

4461

GEOLOGICAL AND GEOCHEMICAL REPORT

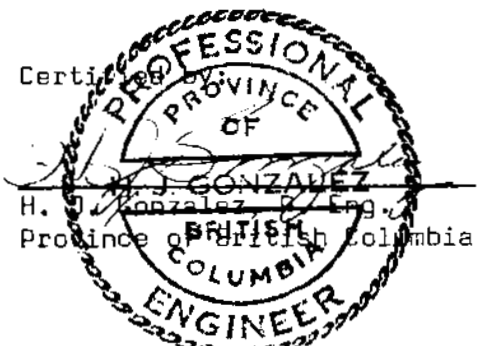
on the

LAKEVALE PROPERTY

Arlington Lake Area, B.C.

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO 4461 MAP

15 June, 1973



Expiry Date: January 4, 1974

GEOLOGICAL AND GEOCHEMICAL REPORT

on the

LAKEVALE PROPERTY

being Mineral Claims DKD 1 - 6 and BRU 15 - 23

Claim Sheet No.
82E/11E(M)

ARLINGTON LAKE AREA

Greenwood Mining Division, B.C.

49° , 119° NE

Owner of Claims

K. F. Brunning

Report by:

D. C. Mitchell

Work completed between 1 May and 7 May, 1973

15 June, 1973

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INTRODUCTION

On behalf of the owner of the Lakevale Property, Mr. K. F. Brunning, a geochemical soil survey and geological mapping were carried out, between May 1 and May 7, by the author. The programme was designed to give a better indication of the potential of the property and to delineate areas of interest.

PROPERTY

The Lakevale Property consists of 15 recorded mineral claims, as listed below.

<u>Claim</u>	<u>Record Numbers</u>
DKD 1 - 6	34308 - 34313
BRU 15 - 23	35973 - 35981

OWNERSHIP

The property is owned by Mr. K. F. Brunning of Calgary, Alberta.

