

Iso Explorations Ltd.

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9 November, 1973

Mr. M.H. Sanguinetti, P. Eng., Barrier Reef Resources Ltd. (N.P.L.), 1418 - 355 Burrard Street, Vancouver 1, B.C.

Dear Mike:

Re: ESP Option

Enclosed for your files is a copy of a report describing in full our work on your ESP property. This report has been filed with both Mining Recorders in compliance with assessment work requirements to provide 2 years' on each claim. Unless you tell us otherwise, we shall send you shortly the transparencies of all maps prepared as we have no further need of them.

We found nothing of interest on the ground and accordingly intend to relinquish the option, as will be communicated shortly.

Thank you for your co-operation in course of our work.

Yours very truly,

ISO EXPLORATIONS LTD.

J.M. CARR, Chief Geologist

JMC*ro

encl. Report & Forms B & I & Mining Receipts

c.c. W.D. Brady

F.C. Wank

Geological, Geochemical & Geophysical Report

On The ESP Claim Group,

Missezula Lake-49°46'N 120°33'W (92H/15E) Nicola and Similkameen Mining Divisions

> Iso Explorations Ltd. and Barrier Reef Resources Limited

April 5 - July 6, 1973

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J. M. Carr, P. Eng.

November, 1973

Vancouver, B.C.

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Geological, Geochemical & Geophysical Report
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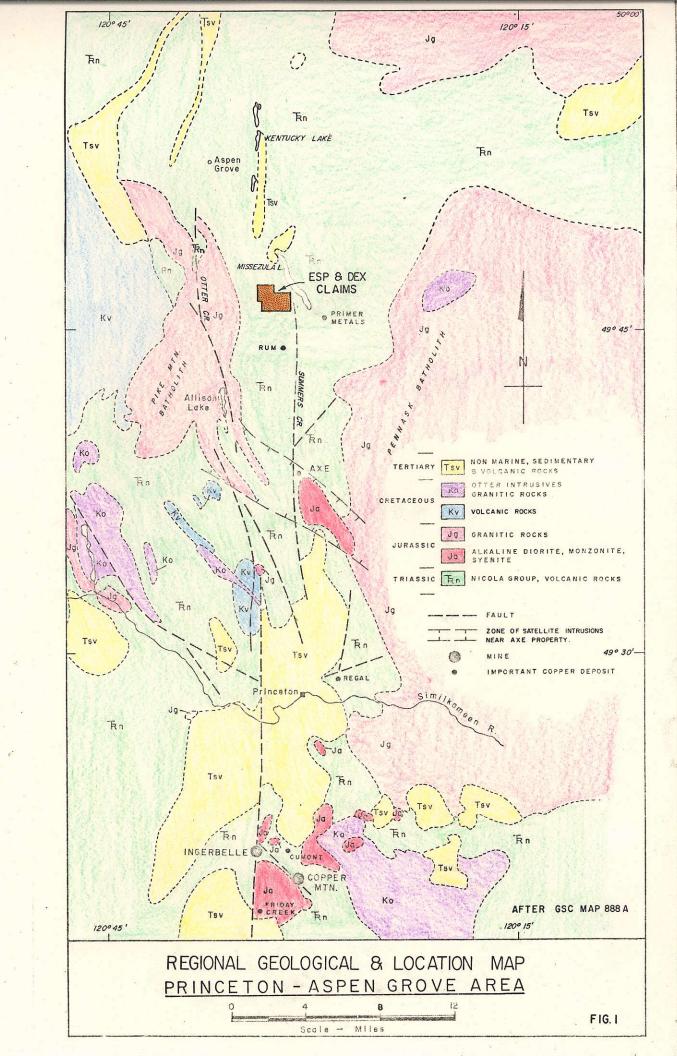
Iso Explorations Ltd. and Barrier Reef Resources Limited

April 5 - July 6, 1973

INTRODUCTION

Geological, geochemical and geophysical surveys on behalf of Iso Explorations Ltd. were carried out between April 5 and July 6, 1973 by a Geophysical Engineering crew on two adjoining claim groups located one to three miles west of the south end of Missezula Lake (Figure 1). This report describes the work done and results obtained on the western group consisting of 23 claims named ESP, owned by Barrier Reef Resources Limited, and the Red Box 2 and 4 Fractional claims recorded on May 1, 1973 and June 11, 1973, respectively, in the name of Barrier Reef Resources Limited. It should be noted that the ESP 4, 6, 96 and 97 claims are located in apparent contravention of the Mineral Act, being overstaked on the Strike and Spike claims, and therefore none of the present work was done on these four claims.

