



Carbon Based Environmental Pty Limited

ABN 74 102 920 285

Rocla Quarry Products Calga Quarry

Environmental Monitoring

Dust Deposition Gauges, Surface and Ground Waters and Meteorological Station

June 2011

A handwritten signature in black ink, appearing to read 'Colin Davies', is written above a horizontal line.

Colin Davies BSc MEIA CENVP
Environmental Scientist
20 July 2011

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Executive Summary

Carbon Based Environmental is contracted by Rocla Quarry Products to conduct environmental monitoring at the Calga Sand Quarry.

The monitoring includes;

- Dust Deposition Gauges;
- Surface Waters;
- Groundwaters; and
- Meteorological Station.

This report was prepared by Carbon Based Environmental and includes the following;

- Dust Deposition results for June 2011;
- Surface Water quality results for June 2011;
- Groundwater depth and quality results for June 2011; and
- Meteorological report for June 2011.

The June 2011 dust deposition results were generally lower than or similar to May 2011 with the exception of CD6 which increased slightly. All sites, on a year to date average basis, are currently below the Air Quality Management Plan exceedance level of 3.7g/m².month. Results were found to be representative of dust levels as determined by the Australian Standard.

Surface water samples were collected for the normal monthly sampling event on the 30 June 2011 at sites A, D and F. There was no access to sites B and C. At the time of sample collection, there was no water discharge observed from the site. Results show generally good quality water with both sites sampled maintaining low Electrical Conductivity, low Total Dissolved Solids, low Total Suspended Solids and no detectable Oil and Grease. pH levels remained stable and were within the slightly acidic range.

Groundwaters were sampled for normal monthly monitoring on 30 June 2011. Groundwater depths decreased at most monitoring bores this month, indicating water moving toward the surface. Exceptions were CP3, CP4 and MW13 where depths increased. pH decreased at all sites this month. EC decreased at all sites with the exception of CQ3 which decreased.

The meteorological station data recovery for the month was 100% with the exception of wind speed which was unavailable for the month due to wind sensor damage. Recorded rainfall on site for June was 206.6 mm, which was lower than that recorded at the BOM Peats Ridge Station and higher than the Peats Ridge long-term average for June. Results are detailed below:

Rocla Calga Quarry	206.6 mm
BOM Peats Ridge*	291.4 mm
BOM Gosford*	264.8 mm
BOM Peats Ridge Long term mean for June*	105.1 mm

*Data sourced from Bureau of Meteorology (BOM) website (www.bom.gov.au).

Note: Differences in the daily rainfall readings between BOM and the Rocla station may occur due to BOM stations reporting rainfall at 9am and the Rocla station recording rainfall at midnight.

1.0 Sampling Program

Rocla Calga Quarry conducts environmental monitoring in accordance to Development Consent, OEH (EPA) licence and Environmental Management Plans. Carbon Based Environmental are contracted to undertake dust deposition gauge, surface and groundwater and meteorological monitoring for the project. Carbon Based Environmental commenced monitoring from the April 2006 monitoring period.

Dust deposition gauges are operated to the Australian Standard AS3580.10.1 “Methods for Sampling and Analysis of Ambient Air Method 10.1 Determination of Particulates—Deposited Matter—Gravimetric Method”. Sampling is undertaken every 30 +/- 2 days and each gauge is analysed for insoluble solids and ash residue. The results are reported as g/m².month.

Surface waters are sampled in accordance with Australian Standards AS5667.1 “Guidance on the Design of Sample Programs, Sampling Techniques and the Preservation and Handling of Samples”, AS5667.6 “Water Quality Sampling—Guidance on sampling of rivers and streams” and AS5667.4 “Water Quality Sampling—Guidance on sampling from lakes, natural and man-made”. Surface water monitoring sites include local streams and dams. Basic analysis including pH, Electrical Conductivity, Total Suspended Solids, Total Dissolved Solids and Total Oil and Grease is conducted monthly at Sites A and F (dams) and when Sites B, C and D are flowing. Additional samples are collected when daily rainfall exceeds 50mm.

Groundwaters are sampled in accordance with Australian Standards AS5667.1 “Guidance on the Design of Sample Programs, Sampling Techniques and the Preservation and Handling of Samples” and AS5667.11 “Water Quality Sampling—Guidance on sampling of ground waters”. Groundwater monitoring sites are sampled at least bi-monthly for water quality and at least quarterly for water level. Groundwater monitoring loggers continuously record water levels in a selection of bores.

Meteorological monitoring is conducted at the quarry and displayed on the site computer with a real time display. Wind parameters are measured according to Australian Standard AS 2923 “Ambient Air— Guide for Measurement of Horizontal Wind for Air Quality Applications”.

The weather stations have the following sensor configuration;

Air temperature

- Humidity
- Rainfall
- Atmospheric pressure
- Evaporation
- Solar radiation
- Wind speed
- Wind direction

Carbon Based Environmental continued to operate the monitoring equipment and utilise site collections at their existing locations.

2.0 Monthly Results

2.1 Dust Deposition Gauges

Table 1 displays the results for June 2011 and the project average. Results are in g/m².month.

Table 1: Dust Deposition results: 1-June 2011 – 30-June 2011

Site	Monthly Insoluble Solids g/m ² .month	Monthly Ash Residue g/m ² .month	Monthly Combustible Matter g/m ² .month	Monthly Ash Residue/ Insoluble Solids %	Rolling Annual Average Insoluble Solids g/m ² .month
CD1	0.8	0.3	0.2	38	1.9
CD2c	0.4	0.3	0.1	75	0.8
CD3	0.3	0.2	0.1	66	0.4
CD4	0.1	0.1	<0.1	100	0.4
CD5	0.2	0.2	<0.1	100	0.3
CD6	1.1	0.9	0.2	82	0.6