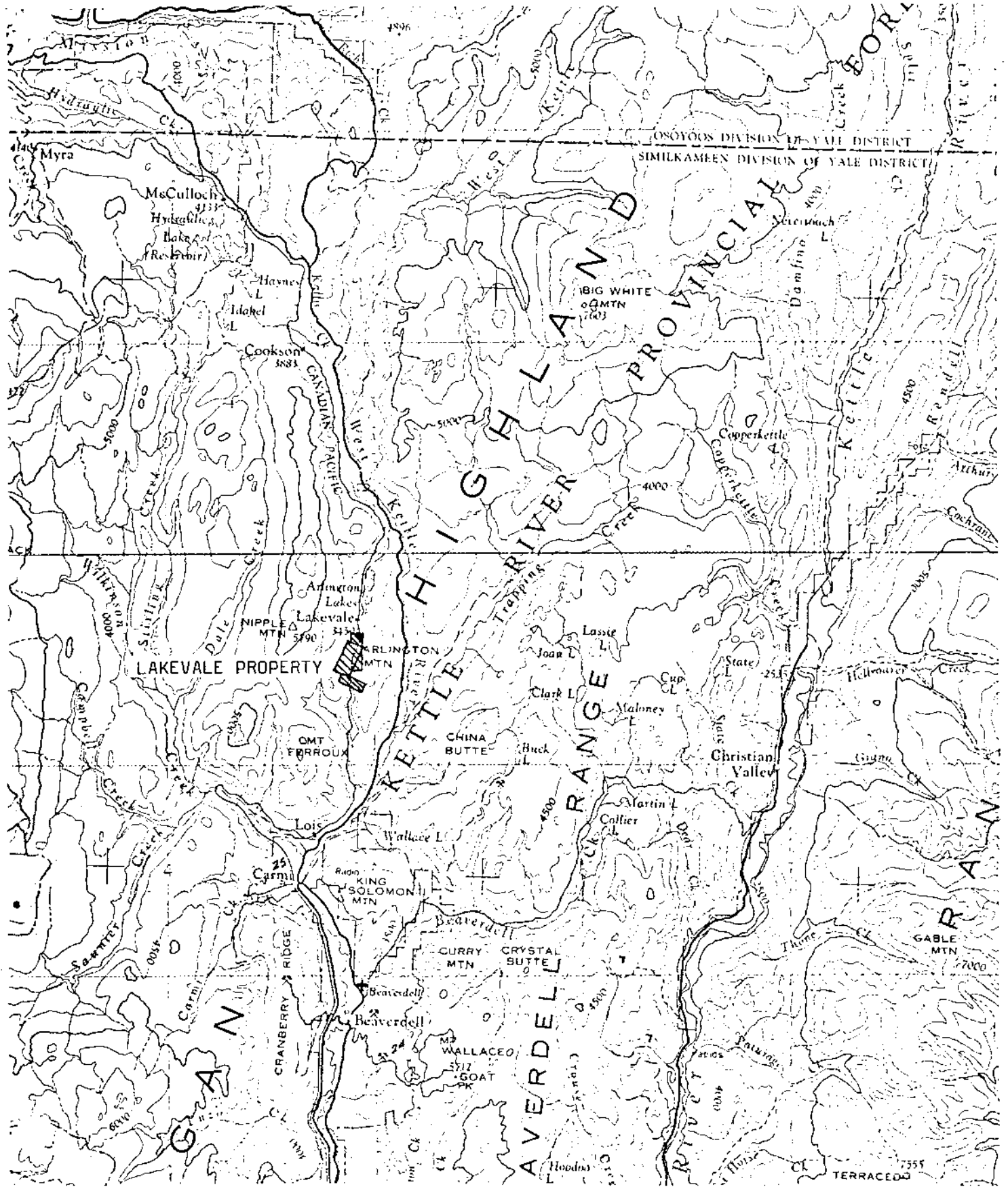
LOCATION AND ACCESS

The claims are located along the Kettle Valley railroad immediately south of Lakevale Siding for a distance of approximately one and one-half miles.

Access is from the main Kelowna - Rock Creek Highway, 35 miles from Kelowna, 3 miles on a poor wagon road to Lakevale Siding.

HISTORY

The locality around the property has been prospected since the early nineteen hundreds when activity spilled over from the Beaverdell and Carmi camps close by. Several shafts, pits, and adits have been excavated on quartz veins and mineralized showings. Apart from a magnetometer survey carried out on behalf of the present owner, little or no work appears to have been performed on the claims in recent years.



4461-M3

GEOLOGICAL SETTING

REGIONAL GEOLOGY

The oldest rocks in the area are mostly tuffaceous greenstones belonging to the Anarchist group, locally known as the Wallace group. They tend to be infolded and ingested into the surrounding intrusive rocks. The oldest intrusives in the district are diorite and quartz diorite in varying stages of metamorphism, correlated with the Nelson intrusions. The younger intrusive, known regionally as the Valhalla Intrusions and locally as the Beaverdell Batholith, is a uniform porphyritic granite. All these rocks are overlain in the higher parts of the district, especially the north west, by tertiary basalt.

<u>Age</u>	<u>Group</u>	<u>Lithology</u>
Tertiary		Basalt
Mesozoic	Valhalla (Beaverdell Batholith)	Porphyritic granite
Mesozoic	Nelson Intrusions	Diorite, Quartz diorite
Paleozoic	Anarchist (Wallace)	Greenstone

Mineralization in the district takes three general forms:

1. vein deposits in the Nelson diorite, of the type which have been productive at Beaverdell and Carmi, usually carrying high values in lead, zinc and silver.
2. replacement deposits in the Wallace greenstones usually small lowgrade concentrations of copper, silver and trace gold.
3. low grade disseminations of copper in both the Wallace group and the Nelson Intrusives. There appears to be good potential for the discovery of commercial tonnages of ore in any of these three types of mineralization.

PROPERTY GEOLOGY

The Lakevale property is underlain by four distinct rock types, with variations within these types due to the degree of alteration present.

1. At the south end of the property along the railway tracks, several outcrops of what is considered to be Anarchist greenstone, were observed. The rock is darkgreen and almost glassy with remnants of what may be tuff particles, additional silica, frequent epidote veins and occasional pyrite cubes.

