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REPORT NO. 1947/57

Plans 1476-87

Preliminary Report on the Bauxite Deposits
near the Township of Ouse, Tasmania.

by

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Geologists.

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DEPARTMENT OF SUPPLY & SHIPPING

Bureau of Mineral Resources, Geology and Geophysics.

PRELIMINARY REPORT ON THE BAUXITE DEPOSITS NEAR THE
TOWNSHIP OF OUSE, TASMANIA.

Report No. 1947/57

Plans 1476 - 1487

INTRODUCTION.

The known bauxite deposits near the township of Ouse are No. 1 on Glen Dhu Estate, Nos. 2, 3, 4 and 5 on Gladfield Estate, Nos. 6, 7, 8, and 9 on Leintwardine Estate, Nos. 10, 11, 12, 13 and 14 on Lachlan Vale Estate, and No. 15 on Lawrenny Estate. The deposits are disconnected and form an irregular line from the principal deposit No. 2, $3\frac{1}{4}$ miles north-west from the township, to No. 15 about $1\frac{1}{2}$ miles south-west from the township. The localities of the deposits are shown on the plan of the area (Plate 1.) Examination of all the occurrences and testing of the more promising by shaft-sinking and boring has shown that Nos. 2, 6, 8, 9, 10, 11 and 12, contain useful quantities of bauxite. The remaining deposits are in an advanced state of erosion, and consist mainly of boulders or somewhat larger separated masses of bauxite.

Sampling.

The deposits were sampled from bores and shafts sited in general at 100 ft. intervals on a square grid. The positions of the bores and shafts are shown on the plans accompanying this report.

Shafts.

Channel samples were cut to a depth of about 1 inch, weighing approximately 1 lb. per foot.

Bores.

The method of percussion boring was adopted, using a heavy sinker-bar and a 5 inch diameter drive pump with a clack valve. Water was used in the quantities required to facilitate boring e.g. in clayey overburden, of the order of 1 gallon per foot of boring. When the top of the bauxite was reached the borehole was cased down to it and cleaned out carefully to avoid contaminating the first sample with overburden. Comparison of the top samples of boreholes and shafts indicates that contamination was negligible. Samples were received from bores in a wet or slurried condition. These were dried in iron pans over wood fires and reduced by quartering to a convenient size.

Determination of Composition and Grade.

The samples were analysed at the Tasmanian Mines Department Laboratory, Launceston, to determine ignition loss, total alumina^x, ferric oxide, titania, and insoluble material (which closely approximates total silica). The figures obtained enabled a comparison of the Ouse bauxite with bauxite in other parts of Australia for which similar data are available.

X.

Extracted with hot sulphuric acid evaporated to fumes of SO₃.

To assess its suitability for the production of aluminium, each of the bauxite samples, excepting those obviously too low in grade, was tested in the Laboratory of the Australian Aluminium Production Commission, Hobart, by a process similar to the Bayer Process for extracting alumina, i.e. each sample was subjected to pressure digestion with sodium hydroxide and sodium carbonate to determine the quantity of alumina extracted by this method, XX and also the loss of soda during the application of the method.

The curve of Plate 10, prepared by the Commission, gives the available alumina - soda loss limits imposed on economic grounds on bauxite which is intended for the production of aluminium. Hereafter in these notes, bauxite which equals or surpasses in grade the limiting values given by the curve of Plate 10 will be termed "metallurgical bauxite" or simply "ore".

Tonnage and Compositions of the Bauxite, and Soda-losses during the Extraction of the Alumina by Caustic Soda.

Three calculations of tonnages and compositions have been made:-
(a) rejecting all bauxite with total-alumina content below 35 per cent
(b) rejecting bauxite in any bore or shaft which would reduce the average total-alumina content for that bore or shaft below 40 per cent;
(c) rejecting bauxite in any bore or shaft which would reduce the average grade for that bore or shaft below metallurgical grade. The results for all of the deposits are summarized in Table 1, and details for the separate deposits are given in tables 3, 5, 6, 7, 8, 9, and 11. Tonnages were estimated by assuming that the bauxite in situ weighs 1.6 tons per cubic yard. This figure was determined by the Tasmanian Mines Department.

The grade of bauxite sampled was frequently well above the lower limit for metallurgical grade, as defined by the curve of Plate 10. In consequence, the quantities of ore for which details of tonnages, compositions, average thicknesses and soda-losses are given in (c) of the above mentioned tables, have soda-losses considerably below the permissible maxima. This will provide a margin of tolerance in working the deposits, in that reasonable quantities of lower grade bauxite accidentally taken out with the ore will not reduce its grade below economic limits.

Overburden.

