

MINNOVA INC.

DATE: January 21, 1991
TO: C. Burge
COPIES TO:
FROM: John Bradford
SUBJECT: Harrison Lake Compilation 0924

A. Overview of Geology**1. Stratigraphy and Correlations**

The Harrison Lake - Fire Lake belt consists of an Upper Paleozoic volcanic arc (Chilliwack Group) and a Jurassic volcanic arc (Harrison Lake Formation) overlain by an Upper Jurassic - Cretaceous volcanic - sedimentary overlap assemblage (Gambier Group and equivalents: Fire Lake Group, Nooksack Group and Kent Formation).

Chilliwack Group is a Devonian to Permian arc containing felsic to mafic volcanics and sediments. It is unconformably overlain by Late Triassic - Jurassic sediments of the Cultus Formation.

On the east shore of Harrison Lake, fault slivers of intermediate to mafic volcanics and phyllite mapped as Slollicum Schist by Monger (1989) have been correlated with Chilliwack Group (Monger, 1970), Upper Triassic Cadwallader Group (Monger, 1989) and Gambier Group (Journeay, 1990). The Gambier Group correlation is based on the lithological similarity of some of the slivers to Cretaceous Peninsula and Brokenback Hill Formations, and a 100 Ma U-Pb date on felsic volcanics.

Lower to Middle Jurassic Harrison Lake Formation (HLF) unconformably overlies Middle Triassic Camp Cove Formation sediments, which are exposed along the west shore of Harrison Lake. A basal conglomerate containing Chilliwack - like clasts suggests a stratigraphic tie between the Paleozoic arc and HLF by Early Jurassic time (Monger, 1989). This suggests the possibility of a facies relationship between part of Cultus Formation and HLF. In the U.S., volcanics correlative with Harrison Lake Formation are exposed in a window along the Nooksack River north of Mount Baker (Wells Creek volcanics). They are unconformably overlain by Nooksack Group sediments, of Jura-Cretaceous age (Brown, 1987).

HLF is unconformably (?) overlain by Upper Jurassic Mysterious Creek (argillite, sandstone) and Billhook Creek (volcaniclastics) Formations on the west side of Harrison Lake. On Mt. Agassiz, Kent Formation (sandstone, argillite, volcaniclastics) overlies Mysterious Creek Formation and is roughly coeval with Billhook Creek Formation (Arthur, 1986).

An important unconformity divides Billhook Creek Formation from overlying Peninsula Formation (sandstone, conglomerate), now correlated with the lower part of the Fire Lake Group in the Fire Lake pendant (Lynch, 1990). Earliest Cretaceous Peninsula Formation basal conglomerates contain granite clasts, indicating exposure of Jurassic Coast Plutonic rocks by latest Jurassic/early Cretaceous time (Arthur, 1986). The occurrence of granite clasts is key to the Peninsula Formation - lower Gambier Group correlation, as similar granite - bearing basal conglomerates occur on Gambier Island, the east shore of Howe Sound, and Mount Seymour (Roddick, 1965).

←
is it
Gambier
older than
CPC

Peninsula Formation is conformably overlain by Brokenback Hill Formation (crystal tuffs, pyroclastics, volcaniclastics) on the west shore of Harrison Lake. Brokenback Hill rocks near Harrison Lake are Lower to mid-Cretaceous (Hauterivian to Albian). Volcanics

correlated with Brokenback Hill Formation in the Fire Lake pendant are undated; the correlation is based solely on lithological similarity. Peninsula Formation is apparently thrust over Brokenback Hill rocks in the Fire Lake pendant (Lynch, 1990).

Correlation of Britannia mine host rocks with Gambier Group (Roddick, 1965), if correct, implies that Britannia age VMS mineralization is to be found in the Fire Lake pendant and in Brokenback Hill Formation rocks on the west side of Harrison Lake. Lynch's (1990) documentation of volcanogenic gypsum beds in the Fire Lake sequence is one of the few hints of VMS - style mineralization in the underexplored Fire Lake - Brokenback Hill belt. In any case, Seneca shows that both Jurassic and presumed Cretaceous sequences are productive VMS environments.

?
question

2. Structure

Recent work (Journeay, 1990) has documented two stages of thrusting affecting rocks on the east side of Harrison Lake and the Fire Lake pendant. Both stages are southwest verging and together span a mid - to Late Cretaceous age. High grade rocks of the Cascade Metamorphic Core east of Harrison Lake were thrust over Gambier Group during accretion of the Insular Belt. The Harrison Lake Fault is apparently coeval, but has a dextral strike slip displacement.

