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FINAL REPORT E.L. 17/75

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Introduction

E. L. 17/75 was granted in late November 1975. The area involved at this stage was 45 km , in the land district of Dorset. It can be described as follows:- commencing in the North West corner, grid co-ordinate EQ 910860 (Map Sheet 8516 Edition 1) known as Tree Point, thence due south to grid co-ordinate EQ 910810, thence in a south easterly direction to grid coordinate FQ 025694, thence in a generally northern direction following the western boundary of the Mount William State Reserve to high water mark grid co-ordinate FQ 007784, thence following the coast line in a north westerly direction to Tree Point.
In April 1976 approval for an additional 100 hectares was received. This took in the area between low and high water mark along the coast line.
It was mutually agreed to reduce the exploration area late in 1978. As a result the area of E L 17/75 was reduced to 18 km .
The areas relinquished being north of a line made by grid coordinate EQ 910810 and EQ 942810, and south of a line made by grid coordinates EQ 950770 and EQ 990771.

The objective of the exploration was to find spherically shaped grains of silica sand in the -20 +30 mesh size of high quality and in sufficient quantity to compete with imported sand from U.S.A, and also any other mineral sands of commercial value.
Prior to the granting of the licence, objections to the granting of the licence had been made by the Tas. Conservation Trust and the Aust. Conservation Foundation. The objectors did not appear at the Mining Wardens Court and thus the licence was granted. However, the Aust. Conservation Trust advised by letter that they felt the appropriate time to object would be when application was made for a mining lease. This did not deter this explorer as he felt that the system would allow an explorer to be confident of the value of his find if any, and thus allow him to decide whether it would be worth proceeding with an application for a mining lease.

Summary

Silica Sand

While most sand in the area is generally of the correct shape only up to about 10% is of a marketable size, and much of the sand in the correct size range is of poor quality due to the presence of coloured grains. The sand found north of Musselroe Bay contains many coloured grains making it unsuitable as the colour extends throughout the crystal structure.
The sands to the south of Musselroe Bay are relatively free of grains which are inherently discoloured but some grains contain surface discolouration which can be removed by chemical washing and or attrition.
Sand samples submitted to Tioxide Pty. Ltd. were not quite up to the standard of the imported sand.
Unfortunately the shortage of the imported sand which had been forecast during the mid nineteen seventies did not result and consequently the urgency to find an alternative sand waned.

Cassiterite

Tin occurs in the heavy mineral sands found in bands on the beach between Musselroe Point and the South Eastern extremity of E L 17/75.
Duplication of grades from the same sampling positions using a hand auger proved to be difficult. The 'live' nature of the beach is thought to be the main reason for the lack of agreement of results.
Attempts to selectively mine by back-hoe during the taking of bulk samples appears generally to have been a failure. In only one case out of four did the yield show an improvement over the predictions based on auger results for mining all sand. In two case out of the four the yield matched the predictions for mining all sand but in the other case the yield was only about 1/5 of what was expected. (See section on Bulk Sampling - Tabling Tests).

SUMMARY cont.

Zircon

In a sample submitted to the Department of Mines Laboratory, L'ton., taken from position 14/2/14 in a manner to simulate ideal selective mining, the recoverable grade of zircon was 1.9%. In the same sample the recoverable Sn was 0.25% and rutile 0.16%.

Ilmenite

In the same report (R741) the ilmenite present in the H M assemblage was quoted as containing 0.65% Cr O and therefore was of no value.

