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CRA EXPLORATION PTY. LIMITED.**OPEN FILE**LEIGH RIVER EL 12/80PROGRESS REPORT FOR YEAR ENDINGJANUARY 22ND, 1983.

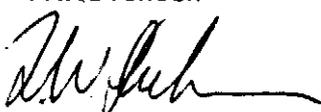
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1. SUMMARY

Compilation and statistical analysis of past stream sediment data as part of a more regional study indicated that limited sampling had been undertaken in the E.L. Two tin anomalies were apparent in the Leigh River, draining an R.T.Z. aeromagnetic anomaly.

A programme of infill stream sediment sampling and mapping was designed to test the tin anomalies. The programme was also designed to test a large aeromagnetic anomaly as well as the possibility of lead-zinc and black shale hosted gold mineralisation. Work completed to date has failed to repeat the tin anomalies and has defined basalt to be the cause of the aeromagnetic anomaly. Lead and zinc values are poor, whilst arsenic shows slight encouragement in the black shales though corresponding gold values are low.

2. INTRODUCTION

EL 12/80 was granted on 22nd February 1980 to investigate two tin stream sediment anomalies obtained during reconnaissance activities by CRAE in 1977. The tin was only apparent in stream sediments and was thought to reflect fine tin associated with massive sulphide mineralisation.

The E.L. was considered to have potential for shale hosted lead-zinc and possibly gold mineralisation. This was supported by the presence of a number of INPUT anomalies obtained by ESSO in 1973.

Access into the E.L. is via the Sumac Road network, recently constructed by the Forestry Commission.

3. CONCLUSIONS

Current investigations have shown a lack of stream sediment anomalies within the E.L. except for one value of 300 ppm Pb. The Leigh River aeromagnetic anomaly has been shown to be an elongate body of spilitic? basalt with little potential for economic mineralisation.

4. RECOMMENDATIONS

1. Detailed follow-up of the 300 ppm Pb stream sediment anomaly with soil sampling and ground magnetics.
2. Mapping and sampling of indicated carbonate horizons interpreted by Prof.Carey's photo-interpretation study.
3. Infill stream sediment sampling and mapping of remaining areas, once access has been completed by the Forestry Commission - early 1983. Particular attention should be given to the lead anomaly in the South-West corner of the E.L.

5. HISTORY OF PREVIOUS INVESTIGATIONS

Little previous work has been completed within the E.L. which is virtually unmapped.

5.1 Pickands Mather Int. (P.M.I.) E.L. 12/65

Approximately 20 minus 80 mesh stream sediment samples were collected in the present E.L. as part of a more regional geochemical programme.

The samples were assayed for Cu,Pb,Zn,Ni,Co,Mo,CxCu,As and no anomalies were reported.

5.2 CRAE Rocky Cape EL 1/77

Approximately 5 drainage samples were collected in the E.L. as part of a helicopter borne reconnaissance survey. Two tin anomalies were obtained in the Leigh River, downstream from a major aeromagnetic anomaly. Limited ground investigations indicated that a lens of spilite with associated carbonates was causative.

5.3 ESSO Australia EL 2/73

ESSO conducted an airborne INPUT survey over EL 2/73 to appraise the EL for volcanogenic massive sulphide mineralisation and for replacement tin deposits. Limited helicopter supported ground follow-up was conducted simultaneously.

Input anomalies were plotted onto a photomosaic from which considerable difficulty has been experienced in transferring them on to 1:100 000 topographic sheets.

4 INPUT anomalies fall within EL 12/80:

Anomaly x 33 approximate location: 338050 5434900

A strong 6 channel anomaly with no associated magnetics occurs in a broad zone of six channel anomalies and a black slate source is suspected.

Anomaly x 34 approximate location: 333600 5431500

A six channel response occurring in the same conductive zone as x 33.

Anomaly x 48 approximate location: 338400 5429700

No comments recorded.

Anomaly x 50 approximate location: 333200 5426500

A weak 2 channel response upgraded by its proximity to a 250nT magnetic response.

A compilation of RTZ aeromagnetic data and ESSO's INPUT anomalies is shown on Plan TASH 990.

5.4 Photo-interpretation by Prof.Carey Plan TASH 991

CRAE together with Geopeko commissioned Prof.Carey to undertake a photo-interpretational study of the Rocky Cape licence areas.

The photogeological succession observed in EL 12/80 is as follows -

Sigma Group Unconformity	Includes Smithton dolomite and equivalents.
Phi Group Possible unconformity	Interview group (part)
Epsilon Group	Balfour Slates, Interview Group (part)
Igneous: Kappa Group	Basic dykes, sills and plutons now amphibolitised.

The Sigma group forms well wooded strike ridges. Folding is more characteristic than faulting and small scale folding is common near the base. The fold pattern suggests some overprinting of WNW Tyennan folding by NNE Tabberabberan folds. The Sigma group appears to unconformably overlies the Phi group. Strong positive magnetic anomalies are often present which are probably caused by basaltic lavas and possibly other volcanics.

The Phi group is characterised by low relief, absence of outcrop and scant vegetation. Sink holes are common, and the formation contains much dolomite and little quartzite. It is not strongly magnetic and there appears to be an unconformity at the base.

The Epsilon group has the photogeological texture of slates or silty greywackes, finely bedded rhythmically, without much quartzite. Most of the recorded mineralisation falls within this group, but appears to be tectonically controlled, since many areas are barren.

The Kappa group has been interpreted as basic dykes, sills or plutons on the basis of photographic tone, transgressive contact relationships and better developed vegetation.

Limited field checking of Kappa group occurrences outside of EL 12/80 suggest that the group is definitely not igneous in origin.

6. PRESENT INVESTIGATIONS

Present investigations include the following:

1. A computer oriented statistical evaluation of past stream sediment data using a package program, MICROGAS.
2. Infill stream sediment sampling and regional mapping.
3. Limited ground geophysics.

7. GEOCHEMICAL COMPUTER STUDY

Information regarding past drainage data was gleaned from open file reports held at the Tasmanian Department of Mines and from CRAE internal reports. The data was compiled and transferred on to disc in a format suitable for use with the package program MICROGAS, (Micro computer geochemical analysis system) originally developed at Queens University (Canada) for CRAE.

7.1 Microgas

MICROGAS is a user interactive set of computer programs designed specifically for geochemical surveys. The package has 13 programs which can be grouped into data management and statistical categories. The programs are as follows:

Data management.

1. CRUNCH Converts data into a binary form suitable for use with the remaining programs.
2. UNCRUNCH Converts data from binary form to the original (ASCII) format.
3. MERGES Merges two data sets having the same variables.

- 4. MERGEV Merges two data sets having different variables.
- 5. SORT Sorts a binary file with reference to sample number.
- 6. LISTER Produces a listing on the printer for any or part of a data set.

Statistical

- 7. DSTATS Calculates simple univariate statistics.
- 8. XY PLOT Constructs XY plots or scatter diagrams and calculates a correlation matrix.
- 9. MAPLOT Plots a symbol map at any scale.
- 10. PROFILE Plots geochemical values against distance.
- 11. FACTOR R-mode analysis.
- 12. MULREG Stepwise multiple regression.
- 13. DISCRIM Discriminant analysis.

Each program within MICROGAS allows for data management in the form of selections and or transformations. Complex calculations can be achieved by a series of simple, sequential arithmetic statements.

More detailed information is given in a paper by Lanvin and Nichol (1981).

7.2 Computer Coding

Stream sediment sample locations were plotted onto 1:100 000 topographic sheets and digitised directly into AMG co-ordinates. Analytical and geological data was added onto disc, both on a free format basis. Each company's data was coded as a separate data file to enable comparison.

7.3 Variables

The following eight elements are those which have been most commonly analysed: Cu,Pb,Zn,Ni,Co,As,Mo,Sn.

Values below detection limit have been coded as half detection limit. Values of minus 1 indicate that a sample has not been analysed for a specific element. Minus 1 values are ignored by the statistical calculations.

EAST, NORTH	AMG metric co-ordinates.
SMPTYP	Refers to sample type whether stream sediment or panned concentrate.
TOPO	Topographical index.
FORMGEOL	Mines Dept. 1:250 000 mapping.
PROFCAR	Prof.Carey's photo-interpretation.
SITEGEOL	Site geology - either dominant outcrop or float geology.

7.4 Methodology

Individual data files of each company's data were prepared so that "fudge factors" could be applied to account for sample variability between data files. The data was surprisingly compatible and was directly merged into a single data file labelled NWTASSS (N.W.Tasmanian Stream Sediments). This file which contained the most common analytical variables, was logarithmically transformed and processed using the program DSTATS to determine population cut offs. Cut offs were manually selected and the file was reprocessed using the MAPLOT program to produce geochemical symbol maps for each element at a scale of 1:100 000.

The total number of samples within EL 12/80 is insufficient to allow a separate statistical analysis and the data has therefore been treated as part of the N.W.Province. A listing of the statistics for each element for the whole province is given in Appendix I, whilst the bounds for each MAPLOT symbol are defined on individual plans.

Anomalous, possibly anomalous and high background values for the whole N.W.Province are listed as follows:

High Background = HBG
Possibly Anomalous = PA
Anomalous = A

		<u>Log Units</u>	<u>PPM</u>
Lead (0 - 100 ppm only)	HBG	0.8 - 1.25	6.3 - 17.8
	P.A.	1.25 - 1.60	17.8 - 39.8
	A	>1.60	>39.8
Zinc	HBG	1.75 - 2.1	56 - 125
	P.A.	2.1 - 2.7	125 - 501
	A	>2.7	>501
Copper	HBG	1.25 - 1.6	17.8 - 39.8
	P.A.	1.6 - 2.05	39.8 - 125
	A	>2.05	>112
Nickel	HBG	1.75 - 2.0	65 - 100
	P.A.	2.0 - 2.35	100 - 223
	A	>2.35	223
Cobalt	HBG	1.25 - 1.6	17.7 - 39.8
	P.A.	1.6 - 2.1	39.8 - 125
	A	>2.1	>125
Arsenic	HBG	0.8 - 1.2	6.3 - 15.8
	P.A.	1.2 - 2.6	15.8 - 398
	A	>2.6	>398
Molybdenum	HBG	0.55 - 0.85	3.5 - 7.1
	P.A.	0.85 - 1.25	7.1 - 17.8
	A	>1.25	>17.8

Tin	HBG	1.2 - 1.72	15.8 - 52.5
	P.A.	1.72 - 2.30	52.5 - 199.5
	A	>2.3	>199.5
CxCopper	HBG	0.5 - 0.8	3.2 - 6.3
	P.A.	0.8 - 1.2	6.3 - 15.8
	A	>1.2	>15.8
Lead (Full Range)	HBG	1.0 - 1.3	10 - 20
	P.A.	1.3 - 1.55	20 - 35.4
	A	>1.55	>35.4

Ratio

Cu/Ni	HBG	3.0 - 8.5
	P.A.	8.5 - 14.0
	A	14.0
Free Copper (CxCu + Cu) Cu	HBG	1.4 - 1.7
	P.A.	1.7 - 2.1
	A	>2.1

7.5 Interpretation

Access into this area has proved difficult in the past and the distribution of stream sediment sampling reflects this. Sampling has been limited to the Horton River, Trias Creek, the Lindsay River and widespread sampling in the Leigh River.

7.5.1. Lead Plan TASH 965

Lead values are all low (less than 10 ppm Pb) with the exception of one sample in the upper reaches of Eighty Creek (20 - 36 ppm Pb) which is considered anomalous.

7.5.2. Lead with Selections Plan TASH 973

This plan increases the sensitivity of determining cut offs since all values of Pb greater than 100 ppm have been screened off during statistical calculations. Again, values are very low, with one sample in the Leigh River showing a slight elevation, up to 16 ppm Pb. The sample in the SW corner of the EL is also anomalous.

7.5.3. Zinc Plan TASH 972

All values of zinc are very low, less than 36 ppm Zn and no anomalies are apparent.

7.5.4. Copper Plan TASH 971

Copper values are all low, less than 9 ppm Cu.

7.5.5. Nickel Plan TASH 968

Nickel values are all less than 36 ppm Ni, perhaps reflecting the lack of basic rocks in the EL.

7.5.6. Cobalt Plan TASH 970

All values of cobalt are less than 8 ppm Co.

7.5.7. Arsenic Plan TASH 966

Values of arsenic are less than 6 ppm, though 2 samples in the NE part of the EL rise up to 16 ppm but are not considered significant.

7.5.8. Molybdenum Plan TASH 969

All values of molybdenum are less than 2 ppm Mo.

7.5.9. Cold Extractible Copper Plan TASH 975

All CxCu values are less than 1 ppm.

7.5.10. Cu/Ni Ratio Plan TASH 974

Cu/Ni ratios are all less than 3.

7.5.11. Free Copper Plan TASH 976

Free copper calculations indicate an excess of cold extraction copper over total copper which perhaps indicates analytical errors.

7.5.12. Tin Plan TASH 967

Only 2 samples have been analysed for tin within the EL. One sample in the Leigh River assays up to 200 ppm Sn, whilst another outside the EL, though still in the Leigh River, assays greater than 500 ppm Sn. Both samples are regarded as highly anomalous when considered away from the coastal plain and the Devonian, tin bearing granites.

8. GEOLOGY Plan TASH 985

The generalised geological succession recognised to date is as follows:

Cambrian basalt + associated tuffaceous sediments

- Unconformity -

Precambrian Quartzite

Minor interbedded carbonates

Black Shale

Green banded siltstone

Geological information has been obtained from road and creek traverses since outcrop in much of the EL is poor owing to button grass and peat cover.

Cambrian Basalt

This unit comprises basalt, tuffs and tuffaceous sediments and unconformably overlies the Precambrian sediments.

The basalt is typically fine grained and contains andesine phenocrysts within a matrix of plagioclase, augite, magnetite and occasionally, altered glass (Fander 1982).

The basalt in the vicinity of the Leigh River bridge is slightly brecciated with an infill of epidote, carbonate and chlorite. Pyrite is common and minor native copper has been observed in hand specimen. Scoriaceous textures are common and spilitic textures have been observed in thin sections. The basalt has been classified as an Hawaiite.

The footwall contact of the basalt is characterised by a significant silicification of the rocks, almost to an impure quartzite. Purple tuffaceous mudstones and tuffs related to or derived from the basalt appear to form the basalt portion of the basalt. ?

Quartzite

This is a relatively impure arenite with numerous shaley partings. It appears to be interbedded with the black shales and banded siltstones. One sample from the Horton loop contained clasts of black shale which may represent mud flakes.

Carbonates

Two occurrences of carbonate rocks have been noted in the EL. An outcrop of chert, a silicified banded rock of probable carbonate-mudstone composition is located at the Leigh quarry at the junction of the Sumac Road and Sumac Spur 10. It resembles cherts mapped elsewhere in this area and is regarded as an erosional remnant whilst its stratigraphic position is uncertain.

An outcrop of impure dolomite interbedded with black shales has been noted in the Horton River approximately 1 km downstream from the Horton Loop bridge.

Black Shales

This unit is a fine grained black carbonaceous shale which contains up to 10% euhedral pyrite concentrated along bedding planes. The pyrite layers are often rimmed with calcite and occasionally accentuate ripple marks.

Concretionary nodules are frequently developed and contain some euhedral pyrite though original bedding has been destroyed.

The black shales show a gradational contact with the underlying banded siltstones, the contact marked by an increase in banding and a change in colour to grey and green.

Green Banded Siltstone

The banded siltstones form the basal unit in this area and are regarded as being equivalent to the Balfour "pyjama siltstones". The rock is composed of irregular alternating layers quartzite and chloritic, silty composition. The siltstone is usually green though may vary to purple in colour.

Towards the western end of Sumac Spur 10, the siltstones appear to have been slightly metamorphosed with the development of spotting, a micaceous cleavage and appear almost schistose in the Lindsay River.

8.1 Structure

The predominant structural trend in the EL is to the NE with gentle warping about NE fold axes. However, this trend is disturbed in the vicinity of the basalt where an E-W structural control predominates. Upstream of the bridge over the Leigh River, the predominant structure is again to the NE.

The structural disturbance may be caused by "basin margin" effects or by regional WNW-ESE faulting - perhaps a continuation of the Marrawah fault. This would be contiguous with the apparent abrupt termination of the black shale horizons.

9. GEOCHEMISTRY

Stream sediment sampling where access has permitted has been completed with an average density of one or two samples per square kilometre.

Bulk samples of fines weighing 1-2kg were collected from suitable trap sites within the active stream. The samples were dried, sieved to minus 80 mesh and analysed for Cu,Pb,Zn,Ni,Co,As,Ag,Sn and W on a routine basis and occasionally for Bi,Cr,Mn,and Sb. Stream sediment sample locations are plotted on Plan TASH 977.

Routine rock chip samples were collected along roads and within creeks and submitted for a similar range of analysis.

9.1 Drainage Geochemistry

An insufficient number of samples (42) have been collected within the EL to allow a meaningful statistical interpretation of the data. Initial attempts at cumulative frequency calculations indicate a lack of anomalies.

9.1.1. Lead Plan TASH 978

Mainly background values with perhaps a slight break at 9 ppm Pb. One single anomaly of 300 ppm occurs in the Leigh River but doesn't appear to have any dispersion train and warrants checking.

9.1.2. Zinc Plan TASH 979

Zinc values indicate a possible break at 70 ppm, probably indicating a high background category.

9.1.3. Copper Plan TASH 980

Mainly background values with a possible break at 30 ppm Cu.

9.1.4. Tin Plan TASH 981

All tin values are very low, less than 9 ppm.

9.1.5. Cobalt Plan TASH 982

Very low values, less than 9 ppm Co. One high background value of 15 ppm.

9.1.6. Nickel Plan TASH 983

The nickel distribution indicates a single background population.

9.1.7. Arsenic Plan TASH 984

Very low values, all less than 9 ppm As.

9.2 Rock Geochemistry Plans TASH 986-989

Routine rock chip samples were collected during mapping and drainage sampling with greater emphasis placed on the black shale belt. The black shales show variable results for Cu, Pb and Zn though generally contain up to 300 ppm arsenic. Elevated arsenic samples together with pyrite taken from the black shales were submitted for gold analysis. Gold assays were disappointing, maximum 0.03 ppm Au.

Assays of basalt tend to be enhanced in copper, maximum 220 ppm Cu.

9.3 Interpretation

The drainage geochemistry is very disappointing especially regarding follow-up of the tin anomalies obtained in the Leigh River during reconnaissance activities. Attempts at re-assaying the original samples failed owing to disposal of the pulps. Tin assays over the basalt are very poor indicating that this is not the source for the tin.

Stream sediment assays from creeks draining the button grass plains to the NE of the Horton River appear to be lower than encountered elsewhere. This may be attributed to a reworking of the alluvial silts encountered in the creeks since the topography is insufficient to allow the creek to erode to bedrock.

Input anomalies X48 and X50 do not appear to have an elevated geochemical signature.

10. GEOPHYSICS APPENDIX IV

One line of VLF and ground magnetics was conducted along Sumac Road, Spur 10 to test the location of the RTZ Leigh River aeromagnetic anomaly.

The ground magnetic signature is very spikey with peaks up to 1500nT above background and is coincident with basalt outcrop.

The VLF profile is generally flat with one cross-over coincident with the contact between green shaley siltstones and purple tuffaceous mudstones. It is uncertain whether this corresponds with INPUT anomaly X50.

11. KEYWORDS

Tin, Lead, Zinc, geol.mapping - regional geochemical - drainage, assays - surf., geophysics - mag, E.M.

12. LOCATION

Burnie 1:250 000 Sheet SK55-3

13. LIST OF REFERENCES

Lavin, O.P. and Nichol, I. 1981 Q'Gas: A mini computer-based system to aid in the interpretation of exploration oriented geochemical data. J.Geochem.Exploration, Vol.15, No.1-3, pp 521-539.

Weir, D.J. Rocky Cape EL 1/77 lead-zinc computer study - stream sediments. Unpublished report CRAE No. 11586.

14. LIST OF PLANS

Leigh River Location Plan	Plan TASH 992
Leigh River area Compilation of Airborne Geophysics	Plan TASH 990
Leigh River Photogeological Interpretation by S.W.Carey	TASH 991
Leigh River Computer Study	Lead TASH 965
	Lead with Selections TASH 973
	Zinc TASH 972
	Copper TASH 971
	Nickel TASH 968
	Cobalt TASH 970
	Arsenic TASH 966
	Molybdenum TASH 969
	Cold Extractible Copper TASH 975

Cu/Ni Ratio	TASh 974
Free Copper	TASh 976
Tin	TASh 967

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15. LIST OF APPENDICES

Appendix I	Statistics for file NWTASSS.
Appendix II	Geochemical Assay Ledgers - Drainage.
Appendix III	" " " - Rock Chips - Roads.
Appendix IV	Geophysical Profiles.
Appendix V	Petrographic Reports.

APPENDIX I

STATISTICS FOR FILE NWTASSS

STATISTICS FOR FILE NWTASSS

Selection of histogram intervals was narrowed down to 0.1 and 0.05 log units by a process of trial and error. Any interval less than 0.05 log units tended to create a wide distribution interpreted as analytical reading errors rather than natural distribution.

Lead

Lead was considered the most important element within this study for two reasons:

- (a) Lead and zinc are the most suitable indicators in Canada for the discovery of Selwyn Basin type deposits.
- (b) Within the Tasmanian geochemical environment lead was considered to be the most insoluble element and therefore the most likely to give an identifiable dispersion train within a drainage system.

Two sets of histograms were produced, one treating the whole data, the other based on a selected portion of the data between 0 - 100 ppm to examine its distribution more closely as lead values greater than 100 ppm were considered to be greatly anomalous.

1. Total Distribution

Four significant populations are defined by the histogram under 2.1 log units (125.9 ppm) which account for over 2/3 of the samples analysed. A significant tailing off of values is apparent above 2.1 log units (125 ppm). Population cut offs have been defined as follows:

0.9, 1.3, 1.55, 2.1, 3.1, log units

Mean = 0.93

Standard deviation = 0.55

Mean + 1 SD = 1.48

Mean + 2 SD = 2.03

2. Lead Distribution with Selections of 0 - 100 ppm

Values of lead between 0 and 2.0 log units were selected. In this

case, 6 cut offs were proposed as follows:

0.5, 0.8, 1.25, 1.6, 1.85, 2.0 log units.

Mean = 0.86

Standard deviation = 0.45

Mean + 1SD = 1.31

Mean + 2SD = 1.76

This set of statistics was considered to be more accurate and was used for later interpretation in preference to those outlined to 1.

Zinc

The zinc distribution is quite complex under 2.7 log units (500 ppm) and could be interpreted either as one single population or as four overlapping ones. The latter interpretation is preferred. Although several extra populations could be defined below 1.55 log units (35 ppm), these were considered to be insignificant.

Population cut offs were selected as follows:

1.55, 1.75, 2.1, 2.7 log units.

Mean = 1.46

Standard Deviation = 0.61

Mean + 1SD = 2.07

Mean + 2SD = 2.68

Copper

Copper exhibits a relatively simple distribution with six populations evident at the following cut offs.

0.5, 0.95, 1.25, 1.60, 2.05, log units.

