



WEST-CENTRAL AND NORTHWEST BRITISH COLUMBIA

By T. G. Schroeter

CAPTAIN SWANNELL (93E/11W)

The Captain Swannell lead-zinc-silver prospect, owned by Clifford McNeill, is situated approximately 130 kilometres south of Smithers on the northeast slope of Swing Peak. During 1978, McNeill constructed a 7.5-kilometre caterpillar road from a landing on Tahtsa Reach to the property and constructed a camp at an elevation of 1 300 metres in the creek valley below the showings.

At an elevation of 1 500 metres, galena, sphalerite, pyrite, and smaller amounts of chalcopyrite, arsenopyrite, and tetrahedrite occur within a 3-metre-wide, 90-metre-long shear zone replacement in Kasalka Group (?) intermediate to acid porphyritic volcanic rocks. The shear zone strikes 150 degrees and dips steeply to the southwest cutting the bedding planes of the country rock which have a trend of 140/75 degrees northeast. In 1929 a tunnel about 120 metres in length was driven at an elevation of 1 470 metres to test the showing.

Above the tunnel, near the top of the mountain, a 1.5-metre quartz vein with galena, sphalerite, and abundant manganese occurs within Kaketsa Group (?) grey rhyolite.

NEW MOON (93E/13W)

The New Moon massive sulphide prospect is located 80 kilometres southwest of Smithers and west of Morice Lake. In 1968 Phelps Dodge Corporation of Canada, Limited first explored the ground and during 1971-72 Agressive Mining Ltd. conducted an electromagnetic survey and completed five diamond-drill holes to test a 150-metre-long, 25-metre-wide shear zone which carried galena, sphalerite, and pyrite in a quartz gangue.

Over the past two years Charles Kowall found occurrences of sulphides in trenches and glacial moraines over a length of 3 kilometres.

A thick sequence (>900 metres) of Hazelton Group (Telkwa Formation) rocks, consisting of green and red andesitic to rhyolitic flows, breccias, and volcanic wackes and interfingering bands of limestone and limy chert, has been intruded by feldspar porphyry dykes and a quartz porphyry pluton to the east. The general attitude of the layered rocks is 120/10 degrees northeast. The volcanic rocks have undergone extensive chloritization and epidotization and the limestone has locally been converted to skarn. Mineralization occurs in shear zones and as distinct bands and consists of chalcopyrite, bornite, sphalerite, galena, pyrite, and specular hematite.

Four main areas of mineralization have been observed:

(1) Plateau Zone

Galena, sphalerite, and pyrite occur in quartz stringers in a northeasterly trending (030/60 degrees east) zone trenched over a 25-metre width and a length of 150 metres in quartz porphyry close to a contact with tuffaceous rhyolite. The results of a five-drill-hole program are not known.

(2) Cliff Breccia Zone

Chalcopyrite, pyrite, and galena occur in a silicified and brecciated andesite in an east/west fault zone immediately south of the Plateau Zone and is exposed over a vertical interval of 610 metres.

(3) Valley Camp Occurrence

Brecciated dark green andesite float with a chalcopyrite 'cement' occurs on the valley floor of the upper part of locally named Dogleg Creek.

(4) Glacial Moraine Occurrence

Scattered and distinct linear zones of massive sulphide float occur on lateral and terminal moraines at the east end of the property. Numerous boulders up to 1.5 metres in diameter with varying amounts of banded chalcopyrite-pyrite-sphalerite-galena-bornite-hematite-magnetite occur in andesite and limy chert. Local lenses of limestone crop out near the base of the succession. The origin of the mineralization is assumed to be either on the ice-covered cliffs to the south or in bedrock underlying the overburden-covered valley floor.

During 1978 Great Plains Development Company of Canada, Ltd. conducted geological, geochemical, and geophysical (ground electromagnetic) surveys on the property.

BOB CREEK (93L/7W)

The Bob Creek prospect is located approximately 12 kilometres south of Houston. During the winter and spring of 1978 DuPont of Canada Exploraton Limited, under an option agreement with Mid Mountain Mining Limited, conducted geophysical, geochemical, and geological surveys and completed six diamond-drill holes, totalling approximately 425 metres, on this massive sulphide prospect.

