

2804

Department
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2804 MAP

GEOLOGICAL SURVEY

GREENWOOD M.D.

ELK 1-12. CLAIMS

82E/11E

ARLINGTON LAKES AREA

Alfred R. Allen, P.Eng.

50°-119°NE : 1-15 Nov.'70

For:

DUROCOP MINES LTD. (N.P.L.)

Vancouver, B.C.

By:

ALLEN GEOLOGICAL ENGINEERING LTD.

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#1 MAP Geolog. Survey

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GEOLOGICAL SURVEY

ELK 1 - 12 MINERAL CLAIMS

ARLINGTON LAKES

BEAVERDELL AREA

B.C.

A. INTRODUCTION

A geological survey was conducted over the Elk 1-12 mineral claims, located west and south of Arlington lakes, 12 miles north of Beaverdell, B.C.

The survey was conducted by Alfred R. Allen, P.Eng., M.G. Mooney, graduate geologist, Bill Jupp, prospector and Fred Madge, prospector.

The purpose of the survey was to locate and observe the rock outcroppings on the property, and from the data so acquired to map the local geology.

B. LOCATION AND ACCESSIBILITY

The property is located in south central British Columbia, forty-two miles north of the border of the United States. It is 8 miles north of Carmi and 12 miles north of Beaverdell.

Geographic location is west longitude $119^{\circ}-07'-30''$ and $49^{\circ}-37'$ north latitude.

This is in the Greenwood Mining Division. The Kettle Valley line of the Canadian Pacific Railway passes through the property and the former station of Lakevale is located near the north end of same.

Access onto the north end of the property is via a narrow and poorly located 3 mile secondary road which branches southerly off the highway, 12 miles north of Carmi. This road is on the west side of Arlington lakes.

C. TOPOGRAPHY

The property is located south and west of Arlington lakes at the head of Hall Creek.

From the valley floor, elevation just under 3,500 feet above sea level, there is a rise of 900 feet in $3/4$ of a mile to the top of Arlington ridge on the east, and a rise of 2,300 feet in 2 miles to the top of Nipple Mountain to the west.

Hall Creek flows southerly into the West Kettle about $3\frac{1}{2}$ miles north of Carmi.

The ridges are rounded and well wooded. The general topographic trend parallels the West Kettle River in a north - south direction.

D. HISTORY

Gold was discovered at Rock Creek in 1859. After the creeks were tested and worked for gold, the hardrock possibilities of the area became apparent to the prospectors and the first mineral claim was staked on Rock Creek in 1884. The first claims were staked on the rich silver-lead showings on Wallace Mountain in 1889. The majority of the important properties were staked from 1896 to 1900 on Wallace Mountain, Carmi and Arlington lakes.

The Kettle Valley branch of the Canadian Pacific Railway was started in 1910 and it traversed the Beaverdell-Carmi area. Steel was laid as far as Arlington lakes by 1913.

With the resultant influx of settlers, wagon roads and trails were located throughout the area and in the next decade many promising mineral discoveries were made.

The mine with the longest production record, the Highland Bell near Beaverdell, is still in operation. Prospecting and extensive exploratory work is currently being carried out on several properties in the area.

E. PROPERTY

The Elk 1-12 mineral claims are held as follows:

<u>Name</u>	<u>Owner</u>	<u>Record No.'s</u>	<u>Data Recorded</u>
Elk 1-6,	R. Slessor,	30989 - 94	21 Nov. 1969.
Elk 7-12,	R. Slessor and G.A. Tarantino	31028 - 33	1 Dec. 1969.

The claim posts and lines have been examined by the writer and assistants and are considered to be staked in accordance with the Mineral Act of British Columbia.

F. GEOLOGY1. Introduction

The Arlington lakes area is underlain by a Permian and/or Triassic complex of metamorphosed intrusive and volcanic rocks with a base of recrystallized limestone strata. These, the oldest rocks of the region are known as the Anarchist Group. They have been intruded by Nelson plutonic rocks, which in turn have been invaded by Cretaceous granite and granodiorite of the Valhalla plutonics.

There is a cover of Tertiary volcanics a short distance west of the Elk mineral claims.

