Elk

882642

RUN DATE: 01/04/80
RUN TIME: 10:34:15

MINFILE / pc
MASTER REPORT
GEOLOGICAL SURVEY BRANCH
ENERGY AND MINERALS DIVISION

MINFILE NUMBER: 092HNE096 NATIONAL MINERAL INVENTORY:

NAME(S): ELK, ELK (SIWASH NORTH), SIWASH NORTH, DUCHESS

STATUS: Past Producer Underground MINING DIVISION: Similkameen
REGIONS: British Columbia
NTS MAP: 092H16W UTM ZONE: 10 (NAD 27)
LATITUDE: 49 51 01 N NORTHING: 5525235
LONGITUDE: 120 18 39 W EASTING: 693315
ELEVATION: 1646 Metres
LOCATION ACCURACY: Within 500M
COMMENTS: Siwash North deposit, 1.1 kilometres northwest of Siwash Lake, 40 kilometres west of Peachland (Assessment Report 19835).

COMMODITIES:	Gold	Silver	Copper	Zinc	Lead
MINERALS					
SIGNIFICANT:	Pyrite	Gold	Chalcopyrite	Sphalerite	Galena
	Tetrahedrite	Pyrrhotite	Electrum		
ASSOCIATED:	Quartz	Ankerite	Calcite	Barite	Fluorite
ALTERATION:	Sericite	Quartz	Pyrite	Clay	Chlorite
ALTERATION TYPE:	Sericitic	Argillic	Propylitic		
MINERALIZATION AGE:	Unknown				

DEPOSIT

CHARACTER: Vein Stockwork Shear
CLASSIFICATION: Epigenetic Hydrothermal
TYPE: I02 Intrusion-related Au pyrrhotite veins I01 Au-quartz veins
I05 Polymetallic veins Ag-Pb-Zn±Au
SHAPE: Bladed
DIMENSION: 925 x 335 x 2 Metres STRIKE/DIP: TREND/PLUNGE:
COMMENTS: Siwash North structure.

HOST ROCK

DOMINANT HOST ROCK: Plutonic

STRATIGRAPHIC AGE	GROUP	FORMATION	IGNEOUS/METAMORPHIC/OTHER
Upper Triassic	Nicola	Undefined Formation	
Middle Jurassic			Osprey Lake Batholith

ISOTOPIC AGE: 166 +/- 1 Ma
DATING METHOD: Lead/Lead
MATERIAL DATED: Zircon

LITHOLOGY: Altered Granite
Quartz Monzonite
Granodiorite
Andesite Dike
Basaltic Andesite
Siliceous Tuff
Agglomerate
Feldspar Porphyry Dike
Quartz Feldspar Porphyry Dike

HOST ROCK COMMENTS: Isotopic age date for the Osprey Lake batholith is from Geological Survey of Canada Paper 91-2, page 95.

GEOLOGICAL SETTING

TECTONIC BELT: Intermontane PHYSIOGRAPHIC AREA: Thompson Plateau
TERRANE: Quesnel Plutonic Rocks
METAMORPHIC TYPE: Regional RELATIONSHIP: GRADE: Greenschist

INVENTORY

ORE ZONE: TOTAL REPORT ON: Y

CATEGORY: Combined YEAR: 1996
QUANTITY: 121350 Tonnes

COMMODITY	GRADE	
Silver	35.3000	Grams per tonne
Gold	25.4000	Grams per tonne

COMMENTS: Includes open-pit and underground probable resources and a further possible underground resource.
REFERENCE: Information Circular 1997-1, page 21.

CAPSULE GEOLOGY

The Elk property is underlain by Upper Triassic volcanics and sediments of the Nicola Group and by Middle Jurassic granites and granodiorites of the Osprey Lake batholith. The contact between these units trends northeasterly across the property. Early Tertiary feldspar porphyry stocks and dikes of the Otter intrusions occur throughout the property.

The western property area is underlain by steeply west-dipping

CAPSULE GEOLOGY

andesitic to basaltic flows, agglomerates, tuffs and minor siltstone and limestone units of the Nicola Group. The eastern half of the property is underlain by granitic rocks of the Osprey Lake batholith. Early Tertiary feldspar porphyry and quartz feldspar porphyry stocks and dikes of the Otter intrusions cut both of the above. Breccias containing rounded volcanic, dioritic and granitic fragments in a granitic matrix crosscut Nicola rocks, Osprey Lake batholith and Otter intrusions rocks. The elongate breccia bodies vary in width from 5 to 30 metres and trend northeasterly. These zones may be portions of major fault structures, but displacement, if any, is not readily apparent. Andesite dikes are the youngest units mapped, postdating all of the above. They are dark greyish green, fine grained and vary in thickness from 30 centimetres to 5 metres. They are commonly muscovite-altered and brown weathering. Strong orange and blue clay alteration is also evident in these rocks. Mineralization appears to be spatially associated with these (Tertiary (?)) andesite dikes which are locally cut by quartz veins.

