

REPORT
on
AUGER DRILLING
in
EXPLORATION LICENCE 4968
ALEXANDRIA STATION
N.T.
by
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<u>MAP No</u>	<u>TITLE</u>	<u>SCALE</u>
FIG 1.	PLAN SHOWING AREAS DRILLED FOR GYPSUM E.L. 4968	1:2,500,000
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FIG 3	AUGER DRILLING PATTERN EIGHTEEN MILE WATER HOLE PLAYFORD RIVER E.L. 4968 N.T.	1:2,500

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SUMMARY.

Although gypsum is widespread in the region, useful concentrations are quite rare, widely scattered, and of variable size and thickness.

Following the discovery of significant deposits of gypsum at and around the Six Mile Waterhole, and at the Eighteen Mile Waterhole on the Playford River, both on Alexandria Station west of the Station Homestead, and in the black soil plain about 1 mile to the ESE of Six Mile Waterhole, a drilling programme was constructed to test the width, areal extent and grade of the occurrences.

The gypsum at Six Mile Waterhole was found to be of varying thickness up to a maximum of about 3 metres and to extend from the western end of the waterhole for at least 2.5 kilometres in a north easterly direction along the southern side of the Playford River. Drill samples from this area confirm that the gypsum is of commercial grade, thickness and size, with sufficient indicated reserves to warrant detailed testing for sale to external markets.

The limits of the gypsum deposit have not yet been defined. Future drilling should be directed towards determining the extent of the deposit.

INTRODUCTION.

Following the discovery of commercial grade gypsum in the vicinity of Six Mile Waterhole, a limited drilling programme was carried out during September 1986 using a hand held machine auger. The object of the programme was to outline sufficient reserves to warrant a small open pit operation to supply Northern Cement's plant at Darwin. Because the objectives of the auger drilling programme were not achieved viz. to outline the extent of the deposit and its thickness, it was decided to carry out a more extensive programme to test the areas around the Six Mile Waterhole and the 18 Mile Waterhole. The objectives of the second programme were to define the limits of the gypsum at both locations, determine the thickness of the gypsum layer, and estimate the grade and possible reserves.

The second drilling programme was constructed to drill a pattern of holes at 100 metre centres over the known and projected extent of the gypsum deposits. A grid was laid out using pace and compass and pegs placed at 100 metre centres. Each peg was flagged and numbered using plastic tape and identified by co-ordinates as shown on FIG 2 Attached. This method of site marking suffered from an unanticipated flaw; the cattle found the flagging palatable and ate it and knocked down the pegs!

DRILLING.

The drill plant used for the current programme was a Proline 4 Tonne Class 2 Slewing Crane with a pendulum Kelly and Kelly bar as shown in photo 1 in Appendix II attached.

The drill is normally used for boring large diameter holes for power line poles. The diameter of the holes drilled during the current programme was 15.25 cms. The auger flight was 1 metre in length and this was attached to the Kelly Bar which fits into the Kelly which rotates the Kelly Bar. The Kelly Bar comes in various lengths from 2 metres to over 4 metres.

Auger drilling is a useful reconnaissance tool but is not suitable for proper evaluation of thickness and grade of a flat lying layered deposit. The main drawbacks are the lack of identification of the top and bottom of a layer because of the mixing action of the rotating flight and consequently the contamination of any samples collected from the various layers.

REGIONAL GEOLOGY.

The regional geology of the area has been outlined in a previous report and is summarised below.

Sediments crop out poorly in the region. They range from Upper Proterozoic to Recent. Large areas are covered with black soil and sand with sub-outcrops of dolomite, limestone and extensive areas of chert pebbles and pisolitic gravel.

Upper Proterozoic. Mittiebah Sandstone.

A medium grained quartz sandstone forming a low rubble covered ridge south of Alexandria homestead, elongated along Buchanan Creek. This outcrop is regarded as the axis of an anticline with low flanking dips.

Middle Cambrian. Rankin Sandstone.

Burton Beds. These sediments are mainly limestone, chert and siltstones. Fossils including trilobites are common in the shales and siltstones.

Cainozoic.

Brunette Limestone. A limestone of Tertiary age which occurs as scattered boulders in the black soils and is exposed in the bed of the Playford River where it occurs as a rubbly, white to brown, fine to coarsely grained, cherty sediment. The environment of deposition is thought to be brackish water. Gypsum is associated with these Tertiary limestones and some writers think the gypsum may be formed as a result of replacement of the carbonate with sulphate.

Recent. Widespread dark grey and black pedocalcic soils which produce the rolling grass covered downs of the Barkly Tableland. These soils are weakly leached and contain carbonate and gypsum horizons.

LOCAL GEOLOGY.

Middle Cambrian. Burton Beds in the Rankin Limestone Formation are the oldest sediments in the licence area. These limestones may be overlain by limestones of tertiary age which outcrop sporadically in the region and are exposed in the bed of the Playford River or they may be covered by black soils of more recent origin.

Gypsum occurs as large crystals or groups of crystals in the black soil or as crystalline rock in layers up to 3 metres thick beneath the black soil. Soil cover can vary from less than a centimetre to over two metres.

ECONOMIC GEOLOGY.

Six Mile Waterhole.

Only gypsum is considered to be of economic importance to Northern Cement. Its discovery in significant volume at the Six Mile Waterhole has been confirmed by an extensive programme of auger drilling.

Gypsum occurs over a wide area to the south and east of the gypsum exposed in the southern bank of the Playford River at the Six Mile Waterhole where it is estimated to have a maximum thickness of about 3 metres.

A second occurrence, thought to be a separate deposit, is exposed in a low rise about 1 kilometre to the ENE of the deposit at the Six Mile Waterhole. Drilling has shown that gypsum is continuous between the two deposits and that the two occurrences are parts of one large deposit. See FIG 2. attached.

Altogether eighty two holes were drilled into the deposit. The drilling defined some of the margins of the gypsum but in places the deposit is open. As can be seen in FIG 2 attached to this report.

Estimated indicated reserves in this area are of the order of 1.2 million tonnes.

Eighteen Mile Waterhole.

Gypsum and gypseous clay are exposed in the southern bank of the Eighteen Mile Waterhole over a length of approximately 800 metres, showing an average thickness of about 2 metres.