Mean = 0.95

Standard Deviation = 0.45

Mean + 1SD = 1.40

Mean + 2SD = 1.85

Nickel

Nickel is quite complex with a number of overlapping populations between 1.0 and 2.5 log units (10 - 316 ppm) at a histogram interval of 0.1 log units. Selections were based on an interval of 0.05 log units.

Population selections were made as follows:

1.2, 1.55, 1.75, 2.0, 2.35, 2.8 log units.

Although 2 well defined populations exist below 1.0 log units, these were considered too low to be of significance and probably fall into the areas of detection limit.

Mean = 1.13

Standard Deviation = 0.61

Mean + 1SD = 1.74

Mean + 2SD = 2.35

Cobalt

Cobalt exhibits a simple distribution with population cut points selected as follows:

0.9, 1.25, 1.6, 1.8, 2.1, 2.6 log units.

Mean = 0.85

Standard Deviation = 0.51

Mean + 1SD = 1.36

Mean + 2SD = 1.87

Arsenic

Arsenic has a poorly defined distribution between 1.3 and 2.6 log units (20 - 400 ppm) and is very difficult to subdivide. Since over 2/3 of the data fall under 0.8 log units (6.3 ppm) one can only assume that this represents a single population.

Cut offs have been defined as follows:

0.8, 1.20, 2.6, 3.1 log units.

Mean = 0.55

Standard Deviation = 0.37

Mean + 1SD = 0.92

Mean + 2SD = 1.29

Molybdenum

Molybdenum shows a wide distribution with the majority of samples below 0.2 log units (1.6 ppm). Population cut offs have been selected as follows:

0.25, 0.55, 0.85, 1.25, 1.55

Mean = 0.21

Standard Deviation = 0.21

Mean + 1SD = 0.42

Mean + 2SD = 0.63

Tin

Tin has a wide distribution with no well defined population breaks between 1.2 - 2.5 log units. This can be interpreted as either a single population or one composed of many smaller populations. The latter interpretation is preferred and cut offs are as follows:

0.7, 1.2, 1.72, 2.3, 2.7 log units.

Mean = 0.98

Standard Deviation = 0.86

Mean + 1SD = 1.84

Mean + 2SD = 2.70

CxCu

Cold extraction copper exhibits a wide distribution with poorly defined populations between 0.6 - 2.0 log units.

Cut points between populations have been defined as follows:

0.1, 0.5, 0.8, 1.2 log units

Mean = 0.18

Standard Deviation = 0.30

Mean + 1SD = 0.48

Mean + 2SD = 0.78

Copper/Nickel Ratio

This variable was chosen to try to distinguish basic rocks from the remainder and was obtained by simple transformation of the data. A reasonable distribution was obtained and cut offs selected as follows:

3.0, 5.0, 8.5, 14.0, 20.5, 30.0, log units.

Mean = 1.41

Standard Deviation = 2.56

Mean + 1SD = 3.86

Mean + 2SD = 6.31

Free Copper, FCU

Free Copper was calculated by the formula -

$$FCU = \frac{CxCu + Cu}{Cu}$$

- to enhance any copper anomalies. It reflects the amount of copper absorbed on to clay particles rather than copper held in mineral lattices.

Cut points were chosen at the following intervals.

1.4, 1.7, 2.1 log units.

Mean = 1.24

Standard Deviation = 0.23

Mean + 1SD = 1.47

Mean + 2SD = 1.70

APPENDIX II

GEOCHEMICAL ASSAY LEDGERS - DRAINAGE

C.R.A. EXPLORATION . GEOCHEMICAL SAMPLE LEDGER

Tenement name LEIGH RIVER EL 12/80 No. Sample numbers..... Collected by D.J. WEIR. Sheet no. 275
 Area / Prospect LEIGH RIVER Date 10/2/82
 Map / Photo reference ARTHUR R. 1:100 000 TOPO SHEET. Analysed by ANALABS CODEE DPO no. 30071

Sample No.	Type	ss channel **						Total Carbon %	Metal content ppm or %											Grid ref	Geological Observations
		fl	wi	al	co	ca	pH		Cu	Pb	Zn	Ni	Co	As	Ag	Bi	Sn	W			
		o/c sample type ***																			
		s sample type ****																			
934337	OC	g/s						10	7	24	90	14	5	<0.1	n.a.	8	<10		Quartz breccia, minor limonite.		
934351	SS	2	6		✓		3	12	8	45	16	8	3	<0.1	<10	5	<10		Leigh R. No % Float: basalt chert banded siltstone. ✓		
352	SS	0.5	1.5		✓		2	13	2	35	12	6	3	0.3	<10	4	<10		4H trib Leigh R. No % Float: chert + quartz. ✓		
353	SS	0	1.5	✓	✓		3	7	41	12	10	4	2	<0.1	<10	6	<10		4H trib Leigh R. No % Float: chert. ✓		
354	SS	0.25	1		✓		3	10	2	59	29	15	3	<0.1	<10	3	<10		4H trib Leigh R No % No Float. ✓		
355	OC	g/s						7	38	62	160	10	8	0.2	n.a.	7	<10		Palegreen spotted siltstone - phyllitic. Sulfaceous?		
356	SS	0	1		✓		4	13	7	32	15	5	4	0.1	<10	3	<10		4H trib Leigh R. No % Float: chert. ✓		
357	SS	5	10		✓		3	9	10	47	14	8	3	<0.1	<10	3	<10		Leigh R. % green spotted chloritic siltstones. ✓		
358	OC	g/s						5	11	130	33	15	2	0.2	n.a.	<3	<10		Green chloritic siltstones - phyllitic.		
359	SS	0	1.5		✓		3	10	10	16	11	3	2	<0.1	<10	<3	<10		4H trib Leigh R. No % Float: green chloritic siltstones + quartz. ✓		
360	OC							5	1	6	200	12	5	0.1	n.a.	3	<10		Chert breccia		
934361	OC							230	25	83	39	8	4	<0.1	n.a.	6	<10		pale green siliceous siltstone.		

623030

* Sample type ss = stream sediment oc = outcrop f = float s = soil
 ** Stream sed. sample description fl = flow m3/sec wi = width m al = alluvial co = colluvial ca = catchment km2
 *** Outcrop sample type gs = grab sample rc = rock chip (state interval & length) cs = channel sample (state length)
 **** Soil sample type auger hole or pit depth m A, B or C horizon

C.R.A. EXPLORATION . GEOCHEMICAL SAMPLE LEDGER

Tenement name LEIGH RIVER EL12/80 No. Sample numbers..... Collected by D.J. WEIR Sheet no. 3875
 Area / Prospect LEIGH RIVER + HORTON R. 623031 Date 10/2/82
 Map / Photo reference ARTHUR R. 1:100 000 TOPO SHEET. Analysed by ANALABS COOGE DPO no. 30072 30075

Sample No.	Type	ss channel **						Carbon Top %	Metal content ppm or %											Grid ref	Geological Observations
		fl	wi	al	co	ca	pH		Cu	Pb	Zn	Ni	Co	As	Ag	Bi	Sn	W Sb			
		o/c sample type ***																			
		s sample type ****																			
934383	SS	0	1	✓	✓			2	4	4	45	4	1	1	0.1	n.a	5	410 5	LH trib GRANE R. No 9c No float. Sl. organic.		
384	SS	0	1		✓			2	21	3	37	11	4	2	<0.1	n.a	5	410 23	LH trib GRANE R. etc. green banded siltstone - phyllite		
385	SS	0	3		✓			3	4	5	35	6	3	1	0.1	n.a	7	410 23	HORTON R. 9c green chloritic siltstone.		
386	SS	3	7		✓			3	8	6	91	15	7	1	<0.1	n.a	<3	410 4	GRANE R. etc. green chloritic siltstone.		
387	SS	0	3		✓			3	5	5	47	10	4	1	<0.1	n.a	6	410 4	LH trib GRANE R. No 9c float green chloritic siltstone		
388	SS	3	10		✓			3	6	10	29	11	5	2	<0.1	n.a	5	410 5	LEIGH R. 9c green spotted phyllite.		
389	SS	3	6		✓			3	5	9	22	11	4	2	<0.1	n.a	10	15 6	LEIGH R. etc green phyllite.		
934390	SS	3	6		✓			3	10	10	25	17	5	2	<0.1	n.a	8	15 23	LEIGH R. etc green phyllites.		
391	oc	9/5							14	72	151	38	13	8	0.2	n.a	5	10 n.a	Above locality green phyllite.		
392	SS	5	10		✓			3	12	10	48	17	5	2	<0.1	n.a	10	410 4	LEIGH R. etc green phyllite.		
393	oc	9/5							7	37	90	48	23	9	0.1	n.a	4	410 n.a	Above locality. green phyllite.		
394	SS	0	1		✓			3	5	6	14	9	3	2	0.1	n.a	8	10 4	RH trib LEIGH R. No 9c No float.		
395	SS	0	1		✓			3	4	3	25	15	5	2	<0.1	n.a	8	410 5	RH trib LEIGH R. etc. green phyllite Fe string along bedding.		
396	SS	0.5	2		✓			3	9	4	25	11	3	2	0.1	n.a	8	410 23	LH trib Leigh R. etc chert? quartz. silic. alt? 33		
397	oc	9/5							15	37	17	146	12	130	0.7	n.a	8	410 n.a	Above locality chert/quartz. Silic. alt. n. by volcanics?		
398	SS	0	1		✓			4	9	5	17	9	3	2	0.1	n.a	<3	410 23	LH trib HORTON R. No 9c No float.		
399	SS	2	7		✓			3	7	7	27	13	6	3	<0.1	n.a	6	10 23	HORTON R. No 9c float: green banded siltstone + gls + basalt. dolomite + chert nodules. sl. brecciated.		
934400	oc	9/5							15	5	29	73	7	6	<0.1	n.a	3	410 n.a	Black ferruginous shales.		
401	oc	9/5							18	19	38	55	9	24	0.2	n.a	6	410 n.a	Dolomite + minor chert.		
402	oc	9/5							7	5	17	49	6	6	<0.1	n.a	6	410 n.a	Black pyritic shales.		
403	oc	9/5							15	16	30	45	7	12	<0.1	n.a	3	410 n.a	Black pyritic shales.		
404	oc	9/5							9	9	17	93	7	4	0.1	n.a	7	410 n.a	Cherty rock. brecciated minor Fe string sl. chloritic.		
934405	SS	0	1		✓			3	8	8	42	11	4	2	<0.1	n.a	9	410 23	RH trib HORTON R. No 9c No float.		

* Sample type ss = stream sediment oc = outcrop f = float s = soil
 ** Stream sed. sample description fl = flow m3/sec wi = width m al = alluvial co = colluvial ca = catchment km2
 *** Outcrop sample type gs = grab sample rc = rock chip (state interval & length) cs = channel sample (state length)
 **** Soil sample type auger hole or pit depth m A B or C horizon

Tenement name LEIGH RIVER EL 12/80 No. 623032 Sample numbers 623032 Collected by D.J. WEIR Sheet no. 495
 Area / Prospect LEIGH + HORTON RIVERS Date 10/2/82
 Map / Photo reference ARTHUR R 1:100 000 TOPO SHEET Analysed by ANALABS COOKE DPO no. 30072
30075

Sample No.	Type	ss channel **						Carbon Total %	Metal content ppm or %								Grid ref	Geological Observations	
		fl	wi	al	co	ca	pH		Cu	Pb	Zn	Ni	Co	As	Ag	Sn			W
		o/c sample type ***																	
		s sample type ****																	
934 406	SS	2	10		✓			4	7	7	24	13	5	2	0.1	4	<10		HORTON R. No o/c float. green banded siltstone, black shale basalt.
407	SS	0	3		✓			3	9	2	18	11	3	2	<0.1	7	10		LH trib HORTON R. of green banded siltstone + float same + tuffaceous rocks.
408	SS	0	1		✓			3	7	2	24	12	7	2	0.1	<3	<10		RH trib LEIGH R. No o/c float banded green silic. siltstone.
409	OC	g/s							9	6	68	57	23	16	<0.1	5	<10		Green chloritic siltstone.
410	SS	3	10		✓			3	7	11	35	14	6	2	<0.1	8	<10		LEIGH R. o/c green phyllitic siltstone.
411	SS	0	1		✓			3	5	3	17	10	4	2	0.1	3	<10		RH trib LEIGH R. o/c green phyllitic siltstone.
934 416	SS	4	10		✓			2	7	11	31	14	4	3	<0.1	<3	<4		HORTON R. No o/c float: grey shales.
417	f								11	14	66	62	9	5	<0.1	<3	<4		Above locality grey shales.
418	SS	3	15		✓			6	14	17	81	27	7	4	0.1	<3	<4		HORTON R: o/c black pyritic shales.
419	OC	g/s							65	36	96	120	19	49	<0.1	<3	<4		Above locality: black pyritic shales.
420	SS	4	10		✓			4	48	18	92	31	7	11	0.1	<3	<4		HORTON R. o/c black shale. float: basalt + minor tuffaceous sed.
421	OC	g/s							12	24	39	53	7	25	0.1	4	<4		Above locality: black shale.
422	SS	0	2		✓			4	20	14	32	31	6	4	0.1	<3	<4		LH trib HORTON R. o/c black shale.
423	OC	g/s							2	11	12	37	4	4	<0.1	6	<4		Above locality: Black shale.
424	SS	4	10		✓			2	33	15	44	35	7	6	0.1	<3	<4		HORTON R: o/c black shale. float: basalt.
425	OC	g/s							14	25	50	54	7	54	0.1	<3	<4		Above locality: black shale.
426	SS	0	2	✓	✓			2	6	6	12	11	4	3	<0.1	<3	<4		LH trib: HORTON R. No o/c float green chloritic siltstone.
427	f								2	6	51	18	8	2	0.1	<3	<4		Above locality: green chloritic siltstone.
934 428	SS	5	12		✓			2	32	14	57	30	8	4	<0.1	<3	<4		HORTON R. o/c black shale. float: dirty grey g/s.

* Sample type ss = stream sediment oc = outcrop f = float s = soil
 ** Stream sed. sample description fl = flow m3/sec wi = width m al = alluvial co = colluvial ca = catchment km2
 *** Outcrop sample type gs = grab sample rc = rock chip (state interval & length) cs = channel sample (state length)
 **** Soil sample type auger hole or pit depth m A B or C horizon

C.R.A. EXPLORATION . GEOCHEMICAL SAMPLE LEDGER

Tenement name LEIGH RIVER EL12/80 No. Sample numbers Collected by D.J. WEIR. Sheet no. 595
 Area / Prospect HORTON RIVER. Date 23/2/82
 Map / Photo reference ARTHUR R. 1:100 000 TOPO SHEET. 623033 Analysed by ANALABS COOGE DPO no. 30075.

Sample No.	Type	ss channel **						Carbon Topo /10	Metal content ppm or %								Grid ref	Geological Observations	
		fl	wi	al	co	ca	pH		Cu	Pb	Zn	Ni	Co	As	Ag	Sn			W
		o/c sample type ***																	
		s sample type ****																	
934429	f							8	9	36	51	4	2	0.1	<3	<4	Above locality: Dirty grey gtzite.		
430	SS	4	10		✓			3	24	12	35	18	3	3	0.1	I.S.	<4	HORTON R.: 9% Dirty grey gtzite. ✓	
431	OC	5/5						1	12	21	10	2	9	<0.1	<3	<4	Above locality: Dirty grey gtzite.		
432	SS	4	10		✓			3	5	12	16	12	2	2	<0.1	4	4	HORTON R.: No 9% float Dirty grey gtzite. ✓	
433	f							1	9	36	42	4	2	<0.1	<3	<4	Above locality: Dirty gtzite.		
434	SS	0	3	✓	✓			3	5	6	13	10	2	1	<0.1	<3	5	Lt trib HORTON R.: No 9% No float. ✓	
435	bank							3	9	14	13	3	3	0.1	7	<4	Above locality: bank sample.		
436	SS	0	6	✓	✓			2	3	8	13	11	3	2	<0.1	<3	5	Lt trib HORTON R. No 9% No float. ✓	
437	bank							5	7	17	11	3	3	<0.1	6	<4	Above locality: bank sample.		
438	SS	0	3	✓	✓			2	1	5	11	10	3	2	<0.1	<3	4	Lt trib HORTON R. No 9% float: Dirty gtzite. ✓	
439	f							1	5	26	39	6	2	<0.1	<3	<4	Above locality Dirty gtzite.		
440	SS	0.5	6	✓	✓			2	9	6	19	18	4	3	0.1	<3	<4	Lt trib HORTON R. No 9% No float. ✓	
441	NO SAMPLE																		
442	SS	0.5	1	✓	✓			2	10	5	20	13	3	3	<0.1	<3	4	Lt trib HORTON R. 9% Dirty gtzite. ✓	
443	OC	5/5						3	11	22	30	4	7	<0.1	<3	<4	Above locality: Dirty gtzite.		

* Sample type ss = stream sediment oc = outcrop f = float s = soil
 ** Stream sed. sample description fl = flow m3/sec wi = width m al = alluvial co = colluvial ca = catchment km2
 *** Outcrop sample type gs = grab sample rc = rock chip (state interval & length) cs = channel sample (state length)
 **** Soil sample type auger hole or pit depth m A B or C horizon

APPENDIX III

GEOCHEMICAL ASSAY LEDGERS - ROCK CHIPS - ROADS

C.R.A. EXPLORATION . GEOCHEMICAL SAMPLE LEDGER

Tenement name LEIGH R. EL12/80

No. Sample numbers

Collected by K. ROBINSON

Sheet no. 1 of 5

Area / Prospect SUMAC ROAD.

Date 6/1/82

Map / Photo reference ARTHUR R. 1:100 000.

623035

Analysed by ANALABS COEE

DPO no. 30069

Sample No.	Type	ss channel **						Carbon	Metal content ppm or %										Grid ref	Geological Observations
		fl	wi	al	co	ca	pH		Cu	Pb	Zn	Ni	Co	As	Bi	Sn	W			
		o/c sample type ***																		
		s sample type ****																		
934123	OC	GS	40m					48	17	29	78	7	60	<2	10	<10		Grey Mudstone, White Siltstone		
124	OC	GS	40m					44	34	30	62	9	90	2	8	<10		Black Pyritic Shales		
125	OC	GS	50m					99	55	31	130	21	220	<2	5	<10		" " "		
126	OC	GS	50m					290	117	13	310	15	250	<2	5	<10		" " "		
127	OC	GS	100m					49	16	33	37	17	11	<2	6	<10		Black Shales, Siltstone Pyritic		
128	OC	GS	50m					55	13	45	74	19	54	2	8	<10		Black Pyritic Shales.		
129	OC	GS	75m					20	14	35	46	15	35	2	8	<10		Black Pyritic Shales, Siltstone.		
934130	OC	GS	50m					91	38	47	130	18	100	<2	5	<10		Black Pyritic Shales.		
934276	OC	GS	50m					12	4	54	43	9	2	<2	6	<10		Siltstone - banded to quartzite?		
277	OC	GS	40m					70	26	30	68	19	70	<2	<3	<10		Black Pyritic Shales.		
278	OC	GS	150m					67	41	22	89	10	51	2	<3	<10		Banded Siltstone, alt. chert, spotted phyllite.		
279	OC	GS	50m					68	18	19	150	14	70	2	7	<10		Black Pyritic Shales		
280	OC	GS	50m					230	80	99	210	17	180	<2	5	<10		" " "		
281	OC	GS	60m					65	48	35	77	26	58	2	7	<10		" " "		
282	OC	GS	50m					92	35	42	80	33	60	<2	5	<10		" " "		
283	OC	GS	50m					83	42	53	75	27	90	<2	7	<10		" " " + Grey Shale		
284	OC	GS	75m					24	28	22	43	6	58	<2	6	<10		" " "		
934285	OC	GS	75m					62	40	16	59	8	42	<2	10	<10		Black deformed Pyritic Shale.		

* Sample type ss = stream sediment oc = outcrop f = float s = soil

** Stream sed. sample description fl = flow m3/sec wi = width m al = alluvial co = colluvial ca = catchment km2

*** Outcrop sample type gs = grab sample rc = rock chip (state interval & length) cs = channel sample (state length)

**** Soil sample type auger hole or pit depth m A, B or C horizon

C.R.A. EXPLORATION . GEOCHEMICAL SAMPLE LEDGER

Tenement name LEIGH RIVER EL12/80 No. Sample numbers..... Collected by K. Robinson Sheet no. 275
 Area / Prospect SUMAC ROADS Date 13/12/81
 Map / Photo reference ARTHUR R. 1:100 000 TOPO SHEET. 623036 Analysed by ANALABS CODE E DPO no. 30065, 66
30070.

Sample No.	Type	ss channel **						Carbon	Metal content ppm or %											Grid ref Au (Fire Assay)	Geological Observations						
		fl	wi	al	co	ca	pH		Cu	Pb	Zn	Ni	Co	As	Bi	Sn	W	Ba									
		o/c sample type ***																									
		s sample type ****																									
934 174	OC	GS	50m					130	41	52	113	25	79	<2	3	<10											Black pyritic shales
175	OC	GS	50m					430	19	46	149	27	140	<2	6	<10											" " "
176	OC	RC	10m					960	95	105	985	25	230	<2	3	<10					350						Pyrite from black shales
177	OC	RC	10m					225	35	70	380	5	150	<2	8	<10					460						" " " "
178	OC	RC	10m					130	30	95	110	50	5	<2	4	<10					60						Basalt, minor native Cu.
179	OC	RC	10m					95	30	90	135	50	2	<2	3	<10					30						Chloritic basalt pyritic
180	OC	RC	10m					110	290	740	115	25	9	<2	7	<10					40						Basalt dissemin. py. Epidote veinings.
934 181	OC	RC	10m					30	185	155	115	45	4	<2	9	<10					40						" " " "
934 131	OC	RC	20m					140	46	29	175	9	300	<2	5	<10											limonitic capping from black shale.
934 132	OC	RC	20m					68	43	37	61	19	40	<2	4	<10											Black pyritic shale.
934 273	OC	RC	20m					4	5	36	36	18	2	<2	7	<10											Spotted chloritic phyllite.
934 260	OC	GS	50m					60	63	37	56	19	71	<2	3	<10											Black pyritic shales
261	OC	GS	30m					47	26	37	78	12	130	<2	3	<10											" " "
262	OC	GS	50m					21	8	27	26	8	13	<2	3	10											Grey pyritic shale
263	OC	GS	50m					27	10	64	63	14	25	<2	5	10											Green Shalesy Siltstone
264	OC	GS	75m					45	6	109	113	36	17	<2	5	<10											Green chloritic shales + purple mudstone.
265	OC	GS	75m					81	5	121	123	44	8	<2	8	40											Contact: basalt / purple mudstone
266	OC	GS	50m					193	5	71	107	140	8	<2	7	<10											purple basic volcanics.
267	OC	GS	20m					220	7	113	81	46	3	<2	4	40											Basalt + minor native Cu.