Strategy

Following the results of the bulk sample-tabling tests, an effort was made to accumulate sufficient processing equipment in order to conduct some in-situ treatment tests of a larger tonnage. By January 1981 sufficient individual units had been acquired to proceed in seeking a licence for scheduled premises from the Department of the Environment.
At this stage this explorer held the view (and still holds the view) that it should be the right of any explorer to be permitted to be reasonaly confident he has a viable deposit before being required to apply for a mining lease. After some initial resistance and almost 11 months, the Dept. of the Environment granted a licence for scheduled premises on a Miners Right Title within E L 17/75.
No sooner had the 'green light' been received from the Dept. of the Environment than the 'amber' started flashing from the Dept. of Mines - a reluctance to renew E L 17/75 (Dec. 1981).
Funds from the sale of property ready to use for integrating processing units into processing plant had been available since February 1981 but could not be justifiably committed based on the tin content within the miners right alone without the E L title, thus nothing could be done. It was June 1982 before notification was received that E L 17/75 would be renewed. The five months remaining was insufficient time to organise the engineering work and the testing as well. It was suggested to the Department that because of the 7 months in which I could not proceed could they rearrange the licence period or fee to suit the circumstances. The reply was that no adjustment to fees or licence period would be made and that the licence would not be renewed beyond the five months hence (by this time the available time was down to about four months).
At this point I contacted the Ombudsman for some assistance. This complaint is continuing.

Thus no work of an exploratory nature was performed in the period Jan. 1981 to Nov. 1981 because of delays in obtaining a licence for scheduled premises and none between Dec. 1981 to Nov. 1982 because of delays in obtaining a renewal for E L 17/75.

Prospects - Tin

There appears little hope of determining the viability of this deposit under the existing arrangement for the following reasons:-

(1) The value of Sn within the area of a Miners Right is unsufficient to justify the cost of plant necessary to recover it.

(2) It is unlikely anyone will risk the cost of court appearances in fighting 'conservation' objections to a mining lease when the ore reserve estimates in this live beach are so unreliable.

Prospects - Silica

Because the recovery plant for silica sand for specialized markets would be simpler than for tin recovery, there must always be a possibility depending on the size of the market, for such an operation to be viable. Should a small plant ever become a reality, after a period of consolidation, several by products could also possibly be produced such as feldspa, garnet, tin and zircon.

PRELIMINARY SAMPLING

Observations during sampling of exposed sand areas including the total length of the beach areas, revealed that the cleanest silica sand and the highest heavy mineral accumulations occurred at the southern end of the licence area.

Results of preliminary auger composites taken at 100 yard intervals between grid co-ordinates FQ 007785 and EQ 996795 appear in Table I. These composites were taken at either 2 or 4 yards from the beach bank.

The top 400 yards of the beach contained the finest silica sand and the least H M and tin values. The mid section contained the highest tin values and highest H M levels, whereas the lower, third of the beach contained almost the same level of H M as the mid section but considerabley less tin.

SECONDARY INVESTIGATION

Traverse auger drillings at the sample positions which reported the highest tin levels in the preliminary program were made to between 4 and 7 feet deep and at approx. 4 yard intervals. Commencing close into the beach bank at a position identified as A A the other positions at 4 yard intervals across the berm towards the sea were identified as A, B, C, D and E respectively. Details of traverse drillings appear in table II and III.

Two travers drillings were made across position 11/1/3 (see sample position chart Appendix I).

Duplication of the H M values were poor although the Sn grades within the H M were in reasonable agreement for positions C D and E. Variations in the depth of the auger holes is mainly due to variations to the depth of sand in the berm due to the movement of sand by wave action.

The results of traverse auger composites for the sample positions nearest to the (4) preliminary sample positions which gave the highest tin values have been included in Table I (bracketed sample numbers) for comparison.

Whilst all traverse samples are deeper and thus increased dilution could probably be expected the resultant Sn values from (3) positions are much lower than dilution can explain whilst in one position the Sn value is actually x 3.5 more than the preliminary sample indicated.

BULK SAMPLING - TABLING TESTS

Samples of approx. 270 kg. were taken selectively by back hoe from positions 11/1/1A, 11/1/2AA, 12/1/1AA and 22/7/3A.

The samples were tabled to produce a concentrate middling and tailing.

The concentrate was magnetically separated to remove ilmenite and garnet. The remainder was panned to produce a cassiterite - zircon concentrate.

