Appendix C4 Bore Logs

Regulation 8

THE NORTHERN TERRITORY OF AUSTRALIA

Control of Waters Act

FINAL STATEMENT OF BORE

RN024747

I. N. 80/3100
RN. 24,747

From	To	Description of Strata (including colour and hardness)
0	3	TOPSOIL & CLAY
3	6	PORSPILLINITE
6	33	CLAY
33	48	BROWN SANDSTONE OR COARSE GRAINED SCHIST.
48	54	BROWN SCHIST
54	69	KHAKI SCHIST.

Location of Bore (or supply sketch on the back hereof) —

..... km

(a) S SE of (b).....
E NW
W SW .....

(a) Circle appropriate direction.
(b) Use known point such as existing bore, homestead, outstation, etc.

Additional information of interest about bore.

ZONE 52
S/B 515

Grid Reference 709099 - 8629613

Map Number 1:10,000 SHEET 09-07 'DARWIN

Samples of Strata and Water Supplies

~~have been~~* will be*

left at the following place —

WATUMA DIV. DARWIN

.....

Signature .....

*Delete non applicable

For Office use only — Plotted 13/10/86

Name of Bore — No 3 (D)

Name of Property — HOLBAGOT

Description of Property — PROPOSED DUMP ADJOINING

Name of Owner — DARWIN City Council

Name of Contractor — BYNOE DRILLING

Name of Driller — ~~G. [illegible]~~ E. CAFFRY

Date of Commencement — 15. 9. 86

Date of Completion — 15. 9. 86

Total Depth — 69m

Particulars of Casing — N.1 - DUD

Particulars of Perforations or Screens —

Water	1st Supply only	2nd Supply only	3rd Supply only
Struck at	33m		
Standing Water Level			
Pumping Supply Litres/sec	.2		
Duration of Pump Test			
Water Level During Test			
Quality: Good, Fair or Bad			

22403.812 G. L. DUFFIELD, Government Printer of the Northern Territory

Dames & Moore
3 Bishop Street, Darwin N.T. 5790
P.O. Box 2005, Darwin N.T. 5794
Telephone (089) 81 7055. Telex 85685

30th September, 1986

Our Ref: 12236-009-073

Town Clerk
Darwin City Council
P O Box 84
DARWIN NT 5794

Attention: Mr Stuart Delahay
Engineering Department

Dear Sir,

SHOAL BAY DUMP - DEEP GROUNDWATER STUDY

1.0 INTRODUCTION

At the request of Mr Stuart Delahay of Darwin City Council, Dames & Moore were commissioned to carry out additional hydrogeological work at the Shoal Bay Waste Disposal Site. The work involved supervising the drilling of two groundwater exploration boreholes (Boreholes D and E).

Previous hydrogeological work on the site involved the drilling of Boreholes A and C during early July 1986. These boreholes yielded low flows and additional boreholes were required.

The hydrogeological investigation has been required to delineate groundwater reserves to meet the likely water demands of the landfill site. These requirements (fire fighting, irrigation and wash down facilities) will approximate a groundwater flow of 2-3L/sec.

SCOPE OF WORK

The investigation was carried out between the 15th and 19th of September, 1986. Drilling was performed by a percussion rig from Bynoe Drilling Pty Ltd of Berry Springs N.T.

Borehole cuttings, collected at intervals of 3 metres, were logged by Dames & Moore staff. The logs of Borehole D and E are presented as Attachment A. It should be noted that cutting returns in Borehole D and E were poor and identification of rock types was difficult.

Electrical conductivity and pH measurements were performed on water samples from the percussion drilling as the boreholes progressed. The results of the water quality testing are listed in Table 1.

DISCUSSION OF RESULTS

The results of the drilling of Boreholes D and E can be summarised as follows:-

BATHURST ISLAND FORMATION (Cretaceous)	0-5m	PORCELLANITE (SILICIFIED SILTSTONE), white, hard surface crust of lateritic gravel.
	5m-32m	SILTSTONE, extremely to moderately weathered, yellow brown and some light grey.
	32m-38m	SILTSTONE & CONGLOMERATE, greyish brown.
		- - - UNCONFORMITY - - -
MASSON FM. (Proterozoic)	38m-80m	SCHIST and/or SANDY SILTSTONE, grey and reddish brown.

Borehole D intersected the water table at 17m with a water inflow of about 0.5L/sec occurring at 32m. The water inflow eminated from the Conglomerate unit located above the contact with the Proterozoic rocks. Borehole D was terminated at 70m. The borehole was not cased due to insuffucient groundwater flow.

Borehole E was drilled to 80m. Groundwater inflow occurred at 30m (9m above the Proterozoic rock contact). The borehole was continued to 80m following directions from officers of the D.M.E Water Resources Division. It was anticpated that Coomalie Dolomite may be intersected at depth in the borehole and significant groundwater reserves could therefore be obtained. However, the four exploration boreholes drilled at Shoal Bay Dump Site have shown the Bathurst Island Formation to be underlain by relatively impermeable Proterozoic rocks; namely schist, sandstone and siltstone. Previous drilling along Vanderlin Drive by D.M.E. Water Resources Divisions has also failed to intersect dolomitic rocks.

Groundwater inflows entering Borehole E at the 30m interval were estimated as 1L/sec during drilling. As a result of this small but significant flow, the borehole was cased and screened with 6" steel casing to 60.2m. Slotted screens were cut in the casing between 30m-34m and 54m-60.2m and the outside of the hole was gravel packed upto 6m from the surface. A concrete seal was then installed to cap off the surface. The bore was developed using airlifting techniques for three hours with a final groundwater yield of 1.3L/sec being achieved.

Borehole C was also cased, screened and developed during the current drilling program. Casing (6" steel casing) was run to 49.5m. The casing was slotted 6m up from the base of the hole and the hole was gravel packed. Airlifting for 2 hours produced only 0.4L/sec.

Groundwater quality testing indicated very low salinity water in all boreholes. Electrical conductivity levels in Boreholes D and E ranged from 14uS/cm to 119uS/cm which is equivalent to Darwin's drinking water conductivity levels. The groundwater varied from slightly acidic to

neutral with a pH range of 5.40 to 7.46.

CONCLUSIONS

Based on the airlifting operation of Boreholes C and E, the total groundwater yield from the two bores is approximately 2L/sec. Water quality testing indicated the groundwater is suitable for all water needs. However, it is recommended that a 24 hour pump test be performed on Boreholes C and E by D.M.E. Water Resources Division. The pump tests will define the long term physical properties of the aquifer. It is further recommended that throughout the 24 hour pump test water samples are collected at regular intervals (say every 2 hours) to determine salinity levels and evaluate the rate of any seawater intrusion.

We trust this report fulfils your current requirements and should you have any questions concerning this work please contact Mr Colin Parker or the undersigned.

Yours faithfully,
DAMES & MOORE

Parker

per Allen Kearns
Managing Principal.

Attach - Attachment A. Borehole Logs

TABLE 1

GROUNDWATER QUALITY TEST RESULTS

SHOAL BAY LANDFILL SITE

BOREHOLE	DEPTH (m)	pH	EC (uS/cm)
D	22	-	53
	30	5.47	26
	36	5.95	14
	44	6.21	23
	52	6.11	44
	61	6.94	70
	68	7.11	119
E	41	7.46	59
	50	7.43	25
	56	7.06	31
	60	5.53	56
	68	5.56	58
	75	5.91	53
	79	5.40	99

NOTE: Water samples collected during percussion drilling.

JOB No. 12236-009-73

PROJECT: SHOAL BAY DUMP, GROUNDWATER STUDY

BOREHOLE LOCATION:

SURFACE ELEVATION: DATUM:

SURFACE CONDITIONS:

BOREHOLE No. D

SHEET 1 OF 2

TIME/DATE STARTED 15 Sept 86

TIME/DATE FINISHED

LOGGED BY CJP

CHECKED BY

GEOL UNIT	SOIL DESCRIPTION	GRAPHIC LOG	UNIFIED SYMBOL	DEPTH (metres)	SAMPLE DATA: SAMPLE TYPE	SAMPLE DATA: CONDITION	SAMPLER RESISTANCE	SAMPLE DATA: FIELD SHEAR STRENGTH (kPa)	CLASSIFICATION DATA: MOISTURE CONTENT %	CLASSIFICATION DATA: PLASTIC LIMIT %	CLASSIFICATION DATA: LIQUID LIMIT %	CLASSIFICATION DATA: LINEAR SHRINKAGE %	CLASSIFICATION DATA: BULK DENSITY (t/m³)	CLASSIFICATION DATA: % FINES (-0.075 mm)	STRENGTH DATA: TYPE OF TEST	STRENGTH DATA: PARAMETERS Su kPa C kPa Ø degrees	GROUND WATER DATA AND ADDITIONAL NOTES	FIELD DATA: DRILLING METHOD	FIELD DATA: CASING DEPTH
	PORCELLANITE, white and SILTSTONE, highly weathered, light brown, silicified			4					D										
	SILTSTONE, extremely and highly weathered yellow brown and some light grey, material is clay, high plasticity		CH	8					M< Wp										
				12					M< Wp										
				16					W								Water Table (Drill Water Introduced)		
	- varied siltstone evident below 20m			20													Ec=53uS/cm		
				24															
				28													Ec 26uS/cm pH 5.47		
				32													Water Inflow ≈0.5L/sec		
	SILTSTONE, extremely and highly weathered yellow brown and some light grey, material is clay, high plasticity, varies with minor rounded pebbles			36													Ec 14uS/cm pH 5.95		
	Sandy SILTSTONE (lithic sand cuttings), reddish brown, some rounded gravel																		

SAMPLE TYPES

AS – auger sample
SPT - Standard Penetration Test
RS - ring sample from Dames & Moore 'U' type
TW - tube sample from Dames & Moore 'U' type with thin wall bit
WS - wash sample
RC - rock core

SAMPLE CONDITION

■ undisturbed soil sample
☒ soil sample disturbed
□ soil sample not recovered

SAMPLER RESISTANCE

N — Number of blows required to drive S.P.T. sampler 300 mm using 66 kg hammer falling 750 mm
PH — sampler advanced by hydraulic pressure
R — refusal of sampler

FIELD SHEAR STRENGTHS

V - shear vane
P - hand penetrometer
E - estimate only

LABORATORY STRENGTH TESTS

Type of Test
T - Triaxial shear test
D - direct shear test
U - unconfined compression test
V — shear vane

Condition of Test
Q - quick (undrained test)
R - consolidated undrained test
R̄ - consolidated undrained test with pore pressure measurement
S - slow (drained test)

Test Results
c', ø' - effective stress strength parameters
c , ø - total stress strength parameters
Su — undrained shear strength

BOREHOLE LOG FIGURE

JOB No. 12236-009-73

PROJECT: SHOAL BAY DUMP, GROUNDWATER STUDY

BOREHOLE LOCATION:

SURFACE ELEVATION: DATUM:

SURFACE CONDITIONS:

BOREHOLE No. D

SHEET 2 OF 2

DATE STARTED 15 Sep 84
DATE FINISHED
LOGGED BY CTP
CHECKED BY

GEOL UNIT	SOIL DESCRIPTION	GRAPHIC LOG	UNIFIED SYMBOL	DEPTH (metres)	SAMPLE DATA: SAMPLE TYPE	SAMPLE DATA: CONDITION	SAMPLE DATA: SAMPLER RESISTANCE	SAMPLE DATA: FIELD SHEAR STRENGTH (kPa)	CLASSIFICATION DATA: MOISTURE CONTENT %	CLASSIFICATION DATA: PLASTIC LIMIT %	CLASSIFICATION DATA: LIQUID LIMIT %	CLASSIFICATION DATA: LINEAR SHRINKAGE %	CLASSIFICATION DATA: BULK DENSITY (t/m³)	CLASSIFICATION DATA: % FINES (-0·075 mm)	STRENGTH DATA: TYPE OF TEST	STRENGTH DATA: PARAMETERS Su kPa C kPa Ø degrees	GROUND WATER DATA AND ADDITIONAL NOTES	FIELD DATA: DRILLING METHOD	FIELD DATA: CASING DEPTH
	Sandy SILTSTONE (lithic sand cuttings), reddish brown, some rounded gravel, slightly metamorphosed, few chip sample cuttings in slurry, quartz fragments indicative of some quartz veins			40													EC 23uS/cm pH 6.21		
				44															
	- marginally more sandy below 51m			48															
				52													EC 44uS/cm pH 6.11		
	SCHIST/SILTSTONE, fine micaceous flakes, green, fine sand and silt size cuttings			56															
				60													EC 70uS pH 6.94		
	- some quartz in cuttings, particles becoming coarser greater sand fraction in cutting			64															
				68													EC 119uS pH 7.11		
	TERMINATED @ 70m - BOREHOLE NOT CASED			72															

SAMPLE TYPES

AS – auger sample
SPT – Standard Penetration Test
RS – ring sample from Dames & Moore 'U' type
TW – tube sample from Dames & Moore 'U' type with thin wall bit
WS – wash sample
RC – rock core

SAMPLE CONDITION

■ undisturbed soil sample
☒ soil sample disturbed
☐ soil sample not recovered

SAMPLER RESISTANCE

N — Number of blows required to drive S.P.T. sampler 300 mm using 65 kg hammer falling 750 mm
PH — sampler advanced by hydraulic pressure
R — refusal of sampler

FIELD SHEAR STRENGTHS

V – shear vane
P – hand penetrometer
E – estimate only

LABORATORY STRENGTH TESTS

Type of Test
T – Triaxial shear test
D – direct shear test
U – unconfined compression test
V – shear vane

Condition of Test
Q – quick (undrained test)
R – consolidated undrained test
R̄ – consolidated undrained test with pore pressure measurement
S – slow (drained test)

Test Results
c', ø' – effective stress strength parameters
c , ø – total stress strength parameters
Su – undrained shear strength

BOREHOLE LOG ... FIGURE

JOB No. 12236-009-73

PROJECT: SHOAL BAY DUMP GROUNDWATER STUDY

BOREHOLE LOCATION:

SURFACE ELEVATION: DATUM:

SURFACE CONDITIONS:

BOREHOLE No. E

SHEET 1 OF 3

GEOL UNIT	SOIL DESCRIPTION	GRAPHIC LOG	UNIFIED SYMBOL	DEPTH (metres)
	LATERITE GRAVEL			0
	SILTSTONE, highly weathered, brown with red and yellow staining			4
	becoming lighter in colour, highly and extremely weathered			8
	varied siltstone below 12m			12
				16
				20
				24
				28
				32
	SANDY SILTSTONE and CONGLOMERATE, greyish brown, with some rounded pebbles extremely weathered, particles break up in layers			36

SAMPLE DATA				CLASSIFICATION DATA					STRENGTH DATA		GROUND WATER DATA AND ADDITIONAL NOTES	FIELD DATA	
SAMPLE TYPE	CONDITION *	SAMPLER RESISTANCE	FIELD SHEAR STRENGTH (kPa)	MOISTURE CONTENT %	PLASTIC LIMIT %	LIQUID LIMIT %	LINEAR SHRINKAGE %	BULK DENSITY (t/m³)	% FINES (−0·075 mm)	TYPE OF TEST	PARAMETERS Su kPa C kPa Ø degrees		DRILLING METHOD	CASING DEPTH
											Water Table			

TIME/DATE STARTED 17 Sep 86

TIME/DATE FINISHED

LOGGED BY PJG

CHECKED BY

SAMPLE TYPES

AS – auger sample
SPT–Standard Penetration Test
RS – ring sample from Dames & Moore 'U' type
TW – tube sample from Dames & Moore 'U' type with thin wall bit
WS – wash sample
RC – rock core

SAMPLE CONDITION *

■ undisturbed soil sample
⊠ soil sample disturbed
□ soil sample not recovered

SAMPLER RESISTANCE

N — Number of blows required to drive S.P.T. sampler 300 mm using 65 kg hammer falling 750 mm
PH — sampler advanced by hydraulic pressure
R — refusal of sampler

FIELD SHEAR STRENGTHS

V – shear vane
P – hand penetrometer
E – estimate only

LABORATORY STRENGTH TESTS

Type of Test

T – Triaxial shear test
D – direct shear test
U – unconfined compression test
V – shear vane

Condition of Test

Q – quick (undrained test)
R – consolidated undrained test
R' – consolidated undrained test with pore pressure measurement
S – slow (drained test)

Test Results

c', ø' – effective stress strength parameters
c , ø – total stress strength parameters
Su – undrained shear strength

BOREHOLE LOG

FIGURE

JOB No. 12236-009-73

PROJECT: SHOAL BAY DUMP GROUNDWATER STUDY

BOREHOLE LOCATION:

SURFACE ELEVATION: DATUM:

SURFACE CONDITIONS:

BOREHOLE No. E

SHEET 2 OF 3

TIME/DATE STARTED 11 Sep 96

TIME/DATE FINISHED

LOGGED BY RJG

CHECKED BY

GEOL UNIT	SOIL DESCRIPTION	GRAPHIC LOG	UNIFIED SYMBOL	DEPTH (metres)	SAMPLE DATA: SAMPLE TYPE	SAMPLE DATA: CONDITION	SAMPLE DATA: SAMPLER RESISTANCE	SAMPLE DATA: FIELD SHEAR STRENGTH (kPa)	CLASSIFICATION DATA: MOISTURE CONTENT %	CLASSIFICATION DATA: PLASTIC LIMIT %	CLASSIFICATION DATA: LIQUID LIMIT %	CLASSIFICATION DATA: LINEAR SHRINKAGE %	CLASSIFICATION DATA: BULK DENSITY (t/m³)	CLASSIFICATION DATA: % FINES (<0·075 mm)	STRENGTH DATA: TYPE OF TEST	STRENGTH DATA: PARAMETERS Su kPa C kPa Ø degrees	GROUND WATER DATA AND ADDITIONAL NOTES	FIELD DATA: DRILLING METHOD	FIELD DATA: CASING DEPTH
	Sandy SILTSTONE and CONGLOMERATE, greyish brown, with some rounded pebbles extremely weathered, particles break up in layers			0															
	SHIST/SANDY SILTSTONE, brown, cuttings sandy with rounded pebbles			40													EC 59uS/cm pH 7.46		
	cuttings becoming darker and grain size becoming larger			44															
	SCHIST/SILTSTONE, with silty clay and gravel, greyish brown			48													EC 25uS/cm pH 7.43		
	cuttings becoming sandy, possibly Schist/Sandstone, also much darker, grey			52															
	- becoming greyer			56													EC 31uS/cm pH 7.06		
				60													EC 56uS/cm pH 5.53		6" STEEL CASING INSTALLED
				64															
				68													EC 58uS/cm pH 5.56		
				72													EC 53uS/cm pH 5.91		

SAMPLE TYPES

AS – auger sample
SPT – Standard Penetration Test
RS – ring sample from Dames & Moore 'U' type
TW – tube sample from Dames & Moore 'U' type with thin wall bit
WS – wash sample
RC – rock core

SAMPLE CONDITION

■ undisturbed soil sample
☒ soil sample disturbed
☐ soil sample not recovered

SAMPLER RESISTANCE

N — Number of blows required to drive S.P.T. sampler 300 mm using 65 kg hammer falling 750 mm
PH — sampler advanced by hydraulic pressure
R — refusal of sampler

FIELD SHEAR STRENGTHS

V – shear vane
P – hand penetrometer
E – estimate only

LABORATORY STRENGTH TESTS

Type of Test
T – Triaxial shear test
D – direct shear test
U – unconfined compression test
V – shear vane

Condition of Test
Q – quick (undrained test)
R – consolidated undrained test
R̄ – consolidated undrained test with pore pressure measurement
S – slow (drained test)

Test Results
c', ø' – effective stress strength parameters
c, ø – total stress strength parameters
Su – undrained shear strength

BOREHOLE LOG FIGURE

JOB No. 12236-009-73

PROJECT: SHOAL BAY DUMP GROUNDWATER STUDY

BOREHOLE LOCATION:

SURFACE ELEVATION: DATUM:

SURFACE CONDITIONS:

BOREHOLE No. E

SHEET 3 OF 3

GEOL UNIT	SOIL DESCRIPTION	GRAPHIC LOG	UNIFIED SYMBOL	DEPTH (metres)	SAMPLE DATA: SAMPLE TYPE	SAMPLE DATA: CONDITION	SAMPLE DATA: SAMPLER RESISTANCE	SAMPLE DATA: FIELD SHEAR STRENGTH (kPa)	CLASSIFICATION DATA: MOISTURE CONTENT %	CLASSIFICATION DATA: PLASTIC LIMIT %	CLASSIFICATION DATA: LIQUID LIMIT %	CLASSIFICATION DATA: LINEAR SHRINKAGE %	CLASSIFICATION DATA: BULK DENSITY (t/m³)	CLASSIFICATION DATA: % FINES (-0·075 mm)	STRENGTH DATA: TYPE OF TEST	STRENGTH DATA: PARAMETERS Su kPa C kPa Ø degrees	GROUND WATER DATA AND ADDITIONAL NOTES	FIELD DATA: DRILLING METHOD	FIELD DATA: CASING DEPTH
	SCHIST/SILTSTONE, with silty clay and gravel, greyish brown becoming lighter grey and slightly browner			78													EC 99uS/cm pH 5.40		
	TERMINATED 2 80.0m - BOREHOLE CASED TO 60.2m			80															

TIME/DATE STARTED 17 Sept 86

TIME/DATE FINISHED

LOGGED BY BTC

CHECKED BY

SAMPLE TYPES

AS – auger sample
SPT – Standard Penetration Test
RS – ring sample from Dames & Moore 'U' type
TW – tube sample from Dames & Moore 'U' type with thin wall bit
WS – wash sample
RC – rock core

SAMPLE CONDITION

■ undisturbed soil sample
⊠ soil sample disturbed
□ soil sample not recovered

SAMPLER RESISTANCE

N — Number of blows required to drive S.P.T. sampler 300 mm using 66 kg hammer falling 750 mm
PH — sampler advanced by hydraulic pressure
R — refusal of sampler

FIELD SHEAR STRENGTHS

V – shear vane
P – hand penetrometer
E – estimate only

LABORATORY STRENGTH TESTS

Type of Test
T – Triaxial shear test
D – direct shear test
U – unconfined compression test
V – shear vane

Condition of Test
Q – quick (undrained test)
R – consolidated undrained test
R̄ – consolidated undrained test with pore pressure measurement
S – slow (drained test)

Test Results
c', ø' – effective stress strength parameters
c , ø – total stress strength parameters
Su – undrained shear strength

BOREHOLE LOG

FIGURE

K. VAN DER VOLDE

Regulation 8

THE NORTHERN TERRITORY OF AUSTRALIA

Control of Waters Act

RN024748

FINAL STATEMENT OF BORE

1-H-80/3101
R.N. 24,748

From	To	Description of Strata (including colour and hardness)
0	3	CLAY + SHALE
3	6	PURSILLINITE + CLAY
6	9	" "
9	24	BROWN CLAY
24	30	CLAY + SILTSTONE
30	89	BROWN SCHIST.