Gold, zinc, silver, and copper values have been obtained from acid volcanic rocks associated with widespread pyritization. Mineralized acid volcanic tuffs and breccias crop out in a 610-metre-long gossan in a gorge in Bob Creek and in trenches to the west of Bob Creek. Intermediate volcanic rocks of andesitic composition crop out on the west side of the property.

A small gabbroic stock has intruded the andesitic rocks near the southern boundary of the claim group. The rhyolitic rocks are overlain to the east and north by post-mineral Tertiary andesites and basalts.

The principal metallic minerals in order of abundance are pyrite, sphalerite, chalcopyrite, galena, silver in unknown form, and gold, both as free gold and in a sulphide matrix. The sulphides occur as tiny fracture fillings, in small lenses, and as coarse disseminations within the rhyolite and rhyolite breccias.

Pyrite is ubiquitous within the acid volcanic rocks and occurs as disseminations, with quartz in small veins, as coatings on fracture surfaces, and in fillings in breccias. Sphalerite in amounts of up to 3 per cent occasionally fills the voids in the breccia and occurs in quartz-pyrite veinlets.

Kaolinization and sericitization are extensive in the rhyolites and breccias.

TELKWA COAL (93L/11E)

Bulkley Valley Collieries Limited's Telkwa coal mine is located approximately 10 kilometres south of Telkwa, straddling Goathorn Creek. Under an option agreement with Lloyd Gething, Cyprus Anvil Mining Corporation diamond drilled six holes, three of which were stopped in overburden at depths of more than 150 metres. The other three holes encountered Skeena Group sedimentary rocks, with or without coal seams, overlying Hazelton Group maroon volcanic rocks. In general, the area appears to be very complexly block faulted over short distances making reconstruction and correlation of rock units very difficult.

On the east side of Goathorn Creek, above the No. 1 and No. 3 mines, there may be some potential for open-pit mining methods.

During 1978, Lloyd Gething and a partner mined a 4.2-metre coal seam (Betty seam, No. 4 mine extension) by a horizontal tunnel. The advance was approximately 60 metres and with the use of an old shaker 30 tonnes of coal per hour was produced. This thermal coal has an average Btu content of 13 000, an ash content of 7 per cent, and a sulphur content of 0.6 per cent.

CRATER (93L/11E)

The Crater A1 to H8 claims, owned and operated by Mecca Minerals Limited, are located approximately 30 kilometres south of Smithers on the north end of the ridge between Webster and Loring Creeks in the Telkwa Range.

A thick sequence (greater than 300 metres) of Hazelton Group (Telkwa Formation) volcanic rocks has been broken by faults and intruded by granodiorite and felsic dykes. The axis of a north/south-trending anticline, plunging to the north, runs through the middle of Crater Lake. The volcanic rocks consist of alternating beds of red and/or green agglomeratic fragmental rocks, brick red tuffs, and massive green andesitic flows, with minor purple andesitic tuffs and clastic sedimentary rocks.

Malachite, bornite, chalcopyrite, chalcocite, tetrahedrite, specular hematite, and magnetite occur in epidote-quartz-calcite-bearing shear zones in predominantly green fragmental andesitic volcanic rocks. Where mineralized, the andesitic rocks have been altered to a fine-matted mixture of sericite (25 per cent), chlorite (25 per cent), carbonate (20 per cent), kaolin (15 per cent), epidote (8 per cent), leucoxene (3 per cent), hematite (2 per cent), magnetite (1 to 2 per cent), chalcopyrite and/or pyrite (less than 1 per cent). Massive green andesitic flows up to 15 metres thick contain up to 5 per cent fine-grained disseminated magnetite.

During 1978 Mecca Minerals conducted a small diamond-drill program to test for disseminated-type sulphide mineralization within individual flow rocks.

