

829001

J of M	A.O.	C.G.	E.O.	D.S.M.E
				Registrar
Received	23 FEB 1982			E & IL
Answered				
DEPT. OF MINES				
REF. No. 1402/82				

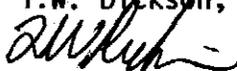
DRILLING OF CAINOZOIC SEDIMENTS IN THE ST. PAULS RIVER VALLEY

NEAR ROYAL GEORGE

E.L. 7.78 N.E. Tasmania

Author: P.R. Dunn

Submitted to: T.W. Dickson, Hobart



Date: 23rd October, 1981

Copies: P.R.Dunn
D.H.Mackenzie Canberra
Cornwall Coal Co.
Cornwall Coal Co.
Melbourne Office
Hobart Office

The contents of this report remain the property of C.R.A. Exploration Pty. Limited and may not be published in whole or in part nor used in a company prospectus without the written consent of the Company.

P.R.Dunn
Crest Exploration Pty.Ltd.
Proverb House,
71 Archer St,
CHATSWOOD. N.S.W. 2067

TABLE OF CONTENTS.

	<u>PAGE</u>
<u>List of Plates</u>	(ii)
1. Summary	1
2. Introduction	1
3. Drilling	2
4. Geology	3
5. Geophysics	4
6. Geochemistry	5
7. Conclusion	6
8. Recommendation	6
9. References.	7
Key words	8
Location.	

LIST OF PLATES

- Plate Number: 1. St Pauls Valley near Royal George,
N.E. Tasmania – Geology and Drill locations – TASH 531
2. Drill Logs SPVPD1 TASH 552
3. Drill Logs SPVPD2 TASH 552
4. Drill Logs SPVPD3A TASH 552
5. Drill Logs SPVPD4 TASH 553
6. Drill Logs SPVPD5 TASH 553
7. Drill Logs SPVPD6 TASH 552

1. Summary

As an adjunct to the work carried out by C.R.A. Exploration Pty. Limited at the Royal George Mine near Avoca in Tasmania, a limited programme of drilling was undertaken in the St.Paul River valley in a search for uranium and alluvial tin.

Six percussion holes were drilled, five in a fence across the valley floor, but no indications of uranium or worthwhile values of alluvial tin were discovered.

The project was dogged by caving holes, sampling problems and equipment breakdowns which are reflected in the scrappiness of the results. The results therefore cannot be regarded as truly definitive and the potential of the area is still open to further testing. However, it is not recommended, at this stage, that any further work be undertaken and the area should therefore be relinquished.

2. Introduction

The Royal George tin mine is about 18 kilometres E.S.E. of the township of Avoca in eastern Tasmania. It was worked for tin in the early part of this century and then abandoned. The discovery of secondary uranium minerals in the old workings revived interest in the mine in 1955 but insufficient uranium was found to revive mining. An account of previous work is given by PURVIS (1979)

On the assumption that the granite in which the mine occurs may contain quantities of easily leachable (or labile) uranium, a short investigation of the uranium content of the granite was undertaken in 1980. The following analyses were obtained:

<u>Sample No:</u>	<u>Locality</u>	<u>U</u>	<u>Th</u>	<u>Sn</u>	<u>W</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Mo</u>	<u>Ag</u>
819971	St.Pauls 1;100,000, Coarse granite EP763692	28	22	18	15	4	5	34	2	1
819972	As above-siliceous	6	22	22	10	2	20	18	1	1
819973	As above-ferruginous Coarse granite	36	20	14	10	2	20	50	2	1
819974	St.Pauls 1;100,000 EP745695.	40	18	30	10	2	5	20	3	1

- 2 -

Sample No;	Locality	U	Th	Sn	W	Cu	Pb	Zn	Mo	Ag
819975	Ferruginous St Pauls 1;100,000 EP745695	36	22	12	10	2	5	24	2	1
819976	Tailings dump	75	24	3,900	35	1,500	660	280	2	65
819977	Tailings dump	180	24	3,350	40	3,900	630	840	4	46

The uranium level in all these samples except 819972 is high (average for granite 5 ppm) while the Th content is normal or slightly low. This would tend to indicate that the uranium is not contained in the refractory minerals such as monazite and may be amenable to surface leaching.

A drilling programme was therefore designed to test the valley of the St.Pauls River for the presence of suitable sands where accumulation of roll-front-type uranium may have taken place

3 - Drilling

A programme of between 5 and 10 percussion drill holes totalling about 300 metres was planned to test for the presence of suitable sands. A contract was let to R.S. and S.J. Rickards of Kingston, Tasmania for the work to be carried out using an Ingersoll Rand T4 DTH rig.