The Nicola Group lithologies mapped on the Elk property consist of dark greyish green, massive basaltic andesite (some porphyritic containing pyroxene and/or amphibole phenocrysts and some containing 0.5-millimetre laminae of sand-sized black grains); pale grey-green siliceous laminated tuff; and brownish green to pale green agglomerates containing fragments from 5-50 centimetres in size. The Nicola rocks are occasionally silicified, carbonatized or epidote-altered. Iron oxide staining and finely disseminated pyrite are common.

Nicola rocks on the west side of the property dip approximately 60 degrees west, forming the east limb of a syncline. The syncline trends roughly north-south and its axis passes about 5 kilometres west of the property. Structural deformation in the area appears to be minimal.

The Osprey Lake granitic rocks are pinkish grey, medium to coarse-grained, equigranular quartz monzonite to granodiorite in composition. Pink, sugary textured aplite dikes cut the quartz monzonite. Quartz diorite related to the batholith is far less common and occurs as stocks. Dikes of quartz monzonite and hornblende-biotite-quartz monzonite also occur. Alteration includes weak to strong propylitic, argillic, phyllic and silicic assemblages.

The Otter intrusions comprise quartz feldspar porphyry, feldspar porphyry and quartz-biotite-feldspar dikes and stocks. The quartz feldspar porphyry is extensively clay altered.

Gold-silver mineralization on the Elk property is hosted primarily by pyritic quartz veins and stringers in altered pyritic granitic and, less frequently, volcanic rocks. Crosscutting relationships indicate that the veins are Tertiary in age; they may be related to Tertiary Otter intrusive events. To date, mineralization has been located in four areas on the Elk property: Siwash North, South Showing (092HNE261), North Showing (092HNE281) and Siwash Lake (092HNE041, 295). The Siwash Lake zone is 800 metres south of the Siwash North deposit; the North Showing and South Showing areas are 2 and 3 kilometres south of Siwash North respectively.

In the Siwash North area, gold occurs in veins measuring 5-70 centimetres wide, hosted by a zone of strongly sericitic altered granite and, in the west, volcanic rocks. In general, the mineralized zone trends east-northeast with southerly dips from 20-80 degrees (from east to west), and appears to be related to minor shearing. Quartz veining occurs in a number of parallel to subparallel zones. Each zone consists of one or more veins within an elevation range of 5 to 10 metres that can be correlated as a group to adjacent drillholes. In the eastern parts of the area, up to six subparallel zones occur. Five of these zones are consistent enough to be labelled the A, B, C, D and E zones. Mineralization in the west has been identified in one or locally two zones (the B and C zones). The main mineralized zone (B) is consistent, with only minor exceptions, across the entire drill grid. The Siwash North structure has been tested to 335 metres downdip and along a strike length of 925 metres. The zone remains open to depth and along strike.

At surface, supergene alteration has leached out most of the sulphides with some pyrite and chalcopyrite remaining. Mineralization occurs primarily as native gold, occasionally as spectacular aggregates of coarse flakes in frothy quartz (strong pyrite boxwork) or in fractures in the vein. Electrum was noted in one area as very coarse-grained flakes associated with strong manganese staining. Gold is rarely seen in boxworks in sericitic (phyllic) alteration.

In drill core, mineralization has not been affected by supergene processes. Metallic minerals in drill core include pyrite, chalcopyrite, sphalerite, galena, tetrahedrite, maldonite ?, pyrrhotite and native gold (in order of decreasing abundance). Gold is strongly associated with pyrite and with a blue-grey mineral.

CAPSULE GEOLOGY

Photomicrographs show the gold commonly in contact with this mineral, which may be a gold-bismuth alloy (maldonite?) or a copper-bismuth-antimony sulphosalt.

Gangue mineralogy consists primarily of quartz and altered wallrock fragments. Ankerite is commonly present, with lesser amounts of calcite. Minor barite is also present. Fluorite was noted in one vein as very small (less than 1 millimetre) zoned purple cubes scattered in the quartz.

Stronger alteration generally accompanies higher grade gold mineralization. Seven main types of alteration were recognized in the granitic rocks throughout the property; propylitic, argillic, sericitic, potassium feldspar stable phyllic, phyllic, advanced argillic and silicic. Locally, potassic alteration, skarnification and silicification are evident, but are relatively minor and do not appear to be related to mineralization.

Propylitic alteration is generally light green with biotite and hornblende altered to chlorite, and plagioclase is saussuritized. In volcanics, the colour is generally olive green, and the rock is soft. Argillic alteration is exemplified by bleached rock, with plagioclase white and clay-altered; potassium feldspar is slightly altered. Volcanics are bleached to light green or grey. Sericitic alteration is typically pale green with a micaceous sheen, with plagioclase altered to sericite; trace disseminated pyrite may be present. This type of alteration is often associated with quartz veins and appears to be the lowest grade alteration associated with gold mineralization. It is not recognized in volcanics. Potassium feldspar stable phyllic alteration is light pink, green or yellowish with potassium feldspar fresh and pink and blocky. Plagioclase and mafic minerals are altered to fine-grained quartz-sericite-pyrite. It often occurs with veins and is associated with gold mineralization; it is not recognized in volcanics. Phyllic alteration is generally grey, fine-grained quartz-sericite-pyrite alteration usually associated with veins and often gradational to quartz and often auriferous. Advanced argillic alteration is exemplified by most or all of feldspar being destroyed, quartz is "free-floating". The alteration is often sheared and white in colour and is often associated with quartz veins. Volcanics are white or blue coloured. Silicic alteration is quartz veining or replacement that is hard with moderate conchoidal fracture.

