

Q36 No 19

INDEXED

REPORT AN 1089/74
and
REPORT MP 3560/73

EL 14/73 - Tasmoney

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649002

EL 14/73
TASMINEX.

DKS
Q36/
73-985



amdel

The Australian Mineral Development Laboratories

Flemington Street, Frewville, South Australia 5063
Phone 79 1662, telex AA82520

Please address all correspondence to the Director
In reply quote: AN3/493/0 - 1089/74

NATA CERTIFICATE

13 September 1973

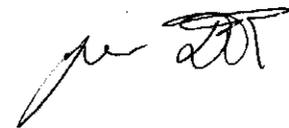
The Exploration Manager
Tasminex N.L.
67 Wilson Street
BURNIE Tas 7320

REPORT AN 1089/74

YOUR REFERENCE:	Sample Despatch dated 10/9/73
IDENTIFICATION:	366
DATE RECEIVED:	12/9/73

Enquiries quoting AN 1089/74 to Officer in Charge please

Officer in Charge, Analytical Section: A.B. Timms


for F.R. Hartley
Director

For location see Dept of Mines
unpublished Report 1973/95.

pkm



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AN 1089/74

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ANALYSIS

picocuries per litre

Sample Mark	Radon Rn	
	(a)	(b)
366	6750	4050

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NOTE ON RADON DETERMINATION

Two values calculated as Radon are given for each sample.

- (a) Assuming all radon is present as a dissolved gas and that no radium is present in the solution. Data have been calculated back to time of sampling using the half life of Radon.
- (b) Assuming all radon is derived from Radium present in the solution, i.e. data have been calculated to time of determination.

We would point out that a determination of Radium can be made after the solutions have been allowed to "breed" for some 15 days and the results used to establish which [(a) or (b)] is correct or if in fact, part of the Rn is derived from Ra in solution and part from a more remote source.



amdel
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 In reply quote: **MP 3/493/0**

Lake Lea

12 March 1973

Tasminex N.L.
6 Wilson Street,
BURNIE Tas 7320

REPORT MP 3560/73

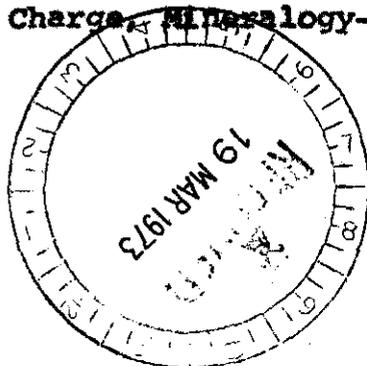
YOUR REFERENCE:	Sample despatch sheet dated 15 February 1973.
MATERIAL:	One hand specimen.
LOCALITY:	Not specified. Ex Burnie, Tasmania office.
IDENTIFICATION:	RL1 251.
DATE RECEIVED:	16 February 1973.
WORK REQUIRED:	Petrographic description, uranium and thorium analyses, and identification of radioactive minerals present.

Investigation and Report by: R.S. Cooper.

Electron probe microanalysis by: P.K. Schultz.

Chemical Analyses (by: X.R.F.) G. Holden.

Officer in Charge, Mineralogy-Petrology Section: Dr K.J. Henley.



K. J. Henley

for F. R. Hartley
 Director

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649006

PETROGRAPHIC DESCRIPTION AND IDENTIFICATION OF RADIOACTIVE
MINERALS IN ONE HAND SPECIMEN

1. INTRODUCTION

The hand specimen RL1 251 was originally submitted by Tasminex N.L. for identification of the radioactive minerals present. The results of this investigation were telephoned to Mr Bolzand at Tasminex's Burnie office. Subsequent to this a telephone call was received from a Mr Johnson saying that the results were not in keeping with earlier work on a specimen of mica schist from the same locality which contained pitchblende in a vein. It was therefore decided to assay the sample for uranium and thorium and also to prepare a thin section in order to describe the sample petrographically.

*approx
4 miles
south:
D. Grace
Berby's*

2. PETROGRAPHIC DESCRIPTION

Specimen RL1 251, PS 20607, TS 30275:

Location:

Not specified, ex Burnie, Tasmania office.

Rock Name:

Silicified rock - replacement of limestone.

Hand Specimen Description:

This hand specimen is hard, generally fine grained and red-brown coloured. Some quartz grains up to 3 mm across are present as well as voids, partially infilled with limonite-goethite which appear to have formed after pyrite. These voids are up to 2 mm across. There are numerous fine fractures running through the rock.