Two fences of holes were planned across the valley of the St.Pauls River Valley - the fences were to be 2.5km apart and the individual holes 300 metres apart. The drilling was undertaken with rock roller bits and downhole hammer. PVC casing was used where possible. Caving and contamination were major problems - the limitation of the available drilling equipment, meant that the holes could only be cased down to the first sandy horizon - which usually coincides with the presence of substantial water flow which enhanced caving problems. Three holes were abandoned before reaching target depth because of collapse and two holes were continued into basement for longer than necessary because contamination from higher in the hole - particularly clay and organic matter made recognition of the basement difficult. In all a total of 399metres of drilling was undertaken providing information on five sites in the first fence and only one site in the second fence. All drill sites were on the "Royslea" property of Mr A.R. Gee.

- 3 -

Details of the holes follow:-

<u>Hole No:</u>	<u>Depth to Major Water</u>	<u>Casing Depth</u>	<u>Total Depth</u>	<u>Remarks</u>
SPVPD 1	-	-	8.5m	Abandoned on hard rock (Dolerite)
SPVPD 1A	24m	6m	40.5m	Hole caved in sand
SPVPD 2	23m	24m	54m	Bottomed in granite
SPVPD 3	15m	18m	21.5m	Hole caved in sand
SPVPD 3A	21.5m	23m	40m	Bottomed in granite
SPVPD 4	34m	42m	84m	Limit of rods available
SPVPD 5	36m	24m	84.5m	Limit of rods available
SPVPD 6	16m	18m	66m	Caved in sand

A cyclone and splitter were provided for sampling but did not work with damp mud. Samples were collected (every 4 metres) samples placed in boxes next to the drill collar where they received a proportion of the material blown out of the hole. This technique was quite adequate.

4 - GEOLOGY

The valley of the St Pauls River is incised through essentially flat-lying Permian and Triassic sediments intruded by Jurassic Dolerite and into a basement of folded Pre-Devonian Mathinna Beds and Devonian granite. The floor of the valley itself is covered by Tertiary and Recent sediments up to 80 metres thick. Downstream the valley is partly filled by Tertiary basalt.

The drilling (Figures 2-7) showed that the Tertiary sediments are mainly composed of grey, blue-grey and blue-green silts and muds, partly indurated in places and containing numerous pebbles and boulders of dolerite and fragments of coal and wood. The coal is derived from the Triassic coal measures through which the river is incised. The presence of dolerite boulders throughout the silts and muds suggests the presence of glacial action or, at least, ice-rafting on a lake possibly formed upstream from the valley-filling basalt. Some dolerite boulders on the surface are up to 5 metres across. Coarse angular sand is common below about 35 metres

- 4 -

in each hole. In SPVPD 6 it appears below 52 metres but 17 metres of basalt is present in the sequence above it. Hole SPVPD 3A indicates the presence of a basement high, probably an interfluvial between the ancestral St Pauls River and Stable Creek. A two-metre thick sand unit is present in holes SPVPD 1,2, and 3A at about 21 metres, roughly about the same stratigraphic level as the basalt in hole SPVPD 6. This sand is not present in holes 4 and 5 but several very thin sandstone bands are scattered through the upper part of the sequence.

The sands generally appear to be unoxidized except in hole 6 where some oxidation is apparent in the pebbly beds.

5. Geophysics

A portable SIE logger, model T450E with natural gamma and gamma-gamma probes and a caliper was used to log the holes. Holes SPVPD 1A and 3 collapsed before the logger could be used - holes 2 and 4 were logged successfully before the logger broke down and had to be returned to Melbourne. As a replacement was not available and the drilling could not be delayed further, holes 3A, 5 and 6 were not logged. However, all samples were scanned with a hand-held Scintex Scintillation counter.

The gamma and gamma-gamma logs for holes 2 and 4 are plotted on Plates 3 and 5. No significant anomalous radioactivity was detected although a small (40cm) interval in hole 4 at 12 metres gave a sharp 'kick' to 50cps on a background of 20-25cps. This appeared to correspond to a thin coarse sand and pebble bed. Unfortunately samples taken from the 14-16 metre intervals did not coincide with the anomaly but the occurrence is insufficiently important to warrant resampling. The granite basement between 5 and 10 times more radioactive than the overlying sediments.

The gamma-gamma log was useful in defining the presence of the granite basement but was influenced by the the caving problems in the sediments as indicated by the caliper log on hole 2. The equipment broke down before the caliper could be used on hole 4.