Northeast striking transcurrent faults are believed to be Tertiary in age; these are associated with possibly coeval high angle reverse and normal faults, and northwest striking transcurrent faults. Northeasterly elongation of some of the Tertiary plutons (e.g. Doctor's Point) suggests that their emplacement was structurally controlled.

3. Harrison Lake Formation

Compilation of government and industry mapping in the HLF indicates numerous conflicting interpretations due to a number of factors, such as the difficulty of distinguishing porphyritic flows and intrusives, varying identification of lithologies (e.g., andesite versus dacite), and alteration effects. No formation - wide markers are evident, and the possibility of stratigraphic correlation across the belt seems unlikely. The Sakwi Creek fault (Pearson, 1973) appears to divide different volcanic facies, with more andesitic rocks and more pyroclastics on the east side. It is not clear whether this is due to normal faulting juxtaposing different stratigraphic levels, or to strike slip juxtaposition of different facies.

Possible felsic centres include:

- (1) Seneca - Vent;
- (2) the head of Wells Creek (Bigfoot property) - a large area of pyrite altered rhyolite with associated base metal soil anomalies;
- (3) east of Mount Klaudt (Cloud claims), where rhyolite is locally "crackle brecciated" and has associated scattered soil anomalies;
- (4) Keiko claims, just above the base of the HLF;
- (5) Mt. Woodside (?).

The Seneca, Vent, Wells Creek and Cloud rhyolites are dissected or bounded by faults. There is evidence of synvolcanic timing of faulting in the Seneca-Vent and Cloud areas.

Several northwest trending faults with north trending splays occur within the belt. These are subparallel to the Harrison Lake fault, but may be later (i.e., Tertiary). The major alteration zones north of Weaver Lake appear to be controlled by northwest and north trending faults. Disentangling Tertiary fault - related

alteration and synvolcanic alteration could be difficult in this area. A lithogeochemical comparison with Vent - style alteration (Na, Ca, Mg depletion; Ba, K enrichment) would be useful (e.g., look for a Hg-As Tertiary signature).

4. References

Arthur, A.J. (1986): Stratigraphy along the west side of Harrison Lake, southwestern B.C. G.S.C. Paper 86-1B, pp 715-720.

Brown, E.H. (1987): Structural geology and accretionary history of the northwest Cascades system, Washington and British Columbia. G.S.A. Bulletin, v. 99, pp. 201-214.

Journey, J.M. (1990): A progress report on the structural and tectonic framework of the southern Coast belt, B.C. G.S.C. Paper 90-1E, pp. 183-195.

Journey, J.M. and Csonos, L. (1989): Preliminary report on the structural setting along the southwest flank of the Coast belt, B.C. G.S.C. Paper 89-1E, pp. 177-187.

Lynch, J.V.G. (1990): Geology of the Fire Lake Group, southeast Coast Mountain, B.C. G.S.C. Paper 90-1E, pp. 197-204.

Monger, J. (1970): Hope Map area, B.C. G.S.C. Paper 69-47.

Monger, J. (1989): Geology, Hope map area, British Columbia. G.S.C. Map 1691A.

Pearson, D. (1973): Harrison, Lucky Jim. B.C. Ministry of Energy, Mines and Natural Resources, Geology, Exploration and Mining.

Roddick, J.A. (1965): Vancouver North, Coquitlam and Pitt Lake map areas. G.S.C. Memoir 335.

B. Mineral Occurrences and Previous Exploration

Known showings in the belt are confined to a narrow strip along the lakeshore south of Long Island. The western half of the HLF is for the most part open ground. This probably reflects

relative accessibility and lack of exploration rather than any geological factors, since the Seneca property is along the western edge. Two R.G.S. zinc anomalies on streams draining into Chehalis Lake indicates the potential of the less explored western half of the belt.

Brokenback Hill rocks northwest of Long Island are poor in known showings, other than the Tertiary gold showings at Doctor's Point and Providence. This may reflect accessibility as well, although geological factors may be involved. If these are Britannia equivalent rocks they could have VMS potential.

The belt from Weaver Lake north to the Bigfoot showing is highly prospective, with a number of felsic centres and alteration zones. Few exhalative horizons have been identified in this belt. A possible Tertiary structural overprint could complicate interpretation of anomalies.