MAX (93M/3E)

The Max claim, owned and operated by Rebel Developments Limited, is located approximately 25 kilometres east of Hazelton. In December 1977, bulldozer trenching exposed the Main showing and the Creek showing. During January 1978, a 2 000-metre winter access road was constructed from Harold Price Creek to the base camp at an elevation of 800 metres and six diamond-drill holes, totalling 303.5 metres, were completed. All six holes intersected diorite. Small veinlets (up to 6 centimetres in width), containing sphalerite, galena, pyrite with minor pyrrhotite and boulangerite in a quartz-carbonate gangue were observed in minor quantities. The fresh diorite is quartz-poor and contains abundant magnetite. Plagioclase has been moderately altered to sericite and hornblende is altered to biotite. Adjacent to mineralized veins, the diorite contains more quartz and the plagioclase has been completely sericitized. Biotite hornfels is well developed adjacent to the diorite which is intrusive into volcanic rocks.

Mineralization in both showings consists of massive sphalerite, galena, pyrite, and boulangerite in a quartz-carbonate gangue. A sample taken over a 12-centimetre width on the Creek showing assayed 2 ppm gold, 4 140 ppm silver, 0.60 per cent copper, 1.9 per cent lead, and 4.37 per cent zinc.

During the summer of 1978, geological and geochemical surveys were performed and at least one packsack drill hole was put down on the Creek showing.

VICTORIA MINE (93M/4W)

The Victoria mine is located approximately 10 kilometres south of Hazelton in the Rocher Deboule Range. This former gold-cobalt-nickel-uranium-molybdenum producer closed in 1950. Four veins exist on the property with three of them paralleling each other within a granodiorite (Rocher Deboule stock) while the fourth occurs in the contact zone between granodiorite and hornfelsed sedimentary rocks to the south.

Mineralization consists of cobalt-nickel sulpharsenides (mainly arsenopyrite), molybdenite, and uraninite in a predominantly hornblende gangue which has filled replacement zones within the granodiorite.

During 1978, J. Hutter, Jr. (lessee) completed construction of an access road to the camp at elevation 1 265 metres and re-opened and retimbered the No. 2 adit (elevation 1 580 metres) and No. 00 adit (elevation 1 760 metres). Mr. Hutter plans to reconstruct part of the 60-year-old aerial tramline to transport ore down the mountain.

The writer sampled four locations within the No. 00 adit. Mineralization consisted of massive arsenopyrite with erythrite (cobalt bloom) within hornblende in a granodiorite host. The No. 00 tunnel is approximately 80 metres in length.

SHAS (94E/2W, 3E)

The Shas gold-silver prospect is located approximately 320 kilometres north of Smithers in the Toodoggone River area, north and east of the Black Lake airstrip.

During 1978 Asarco, under an option agreement with International Shasta Resources Limited, conducted geological and geophysical surveys over the property.

The property is underlain by Toodoggone volcanic rocks, here consisting of porphyritic flows, pyroclastic rocks, and minor sedimentary rocks.

Significant quartz veining trending southeasterly in a zone over 30 metres wide on surface and associated quartz stockworks occur within an altered crystal and lapilli tuff unit in the volcanic sequence. On weathered surface the tuffs are light brown-orange in colour with resistant quartz crystals and lapilli-sized fragments. Typically the rocks are composed of crystals, up to 3 millimetres in diameter, of bright orange feldspar (50 to 60 per cent, with abundant fine-grained hematite) and round quartz grains (20 per cent) in a fine-grained greyish to brownish feldspar-rich matrix. Pyrite occurs as a fine dusting throughout the altered tuff unit and is also present in most of the quartz veins and stockworks. An unidentified silver-grey mineral (argentite?) occurs within the quartz stockwork zone and gold-silver assay values are associated with quartz-rich rocks having a grey hue due to a fine-grained sulphide mixture.

This showing is similar to the Lawyers gold-silver prospect located approximately 15 kilometres to the north, although no quartz amethyst veins were seen.

HECATE GOLD (103G/8)

The Hecate Gold prospect is located 113 kilometres south of Prince Rupert, approximately 3 kilometres inland from Survey Bay on the west coast of Banks Island.

Numerous gold-bearing zones have been recognized on the property held under option by Hecate Gold Corporation from Falconbridge Nickel Mines Limited. The zone of interest during 1977-78 was the Bob

zone, on which underground drifting and sampling were conducted. A 15-per-cent decline was advanced approximately 434 metres.