2. Diorite and quartz diorite are the most common rocks on the property. They are fairly variable in character due to the amount of alteration they have undergone. The diorite is always gneissic with the degree of banding being variable from quite tight to fairly broad. The most common variety of this rock is grey pink in color, tightly gneissic, fine grained, containing approximately 85% plagioclase feldspar, $\pm 5\%$ quartz and $\pm 10\%$ dark minerals, the dark minerals being biotite and hornblende. Alteration of the diorite becomes apparent as one approaches its contacts with greenstone or similar rock and close to major shears. The alteration involves a tightening of the gneissosity, more intense fracturing and shearing, chloritization, silicification and sometimes serpentinization, with fracture and shear filling by quartz, K feldspar and epidote. This altered diorite is the most common host for copper mineralization and quartz veins.

3. The eastern side of the property is cut in a north-south direction by a dyke or sill like body of intensely altered basic rock. This rock has been mapped by the G.S.C. as greenstone belonging to the Anarchist Group. In the opinion of the author, this body has invaded the dioritic rocks as a dyke or similar intrusive. This opinion is supported by the cutting relationships of the body with the diorite and the degree of alteration of the diorite in proximity to it. The rock is generally a dense dark green flaky chlorite biotite hornblende schist, frequently containing magnetite, pyrite and chalcopyrite as accessories. Whenever encountered these rocks were strongly fractured and frequently brecciated with quartz, K feldspar and epidote breccia filling and veining. There are also some zones of hornblendite within the body.

4. Tertiary basalt is limited to the western edge of the DKD claims, it overlies all the other rocks on the high ground in this part of the property. The basalt is a uniform, buff coloured, vesicular, aphanitic rock.

Structurally the rocks underlying the claims strike in a northeasterly direction and dip fairly steeply to the east or are vertical. Several linaments were observed trending at 130°. These probably indicate the presence of lateral faulting. No displacement could be determined. Several faults are exposed in railway cuttings striking in roughly the same direction as the linaments. Quartz veins are commonly associated with the lateral faults and shears.

Mineralization occurs on the property in three forms:

1. chalcopyrite, sphalerite, galena and molybdenite in quartz veins cutting altered diorite. Several of these veins were found near the north end of the beaver pond.
2. disseminations and replacements of chalcopyrite, pyrite and specular hematite in and around shear zones in altered diorite and greenstone. This type of mineralization is the most common and most promising on the property and assays of up to 2% copper have been encountered over narrow widths. It has been observed in several locations scattered over the property (see Fig. 1).
3. disseminations of magnetite, pyrite and chalcopyrite in highly altered basic rocks. This type is not as common as the other, of a low grade nature and is confined to the north-south striking dyke like body on the east side of the property.

GEOCHEMICAL SAMPLING AND ANALYTICAL TECHNIQUES

Control for the survey was established along the BRU 15-20 claim line, by chaining it out and marking it at 200' intervals. Traverse lines were run perpendicular to the control line at 750' intervals. Samples were taken at marked stations at 200' intervals along traverse lines.

Soil samples were taken by digging a hole approximately 6" deep with a small pick, then sampling where possible the red brown "B" soil horizon, or other as noted where no "B" was available.

Samples were analyzed in a field laboratory by means of the Bloom test for exchangeable heavy metals (see appendix II for procedure). The method is fast and inexpensive but only acts as an indicator to the presence of heavy metals. It is neither qualitative nor quantitative. Results were checked by running frequent repeat analyses.

INTERPRETATION OF GEOCHEMICAL RESULTS

Because of the inexactness of the analytical method, a background and anomalous threshold have been established by inspection only. The background was chosen at 2 milliliters of dithizone and anything at 5 mls or above was taken to be anomalous. These limits must be taken with some degree of flexibility and not as absolute.

At least one rather indefinite anomalous zone is evident in the centre of the DKD claims. This anomaly may be due to several small metal concentrations in the underlying rock or a wide spread build up. The latter choice seems more likely because of the continuity along strike. The zone is 4000' long and 1000' wide at its widest point. There are four other small, 1 to 3 sample anomalies which have no apparent lateral extent. These are probably due to veins or small occurrences. The most interesting is in the north east corner of BRU 20 since it could have some continuation off the claims. Most of the geochemically anomalous results should be followed up in order to determine the type and amount of heavy metal concentrations.

