

GEOLOGICAL GEOPHYSICAL GEOCHEMICAL
REPORT

DAGO - OPEN CLAIMS

DAGO 1-10, 15-22; DAGO FR.; OPEN 16-25, 28

1 mi South of Aspen Grove, B.C.

($49^{\circ}55'N$ $120^{\circ}37'W$)

92H/15E

by
Charles A. R. Lammle P.Eng

for

WHITE RIVER MINES LTD. NDL

May 4 - July 25, 1972

3789

3789

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3789 MAP

GEOLOGY, SOIL COPPER AND GROUND MAGNETICS

DAGO - OPEN PROPERTY

Aspen Grove 92 H 15 B. C.

for

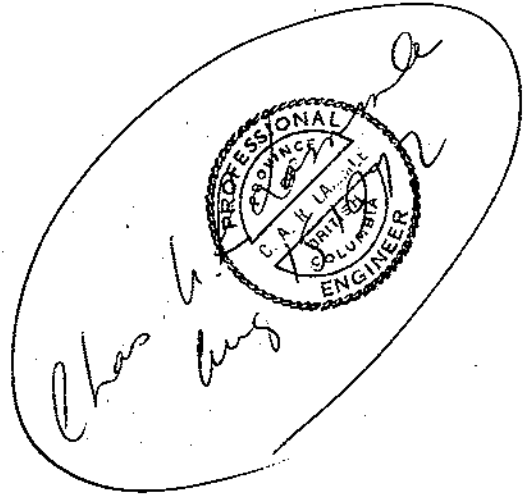
WHITE RIVER MINES LTD. (N.P.L.)

Vancouver, B. C.

by

Charles A.R. Lammle, P. Eng.

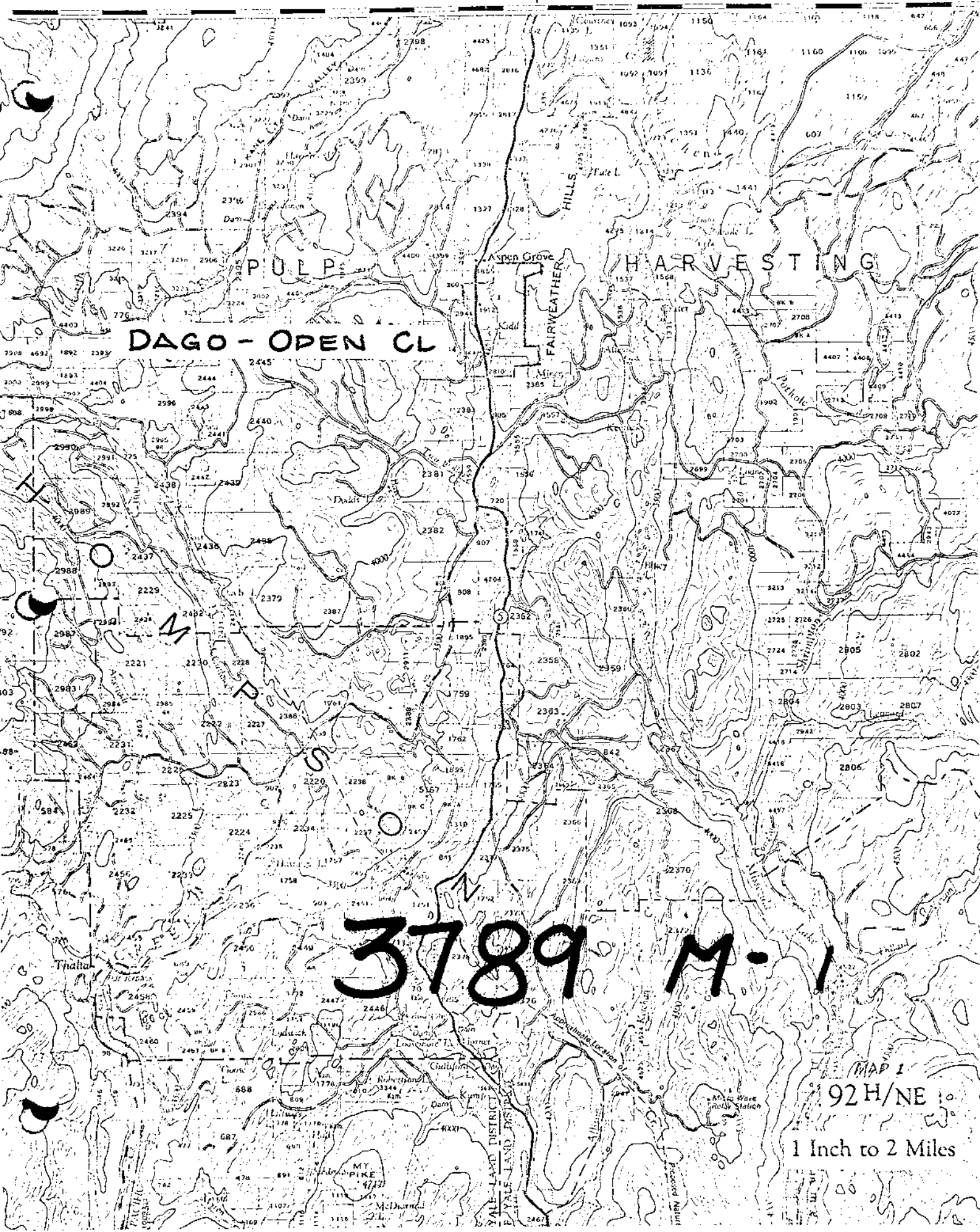
May 24, 1972



ATTACHMENTS

#1 & 4	MAP 1.	Location Map	92 H NE	W' = 2mi
#2 & 5	MAP 2.	Location Map	92 H 15	1: 50,000
#11	MAP 3.	GEOLOGY		1: 2400
#12	MAP 4.	SOIL COPPER		1: 2400
#13	MAP 5.	GROUND MAGNETICS		1: 2400
#3	Cumulative Frequency Distribution - Soil Copper			
#16	FIG 1.	Section 76 + 27N		1: 600
#15	FIG 2.	Section 72 + 56N		1: 600
#14	FIG 3.	Section 68 + 00N		1: 600
#6	FIG 4.	Section 80 + 00N		1: 1200
#7	FIG 5.	Section 61 + 52N		1: 1200
#8	FIG 6.	Section 59 + 45N		1: 1200
#9	FIG 7.	Section 55 + 48N		1: 1200
#10	FIG 8.	Section 51 + 40N		1: 1200

Diamond Drill Logs, Hole 72-1 to 72-14



3789 M-1

MAP 1
92 H/NE
1 Inch to 2 Miles

Department of
Mines and Geology Resources

ASSESSMENT

NO. **3789P87E**

Department of
Mines and Geology Resources
Alaska Department of
no. 3789 #2

S-M P87E

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ATTACHMENTS:	

Fig. 1 Cumulative Frequency Distribution - Soil Copper

Map 1	1" = 2 mi.	Land Pre-emption Map
Map 2	1: 50,000	Location Map
Map 3	1: 2,400	Geology
Map 4	1: 2,400	Soil Copper
Map 5	1: 2,400	Ground Magnetics

May 24, 1972

Charles A.R. Lammle, P.Eng.

GEOLOGY, SOIL COPPER and GROUND MAGNETICS

DAGO - OPEN PROPERTY

Aspen Grove 92 H 15 B. C.

INTRODUCTION

During May, 1972, I was commissioned by WHITE RIVER MINES LTD., Vancouver, B. C., to carry out a preliminary exploration program on its optioned DAGO - OPEN property, Aspen Grove, B. C. Work carried out under this program consisted of the first phases of recommendations made in my preliminary Geological Report (April 30, 1972) on the property and included the following:

1. Preliminary chain and compass boundary survey
2. Line cutting - 14,3 miles
3. Geochemical Sampling - 12.2 miles, 642 samples
4. Magnetometer Survey - 13.5 miles
5. Geological Survey & Supervision, 3 weeks.

In addition to the above work, an induced polarization survey was contracted out late in the month to Seigel Associates, the results of which are not yet available, and a partial Worden Gravimeter survey was contracted to CHARLES A. AGER, Geophysicists.

The purpose of this report is to describe the surveys so far completed and their results. Conclusions and recommendations based on the work to date will be drawn and presented for consideration.

SUMMARY

Geological, soil copper and ground magnetic surveys on Dago - Open property have outlined attractive geochemical and magnetic features north - northwest of, and along strike with the previously uncovered chalcopyrite - bornite - chalcocite showing. Bedrock along this NNW extension is obscured by overburden but favourable rock types and suspected structural features project into the area. In addition a strong induced polarization chargeability with concomitant low resistivity have been detected in a north to NNW trending belt coincident with:

- (a) Soil copper anomaly 1400' x 500' (4 times background of 70 ppm) in an area of relatively low gravimetric readings
- (b) Similar north trending ground magnetic low, apparently colinear with relatively high gravimetric readings
- (c) Very promising lithological, structural and mineralization projections.

It is concluded that the exploration results and correlations so far obtained are very intriguing and encouraging. Continuation of the first phase program up to and including diamond drill testing is warranted and necessary under the circumstances.

CLAIMS

(See location map for approximate perimeter of claims)

The property as outlined by staking configuration sketches consists of the following claims:

Claim	Tag	Record	Record Date
DAGO 1-10	-	50609 - 618	Nov. 15, 1971
DAGO 11-22	316861M-872M	-51918 - 51929	*Apr. 18, 1972
OPEN 1-35	220283M-317M	50153 - 187	Sept. 29, 1971
Dago 23-34		52738 - 749	May 12, 1972
Dago Fe.	* Staking Date	52543	May 17, 1972

*Recorded
(April 25, 1972)*

*(not in agreement)
L.L.*

During the course of my work I examined and preliminarily surveyed many of the claims, and all appeared to conform with regulations set out in the B. C. Mineral Act. However, because of the long and keen competition for mineral rights in the area, the state of the Mining Records map, it is impossible to obtain optimum acreage per claim in the area, and the actual ground held by located claims can only be found by completely surveying all bounding claims of adjoining properties. The Open Claims, staked to cover a narrow strip of open ground, cover less ground than the number of claims would indicate. The Dago claims are relatively well staked. The Dago 11-22 on the west side of the Highway is a staking of an area shown on the Recorders map to be staked, but as there are no posts along the line supposedly claiming this area, I must conclude the earlier staking - or the absence of it - to be invalid, and that the Dago staking unquestionably holds the mineral rights.

I have only surveyed the claims pertinent to this report, i.e., those claims shown on Map 3 attached.

The old Copper Queen mineral property of David Minerals nearby to the north has been let to Frontier Explorations under an option-to-purchase arrangement, and that company in turn has let a working option to Amax Explorations, Inc. Rio Tinto have a working option on the Blue Jay property further north. Bethlehem Copper Corporation are continuing their "Copper Belt" program on several large blocks of claims to the north and east of the area. In addition, Pyramid Mining, Alscope Consolidated, Payco Mines, Adonis Mines and other companies and individuals hold properties nearby.

LOCATION AND ACCESS

(Location Maps, 92 H 15, 92H/NE)

The property spans B. C. Highway 5 at Kidd Lake, immediately south of Aspen Grove, B. C. The showings are on the west central slopes of Fairweather Hills which are low rolling grass-land and forested hills of this portion of Thompson Plateau. Several old logging-ranching ~~access~~ roads provide access to much of the ground. Highway distance to Merritt is 20 miles; Princeton, 40 miles.

B. C. Hydro power transmission line passess immediately east of the property. Douglas Lake Cattle Company and other ranches hold grazing rights on surveyed land lots in the area.

HISTORY AND PREVIOUS WORK

Aspen Grove and Bates Camp area were extensively prospected in the first decade of this century. Abundant old open cuts, shallow shafts, short adits, Crown Granted Claims and abandoned cabins attest the efforts made at that time in the search for high-grade shipping ore. Higher metal prices and low-grade open-pit mining methods has led to a great deal of modern geotechnical search in the area in the last 15 years. Despite this work there has been negligible production from the area.

Area immediate to the north and south of the area surveyed and described herein have been subjected to geochemical and geophysical work, but to my knowledge the Dago - Open grid area was not previously tested in this way. I understand that the first material work on the area was the wintertime prospecting efforts of Mr. Ed Tancowny, and the trenching of the area by Mr. John Tancowny in April, 1972. In late April, I did preliminary geological work on the area and reported on the work to that time.

REGIONAL GEOLOGY

(G.S.C. Me. 243, 249)

Aspen Grove area of the interior copper belt is underlain by the economically important Upper Triassic Nicola Group which locally consist of effusive and clastic volcanic rocks with minor intercalated marine sediments. Occasional thin lenses of biohermal limestone occur in the submarine succession, and at times near the submarine - subaerial interface. During this time of volcanism the volcanic assemblage was invaded by stocks and batholiths, and the rocks yielded to these intrusions by faulting and folding along northerly and northeasterly axis.