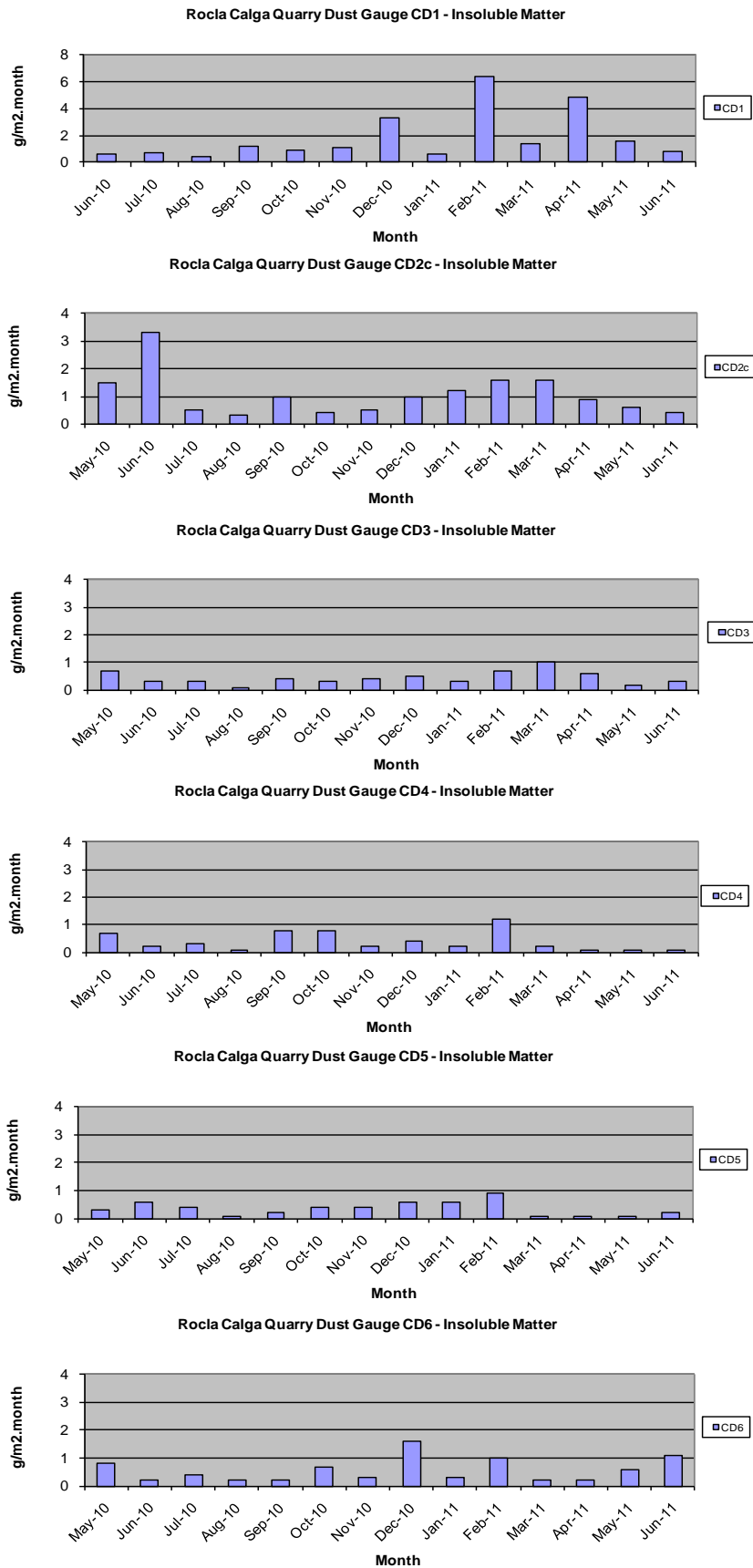
Insoluble Solids marked with an * indicate an excessively contaminated gauge. Contamination can include bird droppings, vegetation (such as plant matter, algae, pollen and seeds) and insects. Results in bold indicate insoluble solids levels above 3.7 g/m².month; the Development Consent’s annual average amenity criteria at residential locations. The current rolling annual average is calculated from July 2010 to June 2011.

NA= Not Available.

CD1 was installed on the 1 May 2006. CD2a was discontinued at the start of August 2006 due to quarry operations “mining out” the site of the gauge. The replacement gauge, Site CD2b, was located in a position adjacent to the boundary between B. Kashouli and F. & J. Gazzana in conformance with the Air Quality Management Plan. CD4 was installed on 3 October 2006, to gauge air quality impacts to the south of the site operations, as were CD5 and CD6 which were installed on the 14 December 2006. CD2b was discontinued at the end of January 2010 due to contamination of the gauge by non-quarry related vehicle movements on a track adjacent to the gauge. The replacement gauge, CD2c, was located on a rehabilitated section of land between the extraction area and adjacent resident.

Dust deposition charts for all dust gauge sites appear in **Figure 1** below. The laboratory analysis is provided in **Appendix 1**.

Figure 1: Dust Deposition Charts



2.2 Water Monitoring

2.2.1 Surface Waters

Monthly surface water monitoring was conducted on the 30 June 2011 and results are listed in **Table 2**. The laboratory analysis sheets for both sampling events are provided in **Appendix 1**.

Table 2: Monthly surface water monitoring – June grab sample results

Site	Observed Flow Rate	Water Colour	Turbidity	pH	EC (µS/cm)	TDS (mg/L)	TSS (mg/L)	Oil and Grease (mg/L)
A	Still	Clear	Clear	5.42	80	51	6	<5
B	DRY							
C	NO ACCESS							
D	Trickle	Clear	Clear	5.16	92	61	<5	<5
F	Still	Clear	Clear	5.73	70	53	7	<5

At the time of sampling, there were no water discharges off site from any sampling location. Samples were collected at sites A, D and F. There was no access to sites B and C. The samples were collected and analysed for a monthly sampling event. Results show pH within the slightly acidic range, low Electrical Conductivity, low Total Dissolved Solids, low Total Suspended Solids and no detectable Oil and Grease.

2.2.2 Groundwaters

Groundwaters were sampled on 30 June 2011. Water quality tests for pH and electrical conductivity were conducted by Carbon Based Environmental Pty Limited. For water quality purposes, water was purged from the bore until constant pH (+/- 0.1 pH units) and Electrical Conductivity (+/- 5%) was obtained between samples. Data is displayed in **Table 3** and **Figures 2 to 5**.

Groundwater depths decreased at most monitoring bores this month, indicating water moving toward the surface. Exceptions were CP3, CP4 and MW13 where depths increased. Longer term monitoring is required to fully evaluate groundwater depth trends.

pH decreased at all sites this month. EC either remained stable at all sites. Detailed biannual water quality monitoring was conducted in April 2011 and is next due in October 2011.

Table 3: Groundwater Quality Data

Reference	Bore	Type	Depth to water TOC (m) April 06	Depth to water TOC (m) This report	pH This report	Electrical Conductivity (μ S/cm) This report
CQ1	Voutos	* Monitor	20.59	19.71	4.27	120
CQ3	Voutos	* Monitor	10.53	10.20	6.20	150
CQ4	Voutos	* Monitor	8.78	7.58	4.73	90
CQ5	Gazzana	DIP Only	8.69	5.07	4.45	130
CQ6	Gazzana	DIP Only	16.00	9.96	5.00	160
CQ7	Gazzana	* Monitor	6.89	5.92	4.57	90
CQ8	Gazzana	* Monitor	11.03	5.25	4.33	140
CQ9	Gazzana	DIP Only	10.10	8.73	4.51	100
CQ10	Voutos	* Monitor	NI	22.48	4.47	100
CQ11S	Gazzana	* Monitor	NI	9.03	4.52	150
CQ11D	Gazzana	* Monitor	NI	10.06	5.00	140
CQ12	Gazzana	* Monitor	NI	3.61	4.19	130
CQ13	Kashouli	* Monitor	NI	11.81	4.99	190
CP3	Gazzana	Domestic	10.40	9.02	4.61	140
CP4	Kashouli	Domestic	13.63	4.82	5.94	200
CP5	Kashouli	Domestic	16.61	5.34	4.38	210
CP6	Kashouli	Domestic	16.27	8.19	4.37	200
CP7	Kashouli	Production	8.56	1.00	4.64	150
CP8	Rozmanec	Domestic	22.17	NR	NR	NR
MW7	Rocla Bore	* Monitor	15.76	15.05	4.45	110
MW8	Rocla Bore	* Monitor	9.82	6.90	4.78	80
MW9	Rocla Bore	* Monitor	22.44	21.87	4.49	80
MW10	Rocla Bore	* Monitor	15.41	NM	NM	NM
MW13	Rocla Bore	DIP Only	NI	7.43	4.52	100
MW16	Rocla Bore	DIP Only	NI	NM	NM	NM

Notes:

TOC = Water level measured from top of bore case to water.

