

72-887.

22nd August, 1972.

Memorandum to: G. W. PATTERSON  
Copies: D. S. Carruthers  
H. J. Evans  
From: T. M. Porter

E.L. 4/72 - Highclere, Northwest Tasmania  
Final Report

SUMMARY

Geochemical drainage sampling within E.L. 4/72 in conjunction with ground scintillometer traversing and geological mapping on a scale of 1:31,680 has outlined a number of marginally anomalous uraniferous areas. These are related to a finer phase in the upper portions of the Devonian Hampshire Hills Granite.

This finer phase is more potassic than the coarser variants and occurs, within the E.L., as two separate narrow north-northeast trending belts with gradational contacts.

The geochemical and radiometric levels are of too low a tenor to represent economic mineralisation. The anomalous values obtained appear to have been magnified by the effect of carbonaceous material resultant from the dense vegetation cover of the area.

INTRODUCTION

E.L. 4/72 embraces approximately 85 square kilometres based on a pegged datum near West Ridgley, some 15 km southwest of Burnie in northwestern Tasmania.

The area was selected on the basis of anomalous uranium drainage levels encountered in the area during a previous broad reconnaissance.

Close spaced geochemical drainage sampling was undertaken over and around the margins of the enclosed portion of the Devonian Hampshire Hills Granite.

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Ground scintillometer traversing ensued in catchments yielding anomalous uranium drainage levels, at a spacing designed to detect any radioactive mineralisation of economic dimensions.

Geological mapping at a scale of 1:31,680 was carried out in conjunction with the geochemical and radiometric programs.

Rock samples were collected from both anomalous and background areas and assayed for comparison.

Bulk drainage samples were scrutinised under ultra violet radiation in an attempt to detect any fluorescent uranium minerals.

All samples were assayed for Pb, Zn, Cu, Ni, Co, Ag, Mo, As and U by The Zinc Corporation Limited at Broken Hill.

WO<sub>3</sub> determinations were made by Daniel C. Griffiths Laboratories in Melbourne. High levels were checked by The Zinc Corporation.

#### GEOLOGICAL SETTING

The Devonian Hampshire Hills Granite, the source of the drainage anomalies, intrudes Upper Proterozoic and possibly Cambrian sediments and is overlain by Tertiary gravels and basalt within E.L. 4/72 (see Plan T.814).

#### Hampshire Hills Granite

This intrusive is of Upper Devonian to Lower Carboniferous age having been emplaced during the Tabberabberan Orogeny. It grades in composition from granite to adamellite, being composed of plagioclase and orthoclase in varying ratios, with accompanying quartz and biotite. The grain size is variable ranging from a fine (crystals from 1 to 2 mm) to a very coarse variety (up to 1 cm). Pseudo porphyritic phases are apparent in some areas. These have phenocrysts of quartz and feldspar, of the same order of dimensions as the coarse variants, in a fine matrix. Small amounts of a quartz-rich tourmaline granite were also encountered.

Within the E.L. the finer phases, with lesser pseudo porphyritic and coarse granite, occur in two separate north-northeast trending zones enclosed by coarse granite. The contact between these phases, although sharp in some areas was found to be gradational in others.

The finer material appears to constitute the remnants of a late phase emplaced in the upper parts of the batholith. This observation is based on the shape of contacts in relation to topography and the nature of the gradational contacts.

002

Fine grained granite to adamellite dykes with associated quartz veining are observable between individual areas of the finer phase along the trend of each belt. A similar development was noted in the coarse granite near its contact with the finer phase.

#### Upper Proterozoic Burnie Beds

These comprise a series of quartzites and slates originally representing a monotonous succession of alternating mudstones and sandstones.

#### Cambrian Sediments

Within the E.L. a small area of siliceous and haematitic siltstone has been interpreted as being of Cambrian age. This exposure lies within an enclosed portion of E.L. 1/69 held by Tasminex and is the host to the old Highclere Iron occurrence.

