APPENDIX L

Groundwater Assessment

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on Groundwater Assessment Proposed Sand Quarry EIS

Newrybar Swamp Road, Lennox Head
Northern New South Wales

Prepared for
Ardill Payne & Partners, Ballina NSW

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
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Report on Groundwater Assessment
Proposed Sand Quarry EIS
Newrybar Swamp Road, Lennox Head, Northern NSW

1. Introduction

Douglas Partners Pty Ltd (DP) was commissioned by Ardill Payne and Partners (AP&P) to undertake a groundwater assessment as input to an Environmental Impact Statement (EIS) for a proposed sand quarry at Newrybar Swamp Road, Lennox Head, Northern New South Wales. The project involves extraction of sand from a new site directly southwest of, and adjacent to an existing sand quarry.

The proposed quarry is located on Lot 32 of DP 1151612 Newrybar Swamp Road, Lennox Head, as shown on Drawing 1.

2. Terms of Reference & Methodology

2.1 Project Terms of Reference

As part of the EIS, the proponent is required to establish that the proposed activity will not contaminate groundwater or impact on groundwater dependent ecosystems. A terms of reference (TOR) for the EIS was provided by the NSW Office of Water (March 2011 and December 2012). Requirements of the TOR relevant to groundwater can be summarised as follows:

1. Conduct a hydrogeological investigation;
2. Identify impacts from the development on groundwater;
3. Conduct a water balance including determination of water requirements;
4. Identify the degree of connection between any surface water features and groundwater;
5. Identify impacts on groundwater dependent ecosystems;
6. Identify impacts on other licensed groundwater users; and
7. Develop a groundwater management plan.

The above items are described in this report.

2.2 Project Methodology

The methodology for the groundwater assessment involved a desktop study supported by a field investigation. The aim of the desktop study was to compile a Conceptual Hydrogeological Model of the site and surrounding area, based on data collated from a number of sources including:

- Geological and topographic mapping;
- Previous groundwater investigations in the region;
- EIS's compiled for similar projects in the region;
- Information from the New South Wales Office of Water (NOW) Groundwater Database; and
- Meteorological data from the Bureau of Meteorology.

The field program was undertaken in parallel with a geotechnical, ASS and resource evaluation drilling program and involved:

- Geological logging of boreholes;
- Completion of 4 bores as groundwater monitoring bores;
- Monitoring of groundwater levels;
- Field permeability testing; and
- The inspection of other sand quarries, surface water drainage and groundwater bores.

3. Physical Setting

3.1 Site Location and Regional Setting

The site is located on Lot 32 of DP 1151612, Newrybar Swamp Road, approximately 10 km north of Ballina and 3 km northwest of Lennox Head in Northern NSW.

The surrounding area is primarily used for sugar cane cultivation and the quarrying of sand. Some mineral sand mining has been undertaken in the past.

3.2 Topography and Vegetation

The site is low lying and generally flat with an elevation ranging from approximately 2.7 mAHD to 3.1 mAHD (Appendix A; Photo 1). A ridge with a maximum height of approximately 90 mAHD is located to the west of the site, as shown in Photo 2 of Appendix A.

Vegetation across the site is indicative of clearing for cane farming and consists mainly of grassland. The surrounding areas are characterised by low-lying coastal vegetation such as heath, banksia scrub, dry sclerophyll forest, grassland and some patches of eucalypts. Much of the surrounding area has been cleared for farming and extractive industry.

3.3 Climate

According to the Australian Bureau of Meteorology (BOM), the Ballina region has a subtropical climate. Moderate humidity and moderate temperatures are experienced all year round and rainfall is highest during the summer months. The hottest temperatures typically occur in January (ranging from 20°C to 28°C) and coldest temperatures typically occur in July and range from 9°C to 19°C.

Average annual rainfall is approximately 1760 mm, ~55% of which occurs in the months January to May. Total annual evaporation is approximately 1510 mm. Evaporation exceeds rainfall only during the months of August tot December (inclusive).

Long term average monthly climate statistics are detailed in Table 1 and graphically presented in Drawing 2.

Table 1: Long-Term Average Monthly Climatic Statistics

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	184	205	220	180	187	159	119	92	72	95	110	139
Evaporation (mm)	174	139	134	104	81	70	79	104	130	155	161	180
Maximum Daily Temp (°C)	27.9	27.5	26.6	24.6	22.0	19.7	19.4	20.7	22.7	24.5	26.0	27.3
Minimum Daily Temp (°C)	19.6	19.5	18.4	15.6	12.7	10.4	9.3	9.8	12.2	14.6	16.7	18.5

4. Hydrogeological Investigations

4.1 Previous Groundwater Investigations

Several previous reports were provided to DP for review. Relevant information from these reports is summarised in the following sub-sections.

4.1.1 Corkery (1988)

RW Corkery & Co Pty Limited compiled an EIS for the Newrybar Mineral Sands Project in 1988 on behalf of Australmin Holdings Limited. The Newrybar Mineral Sands Project area incorporates the proposed quarry site. Findings of Corkery (1988) which relate to the hydrogeology of the proposed quarry site are summarised as follows:

- Registered bores provided information that groundwater resources are found within the coastal low lying sand deposits and also in the basalt rocks which comprise the surrounding elevated land. Some of the sand aquifer bores have yields ranging up to 30 L/s;
- Groundwater levels were observed regularly in two bores and two deep drains. The shallow groundwater bore indicated tidal fluctuations from -0.3 mAHD to 0 mAHD; whereas the deeper groundwater bore showed limited influence of tidal fluctuations with an average water level of approximately -0.6 mAHD. The two drains are at similar depths and water levels fluctuated tidally from -1.3 mAHD to -0.7 mAHD;

- Standing water levels in the bores ranged from 0.1 mbGL (metres below ground level) to 1.9 mbGL;
- Laboratory analysis of water samples from five bores, indicated that groundwater in the region is fresh with the exception of water from WB16 which was slightly brackish. Sulphate levels were variable and pH was near neutral to acidic (7.9 to 3.9); and
- Values of aquifer hydraulic parameters were estimated from similar sand deposits on the NSW coast. The following hydraulic parameters were adopted by Corkery (1988):
    - Hydraulic conductivity 20 m/day;
    - Transmissivity 250 m^2/day; and
    - Specific Yield 20 %.

4.1.2 Coffey (2001)

Coffey (2001) undertook a hydrogeological and ASS investigation for the Gradex quarry northeast of and adjacent to the proposed sand quarry. Findings of Coffey (2001) are summarised as follows:

- Underlying geology is comprised of approximately 0.3 m to 0.4 m of organic loamy sand overlaying 1.0 m to 1.5 m of grey sand with a trace of silt. The grey sand is underlain by dark brown indurated sand (coffee rock) of variable thickness. Varying degrees of cementation in the indurated sand were identified to a depth of 7 m;
- pH measurements collected during the installation of several bores indicated that soil pH is acidic to slightly acidic (pH 4.5 to 6.3). Depth trends indicated that shallower soils are more acidic than underlying soils;
- Water samples collected from 13 groundwater bores and three surface water locations. Results of field measurements can be summarised as follows:
    - pH ranged from 3.2 (McGeary's Sand Quarry) to 6.0 (BH2);
    - Reduction potential ranged from -135 mV (BH9) to 283 mV (North Pond);
    - Electrical conductivity (EC) ranged from 115 µS/cm (North Pond) to 411 µS/cm (McGeary's Sand Quarry); and
    - Dissolved oxygen (DO) ranged from 1.0 mg/L (BH9) to 7.7 mg/L (McGeary's Sand Quarry).
- The primary groundwater flow direction was assessed to be to the southwest towards the boundary creek (a man-made channel) which drains to the south.

4.1.3 Coffey (2008)

In 2008, Coffey undertook a further ASS investigation of the Gradex sand quarry as part of a program for expansion of the quarry. The Coffey (2008) program involved the drilling of 5 test holes (TH1 to

TH5) each to a depth of 9 m. Results from this drilling program did not add materially to the understanding of the hydrogeology of the site.

4.1.4 Ardill Payne & Partners (2008)

In March 2008, AP&P supervised the drilling of 5 test bores across the proposed quarry site. The locations of these bores are shown on Drawing 3.

All 5 bores were drilled to a depth between 15.0 m and 15.5 m, and intersected fine to medium grained coastal dune sands with indurated layers of coffee rock. None of the bores intersected bedrock, indicating the thickness of the dune sands sequence is at least 15 m.

Borelogs of these 5 bores are provided in Appendix B.

4.2 Groundwater & ASS Investigations, May 2011

DP Principal Hydrogeologist Iain Hair, and Environmental Engineer Harry Adsett, supervised drilling and construction of four groundwater monitoring bores at the over the period 9 and 10 May 2011. The drilling program was part of an Acid Sulfate Soils (ASS) investigation during which 13 bores (2.1 to 2.13) were drilled to a depth of approximately 8 m. The bores were drilled by Australian Soil and Concrete Testing P/L using a Explora 85 drill rig with a 100 mm auger.

Four of the ASS bores were selected to be deepened, and completed as groundwater monitoring facilities (piezometers), to provide sufficient groundwater profile information across the site. Specific soil profiles of the bores were logged to optimise construction of piezometers to assess groundwater conditions.

Borelogs for the 13 ASS bores and the 4 groundwater piezometers are attached in Appendix B. The locations of these bores with respect to site boundaries are shown on Drawing 3.

On completion of drilling, the bores were developed to enable sampling for groundwater quality testing, hydraulic testing and monitoring of groundwater levels.

Groundwater levels were recorded in Piezometers P1 to P4 by AP&P after two days, and an automated groundwater level logger was installed in Piezometer P2 and monitored for two months after bore installation.

Several photographs (Appendix A) show various stages of bore drilling, piezometer construction and groundwater sampling.

5. Hydrogeological Regime

Information from regional geological mapping, investigations on nearby properties, drilling programs at the proposed sand quarry site and information from the NOW Groundwater database has been utilised to compile a Conceptual Hydrogeological Model (CHM) of the site which is described in the following sections.

5.1 Physiographic & Geological Setting

Drawing 4 shows the regional geological mapping for the site and surrounding area. The most prominent geological feature is the Tertiary basalt which comprises the low rolling hills and ridgeland to the north, west and south of the site. The basalt is a remnant of the Tweed Shield Volcano, centred on Mt Warning, approximately 70 km northwest of Lennox Head.

The eastern portion of the map area is comprised of Pleistocene / Holocene coastal dune sand and beach deposits, which are dominated by fine to medium grained dune sands with minor silt, mud and coffee rock. The coffee rock is a low permeability layer of sand which has become indurated with the addition of humus and iron oxides. Coffee rock is rarely continuous throughout the profile.

There are some small areas of alluvial and colluvial deposits associated with current drainage systems to the north and southwest of the site.

Bedrock in the region comprises either Mesozoic sedimentary rocks of the Woogaroo Sub-group, or low grade metamorphics of the Palaeozoic Neranleigh-Fernvale Beds. These units do not outcrop within the area covered by Drawing 4, but are found at some coastal headlands and at depth beneath the dune sands. Some bores identified in the NOW Groundwater Database search (Section 5.2) were terminated in these bedrock units at depths between 30 m and 40 m.

5.2 Regional Groundwater Use

A search of the NOW Groundwater Database has identified 29 groundwater facilities within 5 km of the proposed sand quarry site. The locations of these facilities are shown on Drawing 4.

Table 2 lists details of groundwater facilities identified from a search of the NOW Groundwater database. Groundwater Works Summary Sheets for these facilities are provided in Appendix C.

Table 2: Groundwater Utilisation in the Vicinity of the Proposed Sand Quarry

Easting	Northing	GW Number	Type	Use	Aquifer	Yield (L/s)	Depth (m)
556794	6815595	GW030726	Bore	Town Water Supply	Sand	34.0	39.0
556927	6815194	GW030727	Bore	Town Water Supply	Sand		47.0
552161	6816263	GW037459	Well	Stock & Irrigation	Basalt	0.4	1.8
554258	6818253	GW0383	W	Stock & Domestic	Gravel	3.8	3.6

Easting	Northing	GW Number	Type	Use	Aquifer	Yield (L/s)	Depth (m)
		16	ell				
552917	6815551	GW038336	Well	Abandoned	Basalt	-	6.0
553158	6815058	GW038337	Well	Stock & Domestic	Basalt	-	1.5
552207	6814631	GW038931	Well	Stock	Basalt		3.0
553510	6814933	GW038991	Well	Stock	Basalt	-	3.6
553864	6815147	GW038993	Well	Stock	Basalt	0.3	3.0
556793	6815502	GW039161	Bore	GW Exploration	Sand		29.5
554976	6815357	GW039162	Bore	Abandoned	-	-	36.4
554071	6818931	GW043311	Well	Stock	Basalt	-	5.7
556665	6817042	GW052271	Bore	GW Exploration	Sand	2.0	29.0
556640	6817350	GW052272	Bore	GW Exploration	Sand	2.0	27.0
556668	6817657	GW052273	Bore	GW Exploration	Sand	-	24.0
556688	6816118	GW052275	Bore	GW Exploration	Sand	6.0	22.0
556413	6815289	GW052276	Bore	GW Exploration	Sand	6.0	41.0
552185	6815555	GW067116	Bore	Stock & Domestic	Basalt	1.0	45.0
551852	6815116	GW302018	Well	Stock & Irrigation	Basalt		1.5
552583	6816049	GW302465	Bore	Stock & Domestic	Basalt	0.1	54.0
556189	6815761	GW303148	Bore	Domestic	Sand	0.4	9.5
551955	6815969	GW303277	Bore	Domestic	Basalt		48.8
553134	6815332	GW303530	Bore	Domestic	Unknown	-	-
555329	6815426	GW305018	Bore	Domestic	Sand	1.3	12.0
552540	6815358	GW305399	Bore	Monitoring Bore	Basalt	-	25.2
553492	6818708	GW305400	Bore	Monitoring Bore	Silt	-	15.6
551593	6816323	GW305404	Bore	Monitoring Bore	Basalt		11.8
552946	6816900	GW305428	Bore	Monitoring Bore	Sand	-	17.0
553152	6817625	GW305430	Bore	Monitoring Bore	Basalt	-	25.0

Six of the 29 bores or wells were established for groundwater exploration or groundwater monitoring purposes. Nine of the facilities are shallow wells of average depth 3 m established in the Tertiary basalt. The dune sands and coastal deposits have 11 bores established in them. The average depth of these bores is ~27 m and the average yield is ~3 L/s, with the exception of Lennox Head Town Water Supply bores which are capable of yields in excess of 30 L/s.

There is no significant groundwater use in close proximity to the proposed sand quarry. The nearest bore is GW305428, which is a groundwater monitoring bore in the coastal dune sands.

5.3 Site Groundwater Conditions

5.3.1 Aquifer Units & Hydraulic Parameters

Results of drilling programs conducted at the site show that the site is underlain by a sequence of coastal dune sands and sediments which are at least 15 m thick. All bores drilled intersected the groundwater table at a shallow depth. Bores drilled during May 2011 intersected the groundwater table at an average depth of 1.0 m (Range: 0.7 m to 1.2 m).

