COMINCO EXPLORATION PTY. LTD.

PROGRESS REPORT

on

EXPLORATION LICENCE 1/63

for six months ending

August 11, 1976.

76-1181

by D.M. Ransom

13/8/76.

INTRODUCTION

Exploration Licence 1/63 lies 98 km south-west of Burnie in north-west Tasmania. It is 58 square kilometres in area and surrounds the Cleveland Tin mine. Exploration activities within the licence are carried out by Cominco Exploration Pty. Ltd. on behalf of the titleholders, Cleveland Tin N.L. The expiry date of the licence is August 11, 1976, and application has been made for renewal for the six months period ending February 11, 1977.

This report describes exploration within E.L. 1/63 for the six months period ending August 11, 1976, and presents a review of the regional geology of the area.

PREVIOUS EXPLORATION

Previous exploration activities in the E.L. have been reported by Ransom and Hunt (1972); Ransom and Simpson (1973); Sale (1974); Stuart-Smith (1974); Palmer (1975a), Palmer (1975b); and Ransom (1976).

These programmes have included geological mapping, line cutting, soil and stream sediment geochemistry, and self potential and aeromagnetic surveys.

CURRENT PROGRAMME

The programme for the six months to August 11, 1976 was a continuation of the soil geochemical follow-up of the weak stream geochemical anomalies found in 1974 (Palmer, 1975a). The programme consisted of soil sampling and geological mapping of cut lines in three areas within the E.L. designated the Wombat, South Magnet Dam and Washington Hey areas by Palmer (1975b).

At August 11, 1976, all line cutting, soil sampling and mapping had been completed.

In addition to the collection of 540 samples reported by Ransom (1976), a further 85 samples were collected after the renewal date in February, and all remaining samples analysed and plotted. A limited IP programme was completed during the period in the Washington Hey area.

RESULTS

Geological Mapping

All geological mapping completed during the 12 months period to August 11, 1976 was plotted and the fact plans updated. In addition, uncompiled mapping of previous workers (mainly that of R. Cox) was replotted on the fact plans at 1:5,000 scale. These data are presented on Plates CT 112, A, B,C,D,E,F,G. A previous practice of labelling mafic rocks unrelated to the Deep Creek volcanics as "ub" or "ultrabasic" has been discontinued and a specific rock type label, or a general term "greenstone" or "gst" where these rocks are undifferentiated (*cf* Crooke and Felton, 1975), has been substituted on the plans. These changes and others are defined in the legend on Plate CT 112C.

Geochemical Work

Analytical results of all soil samples collected in the past 12 months are presented on Plates CT 33 A,B,C,D,E,F. All samples were collected on cut lines by hand auger at 12.5m intervals. Where possible, the 'C' soil horizon was taken. Sample analysis was for Sn, Cu, Pb, Zn by emission spectograph. Those samples assaying over 50 ppm Sn were re-assayed for Sn by XRF. It was found that, as a rule, the results from emission spectography tended to over estimate Sn in the compositional range of interest.

Sn values exceeding 50 ppm are considered anomalous on the basis of previous orientation work in the Cleveland mine area. Only a few percent of the samples collected exceeded this threshold value after re-assay by XRF. Inspection of the Plates CT 33 and CT 112, comparing geochemistry and geology, indicates that the most concentrated areas of anomalous tin geochemistry occur close to the Meredith granite contacts in the South Magnet Dam and Wombat areas. This almost certainly represents the high Sn background of the Meredith granite. The Sn anomaly described previously by Palmer (1975b) is now clearly shown to be a result of such a source, possibly an irregularity in the granite contact.

Sn values >50 ppm are elsewhere underlain in the Wombat and South Magnet Dam areas by a variety of rock types and the distribution of these values is largely random, most representing spot highs, probably unrelated to any anomalous Sn population.

In the Washington Hey area, similarly, the distribution of anomalous Sn values (after re-assay) is irregular but high values (>500 ppm) are associated with the dumps of the Washington Hey and Confidence mines. These samples, which also exhibit elevated Pb and Zn results, hold some interest in that Sn has not been previously described from this mineralization. A zoning study currently proceeding, of the Cleveland ore mineralization, indicates Pb and Zn are diagnostic indicators of the ore body extremities. It is possible that the Pb/Zn mineralization at Washington Hey and Confidence may be extreme representatives of this zoning pattern.

To date, no systematic interpretation of the distribution of Cu, Pb and Zn has been attempted, but inspection of the plans indicates that in general, higher values of these elements tend to cluster to a significantly greater extent than those of Sn.

At this time almost all Cu, Pb, Zn soil analyses have been carried out by emission spectograph, with its rather poor resolution at high metal concentrations. It is proposed during the coming six month period to February, 1977, to attempt a statistical analysis of all Cleveland soil results currently available, aimed at establishing correlations between the metals and their geological environment.

Geophysical Work

As reported previously (Ransom 1976), an IP programme over the Washington Hey area was planned at the end of the last reporting period. Five lines, RA4, RA6, RA8, RA10, and RA12 were duly covered with 50m dipole IP. The area of the survey is shown in Plate CT 163. No significant anomalies were detected, indicating that no shallow mineralized body exists in the area. However, the zoning considerations outlined above suggest that further work may be warranted. The profiles of the IP data are presented in Plates XCT RA4,6,8,10,12.

REVIEW OF REGIONAL GEOLOGY

A new interpretation of the regional geology of E.L. 1/63 is presented in Plates CT 161, 164. This represents a substantial departure from the previous interpretation and is a product of the considerable amount of additional geological mapping in the more remote areas of the E.L. since the 1973-74 season when the previous interpretation was mooted.

The major changes are the definition of an overturned syncline to the south-east of the Cleveland mine, and changes to the fault locations in various parts of the licence.

Ransom (1973) and Ransom and Simpson (1973) proposed that the following stratigraphy existed in E.L. 1/63 and its immediate environs.

Mt. Bischoff Sequence: black argillite unit, purple shales and tuff unit, quartzite and slate unit.

Magnet Range Sequence: red-brown argillites and chert unit.

Cleveland Mine - Falls Creek Sequence: micaceous sandstone unit, chert and grey shale unit, spilitic volcanic unit, sandstone unit, black argillite and arenite unit.

Mt. Cleveland Sequence: micaceous sandstone with chert units.

It was proposed that the Mt. Bischoff tin deposit occurs in the slates and quartzite unit of the Mt. Bischoff sequence and the Cleveland tin deposit occurs in the chert/grey shale unit of the Cleveland Mine - Falls Creek Sequence. This particular unit is locally known as Hall's formation after Cox (1968) and Cox and Glasson (1972). Each of the sequences above was thought to be separated by large bodies of mafic and ultramafic rock, considered to be allochthonous in origin and to occupy westerly dipping thrust zones.

In 1973 an airborne magnetic survey was flown over part of E.L. 1/63 (Palmer 1975a). The regional interpretation subsequently was modified to rationalize -

i) an interpreted magnetic and photo linear which apparently truncates the volcanic sequence on its eastern side;

ii) the unexpected observation that many of the "ultrabasic" units are non-magnetic; and

iii) the general recognition that these units are dominantly mafic in chemistry and included volcanic units (Ransom 1973).

Hence the presence of chert units within the Magnet Range Sequence, and the superficial similarity of these rocks to Halls Formation, with mafic volcanics on the east and sandstone on the west, led to the conclusion that the sequence near the mine was repeated on the Magnet Range. The soil geochemistry programme presented in this report resulted in part from these considerations.

In succeeding field programmes, a considerable amount of new data accumulated, mainly from mapping cut lines, in the southern parts of the licence, and check mapping in the area of Whyte Hill. A number of new facts and other considerations required further rationalization, as follows:-

1. On line 2100N in the South Magnet Dam area a previously unmapped sequence of mafic volcanics, mainly arenites and lapilli tuffs, interbedded with mica sandstone in identical fashion to rocks in the Washington Hey area, were mapped. This sequence, which is apparently over 300m wide in outcrop, wedges out about 200m south of line 3000N, hence crossing the north-south fault in the previous interpretation.

2. As noted in Ransom (1973) unequivocal facing criteria in the licence area was generally lacking. Only in one creek, approximately 3km south of the mine, was clear evidence present which indicated that the sandy sequence in this area was upright and west facing. As discussed by Ransom (1973) and Ransom and Simpson (1973), the facing of the mine area was problematical. However, data accumulated since that time, mainly from deep drilling of tuffaceous shale sequences and other considerations such as the gross morphology of the ore lenses, indicate that the mine sequence faces east, being overturned at surface, but upright a short distance below suface*. Considering the facing evidence, the need for a fold in the Cleveland Mine - Fall's Creek Sequence is evident.

3. Recent check mapping in the Whyte Hill area has shown that many of the basic volcanic units in road cuttings are again mafic volcanic arenite interlayered with sandstone and minor mafic flows, similar to the Washington Hey and 2100N areas. Also in this area, a more noticeable degree of faulting, brecciation, irregular dips and occasional minor folding is evident, suggestive of a possible fold hinge in the area. The possibility of a fold hinge in this area was considered by Ransom (1973) but dismissed on consideration of the lack of facing criteria.

4. Mapping in the South Magnet Dam area has allowed the mafic and chert sequence in this area to be differentiated into a sequence of volcanics (purple spilites, mafic tuffs and tuff breccias, amygdaloidal picritic basalt flows), a serpentinite unit, and a major sequence of ?intrusive

* The sub-surface easterly dip of the mine sequence is a structural problem not easily resolved in terms of regional geology.

dolerites, with an ophitic texture and distinctive outcrop pattern. These rocks are apparently directly associated with the chert sequence of the Magnet Range, which appears to an integral part of it. Further mapping has shown this sequence to be sharply folded or faulted to the west in the Whyte Hill area. The volcanics and dolerites of this sequence are similar to those in parts of the Washington Hey area and may compose a similar sequence in the Whyte River valley, although outcrop is very poor in this area. These rock are referred to generally as greenstones. The greenstones are easily distinguishable from the spilitic volcanics at the mine in the Deep Creek - Falls Creek area on the basis of the following:-

i) their degree of exposure and outcrop pattern: the spilites tend to be well exposed, with outcrops showing a rough surface. The greenstones are usually poorly exposed, but commonly form bouldery slopes and smooth sided outcrops in steep topography.

ii) their magnetic response: the spilites in the Cleveland area are strongly magnetic, the greenstones generally non-magnetic.

iii) their chemistry, as pointed out by Rubinach (1974): at Serpentine Hill the greenstones exhibit a characteristic low TiO_2 and low K_2O chemistry which distinguishes them from spilitic rocks. Table 1 presents a series of whole rock analyses from the Cleveland area showing those and other chemical differences between the spilites and the greenstones.*

Plates CT 161 and CT 164 show the current interpretation. CT 161 shows an interpretation of rock types and CT 164 shows an interpretation of stratigraphy. Three sequences are proposed, similar to the scheme of Ransom (1973) and Ransom and Simpson (1973), as follows (not necessarily in stratigraphic order):

a) Mt. Cleveland Sequence: occupying the area west of the Whyte River valley, composed of a monotonous poorly bedded sequence of westerly dipping mica sandstone or subgreywackes and containing regionally extensive chert units.