Eight auger holes were drilled on the southern side of the waterhole as shown on FIG 3 attached. Only hole 18/3 showed a useful width of coarsely crystalline gypsum, and only one other hole (18/5) intersected gypsum. The other holes intersected gypseous clay and clayey gypsum of uneconomic grade. See the geological logs in Appendix I attached.

CONCLUSIONS.

Gypsum of Recent age has developed at the Six Mile and Eighteen Mile Waterholes on the southern side of the Playford River.

Overburden of variable thickness covers the deposits ranging from negligible to over 1 metre.

An open pit has been developed at the Six Mile Waterhole and is currently mining commercial grade gypsum over a relatively small part of the deposit.

Analyses of drill samples collected from these areas are shown in Appendix 1 attached. These results confirm that gypsum of commercial grade forms an extensive layer at or near the surface.

Reserves at the Six Mile Waterhole are of the order of 1.2 million tonnes. The following parameters were used.

- i). Cut off thickness one metre.
- ii). Tonnage factor 2.25 tonnes per cubic metre.

Volumes were calculated using Simpsons prismatic formula, $Vol = \frac{1}{6}(A1 + 4A2 + A3)l$, where l is the distance between the end areas, $A1$ & $A3$ are the end areas and $A2$ is the mid section.

Insufficient drilling has been done at the Eighteen Mile Waterhole to establish reserves. But the exploratory drilling recently completed has shown that the deposit is relatively small and not worth further investigation.

Systematic drilling has established that the deposit at the Six Mile Waterhole is continuous over a distance exceeding 2.5 kilometres approximately parallel to the river and extends for several hundreds of metres south. The true thickness and grade of the deposit are not known accurately because of contamination of the samples due to the drilling technique used, but it is estimated to range from a fraction of a metre to about 3 metres. The extent of the gypsum layer is unknown because it extends beyond the limits of the area drilled.

It has been noted that the economic and sub economic concentrations of gypsum are invariably exposed in the southern bank of the watercourses i.e the bank facing the sun and the deposits tend to extend to the south of these exposures. In no instance did the present writer find gypsum on the northern bank in the same concentrations as that found to the south.

RECOMMENDATIONS.

Extend the drilling pattern at the Six Mile Waterhole to the east and south determine the limits of the deposit.

Having determined the limits of the deposit, cover the gypsum bearing ground with mining claims and surrender the Exploration Licence.

ESTIMATED EXPENDITURES.1986/87.

Consultants field charges	\$4900.00
Consultants office charges	\$2888.00
Casual wages	\$600.00
Air fares	\$940.00
Vehicle hire,insurance,fuel etc.	\$2543.00
Accommodation & meals(casual)	\$264.00
Field living allowance	\$1230.00
Plans, prints, photos, report	\$120.00
Communications	\$57.00
Chemical analyses	\$600.00
Management & overheads 20%	\$2828.40

TOTAL	\$16,970.40

L.G. Nixon

Signed.
L.G.Nixon
4/11/1987

APPENDIX 1

AUGER DRILL HOLE LOGS.

SIX MILE WATER HOLE. PLAYFORD RIVER. N.1.

Drilling Contractor:- V & R Carusi Pty. Ltd.

Driller:- Peter Ground.

Drill:- "PROLINE" 4 Tonne Class 2 Slewing Crane with
Pendulum Borer.

Drill bit diameter:- Six inches (15.24 cms)

Drill programme commenced:- 18/8/'87

Drill programme completed:- 23/8/'87

Hole Co-Ord	Depth Metres	Geological Log
1N 3E	0 - 1.30 1.30- 2.50 2.50- 2.60	Brown loam and grey-black clay White and pink gypsum crystals. Grey clay. End hole.
2N 2E	0 - 1.50	Black soil, brown clay grey clay. No gypsum. End hole.
2N 3E	0 - 2.00 2.00- 3.00 3.00- 3.50	Grey-brown loam. Gypsum layer with some clay.. Grey clay. End hole.
2N 4E	0 - 1.30 1.30- 1.50 1.50- 1.60	Black soil and clay. Gypsum too narrow to sample. Gypsum entering grey clay. End hole.
2N 12E	0 - 0.50 0.50- 1.75	Black soil and black clay. Gypsum-clay mixture. No sample. No useful gypsum. End hole.
3N 00E	0 - 1.50	Black soil grading down to brown clay. No gypsum. End hole.
3N 3E	0 - 1.30 1.30- 2.60 2.60- 2.66	Black soil and black clay. Gypsum sample. Grey clay. End hole.
3N 4E	0 - 1.00 1.00- 2.00 2.00- 2.30	Black soil and black clay. Crystalline gypsum. Grey clay. End hole.
3N 5E	0 - 0.50 0.50- 1.50 1.50- 1.75	Black soil and black clay. White & pink crystalline gypsum. Grey clay. End hole.
3N 6E	0 - 0.50 0.50- 0.75 0.75- 1.00	Black soil and black clay. Crystalline gypsum layer. Grey clay. End hole.
3N 8E	0 - 0.50 0.50- 1.00 1.00- 1.25	Black soil and black clay. Crystalline gypsum. No sample. Grey clay. End hole.
3N 10E	0 - 1.00	Black soil and clay grading downwards into brown, gypseous clay.
3N 13E	0 - 0.10 0.10- 3.3 3.3- 3.5	Black soil. Coarsely crystalline gypsum. Mixed grey clay and gypsum.