Younger rocks - Jurassic Spence Bridge Group and Tertiary coal measures and lavas - overlie unconformably, in turn.

Two major faults - Allison and Summers Creek faults - project into the area, the former like^{ly} projects into Kidd Lake, the latter along the valley of Mizzezula Lake. Quichena fault projects from the north along Alleyne - Kentucky Lakes and may link with a strand of Summers Creek fault. There is a great deal of subsidiary longitudinal and transverse faulting between the major faults.

A variety of copper occurrences are associated with some of the faults, with some individual strata of the Nicola Group, and with granitic rocks intrusive into the group.

LOCAL GEOLOGY

(Map 3, 1"=200', attached)

On the mapped portion of the property, Nicola Group rocks are made up of pyroclastic breccias and flows of basic andesites and basalts, and sediments intercalated consist of limy andesitic graywacke and tuff, gray coralline limestone and minor argillite. Generally, sedimentary rocks increase in relative proportion to the west (as far as the highway, at least). General attitude of the strata is N. 20°W./75°E.N.E. Assuming a normal top-side-up succession, the older rocks would be the sedimentary rocks. Rock types are briefly described below in this assumed order of decreasing age:

ROCK TYPES

Tuff, Limestone, Graywacke

The tuff consists of fine to medium grained, thin bedded to laminated lithic-crystal tuffs with individual bedding planes sometimes accentuated by ironoxides; the limestone consists of light to dark gray, relatively fresh corraline limestone, occasionally skarned but not recrystallized, of a thick bedded lensy character, undoubtedly a thin reef-like deposit. Volcano-clastic material falling into limy ooze and mud has in places created nicely preserved corals whose interpolyp spaces has been infilled with tuff, and in other places

a distinctive coarse breccia healed by lime. Graywacke consists of fine grained, thin bedded tuffaceous graywacke grading on a couple of occasions to laminated black argillite.

Limy Andesite

These rocks consist of dark coloured medium grained clastic rocks with a carbonate matrix. Gray limestone and some graywacke occur in the unit.

Gray-Green Andesite Breccia

Gray to dull green coloured pyroclastic breccias having a great diversity of fragment content and size; matrix and fragments alike have a general andesitic composition; frequent epidote - carbonate slips and fracture fillings.

Purple, Pyroxene Basalt

Mauve to dull purple amygduloidal basalt studded with dark green, medium to coarse pyroxene crystals and carbonate-epidote-zeolite amygdules; apparently separated from gray-green breccia by inferred arcuate fault (possibly an unconformity).

Dacite and Black Andesite - Diorite Breccia

The dacite is an aphanitic to fine grained brown weathering feldspathic rock; the andesite diorite breccia

consists of rounded to angular volcanic and light coloured granitic fragments set in a black matrix. The two principal areas of dacite are marginal to the breccia. Outcrop distribution and skarning in limestone suggest an intrusive character for this rock unit. It is possible that these rocks compose a pipe-like breccia.

Maroon Breccia

These maroon coloured pyroclastic breccias of general andesitic composition apparently overlie previously described units (except the purple basalt) unconformably and form a late capping. If this is the case, these rocks likely correlate with the Jurassic Spence Bridge Group.

STRUCTURE

The structure appears to be a relatively simple homocline with attitude N. 20° W./ 75° E.N.E. Regionally the area would be on the west limb of a north trending syncline. The major northerly Allison fault likely projects into Kidd Lake. TWO longitudinal faults of subordinate character have been mapped at 50 N., 7 +60 E. and 19 N., 8 W. coordinates in hundreds of feet. The inferred arcuate fault bounding purple basalt might be an unconformity.

Principal jointing trends N.N.W. and subsidiary jointing, N.E. Minor fissility occurs in dacite rocks at 16 +50 N., 12 E.

ALTERATION AND MINERALIZATION

For the most part, the Nicola rocks have been regionally metamorphosed to the low-grade greenschist facies. The mafics rock constituents are commonly slightly epidotized, chloritized and carbonatized, and minor authigenic pyrite is present. On the mapped area two zones of distinctive brown weathering, ankeritic or sideritic looking alteration occurs, and there is some quartz-siderite veining. Disseminated and some fracture controlled chalcopyrite-bornite-chalcocite mineralization with malachite and azurite occur within these brown carbonate weathering zones. No important argillic, propylitic, potassic or silicic alterations were found.

Grab samples from trench R9 (52 N. 7 +50 E.) returned assays as follows:

1. Qtz. carbonate skarn diss. cpy. bn.	0.32% Cu.
2. Qtz. carbonate skarn banded cpy.	1.74% Cu.
3. And. Breccia, peppered with fine black mineral	0.18% Cu.

Nice disseminated flecks of native copper have recently been found on the northeast corner of Open 11 Mineral Claim.

SOIL COPPER

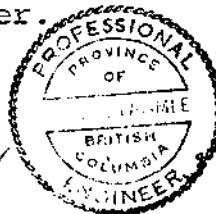
Soil Character and Sampling Details

The portion of the property sampled extends from the Kidd Lake bottomlands up and over a low rolling ridge of Fairweather Hills. Soil profiles are best developed on the bottomlands where the "A" horizon may on occasion exceed 12" in depth. On the hillside this horizon rarely exceeds 4" in depth and occasionally is non-existent. Profile attempted to be sampled by this survey was the top of the "B" horizon, or roughly within the top few inches of the first brown soil. Sampling holes were dug by mattock, generally to depths between 8" and 12" where the soils were mostly brown gravelly silts -- podzolized glacial drift. Samples were taken by hand, placed in appropriately labelled craft paper envelopes, and forwarded to Chemex Labs., Vancouver, British Columbia, for copper analysis. Personnel involved were E. and D. Tancowny and myself.

Analytical Procedure

At the laboratory the samples were dried in a warm air dryer, screened on 80 mesh stainless steel, and a portion of the undersize retained for analysis. One-half gram portions were digested in perchloric-nitric acid (3:1) and then diluted with demineralized water. Copper content was then determined by atomic absorption spectrophotometer.

*Statement
I hereby declare
both E. & D. Tancowny
to be capable and
dependable in so far
as their duties related
to this geotechnical survey
are concerned
K. Lammer*



Results of Soil Copper Survey

(Map 4, attached)

Results of the survey are shown on Map 4, attached, showing the areal distribution of the samples, and on Figure 1 (rear of report section) which shows the cumulative frequency distribution of the logarithmically classified data. Theoretically, the logarithmic-probability plot should separate log-normally distributed data into separate populations, each population reporting as separate straight lines on the graph. Although overlap between separate populations is to be expected, the intersection of the separate straight lines can be taken as population boundaries.

Threshold concentration as determined by the log-probability method is about 68ppm; 17 per cent of the samples exceed that level. Rough contouring levels shown on Map 4 are at 68ppm and at 135ppm.

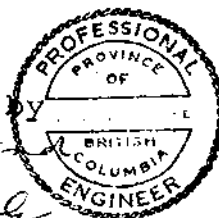
Map 4 shows a distinct soil copper anomaly, 1400' long N-S by 500', spanning 64 N. 68 N. and 72 N. immediately west of the baseline, and enclosed larger, longer area of lower order, yet anomalous results. These lower order results extend eastwards from the east shore of Kidd Lake for its entire length. A second N.N.W. trend extends from Dago-Open showing to the south and encompasses the former three-way showing.

GROUND MAGNETICS
(Map 5)

Instrument and Survey Procedure

The instrument used in the survey was the Scintrex MF-2 fluxgate magnetometer, an instrument designed to measure variations in the vertical component of the earth's magnetic field. The sensitivity of the instrument varies with the instrument's selector range setting. Sensitivities pertaining to this survey were 20 gammas/scale division for readings less than 1000 gammas and 50 gammas/scale division for readings exceeding 1000 gammas.

Instrument operator was Dan Tancowny, supervised by myself. *I hereby Declare D. Tancowny to be a capable and reliable magnetometer operator.*



To facilitate diurnal corrections a closed loop survey of the baseline was made first, and diurnal corrections were then made for this loop. Then readings at the cross lines were averaged and used for master control on each line. All cross lines were then traversed in interlocking figure-eight fashion tying in with master control at each baseline station.

Results of Magnetic Survey

The results of the magnetic survey are shown on Map 5, attached. A distinctive NNW magnetic trend, characterized by relatively abrupt 2,000 gamma relief is the dominant feature. Magnetism in the Kidd Lake bottom lands are flat and low order as are those on the steep hillsides of the northeast quadrant of the

survey area. The magnetic highs consist of several, distinctive, narrow elongate anomalies trending NNW, and lettered on the maps A,B,C,D and E. These appear set on a magnetic background of 300-400 gammas. No doubt these elongate highs reflect bedrock of this distinctive magnetic susceptibility.

The apparent regularity of this pattern is interrupted by the magnetic area G. This area appears to be a magnetically distinctive part of the andesite-diorite breccia, and it would appear to be significant in that the strong portion of the soil copper anomaly terminates against this feature and the DAGO-OPEN showing lies adjacent to it. Also, very interesting intrusive-looking breccia with fine chalcopyrite mineralization has been found as float in trench at 56N, 1W, and this float could come from this area, or from the north.

The purple basalt and maroon breccia units are, for the most part magnetically inactive, and also, copper deficient. Flat subdued magnetics probably reflect increased depth of overburden in the bottomlands; the abrupt relief on the hillsides reflect relatively shallow sources for the magnetic response.

The area of the soil copper anomaly (area X, Map 5) is reflected by low flat magnetics of distinctive, readily outlined shape.

Area H, characterized by regular moderate relief probably reflects andesitic rocks. Linear trends I,J and K could reflect linear structural features such as faults. Trend K, as mentioned

below, supports a similar inference made by Ager from his gravity survey.

GRAVITY SURVEY
(Map 3)

A preliminary partial gravity survey was commissioned to Charles A. Ager, geophysicist, and his preliminary results corrected for drift, free air effect, Bouger effect but not Terrain effect, are traced on Map 3. From this preliminary work Ager interprets two faults, one NNW, (mag. trend K) the other NE, and both are supported by ground magnetic features.

Of particular interest is the gravity low near the intersection of Ager's faults, this low and intersection being conspicuously in the area of best soil copper. Also of particular interest is the gravity highs (localities R) which, although inadequately defined by the limits of the survey appear to correlate one for one with a belt of strong chargeability - low resistivity response from the preliminary I.P. data. This gravity trend might project south to Dago-Open showing.

Another feature of particular interest is the easterly trending gravity low along line 68N. It is likely significant that the chalcocite showings at 72N, 13E; and at 67N, 1E are on this trend as is some of the highest soil copper concentration.

A content of sulphides in rock would be an obvious explanation of the gravity high trend R and coincident high chargeability - low resistivity response. Also, open spaces due to fracturing at 67N, 6W would be an obvious explanation for the gravity low at that locality, and of course, such

conditions would be conducive to mineral deposition.

INDUCED POLARIZATION SURVEY

An induced polarization survey has been completed by Seigel Associates on the crosslines from 88N to 24N on the east side of Kidd Lake bottomlands, and on the tie line immediate to Kidd Lake on the east. At time of writing I have only preliminary field knowledge of the results but it is clear that there is a strong chargeability response with concomitant low resistivity along and paralleling the north-east portion of Kidd Lake. The anomaly extends from 84N to at least 60N, has an appreciable width of 1,000' or so, and reaches chargeabilities, for the most part, in the order of 30 milliseconds. Induced polarization readings drop off east of the mid-part of the lake, and pick up in a lower, more irregular fashion to the southeast of the lake.

GEOTECHNICAL CORRELATIONS

A remarkable collection of either coincident or very closely correlating geological, geochemical and geophysical parameters have been defined by these surveys. These are:

1. Projection of alteration - mineralization belt of Dago-Open showing along east and north boundaries of andesite-diorite breccia unit (pipe?).
2. Soil copper anomaly, 4 times background 1,400 x 500', in covered bottomlands that could overrule geochemical effectiveness.
3. Distinctive magnetic low with readily outlinable shapes.
4. Gravity low at inferred fault intersections beneath area of high soil copper; gravity high apparently matching chargeability high - resistivity low.
5. Impressive chargeability anomaly at least 3,000' long by about 1,000' wide.

This list of correlating data is appreciably more than one generally encounters during preliminary exploration work of this sort.

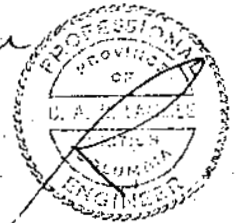
CONCLUSIONS AND RECOMMENDATIONS

An outstanding exploration target has been defined on White River Mines' Dago-Open property at Aspen Grove. The degree of correlation of all geotechnical factors so far defined over the target east of the north portion of Kidd Lake, under covered ground, justifies and necessitates continuation and completion of the first phase program as originally recommended. One might expect fairly heavy drilling expenditures during a second phase program, but the planning for such a program should await receipt of final gravity and induced polarization data.

Chas. A. R. Lammle
Chas. A. R. Lammle

Respectfully submitted
Chas. A.R. Lammle, P. Eng.