#### Tertiary Sands and Gravels

These comprise mainly sand, gravel and clays with some lignite bands considered to take the form of deep leads occupying ancient river valleys.

#### Tertiary Basalt

Basaltic flows overlie the sands and gravels and mask much of the geology of the area, in particular the margins of the intrusive body.

### GEOCHEMISTRY

Close spaced drainage sampling, from catchments of less than one square kilometre, was undertaken over the Hampshire Hills Granite. Uranium displayed a background of from 15 to 20 ppm with a number of anomalous levels up to 58 ppm (see Plan T.814).

Most anomalous values of twice to three times background showed a close spatial relationship to the fine grained phase or the areas of coarse grained granite with fine dykes between, and along the trend of, the finer phases.

Ultra violet lamping of stream sediment failed to reveal any fluorescent uranium minerals.

003

A number of rock samples were collected and assayed for uranium and thorium. These were taken as chips of fresh rock from areas of the order of 100 square metres. They were then crushed and split to smaller assay portions. Such sampling was undertaken in areas yielding anomalous drainage and radiometric levels and also from areas of background.

Uranium levels displayed no marked tendency to be higher in rock samples from anomalous areas than those from background regions, although thorium was usually found to be slightly higher in the former.

It was noted, however, that rock samples from zones displaying anomalous levels were richer in potassium feldspar.

All other elements displayed background levels in stream sediments. Several samples yielded anomalous tungsten values but check assaying reduced these to background.

RADIOMETRIC LEVELS

Subsequent to the receipt of assay results from the drainage sampling, ground scintillometer traversing was instituted over catchments yielding anomalous uranium values. This program outlined a number of areas embracing levels of from twice to three times the background of approximately 35 c.p.s. These anomalous levels were found to exhibit the same spatial relationship to the finer phases of the granite as was indicated by the geochemical data.

There is a tendency for radiometric levels in any particular catchment to have the same approximate average ratio to background as the corresponding drainage value (see Plan T.815).

CONCLUSIONS

It appears likely that the finer high level potassic phases and an associated surrounding halo of coarser granite contain slightly elevated uranium and thorium levels which are only marginally above background. Uranium has probably been concentrated in carbonaceous matter both in the drainage system and above the granite as might be expected in such an area of dense vegetation cover.

The lack of significant radiometric values, the failure of rock samples to attain uranium levels of any consequence and the fact that no uranium minerals were detected indicates that no economic radioactive mineralisation occurs within E.L. 4/72.



T. M. Porter

TMP:jm



ENGIN  
CRAE 16

**C.R.A. EXPLORATION PTY. LIMITED**  
GEOCHEMICAL DRAINAGE SAMPLING LEDGER

D.P.O. 13632 (to 209536)  
D.P.O. 13634 (from 209537)

742006

AREA Highclase  
Highclase E.L.

SAMPLE Nos. 209517 - 209539

COLLECTED BY Stuart + R.J.P.

SHEET No. 1

MAP OR PHOTO REFERENCE Highclase E.L. Geol.-Gardem Adrian Sub.