Thin and Polished Section Description:

A visual estimate of the constituents gave the following:

	<u>Vol %</u>
Quartz	>95
Mica	Trace-1
Goethite/limonite/rutile	1-2
Accessories	Trace

The rock consists principally of quartz with trace amounts of opaques, muscovite and accessory minerals.

The quartz ranges in size from chalcedonic material to grains up to 3 mm across. Most of the large grains show strong undulose extinction and are fractured. Variations in the average grain size of the quartz can be related to the fractures visible in the hand specimen. Irregular cracks known as stylolites, and developed by solution of the rock material under pressure, separate the dominantly chalcedonic silica from the dominantly coarser silica.

The limonite-filled voids are, as described in the hand specimen description, probably derived from the oxidation of pyrite grains. The largest are about 2 mm across. There is also a certain amount of dispersed goethite/limonite and ?rutile in parts of the rock which appear to be more heavily sheared.

Trace amounts of muscovite/sericite are present in flakes up to 0.05 mm long.

A few grains of ?monazite, the largest about 0.5 mm across, are present, one of which had rounded outlines suggestive of a detrital origin.

The origins of this rock are uncertain but the appearance of the quartz and the stylolites indicate that the rock has been formed by the replacement of rock such as a limestone by silica.

3. CHEMICAL ANALYSES

The uranium and thorium contents of the sample were determined by X-ray fluorescence techniques. Approximately half the initial sample was submitted for analysis. The results are as follows:

U	Th
250 ppm	9500 ppm
0.025 %	0.95 %

4. IDENTIFICATION OF THE RADIOACTIVE MINERALS PRESENT

The sample was sawn into a number of slabs and one surface of each slab was ground smooth for autoradiography. The autoradiograph was exposed for three days and this showed the radioactivity was dispersed. There were slight concentrations in the limonite that had partially filled the voids left by the dissolution of pyrite grains and also about the more heavily fractured portions of the rock. However it was clear that there was no uranium or thorium mineral other than monazite present in sufficiently large grains that they could be extracted and X-rayed or identified optically. A briquette (PS 20607) was therefore prepared which contained some of the more radioactive areas of the rock and this was examined with the electron-probe microanalyser. This showed that the dominant radioactive element was thorium and that it was associated with major phosphorus (?in a monazite-type mineral). Also searched for but found to be absent from the thorium-rich areas were silicon, aluminium and zircon whereas there were possibly trace amounts of calcium present and very tentatively some cerium.