Mineralization consists of pyrite, arsenopyrite, chalcopyrite, sphalerite, and galena occurring in a predominantly quartz plus minor calcite gangue, within a shear zone in a foliated granodiorite. The sulphides are for the most part coarse grained and locally are banded. Minor amounts of graphite were noted.

The attitude of the main shear (vein) structure is 090/85 degrees north. Several associated quartz veins have similar strikes with shallower dips (for example, 60 degrees north).

The narrow quartz±pyrite veins exhibit wallrock bleaching (sericite), especially within the first 30.5 metres from the portal.

Clay and chlorite gouge is common in zones wider than 15 centimetres.

The host granodiorite is massive to strongly foliated. A typical mode is: feldspar, 60 per cent; quartz, 20 to 25 per cent; green amphibole, 10 to 20 per cent; brown biotite (after amphibole), 5 per cent; accessories, 1 to 2 per cent. Plagioclase is only weakly to moderately sericitized. Mafic minerals have been weakly chloritized and partially replaced by opaque minerals.

Bands and pods of marble occur within the granodiorite, and at their contact, a red-brown diopside-garnet skarn zone is developed. The skarn is composed mainly of granular garnet with intergrown diopside and minor fillings of quartz and calcite. A typical mode is: garnet, 70 per cent; diopside, 20 per cent; biotite, 2 per cent; calcite, 5 per cent; quartz, 2 per cent; and pyrite, 1 per cent. Banding in the marble is cut by the sulphide mineralization. Assay values up to 168 ppm gold and 305 ppm silver were obtained from underground samples.

It is apparent that the precious metals are contained within pyrite, chalcopyrite, and arsenopyrite.

During the month of May the operation was closed and all equipment was moved from the property.

SILBAK PREMIER MINE (104B/1)

The Silbak Premier mine is situated approximately 15 kilometres north of Stewart. During the spring and summer of 1978, four local men under a lease agreement 'high-graded' and shipped approximately 135 tonnes of hand-sorted high-grade silver-gold ore from the floor of the old Glory Hole (No. 1 level). The lessees believe that they were actually mining a large block of loose rock that had spalled off the wall of the Glory Hole years ago. Mineralization consists of massive pyrite, galena, and sphalerite with tetrahedrite, native silver, and electrum in a quartz gangue within 'Premier porphyry.' The operators estimate that the ore will assay greater than 70 ppm gold and 5 145 ppm silver.

BIG MISSOURI – UNICORN (104B/1)

The Big Missouri–Unicorn gold-silver property, operated by Tournigan Mining Explorations Ltd., is located approximately 25 kilometres north of Stewart. During 1978, a 30-man camp was established. Surface and underground diamond drilling, sampling and mapping, and portal rehabilitation were carried out.

Eight diamond-drill holes, totalling 610 metres, were drilled in the area of the Dago shaft which has been rehabilitated, mapped, and panel sampled.

The Province zone, located 650 metres west of the shaft area, was examined in 50 trenches and by hand blasting over a mineralized area 1 800 metres by 1 200 metres.

An attempt was made to open up the caved portal on the No. 3 tunnel of the Unity claim.

The Groundhog, Show Em, Snow, and Mann portals were rehabilitated.

MOLY, TAKU (NAN) (104K/GW)

The Moly-Taku molybdenum prospect, owned by Frank Onucki and operated by Omni Resources Inc., is located approximately 25 kilometres southeast of Tulsequah on the British Columbia–Alaska border at Mount Ogden. Several tonnes of molybdenite-bearing quartz monzonite porphyry occur on terminal and medial moraines on the surface of an active glacier.

A number of mining companies examined the area in the 1960's and in 1967 a small diamond drill was skidded onto an accessible site and still remains there. One drill hole was collared in a tongue of quartz monzonite.

Country rock on the property consists of a sequence of Permo/Triassic metasedimentary and metavolcanic rocks. These include tactite, a diabase sill, and a thin to thick-bedded sequence of shales and carbonates. Two types of tactite are present: (a) a white calc-silicate rock containing calcite, dolomite, wollastonite, and tremolite, and (b) a fine-grained, green diopside-epidote-garnet unit with or without fine-grained disseminated pyrite, magnetite, or locally sphalerite. These rocks strike northwesterly and dip steeply to the northeast.