* Sample type ss = stream sediment oc = outcrop f = float s = soil
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 *** Outcrop sample type gs = grab sample rc = rock chip (state interval & length) cs = channel sample (state length)
 **** Soil sample type auger hole or pit depth m A, B or C horizon

C.R.A. EXPLORATION . GEOCHEMICAL SAMPLE LEDGER

Tenement name LEIGH R. EL 12/80

No. Sample numbers.....

Collected by K. ROBINSON

Sheet no. 4 of 5

Area / Prospect SUMAC ROAD

Date 7/1/82

Map / Photo reference ARTHUR R. 1:100 000 TOPO SHEET.

623038

Analysed by ANALABS CODEE

DPO no. 30069

Sample No.	Type	ss channel **						Carbon	Metal content ppm or %										Grid ref	Geological Observations
		ss * oc f s	fl	wi	al	co	ca		pH	Cu	Pb	Zn	Ni	Co	As	Bi	Sn	W		
			o/c sample type ***																	
			s sample type ****																	
934 286	oc	GS	50m					51	24	39	66	17	47	42	3	<10		Black banded Pyritic Shale		
287	oc	GS	75m					6	<1	50	45	11	1	<2	9	<10		Quartzite, Green banded Phyllite		
288	f	GS	50m					44	12	83	59	28	3	<2	6	<10		Phyllites, baked Siltstone		
289	f	GS	25m					38	6	53	35	22	1	<2	8	<10		Baked Siltstone, Volcanics?		
290	f	GS	25m					71	5	57	74	30	2	<2	5	<10		Baked Siltstone, basalt ? tremolite?		
291	oc	GS	50m					5	<1	46	51	17	1	<2	9	<10		Green chloritic Phyllites		
292	oc	GS	50m					5	<1	69	47	18	1	<2	9	<10		" " "		
293	oc	GS	50m					50	3	57		24	1	<2	8	<10		Phyllite Siltstone, Volcanics Tuffs.		
294	oc	GS	50m					6	1	65	39	19	1	<2	7	<10		Grey-green phyllite, chlorite bands		
295	oc	GS	75m					21	12	47	150	12	6	<2	6	<10		Grey phyllite - micritic 913 float.		
934 296	oc	GS	75m					10	8	56	42	10	1	<2	6	<10		Black, banded phyllites		
934 303	f	GS	50m					77	10	51	130	33	3	<2	6	<10		Tuffaceous? sed. Volcanics?		
304	oc	GS	100m					48	17	74	52	23	3	<2	7	<10		Grey/Purple banded phyllites.		
305	oc	GS	75m					8	3	92	40	16	2	<2	9	<10		" " " "		
306	oc	GS	25m					36	23	88	48	34	21	<2	3	<10		Grey Pyritic Phyllites		
307	oc	RC	10m					46	44	60	41	26	14	<2	7	<10		" " "		
308	oc	GS	70m					27	31	81	55	12	5	<2	7	<10		" " "		
934 309	oc	RC	30m					5	<1	66	46	18	<1	<2	8	<10		Grey/Purple banded Phyllites		

* Sample type ss = stream sediment oc = outcrop f = float s = soil

** Stream sed. sample description fl = flow m3/sec wi = width m al = alluvial co = colluvial ca = catchment km2

*** Outcrop sample type gs = grab sample rc = rock chip (state interval & length) cs = channel sample (state length)

**** Soil sample type auger hole or pit depth m A, B or C horizon

C.R.A. EXPLORATION . GEOCHEMICAL SAMPLE LEDGER

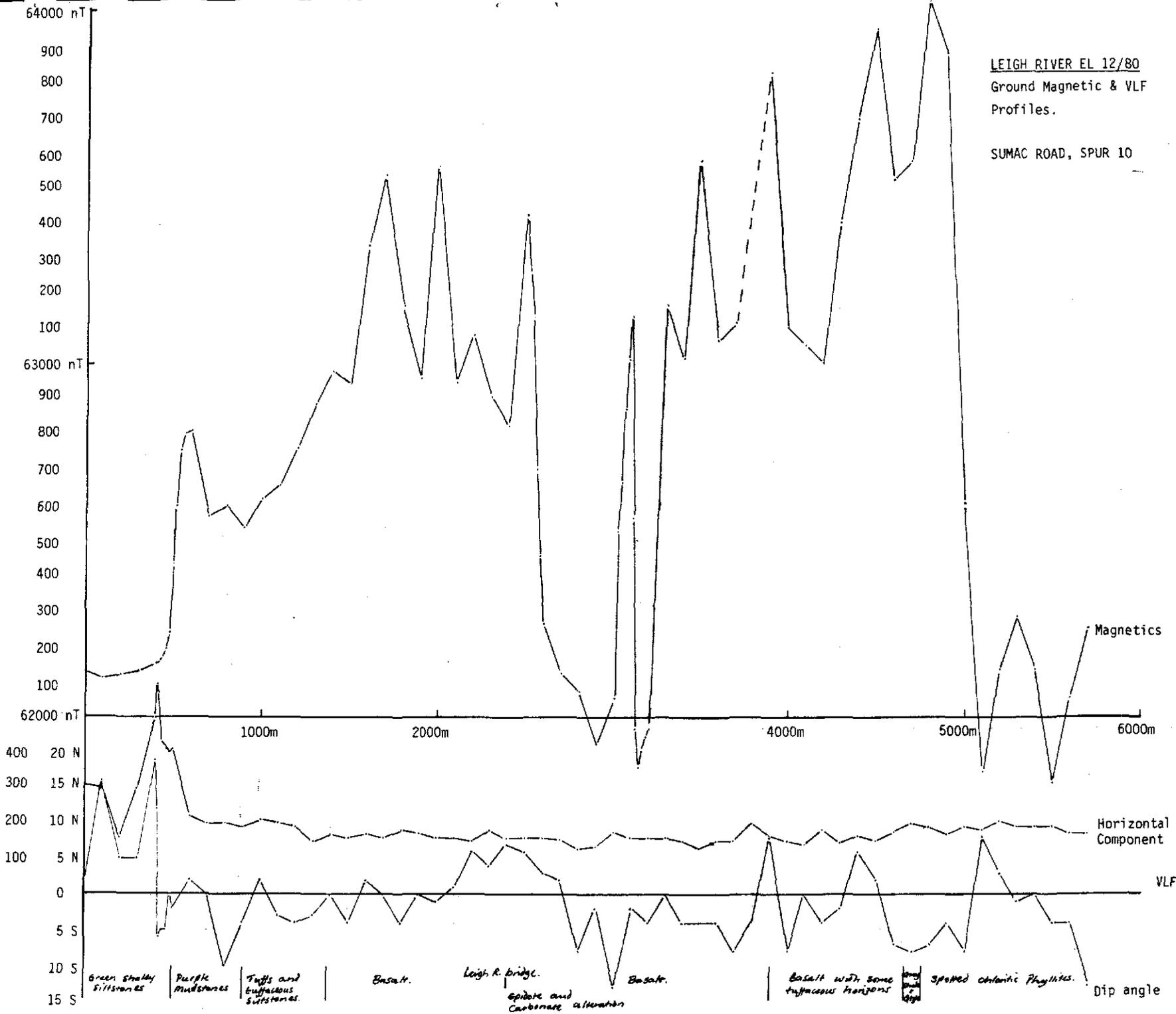
Tenement name LEIGH R. EL 12/80 No. Sample numbers..... Collected by K. ROBINSON Sheet no. 575.
 Area / Prospect SUMAC ROADS Date... 13/1/82
 Map / Photo reference ARTHUR R. 1:100 000 TOPO SHEET 623039 Analysed by ANALABS COBEE DPO no. 30069.

Sample No.	Type	ss channel **						Carbon	Metal content ppm or %										Grid ref	Geological Observations
		fl	wi	al	co	ca	pH		Cu	Pb	Zn	Ni	Co	As	Bi	Sn	W			
		o/c sample type ***																		
		s sample type ****																		
934310	OC	GS	75m					61	24	31	100	29	53	2	9	<10		Altered black pyritic Shale		
311	OC	GS	50m					59	12	36	85	13	52	42	5	<10		black shale/green phyllite contact.		
312	OC	RC	20m					60	78	63	73	23	2	42	3	<10		Ferich banded phyllite.		
313	OC	GS	75m					21	2	90	61	19	1	2	5	<10		Green banded phyllite		
314	OC	GS	50m					5	<1	75	37	18	1	2	10	<10		Green-white phyllite.		
315	OC	GS	100m					21	4	38	35	19	1	<2	8	<10		Green banded phyllite - Tuff Contact.		
316	OC	RC	20m					6	1	61	46	48	1	2	6	<10		Nodular, green pyritic phyllite.		
317	OC	RC	20m					15	5	55	68	10	3	2	6	<10		Qtz outcrop phyllites - green.		
318	OC	GS	50m					150	13	31	96	17	46	2	8	<10		Black pyritic Shale.		
319	OC	GS	100m					16	64	48	34	6	39	<2	3	<10		Black shale - phyllite contact.		
320	OC	GS	100m					20	10	49	31	5	7	<2	6	<10		Quartzite, green phyllite.		
321	OC	GS	75m					11	2	69	26	11	6	<2	7	<10		Nodular pyritic banded phyllite		
934322	OC	GS	150m					17	4	39	27	13	5	<2	6	<10		Grey/purple banded phyllites		

* Sample type ss = stream sediment oc = outcrop f = float s = soil
 ** Stream sed. sample description fl = flow m3/sec wi = width m al = alluvial co = colluvial ca = catchment km2
 *** Outcrop sample type gs = grab sample rc = rock chip (state interval & length) cs = channel sample (state length)
 **** Soil sample type auger hole or pit depth m A, B or C horizon

APPENDIX IV

GEOPHYSICAL PROFILES



623041

APPENDIX V

PETROGRAPHIC REPORTS



39 Beulah Road
Norwood, S.A. 5067
Telephone 42 5659

Central Mineralogical Services

Mr. D.J. Weir
Geologist
C.R.A. Exploration Pty. Ltd.
P.O. Box 138
BURNIE / TAS. 7320

2nd November, 1981

REPORT CMS 81/10/11

YOUR REFERENCE:	D.P.O. No. 30062
DATE RECEIVED:	7th October, 1981
SAMPLE NOS.:	5 Samples
SUBMITTED BY:	D.J. Weir
WORK REQUESTED:	Petrology

Copy to:
The Chief Geologist
C.R.A. Exploration Pty. Ltd.
G.P.O. Box 3840
MELBOURNE / VIC. 3001

Copy & Invoice to:
Administration Officer
C.R.A. Exploration Pty. Ltd.
P.O. Box 138
BELLERIVE / TAS. 7018

H.W. Fander for
H.W. Fander, M. Sc.

REPORT CMS 81/10/11

Five specimens were received for petrological examination and results are summarised in the attached table. Descriptions incorporate data from stereobinocular and petrological microscopic examination of representative thin-sections and offcuts, and include interpretative comments.

Summary

Sample 934051 represents an amygdaloidal basalt with a "spilitic" alteration assemblage of albite, chlorite and epidote accompanied by conspicuous fine-grained pyrite and traces of prehnite. Part of the area sectioned comprises relatively amygdaloidal ("scoriaceous") flow breccia, suggestive of a flow-marginal facies. In view of the association of pyrite with a prehnite alteration assemblage, Cu-geochemistry may be warranted.

The remaining four samples can be classified as carbonaceous cherts. These rocks are rather featureless, but there is evidence of differential modes of origin. Samples 934052 and 934095 appear to be primary cherts or, conceivably, diagenetically chertified limestone in the case of 934052. In contrast, 934080 and 934093 both exhibit evidence of secondary silicification, postdating a weak tectonic overprint. These rocks were possibly impure metacarbonates (?taic-dolomite rocks).

This interpretation requires consideration in the light of field evidence. The apparent association of partly nodular carbonate and chert facies is reminiscent of the basal zones of the Crimson Creek Formation.

D. Cowan, B. Sc.

Central Mineralogical Services

Sample No.	Classification - Composition	Fabric	Accessories	Comments
934 051 (T.S. 39119)	Altered Basalt. Albitised plagioclase phenocrysts, fresh augite microphenocrysts in plagioclase-microlathic/granular augite groundmass, argillic mesostasis. Disseminated chlorite	Glomeroporphyritic, amygdaloidal, basaltic. Sporadic chlorite-pyrite films, veinlets.	Leucogenised opaques. Patchy prehnite, minor allanite (at cores of amygdale epidote).	Grades marginally into relatively chloritised (+ prehnite) scoriaceous breccia. "Spilitic" alteration pattern. Unstressed.
934 052	(epidote-pyrite) amygdaloid Chert. Cherty crypto- to microcrystalline quartz, variably stained with ultrafine carbonaceous matter. Sporadic quartz veinlets.	Modular on sub- to millimetric scale. Vague ?carbonate-pseudomorphous microtextures.	None detected.	Vague affinities with nodular cherts of "Red Rock" sequence Renison area, but non-hematitic. Conceivably a silicified oolitic carbonate, but no
934 080	"Chert". Cherty microcrystalline quartz incipiently stained with carbonaceous matter. Frequent microfilms carbonaceous matter and degraded ?talca.	Vaguely nodular (slm. 934052). Reflects weak relict tectonic fabric (pre-quartz).	None detected.	Essentially quite ^{positive evidence} similar to 934052. Weak relict slaty cleavage predates bulk of cherty silicification. ?Silicified impure limestone or dolomite
934 093	"Chert". Cherty microcrystalline quartz with irregularly distributed carbonaceous stainings, minor degraded ?talca films.	Similar to 934080, but with vague segmented nodular features.	None detected.	Closely related to 934093. Vague relict tectonic fabric is very weak in comparison. ?Silicified impure limestone or dolomite.
934 095 (T.S. 39123)	Chert. Cherty crypto- to microcrystalline quartz with very thinly disseminated fine silt-sized clastic quartz grains, muscovite flakes. Weak, but pervasive carbonaceous stainings.	"Nodular", sub- to millimetric, ovoid, microcrystalline clasts cryptocrystalline matrix.	Minor traces "syngenetic" pyrite, rare diagenetic dolomite rhombs.	Affinities with 934052, but interpreted as a chert breccia (as against nodular chert). Clasts are homogeneous, featureless.

CBW

Central Mineralogical Services



39 Beulah Road
Norwood, S.A. 5067
Telephone 42 5655

Mr. D.J. Weir
Geologist
C.R.A. Exploration Pty. Ltd.
P.O. Box 138
BURNIE / TAS. 7320

27th January, 1982

REPORT CMS 81/12/43

YOUR REFERENCE:	D.P.O. No. 30067
DATE RECEIVED:	29th December, 1981
SAMPLE NOS.:	8 Samples
SUBMITTED BY:	D.J. Weir
WORK REQUESTED:	Petrology

Copy to:
The Chief Geologist
C.R.A. Exploration Pty. Ltd.
G.P.O. Box 3840
MELBOURNE / VIC. 3001

Copy & Invoice to:
Administration Officer
C.R.A. Exploration Pty. Ltd.
P.O. Box 138
BELLERIVE / TAS. 7018

H.W. Fander
H.W. Fander, M. Sc.

REPORT CMS 81/12/43D.P.O. 30067 Rock Samples

Eight rock samples were received for petrological examination; thin-sections were prepared and carefully examined in the light of the comments on the order.

Summary

This suite comprises basalts, a tuff and two sediments. None of the rocks showed any contact-metamorphic or metasomatic effects; calcium silicates, often associated with limestone/basalt contacts, are absent, and the only non-magmatic minerals are the deuteric assemblages (calcite, chlorite, epidote, pyrite, adularia, hastingsite). The carbonate masses present in some specimens are cavity/amygdale-filling, not sedimentary limestones - as far as can be determined from these samples.

The basalts are categorised as hawaiites (andesine basalts) and are generally fresh; compositionally, they verge on Fe-rich andesites or 'melaphyres'. The tuff (934155) is clearly related to (derived from) the basalts.

The two sediments are both unusual; one has been termed a metasomatised siltstone (934194), in which the matrix-cement is silicified and sericitised; it contains quartz pseudomorphs after halite crystals. The other (934247) consists solely of toffee-brown quartz crystals, clearly replacive; the rock may have been a sedimentary carbonate, but there is no direct evidence of this.

Since the basalts are apparently lava flows, the only notable contact effects will be at their base (i.e. the contact with underlying rocks) or adjacent to the feeders.

H.W. Fander, M. Sc.

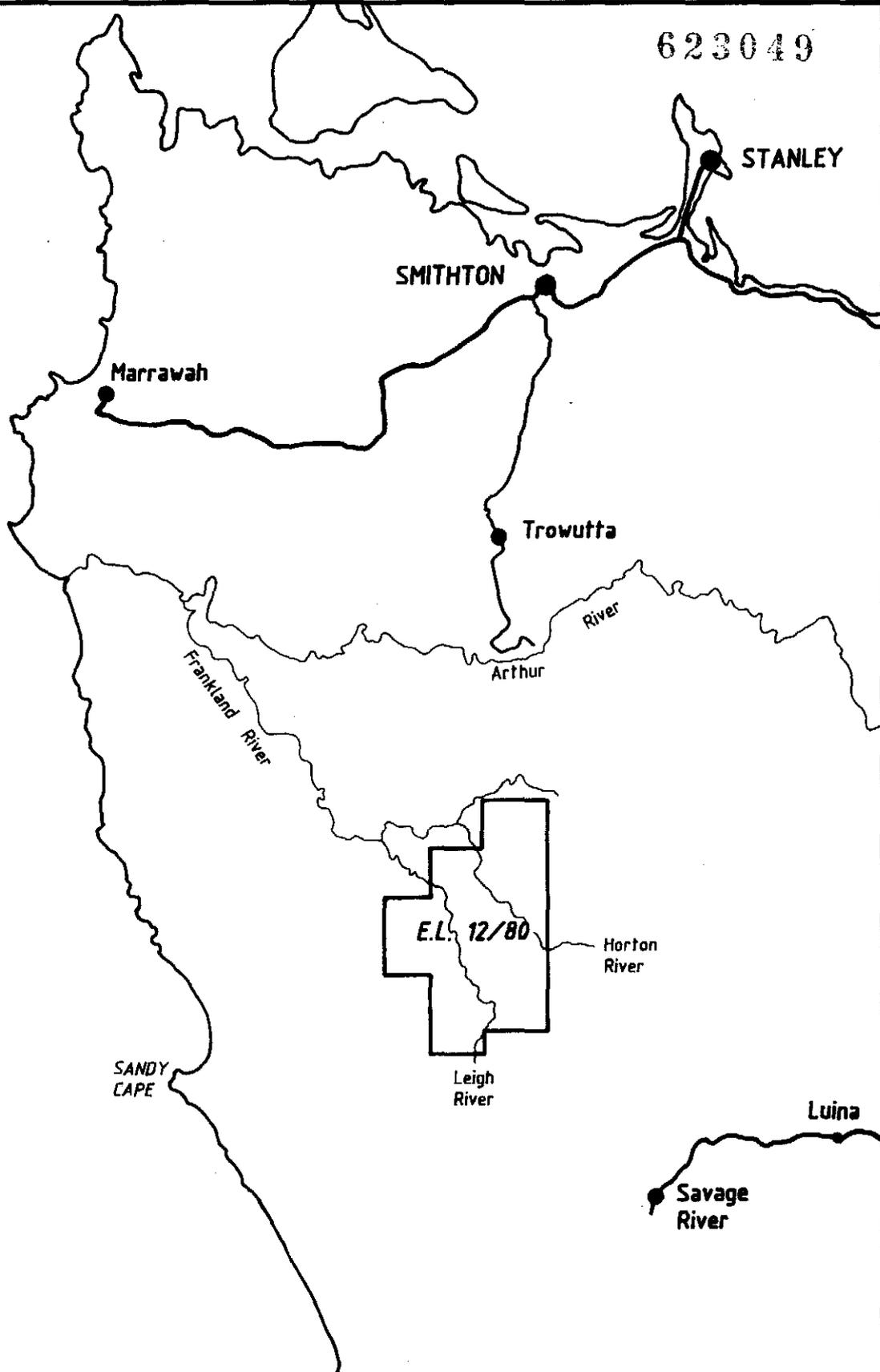
	Rock Type - Composition	Fabric	Minor Minerals	Central Mineralogical Services Comments
934141 (T.S. 40402)	Scoriaceous Basalt. Dense, semi-opaque basalt with altered plagioclase laths in ferruginous groundmass. Chalcedony, epidote in amygdales.	Numerous large/small amygdales, drawn out; Flow-banded lava.	Blebs of red-brown glass. Secondary zoisite representing feldspar.	A rapidly cooled extrusive rock, from flow-top of basic lava. Presumed basaltic composition.
934155	Tuff. Large and small irregular fragments of dolerite, basalt, andesite, dark glass, pyroxene, andesine, chert, in very fine semi-opaque ash matrix.	Smaller fragments stretched, deformed. Unsorted, Grainsizes up to 15 mm.	Some fragments replaced by chlorite, carbonate.	Believed to be subaerially deposited, possibly welded. Andesitic/basaltic source material.
934179	Porphyritic Basalt. Complexly-twinned fresh andesine phenocrysts in mass of andesine, augite, magnetite; large irregular amygdales of calcite-prehnite-chlorite.	Random orientation uniform fabric. Phenocrysts in clusters (glomeroporphyritic texture).	Albite and quartz veinlets. Pyrite crystals. Trace epidote.	More correctly classified as a hawaiite (andesine basalt). White calcitic masses are essentially openings and veins.
934181	Basalt Breccia. Irregular masses of basalt with andesine phenocrysts in andesine-augite-magnetite groundmass; interstitial chlorite, carbonate, epidote.	Basalt is amygdaloidal/scoriaceous, fragmented. Broad shear zones.	Veins of dense epidote with pyrite; younger calcite veins.	Probably a flow-breccia, with extensive deuteric alteration. Compositionally the same as 934179.
934194	Metasomatized ?Siltstone. Small angular quartz grains dispersed through ultrafine featureless quartz-sericite matrix with oxidised chlorite patches.	Very uniform, with faint preferred orientation, but otherwise structureless.	Clastic muscovite; quartz pseudomorphs after thalite cubes. Trace pyrite.	Thought to have been an argillaceous siltstone, possibly evaporitic facies, if pseudomorphs were originally halite.
934247	Quartzite. Interlocking subhedral small quartz crystals; each contains cloudy inclusions of ultrafine goethite; cavities lined with crystals.	Relict banding or bedding preserved, and accentuated by elongate cavities.	None detected.	A monomineralic rock, formed by complete silicification, probably of a fine-grained carbonate.
934269	Basalt. Complexly twinned andesine phenocrysts in a mass of fine andesine, augite, magnetite, altered glass. Coarse adularia veined by hastingsite and chlorite, in cavities.	Basalt is fine-grained, uniform, with large openings.	Quartz-chlorite-epidote-carbonate veins cut all other minerals.	Same type of hawaiite as the others; no indication of skarn formation.
934270 (T.S. 40409)	Porphyritic Basalt. Fresh, complexly-twinned andesine phenocrysts in mass of random andesine laths, subhedral augite, magnetite crystals.	Verging on medium-grained, doleritic fabric. A few amygdales.	Pyrite conspicuous in rock and amygdales, with chlorite. Calcite veins.	Correlates with the other basalts. Pyrite is deuteric. Calcite veins are younger.

