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SUMMARY REPORT

on the

**BIG KID/SHEAR PROPERTY
ASPEN GROVE, B.C.
NICOLA MINING DIVISION**

FOR

PLACER DOME INC.

by

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INTRODUCTION

This is a summary report on 1992 exploration conducted on the Shear Property, Aspen Grove, B.C. by Placer Dome Inc. Details are kept to a minimum, the main aims of this report are:

- 1) To outline the April-June exploration program on the property.
- 2) To discuss the more significant results from this and previous exploration programs.
- 3) To make recommendations for future exploration.

CONCLUSIONS

The Big Kid-Shear Property covers some of the best prospective geology for alkalic porphyry related copper-gold deposits in the Aspen Grove section of the Nicola Belt.

An eroded Nicola age (Triassic-Early Jurassic) volcanic centre is located on the property close to a triple junction between the three major structures in the belt (Quilchena, Allison and Kentucky-Alleyne fault zones). This high level volcanic-intrusive (hydrothermal) complex is centred on the Big Kid intrusion breccia (volcanic neck?) and features comagmatic syenodiorite to syenomonzonite alkalic intrusives, trachyandesite volcanic flows and fragmental units. The main area of intrusives extends from Bald Hill (Big Sioux area) in the north for 2.3 kilometres south to southeast to the Copper Belle area and is up to 1.2 kilometres wide. In this intrusive area structurally controlled and disseminated chalcopyrite-pyrite mineralization has very good copper-gold correlations, the presence of late monzonite to syenomonzonite intrusive phases appear important.

1992 and previous exploration data suggests that the areas with the best exploration potential lie to the north and east of the Big Kid breccia. Past drilling in the Big Sioux and Big Kid areas by Noranda (1954) and Amax (1972) did not adequately explore copper-gold potential (no gold analyses). The drilling did however return a number of interesting copper-intersections in the 0.2% to 0.5% range. Many of the better placed old trenches clearly did not encounter much bedrock. Limited trenching in 1992 testing the northern part of the Big Kid breccia encountered significant gold values associated with chalcopyrite-pyrite mineralization (TR 92-2 32.5m at 0.112% Cu, 0.56 gt Au).

On the property structurally controlled copper mineralization typical of the Aspen Grove camp is associated with subsidiary structures to the main faults

(Kentucky-Alleyne, Allison). This mineralization is predominantly volcanic hosted and contains chalcocite local bornite and secondary copper minerals (native Cu, malachite, azurite, digenite) with high grade copper values and little gold. Examples include the Golden Sovereign, Locality 6 (Amax) and Blue Bird, the Copper Belle appears to have low gold values. Most of these occurrences have settings which suggest very limited tonnage potential.

RECOMMENDATIONS

A three stage exploration program is recommended to adequately test the alkalic porphyry, copper-gold potential of the Big Kid/Shear Property. A minimal amount of surface work including further trenching and IP/Resistivity surveys will greatly aid drill target selection and may develop new targets.

Stage 1 (2 to 3 weeks)

- Surface examination of areas with coincident copper-gold soil anomalies especially over the main intrusive complex.
- IP/Resistivity Survey. 5 lines are proposed for a total of 6 kilometres.
Lines 10600N, 10800N and 11000N from 23300E to 24500E.
Lines 12600 and 12800N from 22300E to 23500E.

Stage 2 (1 week)

Eight or more excavator trenches for a combined total length of 300 to 400 metres. Two in the northern Bald Hill, Big Sioux area. Six testing the eastern and northern margins of the Big Kid breccia and its alteration/pyrite halo.

Stage 3 (3 to 4 weeks)

1200 metres of diamond drilling (NQ). Allow two holes in the northern area (Bald Hill - Big Sioux) and six in the Big Kid area. The final location of these holes will be largely determined from stage 1 and 2

1992 EXPLORATION PROGRAM

The phase 1 exploration program on the property commenced in early April and will be completed by late June 1992. Exploration expenditures (excluding property payments) to mid June total approximately \$185,000. The phase 1 program consisted of the following main elements;

- 1) Grid Control - 110 km of cut grid by Amex Exploration Services Ltd. Complete property coverage. 100 metre spaced lines in the Big Kid - Big Sioux area. 200 to 400 metre spaced lines in the southern and western areas.

