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

March 2012

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23 April 2012

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 March 2012;
- Surface Water quality results for March 2012;
- Groundwater depth and quality results for March 2012; and
- Meteorological report for March 2012.

The March 2012 dust deposition results for insoluble solids varied in comparison to those of February 2012. All sites, on a rolling annual average basis, are currently below the Air Quality Management Plan exceedance level of 3.7g/m^2.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 2 April 2012 at sites A, D and F. Sites B and C were inaccessible and unable to be sampled. At the time of sample collection, there was no water discharge observed from the site. Results show generally good water quality with all sites sampled maintaining low Electrical Conductivity, Total Dissolved Solids and Total Suspended Solids. Oil and Grease was not detected at any of the sites. pH levels remained stable and were within the slightly acidic range.

Groundwaters were sampled for normal monthly monitoring on 2 April 2012. Groundwater depths generally increased across the bores compared to last month. pH and EC remained relatively stable, with the exception of CQ8 which had an increased ph level and MW9 which showed a decreased EC level.

The meteorological station data recovery for the month was approximately 100%. Recorded rainfall on site for March was 164.4mm, which was higher than that recorded at the BOM Peats Ridge Station and higher than the Peats Ridge long-term average for March. Results are detailed below:

Rocla Calga Quarry	164.4 mm
BOM Peats Ridge*	155.8 mm
BOM Gosford*	164.2 mm
BOM Peats Ridge Long term mean for March*	140.3 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/m^2.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.

The locations of monitoring points are provided in **Figure 1**.

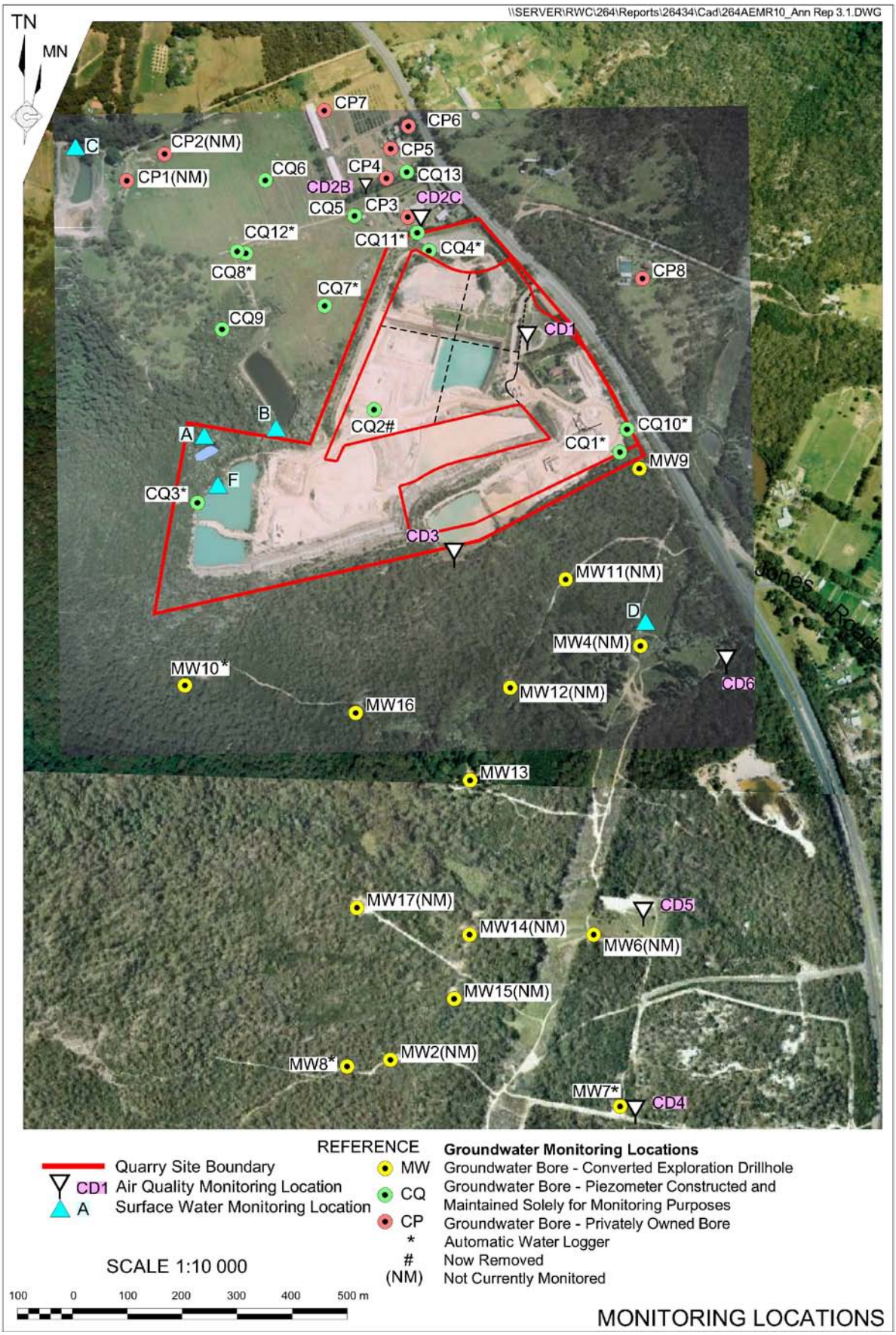


Figure 1: Rocla Calga Quarry environmental monitoring locations

2.0 Monthly Results

2.1 Dust Deposition Gauges

Table 1 displays the results for March 2012 and the project 12 month rolling average. Results are in g/m^2.month.

Table 1: Dust Deposition results: 2 March 2012 – 2 April 2012 (31 days)

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	0.5	0.3	62	2.1
CD2c	6.8*	4.4	2.4	65	0.8
CD3	0.5	0.3	0.2	40	0.6
CD4	0.9	0.3	0.6	33	0.4
CD5	0.5	0.2	0.3	40	0.3
CD6	1.3	0.3	1.0	23	0.5