E basalts

E basalts

Basalt
Basalt
Basalt

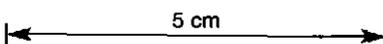
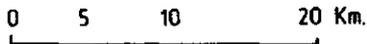
623049



CRA EXPLORATION PTY. LIMITED

E.L. 12/80 LEIGH RIVER

LOCATION DIAGRAM



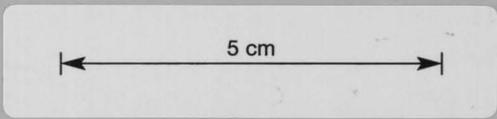
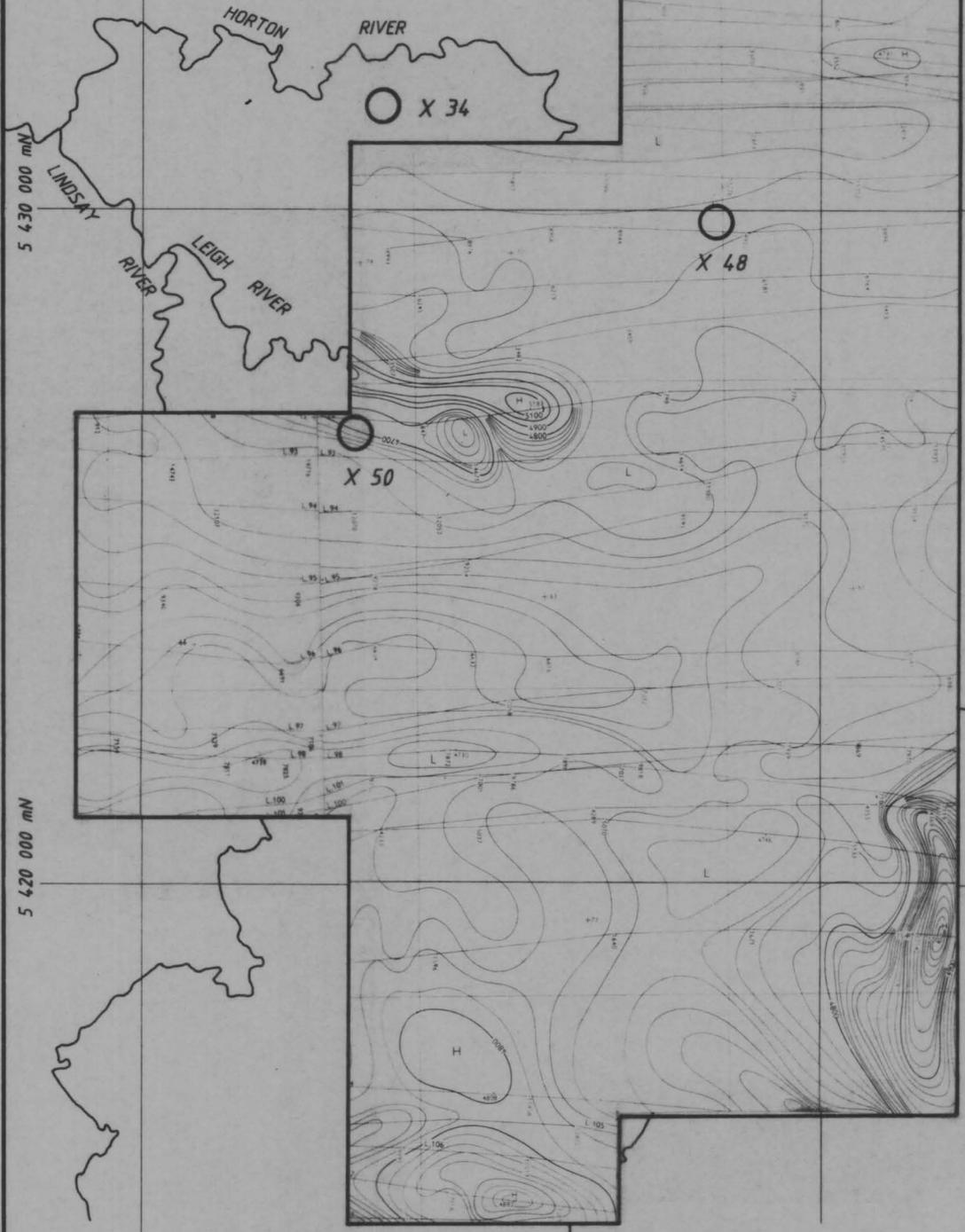
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AUTHOR.	J. W.	REPORT N°. 11857
DATE.	13 - 12 - 1982	TASH N°. 992

049

330 000 mE

340 000 mE

623050



○ ESSO INPUT ANOMALIES

CRA EXPLORATION PTY. LIMITED
 LEIGH RIVER E.L. 12/80
 COMPILATION OF
 AIRBORNE GEOPHYSICS

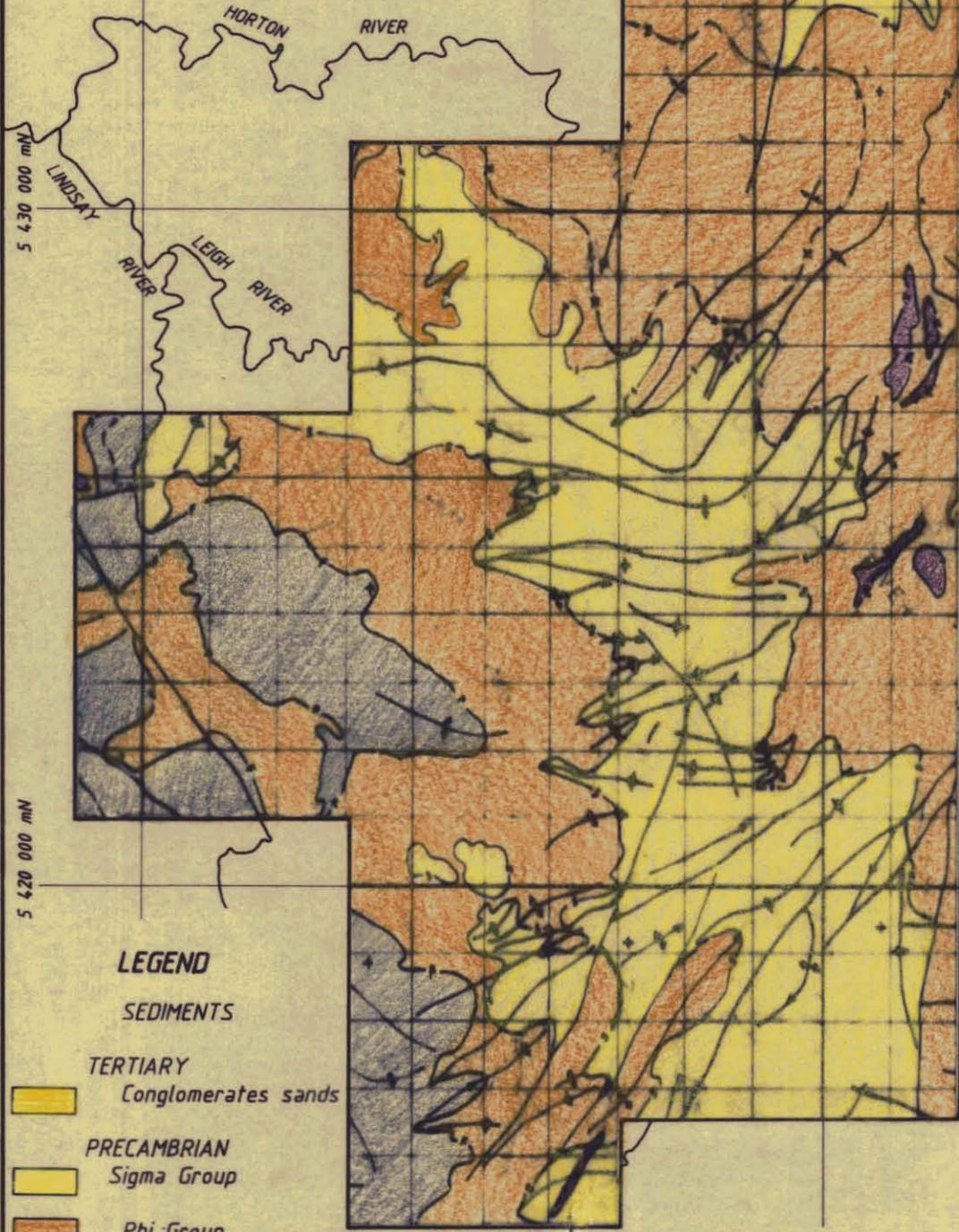
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Author:	J. W.	Report N°. 11857
Date:	December 1982	Plan N°. TASH 990

050

330 000 mE

340 000 mE

623051



LEGEND

SEDIMENTS

TERTIARY

Conglomerates sands

PRECAMBRIAN

Sigma Group

Phi Group

Epsilon Group

EOCAMBRIAN ?

Kappa Group

SYMBOLS

Anticlines

Synclines

Faults



CRA EXPLORATION PTY. LIMITED

LEIGH RIVER E.L. 12/80

**PHOTOGEOLOGICAL INTERPRETATION
AFTER S. W. CAREY**

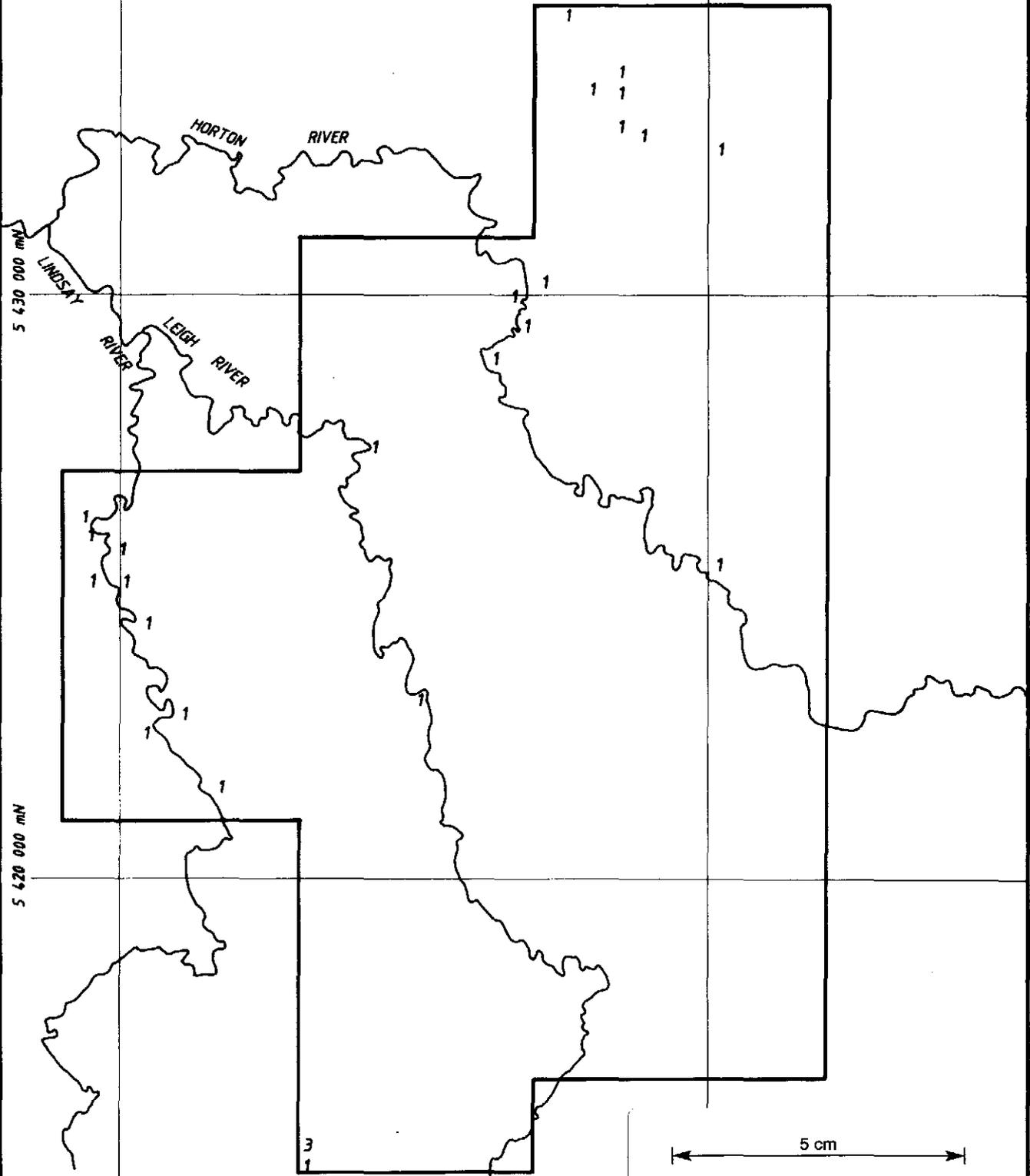
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Author:	J. W.	Report N°. 11857
Date:	December 1982	Plan N°. TASH 991

051

330 000 mE

340 000 mE

623052



LOWER BOUND	LEAD (ppm)	SYMBOL
BELOW	UPPER BOUND	
0.1	0.1	-
10	10	1
20	20	2
36	36	3
126	126	4
1000	1000	5
ABOVE	100 000	6
	100 000	*

VALUES THAT FALL ON A CLASS BOUND ARE ASSIGNED TO THE LOWER CLASS.

CRA EXPLORATION PTY. LIMITED

LEIGH RIVER E.L. 12/80
COMPUTER STUDY
STREAM GEOCHEMISTRY
LEAD

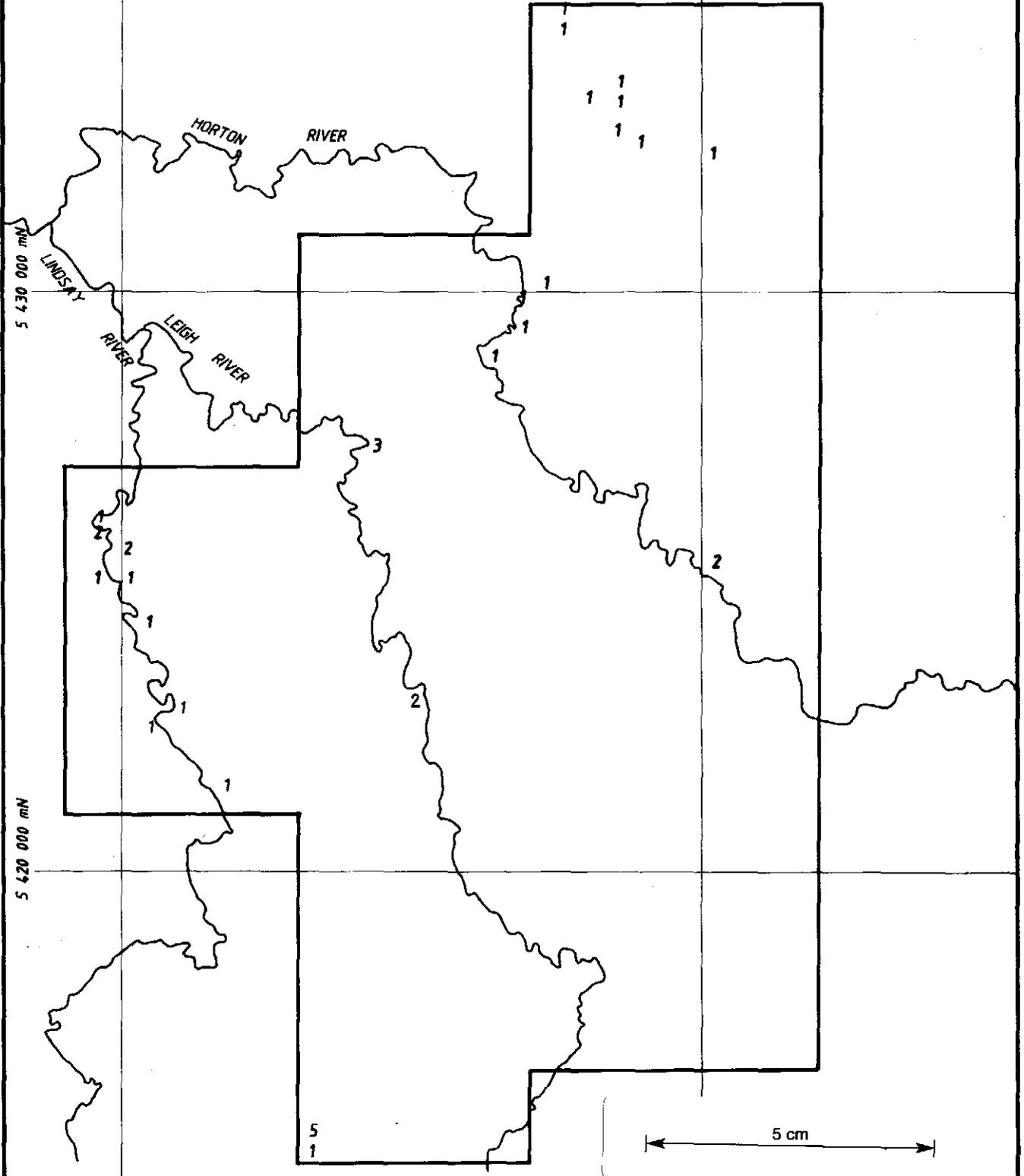
Ref	SK55 - 3	
Scale	1 : 100 000	Drawn: R. T.
Author:	J. W.	Report No. 11857
Date:	December 1982	Plan No. TASH 965

052

330 000 mE

340 000 mE

623053

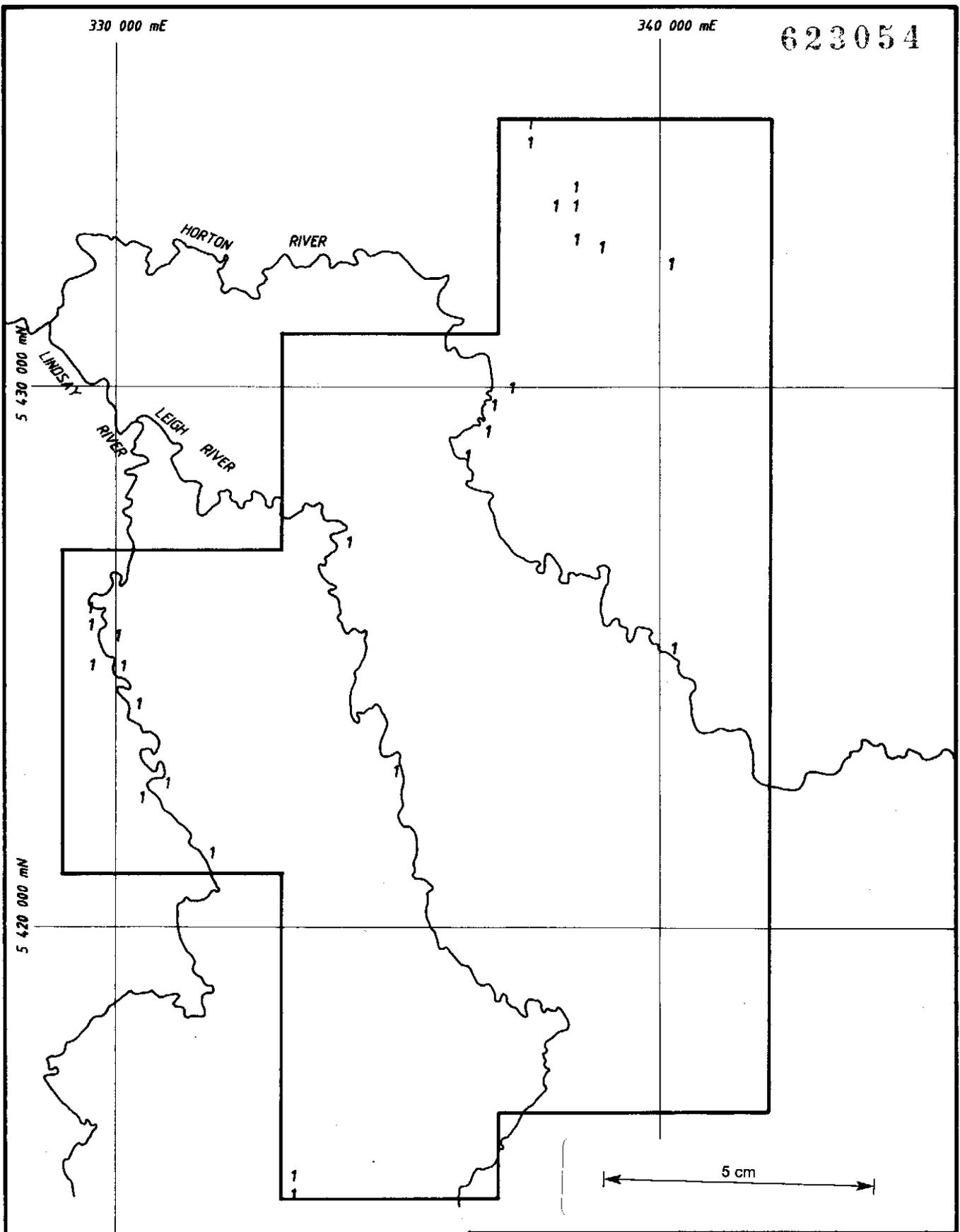


LEAD with SELECTIONS (ppm)		
LOWER BOUND	UPPER BOUND	SYMBOL
BELOW	1	-
1	3	1
3	6	2
6	16	3
18	28	4
28	40	5
40	71	6
71	100	7
ABOVE	100	∞

VALUES THAT FALL ON A CLASS BOUND ARE ASSIGNED TO THE LOWER CLASS.

