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SCOUT DRILLING OF GYPSUM OCCURRENCES - HUNDRED OF HAINES

AND OTHER LOCALITIES - KANGAROO ISLAND

Report No A.B. 91

R.B. 47/150

by

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DEPARTMENT OF MINES
SOUTH AUSTRALIA

SCOUT DRILLING OF GYPSUM OCCURRENCES

HUNDRED OF HAINES & OTHER LOCALITIES - KANGAROO ISLAND

ABSTRACT:

Scout drilling undertaken by hand, on a number of salt lakes in the hundred of Haines, and isolated lakes in the hundreds of Newland and Dudley on Kangaroo Island, indicates that no gypsum occurs in these lakes. Without exception, mud and clay overlie a travertine limestone lake bottom at comparatively shallow depth.

Testing of the previously known occurrences of gypsum on Miscellaneous Lease No 466 (cancelled), an extension of the main deposit on Salt Lake, Hd. of Haines, indicates an additional reserve to those already proved of 150,000 tons but of doubtful economic value.

INTRODUCTION:

At the request of the Colonial Sugar Refining Co. Ltd drilling was undertaken on Mineral Lease No 466 (cancelled), an extension of the Salt Lake gypsum deposit in the hundred of Haines, to assess the economic significance of this occurrence, of gypsum, also scout drill holes were sunk on a number of salt pans and lakes in the vicinity of Salt Lake, to search for other possible occurrences of gypsum.

PREVIOUS REFERENCES:

"Drilling Operations - Miscellaneous Lease No 47, Hundred of Haines, Kangaroo Island" by C. M. Willington, Mining Engineer. Report No. 42/117 - 3.7.56. Recommendation was contained in this report to further investigate the gypsum occurrence in Mineral Lease No 466 (cancelled)

DRILLING OPERATIONS:

In view of the impracticability of manœuvring and operating a mobile mechanical boring plant, on the lake areas to be tested, which in most cases were overlain by 6 to 12 inches of water, soft mud and clay, hand boring methods were adopted similar to the method employed in drilling the principal gypsum deposit in 1955. Vide Report No 42/117.

Where overlying water was of sufficient depth a dinghy was used for transport of tools and equipment.

On Miscellaneous Lease No 466 (cancelled) twenty two holes in eight rows as shown on the accompanying plan No. SS-41.19 were drilled at five chain intervals to provide cross sectional information on the deposit. Borehole logs are attached as an appendix.

Analytical results of borehole samples will be attached as an appendix when available.

To test for any westerly extension of the principal gypsum deposit on Miscellaneous Lease No 47 (cancelled), a borehole was sunk in the centre of each of the four largest salt pans, as shown on the plan at the western end of this lease. Mud and clay only was encountered at depths ranging from 5'6" to 7 feet.

In addition test bore holes were sunk in the centre of the salt lakes occurring in the hundred of Haines on Sections 21, 105, 104, 13, 100, 12, 24, 122-123, 120, 129; hundred of Newland Section 35-37 and hundred of Dudley, Salt Lagoon, adjacent to Section 306.

In each of the twelve lakes tested either a limestone or clay bottom was encountered at depths ranging from two to eight feet. No indication of gypsum was found in any of the boreholes.

GYP SUM RESERVES:

A study of the borehole logs on Miscellaneous Lease No 466 (cancelled) indicates a mean thickness of two feet of gypsum from borehole row 7-8, to borehole row 21-22 at the extreme South end of the deposit. Overburden ranges from 6" to 24" of mud and a travertine limestone crust of 3" to 9" thickness over the Southern half of the deposit.

Proved width ranges from 10 to 15 chains and is probably much narrower at borehole row 11-13, where two small islands occur in the lake.

Based on a mean width of 10 chains and length of 30 chains and 2500 tons per acre foot of gypsum the deposit with a mean depth of two feet would contain 150,000 tons of gypsum.

In view of the hard limestone crust overlying the gypsum at the Southern end of the deposit and the merging of gypsum into limestone gravel at the Northern end of the deposit, contamination could be expected in mining. The comparative thinness of the gypsum deposit overlying a soft mud bottom, combined with a water drainage problem, as yet unknown would also present mining difficulties, such that the deposit on present information is of doubtful economic value.

Although drilling has not fully delineated the extent of the deposit, at least sufficient information has been revealed to show that only a comparatively small tonnage is available, insufficient to warrant further investigation whilst more attractive reserves are available in the main Salt Lake deposit.