* Data provided by John Foden of University of Tasmania.

b) Cleveland Mine - Falls Creek Sequence: occupying the bulk of the western half of the E.L. folded into a south plunging syncline and composed of three mappable rock units, which usually exhibit gradational contacts, in stratigraphic order from the top as follows;

i) a mafic volcanic unit composed mainly of lava flows, interbedded tuffaceous shales and coarser tuffs;

ii) a grey argillite/chert unit, mappable for over 2.5km on the western side of the syncline (Hall's Formation) but apparently not present in the eastern limb.

iii) a mica sandstone unit well bedded in part similar to the rocks of the Mt. Cleveland sequence but containing common lenses of chert, brown and grey shale, and mafic tuff.

c) The Bischoff Sequence: These rocks are dark grey to black argillites and arenites underlying the eastern part of E.L. 1/63, surrounding the Meredith granite. They are strongly magnetic and appear to overlie mafic tuffs and the quartzite/slate sequence in the Mt. Bischoff area, as described by Ransom (1973), and Ransom and Simpson (1973).

These sequences are separated from each other by the greenstones described above, of which the cherts of the Magnet Range, referred to as the Magnet Range Sequence by Ransom (1973) and Ransom and Simpson (1973), now are thought to comprise an integral part. The time relationships of the three sedimentary sequences and the greenstones is uncertain, since all contacts are faulted. From considerations of structure and distribution it is possible that the greenstones of the Magnet Range are thrust over the Mt. Bischoff sequence from the west and underlie the Mt. Cleveland and Cleveland Mine - Falls Creek sequence in similar relationship to that described by Ransom (1973).

REGIONAL GEOLOGY INTERPRETATION AND AIRBORNE MAGNETICS

Plate CT 163 presents a plan of the 1974 airborne magnetic survey at 1:25,000 scale, and an interpretation of magnetic linears by S.S. Webster. It is readily seen that this map is, in part at least, difficult to relate to the regional geology as presented in Plates CT 161 and CT 164. This is difficult to rationalize, but since both maps are interpretive, and line recovery on the

magnetic survey may be inaccurate in some areas, it is probably predictable. However, this presumably points to the need for further geological mapping concentrated perhaps in the following areas:

1. In a north-south zone about 1 km wide between the northern and southern boundaries of the property passing through Whyte Hill.

2. In the Magnet Dam No. 2 area (Plate CT 163).

FINANCE

Expenditure for the six months ending August 11, 1976 is as follows:

	$
Miscellaneous	15
Geology	6,786
Survey	1,423
Geophysics	1,896
Geochemistry	12,237
Tenure	60
	$22,417

Submitted D.M. Ransom

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REFERENCES

Cox, R.	(1968)	"The Economic Geology of the Cleveland and Magnet Mines, Tasmania." Univ. of Sydney Ph.D Thesis (unpublished)
Cox, R. and Glasson, K.R.	(1971)	"Economic Geology of the Cleveland Mine, Tasmania." Econ. Geol. 66, 861-878.
Crooke, K.A.W. and Felton, E.A.	(1975)	"Tasman Geosyncline Greenstones and Opiolites." J. Geol. Soc. Aust., 22, 117-131.
MacIntosh Reid, A.	(1923)	"The Mt. Bischoff Tin Field." Bull. Geol. Surv. Tas. No. 23.
Palmer, K.G.	(1975a)	"Progress Report - Exploration Licence 1/63, Cleveland Tin N.L., period ending February 11, 1975." CEPL unpublished report to Tas. Mines Dept.
Palmer, K.G.	(1975b)	"Progress Report - Exploration Licence 1/63 for six months ending August 11, 1975." CEPL unpublished report to Tas. Mines Dept.
Ransom, D.M.	(1973)	"Regional geology of the Luina-Waratah area and its relationships to the Precambrian/Early Cambrian stratigraphy of the West Coast, Tasmania." CEPL unpublished report.
Ransom, D.M.	(1976)	do. do.
Ransom, D.M. and Hunt, F.L.	(1972)	"Cleveland Tin N.L. Year End report". CEPL unpublished report to Tas. Mines Dept.
Ransom, D.M. and Simpson, D.C.	(1973)	"Progress Report - Cleveland Tin N.L. for 6 months ending June 30, 1973." CEPL unpublished report to Tas. Mines Dept.
Rubinach, M.J.	(1974)	"The origin and emplacement of the Serpentine Hill complex, Western Tasmania." J. Geol. Soc. Aust. 21, 91-106.
Sale, R.V.	(1974)	"Progress Report - Cleveland Tin N.L. for 6 months ending December 31, 1973." CEPL unpublished report to Tas. Mines Dept.
Stuart-Smith, P.G.	(1974)	"Progress Report - Cleveland Tin N.L., 6 months ending June 30, 1974" CEPL unpublished report to Tas. Mines Dept.
Twelvetrees, W.G.	(1900)	Report on the mineral fields between Waratah and Corinna. Dept. of Mines Tas. Published Report 158.

ATTACHMENTS

Plates	CT 33 A,B,C,D,E,F	Cleveland Mine Area, Surface Geochemistry	1:5,000
	CT 112 A,B,C,D,E, F,G.	E.L. 1/63, Geological Surface Outcrop Plan	1:5,000
	XCT 57/RA 4,6,8, 10,12	Pseudo-cross-sections I.P. data	
	CT 161	Cleveland Mine area. Interpretive regional geology (rock units)	1:25,000
	CT 163	Cleveland Mine Area, Summary Map	1:25,000
	CT 164	Cleveland Mine area, Interpretive Regional Geology (Stratigraphy)	1:25,000
	CT 165	Cleveland Mine Area, Interpretive Map of Magnetic Linears .	1:25,000

011

Cleveland.

443012

Table I

Chemical Analyses and C.I.P.W. Norms of Basic Volcanics from the MT. CLEVELAND AREA

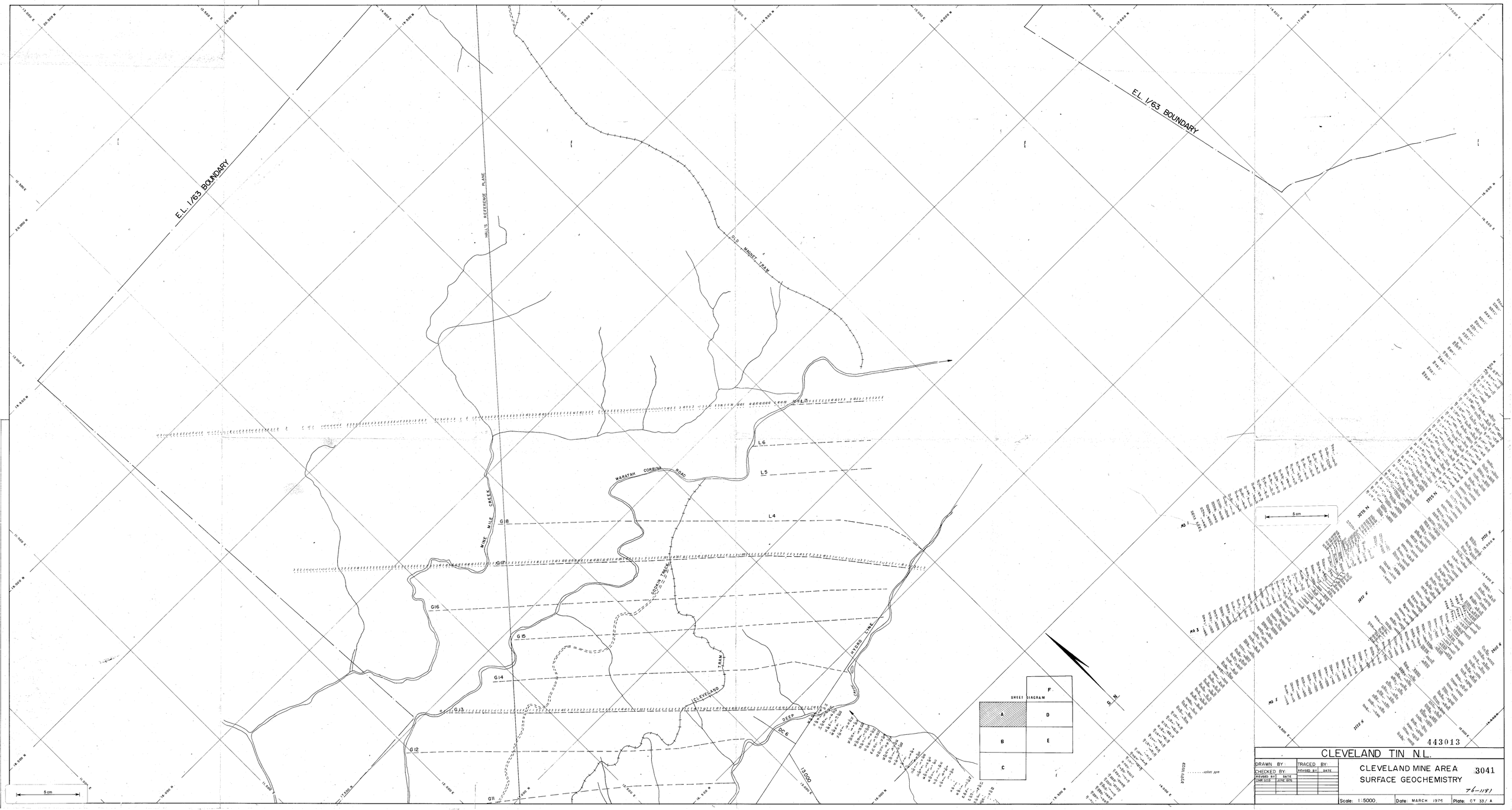
	C14	C4	C5	C3(c)	C2(c)	C12	C8	C1	C1(c)
SiO_2	48.40	48.03	42.63	47.30	49.05	50.55	50.11	45.93	46.24
Al_2O_3	13.56	12.42	8.02	13.25	13.25	14.08	14.12	12.57	12.94
Fe_2O_3	15.24	7.89	10.92	14.55	13.70	14.08	14.84	15.97	13.91
MgO	5.13	9.64	25.19	7.50	6.60	6.27	5.18	4.54	5.85
CaO	9.17	18.00	4.09	8.34	8.33	5.18	7.50	8.20	11.14
Na_2O	3.69	0.85	0.01	2.43	3.24	2.72	3.93	0.30	1.35
K_2O	0.84	[0.01	0.03]	0.38	0.38	1.08	0.08	3.49	1.39
TiO_2	1.59	[0.18	0.11]	1.76	1.68	1.40	1.83	3.84	2.32
P_2O_5	0.20	0.02	0.01	0.15	0.15	0.13	0.17	0.66	0.23
MnO	0.25	0.24	0.14	0.23	0.22	0.23	0.21	0. 9	0.29
Ign.Loss	2.34	3.74	10.05	3.72	2.62	3.66	2.41	2.75	4.41
TOTAL	100.40	101.02	101.19	99.61	99.22	99.36	100.36	98.93	100.05