Chas. A. R. Lammle



99.99 99.9 99.8 99.5 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01

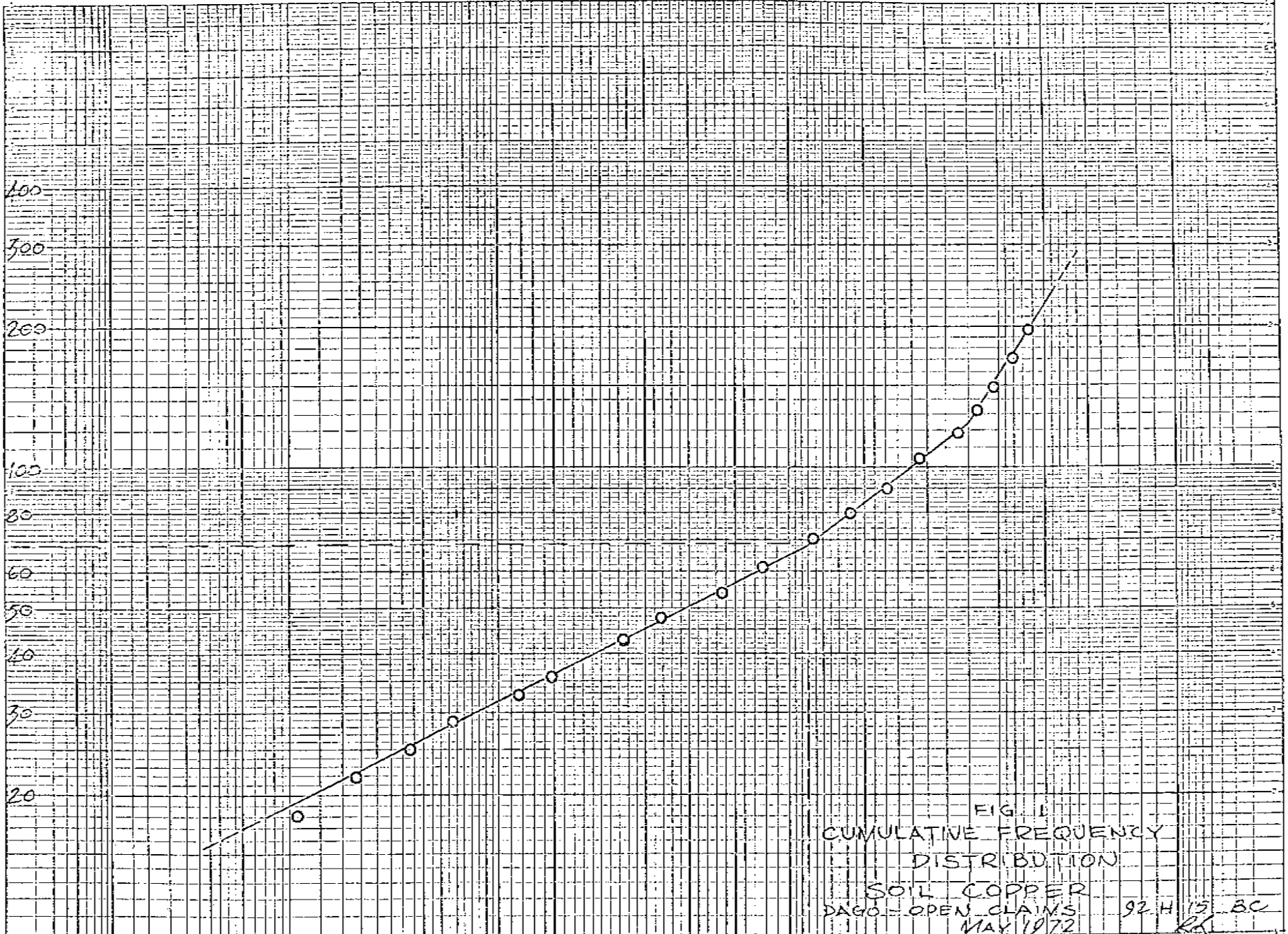


FIG. 1
CUMULATIVE FREQUENCY
DISTRIBUTION
SOIL COPPER
DAGO - OPEN CLAIMS 92.H 15 BC
MAY 1972 RL

0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.5 99.8 99.9 99.99

CUMULATIVE PERCENT OF 642 ANALYSES

COPPER (PPM)

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 3789 M.P. #3

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G.S.C. Mem. 243, 1947.
2. Cockfield, W.E., Geology and Mineral Deposits of Nicola Map Area, B.C.
G.S.C. Mem. 249, 1948.
3. Schau, Mikkel, Stratigraphy and Structure of the Type Area of the Upper Triassic Nicola Group in South-Central British Columbia.
G.A.C. Special Paper No. 6, 1970.
4. Lammle, C.A.R., Geological Report, Dago and Open Claims, 92 H 15 Nicola M.D., B.C., April 30, 1972.

R. Lammle

CHARLES A. R. LAMMLE, P. ENG.

Aspen Grove, B. C.,
July 4th, 1972.

White River Mines Ltd. (NPL)
Dago - Open Mineral Claims
Aspen Grove, 92 H 15, B. C.

PROGRESS REPORT MAY 27 - JULY 4, 1972

Following completion of technically encouraging and intriguing geological, soil copper, ground magnetic, and induced polarization surveys, and limited gravity work on the subject property (described in my report of May 24th, 1972) White River Mines Ltd. (NPL) begun, and of this date, continue a diamond drill testing program under my direct supervision. All of this exploratory work is being carried out in accordance with original recommendation made in my preliminary examination report of April 30th, 1972.

Because of early encouraging results from the drill testing, White River Mines Ltd., authorized three wire-line diamond drills on the property - a Longyear 34, a Longyear 38 and a Boyls 17A. The progress of these machines is outlined below:

.....2

TABLE OF DRILLING PROGRESS

<u>Drill</u>	<u>On Property</u>	<u>Days</u>	<u>Hole</u>	<u>Footage</u>	
"34"	May 25	41	1	147	Final
			2	633	Final
			7	399	Drilling
			<hr/>		1179 - 29 ft/day
"38"	June 3	31	3	65	Final
			4	639	Final
			6	453	Final
			8	706	Final
			10	304	Drilling
<hr/>		2167 - 70 ft/day			
"17A"	June 13	22	5	397	Final
			9	216	Drilling
<hr/>		613 - 28 ft/day			
Total Footage to July 4th, 1972				<hr/>	3959

All of the machines have experienced technical problems in collaring, and in drilling specific sections of blocky ground. In addition, each machine has had down time due to breakdown or other mechanical or labour difficulties. These difficulties are made evident by the daily footage rate tabulated in the above table.

Initial results from Holes 72-2, 72-5 and 72-7 have been encouraging.

Hole 72-2 yielded two sections of copper mineralization (chalcopyrite, and bornite - chalcopyrite respectively):

50' - 85' (35') 0.37% Cu
 305' - 325' (20') Assays not yet available

Hole 72-5 yielded one section of low grade mineralization (chalcocite, chalcopyrite, bornite, native copper and malachite)

20' - 102' (82') Assays not yet available

Hole 72-7 yielded two sections of mineralization (chalcopyrite)

98' - 128' (30') Assays available in Vancouver
 204' - 230' (26') Assays available in Vancouver

The copper mineralization in 72-2 is in a breccia composed of leucocratic diorite porphyry fragments set in a dark matrix, and also in unaltered light green andesite; mineralization in 72-5 is in limestone, the native copper being within 20' of a strong fault at 102-105' below which mineralization is absent; and mineralization in 72-7 is in a contorted sequence of sedimentary rocks consisting of white to light gray tuffaceous siltstone, light gray volcanic wacke, and black argillite which is often crushed and sheared into graphitic argillite. Trace amounts of copper were cored in holes 72-1, 72-3, 72-4, and 72-10.

The technically successful and important discovery of this type of copper mineralization in such a disconcerting variety of rock types is unique in the Aspen Grove area. Lithological and mineralization data brought to light by the drilling has necessitated changes in the original geological interpretation (report of May 24th, 1972) and at the present stage of exploration, at the least, leads to a structural and lithological picture very poorly understood. The association of the best copper sections to date with graphitic argillite opens the possibility of finding such mineralization within any zone of such lithology on the property. Additionally, one of the principal lithological units of exploratory intrigue from which attractive mineralized float has been found - the black andesite - diorite breccia - remains untested by diamond drill.

Because of the possibilities of finding additional copper mineralization on the property, and because of the remaining untested geotechnical intrigue on the property, it is my recommendation that the present diamond drilling be continued with at least two machines. Percussion drilling has been recommended earlier, but because of the

necessity of obtaining as clear a geological picture as possible at this stage, I would delay such percussion drilling to a later date despite the relative economy involved. Percussion drilling could be employed at a later date when the geological picture is sufficiently elucidated.

The amount of drilling warranted under the present circumstances is a matter of personal judgment and will change from day to day depending upon results. However I would advise that at least \$40,000.00 be allotted for the continuation of the present diamond drill test program.

Respectfully submitted,

Charles A. R. Lamble

Charles A. R. Lamble, P. Eng.
July 4th, 1972.