1. Bigfoot (Sasquatch, Woolybooger, Little Bigfoot, SF, Duke, BF)

Work Done

1973 - mapping	
- 142 soils	A.R. 5349, 5415
1974 - mapping	
- geochem	
- shootback EM	A.R. 5427
1975 - VLF-EM	
- gravity	A.R. 5738
1976 - percussion drilling (5 holes, 450 m)	A.R. 6102
- mapping, sampling	A.R. 6566
1977 - hor. loop EM	
1982 - prospecting, blasting	A.R. 10562
1983 - 492 soils	
- 41 rocks	
- IP	A.R. 11030
1984 - diamond drilling (13 holes, 933 m)	A.R. 12213
1987 - 453 soils	
- 36 rocks	
- EM, mag	
- mapping	A.R. 16338
1988 - not available	A.R. 18789

- Claims** - BF1-4, Bigfoot. Owner Steven Coombes.
 - 1491-3, Bigfoot 4-5 expired (S end of claim block).

Geology

- large area of rhyolite in headwaters of Wells Creek, variably altered (quartz-sericite-pyrite); possible dome; hosts sparse Cp-Sp stringers; dissected by northwest trending fault along Wells Creek.
- felsic lapilli tuff trends along road south of Simms Creek, hosts main mineralized zone; it is underlain(?) by a mixed tuff-sediment unit with bedded pyrite in argillite and fine Cp (plus possible Sp) on fractures in black argillite.
- the main zone is about 125 m long within a longer strike length (about 600 m) of sporadic mineralization. It consists of Sp (Cp, Gn) veinlets up to 10 cm wide and disseminated Sp in silica-pyrite altered host rocks.
- main showing, road cut chip sample: 5.7% Zn, 1% Cu, 0.6% Pb, 0.72 oz/t Ag, 0.015 oz/t Au/6.1 m.
- GMS type tuffs are also described in the area.

Geochemistry

- 2 main multielement soil anomalies:
 - (1) trending NW parallel to Wells Creek fault across the rhyolite dome into flanking tuffs (and epiclastics), about 1200 m long; values to 1800 ppm Zn, 137 ppm Pb.
 - (2) near the southeast contact of the rhyolite dome between Wells and Cartmell Creek, about 600 m long; values to 871 ppm Zn; open to the southeast.
- a weak Zn anomaly overlies the main mineralized zone south of Simms Creek.
- other minor anomalies may be worthy of follow up.

Geophysics

- IP: major resistivity low/ chargeability high over the altered rhyolite dome and adjacent tuffs to the south.
- mag: isolated highs probably related to andesite (dykes?).
- EM: a clear EM response over NW trending faults (especially Wells Creek fault). No other strong surface conductors on the southern part of the claims.

Diamond Drilling

- Main showing: 4 holes < 35 m, 2 holes of 105 m.
- best intersection: 4.0% Zn, 0.6% Cu/0.59 m. Numerous other low grade stringer mineralization intersections.
- Wells Creek area: two holes south of the dome on the east side of the fault, 33 and 93 m long; testing soil anomaly (1); some epiclastics intersected, no significant mineralization reported.

Comments

- best surface VMS showing in Harrison Lake rocks outside of the Seneca property; incompletely drill tested.
- geological relationship between the showing area and the dome is unclear.
- possibility of syngenetic sulphides in sediments underlying the lapilli tuff unit.
- Cu-Zn anomalies open to the edge of grid north of Cartmell Creek are on trend with anomalies on Hooey (Keiko 8) claim.
- areas north of Simms Creek (stratigraphically overlying the mineralized lapilli tuff unit) and west of the dome are underexplored.
- ground open to W and S of claim block.

2. I Am 50, 51-56, Dorothy 12, 13 (Weaver Lake, Love)

Work Done

1978 - mapping, 176 soils	A.R. 8385
1979 - 529 soils, mapping	
- EM, IP	A.R. 10894
1981 - 128 soils	
1982 - IP	
1984 - air photo interpretation	
- 7 rocks	
- 5 heavy minerals	A.R. 14221
1985 - mapping	A.R. 14334

Geology

- I Am claims: andesite flows are intruded by a pyrite altered felsic dome; flanked/overlain by rhyolite tuff breccia and fine (ash?) tuff.
- area dissected by numerous NW and N trending faults which appear to control intense pyrite-sericite-silica alteration zones; possible late structurally controlled alteration overprint; some Sp in quartz veins in these zones.
- gypsum rich sediment with thin ferruginous chert interbeds reported on both I Am 50 and 51-6.
- sediments include mudstone with volcanic and siliceous exhalite clasts (Payne, petrographic report).
- Dorothy 12,13: dacite tuffs intruded by rhyolite porphyry, overlain by sediments, then amygdaloidal andesite.

Geochemistry

- several CFC recce litho anomalies (Zn, Cu, Ba) along road near

alteration zones.