The thickness of overburden encountered in each bore or shaft is indicated on the plans accompanying this report. The deposits north of No. 9 are largely exposed over their western portions, but in an easterly direction, pass beneath a shallow depth of Tertiary clay with concretionary ironstone boulders and, uncommonly, thin seams of lignite. The deposits south of No. 9 outcrop strongly but pass in an easterly direction under a rapidly increasing thickness of Tertiary clay with concretionary ironstone boulders, sand, sandy clay, and occasional thin lenses of lignite.

Deposit No. 2.

(1) The Ore Bodies. A plan of deposit No. 2 is given in Plate 2, and sections in Plate 3. A plan of the orebody is given in plate 11. It is seen that the deposit comprises a Northern Block having sensibly straight boundaries trending roughly north-westerly and north-easterly; two smaller central blocks, the North Central and the South Central, divided from the Northern Block and from one another by constrictions of the deposit; a detached Southern Body approximately 100 feet south-east from the South-Central Block; and a small detached Western Body approximately 50 feet from the south-western boundary of the Northern Block. The cross-sections and the isopachs on the plans show that each body of bauxite is roughly lenticular. The average thickness is 9 feet and the maximum thickness 18 feet.

In Sections 00, 200E and 400E it is evident that the South-Central Block is down-faulted relative to the North-Central Block, while

XX. Alumina extracted by caustic soda is often termed "free alumina." In this report the alumina extracted by pressure digestion will be referred to as "available" alumina.

TABLE 1.

BAUXITE DEPOSITS NEAR THE TOWNSHIP OF OUSE, TASMANIA.

Tonnages, Compositions, Average Thicknesses, Soda Losses.

Deposit No.	Composition (Dry)						Thick- ness ft.	Tons (insitu)	Soda-loss, swt. ton Al_2O_3		
									Actual	Permissible	
	(a) Including only a continuous thickness of bauxite with a minimum grade, in any section, of 35 per cent total-alumina.										
	(b) Including only a continuous thickness of bauxite having an average grade of not less than 40 per cent total alumina.										
	(c) Including only a continuous thickness of bauxite having an average grade not lower than metallurgical grade.										
	Insol. per cent.	Al_2O_3 total (1) per cent.	Al_2O_3 avail. (2) per cent.	Fe_2O_3 per cent.	TiO_2 per cent.	Ignit. loss per cent.					
2	(a)	6.14	40.99		27.54	2.29	22.20	7.42	483,851		
	(b)	5.46	42.60		25.94	2.31	23.01	7.25	339,702		
	(c)	4.58	41.61	37.78	29.01	2.30	23.11	7.69	366,000 (3)	1.00	1.81
6	(a)	9.68	39.3		26.38	2.12	22.61	4.37	10,408		
	(b)	6.9	43.8		22.46	2.16	24.9	3.0	3,555		
	(c)	5.82	42.07	37.42	25.24	2.11	24.72	3.17	5,630	1.16	1.92
8	(a)	10.74	40.23		25.97	2.13	21.03	6.29	48,444		
	(b)	9.84	43.39		23.55	1.96	21.98	5.43	22,518		
	(c)	6.7	39.1	34.96	29.43	2.07	22.63	3.5	4,148	1.47	1.64
9	(a)	10.25	37.6		29.7	2.1	20.3	4.08	14,506		
	(b)	5.6	41.2		26.7	1.9	24.5	2.0	1,185		
	(c)	5.17	38.14	36.49	30.34	2.0	22.6	3.5	4,150	1.06	1.74
10	(a)	5.6	42.52		25.67	2.47	23.57	6.5	11,555		
	(b)	5.43	43.23		24.92	2.49	23.67	8.25	9,778		
	(c)	5.44	43.23	37.85	24.92	2.49	23.68	8.25	9,778 (3)	1.23	1.83
11	(a)	5.6	40.4		28.65	2.13	22.39	9.1	68,755		
	(b)	5.25	41.46		27.87	2.09	22.34	9.8	52,266		
	(c)	4.88	40.64	36.57	28.84	2.14	22.92	12.0	64,000	1.04	1.75
12	(a)	6.11	38.65		30.19	2.16	22.30	8.99	149,184		
	(b)	5.04	41.13		28.15	2.08	23.30	7.77	50,677		
	(c)	4.67	39.34	35.83	30.37	2.17	22.97	9.38	105,511	1.00	1.70
Aggregate	(a)	6.11	38.65		30.19	2.18	21.99	8.99	786,703		
	(b)	5.04	41.13		28.15	2.19	22.43	7.77	479,681		
	(c)	4.67	40.98	37.16	29.10	2.25	23.15	8.14	559,217	1.01	1.78

(1) Extracted with sulphuric acid.