NM = Not Monitored – unable to sample water due to access restrictions.

NR = Not Required by resident.

* = Logger Installed.

NI = These bores were not installed in April 2006 but are now operational. April 2006 was the first set of measurements taken by Carbon Based Environmental Pty Limited.

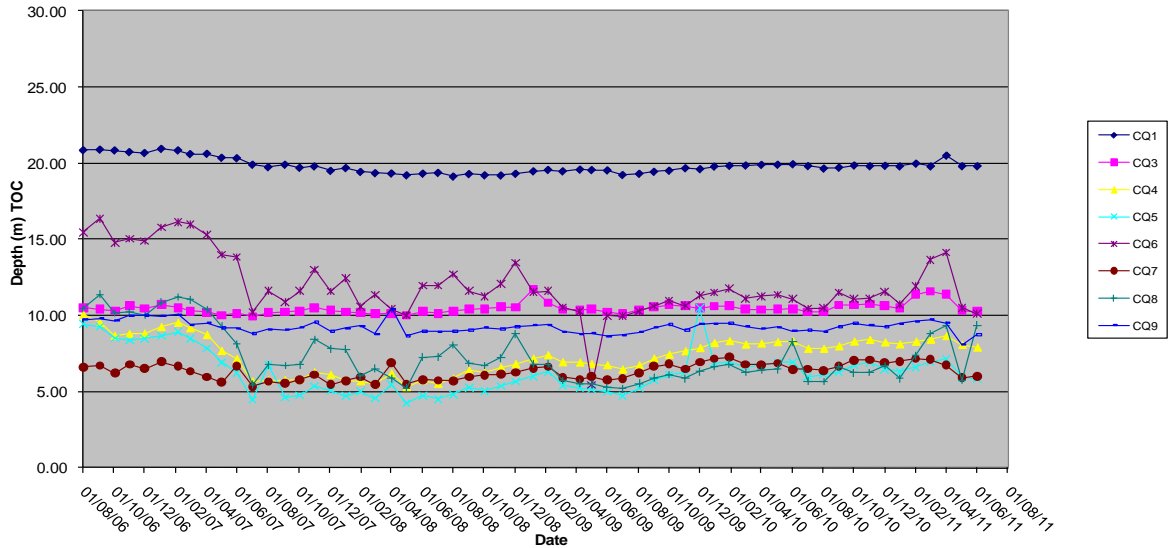
Shading is used to indicate the following trends in water depth (compared to the last reading):

	Increase to ground water depth (water moved away from surface)
	Decrease to ground water depth (water moved towards surface)
	Stable water depth (+/- 0.01m)

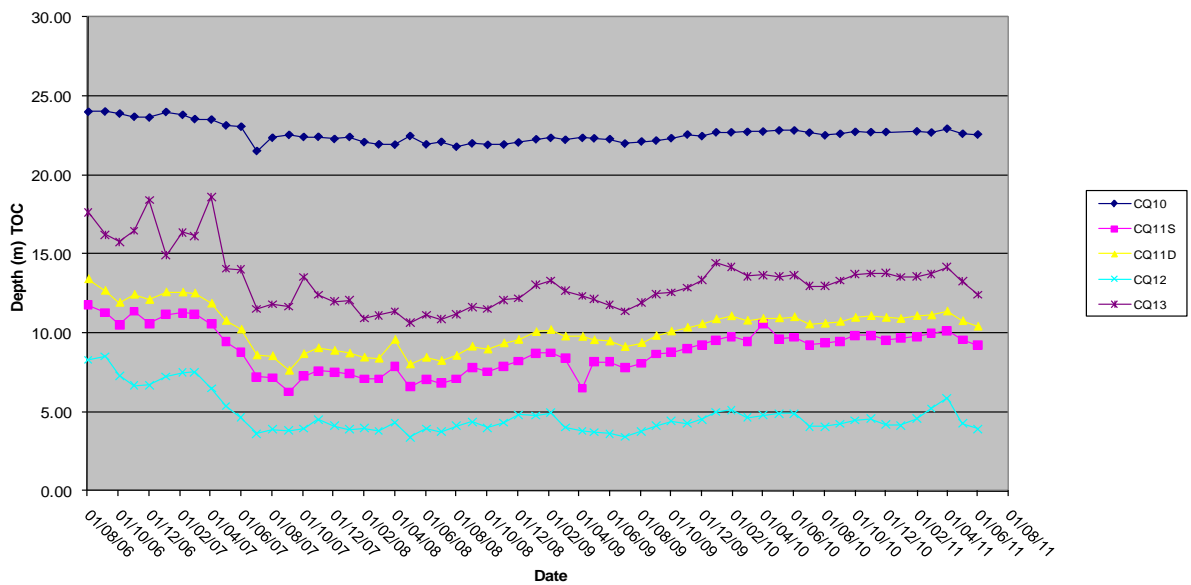
Available groundwater loggers were downloaded and will be forwarded to the Rocla Calga Quarry groundwater consultant.

Figures 2 to 5: Groundwater Depth Charts.