The four piezometers at the site were sampled shortly after construction. Each of the bores was purged of 150 L using a groundwater purging / sampling pump. During the sampling, the piezometers were equipped with pressure transducers / dataloggers, and the recovery following purging was recorded. Residual drawdown data has been analysed to provide a value of aquifer Transmissivity (T).

The following values of T were calculated:

Piezometer 1	13 m^2/day;
Piezometer 2	2 m^2/day;
Piezometer 3	11 m^2/day; and
Piezometer 4	3 m^2/day;

These values are indicative only as pumping rates were low, the tests were conducted in small diameter bores and the full thickness of the aquifer (which is unknown at the site) was not intersected.

5.3.2 Groundwater Levels, Flow Directions & Connection with Surface Water

Groundwater levels have been monitored in each of the 4 piezometers on 8 occasions over the period May to July 2011, and on 10 occasions over the period October 2011 to January 2013. Data are listed in Table 3.

Table 3: Groundwater Levels May 2011 to January 2013

Date	Time	P1	P2	P3	P4
20/05/2011	09:45	2.38	1.64	2.09	1.25
20/05/2011	10:30	2.37	1.40	2.07	1.25
24/05/2011	12:00	2.45	1.66	2.23	1.31
31/05/2011	11:30	2.21	1.60	1.95	1.20
09/06/2011	16:30	2.18	1.51	1.95	1.18
16/06/2011	15:30	2.50	1.97	2.17	1.36
21/06/2011	13:30	2.24	1.62	2.01	1.26
01/07/2011	14:00	2.23	1.60	1.95	1.25
11/10/2011	NR	1.96	1.48	1.70	1.01
11/11/2011	NR	1.93	1.33	1.71	0.99
15/12/2011	NR	2.33	1.73	2.01	1.18
31/01/2012	NR	2.52	1.97	2.14	1.37
29/02/2012	NR	2.37	1.81	2.05	1.21
16/03/2012	NR	2.29	1.66	1.96	1.18
19/04/2012	NR	2.79	1.93	2.36	1.68
16/05/2012	NR	2.16	1.40	2.01	1.12
25/06/2012	NR	2.22	1.54	1.98	1.17
21/01/2013	NR	1.18	0.88	1.17	0.67
	Highest	***2.8***	***2.0***	***2.4***	***1.7***
	Lowest	***1.2***	***0.9***	***1.2***	***0.7***
	Range	***1.6***	***1.1***	***1.2***	***1.0***

Note: *Values for groundwater levels quoted in mAHD.*

Groundwater levels in Piezometers P1 and P3 are elevated with respect to levels in Piezometers P2 and P4, indicating a general groundwater flow from the northwest to the southeast across the site to the drain / creek at the corner of the property.

Groundwater levels grade at least 0.5 m across the site. Data in Table 3 indicate that groundwater levels range seasonally (Wet Season to Dry Season) by approximately 1.0 to 1.6 m.

Groundwater levels were also recorded in Piezometer P2 over the period 9 June to 1 September 2011 using a pressure transducer / datalogger set on a 10 minute recording interval. Groundwater level data are plotted in Drawing 6

Drawing 6 also shows surface water levels recorded at the Newrybar Swamp Road and Ross Lane sites over the period 16 April to 1 September, 2011. The locations of these sites are shown on Drawing 1. Daily rainfall figures for the months of April to August 2011 (inclusive) are also shown on Drawing 6.

A significant rise in groundwater level of the order of ~0.5 m was recorded on 12 June, in response to rainfall and streamflow. A similar event resulting in a groundwater level rise of ~0.9 m occurred over the period 21 and 22 July 2011. Drawing 6 shows very little time lag between rainfall, streamflow, and

rise in groundwater level, indicating rapid recharge of the groundwater system at the site from rainfall events.

This minimal lag time indicates good hydraulic connection between surface water and groundwater systems.

5.3.3 Groundwater Quality

Piezometers P1, P2, P3 and P4 were purged and groundwater samples were collected on 20 May, 2011. Field measurements recorded during sampling are collated in Table 4.

Table 4: Field Measurements Recorded During Sampling – 20 May, 2011.

Parameter	P1	P2	P3	P4	Average
pH (Std. Units)	5.2	5.2	5.5	5.4	5.3
EC (µS/cm)	82	134	118	106	110
TDS (mg/L)	53	87	86	69	74
Turbidity (NTU)	141	188	42	317	172
DO (mg/L)	2.2	1.3	1.5	1.9	1.7
Purging Time (min)	14	7	38	6	

Field measurements of pH indicate that the groundwater at the site is acidic with an average pH of 5.3. The water is very fresh with electrical conductivity (EC) ranging from 82 µS/cm to 134 µS/cm, and total dissolved salts (TDS) varying from 53 mg/L to 87 mg/L.

Dissolved oxygen averaged 1.7 mg/L.

Groundwater samples were submitted to the Environmental Analysis Laboratory, Southern Cross University and analysed for a range of chemical parameters. Results are listed in Table 5,

Table 5: Detailed Chemical Analysis of Groundwater Samples

Parameter	P1	P2	P3	P4
General Parameters				
pH	*5.3*	*5.3*	*5.3*	*5.5*
Conductivity (µS/cm)	80	140	130	110
TDS (mg/L)	54	92	88	73
TSS (mg/L)	30	47	4	38
Turbidity (NTU)	75	82	28	131
True Colour (PtCo)	34	79	23	91
SAR	1.2	0.9	1.0	1.4
Major Ions				
Sodium (mg/L)	14.9	8.7	12.1	12.6
Potassium (mg/L)	1.5	5.3	1.0	0.9
Calcium (mg/L)	2.2	3.6	3.7	2.3
Magnesium (mg/L)	5.2	2.0	4.9	2.6
Chloride (mg/L)	21	18	18	19
Bi-Carbonate (mg/L)	18	26	22	28
Sulphate (mg/L)	54	78	66	84
Fluoride (mg/L)	0.08	0.08	0.09	0.08
Dissolved Metals				
Aluminium (mg/L)	*0.42*	*0.43*	*0.37*	*0.93*
Arsenic (mg/L)	0.002	*0.038*	0.003	0.003
Cadmium (mg/L)	<0.001	<0.001	<0.001	<0.001
Chromium (mg/L)	0.001	0.001	0.001	0.002
Copper (mg/L)	0.001	<0.001	<0.001	<0.001
Iron (mg/L)	*1.65*	*0.69*	*2.01*	*2.73*
Lead (mg/L)	<0.001	<0.001	<0.001	<0.001
Manganese (mg/L)	0.02	0.01	0.03	0.03
Mercury (mg/L)	<0.0001	<0.0001	<0.0001	<0.0001
Nickel (mg/L)	0.002	0.002	0.001	0.001
Selenium (mg/L)	<0.001	<0.001	<0.001	<0.001
Silver (mg/L)	<0.001	<0.001	<0.001	<0.001
Zinc (mg/L)	0.022	0.030	0.048	0.017
Nutrients				
Nitrate (mg/L N)	<0.005	0.000	0.000	0.058
Nitrite (mg/L N)	<0.001	<0.001	0.001	0.001

Parameter	P1	P2	P3	P4
Ammonia (mg/L N)	0.05	0.13	0.06	0.31
TKN (mg/L)	0.25	0.40	0.20	0.71
Total Nitrogen (mg/L)	0.25	0.40	0.21	0.73
Orthophosphate (mg/L)	<0.005	<0.005	<0.005	<0.005
Total Phosphorus (mg/L)	0.05	0.06	0.02	0.13

Results listed in Table 6 show that groundwater of the dune sands aquifer is dominated by the sodium and sulphate ions with percentage reacting values (PRVs) of 51% and 61% respectively. Magnesium is significant in some samples (P1 and P3; PRV 28%), and chloride is a prominent anion (PRV 23%).

However, groundwater at the site is essentially a sodium sulphate type water.

Drinking water guideline values are exceeded for pH, aluminium and iron. Such exceedences are not uncommon in groundwaters of coastal dune sands environments. The guideline values for aluminium and iron relate to aesthetic criteria. pH could be treated by passing water through a lime bed.

For 1 sample (Piezometer 2) the drinking water guideline value for arsenic of 0.007 mg/L is exceeded.

Nutrient levels are low. This is surprising considering land in the region was used for the growing of sugar cane for many years.

6. Groundwater Management During Quarrying Operations

6.1 The Quarrying Operation

The sand quarrying operation will generally operate during the drier months of the year (July to November). Operating during this period will minimise dewatering and pumping requirements. Stockpiles of material will be used during wet periods to cater for market demand of fill material.

6.2 Water Management

The initial pit area will be dewatered directly into the sediment basins. Subsequent excavations will be dewatered into adjacent pit void areas. This will generally avoid having to discharge off site during excavations. As works progress, the pit void will be enlarged. If offsite discharge is unavoidable, it will be undertaken in accordance with a groundwater extraction license. This license would be sought on the basis of the water balance model provided. All discharges from site will be treated in the sediment basins and monitored in accordance with the EPA licence.

Once an area is excavated and material stockpiled, groundwater will be allowed to recharge the area. Given the Transmissivity (T) of the sand, this is expected to occur within hours or a few days. During excavation, dewatering will be continuously undertaken.

A conceptual water balance model for the operations has been prepared. This model balances rainfall and evaporation with additional losses from extraction, dust mitigation (water cart), any irrigation for establishment of revegetation areas and treated discharges from site. Based on this model, the total required discharge will be a maximum of 23 ML/a without impacting or lowering the local groundwater levels.

6.3 Potential Impacts

Results of simple analytical modelling suggests that the limit of drawdown around the pit will be of the order of 100 m. Drawdown should not extend beyond the drains which border the site because of the high degree of hydraulic connection between surface water in the drains and the groundwater system.

Due to the storage of groundwater on site within pit voids and high aquifer Transmissivity, the recovery of groundwater levels after excavation ceases will be rapid. At the end of the Dry Season when operations are suspended, the groundwater table will equilibrate with water levels in the new quarry.

Potential impacts will also be minimised by undertaking deep excavation only during the Dry Season to minimise dewatering. Natural groundwater levels in the area have been measured varying seasonally by greater than 1.5 m.

It is understood that there is concern in regard to a paperbark / sedge wetland in the vicinity of the stockpile area in the eastern portion of the site (near Newrybar Swamp Road). This wetland has been identified as habitat of the wallum froglet. The existing quarry has been operating for about 10 years, adjacent to, and to the north of the wetland. The impact of the proposed operation will be less than that of the current operation in that the net loss of water from the system will be considerably reduced.

It is considered that the proposed sand quarry will not have an adverse effect on the paperbark / sedge wetland.

7. Conclusions & Recommendations

A Conceptual Hydrogeological Model has been developed for the proposed Lennox Head Sand Quarry at Newrybar Swamp Road, Lennox Head, Northern NSW.

The CHM is based on geological mapping, information from the NOW Groundwater Database, drilling programs at the proposed quarry site, and previous hydrogeological investigations undertaken for other projects in the area.

The geology of the site is characterised by Pleistocene / Holocene dune sands and coastal deposits, which are dominated by fine to medium grained sands with layers of indurated coffee rock. This sequence attains a thickness of at least 15 m at the site.

The dune sands / coffee rock sequence hosts a significant groundwater resource. The sequence is saturated from ~1 m below ground (as at May 2011). Groundwater level monitoring shows that

groundwater flow is from the northwest to the southeast across the site at a gradient of approximately 1 in 1000.

Hydraulic testing shows that the aquifer at the site has moderate to high transmissivity and hydraulic conductivity. Groundwater is hydraulically connected to surface water in drains and creeks which comprise the western, southern and eastern boundaries of the site. Recharge from rainfall events is rapid and the aquifer is unconfined.

Groundwater is acidic and of very low salinity. Sodium and sulphate are the dominant ions in groundwater; magnesium and chloride are also prominent. A comparison of water quality with drinking water guidelines shows that groundwater at the site is near potable. Guideline values for pH, aluminium and iron are exceeded. Arsenic concentrations may be above drinking water guideline values in some areas.

A search of the NOW Groundwater Database shows that there are no bores in close proximity to the site that may be adversely affected by quarrying operations.

As the quarry will operate only during the dry months of the year, it will have only a limited impact on groundwater levels in the region. The site is almost surrounded by surface water drains / creeks, which would limit the extent of any cone of depression.

7.1 Recommendations

It is recommended that:

- The current program of monitoring surface water levels at locations W1, W2 and W3 (Drawing 3) should be maintained into the future;
- Automated surface water level monitoring at the Newrybar Swamp Road site (Drawings 1 and 3) should be maintained into the future;
- Groundwater levels should be monitored on a monthly basis in the 4 existing piezometers and in BH12 of the nearby quarrying operation;
- The pressure transducer / datalogger should be moved from Piezometer P2 and relocated in piezometer P1 for the on-going monitoring of groundwater levels;
- Groundwater samples should be collected from each of the 4 piezometers on an annual basis and analysed for the chemical parameters listed in Table 5; and
- All monitoring data should be collated, analysed and reported on an annual basis.

There may be a need to install additional piezometers outside the quarry footprint at some stage in the future, should any of the existing piezometers be destroyed by quarrying operations.

The annual reporting / review recommended above should also incorporate an analysis of monitoring data from other bores in the region which are located in the dune sands. Such data could be obtained from the NOW.