Location of Bore (or supply sketch on the back hereof) —

..... km

(a) S SE of (b).....
E NW
W SW .....

(a) Circle appropriate direction.
(b) Use known point such as existing bore, homestead, outstation, etc.

Additional information of interest about bore.

ZONE 52
S/B 815

Grid Reference 709095 - 8629316

Map Number 1-10,000 SHEET 09-07 'DARWIN

Samples of Strata and Water Supplies

have been* will be*

left at the following place —

WATER DIV DARWIN

Signature

*Delete non applicable

For Office use only — Plotted 13/10/86

Name of Bore — NO 4 (E)

Name of Property — H. of PAGOT

Description of Property — PROPOSED DUMP

Name of Owner — DARWIN CITY COUNCIL

Name of Contractor — BYNOE DRILLING

Name of Driller — K. LADERY

Date of Commencement — 17/9/86

Date of Completion — 18/9/86

Total Depth — DRILLED TO 87 M BACKFILLED WITH GRAVEL TO 60M

Particulars of Casing — 60.2 M x 6"

Particulars of Perforations or Screens — SLOTS 30-33 & BOTTOM 5 M.

Water GRAVEL PACKED

	1st Supply only	2nd Supply only	3rd Supply only
Struck at	30M		
Standing Water Level	15M		
Pumping Supply Litres/sec	1-1.5		
Duration of Pump Test	2 HRS		
Water Level During Test			
Quality: Good, Fair or Bad	FAIR		

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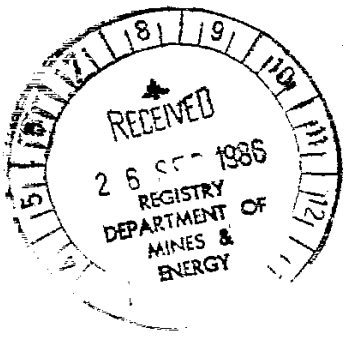
RECEIVED
REGISTRY
DEPARTMENT OF
MINES &
ENERGY

WATER ANALYSIS

POWER AND WATER AUTHORITY
WATER DIRECTORATE

3 BL CPL SC

80/3101

Laboratory Register No.	88/89/0364
Date received in Laboratory	7/9/88

Bottle No.	Time of sampling	Date of sampling
1	1111	7/9/88

LOCATION AND DETAILS SHOAL BAY DARWIN CITY COUNCIL R/N 24748

BORE "E"

D/N 7608 RSP 1956

ANALYSIS — PHYSICAL

☐	pH	☐	Colour (Hazen units)
☐	Specific conductance (microsiemens/cm at 25° C) 3460	☐	Turbidity (NTU's)
☐	Total dissolved solids (mg/l - by evaporation at 180° C)	☐	Suspended solids (mg/l)

ANALYSIS — CHEMICAL (mg/l)

☐	Sodium, Na	☒	Chloride, Cl 1089
☐	Potassium, K	☐	Sulphate, SO^4
☐	Calcium, Ca	☐	Nitrate, NO^3
☐	Magnesium, Mg	☐	Bicarbonate, HCO^3
☐	Total Hardness (as $CaCO^3$)	☐	Carbonate, CO^3
☐	Total Alkalinity (as $CaCO^3$)	☐	Fluoride, F
☐	Iron, (total) Fe	☐	NaCl (calc. from chloride) 1795
☐	Silica, SiO^2		

ANALYSIS — ADDITIONAL (mg/l)

☐ Copper, Cu	☐ Lead, Pb	☐ Arsenic, As
☐ Manganese, Mn	☐ Zinc, Zn	☐ Cadmium, Cd
☐	☐	☐

NATA

This Laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full.

Boxes marked thus ☐ indicate levels are within the limits as quoted in the "Guidelines for Drinking Water Quality in Australia", 1987; issued by the National Health and Medical Research Council and the Australian Water Resources Council.

☒ Levels exceed non-health related limits.

☒ Levels exceed health related limits.

Date 9/8/88

GPO Box 1096, Darwin NT 5794
Telex AA85650
Facsimile (089) 41 0703

WATER ANALYSIS

POWER AND WATER AUTHORITY
WATER DIRECTORATE

80/3101

Laboratory Register No.	88/89/0131
Date received in Laboratory	27/7/88
Bottle No. 3A	Time of sampling 1445
Date of sampling 25/7/88	

LOCATION AND DETAILS DARWIN CITY COUNCIL SHOAL BAY R/N 24748

BORE "E"

R/N 68047 RSP 1956

ANALYSIS — PHYSICAL

☐	pH	☐	Colour (Hazen units)
☐	Specific conductance (microsiemens/cm at 25° C) 3750	☐	Turbidity (NTU's)
☐	Total dissolved solids (mg/l - by evaporation at 180° C)	☐	Suspended solids (mg/l)

ANALYSIS — CHEMICAL (mg/l)

☐	Sodium, Na	☐	Chloride, Cl 1129
☐	Potassium, K	☐	Sulphate, SO^4
☐	Calcium, Ca	☐	Nitrate, NO^3
☐	Magnesium, Mg	☐	Bicarbonate, HCO^3
☐	Total Hardness (as $CaCO^3$)	☐	Carbonate, CO^3
☐	Total Alkalinity (as $CaCO^3$)	☐	Fluoride, F
☐	Iron, (total) Fe	☐	NaCl (calc. from chloride) 1861
☐	Silica, SiO^2		

ANALYSIS — ADDITIONAL (mg/l)

☐	Copper, Cu	☐	Lead, Pb	☐	Arsenic, As
☐	Manganese, Mn	☐	Zinc, Zn	☐	Cadmium, Cd
☐		☐		☐	

Conductivity and Chloride Analysis Only.

NATA

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Date / / 29/7/88

GPO Box 1006, Darwin NT 5794
Telex AA85644
Facsimile (089) 81 0503

Boxes marked thus ☐ Indicate levels are within the limits as quoted in the "Guidelines for Drinking Water Quality in Australia", 1987; issued by the National Health and Medical Research Council and the Australian Water Resources Council.

☒ Levels exceed non-health related limits.

☒ Levels exceed health related limits.

WATER ANALYSIS

80/3101 STORAGE TANK.

POWER AND WATER AUTHORITY
WATER DIRECTORATE

NATA

Laboratory Register No.	88/89/0130
Date received in Laboratory	27/7/88
Bottle No. 2A	Time of sampling 1420
Date of sampling 25/7/88	

LOCATION AND DETAILS DARWIN CITY COUNCIL STORAGE TANK

D/N 6897 RSP 1956

ANALYSIS — PHYSICAL

☐	pH	☐	Colour (Hazen units)
☐	Specific conductance (microsiemens/cm at 25° C) 2500	☐	Turbidity (NTU's)
☐	Total dissolved solids (mg/l - by evaporation at 180° C)	☐	Suspended solids (mg/l)

ANALYSIS — CHEMICAL (mg/l)

☐	Sodium, Na	☐	Chloride, Cl 713
☐	Potassium, K	☐	Sulphate, SO^4
☐	Calcium, Ca	☐	Nitrate, NO^3
☐	Magnesium, Mg	☐	Bicarbonate, HCO^3
☐	Total Hardness (as $CaCO^3$)	☐	Carbonate, CO^3
☐	Total Alkalinity (as $CaCO^3$)	☐	Fluoride, F
☐	Iron, (total) Fe	☐	NaCl (calc. from chloride) 1175
☐	Silica, SiO^2		

ANALYSIS — ADDITIONAL (mg/l)

☐ Copper, Cu	☐ Lead, Pb	☐ Arsenic, As
☐ Manganese, Mn	☐ Zinc, Zn	☐ Cadmium, Cd
☐	☐	☐

Conductivity and Chloride Analysis Only.

NATA

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Date / / 29/7/88

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☒ Levels exceed non-health related limits.

☒ Levels exceed health related limits.

GPO Box 1066, Darwin NT 5794
Telex AA85643
Facsimile (089) 41 0703
Telephone (089) 89 5511

WATER ANALYSIS

80/3101

POWER AND WATER AUTHORITY
WATER DIRECTORATE

80/3101

Laboratory Register No.	87/88/1209
Date received in Laboratory	23/3/88
Bottle No. G.P. 75	Time of sampling 1430	Date of sampling 21/3/88

LOCATION AND DETAILS SHOAL BAY R/N 24748

D/NOTE 5899 RSP 1956B

ANALYSIS — PHYSICAL

☒ pH	4.7	☐ Colour (Hazen units)	
☐ Specific conductance (microsiemens/cm at 25° C)	330	☐ Turbidity (NTU's)	
☐ Total dissolved solids (mg/l - by evaporation at 180° C)	180	☐ Suspended solids (mg/l)	

ANALYSIS — CHEMICAL (mg/1)

☐ Sodium, Na	37	☐ Chloride, Cl	95
☐ Potassium, K	2	☐ Sulphate, SO^4	11
☐ Calcium, Ca	10	☐ Nitrate, NO^3	<1
☐ Magnesium, Mg	8	☐ Bicarbonate, HCO^3	1
☐ Total Hardness (as $CaCO^3$)	58	☐ Carbonate, CO^3	
☐ Total Alkalinity (as $CaCO^3$)	1	☐ Fluoride, F	0.1
☒ Iron, (total) Fe	>10	☐ NaCl (calc. from chloride)	157
☐ Silica, SiO^2	11		

ANALYSIS — ADDITIONAL (mg/1)

☐ Copper, Cu	☐ Lead, Pb	☐ Arsenic, As
☐ Manganese, Mn	☐ Zinc, Zn	☐ Cadmium, Cd
☐	☐	☐

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☒ Levels exceed non-health related limits.

☒ Levels exceed health related limits.

Date 11/4/89

GPO Box 1996, Darwin NT 5794
Telex AA85044
Facsimile (089) 41 0703
Telephone: (089) 89 5511

? SC EPL

80/3101

WATER ANALYSIS

Department of Transport & Works
Water Division, Darwin N.T.

Laboratory Register No.	87/88/0338
Date received in Laboratory	1.9.87

WR 4/1A

Bottle No.	Time of sampling	Date of sampling
R042		25.8.87

LOCATION AND DETAILS SEAL BAY ; COUNCIL DUMP "E" R/N 24748

DEPTH 60m DISCH 1 LPS MAP 09-07 G.R. 709095 8629316

Proposed water use:- Domestic, Stock, Irrigation, other (specify) R/N° 8000 RSP 1972

ANALYSIS — PHYSICAL

☒	pH	5.2	☐ Colour (Hazen units)
☐	Specific conductance (microsiemens/cm at 25° C)	5620	☐ Turbidity (NTU's)
☒	Total dissolved solids (mg/L - by evaporation at 180° C)	2840	☐ Suspended solids (mg/L)

ANALYSIS — CHEMICAL (mg/L)

☐	Sodium, Na	675	☒	Chloride, Cl	1617
☐	Potassium, K	18	☐	Sulphate, SO_4	303
☐	Calcium, Ca	200	☐	Nitrate, NO_3	1
☒	Magnesium, Mg	162	☐	Bicarbonate, HCO_3	7
☒	Total Hardness (as $CaCO_3$)	1164	☐	Carbonate, CO_3	
☐	Total Alkalinity (as $CaCO_3$)	6	☐	Fluoride, F	0.2
☒	Iron, (total) Fe	4.0	☐	Orthophosphate, PO_4	
☐	Silica, SiO_2	19	☒	NaCl (calc. from chloride)	2665

ANALYSIS — ADDITIONAL (mg/L)

☐	Copper, Cu	☐	Lead, Pb	☐	Arsenic, As
☐	Manganese, Mn	☐	Zinc, Zn	☐	Cadmium, Cd
☐	Nickel, N	☐	Cobalt, Co	☐	

THE SAMPLE AS ANALYSED ~~COMPLIES~~/DOES NOT COMPLY WITH NORTHERN TERRITORY DRINKING WATER STANDARDS AS RECOMMENDED BY THE NORTHERN TERRTORY DEPARTMENT OF HEALTH.

Analysed By: [signature] Date 8/9/87

WATER RESOURCES DIVISION

TEST REPORT — BORE RN. 24748

Bore location: Shoal Bay Waste Disposal Site
Client/owner: Darwin City Council
Client's reference:
Purpose of supply: Irrigation

Map: Darwin 1:10 000 Sheet 09-07
Grid reference: 709095 – 8629314

RECOMMENDATIONS

Pumping rate: 1.2 L/s. Pump setting: 54 m below ground level
General recommendations are given on the reverse side.
The aquifer and bore ~~can~~cannot sustain higher pumping rates with deeper pump settings or for short periods in favourable seasons. Further advice can be obtained from: Water Resources Div Sasco House; DARWIN
(In all correspondence refer to the bore's RN number).

BORE DATA

Finished depth: 60 m Completion date: 18/8/86
Standing water level 15.75 m on 30/10/86
Construction details:

AQUIFER TEST

Test date: 4/11/86
Test rates: 1.5 L/s
Test duration 8 hrs

Interval (m)	Description
0 - 30 m	152 mm ID Blank Steel Casing
30 - 33 m	152 mm ID Steel Casing Slotted
33 - 55 m	152 mm ID Blank Steel Casing
55 - 60 m	152 mm ID Steel Casing Slotted
60 - 80 m	Backfilled (See comments)

Notes: 1. Top of casing as constructed was 0.60 m above ground
2. All depths are measured from natural ground level
3. Test rates are not indicative of safe long term pumping rates.

WARNING: MINIMUM INTERNAL BORE DIAMETER IS 152 mm

COMMENTS

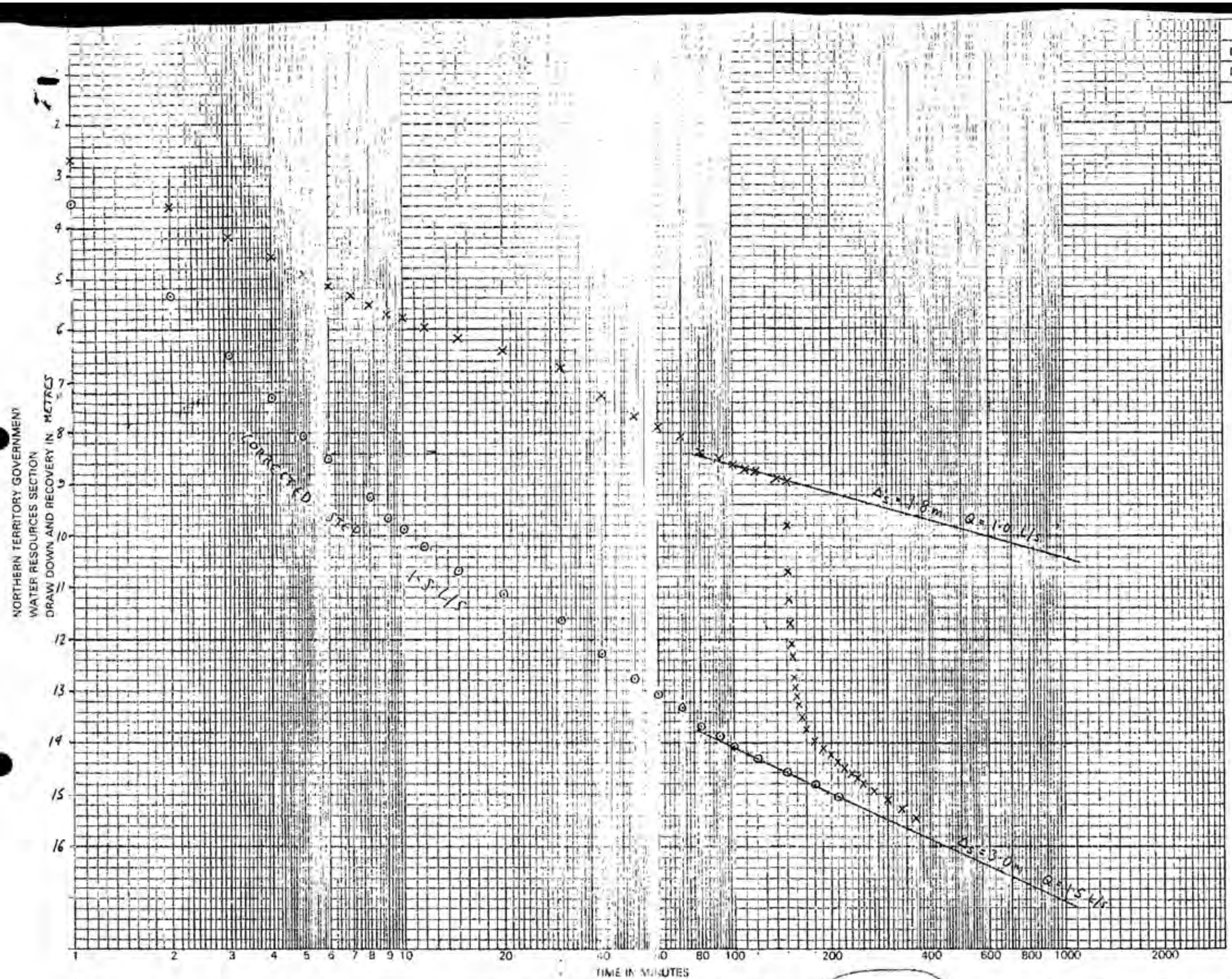
1. Recommended pumping rate is based on a constant rate test at 1.5 L/s for a period of 8 hours and assume that hydrological conditions remains constant.
2. Provisions to obtain water samples at the bore head should be incorporated in any reticulation.
3. Water quality should be monitored regularly for an initial period to determine parameters and thereafter checked for anomalies.
4. This bore was drilled to 80 metres and backfilled to 60 m On completion of testing total depth recorded was 64.85 m.