- 2) Geological - All surveys by PDI personnel.
 - a) Geological mapping of the entire property 1:5000 scale
 - b) 1:2500 scale mapping of the Big Kid area
 - c) Detailed mapping and sampling of all old workings still exposed. Includes a number of adits.

- 3) Geochemical - All surveys by PDI personnel. Analyses by PDI lab. Some Eco Tech Ltd.
 - a) Preliminary orientation soil surveys in the Big Kid and Shear road cut areas.
 - b) Soil geochemical survey-grid coverage with samples at 50 metre stations.
 - c) Litho-geochemical - whole rock studies of intrusive rock suites (Eco Tech Lab.)
 - d) Extensive sampling of mineralized outcrops and old workings.

- 4) Geophysical - surveys by Delta Geoscience Ltd.
 - a) 94 km of Magnetics and VLF-EM (2 station). Grid coverage excluding the northeast area.
 - b) 7.5 km of test IP/Resistivity. Four lines in the Big Kid area, one line over the Big Sioux-Bald Hill.
- 5) Trenching - by Can Mac Construction Ltd. Kelowna.
Eight trenches north and east of the Big Kid primarily to test the main copper in soils anomaly outlined by Amax in 1972.
- 6) Environmental - by H. Goddard. Property examination in particular old workings.
- 7) Compilations - For all 1992 exploration data and previous work on the property at 1:5000 scale.

PROPERTY GEOLOGY AND MINERALIZATION

The property covers Nicola Group (Triassic-Lower Jurassic) volcanic flows, pyroclastics, minor sediments and a variety of intrusive bodies ranging in composition from granite to syenite. This is a structurally complex part of the Nicola Belt at the triple junction between the Kentucky-Alleyne, Allison and Quilchena fault zones. Extensional tectonics in the Lower Mesozoic period resulted in strong inter relationships between faulting, sedimentation, intrusive activity, volcanism, hydrothermal alteration and copper (gold) mineralization.

The property area can be divided into three geological domains separated by major structures, these are the central, west and east.

1. Central Area

This area lies between the Allison and Kentucky-Alleyne (Axel) fault zones, Nicola group pyroxene and plagioclase rich andesitic flows are interbedded with thick, generally coarse fragmental units including lahar deposits. Much of this area is underlain by intrusive rocks centred on the Big Kid breccia (volcanic neck!) possibly representing an eroded Triassic volcano.

The Big Kid appears to be a steeply dipping pipe (intrusion breccia) over 300 metres in diameter with varying proportions of monzonite, diorite and volcanic fragments in an altered microdiorite to syenomonzonite matrix. Silicification and carbonate alteration is widespread with variable chalcopyrite and pyrite mineralization (in matrix). A significant pyrite halo appears to surround the breccia especially to the north and east.

The breccia pipe intrudes an elongate northerly trending diorite-microdiorite body (complex) 2.2 kilometres long with Bald Hill at its north end. A number of small

satellite bodies occur around its margins. The presence of numerous volcanic inclusions and geophysical data strongly suggests much of this area represents a roof zone. Compositionally these intrusive rocks are syenodiorites (alkaline) and chemically similar to the surrounding volcanics (coeval-comagmatic?). Potassic monzonite to syenomonzonite dykes are common at the margins and locally within the Big Kid breccia as well as at the Shear road cut. These are later than the diorites and have associated potassic alteration. Disseminated and weak structurally controlled copper (gold) mineralization is peripheral and probably related to this more alkalic intrusive phase. The Big Kid breccia, surrounding intrusives and roof zone volcanics represents a high level intrusive hydrothermal system with good potential for alkalic porphyry, copper-gold zones.

