AppleBay

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# POSTER ABSTRACT

TITLE: Kaolin and Silica Resources in Advanced Argillic (Acid Sulphate) Alteration Zones, Northern Vancouver Island, B.C. Canada.

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Large Scale Advanced argillic (acid sulphate) alteration zones have been known for many years (Clapp, 1915) at Monteith Bay in Kyuquot Sound. More recently the numerous large alteration zones on the north side of Holberg Inlet (Panteleyev and Koyanagi, 1993 and 1994) have been described within the regional framework in some detail.

Monteith Bay Resources Ltd. (a wholly owned subsidiary of Tilbury Cement [Lehigh Cement]) put the high grade silica portion of the Monteith deposit into production in 1999 as a silica source for the Cement Plant in Delta, B.C. A large bulk sample was excavated in 2000 from the PEM100 quarry, Apple Bay Project on the north side of Holberg Inlet by Homegold Resources Ltd., which was barged to the Cement Plant in Delta. The material from the PEM100 is termed Chalky Geyserite and a typical assay could be 83.26% $SiO_2$, 12.90% $Al_2O_3$ and 0.02% $SO_3$, 1% $Fe_2O_3$, 1.3% CaO, 0.24% MgO, 1% LOI and trace element content is shown below:

**Trace Element Content of Chalky Geyserite**

| Mo | Na% | Ni | P | Pb | S% | Sb | Sc | Sr | Ti% | Tl | U | V | W |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | <0.01 | 1 | 110 | 24 | 0.02 | <2 | <1 | 33 | <0.01 | <10 | <10 | 3 | <10 |

| Zn | Ag | As | B | Ba | Be | Bi | Cd | Co | Cr | Cu | Ga | Hg | Mn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <2 | 0.2 | 6 | <10 | 60 | <0.5 | <2 | <0.5 | <1 | 12 | 12 | <10 | <1 | <5 |

ppm except where shown

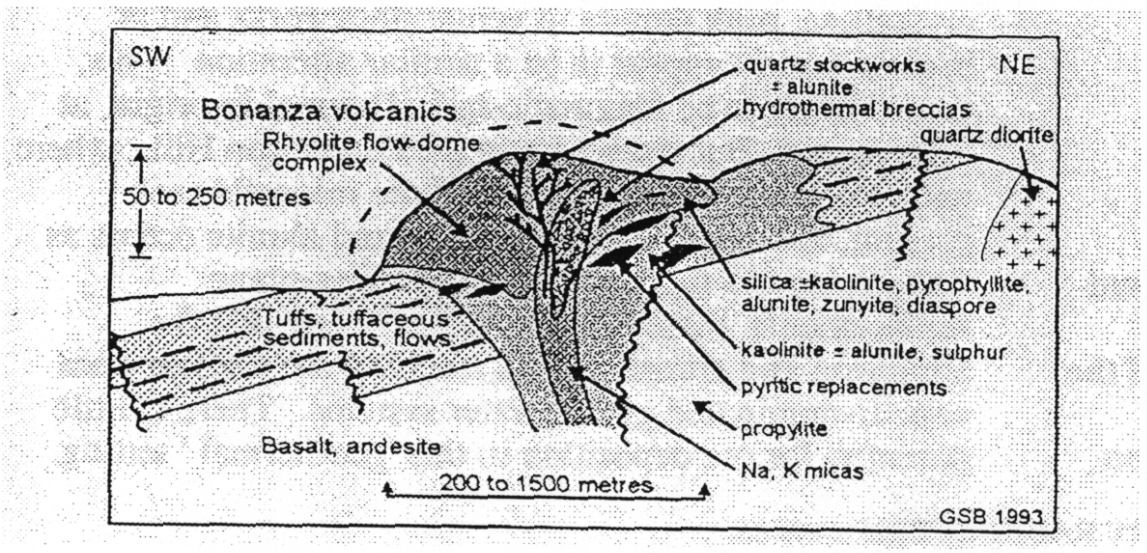
Large areas of clay-altered, and locally intensely acid leached siliceous rocks, are found in the belt of Jurassic Bonanza volcanic rocks to the north of Holberg Inlet. The most intense hydrothermal alteration, including advanced argillic assemblages, is evident in the region from Apple Bay westward to the headwaters of Hushamu Creek, a distance of 15 to 30 kilometres to the west-northwest of Island Copper Deposit. The alteration is most evident in the blanket-like rhyolitic Bonanza map units but also occurs in the immediately underlying, feldspar-phyric, basic to intermediate volcanic rocks and, to a lesser extent, some of the adjoining intrusive bodies of the Island Plutonic Suite. The relationship between regional stratigraphic map units and the hydrothermally altered rocks is discussed in Nixon et al. (1994).