Charles A. R. Lamble



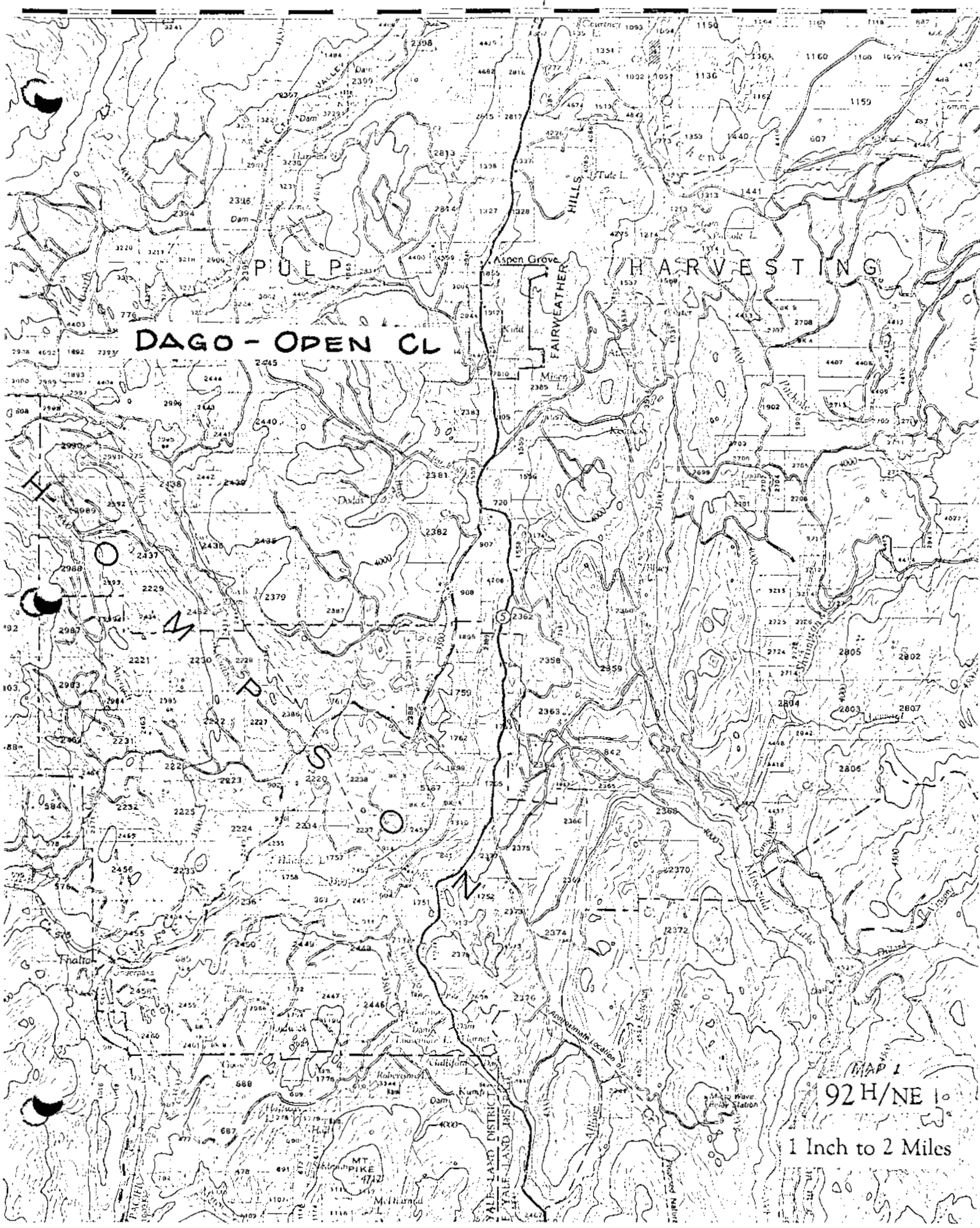
DAGO-OPEN MINERAL CLAIMS
EXPLORATION SUMMARY, JULY 1972

Aspen Grove 92 H 15 BC

White River Mines Ltd (NPL)
Vancouver, BC

by

Chas. A. R. Lammle, P. Eng.
July 27, 1972



PULP
DAGO - OPEN CL

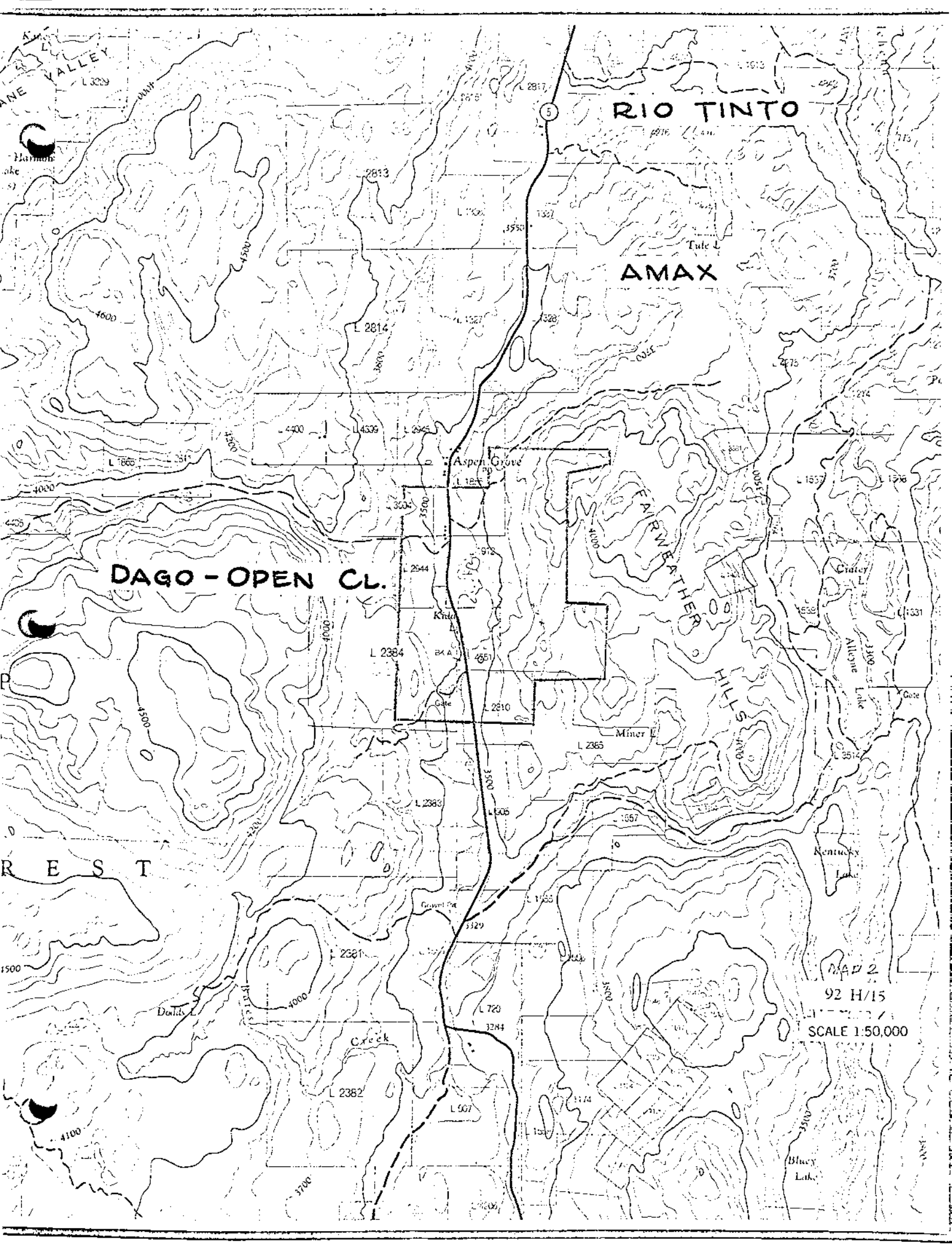
FAIRWEATHER
HARVESTING

MAP 1
92 H/NE 10
1 Inch to 2 Miles

YALE-LAND DISTRICT
YALE-LAND DISTRICT

MT. SPIKE
4712

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3789 MAP #4



RIO TINTO

AMAX

DAGO - OPEN CL.

MAP 2
92 H/15
SCALE 1:50,000

Department of
Mines and Petroleum Resources

ASSESSMENT REPORT

NO. 3789 MAP #5

Charles A. R. Lammle, P. Eng.

July 27, 1972

WHITE RIVER MINES LTD (NPL)
DAGO-OPEN MINERAL CLAIMS
ASPEN GROVE 92 H 15 B.C.
EXPLORATION SUMMARY TO JULY, 1972

Diamond drilling on the subject property terminated July 21, 1972 after a total of 6318 feet in fourteen holes was completed. Five relatively short sections of good copper mineralization were cored in holes 72-2, 72-5 and 72-7, but all ensuing holes failed to intersect any material copper mineralization. Geological information obtained from the core has provided explanation for most of the intriguing anomalies found on the property by the preliminary surveys. The preliminary work program was found to be valid and technically successful, but unfortunately, the amount of mineralization found was insufficient to permit classing the program as economically successful.

Complete details of the drilling are tabulated on the following page:

WHITE RIVER MINES LTD.
DAGO-OPEN DRILL HOLE DATA

Rig	Hole	Dip	Length	Latitude	Departure	Collar Elev.	Intersection
34	72-1	Vert	147	68 + 00N	3 + 40W	3470	---
34	72-2	53	633	72 + 56N	2 + 08W	3506	(50-85) (305-320)
34	72-7	Vert	399	72 + 56N	2 + 05W	3506	(95-125) (205-230)
			<u>1179</u>				
17A	72-5	50	397	76 + 27N	2 + 85W	3524	(50-102)
17A	72-9	Vert	387	76 + 27N	2 + 82W	3524	---
			<u>784</u>				
38	72-3	52	65	50 + 02N	7 + 38E	3684	---
38	72-4	53	639	68 + 00N	0 + 48W	3533	---
38	72-6	50	453	68 + 00N	0 + 35W	3533	---
38	72-8	50	706	51 + 40N	11 + 52E	3789	---
38	72-10	47	482	59 + 45N	1 + 70W	3480	---
38	72-11	49	492	59 + 45N	1 + 80W	3480	---
38	72-12	49	461	55 + 48N	0 + 03E	3530	---
38	72-13	52	557	80 + 00N	2 + 92W	3525	---
38	72-14	48	500	61 + 52N	6 + 93W	3428	---
			<u>4355</u>				
			<u>6318</u>				

Note: Collar elevations by brunton levelling from assumed elevation at 72-1.

Hole 72-2 cored chalcopyrite and bornite sections, respectively, in andesite and breccia rocks as follows:

<u>72-2</u>	50 - 85'	(35')	0.38%Cu	
	305 - 320'	(15')	1.45%Cu	(Au & Ag values)

Hole 72-7 cored the following chalcopyrite sections in graphitic argillite and tuffaceous greywacke:

<u>72-7</u>	95 - 125'	(30')	1.40%Cu	
	205 - 230'	(25')	0.78%Cu	(Ag values)

Hole 72-5 cored the following chalcocite, chalcopyrite, bornite and native copper section in coralline limestone:

<u>72-5</u>	50 - 102'	(52')	0.83%Cu	
-------------	-----------	-------	---------	--

During detailed logging of the cores, trace amounts of copper mineralization was observed in most of the other holes.

The drilling has provided satisfactory explanation for the geochemical and geophysical anomalies previously found on the property. The soil copper anomaly is clearly related to the copper mineralization discovered beneath the soils, and slightly to the north of the anomaly. This mineralization probably contributes, at least partly, to the gravity high at the geochem high. The low magnetics in the area of the mineralization is clearly due to the sedimentary tuffaceous greywacke and laminated argillite. Normal variations in magnetic susceptibility were found in the cored sections of various volcanic rocks, and this has been measured by Charles Ager, geophysicist. Copper and iron sulphides together with argillite and graphitic argillites clearly is the material causing the high induced polarization chargeability and concomitant low resistivity.

The drilling has led to considerable reinterpretation of geologic features as preliminarily mapped. Firstly, the northerly projection of

the black andesite - diorite breccia unit was found to be structurally cut off, and laminated tuff - greywacke - argillite rocks were found along this projection. Secondly, the black andesite - diorite breccia was found to be of pyroclastic - sedimentary origin and was determined to be relatively shallow in depth. Thirdly, the brown - weathering carbonate alteration and associated copper mineralization of the DAGO-OPEN showing was found to be a relatively shallow surficial feature, hole 72-8 having passed beneath the width of the showing. Fourthly, the maroon andesite flow breccia lithological unit was found to be deep seated and steep dipping rather than a possibly younger flat capping - it probably represents a facies change of the gray - green andesite breccia unit.

Also, some aerial magnetics revealed to myself and C. Ager, show a remarkably long curvilinear magnetic low along B.C. Highway 5. The lowest part of this many - miles long anomaly is beneath Kidd Lake. Hole 14 partly tested this anomaly, and showed greywacke and limy graphitic argillites of very low magnetic susceptibility to be the source of this aeromag (and also groundmag) low. It is now clearly evident that a long, narrow sedimentary horizon in the Nicola rocks, relatively incompetent with respect to the adjacent volcanic breccias, in part deformed and block faulted, is responsible for the low magnetics in the vicinity of the property.

The source of the copper mineralization discovered by drilling on the property is not entirely clear. It is my opinion that the copper has syngenetic affinities. I believe that the copper was derived in part from hot volcanic ash falling into shallow - water coral reefs, and in

part from biohermal activity. Small amounts of copper dissolved from the ash by the warmed brines would collect in the limestone, and in the tuffs much as it is observed in these rocks. Subsequent metamorphism and deformation would have caused a degree of remobilization, also as is evident in the cores.

In conclusion, it is my opinion that the part of DAGO-OPEN property explored has been well and adequately tested for commercial ton-nages of copper bearing rock. Unfortunately the amounts of such rock found are too small to be considered ore. Although the best and obvious exploration possibilities have been tested, there remain lesser untested exploration possibilities on the property. For this reason the property should be maintained in good standing. Exploration work being carried out by large companies on adjoining and nearby properties could yield results that would affect the DAGO-OPEN property. It is conceivable that promising results from neighbouring work programs, now or in the future, would justify additional work on untested parts of the property.

Respectfully submitted

Charles A. R. Lammle
Charles A. R. Lammle, P. Eng.
July 27, 1972

Charles A. R. Lammle

ITEMIZED STATEMENT OF
WORKMEN'S TIME DISTRIBUTION AND
EXPENDITURES INCURRED

C.A.R. LAMMIE PENG.

DAGO-OPEN PROPERTY

1972

		DATES	TIME DAYS	COSTS	GRAND SUBTOTAL	DAGO GP PRORATED LINE M: 60%	OPEN GP PRORATED LINE M: 40%
TECHNICAL WORK							
Linecutting	Lammie R.	May 4-9 '72	5 1/2 @ 75	413			
	Tancoway D.	May 4-9 '72	6 @ 35	210			
	Tancoway E.	May 4-9 '72	6 @ 35	210			
	Anderson B.	May 5-9 '72	5 @ 40	200			
	Brock L.	May 5-9 '72	5 @ 40	200			
	Krause H.	May 5-9 '72	5 @ 40	200	1433	860	573
Geology	Lammie R.	May	16 @ 75	1200	1200	720	480
Geochem	Lammie R.	May 10-13/72	4 @ 75	300			
	Tancoway D.	May 10-15/72	6 @ 35	210			
	Tancoway E.	May 10-15/72	6 @ 35	210			
	Chemex Analyses			970	1690	1013	677
Magnetom	Lammie R.	May 17-21/72	5 @ 75	375			
	Tancoway D.	May 23-30/72	8 @ 35	280			
	Rentals	2 weeks		170	825	495	330
I.P.	Sergel Assoc.	May 13-23/72		4877			
	Tancoway D.	May 13-23/72	10 @ 35	350			
	Lammie R.	May 13-16/72	4 @ 75	300	5527	3320	2207
Gravity	C.A. Agar.	May 24-29-72	11 @ 150	1650			
	Rentals	June 29 - July 3/72		856			
	Lammie R.	May 24-25-72	2 @ 75	150	2656	1590	1066
Transport	Rentals	3 mo.		1200			
	Gas, Oil	3 mo.		252	1452	872	580
Meals etc	Groceries	3 mo.		1217	1217	730	487
	TECHNICAL WORK TOTAL					16000	9600
PHYSICAL WORK							
Bulkhoising	Nesbitt	D2 Intermittent	40 hr @ 10	400			
	Dooley Bros.	D7 June 6-7 '72	20 hr @ 25	500			
	Lammie R.	June 6 & intermit	3 dy @ 75	225	1125	580	540
D. Drilling	HAW Hayworth	(1963')		12012			
	Connors D.D.	(4355')		27392			
	Walley & Sons	Box (Core boxes)		630			
	Lammie R.	JUNE JULY '72	34 dy @ 75	2550			
	Tancoway D.	May 29 - JUNE 15		690			
	Smith W.T.	May 29 - June 19	3 wk @ 300	900			
	Assays	Chemex-Crest Labs		606	44,780	24,400	22,500
PHYSICAL WORK TOTAL					46,905		
PHYSICAL + TECHNICAL TOTAL					\$ 62,905		

Declared before me at the city of Vancouver, in the province of British Columbia, this day of August 1972, AD.