CRA EXPLORATION PTY. LIMITED	
LEIGH RIVER E.L. 12/80	
COMPUTER STUDY	
STREAM GEOCHEMISTRY	
LEAD WITH SELECTIONS	
Ref	SK55 - 3
Scale	1 : 100 000
Author:	J. W.
Date	December 1982
Drawn:	R. T.
Report N°	11857
Plan N°	TASH 973

053

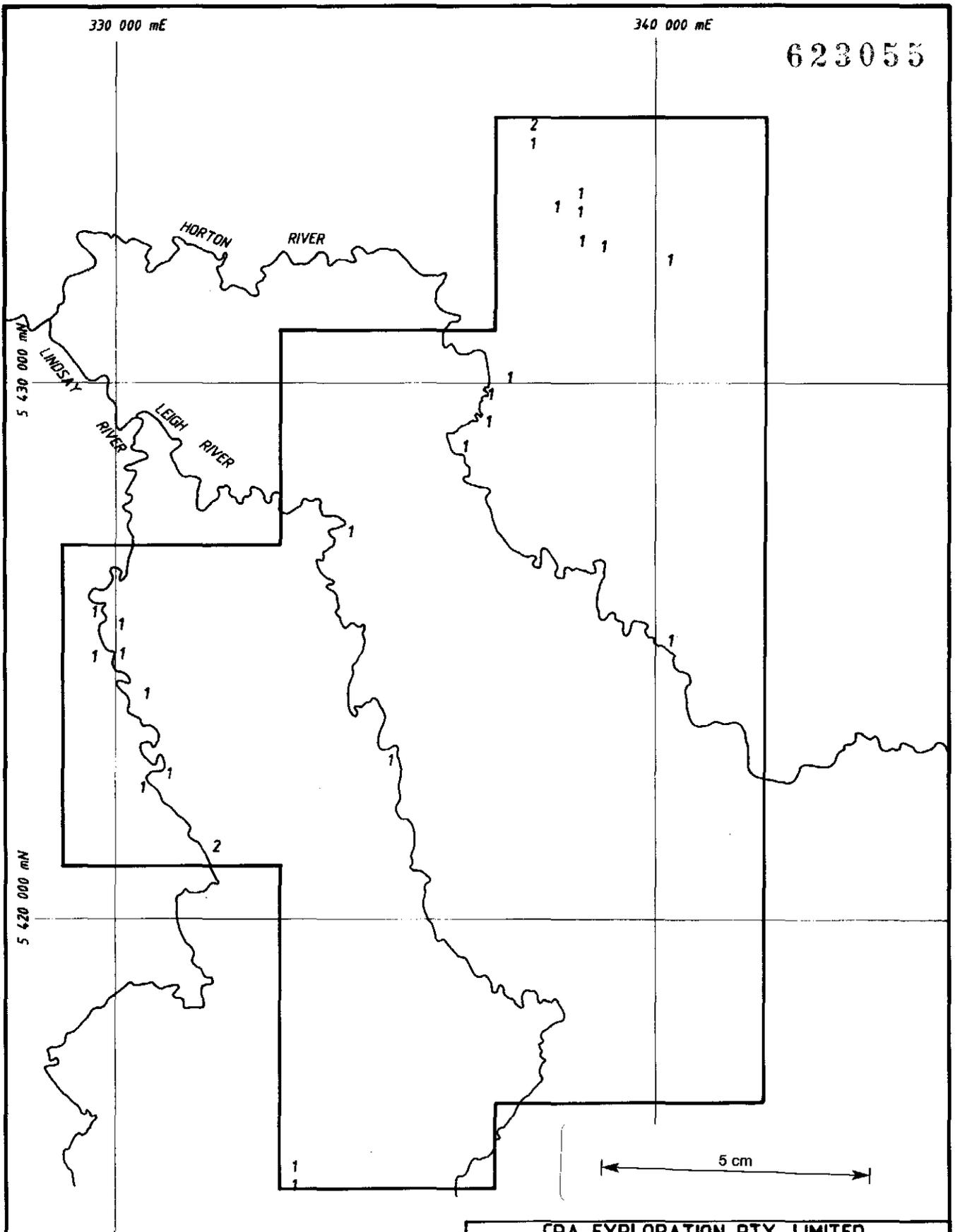


LOWER BOUND	ZINC (ppm) UPPER BOUND	SYMBOL
BELOW	0.1	-
0.1	36	1
36	56	2
56	126	3
126	510	4
510	100 000	5
ABOVE	100 000	*

VALUES THAT FALL ON A CLASS BOUND ARE ASSIGNED TO THE LOWER CLASS.

CRA EXPLORATION PTY. LIMITED	
LEIGH RIVER E.L. 12/80 COMPUTER STUDY STREAM GEOCHEMISTRY ZINC	
Ref	SK55 - 3
Scale	1 : 100 000
Author:	J. W.
Date:	December 1982
Drawn:	R. T.
Report N°.	11857
Plan N°.	T.ASh 972

054



LOWER BOUND	COPPER (ppm)		SYMBOL
BELOW	UPPER BOUND		
0.1	0.1		-
3	3		1
9	9		2
18	18		3
40	40		4
112	112		5
10 000	10 000		6
ABOVE	10 000		+

VALUES THAT FALL ON A CLASS BOUND ARE ASSIGNED TO THE LOWER CLASS.

CRA EXPLORATION PTY. LIMITED

**LEIGH RIVER E.L. 12/80
COMPUTER STUDY
STREAM GEOCHEMISTRY
COPPER**

Ref SK55 - 3

Scale 1 : 100 000

Drawn: R. T.

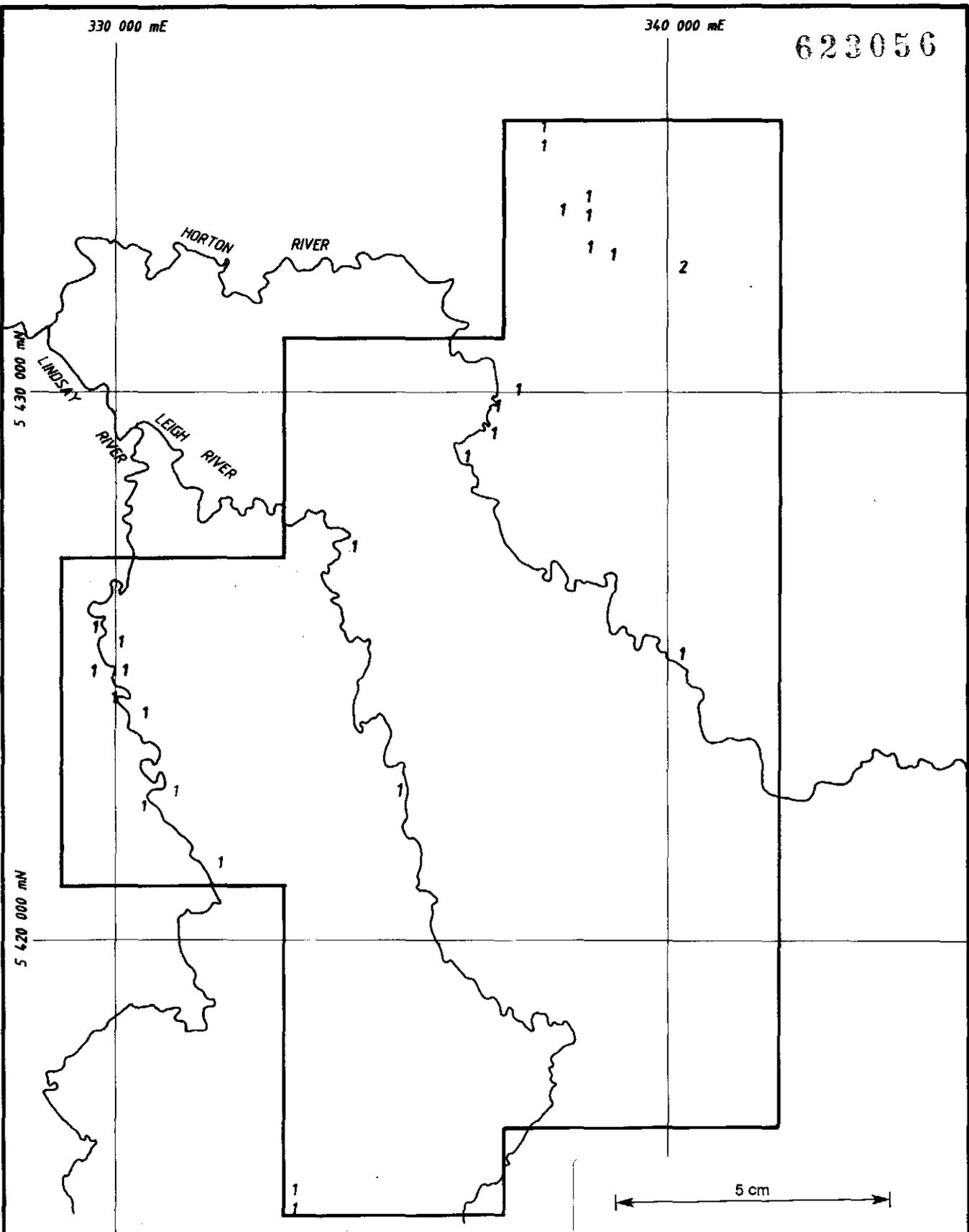
Author: J. W.

Report N°. 11857

Date: December 1982

Plan N°. TASH 971

055



623056

LOWER BOUND	NICKEL (ppm)	SYMBOL
BELOW	UPPER BOUND	
1	16	1
16	36	2
36	56	3
56	100	4
100	224	5
224	631	6
ABOVE	631	+

VALUES THAT FALL ON A CLASS BOUND ARE ASSIGNED TO THE LOWER CLASS.

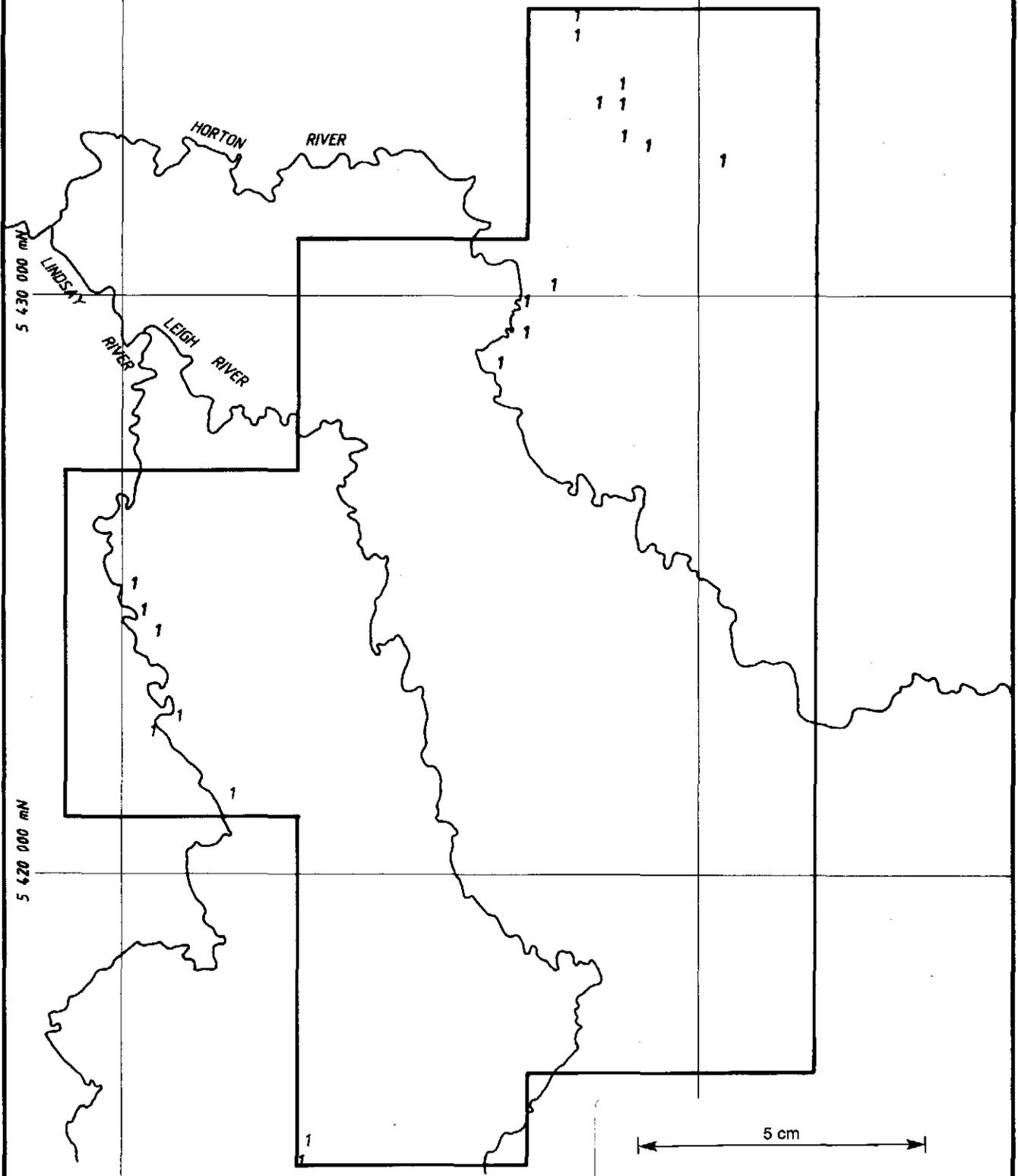
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LEIGH RIVER E.L. 12/80		
COMPUTER STUDY		
STREAM GEOCHEMISTRY		
NICKEL		
Ref	SK55 - 3	
Scale	1 : 100 000	Drawn: R. T.
Author:	J. W.	Report N°. 11857
Date:	December 1982	Plan N°. TASH 968

056

330 000 mE

340 000 mE

623057



LOWER BOUND	COBALT (ppm)	SYMBOL
BELOW	UPPER BOUND	
1	8	1
8	18	2
18	40	3
40	63	4
63	126	5
126	398	6
ABOVE	398	+

VALUES THAT FALL ON A CLASS BOUND ARE ASSIGNED TO THE LOWER CLASS.

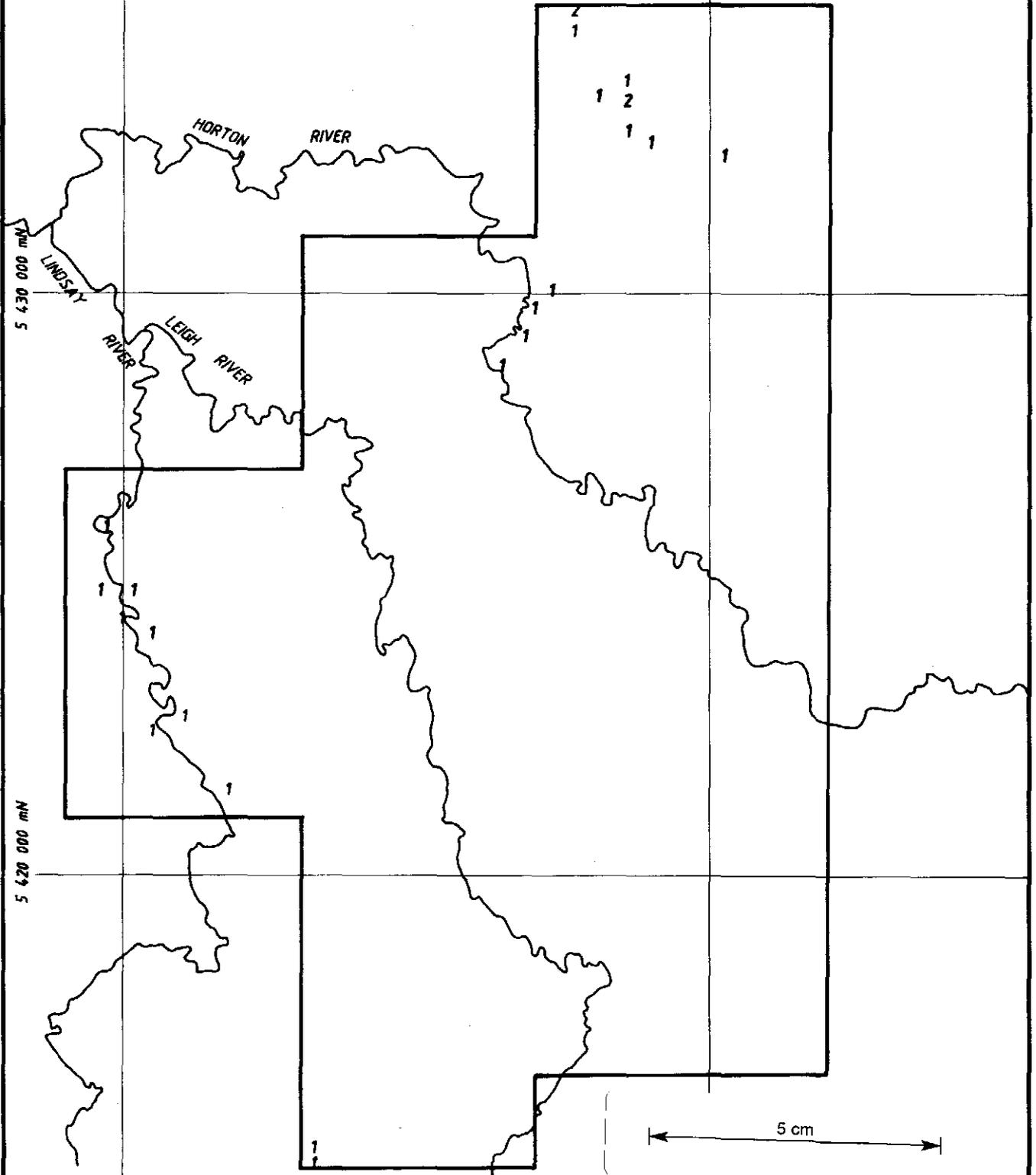
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LEIGH RIVER E.L. 12/80		
COMPUTER STUDY		
STREAM GEOCHEMISTRY		
COBALT		
Ref	SK55 - 3	
Scale	1 : 100 000	Drawn: R. T.
Author:	J. W.	Report N°. 11857
Date:	December 1982	Plan N°. TASH 970

057

330 000 mE

340 000 mE

623058



LOWER BOUND	ARSENIC (ppm)	SYMBOL
BELOW	UPPER BOUND	
1	6	1
6	16	2
16	398	3
398	1259	4
1259	5012	5
ABOVE	5012	6

VALUES THAT FALL ON A CLASS BOUND ARE ASSIGNED TO THE LOWER CLASS.

CRA EXPLORATION PTY. LIMITED

LEIGH RIVER E.L. 12/80
COMPUTER STUDY
STREAM GEOCHEMISTRY
ARSENIC

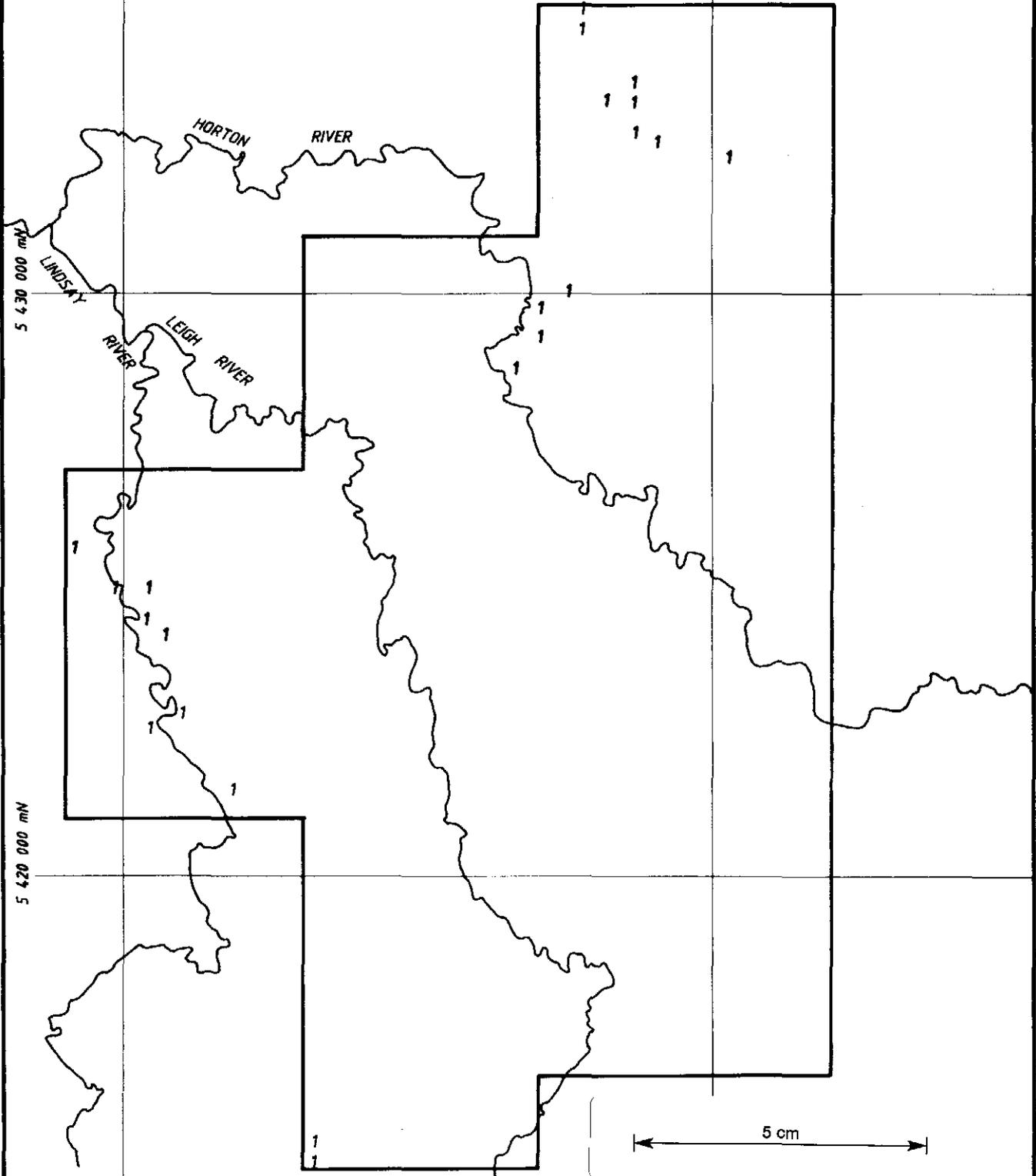
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Scale	1 : 100 000	Drawn: R. T.
Author:	J. W.	Report N°. 11857
Date:	December 1982	Plan N°. TASH 966

058

330 000 mE

340 000 mE

623059



LOWER BOUND	MOLYBDENUM (ppm)	SYMBOL
BELOW	UPPER BOUND	
1	1	-
2	2	1
4	4	2
7	7	3
10	10	4
36	36	5
ABOVE	126	6
	126	*

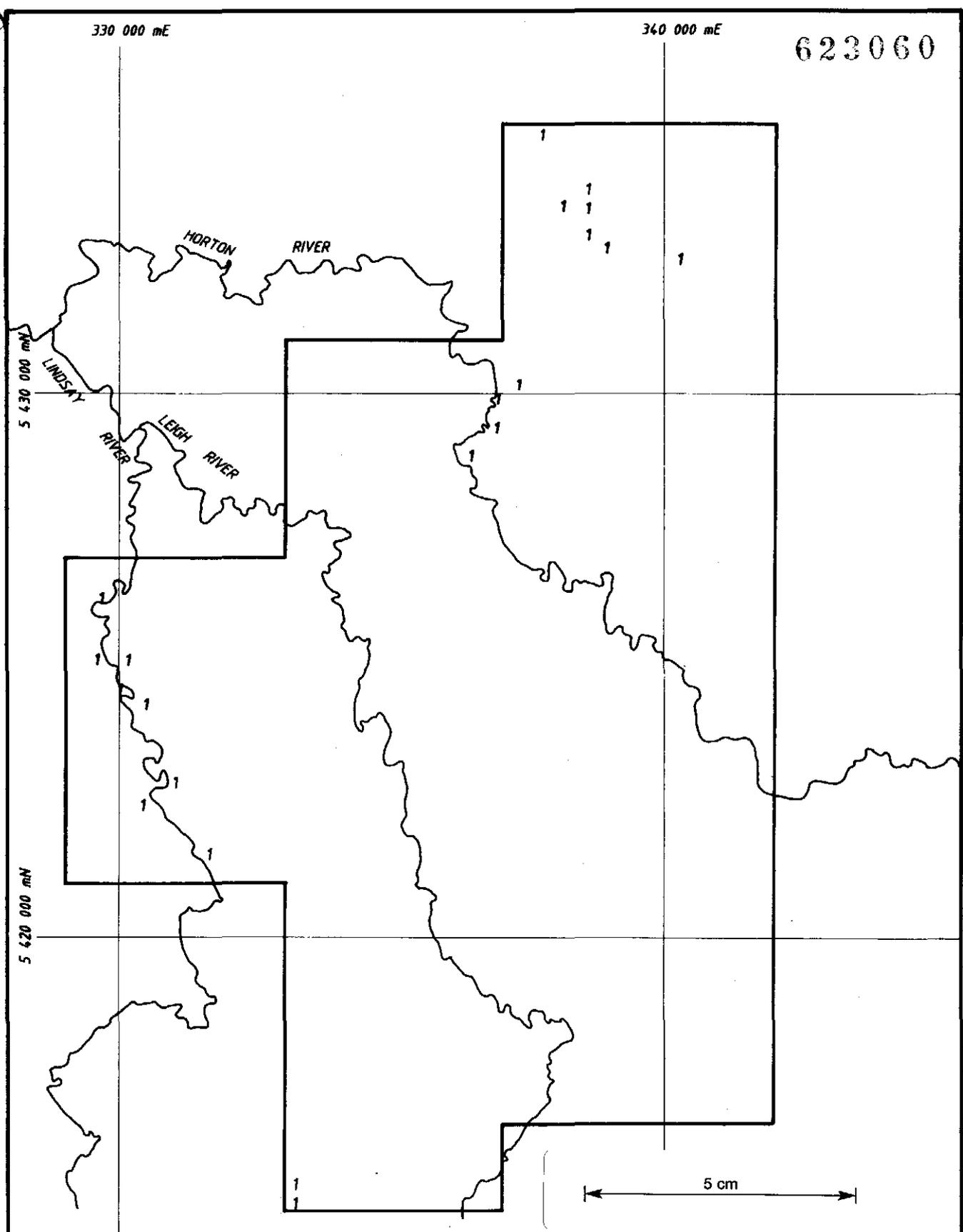
VALUES THAT FALL ON A CLASS BOUND ARE ASSIGNED TO THE LOWER CLASS.

CRA EXPLORATION PTY. LIMITED

LEIGH RIVER E.L. 12/80
 COMPUTER STUDY
 STREAM GEOCHEMISTRY
 MOLYBDENUM

Ref	SK55 - 3	
Scale	1 : 100 000	Drawn: R. T.
Author:	J. W.	Report N°. 11857
Date:	December 1982	Plan N°. TASH 969

059



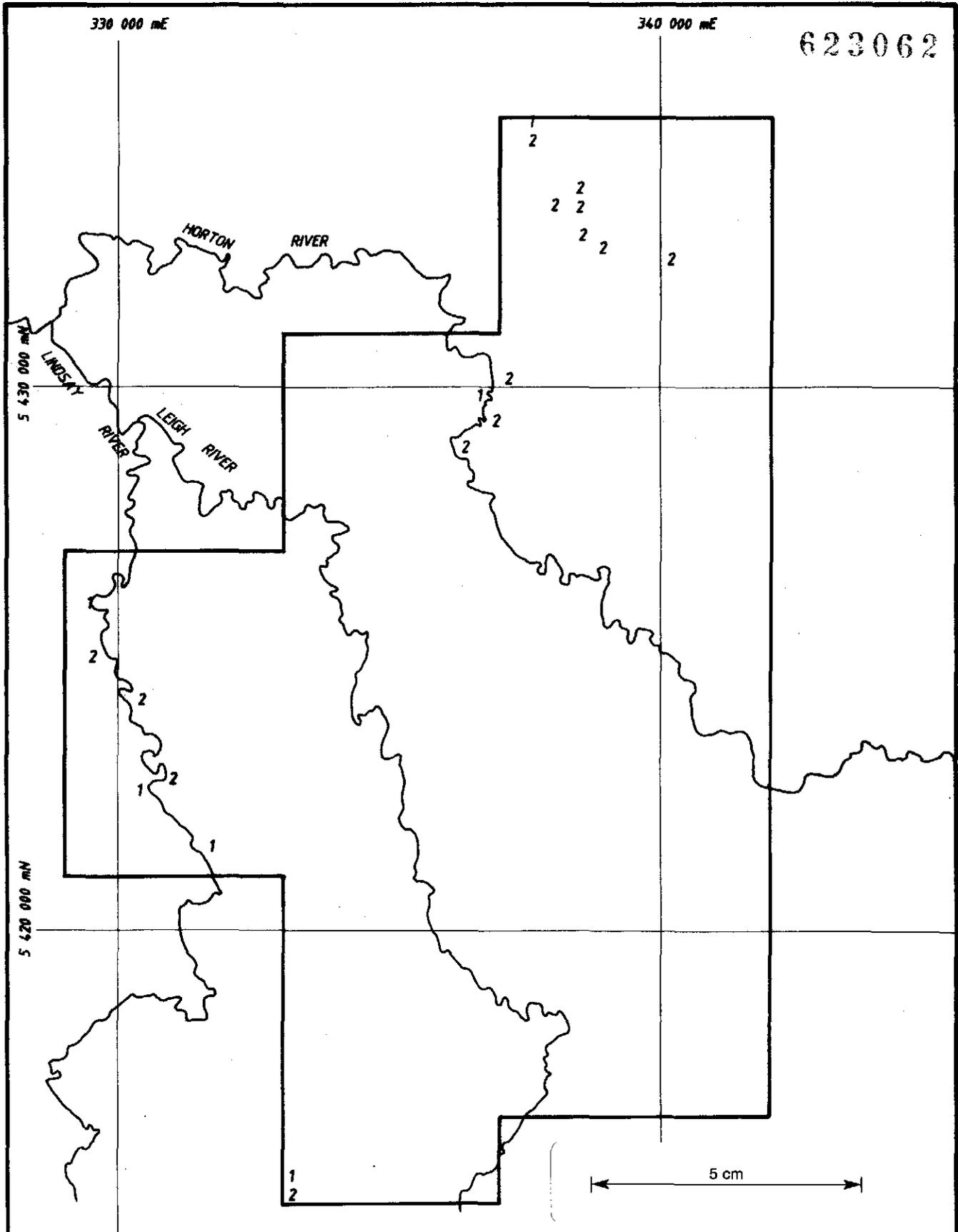
COLD EXTRACTABLE COPPER (ppm)

LOWER BOUND	UPPER BOUND	SYMBOL
BELOW	0.1	-
0.1	1	1
1	3	2
3	6	3
6	16	4
16	316	5
ABOVE	316	+

VALUES THAT FALL ON A CLASS BOUND ARE ASSIGNED TO THE LOWER CLASS.

CRA EXPLORATION PTY. LIMITED	
LEIGH RIVER E.L. 12/80 COMPUTER STUDY STREAM GEOCHEMISTRY COLD EXTRACTABLE COPPER	
Ref	SK55 - 3
Scale	1 : 100 000
Author:	J. W.
Date:	December 1982
Drawn:	R. T.
Report N°.	11857
Plan N°.	TASH 975

061



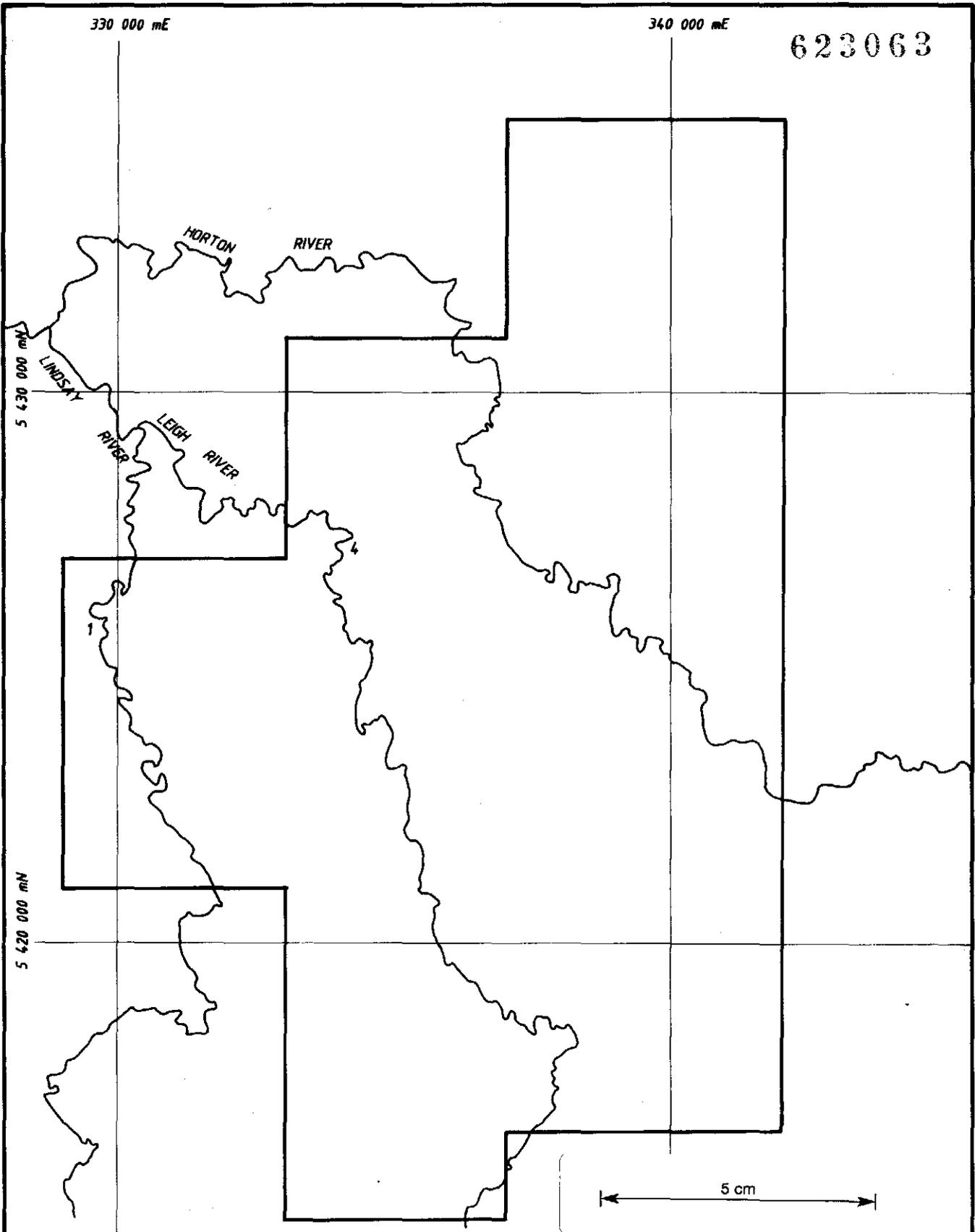
623062

FREE COPPER (ratio)		SYMBOL
LOWER BOUND	UPPER BOUND	
BELOW	0.0	-
0.0	1.4	1
1.4	1.7	2
1.7	2.1	3
2.1	17.0	4
ABOVE	17.0	*

VALUES THAT FALL ON A CLASS BOUND ARE ASSIGNED TO THE LOWER CLASS.

CRA EXPLORATION PTY. LIMITED		
LEIGH RIVER E.L. 12/80		
COMPUTER STUDY		
STREAM GEOCHEMISTRY		
FREE COPPER		
Ref	SK55 - 3	
Scale	1 : 100 000	Drawn: R. T.
Author:	J. W.	Report N°. 11057
Date:	December 1982	Plan N°. TASH 976

062



623063

LOWER BOUND	TIN (ppm) UPPER BOUND	SYMBOL
BELOW	0.1	-
0.1	5	1
5	16	2
16	53	3
53	200	4
200	501	5
501	31623	6
ABOVE	31623	*

VALUES THAT FALL ON A CLASS BOUND ARE ASSIGNED TO THE LOWER CLASS.

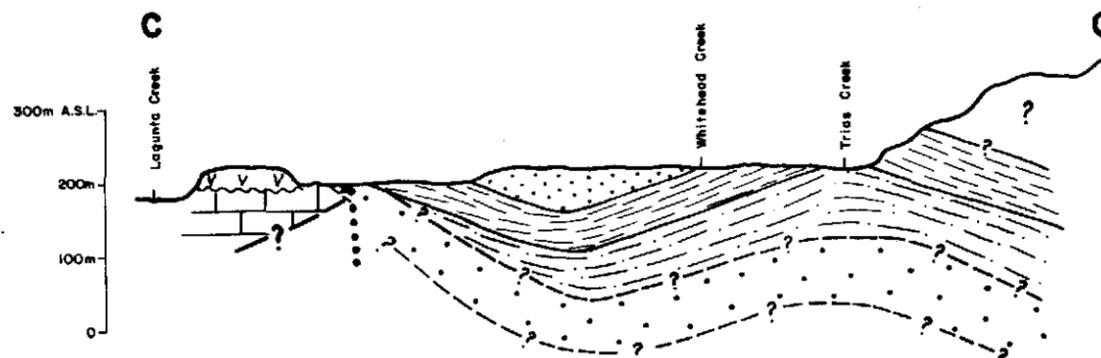
CRA EXPLORATION PTY. LIMITED		
LEIGH RIVER E.L. 12/80 COMPUTER STUDY STREAM GEOCHEMISTRY TIN		
Ref	SKSS - 3	
Scale	1 : 100 000	Drawn: R. T.
Author:	J. W.	Report N°. 11857
Date:	December 1982	Plan N°. TASH 967

063

623064

330 000 mE

340 000 mE

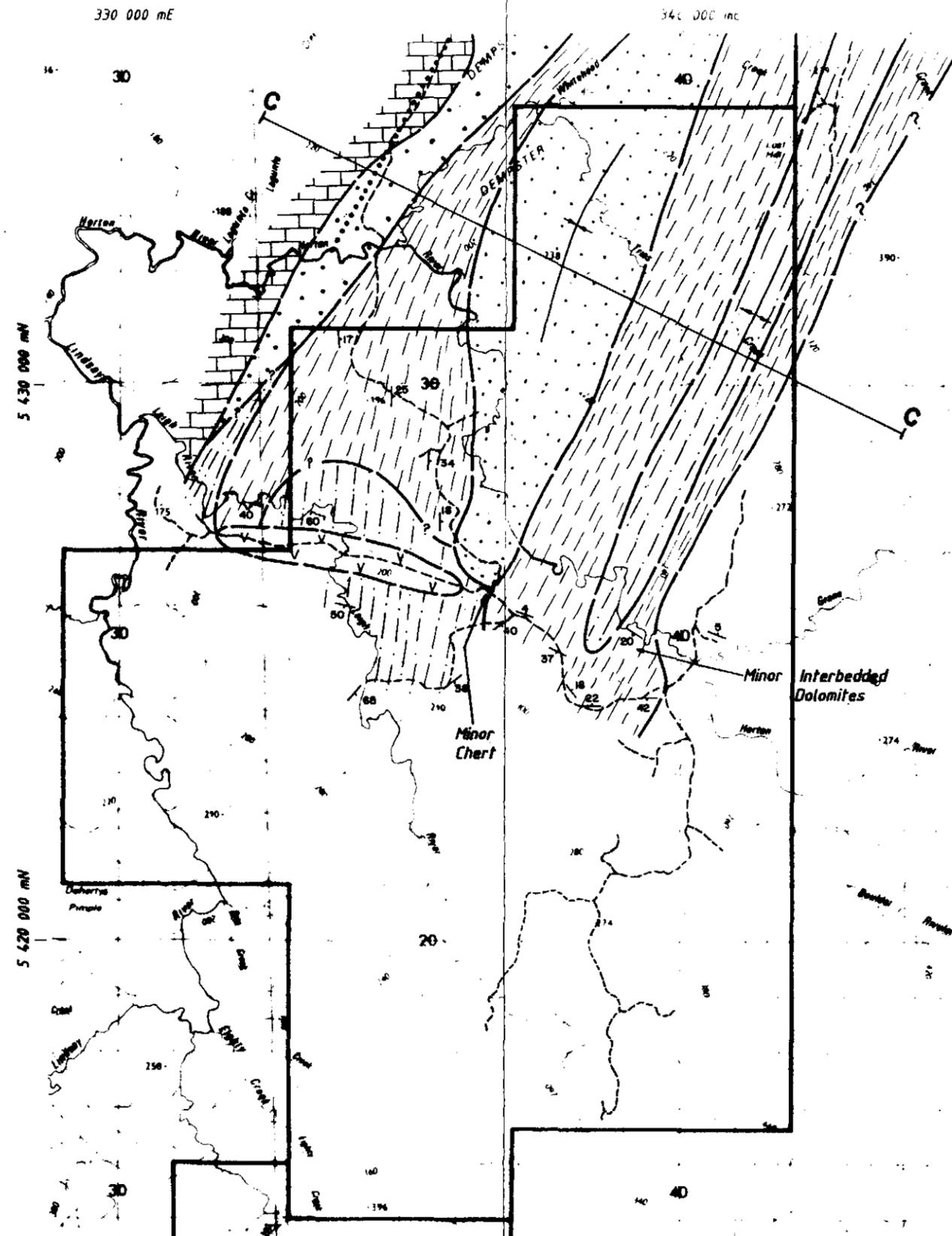
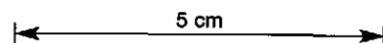


S.E. DOMAIN

-  CAMBRIAN VOLCANICS
-  DOLOMITE/CHERT
-  Quartzite - dirty.
-  Black Pyritic Shales. Euhedral pyrite along bedding. Development of Concretionary nodules ± pyrite.
-  Green chloritic banded siltstone.
-  Quartzite.

SYMBOLS

-  Fault.
-  Fault Inferred.
-  Major photo lineament.
-  Anticlinal Axis.
-  Synclinal Axis.
-  Dip & strike of bedding.
-  Cleavage trace.



CRA EXPLORATION PTY. LIMITED

LEIGH RIVER E.L. 12/80

GEOLOGY PLAN

Ref	SKSS - 3	
Scale	1 : 100 000	Drawn: R. T.
Author:	J. W.	Report N°. 11857
Date:	December 1982	Plan N°. TASH 985

064

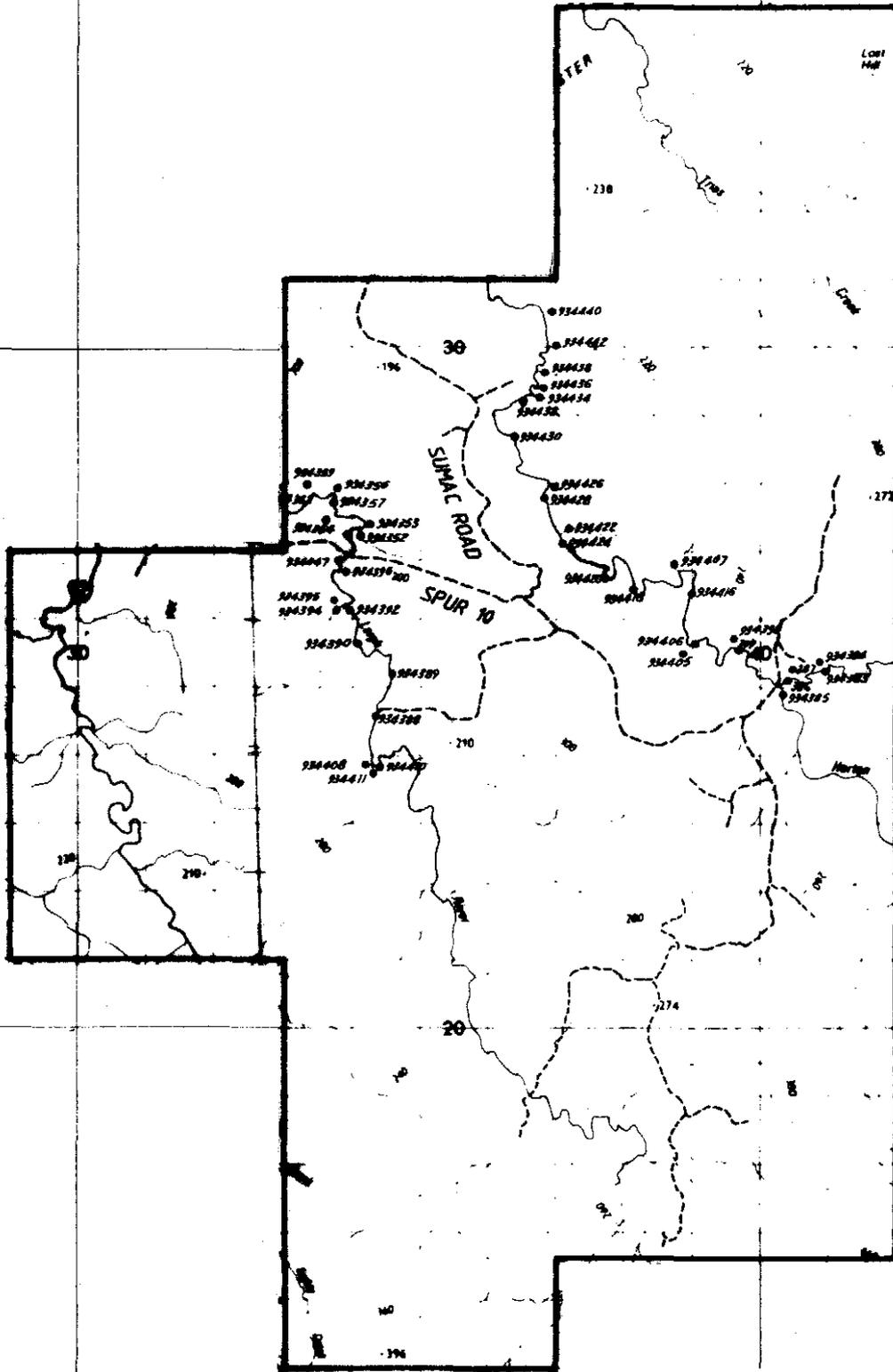
330 000 mE

340 000 mE

623065

5 430 000 mN

5 420 000 mN



CRA EXPLORATION PTY. LIMITED

LEIGH RIVER E.L. 12/80
STREAM SEDIMENT
LOCATION PLAN

Ref SK55 - 3

Scale 1 : 100 000

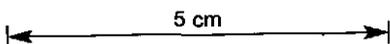
Drawn: R. T.

Author: J. W.

Report N° 11857

Date: December 1982

Plan N°. TASH 977



065

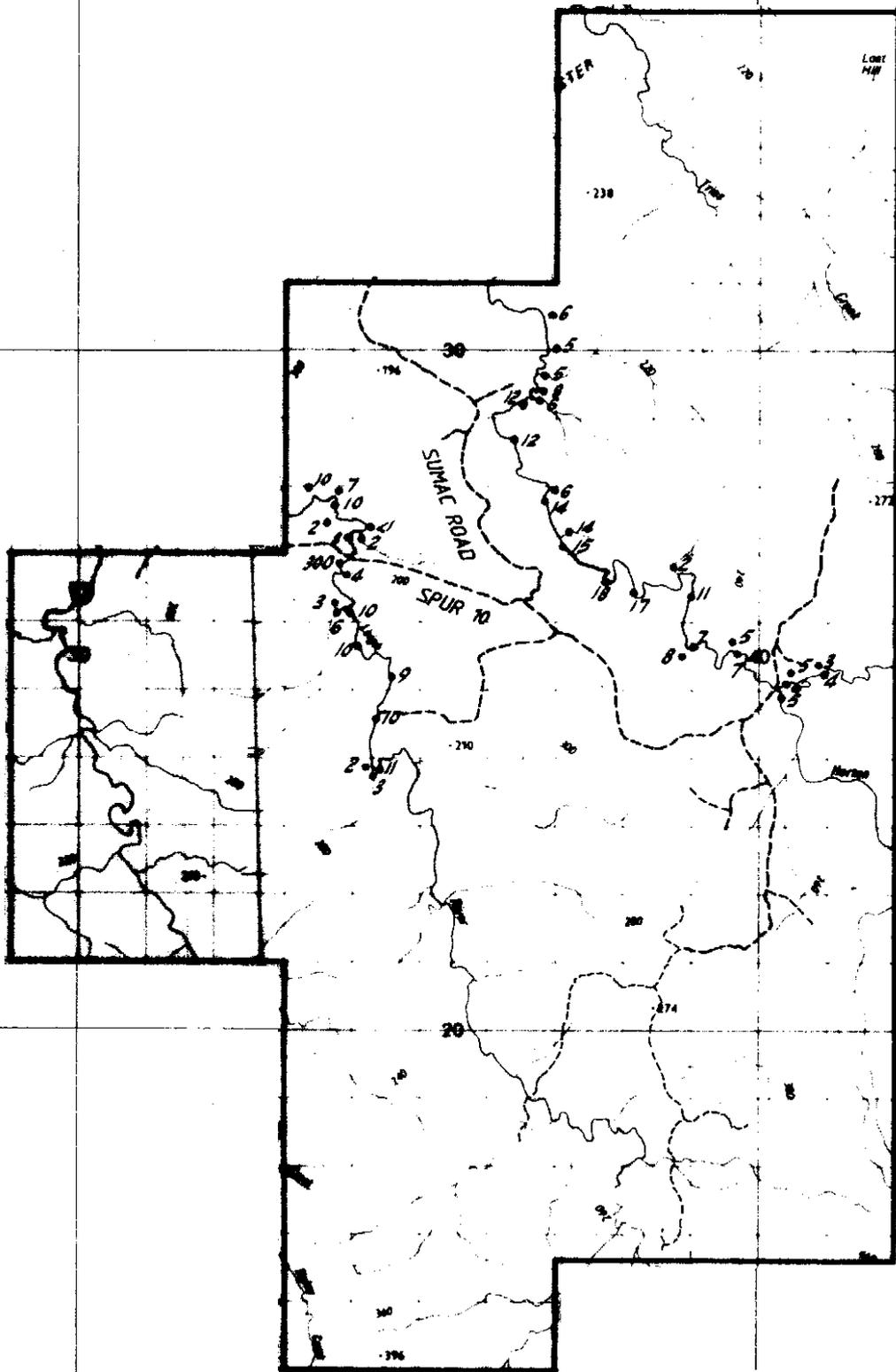
330 000 mE

340 000 mE

623066

5 430 000 mN

5 420 000 mN



CRA EXPLORATION PTY. LIMITED	
LEIGH RIVER E.L. 12/80	
STREAM SEDIMENT SAMPLES	
LEAD	
Ref	SK55 - 3
Scale	1 : 100 000
Author:	J. W.
Date:	December 1982
Drawn:	R. T.
Report N°.	11857
Plan N°.	TASH 978

066

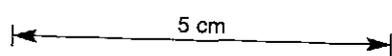
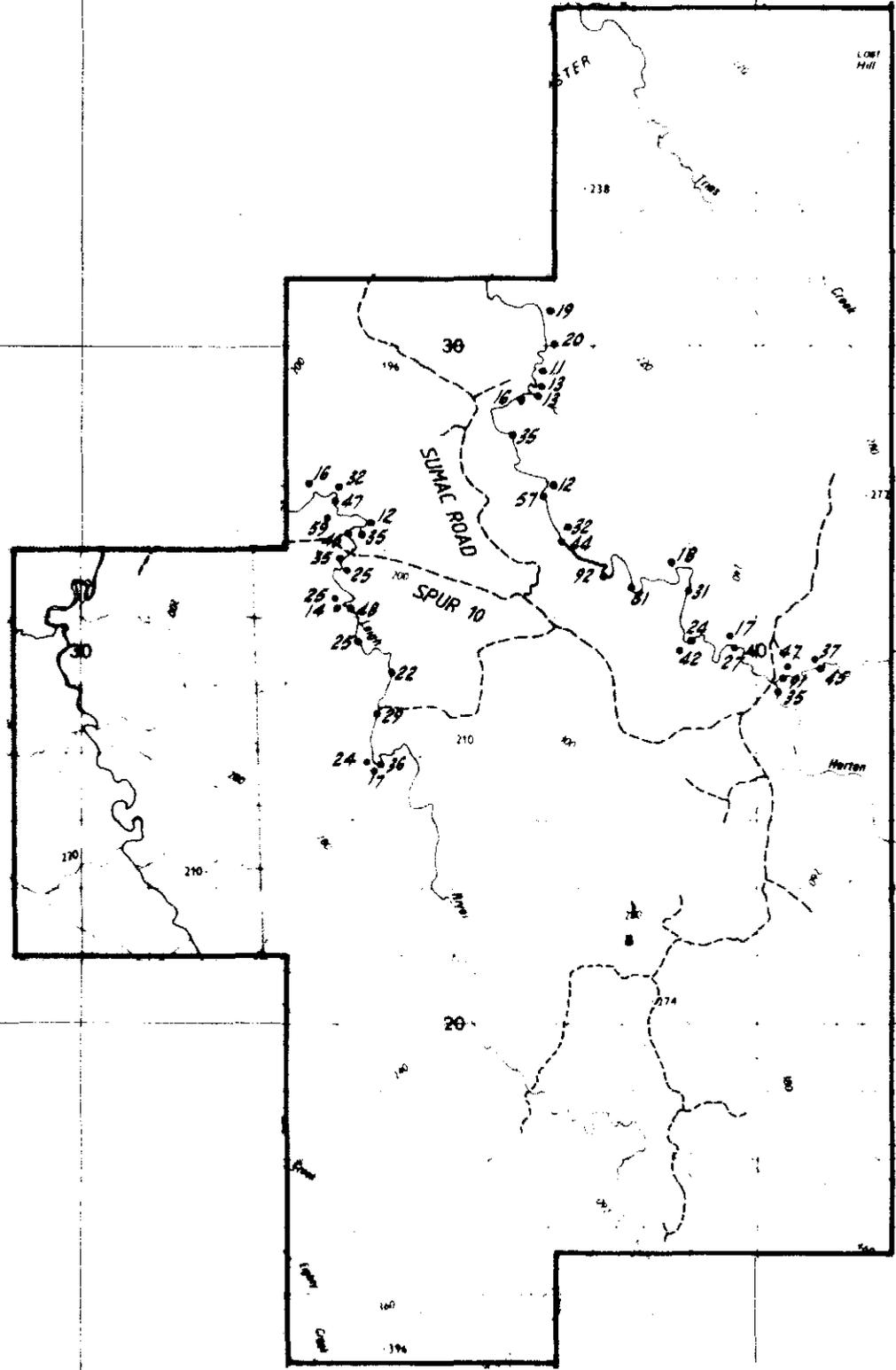
330 000 mE

340 000 mE

623067

5 430 000 mN

5 420 000 mN



CRA EXPLORATION PTY. LIMITED	
LEIGH RIVER E.L. 12/80	
STREAM SEDIMENT SAMPLES	
ZINC	
Ref	SK55 - 3
Scale	1 : 100 000
Author:	J. W.
Date:	December 1982
Drawn:	R. T.
Report N°.	11857
Plan N°.	TASH 979

067

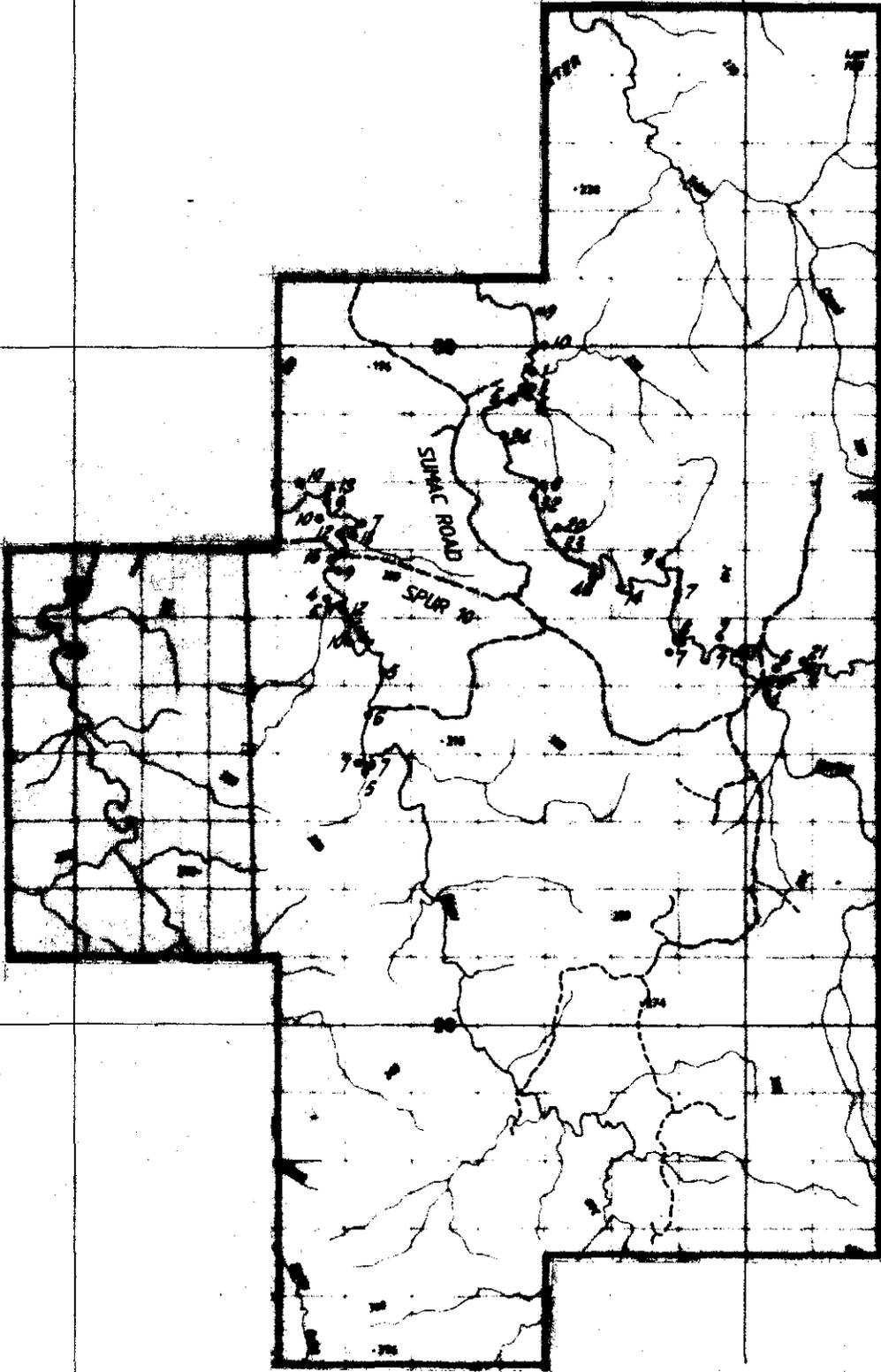
330 000 mE

340 000 mE

623068

5 430 000 mN

5 420 000 mN



CRA EXPLORATION PTY. LIMITED

LEIGH RIVER E.L. 12/80

**STREAM SEDIMENT SAMPLES
COPPER**

Ref SK55 - 3

Scale 1 : 100 000

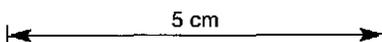
Drawn: R. T.

Author: J. W.

Report N°. 11057

Date: December 1982

Plan N°. TASH 200



068

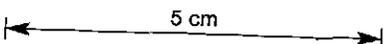
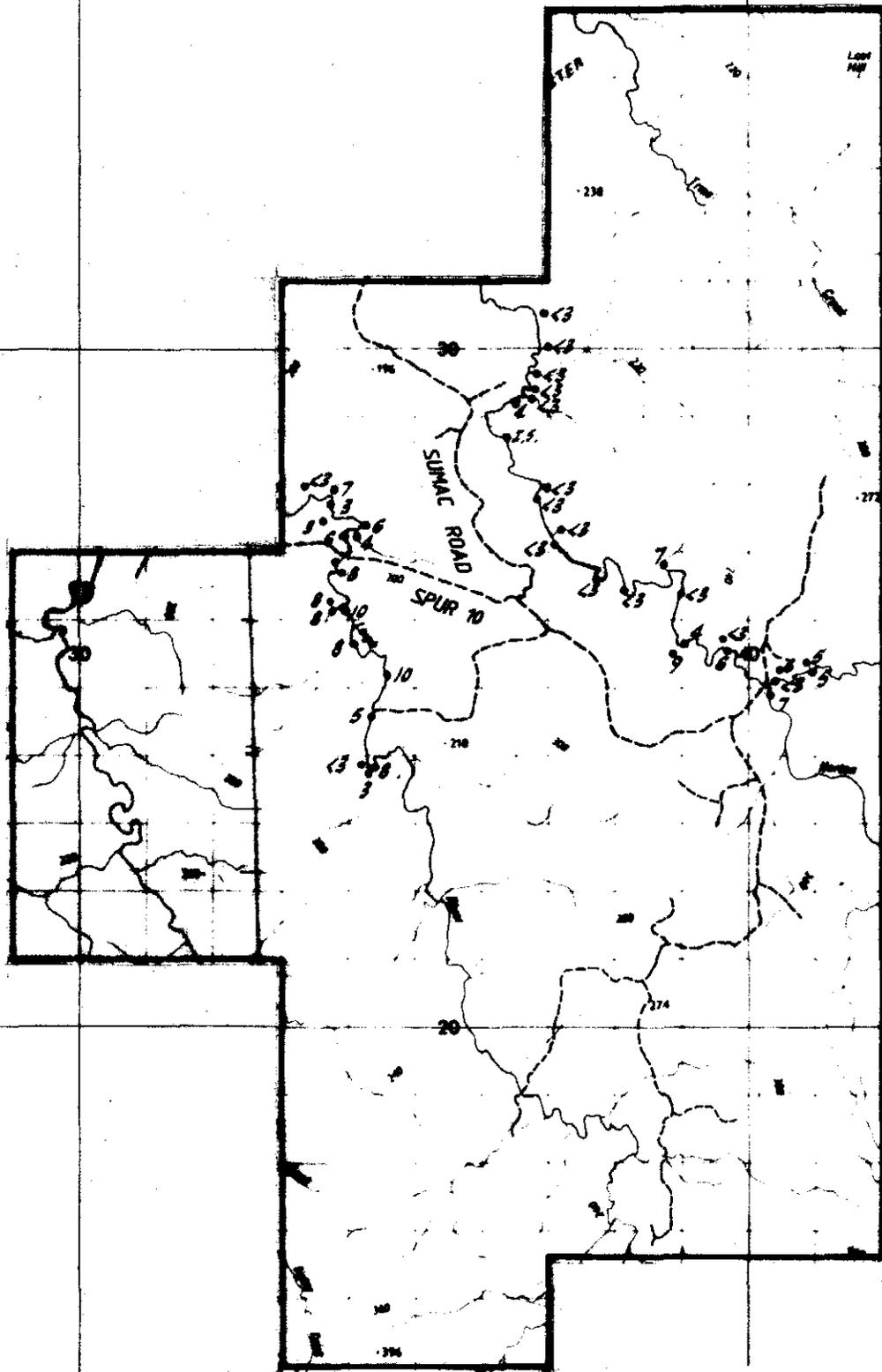
330 000 mE

340 000 mE

623069

N 530 000 mN

N 530 000 mN



CRA EXPLORATION PTY. LIMITED	
LEIGH RIVER E.L. 12/80	
STREAM SEDIMENT SAMPLES	
TIN	
Ref	SK33 - 3
Scale	1 : 100 000
Author	J. W.
Date	December 1982
Drawn	R. J.
Report N°	11857
Plan N°	7420 301

069

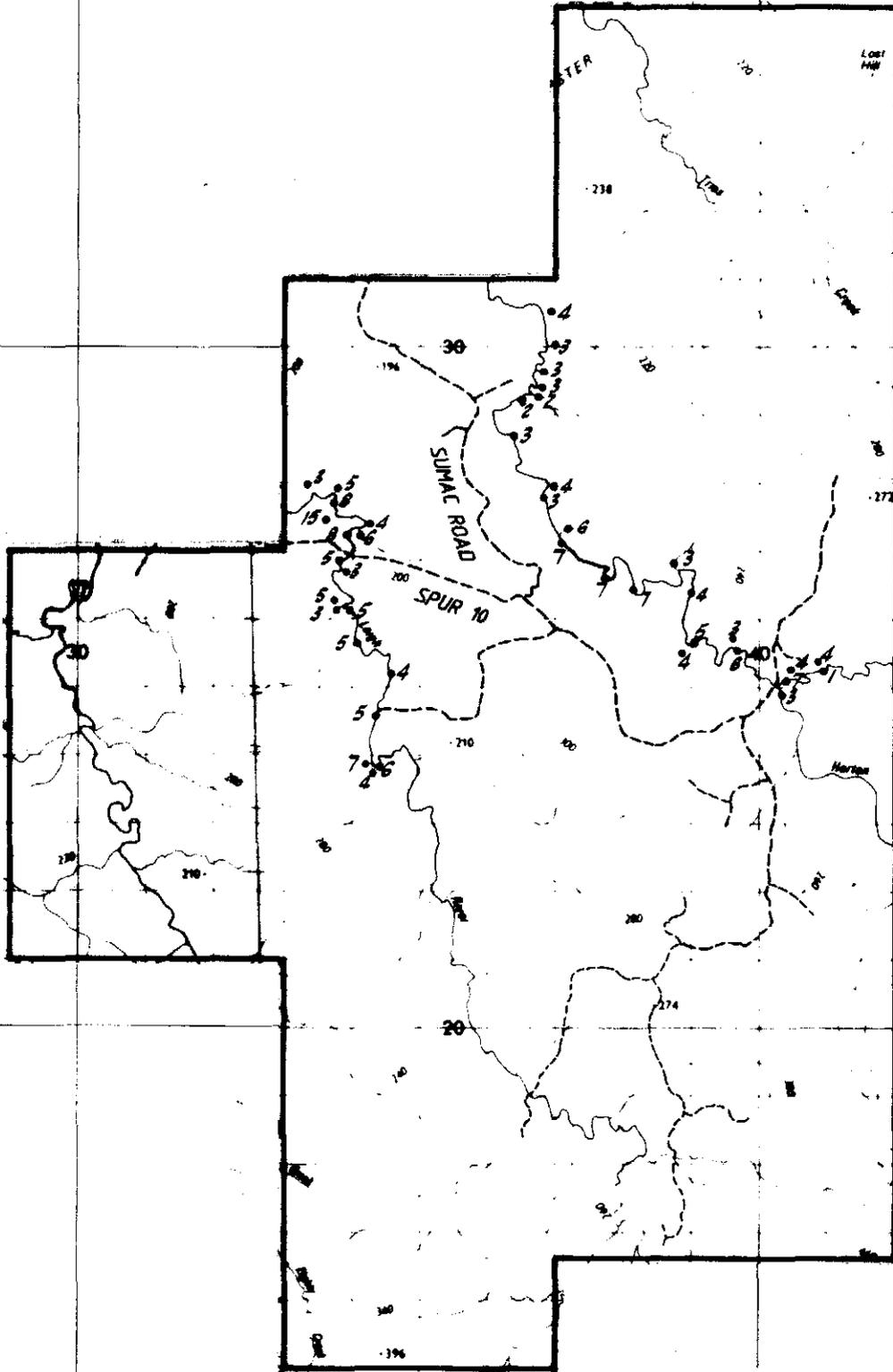
330 000 mE

340 000 mE

623070

5 430 000 mN

5 420 000 mN



CRA EXPLORATION PTY. LIMITED

LEIGH RIVER E.L. 12/80
STREAM SEDIMENT SAMPLES
COBALT

Ref	SK55 - 3	
Scale	1 : 100 000	Drawn: R. T.
Author:	J. W.	Report N°. 11857
Date:	December 1982	Plan N°. TASH 982

070

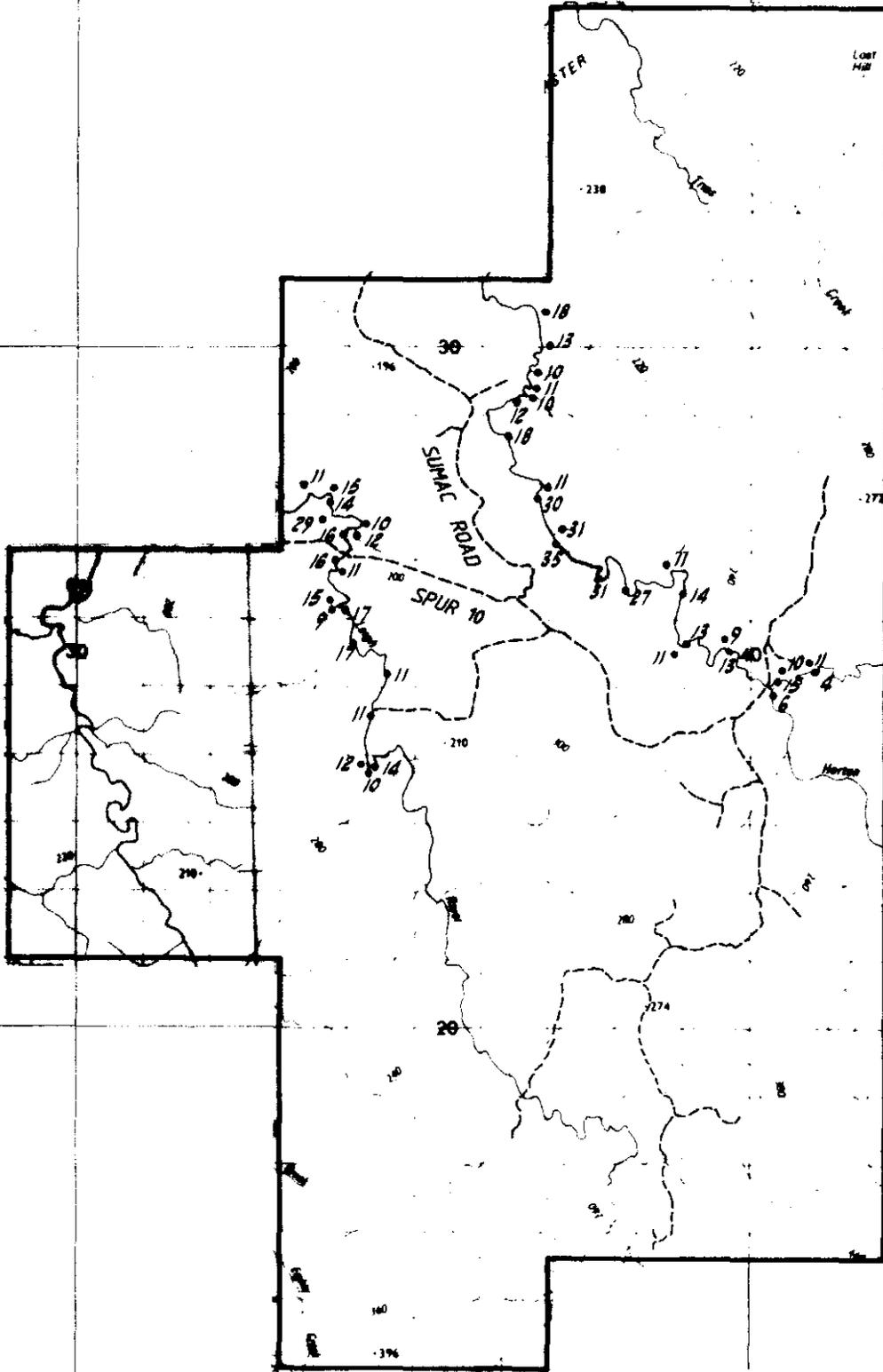
330 000 mE

340 000 mE

623071

5 420 000 mN

5 420 000 mN



CRA EXPLORATION PTY. LIMITED

LEIGH RIVER E.L. 12/80

STREAM SEDIMENT SAMPLES
NICKEL

Ref SK55 - 3

Scale 1 : 100 000

Drawn: R. T.

Author: J. W.

Report N°. 11857

Date: December 1982

Plan N°. TASH 983

071

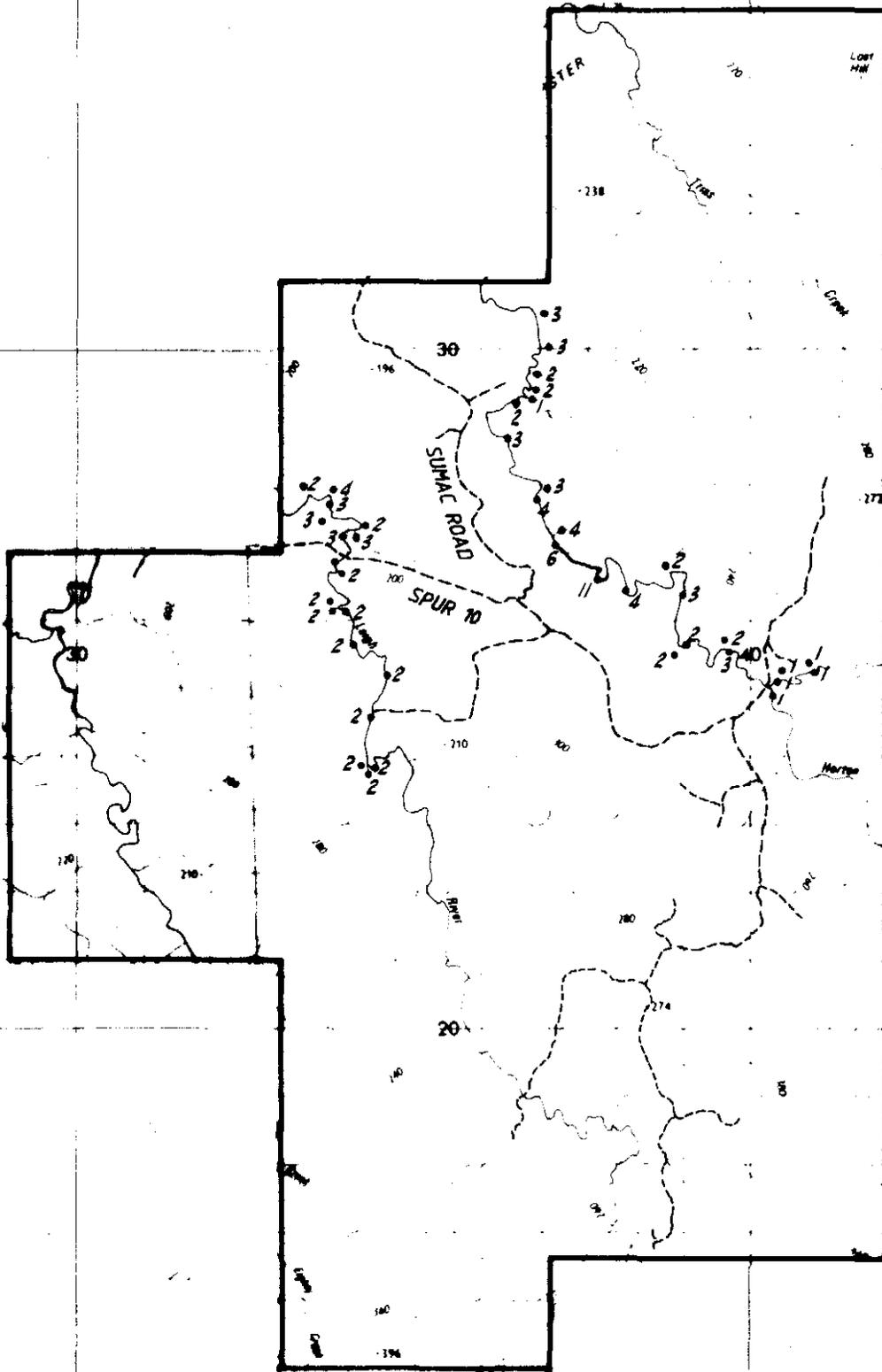
330 000 mE

340 000 mE

623072

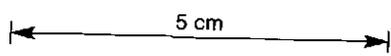
S 430 000 mN

S 420 000 mN



CRA EXPLORATION PTY. LIMITED

LEIGH RIVER E.L. 12/80
STREAM SEDIMENT SAMPLES
ARSENIC



Ref		SK55 - 3	
Scale	1 : 100 000	Drawn:	R. T.
Author:	J. W.	Report N°.	11857
Date:	December 1982	Plan N°.	TASh 984

072

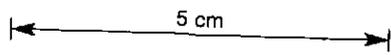
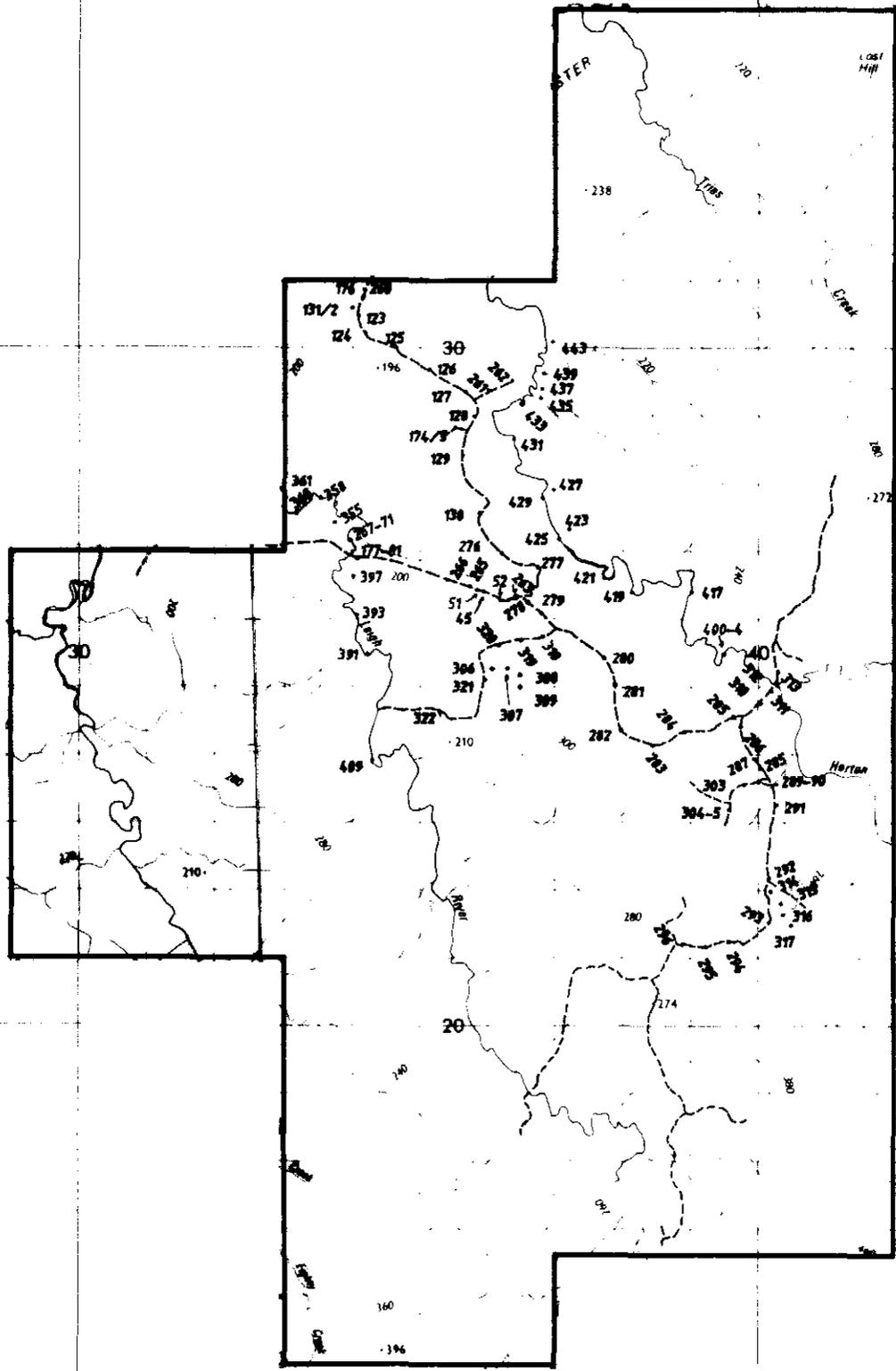
330 000 mE

340 000 mE

623073

S 430 000 mN

S 420 000 mN



CRA EXPLORATION PTY. LIMITED		
LEIGH RIVER E.L. 12/80		
CHIP SAMPLE LOCATIONS		
Ref	SK55 - 3	
Scale	1 : 100 000	Drawn: R. T.
Author:	J. W.	Report N°. 11857
Date:	December 1982	Plan N°. TASH 986

073

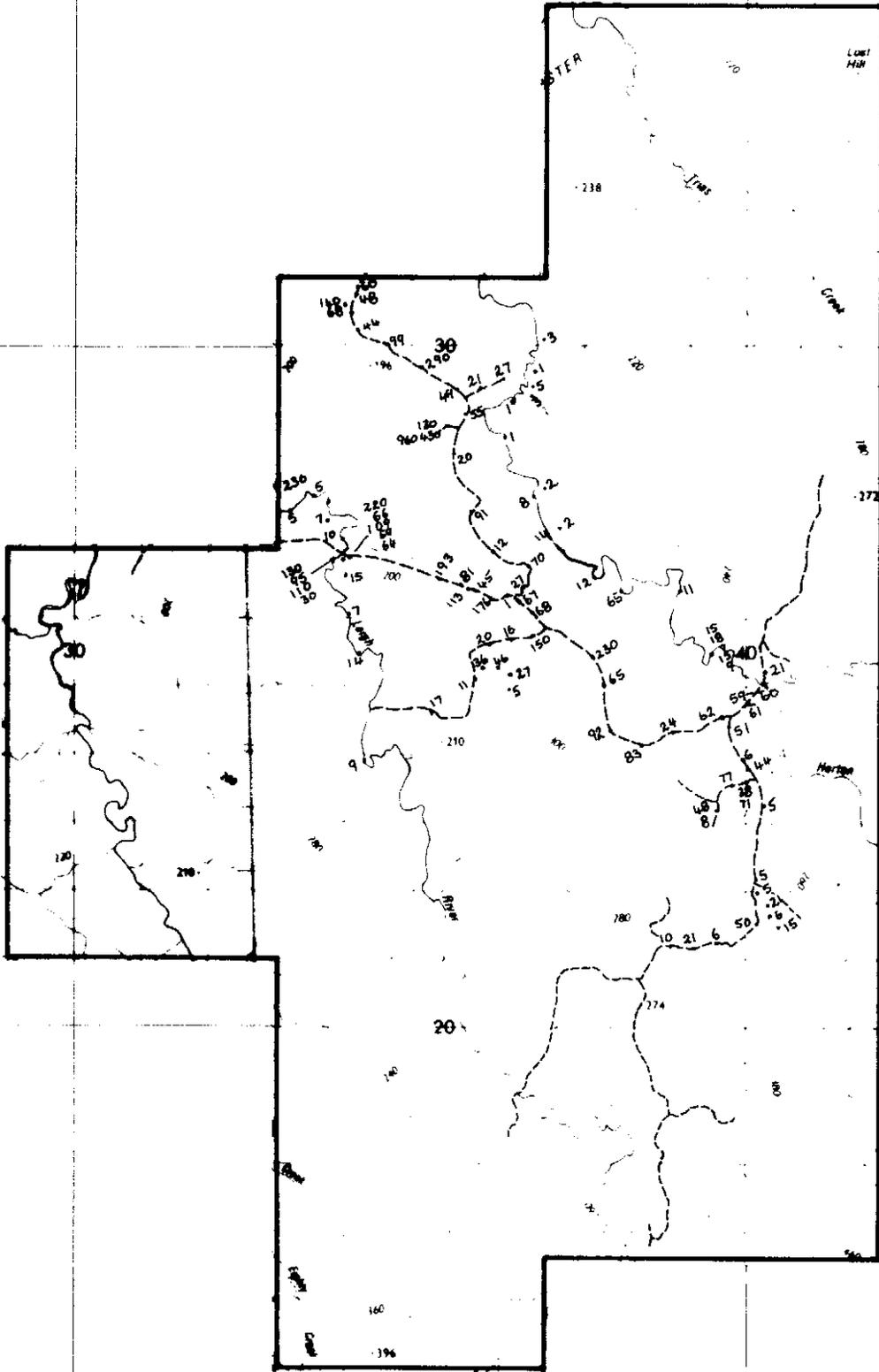
330 000 mE

340 000 mE

623074

5 430 000 mN

5 420 000 mN



5 cm

CRA EXPLORATION PTY. LIMITED	
LEIGH RIVER E.L. 12/80 CHIP SAMPLES COPPER (ppm)	
Ref	SKSS - 3
Scale	1 : 100 000
Author:	J. W.
Date:	December 1982
Drawn:	R. T.
Report N°:	11857
Plan N°:	TASH 987

074

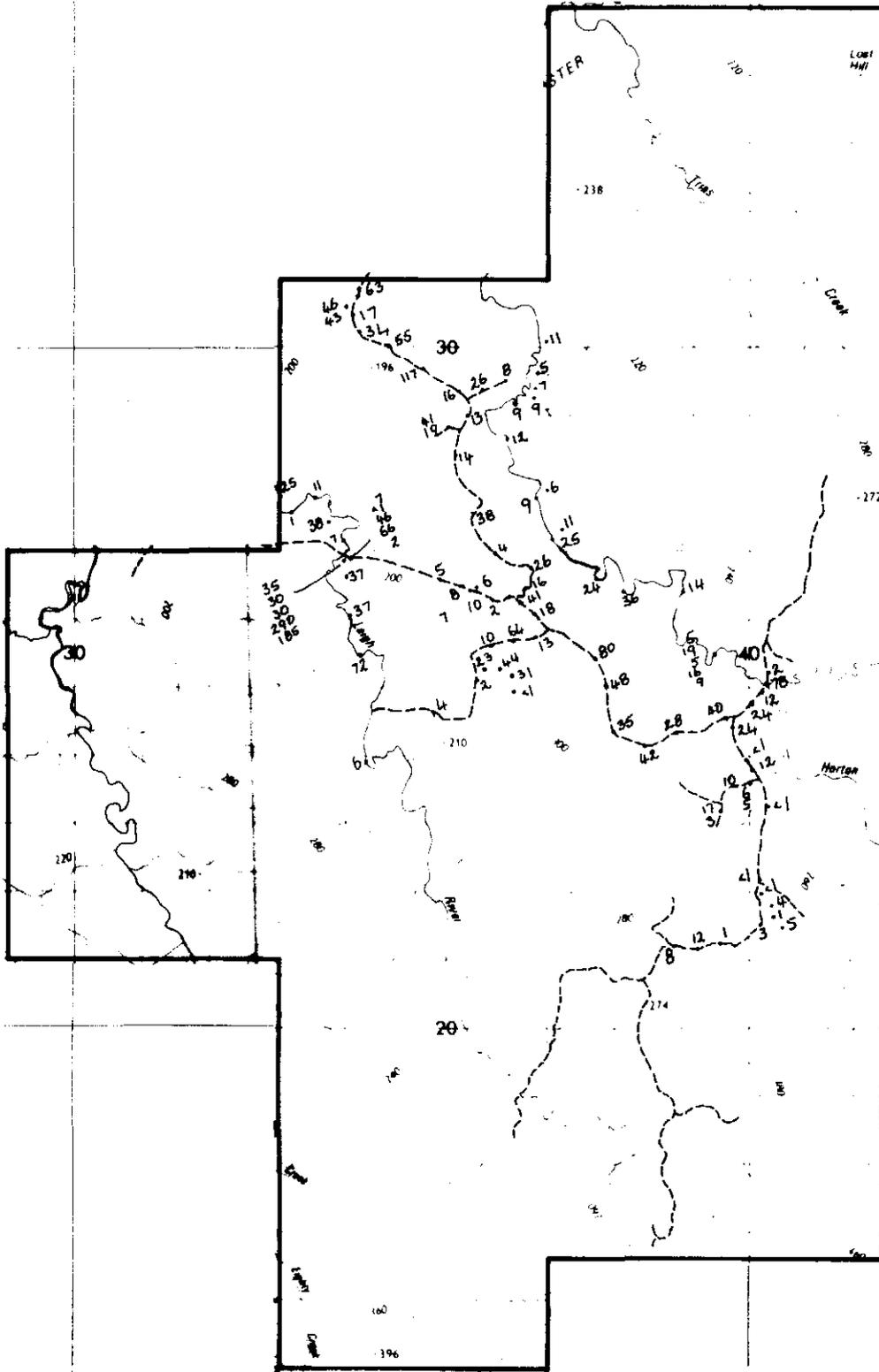
330 000 mE

340 000 mE

623075

5 430 000 mN

5 420 000 mN



5 cm

CRA EXPLORATION PTY. LIMITED	
LEIGH RIVER E.L. 12/80	
CHIP SAMPLES	
LEAD (ppm)	
Ref	SKSS - 3
Scale	1 : 100 000
Author:	J. W.
Date:	December 1982
Drawn:	R. T.
Report N°.	11857
Plan N°.	TASH 988

075

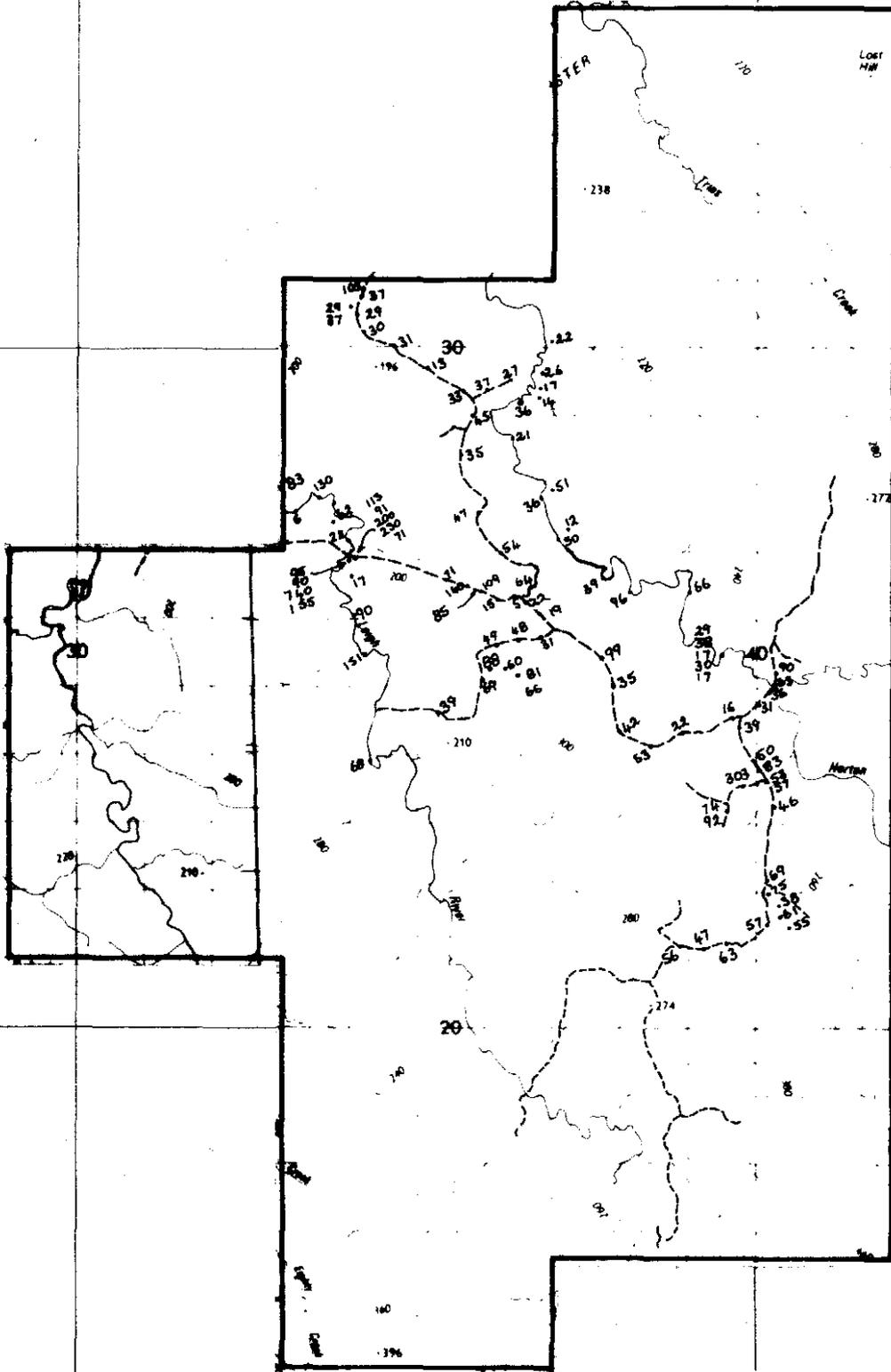
330 000 mE

340 000 mE

623076

NW 000 027 5

NW 000 027 5



CRA EXPLORATION PTY. LIMITED

LEIGH RIVER E.L. 12/80

CHP SAMPLES
ZINC (ppm)

Ref SK55 - 3

Scale 1 : 100 000

Drawn: R. T.

Author: J. W.

Report N°. 11057

Date: December 1982

Plan N°. TASH 989