CMW:CERF
3/12/58

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MISCELLANEOUS LEASE NO 466 (CANCELLED) - BOREHOLE LOGS

<u>Bore No.</u>	<u>Depth</u>	<u>Description</u>
1	0 - 4'6"	Limestone gravel, and mud with clay bottom.
2	0 - 6'	" " " " " "
3	0 - 2'	Water and mud
	2' - 2'6"	Unconsolidated gypsum and limestone gravel.
	2'6"	Clay bottom.
4	0 - 2'	Water and mud.
	2' - 4'	Unconsolidated gypsum and limestone gravel.
	4'	Clay bottom.
5	0 - 2'	Water and mud.
	2' - 4'	Unconsolidated gypsum and limestone gravel.
	4'	Clay bottom.
6	0 - 2'6"	Water and mud.
	2'6" - 3'0"	Unconsolidated gypsum.
	3'0"	Clay bottom.
7	0 - 2'	Mud and water
	2' - 4'	Unconsolidated gypsum and limestone gravel.
	4' - 6'6"	<u>Consolidated rock gypsum.</u>
	6'6"	Clay bottom.
8	0 - 1'9"	Mud and water
	1'9" - 3'3"	Unconsolidated gypsum and limestone gravel.
	3'3" - 5'9"	Unconsolidated gypsum.
	5'9"	Clay bottom.
9	0 - 1'6"	Mud and water
	1'6" - 3'6"	Unconsolidated gypsum and limestone gravel.
	3'6" - 4'6"	Soft dirty gypsum.
	4'6"	Limestone bottom.

<u>Bore No</u>	<u>Depth</u>	<u>Description</u>
10	0 - 1'6"	Mud and water
	1'6" - 2'6"	Unconsolidated gypsum and limestone gravel.
	2'6" - 5'6"	Soft unconsolidated gypsum.
11	0 - 1'	Water
	1' - 6'	Mud and clay.
12	0 - 6"	Water
	6" - 1'6"	Mud.
	1'6" - 1'9"	Hard limestone crust.
	1'9" - 3'9"	<u>Consolidated rock gypsum</u>
	3'9" - 6'9"	Soft unconsolidated gypsum.
	6'9"	Limestone bottom.
13	0 - 2'	Water and mud.
	2' - 6'	Clay.
	6'	Limestone bottom.
14	0 - 1'	Water
	1' - 4'6"	Mud and clay.
	4'6"	Clay bottom.
15	0 - 6"	Water
	6" - 12"	Mud
	12" - 1'6"	Hard limestone crust.
	1'6" - 5'0"	<u>Consolidated rock gypsum.</u>
	5'0"	Clay.
16	0 - 9"	Water
	9" - 1'9"	Mud
	1'9" - 2'0"	Hard limestone crust.
	2'0" - 5'6"	<u>Some consolidated gypsum</u>
	5'6"	Limestone bottom.

<u>Bore No.</u>	<u>Depth</u>	<u>Description</u>
17	0 - 6"	Water
	6" - 12"	Mud
	1' - 1'9"	Hard limestone crust.
	1'9" - 2'9"	<u>Hard consolidated gypsum.</u>
	2'9" - 4'9"	Soft unconsolidated gypsum.
	4'9"	Hard gypsum, unable to drill as hole collapsed below casing.
18	0 - 3"	Water
	3" - 9"	Mud
	9" - 1'3"	Hard limestone crust.
	1'3" - 3'3"	<u>Consolidated rock gypsum</u>
	3'3" - 3'9"	Soft unconsolidated gypsum.
	3'9"	Rock gypsum unable to drill as hole collapsed below casing.
19	0 - 9"	Water
	9" - 1'3"	Mud
	1'3" - 1'6"	Hard limestone crust.
	1'6" - 2'6"	<u>Consolidated rock gypsum.</u>
	2'6" - 3'9"	Unconsolidated gypsum.
	3'9" - 4'3"	Rock gypsum unable to penetrate as hole collapsed below casing.
20	0 - 6"	Mud
	6" - 12"	Hard limestone crust.
	1' - 3'	<u>Consolidated rock gypsum.</u>
	3' - 4'	Soft unconsolidated gypsum - collapsing of hole below casing.
21	0 - 12"	Water
	1' - 2'	Mud
	2' - 3'	Soft unconsolidated gypsum.
	3' - 5'	<u>Consolidated rock gypsum.</u>
	5'	Unconsolidated soft gypsum collapsed below bore casing.

<u>Bore No.</u>	<u>Depth</u>	<u>Description</u>
22	0 - 6"	Water
	6" - 1'6"	Mud
	1'6" - 2'0"	Unconsolidated gypsum.
	2'0"	Clay bottom.

Appendix to report No. AB.91 - RE.47/150.

Analytical results furnished by the Research and Development Branch on gypsum sample, submitted are as follows:-

<u>Mark.</u>	<u>Borehole</u>	<u>Gypsum</u> ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$)	<u>Calcium Carbonate</u> (CaCO_3)
A1473/58	7	88.2 %	9.80 %
A1474/58	8	73.5	19.3
A1475/58	9	75.0	18.4
A1476/58	10	71.7	17.7
A1477/58	12	75.0	20.9
A1478/58	15	87.7	10.5
A1479/58	16	86.3	11.8
A1480/58	17	61.1	33.3
A1481/58	18	87.5	10.8
A1482/58	19	95.4	3.62
A1483/58	20	94.4	4.59
A1484/58	21	79.3	17.7

Locality: From bores on cancelled lease 466, 22 miles from
Kingscote, K.I. Hundred Haines.

Source: C.M. Willington, Mines Department.

23/12/58.