(2) Extracted with caustic soda.

(3) Footnotes appended to Table (3) and (8) give additional tonnages of ore in Deposits Nos. 2 and 10, for which the available alumina and the soda-loss have not been determined. The total quantity is 19,111 tons.

section A-A suggests that the South Central Block is down-faulted relative to the Southern Body. It is probable that a minor fault occurs between each of the adjacent blocks which make up Deposit No. 2 and also between the main portion of the Southern Body and its small south-eastern extension. These supposed faults are indicated by abrupt changes in the dip and often the thickness of the bauxite body. Mining operations may reveal actual displacements and separation of the bauxite instead of the flexures shown in the sections.

Much of the bauxite is exposed at the surface or covered by thin red clayey soil containing fragments of bauxite. Weathering has opened the joints of the outcropping bauxite with the result that in places the surface to a depth of one or two feet consists of bauxite boulders embedded in red or brown clay which constitutes from 10 to 50 per cent of the upper layer. Over the north-eastern portions of the South Central and Southern Blocks the bauxite passes under Tertiary sediments consisting almost wholly of clay with concretionary ironstone boulders.

The principal dimensions of the ore-bodies are given in Table 2, and the tonnages and compositions with average thicknesses in Table 3. The Northern Block is lenticular in shape with an average dip of 6 degrees in the direction 10 degrees south of east (true). The surface of the bauxite is approximately parallel to the topographical surface and for the greater part of the area, the "solid" bauxite is less than 4 feet below the topographical surface. The North-Central Block is continuous with the Northern body of bauxite and may be considered to be a portion of it. However along a line passing nearly through Shaft 26 (1000S/300W) and Bore 27 (00/100E) the ore-body becomes narrower and thinner, while south of this line the average dip changes to 8 degrees in a direction 20 degrees south of east. Like the Northern Block, the North Central Block has only a very shallow overburden.

The South-Central Block, is partly separated from the North Central Block by a constriction of the deposit and also by a change in the average dip to $8\frac{1}{2}$ degrees in a direction $6\frac{1}{2}$ degrees south of east. The overburden near the northern extremity of the South-Central Block has a maximum thickness of about 25 feet, but elsewhere is little heavier than on the Northern and North-Central Blocks.

The Southern Body is somewhat triangular in shape, with sensibly straight boundaries. The average dip is 7 degrees in the direction 6 degrees north of east, except for the small southern extension of the body, where the dip is $7\frac{1}{2}$ degrees in the direction 25 degrees south of east.

Near the north-eastern extremity the Southern Body has a dip of 12 degrees in the direction $8\frac{1}{2}$ degrees north of east, and hence, in a north-easterly direction passes under heavy over-burden. The boundaries of the deposit have not been exposed in this direction, but the plan indicates that they are probably only 100 to 200 feet distant from the most northerly bores.

The Western Body is unimportant both in quantity and grade of bauxite.

TABLE 2.

Bauxite Deposit Ouse No.2

Dimensions.

Bauxite Body	Length maximum. ft.	Width maximum. ft.	Direction of maximum length width		Thickness	
					Max. ft.	Aver. ft.
Northern Block	1,150	650	W-E	S-N	17	7.8
North-Central Block	650	300	N-E	S-E	11.5	6.0
South-Central Block	750	430	N-E	S-E	17	8.0
Southern Body	650	500	W-E	S-N	11	5.0
Western Body	600	170	ENE	NNW	6.25	3.3

- (ii) Tonnages, Compositions, and Soda-losses. The tonnages and compositions with average thicknesses of the bauxite in each of the blocks of Deposit No. 2, and aggregate figures for the whole deposit, are given in Table 3. Figures are given for soda-losses in section (c) of Table 3. Reference to the plan shows that 165 boreholes and shafts were available for sampling the bauxite. Samples were taken from 119 of these. The figures given in (c) Table 3 are based on the results of analyses of these samples. The figures given in (a) and (b) of Table 3 incorporate the results of the analyses of samples from shafts, 1, 74, 75, and 77, which were sunk by the Tasmanian Mines Department during 1941 but filled before the present investigation commenced.

Deposit No. 6

- (i) The Ore Body. A plan of Deposit No. 6 is given in Plate 4 and a section in Plate 5. A plan of the ore-body is included in plate 12. The dimensions of the deposit are given in Table 4. Because of the presence of boulders and detrital blocks embedded in clay, the deposit appears in the field to extend about 500 feet further easterly than the isopachs on the plan indicate. Deposit No. 6 is somewhat lenticular in shape and has a dip of 6 degrees in the direction 45 degrees south of east (true). The overburden has a maximum thickness of 4.5 feet, but in general is less than 3 feet.