Gold, copper, silver, lead and molybdenum mineralization has been encountered associated with strong zones of shearing on the property.

2. Stratigraphy

The following table of formations is applicable to the entire area of the West Kettle Valley.

(a) Table of Formations

<u>AGE</u>	<u>FORMATION</u>	<u>LITHOLOGY</u>	<u>ESTIMATED THICKNESS</u>
Quaternary		River alluvium Glacial till	100
Paleocene or Eocene	Curry Creek Series	Conglomerate, sand- stone, shale, tuff.	200 to 2,500

AGE	FORMATION	LITHOLOGY	ESTIMATED THICKNESS
Eocene or Oligocene	Nipple Mountain Series	Andesite, Trachyte, Minor basalt, Dacite, Minor conglomerate, sandstone, shale and tuff.	4000 to 5000
Cretaceous	Valhalla Plutonics	Granite, grano-diorite	
Jurassic-Cretaceous	Nelson Plutonics	Granite, granodiorite, quartz diorite, quartz monzonite, Syenite, monzonite	
Permian and/or Triassic	Anarchist Group	Greenstone, quartzite, greywache, paragneiss, limestone	

(b) Metamorphic Rocks

The Anarchist Group of Permian and/or Triassic rocks are evident in scattered outcrops at and near the south end of Arlington lakes. On the north they are cut off by the Valhalla igneous rocks and on the west and south by the Nelson plutonics.

The irregular contact of the older rocks extends northerly through the Elk 2, 3 and 7 claims.

On the Elk 7, the rocks are fine- to medium- grained hornblendite and pyroxenite. Magnetite is evident throughout, in finely disseminated grains and bunches and in fracture fillings and thin bands.

On the northern part of Elk 3 the rock is light grey-green, weakly foliated with very fine flakes of white mica evenly disseminated throughout, and some chlorite and scattered grains of magnetite. It is considered to be an altered dacite.

On the Elk 2 the rock is predominantly a greenish black fine-grained hornblende with magnetite, some epidote and finely disseminated chalcopyrite. The copper mineralization is evidenced on the outcrops by weak malachite staining.

No thin section studies have been made since the mineral composition is evident by megascopic examination. From Arlington Mountain, east and up the hillside from the Elk claims, however, L. Reinecke (1) reported for the hornblende; 90% hornblende with magnetite, titanite, biotite, and plagioclase. From the same location he reported for the pyroxenite; 90% augite and secondary hornblende along with magnetite, apatite, titanite, and epidote.

The Anarchist rocks have been warped, fractured, and cut by dykes associated with Valhalla, Nelson or younger intrusives.

Pyrite and chalcopyrite occur near the contact with the dykes, in and adjacent to shear zones, and in small irregular disseminations within the apparently massive phases of these basic rocks.

Specimens representative of the Anarchist Group on the Elk claims area are shown on the accompanying map as S7, S8, S12 to S18 inclusive.

S7 and S8 are greenish grey fine-grained dacitic rocks, containing magnetite in granules and fine fracture fillings, foliated somewhat, slightly micaceous and cut by thin calcite stringers.

In contrast, S12 to S18 are black fine-to medium grained hornblendite and pyroxenite.

There is disseminated chalcopyrite in S12, S14, S17 and S18, and an elliptical zone $\frac{1}{2}$ inch long in S12 is composed of very finely disseminated pyrite and chalcopyrite edged with malachite.

Chalcopyrite is associated with a $\frac{1}{2}$ inch quartz-feldspar vein in S10.

(c) Igneous Rocks

Most of the claims area is underlain by igneous Nelson and Valhalla rocks.

The contact crosses the south end of Arlington lakes and swings north paralleling the west side of the valley through the Elk 12 claim.

Hence the west half of the claims area is underlain by Nelson plutonics and the northeast quadrant by Valhalla granite. Dykes of Tertiary andesitic and felsitic material have been intruded into both the Nelson and Valhalla plutonic rocks.

The exposures of Nelson plutonic rocks on the Elk claims area are uniformly light grey biotite-hornblende granodiorite, fine to medium grained, and near the contact with the younger Valhalla intrusives and zones of shearing, weakly foliated.