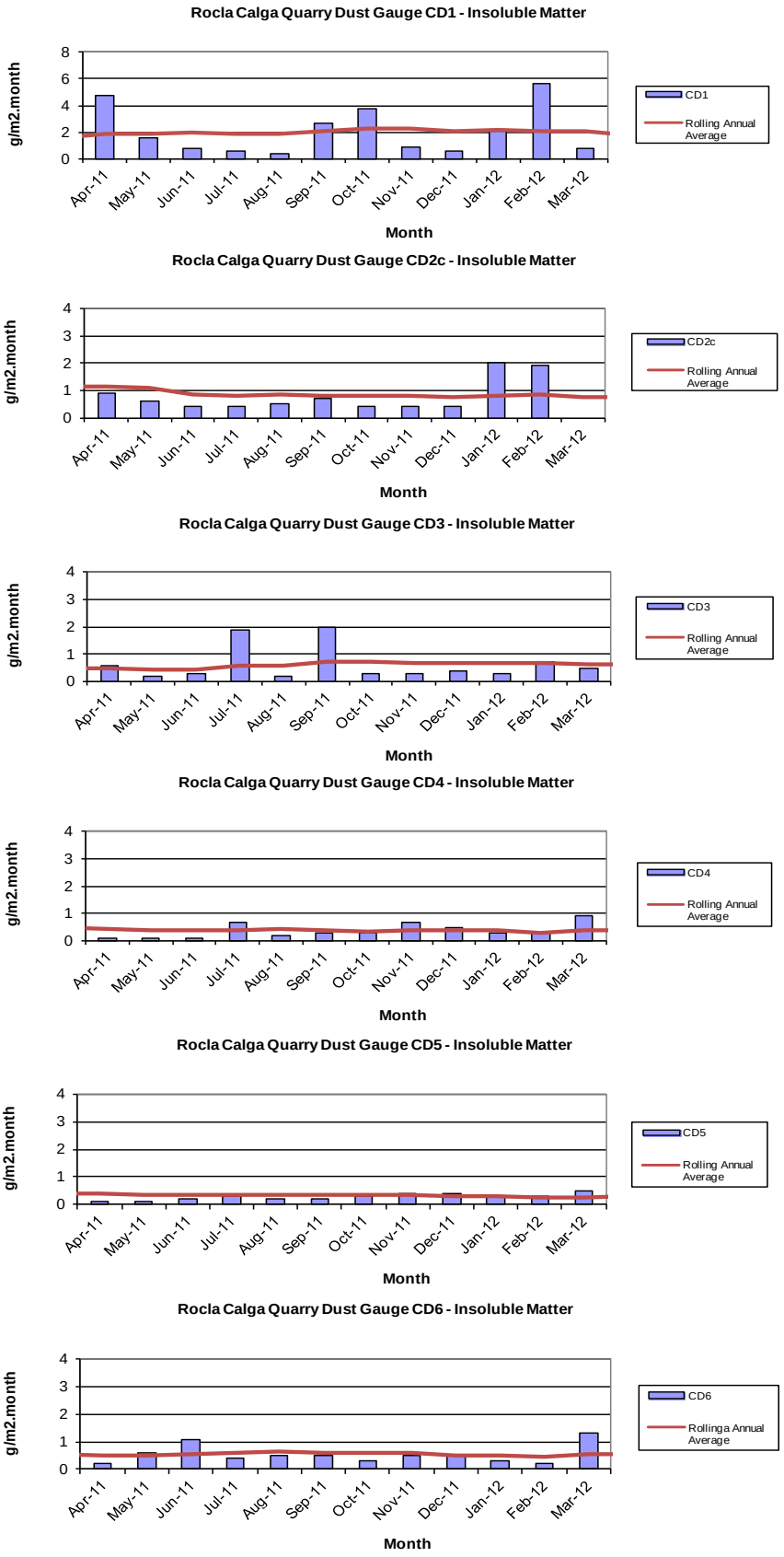
Insoluble Solids marked with an * indicate an excessively contaminated gauge. Contamination can include bird droppings, vegetation (such as plant matter, algae, pollen and seeds) and insects. Results in bold indicate insoluble solids levels above 3.7 g/m^2.month; the Development Consent's annual average amenity criteria at residential locations. The current rolling annual average is calculated from April 2011 to March 2012. Dust gauge CD2c was deemed to be contaminated with insects and vegetation and the water was observed to be turbid.

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 2** below. The laboratory analysis is provided in **Appendix 1.**

Figure 2: Dust Deposition Charts



2.2 Water Monitoring

2.2.1 Surface Waters

Monthly surface water monitoring was conducted on the 2 April 2012 and results are listed in **Table 2**. The laboratory analysis sheets are provided in **Appendix 1.**

Table 2: Monthly surface water monitoring – March 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	Dam	Clear	Clear	5.80	54	41	6	<5
B	No Access							
C	No Access							
D	Slow	Brown	Slight	5.89	84	63	94	<5
F	Dam	Clear	Clear	5.82	53	38	8	<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. Sites B and C were inaccessible and unable to be sampled this month. 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 2 April 2012. 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 3 to 6.**

Groundwater depth generally increased across the sampled groundwater bores compared to last month indicating water moving away from the surface. Exceptions include CQ4, CQ11S, CQ11D, CP3, CP5, CP6, MW8, MW9 and MW10 which all decreased in water depth. CQ10 remained stable in water depth. Both pH and EC levels remained low and relatively stable compared to last month, with the exception of CQ8 which had an increased ph level and MW9 which showed a decreased EC level. CQ1 and CP8 were unable to be sampled this month.

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 (µS/cm) This report
CQ1	Voutos	* Monitor	20.59	NM	NM	NM
CQ3	Voutos	* Monitor	10.53	9.91	6.5	109
CQ4	Voutos	* Monitor	8.78	9.15	5.5	80
CQ5	Gazzana	DIP Only	8.69	5.33	5.1	128
CQ6	Gazzana	DIP Only	16.00	9.99	5.1	182
CQ7	Gazzana	* Monitor	6.89	5.91	5.3	92
CQ8	Gazzana	* Monitor	11.03	5.22	5.7	136
CQ9	Gazzana	DIP Only	10.10	8.70	5.2	102
CQ10	Voutos	* Monitor	NI	21.48	5.0	178
CQ11S	Gazzana	* Monitor	NI	8.72	4.7	161
CQ11D	Gazzana	* Monitor	NI	9.86	4.9	145
CQ12	Gazzana	* Monitor	NI	3.49	4.3	141
CQ13	Kashouli	* Monitor	NI	11.15	5.0	202
CP3	Gazzana	Domestic	10.40	7.43	4.9	146
CP4	Kashouli	Domestic	13.63	5.38	5.0	176
CP5	Kashouli	Domestic	16.61	4.87	4.6	193
CP6	Kashouli	Domestic	16.27	7.31	4.4	200
CP7	Kashouli	Production	8.56	1.26	6.3	239
CP8	Rozmanec	Domestic	22.17	NM	NM	NM
MW7	Rocla Bore	* Monitor	15.76	14.26	5.0	112
MW8	Rocla Bore	* Monitor	9.82	5.83	5.0	86
MW9	Rocla Bore	* Monitor	22.44	21.04	4.9	80
MW10	Rocla Bore	* Monitor	15.41	11.18	4.4	125
MW13	Rocla Bore	DIP Only	NI	7.4	4.7	99
MW16	Rocla Bore	DIP Only	NI	8.08	4.6	111

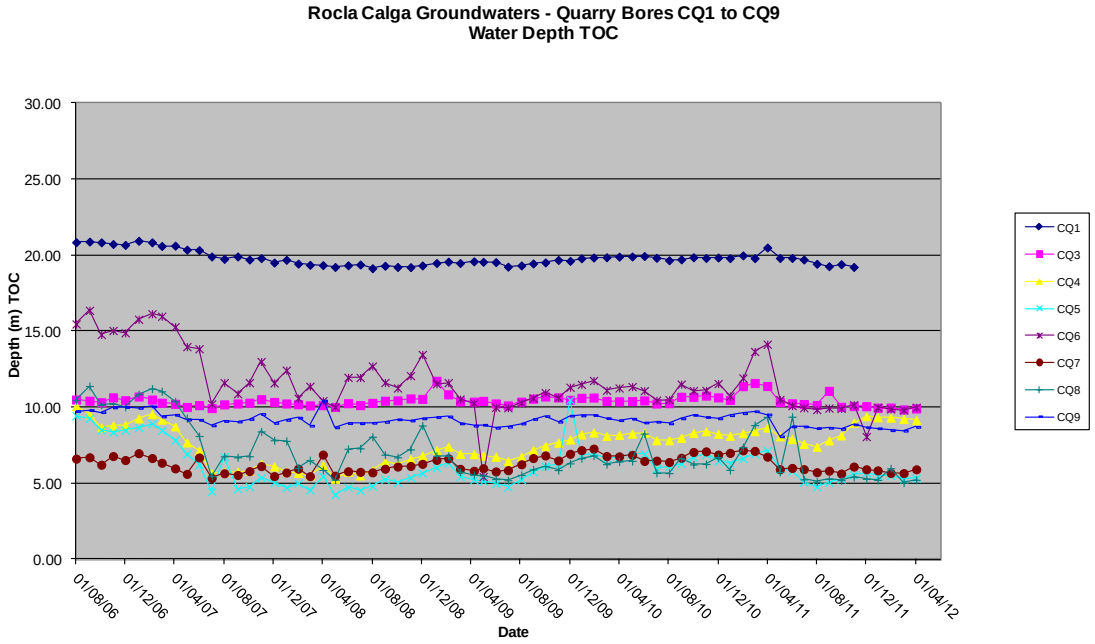
Notes:
TOC = Water level measured from top of bore case to water.
NM = Not Monitored – unable to sample water due to access restrictions.
NR = Not Required by resident.
* = Logger Installed.
NI = These bores were not installed in April 2006 but are now operational. April 2006 was the first set of measurements taken by Carbon Based Environmental Pty Limited.