An irregular body of light-coloured Cretaceous/Tertiary quartz monzonite porphyry intrudes the sequence. The rock varies from coarse to fine grained in texture with 40 per cent by volume consisting of phenocrysts of quartz and feldspar set in a fine-grained cream-coloured groundmass. Mafic minerals are usually lacking.

Molybdenite occurs in quartz veinlets ranging in thickness up to 0.25 centimetre associated with irregular clots of quartz, and as fine disseminations in the quartz monzonite porphyry. Molybdenite and pyrite also occur in quartz veinlets within silicified dark green tactite.

At the drill site southeast of the drill hole, the tectite has been contorted and silicified at the contact with quartz monzonite. Molybdenum-bearing quartz monzonite float observed on the active glaciers appears to be coming from near the drill site area (Lower Moly zone) and the steep rugged headwall to the southeast (Upper Moly zone) which was not visited.

MIR (104N/10W)

The MIR 1 to 6 claims, being explored by the MUG Syndicate (Malabar Mines, Union Oil, and Getty) are located southwest of Trout Lake, 50 kilometres east of Atlin.

The property is underlain by alaskitic quartz monzonite of the Surprise Lake batholith. In places it is banded by layers of aplite and pegmatite.

The MIR claims lie on the western flank of the Trout Lake graben which is a north/south-trending feature bisecting the Surprise Lake batholith.

Galena, sphalerite, chalcopyrite, pyrite, magnetite, and hematite accompanied by secondary uranium mineral(s) [for example, kasolite — $Pb(UO_2)SiO_4 \cdot H_2O$] occur as polymetallic veins or in quartz stockworks. Magnetite is usually significant and secondary manganese is commonly associated with the base metal sulphides which may be either massive or disseminated.

Uranium anomalies occur in radon springs and in silts and are particularly high in areas of bog. The presence of major structural lineaments appears to be favourable for uranium migration. Aplitic phases of the alaskitic quartz monzonite host are commonly more radioactive.

A small amount of trenching by Union Oil, the operator, has exposed some occurrences of polymetallic veining associated with quartz. Three diamond-drill holes totalling approximately 450 metres were also completed to test uranium geochemical anomalies.

On the MIR property and also in other areas within the Surprise Lake batholith, a dull yellowish green waxy looking mineral occurring as a thin coating along fractures has been identified by X-ray techniques as a clay mineral with a diffractogram closely resembling that of tosudite, an aluminium silicate hydrate with minor iron, magnesium, calcium, sodium, and potassium. A small amount of kaolinite is also present.

CY, ENG (104N/11E)

The CY, ENG claim group, owned and operated by Mattagami Lake Mines Limited, is located in the Mount Weir area approximately 40 kilometres east of Atlin, within the Surprise Lake batholith. Three main textural varieties of alaskite have been noted: very coarse grained, uniform medium grained, and fine grained porphyritic. The average modal composition consists of quartz (20 to 40 per cent), orthoclase (20

to 50 per cent), plagioclase (10 to 40 per cent), and minor biotite (less than 2 per cent), and in general the rocks are only weakly altered (local kaolinization of feldspars and minor chloritization and epidotization).

In the south part of the claim group the alaskitic quartz monzonite is in contact with chert, argillite, chert pebble conglomerate, and chert breccia of the Cache Creek Group.

Zeunerite $[\text{Cu}(\text{UO}_2)_2(\text{AsO}_4)_2 \cdot 10\text{-}16\text{H}_2\text{O}]$, molybdenite, galena, sphalerite, pyrite, fluorite, beryl, wolframite, magnetite, and hematite have been noted in various rock types on the property. In addition, a zone of supergene alteration including kasolite $[\text{Pb}(\text{UO}_2)\text{SiO}_4 \cdot \text{H}_2\text{O}]$, wulfenite (PbMoO_4) , and minor vandendriesscheite $[\text{PbU}_7\text{O}_{22} \cdot 12\text{H}_2\text{O}]$ exist on the south flank of Mount Weir. Mineralization is assumed to be associated with local fractures or faults.

