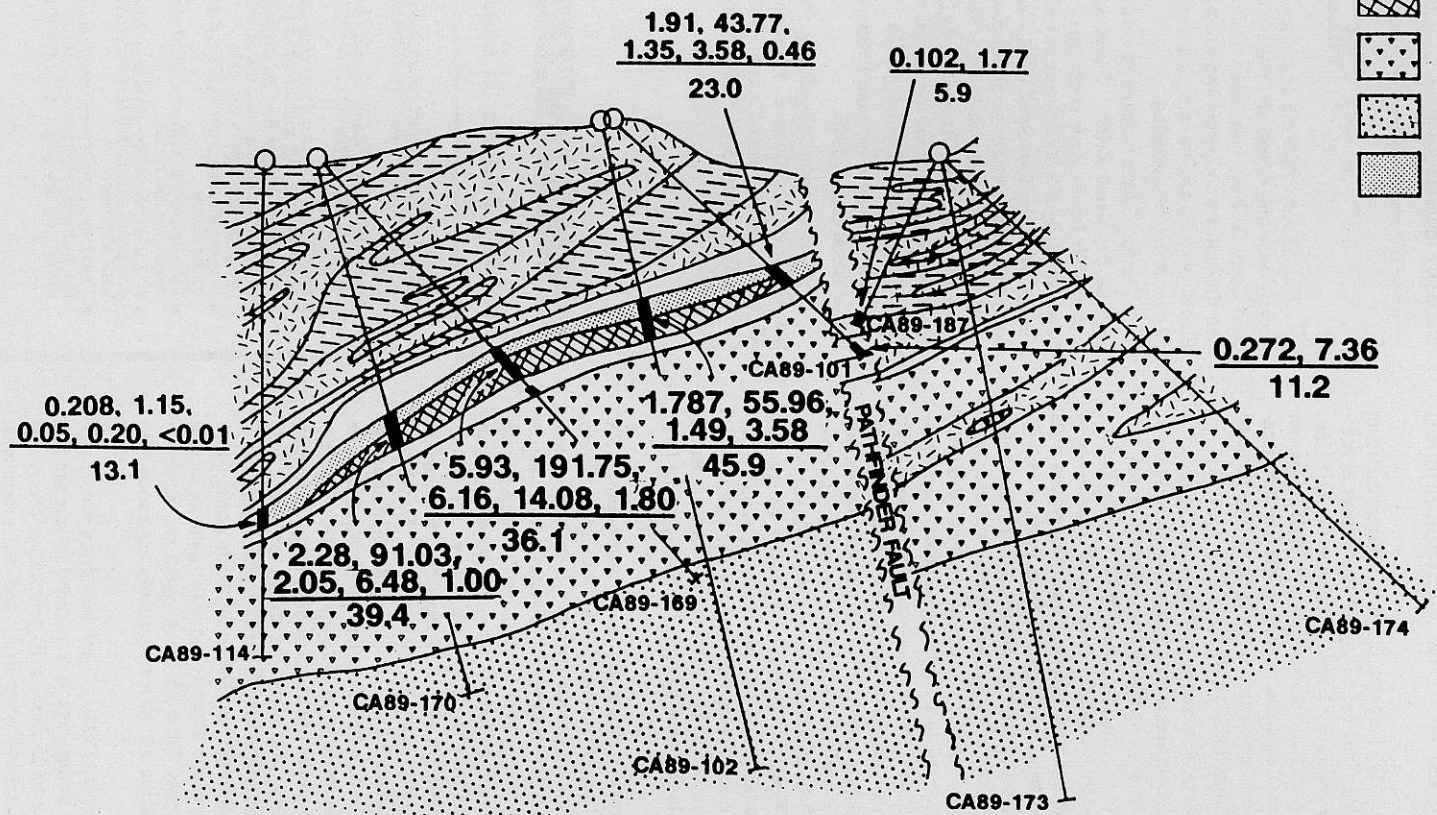
LEGEND

-  Hangingwall Andesite
-  Argillite (minor Andesite)
-  Contact Argillite
-  Massive Sulphides
-  Rhyolite Breccia
-  Dacite
-  >0.1 oz/t Au

Au, Ag (oz/t)
Pb, Zn, Cu (%)
feet

900m

800m



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mineralization faults appears to be more pronounced in the northern segment.

The deposit is displaced on the east by the major northeast-trending Pumphouse Creek fault zone. Associated north-trending splay faults also cut and displace mineralization in a similar manner. The limits of the deposit are yet to be defined at depth to the west, to the northeast along strike, and immediately east on the fault-offset portion of the deposit.