CONCLUSIONS AND RECOMMENDATIONS

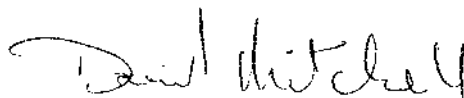
Geological mapping and geochemical soil sampling on the Lakevale Property both reveal favourable conditions for the presence of economic mineralization. A strongly altered gneissic diorite was found to host copper mineralization and quartz veins at several locations on the claims. This geological environment appears very favourable for the occurrence of economic deposits of copper of both large low grade and higher grade vein or replacement type which may also carry values in precious metals. A similar environment prevails at other productive and near productive camps in the district. The geochemistry, although not conclusive, indicates one major zone and several smaller zones of metal concentration in the soils and are definitely worthy of follow-up.

It is recommended that further more detailed soil sampling and mapping be carried out in and around the zones of interest outlined by this survey and that geochem highs uncovered by the detailed work be trenched in order to confirm their cause. If this follow-up programme is successful, then induced Polarization should be considered as a method for developing drill targets.

The cost of the proposed follow-up programme would be:

Wages for 2 samplers and Geologist	
10 days @ \$220/day	\$ 2,200
Sample analysis	
150 samples @ \$2/determination	300
Maintenance	
21 Man days @ \$15/day	315
Travel	100
Supervision and report preparation	1,000
	<hr/>
Total	\$ 3,915
	<hr/>

Respectfully submitted,



APPENDIX I

DETAILS OF EXPENDITURES

1. Wages -	
P. W. Mowat, Sampler, 928 Mapledale Pl. S.E., Calgary 30, Alta.	
8 days @ \$35/day	\$ 280
D. Ellison, Sampler, R.R.2, Kelowna, B.C.	
7 days @ \$35/day	245
D. C. Mitchell, Geologist, 928 Mapledale P. S.E., Calgary 30, Alberta	
7 days @ \$150/day	1,050
	<hr/>
	1,575
	<hr/>
2. Sample Analysis -	
170 Heavy Metal Determinations @ 0.50	85
3. Truck and Camper Rental	
7 days @ \$25/day	175
4. Maintenance (Food, etc.)	
21 Man days @ \$10/man day	210
5. Gas and Oil	40
6. Report Preparation and Supervision	1,000
	<hr/>
	1,510
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	\$ 3,085
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APPENDIX II

HEAVY METALS IN STREAM SEDIMENTS

BLOOM TEST FOR EXCHANGEABLE HEAVY METALS

Field equipment and apparatus (1 Kit)

- 1- field kit (Leather or canvas)
- 1- 100 ml graduate cylinder - pyrex
- 6- pyrex test tubes - calibrated
- 1- 250 ml brown plastic bottle
- 3- 250 ml plastic wash bottles
- 1- 2 liter plastic bottle - Bloom buffer
- 6- polyethylene stoppers
- 1- volumetric scoop - approx. 0.25 gm
- 1- stainless steel spatula

Field Chemicals required:

- 2 liters prepared Bloom buffer
- 2 liters Benzene
- 10- 10 mg capsules Dithizone

Preparation of dithizone stock solution - 0.01%

Dissolve 10 mg (1 capsule) of Dithizone in 100 mls of Benzene.

Preparation of working dithizone solution - 0.001%

Dilute 1 part 0.01% dithizone stock solution with 9 parts clean Benzene.

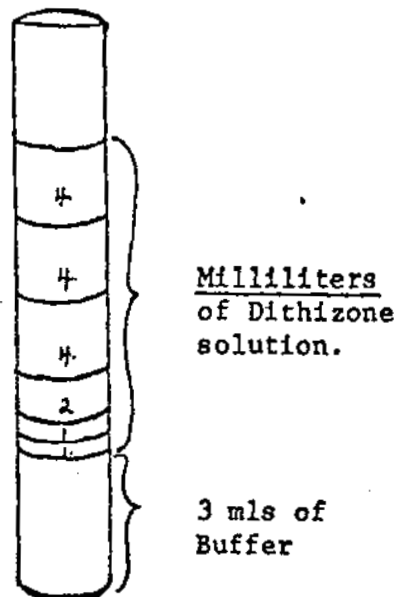
Note 1: Both 0.01% and 0.001% Dithizone solutions should be kept in dark containers. (e.g. Plastic bottles wrapped in aluminum foil.)