C.I.P.W. NORMS:

SI	0.00	0.00	0.00	2.11	0.71	5.48	1.54	6.47	2.56
OR	4.99	0.08	0.17	2.22	2.22	6.37	0.45	20.63	8.23
AB	31.25	7.18	0.06	19.03	27.45	23.01	33.21	2.53	11.42
AN	17.92	30.05	20.24	24.94	20.49	23.03	20.69	22.64	25.12
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DI	21.76	47.39	0.00	12.60	16.22	1.49	12.75	11.32	23.47
HY	2.61	6.84	43.30	24.35	19.61	26.86	18.57	16.37	13.46
OL	8.97	1.69	21.52	0.00	0.00	0.00	0.00	0.00	0.00
MT.	5.97	3.09	4.28	5.70	5.37	5.52	5.81	6.26	5.45
IL	3.02	0.35	0.21	3.34	3.18	2.65	3.47	7.29	4.40
AP	0.46	0.04	0.02	0.36	0.35	0.30	0.39	1.57	0.54
CO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TRACE ELEMENTS

Co	n.d.	n.d.	55	n.d.	41	n.d.	n.d.	n.d.	n.d
Cr	70	[197	2415]	75	53	161	53	81	118
Ni	45	81	1253	48	55	79	27	38	71
Rb	25	1	1	36	49	42	5	974	341
Sr	305	38	7	164	311	228	129	95	250
V	371	[178	117]	422	397	331	397	685	432
Zr	115	10	4	124	116	71	138	220	167
Y	43	13.5	8	36	37.5	36	37	62	28



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CLEVELAND TIN N.L.

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TIME SCO: DATE 2576		

CLEVELAND MINE AREA 3041
SURFACE GEOCHEMISTRY
76-1191

Scale: 1:5000. | Date: MARCH 1976 | Plate: CT 33/ A


EL 1/63 BOUNDARY
EL 1-63
ML 27M/71
LUINA TOWNSHIP
To Corinna
WARATAH CORINNA ROAD
MILL ROAD
HALL'S REFERENCE PLANE
CLEVELAND TRAM
DEEP CREEK
HYDRO LINE
HEC SAVAGE RIVER WARATAH POWER LINE
WHYTE RIVER
TAILINES DAM
GOSKIN TRACK
3K Portal
Top Road
3 LEVEL Road
7 LEVEL Road
G12
G11
G10
G9
G8
G7
G6
G5A
G5
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A
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Sn Cu Zn Pb
values p.p.m.
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CLEVELAND TIN N.L.
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CLEVELAND MINE AREA 3042
SURFACE GEOCHEMISTRY
76-1181
Scale: 1:5000
Date: March 1976
Plate: CT 33-B

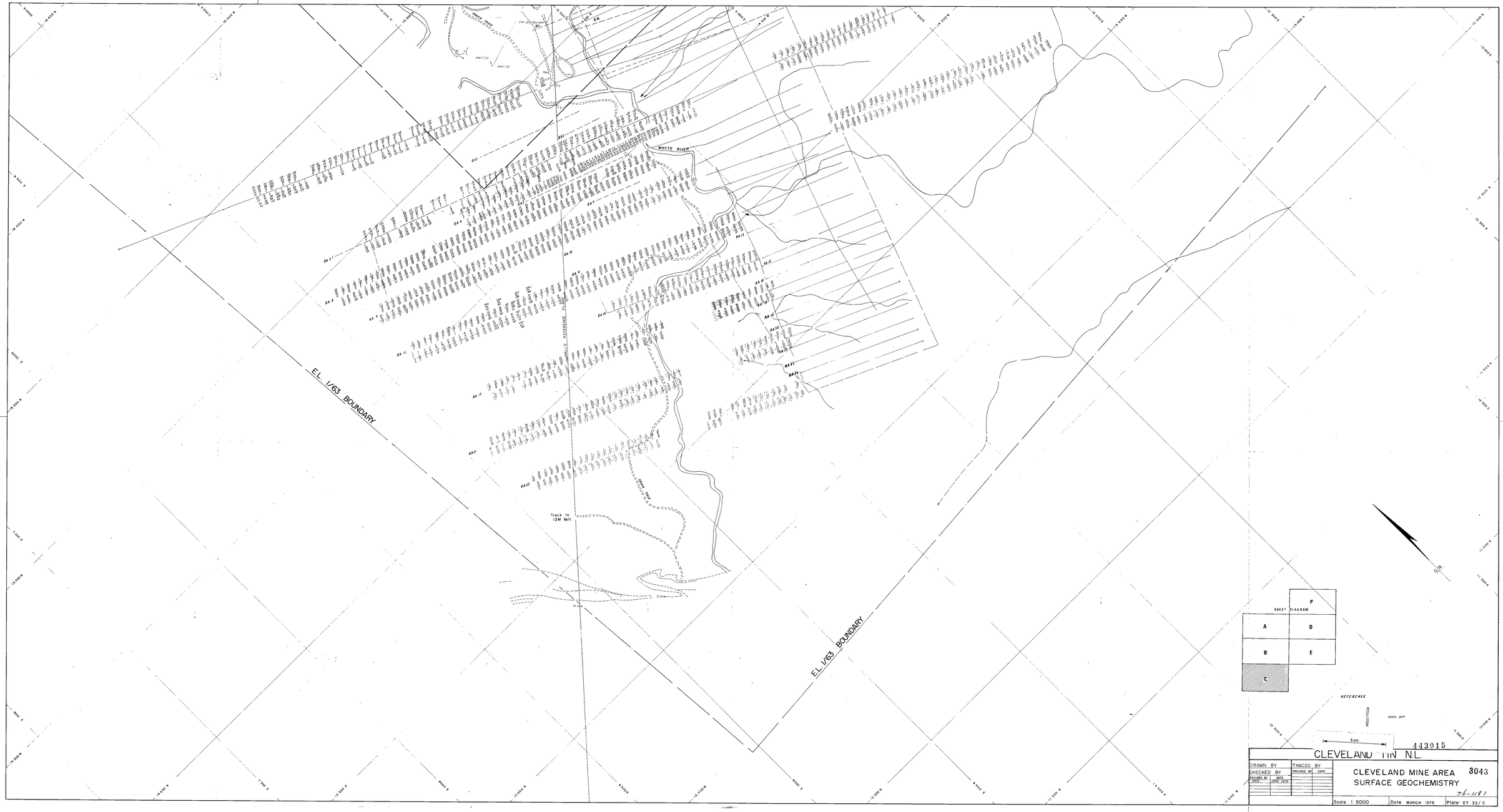
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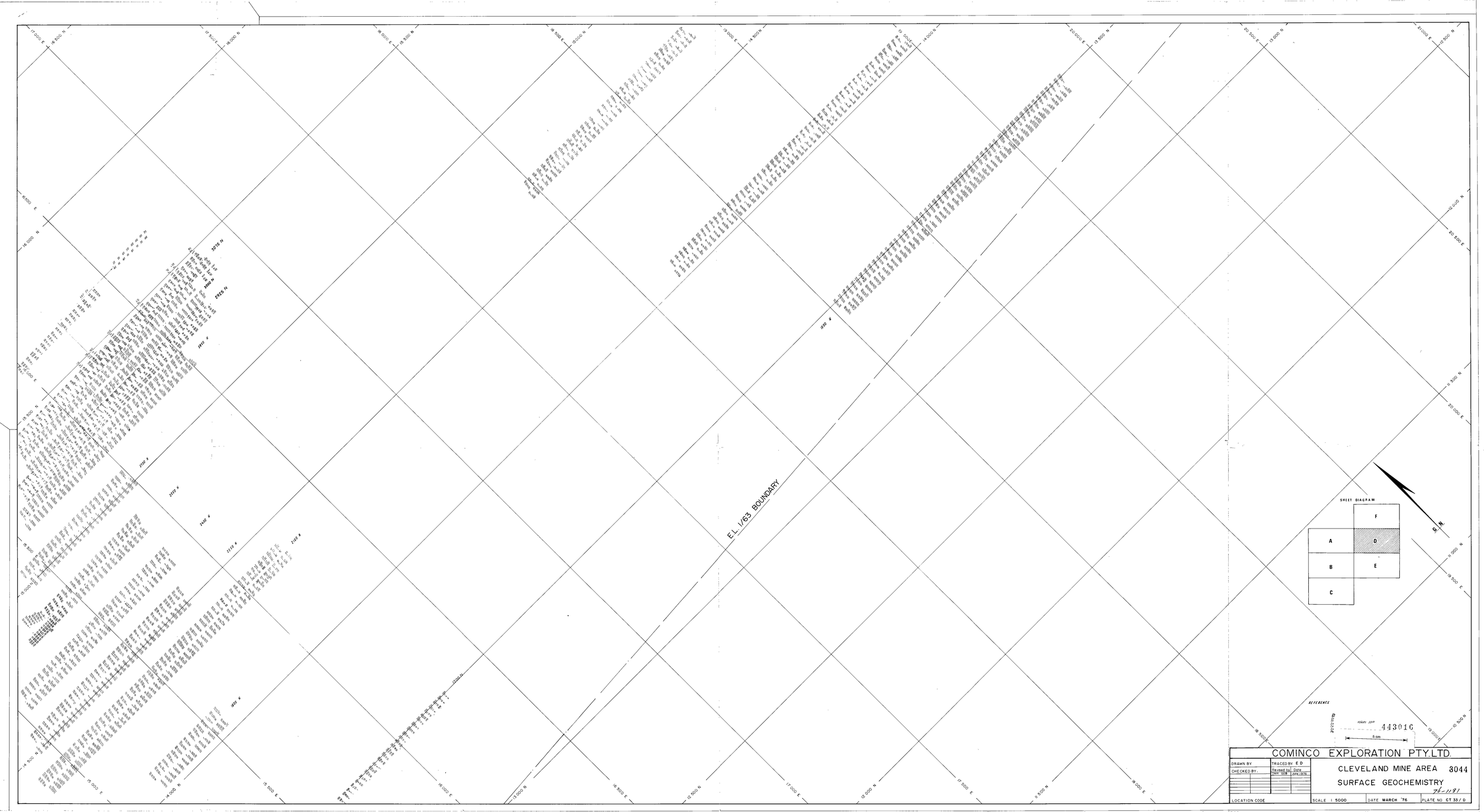
Plate CT 33/C