8. References

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9. Limitations of this Report

Douglas Partners Pty Ltd (DP) has prepared this report for the project at Newrybar Swamp Road, Lennox Head, NSW in accordance with DP's proposal dated 18 April 2011 and acceptance received from Mr James Foster of Ardill Payne & Partners. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Ardill Payne & Partners for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions only at the specific sampling or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of anthropogenic influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be limited by undetected variations in ground conditions between sampling locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

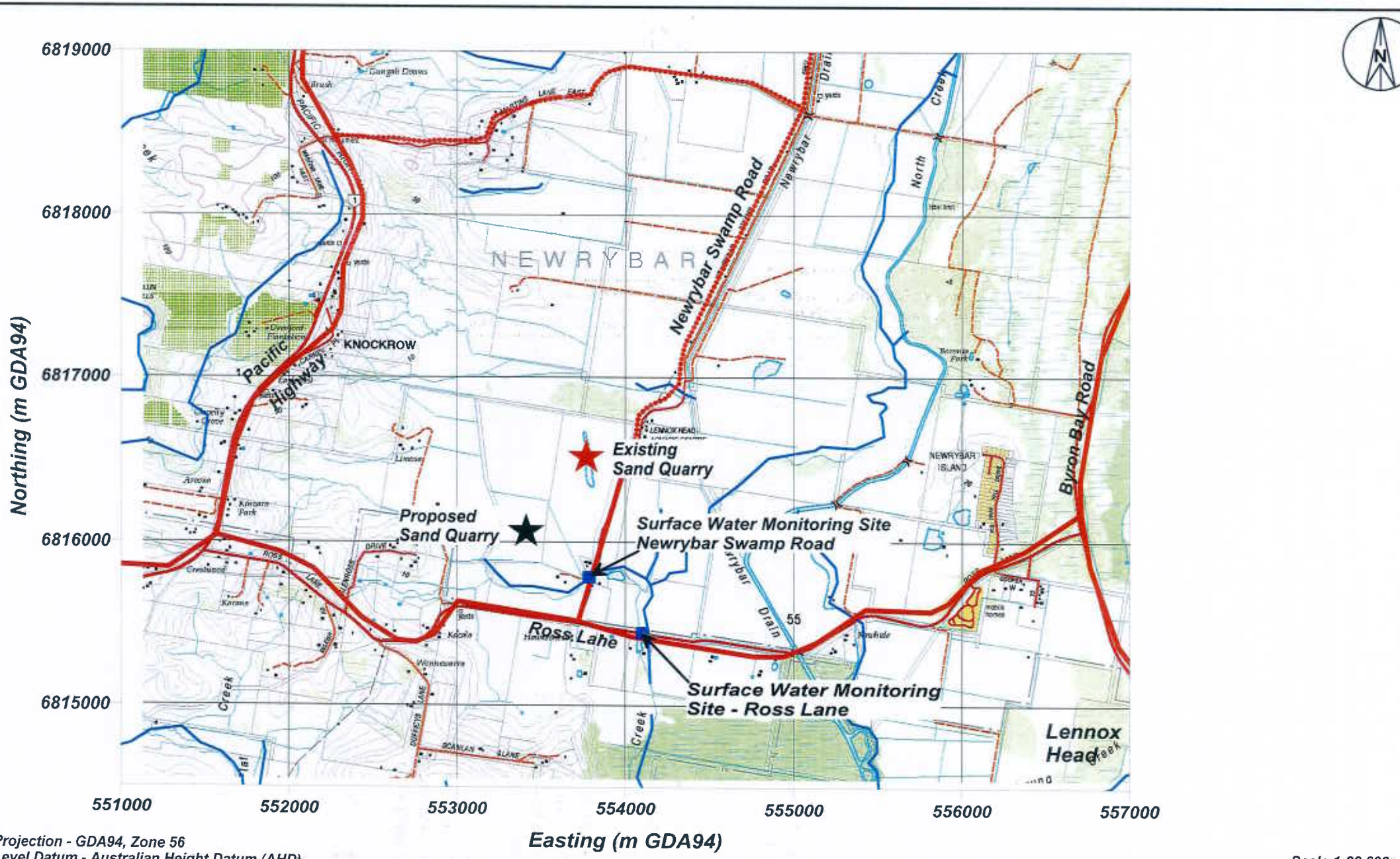
This report must be read in conjunction with all of the attached notes and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion given in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions.

Douglas Partners Pty Ltd

Drawings

Drawing 1: Location of Proposed Lennox Head Sand Quarry
Drawing 2: Long Term Average Monthly Climate Statistics
Drawing 3: Locations of Test Bores, ASS Bores & Piezometers
Drawing 4: Regional Geology
Drawing 5: Locations of Bores – NOW Groundwater Database
Drawing 6: Surface & Groundwater Levels –April to September, 2011



Projection - GDA94, Zone 56
Level Datum - Australian Height Datum (AHD)

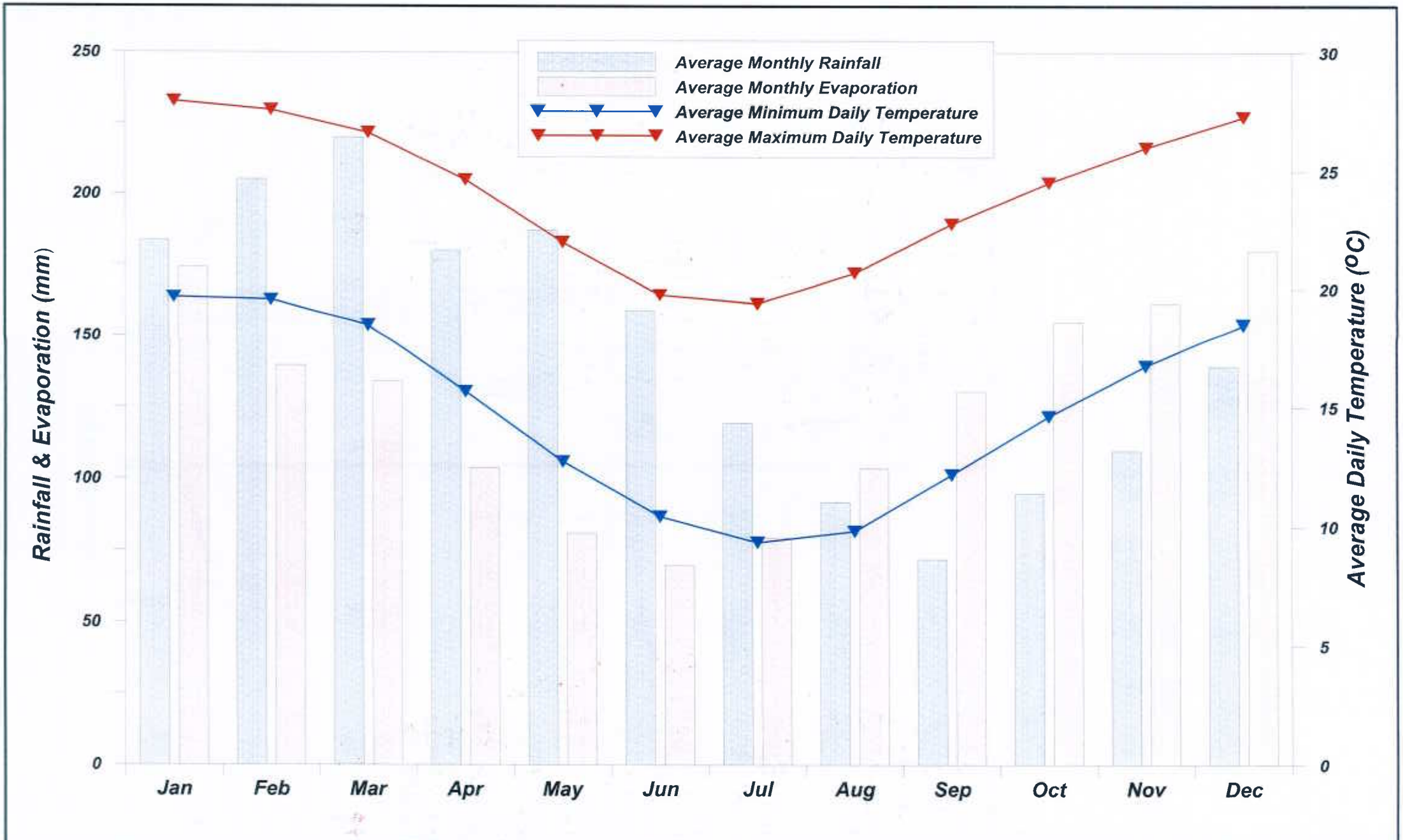
Scale 1:30,000

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Ardill Payne & Partners		
DRAWN BY: HA	DATE: Aug 2011	
APPROVED BY: IDH	OFFICE: Brisbane	

LOCATION OF PROPOSED LENNOX HEAD SAND QUARRY
Groundwater Assessment for Proposed Sand Quarry EIS
Newrybar Swamp Road, Lennox Head Northern NSW

PROJECT No:	74778.00
DRAWING No:	1
REVISION:	A

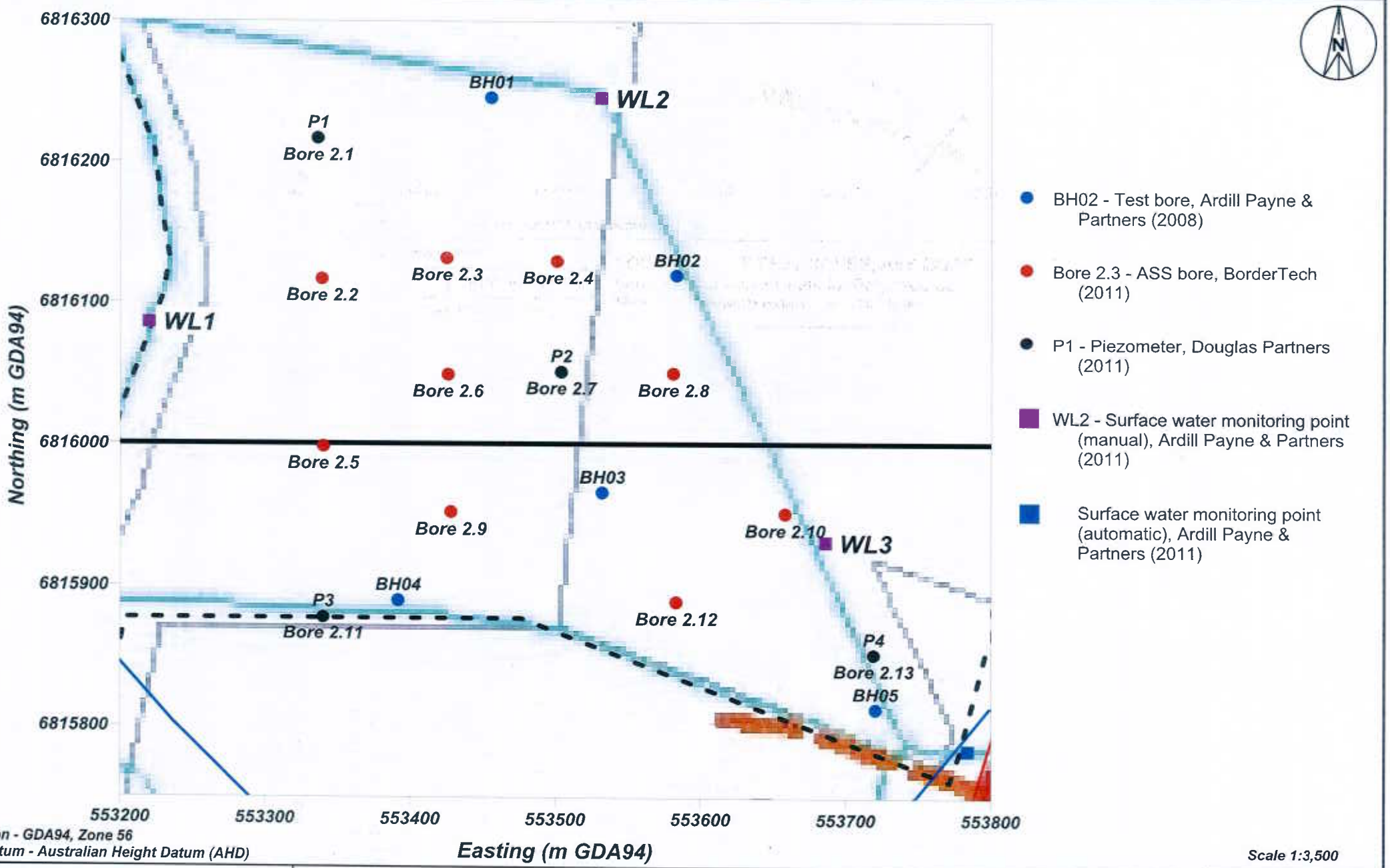


Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: Ardill Payne & Partners	
DRAWN BY: IDH	DATE: Aug 2011
APPROVED BY: IDH	OFFICE: Brisbane

LONG TERM AVERAGE MONTHLY CLIMATE STATISTICS
Groundwater Assessment for Proposed Sand Quarry EIS
Newrybar Swamp Road, Lennox Head Northern NSW

PROJECT No:	74778.00
DRAWING No:	2
REVISION:	A



Projection - GDA94, Zone 56
Level Datum - Australian Height Datum (AHD)

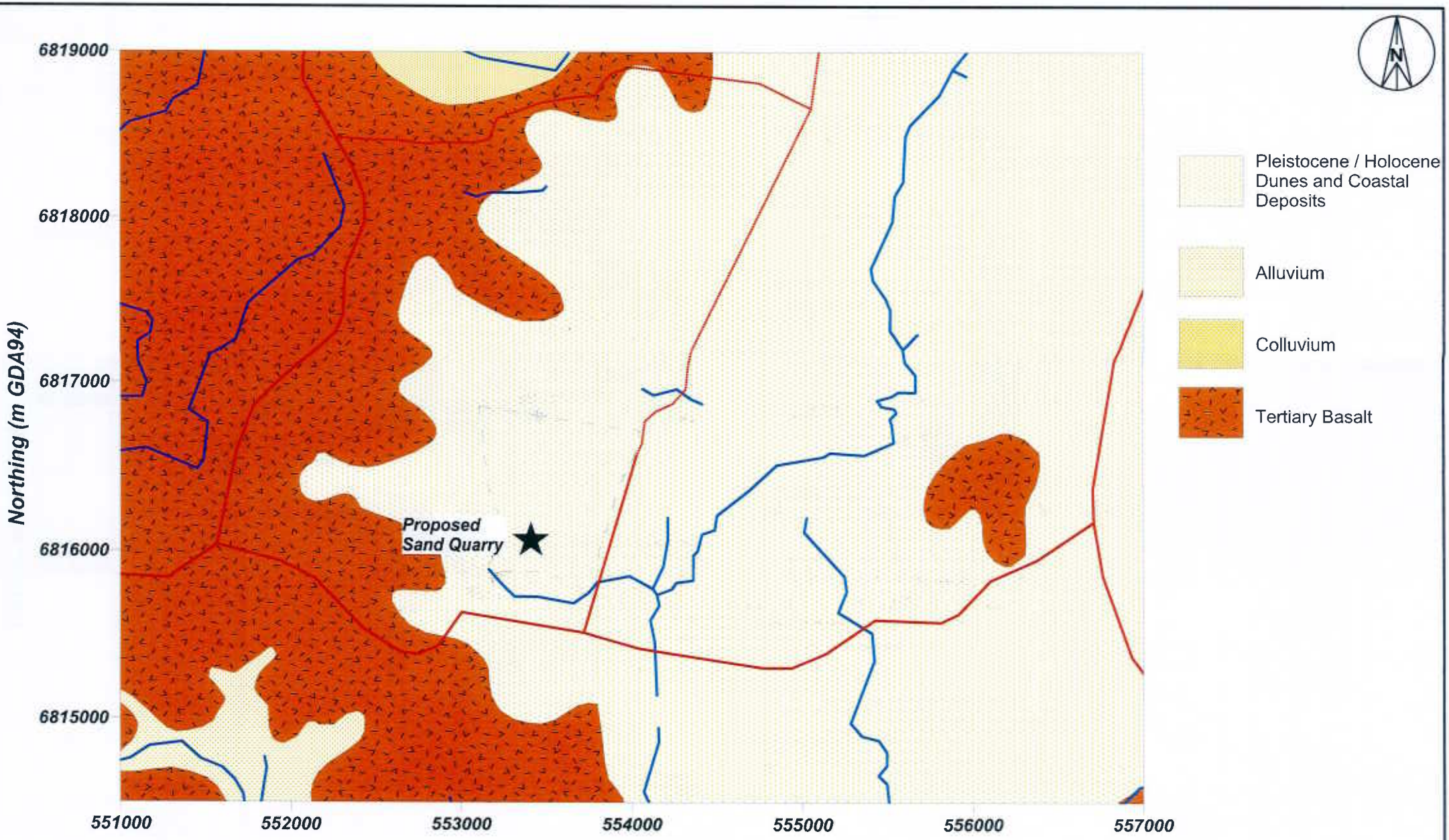
Scale 1:3,500

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Ardill Payne & Partners	
DRAWN BY: HA	DATE: Aug 2011
APPROVED BY: IDH	OFFICE: Brisbane