The Nelson plutonics are classified as late Jurassic or early Cretaceous. Megascopic examination of numerous hand specimens suggest an average composition of 50 to 55 percent plagioclase feldspar, 5% potassium feldspar, 20 to 25 percent quartz, about 20% biotite and hornblende with the biotite usually more abundant, and minor accessory sphene, apatite and magnetite.

Strong shear zones, most of which contain irregular veins of white quartz, are mineralized with pyrite, chalcopyrite, molybdenite, and lesser pyrrhotite, magnetite and copper and iron-carbonates and oxides.

The Valhalla plutonic rock exposures on the Elk claims area are limited because of the large percentage of the surface being covered by lakes, swamp, valley sand and gravels and glacial till. The limited exposures are similar in most respects and are classed as medium- to coarse-grained granite.

Megascopic examination of hand specimens indicate an average composition of 30% cream to pink potassium feldspar, 35% light grey plagioclase feldspar, 30% glassy quartz in coarse grains and 5% biotite and other accessory minerals. Generally the rock has a flesh to pinkish colouration and a smooth weathered surface. No foliation or sulphide mineralization is evident on the property within the Valhalla granite.

Both Nelson and Valhalla plutonic rocks have been intruded by small scattered dykes of aplitic to pegmatitic composition, and lesser dark andesitic lamprophyres, all representative of the final respective intrusive phases. In addition, the Jurassic-Cretaceous plutonics are intruded by lesser syenitic, felsitic and andesitic dykes associated with the Tertiary volcanics lying to the west of the property.

(d) Volcanic and Sedimentary Rocks

On the west boundary of the Elk 1-12 mineral claims, and extending from the 3,800 level up and over the 5,738 foot top of Nipple Mountain, there is a thick cover of Tertiary volcanic rocks.

The rocks are chiefly lavas composed of augite andesite, hornblende andesite and dacite, ranging in colour from black to brown and red.

There are also limited deposits of conglomerate, sandstone, shale and tuff. These rocks are not known to contain mineral deposits.

These rocks have been classified as Paleocene, Eocene and Oligocene and have been referred to as the Nipple Mountain and Curry Creek series.

No outcrop of these series has been observed on the Elk 1-12 property.

3. Structure

The Anarchist group is represented by highly metamorphosed igneous rocks wedged in a small area between the Nelson and Valhalla intrusives.

The pyroxenite hornblenditic and dacitic rocks are not considered to have appreciable lateral or vertical extent.

The Nelson granodiorite is foliated irregularly near the contact with the younger Valhalla granite. It is also traversed by numerous shears and fractures trending northwest to westerly, some of which are mineralized with copper and molybdenum in quartz veins and altered wall rock.

The Valhalla granite appears to be unaltered and unmineralized, with few zones of shearing.

4. Mineral Showings

In the general area of Arlington lakes there are reported occurrences of copper, molybdenum, tungsten and asbestos.

On the Elk 1-12 claims area there are showings of copper and molybdenum, and at several locations limited work has been completed on the mineralized zones.

A shaft and adit tunnel have been driven on a 4 to 6 foot quartz vein on the Elk 2 and 4 claims. Neither workings is accessible for examination, but quartz on the shaft dump contains molybdenite.

The strongest mineralization was noted in quartz which contains stringers or inclusions of granitic material. The molybdenite ranges from small specks to rosettes up to one inch across. The granodiorite wall rock is foliated and pyrite is evident in places.

Overburden is heavy and the extent of the deposit is not evident.

82 E/NW
-5

Seven hundred feet due south, near the boundary of the Elk 2 and 4 claims, there is an 8-foot open pit on a quartz vein containing pyrite and chalcopyrite. The quartz vein strikes north 35 degrees east and dips 75 degrees northwesterly.

82E/NW-6

About 200 feet east of the adit tunnel there is disseminated pyrite and chalcopyrite in hornblendite.

On the Elk 3 claim there is pyrite and chalcopyrite in fine disseminations and in quartz-calcite stringers within hornblendite on the east side of a railway rock cut.

82E/NW
-38

Similarly, on the Elk 7 claim to the north there is chalcopyrite in hornblendite exposed in road rock cuts and along the eastern lakeshore.