E.L. 1163 BOUNDARY
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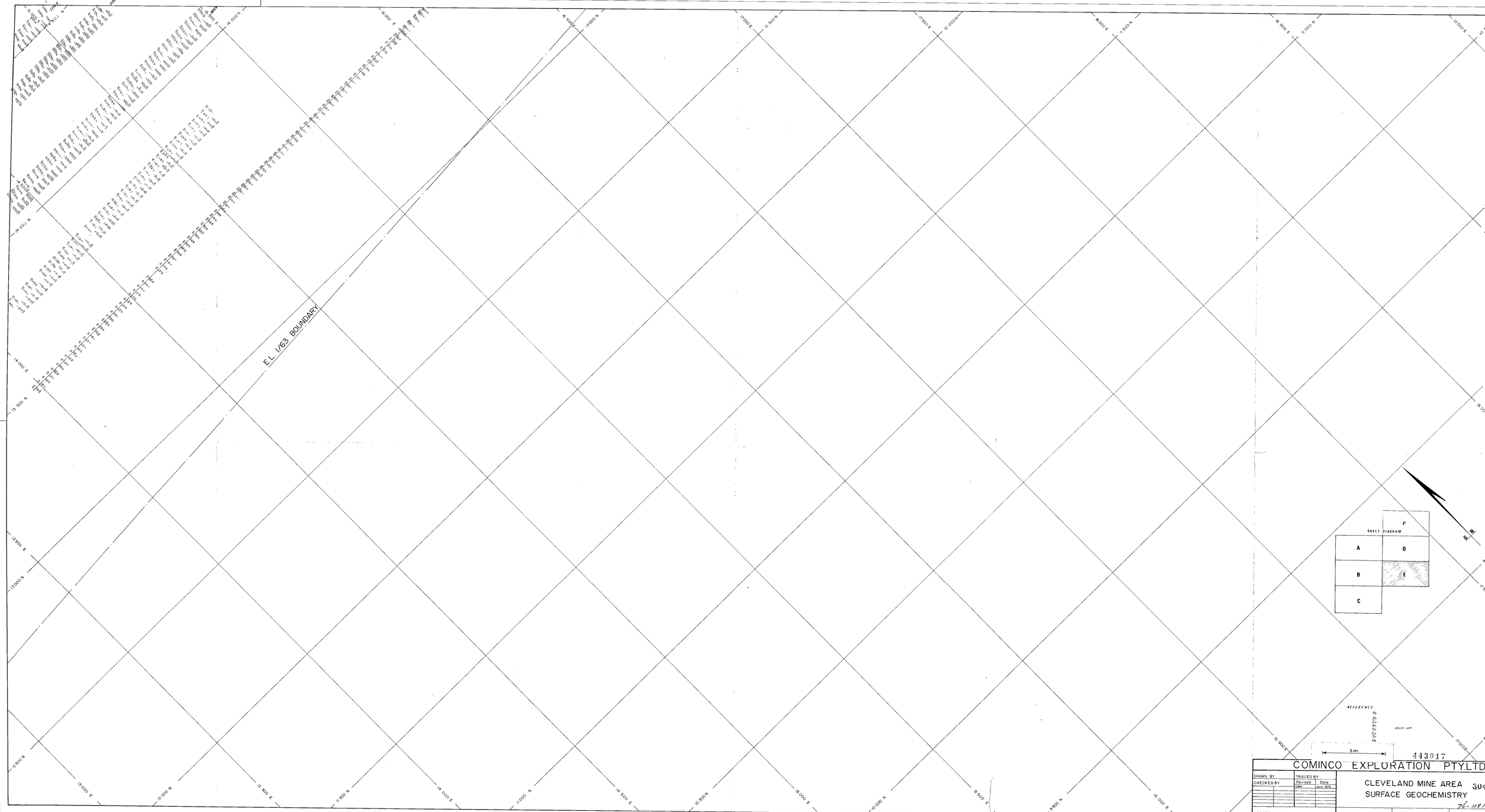
Date
June 1979
CLEVELAND MINE AREA 3044
SURFACE GEOCHEMISTRY
76-1191
LOCATION CODE
SCALE 1:5000
DATE MARCH '76
PLATE NO. CT 33/D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74-1181
LOCATION CODE
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DATE MARCH 1976
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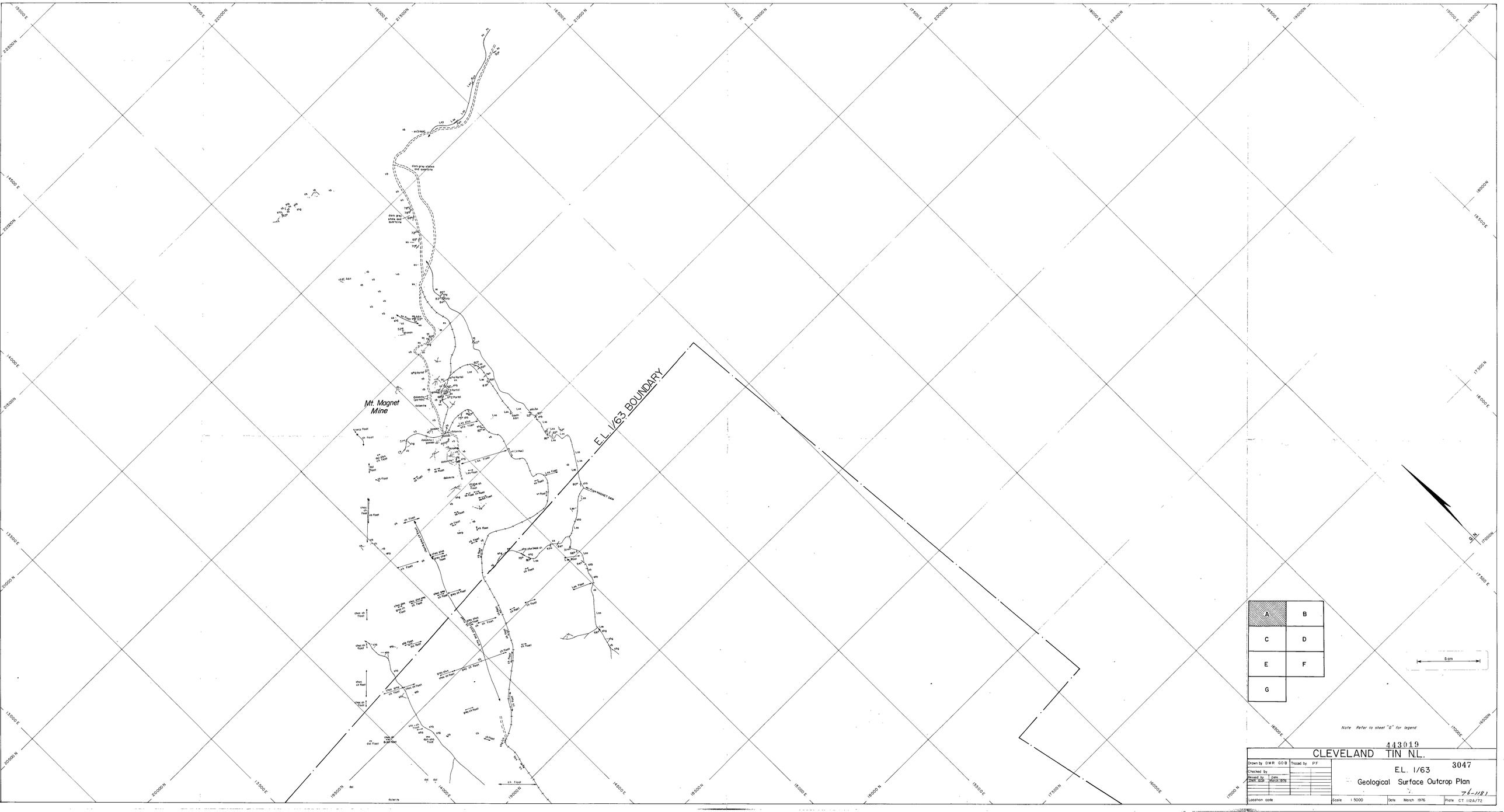
CLEVELAND MINE AREA 3046
SURFACE GEOCHEMISTRY
76-11-81
LOCATION CODE
SCALE : 5000
DATE MAY 1976
PLATE NO CT 33/3



Note Refer to sheet "G" for legend

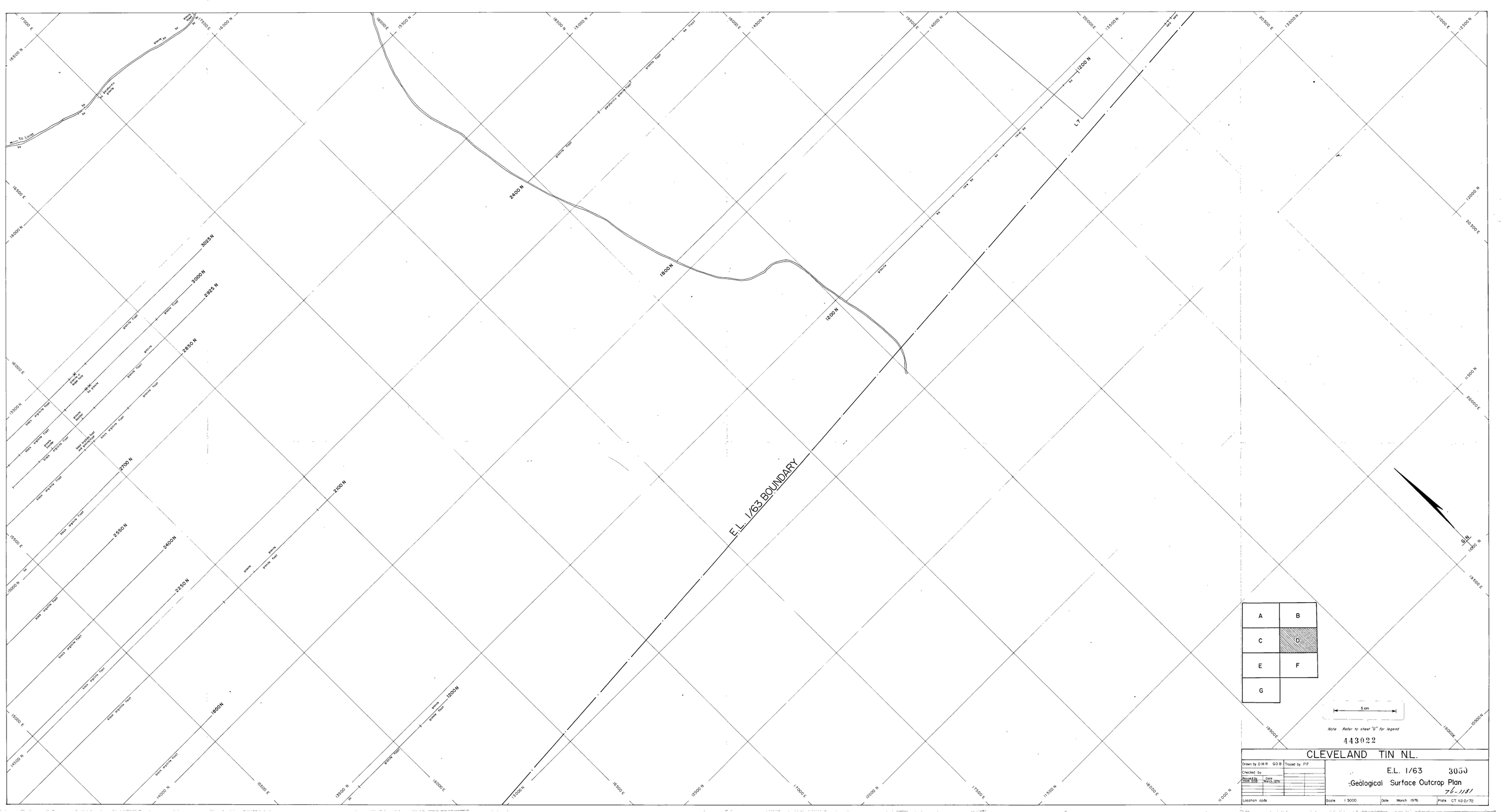
443019

CLEVELAND TIN N.L.