LOCATIONS OF TEST BORES, ASS BORES & PIEZOMETERS
Groundwater Assessment for Proposed Sand Quarry EIS
Newrybar Swamp Road, Lennox Head Northern NSW

PROJECT No:	74778.00
DRAWING No:	3
REVISION:	A



Projection - GDA94, Zone 56
Level Datum - Australian Height Datum (AHD)

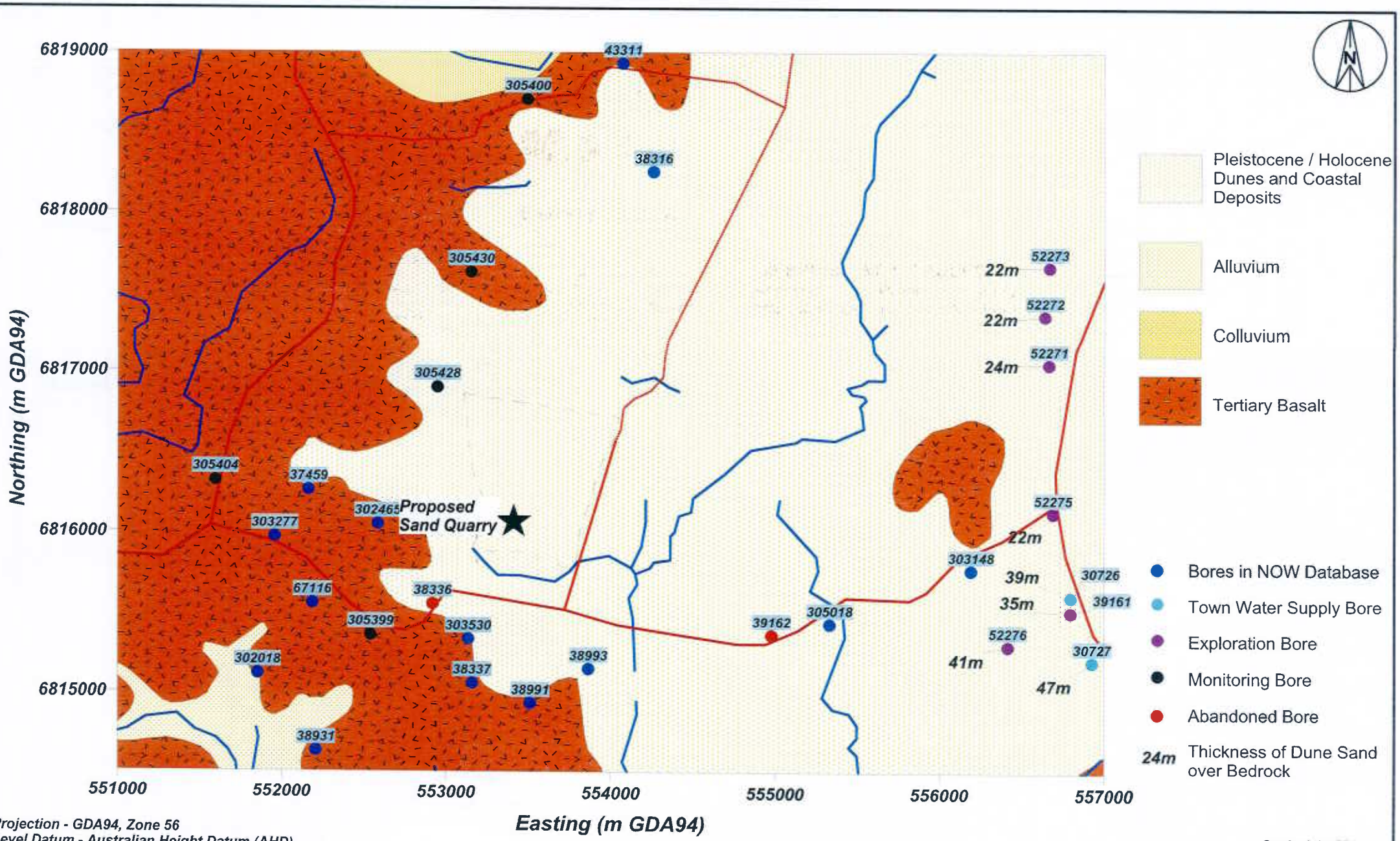
Scale 1:30,000

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Ardill Payne & Partners		
DRAWN BY: HA	DATE: Aug 2011	
APPROVED BY: IDH	OFFICE: Brisbane	

REGIONAL GEOLOGY
Groundwater Assessment for Proposed Sand Quarry EIS
Newrybar Swamp Road, Lennox Head Northern NSW

PROJECT No: 74778.00
DRAWING No: 4
REVISION: A



Projection - GDA94, Zone 56
Level Datum - Australian Height Datum (AHD)

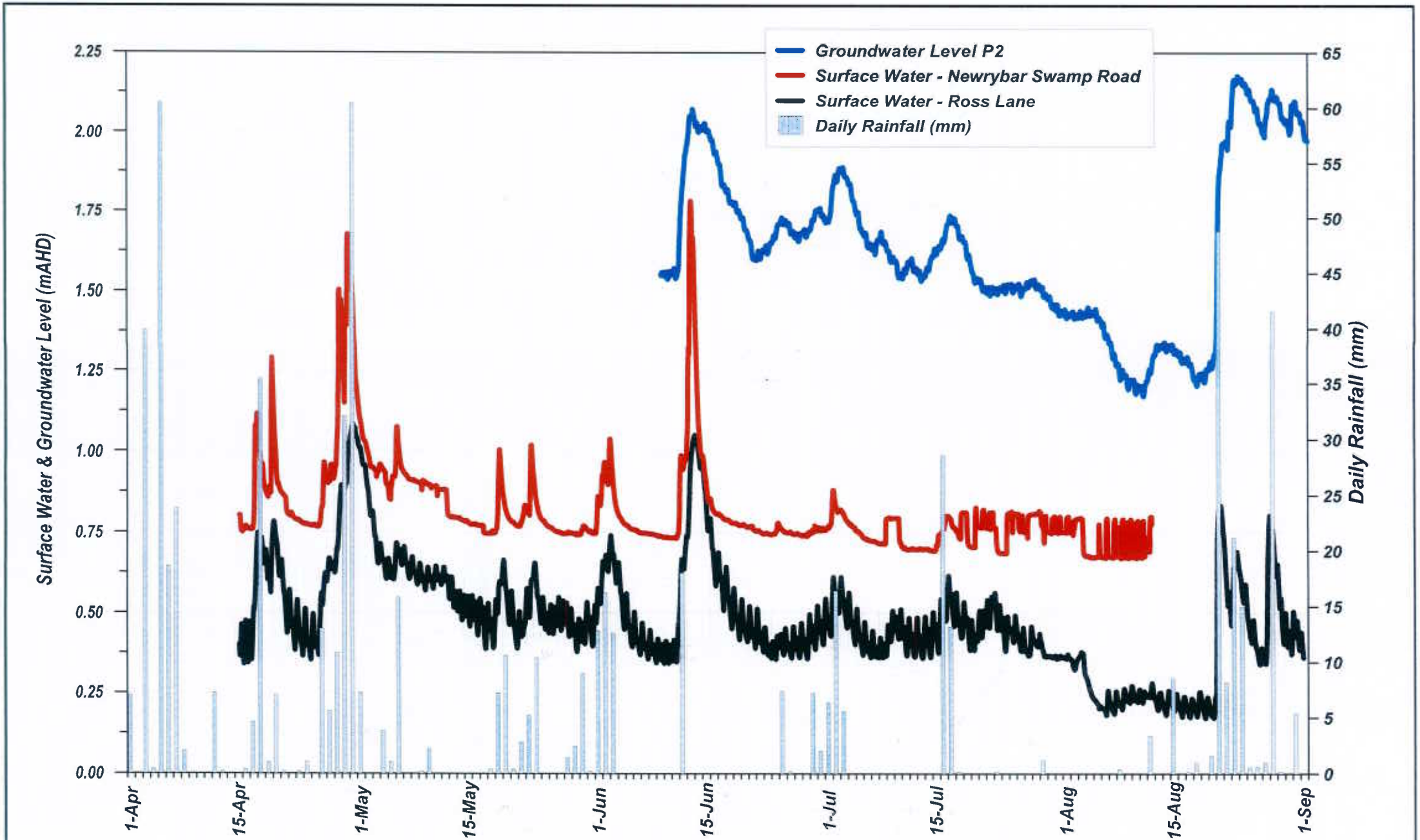
Scale 1:30,000

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Ardill Payne & Partners		
DRAWN BY: HA	DATE: Aug 2011	
APPROVED BY: IDH	OFFICE: Brisbane	

LOCATIONS OF BORES - NOW GROUNDWATER DATABASE
Groundwater Assessment for Proposed Sand Quarry EIS
Newrybar Swamp Road, Lennox Head Northern NSW

PROJECT No:	74778.00
DRAWING No:	5
REVISION:	A



Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Ardill Payne & Partners		
DRAWN BY: IDH	DATE: Sep 2011	
APPROVED BY: IDH	OFFICE: Brisbane	

SURFACE & GROUNDWATER LEVELS - APRIL to SEPTEMBER, 2011
Groundwater Assessment for Proposed Sand Quarry EIS
Newrybar Swamp Road, Lennox Head Northern NSW

PROJECT No:	74778.00
DRAWING No:	6
REVISION:	A

Appendix A

Selected Project Photographs

Photo 1: View Across Project Site

Photo 2: Elevated Land to the West of the Site

Photo 3: Augering in Saturated Sand

Photo 4: Flushing 100 mm Steel Casing Prior to Installation of Piezometer

Photo 5: Water Flush of Piezometer Post Construction

Photo 6: Purging Piezometer P2 Prior to Sampling

Photo 7: Water Filled Lake – Gradex Quarry

Photo 8: Pumping Water from Gradex Quarry

Appendix B

Logs of Exploration Bores, ASS Bores & Piezometers

ARDILL PAYNE AND PARTNERS

BOREHOLE LOG

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Job No:	6542
Date:	18/03/2008
No:	**BH1**
Client	Ballina Sands Pty Ltd
Sheet:	1 of 3
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Logged by:	P. Moodie
Equipment	Truck mounted drill rig
Ckecked:	
Location	See Site Plan
Level:	Existing

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
						Silty SAND - black grey.	D	Sample at 0.5 mbgl
			1.0			SAND - grey to brown.	M	Sample at 1.0 mbgl
								Sample at 1.5 mbgl
			2.0			SAND - brown.	W	Sample at 2.5 - 2.95 mbgl
			3.0			Indurated SAND - brown/green	W	
			4.0					Sample at 4.0 - 4.45 mbgl
			5.0			Sand - pale brown	W	

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

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BOREHOLE LOG

Job No:	6542
Date:	18/03/2008
No:	**BH1**
Sheet:	2 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
			6.0			Sand - pale brown (continued)	W	Sample at 6.0 - 6.5 mbgl
			7.0			Indurated SAND - brown	W	
			8.0			Coffee rock - brown, very hard.	W	Sample at 8.0 - 8.2 mbgl
			9.0			Indurated SAND - brown	W	
			10.0					

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

ARDILL PAYNE AND PARTNERS

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Job No:	6542
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No:	**BH1**
Sheet:	3 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
			11.0			Indurated SAND - brown (continued)	W	Sample at 11.0 - 11.15 mbgl
			12.0			Indurated SAND - pale brown	W	
			13.0					
			14.0					
			15.0			Indurated SAND - blue to grey		Sample at 15.0 - 15.45 mbgl
						End of borehole at 15.45 mbgl.		

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

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BOREHOLE LOG

Job No:	6542
Date:	18-19/03/2008
No:	**BH2**
Sheet:	1 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
						Silty SAND - brown.	D	Sample at 0.5 mbgl
			1.0			SAND - grey to brown.	D	Sample at 1.0 mbgl
								Sample at 1.5 mbgl. Water at 1.3 mbgl
			2.0					
			3.0			Indurated SAND - brown.	W	Sample at 3.0 - 3.3 mbgl
			4.0					
			5.0					

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

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BOREHOLE LOG

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Job No:	6542
Date:	18-19/03/2008
No:	**BH2**
Sheet:	2 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
			6.0			Indurated SAND - brown (continued).	W	Sample at 6.0 - 6.2 mbgl
			7.0				W	
			8.0			Indurated SAND - brown, very hard	W	Sample at 8.0 - 8.2 mbgl
			9.0				W	
			10.0					

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

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BOREHOLE LOG

Job No:	6542
Date:	18-19/03/2008
No:	**BH2**
Sheet:	3 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
			11.0					
			12.0			SAND - brown to grey	W	
			13.0					
			14.0					
			15.0					
						End of borehole at 15.0 mbgl.		

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

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BOREHOLE LOG

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Job No:	6542
Date:	19/03/2008
No:	**BH3**
Client	Ballina Sands Pty Ltd
Sheet:	1 of 3
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Logged by:	P. Moodie
Equipment	Truck mounted drill rig
Ckecked:	
Location	See Site Plan
Level:	Existing

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
						SAND - grey.	D	Sample at 0.2 mbgl
			1.0			SAND - dark brown to black.	D	Sample at 0.6 mbgl Water at 1.0 mbgl
			2.0			SAND - brown	W	Sample at 1.2 mbgl
			3.0			SAND - red to brown	W	Sample at 4.0 - 4.45 mbgl
			4.0				W	
			5.0					

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

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Job No:	6542
Date:	19/03/2008
No:	**BH3**
Sheet:	2 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
			6.0			SAND - red to brown (continued)	W	Sample at 5.0 - 5.4 mbgl
			7.0			SAND - dark brown	W	
			8.0			SAND - red to brown	W	
			9.0			SAND - brown	W	
			10.0					Sample at 9.5 - 9.59 mbgl

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

ARDILL PAYNE AND PARTNERS

BOREHOLE LOG

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Job No:	6542
Date:	19/03/2008
No:	**BH3**
Sheet:	3 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
			11.0			SAND - brown (continued)	W	Sample at 11.0 - 11.12 mbgl
			12.0					
			13.0			SAND - pale brown	W	
			14.0			SAND - white	W	
			15.0			SAND - blue to grey	W	Sample at 15.0 - 15.45 mbgl
						End of borehole at 15.45 mbgl.		