The advanced argillic alteration is characterized by the presence of kaolinite, dickite, alunite and pyrophyllite. Other associated minerals confirmed by X-ray diffraction analysis are abundant quartz, diaspore [AlO(OH)], zunyite [$Al_{13}Si_5(OH,F)_{18}Cl$], various micas, including sericite, muscovite and illite; lesser smectite, paragonite, gypsum, anhydrite, natroalunite, sulphur and rutile; and minor topaz, meta-halloysite, arenian alunite (schlossmacherite) and tridymite (Panteleyev & Koyanagi, 1993).

The clay-rich hydrothermal alteration assemblages all contain some quartz. It is derived from both residual and, less commonly, added silica. Main alteration assemblages are: quartz+kaolinte, quartz+dickite±pyrophyllite and/or kaolinite, all with or without alunite,

diaspore, zunyite and minor mica; and quartz+alunite±kaolinite. The PEM100 Deposit is a blanket-like deposit, which varies between large areas of <4% $Al_2O_3$ to extensive zones of >25% $Al_2O_3$. Zones of greater than 10% $Al_2O_3$ have an important physical property of being relatively soft and non-abrasive.

Strongly altered rocks are bleached and chalky appearing. Relict clay-altered plagioclase at Monteith Bay suggests that the altered zone was derived from tuffaceous basaltic to andesitic protoliths. The more intense alteration in both feldspar-phyric and rhyolitic rocks creates a mottled rock with grey-buff-pink clay patches in grey, fine-grained to microcrystalline siliceous groundmass. The mottled anhedral, but generally equant, clay patches range in size from a few millimetres to a few centimetres in diameter. In thin section, they consist of aggregates of fine-grained clay minerals, mainly kaolinite. In some outcrops, the rocks consist, in large part, of quartz stockworks, veins and patches of pervasive silica replacement. The most intensely leached rocks are made up of almost entirely quartz (>98%) and voids that give rise to a vuggy texture. This vuggy silica with associated volume reduction of the altered hostrock is the characteristic siliceous residuum of intensely acid leached rocks in high sulphidation epithermal systems. These highly porous rocks typically have 10 to 30% voids surrounded by fine, granular, interlocking, crystalline quartz grains. There are 9 other major zones of advanced argillic alteration within the Apple Bay Project. Further diamond drilling and mine planning are scheduled for 2001. The PEM100 Quarry is in the final stages of mine permitting. A Memorandum of Understanding has been signed with the Quatsino First Nation.




Refer to Figure 1 for a diagram of schematic relationships between permeable lithologies, volcanic structures, hydrothermal conduits and mineralization in the Pemberton Hills (after Panteleyev and Koyanagi, 1993).

These tuffaceous rocks are often deposited in a graben, or similar fault-bounded basin, possibly a caldera or series of nested calderas, along the trend of the andesitic volcanic arc. The rhyolite assemblage that overlaps the structurally bounded tuff-inundated basins form several thick flow-dome complexes with flanking welded and coarse pyroclastic deposits that are contained in the Apple Bay Project. Within this structural setting, the most important control on movement of hydrothermal fluids and on alteration is the inherently high permeability of coarse subaerial pyroclastic, volcaniclastic rocks.

Additional permeability has been created by the congruency of high and low-angle faults, late dike emplacements and the extensive systems of fractures and hydrothermally brecciated and leached rocks that acted as effective fluid conduits.

The Poster will illustrate the distribution of $Al_2O_3$ and $SiO_2$ in the PEM100 Quarry, regional extent of altered zones and typical appearance of rock types. For more information, a detail report is posted at www.HomegoldResources.com.

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