ANALYSED BY Zinc Corp. Broken Hill

DATE 25/1/72-7/3/72

Map or photo No.	No. Sample	Sediment				Channel				pH	Metal content, p.p.m.											Geological observations	
		Gravel	Sand	Silt/mud	Organic	Flow	Width	Alluvial	Cellular		Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As	U		UO <sub>3</sub>
	209517	10	70	20	-	M 1'	✓	✓	-	17	50	6	21	20			41	2	25	34	15		a/c c.g. gr. Float same
	209518	20	55	25	-	M 50'	✓	-	-	35	83	11	47	20			41	42	5	10		No ofc. Float congl. + gr + quartz + basalt. Emu R.	
	209519	25	50	25	-	M 10'	✓	-	-	9	24	3	19	7			41	42	25	28	9	a/c c.g. gr. Float same + basalt + congl. Titlie Gee Ch.	
	209520	10	70	20	-	M 50'	✓	-	-	*16 21	81 80	14 13	57 53	19 18			1	42	25	10	14		a/c c.g. gr. Float same + congl + basalt + apatite + pyritic banded siliceous rock. Emu R.
	209521	5	65	30	-	S 2'	✓	✓	-	8	18	2	10	5			1	42	25	16	10		a/c c.g. gr. Float same
	209522	20	70	10	-	S 2'	✓	✓	-	8	12	4	2	1			41	42	25	30	6		As above
	209523	5	75	20	-	M 8'	✓	✓	-	11	45	6	40	17			41	42	25	22	5		As above. Titlie Gee Ch.
	209524	15	50	10	25	S 1'	✓	✓	-	9	24	2	6	1			41	42	25	22	12		a/c c.g. gr. no float
	209525	10	70	20	-	M 10'	✓	✓	-	21	83	13	79	35			1	2	5	12	10		a/c c.g. gr. Float same + apatite + fopph. apatite. Titlie Gee Ch.
	209526	15	50	5	-	M 75'	✓	✓	-	23	87	14	59	23			1	42	25	8	6		a/c c.g. gr. Float same + congl + fopph. apatite. Emu R. (as for 213446)
	209527	20	70	10	-	M 5'	✓	✓	-	7	7	4	4	4			41	42	25	15	76		a/c c.g. gr. Granitic sand and gravel
	209528	30	65	5	-	M 3'	✓	✓	-	*14 24	23 280	14 25	2 110	3 60			41	42	25	25	20		As above
	209529	20	55	25	-	M 5'	✓	✓	-	*24	280	25	110	60			1	42	25	3	19		a/c c.g. congl. gr. Float same + basalt + quartz.
	209530	30	50	20	-	M 75'	✓	✓	-	26	84	7	35	16			41	42	25	3	15		a/c m.g. + c.g. gr. Float same + basalt + congl. + py. banded siliceous rock. Emu R.
	209531	20	50	30	-	M 5'	✓	✓	-	14	140	30	160	78			1	42	25	5	6		no ofc. Float m.g. gr. + basalt + silt (Parnal)
	209532	10	65	25	-	M 60'	✓	✓	-	19	59	6	30	11			41	42	25	3	5		a/c f.g. → m.g. gr. Float same + basalt + congl. + py. banded siliceous rock. Emu R.
	209533	10	55	35	-	S 6'	✓	✓	-	26	66	6	35	14			41	42	25	10	25		No ofc. Float basalt + quartz + f.g. m.g. gr.
	209534	30	50	20	-	M 6'	✓	✓	-	16	86	15	110	52			1	42	25	7	20		a/c c.g. gr. Float basalt + c.g. gr.
	209535	15	65	20	-	M 6'	✓	✓	-	*14 14	42 42	8 8	58 58	8 8			41	42	25	15	8		No ofc. Float basalt + m.g. gr. Paton Ch.
	209536	10	10	20	-	M 10'	✓	✓	-	23	89	19	130	41			1	2	25	7	10		a/c basalt. Float same + m.g. gr. Titlie Gee Ch.
	209537	10	65	25	-	M 50'	✓	✓	-	14	69	7	37	14			41	42	5	3	9		a/c c.g. gr. Float same + basalt + congl + apatite + py. banded siliceous rock. Emu R.
	209538	10	70	20	-	S 2'	✓	✓	-	11	21	1	4	4			41	42	5	32	10		No ofc. Float. Granitic sand and gravel
	209539	15	75	10	-	M 10'	✓	✓	-	9	52	4	34	17			41	2	5	20	10		a/c gr. Paton Ch.

742007

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ENSGN  
CRAE 16.