The southeastern margin of the intrusive complex is bounded by the Kentucky-Alleyne (Axel) Fault Zone. On the property this zone consists of two major northerly trending structures between 100 and 200 metres apart enclosing volcanics and monzonitic to dioritic intrusives (syenodiorites) similar to those to the west. Clearly some late fault movements postdate intrusive activity.

A number of copper showings such as Amax Locality 6 and the Copper Belle are associated with the margins of the fault zone and parallel structures. Most feature fracture controlled chalcocite, local bornite and a variety of secondary copper minerals (malachite, native copper, local azurite, digentite) with very little pyrite and chalcopyrite. The host is predominantly volcanics and subsidiary west to northwest trending structures (to the main northerly structures) appear to be an important control. Copper values up to several percent can be obtained from these showings they are however, narrow, generally gold poor (except the Copper Belle) and in geological settings that have limited tonnage potential.

2. East Area

East of the Kentucky-Alleyne Fault Zone the Nicola (Central Belt) consists predominantly of fragmental volcanic rocks, epiclastics and immature sediments with minor volcanic flows. A thick sequence of generally well bedded volcanic sandstones, crystal and fine lithic tuffs lie immediately east of the fault zone. These have northerly strike and dip steeply to the east or west. To the east on the higher ground coarse lapilli tuffs and massive lahar deposits dominate.

Copper mineralization in this area is similar to that along the Axel fault zone with the Golden Sovereign workings being a good example. Again subsidiary westerly trending, structures appear important controls on mineralization and the host rocks are volcanics. Chalcocite-native copper veins yield high grade copper values generally with very little gold, tonnage potential usually appears small.

3. West Area

This area is west of the old Princeton highway and covers the northern end of the Allison fault system. Much of the lower ground from Aspen Grove valley to the north is covered by thick glacial and lacustrine deposits. Geophysical data suggests that the main structures underlie these areas.

The Nicola volcanics (Central Belt) consists largely of volcanic fragmental rocks (lapilli and crystal tuffs) in the east and more massive andesitic flows in the west. A wide zone of dioritic intrusive rocks in this western area probably follows an old northerly trending suture. The intrusives are predominantly diorite and diorite breccias with a central zone of later monzonites and quartz monzonites (dykes!). A number of small monzonite to granite intrusions occur to the east, one of these was previously mapped as Pennask granite (Preto 1979). There is strong chemical evidence that these diorites, monzonites and granites (sub alkaline-calc alkalic) are related and possibly comagmatic. In many cases there is strong structural control on intrusives.

In the far northwestern part of the area the Nicola volcanics come against younger pebble conglomerates, dacitic flows and coarse sandstones possibly belonging to the Kingsvale Group (Cretaceous).

Copper mineralization is largely restricted to the northern area, west of the highway and is hosted by fractured volcanics, proximal to northerly structures and locally narrow siliceous dykes. Secondary copper mineralization consisting largely of malachite with local chalcocite commonly yields significant copper values but generally over narrow widths with little gold.

GEOCHEMISTRY

1. Soils

The main geochemical feature is a large southeast trending copper anomaly (> 125ppm) with semi coincident gold 2.7 km long by 1 to 1.3 km wide. This copper anomaly basically overlies the Big Sioux-Big Kid intrusive complex and agrees well with anomalies defined by previous Amax and Noranda surveys. Low but anomalous gold values occur north and east of the Big Kid breccia and roughly outlines a northwesterly zone, which continues up into the Bald Hill region.

Copper anomalies are also associated with the main northerly trending structures, in particular the Kentucky Alleyne - Axel fault system. Gold values are generally low with erratic (weak) anomalies. Spotty copper anomalies with erratic gold occur in the western area over the Allison Fault Zone and associated intrusives. Overburden depth is a problem over much of this area with thick glacial and lacustrine deposits.

2. Lithogeochemistry

Forty three type samples of relatively unaltered intrusive and volcanic rocks were selected for whole rock analysis. The intrusive rocks on the property can be divided into two distinct suites.