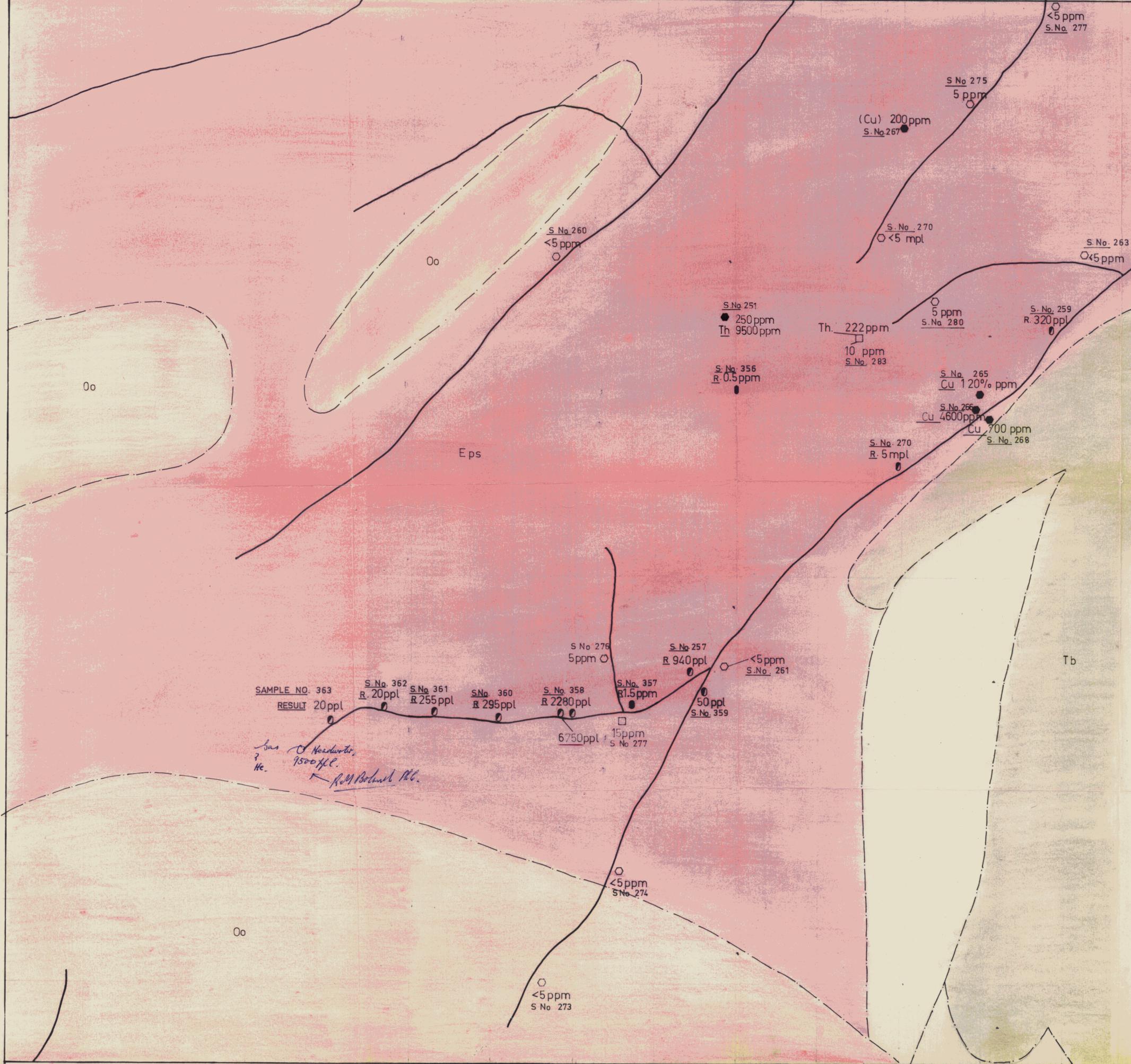
Monazite $Ce, La (PO_4)$ is isostructural with cheralite $Ca, Th (PO_4)$ and substitution can occur between these two end-members. It is likely that this rock contains a thorium-rich member of the above series in a finely divided form.

5. COMMENTS

In a telephone call (22/2/73) Mr Boland asked whether uranium mineralization is normally found associated with that of thorium.

The two elements behave very differently chemically, uranium being very 'mobile' and forming a large number of compounds whereas thorium is chemically fairly 'immobile' and only forms a comparatively few compounds of which the chief one is monazite.

However if primary uranium mineralization occurs there is usually some associated thorium. During exposure of a deposit to weathering the uranium is commonly oxidised and leached downwards or sideways, whereas the thorium remains in the residuum. If uranium is carried down to the water-table and redeposited in this position it can well have a thorium-rich 'capping' above it. The thorium-rich rocks in such cases are indicators or guides to uranium mineralization at depth.



NOTE
 ALL SAMPLES ANALYSED FOR URANIUM UNLESS OTHERWISE SPECIFIED.

KEY
 ENLARGEMENT OF GRID AREA ON L.L. 17/68-04

- Location of Water Sample
- Location of Vegetation Sample
- Location of Rock Sample
- Location of Sediment Sample
- Location of Gossan Sample

■ -TERTIARY Basalt
 ■ -ORDOVICIAN Conglomerate
 ■ -CAMBRIAN Quartz & Feldspar (Igneous)