**C.R.A. EXPLORATION PTY. LIMITED**  
**GEOCHEMICAL DRAINAGE SAMPLING LEDGER**

Z.C. D.P.O. 13634  
O.C.G. D.P.O. 13635  
Z.C. D.P.O. 13639 (from 212817)

AREA Highclere  
Highclere  
MAP OR PHOTO REFERENCE Highclere  
Highclere EL. Geological - Gochan As chain sheet

SAMPLE Nos. 209540 - 209550  
212801 - 212819

COLLECTED BY Stap P. R. P.  
ANALYSED BY Zinc Corp Broken Hill

SHEET No. 2  
DATE 7/3/72 - 2/6/72

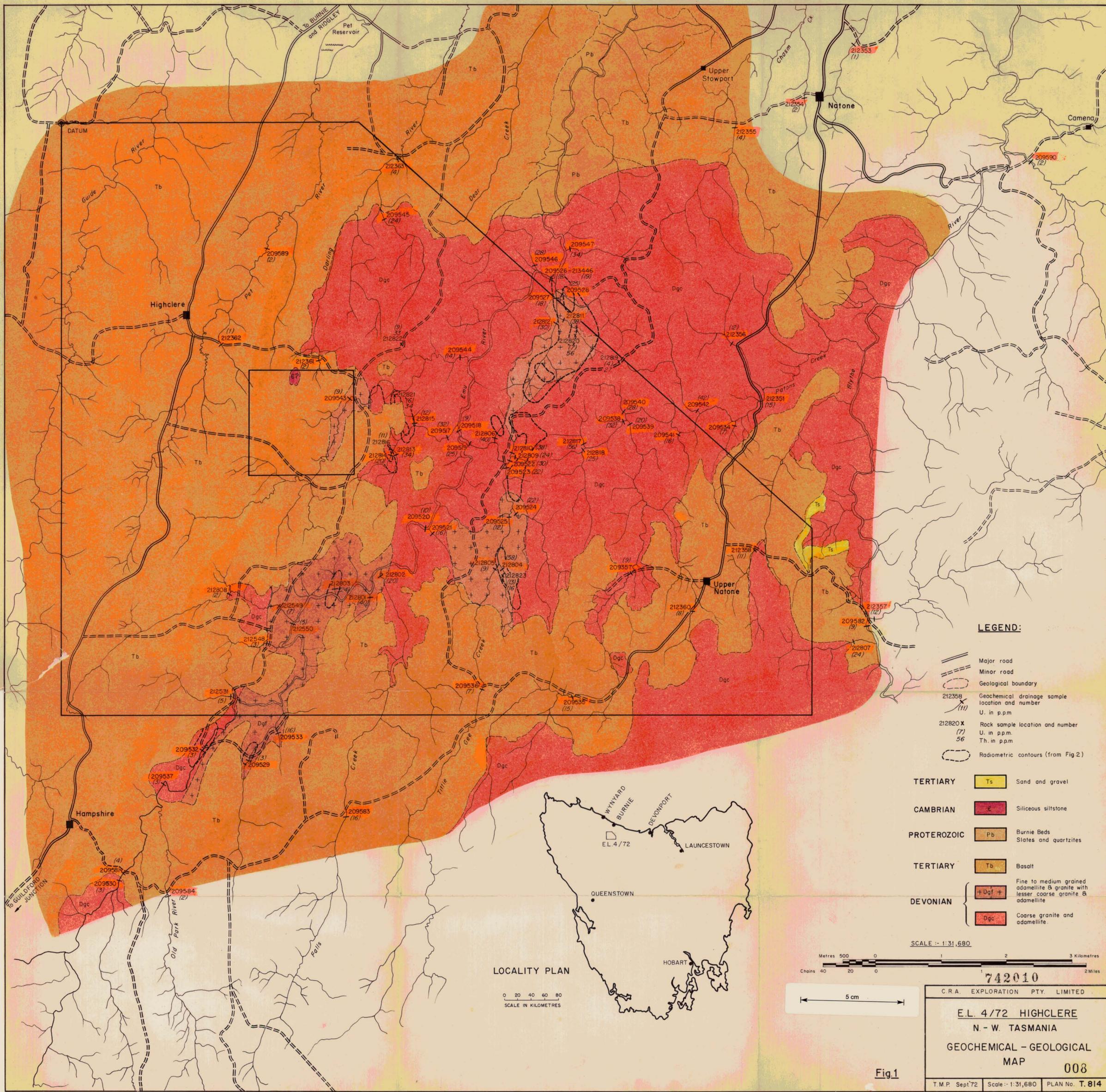
Map or photo No.	No. Sample	Sediment				Channel				pH	Metal content, p. p. m.											Geological observations	
		Gravel	Sand	Silt/mud	Organic	Flow	Width	Aluvial	Colluvial		Pb	Zn	Cu	Ni	Co	Cr	Th	Ag	Mo	As	U		W <sub>2</sub>
	209540	5	80	15	-	S	1	✓	✓	-	7	22	1	3	5		<1	<2	55	2	15	15	dc granite float same
	209541	10	85	5	-	S	1	✓	✓	-	12	45	1	14	22		<1	2	15	16	101	dc float granite	
	209542	10	85	5	-	S	1	✓	✓	-	19	73	3	9	89		<1	2	5	16	42	10	No dc float Granitic sand and gravel
	209543	15	80	5	-	S	3	✓	✓	-	10	93	12	13	29		<1	2	45	9	10	10	dc gr. no float
	209544	10	75	15	-	M	6	✓	✓	-	4	76	5	54	57		<1	2	45	14	15	15	As above
	209545	10	75	15	-	M	2	✓	✓	-	6	22	<1	5	3		<1	<2	45	24	10	10	dc gr float same + quartz with py + kaolinite rich quartz
	209546	5	85	10	-	M	1	✓	✓	-	9	30	1	18	11		<1	<2	5	28	20	20	dc c.g. gr float same + albite
	209547	5	65	30	-	M	1	✓	✓	-	7	28	<1	4	8		<1	<2	45	34	19	19	As above
	209548	10	25	35	-	S	1	✓	✓	-	7	120	8	150	85		1	2	45	3	10	10	No dc float basalt
	209549	5	70	25	-	M	8	✓	✓	-	10	112	9	110	66		1	2	45	7	6	6	dc m.g. - fg. gr. float same + basalt
	209550	20	55	25	-	M	10	✓	✓	-	317	366	36	36	15		1	<2	45	5	35	35	dc m.g. gr float same + rough + basalt + banded by siliceous rock. Finer R.