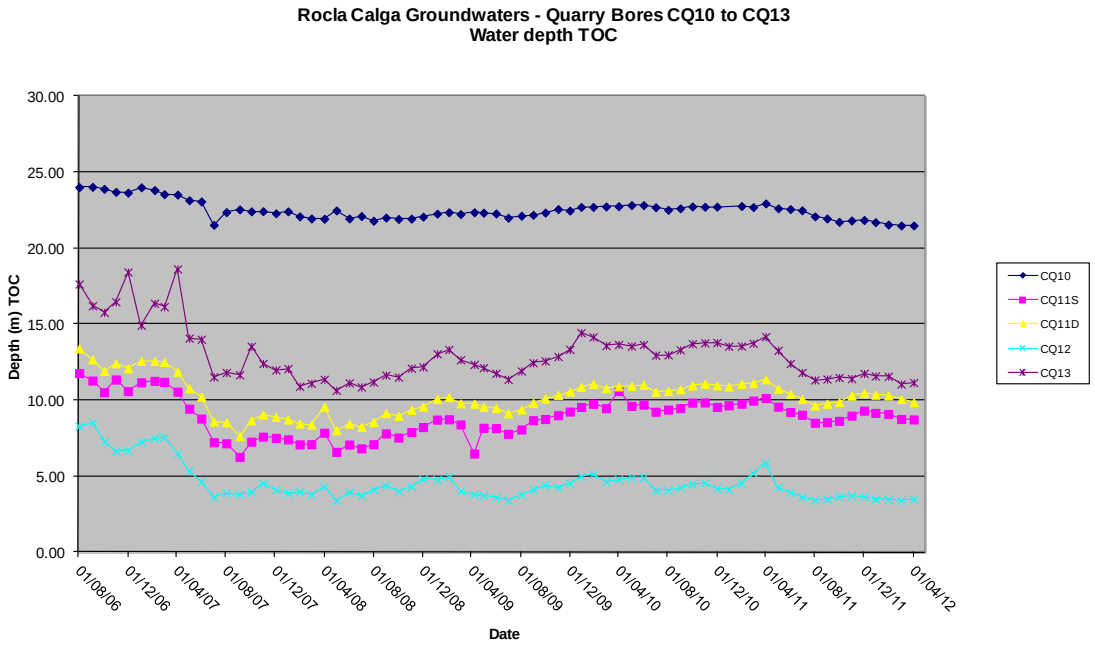
Shading is used to indicate the following trends in water depth (compared to the last reading):

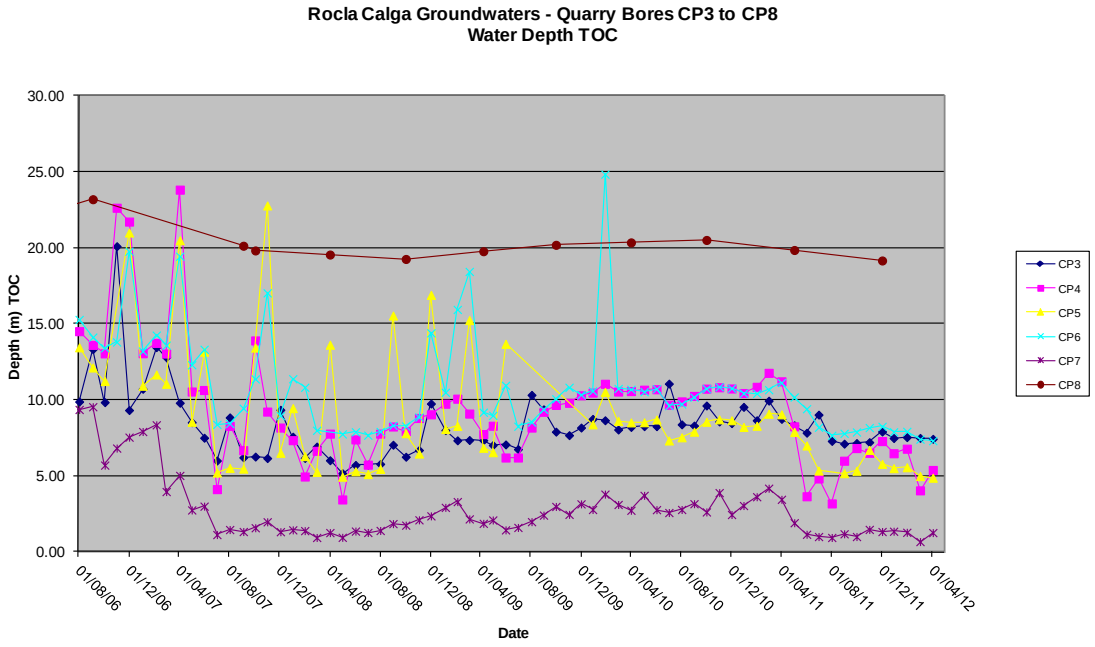
	Increase to ground water depth (water moved away from surface)
	Decrease to ground water depth (water moved towards surface)
	Stable water depth (+/- 0.01m)

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

Figures 3 to 6: Groundwater Depth Charts.






Rocla Calga Groundwaters - Quarry Bores CP3 to CP8
Water Depth TOC
Depth (m) TOC
30.00
25.00
20.00
15.00
10.00
5.00
0.00
01/08/06
01/12/06
01/04/07
01/08/07
01/12/07
01/04/08
01/08/08
01/12/08
01/04/09
01/08/09
01/12/09
01/04/10
01/08/10
01/12/10
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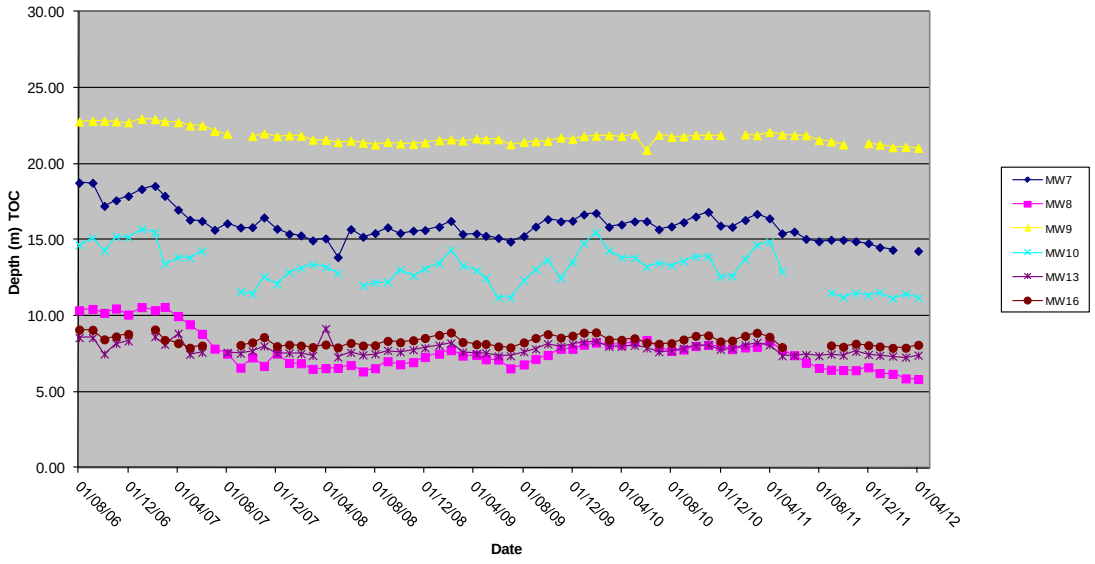
01/08/11
01/12/11
01/04/12
Date
CP3
CP4
CP5
CP6
CP7
CP8