SEE OVER

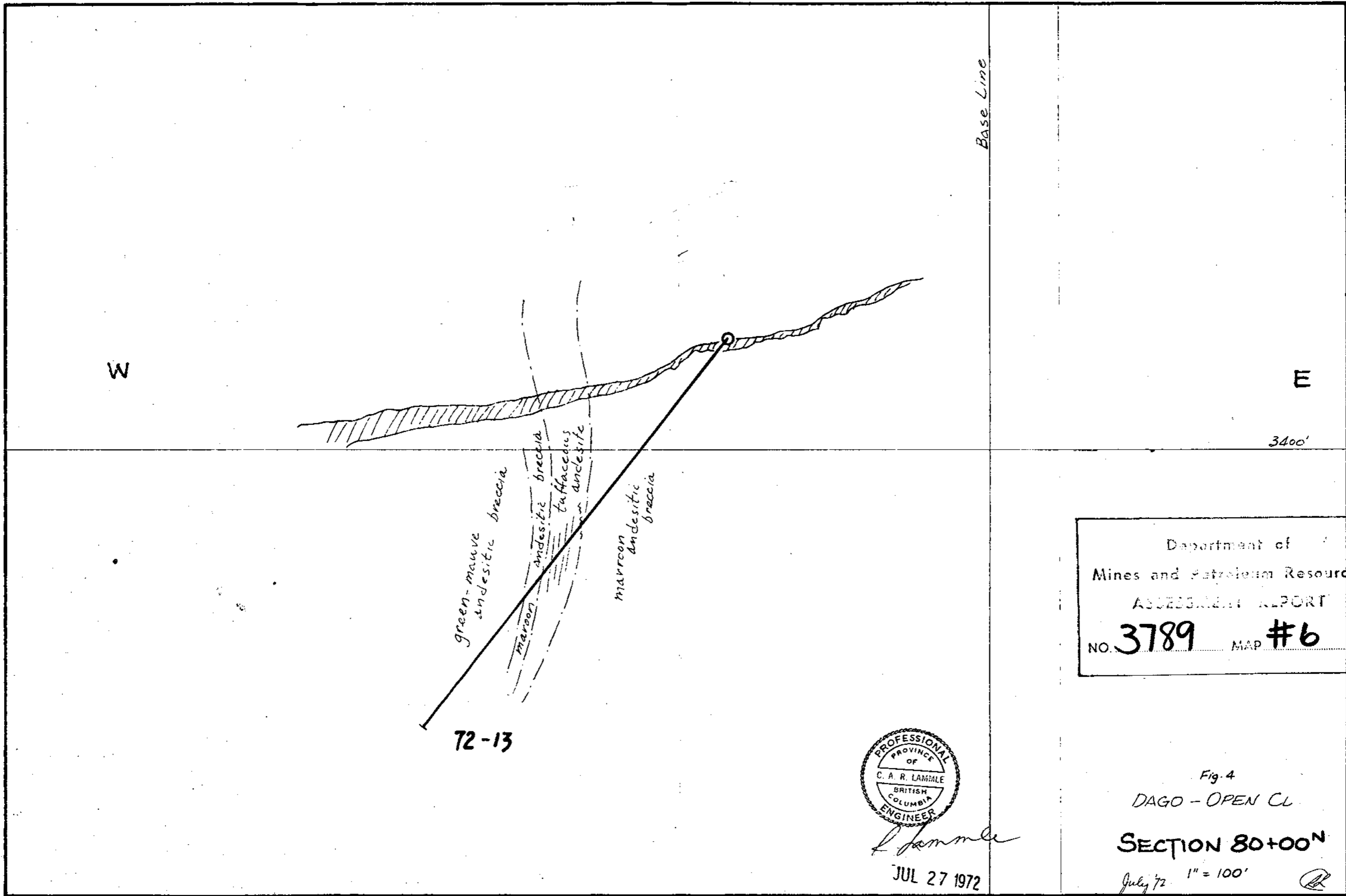
Declared before me at the *City*
of *Vancouver*, in the
Province of British Columbia, this *17th*
day of *August* *1972*, A.D.

Chas. G. R. Lammie

G. Phillips

A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia,

SUB-MINING RECORDER

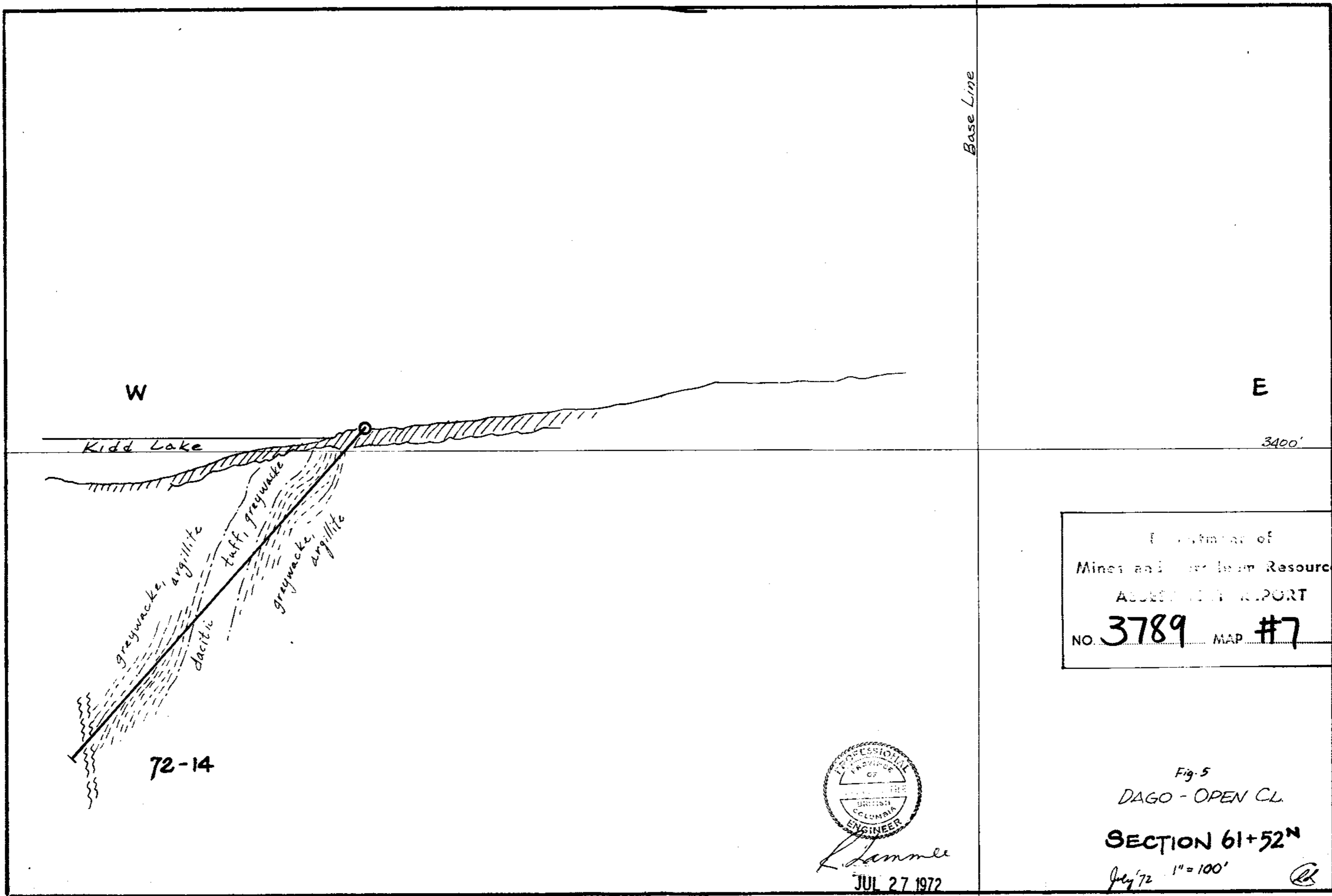


Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. **3789** MAP **#6**



C. A. R. Lammler
 JUL 27 1972

Fig. 4
 DAGO - OPEN CL.
 SECTION 80+00N
 July 72 1" = 100'