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

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BOREHOLE LOG

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Job No:	6542
Date:	19/03/2008
No:	**BH4**
Sheet:	1 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
						SAND - dark brown.	D	
						SAND - paler brown.	D	Sample at 0.5 mbgl
			1.0			SAND - red to brown.		Sample at 0.8 mbgl
						SAND - red to brown.	W	Sample at 1.2 mbgl Water at 1.3 mbgl Sample at 1.9 mbgl
			2.0					
			3.0			SAND - dark brown		Sample at 3.0 - 3.25 mbgl
			4.0			SAND - pale brown	W	
			5.0				W	

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

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Job No:	6542
Date:	19/03/2008
No:	**BH4**
Sheet:	2 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
			6.0			SAND - pale brown (continued)	W	Sample at 6.0 - 6.4 mbgl
			7.0					
			8.0			SAND - white	W	
			9.0			SAND - dark brown	W	Sample at 9.0 - 9.17 mbgl
			10.0					

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

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Job No:	6542
Date:	19/03/2008
No:	**BH4**
Sheet:	3 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
			11.0			SAND - dark brown (continued)	W	
			12.0					Sample at 12.0 - 12.3 mbgl
			13.0				W	
			14.0			SAND - white to grey	W	
			15.0			SAND - blue to grey	W	Sample at 15.0 - 15.45 mbgl
						End of borehole at 15.45 mbgl.		

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

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Job No:	6542
Date:	20/03/2008
No:	**BH5**
Sheet:	1 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
						Silty SAND - grey brown.	D	
			1.0			SAND - dark grey to brown.	M	Sample at 0.5 mbgl
								Sample at 1.0 mbgl
			2.0			SAND - dark brown.	W	Water 1.95 - 2.8 mbgl
								Sample at 2.0 mbgl
			3.0					Sample at 2.8 - 2.95 mbgl
			4.0			SAND - red brown	W	
			5.0					

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

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Job No:	6542
Date:	20/03/2008
No:	**BH5**
Sheet:	2 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
			6.0			SAND - red brown (continued)	W	Sample at 6.0 - 6.5 mbgl
			7.0					
			8.0			SAND - blue white	W	
			9.0					Sample at 9.0 - 9.3 mbgl
			10.0			SAND - red brown	W	

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

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Job No:	6542
Date:	20/03/2008
No:	**BH5**
Sheet:	3 of 3
Logged by:	P. Moodie
Ckecked:	
Level:	Existing

Client	Ballina Sands Pty Ltd
Project	New Extractive Industry, Newrbar Swamp Rd, Lennox Head
Equipment	Truck mounted drill rig
Location	See Site Plan

Test Method	Water	Samples and Tests	Depth	ASS	PASS	DESCRIPTION (Material, Plasticity, Particle Size, Colour, Secondary Components, Other)	MOISTURE	COMMENTS
			11.0			SAND - red brown (continued)	W	
			12.0					Sample at 12.0 - 12.1 mbgl
			13.0			Indurated SAND - brown	W	
			14.0					
			15.0					Sample at 15.0 - 15.3 mbgl
						SAND - blue to grey. End of borehole at 15.3 mbgl.		

CLASSIFICATION SYMBOLS

TEST METHOD	Size	PLASTICITY	MOISTURE	CONSISTENCY/DENSITY	
X Existing excavation	F Fine	LP Low Plastity	D Dry	VS Very soft	VL Very loose
A Auger	M Medium	MP Medium Plasticity	M Moist	S Soft	L Loose
BH Backhoe Bucket	C Coarse	HP Highly Plastic	W Wet	Fi Firm	MD Medium
				St Stiff	D Dense
				V St Very stiff	VD Very dense
				H Hard	Fb Friable

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

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BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13708		**Borehole No**: 2.1	**Page**:	**Of**:

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 9/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.1 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: black, low plastic, low dry strength, fine sand, some organic matter and clay, loose, wet.	- 0.0		SM	L	ASS Topsoil
SILTY SAND: dark grey, low plastic, low dry strength, fine sand, trace of clay, loose, wet.	- 0.3		SM/SC	L	ASS 0.0-0.5m
Water Table @ 1.0m					ASS 0.5-1.0m
SAND: brown, non-plastic, no dry strength, fine sand, loose to medium dense, wet.	- 1.0		SP	L-MD	ASS 1.0-1.5m
SAND: pale grey to white, non-plastic, no dry strength, fine to medium sand, medium dense to dense, wet.	- 1.7		SP	MD-D	ASS 1.5-2.0m
					ASS 2.0-2.5m
SAND: pale brown-grey to brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet	- 2.7		SP	MD-D	ASS 2.5-3.0m
					ASS 3.0-3.5m
					ASS 3.5-4.0m
					ASS 4.0-4.5m
					ASS 4.5-5.0m
					ASS 5.0-5.5m
					ASS 5.5-6.0m
SAND: grey, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 6.5		SP	MD-D	ASS 6.0-6.5m
					ASS 6.5-7.0m
					ASS 7.0-7.5m
Stopped – No Change.	- 8.3				ASS 7.5-8.0m

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BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13712		**Borehole No**: 2.2	**Page**:	**Of**:

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 10/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.2 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: dark grey, non-plastic, low dry strength, fine sand, some organic matter, trace of clay, loose, very moist.	- 0.0		SM	L	ASS Topsoil
SILTY SAND: dark brown, non-plastic, low dry strength, fine sand, trace of clay, loose to medium dense, moist to wet.	- 0.2		SM	L-MD	ASS 0.0-0.5m
	- 0.8				ASS 0.5-1.0m
SAND: pale brown grey, non-plastic, no dry strength, fine sand, medium dense, wet.			SP	MD	
Water Table @ 1.0m	***1.0***				ASS 1.0-1.5m
					ASS 1.5-2.0m
					ASS 2.0-2.5m
					ASS 2.5-3.0m
					ASS 3.0-3.5m
					ASS 3.5-4.0m
					ASS 4.0-4.5m
					ASS 4.5-5.0m
					ASS 5.0-5.5m
					ASS 5.5-6.0m
					ASS 6.0-6.5m
SAND: dark brown, partly indurated, non-plastic, no dry strength, fine sand, dense, wet.	- 7.1		SP	D	
					ASS 6.5-7.0m
					ASS 7.0-7.5m
Stopped – No Change.	- 8.0				ASS 7.5-8.0m

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BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13712		**Borehole No**: 2.3	**Page**:	**Of**:

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 10/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.3 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: black, non-plastic, low dry strength, fine sand, some organic matter, trace of clay, very loose, wet.	- 0.0		SM	VL	ASS Topsoil
CLAYEY SILTY SAND: dark brown grey, low plastic, low dry strength, fine sand, very soft to firm, wet.	- 0.25		SC/SM	VS-F	ASS 0.0-0.5m
					ASS 0.5-1.0m
Water Table @ 1.0m	***- 1.0***				
					ASS 1.0-1.5m
SAND: brown, non-plastic, no dry strength, fine sand, loose to dense, wet.	- 1.5		SP	L-D	ASS 1.5-2.0m
					ASS 2.0-2.5m
					ASS 2.5-3.0m
					ASS 3.0-3.5m
					ASS 3.5-4.0m
					ASS 4.0-4.5m
SAND: grey, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 5.1		SP	MD-D	ASS 4.5-5.0m
					ASS 5.0-5.5m
					ASS 5.5-6.0m
					ASS 6.0-6.5m
SAND: dark brown, partly indurated, non-plastic, no dry strength, fine sand, dense, wet	- 7.1		SP	D	ASS 6.5-7.0m
					ASS 7.0-7.5m
Stopped – No Change.	- 8.0				ASS 7.5-8.0m

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BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13708		**Borehole No**: 2.4	**Page**:	**Of**:

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 9/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.4 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: black, low plastic, low dry strength, fine sand, some organic matter and clay, very loose/very soft, wet.	- 0.0		SM/SC	VL/VS	ASS Topsoil
SILTY SAND: dark brown, low plastic, low dry strength, fine sand, trace of clay, loose to medium dense, wet.	- 0.3		SM	L-MD	ASS 0.0-0.5m
Water Table @ 0.9m	- ***0.9***				ASS 0.5-1.0m
SAND: brown to dark brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 1.0		SP	MD-D	ASS 1.0-1.5m
					ASS 1.5-2.0m
					ASS 2.0-2.5m
					ASS 2.5-3.0m
					ASS 3.0-3.5m
					ASS 3.5-4.0m
					ASS 4.0-4.5m
					ASS 4.5-5.0m
					ASS 5.0-5.5m
					ASS 5.5-6.0m
					ASS 6.0-6.5m
					ASS 6.5-7.0m
					ASS 7.0-7.5m
Stopped – No Change.	- 8.0				ASS 7.5-8.0m

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BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13712		**Borehole No**: 2.5	**Page**:	**Of**:

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 10/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.5 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: dark grey, non-plastic, low dry strength, fine sand, some organic matter, trace of clay, loose, moist.	- 0.0		SM	L	ASS Topsoil
SILTY SAND: dark brown, non-plastic, low dry strength, fine sand, trace of clay, loose, moist to very moist.	- 0.3		SM	L	ASS 0.0-0.5m
					ASS 0.5-1.0m
SAND: brown to pale brown, non-plastic, no dry strength, fine sand, medium dense, wet.	- 0.8		SP	MD	
Water Table @ 1.0m	***1.0***				ASS 1.0-1.5m
					ASS 1.5-2.0m
					ASS 2.0-2.5m
					ASS 2.5-3.0m
					ASS 3.0-3.5m
					ASS 3.5-4.0m
					ASS 4.0-4.5m
SAND: grey, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 4.8		SP	MD-D	ASS 4.5-5.0m
					ASS 5.0-5.5m
					ASS 5.5-6.0m
					ASS 6.0-6.5m
SAND: dark brown, indurated, non-plastic, no dry strength, fine sand, dense to very dense, wet.	- 6.7		SP	D-VD	
					ASS 6.5-7.0m
					ASS 7.0-7.5m
Stopped – No Change.	- 8.0				ASS 7.5-8.0m

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ASCT Doc. W40 Rev. No. 03-30/4/08 BH

BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13712		**Borehole No**: 2.6	**Page**:	**Of**:

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 10/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.6 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: black, low plastic, low dry strength, fine sand, some organic matter, trace of clay, very loose, wet.	- 0.0		SM	VL	ASS Topsoil
SILTY SAND: dark grey brown, non-plastic, low dry strength, fine sand, trace of clay, loose, wet.	- 0.25		SM	L	ASS 0.0-0.5m
Water Table @ 0.8m	- ***0.8***				ASS 0.5-1.0m
SAND: brown, non-plastic, no dry strength, fine sand, loose to dense, wet.	- 1.2		SP	L-D	ASS 1.0-1.5m
					ASS 1.5-2.0m
					ASS 2.0-2.5m
					ASS 2.5-3.0m
					ASS 3.0-3.5m
					ASS 3.5-4.0m
					ASS 4.0-4.5m
					ASS 4.5-5.0m
SAND: grey, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 5.2		SP	MD-D	ASS 5.0-5.5m
					ASS 5.5-6.0m
					ASS 6.0-6.5m
					ASS 6.5-7.0m
SAND: dark brown, indurated, non-plastic, no dry strength, fine sand, dense to very dense, wet	- 7.2		SP	D-VD	ASS 7.0-7.5m
Stopped – No Change.	- 8.0				ASS 7.5-8.0m

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BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13708		**Borehole No**: 2.7	**Page**:	**Of**:

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 9/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.7 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SAND TOPSOIL: dark grey, non-plastic, no dry strength, fine to medium sand, some organic matter, very loose, very moist.	- 0.0		SP	VL	ASS Topsoil
SAND: grey, non-plastic, no dry strength, fine to medium sand, loose, very moist.	- 0.2		SP	L	ASS 0.0-0.5m ASS 0.5-1.0m
SAND: dark brown to brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 0.7		SP	MD-D	ASS 1.0-1.5m
Water Table @ 0.8m	- ***0.8***				ASS 1.5-2.0m
					ASS 2.0-2.5m
					ASS 2.5-3.0m
					ASS 3.0-3.5m
					ASS 3.5-4.0m
SAND: grey brown, non-plastic, no dry strength, fine to medium sand, medium dense to dense, wet.	- 5.0		SP	MD-D	ASS 4.0-4.5m ASS 4.5-5.0m ASS 5.0-5.5m
SAND: dark brown, indurated, non-plastic, no dry strength, fine sand, trace of silt, dense to very dense, wet	- 6.6		SP	D-VD	ASS 5.5-6.0m ASS 6.0-6.5m ASS 6.5-7.0m ASS 7.0-7.5m ASS 7.5-8.0m
SAND: brown, non-plastic, no dry strength, fine sand, dense, wet.	- 10.2		SP	D	
Stopped – No Change.	- 11.1				

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

7/17 Southern Cross Drive, Ballina, NSW 2478. Ph: (02) 6686 8567 Fax: (02) 6686 8396

BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13712		**Borehole No**: 2.8	**Page**:	**Of**:

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 10/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.8 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: black, non-plastic, low dry strength, fine sand, some organic matter, trace of clay, loose, very moist.	- 0.0		SM	L	ASS Topsoil
SAND: dark grey, non-plastic, no dry strength, fine sand, loose, very moist to wet.	- 0.3		SP	L	ASS 0.0-0.5m
Water Table @ 0.7m	- ***0.7***				ASS 0.5-1.0m
SAND: brown to dark brown, non-plastic, no dry strength, fine sand, loose to dense, wet.	- 0.8		SP	L-D	ASS 1.0-1.5m
					ASS 1.5-2.0m
					ASS 2.0-2.5m
					ASS 2.5-3.0m
					ASS 3.0-3.5m
					ASS 3.5-4.0m
					ASS 4.0-4.5m
					ASS 4.5-5.0m
					ASS 5.0-5.5m
					ASS 5.5-6.0m
					ASS 6.0-6.5m
SAND: dark brown, partly indurated, non-plastic, no dry strength, fine sand, dense, wet.	- 7.0		SP	D	ASS 6.5-7.0m
					ASS 7.0-7.5m
Stopped – No Change.	- 8.0				ASS 7.5-8.0m

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

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ASCT Doc. W40 Rev. No. 03-30/4/08 BH

BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13700		**Borehole No**: 2.9	**Page**:	**Of**:

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 6/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.9 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: dark grey, non-plastic, low dry strength, fine sand, some organic matter, trace of clay, very loose, wet.	- 0.0		SM	VL	ASS Topsoil
SILTY SAND: brown, non-plastic, low dry strength, fine sand, trace of clay, loose, very moist.	- 0.25		SM	L	ASS 0.0-0.5m
SAND: brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 0.6		SP	MD-D	ASS 0.5-1.0m
Water Table @ 0.8m	***- 0.8***				ASS 1.0-1.5m
					ASS 1.5-2.0m
					ASS 2.0-2.5m
					ASS 2.5-3.0m
					ASS 3.0-3.5m
					ASS 3.5-4.0m
					ASS 4.0-4.5m
					ASS 4.5-5.0m
					ASS 5.0-5.5m
					ASS 5.5-6.0m
Stopped – No Change.	- 6.0				