Middlings were retabled, but no cassiterite was visible in samples from 11/1/1A, 11/1/2AA and 12/1/1AA positions and for this reason no further recovery work was attempted on these samples. The sample from position 22/7/3A however indicated a significant quantity of cassiterite. This second concentrate was magnetically separated and panned in the same manner as above. This increased the recoverable Sn from this sample position from 1.9 to 3.5 lbs/yd .

The results are tabulated below together with the predictions inferred from previous auger drilling results and those expected had selective mining been successful in discarding 50% of the bulk for zero Sn loss.

Sample Position	Predictions lbs Sn/yd		Bulk Tests lbs Sn/yd
	Auger	Selective Mining	
11/1/1A	5.2	10.4	1.0
11/1/2AA	2.3	4.6	2.4
12/1/1AA	3.2	6.4	2.9
22/7/3A	1.3	2.6	3.5

Because only one result out of four indicated that the back hoe was successfully selective one must have grave doubts about the likely success of selective mining using a back hoe.

Provided no selectivity occurred the middle two bulk tests confirm the predictions made from auger drilling results, and the fourth test somewhat makes up for the disappointingly low result produced on the first sample.

CONCLUSION

The promised objections by the Aust. Conservation Foundation to the granting of a mining lease for this area were instrumental in the licence holder seeking to conduct in-situ treatment tests on the basis of a Miners Right but within the security of tenure that E L 17/75 would give to the extra area containing tin.

In order to justify the expenditure on integrating the various production units into a mobile treatment plant, security of tenure over the whole beach south of Musselroe Point was necessary.

The reason in-situ tests involving the treatment of larger quantities of sand were considered necessary was that auger drilling and duplicate drillings had proven to be unreliable for estimating ore reserves.

Because the licence holder had and still has insufficient confidence in the likely tin ore reserve,no application for a mining lease is planned.

The Department of Mines by their actions have not appeared to approve of the in-situ tests as planned. Thus their attitude coupled with the poor current outlook for tin has meant that this tin project has a low priority. Attention is being again given to the silica sand side of the project and a Miners Right and Easement Licence are being kept current in case sample lots are required by potential customers.

C.C.J. BLACKLOW

TABLE I

PRELIMINARY SAMPLING

Sample Ref. No.	Auger depth feet	% HM in -850u	% HM in -55u	% +850u	% -850 +500u	% -500u	% Sn in HM	% Sn in Sand	Distance From Beach Bank Yds.
11/47/8	4	1.97		6.2	3.2	90.6	0.10	0.0019	4
11/47/7	4	4.02		0.9	1.7	97.4	0.11	0.0044	4
11/47/6	4	3.65		19.9	10.6	70.5	0.13	0.0047	4
11/47/5	4	1.43		40.0	8.9	51.1	0.15	0.0021	4
(11/47/4	4	11.80		5.6	9.0	85.4	0.45	0.053	4
11/1/1	5.5							0.189	4
11/47/3	4	1.50		36.9	9.7	53.4	0.60	0.009	4
11/47/2	4	3.89		18.1	10.6	71.3	1.40	0.054	4
11/1/2	5.5							0.019	4
11/47/1	4	8.28		10.6	10.6	78.8	0.53	0.044	4
11/47/9	4	8.75		7.8	12.6	79.6	1.60	0.140	4
12/1/1	7							0.032	4
11/47/10	4	6.90		25.0	15.7	59.3	0.58	0.040	4
6/6/9	3	3.16		8.7	9.3	82.0	2.80	0.092	2
11/47/11	4							0.013	3
11/1/3	5.5							0.011	4
6/6/8	3	7.69		12.0	9.1	78.9	1.80	0.138	2
22/7/3	5							0.048	4
6/6/7	2	2.64		39.8	8.2	52.0	0.20	0.005	2
6/6/6	3	2.80		6.8	6.8	86.5	0.30	0.008	2
6/6/5	3	8.15		3.8	8.6	87.6	0.40	0.033	2
6/6/4	3	2.66		12.5	8.7	78.9	0.30	0.008	2
6/6/3	3	8.19		18.2	9.1	72.7	0.70	0.057	2
6/6/1	3	7.00		8.5	8.5	83.0	0.20	0.014	2