Department of
 Mines and Technical Resources
 ASSESSMENT REPORT
 NO. 3789 MAP #8

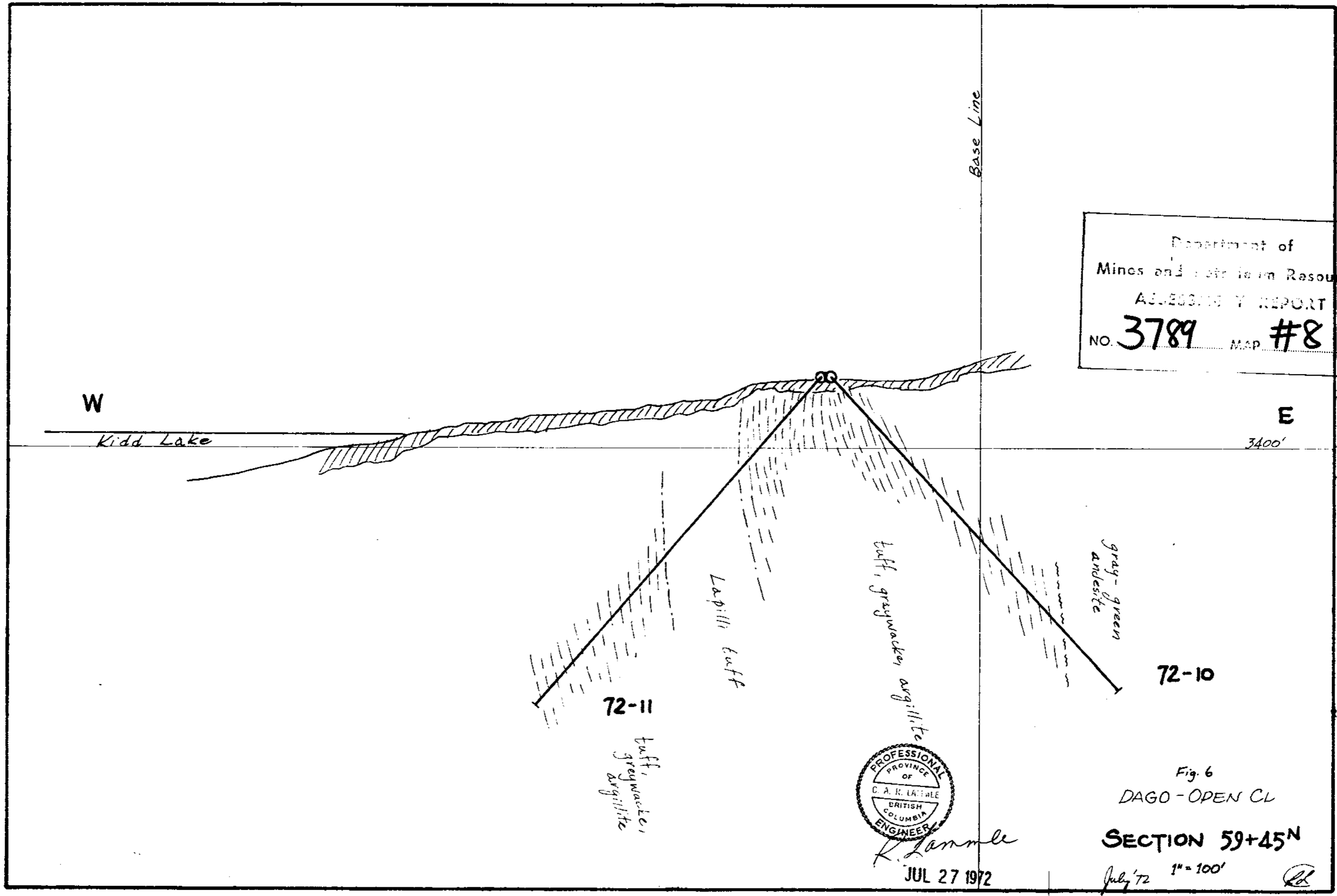
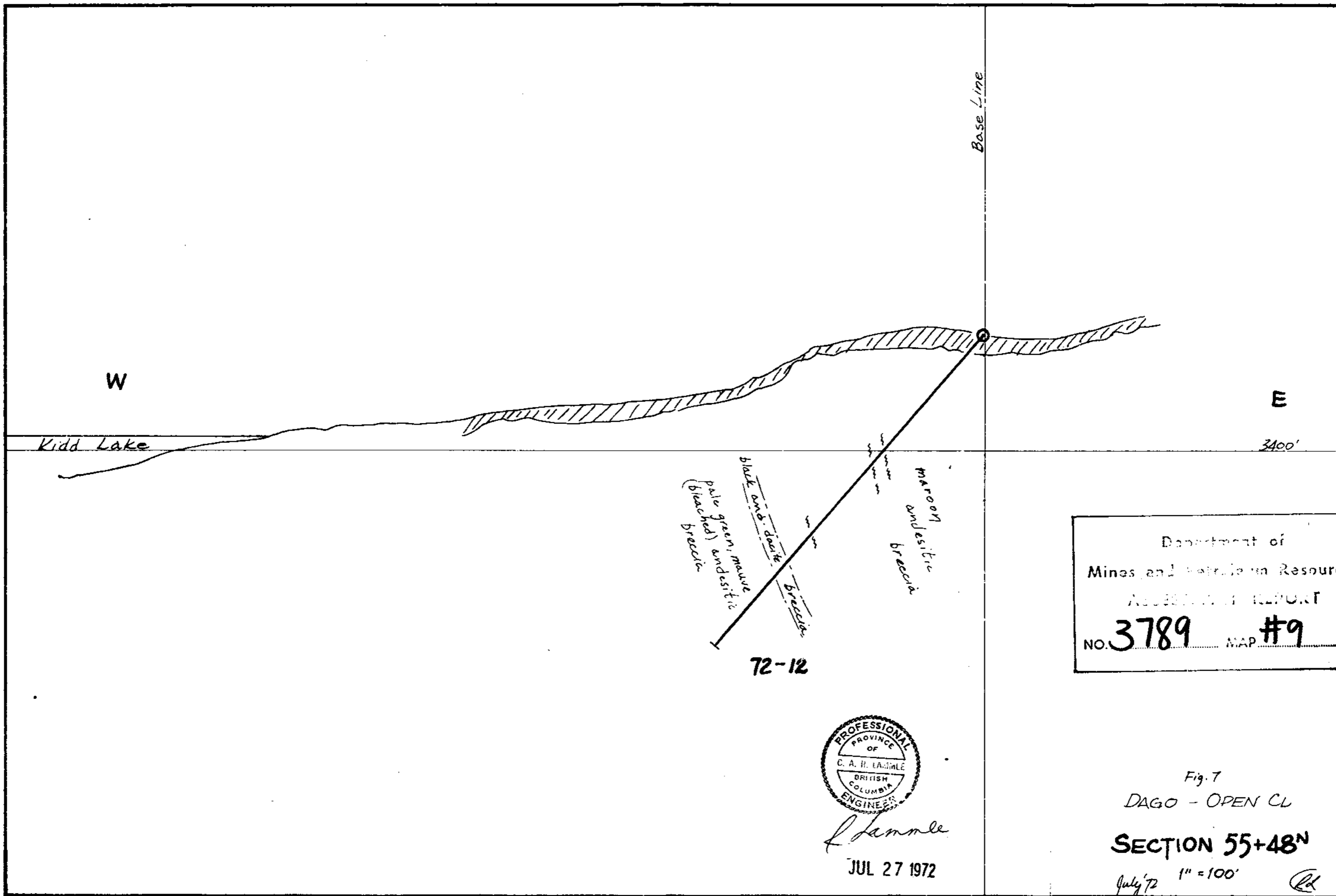
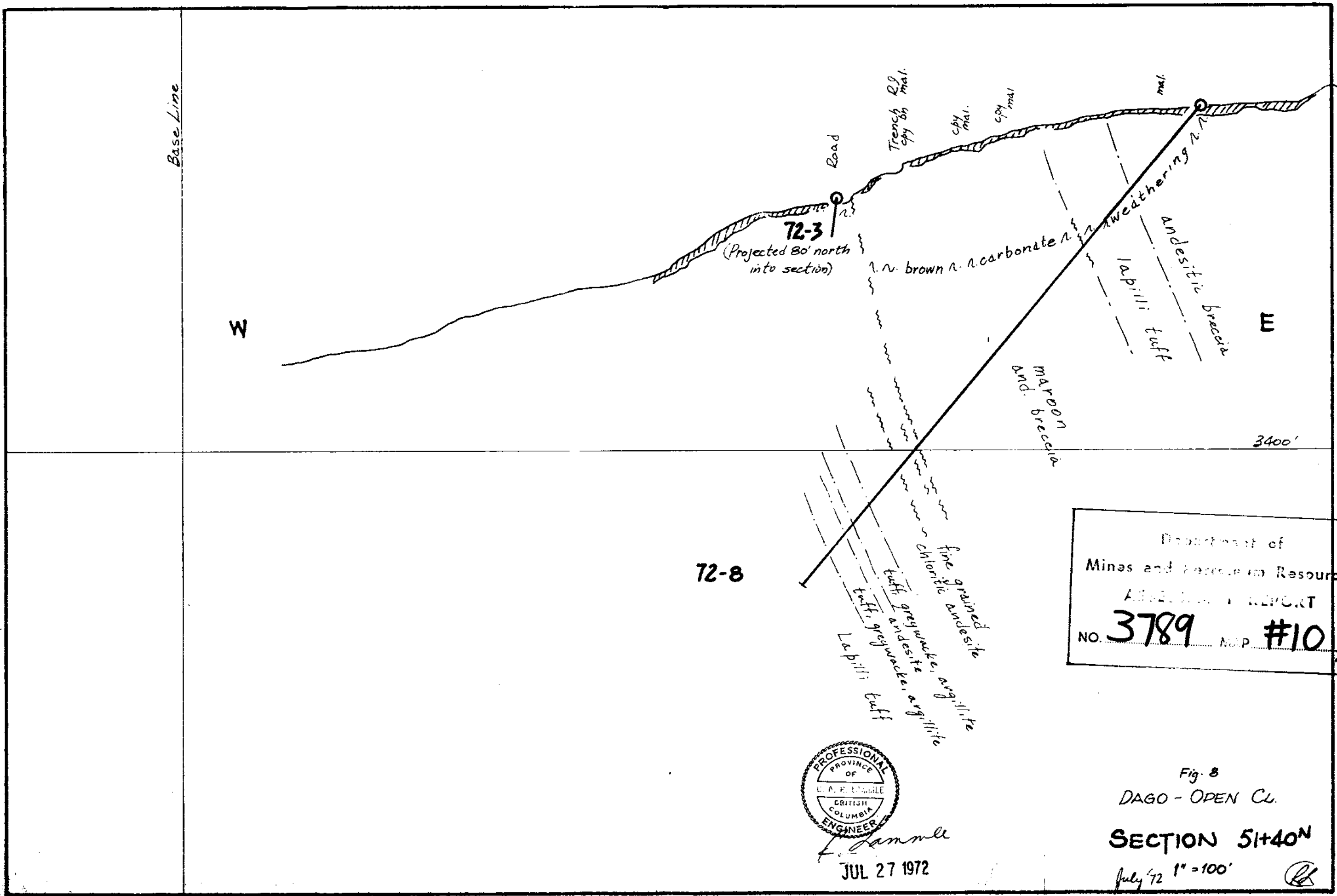
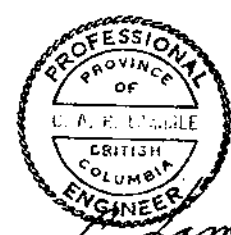


Fig. 6
 DAGO - OPEN CL
 SECTION 59+45N
 July '72 1" = 100'



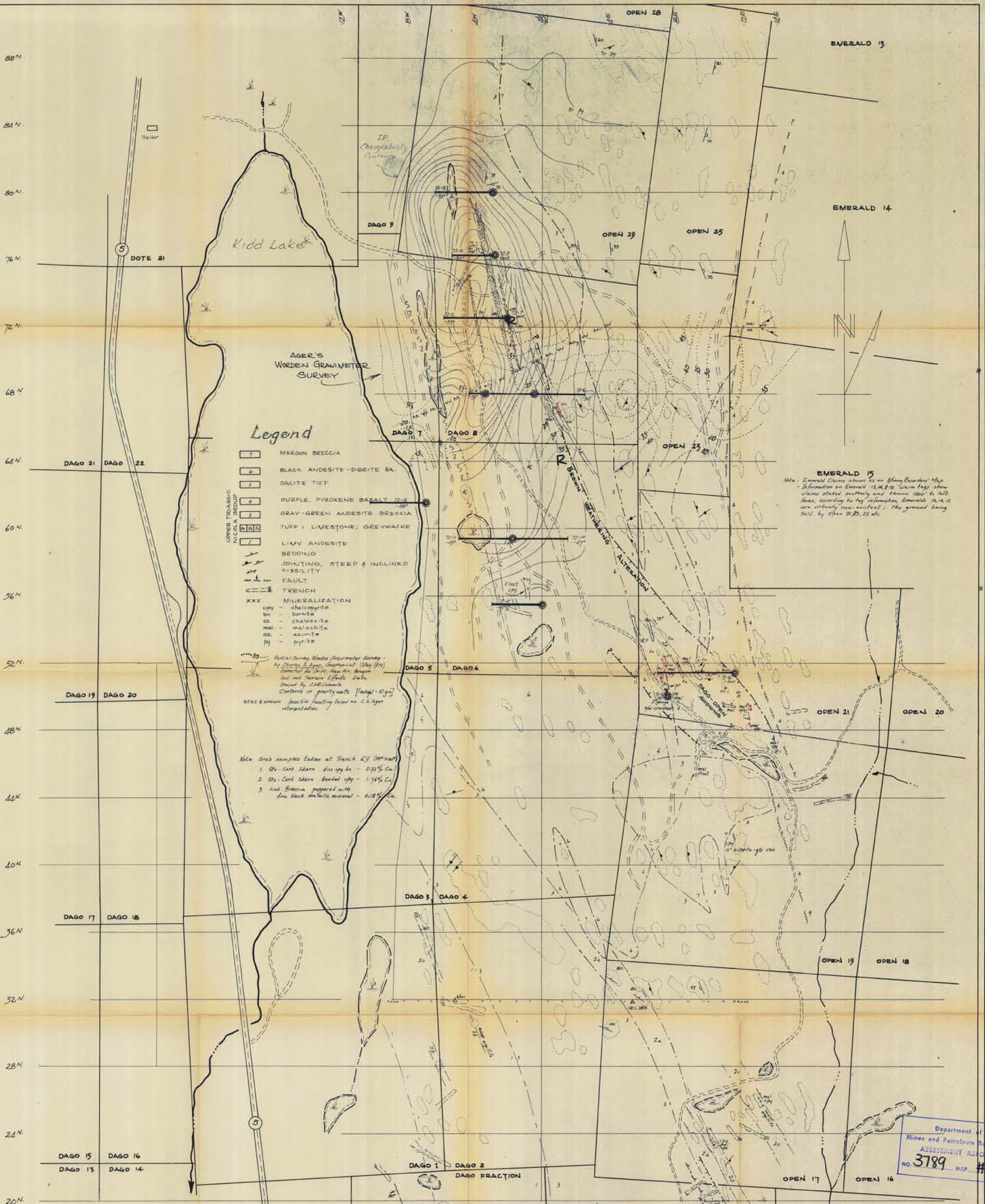


Department of
 Mines and Technical Resources
 ANNUAL REPORT
 NO. 3789 MAP #10



C. A. E. Gamble
 JUL 27 1972

Fig. 8
 DAGO - OPEN CL.
 SECTION 51+40N
 July '72 1" = 100'



Legend

- 7 MARDON BRECCIA
- 6 BLACK ANDESITE-DIORITE BA
- 5 DACITE TUFF
- 4 PURPLE, PYROKENE BASALT 724
- 3 GRAY-GREEN ANDESITE BRECCIA
- 2 TUFF, Limestone, GREYWACKE
- 1 LIMY ANDESITE
- UPPER TRIASSIC NICOLA GROUP
- BEDDING
- JOINTING, STEEP & INCLINED
- FISSILITY
- FAULT
- TRENCH
- MINERALIZATION
 - cpy - chalcopyrite
 - bn - borate
 - cc - chalcocite
 - mal - malachite
 - az - azurite
 - py - pyrite

Note: Grab samples taken at Trench 29 (100' x 100')

1. Gr. Carb. Shale, dis. sp. in - 0.32% Cu
2. Gr. Carb. Shale, banded sp. - 1.74% Cu
3. 2nd Breccia, peppered with fine black malachite mineral - 0.18% Cu

EMERALD 15
 Note: Emerald Claims shown as on Mining Records Map. Information on Emerald 13, 14, 15 claim tags show claims staked southward and thence 180° to left. Hence, according to tag information, Emeralds 13, 14, 15 are actually from eastward; the ground being held by Open 22, 23, 25 etc.