- anomalous Zn (1716 ppm) and Pb (159 ppm) in one heavy in stream draining into Weaver Lake, with anomalous Zn in a nearby litho.
- soil maps unavailable; high mean Pb (40 ppm) and Cu (40 ppm); soil anomalies related to contact of felsic intrusive north of Weaver Lake (Chevron mapping).
- anomalous Cu (186 ppm) and Zn (350 ppm) in creek south of Mount Keenan.
- Dorothy 12, 13: 250x350 metre Zn anomaly near SE end of Weaver grid.

Geophysics

- IP: summary notes anomalies on Weaver grid; one similar to anomaly over Seneca.

Comments

- area of widespread alteration; some may be synvolcanic, some later. Weaver Lake is at the centre of a highly faulted area. Tertiary gold potential?
- not able to locate gypsum/chert beds; would be important in evaluating VMS potential.
- definitely poorly explored; ripe for a systematic mapping/soil survey.

3. Brett Creek (Cloud)

Work Done

1977 - IP, gravity	A.R. 6344
1980 - mapping	
- 182 soils	A.R. 9483
1981 - mapping	
- 104 soils	
- 53 rocks	A.R. 10022
1985 - 175 soils	
- 25 rocks	A.R. 13818
1986 - 51 soils, rocks	A.R. 15889
1987 - 660 soils	
- 123 rocks	A.R. 17350

Claims - Cloud 1-3, 7. Owner Gordon C. Richards.

Geology

- Jurassic quartz monzonite stock along W claim boundary.
- most of property underlain by south dipping sequence of andesite flows and tuffs with one rhyodacite flow/argillite unit. -

intercalated argillite on Cloud 3 and low down in Brett Creek and Cartmell Creek.

- "chlorite mottled" andesite on Cloud 3 above argillite (probably similar to Seneca "hangingwall marker").
- rhyodacite flow/dome along the S edge of property adjoining I Am claims; "crackle breccia" mapped along one flank and within part of dome.
- major N trending fault along Brett Creek; possible remobilized synvolcanic fault.
- two main mineralized zones spatially related to the fault: (1) stringers with Sp, Cp, Gn, Ba in crackle brecciated rhyolite dome; (2) Sp stringers in rhyodacite flow in Brett Creek, overlying rhyodacite breccia with quartz-pyrite altered matrix.

Geochemistry

- Cloud 3: recce soils along road with anomalous Pb (up to 81 ppm), Zn (up to 2200 ppm) near contact of feldspar porphyritic andesite and "tuffaceous argillite".
- somewhat scattered anomalies (Zn, locally with Pb) in two areas on grid: (1) over and east of faulted/mineralized area in Brett Creek, with several >1000 ppm Zn; 3 lithos in the area of the creek showing with >10000 ppm Zn; (2) east side of Brett Creek fault around mineralized rhyolite dome.
- recce soil in Cartmell Creek area (felsic flows, argillite) with 2840 ppm Zn; several anomalous lithos along the creek.
- anomalous copper appears to be related to the Jurassic Mount Klautt stock.

Comments

- good soil anomalies at roughly same horizon as mineralization in Brett Creek; deserves drill testing.
- soil grid should be extended to Cartmell Creek and beyond.

4. Hooey

Work Done

1982 - mapping	
- 16 rocks	
- 4 silts	A.R. 10661
1983 - 201 soils	A.R. 11683

Claims - now Keiko 8, part of Keiko group. Owner William A. Howell.

Geology

- E trending argillite unit along Cartmell Creek, within andesitic tuffs, minor flows.

- argillite dips north; probable antiformal hinge between Cartmell Creek and south dipping sequence on Cloud claims.
- extension of Wells Creek fault passes just W of junction of Brett and Cartmell Creeks.
- shear and vein hosted Sp, Py, Cp in three places in andesites on both sides of Wells Creek fault.

Geochemistry

- NW trending Zn (Pb, Cu) anomaly about 800 m long, parallel to Wells Creek fault and anomalies to NW on Little Bigfoot, values to 1140 ppm Zn. Open at claim boundary.

Comments

- both Hooey and Bigfoot have soil anomalies sub-parallel to Wells Creek fault; possible that some remobilization has occurred as a result of late faulting, or fault is remobilized synvolcanic fault that exerted control on early fluids.

5. Keiko

Work Done

- 1970 - geochemistry(?)
- 1975 - percussion drilling (7 holes, 231 m)
- 1985 - mapping
 - 827 soils
 - 160 rocks
 A.R. 15094
- 1986 - mapping
 - 498 soils
 - 67 rocks
 A.R. 15579

Claims - Keiko 1-8. Owner William A. Howell.