Rocla Calga Groundwaters - Quarry Bores MW7 to MW16
Water Depth TOC
Depth (m) TOC
30.00
25.00
20.00
15.00
10.00
5.00
0.00
01/08/06
01/12/06
01/04/07
01/08/07
01/12/07
01/04/08
01/08/08
01/12/08
01/04/09
01/08/09
01/12/09
01/04/10
01/08/10
01/12/10
01/04/11
01/08/11
01/12/11
01/04/12
Date
MW7
MW8
MW9
MW10
MW13
MW16

2.3 Meteorological Monitoring

The Rocla Calga Quarry weather station data recovery in March was approximately 100%. 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 March 2012 shows that rainfall recorded at the Rocla Calga Quarry was higher than that recorded at nearby Peats Ridge BOM station and similar to the Gosford BOM station recorded rainfall. Recorded rainfall at Rocla Calga Quarry was higher than the Peats Ridge long term mean rainfall for March. The rainfall comparison is provided below:

Rocla Calga Quarry	164.4 mm
BOM Peats Ridge*	155.8 mm
BOM Gosford*	164.2 mm
BOM Peats Ridge Long term mean for March*	140.3 mm

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

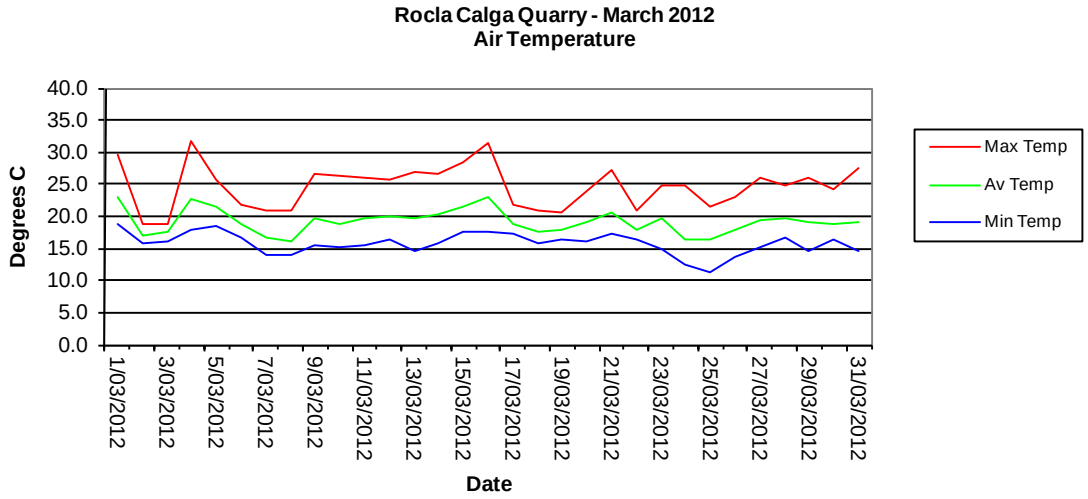
Results are displayed in the following table and figures.

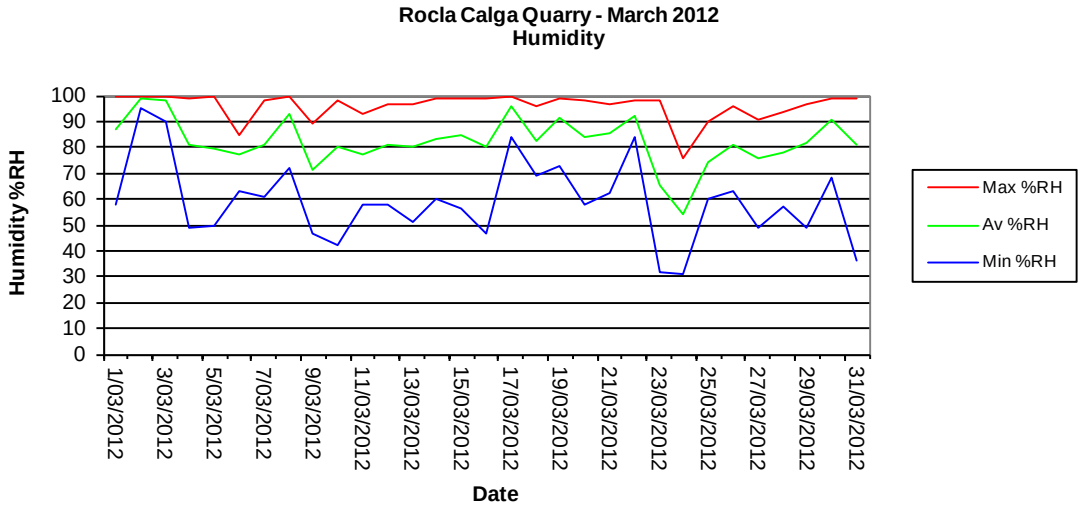
2.3.1 Monthly Meteorological Data Summary