The ESP group is reached via the Missezula Lake logging road which leaves Highway No. 5 south of Aspen Grove at a point 30 miles from Princeton and 26 miles from Merritt. The logging road forks to the right at 3.5 miles and is followed to the 6.5 Mile marker, where a branch road forks to the right and ends on the western ESP claims at a total distance from the highway of 7.5 miles.



This part of the dissected Interior Plateaux is at elevations exceeding 4,000 feet and exhibits a southerly topographic grain impressed by Pleistocene ice sheets moving in that direction (Rice, 1947: Map 889A). The ESP group covers about 1-1/2 square miles and has a topographic relief of about four hundred feet, with the highest ground occurring in its southeastern part. Parallel hill-spurs decrease in elevation northward towards Duke Lake and are separated by minor creeks. Outcrop is plentiful on the high ground and locally it forms cliffs. The hill slopes are timbered in park-like fashion, and the low ground is partly swampy and everywhere thick with alder and buckbrush. Logging completed on the western claims has caused widespread disturbance of top soil and probably the obscuring of some rock outcrops.

Location lines of the claims were surveyed by chain and compass in course of the present work, and grid lines were chained and flagged (Map No. 1).

PREVIOUS WORK

Except on the contravening northern claims ESP 4, 6, 96 and 97, which occupy part of the Strike-Lorna group owned by Plateau Metals Ltd. (now Wharf Resources Ltd.) and Adera Mining Limited, there is no record of work in this area prior to recording of the ESP claims in 1972. In 1972 a geochemical soil survey for copper and silver was done by Barrier Reef Resources Limited (Sanguinetti, 1973). This survey involved collection and analysis of soil samples at 200-foot stations on 800-foot line-spacing. The three northwesterly claims ESP 34, 49 and 58 were not covered by this survey, which showed the existence of anomalous metal contents in the Strike-Lorna area and only locally elsewhere.

Discovery of copper mineralization in the Strike-Lorna area in 1962 led to exploration the results of which suggest a large southeast trending pyritic zone containing centrally as much as 4 per cent pyrite, with copper mineralization apparently restricted to local wide-spaced sections on the northern and northeastern flanks. The best reported assays include variously: 12 feet of 1.56% Cu and 95 feet of 0.17% Cu, 0.24 oz. Ag, respectively (from surface sampling); and 130 feet of 0.22% Cu and 10 feet of 0.42% Cu, respectively (from drill core sampling) (Lammle, 1967).

REGIONAL GEOLOGY

Lying between the Pike Mountain and Pennask batholiths is a north-trending belt, about 8-miles wide where it encloses Missezula Lake, that is underlain by Upper Triassic Nicola Group volcanic and sedimentary rocks (Figure 1). Persistent north-trending shear-or fracture-zones which bisect this belt and extend along its western margin, respectively, are known as the Summers Creek-Kentucky Lake Fault and Otter Creek Fault; they are marked topographically by valleys and geologically by local occurrences of late Cretaceous to Tertiary sedimentary and volcanic rocks. Near Missezula Lake the continuity of the Summers Creek-Kentucky Lake Fault system is apparently interrupted and a northerly structural trend, normally prevailing in Nicola rocks west of the Fault, is changed locally to a northwesterly trend throughout a transverse zone extending northwestward from Missezula Lake to the Otter Creek Fault and enclosing the ESP and DEX claim groups.

LOCAL GEOLOGY

1. Nicola Group

With the exception of single outcrops of probable dyke-rock on the ESP 77 and 78 claims respectively, all rocks mapped are volcanic and belong to the Nicola Group. In general, they are weakly jointed, massive-appearing rocks with only slight to moderate degrees of alteration apparent. Lithologically

they fall into three types which are separately mapped and show no well defined patterns of individual distribution; Type 1) tuff and breccia, Type 2) feldsparphyric andesite (lava), Type 4) augite porphyry (lava).

Type 1) is tuff breccia comprising a green, dense, granular matrix of crystal and rock fragments in which occurs a variable proportion of volcanic fragments up to 6 inches in size and generally sub-angular. The proportion of fragments varies widely and consequently some outcrops may be mapped as tuff and others as breccia. The rock has the composition of andesite and it weathers purplish in colour. Stratification is rarely visible and has been noted in only two places on the ESP 34 and 35 claims, respectively, where the observed strike is northwesterly, but in one case with a dip to the southwest and in the other case, to the northeast.