Hole CO-Ords	Depth metres	Geological Log
3N 14E	0 - 0.25 0.25- 2.90 2.90- 3.00	Black soil and clay. Pink, crystalline gypsum. Grey clay. End hole.
4N 00E	0 - 1.5	Black soil grading down to brown clay, End hole
4N 1E	0 - 1.5	Black soil grading down to brown gypseous clay then grey clay. No gypsum. End hole.
4N 2E	0 - 1.0 1 - 1.5 1.5- 2.0	Black soil grading down to a mixture of clay and gypsum. Black clay and gypsum mixture. Gypsum grading into clay at 2m. End hole.
4N 3E	0 - 0.25 0.25- 1.30 1.30- 1.50	Black soil. White crystalline gypsum. Gypsum and clay. End hole.
4N 4E	0 - 0.20 0.20- 1.40 1.40- 1.50	Black soil. Crystalline gypsum. Very clayey gypsum. End hole.
4N 5E	0 - 0.10 0.18- 2.80 2.80- 2.90	Black soil. Crystalline pink and white gypsum. Grey clay. End hole.
4N 6E	0 - 0.10 0.18- 2.50 2.50- 2.90	Black soil. Crystalline gypsum. Grey clay. End hole.
4N 7E	0 - 0.50 0.50- 1.85 1.85- 2.00	Black soil and black clay. Crystalline white gypsum. Grey clay. End hole.
4N 8E	0 - 1.00 1.00- 1.10 1.10- 2.30 2.30- 2.50	Black soil and black clay. Mixture of black clay and gypsum. Crystalline gypsum. Grey clay. End hole.
4N 9E	0 - 0.25 0.25- 2.00 2.00- 2.10	Black soil and black clay. Crystalline white gypsum. Grey clay. End hole.
4N 10E	0 - 0.25 0.25- 1.50 1.50- 1.60	Black soil and black clay. Crystalline white gypsum. Grey clay. End hole.

Hole Co-Ords	Depth metres	Geological log
4N 12E	0 - 0.75 0.75- 1.75 1.75- 2.00 2.00- 3.00	Black soil and black clay. Crystalline gypsum. Gypsum with some clay. Crystalline gypsum entering pale green clay at 3 metres. End hole.
4N 13E	0 - 1.00 1.00- 3.00 3.00- 3.20	Black soil and black clay. Crystalline gypsum. Grey to pale green clay and gypsum. End hole.
4N 14E	0 - 0.75 0.75- 2.30	Black soil and black clay. Crystalline pink gypsum. Entering grey and green clay. End hole.
4N 15E	0 - 0.20 0.20- 1.50 1.50- 1.75	Black soil, gypsum float and black clay. Crystalline gypsum. Gypsum with clay contamination. End hole.
5N 00E	0 - 0.30 0.30- 1.30 1.30- 1.50	Black soil and black clay. Crystalline white gypsum. Grey clay. End hole.
5N 1E	0 - 1.00 1.00- 1.50	Black soil and black clay. White crystalline gypsum entering grey clay at 1.5 metres. End hole.
5N 2E	0 - 0.20 0.20- 1.20 1.20- 1.50	Black soil. Crystalline white gypsum. Gypseous grey and pale green clay. End hole.
5N 3E	0 - 0.20 2.00- 2.40 2.40- 2.50	Black soil and clay. Crystalline white gypsum. Gypsum and grey clay mixture. End hole.
5N 4E	0 - 0.10 0.10- 1.00 1.00- 1.50	Black soil. Crystalline gypsum. Very clayey gypsum. End hole.
5N 5E	0 - 2.80 2.80- 3.00	Crystalline gypsum. Grey clay. End hole.
5N 6E	0 - 0.50 0.50- 2.00 2.00- 2.10	Black soil and black clay. Crystalline white gypsum. Grey clay. End hole.

5N 7E	0 - 1.00 1.00- 1.10	Black soil and black clay. Creamy white limestone. End hole.
5N 8E	0 - 0.50 0.50- 1.25 1.25- 1.50	Black soil and clay. Crystalline gypsum. Enter grey clay with gypsum. End hole.
5N 9E	0 - 0.25 0.25- 2.50 2.50- 2.60	Black soil and clay. Crystalline pink and white gypsum. Grey gypseous clay. End hole.
5N 10E	0 - 0.30 0.30- 1.50 1.50- 1.75 1.75- 1.85	Black soil and clay. Crystalline gypsum. Gypsum contaminated with clay. Grey and pale green clay. End Hole
5N 12E	0 - 0.75 0.75- 2.00 2.00- 2.20	Black soil and black clay. Crystalline pink and white gypsum. Mixture of gypsum and green and grey clay. End hole.
5N 13E	0 - 1.30 1.30- 3.20 3.20- 3.30	Black soil and black clay. Crystalline pink gypsum contaminated with surface soil and clay. Grey clay and gypsum mixture. End hole.
5N 14E	0 - 0.20 0.20- 0.50 0.50- 1.50 1.50- 1.80	Black soil. Gypsum-clay mixture. Crystalline gypsum. Pale grey and green clay. End hole
5N 15E	0 - 0.10 0.10- 2.00 2.00- 2.30	Black soil. Crystalline gypsum. Gypsum-clay mixture. End hole.
6N 6E	0 - 0.25 0.25- 1.00	Black soil. Creamy white limestone. End hole.
6N 7E	0 - 0.50 0.50- 1.00	Black soil. Creamy white limestone. End hole.
6N 8E	0 - 0.50 0.50- 1.00	Black soil. Creamy white limestone. End hole.
6N 9E	0 - 0.25 0.25- 2.00 2.00- 2.30	Black soil. Crystalline white gypsum. Mixture of grey clay and gypsum. End hole.
6N 10E	0 - 0.25 0.25- 2.00 2.00- 2.20	Black soil Crystalline gypsum. Gypsum-clay mix. End hole.

6N 11E	0 - 0.25	Black soil.
	0.25- 1.50	Coarsely crystalline pink and white gypsum.
	1.50- 1.60	Gypsum-clay mix. End hole.
6N 12E	0 - 1.00	Black soil and black clay.
	1.00- 2.20	Crystalline pink and white gypsum
	2.20- 2.50	Gypseous grey clay. End hole.
6N 13E	0 - 2.20	Black soil grading down to grey clay. No gypsum. End hole.
6N 14E	0 - 1.00	Black soil and black clay.
	1.00- 2.00	Crystalline white and pink gypsum
	2.00- 2.20	Gypsum-clay mix. End hole.
6N 15E	0 - 0.10	Black soil.
	1.00- 2.00	Crystalline gypsum.
	2.00- 2.20	Mixed gypsum and grey clay. End hole.
6N 16E	0 - 0.50	Black soil and black clay.
	0.50- 1.00	Crystalline gypsum.
	1.00- 1.10	Grey clay and gypsum.
7N 9E	0 - 1.00	Black soil and black clay.
	1.00- 1.02	Creamy white limestone. End hole.
7N 10E	0 - 2.00	Black soil and black clay. No gypsum. End hole.
7N 11E	0 - 1.25	Black soil and black clay.
	1.25- 2.00	Crystalline white & pink gypsum.
	2.00- 2.21	Mix of gypsum and clay. End hole.
7N 12E	0 - 0.50	Black soil and black gypsum.
	0.50- 1.50	Mottled brown clay, no gypsum. End hole.
7N 13E	0 - 2.10	Black soil and clay. No gypsum. End hole.
7N 14E	0 - 0.50	Black soil and black clay.
	0.05- 1.50	Gypsum and clayey gypsum.
	1.50- 1.80	Grey clay. End hole.
7N 15E	0 - 0.10	Black soil.
	0.10- 2.00	Crystalline white gypsum.
	2.00- 2.10	Mix of gypsum & grey clay. End hole.
7N 16E	0 - 0.50	Black soil and black clay.
	0.50- 1.00	Crystalline gypsum.
	1.00- 1.10	Grey and brown clay. End hole.