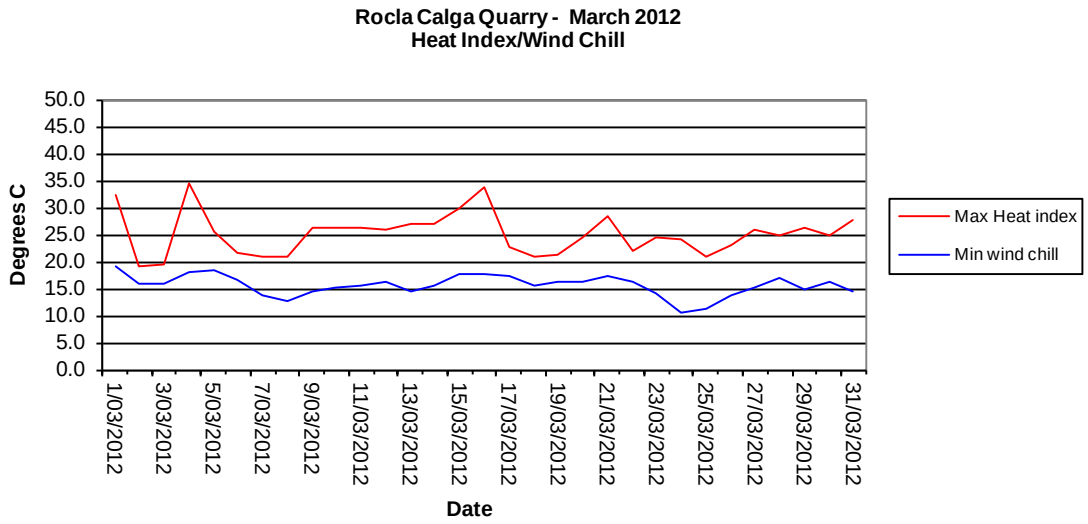
Summary **Mar-12** **Rocla - Calga**

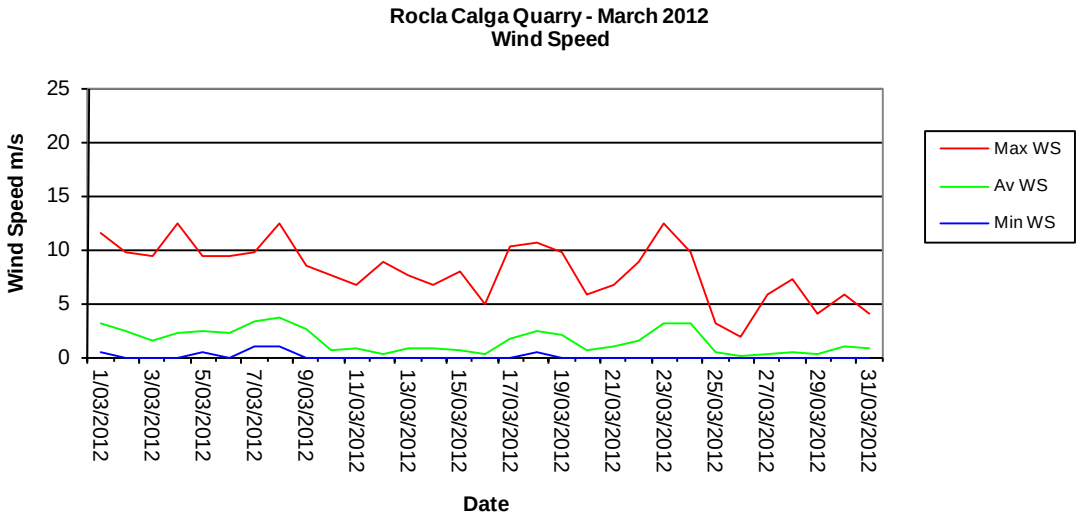
Date	Min Temp	Av Temp	Max Temp	Min %RH	Av %RH	Max %RH	RAIN mm	ET mm	Min WS	Av WS	Max WS	Min wind chill	Max Heat index	Min Atm P	Av Atm P	Max Atm P	Min Solar Rad	Av Solar Rad	Max Solar Rad	Min Data %	Av data %	Max Data %
1/03/2012	18.7	23.0	29.7	58	87	100	12.2	2.7	0.4	3.2	11.6	19.2	32.4	1000.8	1005.4	1010.8	0	127.1	809	82.7	98.9	100
2/03/2012	15.9	17.1	18.7	95	99	100	46.2	0.6	0	2.5	9.8	15.9	19.1	1006.9	1013.4	1019.1	0	39.7	212	85.1	96.7	100
3/03/2012	16.0	17.5	18.7	90	98	100	7.6	0.7	0	1.4	9.4	16.0	19.3	1016.6	1018.2	1019.4	0	42.2	193	81	94.4	100
4/03/2012	18.0	22.8	31.7	49	81	99	6.0	4.1	0	2.1	12.5	18.0	34.4	1008.0	1011.9	1016.4	0	217.4	904	88.9	96.2	100
5/03/2012	18.4	21.4	25.7	50	80	100	1.2	4.2	0.4	2.5	9.4	18.4	25.7	1009.0	1012.8	1017.3	0	232.8	977	90.6	96.4	100
6/03/2012	16.6	18.8	21.8	63	77	85	0.0	2.8	0	2.2	9.4	16.6	21.6	1016.1	1017.3	1018.6	0	134.3	640	88.6	96.7	100
7/03/2012	14.1	16.6	20.8	61	81	98	26.2	2.5	0.9	3.3	9.8	13.7	20.8	1013.4	1016.0	1018.4	0	107.8	763	88.9	97.7	100
8/03/2012	13.9	16.0	20.8	72	93	100	30.8	1.6	0.9	3.7	12.5	12.6	20.9	1005.0	1007.8	1013.0	0	93.5	791	90.9	99.4	100
9/03/2012	15.6	19.7	26.5	47	71	89	0.0	3.4	0	2.6	8.5	14.6	26.1	1007.0	1008.4	1010.9	0	171.9	932	91.8	98.8	100
10/03/2012	15.1	18.9	26.4	42	80	98	0.0	2.9	0	0.6	7.6	15.2	26.1	1010.1	1013.3	1017.3	0	186.7	922	84.8	98.8	100
11/03/2012	15.6	19.7	25.9	58	77	93	0.0	3.1	0	0.8	6.7	15.6	26.2	1014.5	1016.8	1018.5	0	178.4	785	93	98.7	100
12/03/2012	16.3	20.0	25.7	58	81	97	0.0	2.5	0	0.3	8.9	16.4	25.9	1017.1	1018.9	1021.3	0	160.7	856	86	98.0	100
13/03/2012	14.5	19.7	26.9	51	80	97	0.0	3.0	0	0.9	7.6	14.6	27.1	1018.3	1020.1	1022.1	0	179.2	954	91.8	98.6	100
14/03/2012	15.7	20.4	26.5	60	84	99	0.0	2.5	0	0.8	6.7	15.7	27.1	1015.5	1017.9	1019.8	0	149.5	587	80.1	98.4	100
15/03/2012	17.7	21.6	28.5	56	85	99	0.2	2.5	0	0.6	8	17.7	29.7	1012.4	1014.6	1016.9	0	151.1	917	86.8	97.8	100
16/03/2012	17.7	22.9	31.3	47	80	99	0.0	2.3	0	0.3	4.9	17.8	33.8	1007.3	1010.4	1012.9	0	138.5	832	90.4	97.5	100
17/03/2012	17.3	18.7	21.8	84	96	100	17.6	0.5	0	1.8	10.3	17.4	22.6	1008.9	1013.7	1019.3	0	26.9	146	81.3	94.5	100
18/03/2012	15.7	17.7	20.8	69	82	96	2.4	2.2	0.4	2.4	10.7	15.7	20.9	1019.2	1021.1	1022.9	0	104.9	451	89.5	96.7	100
19/03/2012	16.3	17.9	20.6	73	92	99	5.8	1.4	0	2.1	9.8	16.3	21.2	1020.6	1021.6	1023.3	0	74.4	346	83.6	96.1	100
20/03/2012	16.2	19.0	23.8	58	84	98	2.2	1.7	0	0.7	5.8	16.2	24.3	1013.5	1017.3	1020.6	0	104.0	411	90.4	98.5	100
21/03/2012	17.2	20.7	27.2	62	86	97	0.2	2.0	0	1.1	6.7	17.2	28.3	1002.7	1007.4	1013.3	0	108.7	527	85.7	98.7	100
22/03/2012	16.3	17.8	20.9	84	92	98	0.6	0.8	0	1.5	8.9	16.2	21.8	1003.5	1006.9	1009.5	0	42.3	238	74.9	96.7	100
23/03/2012	15.0	19.8	24.9	32	65	98	0.0	3.7	0	3.1	12.5	14.1	24.3	1000.9	1003.5	1008.5	0	138.0	851	83	95.7	100
24/03/2012	12.4	16.4	24.8	31	54	76	0.0	3.7	0	3.2	9.8	10.7	24.1	1008.6	1012.5	1018.3	0	124.0	849	93.6	98.7	100
25/03/2012	11.3	16.3	21.4	60	74	90	0.0	1.8	0	0.4	3.1	11.4	20.9	1018.1	1020.8	1022.5	0	104.5	497	98.2	99.9	100
26/03/2012	13.8	17.9	23.1	63	81	96	0.4	1.5	0	0.1	1.8	13.8	23.0	1019.8	1021.5	1023.1	0	87.3	473	89.5	96.4	100
27/03/2012	15.1	19.5	25.9	49	75	91	0.0	2.0	0	0.3	5.8	15.1	26.0	1020.4	1021.8	1022.9	0	109.3	818	84.8	98.4	100
28/03/2012	16.8	19.7	24.8	57	78	94	0.0	1.6	0	0.5	7.2	16.8	24.9	1018.4	1020.5	1022.6	0	94.3	386	92.1	97.7	100
29/03/2012	14.7	19.0	25.9	49	81	97	3.6	1.2	0	0.3	4	14.7	26.2	1015.3	1017.4	1018.9	0	66.1	585	79.2	94.1	100
30/03/2012	16.4	18.7	24.2	68	91	99	1.0	1.3	0	0.9	5.8	16.4	24.9	1015.6	1017.3	1019.0	0	88.3	484	77.5	95.9	100
31/03/2012	14.5	19.1	27.5	36	81	99	0.2	1.8	0	0.8	4	14.5	27.7	1015.1	1016.9	1018.7	0	102.9	680	69.9	98.4	100
Monthly	11.3	19.2	31.7	31	82	100	164.4	68.3	0	1.5	12.5	10.7	34.4	1000.8	1014.9	1023.3	0	118.9	977	69.9	97.4	100