Within the 21B Deposit there are three differing mineralized regimes. The most significant is a sheet of massive sulphide mineralization hosted within the Contact Unit. Also present is an areally restricted grouping of Hangingwall Unit-hosted stacked sulphide lenses (in the northern segment), and more widespread, less continuous disseminated mineralization within the Rhyolite Unit.

Contact Unit mineralization in the southern segment of the 21B Deposit comprises a continuous stratiform sheet of banded high-grade gold and silver-bearing base metal sulphide layers, from 2 to 12 meters thick. Mineralization appears to be bedding-parallel. Of note is the abundance of mineralized bands containing slump structures, graded beds and tuffaceous debris. Sulphide minerals present include sphalerite, tetrahedrite, boulangerite, bournonite plus minor galena and pyrite. Gold and silver is associated with electrum, which occurs as abundant grains associated with sphalerite. Peripheral and footwall to the banded sulphide mineralization are areas of micro-fracture veinlet hosted disseminated tetrahedrite, pyrite and minor boulangerite mineralization. Significant results from recent drilling within this area include CA89-169, which contains a core length intercept of 11 metres grading 203.04 g/t Au and 6,565 g/t Ag, 14.08% Zn, 6.16% Pb and 1.80% Cu (Figure 2). Overall this portion of the 21B Deposit is outstanding in terms of the predictability of its geology and tenor, and its relatively well-defined contact-controlled assay boundaries. The bulk of the currently stated reserves fall within this area, incorporating the Contact Unit mineralization.

The host rock stratigraphy in the northernmost 300 metres of the 21B deposit is similar to that found to the south, however in the northern portion all three mineralized regimes are important. Contact-hosted bedded-type mineralization extends northerly through the western, or downdip portion of the zone, comprising semi-massive to massive sphalerite, galena and tetrahedrite bands up to 10 metres thick. Hangingwall Unit mineralization is also present as two lenses of massive sphalerite, galena, chalcopyrite, pyrite and tetrahedrite. Footwall Rhyolite Unit mineralization occurs as siliceous and carbonate-rich breccias containing crustiform veinlets and disseminations of sphalerite, galena and minor pyrite and chalcopyrite. Gold mineralization occurs as spectacular films, wires, and blebs intimately associated with sphalerite. Within this portion of the deposit is a corridor of shearing and fracturing (the Pathfinder Fault Zone) which transects the axis of the deposit, and is the locus of intense alteration. It appears that both Hangingwall and Rhyolite-hosted mineralization are at least spatially associated with this corridor.

Current activity at Eskay Creek includes a winter program utilizing six drilling rigs. It is intended to take the 21B Deposit data base to 25 metre drill penetration centres, as well as continue testing both strike and dip projections. Numerous other targets are also being evaluated, both within

the #21 area and elsewhere on the property. A program of underground exploration and development is in the planning stages.

Fossil Stamps !

Contributed by A.D. McCracken
Paleontology Division - GAC

On 12 July 1990 the first four of a series of sixteen stamps depicting Canadian fossils will be issued by Canada Post Corp. The series is called "Prehistoric Life in Canada" and illustrates fossils from the Precambrian to Pleistocene. Plants, bacteria and invertebrate and vertebrate fossils may all eventually be illustrated.

The four 39-cent stamps issued in 1990 are entitled "The Age of Primitive Life". These represent a columnar stromatolite from the Precambrian of western Quebec (GSC Paper 69-39, fig.20), the trilobite *Paradoxides davidis* from the Cambrian of Newfoundland (GSC Bulletin 88, p68), a soft-bodied marine invertebrate of unknown affinities - *Opabinia regalis* from the Cambrian Burgess Shale in southern British Columbia (GSC Misc Report 43, fig.26), and the eurypterid *Eurypterus remipes* from the Silurian of southern Ontario (GSC Econ. Geol. Report 1, p.592).

The first day cover cancellation will be at Field, British Columbia on 12 July 1990.

For information on ordering stamps, contact the National Philatelic Centre, Canada Post Corporation, Antigonish, Nova Scotia, Canada, B2G 2R8; or, from within Canada Tel: 1-800-565-4362, from outside Canada Tel: (902) 863-6550.

Murphy's Laws of Exploration

- Only God knows where all the orebodies are. Accountants are his little helpers in keeping this information secret.
- Coincident anomalies should be avoided - they only promote arguments as to which technique found the ore.
- Geological mapping is the only known way of proving a prospect is not worth mapping.
- A Chief Geologist may be defined as the person who discovers a critical outcrop 20 metres beyond the end of a field geologist's traverse.
- The most critical outcrop is always on the other side of the valley.
- The orebody will always be 50 metres beyond the end of the last drill hole.
- If an exploration geologist buys stock in a 'hot prospect' the stock value will decrease by at least 80% within the week.
- The richest part of the orebody is located directly under the exploration camp; if not, it can be located by drilling a pilot hole for the main shaft.