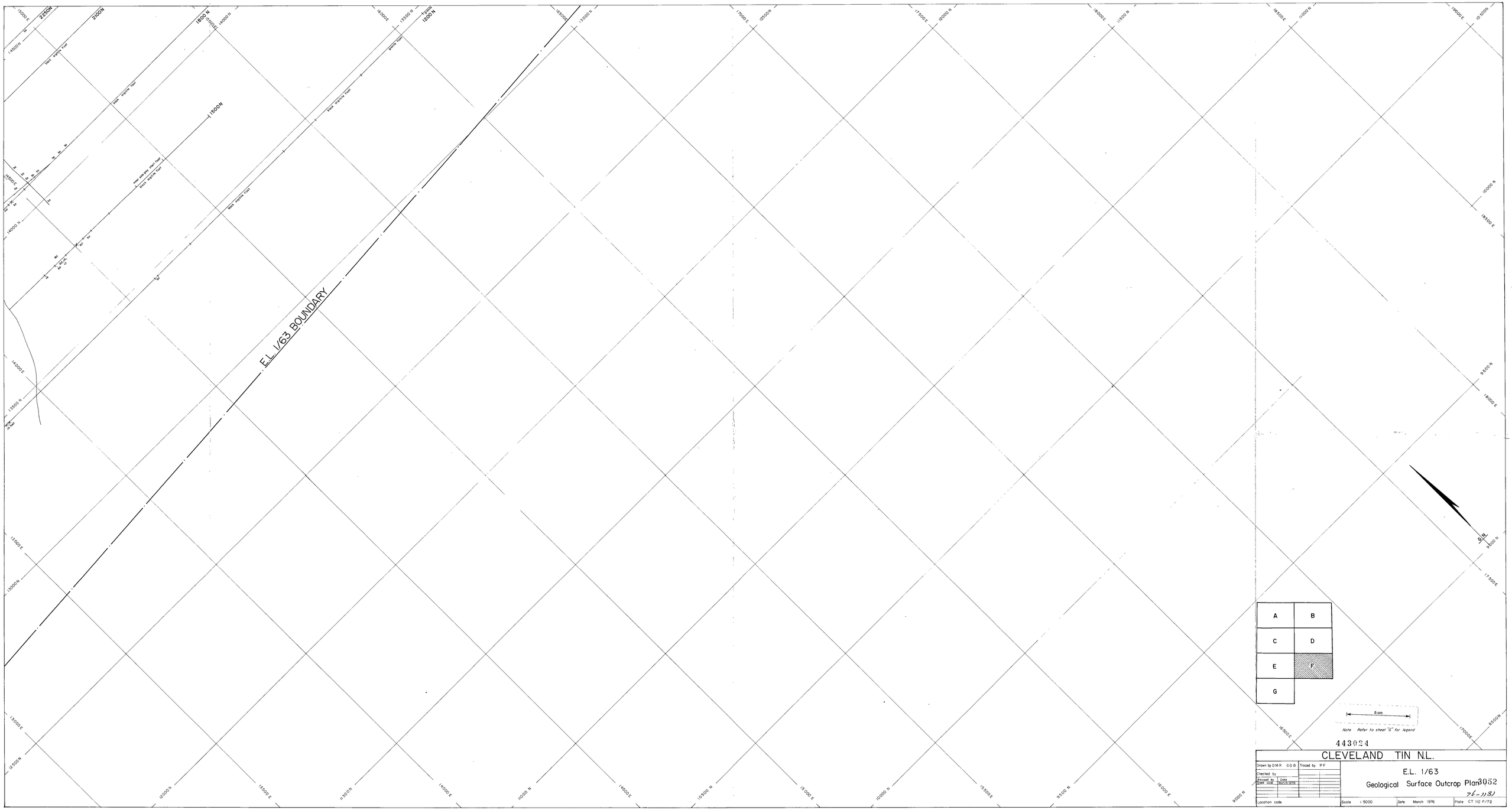
Drawn by D.M.R. G.O.B.	Traced by P.F.	E.L. 1/63	3047
Checked by		Geological Surface Outcrop Plan	
Revised by Date			74-1181
Location code		Scale 1:5000	Date March 1976
			Plate C.T. 112A/72


E.L. 1/63 BOUNDARY
granite (porphyritic)
porphyritic granite
granite outcrop/ subcrop
granite outcrop
granite
TB Wombat Flat alluvial Sn workings
L5
L6
L7
2400 N
1800N
1200 N
A
B
C
D
E
F
G
5 cm
Note: Refer to sheet "G" for legend
443020
CLEVELAND TIN N.L.
Drawn by DMR GOB
Traced by PF
Checked by
Revised by DMR GOB
Date June 1976
E.L. 1/63
3048
Geological Surface Outcrop Plan
76-1181
Location code
Scale 1 5000
Date March 1976
Plate CT 112 B/72


E.L. 1/63 BOUNDARY
E.L. 1/63 BOUNDARY
To Waratah
OLD MAGNET TRAM
WARATAH CORINNA ROAD
WHYTE HILL
NINE MILE CREEK
DEEP CREEK
HYDRO LINE
BADGER LINE
L7
L6
L5
L4
G18
G17
G16
G15
G14
G13
G12
G11
MD 1
MD 3
MD 5
DC 6
Grey feldspathic arenites
Fine dark green pyritic arenite
A
B
C
D
E
F
G
5 cm
Note Refer to sheet "G" for legend
443021
CLEVELAND TIN N.L.
3049
DRAWN BY
TRACED BY
CHECKED BY
REVISED BY
DATE
E.L. 1/63
Geological Surface Outcrop Plan
76-1181
Scale 1:5000
Date OCTOBER 1972
Plate: CT 112C/72


E.L. 1/63 BOUNDARY
L 7
3025 N
3000 N
2925 N
2850 N
2700 N
2100 N
2550 N
2400 N
2250 N
1800 N
1200 N
2400 N
1800 N
1200 N
A
B
C
D
E
F
G
5 cm
Note Refer to sheet "G" for legend
443022
CLEVELAND TIN NL.
Drawn by D.M.R. G.O.B. Traced by P.F.
Checked by
Revised & Date
E.L. 1/63 3050
Geological Surface Outcrop Plan
76-1181
Location code
Scale 1:5000
Date March 1976
Plate CT 112.D/72


E.L. 1/63 BOUNDARY
ML 27M/71
LUINA TOWNSHIP
To Corinna
WARATAH CORINNA ROAD
MILL ROAD
HALL'S REFERENCE PLANE
TRAM
CLEVELAND
DEEP CREEK
HYDRO LINE
BADGER LINE
HEC SAVAGE RIVER WARATAH POWER LINE
TAILINGS DAM
WHYTE RIVER
E.L. 1/63 Boundary
E.L. 1/63 BOUNDARY
A B
C D
E F
G
5 cm
Note Refer to sheet "G" for legend
443023
CLEVELAND TIN N.L.
DRAWN BY
TRACED BY
CHECKED BY
E.L. 1/63
3051
Geological Surface Outcrop Plan
Scale 1:5000
Date: OCTOBER 1972
Plate CT 112E/72



443024

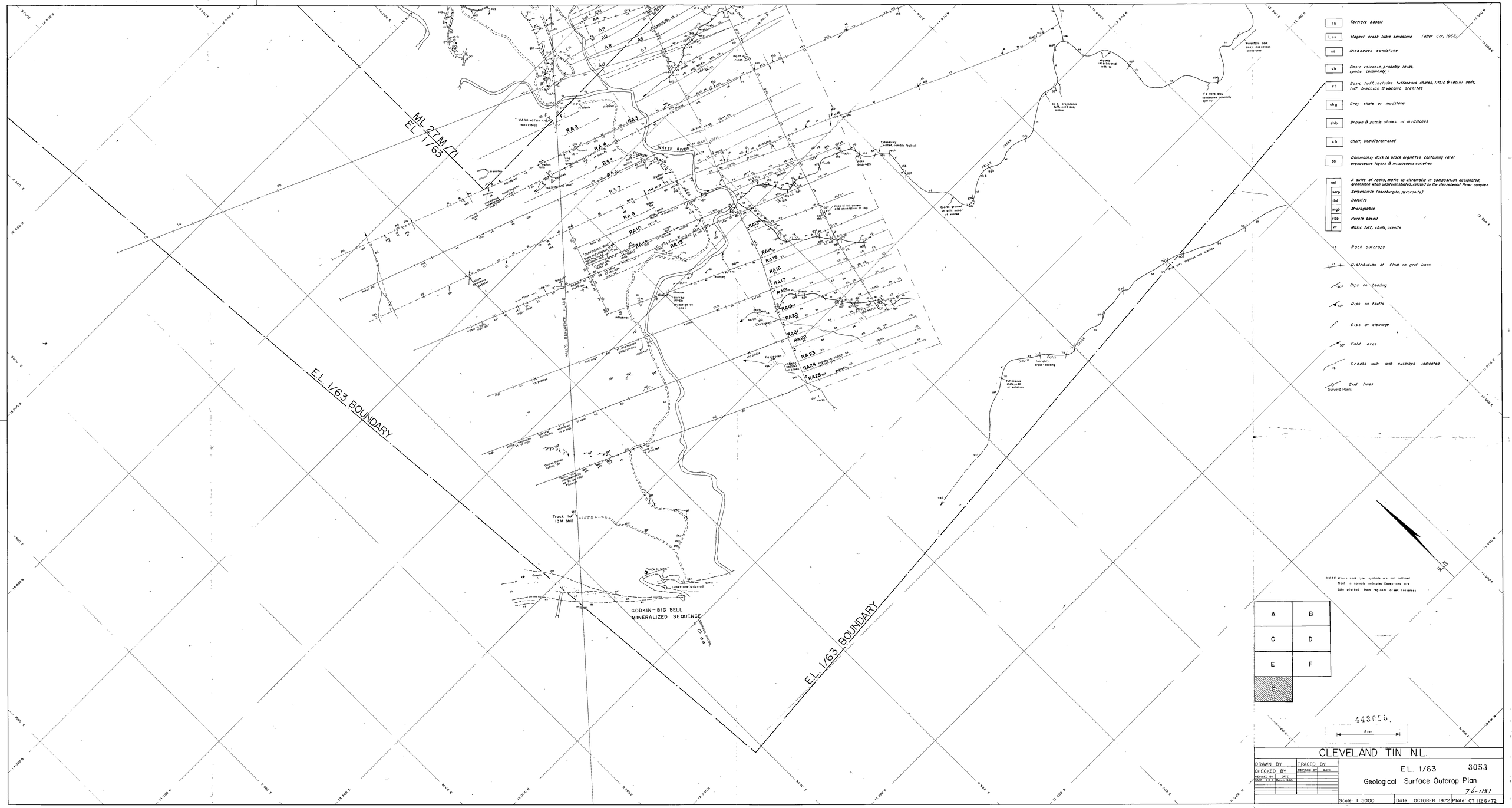
CLEVELAND TIN N.L.

E.L. 1/63

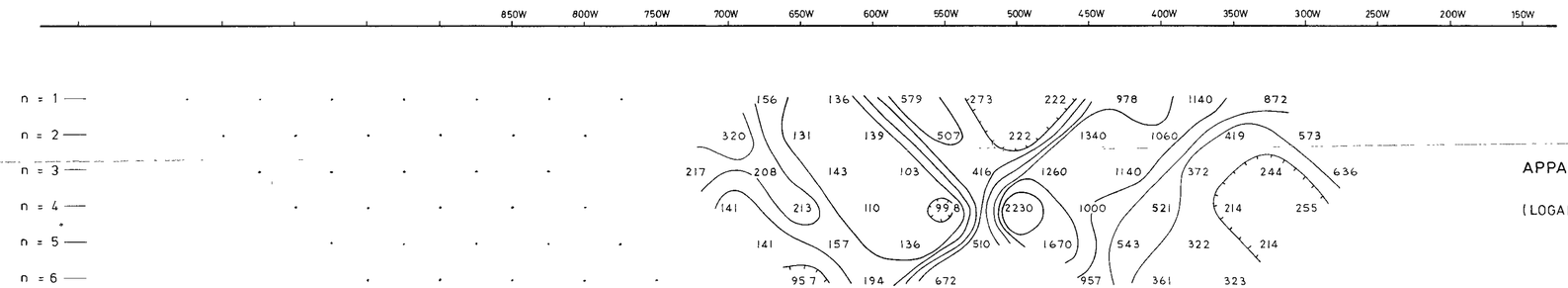
Geological Surface Outcrop Plan 3052

7E-1181

Drawn by D.M.R G.O.B	Traced by P.F		
Checked by			
Revised by Date			
Drawn Date 16.12.1976			
Location code	Scale 1:5000	Date March 1976	Plate CT 112 F/72


E.L. 1/63 BOUNDARY
ML 27M/71
E.L. 1/63
E.L. 1/63 BOUNDARY
WHYTE RIVER
GODKIN TRACK
"WASHINGTON-HALL" WORKINGS
"CONFIDENCE" WORKINGS
HALL'S REFERENCE PLANE
Tyrock top 13M Mill
GODKIN SHAFT
Limestone (Silurian) quarry
GODKIN-BIG BELL MINERALIZED SEQUENCE
Tb Tertiary basalt
L ss Magnet creek lithic sandstone (after Cox, 1968)
ss Micaceous sandstone
vb Basic volcanic, probably lavas, spilitic commonly
vt Basic tuff, includes tuffaceous shales, lithic & lapilli beds, tuff breccias & volcanic arenites
shg Grey shale or mudstone
shb Brown & purple shales or mudstones
ch Chert, undifferentiated
ba Dominantly dark to black argillites containing rarer arenaceous layers & micaceous varieties
gst A suite of rocks, mafic to ultramafic in composition designated, greenstone when undifferentiated, related to the Heemskwood River complex
serp Serpentinite (harzburgite, pyroxenite)
dol Dolerite
mgb Microgabbro
vbp Purple basalt
vt Mafic tuff, shale, arenite
Rock outcrops
Distribution of float on grid lines
Dips on bedding
Dips on faults
Dips on cleavage
Fold axes
Creeks with rock outcrops indicated
Grid lines
Surveyed Points
NOTE Where rock type symbols are not outlined float is normally indicated Exceptions are data plotted from regional creek traverses
A B C D E F G
443615.
5 cm
CLEVELAND TIN N.L.
DRAWN BY
CHECKED BY
TRACED BY
REVISED BY DATE
E.L. 1/63 3053
Geological Surface Outcrop Plan
76-1181
Scale: 1 5000
Date OCTOBER 1972
Plate CT 112 G/72

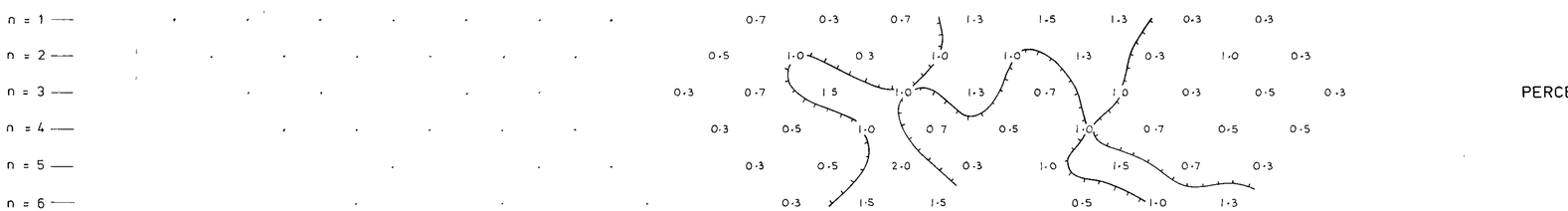
I.P. PSEUDO SECTION



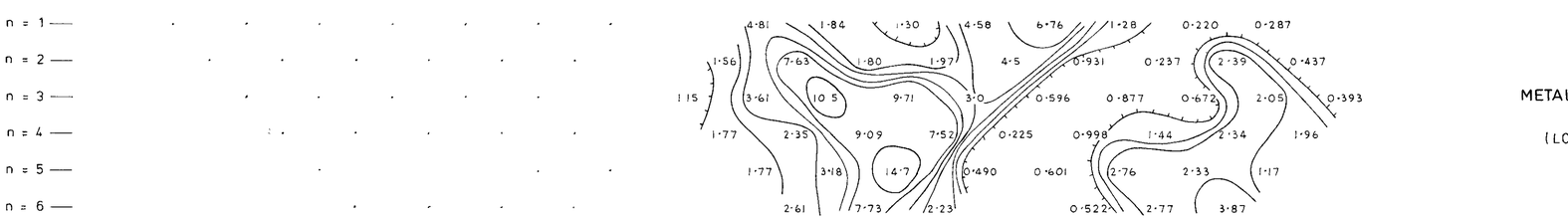
APPARENT RESISTIVITY
OHM METRES
(LOGARITHMIC CONTOURING)

CULTURAL AND PHYSIOGRAPHIC FEATURES

TRAVERSE BEARING °



PERCENTAGE FREQUENCY EFFECT
(LINEAR CONTOURING)



METALLIC CONDUCTION FACTOR
MHOS METRES^{-1}
(LOGARITHMIC CONTOURING)

CLIENT	COMINCO EXPLORATION
AREA	CLEVELAND
JOB NUMBER	7601
TRAVERSE	R A 4
SPACING (a)	50m
FREQUENCIES	2·5 – 0·3Hz
DATE SURVEYED	26 MARCH 1976
COMMENT	MINIMUM CONTOUR VALUE FOR M C F 10
PARTY LEADER	N.G.H.

5 cm

GEOQUEST PTY LIMITED

8.6.76

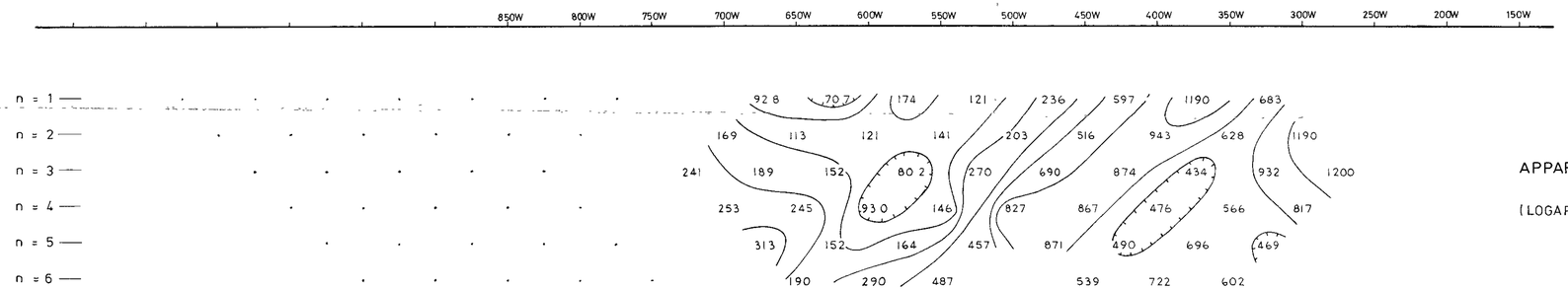
443026

3054

CEPL Dwg No XCT 57/RA4

DWG No 7601-201

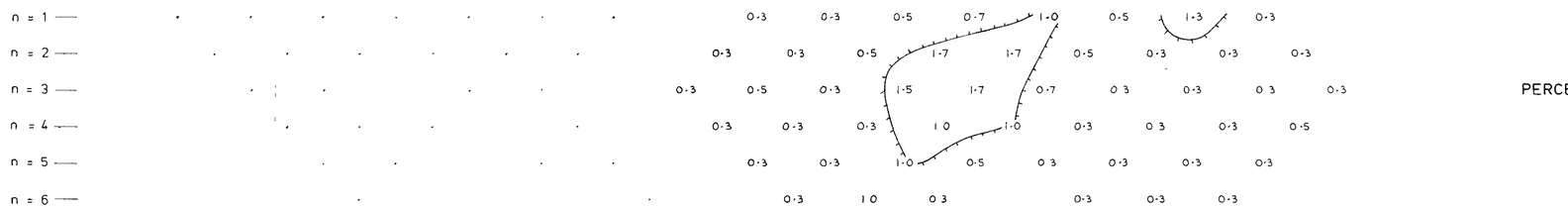
I.P. PSEUDO SECTION



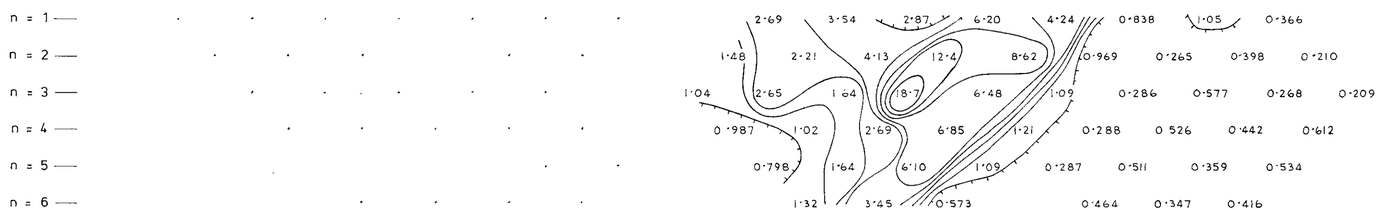
APPARENT RESISTIVITY
OHM METRES
(LOGARITHMIC CONTOURING)

CULTURAL AND PHYSIOGRAPHIC FEATURES

TRAVERSE BEARING °



PERCENTAGE FREQUENCY EFFECT
(LINEAR CONTOURING)



METALLIC CONDUCTION FACTOR
MHOS METRES^{-1}
(LOGARITHMIC CONTOURING)

CLIENT	COMINCO EXPLORATION
AREA	CLEVELAND
JOB NUMBER	7601
TRAVERSE.	RA6
SPACING (a)	50m
FREQUENCIES	2.5-0.3Hz
DATE SURVEYED	29 MARCH 1976
COMMENT	MINIMUM CONTOUR VALUE 1.0 FOR MCF
PARTY LEADER	NGH

5 cm

GEOQUEST PTY LIMITED

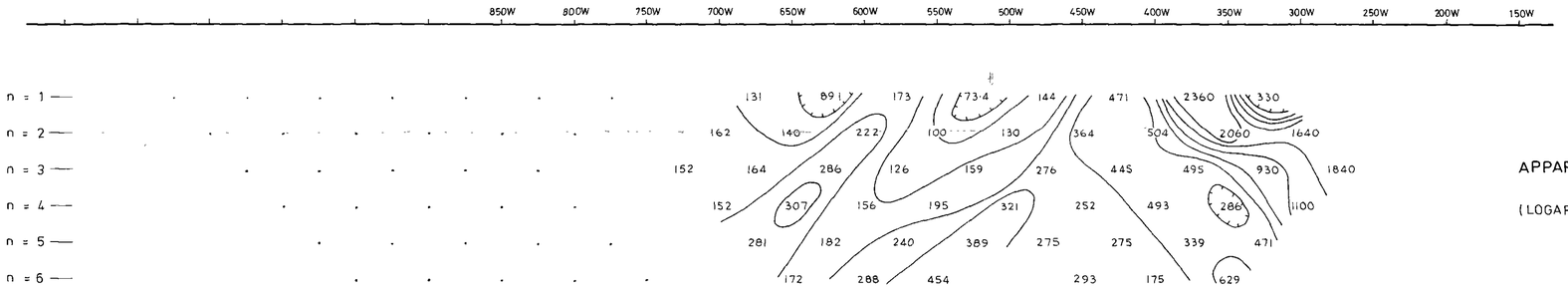
CEPL. DWG. No. XCT 57/RA6

3055

443027

DWG No 7601-202

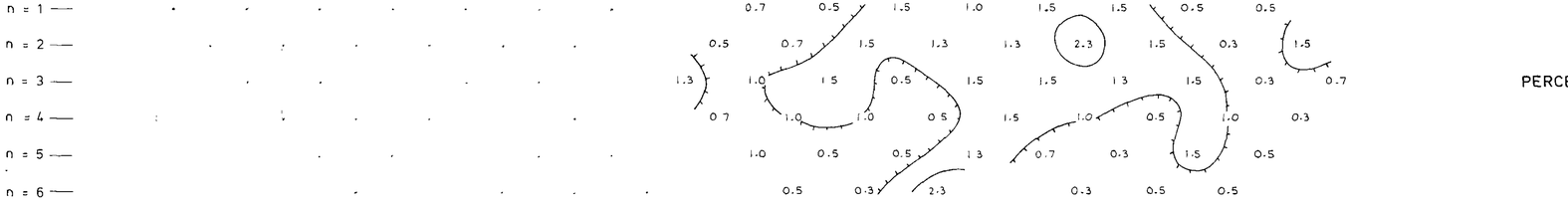
I.P PSEUDO SECTION



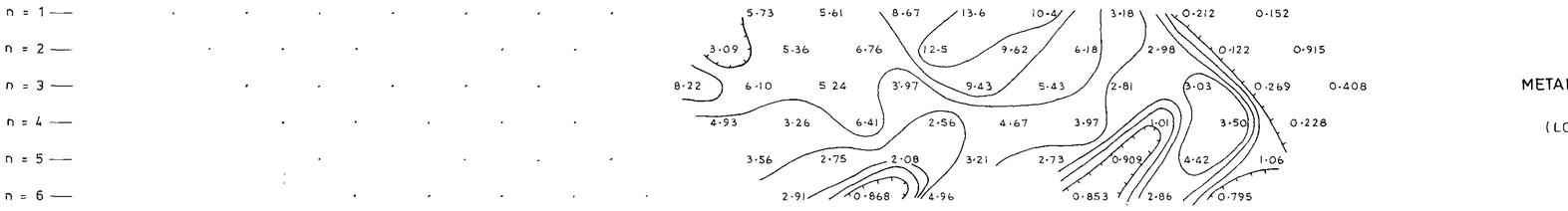
APPARENT RESISTIVITY
OHM METRES
(LOGARITHMIC CONTOURING)

CULTURAL AND PHYSIOGRAPHIC FEATURES

TRAVERSE BEARING °



PERCENTAGE FREQUENCY EFFECT
(LINEAR CONTOURING)



METALLIC CONDUCTION FACTOR
MHOS METRES^{-1}
(LOGARITHMIC CONTOURING)

CLIENT	COMINCO EXPLORATION
AREA	CLEVELAND
JOB NUMBER	7601
TRAVERSE	RA8
SPACING (a)	50m
FREQUENCIES	2·5-0·3Hz
DATE SURVEYED	30 MARCH 1976
COMMENT	MINIMUM CONTOUR VALUE 10 FOR MCE
PARTY LEADER	NGH

5 cm

GEOQUEST PTY LIMITED

3053

443028

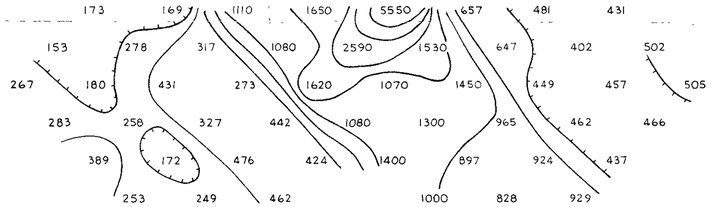
CEPL DWG No XCT 57/RA 8

DWG No 7601-203

I.P. PSEUDO SECTION

650W 600W 550W 500W 450W 400W 350W 300W 250W 200W 150W 100W 50W 00 50E

n = 1
n = 2
n = 3
n = 4
n = 5
n = 6



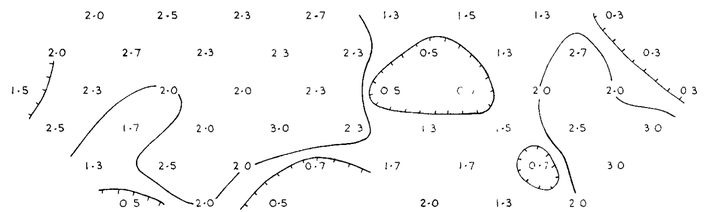
APPARENT RESISTIVITY
OHM METRES
(LOGARITHMIC CONTOURING)

CULTURAL AND PHYSIOGRAPHIC FEATURES

TRAVERSE BEARING °

CLIENT	COMINCO EXPLORATION
AREA	CLEVELAND
JOB NUMBER	7601
TRAVERSE	R A 10
SPACING (a)	50m
FREQUENCIES	2 5 - 0 3 Hz
DATE SURVEYED	31 MARCH 1976
COMMENT	MINIMUM CONTOUR VALUE 10 FOR M C F
PARTY LEADER	N G H.

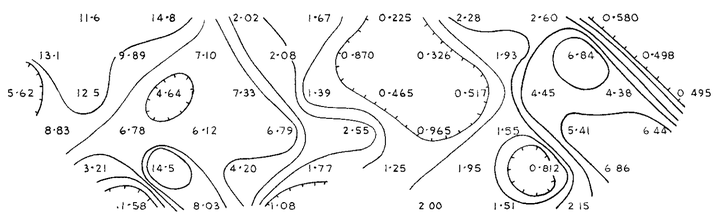
n = 1
n = 2
n = 3
n = 4
n = 5
n = 6



PERCENTAGE FREQUENCY EFFECT
(LINEAR CONTOURING)

5 cm

n = 1
n = 2
n = 3
n = 4
n = 5
n = 6



METALLIC CONDUCTION FACTOR
MHOS METRES^{-1}
(LOGARITHMIC CONTOURING)