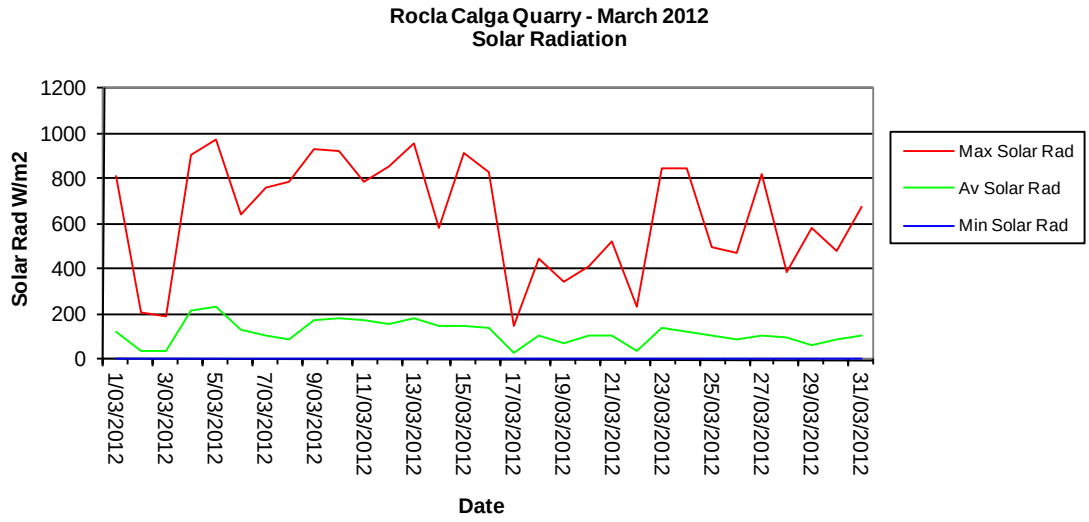
2.3.2 Monthly Weather Charts

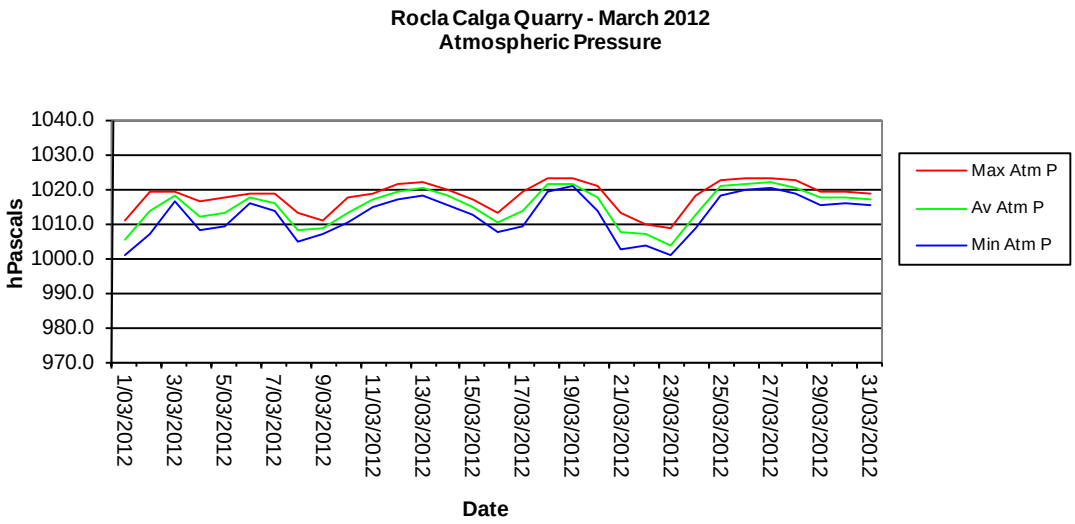


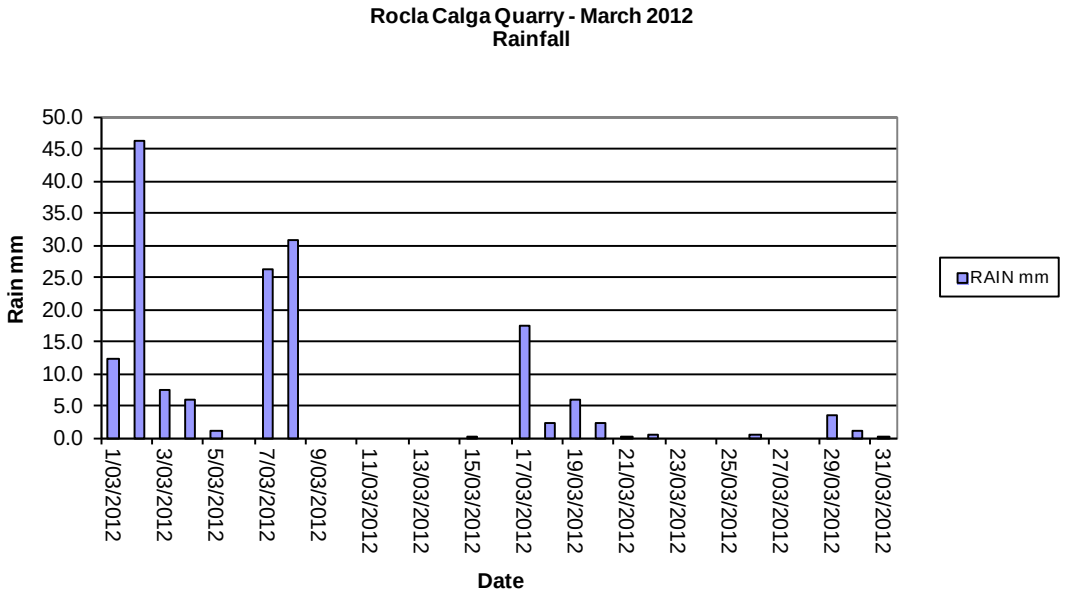


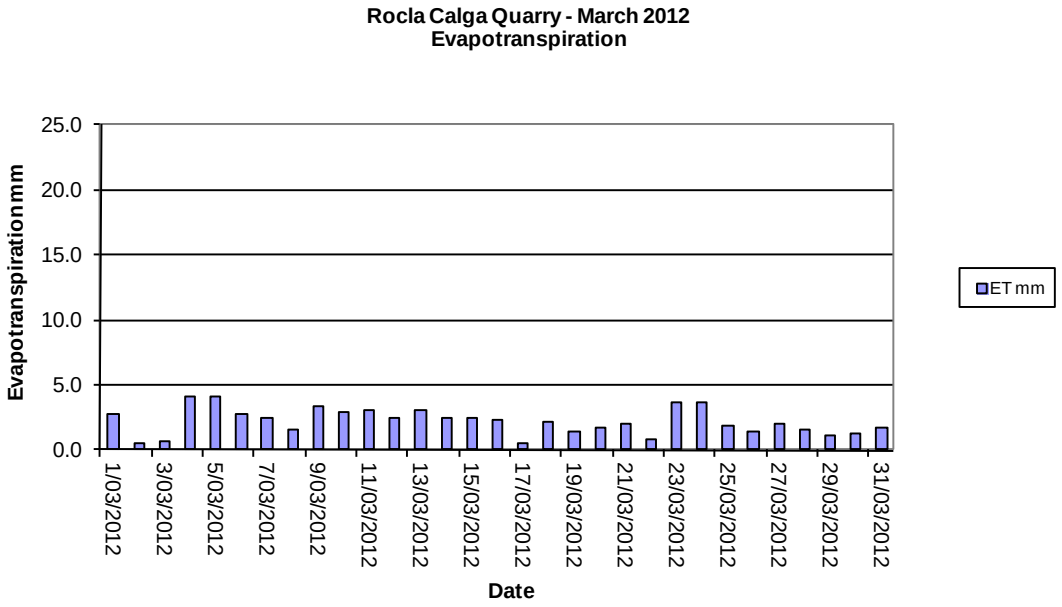


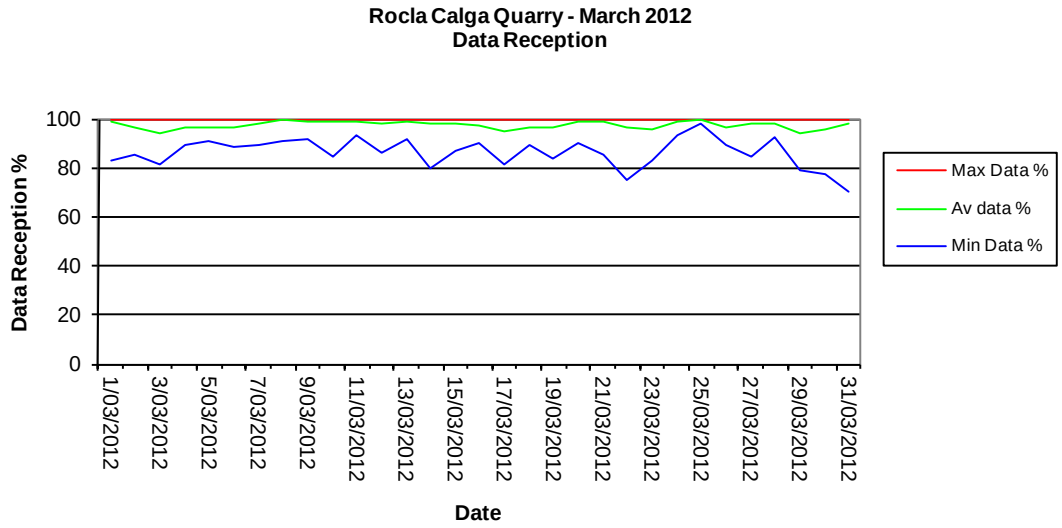

Rocla Calga Quarry - March 2012
Wind Speed
Wind Speed m/s
25
20
15
10
5
0
1/03/2012
3/03/2012
5/03/2012
7/03/2012
9/03/2012
11/03/2012
13/03/2012
15/03/2012
17/03/2012
19/03/2012
21/03/2012
23/03/2012
25/03/2012
27/03/2012
29/03/2012
31/03/2012
Date
Max WS
Av WS
Min WS


Rocla Calga Quarry - March 2012
Solar Radiation
Solar Rad W/m2
1200
1000
800
600
400
200
0
1/03/2012
3/03/2012
5/03/2012
7/03/2012
9/03/2012
11/03/2012
13/03/2012
15/03/2012
17/03/2012
19/03/2012
21/03/2012
23/03/2012
25/03/2012
27/03/2012
29/03/2012
31/03/2012
Date
Max Solar Rad
Av Solar Rad
Min Solar Rad


Rocla Calga Quarry - March 2012
Atmospheric Pressure
hPascals
1040.0
1030.0
1020.0
1010.0
1000.0
990.0
980.0
970.0
1/03/2012
3/03/2012
5/03/2012
7/03/2012
9/03/2012
11/03/2012
13/03/2012
15/03/2012
17/03/2012
19/03/2012
21/03/2012
23/03/2012
25/03/2012
27/03/2012
29/03/2012
31/03/2012
Date
Max Atm P
Av Atm P
Min Atm P


Rocla Calga Quarry - March 2012
Rainfall
Rain mm