Sta	Mag	Dist	True Azimuth	Dist	Elev	Intersections
31	12-1	30'	147°	68+00N	3140'	5470'
32	12-2	W	93°	43'	72+26N	2200W
33	12-3	N 60° W	52°	65'	50+02N	7+38W
34	12-4	W	53°	53'	68+00N	0+42W
35	12-5	W	50°	57'	76+27N	2+85W
36	12-6	E	50°	45'	88+00N	0+35E
37	12-7	-	90°	139'	72+02N	2+05E
38	12-8	W	50°	76'	51+40N	11+82E
39	12-9	-	90°	387'	76+27N	2+85W
40	12-10	E	47°	482'	59+45N	11+70W
41	12-11	W	49°	492'	59+45N	11+80W
42	12-12	W	59°	441'	53+48N	0+43E
43	12-13	W	52°	571'	80+00N	2+92W
44	12-14	W	48°	500'	61+00N	4+93W

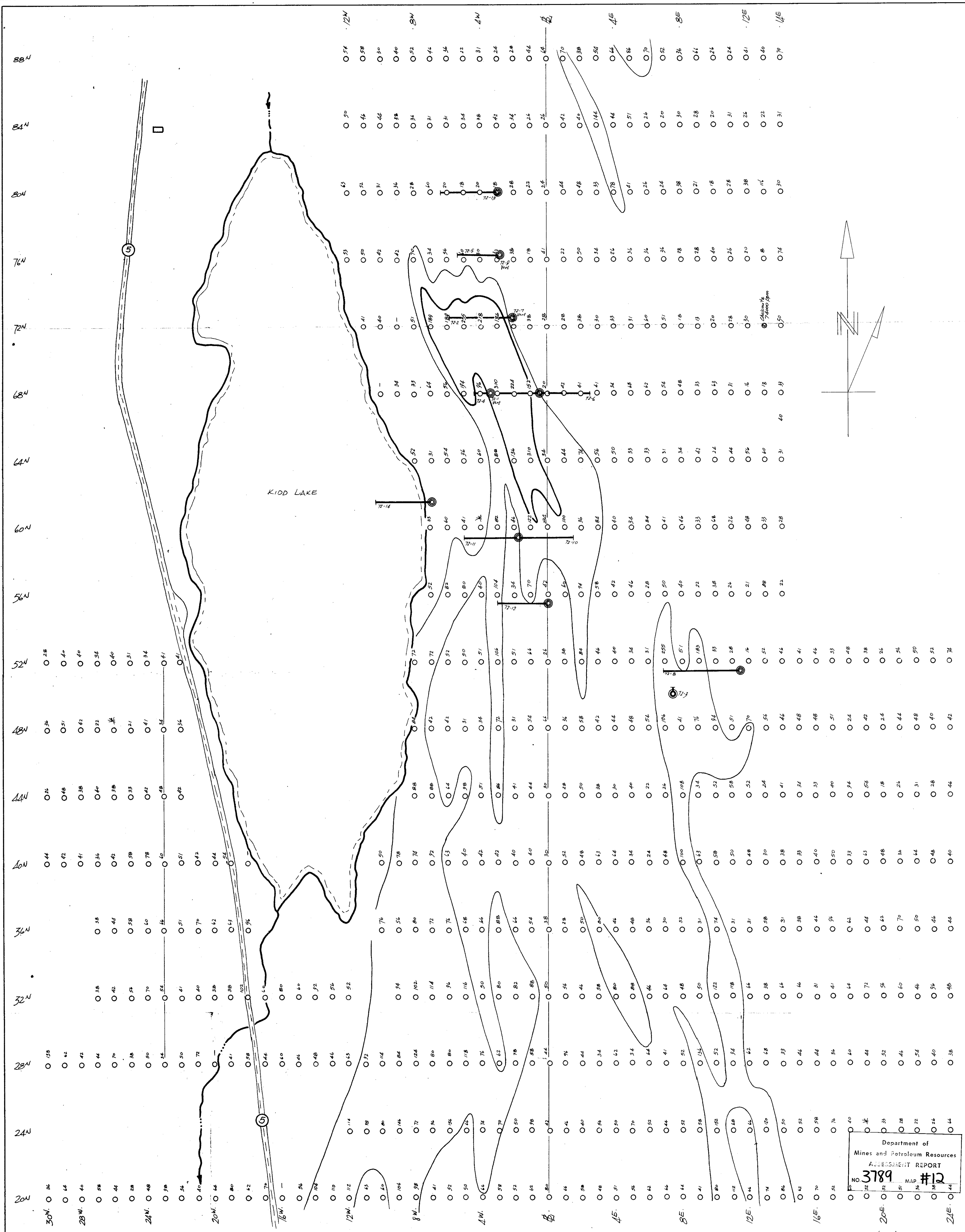
3789 M-11

Department of Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 3789 MAP #11

Map 3
 WHITE RIVER MINES LTD (NPL)
 VANCOUVER
 To accompany Report
 DAGO - OPEN CLAIMS
 ASPEN GROVE 92.15 BC
 GEOLOGY

Scale - Feet
 0 100 200 400 600 800

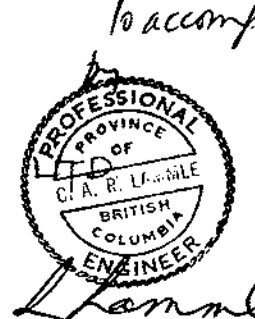
JUL 27 1972
 Emeralds May 1972, July 1972



Colour Code
 ○ > 200 ppm
 ○ 151 - 200
 ○ 101 - 150
 ○ 71 - 100
 ○ 41 - 70
 ○ < 40 ppm

NOTE CIRCLES DENOTE SAMPLE LOCATIONS,
 FIGURES DENOTE COPPER CONTENT IN PPM.
 ANALYSES - ATOMIC ABSORPTION - CHEMEX LABS
 SAMPLING - E. D. TANLOWNY
 SUPERVISION - CHAS. A. R. LAMMLE, PENG

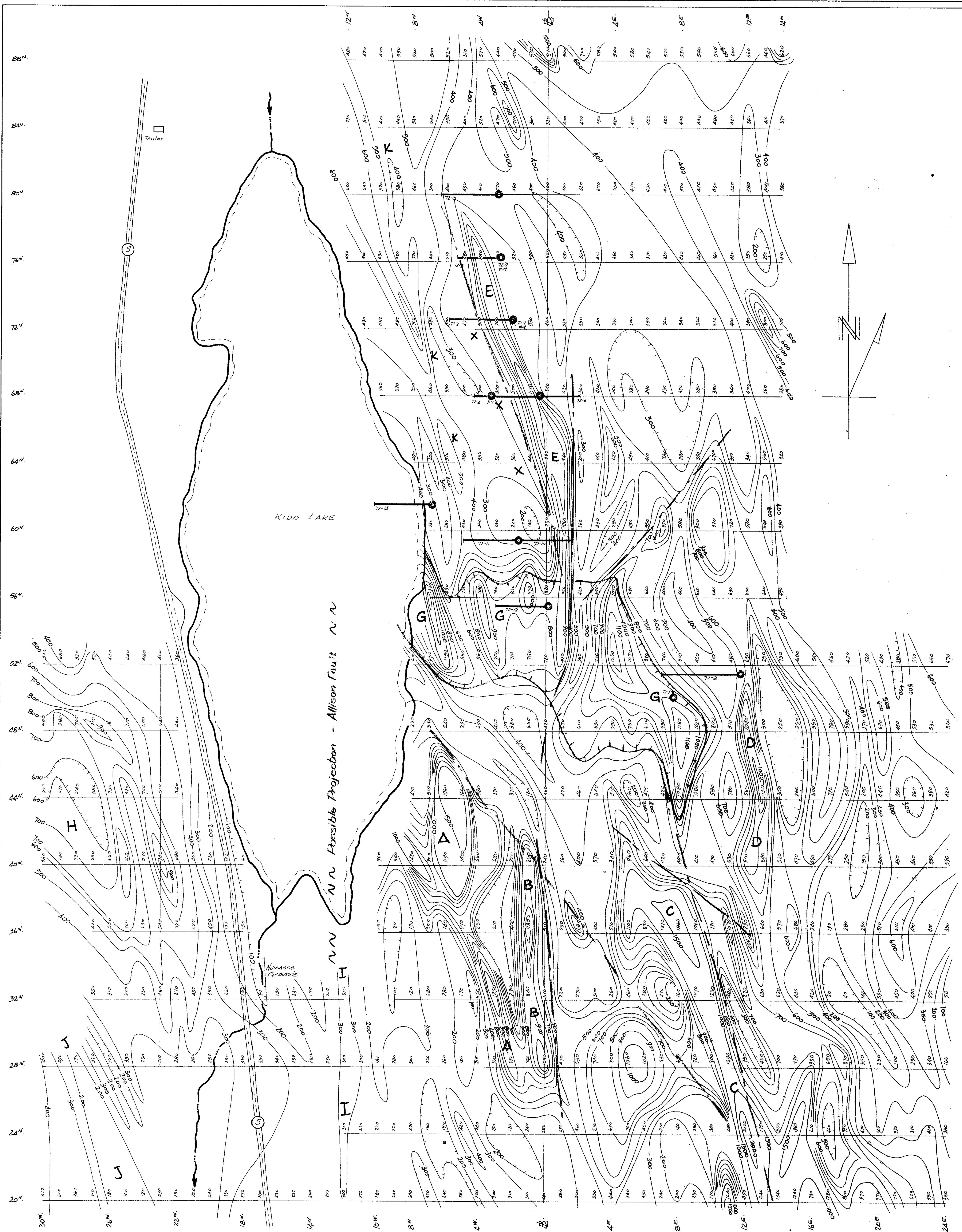
Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 3789 MAP #12
 ASPEN GROVE 92 H 15 BC



Scale - Feet
 0 200 400 600 800

SEE MAP 3 FOR MINERAL CLAIM - GRID LINE CONFIGURATION

Map 4
 WHITE RIVER MINES LTD (NPL)
 VANCOUVER
 To accompany Report on
DAGO - OPEN CLAIMS
 ASPEN GROVE 92 H 15 BC
SOIL COPPER
 May 1972 JUL 27 1972



INSTRUMENT - Scintrex Model MF 2 (vert. field flux gate) corrected for diurnal variation.
 SENSITIVITY 20 γ /scale division for readings < 1000 γ
 50 γ /scale division for readings > 1000 γ
 OPERATOR DAN TANCOWNY
 SUPERVISOR CHAS A. R. LAMBLE, P.ENG.

SEE MAP 3 FOR MINERAL CLAIM - GRID LINE CONFIGURATION

3789 M-13

Map 5
 WHITE RIVER MINES LTD (NPL)
 VANCOUVER
 DAGO - OPEN CLAIMS
 ASPEN GROVE 92 H15 BC
GROUND MAGNETICS
 Scale - Feet
 0 100 200 300 400 500 600 700 800
 JUL 27 1972
 May 1972