7N 18E	0 - 1.00	Black soil and clay. No gypsum. End hole.
8N 12E	0 - 2.00	Black soil and clay grading down to brown clay. No gypsum. End hole
8N 14E	0 - 0.20 0.20- 1.80 1.80- 1.90	Black soil. Crystalline gypsum. Grey clay. End hole.
8N 15E	0 - 0.10 0.10- 2.00 2.00- 2.20	Black soil. Crystalline white gypsum. Mix of gypsum and grey clay. End hole.
8N 16E	0 - 0.60 0.60- 2.00	Black soil and black clay. Grey clay. No gypsum. End hole.
8N 17E	0 - 0.15 0.15- 0.65 0.65- 1.50	Black soil. Crystalline gypsum. Grey clay and gypsum mixture. End hole.
8N 18E	0 - 0.50 0.50- 2.00 2.00- 2.10	Black soil and clay. Crystalline pink & white gypsum. Pale grey clay. End hole.
8N 20E	0 - 0.50 0.50- 1.00 1.00- 1.10	Black soil and clay. Crystalline gypsum. Grey clay. End hole.
8N 22E	0 - 0.50 0.50- 1.00	Black soil and clay. Brown clay, no gypsum. End hole.
9N 14E	0 - 1.00 1.00- 2.00	Black soil and black clay. Gypseous clay. End hole.
9N 15E (Pit)	0 - 1.00 1.00- 1.10	Crystalline gypsum Clayey gypsum. End hole.
9N 16E	0 - 3.50 3.50- 3.60	Crystalline gypsum. Mix of grey clay and gypsum. End hole.
9N 17E	0 - 0.20 0.20- 0.70 0.70- 1.50	Black soil. Crystalline gypsum. Gypsum and clay mixture. End hole.
10n 16E	0 - 1.00 1.00- 1.10	Gypsum. Clay-gypsum mixture. End hole.
10N 18E	0 - 1.00 1.00- 1.10	Black soil and clay. Gypsum-pale green clay mixture. End hole.

10N 20E	0 - 1.50	Black soil grading down into black clay and grey gypseous clay. End hole.
10N 22E	0 - 0.25 0.25- 1.00 1.00- 1.50	Black soil. Mixed gypsum and clay. Brown plastic clay. End hole.
11N 18E	0 - 1.00	Black soil and clay grading down into a gypsum-clay mixture. End hole.
11N 20E	0 - 0.50 0.50- 2.00 2.00- 2.10	Black soil and clay. Crystalline gypsum. Grey-green plastic clay. End hole.
11N 22E	0 - 0.50 0.50- 1.00 1.00- 1.10	Black soil and clay. Gypsum clay mixture. Grey-brown plastic clay. End hole.

APPENDIX

AUGER DRILL HOLE LOGS.

EIGHTEEN MILE WATER HOLE, PLAYFORD RIVER, N.T.

Drilling Contractor:- V & R Carusi Pty. Ltd.

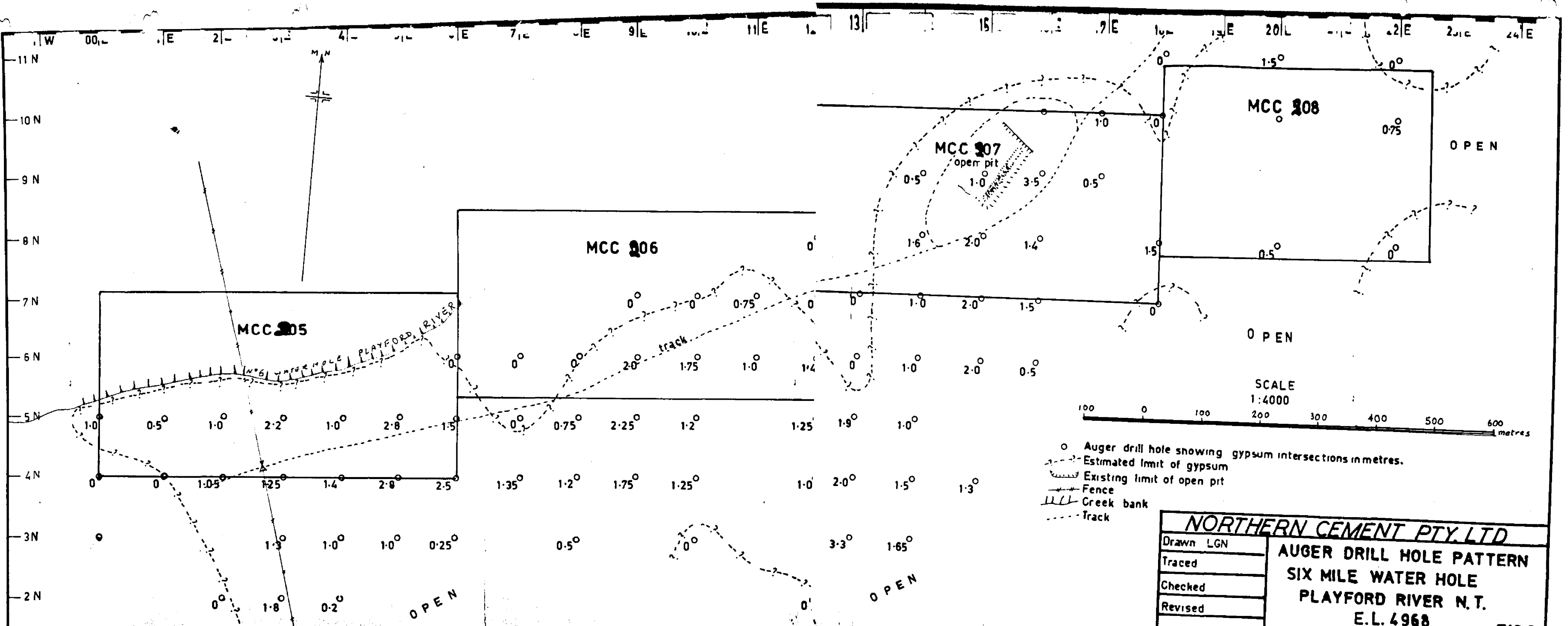
Driller:- Peter Ground.

Drill:- "PROLINE" 4 Tonne Class 2 Slewing Crane with
Pendulum Borer.

Drill:- Programme commenced 21/8/'87

Drill:- programme completed 21/8/'87

Hole Number	Depth Metres	Geological Log
18/1	0.00-0.10	Brown loam with jasper and chert gravel.
	0.10-2.00	Brown gypseous clay. End hole.
18/2	0.00-2.20	Brown loam grading down to brown gypseous clay then into mottled brown and white clay. End hole.
18/3	0.00-1.00	Brown loam and clay with abundant gypsum crystals.
	1.00-2.00	Crystalline gypsum.
	2.00-2.20	Grey-green clay. End hole.
18/4	0.00-2.00	Brown loam and clay with abundant gypsum crystals scattered through the clay. End hole.
18/5	0.00-1.65	Brown plastic clay.
	1.65-2.00	Crystalline gypsum.
	2.00-2.20	Palegrey-brown clay. End hole.
18/6	0.00-2.00	Brown loam grading downwards to a mottled brown and white clay. No gypsu. End hole.
18/7	0.00-1.00	Alluvium and brown clay.
	1.00-1.75	Gypsum grading downwards into a mixture of pale green clay and gypsum. End hole.
18/8	0.00-1.00	Alluvium & brown clay. No gypsum. End hole.



GYPSUM SAMPLE LIST
 PLAYFORD RIVER
 ALEXANDRIA STATION N.T.

SIX MILE WATERHOLE SAMPLES

Co-Ords	Sample Interval Depth in metres	Width metres	SO ₃	Gypsum %
1N 3E	1.3 to 2.3	1.0	133.0	71.0
2N 3E	2.0 to 3.0	1.0	131.0	66.7
3N 3E	1.3 to 2.6	1.3	127.0	
3N 4E	1.0 to 2.0	1.0	130.0	64.5
3N 5E	0.5 to 1.5	1.0	131.0	66.7
3N 13E	0.1 to 3.3	3.2	129.0	62.4
3N 14E	0.3 to 2.5	2.3	133.0	71.0
3N 14E	2.5 to 3.0	0.5	134.0	
4N 2E	1.0 to 1.8	0.8	128.0	60.2
4N 3E	0.3 to 1.3	1.1	126.0	55.9
4N 4E	0.0 to 1.4	1.4	132.0	68.8
4N 5E	0.0 to 2.8	2.8	131.0	66.7
4N 6E	0.0 to 2.5	2.5	134.0	
4N 7E	0.5 to 1.9	1.4	132.0	68.8
4N 8E	1.0 to 2.3	1.3	128.0	60.2
4N 9E	0.3 to 2.0	1.8	134.0	
4N 10E	0.3 to 1.3	1.0	131.0	66.7
4N 12E	0.8 to 3.0	2.3	123.0	49.5
4N 13E	1.0 to 3.0	2.0	133.0	71.0
4N 14E	0.8 to 2.2	1.5	132.0	68.8
4N 15E	0.2 to 1.5	1.3	132.0	68.8
5N 0E	0.3 to 1.3	1.0		
5N 1E	1.0 to 1.5	0.5		
5N 2E	0.2 to 1.2	1.0		
5N 3E	0.1 to 2.4	2.3		
5N 4E	0.1 to 1.0	0.9	134.0	
5N 5E	0.0 to 2.8	2.8	134.0	
5N 6E	0.5 to 2.0	1.5		
5N 8E	0.5 to 1.3	0.8		
5N 9E	0.3 to 2.5	2.3		
5N 10E	0.3 to 1.7	1.4		
5N 12E	0.8 to 2.0	1.3		
5N 13E	1.3 to 3.3	2.0		
5N 14E	0.5 to 1.5	1.0		
5N 15E	0.1 to 2.0	1.9	136.0	
6N 14E	1.0 to 2.0	1.0		
6N 16E	0.5 to 1.0	0.5	126.0	
6N 12E	1.0 to 2.2	1.2		
6N 9E	0.3 to 2.0	1.8	136.0	
6N 10E	0.3 to 2.0	1.8		
6N 11E	0.5 to 1.5	1.0		
6N 12E	1.3 to 2.0	0.8		
6N 15E	0.1 to 2.0	1.9		
7N 14E	0.5 to 1.5	1.0	133.0	71.0
7N 15E	0.0 to 2.0	2.0	137.0	
7N 16E	0.5 to 1.0	0.5	124.0	51.6
8N 14E	0.2 to 1.8	1.6	130.0	
8N 15E	0.1 to 2.0	1.9	133.0	71.0
8N 16E	0.5 to 2.0	1.5		
8N 17E	0.2 to 0.7	0.5	135.0	75.3
8N 18E	0.5 to 2.0	1.5	127.0	
8N 20E	0.3 to 1.0	0.8	121.0	45.2
9N 14E	1.0 to 2.0	1.0	120.0	43.0

9N 16E	:	0.0	to	2.0	:	2.0	:	138.0	:	81.7
9N 16E	:	2.0	to	3.5	:	1.5	:	135.0	:	75.3
9N 17E	:	0.2	to	0.7	:	0.5	:	130.0	:	64.5
10N 16E	:	0.0	to	1.0	:	1.0	:	136.0	:	77.4
10N 17E	:	0.2	to	1.0	:	0.8	:	132.0	:	68.8
10N 19E	:	0.5	to	2.0	:	1.5	:	127.0	:	
10N 22E	:	0.3	to	1.0	:	0.8	:	118.0	:	38.7
11N 20E	:	0.5	to	2.0	:	1.5	:	127.0	:	58.1

EIGHTEEN MILE WATERHOLE SAMPLES

18/3	:	1.0	to	2.0	:	1.0	:	127.0	:	58.1
18/5	:	1.7	to	2.2	:	0.6	:	124.0	:	51.6
18/7	:	1.0	to	1.8	:	0.8	:	129.0	:	62.4
	:				:		:		:	0.0

BRUNETTE CREEK SAMPLES

BC 1	:	1.0	to	2.0	:	2.0	:		:	4.3
BC 2	:	0.5	to	1.5	:	0.4	:	17.6	:	18.1
BC 3	:	1.0	to	2.0	:	1.0	:	17.6	:	37.9
BC 6	:	1.0	to	2.0	:	1.0	:	7.0	:	15.1
BC11	:	1.0	to	2.0	:	1.0	:	3.6	:	7.7
	:				:		:		:	0.0

$$SO_3 \times 2.151 = GYPSUM$$

GYPSUM SAMPLE LIST
PLAYFORD RIVER
ALEXANDRIA STATION N.T.

SIX MILE WATERHOLE SAMPLES

Co-Ords	Sample Interval Depth in metres	Width metres	SO	Gypsum %
1N 3E	1.3 to 2.3	1.0	34.2	73.6
2N 3E	2.0 to 3.0	1.0	31.7	68.2
3N 3E	1.3 to 2.6	1.3		
3N 4E	1.0 to 2.0	1.0	31.3	67.3
3N 5E	0.5 to 1.5	1.0	32.3	69.5
3N 13E	0.1 to 3.3	3.2	29.5	63.5
3N 14E	0.3 to 2.5	2.3	34.3	73.8
3N 14E	2.5 to 3.0	0.5		
4N 2E	1.0 to 1.8	0.8	28.2	60.7
4N 3E	0.3 to 1.3	1.1	26.9	57.9
4N 4E	0.0 to 1.4	1.4	33.1	71.2
4N 5E	0.0 to 2.8	2.8	32.0	68.8
4N 6E	0.0 to 2.5	2.5		
4N 7E	0.5 to 1.9	1.4	33.4	71.8
4N 8E	1.0 to 2.3	1.3	28.8	61.9
4N 9E	0.3 to 2.0	1.8		
4N 10E	0.3 to 1.3	1.0	31.5	67.8
4N 12E	0.8 to 3.0	2.3	24.0	51.6
4N 13E	1.0 to 3.0	2.0	33.5	72.1
4N 14E	0.8 to 2.2	1.5	33.0	71.0

7N 14E	0.5 to 1.5	1.0	33.8	72.7
7N 15E	0.0 to 2.0	2.0		
7N 16E	0.5 to 1.0	0.5	24.5	52.7
8N 14E	0.2 to 1.8	1.6		
8N 15E	0.1 to 2.0	1.9	33.9	72.9
8N 16E	0.5 to 2.0	1.5		
8N 17E	0.2 to 0.7	0.5	35.8	77.0
8N 18E	0.5 to 2.0	1.5		
8N 20E	0.3 to 1.0	0.8	22.3	48.0
9N 14E	1.0 to 2.0	1.0	21.4	46.0
9N 16E	0.0 to 2.0	2.0	39.0	83.9
9N 16E	2.0 to 3.5	1.5	36.3	78.1
9N 17E	0.2 to 0.7	0.5	30.5	65.6
10N 16E	0.0 to 1.0	1.0	37.0	79.6
10N 17E	0.2 to 1.0	0.8	32.5	69.9
10N 19E	0.5 to 2.0	1.5		
10N 22E	0.3 to 1.0	0.8	18.7	40.2
11N 20E	0.5 to 2.0	1.5	27.5	59.2

EIGHTEEN MILE WATERHOLE SAMPLES

18/3	1.0 to 2.0	1.0	28.0	60.2
18/5	1.7 to 2.2	0.6	25.0	53.8
18/7	1.0 to 1.8	0.8	29.8	64.1

*Taken on the bank.
See Form 18/11
GJB*

APPENDIX 11



Photo 1. Froline drill folded for mobilisation.



Photo 2. Operator preparing to swing the crane around to the drilling position.

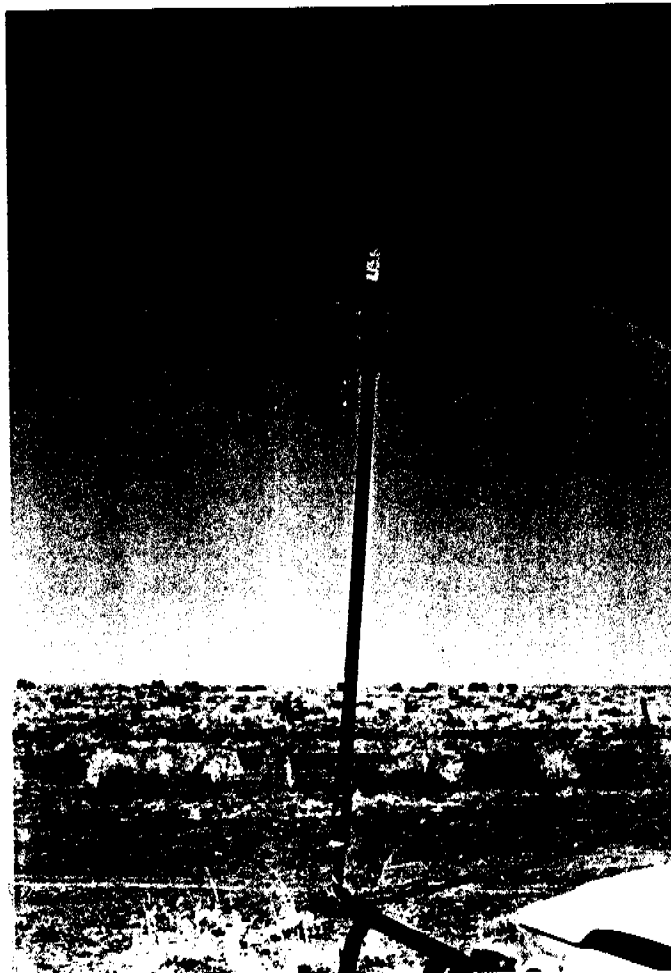


Photo 3. Photo of crane extended, Kelly, Kelly Bar and auger bit commencing a hole. Note the angle of entry of the bit.



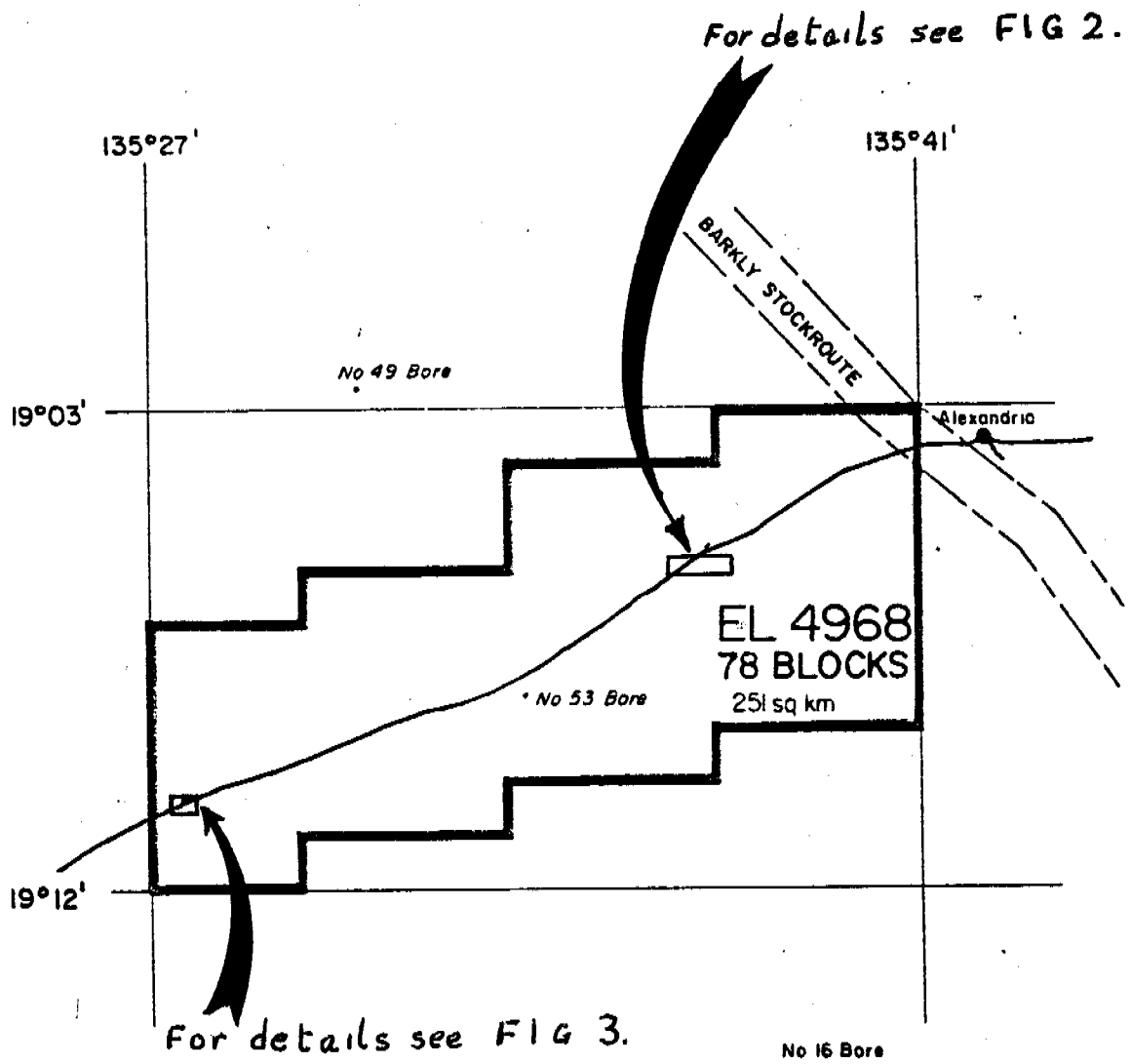
Photo 4. Drill completing a hole to full length of Kelly bar.



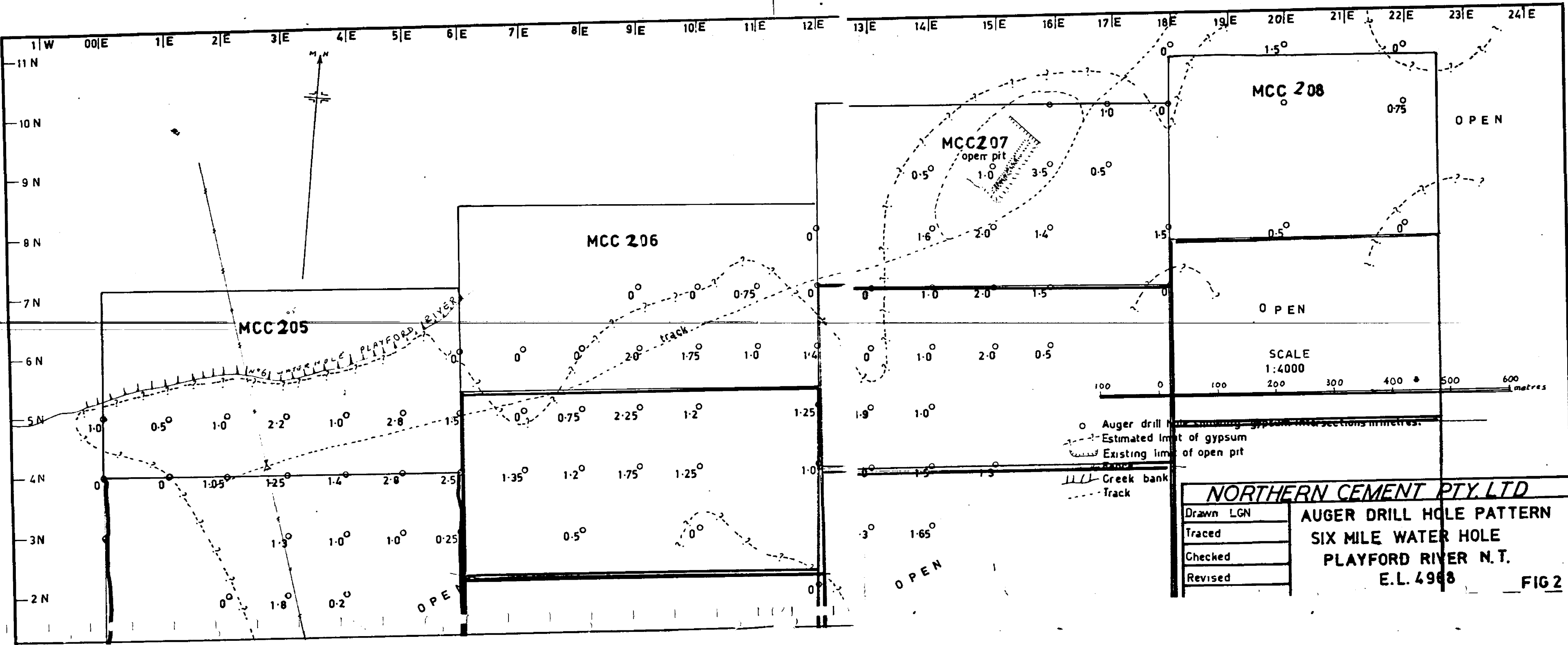
Photo 5. End of Kelly Bar and top of auger flight at completion of a hole. Note the sample on the top of the spiral and the broken ground around the auger on pulling up.



Photo 6. Completed hole. Note sample on auger. The spiral action causes mixing of clay from above and below the gypsum horizon.



NORTHERN CEMENT PTY, LTD.	
PLAN SHOWING	
AREAS DRILLED for GYPSUM	
in	
EL 4968 FIG 1	
Dt 8/8/1987	L G B NIXON & ASSOCIATES



NORTHERN CEMENT PTY. LTD

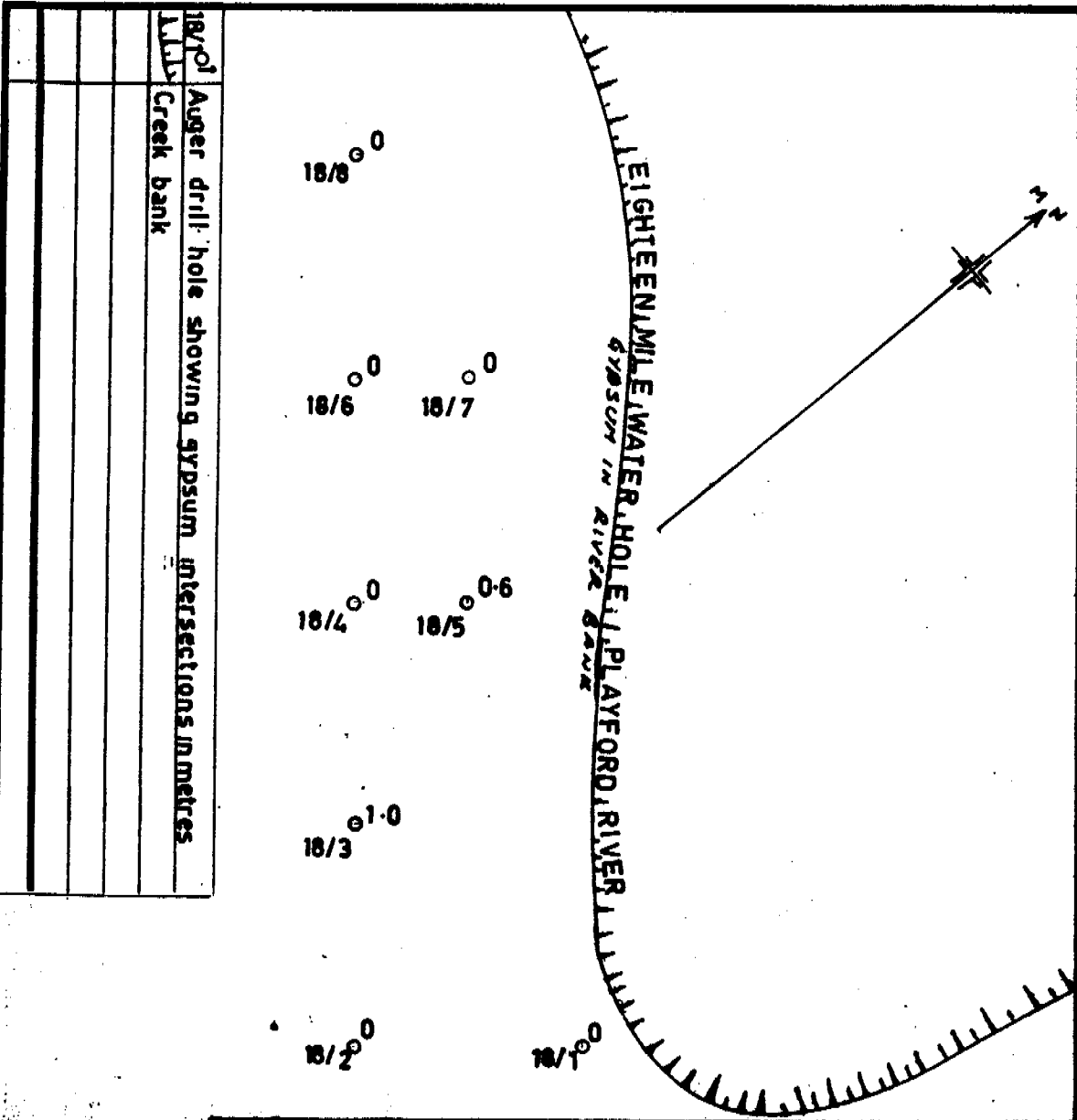
Drawn LGN	AUGER DRILL HOLE PATTERN SIX MILE WATER HOLE PLAYFORD RIVER N.T. E.L. 4968
Traced	
Checked	
Revised	

FIG 2

- Auger drill hole locations
- Estimated limit of gypsum
- - - Existing limit of open pit
- ▨▨▨ Creek bank
- - - Track

SCALE
1:4000

100 0 100 200 300 400 500 600 metres



18/01 Auger drill hole showing gypsum intersections in metres
 18/02 Creek bank

NORTHERN CEMENT PTY. LTD.	
Drn. L.G.N	AUGER DRILLING PATTERN EIGHTEEN MILE WATER HOLE PLAYFORD RIVER E.L. 4968 N.T. FIG 3
Ckd.	
Rev.	
Scale 1:2500	
Dt. 7/1/1987	L.G.B. NIXON & ASSOCIATES.