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1/03/2012
3/03/2012
5/03/2012
7/03/2012
9/03/2012
11/03/2012
13/03/2012
15/03/2012
17/03/2012
19/03/2012
21/03/2012
23/03/2012
25/03/2012
27/03/2012
29/03/2012
31/03/2012
Date
RAIN mm

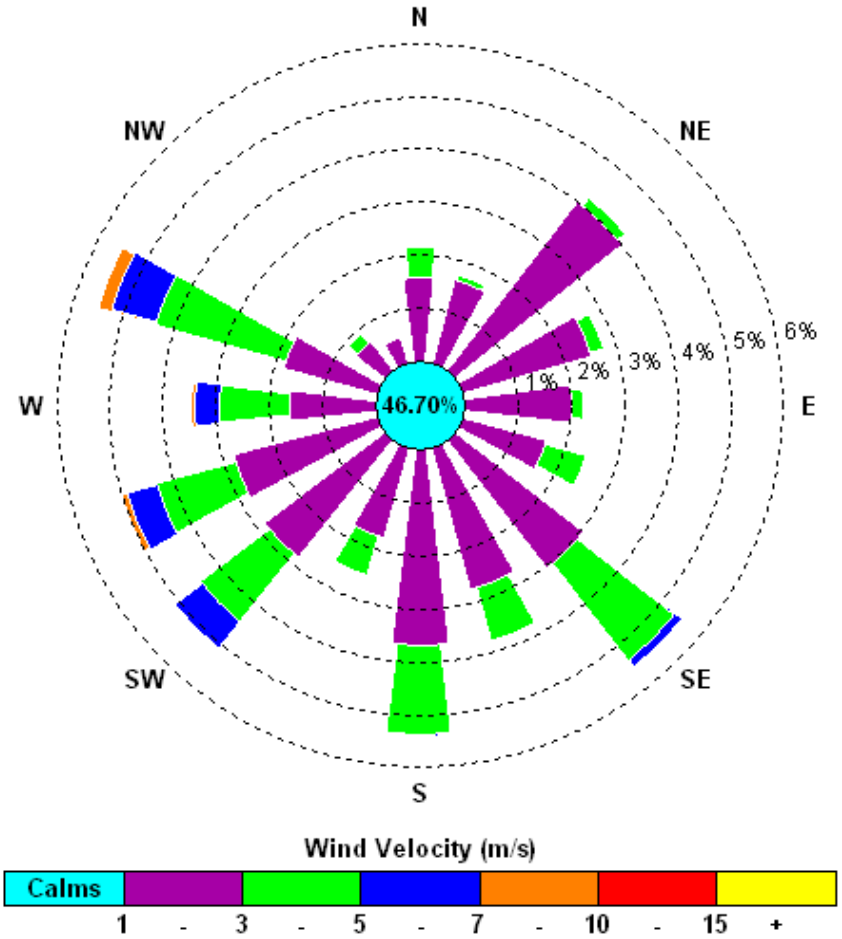

Rocla Calga Quarry - March 2012
Evapotranspiration
Evapotranspiration mm
25.0
20.0
15.0
10.0
5.0
0.0
1/03/2012
3/03/2012
5/03/2012
7/03/2012
9/03/2012
11/03/2012
13/03/2012
15/03/2012
17/03/2012
19/03/2012
21/03/2012
23/03/2012
25/03/2012
27/03/2012
29/03/2012
31/03/2012
Date
ET mm


Rocla Calga Quarry - March 2012
Data Reception
Data Reception %
100
80
60
40
20
0
1/03/2012
3/03/2012
5/03/2012
7/03/2012
9/03/2012
11/03/2012
13/03/2012
15/03/2012
17/03/2012
19/03/2012
21/03/2012
23/03/2012
25/03/2012
27/03/2012
29/03/2012
31/03/2012
Date
Max Data %
Av data %
Min Data %

2.3.3 Monthly Windrose Plot

Frequency plot of the average wind speed and average direction over each 15 minute sampling period. Wind is considered to be calm when less than a 15 minute average of 1m/s.

00:01, 1 March 2012 – 23:45, 31 March 2012



The predominant winds were from the SE, with strongest winds from the SE and WNW. The maximum wind speed was 12.5 m/s from the NNE.