TABLE 3.

BAUXITE DEPOSIT OUSE NUMBER 2.

Tonnages, Compositions, Average Thicknesses.

Soda-losses.

Bauxite Body	Composition (Dry)						Tons	Thickness feet.	Soda-loss	
							(in situ)		cwt/ton of Al ₂ O ₃	
(a)	Including only a continuous thickness of bauxite with a minimum grade, in any section, of 35 per cent total-alumina.									
(b)	Including only a continuous thickness of bauxite having an average grade of not less than 40 per cent total alumina.								Actual	Permissible.
(c)	Including only a continuous thickness of bauxite having an average grade not lower than metallurgical grade.									
	Al ₂ O ₃ total %(1)	Al ₂ O ₃ avail. %(2)	Insol. %	Fe ₂ O ₃ %	TiO ₂ %	Ignition loss %				
Northern Block (3)										
(a)	41.56		6.60	26.97	2.25	22.39	218,222	9.0		
(b)	42.87		5.85	26.08	2.27	22.52	170,074	8.2		
(c)	41.68	38.14	4.48	27.41	2.25	23.12	161,259 (4)	8.89	0.97	1.85
North-Central Block (3)										
(a)	39.9		7.16	27.86	2.24	22.19	60,296	6.66		
(b)	42.41		4.35	27.00	2.22	23.20	32,000	6.75		
(c)	41.41	37.59	3.99	28.57	2.22	22.92	36,148	6.10	0.96	1.81
South- Central Block										
(a)	40.95		4.86	27.61	2.23	23.89	121,333	7.57		
(b)	42.22		4.88	25.77	2.34	24.03	87,555	9.23		
(c)	41.39	38.12	4.36	27.61	2.36	23.81	88,000	9.28	1.02	1.85
Southern Body										
(a)	40.49		6.02	28.85	2.38	22.43	66,578	5.34		
(b)	42.39		5.60	25.39	2.45	22.77	43,110	4.55		
(c)	42.06	37.57	5.47	28.33	2.43	22.62	58,963	5.85	1.05	1.81
Western Body										
(a)	39.90		6.45	28.16	2.21	23.07	17,482	3.69		
(b)	43.2		7.63	22.73	2.18	24.17	6,963	2.94		
(c)	40.59	36.78	4.90	28.34	2.10	23.77	9,630	4.06	1.10	1.76
Aggregate for Deposit No.2										
(a)	40.99		6.14	27.54	2.29	22.74	483,851	7.42		
(b)	42.60		5.46	25.94	2.31	23.01	339,702	7.25		
	41.61	37.78	4.58	29.01	2.30	23.11	366,00	7.69	1.00	1.81

(1) Extracted with sulphuric acid.

(2) Extracted with caustic soda.

(3) To the above tonnages for (c) may be added 4741 tons of bauxite intersected in shaft 68 (Northern Block) and 8,444 tons of bauxite intersected in shafts 74 and 77 (North-Central Block). The percentages of total alumina and insoluble material are 44.47 and 2.53:42.15 and 2.91 respectively. These shafts were sunk and sampled by the Tasmanina Mines Department during 1941, but filled before the present investigation commenced. In consequence the available alumina and the soda-loss have not been determined.

(4) The assay results for Bore 15 have been used in calculating tonnages only.

TABLE 4.
BAUXITE DEPOSITS, COUSE NOS. 6, 8, and 9.
DIMENSIONS.

Bauxite Body	Maximum		Direction of maximum.		Thickness	
	Length ft.	Width ft.	length	width	maximum ft.	average ft.
Deposit No. 6	500	200	NE	NW	6.5	3.5
Deposit No. 8						
Northern Block	450	150	ENE	SSE	9.0	5.0
Southern Block	500	230	ENE	SSE	9.0	4.6
Western Body	200	100	ENE	SSE	5.0	3.1
Deposit No. 9	400	350	S-N	W-E	7.0	4.4

(ii) Tonnage, Composition and Soda-loss.

Figures of tonnages, compositions, soda-loss and average thickness of bauxite in Deposit No. 6 are given in Table 5. Of a total of 18 boreholes and shafts sunk on or around the deposit, 8 passed through bauxite. Samples were taken from 5 of these, and the figures of Table 5 were calculated from the results of analyses of the samples.

Deposit No. 8.

- (i) The Ore Body. A plan of Deposit No. 8 is given in Plate 4 and sections in Plate 5. A plan of the orebody is included in Plate 12. The deposit consists of a Northern Block and a Southern Block, each roughly oval-shaped and elongated, and an unimportant oval-shaped Western Body. Each Body of bauxite has somewhat the appearance of a thin lens distorted by undulations of the upper and lower surfaces. The principal dimensions are given in Table 4.