There is a strong symmetrical zoning of alteration around the quartz veins; vein - advanced argillic - phyllic - potassium feldspar stable phyllic - argillic - propylitic.

Measured geological reserves of the Siwash North deposit are 308,414 tonnes grading 22.17 grams per tonne gold and 24.68 grams per tonne silver using a cutoff grade of 10 grams per tonne gold. Reserves are based on results from 107 drillholes at 50-metre grid spacings along 804 metres of strike length to 304 metres downdip. All veining intercepts have been adjusted for true width and assays diluted to 2-metre mining widths (George Cross News Letter No. 223 (November), 1991).

The revised drill indicated reserve, based on more realistic open pit and underground mining widths of 0.39 to 0.79 metre with a 20.5 grams per tonne gold cutoff grade, is 122,458 tonnes averaging 54.5 grams per tonne gold (George Cross News Letter No. 65 (April 2), 1993).

In 1995, Fairfield Minerals with the support from the Explore B.C. Program carried out an extensive program including geochemistry, 13,972 metres of surface and underground diamond drilling in 315 holes and reserve calculations. Surface drilling was done on fences 10-50 metres apart, underground drilling on fences 10 metres apart. Reserve calculations by the company and consultant Roscoe Postle gave the following results (Explore B.C. Program 95/96 - A38):

	Company	Roscoe Postle
Probable (undiluted)	16,991 tonnes at 50.2 g/t gold	28,200 tonnes at 26.6 g/t gold
Possible (undiluted)	50,260 tonnes at 42.0 g/t gold	66,400 tonnes at 31.4 g/t gold

The 1996 exploration program consisted of 6873 metres of drilling in 91 holes. The Siwash zone has been traced along a 914 metre strike length and downdip to 245 metres.

Reserves estimated by the company at January 1, 1996 were 121,350 tonnes grading 25.4 grams per tonne gold and 35.3 grams per tonne silver. These inlcude a diluted, probable open-pit resource of 11,340 tonnes grading 58.97 grams per tonne gold, an underground probable resource below the open pit of 20,225 tonnes grading 26.74 grams per tonne gold, and a further possible underground resource of 89,790 tonnes grading 23.66 grams per tonne gold (Information Circular 1997-1, page 21).

From 1992 and 1995 (inclusive), 16,570 tonnes of tonnes of ore

CAPSULE GEOLOGY

were mined and milled and 1519 kilograms of gold and 1903 kilograms of silver recovered. In 1996, Fairfield shipped all remaining stockpiles, estimated to contain 2700 tonnes and grading greater than 12 grams per tonne (Information Circular 1997-1, page 21). A total of 994 metres of ramp access and three development levels exist underground.

BIBLIOGRAPHY

EMPR ASS RPT 4525, 16644, 18511, 19489, *19835, *21443, *22368
EMPR BULL 69
EMPR Explore B.C. Program 95/96 - A38
EMPR GEM 1973-161-162
EMPR INF CIRC 1993-13; 1994-19, p. 15; 1995-1, p. 15; 1995-9, p. 18; 1996-1, p. 18; 1997-1, p. 21
EMPR OF 1992-1; 1994-1
EMPR PF (Fairfield Minerals Ltd. (September 12, 1989): News Release; Fairfield Minerals Ltd. (1988): Annual Report; *Fairfield Minerals Ltd. (1990): Annual Report; Fairfield Minerals Ltd. (March 26, 1991): News Release)
GSC MAP 888A; 889A; 41-1989
GSC MEM 243
GSC P 85-1A, pp. 349-358; 91-2, pp. 87-107
GCNL #102(May 29),#176(Sept.13),#234(Dec.6), 1989; #43(Mar.1), #75(Apr.18),#157(Aug.15),#161(Aug.21),#181(Sept.19),#204(Oct.22), #230(Nov.28), 1990; #93(May14),#127(Jul.3),#138(Jul.18), #223(Nov.20),#174(Sept.10),#175(Sept.11),#194(Oct.8),*#223 (Nov.20), 1991; #178(Sept.15),#213(Nov.4), 1992
N MINER Sept.25, 1989; Apr.30, Sept.3, 1990; Apr.1, Sept.23, Dec.16, 1991; Sept.21, Nov.23, 1992; Feb.1, 1993; June 12, 1995; July 1, 1996

DATE CODED: 870525 CODED BY: LDJ FIELD CHECK: N
DATE REVISED: 970502 REVISED BY: GO FIELD CHECK: N