ppm - Parts Per Million
 ppl - Picocuries Per Litre

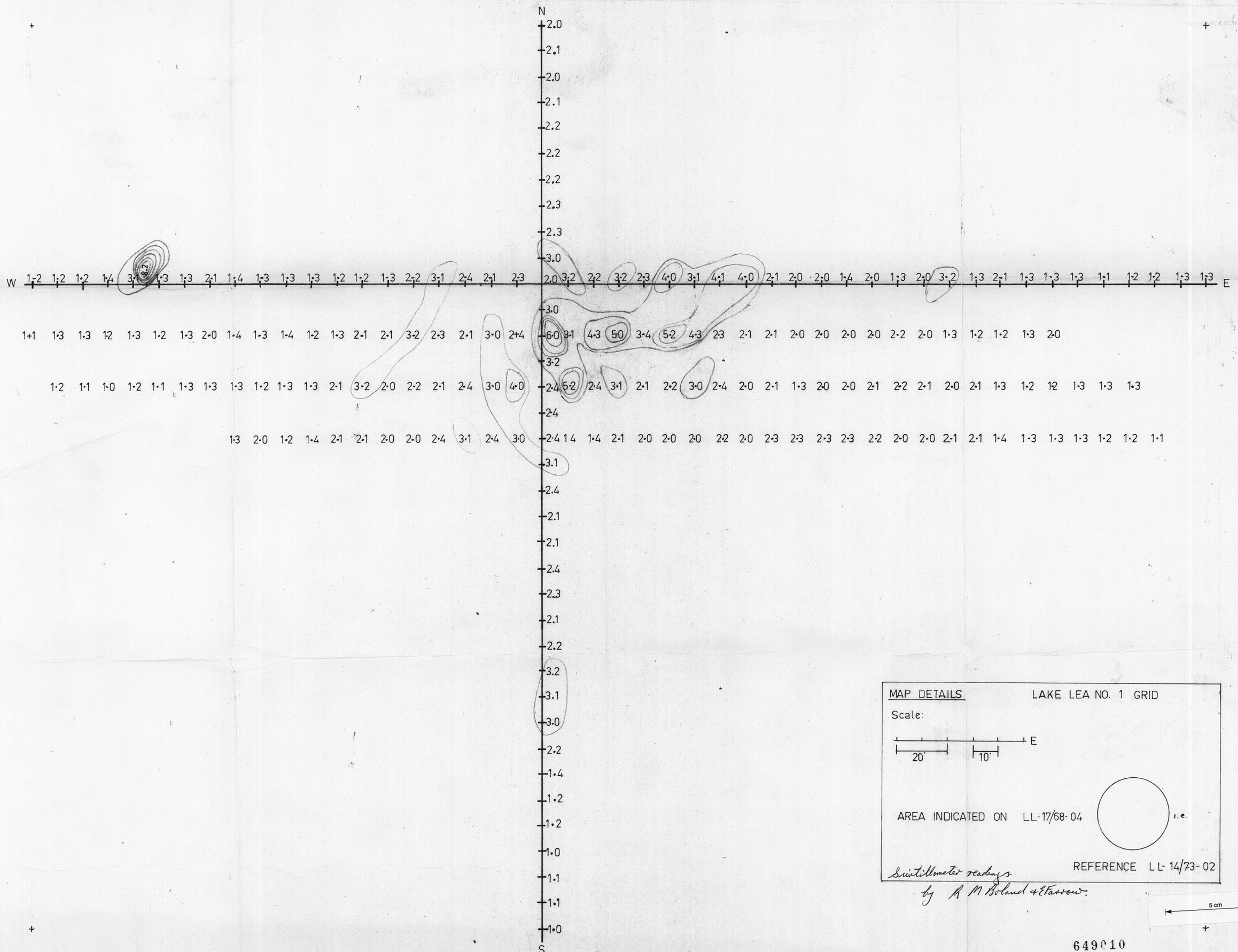
TASMINEX N. L. 73-985

SAMPLE RESULTS
 649009

5 cm

007

DRAWN BY: K. Manson		PREPARED BY: K. Manson	
DATE: 25-9-73	SCALE: 9" = 1/2 mile	REFERENCE NO:	
BASED ON: Ref. No LL-17/68-04		APPROVED BY:	LL-14/73-01



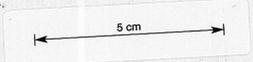
MAP DETAILS LAKE LEA NO. 1 GRID

Scale:

AREA INDICATED ON LL-17/68-04

REFERENCE LL-14/73-02

*Spiritillimeter readings
by R M Boland & Farrow.*



649010

73-985

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KEY

-  QUATERNARY Aluvium & Sand Deposits
-  TERTIARY Basalt
-  ORDOVICIAN Conglomerates
-  CAMBRIAN Quartz & Feldspar

-  Location of water sample
-  Location of vegetation sample

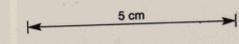
 ANOMOLY

NOTES

GRID AREA - INDEX FOR LL-14/73-01
 CIRCLED AREA - INDEX FOR LL-14/73-02

LEA RIVER MINE - BLACK COAL MINE AREA

649011



TASMINEX N.L. 73-985

LEA RIVER AREA 17/68

LOCATIONS OF WATER SAMPLES
 003

Drawn by:	Date:	Scale:	Reference No.:
K MANSON	7th MAY 1973	3" : 1/4 mile	LL-17/68-04