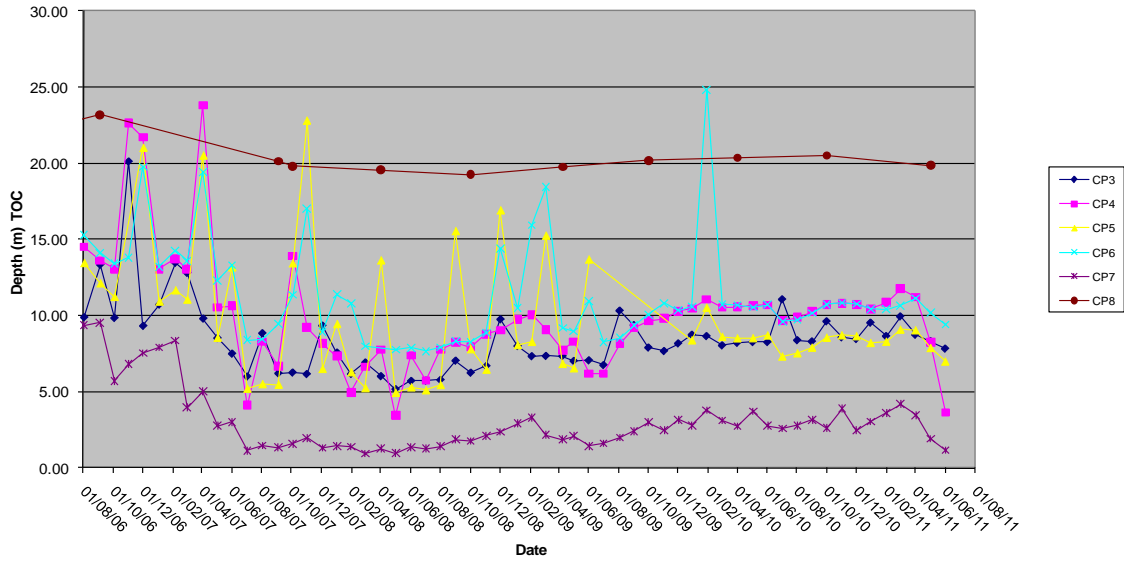
**Rocla Calga Groundwaters - Quarry Bores CQ1 to CQ9
Water Depth TOC**



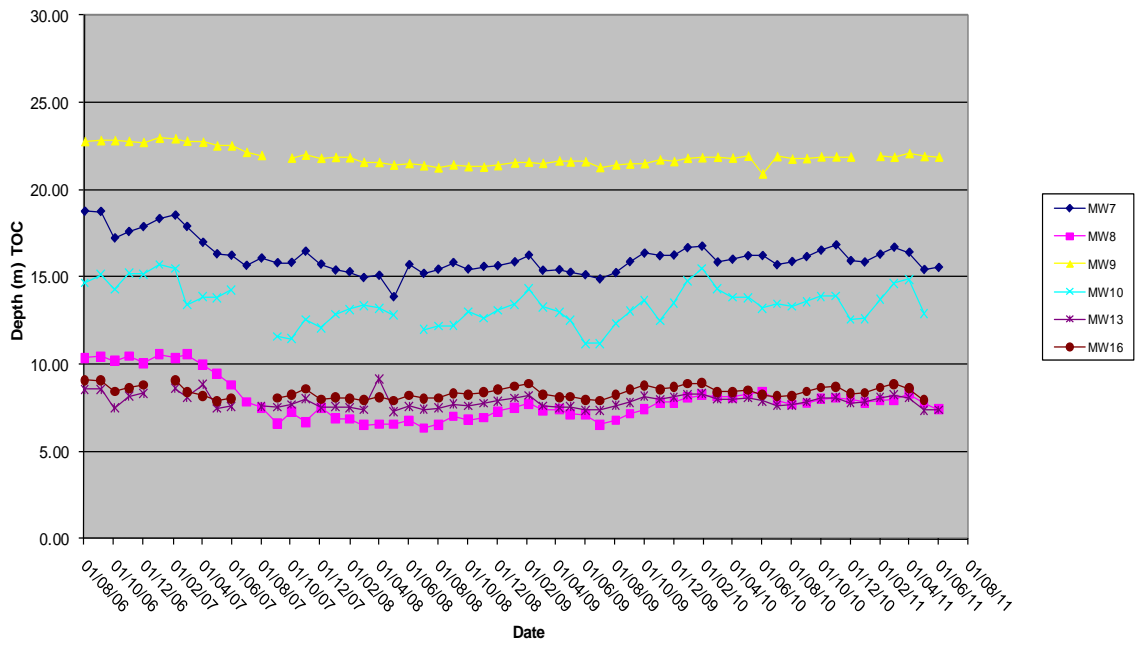
**Rocla Calga Groundwaters - Quarry Bores CQ10 to CQ13
Water depth TOC**



Rocla Calga Groundwaters - Quarry Bores CP3 to CP8
Water Depth TOC



Rocla Calga Groundwaters - Quarry Bores MW7 to MW16
Water Depth TOC



2.3 Meteorological Monitoring

The Rocla Calga Quarry weather station data recovery in June was approximately 100%. No wind speed data was recorded due to wind sensor damage. The weather station data follows and includes;

- Monthly data numerical summary;
- Weather charts of air temperature, humidity, heat index and wind chill, atmospheric pressure, solar radiation, evapotranspiration, rain, wind speed and data reception; and
- Wind rose (frequency distribution diagram of wind speed and direction).

Monthly weather statistics from two nearby Bureau of Meteorology (BOM) stations, Peats Ridge and Gosford are included in **Appendix 2** for comparison purposes.

Data for June 2011 shows rainfall recorded at the Rocla Calga Quarry was lower than that recorded at nearby Peats Ridge and Gosford BOM stations. Recorded rainfall at Rocla Calga Quarry was higher than the Peats Ridge long term mean rainfall for June. The rainfall comparison is provided below:

Rocla Calga Quarry	206.6 mm
BOM Peats Ridge*	291.4 mm
BOM Gosford*	264.8 mm
BOM Peats Ridge Long term mean for June*	105.1 mm

*Data sourced from Bureau of Meteorology (BOM) website (www.bom.gov.au).

Results are displayed in the following table and figures.