6.- Geochemistry

Samples weighing about 4 kilograms were taken from selected 2-metre intervals and sent to Analabs (Aust) Pty. Limited for analysis for tin, wolfram, uranium, copper, lead, zinc, and silver, every 5th sample was analysed for gold. As gold was not detected and the silver values were less than 0.5 ppm these results have not been plotted but all other metal values have been plotted against the appropriate intervals on the lithological logs (Plates 2-7)

Tin - Tin values were present (≤ 3 ppm) in all samples except one but no economic concentrations were apparent. The highest value (65 ppm) was from granite basement in hole 3A but the granite in hole 4 only contained a maximum 15 ppm - this may have been due to sample dilution by overlying sands or, most probably, reflects the variable tin content of the granite. The highest value in unequivocal sand was 30 ppm in hole 6, although a value of 50 ppm in hole 3A is probably in sand derived from the underlying granite.

Wolfram - The wolfram values are erratic and do not appear to bear any relationship to a particular rock type. The highest value was 45 ppm in clayey silt from hole 3A.

Uranium - Uranium values in the sediments were low - generally < 3 ppm with a maximum of 7 ppm. In the granite most samples contained some detectable uranium with maximum values of 15 ppm. These values are somewhat lower than those reported earlier, obtained from fresh granite on the surface, but the latter were chosen from sites with a greater than average background radiation. The consistent presence of uranium in samples provided good evidence that they came from basement rocks - particularly where this was not clear because of sample contamination, and radiometric logs were not available.

Copper - Copper values in basement granite were generally low ≤ 20 ppm and higher values were mainly due to the presence of dolerite.

- 6 -

Lead - Lead values were generally low throughout (≤ 10 ppm) except in hole 5 where values were between 10 and 20 ppm down to 70 metres below which they dropped to about 5 ppm - no ready explanation is available for this apparent anomaly.

Zinc - Zinc values are erratic and vary between 30 and 170 ppm. In hole 3A the Zinc values in the granite are more than twice those in the overlying sediments and are clearly anomalous in respect to all other samples. In hole 5 where the position of the sediment/granite contact is in doubt, higher zinc (and uranium) values below 56 metres suggest that the contact is at that depth. Elsewhere the zinc values do not appear to reflect lithologies at all.

7.- Conclusions

The purpose of this programme was to try to find indications of uranium accumulations in the Tertiary sediments or, at least, to find indications of the presence of an oxidation/ reduction contact in the sands typical of a 'roll-front' situation. No indications of uranium accumulation were detected and all the lower sands in holes 1-5 were in the reduced state. The presence of some oxidised sand in hole 6 suggests possible local oxidation but it does not appear to be part of a classical oxidation cell which has moved downstream with groundwater flow.

Although the tin content of some sands and granite is anomalous it is not sufficiently high to be of economic interest. The average grade of dredged material in Malaya is between 48 and 96 ppm, Sn, at Mt Garnet is between 102 and 126 ppm Sn and at Gibsonvale was 1300 ppm. There is insufficient sand within the St Pauls Valley to support an operation like those in Malaya or even the Mount Garnet area - particularly as such operations would require the removal of at least 39 metres of overburden material.

8.- Recommendations

The potential for finding economic concentrations of uranium and tin within

- 7 -

the Cainozoic sediments of Exploration Licence 7/78 is severely downgraded from this programme. The potential still exists for accumulations further downstream and particularly below the junction of the St Pauls and South Esk Rivers where further uranium and tin may have been supplied to the system by the tin and uranium-rich Rossarden Granite.

It is recommended that no further exploration work be carried out for sedimentary uranium and alluvial tin in the Cainozoic of Exploration Licence 7/78 at this stage.

8.-References

- PURVIS J.G., 1979 - Initial exploration at the Old Royal George Tin mine E.L. 7/78, N.E. Tasmania.
C.R.A.E. Report 9786

KEY WORDS

Uranium, tin, wolfram, copper, lead, zinc, drilling, natural gamma logs, gamma-gamma logs, Tertiary, Cainozoic, sands, clay, silt, dolerite, granite, basalt, geochemistry, assays, ore potential.