It can be seen on the plan that data for determining the attitude of the Northern Block can be obtained only from the 100N grid-line and Bore 4 on the 00 line. The sections 400E and 200E suggest that either (a) the Northern and Southern Blocks constitute a deposit which is continuous but thin along the 00 (W-E) line, or (b) the 00 line is parallel to a nearby fault or warp.

Assuming that (a) is true, the Northern Block has an average dip of $5\frac{1}{2}$ degrees in the direction 051 degrees (M). Assuming that (b) is true, sections 400E and A-A suggest that the bauxite in Bore 4 is continuous with the bauxite in the Southern Block, and cannot be regarded as a portion of the Northern Block. If this is so, the attitude of the Northern Block cannot be determined in the absence of another bore or shaft away from the 100N line.

The Southern Block has a dip of 5 degrees in the direction 23 degrees south of east (true).

The overburden increases from 2 feet and 1 foot at the Western ends of the Northern and the Southern Blocks to 8 feet and 5 feet respectively at the eastern ends of these blocks.

TABLE 5.

Bauxite Deposit Ouse No. 6.Tonnages, Compositions, Average Thicknesses,
Soda-loss.

COMPOSITION (Dry)						Tons (in situ)	Thickness average (feet)	Soda-loss cwt/ton Al ₂ O ₃	
								Actual	Perm- issible
(a) Including only a continuous thickness of bauxite with a minimum grade, in any section, of 35 per cent total-alumina.									
(b) Including only a continuous thickness of bauxite having an average grade of not less than 40 per cent total alumina.									
(c) Including only a continuous thickness of bauxite having an average grade not lower than metallurgical grade.									
Al ₂ O ₃ total (1)	Al ₂ O ₃ avail (2)	Insol. %	Fe ₂ O ₃ %	TiO ₂ %	Ignition loss %				
(a) 39.3		9.68	26.38	2.12	22.61	10,408	4.37		
(b) 43.8		6.9	22.46	2.16	24.9	3,555	3.0		
(c) 42.07	37.42	5.82	25.24	2.11	24.72	5,630	3.17	1.16	1.92

(1) Extracted with sulphuric acid.

(2) Extracted with caustic soda.

(ii) Tonnages, Compositions and Soda-loss. Figures of tonnages, composition, soda-losses, and average thicknesses of bauxite in Deposit No. 8 are given in Table 6. Of a total of 28 bores and shafts sunk on or around the deposit, 17 passed through bauxite from which samples were taken. The figures of Table 6 were calculated from the results of analyses of these samples and the recorded results of analyses of samples from shaft 6, (0808/2307) which was sunk and sampled by the Tasmanian Mines Department during 1941.

Deposit No. 9 is a small body of bauxite somewhat circular in outcrop, dipping at 7 degrees in a north-westerly direction. A plan of the deposit is given in Plate 6, a section in Plate 7, and a plan of the orebody in Plate 12. The principal dimensions are stated in Table 4 and figures of tonnages, compositions, thicknesses and soda-loss in Table 7. The overburden has a maximum thickness of 4 feet but over most of the deposit is less than 3 feet.

Deposits Nos. 10 and 11. These deposits appear to form a single body of bauxite, but they may be separated by a fault. This appears probable in the section in Plate 7.

Deposit No. 10

(i) The Ore Body. Deposit No. 10 appears in plan (Plate 6) to be a narrow north-northwesterly trending body, curving around towards the west near its northern end. The maximum length is 500 feet and the maximum width 125 feet. In section (Plate 7) the deposit is wedge-shaped with a maximum thickness of 14 feet near the outcrop. The main body of the deposit dips at an angle of 8 degrees towards the east-north-east (365°). The northern portion, indicated by the northerly curve of the outcrop, has a dip of 12 degrees in the direction 20 degrees east of north. Away from the outcrop, in the direction of dip, the ore body thins rapidly, while the thickness of the overburden rapidly increases, so that the economic limit of the deposit is reached in little more than 100 feet. A plan of the ore body in Deposit No. 10 is given in Plate 12.

Section A-A suggests that bauxite may occur between the northern end of deposit No. 10 and the small outcrop in the creek-bed 350 to 400 feet towards the north-west. The area of any such possible body of bauxite can only be small. Hence, in view of the thinning of Deposit No. 10 as this area is approached, and the decrease in grade, no appreciable tonnage, if any, of metallurgical bauxite could be expected.