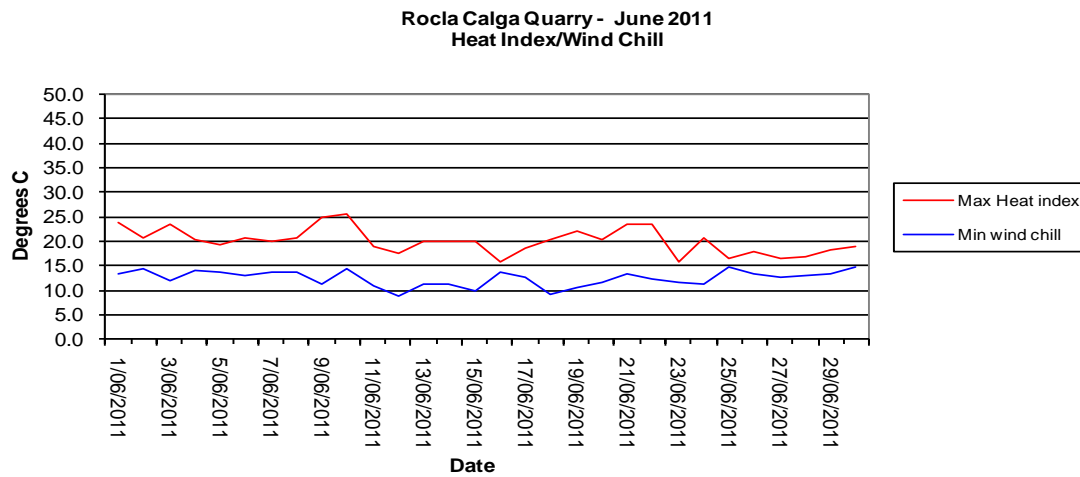
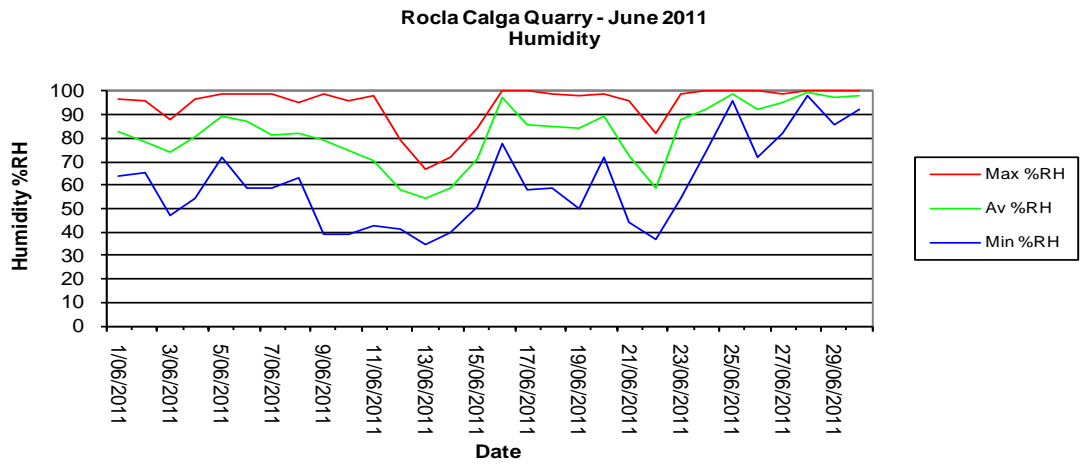
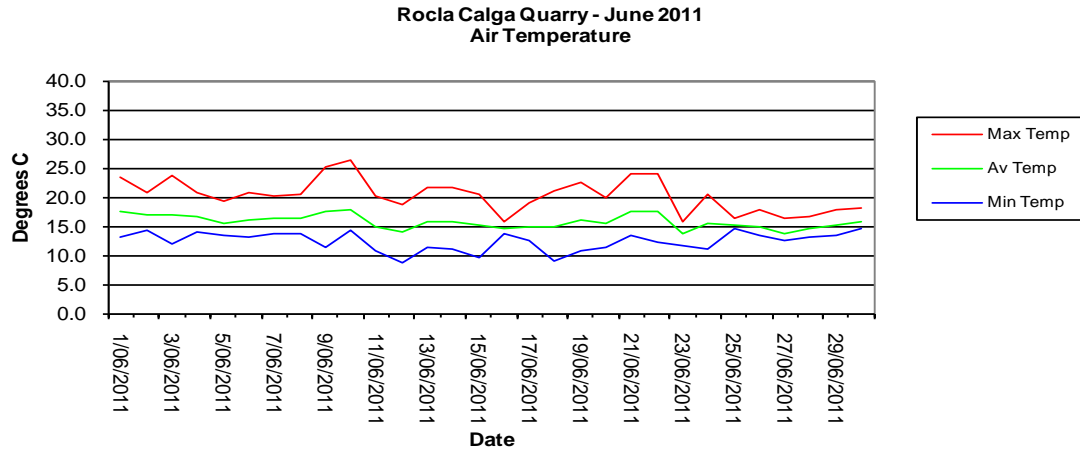
2.3.1 Monthly Meteorological Data Summary

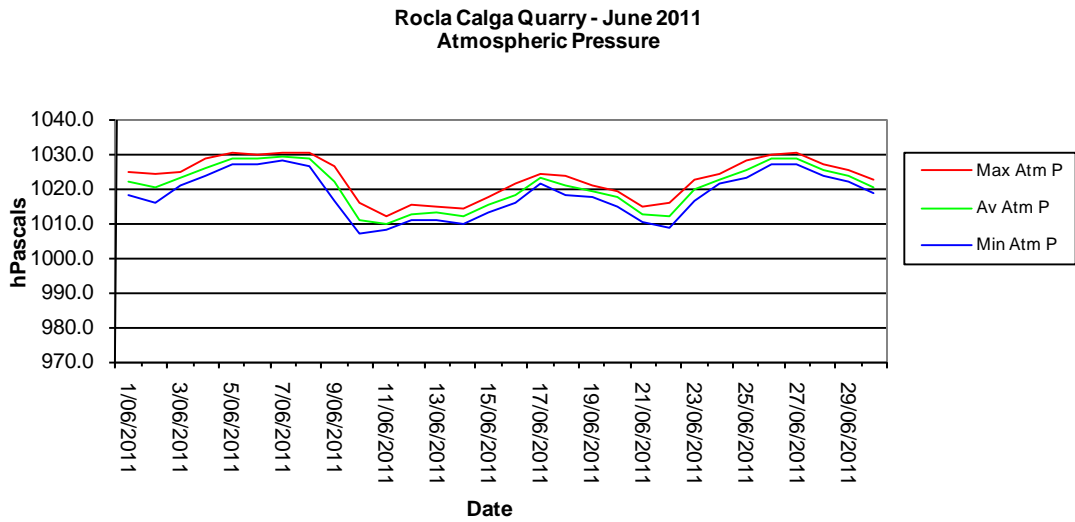
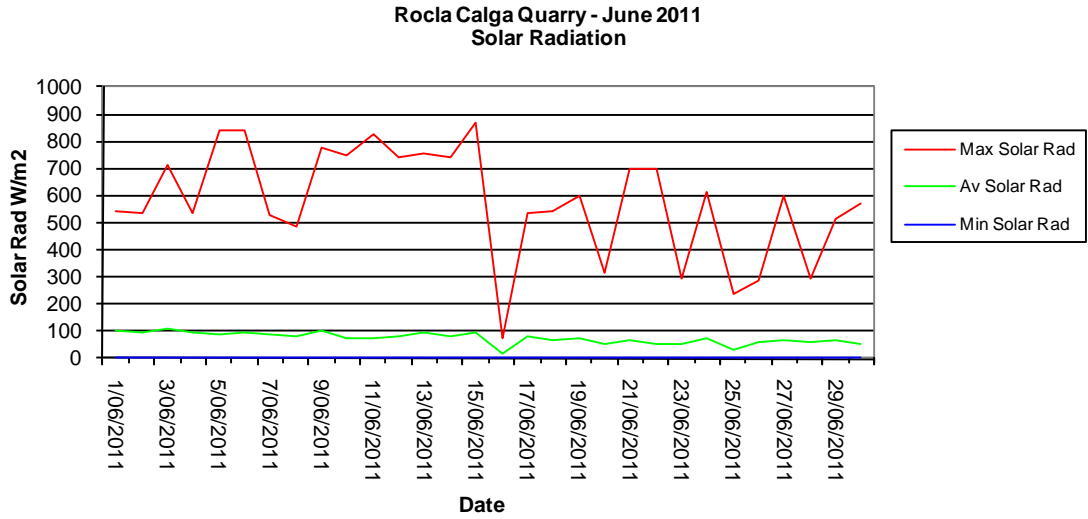
Summary Jun-11 Rocla - Calga