LOCATION

Oatlands	1:250,000 Sheet	SK 55-6	Tasmania
St Pauls	1:100,000 Sheet	8414	Tasmania

LEGEND

QUATERNARY

- Qa Alluvial Deposits
- Qs Soil, Numerous Dolerite Boulders
- Qg Granite, Soil & Debris

JURASSIC

- Jd Dolerite

DEVONIAN

- + Granite

--- Geological Boundary

SPVD1 ○ Drill Site

— Road

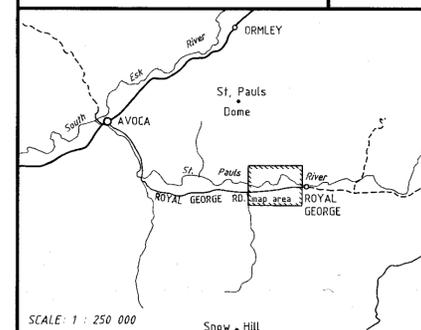
--- Track

— Fence

■ Building

● Dam

LOCALITY DIAGRAMS



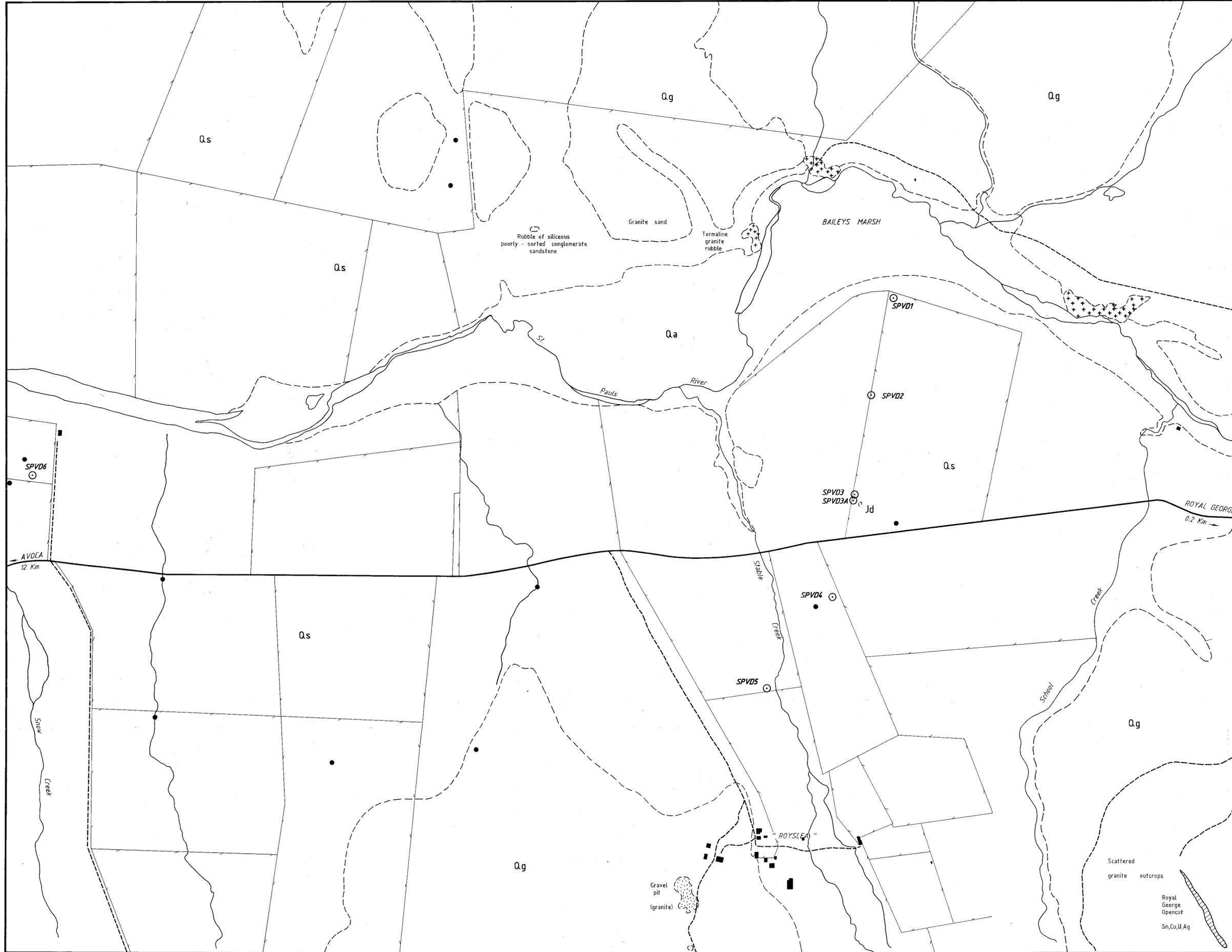
SCALE: 1 : 250 000

CRA EXPLORATION PTY. LTD.

