

pyrite, coarser euhedral to subhedral arsenopyrite and in places chalcopyrite.

Vein gangue is chiefly manganese-rich siderite that weathers to a bluish black, and manganese oxide. Chalcedonic to euhedral quartz crystals rim fragments and line fractures, and commonly post-date siderite. Late stage calcite fills open spaces.

The analytical results for three grab samples from the hangingwall, vein and footwall at 3-level portal (1940 metre elevation) and from the dump below the 1790-metre level crosscut are given in Table 6.

TABLE 6  
MOLLY GIBSON MINE ANALYTICAL RESULTS

Sample	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (%)	Zn (%)	Mo (ppm)
2-1 (5890 level)	820	940	1200	9.3	4.1	<10
170-1 (3-level)	<10	29.2	42	0.3	0.1	<10
170-2 (3-level)	510	2300	2050	9.1	3.9	32
170-3 (3-level)	50	445	338	1.6	0.6	18

2-1 = Quartz-siderite vein grab sample.

170 = channel sample; 170-1 = hangingwall, 170-2 = vein, 170-3 = footwall.

The Smuggler workings, 2 kilometres northwest and on strike with the Molly Gibson veins produced 13 tonnes of ore. The 1.8-metre-wide Smuggler vein strikes 150 degrees, dips 80 degrees southwest and contains vein mineralogy and morphology indistinguishable from that at Molly Gibson. The ore is galena and lesser sphalerite with arsenopyrite (to 5 per cent) in a manganese-siderite quartz-breccia vein healed with chalcedonic quartz. The Slocan Chief, located 1 kilometre northwest of Smuggler, produced 4 tonnes of ore. The Blackburn occurrence, with no recorded production, lies about 2 kilometres northwest of Slocan Chief. Similar mineralogy, structural continuity and similar lead isotope ratios (Logan *et al.*, 1988) suggest Molly Gibson, Smuggler, Slocan Chief and Blackburn are part of the same vein system.

#### SCRANTON, PONTIAC, SUNRISE AND SUNSET (MINFILE 82FNW-112,111,113)

The Scranton, Pontiac, Sunrise and Sunset deposits are located close to the eastern boundary of the park and are accessible from Highway 31, via Woodbury Creek road. Initial production is reported from the Pontiac claim in 1898, Sunset-Sunrise in 1899 and Scranton in 1948. Combined production totals at least 25 900 tonnes which yielded 125 676 grams gold, 4.4 million grams silver, 1313 kilograms copper, 1400 tonnes lead, 1200 tonnes zinc and 14 tonnes cadmium (Table 3). Scranton accounts for more than 90 per cent of the gold, lead, zinc, copper and cadmium, and 80 per

cent of the silver production. Fifty per cent of Scranton production occurred between 1969 and 1979.

The Pontiac, Scranton, Sunset, Grandview and Sunrise workings (from northeast to southwest) follow a southwest-striking vein system of at least 2.1 kilometres strike length. The vein system comprises sheared zones 10 metres or more in width hosting quartz veins and irregular quartz bodies. Country rock is hornblende potassium-feldspar granite and potassium-feldspar granite. Hornblende diorite outcrops in Sunrise basin. Minor amounts of biotite-grade thinly bedded metasiltstone, meta-argillite and recrystallized limestone outcrop on the Scranton claims and quartzite was intersected in underground workings.

The Scranton mine is on the east side of Pontiac creek, the Sunset mine on the west side. Both are presumed to be on the same vein. The Scranton zone contains at least two veins striking northeast to east; dips average 25 degrees southeast at the southwest end of the vein, steepening to 60 degrees southeast toward the northeast. Vein widths vary from 15 to 60 centimetres in the granite but veins commonly pinch out in the sediments. Mineralization is predominantly pyrite, up to 35 per cent, with lesser galena and sphalerite stringers and blebs in a fractured quartz gangue. The inaccessible lower Pontiac workings, at the 1920-metre elevation, follow a quartz vein striking between 025 and 045 degrees. Vein material from the dump is massive coarse white carbonate mineralized with blebs and stringers of galena and sphalerite (10 per cent combined) and flooded by (2-3 per cent) finely disseminated pyrite (Table 7, sample 291).

Workings in the Sunrise basin include the Sunrise and Grandview 215 metres to the northeast. The Sunrise was developed on two levels: the lower level (1975-metre elevation) is wet but apparently accessible; the upper level (2030-metre elevation) is completely collapsed. The vein is less than 1.5 metres wide, limonite stained, fractured and sulphide-poor. The footwall granite is fractured and limonitic over 1 metre or less; the hangingwall is sharply defined and locally sericitized (20-centimetre widths). Galena and sphalerite occur intergrown in layers, blebs and patches. Pyrite occurs as coarse aggregates (2 by 1.5 centimetres) and finely crystalline concentrations rimming galena. Erratic, high grade gold values suggest free gold occurs in the veins (Table 7).