Type 2) is equally abundant and is pinkish to purple weathering, grey or green feldsparphyric andesite occasionally showing vesicles with calcite fillings. The rock is crowded with small feldspar phenocrysts which are mostly white plagioclase, but locally are pink and may be K-feldspar. This uniform rock contains visible disseminated magnetite.

Type 4) is less common in outcrop than the preceding types. It is a dark green augite-porphyry with scattered vesicles containing calcite. Its characteristic feature is the presence of abundant augite crystals forming prismatic phenocrysts of size 3 mm or less. A contact between this type and the preceding types is visible on the ESP 3 claim and it strikes northwestward.

A propylitic alteration is locally developed, as evidenced by epidote which is variously disseminated and in fractures, and by accompanying calcite and rarely pyrite. Introduction of secondary K-feldspar was noted on the ESP 35 claim.

2. Intrusive Dykes

The two small outcrops previously mentioned are believed to be dykes of which one is latite porphyry and the other felsite. Latite porphyry is a pink-green, fine-grained, inconspicuously porphyritic rock with a buff-or green-coloured groundmass and scattered 1 mm. pink feldspar laths. Felsite is a dense, fine-grained, grey rock with no distinctive features.

3. Structure

The rocks are apparently little deformed and there is no evidence of major faults on the claim group, nor is the observed fracturing anywhere intense. Fractures occupied in part by quartz, epidote and calcite dip in either direction and mostly strike northwesterly.

4. Mineralization

Copper mineralization was observed at a single occurrence on the ESP 34 claim, where small amounts of chalcocite and malachite occupy fractures. Pyrite, or limonite after pyrite, occurs in minor amounts in calcitequartz-epidote veinlets mainly near the northeast and southwest corners of the property. Similar small amounts of specular hematite were also noted.

GEOCHEMICAL SURVEY

1. Method

Westward from a baseline designated 60E, lines at 400-feet spacing were flagged every 100-feet. Soil samples were collected at 200-foot interval from the B-1 horizon using either a grubhoe or, in slashed and disturbed areas, an auger. They were examined, noted, placed in numbered kraft envelopes, partly air dried and sent to Chemex Labs. Ltd. (212 Brooksbank Avenue, North Vancouver) for determination of total Cu content. Samples had to be omitted at a number of waterlogged places. A total of 218 samples were collected from the ESP claims and analysed.

At the laboratory the samples were dried in warm air, screened at 80-mesh, and a one-half gram sample of the undersize of each sample was individually digested in perchloric-nitric acid mixture and the cool solution diluted with de-mineralized water. Copper was determined by atomic absorption spectrophotometer.

2. Results

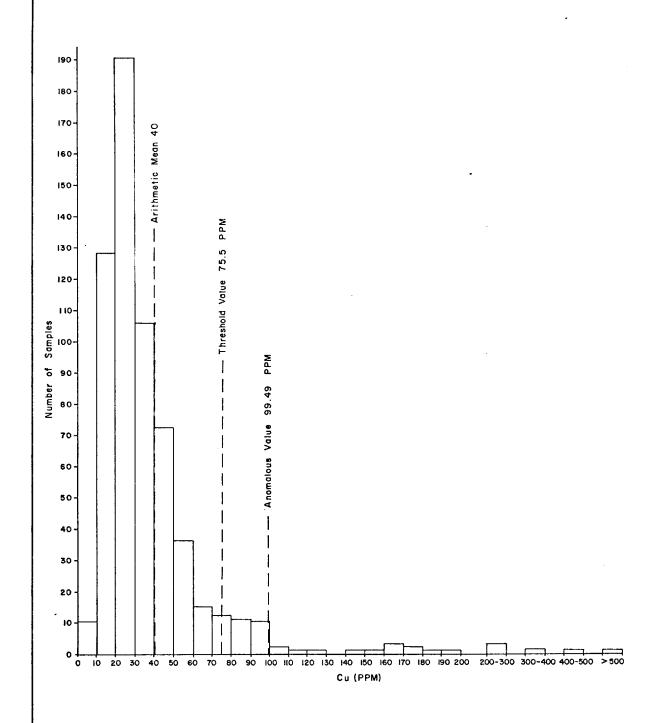
These are shown on the accompanying map (Map No. 3). Recognition of anomalous concentration was done by employing the total number of analyses available in the area, which includes the DEX claims. Thus, by weighting and combining the mathematical derivations of the 1972 (ESP) and 1973 (ESP and DEX) surveys, as shown in Appendix 'A', the significant values for soils at the B-1 horizon in this area of Nicola Group rocks were found to be as follows:

Mean or average	40	ppm	Cu
Threshold	75	ppm	Cu
Anomalous	100	ppm	Cu

Figure 2 illustrates graphically the frequency distribution of the copper values.