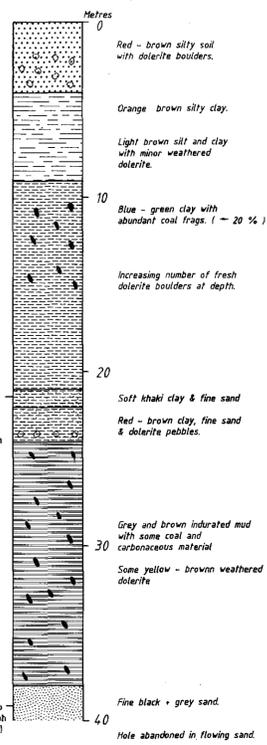
ST. PAULS VALLEY
near ROYAL GEORGE N.E. TAS
E.L. 7/78
GEOLOGY & DRILL HOLE
LOCATIONS

FEBRUARY 1981

Ref: SK55 4	Report N°
Author: P.R. DUNN	Scale: AS SHOWN
Drawn By: R. T.	Plan N° TASH 531

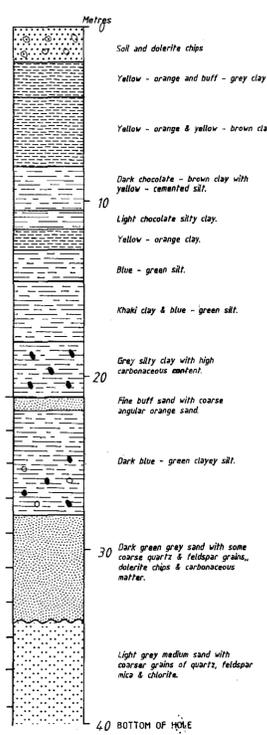


SPVPD1

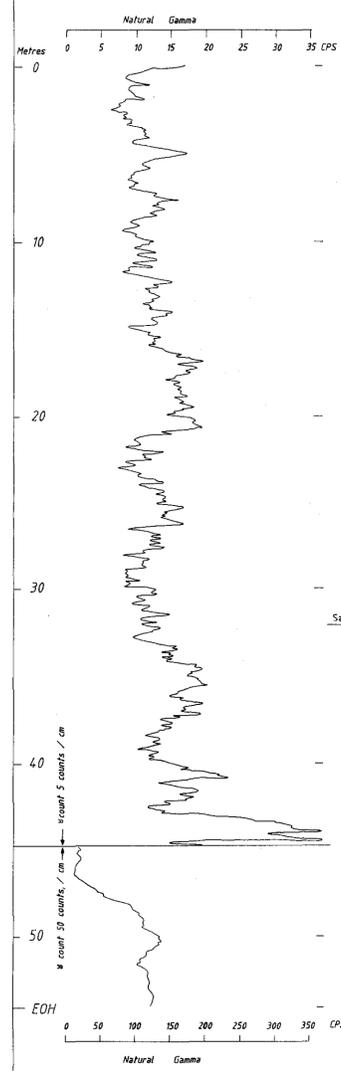


Sample No	Sn	W	U	Cu	Pb	Zn
795709	7	X	X	50	10	85
795710	10	X	3	60	5	95

SPVPD3A

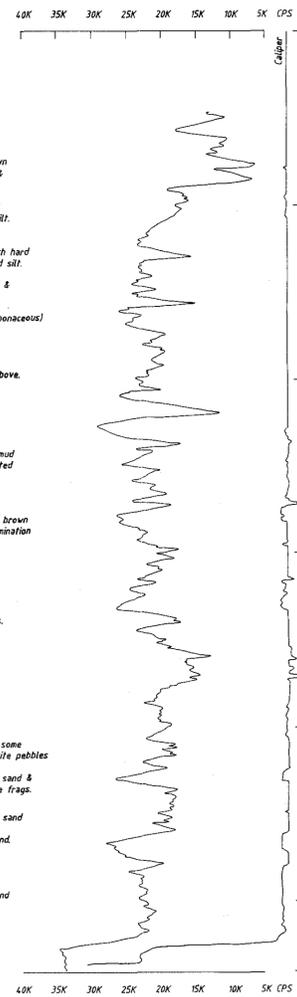
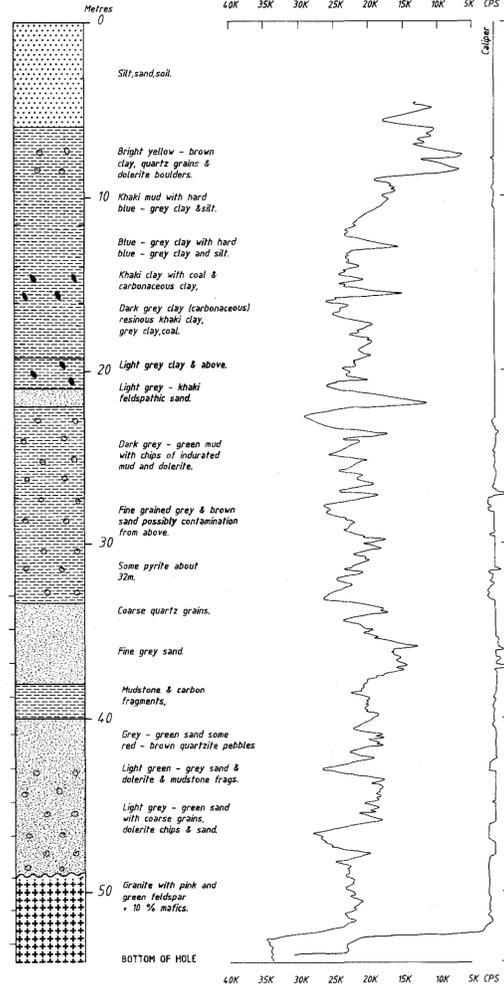