Geology

- Camp Cove Formation greywacke, argillite and chert overlain by: interbedded tuff and sediments, massive rhyolite flow/dome, rhyolite tuffs and argillite, and andesite flows and tuff.
- N trending fault through Francis Lake.
- Westerman suggests that the rhyolite tuffs and argillite are equivalent to "Seneca horizon"; this would imply that the Trough sediments are Camp Cove Formation.
- two areas of pyrite-quartz-sericite (clay) alteration: (1) N and S of Francis Lake, possibly associated with Francis Lake fault; (2) in Camp Cove Fmn., along W trending fault, with Sp, anomalous Cu, As.
- red and green cherts in Camp Cove Fmn thought to be distal exhalites.

Geochemistry

- NW trending Au-Ag (Hg, Pb, Zn) anomaly 400 m long SW of Francis Lake; follow-up uncovered narrow E trending quartz - calcite veins with anomalous Au and Ag; possible Tertiary overprint?
- scattered Zn (Ba, locally other elements) anomalies in Camp Cove Fmn.

6. Valley View (Gold Top, Mount Woodside)

- Mt. Woodside

Work Done

- | | |
|----------------|------------|
| 1984 - mapping | |
| - rocks | |
| - mag | A.R. 12222 |
| 1985 - mag | A.R. 13479 |
| 1986 - mapping | |
| - EM, mag | |
| - 100 rocks | |
| - 495 soils | A.R. 17318 |

Claims - Vally View 1,2, Goldtop 1-3. Owner Walter Schoenbaechler.

Geology

- mainly andesitic sequence in area of showings; felsics mapped along upper road by Pirie.
- two showings: (1) Valley View: NE trending propylitic alteration zone with Py, minor Cp, Sp, Gn; (2) Stacey Creek: silica-sericite alteration/breccia zone with Ba veins with Py, Cp, Gn, Sp.

Geochemistry

- E trending Zn anomaly about 350 m long

7. Ascot (Treblif, Jes, Gloria, J)

- Mt. Woodside, south side

Work Done

- 1966 - trenching
- 1979 - 60 soils

Geology

- mainly porphyritic andesite, andesite flow breccia.
- silicified, pyritized shear 15 cm wide in andesite with Cp, Sp; next to pyritic cherty tuff.

Geochemistry

- no significant anomalies; Zn ranges 74-308 ppm, Cu 10-247 ppm.

8. Top (Rain)

- W of Mt. Downing

Work Done

- 1981 - 419 soils
 - 38 silts
 - 111 rocks

A.R. 10771

Claims - now Mount Downing Gold 1,2. Owner West Point Ventures.

Results

- no significant anomalies or mineralization reported.

9. Ku

- NW. of Mt. McRae

Work Done

- 1976 - IP
 - EM
 - soils

A.R. 5755

- 1977 - diamond drilling (4 holes, 793 m)

A.R. 6499

Claims - now Mysty group? Owner William A Howell.

Geology

- intermediate volcanics in uppermost Harrison Lake Fmn, below Fire Lake Group sediments.
- Sp, Gn, Cp reported.
- no intersections reported.

10. Jogo

- NW of Harrison Hot Springs.

Work Done

1985 - mag	A.R. 14173
1986 - EM	A.R. 15689
1987 - 25 rocks	A.R. 17221

Claims - now LD 1, 2. Owner Leszek Demzuk.

Geology

- mainly andesite, locally fractured, with hematite.

11. Arany (Rye, Emile, Mad, Aaron?)

Work Done

1969 - blasting, percussion drilling.	
1974 - diamond drilling (4 holes, 223 metres)	
1975 - percussion drilling (9 holes, 129 metres)	A.R. 5421
1976 -	A.R. 5735
1977 - mag	A.R. 6181

Geology

- andesite with quartz - calcite veins with Py, minor Sp; Ag mineral reported.

12. Condor

- N edge of 92H/5.

Work Done

1983 - EM	
- mag	A.R. 12782
1984 - mapping	
- EM	
- 12 rocks	
- 3 heavy minerals	A.R. 14395

Claims - expired.

Geochemistry

- anomolous Au reported in stream sediments.

Geophysics

- no significant conductors found.

C. Stream Sediment Geochemistry (R.G.S. Data)

1. Draining Known Showings

- Vent/S2 CreeK: 195 ppm Zn, 75 ppm Cu, <10 ppm Pb; source is probably mineralized heterolithic pyroclastics in S2 Creek. Two samples not anomalous above S2 Creek.
- Cartmell Creek: 275 ppm Zn, 10 ppm Pb; drainage includes Brett Creek and Wells Creek.
- Mt. Woodside, south slope: 200 ppm Zn.
- Quet showing (Fire Lake pendant): 4 samples with >300 ppm Zn (up to 420 ppm) in Simpson and North Sloquet Creek areas, anomalous Cu and Pb as well.