GEOQUEST PTY LIMITED

5.6.76

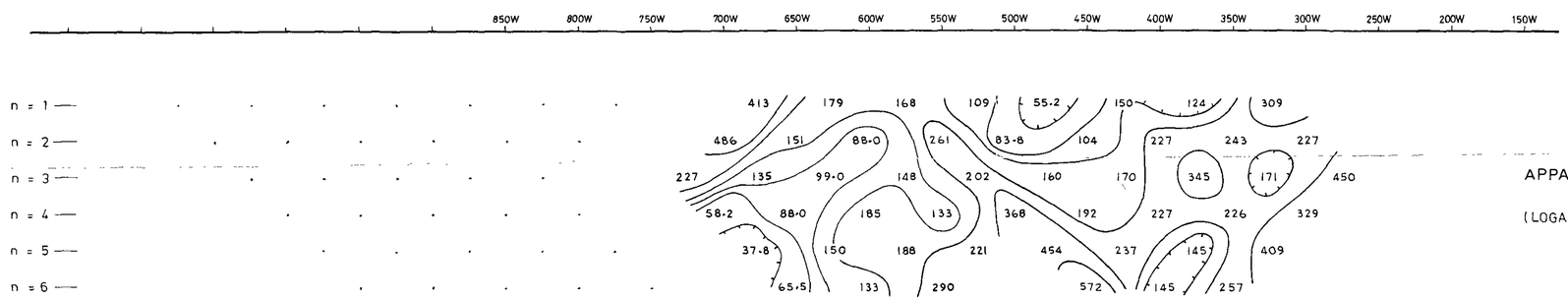
3057

443029

CEPL. DWG NO XCT 57/RA10

DWG No 7601-204

I.P. PSEUDO SECTION

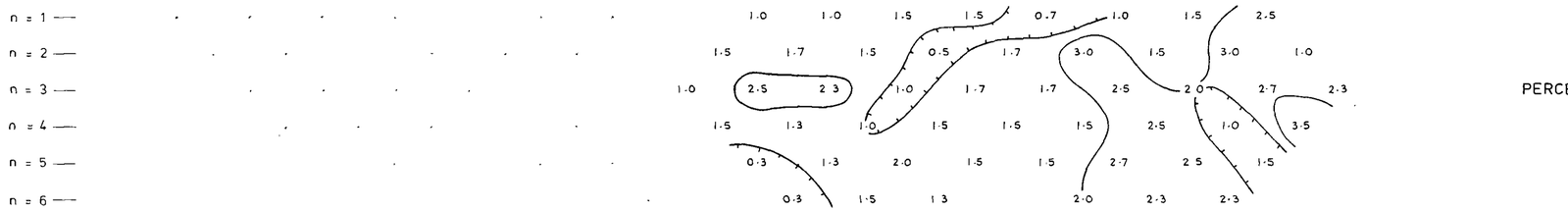


APPARENT RESISTIVITY
OHM METRES
(LOGARITHMIC CONTOURING)

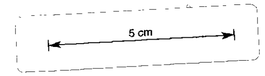
CULTURAL AND PHYSIOGRAPHIC FEATURES

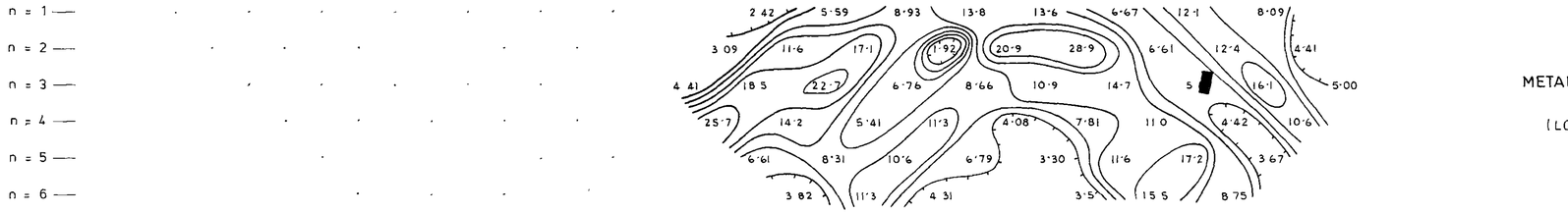
TRAVERSE BEARING °

JOB NUMBER:	7601
CLIENT:	COMINCO EXPLORATION
AREA	CLEVELAND
TRAVERSE	R A 12
SPACING (a):	50m
FREQUENCIES	2 5-0 3Hz
DATE SURVEYED	1 APRIL 1976
COMMENT	
PARTY LEADER	NGH



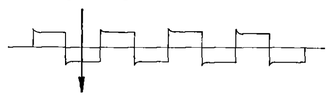
PERCENTAGE FREQUENCY EFFECT
(LINEAR CONTOURING)





METALLIC CONDUCTION FACTOR
MHOS METRES^{-1}
(LOGARITHMIC CONTOURING)

GEOQUEST PTY LIMITED



3058

443020

CEPL Dwg No XCT 57/RA12

DWG No 7601-205

443031 76-1181

Cominco Exploration Pty Ltd

Drawn by G O B D M R	Traced by R J E	NORTH WEST TASMANIA	3059
Checked by		CLEVELAND MINE AREA	
		Interpretive Regional Geology	
		(ROCK UNITS)	
Location code		Scale 1 25,000	Date July, 1976	Plate CT 161

Magnet No.2 Dam

Magnet Dam

WOMBAT AREA

SOUTH MAGNET DAM AREA

CLEVELAND MINE

WASHINGTON HEY MINE

WASHINGTON HEY AREA

LUINA

EL 1/63

Gst

CMS

MBS

Mg

Tb

MCS

HF

RA3 RA4 RA6 RA8 RA12 RA17 RA21 RA25

— LEGEND —

	Tb	*Tertiary basalt*
DEVONIAN	Mg	*Meredith Granite*
CAMBRIAN/ PRECAMBRIAN	MCS	*Mt. Cleveland Sequence*
	CMS / HF	*Cleveland Mine- Falls Creek Sequence / Halls Formation*
	MBS	*Mt. Bischoff Sequence*
	Gst	*Greenstone sequences*

Exploration survey line

Lines cut, sampled and mapped in current survey to 11/8/76

Area of I.P. Survey

443032

5 cm

Cominco Exploration Pty Ltd

Drawn by D.M.R	Traced by R.J.E	NORTH WEST TASMANIA	3060
Checked by		CLEVELAND MINE AREA	
Location code		Summary Map	76-1181
Scale 1 25,000	Date August, 1976	Plate CT 163	

Magnet No 2 Dam

Magnet Dam

LUINA

To SAWAGE RIVER

DEEP CREEK

CLEVELAND MINE

WASHINGTON HEY MINE

WHITE RIVER

EL 1/63

EL 1/63

Tb

MBS

Mg

Gst

CMS

HF

MCS

— LEGEND —

TERTIARY	Tb	*Tertiary basalt*
DEVONIAN	Mg	*Meredith Granite*
CAMBRIAN / PRECAMBRIAN	CMS	*Mafic volcanic dominated rock types*
	HF	*Hall's Formation (grey shale and chert)*
		Mica sandstone dominated rock types
	MCS	*Mt Cleveland Sequence*
	MBS	*Mt Bischoff Sequence*
	Gst	*Greenstone sequences*

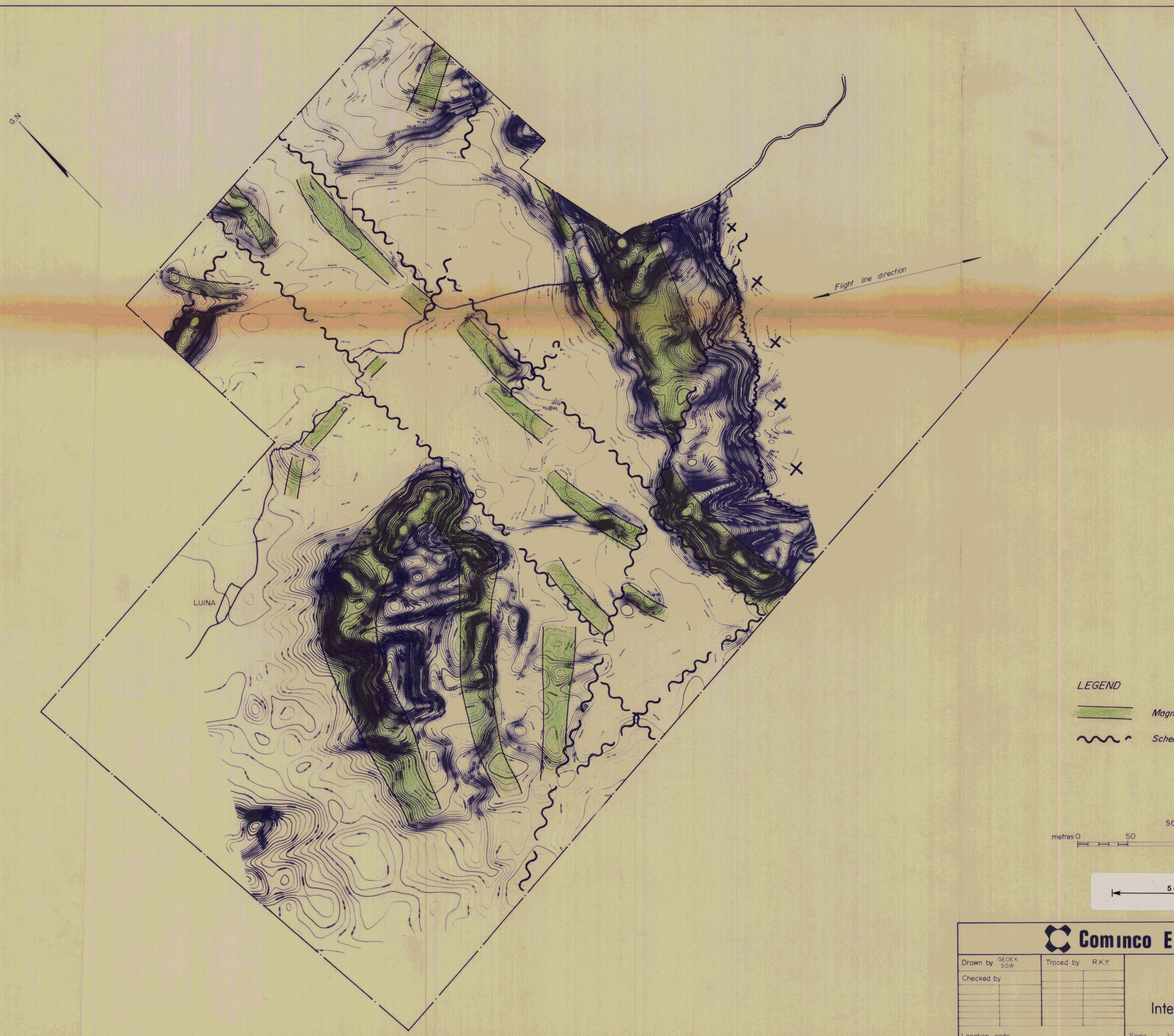
5 cm

443033

76-1181

Cominco Exploration Pty Ltd

Drawn by D M R	Traced by R J E	NORTH WEST TASMANIA	3061
Checked by		CLEVELAND MINE AREA	
		Interpretive Regional Geology	
		(STRATIGRAPHY)	
Location code		Scale 1 25,000	Date August, 1976	Plate CT 164



LEGEND

Magnetic rock units

Schematic position of linears

SCALE

metres 0 50 100 200 metres

5 cm

443034

76-1181

Cominco Exploration Pty Ltd

Drawn by GEOEX SSW	Traced by R.K.Y.	NORTH WEST TASMANIA 3062
Checked by		CLEVELAND MINE AREA
		Interpretative map of magnetic linears
Location code		Scale 1:25,000 · Date August 1976 · Plate CT 165