82E/NW
-4

G. SUMMARY AND CONCLUSIONS

A geological survey of the Elk 1-12 mineral claims was conducted by establishing a series of chain and Brunton compass survey lines over the property, using roads and the Kettle Valley branch of the Canadian Pacific Railway as base lines. From these lines, outcrops and other features were tied in by pace and compass.

The outcrops encountered were sufficient to establish reasonably well the locations of the contacts between the Anarchist metamorphic rocks and the Nelson and Valhalla intrusives. Copper and molybdenum mineralization was encountered, along with old exploratory workings, and these are shown on the accompanying map.

It is concluded that the copper and molybdenum mineralization exposed to date is confined within the Anarchist metamorphic and Nelson igneous rocks, particularly near the contact phases with the Valhalla granite, and that additional investigations are warranted.

H. RECOMMENDATIONS

It is recommended that additional work be carried out on the Elk 1-12 mineral claims, as follows:

1. Clear and open up the old workings and showings.
2. Conduct geophysical investigations over selected areas to locate and outline presently indicated zones of mineralization.
3. Conduct geophysical investigations over selected areas which are considered favourable for the occurrence of mineralized zones but are masked by overburden, water or swamp.

Details and estimated time and cost factors can be made when a decision is reached regarding the extension of the exploration programme over the considerable area of adjoining ground held by Durocop Mines.

Respectfully submitted,

ALLEN GEOLOGICAL ENGINEERING LTD.

Per Alfred R. Allen P.Eng.
Alfred R. Allen

Vancouver, B.C.

December 15th. 1970.

REFERENCES

1. Reinecke, L. : Ore Deposits of the Beaverdell Map
Area: G.S.C. Mem. 79 (1915)
2. Minister of Mines of B.C. Reports 1901 - 1960
3. Map #15-1961, G.S.C. Kettle River, 82E (W)

* * * * *

ALFRED R. ALLEN

EXHIBIT "A"

December 30th. 1970.

GEOLOGICAL SURVEY

A geological survey was conducted over the ELK 1-12 mineral claims in the Arlington Lakes area, near Beaverdell, Greenwood, M.D.

The area was traversed by chain and Brunton compass and pace and compass traverses were also used. All traverses were tied into the bench marks and mile posts on the Kettle Valley line of the Canadian Pacific Railway at Lakevale.

The following expenditures were made:

Alfred R. Allen, P.Eng., Field work, supervision, report, Nov. 1-3 incl., 8,9, Dec.29-31 incl.	\$1,050.00
M. Mooney, Graduate geologist, Field work, Nov. 9-15 incl.	360.00
F. Madge, prospector and assistant, Field work, Nov. 10-11 incl.	125.00
Supplies, transportation, equipment rental, maps, reports,	311.55
	<u>\$1,846.55</u>

Declared in the
City of Vancouver
Province of British Columbia
this 6th day of January 1971