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

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BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13700		**Borehole No**: 2.10	**Page**:	**Of**:

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 6/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.10 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: dark grey, non-plastic, low dry strength, fine sand, some organic matter, trace of clay, very loose, very moist.	- 0.0		SM	VL	ASS Topsoil
SILTY SAND: dark grey, low plastic, low dry strength, fine sand, trace of clay, loose, very moist.	- 0.2		SM/SC	L	ASS 0.0-0.5m
SAND: brown, non-plastic, no dry strength, fine sand, trace of silt and clay, loose to medium dense, wet.	- 0.6		SP	L-MD	ASS 0.5-1.0m
Water Table @ 1.1m	- *1.1*				ASS 1.0-1.5m
SAND: brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 1.2		SP	MD-D	ASS 1.5-2.0m
					ASS 2.0-2.5m
					ASS 2.5-3.0m
					ASS 3.0-3.5m
					ASS 3.5-4.0m
					ASS 4.0-4.5m
					ASS 4.5-5.0m
					ASS 5.0-5.5m
SAND: dark brown, indurated, non-plastic, no dry strength, fine sand, dense to very dense, wet	- 6.0		SP	D-VD	ASS 5.5-6.0m
					ASS 6.0-6.5m
					ASS 6.5-7.0m
					ASS 7.0-7.5m
Stopped – No Change.	- 8.0				ASS 7.5-8.0m

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

7/17 Southern Cross Drive, Ballina, NSW 2478. Ph: (02) 6686 8567 Fax: (02) 6686 8396

BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13700		**Borehole No**: 2.11	**Page:**	**Of:**

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 6/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.11 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
CLAYEY SILTY SAND TOPSOIL: black, low plastic, low dry strength, fine sand, some organic matter, very soft, very moist.	- 0.0		SC/SM	VS	ASS 0.0-0.5m
CLAYEY SILTY SAND: dark grey, low plastic, low dry strength, fine sand, loose, very moist to wet.	- 0.25		SC/SM	L	ASS 0.5-1.0m
Water Table @ 1.2m					
SAND: grey, non-plastic, no dry strength, fine sand, loose to medium dense, wet.	- 1.2		SP	L-MD	ASS 1.0-1.5m
SAND: brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 1.8		SP	MD-D	ASS 1.5-2.0m ASS 2.0-2.5m ASS 2.5-3.0m ASS 3.0-3.5m
SAND: brown, non-plastic, low dry strength, fine sand, trace of silt and clay, medium dense to dense, wet.	- 3.5		SP	MD-D	ASS 3.5-4.0m ASS 4.0-4.5m
SAND: brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 4.5		SP	MD-D	ASS 4.5-5.0m ASS 5.0-5.5m ASS 5.5-6.0m
SAND: grey, non-plastic, no dry strength, fine sand, medium dense to dense, wet	- 6.0		SP	MD-D	ASS 6.0-6.5m ASS 6.5-7.0m ASS 7.0-7.5m ASS 7.5-8.0m
Stopped – No Change.	- 8.0				

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

7/17 Southern Cross Drive, Ballina, NSW 2478. Ph: (02) 6686 8567 Fax: (02) 6686 8396

BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13700		**Borehole No**: 2.12	**Page**:	**Of**:

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 6/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.12 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: dark grey, non-plastic, low dry strength, fine to medium sand, some organic matter, very loose, very moist.	- 0.0		SM	VL	ASS Topsoil
SAND: dark brown, non-plastic, no dry strength, fine sand, some thin bands of induration throughout, loose to dense, moist to wet.	- 0.2		SP	L-D	ASS 0.0-0.5m
					ASS 0.5-1.0m
Water Table @ 1.2m	- ***1.2***				ASS 1.0-1.5m
					ASS 1.5-2.0m
					ASS 2.0-2.5m
					ASS 2.5-3.0m
					ASS 3.0-3.5m
					ASS 3.5-4.0m
					ASS 4.0-4.5m
					ASS 4.5-5.0m
					ASS 5.0-5.5m
					ASS 5.5-6.0m
SAND: brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 7.0		SP	MD-D	ASS 6.0-6.5m
					ASS 6.5-7.0m
					ASS 7.0-7.5m
Stopped – No Change.	- 8.0				ASS 7.5-8.0m

Testing performed at ASCT P/L Ballina Laboratory, NATA Accreditation No. 3229.

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

7/17 Southern Cross Drive, Ballina, NSW 2478. Ph: (02) 6686 8567 Fax: (02) 6686 8396

BOREHOLE LOG

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13700		**Borehole No**: 2.13	**Page**:	**Of**:

Borehole Inclination: 90°	**Borehole Direction**: Vertical	**Date Drilled**: 6/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Borehole Location: 2.13 (see plan attached)		

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: dark grey, non-plastic, low dry strength, fine sand, some organic matter, very loose, wet.	- 0.0		SM	VL	ASS Topsoil
SILTY SAND: dark grey, non-plastic, low dry strength, fine sand, some organic matter, loose, very moist to wet.	- 0.3		SM	L	ASS 0.0-0.5m
SAND: dark brown, partly indurated, non-plastic, no dry strength, fine sand, dense, moist to wet.	- 0.5		SP	D	ASS 0.5-1.0m
Water Table @ 0.9m	- ***0.9***				ASS 1.0-1.5m
SAND: dark brown to brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 2.0		SP	MD-D	ASS 1.5-2.0m
					ASS 2.0-2.5m
					ASS 2.5-3.0m
					ASS 3.0-3.5m
					ASS 3.5-4.0m
					ASS 4.0-4.5m
					ASS 4.5-5.0m
					ASS 5.0-5.5m
					ASS 5.5-6.0m
					ASS 6.0-6.5m
					ASS 6.5-7.0m
SAND: dark brown, indurated, non-plastic, no dry strength, fine sand, dense to very dense, moist.	- 7.6		SP	D-VD	ASS 7.0-7.5m
Stopped – No Change.	- 8.0				ASS 7.5-8.0m

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

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BOREHOLE LOG – PIEZOMETER

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.	
Lab No: 13708		**Piezo No**: 1	**Page**: / **Of**:

Piezo Information

Diameter (mm): 50	**Sump (m)**: 0.95	**Slotted (m)**: 3.0	**Depth in ground (m)**: 8.3	**Stick-up (m)**: 0.4

Bore Information

Piezometer Inclination: 90°	**Piezometer Direction**: Vertical	**Date Installed**: 9/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Piezometer Location: P1 (see plan attached)		

Bore Log

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: black, low plastic, low dry strength, fine sand, some organic matter and clay, loose, wet.	- 0.0		SM	L	None
SILTY SAND: dark grey, low plastic, low dry strength, fine sand, trace of clay, loose, wet. *Water Table @ 1.0m*	- 0.3		SM/SC	L	
SAND: brown, non-plastic, no dry strength, fine sand, loose to medium dense, wet.	- 1.0		SP	L-MD	
SAND: pale grey to white, non-plastic, no dry strength, fine to medium sand, medium dense to dense, wet.	- 1.7		SP	MD-D	
SAND: pale brown-grey to brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet	- 2.7		SP	MD-D	
SAND: grey, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 6.5		SP	MD-D	
Stopped – No Change.	- 8.3				

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

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ASCT Doc. W40 Rev. No. 03-30/4/08 BH

BOREHOLE LOG – PIEZOMETER

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.	
Lab No: 13708		**Piezo No**: 2	**Page**: / **Of**:

Piezo Information

Diameter (mm): 50	**Sump (m):** 0.7	**Slotted (m):** 3.0	**Depth in ground (m):** 11.1	**Stick-up (m):** 0.4

Bore Information

Piezometer Inclination: 90°	**Piezometer Direction**: Vertical	**Date Installed**: 9/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Piezometer Location: P2 (see plan attached)		

Bore Log

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SAND TOPSOIL: dark grey, non-plastic, no dry strength, fine to medium sand, some organic matter, very loose, very moist.	- 0.0		SP	VL	None
SAND: grey, non-plastic, no dry strength, fine to medium sand, loose, very moist.	- 0.2		SP	L	
SAND: dark brown to brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 0.7		SP	MD-D	
Water Table @ 0.8m	- ***0.8***				
SAND: grey brown, non-plastic, no dry strength, fine to medium sand, medium dense to dense, wet.	- 5.0		SP	MD-D	
SAND: dark brown, indurated, non-plastic, no dry strength, fine sand, trace of silt, dense to very dense, wet	- 6.6		SP	D-VD	
SAND: brown, non-plastic, no dry strength, fine sand, dense, wet.	- 10.2		SP	D	
Stopped – No Change.	- 11.1				

Testing performed at ASCT P/L Ballina Laboratory, NATA Accreditation No. 3229.

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

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BOREHOLE LOG – PIEZOMETER

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.		
Lab No: 13712		**Piezo No**: 3	**Page**:	**Of**:

Piezo Information

Diameter (mm): 50	**Sump (m):** 0.5	**Slotted (m):** 3.0	**Depth in ground (m):** 9.1	**Stick-up (m):** 0.4

Bore Information

Piezometer Inclination: 90°	**Piezometer Direction**: Vertical	**Date Installed**: 10/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Piezometer Location: P3 (see plan attached)		

Bore Log

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
CLAYEY SILTY SAND TOPSOIL: black, low plastic, low dry strength, fine sand, some organic matter, very soft, moist.	- 0.0		SC	VS	None
CLAYEY SILTY SAND: dark grey, low plastic, low dry strength, fine sand, soft, moist to wet.	- 0.4		SC	S	
Water Table @ 0.9m	- 0.9				
SAND: grey, non-plastic, low dry strength, fine sand, trace of silt and clay, loose to medium dense, wet.	- 1.4		SP	L-MD	
SAND: brown, non-plastic, no dry strength, fine sand, loose to medium dense, wet.	- 1.8		SP	L-MD	
SAND: palé grey to white, non-plastic, no dry strength, fine sand, medium dense, wet.	- 2.3		SP	MD	
SAND: brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet.			SP	MD-D	
SAND: dark brown, partly indurated, non-plastic, no dry strength, fine sand, dense to very dense, wet.	- 9.7		SP	D-VD	
Stopped – No Change.	- 10.5				

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ASCT Doc. W40 Rev. No. 03-30/4/08 BH

BOREHOLE LOG – PIEZOMETER

Client: Ardill Payne & Partners	**Project No**: 044-513	**Project**: Proposed Sand Pit, Lot 32 Newrybar Swamp Road, Lennox Head.	
Lab No: 13712		**Piezo No**: 4	**Page**: **Of**:

Piezo Information

Diameter (mm): 50	**Sump (m)**: 0.5	**Slotted (m)**: 3.0	**Depth in ground (m)**: 10.6	**Stick-up (m)**: 0.4

Bore Information

Piezometer Inclination: 90°	**Piezometer Direction**: Vertical	**Date Installed**: 10/5/11
Surface Elevation: Existing Surface Level	**Drilling Method**: Explora 85 Drill Rig	**Drill Type**: 100mm Auger
Piezometer Location: P4 (see plan attached)		

Bore Log

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND TOPSOIL: black, non-plastic, no dry strength, fine sand, some organic matter, loose, moist.	- 0.0		SM	L	None
SAND: grey, non-plastic, no dry strength, fine sand, loose, moist to very moist.	- 0.2		SP	L	
SAND: brown, non-plastic, no dry strength, fine sand, medium dense to dense, wet.	- 1.2		SP	MD-D	
Water Table @ 1.2m					
SAND: dark brown, indurated, non-plastic, no dry strength, fine sand, dense to very dense, wet.	- 7.8		SP	D-VD	
SAND: dark brown, partly indurated (some indurated bands), non-plastic, no dry strength, fine sand, dense to very dense, wet.	- 8.3		SP	D-VD	
Stopped – No Change.	- 10.6				

Legend

- Existing Test borehole locations
- Borehole for ASS testing
- Peizometer installation
- Bench Mark (BM)

Project:
Lot 32 DP 1151612
Newrybar Swamp rd
Lennox Head

Do not scale drawing. Use written dimensions only

Client: Ballina Sands

Title: Borehole Locations

ARDILL PAYNE & PARTNERS
Consulting Civil & Structural Engineers Project Managers
Town Planners & Surveyors
79 Tamar Street
P.O. Box 20
BALLINA NSW 2478
Telephone: 02 6686 3280
Facsimile: 02 6686 7920
Email: info@ardillpayne.com.au
Website: www.ardillpayne.com.au

Design	JF	Scale at A3	1:2500
Drawn	RMcG	Datum	AHD
Date	18.05.12	Filename	6542w-Borehole Locations
Checked		Approved	
Job No.	6542w	Dwg. No.	ASS.1
		Issue	

Appendix C

Groundwater Works Summary Sheets

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW030726

Works Details (top)

GROUNDWATER NUMBER	GW030726
LIC-NUM	30BL109160
AUTHORISED-PURPOSES	TOWN WATER SUPPLY
INTENDED-PURPOSES	PUBLIC/MUNICIPL
WORK-TYPE	Bore
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	Cable Tool
OWNER-TYPE	Local Govt
COMMENCE-DATE	
COMPLETION-DATE	1978-09-01
FINAL-DEPTH (metres)	39.50
DRILLED-DEPTH (metres)	41.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	LENNOX HEAD TOWN WATER
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6815595.00
EASTING	556794.00
LATITUDE	28 47' 9"
LONGITUDE	153 34' 55"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	66

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	86 755725

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Backfill	Backfill	39.50	41.00	0			
1	1	Casing	Threaded Steel	0.30	34.60	200			(Unknown)
1	1	Casing	Threaded Steel	37.00	39.20	200			(Unknown)
1	1	Opening	Screen	34.00	36.50	200		1	Johnson; Stainless Steel; SL: 0mm; A: 1.52mm
1	1	Annulus	(Unknown)	0.00	39.50	400			Graded; GS: 1.5-2.5mm

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
11.00	37.00	26.00	Unconsolidated	5.00		33.97			0-500 ppm

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.30	0.30	Sand Grey Surface		
0.30	1.20	0.90	Sand White Very Fine		
1.20	3.00	1.80	Sand Grey Silty		
3.00	4.00	1.00	Sand White Fine		

4.00	4.70	0.70	Sand White Fine Silty
4.70	11.00	6.30	Sand Carbonaceous
4.70	11.00	6.30	Bands Cemented
11.00	13.00	2.00	Sand Carbonaceous Water Supply
13.00	22.00	9.00	Sand Fine Water Supply
22.00	37.00	15.00	Sand Fine-medium Water Supply
37.00	39.00	2.00	Clay Black
37.00	39.00	2.00	Sand Bands
39.00	41.00	2.00	Phyllite

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW030727

Works Details (top)