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TABLE II

TRAVERSE DRILLINGS (A)

Position 11/1/1

	AA ← 4 yds →	A	4	B	4	C	4	D	4	E
Depth	6.ft	5.5		5.5		5.5		3.5		
% HM	1.36	3.50		1.94		5.80		1.0		
% Sn in HM	4.0	5.4		2.4		0.16		0.16		
% -850 +600u Sand	20.7	12.0		10.0		10.6		10.4		
% Sn in Sand	0.055	0.189		0.047		0.0090		0.0016		

Position 11/1/2

	AA ← 4 yds →	A	4	B	4	C	4	D
Depth	7.0 ft	5.5		5.5		4.0		4.0
% HM	9.2	2.92		1.88		0.37		tr.
% Sn in HM	0.92	0.66		0.57		0.37		—
% -850 +500 u Sand	2.7	10.8		10.3		9.4		16.8
% Sn in Sand	0.004	0.019		0.011		0.001		—

Position 12/1/1

	AA ← 4 yds →	A	4	B	4	C	4	D
Depth	5.0 ft	7.0		6.0		6.0		5.0
% HM	5.80	2.16		3.4		2.06		0.87
% Sn in HM	2.0	1.5		1.7		2.7		0.62
% -850 + 500 uSand	9.5	16.4		19.0		19.0		15.7
% Sn in Sand	0.116	0.032		0.058		0.056		0.0054

Position 11/1/3

	AA ← 4 yds →	A	4	B	4	C	4	D	4	E
Depth	6.0 ft	5.5		7.0		5.5		4.5		4.0
% HM	0.76	2.60		1.80		1.44		1.09		0.47
% Sn in H M	0.18	0.43		0.26		0.16		0.28		0.17
% -850 +500 u Sand	23.3	13.5		13.2		10.4		14.8		16.3
% Sn in Sand	0.0014	0.011		0.0017		0.0023		0.0031		0.0018

Position 11/47/11 (same position as 11/1/3 above)

	AA ← 3 yds →	A	5	B	3	C	4	D	4	E
Depth		4.0		4.0		7.0		6.5		7.0
% HM		6.54		4.74		1.84		1.86		0.87
% Sn in HM		0.20		0.17		0.16		0.24		0.21
% -850 +500u Sand		11.0		9.7		11.2		11.1		11.6
% Sn in Sand		0.013		0.008		0.0029		0.0045		0.0018

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TABLE III

TRAVERSE DRILLINGS (B)

A high water table caused drilling from positions B C and D to be abandonned.

Position 22/7/2

	AA	← 4 yds →	A
Depth	5.0 ft		5.0
% HM	2.4		tr.
% Sn in HM	0.18		—
% −850 +500u in Sand	13.6		17.0
% Sn in Sand	0.0043		—

Position 22/7/1

	AA	← 4 yds →	A
Depth	5.0 ft		5.0
% HM	6.7		5.8
% Sn in HM	0.66		1.0
% −850 +500u in Sand	17.1		14.7
% Sn in Sand	0.044		0.058

Position 22/7/5

	AA	← 4 yds →	A
Depth	5.0 ft		5.0
% Hm	10.9		8.2
% Sn in HM	0.36		0.17
% −850 +500u in Sand	15.3		15.8
% Sn in Sand	0.039		0.014

Position 22/7/4

	AA	← 4 yds →	A
Depth	5.0 ft		5.0
% HM	0.5		7.0
% Sn in HM	0.76		0.22
% −850 +500u in Sand	15.1		20.9
% Sn in Sand	0.0038		0.015

Position 22/7/3

	AA	← 4 yds →	A
Depth	5.0 ft		5.0
% HM	0.4		10.4
% Sn in HM	0.41		0.46
% −850 +500u in Sand	17.3		12.8
% Sn in Sand	0.0016		0.048