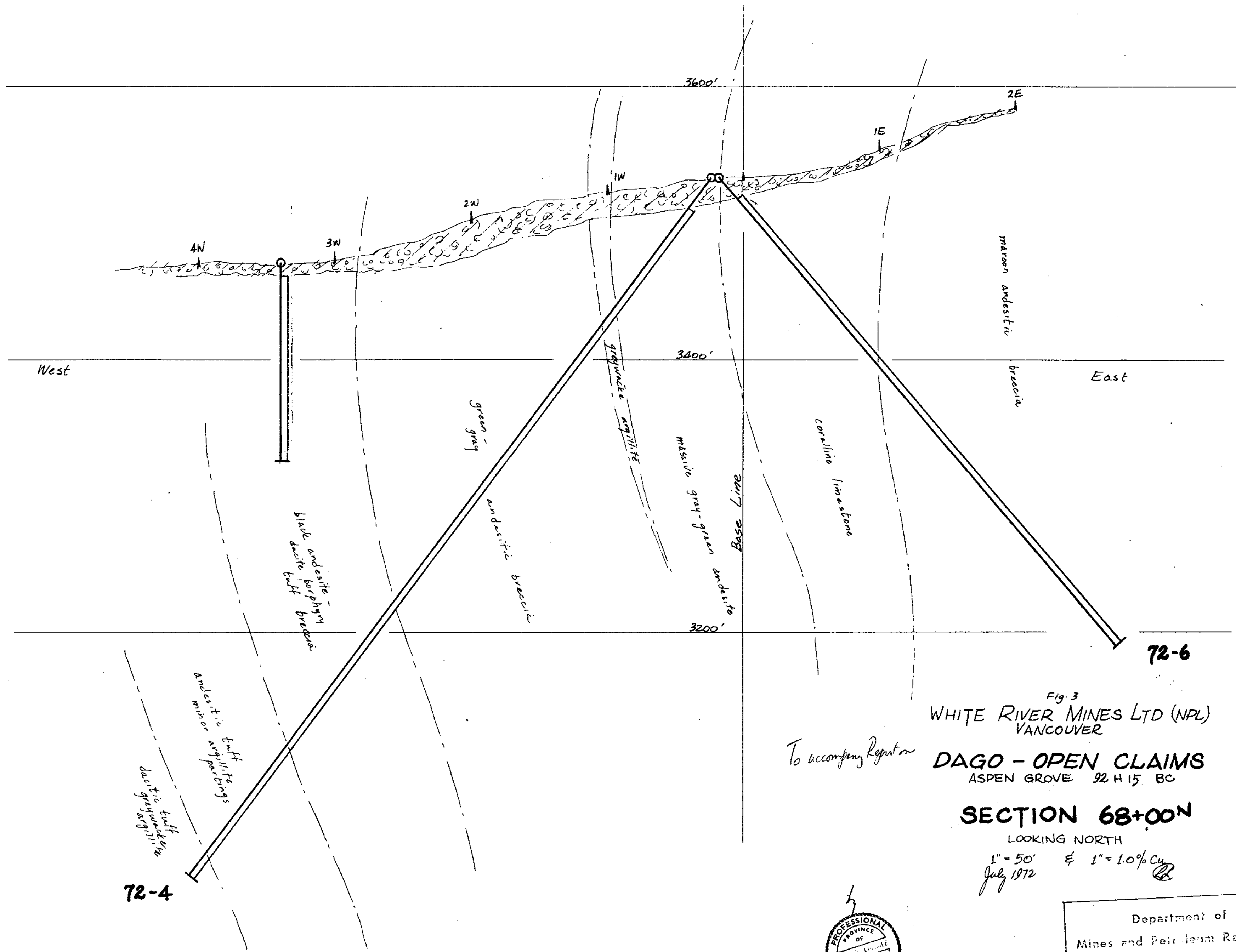


Fig. 3
 WHITE RIVER MINES LTD (NPL)
 VANCOUVER
 To accompany Report on
DAGO - OPEN CLAIMS
 ASPEN GROVE 92 H 15 BC
SECTION 68+00N
 LOOKING NORTH
 1" = 50' & 1" = 10% Cu
 July 1972

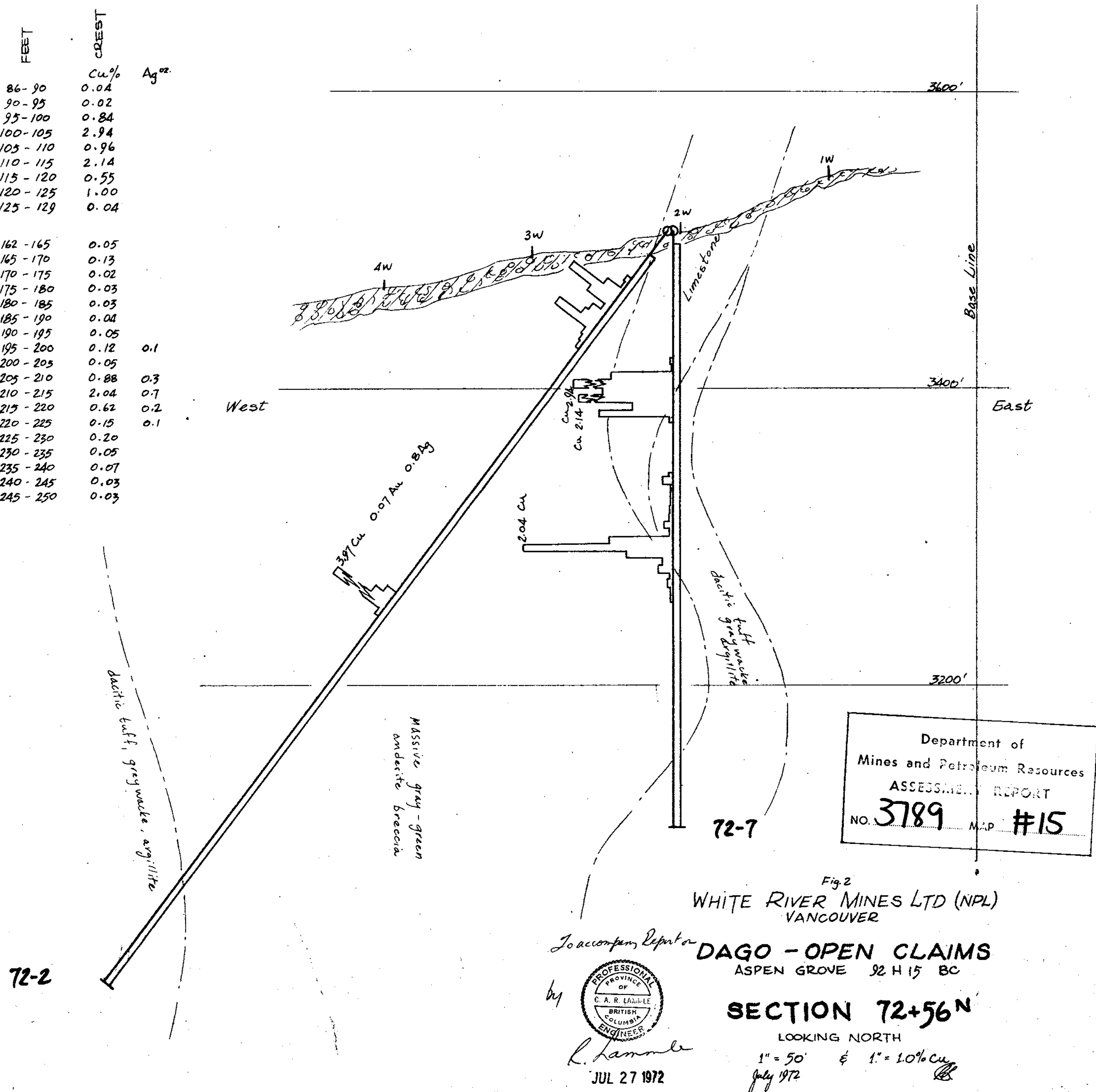
PROFESSIONAL
 ENGINEER
 PROVINCE OF
 BRITISH COLUMBIA
 JUL 27 1972

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 3789 MAP #14

DDH 72-2	FEET	CHEMEX		CHEMEX REJECTS		Quartered Core	
		Cu%	Cu%	CREST	CREST	Cu%	CREST
	40-45	0.06	0.08			0.06	
	45-50	0.03	0.04			0.03	
	50-55	0.25	0.24			0.44	
	55-60	0.77	0.76			0.52	
	60-65	0.39	0.37			0.32	
	65-70	0.08	0.11			0.08	
	70-75	0.20	0.22			0.26	
	75-80	0.27	0.28			0.35	
	80-85	0.63	0.72			0.40	
	85-90	0.10	0.14			0.05	
	90-95	0.07	0.08			0.08	
	95-100	0.06	0.07			0.04	

DDH 72-2	CREST	CREST		
		Cu%	Au ^{oz}	Ag ^{oz}
	305-310	0.13		
	310-315	0.26		
	315-320	3.97	0.07	0.8
	320-325	0.03		

DDH 72-7	FEET	CREST	
		Cu%	Ag ^{oz}
	86-90	0.04	
	90-95	0.02	
	95-100	0.84	
	100-105	2.94	
	105-110	0.96	
	110-115	2.14	
	115-120	0.55	
	120-125	1.00	
	125-129	0.04	
	162-165	0.05	
	165-170	0.13	
	170-175	0.02	
	175-180	0.03	
	180-185	0.03	
	185-190	0.04	
	190-195	0.05	
	195-200	0.12	0.1
	200-205	0.05	
	205-210	0.88	0.3
	210-215	2.04	0.7
	215-220	0.62	0.2
	220-225	0.15	0.1
	225-230	0.20	
	230-235	0.05	
	235-240	0.07	
	240-245	0.03	
	245-250	0.03	



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3789 M.P. #15

Fig. 2
WHITE RIVER MINES LTD (NPL)
VANCOUVER
To accompany Report on
DAGO - OPEN CLAIMS
ASPEN GROVE 92 H 15 BC
SECTION 72+56N
LOOKING NORTH
1" = 50' & 1" = 1.0% Cu
July 1972
by R. Lamont
PROFESSIONAL ENGINEER
JUL 27 1972

DDH 72-5	FEET	CREST	
		Cu%	Ag ^{oz}
	20-25	0.04	
	25-30	0.11	
	30-35	0.05	
	35-40	0.06	
	40-45	0.09	
	45-50	0.11	
	50-55	0.38	
	55-60	0.80	0.1
	60-65	1.40	0.1
	65-70	1.44	0.1
	70-75	1.16	0.1
	75-80	0.96	0.1
	80-85	0.53	0.1
	85-90	0.35	
	90-95	0.80	
	95-100	0.55	
	100-102	0.56	

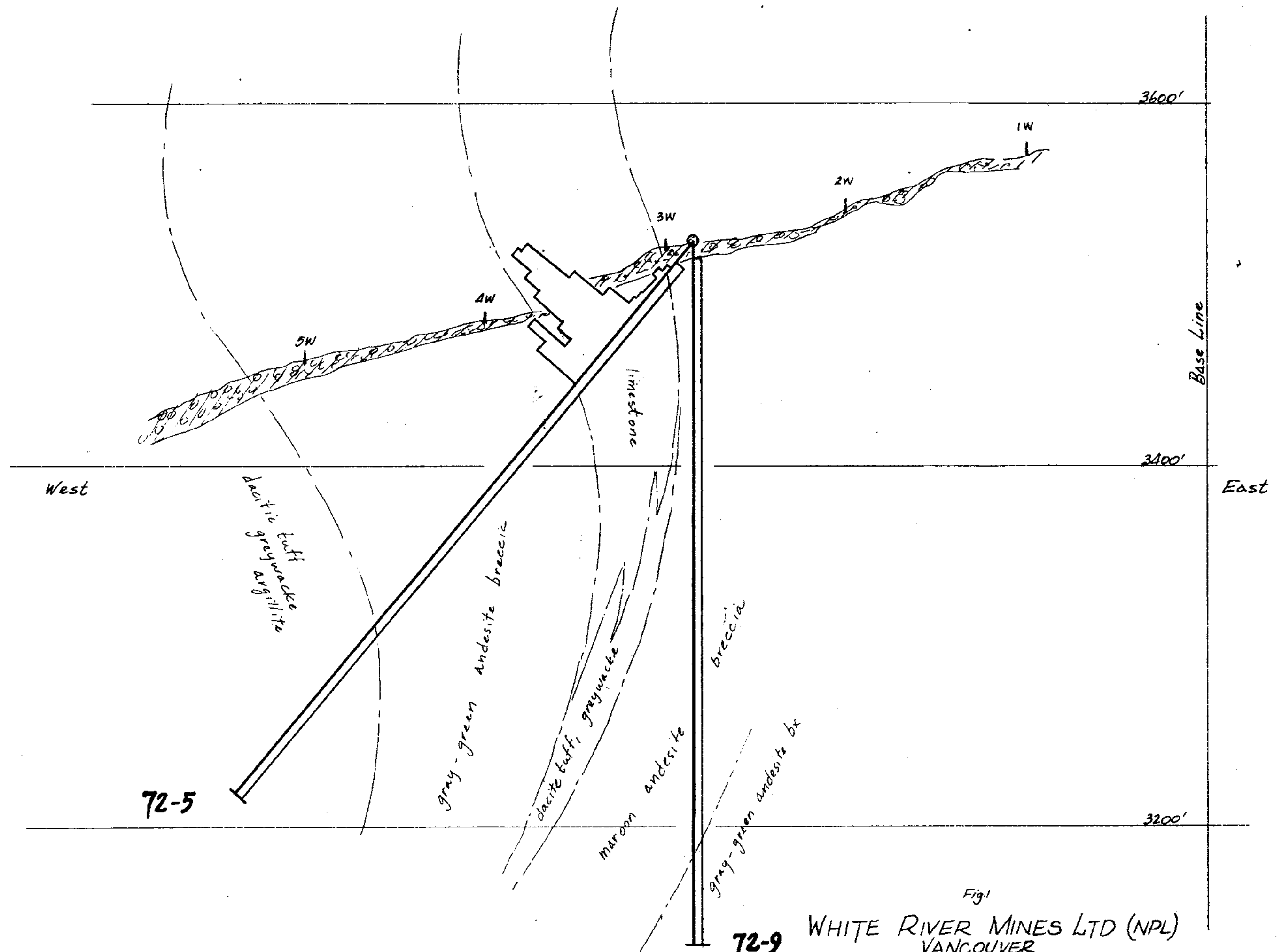


Fig 1
72-9 WHITE RIVER MINES LTD (NPL)
 VANCOUVER
 To accompany Report on **DAGO - OPEN CLAIMS**
 ASPEN GROVE 92 H 15 B.C.



by
R. J. Jannell
 JUL 27 1972

SECTION 76+27N
 LOOKING NORTH
 1" = 50' & 1" = 1.0% Cu
 July 1972

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. **3789** MAP #16

R. Jannell
 Sept 12 72