(ii) Tonnages, Compositions and Soda-loss. Details of the tonnages and compositions of the bauxite in Deposit No. 10, together with a figure for soda-loss, are given in Table 8. Of 6 bore-holes and 2 shafts sunk on or around the deposit, 4 boreholes and 1 shaft passed through bauxite. The figures of composition and tonnage in Table 8 are based on the results of analyses of samples from 4 bores. The figure given for maximum thickness of bauxite was obtained from the records of shaft 100 which was sunk by the Tasmanian Mines Department but filled in before the present investigation was undertaken. As most of the bores were near the eastern edge of the deposit, where the bauxite body is thin, the tonnages given in Table 8 are somewhat low. Thus, as in footnote (3) of Table 8, a further 5926 tons of metallurgical bauxite is indicated in shaft 100, and probably a similar tonnage could be mined in a northerly direction from shaft 100, between the edge of the outcrop and the section-line BB.

Deposit No. 11

(i) The Ore Body. Deposit No. 11 is shown in plan (Plate 6) and section (Plate 7) to comprise a tabular ore body which dips at an angle of 11 degrees in the direction 13 degrees south of east (M) and thins somewhat towards the eastern boundary. The deposit has a maximum thickness of 19 feet, a maximum length of 600 feet in a direction parallel to the outcrop, and a maximum width of 250 feet at right angles to the outcrop.

TABLE 6.

BAUXITE DEPOSIT OUSE NO. 8.

Tonnages, Compositions, Average Thicknesses
Soda-losses.

Bauxite Body	Composition (Dry)						Tons (in situ)	thickness average ft.	Soda-loss Cwt/ton Al_2O_3	
									Actual	Permiss- ible
(a)	Including only a continuous thickness of bauxite with a minimum grade, in any section, of 35 per cent total-alumina.									
(b)	Including only a continuous thickness of bauxite having an average grade of not less than 40 per cent total alumina.									
(c)	Including only a continuous thickness of bauxite having an average grade not lower than metallurgical grade.									
	Al_2O_3 (1) total %	Al_2O_3 (2) avail. %	Insoluble %	Fe_2O_3 %	TiO_2 %	Ignition loss %				
Northern Block										
(a)	38.58		11.21	26.93	2.17	20.81	20,445	8.63		
(b)	41.5		11.1	23.0	1.95	21.4	4,741	8.0		
(c)	38.4	33.7	7.1	32.0	2.3	20.8	1,778	3.0	1.31	1.55
Southern Block										
(a)	41.84		10.74	24.38	2.11	21.16	26,222	5.53		
(b)	43.89		9.5	23.70	1.96	22.15	17,777	5.00		
(c)	40.0	35.9	6.4	27.5	1.9	24.0	2,370	4.0	1.59	1.70
Western Body										
(a)	35.5	-	5.2	35.4	2.0	22.1	1,777	3.0		
(b)	-	-	-	-	-	-	-	-		
(c)	-	-	-	-	-	-	-	-		
Aggregate for No. 8 Deposit										
(a)	40.23	-	10.74	25.97	2.13	21.03	48,444	6.29		
(b)	43.39	-	9.84	23.55	1.96	21.98	22,518	5.43		
(c)	39.31	34.96	6.7	29.43	2.07	22.63	4,148	3.5	1.47	1.64

(1) Extracted with sulphuric acid.

(2) Extracted with caustic soda.

TABLE 7.

BAUXITE DEPOSIT - OUSE No. 9

TONNAGES, COMPOSITIONS, AVERAGE THICKNESSES,

SODA-LOSS

		COMPOSITION (Dry)						Tons (in situ)	Thickness average ft.	Soda-loss cwt/ton Al ₂ O ₃	
-11-	(a)	Including only a continuous thickness of bauxite with a minimum grade, in any section, of 35 per cent total-alumina.								Actual	Permiss- ible
	(b)	Including only a continuous thickness of bauxite having an average grade of not less than 40 per cent total alumina.									
	(c)	Including only a continuous thickness of bauxite having an average grade not lower than metallurgical grade.									
		Insol. %	Al ₂ O ₃ (1) total %	Al ₂ O ₃ (2) avail. %	Fe ₂ O ₃ %	TiO ₂ %	Ignition loss %				
	(a)	10.25	37.6		29.7	2.1	20.3	14,506	4.08		
	(b)	5.6	41.2		26.7	1.9	24.5	1,185	2.0		
	(c)	5.17	38.14	36.49	30.34	2.0	22.6	4,150	3.5	1.06	1.74

The thickness of the overburden increases rapidly in the direction of dip to more than 50 feet near the eastern edge of the deposit.