GROUNDWATER NUMBER	GW030727
LIC-NUM	30BL109161
AUTHORISED-PURPOSES	TOWN WATER SUPPLY
INTENDED-PURPOSES	PUBLIC/MUNICIPL
WORK-TYPE	Bore
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	Cable Tool
OWNER-TYPE	Local Govt
COMMENCE-DATE	
COMPLETION-DATE	1978-10-01
FINAL-DEPTH (metres)	43.60
DRILLED-DEPTH (metres)	51.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	LENNOX HEADTOWN WATER
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6815194.00
EASTING	556927.00
LATITUDE	28 47' 22"
LONGITUDE	153 34' 60"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	60

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	86 755725

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Backfill	Backfill	43.60	51.00	0			
1	1	Casing	Threaded Steel	-0.30	38.00	200			(Unknown)
1	1	Casing	Welded Steel	0.00	8.40	400			(Unknown)
1	1	Casing	Threaded Steel	41.00	43.60	200			(Unknown)
1	1	Opening	Screen	38.00	41.00	200		1	Johnson; Stainless Steel; SL: 0mm; A: 1.52mm
1	1	Annulus	(Unknown)	0.00	43.60	400			Graded; GS: 1.5-3mm

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
11.00	21.00	10.00	Unconsolidated						(Unknown)
22.00	28.00	6.00	Unconsolidated						(Unknown)
30.00	47.00	17.00	Unconsolidated						501-1000 ppm

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.60	0.60	Sand Dark Grey Surface		

0.60	4.50	3.90	Sand White Fine
4.50	11.00	6.50	Sand Carbonaceous Cemented
11.00	19.00	8.00	Sand Carbonaceous Water Supply
19.00	21.00	2.00	Sand Fine Water Supply
21.00	22.00	1.00	Clay Grey
22.00	28.00	6.00	Sand Light Brown Fine-medium Water Supply
28.00	30.00	2.00	Clay Dark Grey Sandy
30.00	44.00	14.00	Sand Light Brown Fine-medium Water Supply
44.00	47.00	3.00	Sand Light Grey Fine Water Supply
47.00	51.00	4.00	Phyllite Weathered

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW037459

Works Details (top)

GROUNDWATER NUMBER	GW037459
LIC-NUM	30WA301648
AUTHORISED-PURPOSES	STOCK
INTENDED-PURPOSES	IRRIGATION
WORK-TYPE	Well
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	(Unknown)
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	
FINAL-DEPTH (metres)	1.80
DRILLED-DEPTH (metres)	1.80
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	N/A
GWMA	804 - ALSTONVILLE BASALT
GW-ZONE	006 - LENNOX GROUNDWATER SOURCE
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6816263.00
EASTING	552161.00
LATITUDE	28 46' 48"
LONGITUDE	153 32' 4"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	81

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	81

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	Timber	0.00	1.80	1828			Seated on Bottom

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
0.30	1.80	1.50	Fractured	0.00		0.38			Good Stock

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.30	0.30	Pug		
0.30	1.83	1.53	Basalt Broken Water Supply		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW038316

Works Details (top)

GROUNDWATER NUMBER	GW038316
LIC-NUM	30BL101397
AUTHORISED-PURPOSES	DOMESTIC STOCK
INTENDED-PURPOSES	DOMESTIC STOCK
WORK-TYPE	Well
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	(Unknown)
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	1930-01-01
FINAL-DEPTH (metres)	3.60
DRILLED-DEPTH (metres)	3.70
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	N/A
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6818253.00
EASTING	554258.00
LATITUDE	28 45' 43"
LONGITUDE	153 33' 21"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	88

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	88

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	Masonry	0.00	0.00	1524			(Unknown)

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
3.30	3.60	0.30	Unconsolidated	1.80		3.79			(Unknown)

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.60	0.60	Soil		
0.60	3.65	3.05	Rock Broken Gravel Water Supply		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW038336

Works Details (top)

GROUNDWATER NUMBER	GW038336
LIC-NUM	30BL101696
AUTHORISED-PURPOSES	STOCK
INTENDED-PURPOSES	NOT KNOWN
WORK-TYPE	Well
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	(Unknown)
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	1930-01-01
FINAL-DEPTH (metres)	0.00
DRILLED-DEPTH (metres)	6.10
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	N/A
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6815551.00
EASTING	552917.00
LATITUDE	28 47' 11"
LONGITUDE	153 32' 32"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	125

Licensed (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	125

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Backfill	Backfill	0.00	6.00	1828			
1	1	Casing	Drilled	0.00	0.00	1828			(Unknown)

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
5.70	6.00	0.30	Fractured	5.10					Fair

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	2.43	2.43	Soil Rock		
2.43	5.79	3.36	Rock Broken Clay		
5.79	6.09	0.30	Basalt Broken Water Supply		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW038337

Works Details (top)

GROUNDWATER NUMBER	GW038337
LIC-NUM	30WA301644
AUTHORISED-PURPOSES	DOMESTIC STOCK
INTENDED-PURPOSES	DOMESTIC STOCK
WORK-TYPE	Well
WORK-STATUS	Supply Obtained
CONSTRUCTION-METHOD	(Unknown)
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	
FINAL-DEPTH (metres)	1.50
DRILLED-DEPTH (metres)	1.50
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	SKENNAR'S
GWMA	804 - ALSTONVILLE BASALT
GW-ZONE	006 - LENNOX GROUNDWATER SOURCE
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6815058.00
EASTING	553158.00
LATITUDE	28 47' 27"
LONGITUDE	153 32' 41"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	125

Licensed (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	125

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Backfill	Backfill	0.00	6.00	1828			
1	1	Casing	Drilled	0.00	0.00	1828			(Unknown)

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
5.70	6.00	0.30	Fractured	5.10					Fair

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	2.43	2.43	Soil Rock		
2.43	5.79	3.36	Rock Broken Clay		
5.79	6.09	0.30	Basalt Broken Water Supply		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW038337

Works Details (top)

GROUNDWATER NUMBER	GW038337
LIC-NUM	30WA301644
AUTHORISED-PURPOSES	DOMESTIC STOCK
INTENDED-PURPOSES	DOMESTIC STOCK
WORK-TYPE	Well
WORK-STATUS	Supply Obtained
CONSTRUCTION-METHOD	(Unknown)
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	
FINAL-DEPTH (metres)	1.50
DRILLED-DEPTH (metres)	1.50
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	SKENNAR'S
GWMA	804 - ALSTONVILLE BASALT
GW-ZONE	006 - LENNOX GROUNDWATER SOURCE
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6815058.00
EASTING	553158.00
LATITUDE	28 47' 27"
LONGITUDE	153 32' 41"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	125

Licensed (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	4 1013071

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	Drilled	0.00	0.00	1828			(Unknown)

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
1.30	1.40	0.10	Fractured	0.00					Fair

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.60	0.60	Soil Rock		
0.60	1.37	0.77	Rock Broken		
1.37	1.52	0.15	Basalt Broken Water Supply		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, May 4, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW038931

Works Details (top)

GROUNDWATER NUMBER	GW038931
LIC-NUM	30WA301118
AUTHORISED-PURPOSES	STOCK
INTENDED-PURPOSES	STOCK
WORK-TYPE	Well
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	(Unknown)
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	1920-01-01
FINAL-DEPTH (metres)	3.00
DRILLED-DEPTH (metres)	3.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	PERKINS
GWMA	804 - ALSTONVILLE BASALT
GW-ZONE	001 - ALSTONVILLE GROUNDWATER SOURCE
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6814631.00
EASTING	552207.00
LATITUDE	28 47' 41"
LONGITUDE	153 32' 6"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	133

Licensed (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	3 618742

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	Timber	0.00	0.00	2438			(Unknown)

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
2.70	3.00	0.30	Fractured	1.20		0.32			Good Stock

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	3.04	3.04	Basalt Broken Water Supply		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW038991

Works Details (top)

GROUNDWATER NUMBER	GW038991
LIC-NUM	30WA301629
AUTHORISED-PURPOSES	STOCK
INTENDED-PURPOSES	STOCK
WORK-TYPE	Well
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	(Unknown)
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	1880-01-01
FINAL-DEPTH (metres)	3.60
DRILLED-DEPTH (metres)	3.70
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	N/A
GWMA	804 - ALSTONVILLE BASALT
GW-ZONE	005 - WYRALLAH GROUNDWATER SOURCE
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6814933.00
EASTING	553510.00
LATITUDE	28 47' 31"
LONGITUDE	153 32' 54"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	126

Licensed (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	126

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	Nil	0.00	0.00	0			(Unknown)
1	1	Casing	Drilled	0.00	3.60	2438			(Unknown)

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	3.04	3.04	Nominal Water Supply		
3.04	3.65	0.61	Basalt Nominal		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW038993

Works Details (top)

GROUNDWATER NUMBER	GW038993
LIC-NUM	30BL101728
AUTHORISED-PURPOSES	STOCK
INTENDED-PURPOSES	STOCK
WORK-TYPE	Well
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	(Unknown)
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	1880-01-01
FINAL-DEPTH (metres)	3.00
DRILLED-DEPTH (metres)	3.10
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	N/A
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6815147.00
EASTING	553864.00
LATITUDE	28 47' 24"
LONGITUDE	153 33' 7"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	193

Licensed (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	193

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	Nil	0.00	0.00	0			(Unknown)
1	1	Casing	Drilled	0.00	3.00	2438			(Unknown)

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
2.40	3.00	0.60	Fractured			0.25			(Unknown)

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	2.44	2.44	Nominal		
2.44	3.05	0.61	Basalt Nominal Water Supply		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW039161

Works Details (top)

GROUNDWATER NUMBER	GW039161
LIC-NUM	
AUTHORISED-PURPOSES	
INTENDED-PURPOSES	G/WATER XPLORE
WORK-TYPE	Bore
WORK-STATUS	Test Hole
CONSTRUCTION-METHOD	Rotary Mud
OWNER-TYPE	NSW Office of Water
COMMENCE-DATE	
COMPLETION-DATE	1976-09-01
FINAL-DEPTH (metres)	29.50
DRILLED-DEPTH (metres)	36.60
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	
GWMA	
GW-ZONE	
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	R.L. at W.L.M.Pt.
NORTHING	6815502.00
EASTING	556793.00
LATITUDE	28 47' 12"
LONGITUDE	153 34' 55"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	86//755725

Licensed (top)

no details

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	2	Casing	P.V.C.	-0.90	29.50	102			(Unknown)
1	2	Opening	Slots	26.50	29.50	102		2	Slotted On Site; SL: 0mm; A: 0mm
2		Backfill	Backfill	0.00	29.60	0			
2	1	Opening	Screen	25.70	27.50	0		1	Stainless Steel; SL: 0mm; A: .25mm

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
10.70	34.80	24.10	Unconsolidated						(Unknown)

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	4.57	4.57	Sand White		
4.57	10.67	6.10	Sand Indurated		
10.67	34.75	24.08	Sand Grey Water Supply		
34.75	36.58	1.83	Chert Phyllite		

use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW039162

Works Details (top)

GROUNDWATER NUMBER	GW039162
LIC-NUM	
AUTHORISED-PURPOSES	
INTENDED-PURPOSES	G/WATER XPLORE
WORK-TYPE	Bore
WORK-STATUS	Test Hole
CONSTRUCTION-METHOD	Rotary Mud
OWNER-TYPE	NSW Office of Water
COMMENCE-DATE	
COMPLETION-DATE	1976-09-01
FINAL-DEPTH (metres)	0.00
DRILLED-DEPTH (metres)	36.40
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	
GWMA	
GW-ZONE	
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6815357.00
EASTING	554976.00
LATITUDE	28 47' 17"
LONGITUDE	153 33' 48"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	328

Licensed (top)

no details

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL DETAIL
1		Backfill	Backfill	0.00	36.60	0		

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.61	0.61	Topsoil		
0.61	1.22	0.61	Sand		
1.22	9.14	7.92	Sand Indurated Clay		
9.14	36.27	27.13	Clay Multicoloured		
36.27	36.42	0.15	Phyllite Siliceous		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW043311

Works Details (top)

GROUNDWATER NUMBER	GW043311
LIC-NUM	30BL102193
AUTHORISED-PURPOSES	STOCK
INTENDED-PURPOSES	STOCK
WORK-TYPE	Well
WORK-STATUS	Supply Obtained
CONSTRUCTION-METHOD	(Unknown)
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	
FINAL-DEPTH (metres)	5.70
DRILLED-DEPTH (metres)	5.80
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	BOOKER'S
GWMA	804 - ALSTONVILLE BASALT
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6818931.00
EASTING	554071.00
LATITUDE	28 45' 21"
LONGITUDE	153 33' 14"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	38

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	38 755725

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	Timber	0.00	0.00	2438			(Unknown)

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	5.79	5.79	Basalt Nominal Water Supply		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW052271

Works Details (top)

GROUNDWATER NUMBER	GW052271
LIC-NUM	
AUTHORISED-PURPOSES	
INTENDED-PURPOSES	G/WATER XPLORE
WORK-TYPE	Bore
WORK-STATUS	Test Hole
CONSTRUCTION-METHOD	Rotary
OWNER-TYPE	Local Govt
COMMENCE-DATE	
COMPLETION-DATE	1981-01-01
FINAL-DEPTH (metres)	29.00
DRILLED-DEPTH (metres)	29.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	
GWMA	
GW-ZONE	
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6817042.00
EASTING	556665.00
LATITUDE	28 46' 22"
LONGITUDE	153 34' 50"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	58

Licensed (top)

no details

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
12.00	21.00	9.00	Unconsolidated	2.00		2.00			(Unknown)

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	12.00	12.00	Sand Indurated		
12.00	21.00	9.00	Sand		
21.00	24.00	3.00	Clay		
24.00	29.00	5.00	Phyllite Weathered		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW052272

Works Details (top)

GROUNDWATER NUMBER	GW052272
LIC-NUM	
AUTHORISED-PURPOSES	
INTENDED-PURPOSES	G/WATER XPLORE
WORK-TYPE	Bore
WORK-STATUS	Test Hole
CONSTRUCTION-METHOD	Rotary
OWNER-TYPE	Local Govt
COMMENCE-DATE	
COMPLETION-DATE	1981-01-01
FINAL-DEPTH (metres)	27.00
DRILLED-DEPTH (metres)	27.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	
GWMA	
GW-ZONE	
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6817350.00
EASTING	556640.00
LATITUDE	28 46' 12"
LONGITUDE	153 34' 49"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	RES 4969

Licensed (top)

no details

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
14.00	18.00	4.00	Unconsolidated	2.00		2.00			(Unknown)

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	14.00	14.00	Sand Indurated		
14.00	18.00	4.00	Sand		
18.00	22.00	4.00	Clay		
22.00	27.00	5.00	Phyllite Weathered		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW052273

Works Details (top)

GROUNDWATER NUMBER	GW052273
LIC-NUM	
AUTHORISED-PURPOSES	
INTENDED-PURPOSES	G/WATER XPLORE
WORK-TYPE	Bore
WORK-STATUS	Test Hole
CONSTRUCTION-METHOD	Rotary
OWNER-TYPE	Local Govt
COMMENCE-DATE	
COMPLETION-DATE	1981-01-01
FINAL-DEPTH (metres)	24.00
DRILLED-DEPTH (metres)	24.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	
GWMA	
GW-ZONE	
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6817657.00
EASTING	556668.00
LATITUDE	28 46' 2"
LONGITUDE	153 34' 50"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	RES 4969