Appendix 1

Laboratory Certificates

Appendix 2

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

Peats Ridge, New South Wales
March 2012 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Th	18.8	30.0	4.4	2.4					21.1	92	7	NW	9		29.9	56	7	NW	19	
2	Fr	16.1	17.5	26.6	4.8					17.2	97	8	S	4		17.2	99	8	SE	4	
3	Sa	15.0	21.2	31.2	0.8					16.6	97	8	SE	4		17.8	90	8	E	4	
4	Su	16.2	29.8	1.6	0.4					21.2	80	1	N	4							
5	Mo	18.8	24.9	3.4	4.8					19.6	86	8	SW	4		24.0	58	2	SE	19	
6	Tu	15.1	20.8	0	3.8					19.1	78	3	SSW	9		19.6	73	5	SSW	19	
7	We	14.3	20.0	0.4	2.8					15.1	79	6	SW	19		18.5	72	7	E	4	
8	Th	13.0	19.9	38.4	0.2					13.7	97	8	NW	9		18.6	80	5	SW	19	
9	Fr	13.2	26.6	19.4	2.2					18.9	68	0	NW	9		25.6	55	4	SSW	4	
10	Sa	13.3	25.6	0	3.4					18.5	83	1	NW	4		25.2	41	3	S	4	
11	Su	13.8	24.0	0	4.6					17.4	88	0	SW	4		22.7	70	3	SE	4	
12	Mo	15.7	23.7	0	3.4					19.1	92	8	ENE	4		22.9	67	5	N	9	
13	Tu	12.9	26.6	0	2.6					19.9	74	0	NE	4		24.3	65	1	SE	9	
14	We	13.8	23.6	0	3.6					19.4	92	2	NE	4		23.1	74	8	E	19	
15	Th	16.2	26.7	0	3.2					18.2	98	8	E	4		25.5	67	4	E	19	
16	Fr	16.0	29.1	0	3.4					19.1	97	7	ENE	4		28.6	55	4	NE	9	
17	Sa	18.5	19.7	11.2	3.4					19.3	97	8	SW	4		17.7	97	8	S	4	
18	Su	14.3	20.2	3.4	1.6					16.1	85	6	SSW	4		19.6	71	4	SE	9	
19	Mo	15.1	21.1	5.2	4.0					17.2	94	8	S	4		18.9	84	8	E	4	
20	Tu	14.0	23.7	8.4	1.8					18.5	90	5	SE	4		21.6	68	8	E	9	
21	We	15.7	24.8	0.4	2.4					18.3	97	8	NE	4		23.8	75	5	NE	9	
22	Th	15.4	19.8	0.4	2.6					15.9	98	8	S	4		17.5	93	8	SSW	4	
23	Fr	15.4	24.7	0.8	0.8					19.8	80	1	NW	9		24.5	35	0	W	9	
24	Sa	10.5	22.1	0	5.2					14.4	56	0	W	19		21.2	34	0	S	9	
25	Su	10.2	20.6	0	4.4					15.0	79	5	E	4		20.0	64	6	E	9	
26	Mo	12.5	22.5	0	1.2					16.8	91	6	E	9		20.6	73	7	E	9	
27	Tu	14.8	24.8	0	2.2					18.6	76	1	NE	4		23.5	62	5	E	4	
28	We	15.7	24.6	0	4.2					17.6	93	8	E	4		22.6	66	6	E	4	
29	Th	13.2	26.3	0	2.4					18.5	81	1	ENE	4		23.5	64	3	E	9	
30	Fr	15.0	22.4	0.6	3.0					17.6	92	7	SE	4		21.0	74	6	E	9	
31	Sa	13.0		0	2.0					16.5	96	1	E	4		23.8	71	0	SE	9	
Statistics for March 2012																					
Mean		14.7	23.6		2.8					17.9	87	4		5		22.1	68	4		9	
Lowest		10.2	17.5		0.2					13.7	56	0	#	4		17.2	34	0	#	4	
Highest		18.8	30.0	38.4	5.2					21.2	98	8	#	19		29.9	99	8	#	19	
Total				155.8	87.6																

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.

IDCJDW2110.201203 Prepared at 13:01 UTC on 21 Apr 2012

Gosford, New South Wales
March 2012 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Th	20.3	31.3	7.6			NNW	28	14:14	22.7	99		NNW	7		30.8	54		NNE	9	
2	Fr	18.0	19.5	31.0			SSE	30	23:01				SE	11		18.6	99		SE	11	
3	Sa	16.3	21.7	26.8			NNW	24	22:39					Calm		20.3	87		E	7	
4	Su	17.3	29.0	2.2			SSE	24	17:54	21.4	94		NNW	11		28.2	69		NE	9	
5	Mo	18.7	26.2	3.8			SSE	28	14:15	20.5	99			Calm		24.5	57		SE	15	
6	Tu	16.7	23.6	0.4			SSE	35	15:09	20.5	77		SSW	4		22.5	67		SE	15	
7	We	16.9	22.4	0.2			ESE	35	20:01	17.0	76		SSE	9		22.2	62		SSE	7	
8	Th	14.7	22.1	35.6			WNW	35	11:28	15.1	99		NNW	13		20.5	86		W	9	
9	Fr	13.1	28.0	25.6			NNW	26	11:36	20.4	69		NNW	7		27.2	40		NNW	7	
10	Sa	13.0	27.2	0			ESE	28	14:49	18.1	100			Calm		24.6	55		SE	13	
11	Su	14.4	25.0	0.2			E	24	15:18	20.3	87		E	6		24.2	64		NE	9	
12	Mo	15.6	25.1	0			SE	30	15:25	19.4	100			Calm		24.6	69		E	13	
13	Tu	12.9	25.8	1.0			ENE	22	15:55	17.9	100			Calm		25.1	55		NE	9	
14	We	13.7	25.5	0			NNE	22	17:02	19.3	100			Calm		24.7	67		E	6	
15	Th	16.6	27.3	0			ENE	26	16:04				N	6		26.1	67		NE	9	
16	Fr	16.4	29.9	0			E	22	14:18				N	6		28.2	66		ENE	11	
17	Sa	19.6	19.8	16.2			SSE	24	21:09	19.6	100		SE	9		19.1	99		S	7	
18	Su	16.3	22.4	3.6			SE	35	14:08	18.4	81		SSW	7		21.3	70		SE	17	
19	Mo	15.8	22.9	4.6			S	35	14:54					Calm		21.9	72		SE	15	
20	Tu	14.9	24.8	2.8			ESE	19	09:23	18.6	100			Calm		23.5	59		ESE	9	
21	We	15.4	26.4	0.4			NNW	20	10:09					Calm		25.2	73		N	7	
22	Th	17.6	20.9	0			SE	35	02:38	17.9	99		S	6		20.4	90		SSE	2	
23	Fr	16.6	26.6	0			NW	33	10:31	20.8	98		ENE	2		26.3	29		WNW	9	
24	Sa	8.2	24.1	0			SSW	26	11:06	16.5	49		NW	11		22.8	32		SSE	7	
25	Su	10.6	21.9	0			SSE	20	13:33	15.7	93			Calm		20.9	64		SE	7	
26	Mo	13.3	23.8	0			N	22	10:02	16.1	100			Calm		22.0	67		ESE	11	
27	Tu	13.3	25.5	0			ENE	48	14:02	17.0	99			Calm		24.1	51		E	9	
28	We	16.1	25.1	0			ESE	22	14:09	18.9	100			Calm		24.7	59		NE	7	
29	Th	13.0	26.5	0			SE	19	13:16	17.5	99			Calm		24.9	54		ESE	9	
30	Fr	15.5	23.9	2.0			SE	19	13:37				NW	4		22.5	71		SE	9	
31	Sa	12.0	26.6	0.2			ESE	17	15:08					Calm		25.8	51		ESE	9	
Statistics for March 2012																					
Mean		15.3	24.9							18.7	92			3		23.8	64			9	
Lowest		8.2	19.5							15.1	49			Calm		18.6	29		SSE	2	
Highest		20.3	31.3	35.6			ENE	48		22.7	100		NNW	13		30.8	99		SE	17	
Total				164.2																	

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.

IDCJDW2048.201203 Prepared at 13:00 UTC on 21 Apr 2012