On top of Mount Weir, tension fractures filled with smoky quartz veins and carrying galena and sphalerite occur in coarse-grained alaskite. Quartz veins are up to 20 centimetres in width and are exposed over a length of 40 centimetres. Euhedral quartz crystals up to 3 centimetres long occur in vuggy veins. A uranium anomaly coexists with the base metal mineralization here.

Elsewhere near the summit of Mount Weir near massive magnetite±hematite veins, 1 to 2 metres across, intrude alaskite with a general trend of 050/65 degrees northwest. The quartz-rich zones have a general trend of 160/75 degrees west.

On the CY 6 claim a yellow-orange-coloured supergene zone exposed over an area of 10 metres by 40 metres contains kasolite, wulfenite, and vandendriesscheite. Shallow test pits showed the bedrock to be very intensely weathered and anomalous in uranium. Not far from this occurrence, a mafic-rich dyke carrying disseminated sphalerite was noted.

On the west side of Caribou Creek, on the CY 8 claim, several mafic dykes up to 4 metres wide and trending 050/60 degrees northwest intrude the alaskite. Up to 20 per cent disseminated sphalerite occurs within the dykes. Purple fluorite and beryl are also minor constituents.

On the northeast flank of Mount Weir mafic-rich dykes with sphalerite, galena, magnetite, hematite, quartz, and danalite $[(\text{Fe},\text{Mn},\text{Zn})_4\text{Be}_3(\text{SiO}_4)_3\text{S}]$ intrude alaskite.

YKR (104N/11W)

The YKR property, owned by A. Matson and explored by Yukon Revenue Mines Limited, is located on the west side of Boulder Creek, approximately 20 kilometres east of Atlin. During 1978 Yukon Revenue carried out magnetic surveys, mapping, and trenching over a 300-square-metre area.

The claim group is underlain by Cache Creek Group greenstone interbedded with small sections of limestone and quartzite. On the west side of the claim group there are three small stocks of peridotite and metadiorite. The Surprise Lake batholith, consisting of alaskite, underlies the northeastern part of the claim group.

Pyrrhotite and pyrite with minor amounts of chalcopyrite, tetrahedrite, galena, sphalerite, fluorite, cassiterite, and scheelite occur as disseminations and irregular massive lenses in altered talcose basic volcanic rocks and peridotite. Traces of molybdenite also exist. Galenobismutite (PbBi_2S_4) with a minor amount of tetradyomite (?) ($\text{Bi}_2\text{Te}_2\text{S}$) has also been identified by X-ray techniques.

AP (1040/7E)

The AP claims, owned by DuPont of Canada Exploration Limited, are located approximately 80 kilometres south-southeast of Swift River, just north of Ash Mountain in the Jennings River area. Tungsten mineralization occurs in garnet-diopside skarn zones (in quartz veinlets and as disseminations) in contact with host argillaceous quartzite and metachert of the Oblique Creek Formation and granitic rocks, similar in appearance to the Surprise Lake and Seagull batholiths (that is, with smoky grey quartz eyes). Faulting on the property is complex.

DuPont has carried out geochemical surveys and preliminary geological mapping.

ATAN (104P/1E)

The ATAN lead-zinc prospect, being explored by Amoco Canada Petroleum Company Ltd., is located approximately 20 kilometres east of Deadwood Lake, 110 kilometres south of Watson Lake. Thirty-four units comprise the Atan 1, 2, 3, and 4 claims. Sphalerite and galena occur as pods, disseminations, and veinlets in massive to thin-bedded Atan Group limestone (up to 150 metres thick) of Early Cambrian age. Resistant 'ribs' of sphalerite (light brown) and galena (grey) give the limestone a ribbon appearance. The Atan limestone is part of a block-faulted anticlinal structure that is flanked to the west by phyllites of the Kechika Group and to the east by thick alluvium. Pyrite is generally less than 5 per cent by volume and does not necessarily correlate with zones of lead-zinc mineralization. Secondary hydrozincite is common in mineralized lead-zinc outcrops. Gypsum-carbonate veining is less abundant.

Amoco diamond drilled three holes on the prospect during 1978.