Date	Min Temp	Av Temp	Max Temp	Min %RH	Av %RH	Max %RH	RAIN mm	ET mm	Min WS	Av WS	Max WS	Min wind chill	Max Heat index	Min Atm P	Av Atm P	Max Atm P	Min Solar Rad	Av Solar Rad	Max Solar Rad	Min Data %	Av data %	Max Data %
1/06/2011	13.3	17.6	23.4	64	83	97	0.2	1.6				13.4	23.9	1018.0	1021.8	1024.8	0	104.9	542	94.7	99.9	100
2/06/2011	14.3	17.1	20.8	65	79	96	0.0	1.4				14.4	20.9	1016.0	1020.3	1024.0	0	96.5	539	90.4	99.2	100
3/06/2011	11.9	17.1	23.7	47	74	88	0.0	1.6				11.9	23.7	1020.6	1023.0	1024.7	0	113.5	710	95.6	99.9	100
4/06/2011	14.1	16.8	20.8	54	81	97	4.0	1.5				14.1	20.3	1023.5	1025.9	1028.4	0	98.3	539	95.3	99.6	100
5/06/2011	13.5	15.5	19.3	72	90	99	5.6	1.2				13.6	19.4	1026.9	1028.7	1030.1	0	91.3	842	87.7	99.2	100
6/06/2011	13.1	16.0	20.8	59	88	99	5.8	1.4				13.1	20.6	1027.2	1028.5	1029.6	0	96.8	838	92.4	99.4	100
7/06/2011	13.8	16.5	20.3	59	81	99	2.0	1.4				13.8	20.2	1028.1	1029.2	1030.3	0	92.0	529	90.9	98.7	100
8/06/2011	13.7	16.3	20.6	63	82	95	0.0	1.2				13.7	20.7	1026.4	1028.4	1030.5	0	81.5	488	82.2	98.4	100
9/06/2011	11.3	17.6	25.2	39	79	99	0.2	1.5				11.3	25.1	1016.4	1021.8	1026.3	0	103.8	776	91.8	99.4	100
10/06/2011	14.3	17.9	26.3	39	75	96	11.4	1.1				14.4	25.7	1007.1	1010.9	1016.1	0	71.6	751	94.4	99.9	100
11/06/2011	10.8	15.1	20.2	43	71	98	0.0	1.1				10.9	18.9	1007.9	1009.8	1011.9	0	75.8	823	89.8	99.0	100
12/06/2011	8.9	14.1	18.8	41	58	79	0.2	1.2				8.9	17.5	1010.9	1012.5	1015.2	0	80.4	743	86	99.4	100
13/06/2011	11.3	15.9	21.6	35	54	67	0.0	1.6				11.3	20.2	1010.8	1013.3	1015.0	0	92.3	757	90.1	98.9	100
14/06/2011	11.1	15.8	21.6	40	59	72	0.0	1.6				11.2	20.2	1010.0	1012.2	1014.0	0	82.3	740	89.5	99.3	100
15/06/2011	9.8	15.2	20.5	51	71	84	0.0	1.7				9.9	19.9	1013.3	1015.4	1017.3	0	98.1	867	95	99.7	100
16/06/2011	13.7	14.7	15.7	78	98	100	104.2	0.2				13.7	15.9	1015.6	1018.3	1021.4	0	14.8	77	68.7	98.6	100
17/06/2011	12.6	15.0	19.0	58	86	100	2.0	1.1				12.6	18.8	1021.2	1022.8	1024.2	0	83.2	533	62.3	94.9	100
18/06/2011	9.1	14.9	21.1	59	85	99	0.2	1.0				9.1	20.5	1018.3	1020.9	1023.5	0	68.9	545	90.9	99.5	100
19/06/2011	10.8	16.1	22.6	50	84	98	0.2	1.1				10.8	22.3	1017.5	1019.1	1020.9	0	76.5	601	82.2	98.5	100
20/06/2011	11.5	15.6	19.9	72	90	99	0.2	0.8				11.6	20.4	1014.9	1017.2	1019.4	0	55.1	319	78.9	98.6	100
21/06/2011	13.5	17.5	24.0	44	72	96	0.2	1.0				13.5	23.7	1010.4	1012.7	1015.0	0	65.2	701	85.7	99.0	100
22/06/2011	12.4	17.7	24.0	37	59	82	0.0	1.1				12.4	23.7	1008.6	1011.9	1016.0	0	55.0	697	94.2	99.9	100
23/06/2011	11.6	13.8	15.8	54	88	99	1.8	0.9				11.6	16.0	1016.3	1019.9	1022.4	0	53.3	296	98.5	99.9	100
24/06/2011	11.2	15.4	20.4	74	92	100	0.2	1.0				11.2	20.8	1021.5	1022.6	1023.9	0	74.9	613	99.7	100.0	100
25/06/2011	14.7	15.3	16.3	96	99	100	19.0	0.4				14.7	16.7	1022.8	1025.3	1027.8	0	29.4	237	90.9	99.7	100
26/06/2011	13.5	15.1	17.9	72	93	100	8.2	0.8				13.5	17.8	1026.9	1028.6	1030.0	0	58.9	286	97.7	99.9	100
27/06/2011	12.7	13.9	16.3	82	95	99	11.4	0.9				12.7	16.4	1027.1	1028.6	1030.3	0	70.6	602	92.1	99.5	100
28/06/2011	13.2	14.7	16.8	98	99	100	21.0	0.7				13.2	17.0	1023.6	1025.2	1026.9	0	60.1	292	93.6	99.8	100
29/06/2011	13.4	15.4	17.8	86	98	100	3.6	0.9				13.4	18.2	1022.2	1023.5	1025.2	0	67.4	515	85.4	99.4	100
30/06/2011	14.7	15.9	18.3	92	98	100	5.0	0.7				14.7	18.9	1018.6	1020.5	1022.5	0	51.3	570	88.3	98.3	100
Monthly	8.9	15.8	26.3	35	82	100	206.6	33.7				8.9	25.7	1007.1	1020.6	1030.5	0	75.5	867	62.3	99.2	100