PROCEDURE:

1. Measure one scoopful of sample, leveled with spatula, and tap into marked test tube.
2. Add Bloom Buffer solution to 3 ml mark.
3. Add 1 ml. of 0.001% Dithizone in Benzene, bringing level to 4 ml mark.
4. Insert stopper and shake 50 times.
5. Allow Dithizone solution to collect at surface of liquid and observe color. If green, record 0; if blue, record 1; if red, proceed with step 6.
6. Add 1 ml more of 0.001% Dithizone solution, bringing the level to 5 ml mark and shake 15 times. If color is blue, record 2; if purple or red, repeat the shakeout adding Dithizone solution in increments of 2 mls, 4 mls, 4 mls, and 4 mls, until blue-grey end point is reached. Record total volume of Dithizone solution needed to reach blue-grey end point.

Note 2: One ml of the 0.001% Dithizone solution at the blue-grey end point is roughly equivalent to 2 parts per million exchangeable heavy metals (as Zinc). Total heavy metal content in samples may be as much as 20 times greater.

Note 3: As the Bloom buffer contains ammonium hydroxide, this solution should be kept separate from any pH paper.



CERTIFICATE

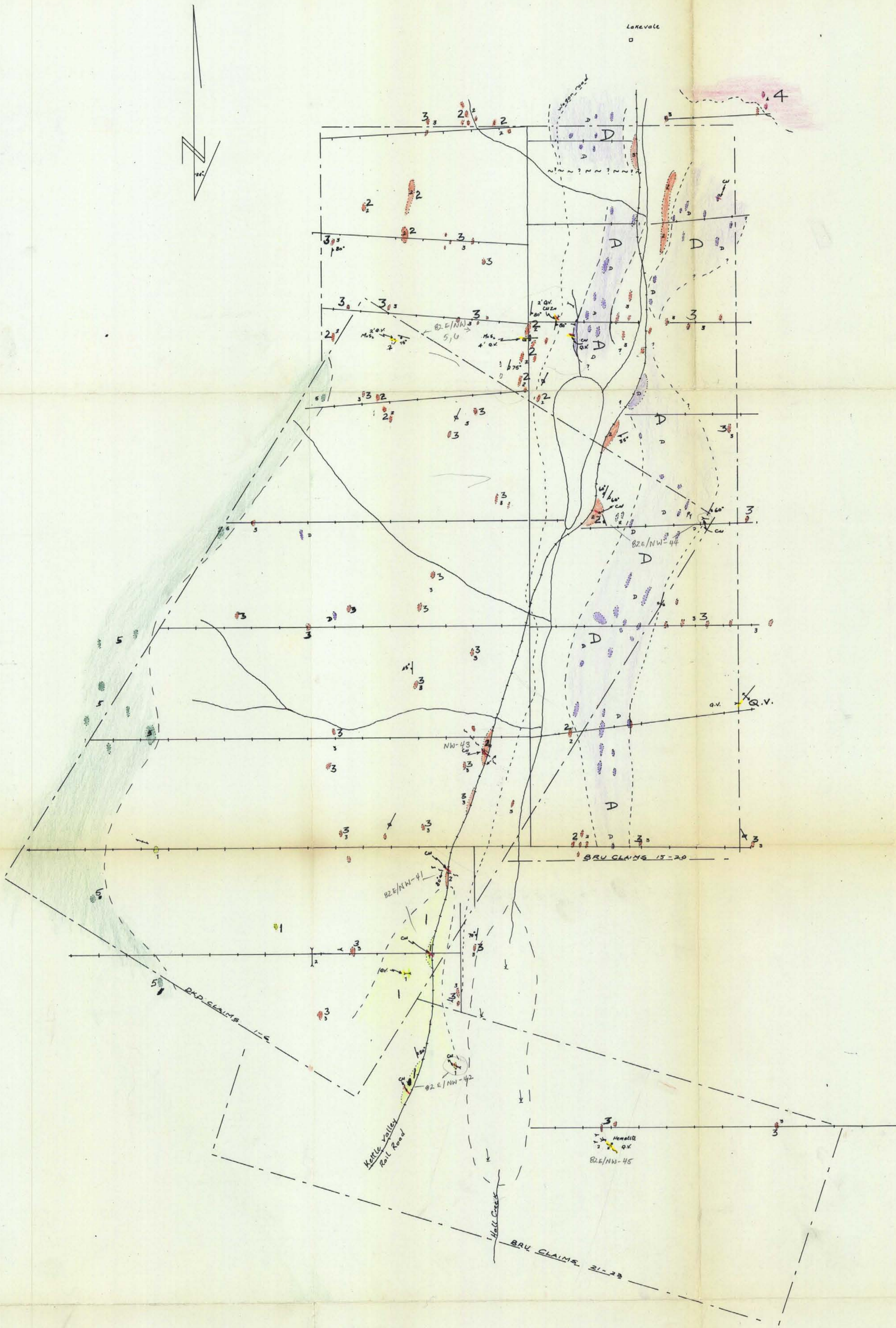
June 1, 1973

I, David C. Mitchell, of 928 Mapledale Place S.E.,
Calgary 30, Alberta, Canada, do hereby certify that