In the Western area the intrusions along the Allison Fault Zone are chemically sub-alkaline, calc-alkalic diorites, monzonites and granites. They quite possibly are comagmatic excepting highly siliceous feldspar porphyries that outcrop in the extreme west.

In the Big Sioux - Big Kid area the diorites and microdiorites forming the main intrusive mass and the structurally controlled bodies along the fault zone (Axel) to the east all plot in the alkaline field (alkali-calcic to alkali) and are syenodiorites. Volcanic

flows from the same area are chemically very similar and are alkaline-trachyandesites. Monzonites from the Shear road cut and Big Kid area are alkalic syenomonzonites and lesser syenites. Chemically all the intrusives and most of the volcanics in this area appear to be comagmatic. The intrusives in the western area clearly belong to a different suite.

3. Copper-gold Correlations

Scatter plots (XY) with gold against copper were produced for values from mineralized rock samples taken from the property. Samples from the intrusive complex (Big Kid-Sioux) show excellent copper gold correlations. The correlation coefficient for chip samples taken from the 1992 trenches is 0.68 (all samples).

Plots for all mineralized samples from the property indicate a second population with high copper and little gold. These correlate with samples taken from structurally controlled secondary copper mineralization.

Copper-gold scatter plots for soil samples taken from the property also show the two populations. The majority of the samples show reasonable copper-gold correlation.

GEOPHYSICS

The geophysical data generated by the 1992 surveys correlates well with the known geology and previous surveys.

On total field magnetic maps areas with greater than 57600 NT overlie the known intrusives. The Big Kid intrusion breccia cannot easily be distinguished from the main diorite mass that surrounds it. North of the Big Kid the patchy nature of the magnetic highs suggests a roof zone with mixed volcanics and intrusives. Further to the north in the Bald Hill area the intrusives appear to plunge beneath volcanic cover (to reappear at the Snowflake showings to the north?). The strongest magnetics on the property occur at the southeastern end of the intrusive complex where there is 40 metres of volcanic cover (determined from a magnetic model).

The VLF survey clearly distinguishes the main structures especially when combined with magnetics. The Kentucky Alleyne-Axel fault is distinct at the eastern edge of the intrusives. A northeasterly trending structure crosses the intrusive complex south of the shear road cut and has apparent sinistral displacement. To the west a number of parallel north trending structures are indicated along the Allison Fault Zone.

Four test I.P./Resistivity Lines were run over the Big Kid and basin area to the north (copper anomaly). Strong chargeability anomalies occur around the breccia and possibly form a northwest trending zone parallel to the long axis of the complex. The strongest chargeabilities occur at the northern edge of the breccia in the old trenched area. To the north layering in the profiles suggests that the chargeability zone dips north and then rises before the highway.

To the north of the highway a single line of IP/Resistivity outlined strong chargeabilities marginal to the diorite intrusion. This area was drilled by Noranda in 1956 and produced some of the better copper intersections.

1992 TRENCHING

The 1972 Amax Copper (in soils) anomaly north of the Big Kid breccia was tested with seven trenches during May, four in the south, three in the north. These trenches were at the margins of a topographic basin where bedrock is close to surface, the central part of the basin (and anomaly) has deeper overburden and is difficult to trench. A single trench tested copper mineralization exposed at the eastern edge of the Big Kid breccia, this area was previously tested by a single hole by David Minerals in 1976-77.

The results from the trench program are summarized in the following table.