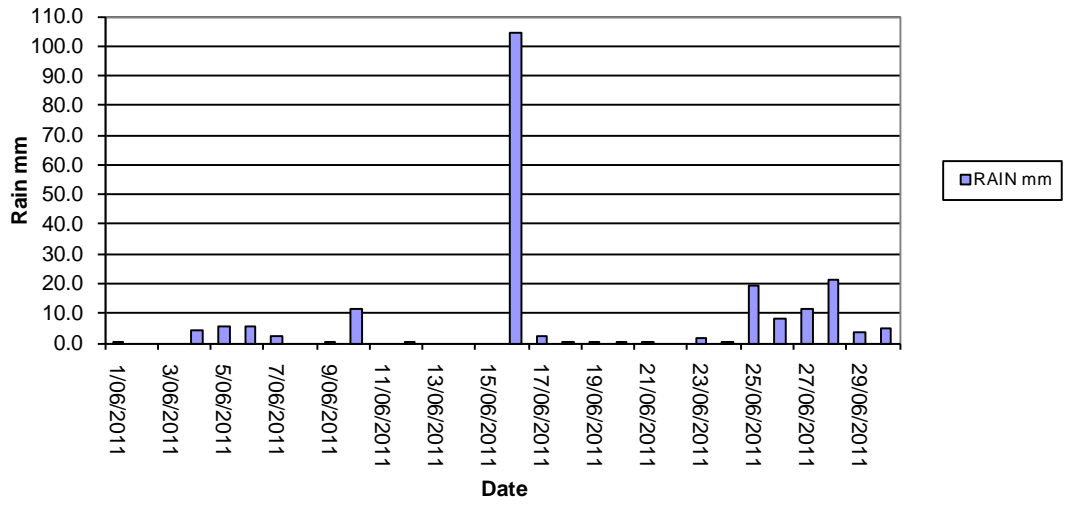
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2.3.2 Monthly Weather Charts

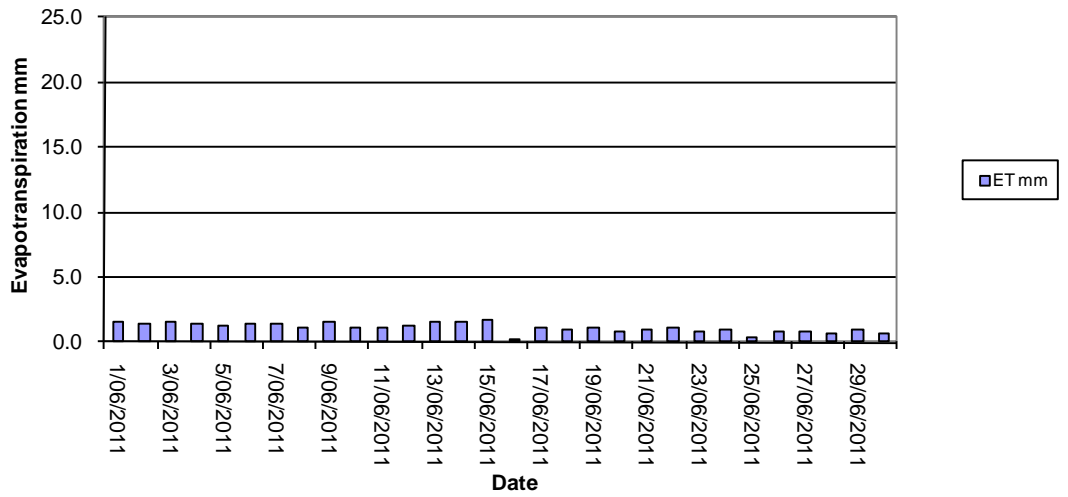




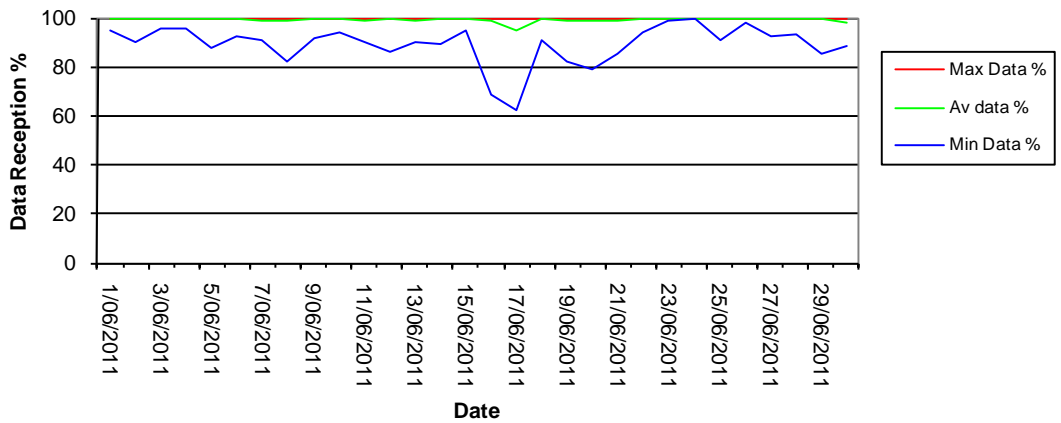
Rocla Calga Quarry - June 2011
Rainfall



Rocla Calga Quarry - June 2011
Evapotranspiration



Rocla Calga Quarry - June 2011
Data Reception



2.3.3 Monthly Windrose Plot

A windrose is not provided this month due to the unavailability of wind data.

Appendix 1
Laboratory Certificates

Appendix 2

Additional Bureau of Meteorology Data from Peats Ridge and Gosford Monitoring Stations