(ii) Tonnages, Compositions and Soda-loss. Details of the tonnages, compositions, and average thicknesses of the bauxite in Deposit No. 11, with a Figure for soda-loss, are given in Table 9. A total of 12 bores and 4 shafts were sunk on or around the deposit during the present investigation. Of these, 10 bores and 3 shafts passed through bauxite, which was sampled. Shaft 102, sunk by the Tasmanian Mines Department during 1941, was also sampled. The figures of Table 9 are based on the results of analyses of these samples.

Deposit No. 12.

(i) The Ore Bodies. Deposit No. 12 is shown in plan in Plate 8 and in section in Plate 9. The ore body comprises a Northern Block, a North Central Block, a South Central Block and a Southern Block, divided from one another by constriction and thinning of the deposit. The dimensions of the bauxite body are given in Table 10.

In passing from one block to another, a change takes place in the level and the attitude of the ore body, suggesting displacement of the blocks by faulting. The ore body dips in general towards the north-east, and in an easterly direction passes under heavy overburden. The overburden consists largely of clays with concretionary ironstone boulders, sand and sandy clay, with thin lenses of lignite in some of the deeper portions towards the north-east.

The Northern Block. is tabular, but thins out towards the junction with the North-Central Block. The dip is 10 degrees in the direction 056 degrees magnetic. The ore body outcrops strongly along its Western edge. A limit to the exploration of the deposit in an easterly direction was imposed by the thickness of the overburden. Hence the eastern edge of the ore body in the Northern Block has not been revealed.

The North-Central Block is tabular and dips at an angle of 16 degrees in the direction 040 degrees magnetic. In section, the North-Central Block appears to have been displaced downward in relation to the Northern Block, the displacement near the junction of the two blocks being of the order of 15 or 20 feet. The North-Central Body outcrops strongly at its western edge, and the eastern boundary has been approximately defined by Bores 4 and 11.

The South-Central Block in its attitude and its tabular shape resembles the North-Central Block, relative to which it appears to be displaced upwards from 7 to 20 feet. The South-Central Block is completely covered by overburden, which has a minimum thickness of 2 feet near the western edge of the bauxite body, near shaft A. As in the case of the Northern Block, the eastern edge of the ore body has not been revealed, because of excessive overburden. The dip is 14 degrees in the direction 052 degrees magnetic.

The Southern Block of Deposit No. 12 consists of a tabular ore body with a dip of 20 degrees in the direction 046 degrees magnetic. The deposit outcrops along a portion of its south-western edge. In Bore 34, near the southern extremity of the ore body, the bauxite occurs 13 feet lower than would be expected with the dip and strike given above. This may be due to a change of dip near the southern extremity or else to down-faulting of the deposit in this area.

Because of the comparatively steep dip of the deposit, and the sharp rise of the topographic surface along the direction of dip, the thickness of the overburden confined boring and shafting to a strip less than 100 feet from the western edge of the deposit. Insufficient data was obtained to enable a reliable determination of the shape and the attitude of the deposit, and hence the dip given above may be inaccurate.

TABLE 8.

BAUXITE DEPOSIT - OUSE NO. 10.

TONNAGES, COMPOSITIONS, AVERAGE THICKNESSES.

SODA-LOSS

Composition (Dry)							Tons (in situ)	Thickness average feet	Soda Loss cwt/ton of Al ₂ O ₃	
									Actual	Permissible
(a)	Including only a continuous thickness of bauxite with a minimum grade, in any section, of 35 per cent total-alumina.									
(b)	Including only a continuous thickness of bauxite having an average grade of not less than 40 per cent total alumina.									
(c)	Including only a continuous thickness of bauxite having an average grade not lower than metallurgical grade.									
	Insol.	Al ₂ O ₃ (1) total	Al ₂ O ₃ (2) avail.	Fe ₂ O ₃	TiO ₂	Ignition loss				
	%	%	%	%	%	%				
(3? (a)	5.6	42.52		25.67	2.47	23.57	11,555	6.5		
(b)	5.43	43.23		24.92	2.49	23.67	9,778	8.25		
(3) (c)	5.44	43.23	37.85	24.92	2.49	23.68	9,778	8.25	1.23	1.83

(1) Extracted with sulphuric acid.

(2) Extracted with caustic soda.

(3) To these tonnages may be added 5,926 tons of bauxite, intersected in shaft 100, having percentages of total alumina and insoluble material equal to 37.95 and 2.1 respectively. This shaft was sunk and sampled by the Tasmanian Mines Department during 1941, but the figure of available alumina and soda-loss were not determined. See also the above paragraph "Tonnages and Compositions".

TABLE 9.

BAUXITE DEPOSIT - OUSE No. 11.

TONNAGES, COMPOSITIONS, AVERAGE THICKNESSES.