Sample No	Sn	W	U	Cu	Pb	Zn
795771	15	25	X	30	X	40
772						
773	10	45	X	60	5	75
774	10	35	X	65	5	70
775	10	10	X	65	X	80
776	50	10	X	75	X	70
777	35	X	X	55	X	65
778	65	X	10	15	X	140
779	55	X	15	15	X	170
780	50	X	10	10	5	165

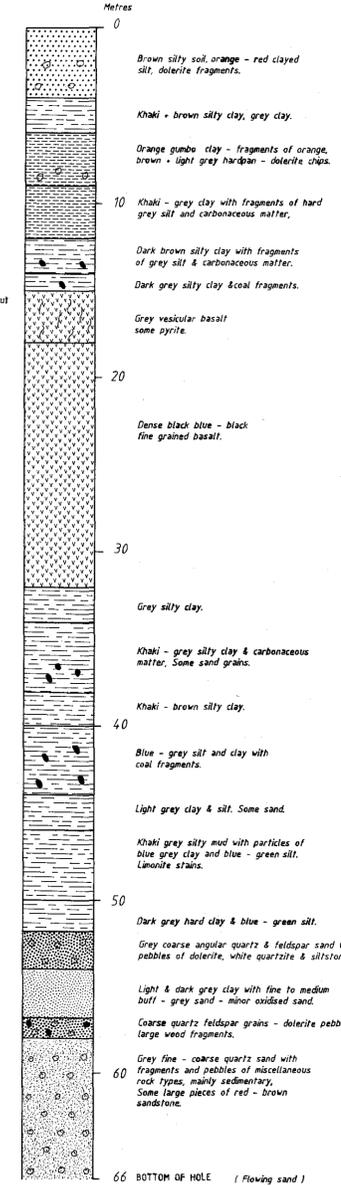


Sample No	Sn	W	U	Cu	Pb	Zn
732	9	X	X	80	5	50
733	5	10	X	55	5	75
734	8	10	3	60	5	75
735	3	10	4	65	7	75
736	X	20	0	65	5	80
737	10	X	X	60	5	50
738	15	15	5	50	10	85
739	5	X	3	80	10	65
740	8	X	10	15	5	45
741	25	X	15	35	10	80
742	15	X	15	20	10	50

SPVPD2



SPVPD6



Sample No	Sn	W	U	Cu	Pb	Zn
795800	15	25	7	40	15	70
795816	30	X	4	50	10	70
817	20	X	X	15	5	45
818	15	X	X	20	X	45
819	15	X	X	30	10	80
820	20	X	X	20	5	60
821	20	X	X	20	10	50
822	35	X	X	25	10	85