Peats Ridge, New South Wales
June 2011 Daily Weather Observations



Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain mm	Evap mm	Sun hours	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C					km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	We	12.7	16.6	34.6	2.0					15.0	75	8	SE	9		15.6	83	6	SE	4	
2	Th	9.8	17.8	6.0	1.0					13.4	94	6	S	4		16.2	79	5	ESE	4	
3	Fr	8.8	17.9	2.0	1.0					11.2	97	1	NW	4		17.2	62	5	NW	4	
4	Sa	8.8	18.0	0	1.4					13.6	70	4	NW	9		17.8	67	7	WNW	4	
5	Su	6.8	16.4	3.6	1.4					11.1	77	1	W	4		15.2	56	3	NW	4	
6	Mo	6.3	15.5	0	2.0					11.6	65	0	NW	9		14.4	69	6			Calm
7	Tu	4.6	14.1	0	1.6					6.6	80	5	NW	4		12.0	49	3	S		22
8	We	5.7	12.8	0	2.2					8.6	55	0	NW	19		10.2	42	0	NW	19	
9	Th	3.9	15.1	0	1.4					7.4	67	0	NW	19		13.9	49	3	W	9	
10	Fr	5.4	15.0	0	1.6					10.2	70	1	NW	4		12.6	63	8	SW	11	
11	Sa	7.5	14.6	1.8	1.4					10.2	91	6	SW	9		13.1	82	7	S	9	
12	Su	9.3	12.1	29.4	2.6					11.6	95	8	SSW	9		11.5	96	8	S	9	
13	Mo	10.6	13.9	105.8						11.6	94	8	SW	4		13.6	77	8	ESE	4	
14	Tu	10.5	15.2	8.4	2.2					13.1	77	8	S	7		13.0	96	8	E	9	
15	We	11.5	14.2	47.4	3.8					13.0	92	8	S	4		14.2	77	7	E	6	
16	Th	11.0	14.1	22.2	2.6					12.2	97	8	SW	4		12.5	87	4	SW	6	
17	Fr	6.7	15.5	2.0	0.2					11.3	80	0	W	4		14.5	52	2	SW	4	
18	Sa	5.1	16.0	0	2.2					10.0	63	0	WSW	4		15.0	49	1	SW	9	
19	Su	5.6	16.6	0	1.2					10.8	71	0	W	4		15.8	49	0	NW	4	
20	Mo	5.7	17.5	0	1.4					11.8	68	0	NW	9		16.7	50	3	WSW	9	
21	Tu	9.9	18.0	0	1.8					13.0	62	3	N	19		17.5	45	6	NW	9	
22	We	5.5	13.7	3.6	3.2					8.4	62	0	W	9		13.1	46	1	SW	19	
23	Th	6.7	17.7	0	2.2					10.1	73	0	NW	9		16.9	51	0			Calm
24	Fr	4.9	16.8	0	1.2					10.4	76	0	SW	4		15.9	55	1	W	4	
25	Sa	5.0	17.0	0						10.5	80	0		Calm		14.6	74	3	NNE	4	
26	Su	6.8	18.6	0	1.8					12.0	74	0	W	9		18.0	45	0	W	9	
27	Mo	5.6	16.7	0	1.4					11.2	63	0	SW	4		16.1	61	2	SE	4	
28	Tu	5.8	14.1	0	1.0					10.6	87	0	SW	4		12.3	92	8	S	4	
29	We	9.8	15.1	21.6	2.6					12.1	95	8	S	4		12.8	93	7	NE	4	
30	Th	8.1	14.6	3.0	0.6					11.2	99	7	NE	4		13.9	75	7	SE	4	
Statistics for June 2011																					
Mean		7.5	15.7		1.8					11.1	78	3		6		14.5	65	4		7	
Lowest		3.9	12.1		0.2					6.6	55	0		Calm		10.2	42	0		Calm	
Highest		12.7	18.6	105.8	3.8					15.0	99	8	#	19		18.0	96	8	S	22	
Total				291.4	49.0																

Observations were drawn from Peats Ridge (Waratah Road) (station 061351)

The closest station with pressure observations is at Norah Head, about 32 km to the east. The closest station with sunshine observations is at Williamtown, about 82 km to the northeast.

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Gosford, New South Wales
June 2011 Daily Weather Observations



Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain mm	Evap mm	Sun hours	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C					km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	We	14.0	18.6	31.2			SSE	31	11:47	16.0	96		SSE	4		18.3	73		SE	9	
2	Th	11.2	20.0	3.6			ESE	24	15:03	15.3	99		NW	2		19.2	69		SE	7	
3	Fr	8.9	19.9	3.0			NNE	19	12:25	13.7	98		ENE	2		18.6	66		NW	2	
4	Sa	8.1	20.2	0.2			SW	22	10:17	15.9	64		N	9		18.2	79			Calm	
5	Su	7.3	18.8	4.8			NNW	20	12:51	12.8	79			Calm		16.8	60			Calm	
6	Mo	4.3	18.2	0.2			SW	20	10:47	12.2	73		N	7		15.9	62			Calm	
7	Tu	2.9	15.7	0			N	30	11:14	8.7	97		ENE	6		14.2	41		NNW	9	
8	We	3.5	14.8	0			NNW	39	11:09	10.8	46		NNW	11		13.9	29		NW	9	
9	Th	5.4	17.6	0			NNW	30	07:52	10.7	52		NNW	15		16.2	38		NW	9	
10	Fr	7.5	17.5	0			SSW	28	11:53	12.9	56		NNW	7		14.4	59		SSE	11	
11	Sa	9.6	16.8	5.8			S	24	12:15	12.1	98		NNW	2		15.1	75		SSE	6	
12	Su	10.9	14.8	38.0			SSE	33	17:36	13.6	98		SE	7		13.4	99		SSE	11	
13	Mo	11.7	16.9	91.8			WSW	31	20:45	14.7	84		SSE	4		16.2	65		SSE	9	
14	Tu	12.0	17.7	6.2			SE	50	19:48	16.6	59		SSE	13		15.2	98		SSE	13	
15	We	13.5	17.5	36.8			ESE	50	10:40	16.0	86		SSE	13		17.3	67		SSE	17	
16	Th	13.2	17.7	10.0			ENE	28	06:42	14.6	98		S	4		15.8	78		NW	6	
17	Fr	6.0	18.6	3.0			NNW	50	08:19	14.2	67		N	11		16.8	40		W	15	
18	Sa	5.4	18.0	0			WSW	28	10:44	11.8	55		N	11		17.2	46		NW	7	
19	Su	3.2	18.6	0			WNW	17	10:51	9.9	96			Calm		16.1	48			Calm	
20	Mo	4.6	19.1	0			N	24	10:51	12.3	83			Calm		17.3	56		WNW	6	
21	Tu	4.3	20.1	0			N	48	14:14	10.2	98		NW	4		18.9	39		NNW	13	
22	We	4.2	15.9	2.4			NNW	37	12:55	10.9	54		N	11		15.4	40		WNW	9	
23	Th	3.6	19.8	0			NW	26	10:49	12.9	63		NNE	6		18.6	47		NW	4	
24	Fr	2.6	18.8	0			N	20	11:02	8.6	99			Calm		17.4	50		NNE	7	
25	Sa	2.8	19.4	0.2			NE	13	13:42	8.2	99			Calm		18.6	54		NW	6	
26	Su	3.1	20.6	0			N	31	10:34	9.8	99		SE	7		19.6	42		WNW	4	
27	Mo	3.6	19.2	0.2			NW	20	10:33	11.3	81			Calm		15.6	72			Calm	
28	Tu	5.5	16.6	0			S	24	13:34	9.8	99			Calm		14.3	90			Calm	
29	We	9.8	16.6	26.8			SE	26	12:04	12.7	100			Calm		15.3	86			Calm	
30	Th	10.1	17.4	0.6			SE	22	12:58	12.2	99			Calm		16.2	69			Calm	
Statistics for June 2011																					
Mean		7.1	18.0							12.4	82			5		16.5	61			6	
Lowest		2.6	14.8							8.2	46			Calm		13.4	29			Calm	
Highest		14.0	20.6	91.8			#	50		16.6	100		NNW	15		19.6	99		SSE	17	
Total				264.8																	

Observations were drawn from Gosford (Narara Research Station) AWS (station 061087)

The closest station with pressure observations is at Norah Head about 27 km to the northeast. The closest station with cloud and evaporation data is at Peats Ridge about 15 km to the northwest. The closest station with sunshine observations is at Sydney Airport about 59 km to the south.

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