SODA-LOSS

COMPOSITION (Dry)						Tons (in situ)	Thickness average feet.	Soda-Loss	
								actual	permiss- ible
(a)	Including only a continuous thickness of bauxite with a minimum grade, in any section, of 35 per cent total-alumina.								
(b)	Including only a continuous thickness of bauxite having an average grade of not less than 40 per cent total alumina.								
(c)	Including only a continuous thickness of bauxite having an average grade not lower than metallurgical grade.								
	Ir.Sol.	Al ₂ O ₃ total (1) %	Al ₂ O ₃ avail. (2) %	Fe ₂ O ₃ %	TiO ₂ %	Ignition loss %			
(a)	5.6	40.4		28.65	2.13	22.39	68,755	7.1	
(b)	5.25	41.46		27.87	2.09	22.34	52,266	9.8	
(c)	4.88	40.64	36.57	28.84	2.14	22.92	64,000	12.0	1.04 1.75

(1) Extracted with sulphuric acid,

(2) Extracted with caustic soda.

TABLE 10
BAUXITE DEPOSIT - OUSE No.12.

Ore Body	Length maxim. ft.	Width maxim. ft.	Direction of maximum length width		Thickness	
					max. ft.	average ft.
Northern Block	350	250 ^X	S-N	W-E	18	9.9
North-Central Block	500	400	NE	SW	19	9.6
South-Central Block	400	230 ^Ø	W-E	S-N	16.5	8.2
Southern Block	500	//	NE	//	12	5.7

X The ore body continues further in an easterly direction beneath excessive overburden.

Ø The ore body continues easterly and north-easterly beneath excessive overburden.

// The ore body has been explored over a width of less than 100 feet in a north-easterly direction.

(ii) Tonnages, Compositions and Soda-losses. Details of tonnages, compositions and average thickness of the bauxite in Deposit No. 12, with figures for soda-losses, are given in Table 11. During the present investigation 39 bores and 6 shafts were sunk on or around the deposit; while shafts 101, 103, 104, and 105 sunk by the Tasmanian Mines Department during 1941, were still open for sampling. The figures of Table 11 are based on the results of analyses of samples taken from these bores and shafts.

TABLE 11.

BAUXITE DEPOSIT OUSE NO. 12.
TONNAGES, COMPOSITIONS AVERAGE THICKNESSES.

SODA-LOSS

BAUXITE		COMPOSITION (Dry)					Tons (in situ)	Thickness, average feet.	Soda-loss cwt/ton of Al ₂ O ₃		
Body									Actual	Permissible	
(a)	Including only a continuous thickness of bauxite with a minimum grade, in any section, of 35 per cent total-alumina.										
(b)	Including only a continuous thickness of bauxite having an average grade of not less than 40 per cent total alumina.										
(c)	Including only a continuous thickness of bauxite having an average grade not lower than metallurgical grade.										
	Insol.	Al ₂ O ₃ total (1)	Al ₂ O ₃ avail (2)	Fe ₂ O ₃	TiO ₂	Ignition loss					
	%	%	%	%	%	%					
Northern Block	(a)	5.36	38.8		32.03	2.25	22.15	30,370	7.32		
	(b)	3.54	40.63		30.48	2.02	23.0	6,518	11.0		
	(c)	3.78	38.61	35.37	32.56	2.11	22.04	18,222	7.69	0.77	1.66
North-Central Block	(a)	5.89	39.11		29.69	2.07	22.52	78,814	13.02		
	(b)	4.70	41.3		28.06	2.08	23.61	39,408	8.31		
	(c)	4.70	39.4	35.62	29.80	2.16	23.42	62,400	10.55	1.03	1.68
South-Central Block	(a)	8.77	38.69		28.24	2.24	21.45	21,037	7.1		
	(b)	9.89	40.5		25.62	2.23	21.1	4,741	4.0		
	(c)	6.0	38.83	34.60	30.3	2.30	22.0	8,889	7.5	1.20	1.61
Southern Block	(a)	5.00	39.39		30.81	2.22	22.1	18,963	10.66		
	(b)	4.48	43.48		28.65	2.06	21.16	5,333	9.0		
	(c)	4.69	40.21	37.74	30.11	2.22	22.33	16,000	9.0	1.07	1.82
Aggregate	(a)	6.08	38.84		30.15	2.15	22.24	149,184	8.99		
	(b)	4.98	41.35		28.22	2.08	23.09	56,033	7.87		
	(c)	4.65	39.34	35.83	30.37	2.17	22.95	105,511	9.38	1.00	1.70

(1) Extracted with sulphuric acid.

(2) Extracted with caustic soda.

(3) For shaft 33 all analyses by Australian Aluminium Production Commission.