Licensed (top)

no details

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
0.00	15.00	15.00	Unconsolidated						(Unknown)

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	15.00	15.00	Sand Indurated		
15.00	22.00	7.00	Clay		
22.00	24.00	2.00	Phyllite Weathered		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
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Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW052275

Works Details (top)

GROUNDWATER NUMBER	GW052275
LIC-NUM	
AUTHORISED-PURPOSES	
INTENDED-PURPOSES	G/WATER XPLORE
WORK-TYPE	Bore
WORK-STATUS	Test Hole
CONSTRUCTION-METHOD	Rotary
OWNER-TYPE	Local Govt
COMMENCE-DATE	
COMPLETION-DATE	1981-01-01
FINAL-DEPTH (metres)	22.00
DRILLED-DEPTH (metres)	22.10
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	
GWMA	
GW-ZONE	
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6816118.00
EASTING	556688.00
LATITUDE	28 46' 52"
LONGITUDE	153 34' 51"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	58

Licensed (top)

no details

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
18.00	22.00	4.00	Unconsolidated	3.50		6.00			(Unknown)

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	5.00	5.00	Sand Grey		
5.00	12.00	7.00	Sand Indurated		
12.00	18.00	6.00	Sand		
18.00	22.00	4.00	Sand Grey		
22.00	22.05	0.05	Basalt		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Wednesday, May 4, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW052276

Works Details (top)

GROUNDWATER NUMBER	GW052276
LIC-NUM	
AUTHORISED-PURPOSES	
INTENDED-PURPOSES	G/WATER XPLORE
WORK-TYPE	Bore
WORK-STATUS	Test Hole
CONSTRUCTION-METHOD	Rotary
OWNER-TYPE	Local Govt
COMMENCE-DATE	
COMPLETION-DATE	1981-01-01
FINAL-DEPTH (metres)	41.00
DRILLED-DEPTH (metres)	41.10
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	
GWMA	
GW-ZONE	
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	9640-3N
GRID-ZONE	56/2
SCALE	1:25,000
ELEVATION	
ELEVATION-SOURCE	(Unknown)
NORTHING	6815289.00
EASTING	556413.00
LATITUDE	28 47' 19"
LONGITUDE	153 34' 41"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	189

Licensed (top)

no details

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
18.00	32.00	14.00	Unconsolidated	1.30		6.00			(Unknown)

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	1.00	1.00	Loam Black Sandy		
1.00	11.00	10.00	Sand Indurated		
11.00	18.00	7.00	Sand		
18.00	32.00	14.00	Sand Grey		
32.00	41.00	9.00	Clay Sand		
41.00	41.05	0.05	Basalt		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW067116

Works Details (top)

GROUNDWATER NUMBER	GW067116
LIC-NUM	30WA301650
AUTHORISED-PURPOSES	DOMESTIC STOCK
INTENDED-PURPOSES	DOMESTIC STOCK
WORK-TYPE	Bore
WORK-STATUS	Supply Obtained
CONSTRUCTION-METHOD	(Unknown)
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	
FINAL-DEPTH (metres)	45.00
DRILLED-DEPTH (metres)	45.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	GEORGE'S
GWMA	804 - ALSTONVILLE BASALT
GW-ZONE	006 - LENNOX GROUNDWATER SOURCE
STANDING-WATER-LEVEL	
SALINITY	
YIELD	1.00

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	203 - RICHMOND RIVER
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	Est. Contour 8-15M.
NORTHING	6815555.00
EASTING	552185.00
LATITUDE	28 47' 11"
LONGITUDE	153 32' 5"
GS-MAP	0005C4

AMG-ZONE	56
COORD-SOURCE	GD.,ACC.MAP
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	LOT 1 DP540904

Licensed (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	1 540904

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1	1	Casing	P.V.C.	-0.30	45.00	160			Seated on Bottom
1	1	Opening	Slots - Vertical	22.00	45.00	160		1	Mechanically Slotted; SL: 0mm; A: 3mm

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
12.00	22.00	10.00	Fractured			0.05			
40.00	45.00	5.00	Fractured			0.95			

Drillers Log (top)

no details

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW302018

Works Details (top)

GROUNDWATER NUMBER	GW302018
LIC-NUM	30CA300086
AUTHORISED-PURPOSES	IRRIGATION STOCK
INTENDED-PURPOSES	IRRIGATION STOCK
WORK-TYPE	Bore
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	
FINAL-DEPTH (metres)	1.50
DRILLED-DEPTH (metres)	
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	SHARPE
GWMA	804 - ALSTONVILLE BASALT
GW-ZONE	001 - ALSTONVILLE GROUNDWATER SOURCE
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6815116.00
EASTING	551852.00
LATITUDE	28 47' 26"
LONGITUDE	153 31' 53"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	LOT 1 DP251148

Licensed (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	101 1123404

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	1.50	5000			(Unknown)
1	1	Casing	Lining	0.00	1.50				

Water Bearing Zones (top)

no details

Drillers Log (top)

no details

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW302465

Works Details (top)

GROUNDWATER NUMBER	GW302465
LIC-NUM	30BL154008
AUTHORISED-PURPOSES	DOMESTIC STOCK
INTENDED-PURPOSES	DOMESTIC INDUSTRIAL IRRIGATION STOCK
WORK-TYPE	Bore
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	Rotary Air
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	1994-02-23
FINAL-DEPTH (metres)	54.00
DRILLED-DEPTH (metres)	54.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	ROSSDENE HOMESTEAD
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	0.06

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6816049.00
EASTING	552583.00
LATITUDE	28 46' 55"
LONGITUDE	153 32' 19"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	LOT 1 DP255992

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	LT1 DP255992

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	54.00	165			Rotary Air

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	34.00	34.00	BASALT		
34.00	42.00	8.00	CLAY		
42.00	54.00	12.00	SHALE		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW303148

Works Details (top)

GROUNDWATER NUMBER	GW303148
LIC-NUM	30BL179619
AUTHORISED-PURPOSES	DOMESTIC
INTENDED-PURPOSES	DOMESTIC
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	2002-01-23
FINAL-DEPTH (metres)	9.50
DRILLED-DEPTH (metres)	9.50
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	" MARTIN'S "
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6815761.00
EASTING	556189.00
LATITUDE	28 47' 4"
LONGITUDE	153 34' 32"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	Map Interpretation
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	LT 1 DP 749166

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	1 749166

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	9.50	115			Rotary
1	1	Casing	PVC Class 12	-0.03	4.00	115	103		Driven into Hole
1	1	Opening	Slots	8.20	8.80	50			PVC Class 12

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
8.20	8.80	0.60		0.60	3.20	0.40	8.80	1.00	

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	1.20	1.20	Sand White Fine		
1.20	9.50	8.30	Coffee Rock Brown		
9.50	9.50	0.00	Free Flowing Sand Light Brown		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW303277

Works Details (top)

GROUNDWATER NUMBER	GW303277
LIC-NUM	30BL179205
AUTHORISED-PURPOSES	DOMESTIC
INTENDED-PURPOSES	DOMESTIC
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	Rotary Air
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	2001-01-24
FINAL-DEPTH (metres)	48.80
DRILLED-DEPTH (metres)	48.80
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	" D AGOSTINO'S "
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6815969.00
EASTING	551955.00
LATITUDE	28 46' 58"
LONGITUDE	153 31' 56"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	Map Interpretation
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	LT 1 DP 1017603

Licensed (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	1 1017603

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	48.80	165			Rotary Air

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
44.00	45.00	1.00				0.90	50.00	1.00	

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	1.60	1.60	Fill & Boulders		
1.60	2.70	1.10	Clay		
2.70	7.30	4.60	Fill		
7.30	9.10	1.80	Clay		
9.10	26.80	17.70	Firm Grey Basalt		
26.80	31.70	4.90	Clay		
31.70	32.90	1.20	Soft Grey Basalt		
32.90	48.80	15.90	Hard Grey Rocks (Greywackie)		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
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Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW303530

Works Details (top)

GROUNDWATER NUMBER	GW303530
LIC-NUM	30BL181215
AUTHORISED-PURPOSES	DOMESTIC
INTENDED-PURPOSES	DOMESTIC
WORK-TYPE	Bore
WORK-STATUS	(Unknown)
CONSTRUCTION-METHOD	(Unknown)
OWNER-TYPE	Private
COMMENCE-DATE	
COMPLETION-DATE	1992-01-01
FINAL-DEPTH (metres)	
DRILLED-DEPTH (metres)	
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	MC CANN'S
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6815332.00
EASTING	553134.00
LATITUDE	28 47' 18"
LONGITUDE	153 32' 40"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	LT 102 DP 786654

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	102 786654

Water Bearing Zones (top)

no details

Drillers Log (top)

no details

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW305018

Works Details (top)

GROUNDWATER NUMBER	GW305018
LIC-NUM	30BL183236
AUTHORISED-PURPOSES	DOMESTIC
INTENDED-PURPOSES	DOMESTIC
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	Rotary - Air/Foam
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	2004-02-11
FINAL-DEPTH (metres)	12.00
DRILLED-DEPTH (metres)	12.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	WALKER
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	2.00
SALINITY	
YIELD	1.25

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6815426.00
EASTING	555329.00
LATITUDE	28 47' 15"
LONGITUDE	153 34' 1"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	3 713103

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	3 713103

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter; ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	12.00	200			Rotary - Air/Foam
1	1	Casing	PVC Class 9	0.00	12.00	140	129		Screwed and Glued; Seated on Bottom
1	1	Opening	Slots - Horizontal	9.00	10.00	140			PVC Class 9; Casing - Hand Sawn Slot; SL: 50mm; A: 1mm
1		Annulus	(Unknown)	2.00	12.00				Graded; GS: 3-5mm; Q: 2m³

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
9.00	10.00	1.00		2.00	8.00	1.25		1.75	

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	2.00	2.00	fill		
2.00	3.00	1.00	white sand		

3.00	6.00	3.00	white clay & coffee rock
6.00	12.00	6.00	white sand m-g

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW305399

Works Details (top)

GROUNDWATER NUMBER	GW305399
LIC-NUM	30BL183865
AUTHORISED-PURPOSES	MONITORING BORE
INTENDED-PURPOSES	MONITORING BORE
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	2005-05-30
FINAL-DEPTH (metres)	25.15
DRILLED-DEPTH (metres)	25.15
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	ROAD RESERVE
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6815358.00
EASTING	552540.00
LATITUDE	28 47' 18"
LONGITUDE	153 32' 18"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	8 612318

Licensed (top)

COUNTY	ROUS
PARISH	BALLINA
PORTION-LOT-DP	8 612318

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL DETAIL
1		Hole	Hole	0.00	24.15	71		

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	1.60	1.60	silty clay		
1.60	2.10	0.50	gravelly silty clay		
2.10	2.60	0.50	basalt		
2.60	3.50	0.90	basalt - core loss		
3.50	4.15	0.65	gravelly silty clay - basalt		
4.15	6.40	2.25	basalt		
6.40	8.00	1.60	sandy clay		
8.00	9.80	1.80	sand		
9.80	10.30	0.50	clayey silt		
10.30	11.00	0.70	sand		
11.00	14.40	3.40	clayey silt		
14.40	16.60	2.20	basalt		
16.60	17.37	0.77	clay & cobbles		
17.37	18.43	1.06	basalt		
18.43	25.15	6.72	basalt - clay		

Warning To Clients: This raw data has been supplied to the Department of Infrastructure, Planning and Natural Resources (DIPNR) by drillers, licensees and other sources. The DIPNR does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW305400

Works Details (top)

GROUNDWATER NUMBER	GW305400
LIC-NUM	30BL183864
AUTHORISED-PURPOSES	MONITORING BORE
INTENDED-PURPOSES	MONITORING BORE
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	2005-05-24
FINAL-DEPTH (metres)	15.55
DRILLED-DEPTH (metres)	15.55
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	ROAD RESERVE
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6818708.00
EASTING	553492.00
LATITUDE	28 45' 29"
LONGITUDE	153 32' 53"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	2 815134

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	2 815134

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL DETAIL
1		Hole	Hole	0.00	15.55	71		

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	3.20	3.20	gravelly clay		
3.20	6.50	3.30	basalt		
6.50	7.50	1.00	clayey silt		
7.50	11.70	4.20	basalt		
11.70	15.55	3.85	clayey silt		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW305404

Works Details (top)

GROUNDWATER NUMBER	GW305404
LIC-NUM	30BL183858
AUTHORISED-PURPOSES	MONITORING BORE
INTENDED-PURPOSES	MONITORING BORE
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	2005-01-31
FINAL-DEPTH (metres)	11.75
DRILLED-DEPTH (metres)	11.75
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	ROAD RESERVE
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6816323.00
EASTING	551593.00
LATITUDE	28 46' 46"
LONGITUDE	153 31' 43"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	2 581364

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	2 581364

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	0.50	76			(Unknown)

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.50	0.50	fill		
0.50	1.60	1.10	silty clay		
1.60	11.75	10.15	basalt		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW305428

Works Details (top)

GROUNDWATER NUMBER	GW305428
LIC-NUM	30BL183945
AUTHORISED-PURPOSES	MONITORING BORE
INTENDED-PURPOSES	MONITORING BORE
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	2005-11-24
FINAL-DEPTH (metres)	16.95
DRILLED-DEPTH (metres)	16.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	FLICK'S (BH337)
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6816900.00
EASTING	552946.00
LATITUDE	28 46' 27"
LONGITUDE	153 32' 33"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	1 33793

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	1 33793

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	2.10	2.10	silty clay		
2.10	2.50	0.40	sandy clay		
2.50	10.70	8.20	sand		
10.70	11.50	0.80	clayey sand		
11.50	15.20	3.70	silty clay		
15.20	16.00	0.80	clayey sand		

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, May 3, 2011

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW305430

Works Details (top)

GROUNDWATER NUMBER	GW305430
LIC-NUM	30BL183942
AUTHORISED-PURPOSES	MONITORING BORE
INTENDED-PURPOSES	MONITORING BORE
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	2005-06-20
FINAL-DEPTH (metres)	25.00
DRILLED-DEPTH (metres)	25.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	SIMMPSON'S (BH329)
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	
SALINITY	
YIELD	

Site Details (top)

REGION	30 - NORTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6817625.00
EASTING	553152.00
LATITUDE	28 46' 4"
LONGITUDE	153 32' 40"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	23 1028025

Licensed (top)

COUNTY	ROUS
PARISH	NEWRYBAR
PORTION-LOT-DP	23 1028025

Water Bearing Zones (top)

no details

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	0.80	0.80	silty clay		
0.80	16.77	15.97	basalt		
16.77	17.75	0.98	breccia		
17.75	21.23	3.48	sandstone		
21.23	22.25	1.02	argillite		
22.25	25.00	2.75	sandstone		