	212801	15	65	20	-	M	1	✓	✓	-	137	30	1	20	11		<1	<2	45	40	5	5	dc c.g. gr float same + basalt + albite
	212802	35	45	20	-	M	1	✓	✓	-	10387	16	100	38			1	2	45	30	14	14	As above + quartz float
	212803	10	75	15	-	S	2	✓	✓	-	30	24	1	9	11		<1	<2	45	24	15	15	dc c.g. gr float same + basalt
	212804	25	65	10	-	M	2	✓	✓	-	13	48	3	33	24		<1	<2	5	58	10	10	dc m.g. gr float same + basalt
	212805	10	75	15	-	M	1	✓	✓	-	617	96	13	100	60		<1	2	45	7	10	10	As above + basalt float
	212806	15	65	20	-	S	1	✓	✓	-	12	13	<1	2	5		<1	<2	45	40	6	6	dc float c.g. gr. Tittle G. Ch.
	212807	15	65	20	-	M	1	✓	✓	-	12	41	2	23	16		<1	<2	45	24	10	10	No dc float. Good m.g. gr.
	212808	-	60	40	-	M	1	✓	✓	-	10	131	23	170	77		1	<2	45	2	11	11	No dc float basalt
	212809	15	75	10	-	S	2	✓	✓	-	10	14	1	2	5		<1	<2	45	24	30	30	No dc float. Sand c.g. m.g. granitic
	212810	25	65	10	-	M	2	✓	✓	-	7	14	1	2	5		<1	<2	45	38	21	21	As above
	212811	10	75	15	-	M	1	✓	✓	-	7	16	1	1	3		<1	<2	45	38	15	15	As above
	212812	15	65	20	-	M	2	✓	✓	-	137	14	<1	2	2		<1	<2	45	30	15	15	No dc float quartz + albite + fg + c.g. granitic sand
	212813	15	75	10	-	S	1	✓	✓	-	10	41	3	19	21		<1	<2	45	34	10	10	dc c.g. gr float same
	212814	10	80	10	-	S	1	✓	✓	-	13	63	9	49	52		<1	2	5	20	55	55	As above
	212815	10	75	15	-	M	2	✓	✓	-	16	38	7	23	12		1	2	5	12	25	25	As above + quartz float
	212816																						Crushed granite for geochemical analysis
	212817	20	70	10	-	M	5	✓	✓	-	18	27	5	6	7		<1	3	56				dc c.g. gr float same + albite + white quartz
	212818	20	70	10	-	M	6	✓	✓	-	21	26	5	7	4		<1		25				As above
	212819																						Crushed granite c.g. plogomior Kaper + white granitic. Crushed 60 cps. Over 85 cps.