2. Other Drainages

- Bremner Creek area (Brokenback Hill Fmn): 3 samples > 160 ppm Zn; anomalous Pb in 2.
- Upper Chehalis River - Eagle Creek: 2 samples with anomalous Zn and Cu, 1 with Pb; showing in area (Hi or Shrew).
- east side of Chehalis Lake: 2 samples with anomalous Zn, 1 of 350 ppm, with Cu.
- Weaver Creek below Weaver Lake: 1 sample, 550 ppm Zn, 34 ppm Pb.
- no anomalous samples in Fire Lake equivalent rocks south of Doctor's Point, in HLF north of Cartmell Creek, or in Sakwi Creek.

Jan 14/90

Mineral Occurrences of the Harrison Lake Formation

January 14, 1991

1. Bigfoot (Sasquatch, Woollybooger, Little Bigfoot, SF, Duke, BF)

Work Done

1973 - mapping	
- 142 soils	A.R. 5349, 5415
1974 - mapping	
- geochem	
- shootback EM	A.R. 5427
1975 - VLF-EM	
- gravity	A.R. 5738
1976 - percussion drilling (5 holes, 450 m)	A.R. 6102
- mapping, sampling	A.R. 6566
1977 - hor. loop EM	
1982 - prospecting, blasting	A.R. 10562
1983 - 492 soils	
- 41 rocks	
- IP	A.R. 11030
1984 - diamond drilling (13 holes, 933 m)	A.R. 12213
1987 - 453 soils	
- 36 rocks	
- EM, mag	
- mapping	A.R. 16338
1988 - not available	A.R. 18789

Claims - BF1-4, Bigfoot. Owner Steven Coombes.
- 1491-3, Bigfoot 4-5 expired (S end of claim block).

Geology

- large area of rhyolite in headwaters of Wells Creek, variably altered (quartz-sericite-pyrite); possible dome; hosts sparse Cp-Sp stringers; dissected by northwest trending fault along Wells Creek.
- felsic lapilli tuff trends along road south of Simms Creek, hosts main mineralized zone; it is underlain(?) by a mixed tuff-sediment unit with bedded pyrite in argillite and fine Cp (plus possible Sp) on fractures in black argillite.
- the main zone is about 125 m long within a longer strike length (about 600 m) of sporadic mineralization. It consists of Sp (Cp, Gn) veinlets up to 10 cm wide and disseminated Sp in silica-pyrite altered host rocks.
- main showing, road cut chip sample: 5.7% Zn, 1% Cu, 0.6% Pb, 0.72 oz/t Ag, 0.015 oz/t Au/6.1 m.
- GMS type tuffs are also described in the area.

Geochemistry

- 3 main multielement soil anomalies:
 - (1) trending NW parallel to Wells Creek fault across the rhyolite dome into flanking tuffs (and epiclastics), about 1200 m long; values to 1800 ppm Zn, 137 ppm Pb.
 - (2) trending WNW south of Simms Creek over the main mineralized zone, up to 800 m long; values to 540 ppm Zn, 96 ppm Pb.
 - (3) near the south contact of the rhyolite dome between Wells and Cartmell Creek, about 600 m long; values to 871 ppm Zn.
- other minor anomalies may be worthy of follow up.

Geophysics

- IP: major resistivity low/ chargeability high over the altered rhyolite dome and adjacent tuffs to the south.
- mag: isolated highs probably related to andesite (dykes?).
- EM: a clear EM response over NW trending faults (especially Wells Creek fault). No other strong surface conductors on the southern part of the claims.

Diamond Drilling

- Main showing: 4 holes < 35 m, 2 holes of 105 m.
- best intersection: 4.0% Zn, 0.6% Cu/0.59 m. Numerous other low grade stringer mineralization intersections.
- Wells Creek area: two holes south of the dome on the east side of the fault, 33 and 93 m long; testing soil anomaly (1); some epiclastics intersected, no significant mineralization reported.

Comments

- best surface VMS showing in Harrison Lake rocks outside of the Seneca property; incompletely drill tested.
- geological relationship between the showing area and the dome is unclear.
- possibility of syngenetic sulphides in sediments underlying the lapilli tuff unit.
- areas north of Simms Creek (stratigraphically overlying the mineralized lapilli tuff unit) and west of the dome are underexplored.
- ground open to W and S of claim block.