829013

5 cm

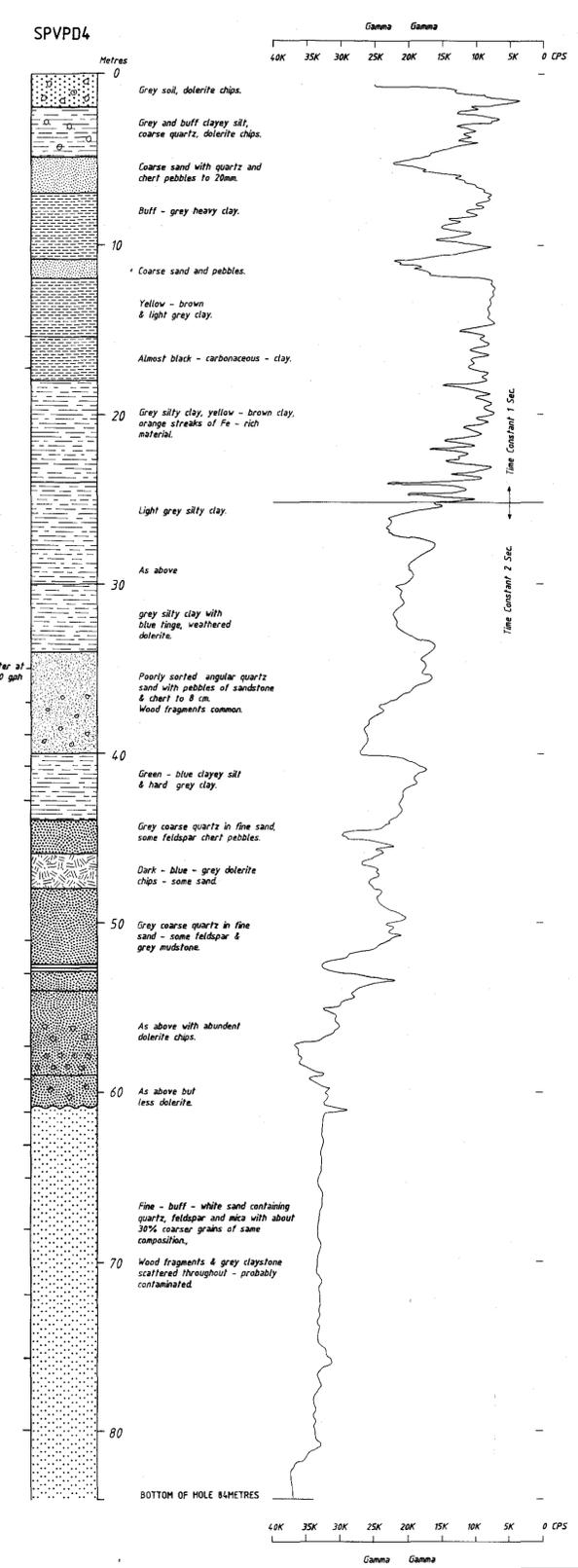
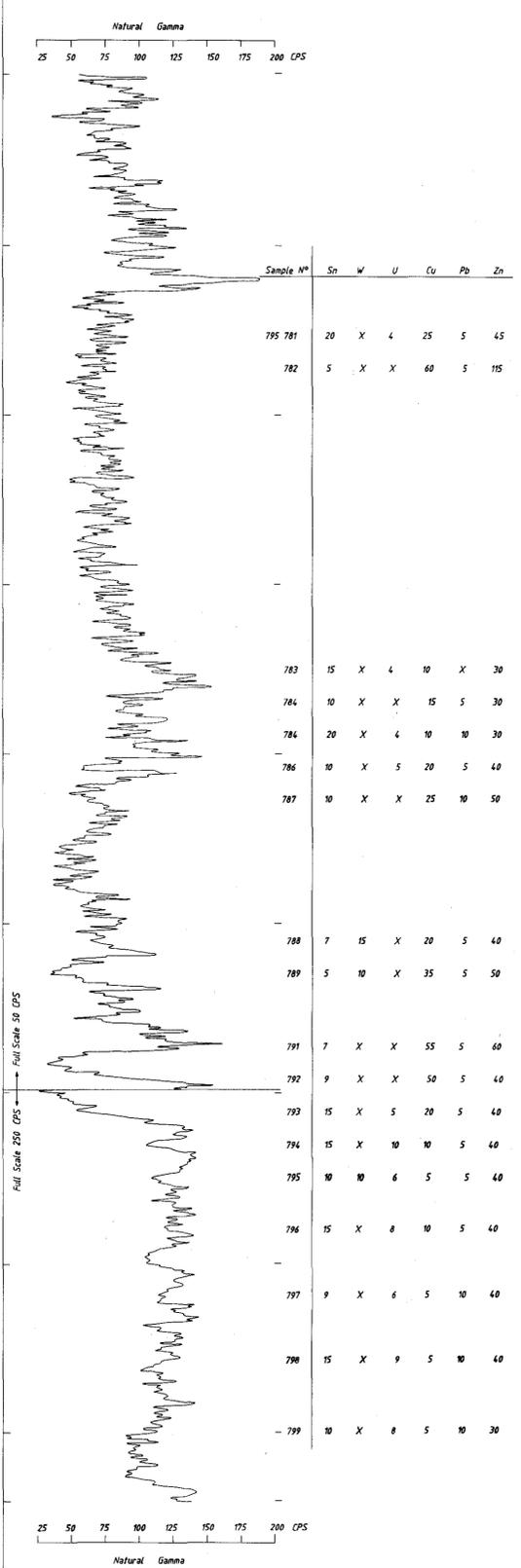
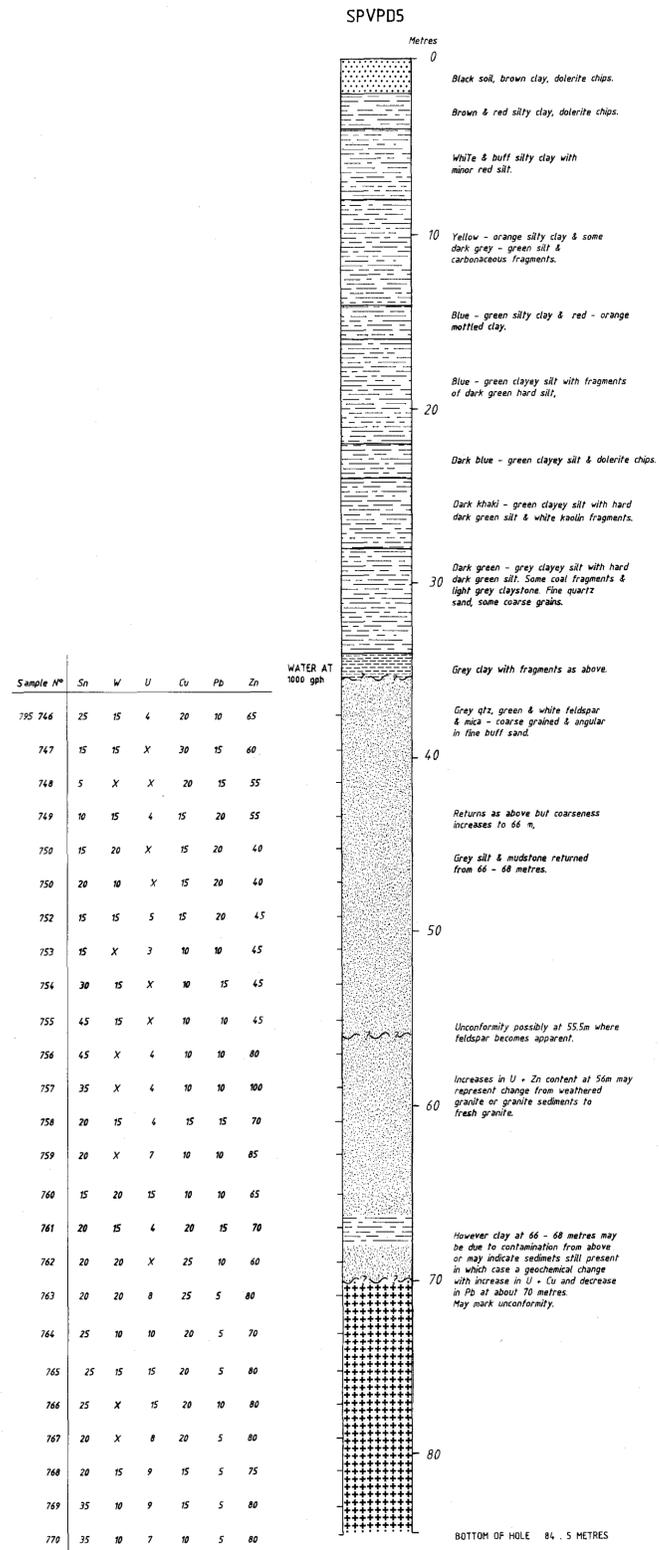
82-1701

CRA EXPLORATION PTY. LIMITED

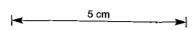
ST. PAULS VALLEY
near ROYAL GEORGE N.E. TAS.

DRILL LOGS PD 81 SPV 1, 2, 3A, 6.

Ref: SK 55 4	Date: FEBRUARY 1981
Scale: AS SHOWN	Report No
Author: P. R. DUNN	Plan No: TASH 532
Drawn by: R. T.	



829014



82-1701

CRA EXPLORATION PTY. LIMITED

ST. PAULS VALLEY
near ROYAL GEORGE N.E. TAS

DRILL LOGS PD 81 SVP 4, 5.

Ref. Sk 55 4	Date: FEBRUARY 1981
Scale: AS SHOWN	Report No
Author: P. R. DUNN	Plan No. TASH 533
Drawn by: R. T.	