WATER QUALITY

See water laboratory report (Analysis No. 86/87/0765)

WRD4020 By: J Rykiert 12/11/86

NORTHERN TERRITORY GOVERNMENT
WATER RESOURCES SECTION



NAME OF BORE: "E" BORE	PUMPING TEST No: STEP TEST
LOCATION: SHOAL BAY RUBBISH TIP	ACTUAL TIME OF TEST: 0915 CST
REG. No: 24748	DATE OF TEST: 3.11.86
INDEX No: 80/3101	DURATION OF TEST: 360 minutes
STANDING WATER LEVEL: 15.26	FINAL PUMPING RATE: 1.5 L/s
TOTAL DEPTH OF BORE: 62.25	FINAL DRAW DOWN: 15.44 m
MEASURING POINT: T.O.C. [0.60 m A.G.L.]	RECOVERY TIME (DURATION):
DIAMETER OF BORE: 162 mm	REMARK: AVAILABLE DRAWDOWN = 38.74 m
TOTAL CASING IN BORE: 60 m	TECH NOTE BOOK NO 1583

BORE DATA

DRILLED BY
DATE DRILLED

DEPTH	CASING	STRATA

DEPTH STRUCK:
AQUIFER
THICKNESS:
WATER TEMP:
S.W.L.

$$T_1 = \frac{15.81\,Q\,L/s}{\Delta_s} = \frac{15.81 \times 1.0}{1.8}$$

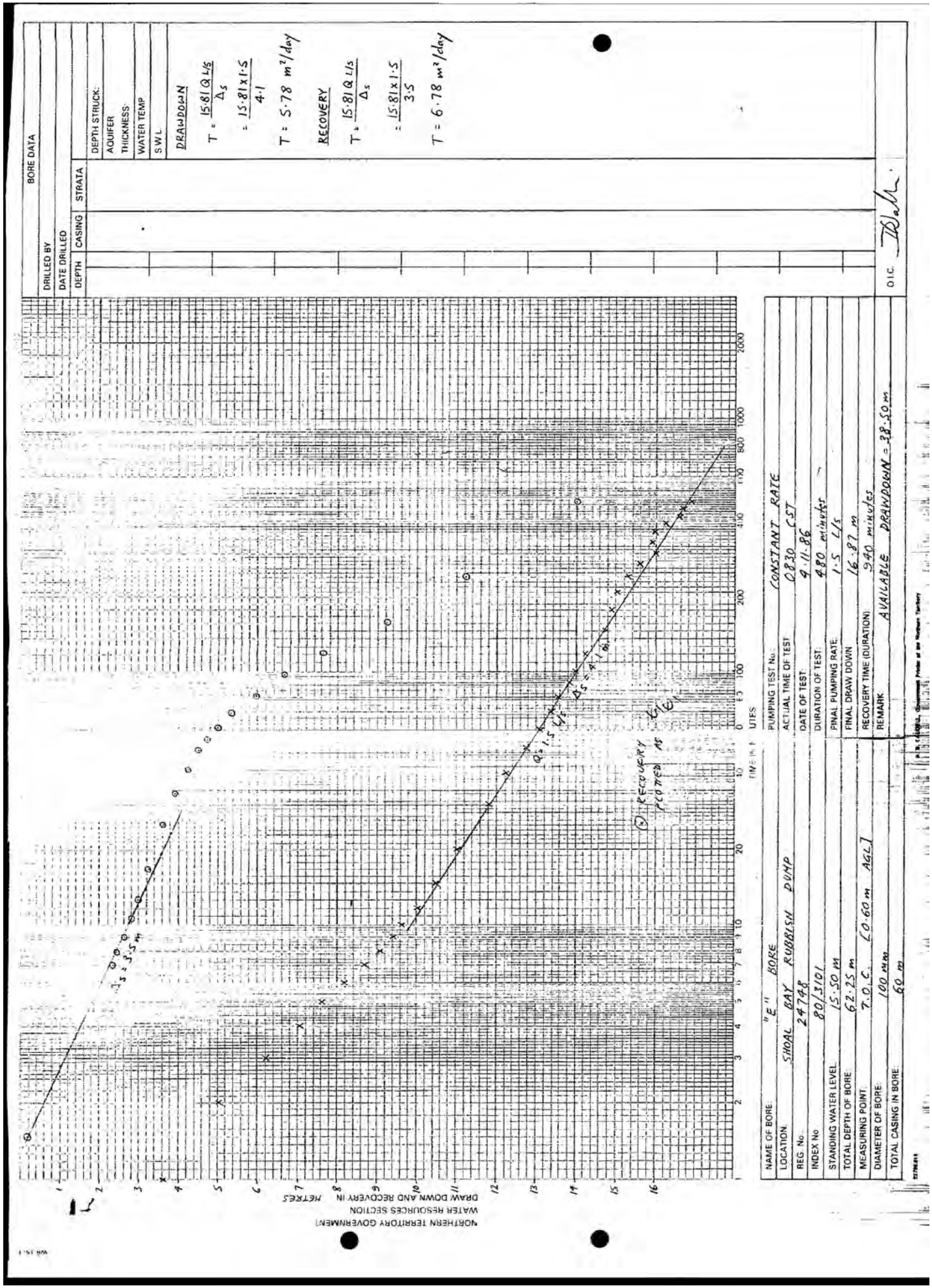
$$T_1 = 8.78\ m^2/day$$

$$T_2 = \frac{15.81\,Q\,L/s}{\Delta_s} = \frac{15.81 \times 1.5}{3.0}$$

$$T_2 = 7.91\ m^2/day$$

O.I.C. [signature]

A. B. CAUDELL, Government Printer of the Northern Territory


BORE DATA
DRILLED BY
DATE DRILLED
DEPTH
CASING
STRATA
DEPTH STRUCK:
AQUIFER
THICKNESS:
WATER TEMP
S.W.L
DRAWDOWN
T = 15·81 Q L/s / Δs
= 15·81 x 1·5 / 4·1
T = 5·78 m²/day
RECOVERY
T = 15·81 Q L/s / Δs
= 15·81 x 1·5 / 3·5
T = 6·78 m²/day
NORTHERN TERRITORY GOVERNMENT
WATER RESOURCES SECTION
DRAW DOWN AND RECOVERY IN METRES
TIME IN MINUTES
Q = 1·5 L/s
Δs = 4·1m
RECOVERY PLOTTED AS Δs/t
NAME OF BORE: "E" BORE
LOCATION: SHOAL BAY RUBBISH DUMP
REG. No: 24748
INDEX No: 80/3101
STANDING WATER LEVEL: 15·50 m
TOTAL DEPTH OF BORE: 62·25 m
MEASURING POINT: T.O.C. 60·60 m AGL
DIAMETER OF BORE: 100 mm
TOTAL CASING IN BORE: 60 m
PUMPING TEST No.: CONSTANT RATE
ACTUAL TIME OF TEST: 0830 CST
DATE OF TEST: 9.11.86
DURATION OF TEST: 480 minutes
FINAL PUMPING RATE: 1·5 L/s
FINAL DRAW DOWN: 16·87 m
RECOVERY TIME (DURATION): 940 minutes
REMARK: AVAILABLE DRAWDOWN = 38·50 m
O.I.C.

80/3101

WATER ANALYSIS

Department of Transport & Works
Water Division, Darwin N.T.

WR 4/1A

Laboratory Register No.	86/87/0782
Date received in Laboratory	10.11.86
Bottle No. G091	Time of sampling	Date of sampling 18.9.86

LOCATION AND DETAILS SHOAL BAY AREA 100 OF BAGOT DUMP N°4
R/N 24748 DEPTH 60m DTSCH 1:SLPS MAP: DARWIN

Proposed water use:- Domestic, Stock, Irrigation, other (specify) G.R. 709095 8629316 WRD 6002

ANALYSIS — PHYSICAL

RSP 1956

☒ pH	5.4	☐ Colour (Hazen units)	
☐ Specific conductance (microsiemens/cm at 25° C)	25	☐ Turbidity (NTU's)	
☐ Total dissolved solids (mg/L - by evaporation at 180° C)	35	☐ Suspended solids (mg/L)	

ANALYSIS — CHEMICAL (mg/L)

☐ Sodium, Na	2	☐ Chloride, Cl	5
☐ Potassium, K	2	☐ Sulphate, SO_4	1
☐ Calcium, Ca	1	☐ Nitrate, NO_3	<1
☐ Magnesium, Mg	1	☐ Bicarbonate, HCO_3	2
☐ Total Hardness (as $CaCO_3$)	7	☐ Carbonate, CO_3	
☐ Total Alkalinity (as $CaCO_3$)	2	☐ Fluoride, F	0.1
☒ Iron, (total) Fe	UNSUITABLE FOR ANALYSIS	☐ Orthophosphate, PO_4	
☐ Silica, SiO_2	15	☐ NaCl (calc. from chloride)	8

ANALYSIS — ADDITIONAL (mg/L)

☐ Copper, Cu	☐ Lead, Pb	☐ Arsenic, As
☐ Manganese, Mn	☐ Zinc, Zn	☐ Cadmium, Cd
☐ Nickel, N	☐ Cobalt, Co	☐

THE SAMPLE AS ANALYSED ~~COMPLIES~~/DOES NOT COMPLY WITH NORTHERN TERRITORY DRINKING WATER STANDARDS AS RECOMMENDED BY THE NORTHERN TERRTORY DEPARTMENT OF HEALTH.

With suitable treatment the pH may be adjusted to an acceptable level.

With suitable treatment the Iron concentration may be lowered to an acceptable level.

Analysed By: [signature] Date 26/11/86

Boxes marked thus ☒ indicate levels considered undesirable for drinking water by the Northern Territory Department of Health.

S. SMART
E. THATCHER

WATER ANALYSIS

Department of Transport & Works
Water Division Darwin N.T.

30/3/01

WR 4/1A

Laboratory Register No.	86/87/0765	
Date received in Laboratory	6/11/86	
Bottle No. EB21	Time of sampling 1600	Date of sampling 4/11/86

LOCATION AND DETAILS HOLMES JUNGLE DARWIN R/N 24748 DEPTH 54m
DISCH 1.5LPS TEMP 32.1°C pH 5.7 COND 482 RWD 454 RSP 1956

Proposed water use:- Domestic, Stock, Irrigation, other (specify)

ANALYSIS — PHYSICAL

☒	pH	5.8	☐	Colour (Hazen units)
☐	Specific conductance (microsiemens/cm at 25° C)	505	☐	Turbidity (NTU's)
☐	Total dissolved solids (mg/L - by evaporation at 180° C)	250	☐	Suspended solids (mg/L)

ANALYSIS — CHEMICAL (mg/L)

●	Sodium, Na	52	☐	Chloride, Cl	125
☐	Potassium, K	6	☐	Sulphate, SO_4	18
☐	Calcium, Ca	15	☐	Nitrate, NO_3	1
☐	Magnesium, Mg	14	☐	Bicarbonate, HCO_3	19
☐	Total Hardness (as $CaCO_3$)	95	☐	Carbonate, CO_3	
☐	Total Alkalinity (as $CaCO_3$)	16	☐	Fluoride, F	0.2
☒	Iron, (total) Fe	2.4	☐	Orthophosphate, PO_4	
☐	Silica, SiO_2	21	☐	NaCl (calc. from chloride)	206

ANALYSIS — ADDITIONAL (mg/L)

☐	Copper, Cu	☐	Lead, Pb	☐	Arsenic, As
●	Manganese, Mn	☐	Zinc, Zn	☐	Cadmium, Cd
☐	Nickel, N	☐	Cobalt, Co	☐	

THE SAMPLE AS ANALYSED ~~COMPLIES~~/DOES NOT COMPLY WITH NORTHERN TERRITORY DRINKING WATER STANDARDS AS RECOMMENDED BY THE NORTHERN TERRTORY DEPARTMENT OF HEALTH.

With suitable treatment the Iron concentration may be lowered to an acceptable level.

With suitable treatment the pH may be adjusted to an acceptable level.

Analysed By: Date 20/11/86

Boxes marked thus ☒ indicate levels considered undesirable for drinking water by the Northern Territory Department of Health.

80/3101

WATER ANALYSIS

Department of Transport & Works
Water Division, Darwin N.T.

80/3101 WR 4/1A

Laboratory Register No.	86/87/0781
Date received in Laboratory	10-11-86
Bottle No. 6082	Time of sampling
	Date of sampling 18.9.86

LOCATION AND DETAILS SILOAM BAY AREA 100 OF BAGOT - DUMP N°4
R/N 24748 DEPTH 60m DISCH 1.5LPS MAP: DARWIN

Proposed water use:- Domestic, Stock, Irrigation, other (specify) G.R. 709095 8629316 WRD 6002

RSP 1956

ANALYSIS — PHYSICAL

☐ pH	6.5	☐ Colour (Hazen units)	
☐ Specific conductance (microsiemens/cm at 25° C)	305	☐ Turbidity (NTU's)	
☐ Total dissolved solids (mg/L - by evaporation at 180° C)	180	☐ Suspended solids (mg/L)	

ANALYSIS — CHEMICAL (mg/L)

☐ Sodium, Na	33	☐ Chloride, Cl	65
☐ Potassium, K	7	☐ Sulphate, SO_4	15
☐ Calcium, Ca	5	☐ Nitrate, NO_3	<1
☐ Magnesium, Mg	9	☐ Bicarbonate, HCO_3	28
☐ Total Hardness (as $CaCO_3$)	50	☐ Carbonate, CO_3	
☐ Total Alkalinity (as $CaCO_3$)	23	☐ Fluoride, F	0.4
☒ Iron, (total) Fe	UNSUITABLE FOR ANALYSIS	☐ Orthophosphate, PO_4	
☐ Silica, SiO_2	24	☐ NaCl (calc. from chloride)	105

ANALYSIS — ADDITIONAL (mg/L)

☐ Copper, Cu	☐ Lead, Pb	☐ Arsenic, As
☐ Manganese, Mn	☐ Zinc, Zn	☐ Cadmium, Cd
☐ Nickel, N	☐ Cobalt, Co	☐

THE SAMPLE AS ANALYSED ~~COMPLIES~~/DOES NOT COMPLY WITH NORTHERN TERRITORY DRINKING WATER STANDARDS AS RECOMMENDED BY THE NORTHERN TERRTORY DEPARTMENT OF HEALTH.

With suitable treatment the Iron concentration may be lowered to an acceptable level.

Analysed By [signature] Date 21/11/86

Boxes marked thus ☒ indicate levels considered undesirable for drinking water by the Northern Territory Department of Health.

1582

BORE NAME "E" Bore

Registered Number 24748

Index Number 80/3101

Location SHOAL BAY RUBBISH TIP

Total Depth 60 m

Depth Water Struck 30 m

Estimated Supply 1 to 1.5 L/s

Aquifer Material BROWN SCHIST

Construction details casing screens, etc.

Interval	Size and description
0 - 30 m	6" BLANK STEEL
30 - 33 m	6" SLOTTED STEEL
33 - 55 m	6" BLANK STEEL
55 - 60 m	6" SLOTTED STEEL

Distance to production bore

Bore name	Distance
RN 24627	197m, 006°M, 002°T

Pump test crew D. WALLIS TA II
L. STAFFA LHF
G. BURMAN MDA

Pump type MONO 620

Powered by 3 CYLINDER LISTER DIESEL

Pump setting 54.00 m

Method measuring pump discharge ORIFICE TUBE WITH PIEZOMETER TUBE, WATCH, 20 L DRUM

List any other equipment used
6x6 M.A.N FITTED WITH SMEAL CRANE
4x4 TOYOTA LANDCRUISER

Comments T.O.C. AGL = 0.60 m
T.D. BEFORE TESTING = 62.25 m 30.10.86
T.D. AFTER TESTING = 65.45 m 4.11.86
S.W.L. 15.75 m 30.10.86
S.W.L 15.26 m 3.11.86
S.W.L. 15.50 m 4.11.86
* THIS BORE HAS UPPER AQUIFER WATER INFLOWING THROUGH THE CASING JOINT APPROX. 5 m BELOW GROUND LEVEL. FLOW APPEARS TO BE APPROX 0.1 L/S.

INDEX

Pumped Bore: RN 24748 OBS Bore:

Standing Water Level: 15.75 m

Available Drawdown: 38.25 m

Time Started: 1105 CST Date: 30.10.86

Time Stopped: 1415 CST Date: 30.10.86 01

Test Type: PRELIMINARY Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)	pH	Comments	CONDUCTIVITY		
1106	1	1.85										
1107	2	3.30										
1108	3	3.48							RATE ADJUSTED			
1109	4	5.15										
1110	5	5.25			1.18				DISCHARGE BROWN			
1111	6	5.59							"			
1112	7	5.89							"			
1113	8	6.05							"			
1114	9	6.34							"			
1115	10	6.47							"			
1117	12	6.76			1.18		31.2°C	6.2	"	96.4		
1120	15	7.18							"			
1125	20	7.54							"			
1130	25	7.79							DISCHARGE LIGHT			
1135	30	8.01							BROWN			
1140	35	8.19							"			
1145	40	8.35							"			
1150	45	8.49							"			
1155	50	8.57							"			
1200	55	8.66							"			
1205	60	8.70							"			
1206	61	9.30			1.33				"			
1207	62	9.61							"			
1208	63	9.82							"			
1209	64	9.97							"			
1210	65	10.08							"			
1211	66	10.18							"			
1212	67	10.26							"			

Pumped Bore: RN 24748 OBS Bore:

Standing Water Level: 15.75

Available Drawdown: 38.25

Time Started: 1105 CST Date: 30.10.86

Time Stopped: 1415 CST Date: 30.10.86 02

Test Type: PRELIMINARY Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)	pH	Comments	CONDUCTIVITY		
1213	68	10.34			1.33				DISCHARGE LIGHT			
1214	69	10.39							BROWN			
1215	70	10.45							"			
1217	72	10.53							DISCHARGE DARK			
1220	75	10.69							BROWN WITH FINE			
1225	80	10.70							SILT			
1230	85	10.63					32.0°C	6.04	"	171.6		
1235	90	10.65							"			
1240	95	10.66							"			
1245	100	10.69							"			
1250	105	10.75							"			
1255	110	10.78							"			
1300	115	10.79							"			
1305	120	10.81							"			
1306	121	9.85			0.7			PUMPING	RATE REDUCED TO SEE IF BORE			
1315	130	6.98							DISCHARGE WOULD CLEAR UP			
1325	140	6.68										
1335	150	6.35										
1345	160	6.28										
1355	170	6.31							DISCHARGE LIGHT			
1415	190	6.28							BROWN			

Pumped Bore: RN 24748 OBS Bore:

Standing Water Level: 15·26 m

Available Drawdown: 38·74 m

Time Started: 0915 CST Date: 3·11·86

Time Stopped: 1515 CST Date: 3·11·86 03

Test Type: STEP TEST Step No.: ONE

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)		Comments
0916	1	2·65	25	30 mm	1·0				RATE ADJUSTED
0917	2	3·60							DISCHARGE LIGHT BROWN
0918	3	4·19							DISCHARGE DARK BROWN
0919	4	4·60							"
0920	5	4·90							"
0921	6	5·15							DISCHARGE LIGHT BROWN
0922	7	5·35							DISCHARGE MEDIUM BROWN
0923	8	5·52							"
0924	9	5·69							"
0925	10	5·77							"
0927	12	5·96							"
0930	15	6·17							"
0935	20	6·40							"
0945	30	6·72							DISCHARGE LIGHT BROWN
0955	40	7·27							DISCHARGE SLIGHT
0905	50	7·68							DISCHARGE CLEAR
1015	60	7·91							"
1025	70	8·07							"
1035	80	8·37							DISCHARGE LIGHT BROWN
1045	90	8·48							"
1055	100	8·61							DISCHARGE MEDIUM BROWN
1105	110	8·68							"
1115	120	8·73							"
1135	140	8·87							DISCHARGE LIGHT BROWN
1145	150	8·91							"

Pumped Bore: RN 24748 OBS Bore:

Standing Water Level: 15.26 m

Available Drawdown: 38.74 m

Time Started: 0915 CST Date: 3.11.86

Time Stopped: 1515 CST Date: 3.11.86 04

Test Type: STEP TEST Step No.: TWO

Time C.S.T.	Time (min)	D/Down (m)	PZn (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)	pH	Comments	CONDUCTIVITY
1146	151	9.79	55	30 mm	1.5				DISCHARGE LIGHT BROWN	
1147	152	10.70							"	
1148	153	11.24							"	
1149	154	11.70							"	
1150	155	12.07							"	
1151	156	12.35							"	
1152	157	MISSED							RATE ADJUSTED	
1153	158	12.76							DISCHARGE LIGHT BROWN	
1154	159	12.93							"	
1155	160	13.10							"	
1157	162	13.26							"	
1200	165	13.49							"	
1205	170	13.75							"	
1215	180	13.98							"	
1225	190	14.12							"	
1235	200	14.25							"	
1245	210	14.39							"	
1255	220	14.50							"	
1305	230	14.61							"	289
1315	240	14.70							"	
1325	250	14.80							"	308
1345	270	14.93							DISCHARGE SLIGHT	
1415	300	15.12							"	307
1445	330	15.27							DISCHARGE CLEAR	
1515	360	15.44							"	

Pumped Bore: RN 24748 OBS Bore:

Standing Water Level: 15·26 m

Available Drawdown: 38·74 m

Time Started: 1515 CST Date: 3·11·86

Time Stopped: 1535 CST Date: 3·11·86

Test Type: STEP TEST RECOVERY Step No.: 05

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.
1516	1	11·90				
1517	2	9·30				
1518	3	7·59				
1519	4	6·42				
1520	5	5·62				
1521	6	5·05				
1522	7	4·70				
1523	8	4·52				
1524	9	4·20				
1525	10	4·00				
1527	12	MISSED				
1530	15	3·57				
1535	20	3·32				

Water Sample Temp. (°C)		Comments			

Pumped Bore: RN 24748 OBS Bore:

Standing Water Level: 15·50 m

Available Drawdown: 38·50 m

Time Started: 0830 CST Date: 4·11·86

Time Stopped: 1630 CST Date: 4·11·86 06

Test Type: CONSTANT RATE Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)	pH	Comments	CONDUCTIVITY		
0831	1	3·63	55	30 mm	1·5				RATE ADJUSTED			
0832	2	5·05							DISCHARGE CLOUDY			
0833	3	6·22							"			
0834	4	7·08							"			
0835	5	7·65							DISCHARGE LIGHT			
0836	6	8·20							BROWN			
0837	7	8·70							"			
0838	8	9·09							"			
0839	9	9·42							"			
0840	10	9·65							"			
0842	12	10·04							"			
0845	15	10·49							"			
0850	20	11·05							"			
0900	30	11·82					31·8°C		DISCHARGE SLIGHT	315		
0910	40	12·24							DISCHARGE CLEAR			
0920	50	12·75					31·5°C		"	331		
0930	60	13·08					31·7°C		DISCHARGE SLIGHT	341		
0940	70	13·36							"			
0950	80	13·53							"			
1000	90	13·84					31·7°C		"	342		
1010	100	13·98				D1183	31·7°C	6·2	"	351		
1030	120	14·25							"			
1100	150	14·75							"			
1130	180	14·87					31·8°C	6·2	"	364		
1200	210	15·03							"			
1230	240	15·49					31·8°C	5·85	"	386		
1300	270	15·60							"			
1330	300	15·99					31·9°C		RATE ADJUSTED	441		

Pumped Bore: RN 24748 OBS Bore:

Standing Water Level: 15.50 m

Available Drawdown: 38.50 m

Time Started: 0830 CST Date: 4.11.86

Time Stopped: 1630 CST Date: 4.11.86

Test Type: CONSTANT RATE Step No.: 07

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)	pH	Comments	CONDUCTIVITY		
1400	330	15.88	55	30 mm	1.5				DISCHARGE CLEAR			
1430	360	15.99							"			
1500	390	16.24					31.8 °C	5.71	"	463		
1530	420	16.58							"			
1600	450	16.65				6B94			"			
1630	480	16.87				EB21	32.1 °C	5.71	"	482		

Pumped Bore: RN 24748 OBS Bore:

Standing Water Level: 15.50 m

Available Drawdown: 38.50 m

Time Started: 1630 CST Date: 4.11.86

Time Stopped: 0810 CST Date: 5.11.86 08

Test Type: CONSTANT RATE TEST RECOVERY Step No.:

Time C.S.T.	t_1 Time (min)	D/Down (m)	t PZh (cm)	Oriface Plate t/t_1 Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)		Comments			
1631	1	14.00	481	481								
1632	2	11.25	482	241								
1633	3	9.22	483	161								
1634	4	7.75	484	121								
1635	5	6.67	485	97								
1636	6	5.89	486	81								
1637	7	5.36	487	69.5								
1638	8	5.00	488	61								
1639	9	4.74	489	54.3								
1640	10	4.54	490	49								
1642	12	4.25	492	41								
1645	15	3.92	495	33								
1650	20	3.61	500	25								
1700	30	3.25	510	17								
1710	40	2.99	520	13								
1720	50	2.79	530	10.6								
1730	60	2.61	540	9								
1740	70	2.45	550	7.9								
1750	80	2.33	560	7								
0810	940	0.15	1420	1.5								

Pumped Bore: RN 24748 OBS Bore: RN 24627

Standing Water Level: 13.30 m

Available Drawdown: NOT APPLICABLE

Time Started: 0830 CST Date: 4.11.86

Time Stopped: 1630 CST Date: 4.11.86 09

Test Type: OBSERVATION BORE Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)		Comments			
0831	1	0.00										
0832	2	0.00										
0833	3	0.00										
0834	4	0.00										
0835	5	0.00										
0836	6	0.00										
0837	7	0.00										
0838	8	0.00										
0839	9	0.00										
0840	10	0.00										
0842	12	0.00										
0845	15	0.00										
0850	20	0.00										
0900	30	0.00										
0910	40	0.00										
0920	50	0.00										
0930	60	0.00										
0940	70	0.00										
0950	80	0.00										
1000	90	0.00										
1010	100	0.00										
1030	120	0.00										
1100	150	0.00										
1130	180	0.00										
1200	210	0.00										
1230	240	0.00										
1300	270	0.00										
1330	300	0.00										

Pumped Bore: RN 24748 OBS Bore: RN 24627

Standing Water Level: 13.30 m

Available Drawdown: NOT APPLICABLE

Time Started: 0830 CST Date: 4.11.86

Time Stopped: 1630 CST Date: 4.11.86 10

Test Type: OBSERVATION BORE Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No	Water Sample Temp. (°C)		Comments			
1400	330	0.00										
1430	360	0.00										
1500	390	0.00										
1530	420	0.00										
1600	450	0.00										
1630	480	0.00										

DAR 09-07

RN024628

Regulation 8

THE NORTHERN TERRITORY OF AUSTRALIA

Control of Waters Act

FINAL STATEMENT OF BORE

I. N. 80/3054
R.N. 24,628

From	To	Description of Strata (including colour and hardness)
0	3	LATERITE + Clay
3	6	PORCILLINITE
6	9	PORCILLINITE + clay
9	12	SILTSTONE + clay
12	30	SOFT + HARD LAYERS ~~SCHIST~~ SHALE + SILTSTONE
30	42	BROWN SCHIST
42	49	GRAY SCHIST

Name of Bore — COUNCIL HOLE C

Name of Property — H of BAGOT. PROPOSED DUMP

Description of Property — SHOAL BAY

Name of Owner — DARWIN CITY COUNCIL

Name of Contractor — BYNOE DRILLING

Name of Driller — E. CAFFREY

Date of Commencement — 4.7.86

Date of Completion — 4.7.86

Total Depth — 49 m

Particulars of Casing — Nil

Particulars of Perforations or Screens —

Location of Bore (or supply sketch on the back hereof) —

.... km

(a) S SE of (b)..
E NW
W SW ....

(a) Circle appropriate direction.
(b) Use known point such as existing bore, homestead, outstation, etc.

ZONE 52
5/B 815

Additional information of interest about bore.

Grid Reference ~~[illegible]~~ 709129-8629510.

Map Number 1:10,000 SHEET 09-07 'DARWIN'

Samples of Strata and Water Supplies

have been* will be*

left at the following place —

....

....

Signature [signature]

*Delete non applicable

Water	1st Supply only	2nd Supply only	3rd Supply only
Struck at	30 M		
Standing Water Level	11 M		
Pumping Supply Litres/sec	.5		
Duration of Pump Test	1 1/2		
Water Level During Test			
Quality: Good, Fair or Bad	FAIR		

For Office use only — [signature] 10/1/86 No W/S.

22403.812

G. L. DUFFIELD, Government Printer of the Northern Territory

Dames & Moore
3 Bishop Street Darwin N.T. 5794
P.O. Box 2065 Darwin N.T. 5794
Telephone (089) 81 7055 Telex ao6915

INITIAL WORKS TO BORE 'A' & 'C'
BORE 'C' later cased with 6" steel

4/816 DCC
REC 11 JUL 1986
6628
FILE: EL6.

7th July 1986

Our Ref: 12236-009-73

LORD MAYOR		NTLGA		GEN	
TC		LGITC		SPEC	
ASM		See TC	1	P&P	
FC		Reply Direct	2	AS	
CSM		Prep Reply for TC	3	CS	
CE	H	INFO	4	TS	
RRM		Report to LM	5	TP	
		Prep Reply for LM	6	COG	
ACK:					

Town Clerk
Darwin City Council
P O Box 84
DARWIN NT 5794

Attention: Mr Stuart Delahay
Engineering Department

Dear Sir,

SHOAL BAY WASTE DISPOSAL SITE - GROUNDWATER BORES SITE REPORT

INTRODUCTION

We herewith submit our site report on the drilling supervision of two groundwater exploration bores at the above site from the 1st to the 5th July, 1986. Following a verbal request by Mr Stuart Delahay of Darwin City Council, Mr Colin Parker (Environmental Geologist) of Dames & Moore carried out drill rig supervision, geological logging of chip samples and performed a limited water quality testing program.

The boreholes were drilled to identify the groundwater resources of the site. A water supply of approximately 3L/S is needed by Darwin City Council for the proposed landfill site to service the requirements of equipment washdown areas, fire fighting facilities and irrigation. Mains water is available from Vanderlin Drive 1km from the site but a lower cost groundwater source is considered to be a useful objective for appraisal and development.

SD info

FIELD METHODOLOGY

Darwin City Council obtained advice from Water Resources Division, NT Department of Mines & Energy, for the location and target depths of 3 possible boreholes. Two boreholes (Boreholes A and C) were drilled at the locations shown on Figure 1. Each borehole was terminated at 49m depth with a hole diameter of 8" (203mm).

Drilling was performed using a percussion drill rig from Bynoe Drilling Pty Ltd. Water was used as a drilling fluid in conjunction with air to improve drill performance below the water table.

At the completion of drilling, each hole was airlifted for 20 minutes and a water sample collected. Electrical Conductivity (EC) and pH determinations were carried out on water samples from various depths. Water quality results are presented in Table 1.

Geological logging was performed on the cuttings and borehole logs are presented in Appendix A. Under the direction of Darwin City Council, the boreholes were not cased but PVC casing was installed from 0 to 3m as a protective measure.

DISCUSSION OF RESULTS

Based on the drilling of groundwater bores the geology of the Shoal Bay Dump Site can be generalized as follows:

Bathurst Island Formation (Cretaceous Age)	0 - 6m	PORCELLANITE (SILICEOUS SILTSTONE), white, hard, minor pockets of grey silt.
	6 - 25m	SILTSTONE, extremely to moderately weathered, yellow- brown. Clay of high plasticity.
	25 - 27m	Basal CONGLOMERATE, yellow-brown, pebbles to 40mm.

---------UNCONFORMITY---------

Proterozoic Rocks	27 - 49m	SCHIST or PEBBLY SANDSTONE, yellow-brown, red-brown and grey. Schist is finely micaceous.

It should be noted that cutting returns in Borehole C were poor. The bulk of the samples, from 28m to 49m, consisted of a brown slurry with isolated rounded pebbles and rare angular sandstone/siltstone fragments.

Previous geological investigations have been limited in the area. Based on the information presented by Pietsch (1983) and a review of adjacent groundwater bores, the underlying Proterozoic Rocks (below 27m) are thought to form part of either the Burrell Creek Formation or the Undifferentiated South Alligator Group (formerly Masson Formation). An inferred fault, projected through the Shoal Bay Site, separates the two formations. However, the exact location of the fault is not known and therefore a true formation name cannot be assigned.

Groundwater was intersected at 19m in Borehole A and 22m in Borehole C. Binch (1979) and Pietsch (1983) believe significant good quality water is found above the contact with the Proterozoic Rocks and this water is derived from infiltrating waters through the Bathurst Island Formation. The Proterozoic rocks found at the site are thought to be of low permeability. The other significant groundwater supply in the Darwin Rural Area is obtained from the Coomalie Dolomite (Proterozoic Age). However, no dolomite was intersected in Boreholes A and C and other nearby bores have failed to intersect the dolomite at depths of up to 109m.

Water quality results in Table 1 indicate high quality water with approximately 30mg/L Total Dissolved Solids and pH ranging from 6.18 to 6.60. Based on this limited testing programme the water is suitable for all domestic and irrigation purposes.

The water derived from Borehole A consisted of a thin slurry, even after 20 minutes of airlifting. The flow was estimated at 0.5 litres/sec and further development of this borehole is not advised.

Airlifting Borehole C produced a favourable quantity of water, approximating 1 litre/sec. This quantity should improve if the borehole is cased and developed. However, further pump testing of the borehole (ie. 24 hour test) should incorporate routine EC monitoring to determine whether the salt water intrusion evident in the shallow aquifer beneath the proposed landfill site (ie. standpipes SP4 and SP5) extends into the deeper aquifer following long term pumping.

Borehole water levels measured at the completion of airlifting were 14m in Borehole A and 9m in Borehole C.

CONCLUSION

Based on the limited groundwater drilling program good quality groundwater exists beneath the proposed Shoal Bay Landfill Service Area site. Borehole C has the potential for producing approximately 2 litres/sec, however it is recommended that Borehole A be abandoned.

If additional groundwater supplies are required, it is recommended that a series of 5" (127mm) exploration boreholes be drilled north and south of Borehole A. This will enable a cost efficient delineation of further possible groundwater supplies and aid the exploration and development of the local groundwater resource.

We trust this report fulfils your current requirements and should you have any questions concerning this work please contact Mr Colin Parker or the undersigned.

Yours faithfully,
DAMES & MOORE

Allen Kearns

Allen Kearns
Managing Principal.

REFERENCES

Binch, I.R. (1979). Hydrogeology of the McMinns - Benham Lagoon Area, Northern Territory. Unpub. M.App. Sc. Thesis, U.N.S.W.

Pietsch, B.A. (1983). 1:100,000 Geological Map Series; Explanatory Notes, Darwin 5073. Geological Survey, NT Dept of Mines & Energy.

TABLE 1

GROUNDWATER QUALITY TEST RESULTS

BOREHOLE	DEPTH	pH	EC(uS/cm)
A	21m (1)	-	25
	39m (1)	-	32
	49m (1&2)	6.18	24
C	29m	6.40	49
	49m (2)	6.60	36

NOTE: (1) Water sample consisted of paste/slurry

(2) Sampled at 49m after 20 minutes airlifting

JOB No. 12236-009-73

PROJECT: SHOAL BAY DUMP - GROUNDWATER BORES

BOREHOLE LOCATION: SEE FIGURE 1

SURFACE ELEVATION: DATUM:

SURFACE CONDITIONS:

BOREHOLE No. A

SHEET 1 OF 2

LOGGED BY CJH CHECKED BY

TIME/DATE STARTED 4-7-86 TIME/DATE FINISHED 4-7-86

GEOL UNIT	SOIL DESCRIPTION	DEPTH (metres)	SAMPLE TYPE	GROUND WATER DATA AND ADDITIONAL NOTES	DRILLING METHOD
BATHURST ISLAND FORMATION	PORCELLANITE (SILICEOUS SILTSTONE), white	0–4			PERCUSSION DRILLING
	SILTSTONE (MW), brown, iron indurated and PORCELLANITE, white	4–6			
	CLAY, medium to high plasticity, yellow-brown, moist >Wp below 9m. Material is extremely weathered siltstone	6–27	D (approx. 6–9 m)		
			D (approx. 15–18 m)	5 July '86 (water level approx. 14 m)	
	EC at 21m was 25uS/cm (soil paste)			Water Inflow (approx. 19 m)	PERCUSSION DRILLING WITH WATER
PROTEROZOIC BEDS (boundary ?)	CONGLOMERATE, rounded pebbles of quartz and lithic fragments. Cuttings consist of yellow-brown slurry. Possibly grading to a pebbly SANDSTONE	27–37	D (approx. 33–36 m)		

Column headings: SAMPLE DATA: SAMPLE TYPE, CONDITION *, SAMPLER RESISTANCE, FIELD SHEAR STRENGTH (kPa); CLASSIFICATION DATA: MOISTURE CONTENT %, PLASTIC LIMIT %, LIQUID LIMIT %, LINEAR SHRINKAGE %, BULK DENSITY (t/m³), % FINES (-0.075 mm); STRENGTH DATA: TYPE OF TEST, PARAMETERS Su kPa, C kPa, Ø degrees; GROUND WATER DATA AND ADDITIONAL NOTES; FIELD DATA: DRILLING METHOD, CASING DEPTH; GRAPHIC LOG; UNIFIED SYMBOL.

SAMPLE TYPES
AS – auger sample
SPT – Standard Penetration Test
RS – ring sample from Dames & Moore 'U' type
TW – tube sample from Dames & Moore 'U' type with thin wall bit
WS – wash sample
RC – rock core

SAMPLE CONDITION *
■ undisturbed soil sample
☒ soil sample disturbed
☐ soil sample not recovered

SAMPLER RESISTANCE
N — Number of blows required to drive S.P.T. sampler 300 mm using 65 kg hammer falling 750 mm
PH – sampler advanced by hydraulic pressure
R — refusal of sampler

FIELD SHEAR STRENGTHS
V – shear vane
P – hand penetrometer
E – estimate only

LABORATORY STRENGTH TESTS
Type of Test
T – Triaxial shear test
D – direct shear test
U – unconfined compression test
V – shear vane

Condition of Test
Q – quick (undrained test)
R – consolidated undrained test
R̄ – consolidated undrained test with pore pressure measurement
S – slow (drained test)

Test Results
c', ø' – effective stress strength parameters
c, ø – total stress strength parameters
Su – undrained shear strength

BOREHOLE LOG FIGURE

JOB No. 12236-009-73

PROJECT: SHOAL BAY DUMP - GROUNDWATER BORES

BOREHOLE LOCATION: SEE FIGURE 1

SURFACE ELEVATION: DATUM:

SURFACE CONDITIONS:

BOREHOLE No. A

SHEET 2 OF 2

GEOL. UNIT	SOIL DESCRIPTION	GRAPHIC LOG	UNIFIED SYMBOL	DEPTH (metres)	SAMPLE DATA: SAMPLE TYPE	SAMPLE DATA: CONDITION *	SAMPLER RESISTANCE	SAMPLE DATA: FIELD SHEAR STRENGTH (kPa)	CLASSIFICATION DATA: MOISTURE CONTENT %	CLASSIFICATION DATA: PLASTIC LIMIT %	CLASSIFICATION DATA: LIQUID LIMIT %	CLASSIFICATION DATA: LINEAR SHRINKAGE %	CLASSIFICATION DATA: BULK DENSITY (t/m3)	CLASSIFICATION DATA: % FINES (-0.075 mm)	STRENGTH DATA: TYPE OF TEST	STRENGTH DATA: PARAMETERS Su kPa C kPa Ø degrees	GROUND WATER DATA AND ADDITIONAL NOTES	FIELD DATA: DRILLING METHOD	FIELD DATA: CASING DEPTH
PROTEROZOIC BEDS	Yellow-brown slurry with rounded pebbles as above			40														PERCUSSION DRILLING	
	PEBBLY SANDSTONE/CONGLOMERATE, red-brown slurry with rounded pebbles and some angular sandstone and siltstone fragments			42															
				44															
				46															
	EC at 39m was 32uS/cm (paste)			48															
	EC at 49m was 24uS/cm (paste) and pH 6.18																		
	END BOREHOLE A @ 49m - TERMINATED, NOT CASED			50															

TIME/DATE STARTED 5-7-81
TIME/DATE FINISHED 5-7-81

LOGGED BY CMV
CHECKED BY

SAMPLE TYPES

AS - auger sample
SPT - Standard Penetration Test
RS - ring sample from Dames & Moore 'U' type
TW - tube sample from Dames & Moore 'U' type with thin wall bit
WS - wash sample
RC - rock core

SAMPLE CONDITION

■ undisturbed soil sample
⊠ soil sample disturbed
□ soil sample not recovered

SAMPLER RESISTANCE

N — Number of blows required to drive S.P.T. sampler 300 mm using 65 kg hammer falling 750 mm
PH — sampler advanced by hydraulic pressure
R — refusal of sampler

FIELD SHEAR STRENGTHS

V - shear vane
P - hand penetrometer
E - estimate only

LABORATORY STRENGTH TESTS

Type of Test
T - Triaxial shear test
D - direct shear test
U - unconfined compression test
V - shear vane

Condition of Test
Q - quick (undrained test)
R - consolidated undrained test
R̄ - consolidated undrained test with pore pressure measurement
S - slow (drained test)

Test Results
c', ø' - effective stress strength parameters
c , ø - total stress strength parameters
Su - undrained shear strength

BOREHOLE LOG FIGURE

JOB No. 12236-009-73

PROJECT: SHOAL BAY DEEP BORES

BOREHOLE LOCATION: SEE FIGURE 1

SURFACE ELEVATION: DATUM:

SURFACE CONDITIONS:

BOREHOLE No. C

SHEET 1 OF 2

GEOL UNIT	SOIL DESCRIPTION	GRAPHIC LOG	UNIFIED SYMBOL	DEPTH (metres)	SAMPLE DATA: SAMPLE TYPE	SAMPLE DATA: CONDITION	SAMPLER RESISTANCE	SAMPLE DATA: FIELD SHEAR STRENGTH (kPa)	CLASSIFICATION DATA: MOISTURE CONTENT %	CLASSIFICATION DATA: PLASTIC LIMIT %	CLASSIFICATION DATA: LIQUID LIMIT %	CLASSIFICATION DATA: LINEAR SHRINKAGE %	CLASSIFICATION DATA: BULK DENSITY (t/m³)	CLASSIFICATION DATA: % FINES (<0.075mm)	STRENGTH DATA: TYPE OF TEST	STRENGTH DATA: PARAMETERS Su kPa C kPa Ø degrees	GROUND WATER DATA AND ADDITIONAL NOTES	FIELD DATA: DRILLING METHOD	FIELD DATA: CASING DEPTH
BATHURST ISLAND FORMATION	PORCELLANITE, (Silicified Siltstone), white with zones of grey clayey silt in voids in Porcellanite			2															
	SILTSTONE, iron stained, brown some minor grey (MW-HW), zones of extremely weathered siltstone with orange clay, medium plasticity			4															
	"			6															
				8															
				10															
				12															
	colour change to brown and slightly yellow-brown SILTSTONE (MW) with Clay (CH) zones common, medium to high plasticity			14	D												4 July '86 ▼ 5 July '86 ▼		PERCUSSION DRILLING
			CH	16															
	poor cutting return (muddy sample)			18															
				20															
				22													Water Inflow		
	CONGLOMERATE (MW-HW), pebbles rounded to 35mm diameter, matrix washed away			24	D														
				25															
PROTEROZOIC BEDS	SCHIST/PHYLLITE, red-brown with orange staining, fine mica laminae			26	D														
				28	&														
	EC at 29m was 49uS/cm and pH 6.40			30															
	change in colour to yellow-brown			32															
	change in colour to reddish-brown			34															
				36	D														

TIME/DATE STARTED 1-7-86
TIME/DATE FINISHED 4-7-86

LOGGED BY 'FT'
CHECKED BY

SAMPLE TYPES

AS - auger sample
SPT - Standard Penetration Test
RS - ring sample from Dames & Moore 'U' type
TW - tube sample from Dames & Moore 'U' type with thin wall bit
WS - wash sample
RC - rock core

SAMPLE CONDITION

■ undisturbed soil sample
⊠ soil sample disturbed
□ soil sample not recovered

SAMPLER RESISTANCE

N — Number of blows required to drive S.P.T. sampler 300 mm using 65 kg hammer falling 750 mm
PH — sampler advanced by hydraulic pressure
R — refusal of sampler

FIELD SHEAR STRENGTHS

V - shear vane
P - hand penetrometer
E - estimate only

LABORATORY STRENGTH TESTS

Type of Test

T - Triaxial shear test
D - direct shear test
U - unconfined compression test
V - shear vane

Condition of Test

Q - quick (undrained test)
R - consolidated undrained test
R - consolidated undrained test with pore pressure measurement
S - slow (drained test)