SAMPLE LOG (1)

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SAMPLE NUMBER	DEPTH	DISTANCE FROM BEACH BANK
15/2/9	4.0 feet	2 yards
15/2/10	4.5 "	2 "
15/2/11	4.0 "	2 "
15/2/12	4.0 "	2 "
15/2/13	4.0 "	2 "
15/2/14	4.0 "	2 "
14/2/11	2.5 "	1 "
14/2/12	4.0 "	5 "
14/2/13	2,5 to 4 ft,	4 Feet
14/2/14	H.M. band 5" deep.	
14/2/15	The 1 ft. immediately under 14/2/14	
14/2/16	H.M. band 3" deep.	
14/2/17	Composite of sand above the 3" band	
14/2/5	1 ft. to 4 ft.	2 yards
14/2/6	4 ft. to 7.5 ft.	2 "
14/2/7	3.5.ft. to 6 ft.	10 feet
14/2/8	2.5 ft. to 3.5 ft.	10 "
14/2/10	0 to 2.5 ft.	10 "
14/2/3	0 to 2 ft.	3 "
14/2/4	2 ft to 5 ft.	3 "
14/2/9	0 to 3 ft.	10 "

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SAMPLE LOG (2)

SAMPLE NUMBER	DEPTH	DISTANCE FROM BEACH BANK
11/47/8	4 feet	4 yards
11/47/7	4 "	4 "
11/47/6	4 "	4 "
11/47/5	4 "	4 "
11/47/4	4 "	4 "
11/47/3	4 "	4 "
11/47/2	4 "	4 "
11/47/1	4 "	4 "
11/47/9	4 "	4 "
11/47/10	4 "	4 "
11/47/11 A	4 "	3 "
11/47/11 B	4 "	8 "
11/47/11 C	7 "	11 "
11/47/11 D	6.5 "	15 "
11/47/11 E	7 "	19 "
6/6/9	3 "	2 "
[illegible]	[illegible]	2
6/6/7	2 "	2 "
6/6/6	3 "	2 "
6/6/5	3 "	2 "
6/6/4	3 "	2 "
6/6/3	3 "	2 "
6/6/2	1.5 "	12 "
6/6/1	3 "	2 "

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SAMPLE LOG (3)

SAMPLE NUMBER	DEPTH	DISTANCE FROM BEACH BANK
11/1/1/ A A	6 feet	nil
11/1/1 A	5.5 "	4 yards
11/1/1 B	5.5 "	8 "
11/1/1/C	5.5 "	12 "
11/1/1 D	3.5 "	16 "
11/1/2 A A	7.0 "	nil
11/1/2 A	5.5 "	4 yards
11/1/2 B	5.5 "	8 "
11/1/2 C	4.0 "	12 "
11/1/2 D	4.0 "	16 "
12/1/1 A A	5.0 "	nil
12/1/1 A	7.0 "	4 yards
12/1/ 1 B	6.0 "	8 "
12/1/1 C	6.0 "	12 "
12/1/1 D	5.0 "	16 "
11/1/3 A A	6.0 "	nil
11/1/3 A	5.5 "	4 yards
11/1/3 B	7.0 "	8 "
11/1/3 C	5.5 "	12 "
11/1/3 D	4.5 "	16 "
11/1/3 E	4.0 "	20 "