2. I Am 50, 51-56 (Weaver Lake, Love)

Work Done

1978 - mapping	A.R. 8385
1979 - soil sampling?	
- EM, IP	A.R. 10894
1984 - air photo interpretation	

- 7 rocks
 - 5 heavy minerals
 1985 - mapping

A.R. 14221
 A.R. 14334

Geology

- andesite flows are intruded by a pyrite altered felsic dome; flanked/overlain by rhyolite tuff breccia and fine tuff.
 - area dissected by numerous NW and N trending faults which appear to control intense pyrite-sericite-silica alteration zones; possible late structurally controlled alteration overprint; some Sp in quartz veins in these zones.
 - gypsum rich sediment with thin ferruginous chert interbeds reported on both I Am 50 and 51-6.

Geochemistry

- anomalous Zn (1716 ppm) and Pb (159 ppm) in one heavy in stream draining into Weaver Lake, with anomalous Zn in a nearby litho.
 - soil data unknown; possibly reference is to Seneca or Trough area.

Geophysics

- IP: summary notes good anomalies on Weaver grid; not surprising considering the amount of pyritic alteration.

Comments

- area of widespread alteration; some may be synvolcanic, some later. Weaver Lake is at the centre of a highly faulted area. Shouldn't overlook Tertiary gold potential.
 - not able to locate gypsum/chert beds; would be important in evaluating VMS potential.
 - definitely poorly explored; ripe for a systematic mapping/soil survey.

3. Brett Creek (Cloud)

Work Done

1977 - IP, gravity	A.R. 6344
1980 - mapping	
- 182 soils	A.R. 9483
1981 - mapping	
- 104 soils	
- 53 rocks	A.R. 10022
1985 - 175 soils	
- 25 rocks	A.R. 13818
1986 - 51 soils, rocks	A.R. 15889

1987 - 660 soils
 - 123 rocks

A.R. 17350

Claims - Cloud 1-3, 7. Owner Gordon C. Richards.

Geology

- Jurassic quartz monzonite stock along W claim boundary.
- most of property underlain by south dipping sequence of andesite flows and tuffs with one rhyodacite flow/argillite unit.
- intercalated argillite on Cloud 3 and low down in Brett Creek and Cartmell Creek.
- "chlorite mottled" andesite on Cloud 3 above argillite (probably similar to Seneca "hangingwall marker").
- rhyodacite flow/dome along the S edge of property adjoining I Am claims; "crackle breccia" mapped along one flank and within part of dome.
- major N trending fault along Brett Creek; possible remobilized synvolcanic fault.
- two main mineralized zones spatially related to the fault: (1) stringers with Sp, Cp, Gn, Ba in crackle brecciated rhyolite dome; (2) Sp stringers in rhyodacite flow in Brett Creek, overlying rhyodacite breccia with quartz-pyrite altered matrix.

Geochemistry

- Cloud 3: recce soils along road with anomalous Pb (up to 81 ppm), Zn (up to 2200 ppm) near contact of feldspar porphyritic andesite and "tuffaceous argillite".
- somewhat scattered anomalies (Zn, locally with Pb) in two areas on grid: (1) over and east of faulted/mineralized area in Brett Creek, with several >1000 ppm Zn; 3 lithos in the area of the creek showing with >10000 ppm Zn; (2) east side of Brett Creek fault north of mineralized rhyolite dome.
- recce soil in Cartmell Creek area (felsic flows, argillite) with 2840 ppm Zn; several anomalous lithos along the creek.

Comments

- good soil anomalies at roughly same horizon as mineralization in Brett Creek; deserves drill testing.
- soil grid should be extended to Cartmell Creek and beyond.

4. Hooey

Work Done

1982 - mapping
 - 16 rocks
 - 4 silts

A.R. 10661

1983 - 201 soils

A.R. 11683

Claims - now Keiko 8, part of Keiko group. Owner William A. Howell.

Geology

- E trending argillite unit along Cartmell Creek, within andesitic tuffs, minor flows.
- argillite dips north; probable antiformal hinge between Cartmell Creek and south dipping sequence on Cloud claims.
- extension of Wells Creek fault passes just W of junction of Brett and Cartmell Creeks.
- shear and vein hosted Sp, Py, Cp in three places in andesites on both sides of Wells Creek fault.

Geochemistry

- NW trending Zn (Pb, Cu) anomaly about 800 m long, parallel to Wells Creek fault and anomalies to NW on Little Bigfoot, values to 1140 ppm Zn. Open at claim boundary.