Test Results

c', ø' - effective stress strength parameters
c, ø - total stress strength parameters
Su - undrained shear strength

BOREHOLE LOG FIGURE

JOB No. 12236-009-73

PROJECT: SHOAL BAY DUMP GROUNDWATER STUDY

BOREHOLE LOCATION: SEE FIGURE 1

SURFACE ELEVATION: DATUM:

SURFACE CONDITIONS:

BOREHOLE No. C

SHEET 2 OF 2

GEOL UNIT	SOIL DESCRIPTION	GRAPHIC LOG	UNIFIED SYMBOL	DEPTH (metres)	SAMPLE DATA: SAMPLE TYPE	SAMPLE DATA: CONDITION *	SAMPLER RESISTANCE	SAMPLE DATA: FIELD SHEAR STRENGTH (kPa)	CLASSIFICATION DATA: MOISTURE CONTENT %	CLASSIFICATION DATA: PLASTIC LIMIT %	CLASSIFICATION DATA: LIQUID LIMIT %	CLASSIFICATION DATA: LINEAR SHRINKAGE %	CLASSIFICATION DATA: BULK DENSITY (t/m3)	CLASSIFICATION DATA: % FINES (<0·075mm)	STRENGTH DATA: TYPE OF TEST	STRENGTH DATA: PARAMETERS Su kPa / c kPa / ø degrees	GROUND WATER DATA AND ADDITIONAL NOTES	FIELD DATA: DRILLING METHOD	FIELD DATA: CASING DEPTH
PROTEROZOIC BEDS	SCHIST/PHYLLITE, as above				D														
	SCHIST/PHYLLITE, red-brown silt and sand sized cuttings and rock pieces			40															
				42															
				44															
	SCHIST, grey, (silt sized cuttings rare chips) some dark grey flecks, coarser cuttings at base of hole			46															
	— EC at 49m is 36uS/cm and pH 6.60			48	D														
	END BOREHOLE C @ 49.0m - TERMINATED - NOT CASED			50															

DRILL DATE STARTED [illegible]
DRILL DATE FINISHED [illegible]

LOGGED BY [illegible]
CHECKED BY

SAMPLE TYPES

AS – auger sample
SPT - Standard Penetration Test
RS - ring sample from Dames & Moore 'U' type
TW - tube sample from Dames & Moore 'U' type with thin wall bit
WS - wash sample
RC - rock core

SAMPLE CONDITION

■ undisturbed soil sample
☒ soil sample disturbed
☐ soil sample not recovered

SAMPLER RESISTANCE

N — Number of blows required to drive S.P.T. sampler 300 mm using 65 kg hammer falling 750 mm
PH – sampler advanced by hydraulic pressure
R — refusal of sampler

FIELD SHEAR STRENGTHS

V - shear vane
P - hand penetrometer
E - estimate only

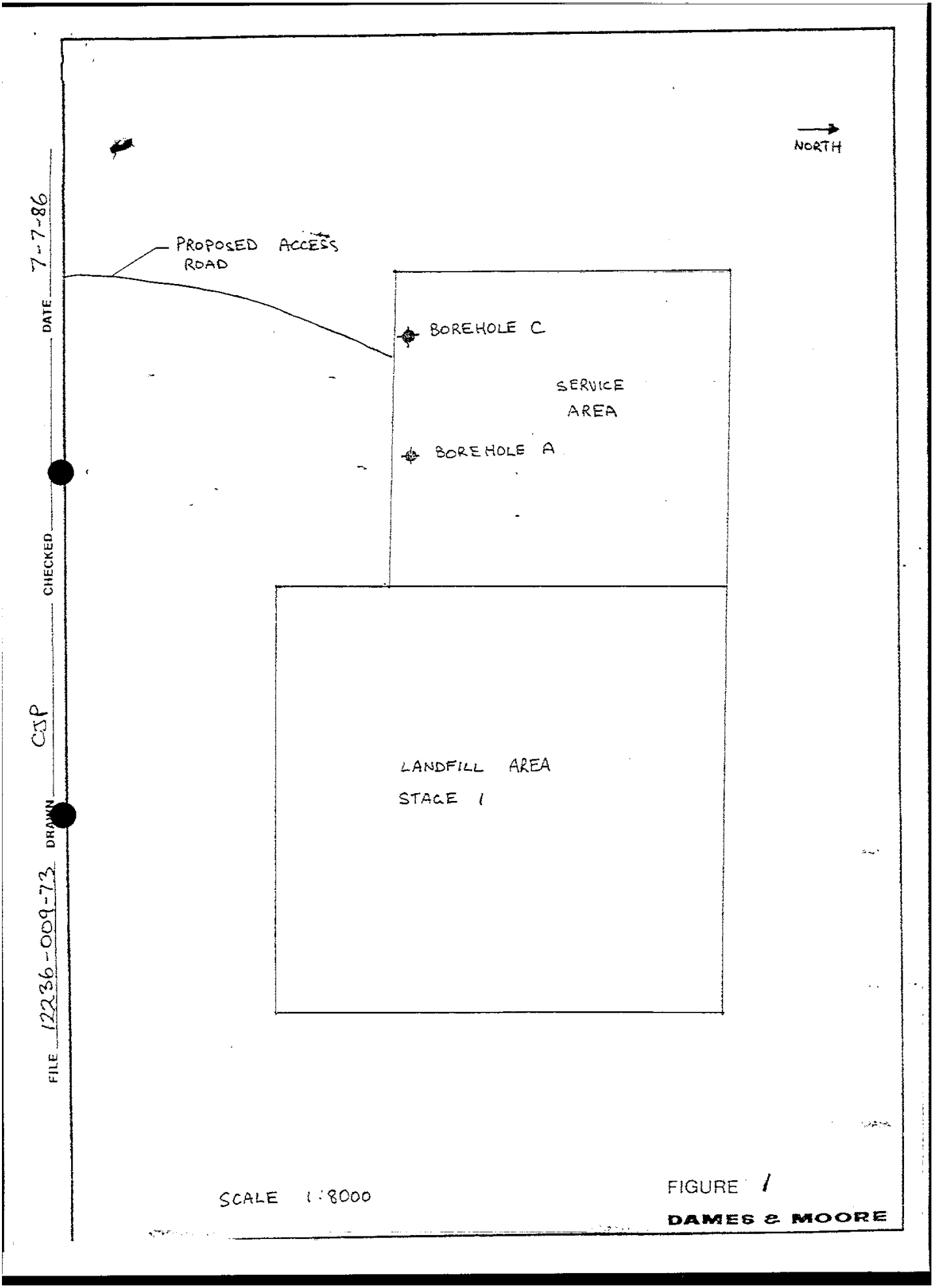
LABORATORY STRENGTH TESTS

Type of Test
T - Triaxial shear test
D - direct shear test
U - unconfined compression test
V - shear vane

Condition of Test
Q - quick (undrained test)
R - consolidated undrained test
R̄ - consolidated undrained test with pore pressure measurement
S - slow (drained test)

Test Results
c', ø' - effective stress strength parameters
c , ø - total stress strength parameters
Su - undrained shear strength

BOREHOLE LOG FIGURE


NORTH
PROPOSED ACCESS ROAD
BOREHOLE C
SERVICE AREA
BOREHOLE A
LANDFILL AREA
STAGE 1
DATE 7-7-86
CHECKED
DRAWN CJP
FILE 12236-009-73
SCALE 1:8000
FIGURE 1
DAMES & MOORE

DAR 09-07

RN024627

Regulation 8

THE NORTHERN TERRITORY OF AUSTRALIA

Control of Waters Act

I.N. 80/3053
R.N. 24,627

FINAL STATEMENT OF BORE

COUNCIL HOLE A

From	To	Description of Strata (including colour and hardness)
0	3	LATERITE + PORCELLANITE
3	6	PORCELLANITE + SILTSTONE
6	24	BROWN SANDY CLAY
24	49	CLAY + GRAVEL

Name of Bore —

Name of Property — H of BAGOT. PROPOSED DUMP

Description of Property — SHOAL BAY

Name of Owner — DARWIN CITY COUNCIL

Name of Contractor — BYNOE DRILLING

Name of Driller — E. CAFFERY

Date of Commencement — 5.7.86

Date of Completion — 5.7.86

Total Depth — 49 m

Particulars of Casing — Nil

Particulars of Perforations or Screens —

Location of Bore (or supply sketch on the back hereof) —

.... km

(a) S SE of (b)..
E NW
W SW ....

(a) Circle appropriate direction.
(b) Use known point such as existing bore, homestead, outstation, etc.

Additional information of interest about bore. ZONE 52 S/B 815

Grid Reference ~~710150 - 8629915~~ 709279 - 8629517.

Map Number 1:10,000 SHEET 09-07 'DARWIN'

Samples of Strata and Water Supplies

have been* will be*

left at the following place —

....

....

Signature [signature]

*Delete non applicable

Water	1st Supply only	2nd Supply only	3rd Supply only
Struck at	24		
Standing Water Level	—		
Pumping Supply Litres/sec	·2		
Duration of Pump Test	1/2 hr		
Water Level During Test			
Quality: Good, Fair or Bad	BAD		

For Office use only — No W/S
Plotted 10/7/86

22403.812 G. L. DUFFIELD, Government Printer of the Northern Territory

WATER ANALYSIS

POWER AND WATER AUTHORITY
WATER DIRECTORATE

3
SC
BL
EH

80/3053

Laboratory Register No.	88/89/0365	
Date received in Laboratory	7/9/88	
Bottle No. 2	Time of sampling 1056	Date of sampling 7/9/88

LOCATION AND DETAILS SHOAL BAY DARWIN CITY COUNCIL R/N 24627
BORE "C"
D/N 7608 RSP 1956.

ANALYSIS — PHYSICAL

☐	pH	☐	Colour (Hazen units)
☐	Specific conductance (microsiemens/cm at 25° C) 145	☐	Turbidity (NTU's)
☐	Total dissolved solids (mg/l - by evaporation at 180° C)	☐	Suspended solids (mg/l)

ANALYSIS — CHEMICAL (mg/l)

☐	Sodium, Na	☐	Chloride, Cl 35
☐	Potassium, K	☐	Sulphate, SO^4
☐	Calcium, Ca	☐	Nitrate, NO^3
☐	Magnesium, Mg	☐	Bicarbonate, HCO^3
☐	Total Hardness (as $CaCO^3$)	☐	Carbonate, CO^3
☐	Total Alkalinity (as $CaCO^3$)	☐	Fluoride, F
☐	Iron, (total) Fe	☐	NaCl (calc. from chloride) 58
☐	Silica, SiO^2		

ANALYSIS — ADDITIONAL (mg/l)

☐	Copper, Cu	☐	Lead, Pb	☐	Arsenic, As
☐	Manganese, Mn	☐	Zinc, Zn	☐	Cadmium, Cd
☐		☐		☐	

NATA

This Laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full

Boxes marked thus ☐ Indicate levels are within the limits as quoted in the "Guidelines for Drinking Water Quality in Australia", 1987; issued by the National Health and Medical Research Council and the Australian Water Resources Council.

☒ Levels exceed non-health related limits.

☒ Levels exceed health related limits.

Date 9.8.88

GPO Box 1096, Darwin NT 5794
Telex AA85044
Facsimile (089) 41 0705

WATER ANALYSIS

POWER AND WATER AUTHORITY
WATER DIRECTORATE

3
SC
BL
EPL

30/3053.

Laboratory Register No.	88/89/0129	
Date received in Laboratory	27/7/88	
Bottle No.	Time of sampling	Date of sampling
1/A	1427	25/7/88

LOCATION AND DETAILS DARWIN CITY COUNCIL SHOAL BAY R/N 24627

BORE "C"

D/N 6897 RSP 1956

ANALYSIS — PHYSICAL

☐	pH	☐	Colour (Hazen units)
☐	Specific conductance (microsiemens/cm at 25° C) 130	☐	Turbidity (NTU's)
☐	Total dissolved solids (mg/l - by evaporation at 180° C)	☐	Suspended solids (mg/l)

ANALYSIS — CHEMICAL (mg/l)

☐	Sodium, Na	☐	Chloride, Cl 32
☐	Potassium, K	☐	Sulphate, SO^4
☐	Calcium, Ca	☐	Nitrate, NO^3
☐	Magnesium, Mg	☐	Bicarbonate, HCO^3
☐	Total Hardness (as $CaCO^3$)	☐	Carbonate, CO^3
☐	Total Alkalinity (as $CaCO^3$)	☐	Fluoride, F
☐	Iron, (total) Fe	☐	NaCl (calc. from chloride) 53
☐	Silica, SiO^2		

ANALYSIS — ADDITIONAL (mg/l)

☐ Copper, Cu	☐ Lead, Pb	☐ Arsenic, As
☐ Manganese, Mn	☐ Zinc, Zn	☐ Cadmium, Cd
☐	☐	☐

Conductivity and Chloride Analysis Only.

This Laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full

Date 29/7/88

GPO Box 1006, Darwin NT 5794
Telex AA85041
Facsimile (089) 47 0705
Telephone (089) 89 5511

Boxes marked thus ☐ Indicate levels are within the limits as quoted in the "Guidelines for Drinking Water Quality in Australia", 1987; issued by the National Health and Medical Research Council and the Australian Water Resources Council.

☒ Levels exceed non-health related limits.

☒ Levels exceed health related limits.

2
SC
EPL

80/3053

WATER ANALYSIS

Department of Transport & Works
Water Division, Darwin N.T.

WR 4/1A

Laboratory Register No.	87/88/0337
Date received in Laboratory	1.9.87
Bottle No. R010	Time of sampling	Date of sampling 25.8.87

LOCATION AND DETAILS SHOAL BAY COUNCIL COUNCIL DUMP "C" R/N 24627

DEPTH 3.9m DISCH 0.7 LPS MAP 09-07 G.R. 709279 - 8629517

Proposed water use:- Domestic, Stock, Irrigation, other (specify) P/N° 8000 RSP 1972

ANALYSIS — PHYSICAL

☒ pH	6.2	☐ Colour (Hazen units)	
☐ Specific conductance (microsiemens/cm at 25° C)	95	☐ Turbidity (NTU's)	
☐ Total dissolved solids (mg/L - by evaporation at 180° C)	70	☐ Suspended solids (mg/L)	

ANALYSIS — CHEMICAL (mg/L)

☐ Sodium, Na	3	☐ Chloride, Cl	11
☐ Potassium, K	3	☐ Sulphate, SO_4	3
☐ Calcium, Ca	8	☐ Nitrate, NO_3	<1
☐ Magnesium, Mg	3	☐ Bicarbonate, HCO_3	35
☐ Total Hardness (as $CaCO_3$)	32	☐ Carbonate, CO_3	
☐ Total Alkalinity (as $CaCO_3$)	29	☐ Fluoride, F	0.2
☒ Iron, (total) Fe	1.3	☐ Orthophosphate, PO_4	
☐ Silica, SiO_2	14	☐ NaCl (calc. from chloride)	18

ANALYSIS — ADDITIONAL (mg/L)

☐ Copper, Cu	☐ Lead, Pb	☐ Arsenic, As
☐ Manganese, Mn	☐ Zinc, Zn	☐ Cadmium, Cd
☐ Nickel, N	☐ Cobalt, Co	☐

THE SAMPLE AS ANALYSED ~~COMPLIES~~/DOES NOT COMPLY WITH NORTHERN TERRITORY DRINKING WATER STANDARDS AS RECOMMENDED BY THE NORTHERN TERRTORY DEPARTMENT OF HEALTH.

With suitable treatment the pH may be adjusted to an acceptable level.

With suitable treatment the Iron concentration may be lowered to an acceptable level.

Analysed By: [signature] Date 6, 9, 87

☒ ... levels considered undesirable for drinking water by the ...

2
SC
EPL

80/3053

WATER ANALYSIS

Department of Transport & Works
Water Division Darwin N.T.

WR 4/1A

Laboratory Register No.	87/88/0337
Date received in Laboratory	1.9.87
Bottle No. R010	Time of sampling	Date of sampling 25.8.87

LOCATION AND DETAILS SHOAL BAY COUNCIL COUNCIL DUMP "C" R/N 24627

DEPTH 3.9m DISCH 0.7 LPS MAP 09-07 G.R. 709279-8629517

Proposed water use:- Domestic, Stock, Irrigation, other (specify) P/N° 8000 RSP 1972

ANALYSIS — PHYSICAL

☒	pH	6.2	☐ Colour (Hazen units)
☐	Specific conductance (microsiemens/cm at 25° C)	95	☐ Turbidity (NTU's)
☐	Total dissolved solids (mg/L - by evaporation at 180° C)	70	☐ Suspended solids (mg/L)

ANALYSIS — CHEMICAL (mg/L)

☐	Sodium, Na	3	☐	Chloride, Cl	11
☐	Potassium, K	3	☐	Sulphate, SO_4	3
☐	Calcium, Ca	8	☐	Nitrate, NO_3	<1
☐	Magnesium, Mg	3	☐	Bicarbonate, HCO_3	35
☐	Total Hardness (as $CaCO_3$)	32	☐	Carbonate, CO_3	
☐	Total Alkalinity (as $CaCO_3$)	29	☐	Fluoride, F	0.2
☒	Iron, (total) Fe	1.3	☐	Orthophosphate, PO_4	
☐	Silica, SiO_2	14	☐	NaCl (calc. from chloride)	18

ANALYSIS — ADDITIONAL (mg/L)

☐	Copper, Cu	☐	Lead, Pb	☐	Arsenic, As
☐	Manganese, Mn	☐	Zinc, Zn	☐	Cadmium, Cd
☐	Nickel, N	☐	Cobalt, Co	☐	

THE SAMPLE AS ANALYSED ~~COMPLIES~~ DOES NOT COMPLY WITH NORTHERN TERRITORY DRINKING WATER STANDARDS AS RECOMMENDED BY THE NORTHERN TERRTORY DEPARTMENT OF HEALTH.

With suitable treatment the pH may be adjusted to an acceptable level.

With suitable treatment the Iron concentration may be lowered to an acceptable level.

Analysed By: [signature] Date 6,9,87

Boxes marked thus ☒ indicate levels considered undesirable for drinking water by the

WATER RESOURCES DIVISION

TEST REPORT — BORE RN. 24627

Bore location: Shoal Bay Waste Disposal Site
Client/owner: Darwin City Council
Client's reference:
Purpose of supply: Irrigation

Map: Darwin 1:10 000 Sheet 09-07
Grid reference [illegible]

RECOMMENDATIONS

Pumping rate: 1.0 L/s Pump setting: 39.0 m below ground level
General recommendations are given on the reverse side.
The aquifer and bore can cannot sustain higher pumping rates with deeper pump settings or for short periods in favourable seasons. Further advice can be obtained from: Water Resources Div Sasco House, DARWIN
(In all correspondence refer to the bore's RN number).

BORE DATA

Finished depth: 49 m Completion date: 19/9/86
Standing water level 13.30 m on 4/11/86
Construction details:

Interval (m)	Description
0 – 43.5 m	152 mm ID Blank Steel Casing
43.5 – 49.5 m	152 mm ID Steel Casing Slotted

AQUIFER TEST

Test date: 6/11/86
Test rates: 1.0 to 0.88 L/s
Test duration 6½ hrs

Notes: 1. Top of casing as constructed was 0.60 m above ground
2. All depths are measured from natural ground level
3. Test rates are not indicative of safe long term pumping rates.