742009

TCR 72-887

Sample No	U		U		U
212363	4	209534	7	209581	4
209545	24	212351	15	209530	3
212361	2	212356	12	209584	2
209589	2	212355	4	209583	16
212362	1	212354	2		
209543	9	212353	1		
212815	12	209590	2		
212814	20	212358	11		
212813	34	212357	12		
209544	14	209582	9		
209517	32	212807	24		
209518	9	212360	8		
209519	25	209357	9		
212806	40	209535	15		
209547	34	209536	7		
209546	28	209524	22		
209526	8	209525	12		
213446	19	212805	9		
209528	25	212804	58		
209527	18	209520	10		
212811	38	209521	16		
212812	30	212802	20		
212810	38	212801	40		
212809	24	212803	24		
209522	30	212550	5		
209523	22	212549	7		
212817	56	212548	3		
212818	25	212808	2		
209538	32	212531	5		
209540	28	209532	3		
209539	20	209537	3		
20954	16	209529	3		
209542	42	209533	16		



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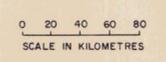
- Major road
- Minor road
- Geological boundary
- 212358 (11)  
Geochemical drainage sample location and number  
U. in p.p.m.
- 212820 X (7)  
Rock sample location and number  
U. in p.p.m.  
56 Th. in p.p.m.
- Radiometric contours (from Fig 2)

- TERTIARY** Sand and gravel
- CAMBRIAN** Siliceous siltstone
- PROTEROZOIC** Burnie Beds  
Slates and quartzites
- TERTIARY** Basalt
- DEVONIAN** Fine to medium grained  
adamellite & granite with  
lesser coarse granite &  
adamellite
- Coarse granite and  
adamellite.