Comments

- both Hooey and Bigfoot have soil anomalies parallel to Wells Creek fault; possible that some remobilization has occurred as a result of late faulting, or fault is remobilized synvolcanic fault that exerted control on early fluids.

5. Keiko

Work Done

- 1970 - geochemistry(?)
- 1975 - percussion drilling (7 holes, 231 m)
- 1985 - mapping
 - 827 soils
 - 160 rocks
- 1986 - mapping
 - 498 soils
 - 67 rocks

Claims - Keiko 1-8. Owner William A. Howell.

Geology

- Camp Cove Formation greywacke, argillite and chert overlain by: interbedded tuff and sediments, massive rhyolite flow/dome, rhyolite tuffs and argillite, and andesite flows and tuff.
- N trending fault through Francis Lake.
- Westerman suggests that the rhyolite tuffs and argillite are equivalent to "Seneca horizon"; this would imply that the Trough

Westerman

Property visit
May 21

Jasper horizon
+ py bedded?
+ maf.

Altn zone above
but looks late

A.R. 15094

A.R. 15579

Flow banded rhy
flows above with
int silica - much
open space
- conglomerate with
5" thick clasts.

sediments are Camp Cove Formation.

- two areas of pyrite-quartz-sericite (clay) alteration: (1) N and S of Francis Lake, possibly associated with Francis Lake fault; (2) in Camp Cove Fmn., along W trending fault, with Sp, anomalous Cu, As.

- red and green cherts in Camp Cove Fmn thought to be distal exhalites.

Geochemistry

- NW trending Au-Ag (Hg, Pb, Zn) anomaly 400 m long SW of Francis Lake; follow-up uncovered narrow E trending quartz - calcite veins with anomalous Au and Ag; possible Tertiary overprint?

- scattered Zn (Ba, locally other elements) anomalies in Camp Cove Fmn.

6. Valley View (Gold Top, Mount Woodside)

- Mt. Woodside

Work Done

1984 - mapping

- rocks

- mag

A.R. 12222

1985 - mag

A.R. 13479

1986 - mapping

- EM, mag

- 100 rocks

- 495 soils

A.R. 17318

Claims - Vally View 1,2, Goldtop 1-3. Owner Walter Schoenbaechler.

Geology

- mainly andesitic sequence.

- two showings: (1) Valley View: NE trending propylitic alteration zone with Py, minor Cp, Sp, Gn; (2) Stacey Creek: silica-sericite alteration/breccia zone with Ba veins with Py, Cp, Gn, Sp.

Geochemistry

- E trending Zn anomaly about 350 m long

7. Treblif (Ascot, Jes, Gloria, J)

- Mt. Woodside, south side

Work Done

? - trenching
1979 - 60 soils

Geology

- mainly porphyritic andesite, andesite flow breccia.
- silicified, pyritized shear 15 cm wide in andesite with Cp, Sp;
next to pyritic cherty tuff.

Geochemistry

- no significant anomalies; Zn ranges 74-308 ppm, Cu 10-247 ppm.

8. Rain (Top)

- W of Mt. Downing

Work Done

1981 - 419 soils
- 38 silts
- 111 rocks

Claims - now Mount Downing Gold 1,2. Owner West Point Ventures.

Results

- no significant anomalies or mineralization reported.

9. Ku

- NW. of Mt. McRae

Work Done

1976 - IP
- EM
- soils A.R. 5755
1977 - diamond drilling (4 holes, 793 m) A.R. 6499

Claims - now Mysty group? Owner William A Howell.

Geology

- intermediate volcanics in uppermost Harrison Lake Fmn, below Fire
Lake Group sediments.
- Sp, Gn, Cp reported.
- no intersections reported.

10. Jogo

- NW of Harrison Hot Springs.

Work Done

1985 - mag	A.R. 14173
1986 - EM	A.R. 15689
1987 - 25 rocks	A.R. 17221

Claims - now LD 1, 2. Owner Leszek Demzuk.

Geology

- mainly andesite, locally fractured, with hematite.

11. Arany (Rye, Emile, Mad, Aaron?)**Work Done**

? - underground	
1975 -	A.R. 5421
1976 -	A.R. 5735
1977 - mag	A.R. 6181

Geology

- fault breccia in dacite pyroclastics with minor Sp, Ag mineral reported.

12. Condor

- N edge of 92H/5.

Work Done

1983 - EM	
- mag	A.R. 12782
1984 - mapping	
- EM	
- 12 rocks	
- 3 heavy minerals	A.R. 14395

Claims - expired.

Geochemistry

- anomolous Au reported in stream sediments.

Geophysics

- no significant conductors found.