1. I am an independent Mining Exploration Geologist with registration pending in both Alberta and British Columbia.
2. I have had nine years experience in both mining and mining exploration in Canada and Southern Africa.
3. I am a graduate of Dalhousie University in Halifax, N.S. (B.Sc. geology, 1963).
4. I am a graduate of The Camborne School of Metaliferous Mining, Camborne, Cornwall, England. (D.M.T. geochemistry, 1965).
5. I was in charge of the work described in this report.

David Mitchell

Lakevale



LEGEND

- | | | | |
|----|--|-------|------------------------------|
| 5 | BASALT | ↖ | ATTITUDE OF JOINTING |
| 4 | VALHALLA GRANITE (BEAVERDELL BATHOLITH) | Y | ADIT OR PIT |
| 3 | MAINLY GNEISSIC, STRONGLY JOINTED QUARTZ DIOIRITE, FREQUENT QUARTZ FELDSPAR VEINING | ↘ | ATTITUDE OF GNEISSOSITY |
| 2 | ALTERED GNEISSIC DIOIRITE, GENERALLY STRONGLY CHLORITIC AND SILICIFIED SOMETIMES SERPENTINIZED | ↖ | ATTITUDE OF VEINS & CONTACTS |
| 1 | WALLACE GROUP, ALTERED TUFFACEOUS GREENSTONE | ↘ | ATTITUDE OF SCHISTOSITY |
| qv | QUARTZ VEIN | ↗ | FAULT OR SHEAR |
| D | CHLORITE BIOTITE SCHIST, USUALLY FINE GRAINED AND DENSE, MAY INCLUDE HOAR-BLENDED ZONES, FREQUENTLY CUT BY QUARTZ FELDSPAR AND EPIDOTE VEINS. MAY BE A DYKE OR OTHER ALTERED INTRUSIVE | --- | GEOLOGICAL CONTACT |
| | | - - - | CLAIM BOUNDARY |
| | | ○ | OUTCROP OUTLINE |