One hundred fifty metres southwest of the upper Sunrise portal, on the Granite claim, vein mineralization is exposed in a portal at 2090 metres elevation. The vein is 0.5 metre wide and comprised predominantly of pyrite (to 15 per cent), in patches, intergrown with galena and sphalerite. Indicated

reserves were reported at 17 890 tonnes averaging 9.3 grams per tonne gold, 240.1 grams per tonne silver, 8.2 per cent lead and 8.0 per cent zinc (Northern Miner, January 12, 1978).

TABLE 7  
SCRANTON/PONTIAC/SUNSET MINE ANALYTICAL RESULTS

Sample	Au (g/t)	Ag (g/t)	Cu (ppm)	Pb (%)	Zn (%)	Mo (ppm)
275 a	1.1	420	51	15.4	3.5	<10
277 b	0.15	5	4	0.1	0.1	<10
278 b	180.0	165	4	1.0	tr	<10
279 b	32.0	310	62	21.2	13.8	<10
281 c	7.9	245	23	18.7	10.0	<10
283 d	3.0	1300	50	20.9	3.9	<10
287 e	2.1	440	212	12.0	12.0	<10
291 f	41.0	220	204	12.3	5.6	<10

Analytical results for quartz vein grab samples. Locations: a = Granite dump; b = Sunrise upper portal; c = Sunrise lower portal; d = Grandview lower dump; e = Scranton lower portal; f = Pontiac lower portal. Trace = tr.

### REVENUE (MINFILE 82FNW106)

The Revenue mine is on the north side of Sturgis Creek, a tributary of Keen Creek. It is accessible via an overgrown trail from Keen Creek road. Sporadic production between 1913 and 1941 yielded 244 tonnes of ore containing 217 grams gold, 635 620 grams silver, 68.8 tonnes lead and 20.7 tonnes zinc. Workings consist of four collapsed adits and a few surface trenches. Cairnes (1935) reported over 200 metres of tunnelling had been completed by June, 1927.

The quartz veins are hosted in unaltered hornblende potassium-feldspar porphyritic granite with hornblende diorite xenoliths. The veins are less than 150 centimetres wide and strike about 020 degrees and dip steeply southeast. Mineralization consists of sphalerite-rich layers and pods in quartz veins with patches of galena. Disseminated and massive pyrite is also present in the veins. Limonitic fractures parallel the vein, across a zone less than 3 metres wide.

### ONTARIO No. 2 (MINFILE 82FNW110)/ BALTIMORE (MINFILE 82FNW109)

The Ontario No. 2 and Baltimore workings are located north of Woodbury Creek on the west and east sides of Silver Spray Creek respectively. Both workings apparently explored the same east-northeast-trending lode structure. The Ontario workings lie within the park adjacent to Crown Granted Claim (lot number 3182). The Baltimore claims, 1 kilometre to the east are outside the eastern boundary of the park.

Production from the Ontario between 1907 and 1921 totalled 156 tonnes of ore and yielded 31 grams gold, 1792 kilograms silver and 15 600 kilograms lead.

Production from the Baltimore from 1902 to 1907 and 1954 totalled 60 tonnes of ore and yielded 31 grams gold, 352 025 grams silver, 5.6 tonnes lead and 131 kilograms zinc.

The lode structure is strongly sheared, strikes 255 degrees, dips 75 degrees north and is hosted by hornblende potassium-feldspar porphyritic granite. Narrow blocks of muscovite-biotite schist and psammite occupy sections of the hangingwall and footwall in the Baltimore workings. Mineralization occupies quartz breccia veins and comprises galena, pyrite, sphalerite and silver minerals as massive and irregular disseminations.

The Baltimore workings are mainly shallow surface trenching. Cairnes (1935), reports a 33 metre shaft connected to an adit (now caved) which explores the vein for 75 metres of strike length. On surface the vein can be traced for well over 100 metres. The Ontario workings now inaccessible, include two adits 30 metres apart vertically and comprise about 500 metres of development work. Considerable stoping is reported to have been completed above the lower level.

### SUN (MINFILE 82FNW207)

The Sun is located 1 kilometre south of the Revenue mine. It produced 31 tonnes of ore, 84.6 kilograms silver and 12.3 tonnes lead. The workings were not visited during the 1987 field season.

### PARA (MINFILE 82FNW105)/ CHRISTINA (MINFILE 82FNW104)

The Para and Christina workings are situated on the west and east flanks of Paupo Mountain, in the northwest corner of the park. Production from the Para totalled 15 tonnes of ore, no grade is recorded.

Both explore narrow (up to 50 centimetre) north-striking steeply dipping vein cutting coarse grained potassium-feldspar porphyritic granite. Mineralization comprises pyrite, sphalerite and galena in a banded quartz gangue containing finely disseminated sulphides. Tetrahedrite, chalcopryrite and pyrargyrite have been reported (Cairnes, 1935). A grab sample of stockpiled massive sphalerite ore at the Para assayed 1.0 gram per tonne gold, 1750 grams per tonne silver, 2.16% lead and 36.5% zinc.

### VIOLET (MINFILE 82FNW107)

The Violet workings occupy the divide between Mount McQuarrie and Sunset Mountain at 2562 metres elevation and are accessible by the Silver Spray trail from Woodbury Creek. Production in 1921 totalled 4