SCALE :- 1:31,680



**LOCALITY PLAN**

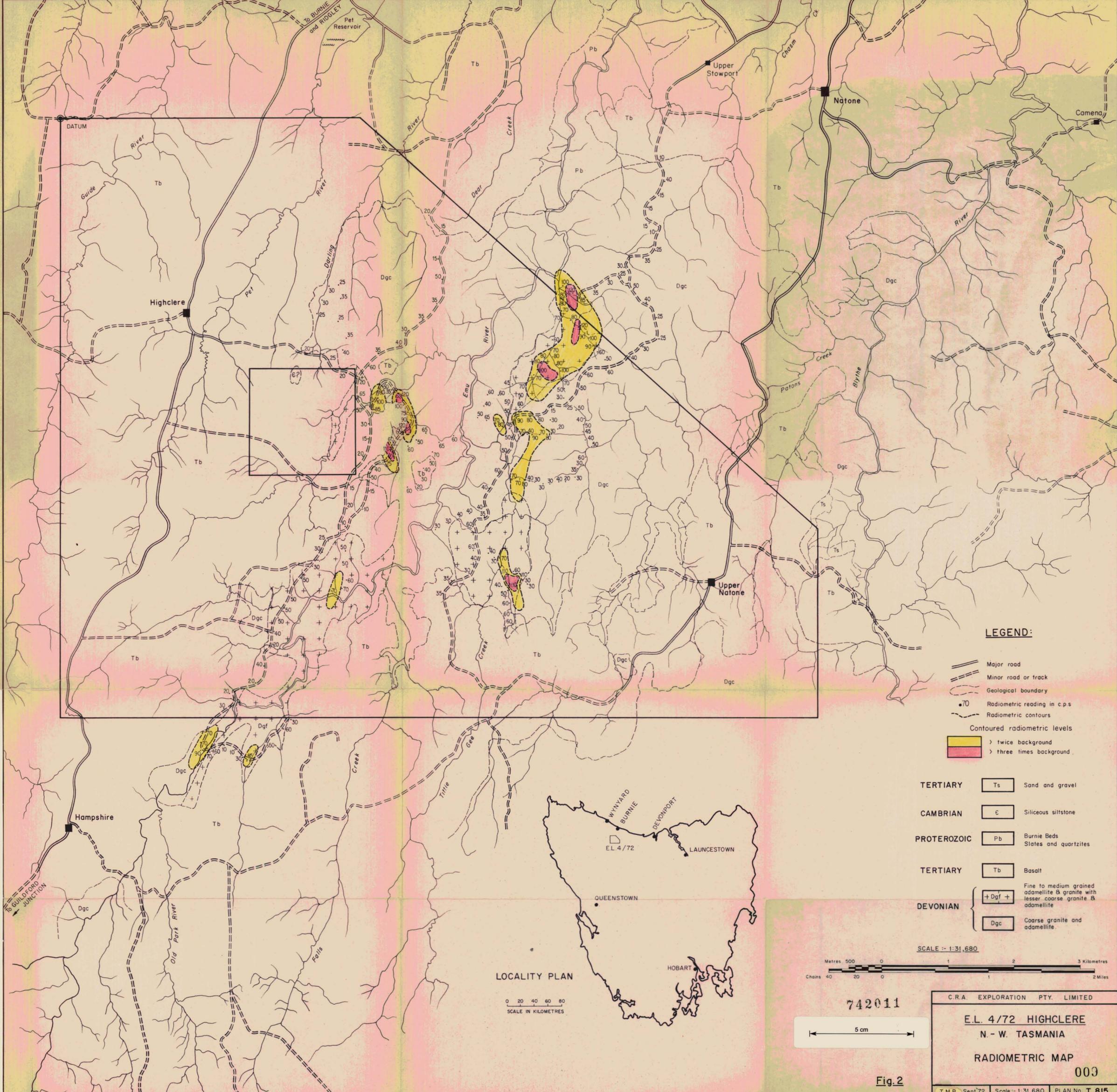


**742010**

C.R.A. EXPLORATION PTY. LIMITED

**E.L. 4/72 HIGHCLERE  
N - W. TASMANIA  
GEOCHEMICAL - GEOLOGICAL  
MAP 008**

Fig.1

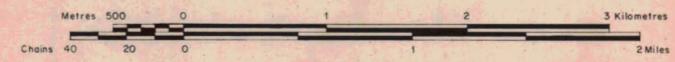


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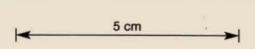
- Major road
- Minor road or track
- Geological boundary
- Radiometric reading in c.p.s
- Radiometric contours
- Contoured radiometric levels**
- > twice background
- > three times background

- TERTIARY** Sand and gravel
- CAMBRIAN** Siliceous siltstone
- PROTEROZOIC** Burnie Beds  
Slates and quartzites
- TERTIARY** Basalt
- DEVONIAN** Fine to medium grained  
adamellite & granite with  
lesser coarse granite &  
adamellite
- Coarse granite and  
adamellite.

SCALE: 1:31,680



742011



C.R.A. EXPLORATION PTY. LIMITED

**E.L. 4/72 HIGHCLERE**  
N - W. TASMANIA

**RADIOMETRIC MAP**

003

T.M.P. Sept'72 Scale: 1:31,680 PLAN No. T. 815

Fig.2

**LOCALITY PLAN**