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4461 MAP #1

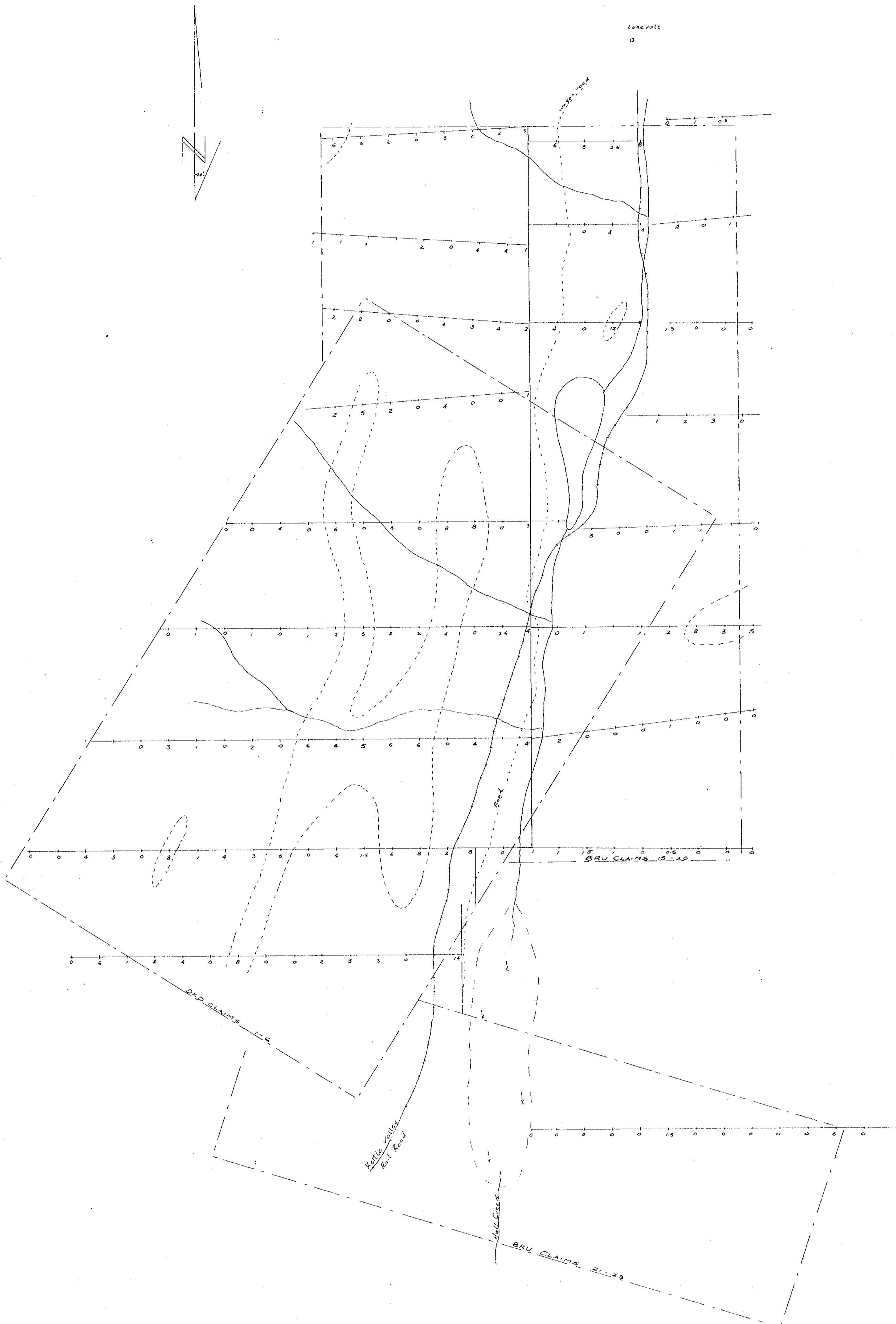
DKD 1-6 & BRU 15-23
CLAIMS
GEOLOGY MAP
Lakevale Area
Greenwood Mining Div.

SCALE: 1" = 400' DATE: JUNE 73 NTS 82-E-11

David Mitchell

FIG 1 To accompany geological and geochemical report by D.C. Mitchell on the Lakevale Property Arlington Lakes Area Greenwood Mining Div., dated 15 June 1973

4461-M1



LEGEND
 TRVERSE LINE
 SAMPLE STATION
 HEAVY METAL CONTENT
 IN MILLILITERS OF DITHIONITE
 CLAIM BOUNDARY

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 4461 MAP #2

DKD1-6 & BRU 15-23
 CLAIMS
 GEOCHEMISTRY MAP
 HEAVY METALS IN SOIL
 Lakevale Area
 Greenwood Mining Div.

SCALE 1"=400' DATE JUNE 73 NTS 82-E-11

Handwritten signature

FIG 2 To accompany geological and geochemical report by
 D.C. Mitchell on the Lakevale Property, Arlington Lakes Area
 Greenwood Mining Div., dated 13 June 1973

4461-M2