WARNING: MINIMUM INTERNAL BORE DIAMETER IS 152 mm

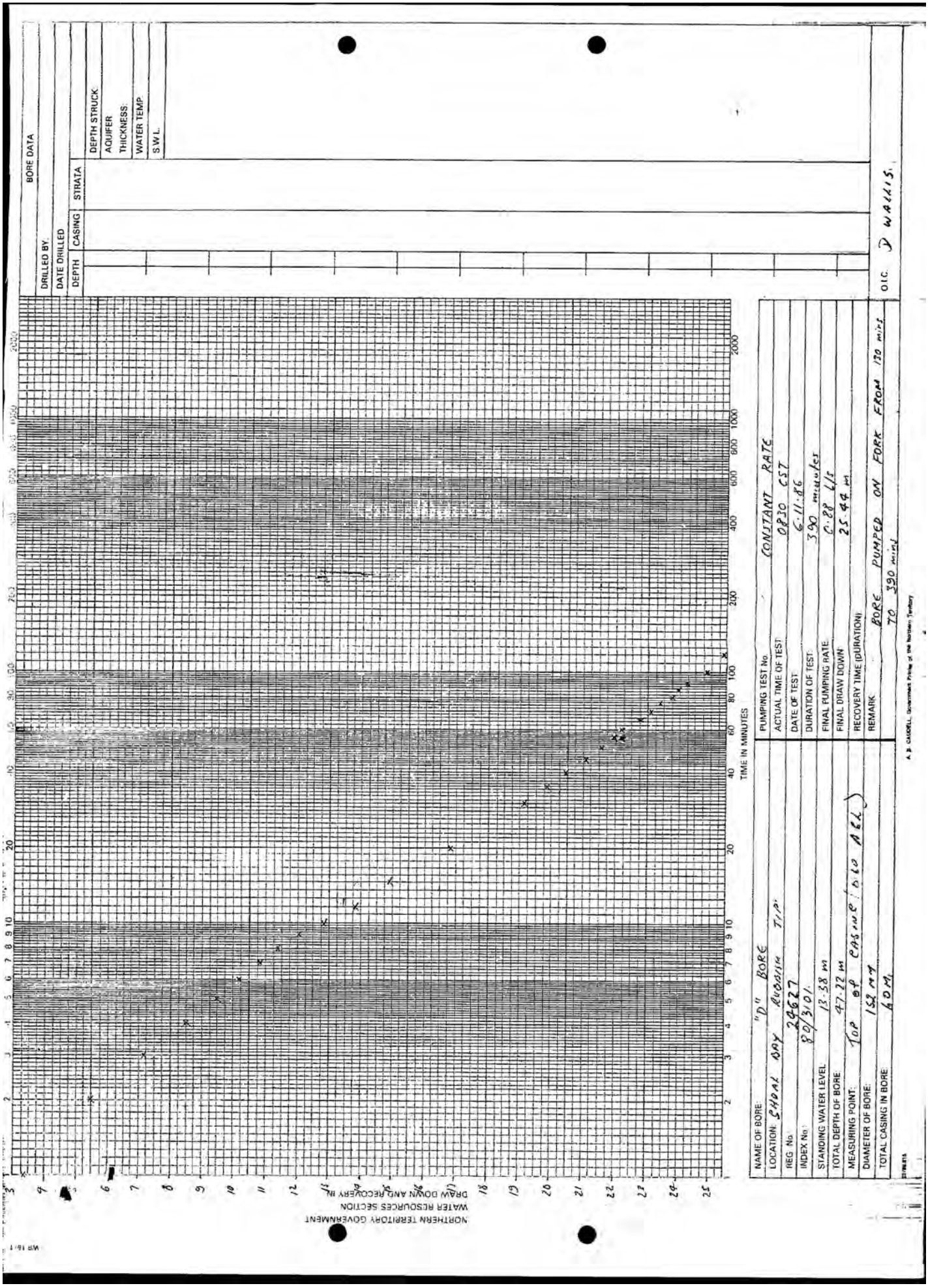
COMMENTS

1. Recommended pumping rate is based on a constant rate test at 1.0 L/s for a period of 6½ hours and assume that hydrological conditions remain constant.
2. Provisions to obtain water samples at the bore head should be incorporated in any reticulation.
3. Water quality should be monitored regularly for an initial period to determine parameters and thereafter checked for anomalies.

WATER QUALITY

See water laboratory report (Analysis No. 86/87/0775)

WRD4020 By: J Rykiert 12/11/86


BORE DATA
DRILLED BY:
DATE DRILLED
DEPTH
CASING
STRATA
DEPTH STRUCK:
AQUIFER
THICKNESS:
WATER TEMP
S.W.L.
NORTHERN TERRITORY GOVERNMENT
WATER RESOURCES SECTION
DRAW DOWN AND RECOVERY IN
TIME IN MINUTES
NAME OF BORE: "D" BORE
LOCATION: SANDAL BAY RUBBISH TIP.
REG. No: 24627
INDEX No: 80/310.
STANDING WATER LEVEL 13.38 m
TOTAL DEPTH OF BORE 47.22 m
MEASURING POINT: TOP OF CASING 0.60 AEL
DIAMETER OF BORE: 152 mm
TOTAL CASING IN BORE: 40m
PUMPING TEST No
ACTUAL TIME OF TEST 0830 CST
DATE OF TEST 6.11.86
DURATION OF TEST 390 minutes
FINAL PUMPING RATE 6.88 L/s
FINAL DRAW DOWN 25.44 m
RECOVERY TIME (DURATION)
REMARK: BORE PUMPED ON FORK FROM 130 mins TO 390 mins
CONSTANT RATE
O.I.C. D WALLIS.

80/3053

WATER ANALYSIS

Department of Transport & Works
Water Division, Darwin N.T.

80/3053 WR 4/1A

Laboratory Register No.	86/87/0775
Date received in Laboratory	10.11.86

Bottle No.	Time of sampling	Date of sampling
P032	1530	6.11.86

LOCATION AND DETAILS HOLMES JUNGLE R/N 24627 DEPTH 39.2m
BISCH 1.0LPS TEMP 32°C pH 5.77 COND 48 RWD 454

Proposed water use:- Domestic, Stock, Irrigation, other (specify) RSP 1956

ANALYSIS — PHYSICAL

☒ pH	5.9	☐ Colour (Hazen units)	
☐ Specific conductance (microsiemens/cm at 25° C)	40	☐ Turbidity (NTU's)	
☐ Total dissolved solids (mg/L - by evaporation at 180° C)	35	☐ Suspended solids (mg/L)	

ANALYSIS — CHEMICAL (mg/L)

☐ Sodium, Na	2	☐ Chloride, Cl	2
☐ Potassium, K	2	☐ Sulphate, SO_4	1
☐ Calcium, Ca	1	☐ Nitrate, NO_3	<1
☐ Magnesium, Mg	2	☐ Bicarbonate, HCO_3	15
☐ Total Hardness (as $CaCO_3$)	11	☐ Carbonate, CO_3	
☐ Total Alkalinity (as $CaCO_3$)	12	☐ Fluoride, F	0.2
☒ Iron, (total) Fe	3.9	☐ Orthophosphate, PO_4	
☐ Silica, SiO_2	15	☐ NaCl (calc. from chloride)	3

ANALYSIS — ADDITIONAL (mg/L)

☐ Copper, Cu	☐ Lead, Pb	☐ Arsenic, As
☐ Manganese, Mn	☐ Zinc, Zn	☐ Cadmium, Cd
☐ Nickel, N	☐ Cobalt, Co	☐

THE SAMPLE AS ANALYSED ~~COMPLIES~~/DOES NOT COMPLY WITH NORTHERN TERRITORY DRINKING WATER STANDARDS AS RECOMMENDED BY THE NORTHERN TERRTORY DEPARTMENT OF HEALTH.

With suitable treatment the iron concentration may be lowered to an acceptable level.

With suitable treatment the pH may be adjusted to an acceptable level.

Analysed By [illegible] Date 21/11/86

Boxes marked thus ☒ indicate levels considered undesirable for drinking water by the Northern Territory Department of Health.

Department of Mines and Energy

HEAD OFFICE MINERALS HOUSE ESPLANADE DARWIN N.T. 5790
G.P.O. BOX 2901, DARWIN, N.T. 5794
TELEPHONE (089) 81 5844, TELEX AA85473, VOCADEX (089) 81 4806

PHOTO STAT TO RINK PLEASE

WATER RESOURCES DIVISION

IN REPLY
PLEASE QUOTE 01/36/M768
BT:MW:283

Town Clerk
Darwin City Council
G P O Box 84
DARWIN NT 5794

Attention: Mr Dieter Jankovic

TESTING OF BORES REGISTERED NUMBERS 24627 AND 24748

Estimated cost to conduct tests on the above bores is $1000.

Tests would comprise preliminary/step, 8 hours nominal constant discharge and recovery.

Work could be carried out the week beginning 27 October.

If this offer is acceptable prepayment of the amount is required to:

Receiver of Territory Monies (R.T.M.)
Department of Mines and Energy
minerals House
The Esplanade
DARWIN NT 5794

Marked: Bore Test Waste Disposal Site
Attention: Recoverable Works Account

Should you have any queries please contact the writer at Sasco House, 8 Cavenagh Street, Darwin phone 89 7352.

B THATCHER
for Director
Water Resources Division

38:GEN1

1583

BORE NAME "C" BORE

Registered Number 24627

Index Number 80/3053

Location SHOAL BAY RUBBISH TIP

Total Depth 49 m

Depth Water Struck 24 m

Estimated Supply 1 L/s

Aquifer Material CLAY & GRAVELS

Construction details casing screens, etc.

Interval	Size and description
0 - 43.5 m	6" BLANK STEEL
43.5 - 49.5m	6" SLOTTED STEEL.

Distance to production bore

Bore name	Distance
RN 24748	197m, 186°M, 182°T

Pump test crew D. WALLIS TA II
L. STAFFA LHF
G. BURMAN MDA

Pump type MONO 620

Powered by 3 CYLINDER LISTER DIESEL

Pump setting 39.20 m

Method measuring pump discharge ORIFICE TUBE WITH PIEZOMETER TUBE, WATCH, 20 L DRUM

List any other equipment used 6x6 M.A.N. FITTED WITH SMEAL CRANE
4x4 TOYOTA LANDCRUISER

Comments T.O.C AGL = 0.95 m
T.D. BEFORE TESTING = 47.22 30.10.86
T.D. AFTER TESTING = 47.18 6.11.86

S.W.L. 13.30 4.11.86
S.W.L. 13.54 5.11.86
S.W.L. 13.38 6.11.86

* SEE PAGE 8

INDEX

Pumped Bore: RN 24627 OBS Bore:

Standing Water Level: 13.54 m

Available Drawdown: 25.66 m

Time Started: 1208 CST Date: 5.11.86

Time Stopped: 1509 Date: 5.11.86 01

Test Type: PRELIMINARY Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)		Comments	CONDUCTIVITY
1209	1	0.18	80	20 mm	0.78				DISCHARGE DIRTY	
1210	2	0.19							DISCHARGE CLEAR	
1211	3	0.21							"	
1212	4	0.21							"	
1213	5	0.21							"	
1214	6	0.21							"	
1215	7	0.21							DISCHARGE DARK BROWN	
1216	8	0.22							DISCHARGE RED	
1217	9	0.22							"	
1218	10	0.23							"	
1220	12	0.22							"	
1223	15	0.22							"	
1228	20	0.22							"	
1238	30	0.24							DISCHARGE LIGHT	
1248	40	0.25							BROWN	60
1258	50	0.25							DISCHARGE SLIGHT	
1308	60	0.27							"	
1309	61	0.27	25	30 mm	1.0				"	
1310	62	0.27							"	
1311	63	0.27							"	
1312	64	0.27							"	
1313	65	0.27							DISCHARGE LIGHT	
1314	66	0.27							BROWN	
1315	67	0.28							"	
1316	68	0.28							"	
1317	69	0.28							"	
1318	70	0.28							"	50
1320	72	0.28							"	

DRAWDOWN READINGS INCORRECT AS P.V.C MERCER TUBE WAS BLOCKED

Pumped Bore: RN 24627 OBS Bore:

Standing Water Level: 13.54 m

Available Drawdown: 25.66 m

Time Started: 1208 CST Date: 5.11.86

Time Stopped: 1509 CST Date: 5.11.86 02

Test Type: PRELIMINARY Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)		Comments	CONDUCTIVITY		
1323	75	0.29	25	30 mm	1.0				1 mL/L SEDIMENT			
1328	80	0.29							DISCHARGE SLIGHT			
1333	85	0.30							"			
1338	90	0.30	55	30 mm	1.5				"			
1339	91	0.31							"			
1340	92	0.32							"			
1341	93	0.32							"			
1342	94	0.31						*	BORE FORKED	*		
									INCORRECT S.W.L. READINGS WERE TAKEN, AS THE P.V.C. GUIDE TUBE FOR THE MEGA PROBE HAD BECOME BLOCKED. PUMPING RATE WAS REDUCED, P.V.C. WAS WITHDRAWN FROM BORE AND UNBLOCKED.			
1358	110	20.76	84	20 mm	0.8				* BORE RECOVERING AT 0.8 L/s			
1359	111	20.55										
1400	112	20.40										
1401	113	20.81	25	30 mm	1.0							
1402	114	21.17										
1403	115	21.11						*	BORE FORKED	*		
									PUMPING CEASED TO ALLOW PARTIAL RECOVERY			
1406	118	17.10	84	20 mm	0.8							
1407	119	17.25										
1408	120	17.34										
1409	121	17.39										
1410	122	17.44							DISCHARGE SLIGHT	50		
1411	123	17.45							"			

Pumped Bore: RN 24627 OBS Bore:

Standing Water Level: 13.54 m

Available Drawdown: 25.66 m

Time Started: 1208 CST Date: 5.11.86

Time Stopped: 1509 CST Date: 5.11.86 03

Test Type: PRELIMINARY Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)		Comments	CONDUCTIVITY		
1412	124	17.49	84	20 mm	0.8				DISCHARGE SLIGHT			
1413	125	17.51							"			
1414	126	17.52							"			
1415	127	17.53							"			
1417	129	17.54							"			
1420	132	17.61							"			
1425	137	17.66							"			
1435	147	17.75							DISCHARGE CLEAR			
1445	157	17.80							"			
1455	167	17.77							"			
1458	170	18.36	25	30mm	1.0				"			
1459	171	19.00							"			
1500	172	19.40							"			
1501	173	19.82							"			
1502	174	20.22							"			
1503	175	20.54							"			
1504	176	20.81							"			
1505	177	21.04							"			
1506	178	21.29							"			
1507	179	21.48							"			
1508	180	21.67							"			
1509	181	21.89							"			

Pumped Bore: RN 24627 OBS Bore:

Standing Water Level: 13.38 m

Available Drawdown: 25.82 m

Time Started: 0830 CST Date: 6.11.86

Time Stopped: 1500 Date: 6.11.86 04

Test Type: CONSTANT RATE Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)	pH	Comments	CONDUCTIVITY		
0831	1	3.33	25	30 mm	1.0							
0832	2	5.49										
0833	3	7.17										
0834	4	8.48										
0835	5	9.49										
0836	6	10.19										
0837	7	10.86										
0838	8	11.44							DISCHARGE CLEAR			
0839	9	12.05							"			
0840	10	12.81							"			
0842	12	13.83							"			
0845	15	15.13							"			
0850	20	16.82							"			
0900	30	19.14							"			
0905	35	19.83							"			
0910	40	20.48							"			
0915	45	21.06							"			
0920	50	21.54							"			
0925	55	21.96							"			
0930	60	22.35							"	51		
0935	65	22.74							"			
0940	70	23.11							"			
0945	75	23.42							"			
0950	80	23.76					32.1°C	5.9	"	52		
0955	85	23.98							"			
1000	90	24.23							"			
1010	100	24.63				AS2A	32.1°C	5.66	"	51		
1030	120	25.40							"			

Pumped Bore: RN 24627 OBS Bore:

Standing Water Level: 13.38 m

Available Drawdown: 25.82 m

Time Started: 0830 CST Date: 6.11.86

Time Stopped: 1500 CST Date: 6.11.86 05

Test Type: CONSTANT RATE Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)	pH	Comments	CONDUCTIVITY		
1040	130	25.94						*	BORE FORKED			
	*	TIME IN SECONDS TO FILL A 20 L DRUM	*									
1100	150	12.97			1.0		* BORE	PUMPING	G.N FORK *	48		
1130	180	12.99			1.0				DISCHARGE CLEAR	52		
1200	210	20.20			0.99				"	48		
1230	240	20.43			0.98				"	48		
1300	270	20.32			0.98				"	48		
1330	300	20.82			0.96				"	48		
1400	330	20.30			0.99				"	48		
1430	360	21.14			0.95	PO 32			"	48		
1500	390	22.67			0.88	BN 29	32°C	5.77	"	48		

Pumped Bore: RN 24627 OBS Bore:

Standing Water Level: 13.38 m

Available Drawdown: 25.82 m

Time Started: 1500 CST Date: 6.11.86

Time Stopped: 1632 CST Date: 6.11.86 06

Test Type: CONSTANT RATE TEST RECOVERY Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)		Comments			
1501	1	22.95										
1502	2	20.65										
1503	3	18.60										
1504	4	MISSED										
1505	5	19.82										
1506	6	13.20										
1507	7	11.88										
1508	8	10.65										
1509	9	9.59										
1510	10	8.63										
1512	12	6.95										
1515	15	5.52										
1520	20	4.17										
1531	31	3.11										
1540	40	2.58										
1550	50	3.04										
1600	60	2.69										
1610	70	2.11										
1622	82	1.93										
1632	92	1.80										

Pumped Bore: RN 24627 OBS Bore: RN 24748

Standing Water Level: 15.50m

Available Drawdown: NOT APPLICABLE

Time Started: 0830 CST Date: 6.11.86

Time Stopped: 1500 CST Date: 6.11.86 07

Test Type: OBSERVATION BORE Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)		Comments			
0831	1	0·00										
0832	2	0·00										
0833	3	0·00										
0834	4	0·00										
0835	5	0·00										
0836	6	0·00										
0837	7	0·00										
0838	8	0·00										
0839	9	0·00										
0840	10	0·00										
0842	12	0·00										
0845	15	0·00										
0850	20	0·00										
0900	30	0·00										
0910	40	0·00										
0920	50	0·00										
0930	60	0·00										
0940	70	0·00										
0950	80	0·00										
1000	90	0·00										
1010	100	0·00										
1030	120	0·00										
1100	150	0·00										
1130	180	0·00										
1200	210	0·00										
1230	240	0·00										
1300	270	0·00										
1330	300	0·00										

Pumped Bore: RN 24627 OBS Bore: RN 24748

Standing Water Level: 15.50 m

Available Drawdown: NOT APPLICABLE

Time Started: 0830 CST Date: 6.11.86

Time Stopped: 1500 CST Date: 6.11.86 08

Test Type: OBSERVATION BORE Step No.:

Time C.S.T.	Time (min)	D/Down (m)	PZh (cm)	Oriface Plate Size	Q (l/S)	Water Sample Bot. No.	Water Sample Temp. (°C)		Comments			
1400	330	0.00										
1430	360	0.00										
1500	390	0.00										
									ON 26.11.86 THIS BORE WAS REVISITED. TOTAL DEPTH OF BORE WAS 47.38 m. DUO-PIPE AIRLIFT EQUIPMENT WAS RUN DOWN THE BORE. AT COMPLETION OF AIRLIFTING THE DISCHARGE WAS CLEAR AND CLEAN AND TOTAL DEPTH WAS 49.74 m FROM T.O.C.			

BORES NT
BORES NT PTY LTD ABN: 75 109 951 117
PO BOX 1840 HUMPTY DOO NT 0836
Mobile 0411 631195 Fax (08) 8988 0038
Email: water...

THE NORTHERN TERRITORY OF AUSTRALIA
APPROVED FORM 21 (25/01/2011)

STATEMENT OF BORE

As per Water Regulations (2009)

ENTERED 18/4/13

Name of Owner: McMAHON
Location/Address: Shoal Bay Tip
Intended Use: Monitoring 2

Registration No.: 37985
BC Permit No:

GPS Location: Zone: 52L GDA94 ☑ Other: ☐ Specify:
Easting: 0709018 Northing: 8630598

From	To	Particulars of Strata
0	1	TopSoil
1	10	MULTICOLOURED Siltstone

Name of Drilling Company: Bores NT
Name of Driller: B. BURRows
Name of supervising driller
Date Commenced: 3-9-12
Date Completed: 3-9-12
Depth Drilled: 10 (m)
Completion Depth: 10 (m)

METHOD OF DRILLING

Other	Auger	Rev. Circ.	Rotary Air	Rotary Mud
☐	☐	☐	☑	☐

Specify:

HOLE DIAMETER / DRILLING FLUID

From (m)	To (m)	Dia. (mm)	Type
0	.5	200	AIR
.5	10	150	AIR

PARTICULARS OF CASING

From	To	Dia (ID)	Type
+0.8	0.5	157	Steel
+0.7	10	50	PVC

PARTICULARS OF PERFORATIONS OR SCREEN STRINGS

From	To	Dia (ID)	Aperture	Type
1	10	50	1mm	machine slotted

Casing Suspended: Yes ☐ No ☑
Method: Seated
Height of Casing above GL: +0.8 (m)

Top of Packer Set at: (m)
Length of Packer: (m)
Method of Packer Connection:

CEMENTING/GRAVEL PACKING

From	To	Type
1	10	gravel
.5	1	Bentonite
0	.5	Cement

WATER BEARING BEDS

Depth (m) From	Depth (m) To	Yield (L/s)	SWL (m)	Duration (hr)	Quality	EC	pH	Bottle No.
6	10	Seepage.						

STRATA / WATER SAMPLES
Have been ☐ Will be ☑
Left at: NR Depot

Completion Yield: Seepage. (L/s) Method: Drilling
Completion SWL from GL: (m)
Duration: (hr)
Depth of Lift: (m)

LOCATION SKETCH OF BORE RN: 0 37985

LOCATION DESCRIPTION OF BORE

m/km

NW ☐	North ☐	NE ☐
West ☐		East ☐
SW ☐	South ☐	SE ☐

OF:

FINAL CONSTRUCTION STATUS

Capped ☑ Casing Pulled ☐ Left for Obs. ☐ Abandoned ☐ Equipped ☐ Backfilled ☐ Other ☐

ADDITIONAL INFORMATION ABOUT THE BORE: *(Include any information which may assist for future reference)*

No water on drilling

Well fitted with lockable cover.

Note: The holder of the NT licence shall submit the form to the Department within 28 days of completion of any works.

I certify that the information contained above is true and correct, and that I have complied with the bore licensing requirements and conditions of the Bore Construction Permit as issued if a Bore Construction Permit was required.