The 1972 copper-silver soil survey of the ESP claims on 800-foot line-spacing confirmed the existence of a geochemical anomaly in the mineralized Strike-Lorna area. Farther south the present survey indicates only minor copper anomalies; the largest being a narrow anomaly extending from the Strike area southward across the ESP 38 claim possibly as a result of glacial transportation. There are no observed outcrops in the area of this anomaly.

One claim-length farther south, a narrow moderate anomaly extends across two lines (30 00N and 34 00N in a low-lying area southeast of a small lake, and is probably of organic origin. A separate, similar sized anomaly on lines 34 00N and 38 00N lies 1,000 feet further east at the edge of the claim group, where the only rock present is unmineralized float but where nearby outcrops on the DEX group contain malachite and pyrite.



FREQUENCY DISTRIBUTION OF GEOCHEMICAL ANALYSES

F1G. 2 ISO EXPLORATIONS LTD. MISSEZULA LAKE B.C. ESP & DEX CLAIM GROUPS

NOTE:
TO ACCOMPANY REPORT ON THE ESP & DEX GROUPS NICOLA M.D. & SIMILKAMEEN M.D. BY J.M. CARR, P. ENG. DATED JUNE 20, 1973 & NOV. 8,1973.

All other anomalous values resulting from the survey are isolated single occurrences of no significance.

MAGNETOMETER SURVEY

Using a Scintrex MF-2 instrument and reading-back to a baseline control station every hour, a magnetometer survey was conducted at 100-foot station interval on all accessible parts of the 400-foot spaced lines (see Map No. 4).

Magnetic trends are found to be mainly north by west of north, similar to those on the DEX claims to the east but differing from those on the Strike-Lorna claims to the north where the trends are northwesterly and show a coincidence of magnetically-low areas with induced polarization anomalies and in part sulphides (Lammle, 1967).

Compared to results of the present survey on the DEX claims, the ESP claims are characterized by a more intense vertical magnetic component. On the ESP claims as much as one-third of the total area has intensities exceeding 1500 %, whereas on the DEX claims these higher readings are confined to only a few places. The higher magnetic intensity on the ESP group accords with the conspicuous content of disseminated magnetite seen in many outcrops on these claims.

VLF-ELECTROMAGNETIC SURVEY

VLF-EM surveys were made with a Crone Radem receiver, Model 97, with dip angle measurements taken every 100-feet, using the signal firstly from the Cutler, Maine transmitter and subsequently from the Seattle, Washington transmitter. The results are presented separately on Maps 5 and 6 in filtered form after the method of Fraser (1969, 1971). Neither of these two available signals are transmitted from a direction suitable to discern conductors whose strikes are between WNW and NNE.

An 800-foot line spacing with partial detail on 400-foot lines was used for the Cutler survey, and a 1,600-foot line spacing was used for the Seattle survey; in neither case is the line spacing sufficient to allow proper correlation of the intercepted conductors, and therefore the resulting maps are not contoured. Numerous anomalous and moderately anomalous readings (filtered tilt readings exceeding 10 and 5, respectively) were obtained throughout the ESP property and cannot be used to identify linear structures until additional, closer-spaced surveying is done.

SUMMARY AND CONCLUSION

The ESP claim group has been tested adequately by prospecting, geological mapping, geochemical, magnetometer, and VLF-EM surveys.

The lack of mineralization in abundant outcrops and also of significant geochemical responses in this area of shallow overburden forces the conclusion that no large amount of copper mineralization exists on the property.

J.M. Carr, P. Eng. November 8, 1973

REFERENCES

1. Rice, H.M.A. (1947)

"Geology and Mineral Deposits of the Princeton Map Area, British Columbia", Geological Survey of Canada, Mem. 243.

2. Lammle, C.A.R. (1971)

"Geological and Geophysical Report on Strike-Lorna Mineral Claims", for Adera Mining Limited, dated February 28, 1967. (Assessment Report).

3. Lammle, C.A.R. (1971)

"Geochemical Report on Strike-Lorna Group", for Adera Mining Limited and Plateau Metals Limited (N.P.L.), dated July 5, 1971. (Assessment Report).

4. Fraser, D.C. (1969)

"Contouring of VLF-Em Data", Geophysics, XXXIV, 6, pp. 958 - 967, December, 1969.

5. Fraser, D.C. (1971)

"VLF-EM Data Processing", CIM Bulletin, January, 1971, pp. 39 - 41.

6. Salaken, L.W. (1972)

'Report on the Geology, Geochemistry and Magnetics, Princeton Claims: South MDA-RCS and North MDA-CORB Claim Groups', for Sheba Copper Mines Ltd., dated November 16, 1972. (Assessment Report).

7. Sanguinetti, M.H. and Reeve, A.F. (1973)

"Geochemical Report on the ESP Claim Group, Aspen Grove Area", for Barrier Reef Resources Ltd. (N.P.L.), January 8, 1973. (Assessment Report).

8. Carr, J.M. (1973)

"Geological, Geochemical and Geophysical Report on the DEX 1-16, Red Box 1 Fr., Red Box 3 Fr. Claims, Missezula Lake", for Iso Explorations Ltd., and Kalco Valley Mines Ltd., dated June, 1973. (Assessment Report).

LIST OF FIELD PERSONNEL

		No. of Days Employed on ESP Group		
Name	Position	April 5-May 1	May 2-June 8	July 5-6
J.M. Carr	Consulting Geologist			2
G.W. Davies	Field Supervisor	12	1	
G. Lovang	Senior Prospector	15		
K.W. Davies	Instrument Man & Linecutter	24		

J'M. Carr, P. Eng., November 8, 1973

STATEMENT OF APPLICABLE COSTS

	Incurred in Period:		
2	April 5-May 1	May 2-June 8	July 5-6
Line cutting: 9 miles @ \$75	\$ 675.00	\$	\$
Geological mapping: 3 man-days (G.W. Davies) @ \$90 1 man-day (G.W. Davies) @ \$90 2 man-days (J.M. Carr) @ \$150	270.00	90.00	300.00
Geochemical survey: 9 miles @ \$80	720.00		
Magnetometer survey: 16 miles @ \$40	640.00		
VLF-EM survey: 13-3/4 miles @ \$65	893.75		
Geochemical analyses: 218 samples @ \$1.00	218.00		
Board & lodging: 48 man-days @ \$1 2 man-days @ \$1 2 man-days @ \$1	2	24.00	24.00
Transportation on the property: 19 days @ \$18 1 day @ \$18 2 days @ \$18	342.00	18.00	36.00
Preparation of report & supervision	380.00		20.00
Totals	\$4,714.75 (a)	\$132.00 (b)	\$380.00 (c)
Grand Total		\$5,226.75	

J.M. Carr, P. Eng., November 8, 1973

LIST OF CLAIMS AND WORK DISTRIBUTION

Claim	Mining Division	Record No.	Present Expiry Date	No. of Years Applied For (per claim)
ESP 3-6 incl.	Nicola	48449-48452	March 5/75	2
ESP 58	Nicola	48480	March 5/75	2
ESP 96-97	Nicola	48498-48499	March 5/75	2
ESP 33- 38 incl.	Similkameen	31362-31367	March 5/75	2
ESP 49-50	Similkameen	31378-31379	March 5/75	2
ESP 73- 80 incl.	Similkameen	31386-31393	March 5/75	2
Red Box 2 Fr.	Similkameen	40388	May 1/74	* 2
Red Box 4 Fr.	Similkameen	40616	June 11/74	Ø 2

Total number of claims: 25

Certificates of Work applied for as indicated in last column (total number applied for = 50).

J.M. Carr, P. Eng., November 8, 1973

^{*} Per work shown in Statement of Applicable Costs as sums (b) & (c).

Ø Per work shown in Statement of Applicable Costs as sum (c).

CERTIFICATE

I, John M. Carr, do hereby certify that:

- 1. I am a geologist residing at 3896 Scolton Road, Victoria, British Columbia and employed by Teck Mining Group Limited.
- 2. I am a graduate of the University of Oxford with a B.A. (Hons.) degree in Geology and a D. Phil degree in Geology obtained at the same University.
- 3. I am a Professional Engineer registered in the Province of British Columbia.
- 4. I have practised my profession in geology continuously for the past 22 years and since 1955 in British Columbia.
- 5. Between 5 April and 6 July, 1973, I directed a field programme on the ESP claim group on behalf of Iso Explorations Limited.