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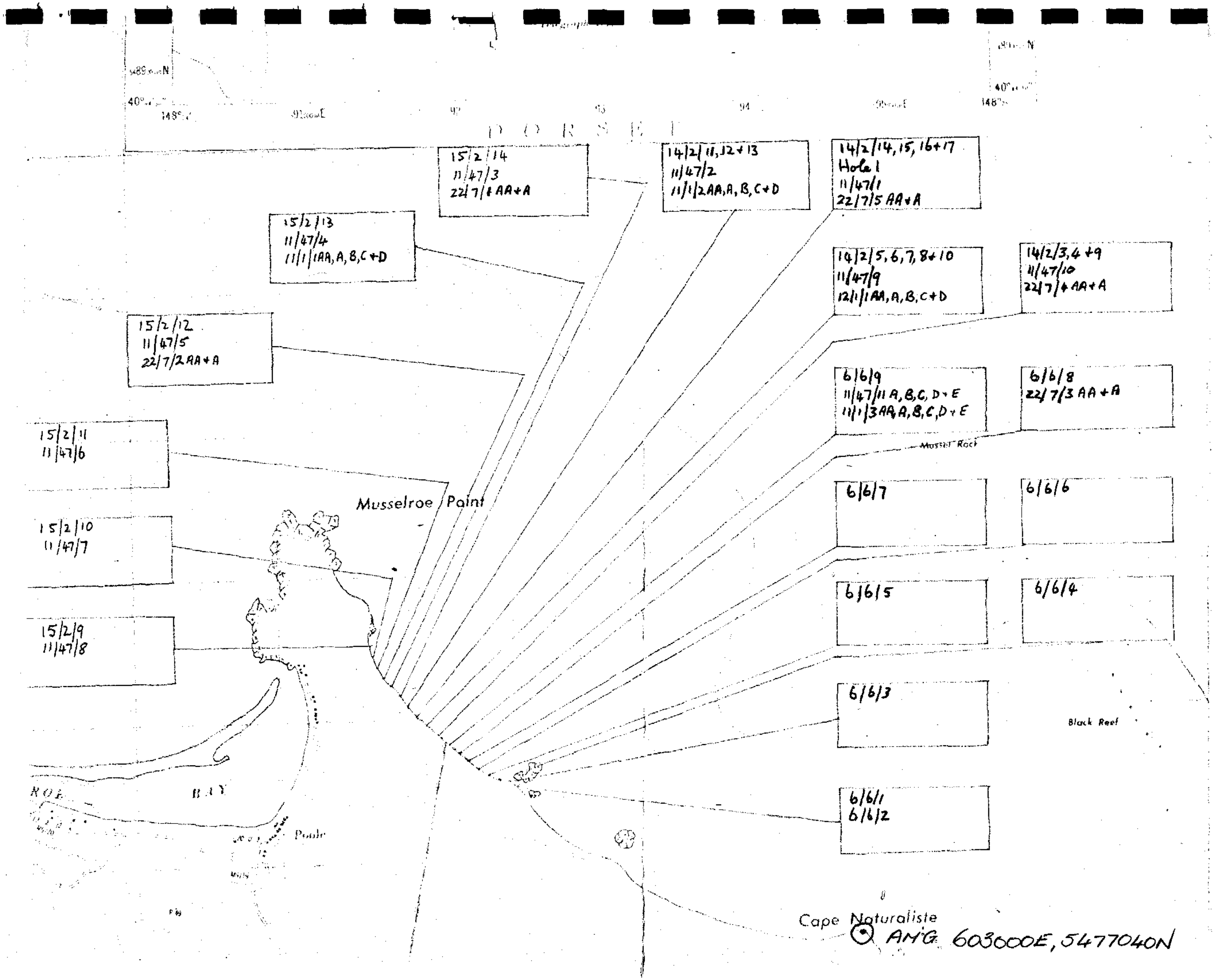
SAMPLE LOG (4)

SAMPLE NUMBER	DEPTH	DISTANCE FROM BANK
22/7/1AA	5.0 feet	NIL
22/7/1A	"	4 yards
22/7/2AA	"	NIL
22/7/2A	"	4 yards
22/7/3AA	"	NIL
22/7/3A	"	4 yards
22/7/4AA	"	NIL
22/7/4A	"	4 yards
22/7/5AA	"	NIL
22/7/5A	"	4 yards



SAMPLE POSITION CHART - APPENDIX I

AMG REFERENCE POINTS ADDED

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