J.P. Phelps Registrar
Alfred R. Allen
in British Columbia or
Substituted Records

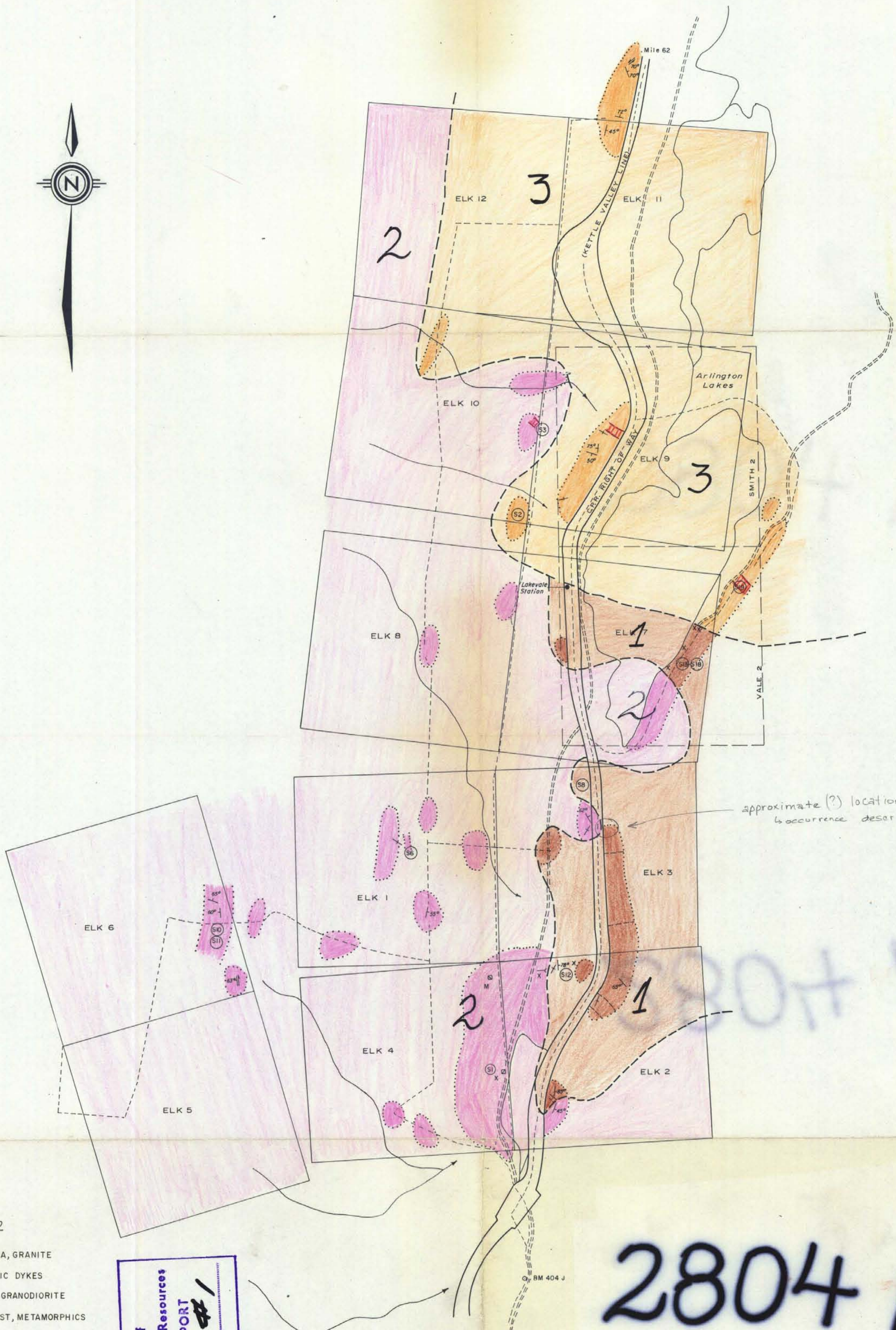
GEOLOGICAL SURVEY

ELK 1-12 MINERAL CLAIMS

Greenwood M.D.

SURVEY PARTY

A.R. Allen, P.Eng. Geological Engineer, Vancouver, B.C.
M.G. Mooney, Graduate geologist, Osoyoos, B.C.
F. Madge, Prospector and assistant, Beaverdell, B.C.



approximate (?) location of 82E/NW-38.
to occurrence described in rept.
Jan. 10/75.

LEGEND

- 3 VALHALLA, GRANITE
- ANDESITIC DYKES
- 2 NELSON, GRANODIORITE
- 1 ANARCHIST, METAMORPHICS
- Chain & Compass Traverses
- ⊙ Specimen Location
- x Copper
- M Molybdenum
- 60° Shearing
- 45° Jointing
- ⋯ Areas of Rock Outcrops
- Roads
- Shaft
- Adit Tunnel
- ~ Geological Contact

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 2804 MAP #1

2804 M-1

DUROCOP MINES LTD. N.P.L.	
GEOLOGICAL SURVEY	
82E/11E ELK 1-12 CLAIMS GREENWOOD M.D., B.C.	
Ft. 500 0 500 1000 Ft. SCALE IN FEET	
DRAWN BY A.R. ALLEN & M. MOONEY	DATE JAN 6, 1971
CHECKED BY A.R. ALLEN	DRAWING No. D-1
ALLEN GEOLOGICAL ENGINEERING LTD. <i>A.R. Allen</i>	