J.M. Carr/

November 8, 1973

APPENDIX 'A'

APPENDIX 'A' (Page 1)

. CALCULATIONS OF THRESHOLD AND ANOMALOUS VALUES USING STANDARD DEVIATION

(Iso Explorations Ltd. - Samples Only)

Employing the S =
$$\sqrt{\frac{\sum (Xi)^2 - N(\overline{X})^2}{N - 1}}$$
in which \overline{X} =
$$\frac{\sum Xi}{N}$$
S = standard deviation
$$\overline{X}$$
 = mean or average value
$$Xi = \text{value}$$

$$N = \text{total number of values}$$

$$\overline{X}$$

$$\overline{X}$$
=
$$\frac{Xi}{N}$$
 = 33.3
$$(Xi)^2 = 570,642$$
S =
$$\sqrt{\frac{\sum (Xi)^2 - N(\overline{X})^2}{N - 1}}$$
S =
$$\sqrt{\frac{570,642 - 359(1108.9)}{358}}$$
S = 21.952

Threshold value = X + 2S = 33.3 + 2 (21.952) = 77.204) For 1973 (ESP and DEX) Anomalous value = X + 3S = 33.3 + 3 (21.952) = 99.156) survey

APPENDIX 'A' (Page 2)

For 1972 (ESP) Survey (Sanguinetti, 1973):

Total Values 250

Mean or Average = 47.48

Threshold Value = 73 ppm

Anomalous Value = 100 ppm

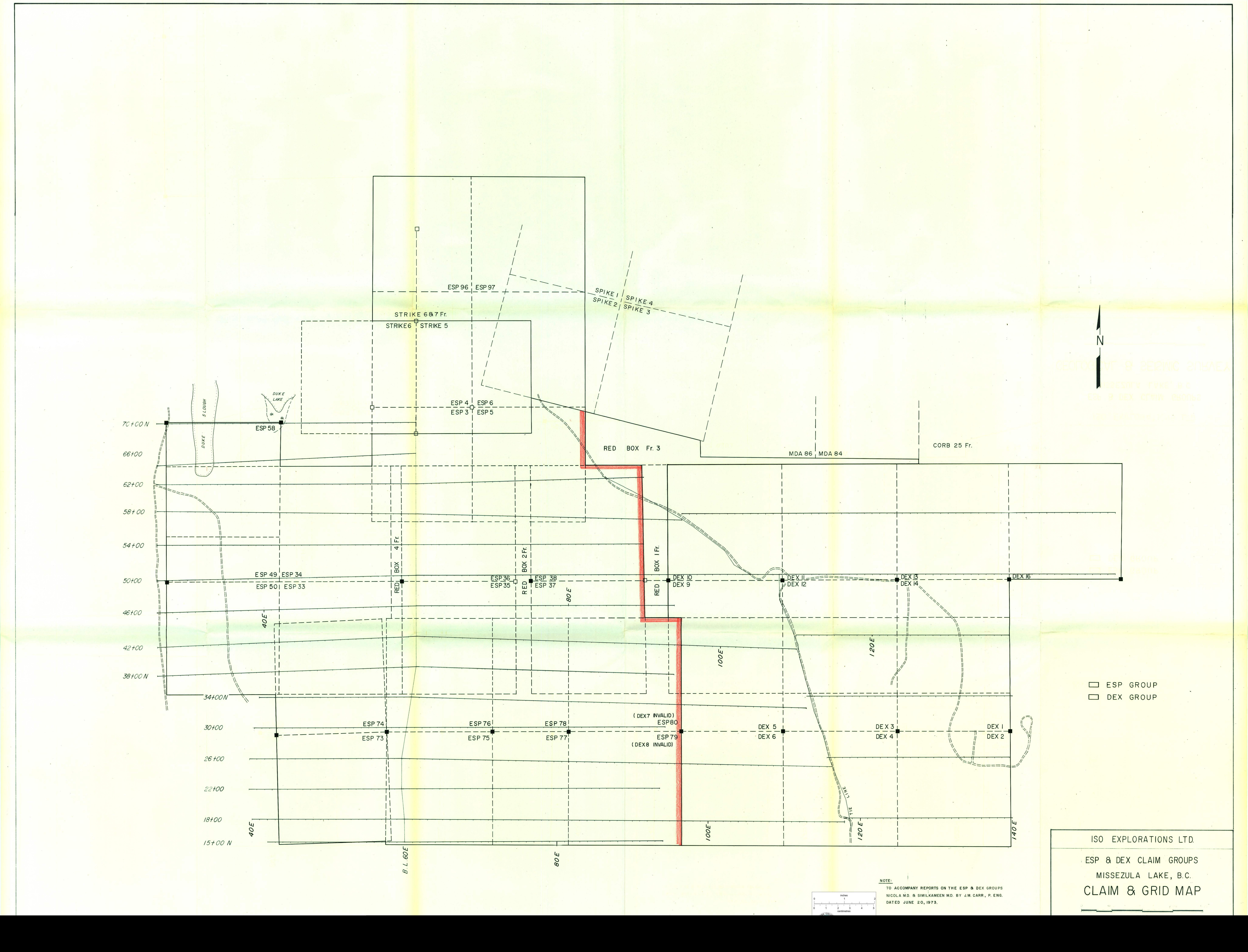
Weighted Values Combining Both Surveys:

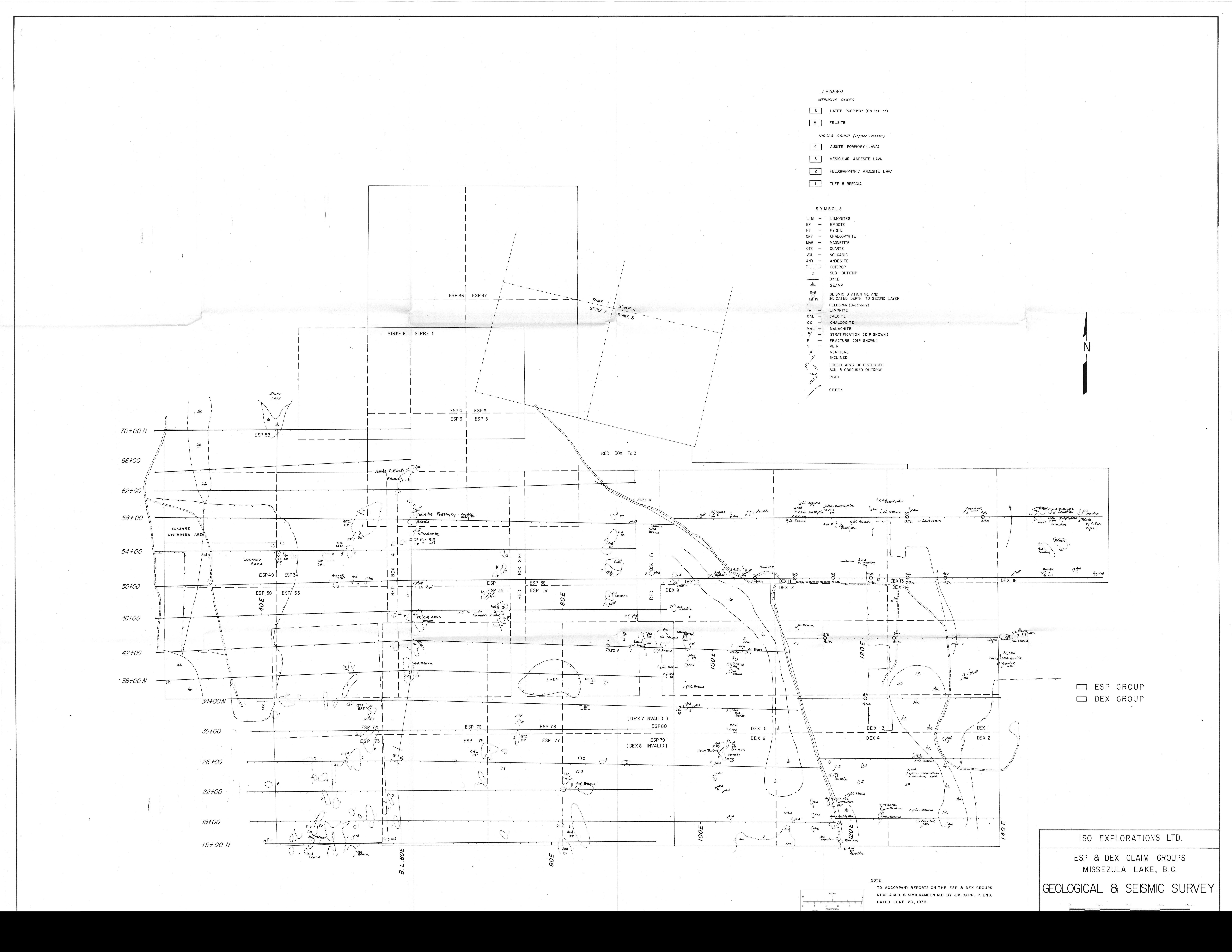
Total Values 609

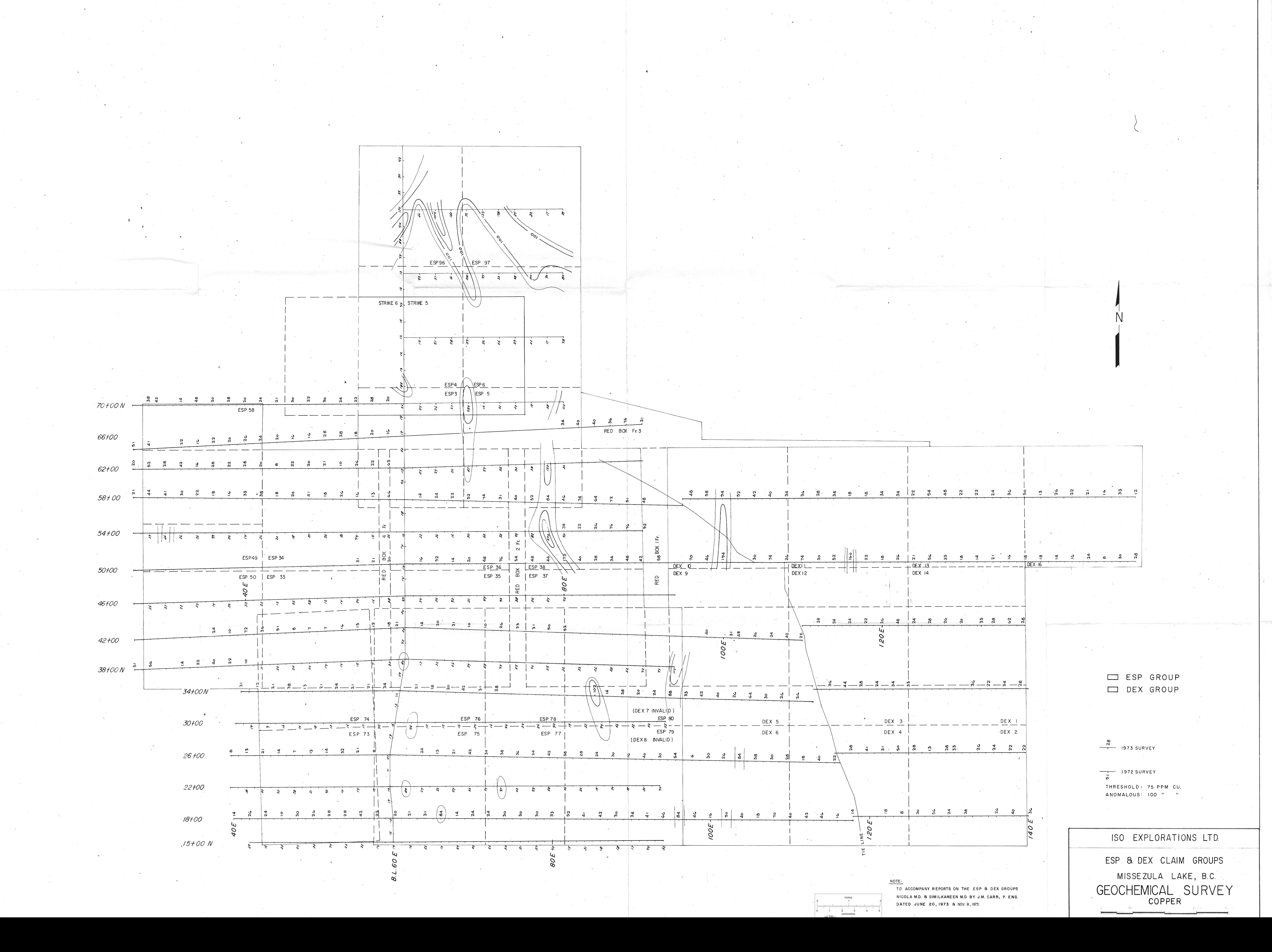
Mean or Average = 40

Threshold Value = 75.47 ppm

Anomalous Value = 99.49 ppm







ESP GROUP DEX GROUP 18+00 ISO EXPLORATIONS LTD. 15+00 N ESP & DEX CLAIM GROUPS

MISSEZULA LAKE, B.C. MAGNETOMETER SURVEY

TO ACCOMPANY REPORTS ON THE ESP & DEX GROUPS

NICOLA M.D. & SIMILKAMEEN M.D. BY J.M. CARR, P. ENG.

DATED JUNE 20, 1973 & NOV. 8, 1973.