Name and licence number of driller: Bryce Burrows 104

Signature and licence number of licensed driller: B. Burrows 104 Date: 4/9/12

FOR OFFICIAL USE ONLY

How Located: GPS ☑ TST ☐ Survey ☐ Hand Plotted ☐ Other ☐

DESCRIPTION OF PROPERTY:

Rural ☐ Mineral ☐ Pastoral ☐ Reserve ☐ VCL ☐ Other ☑

Lease No: Lot No: Hundred of:

Portion No: Section No: 3952 Town of: SANDERSON

Class of Bore: Town ☐ Domestic ☐ Investigation ☑ Agriculture ☐ Mineral ☐ Pastoral ☐ Other ☐

Use of Bore: Production ☐ Investigation ☐ Irrigation ☐ Observation ☐ Monitoring ☑ Roads ☐ None ☐

Grid Reference: AMG ☑ Clark ☐ Zone: 52

Easting: 709018 Latitude: Scale:

Northing: 8630598 Longitude: Map Name:

Index Map Number: 80/9595

Date Registered: Bore Plotted on the map? Yes ☐ No ☐

Dept Officer: Signature:

Remarks: COMMONWEALTH OF AUSTRALIA

S/B 0815

BORES NT
BORES NT PTY LTD ABN: 75 109 951 117
PO BOX 1840 HUMPTY DOO NT 0836
Mobile 0411 631195 Fax (08) 8988 2038
Email: water...@bigpond.com.au

THE NORTHERN TERRITORY OF AUSTRALIA
APPROVED FORM 21 (25/01/2011)

STATEMENT OF BORE

As per Water Regulations (2009)

ENTER 18/4/13

Name of Owner: McMAHON
Location/Address: Shoal Bay Tip
Intended Use: Monitoring 3 HW10

Registration No.: 37986
BC Permit No:

GPS Location: Zone: 52L GDA94 ☑ Other: ☐ Specify:
Easting: 0709235 Northing: 8630600

From	To	Particulars of Strata
0	.5	Topsoil
.5	2	percolinite
2	10	multicoloured Siltstone

Name of Drilling Company: Bores NT
Name of Driller: B. Burrows
Name of supervising driller
Date Commenced: 3-9-12
Date Completed: 3-9-12
Depth Drilled: 10 (m)
Completion Depth: 10 (m)

METHOD OF DRILLING

Other	Auger	Rev. Circ.	Rotary Air	Rotary Mud
☐	☐	☐	☑	☐

Specify:

HOLE DIAMETER

From (m)	To (m)	Dia. (mm)
0	.5	200
.5	10	150

DRILLING FLUID

Type
AIR
AIR

PARTICULARS OF CASING

From	To	Dia (ID)	Type
+0.8	0.5	157	steel
+0.7	10	50	PVC

PARTICULARS OF PERFORATIONS OR SCREEN STRINGS

From	To	Dia (ID)	Aperture	Type
1	10	50	1mm	machine slotted

Casing Suspended: Yes ☐ No ☑
Method: Seated
Height of Casing above GL: 0.8 (m)

Top of ~~Packer Set at~~: (m)
Length of ~~Packer~~: (m)
Method of ~~Packer~~ Connection:

CEMENTING/GRAVEL PACKING

From	To	Type
1	10	Gravel
.5	1	Bentonite
0	.5	Cement

WATER BEARING BEDS

Depth (m) From	Depth (m) To	Yield (L/s)	SWL (m)	Duration (hr)	Quality	EC	pH	Bottle No.
6	10	Seepage.						

STRATA / WATER SAMPLES
Have been ☐ Will be ☑
Left at: WR Depot

Completion Yield: Seepage. (L/s) Method: Drilling
Completion SWL from GL: (m)
Duration: (hr)
Depth of Lift: (m)

LOCATION SKETCH OF BORE RN: 0	LOCATION DESCRIPTION OF BORE		
			m/km
	NW ☐	North ☐	NE ☐
	West ☐		East ☐
	SW ☐	South ☐	SE ☐
	OF:		

FINAL CONSTRUCTION STATUS

Capped	Casing Pulled	Left for Obs.	Abandoned	Equipped	Backfilled	Other
☑	☐	☐	☐	☐	☐	☐

ADDITIONAL INFORMATION ABOUT THE BORE: *(Include any information which may assist for future reference)*

No Water when Drilling

Well fitted with lockable cover

Note: The holder of the NT licence shall submit the form to the Department within 28 days of completion of any works.

I certify that the information contained above is true and correct, and that I have complied with the bore licensing requirements and conditions of the Bore Construction Permit as issued if a Bore Construction Permit was required.

Bryce Burrows 104 — Name and licence number of driller:

B.Burrows. 104 — Signature and licence number of licensed driller: Date: 4/9/12

FOR OFFICIAL USE ONLY

How Located: GPS ☑ TST ☐ Survey ☐ Hand Plotted ☐ Other ☐

DESCRIPTION OF PROPERTY:

Rural ☐ Mineral ☐ Pastoral ☐ Reserve ☐ VCL ☐ Other ☑

Lease No: Lot No: Hundred of:

Portion No: Section No: 3952 Town of: SANDERSON

Class of Bore: Town ☐ Domestic ☐ Investigation ☑ Agriculture ☐ Mineral ☐ Pastoral ☐ Other ☐

Use of Bore: Production ☐ Investigation ☐ Irrigation ☐ Observation ☐ Monitoring ☑ Roads ☐ None ☐

Grid Reference: AMG ☑ Clark ☐ Zone: 52 Scale:

Easting: 709235 Lattitude: Map Name:

Northing: 8630600 Longitude: Index Map Number: 80/9596

Date Registered: Bore Plotted on the map? Yes ☐ No ☐

Dept Officer: Signature:

Remarks: COMMONWEALTH OF AUSTRALIA

S/B 0815

BORES NT
BORES NT PTY LTD ABN: 75 109 951 117
PO BOX 1840 HUMPTY DOO NT 0836
Mobile 0411 631195 Fax (08) 8988 [illegible]038
...ail: [illegible]

THE NORTHERN TERRITORY OF AUSTRALIA
APPROVED FORM 21 (25/01/2011)

STATEMENT OF BORE

As per Water Regulations (2009)

ENTER 17/4/13

Name of Owner: McMAHON
Location/Address: SHOAL BAY TIP
Intended Use: Monitoring No. 1 NW11

Registration No.: 37984
BC Permit No:

GPS Location: Zone: 52L GDA94 ☑ Other: ☐ Specify:
Easting: 0709234 Northing: 8630490

From	To	Particulars of Strata
0	3	Hard white percilinite
3	10	multicoloured Siltstone

Name of Drilling Company: BORES NT
Name of Driller: B. BURROWS
Name of supervising driller
Date Commenced: 3-9-12
Date Completed: 3-9-12
Depth Drilled: 10 (m)
Completion Depth: 10 (m)

METHOD OF DRILLING

Other	Auger	Rev. Circ.	Rotary Air	Rotary Mud
☐	☐	☐	☑	☐

Specify:

HOLE DIAMETER / DRILLING FLUID

From (m)	To (m)	Dia. (mm)	Type
0	.5	200	AIR
.5	10	150	AIR

PARTICULARS OF CASING

From	To	Dia (ID)	Type
+0.8	0.5	157	steel
+0.7	10	50	PVC

PARTICULARS OF PERFORATIONS OR SCREEN STRINGS

From	To	Dia (ID)	Aperture	Type
1	10	50	1mm	Machine slotted

Casing Suspended: Yes ☐ No ☑
Method: Seated
Height of Casing above GL: +0.8 (m)
Top of ~~Packer Set~~ at: (m)
Length of Packer: (m)
Method of ~~Packer~~ Connection:

CEMENTING/GRAVEL PACKING

From	To	Type
1	9	Gravel
.5	1	Bentonite
0	.5	Cement

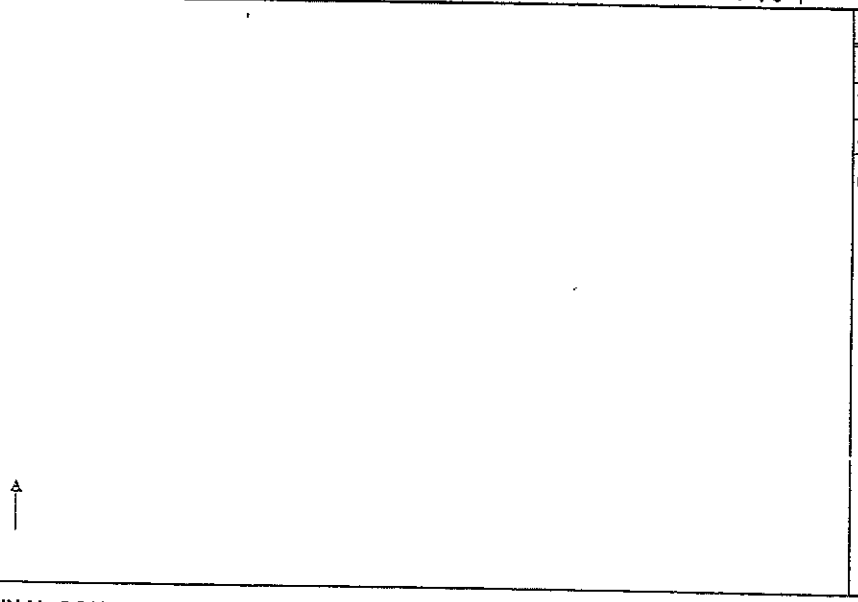
WATER BEARING BEDS

Depth (m) From	Depth (m) To	Yield (L/s)	SWL (m)	Duration (hr)	Quality	EC	pH	Bottle No.
6	10	Seepage.						

STRATA / WATER SAMPLES
Have been ☐ Will be ☑
Left at: NR Depot

Completion Yield: Seepage. (L/s) Method: Drilling
Completion SWL from GL: (m)
Duration: (hr)
Depth of Lift: (m)

LOCATION SKETCH OF BORE RN: 0 37984



LOCATION DESCRIPTION OF BORE

		m/km
NW ☐	North ☐	NE ☐
West ☐		East ☐
SW ☐	South ☐	SE ☐

OF:

FINAL CONSTRUCTION STATUS

Capped ☑ Casing Pulled ☐ Left for Obs. ☐ Abandoned ☐ Equipped ☐ Backfilled ☐ Other ☐

ADDITIONAL INFORMATION ABOUT THE BORE: *(Include any information which may assist for future reference)*

No water on drilling

Well fitted with lockable cover

Note: The holder of the NT licence shall submit the form to the Department within 28 days of completion of any works.

I certify that the information contained above is true and correct, and that I have complied with the bore licensing requirements and conditions of the Bore Construction Permit as issued if a Bore Construction Permit was required.

Name and licence number of driller: Bryce Burrows 104

Signature and licence number of licensed driller: B.Burrows. 104 Date: 4 / 9 / 12

FOR OFFICIAL USE ONLY

How Located: GPS ☑ TST ☐ Survey ☐ Hand Plotted ☐ Other ☐

DESCRIPTION OF PROPERTY:

Rural ☐ Mineral ☐ Pastoral ☐ Reserve ☐ VCL ☐ Other ☑

Lease No: Lot No: Hundred of:

Portion No: Section No: 3952 Town of: SANDERSON

Class of Bore: Town ☐ Domestic ☐ Investigation ☑ Agriculture ☐ Mineral ☐ Pastoral ☐ Other ☐

Use of Bore: Production ☐ Investigation ☐ Irrigation ☐ Observation ☐ Monitoring ☑ Roads ☐ None ☐

Grid Reference: AMG ☑ Clark ☐ Zone: 52 Scale:

Easting: 709234 Latitude: Map Name:

Northing: 8630490 Longitude: Index Map Number: 80/9594

Date Registered: Bore Plotted on the map? Yes ☐ No ☐

Dept Officer: Signature:

Remarks:

COMMONWEALTH OF AUSTRALIA

S/B 0815

BORES NT
BORES NT PTY LTD ABN: 75 109 951 117
PO BOX 1840 HUMPTY DOO NT 0836
Mobile 0411 631195 Fax (08) 8988 8038
E-mail: waterbores@bigpond.com

THE NORTHERN TERRITORY OF AUSTRALIA
APPROVED FORM 21 (25/01/2011)

STATEMENT OF BORE

As per Water Regulations (2009)

ENTER 18/4/13

Name of Owner: McMAHON
Location/Address: Shoal Bay Tip
Intended Use: Monitoring 4 WW12

Registration No.: 37987
BC Permit No:

GPS Location: Zone: 52L GDA94 ☑ Other: ☐ Specify:
Easting: 0709458 Northing: 8630 600

From	To	Particulars of Strata
0	1	TopSoil
1	10	MULTICOCOARSED Siltstone

Name of Drilling Company: Bores NT
Name of Driller: B. Burrows
Name of supervising driller
Date Commenced: 3-9-12
Date Completed: 3-9-12
Depth Drilled: 10 (m)
Completion Depth: 10 (m)

METHOD OF DRILLING
Other ☐ Auger ☐ Rev. Circ. ☐ Rotary Air ☑ Rotary Mud ☐
Specify:

HOLE DIAMETER From (m)	To (m)	Dia. (mm)	DRILLING FLUID Type
0	.5	200	AIR
.5	10	150	AIR

PARTICULARS OF CASING

From	To	Dia (ID)	Type
+0.8	0.5	157	Steel
+0.7	10	50	PVC

PARTICULARS OF PERFORATIONS OR SCREEN STRINGS

From	To	Dia (ID)	Aperture	Type
1	10	50	1mm	machine slotted

Casing Suspended: Yes ☐ No ☑
Method: Seated
Height of Casing above GL: +0.8 (m)
Top of Packer Set at: (m)
Length of Packer: (m)
Method of Packer Connection:

CEMENTING/GRAVEL PACKING

From	To	Type
1	10	Gravel
.5	1	Bentonite
0	.5	Cement

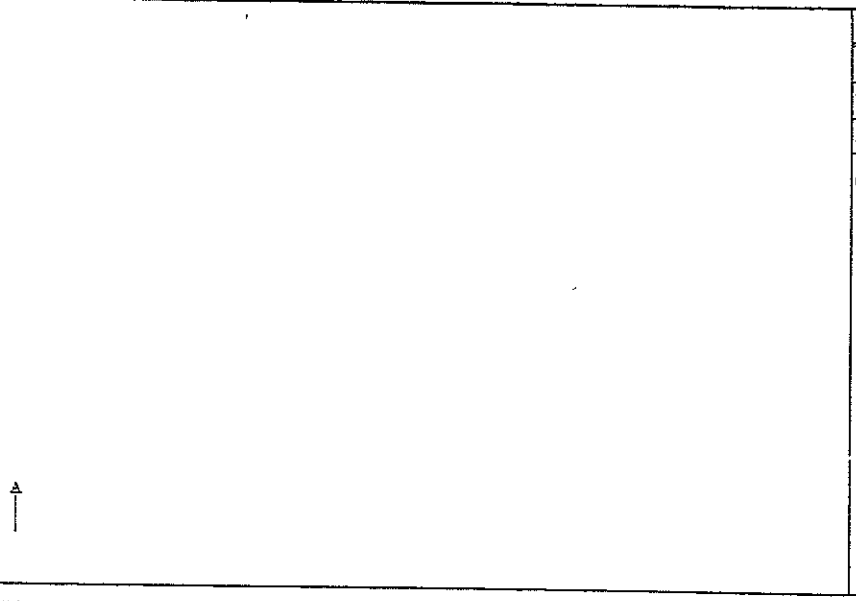
WATER BEARING BEDS

Depth (m) From	To	Yield (L/s)	SWL (m)	Duration (hr)	Quality	EC	pH	Bottle No.
6	10	Seepage.						

STRATA / WATER SAMPLES
Have been ☐ Will be ☑
Left at: WL Depot

Completion Yield: Seepage. (L/s) Method: Drilling
Completion SWL from GL: (m)
Duration: (hr)
Depth of Lift: (m)

LOCATION SKETCH OF BORE RN: 0



LOCATION DESCRIPTION OF BORE

m/km

NW ☐	North ☐	NE ☐
West ☐		East ☐
SW ☐	South ☐	SE ☐

OF:

FINAL CONSTRUCTION STATUS

Capped ☑ | Casing Pulled ☐ | Left for Obs. ☐ | Abandoned ☐ | Equipped ☐ | Backfilled ☐ | Other ☐

ADDITIONAL INFORMATION ABOUT THE BORE: *(Include any information which may assist for future reference)*

No water upon drilling

Well fitted with lockable cover.

Note: The holder of the NT licence shall submit the form to the Department within 28 days of completion of any works.

I certify that the information contained above is true and correct, and that I have complied with the bore licensing requirements and conditions of the Bore Construction Permit as issued if a Bore Construction Permit was required.

Name and licence number of driller: Bryce Burrows 104

Signature and licence number of licensed driller: B. Burrows. 104

Date: 4 / 9 / 12

FOR OFFICIAL USE ONLY

How Located: GPS ☑ | TST ☐ | Survey ☐ | Hand Plotted ☐ | Other ☐

DESCRIPTION OF PROPERTY:

Rural ☐ | Mineral ☐ | Pastoral ☐ | Reserve ☐ | VCL ☐ | Other ☑

Lease No:

Portion No:

Lot No:

Section No: 3952

Hundred of:

Town of: SANDERSON

Class of Bore: Town ☐ | Domestic ☐ | Investigation ☑ | Agriculture ☐ | Mineral ☐ | Pastoral ☐ | Other ☐

Use of Bore: Production ☐ | Investigation ☐ | Irrigation ☐ | Observation ☐ | Monitoring ☑ | Roads ☐ | None ☐

Grid Reference: AMG ☑ Clark ☐ Zone: 52 Scale:

Easting: 709458

Northing: 8630600

Lattitude:

Longitude:

Map Name:

Index Map Number: 80/9597

Date Registered:

Bore Plotted on the map? Yes ☐ No ☐

Dept Officer:

Signature:

Remarks:

COMMONWEALTH OF AUSTRALIA

4/B 0815

BORES NT
BORES NT PTY LTD ABN: 75 109 951 117
PO BOX 1840 HUMPTY DOO NT 0836
Mobile 0411 631195 Fax (08) 8988 6038
E-mail: waterbores@bigpond.com

THE NORTHERN TERRITORY OF AUSTRALIA
APPROVED FORM 21 (25/01/2011)

STATEMENT OF BORE

As per Water Regulations (2009)

ENTERED 18/4/13

Name of Owner: McMAHON
Location/Address: Shoal Bay Tip
Intended Use: Monitoring 5 WW 13

Registration No.: 37988
BC Permit No:

GPS Location: Zone: 52 GDA94 ☑ Other: ☐ Specify:
Easting: 0709451 Northing: 8630496

From	To	Particulars of Strata
0	.5	Top Soil
.5	3	White Percilinite
3	10	Multicoloured Siltstone

Name of Drilling Company: Bores NT
Name of Driller: B. Burrows
Name of supervising driller
Date Commenced: 3-9-12
Date Completed: 3-9-12
Depth Drilled: 10 (m)
Completion Depth: 10 (m)

METHOD OF DRILLING
Other ☐ Auger ☐ Rev. Circ. ☐ Rotary Air ☑ Rotary Mud ☐
Specify:

HOLE DIAMETER From (m)	To (m)	Dia. (mm)	DRILLING FLUID Type
0	.5	200	AIR
.5	10	150	AIR

PARTICULARS OF CASING

From	To	Dia (ID)	Type
+0.8	.5	157	Steel
+0.7	10	50	PVC

PARTICULARS OF PERFORATIONS OR SCREEN STRINGS

From	To	Dia (ID)	Aperture	Type
1	10	50	1mm	Machine slotted

Casing Suspended: Yes ☐ No ☑
Method: Seated
Height of Casing above GL: 0.8 (m)
Top of Packer Set at: (m)
Length of Packer: (m)
Method of Packer Connection:

CEMENTING/GRAVEL PACKING

From	To	Type
1	10	Gravel
.5	1	Bentonite
0	.5	Cement

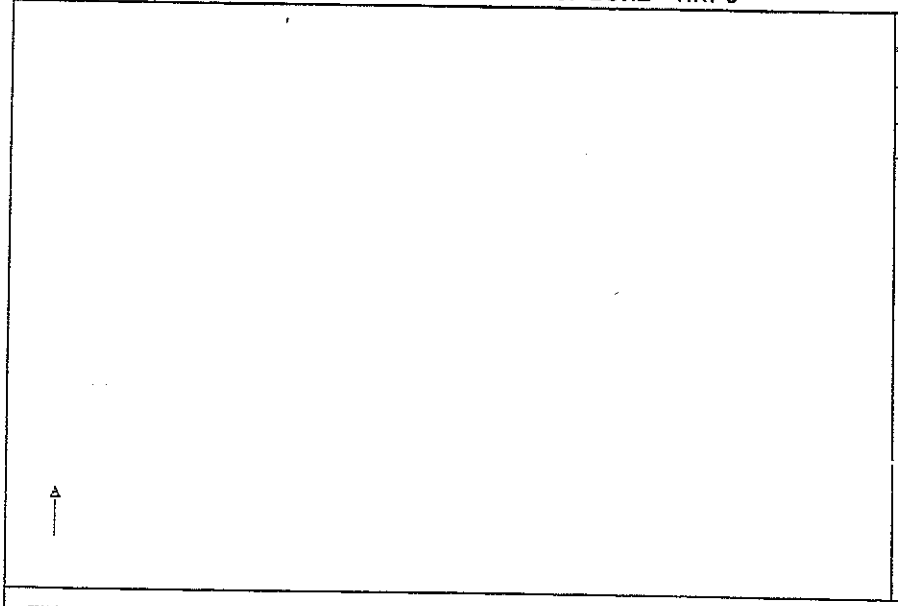
WATER BEARING BEDS

Depth (m) From	To	Yield (L/s)	SWL (m)	Duration (hr)	Quality	EC	pH	Bottle No.
6	10	Seepage						

STRATA / WATER SAMPLES
Have been ☐ Will be ☑
Left at: NR Depot

Completion Yield: Seepage (L/s) Method: Drilling Duration: (hr)
Completion SWL from GL: (m) Depth of Lift: (m)

LOCATION SKETCH OF BORE RN: 0



LOCATION DESCRIPTION OF BORE

		m/km
NW ☐	North ☐	NE ☐
West ☐		East ☐
SW ☐	South ☐	SE ☐

OF:

FINAL CONSTRUCTION STATUS

Capped	Casing Pulled	Left for Obs.	Abandoned	Equipped	Backfilled	Other
☑	☐	☐	☐	☐	☐	☐

ADDITIONAL INFORMATION ABOUT THE BORE: *(Include any information which may assist for future reference)*

~~RL~~ No water on drilling

Well fitted with lockable Cover,

Note: The holder of the NT licence shall submit the form to the Department within 28 days of completion of any works.