Trench No.	Grid Location	Purpose to test	Results
TR 92-1	11600N 23450E	Au/Cu David Minerals Trenches. Southern margin Cu soil anom.	0.063% Cu, 0.237 gt Au/15m. Altered intrusion breccia.
TR 92-2	11580N 23525E	Au/Cu David Minerals Trenches. Southern margin Cu soil anom.	0.112% CU, 0.56 gt Au/32.5m. Altered intrusion breccia.
TR 92-3	11600N 23550E	Au/Cu David Minerals Trenches. Southern margin Cu soil anom.	0.08% Cu/14m. Low Au intrusion breccia.
TR 92-4	11420N 23750E	Southern margin of Cu soils anom.	Cu to 448 ppm Au to 81 ppb.
Tr 92-5	11215N 23555E	Eastern Margin of Big Kid breccia. Surface Cu showing.	0.217% Cu/21.5m Au to 91 ppb.
Tr 92-6	11850N 23600E	Northern Part of Cu anomaly.	Cu to 228 ppm Au to 19 ppb.
Tr 92-7	12000N 23750E	Northern Part of Cu anomaly.	Cu to 710 ppm coincident Au to 34 ppb.

Tr 92-8	11610N 24050E	North Eastern part of Cu anomaly.	Cu to 805 ppm low gold.
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An important point regarding previous trenching in the Big Kid area is that very few trenches actually encountered bedrock. Many of the bulldozer trenches scraped hardpan especially those by David Minerals (1976-77). Gold values encountered by David (in hardpan in the trench 92-1 and 2 area appear to lie directly above gold mineralized bedrock. Strong gold in soil anomalies also occur in this area.

COMMENTS ON PREVIOUS WORK

The property area has received a significant amount of previous work, much of this has focused on individual showings and small areas rather than the large picture.

Early work before 1950 was largely in the form of trenches, pits and short adits testing high grade copper showings such as the Golden Sovereign, Copper Belle and Blue Bird. Three short adits and a large number of pits (now overgrown) tested copper mineralized structures cutting the Big Kid breccia pipe.

Both Noranda in the mid 1950's and Amax in 1972 completed integrated geological, geochemical and geophysical programs with trenching and limited drilling in the Big Kid-Big Sioux area. The target was porphyry copper, no analyses were made for gold (none are documented in reports).

Noranda completed 4 diamond drill holes on the Big Sioux and 5 on the Big Kid these were all small diameter (EXT). CW Ball (Canex Aerial memo 1972) made the following comments about this drilling:

- 1) The core size is mainly EXT which could not be expected to yield good core recovery in the breccia zone.
- 2) All the holes were widely spaced angle holes and no attempt was made to drill a grid to establish a trend. Correlation between holes is therefore extremely difficult.
- 3) The drill holes were carefully logged but wide zones of chalcopyrite mineralization were not split or assayed.

Clearly a great deal of confidence cannot be placed in these drill results, they are not conclusive. Holes 7,8, and 9 in the Big Sioux area returned a number of copper intersections in the 0.2% to 0.48% range in mixed volcanics and dioritic intrusives. Holes 2,3,4, and 5 were drilled in the northern part of the Big Kid breccia and probably were testing the adit mineralization. Each of these holes returned a number of copper intersections in the 0.1% to 0.36% range (which are not as high as some adit chip samples).

Amax in 1972 did no diamond drilling, 22 percussion holes (most to a depth of 300') were scattered in a rough grid pattern to test size and grade around the Big Kid breccia and Big Sioux area. Many of the holes returned low copper values, however the validity of this drilling approach has to be questioned, most structures and many intrusive contacts have steep to vertical dips in the area. Holes 72-1,2 and 22 in the Big Sioux are returned copper intersections in the 0.16% to 0.26% range. Holes 72-6,7 and 12 were drilled north of the Big Kid in the copper anomaly area and returned similar copper values to the Big Sioux. Other holes in the copper anomaly area such as 72-8,9,10 and 19 returned low copper values.

David Minerals Ltd. 1976-77 completed a number of low budget programs on the property including trenching and diamond drilling. As mentioned in another part of this report, trenches north of the Big Kid returned significant gold values however, these were from hardpan and not bedrock. Five diamond drill holes were completed, 3 on the Big Kid, 1 each on the Big Sioux and Copper Belle. These holes were described in great detail with numerous mentions of chalcopyrite but no analyses were made for either copper or gold.

In conclusion there has been basically no drilling of any substance on the Big Sioux and Big Kid, no attempt has been made to evaluate gold potential.