I certify that the information contained above is true and correct, and that I have complied with the bore licensing requirements and conditions of the Bore Construction Permit as issued if a Bore Construction Permit was required.

Name and licence number of driller: Bryce Burrows 104

Signature and licence number of licensed driller: B. Burrows. 104 Date: 4 / 9 / 12

FOR OFFICIAL USE ONLY

How Located: GPS ☑ TST ☐ Survey ☐ Hand Plotted ☐ Other ☐

DESCRIPTION OF PROPERTY:

Rural ☐ Mineral ☐ Pastoral ☐ Reserve ☐ VCL ☐ Other ☑

Lease No: Lot No: Hundred of:

Portion No: Section No: 3952 Town of: SANDERSON

Class of Bore: Town ☐ Domestic ☐ Investigation ☑ Agriculture ☐ Mineral ☐ Pastoral ☐ Other ☐

Use of Bore: Production ☐ Investigation ☐ Irrigation ☐ Observation ☐ Monitoring ☑ Roads ☐ None ☐

Grid Reference: AMG ☑ Clark ☐ Zone: 52 Scale:

Easting: 709451 Lattitude: Map Name:

Northing: 8630496 Longitude: Index Map Number: 80/9598

Date Registered: Bore Plotted on the map? Yes ☐ No ☐

Dept Officer: Signature:

Remarks: COMMONWEALTH OF AUSTRALIA

S/B 0815

NORTHERN TERRITORY GOVERNMENT

STATEMENT OF BORE

RECEIVED DATE 17.6.20 BY RM

Pursuant to section 53 of the Water Act and section 11 of the Water Regulations

Name of Owner:	Darwin City Council
Street address /NT Parcel:	Shoal Bay tip Vanderlin drive
Bore Registration No:	RN 41645
Bore Name:	
BCP Permit No:	BCP

Coordinate of Bore:	GDA2020	GDA94	WGS84	Zone: 52 / 53	Easting:	Northing:
	☐	☑	☐	☑ / ☐	709 494	8630026

Latitude(DMS):
Longitude(DMS):

Name of Drilling Company: **Bores NT Pty Ltd**
Name of Driller: B. Burrows
Name of supervising driller

Date Commenced: 19/5/20
Date Completed: 20/5/20

Depth Drilled: 12 (m)
Completion Depth: 12 (m)

From	To	Particulars of Strata
0	2	yellow & red clayey soil
2	6	Porcilinite
6	12	weathered white & yellow siltstone.

METHOD OF DRILLING

Auger	Rotary Air	Rotary Mud	Sonic	Other
☐	☑	☐	☐	☐

Specify:

HOLE DIAMETER

From (m)	To (m)	Dia. (mm)	DRILLING FLUID Type
0	.5	200	AIR
.5	12	125	AIR

PARTICULARS OF CASING

From (m)	To (m)	ID Dia (mm)	Type
+1.0	0.5	158	s/steel
+0.9	12	50	PVC

PARTICULARS OF PERFORATIONS OR SCREEN STRINGS

From (m)	To (m)	ID Dia (mm)	Aperture(mm)	Type
9	12	50	1.4mm	machine slotted

Casing Suspended: Yes ☐ No ☑
Method: Seated on end cap
Height of Casing above GL: +1.0 (m)

Top of Packer Set at: (m)
Length of Packer: (m)
Method of Packer Connection:

CEMENTING/GRAVEL PACKING

From (m)	To (m)	Type
0	7	Grout
7	8	Bentonite
8	12	Gravel

WATER BEARING BEDS

Depth From (m)	Depth To (m)	Yield (L/s)	SWL (m)	Duration (hrs)	Quality	EC (µS/cm)	pH	Bottle (No.)
	12	Seepage.						

Cumulative Yield:

STRATA / WATER SAMPLES
Have been ☐ Will be ☐
Left at:

Completion Yield: seepage (L/s) Method: Air lift Duration (hrs): .5
Completion SWL from GL: 7 (m) Depth of Lift (m): 12

NOTE: No company advertising is to be imprinted on this certificate apart from where requested.

SKETCH AND BRIEF DESCRIPTION OF THE BORE'S LOCATION RN:

N

FINAL CONSTRUCTION STATUS

Constructed and Capped ☑ Decommissioned ☐ *(Jump to 'Additional Information' to provide more Decommissioning Method details)*

THE TYPE OF BORE *(Multiple Selection Acceptable)*

Production Bore ☐ Investigation Bore ☐ Monitoring Bore ☑ Other ☐ Specify:

THE PROPOSED USE OF PRODUCTION BORE *(Optional and Multiple Selection Acceptable)*

Agriculture ☐ Public Water Supply ☐ Cultural ☐ Rural Stock and Domestic ☐

Aquaculture ☐ Environment ☑ Industry ☐ Mining ☐ Petroleum ☐

Bore RN permanently displayed on completed bore? Yes ☐ No ☐

Surface Slab Completed? Yes ☐ No ☐ NA

ADDITIONAL INFORMATION ABOUT THE BORE: *(Include any information which may assist for future reference)*

Bores NT Pty Ltd Ph: 0411 631 195 E:waterbores1@bigpond.com

well fitted with lockable monument

I hereby declare that the information provided in this application and accompanying documents is to the best of my knowledge, true and correct

Name and Licence# of Driller under supervision: B. Burrows 104

Signature of Driller under supervision: B. Burrows. 104

Date: / /

Name and Licence# of Licensed Driller:

Signature of Licensed Driller:

Date: 21 / 5 / 20

Note: The holder of the NT licence shall submit the form to the Department within 28 days of completion of any works.

FOR OFFICIAL USE ONLY

How Located:	GPS ☐		Survey ☐	Other ☐
Property Location:	Section No:	Lot No:	LTO Code:	Town of:
	Portion No:	Lease No:		Hundred of:
Coordinate Location Verified:	Datum: GDA94 ☐		GDA2020 ☐	
	MGA Zone:	Easting:	Latitude (DMS):	
	Index Map Number:	Northing:	Longitude (DMS):	

Date Registered: Dept Officer: Signature:

Remarks:

NORTHERN TERRITORY GOVERNMENT

STATEMENT OF BORE

RECEIVED DATE 17.6.20 BY RM

Pursuant to section 53 of the Water Act and section 11 of the Water Regulations

Name of Owner:	Darwin City Council
Street address /NT Parcel:	Shoal Bay Tip Vanderlin drive
Bore Registration No:	RN 41642
Bore Name:	
BCP Permit No:	BCP

Coordinate of Bore:	GDA2020	GDA94	WGS84	Zone: 52 / 53	Easting:	Latitude(DMS):
	☐	☑	☐	☑ / ☐	709 495	
					Northing: 863 0022	Longitude(DMS):

From	To	Particulars of Strata
0	2	yellow & red clay soil
2	6	White Porcellinite
6	18	Weathered yellow & pink Siltstone
18	24	siltstone & Gravels
24	26	Weathered siltstone

Name of Drilling Company: **Bores NT Pty Ltd**

Name of Driller: B. Burrows

Name of supervising driller:

Date Commenced: 19-5-20

Date Completed: 20-5-20

Depth Drilled: 26 (m)

Completion Depth: 26 (m)

METHOD OF DRILLING

Auger ☐ Rotary Air ☑ Rotary Mud ☐ Sonic ☐ Other ☐

Specify:

HOLE DIAMETER / DRILLING FLUID

From (m)	To (m)	Dia. (mm)	Type
0	.5	200	AIR
.5	26	125	AIR

PARTICULARS OF CASING

From (m)	To (m)	ID Dia (mm)	Type
+1.0	0.5	158	s/steel movment
+0.9	26	50	PVC

PARTICULARS OF PERFORATIONS OR SCREEN STRINGS

From (m)	To (m)	ID Dia (mm)	Aperture(mm)	Type
20	26	50	1mm	slotted PVC machine

Casing Suspended: Yes ☐ No ☑

Method: Seated with end cap.

Height of Casing above GL: +1.0 (m)

Top of Packer Set at: (m)

Length of Packer: (m)

Method of Packer Connection:

CEMENTING/GRAVEL PACKING

From (m)	To (m)	Type
0	17	Grout
17	18	Bentonite
18	26	Gravel

WATER BEARING BEDS

Depth From (m)	Depth To (m)	Yield (L/s)	SWL (m)	Duration (hrs)	Quality	EC (µS/cm)	pH	Bottle (No.)
18	24	1						

Cumulative Yield:

STRATA / WATER SAMPLES

Have been ☐ Will be ☐

Left at:

Completion Yield: 1 (L/s) Method: Air lift Duration (hrs): .5

Completion SWL from GL: 7 (m) Depth of Lift (m): 26

NOTE: No company advertising is to be imprinted on this certificate apart from where requested.

RECEIVED
BY DATE

SKETCH AND BRIEF DESCRIPTION OF THE BORE'S LOCATION **RN:**

FINAL CONSTRUCTION STATUS

Constructed and Capped ☑ Decommissioned ☐ *(Jump to 'Additional Information' to provide more Decommissioning Method details)*

THE TYPE OF BORE *(Multiple Selection Acceptable)*

Production Bore ☐ Investigation Bore ☐ Monitoring Bore ☑ Other ☐ Specify:

THE PROPOSED USE OF PRODUCTION BORE *(Optional and Multiple Selection Acceptable)*

Agriculture ☐ Public Water Supply ☐ Cultural ☐ Rural Stock and Domestic ☐

Aquaculture ☐ Environment ☑ Industry ☐ Mning ☐ Petroleum ☐

Bore RN permanently displayed on completed bore?	Yes ☑ No ☐	Surface Slab Completed?	Yes ☐ No ☐ NA

ADDITIONAL INFORMATION ABOUT THE BORE: *(Include any information which may assist for future reference)*

Bores NT Pty Ltd Ph: 0411 631 195 E:waterbores1@bigpond.com

Monitoring well fitted with lockable Movment.

I hereby declare that the information provided in this application and accompanying documents is to the best of my knowledge, true and correct

Name and Licence# of Driller under supervision	Signature of Driller under supervision	Date: / /
B. Burrows 104	B. Burrows. 104	

Name and Licence# of Licensed Driller:	Signature of Licensed Driller:	Date: 21 / 5 / 20

Note: The holder of the NT licence shall submit the form to the Department within 28 days of completion of any works.

FOR OFFICIAL USE ONLY

How Located:	GPS ☐		Survey ☐	Other ☐
Property Location:	Section No:	Lot No:	LTO Code:	Town of:
	Portion No:	Lease No:		Hundred of:
Coordinate Location Verified:	Datum: GDA94 ☐		GDA2020 ☐	
	MGA Zone:	Easting:	Latitude (DMS):	
	Index Map Number:	Northing:	Longitude (DMS):	

Date Registered:	Dept Officer:	Signature:

Remarks:

NORTHERN TERRITORY GOVERNMENT

STATEMENT OF BORE

Pursuant to section 53 of the Water Act and section 11 of the Water Regulations

RECEIVED DATE 17.6.20 BY RM

Name of Owner:	Darwin City Council
Street address /NT Parcel:	Shoal Bay tip Vanderlin drive
Bore Registration No :	RN 41644
Bore Name:	
BCP Permit No:	BCP

Coordinate of Bore:	GDA2020	GDA94	WGS84	Zone: 52 ☑ / 53 ☐	Easting: 709 494	Latitude(DMS):
	☐	☑	☐		Northing: 8630030	Longitude(DMS):

From	To	Particulars of Strata
0	2	yellow & red clayey soil
2	3	Porcilinite

Name of Drilling Company: **Bores NT Pty Ltd**

Name of Driller: B-Burrows

Name of supervising driller:

Date Commenced: 19-5-20

Date Completed: 20-5-20

Depth Drilled: 3 (m)

Completion Depth: 3 (m)

METHOD OF DRILLING

Auger	Rotary Air	Rotary Mud	Sonic	Other
☐	☑	☐	☐	☐

Specify:

HOLE DIAMETER			DRILLING FLUID
From (m)	To (m)	Dia. (mm)	Type
0	.5	200	AIR
.5	3	125	AIR.

PARTICULARS OF CASING

From (m)	To (m)	ID Dia (mm)	Type
+1.0	.5	158	s/steel
+0.9	3	50	PVC

PARTICULARS OF PERFORATIONS OR SCREEN STRINGS

From (m)	To (m)	ID Dia (mm)	Aperture(mm)	Type
1.5	3	50	1mm	Machine slotted

Casing Suspended: Yes ☐ No ☑

Method: Seated

Height of Casing above GL: +1.0 (m)

Top of Packer Set at: (m)

Length of Packer: (m)

Method of Packer Connection:

CEMENTING/GRAVEL PACKING

From (m)	To (m)	Type
0	.5	Grout
.5	1	Bentonite
1	3	Gravel

WATER BEARING BEDS

Depth From (m)	Depth To (m)	Yield (L/s)	SWL (m)	Duration (hrs)	Quality	EC (µS/cm)	pH	Bottle (No.)
	3	Seepage						

Cumulative Yield:

STRATA / WATER SAMPLES

Have been ☐ Will be ☐

Left at:

Completion Yield: Seepage (L/s) Method: Airlift Duration (hrs): .5

Completion SWL from GL: 2 (m) Depth of Lift (m): 3

NOTE: No company advertising is to be imprinted on this certificate apart from where requested.

SKETCH AND BRIEF DESCRIPTION OF THE BORE'S LOCATION RN:

N

FINAL CONSTRUCTION STATUS

Constructed and Capped ☑ Decommissioned ☐ *(Jump to 'Additional Information' to provide more Decommissioning Method details)*

THE TYPE OF BORE *(Multiple Selection Acceptable)*

Production Bore ☐ Investigation Bore ☐ Monitoring Bore ☑ Other ☐ Specify:

THE PROPOSED USE OF PRODUCTION BORE *(Optional and Multiple Selection Acceptable)*

Agriculture ☐ Public Water Supply ☐ Cultural ☐ Rural Stock and Domestic ☐

Aquaculture ☐ Environment ☑ Industry ☐ Mining ☐ Petroleum ☐

Bore RN permanently displayed on completed bore? Yes ☑ No ☐

Surface Slab Completed? Yes ☐ No ☐ NA

ADDITIONAL INFORMATION ABOUT THE BORE: *(Include any information which may assist for future reference)*

Bores NT Pty Ltd Ph: 0411 631 195 E:waterbores1@bigpond.com

Well fitted with lockable Monument.

I hereby declare that the information provided in this application and accompanying documents is to the best of my knowledge, true and correct

Name and Licence# of Driller under supervision	Signature of Driller under supervision	Date: / /
B. Burrows 104	B. Burrows 104	
Name and Licence# of Licensed Driller:	Signature of Licensed Driller:	Date: 21 / 5 / 20

Note: The holder of the NT licence shall submit the form to the Department within 28 days of completion of any works.

FOR OFFICIAL USE ONLY

How Located:	GPS ☐		Survey ☐	Other ☐
Property Location:	Section No:	Lot No:	LTO Code:	Town of:
	Portion No:	Lease No:		Hundred of:
Coordinate Location Verified:	Datum: GDA94 ☐		GDA2020 ☐	
	MGA Zone:	Easting:	Latitude (DMS):	
	Index Map Number:	Northing:	Longitude (DMS):	
Date Registered:	Dept Officer:		Signature:	
Remarks:				

EcOz Environmental Services

Project No: EZ20078 Project Name: Shoal Bay GW Bore Logged By: AL

BORE RN: 41644 Datum: UTM Easting: 0709494 SWL = Standing Water Level

Bore Name: GW16-3 Zone: 52L Northing: 8630030 mbTOC - metres below Top of Casing

Bore Type/Purpose: Monitoring Start Date: 19-5-20 Ground Level mAHD:

Location: Shoal Bay WMF End Date: 20-5-20 SWL (mbTOC): 2.76

Drilled by: Bores NT SWL Date: 20-5-20 TOC above ground level: 1m

Depth (mbgl)	Depth (mAHD)	Bore Details	Depth (m)	Lithological Description	Remarks and Observations	Flow Rate L/s Moisture Content
0.0	0.00					
1.0	-1.00		0-4	Sandy clay loam	did not hit water	✓
2.0	-2.00					
3.0	-3.00					
4.0	-4.00					
5.0	-5.00					
6.0	-6.00					
7.0	-7.00					
8.0	-8.00					
9.0	-9.00					
10.0	-10.00					
11.0	-11.00					
12.0	-12.00					
13.0	-13.00					
14.0	-14.00					
15.0	-15.00					
16.0	-16.00					
17.0	-17.00					
18.0	-18.00					
19.0	-19.00					
20.0	-20.00					
21.0	-21.00					
22.0	-22.00					
23.0	-23.00					
24.0	-24.00					
25.0	-25.00					
26.0	-26.00					
27.0	-27.00					
28.0	-28.00					
29.0	-29.00					
30.0	-30.00					

Key:
- Solid casing
- Steel Collar
- Cement
- Gravel
- Bentonite seal
- Screen
- Ground Water Level
- Water Strike

Groundwater Quality:

Field Measurements:	Units:
Date:	
pH:	pH units
Electrical Conductivity:	mS/cm
Salinity:	ppt
Dissolved Oxygen:	%
Turbidity:	NTU
Temperature:	°C

Additional Comments:

EcOz Environmental Services

Project No: EZ20078	Project Name: Shark Bay GW Bore Install			Logged By: AL	
BORE RN: 41643	Datum: UTM		Easting: 0709494		SWL = Standing Water Level
Bore Name: GW16-12	Zone: 52L		Northing: 8650026		mbTOC = metres below Top of Casing
Bore Type/Purpose: Monitoring	Start Date: 19-5-20		Ground Level mAHD:		
Location: Shark Bay WMF	End Date: 20-5-20		SWL (mbTOC): 11.95		
Drilled by: Bores NT	SWL Date: 20-5-20		TOC above ground level: 1m		

Depth (mbgl)	Depth (mAHD)	Bore Details	Depth (m)	Lithological Description	Remarks and Observations	Flow Rate L/s Moisture Content
0.0	0.00					
1.0	-1.00		0-2	Sandy clay loam		
2.0	-2.00					
3.0	-3.00					
4.0	-4.00					
5.0	-5.00					
6.0	-6.00		2-10	Porcellanite	no water	
7.0	-7.00					
8.0	-8.00					
9.0	-9.00					
10.0	-10.00					
11.0	-11.00		10-12.5	weathered siltstone		
12.0	-12.00					
13.0	-13.00					
14.0	-14.00					
15.0	-15.00					
16.0	-16.00					
17.0	-17.00					
18.0	-18.00					
19.0	-19.00					
20.0	-20.00					
21.0	-21.00					
22.0	-22.00					
23.0	-23.00					
24.0	-24.00					
25.0	-25.00					
26.0	-26.00					
27.0	-27.00					
28.0	-28.00					
29.0	-29.00					
30.0	-30.00					

Key:
- Solid casing
- Steel Collar
- Cement
- Gravel
- Bentonite seal
- Screen
- Ground Water Level
- Water Strike

Groundwater Quality: Field Measurements:	Units:
Date:	
pH:	pH units
Electrical Conductivity:	mS/cm
Salinity:	ppt
Dissolved Oxygen:	%
Turbidity:	NTU
Temperature:	°C

Additional Comments:

EcOz Environmental Services

Project No: EZ20075 Project Name: Shoal Bay GW Bore install Logged By: AC

BORE RN: 41642 Datum: UTM Easting: 0709495 SWL = Standing Water Level

Bore Name: GW16-30 Zone: 52L Northing: 8630022 mbTOC = metres below Top of Casing

Bore Type/Purpose: Monitoring Start Date: 19-5-20 Ground Level mAHD:

Location: Shoal Bay WMF End Date: 20-5-20 SWL (mbTOC): 7.86

Drilled by: Bores NT SWL Date: 20-5-20 TOC above ground level: 1m

Depth (mbgl)	Depth (mAHD)	Bore Details	Depth (m)	Lithological Description	Remarks and Observations	Flow Rate L/s Moisture Content
0.0	0.00		0-2.5	Sandy clay Loam	small amount of water perched at 2m	
2.5			2.5 to 7.5	Porcellanite		
7.5			7.5 to 18.5	Weathered Siltstone		
18.5			18.5 to 24	Gravel with large rounded pebbles		1-2 L/sec
24.0	-24.00					
30.0	-30.00					

Key:
- Solid casing
- Steel Collar
- Cement
- Gravel
- Bentonite seal
- Screen
- Ground Water Level
- Water Strike

Groundwater Quality:

Field Measurements:	Units:
Date:	
pH:	pH units
Electrical Conductivity:	mS/cm
Salinity:	ppt
Dissolved Oxygen:	%
Turbidity:	NTU
Temperature:	°C

Additional Comments: