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

February 2012

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

The February 2012 dust deposition results show generally similar or lower levels of insoluble solids compared to January 2012 with the exception of CD1 which showed an increase in dust levels . All sites, on a rolling annual average basis, are currently below the Air Quality Management Plan exceedence 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 March 2012 at sites A, B, D and F. Site C was 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 neutral - slightly acidic range.

Groundwaters were sampled for normal monthly monitoring on 2 March 2012. Groundwater depths generally decreased across the bores compared to last month. pH and EC remained relatively stable, with the exception of MW10, which increased in electrical conductivity.

The meteorological station data recovery for the month was approximately 100%. Recorded rainfall on site for February was 227.8 mm, which was higher than that recorded at the BOM Peats Ridge Station and higher than the Peats Ridge long-term average for February. Results are detailed below:

Rocla Calga Quarry	227.8 mm
BOM Peats Ridge*	175.6 mm
BOM Gosford*	220.0 mm
BOM Peats Ridge Long term mean for February*	159.3 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**.

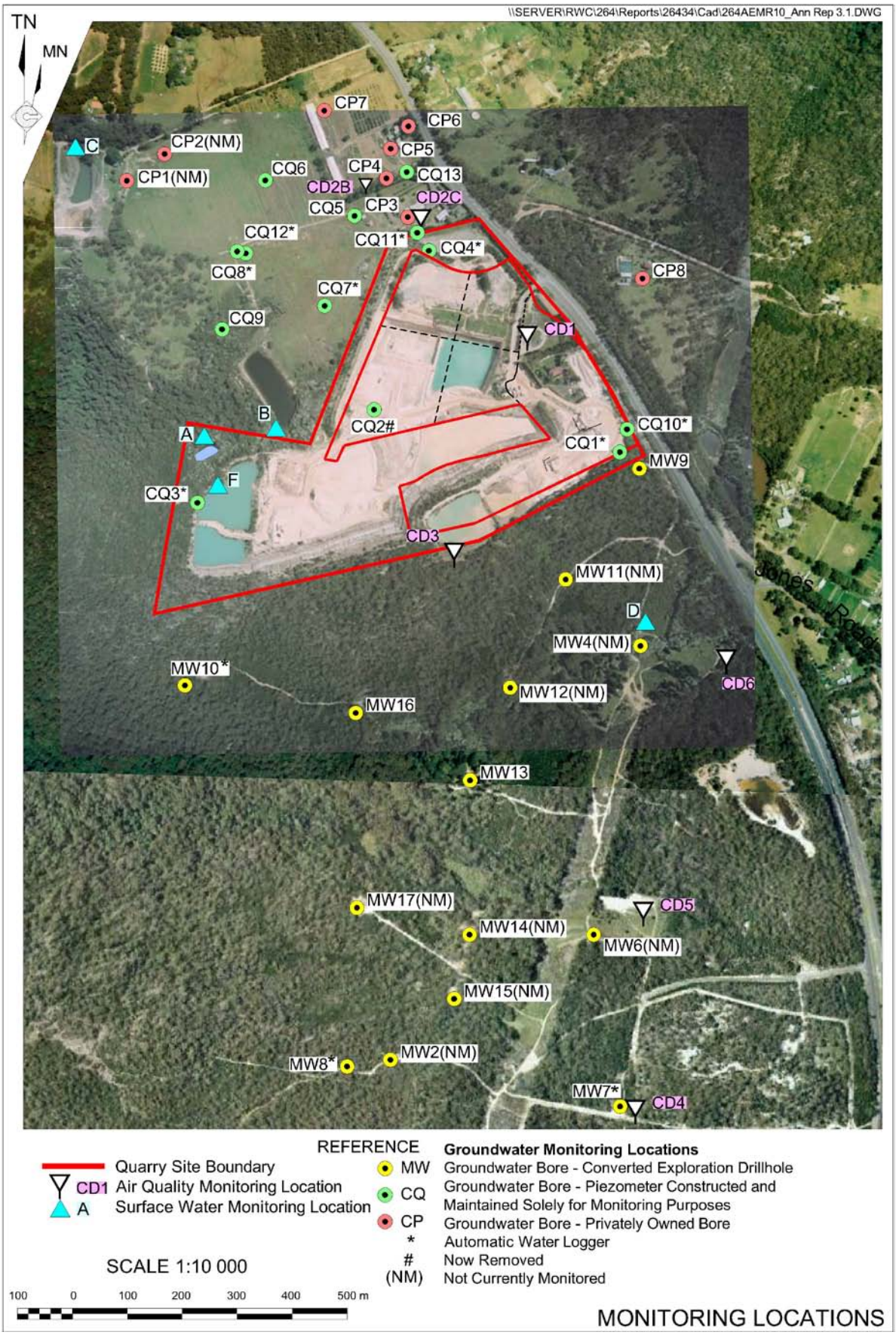


Figure 1: Rocla Calga Quarry environmental monitoring locations

2.0 Monthly Results

2.1 Dust Deposition Gauges

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

Table 1: Dust Deposition results: 30 January 2012 – 2 March 2012 (32 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	**5.6**	5.3	0.3	95	2.1
CD2c	1.9	1.6	0.3	84	0.9
CD3	0.7	0.7	<0.1	100	0.7
CD4	0.3	0.1	0.2	33	0.3
CD5	0.3	0.1	0.2	33	0.2
CD6	0.2	0.2	<0.1	100	0.4

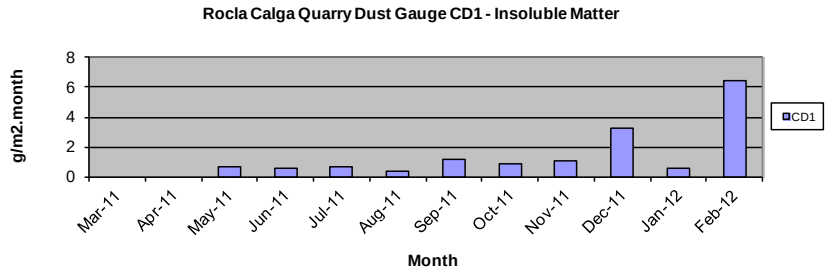
Insoluble Solids marked with an * indicate an excessively contaminated gauge. Contamination can include bird droppings, vegetation (such as plant matter, algae, pollen and seeds) and insects. Results in bold indicate insoluble solids levels above 3.7 g/m^2.month; the Development Consent's annual average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

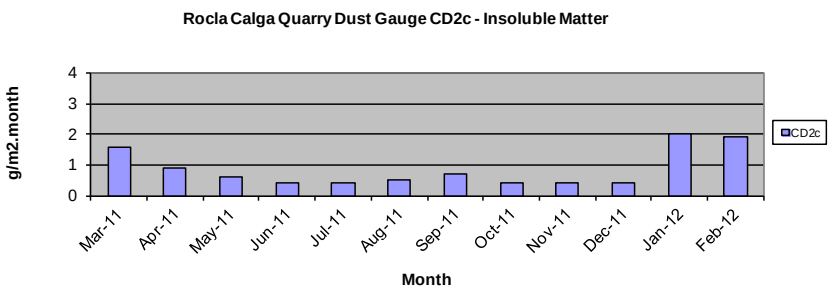
NA= Not Available.

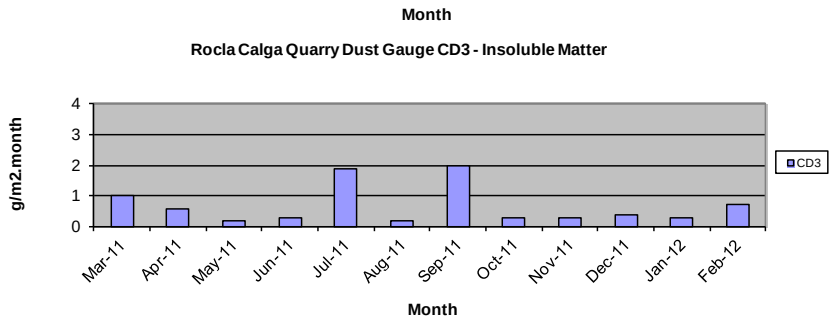
CD1 was installed on the 1 May 2006. CD2a was discontinued at the start of August 2006 due to quarry operations "mining out" the site of the gauge. The replacement gauge, Site CD2b, was located in a position adjacent to the boundary between B. Kashouli and F. & J. Gazzana in conformance with the Air 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.

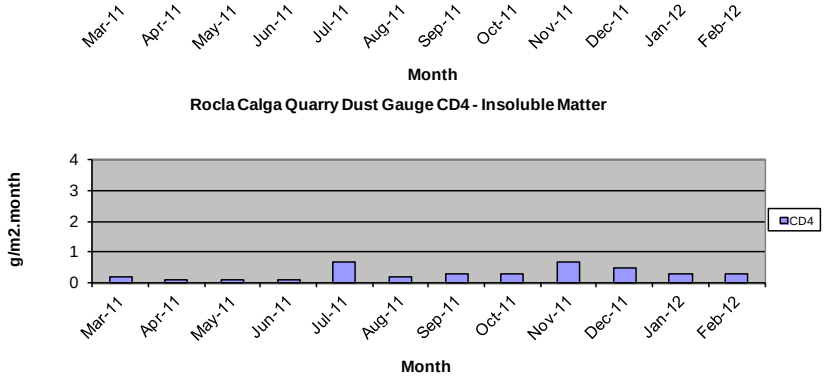
Dust deposition charts for all dust gauge sites appear in **Figure 2** below. The laboratory analysis is provided in **Appendix 1.**

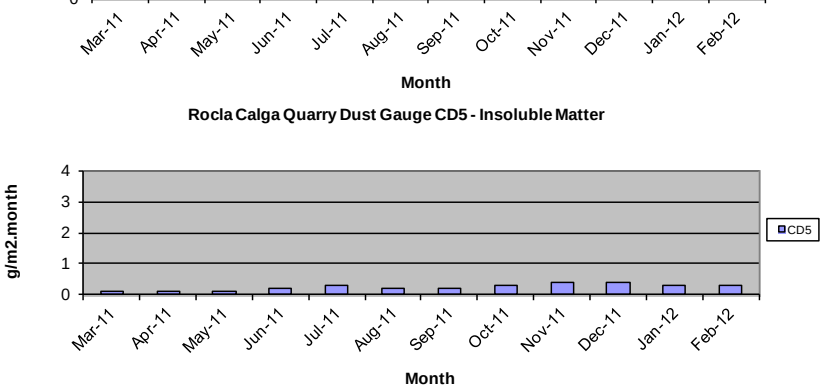
Figure 2: Dust Deposition Charts

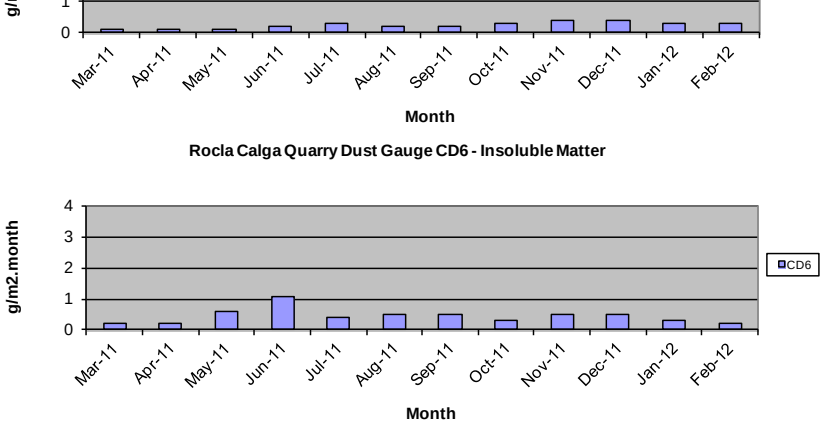












2.2 Water Monitoring

2.2.1 Surface Waters

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

Table 2: Monthly surface water monitoring – February 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	5.66	50	58	10	<5
B	Fast	Clear	Slight	6.73	82	80	6	<5
C	NO ACCESS							
D	Fast	Clear	Slight	6.74	49	70	40	<5
F	Dam	Clear	Clear	5.98	70	49	48	<5

At the time of sampling, there were no water discharges off site from any sampling location. Samples were collected at sites A, B, D and F. Site C was inaccessible and unable to be sampled this month. The samples were collected and analysed for a monthly sampling event. Results show pH within the neutral- 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 March 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 decreased across the sampled groundwater bores compared to last month indicating water moved towards the surface. Exceptions include MW8 and MW9 which both increased in water depth. Both pH and EC levels remained low and relatively stable compared to last month, with the exception of MW9 which increased in electrical conductivity. 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	9.85	6.7	150
CQ4	Voutos	* Monitor	8.78	9.23	4.9	120
CQ5	Gazzana	DIP Only	8.69	5.26	4.7	180
CQ6	Gazzana	DIP Only	16.00	9.81	4.8	240
CQ7	Gazzana	* Monitor	6.89	5.66	5.1	200
CQ8	Gazzana	* Monitor	11.03	5.04	4.6	200
CQ9	Gazzana	DIP Only	10.10	8.45	5.0	140
CQ10	Voutos	* Monitor	NI	21.48	5.8	220
CQ11S	Gazzana	* Monitor	NI	8.75	4.6	210
CQ11D	Gazzana	* Monitor	NI	10.06	5.0	190
CQ12	Gazzana	* Monitor	NI	3.40	4.6	180
CQ13	Kashouli	* Monitor	NI	11.05	4.9	330
CP3	Gazzana	Domestic	10.40	7.49	4.8	200
CP4	Kashouli	Domestic	13.63	4.04	4.4	300
CP5	Kashouli	Domestic	16.61	4.98	4.6	320
CP6	Kashouli	Domestic	16.27	7.41	4.4	320
CP7	Kashouli	Production	8.56	0.67	6.3	370
CP8	Rozmanec	Domestic	22.17	NM	NM	NM
MW7	Rocla Bore	* Monitor	15.76	NM	4.7	150
MW8	Rocla Bore	* Monitor	9.82	5.87	4.7	120
MW9	Rocla Bore	* Monitor	22.44	21.1	4.8	1150
MW10	Rocla Bore	* Monitor	15.41	11.43	4.5	170
MW13	Rocla Bore	DIP Only	NI	7.27	4.6	140
MW16	Rocla Bore	DIP Only	NI	7.89	4.5	150

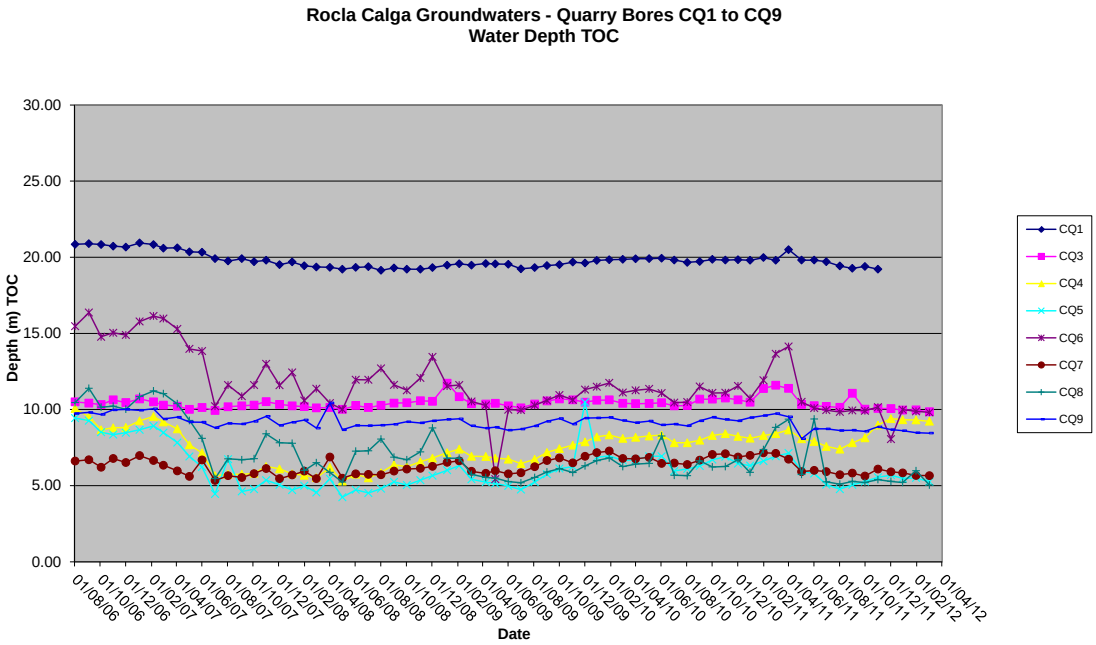
Notes:
TOC = Water level measured from top of bore case to water.
NM = Not Monitored – unable to sample water due to access restrictions.
NR = Not Required by resident.
* = Logger Installed.
NI = These bores were not installed in April 2006 but are now operational. April 2006 was the first set of measurements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

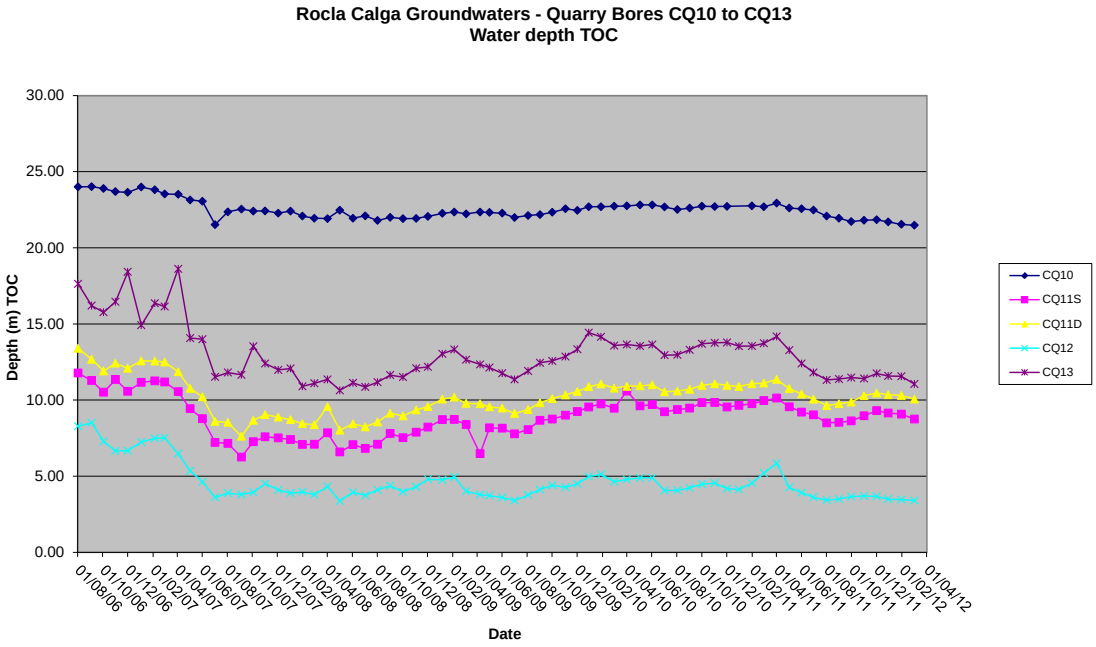
Shading is used to indicate the following trends in water depth (compared to the last reading):

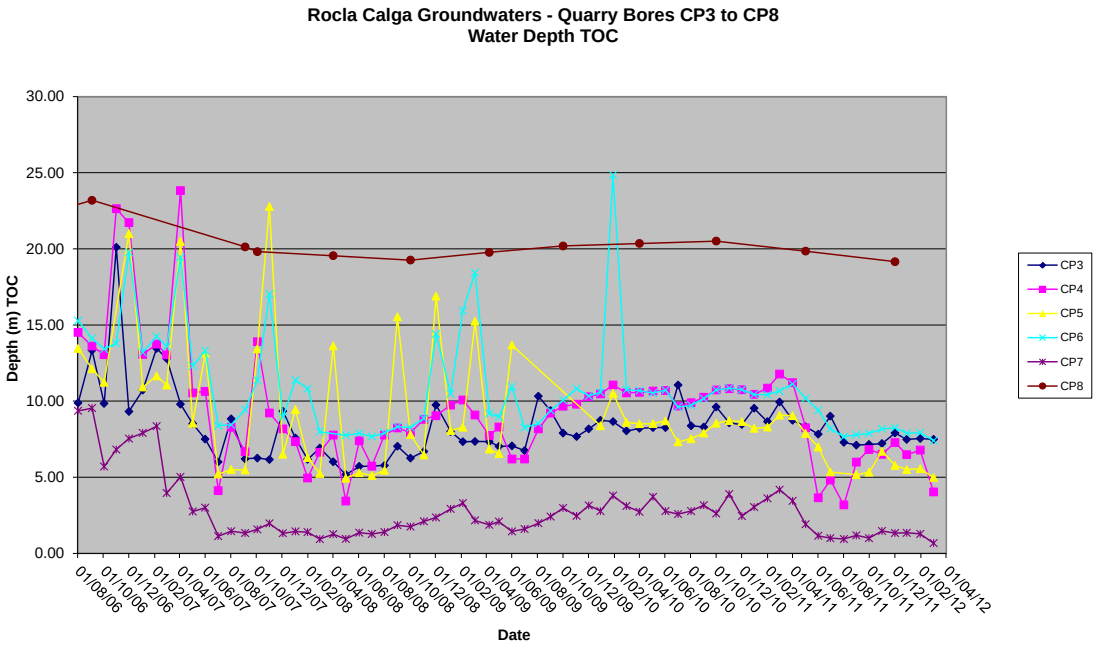
	Increase to ground water depth (water moved away from surface)
	Decrease to ground water depth (water moved towards surface)
	Stable water depth (+/- 0.01m)

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
01/10/06
01/12/06
01/02/07
01/04/07
01/06/07
01/08/07
01/10/07
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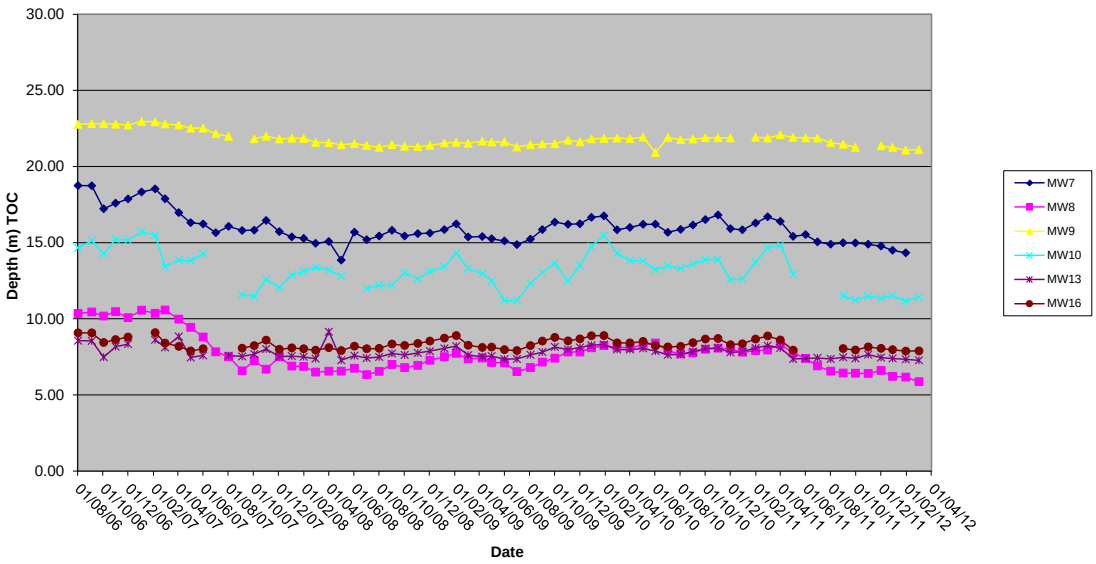
Date
CP3
CP4
CP5
CP6
CP7
CP8


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
01/10/06
01/12/06
01/02/07
01/04/07
01/06/07
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01/04/11
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01/10/11
01/12/11
01/02/12
01/04/12
Date
MW7
MW8
MW9
MW10
MW13
MW16

2.3 Meteorological Monitoring

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

Rocla Calga Quarry	227.8 mm
BOM Peats Ridge*	175.6 mm
BOM Gosford*	220.0 mm
BOM Peats Ridge Long term mean for February*	159.3 mm

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

Results are displayed in the following table and figures.

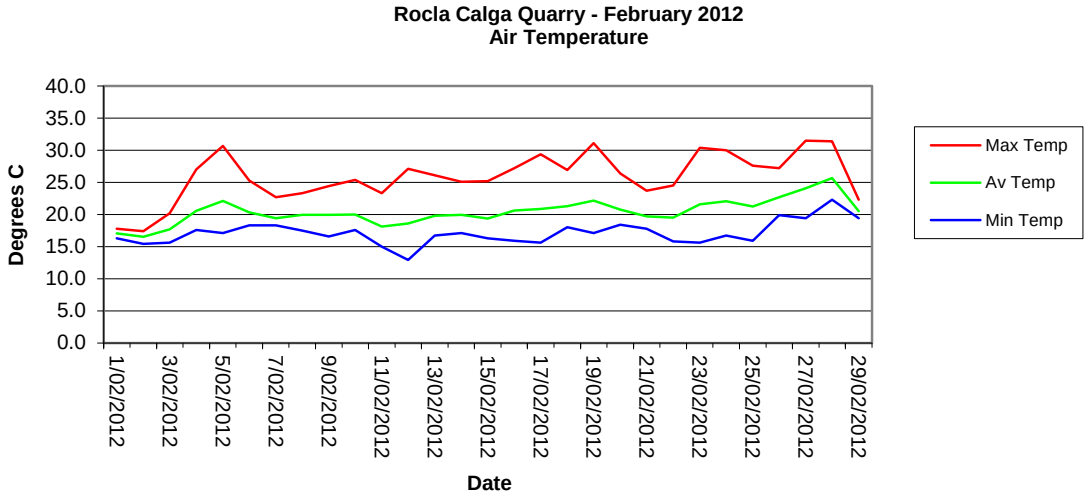
2.3.1 Monthly Meteorological Data Summary

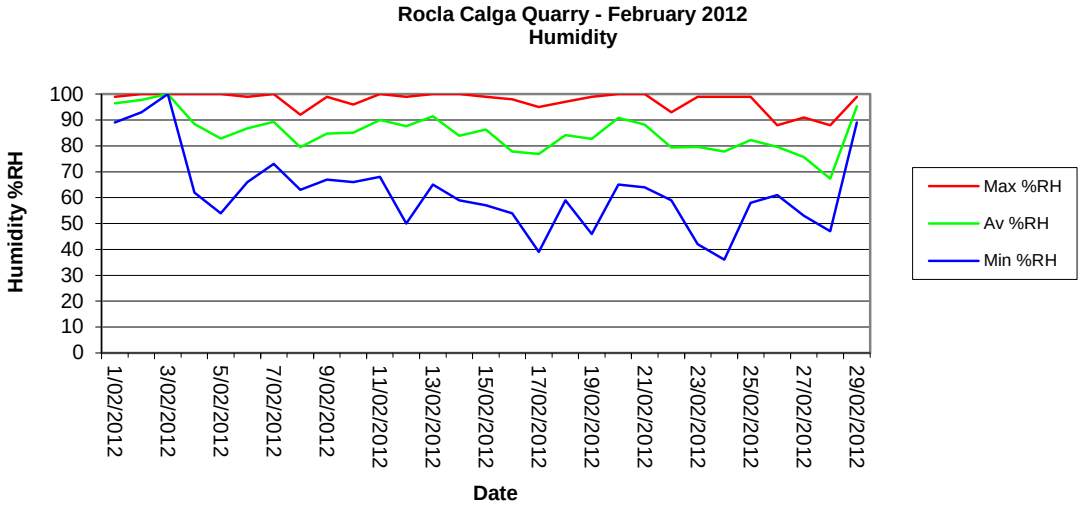
Summary **Feb-12** **Rocla - Calga**

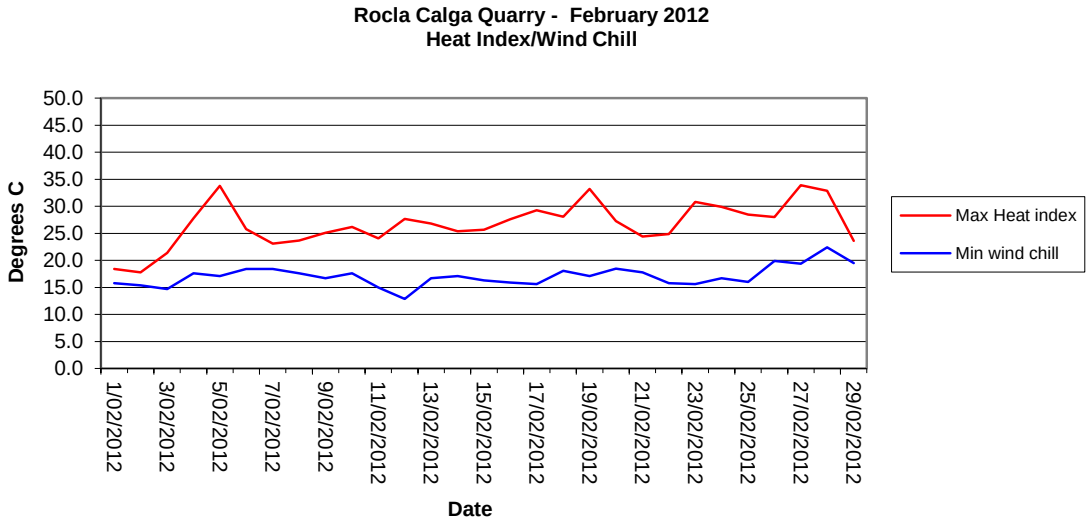
Date	Min Temp	Av Temp	Max Temp	Min %RH	Av %RH	Max %RH	RAIN mm	ET mm	Min WS	Av WS	Max WS	Min wind chill	Max Heat index	Min Atm P	Av Atm P	Max Atm P	Min Solar Rad	Av Solar Rad	Max Solar Rad	Min Data %	Av data %	Max Data %
1/02/2012	16.3	17.1	17.8	89	96	99	36.4	0.5	0.4	2.5	10.7	15.8	18.4	1011.0	1012.8	1014.7	0	38.6	228	88	97.2	100
2/02/2012	15.4	16.5	17.4	93	98	100	36.8	0.6	0	1.8	8.5	15.4	17.8	1006.9	1010.0	1012.4	0	42.4	186	76.3	92.2	100
3/02/2012	15.6	17.7	20.2	100	100	100	24.6	0.8	0	1.5	7.2	14.7	21.4	1003.2	1005.1	1007.0	0	59.2	288	65.5	95.9	100
4/02/2012	17.6	20.6	27.0	62	88	100	11.4	2.8	0	1.2	4.9	17.6	27.8	1002.0	1003.5	1004.8	0	182.2	1094	89.8	96.8	100
5/02/2012	17.1	22.1	30.7	54	83	100	0.2	5.3	0	1.5	7.2	17.1	33.8	998.0	1001.1	1003.9	0	312.8	1050	91.2	97.5	100
6/02/2012	18.3	20.3	25.3	66	87	99	0.0	3.3	0	2.2	9.4	18.4	25.8	997.7	1001.6	1005.6	0	187.9	1040	92.1	99.4	100
7/02/2012	18.3	19.4	22.7	73	89	100	5.4	1.5	0.4	2.1	8	18.4	23.1	1004.4	1006.4	1008.7	0	79.8	571	91.8	96.7	100
8/02/2012	17.5	20.0	23.3	63	80	92	0.0	2.5	0	1.8	8	17.6	23.7	1008.1	1010.4	1012.5	0	124.4	561	86.5	98.5	100
9/02/2012	16.6	19.9	24.4	67	85	99	0.8	2.5	0	1.7	9.8	16.7	25.1	1010.4	1011.8	1013.1	0	118.5	607	92.7	97.3	100
10/02/2012	17.6	20.0	25.4	66	85	96	2.6	2.1	0	1.5	8	17.6	26.2	1007.6	1010.0	1011.6	0	107.0	658	90.4	96.7	100
11/02/2012	15.0	18.1	23.3	68	90	100	16.2	2.2	0	1.9	26.4	15.0	24.1	1008.4	1010.1	1012.3	0	136.7	881	90.4	98.3	100
12/02/2012	12.9	18.6	27.1	50	88	99	12.6	3.8	0	0.7	11.2	12.9	27.7	1011.8	1013.9	1016.6	0	254.6	1014	90.9	99.2	100
13/02/2012	16.7	19.8	26.1	65	91	100	0.4	2.5	0	1.1	6.3	16.7	26.8	1014.9	1016.6	1018.9	0	152.3	1116	88.3	96.3	100
14/02/2012	17.1	20.0	25.1	59	84	100	0.4	3.4	0	0.8	7.2	17.1	25.4	1018.2	1019.5	1021.2	0	218.9	1219	87.4	97.3	100
15/02/2012	16.3	19.4	25.2	57	86	99	19.4	2.5	0	0.6	5.8	16.3	25.7	1017.9	1019.8	1021.6	0	164.3	800	79.5	96.3	100
16/02/2012	15.9	20.6	27.2	54	78	98	0.0	4.3	0	1.3	8	15.9	27.6	1016.0	1018.0	1019.5	0	259.8	1118	86	95.7	100
17/02/2012	15.6	20.9	29.4	39	77	95	0.0	3.7	0	0.9	7.2	15.6	29.3	1014.4	1015.8	1017.0	0	220.1	990	90.1	98.5	100
18/02/2012	18.0	21.3	26.9	59	84	97	0.0	3.5	0	1.0	6.7	18.1	28.1	1013.9	1015.8	1017.6	0	230.0	967	90.4	96.8	100
19/02/2012	17.1	22.1	31.1	46	83	99	16.4	3.9	0	0.9	19.2	17.1	33.2	1010.1	1014.4	1017.5	0	248.7	1007	84.5	97.5	100
20/02/2012	18.4	20.8	26.4	65	91	100	16.4	2.7	0	1.6	7.2	18.5	27.3	1008.7	1010.4	1013.1	0	160.1	876	75.7	95.9	100
21/02/2012	17.8	19.7	23.7	64	88	100	15.6	2.4	0	2.7	11.6	17.8	24.4	1007.6	1010.1	1013.6	0	123.2	485	76.6	96.6	100
22/02/2012	15.8	19.5	24.5	59	79	93	0.0	3.3	0	1.6	7.2	15.8	24.9	1012.5	1014.8	1017.9	0	186.9	913	90.1	97.2	100
23/02/2012	15.6	21.6	30.4	42	80	99	0.2	4.3	0	0.7	6.3	15.6	30.8	1016.7	1018.4	1020.2	0	271.1	968	82.2	97.0	100
24/02/2012	16.7	22.1	30.0	36	78	99	0.2	4.6	0	0.7	5.8	16.7	29.9	1019.2	1021.5	1023.4	0	290.8	973	83.9	98.1	100
25/02/2012	15.9	21.3	27.6	58	82	99	0.2	4.0	0	1.6	8.5	16.0	28.5	1019.7	1021.5	1023.1	0	237.5	1024	84.5	96.8	100
26/02/2012	19.9	22.7	27.2	61	80	88	0.0	2.4	0	1.3	8	19.9	28.0	1016.1	1018.3	1020.5	0	125.8	739	83.3	99.1	100
27/02/2012	19.4	24.1	31.5	53	76	91	0.0	3.0	0	1.0	5.8	19.4	33.9	1013.5	1015.1	1016.9	0	150.9	959	85.1	98.5	100
28/02/2012	22.3	25.7	31.4	47	67	88	0.0	3.4	0	1.1	7.2	22.4	32.9	1010.2	1011.8	1013.4	0	172.5	888	88.6	97.6	100
29/02/2012	19.4	20.5	22.3	89	95	99	11.6	0.7	0	1.5	8	19.5	23.6	1011.1	1012.0	1013.4	0	40.7	247	85.4	97.0	100
Monthly	12.9	20.4	31.5	36	85	100	227.8	82.6	0	1.4	26.4	12.9	33.9	997.7	1012.8	1023.4	0	168.9	1219	65.5	97.2	100

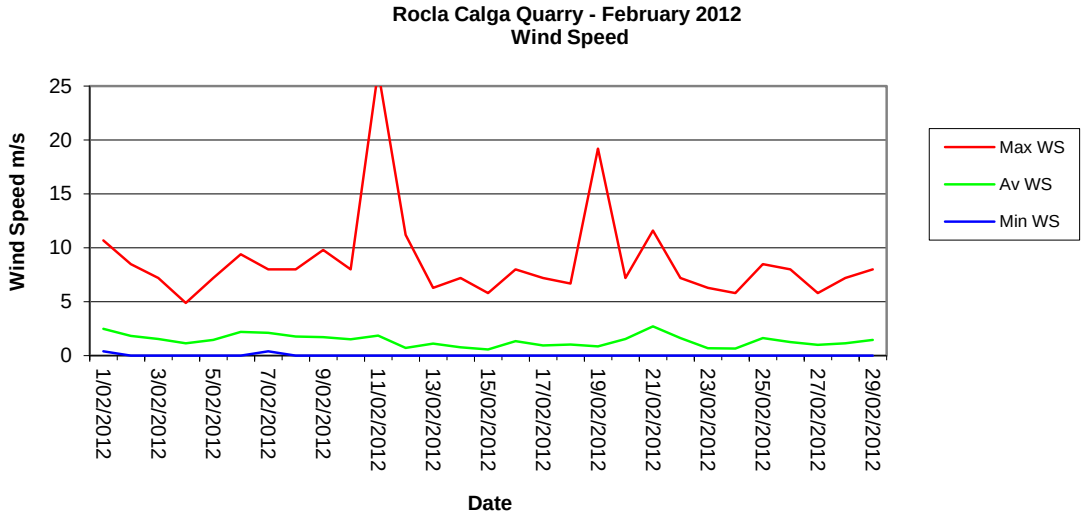
Note: Cells highlighted in yellow denote no available data.

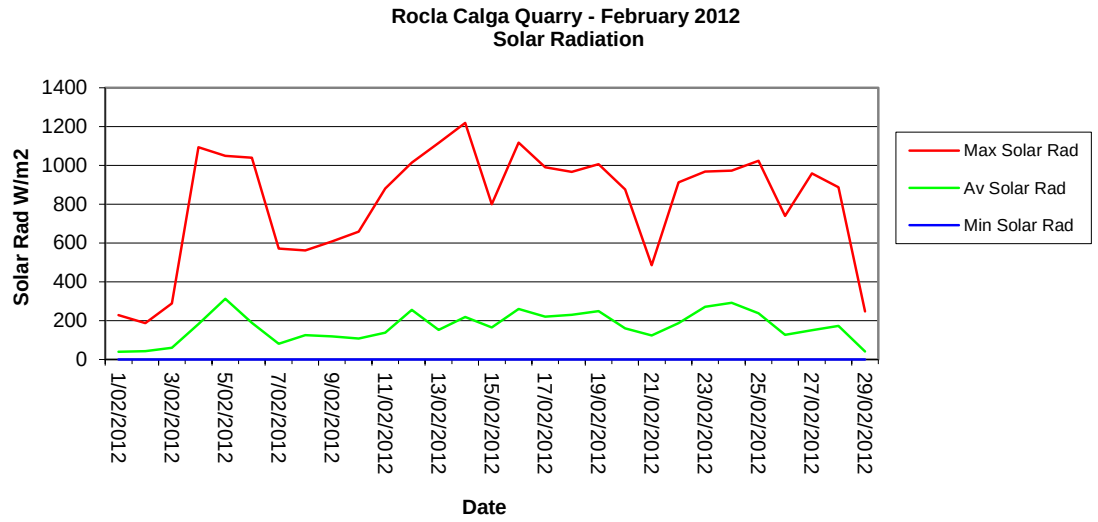
2.3.2 Monthly Weather Charts

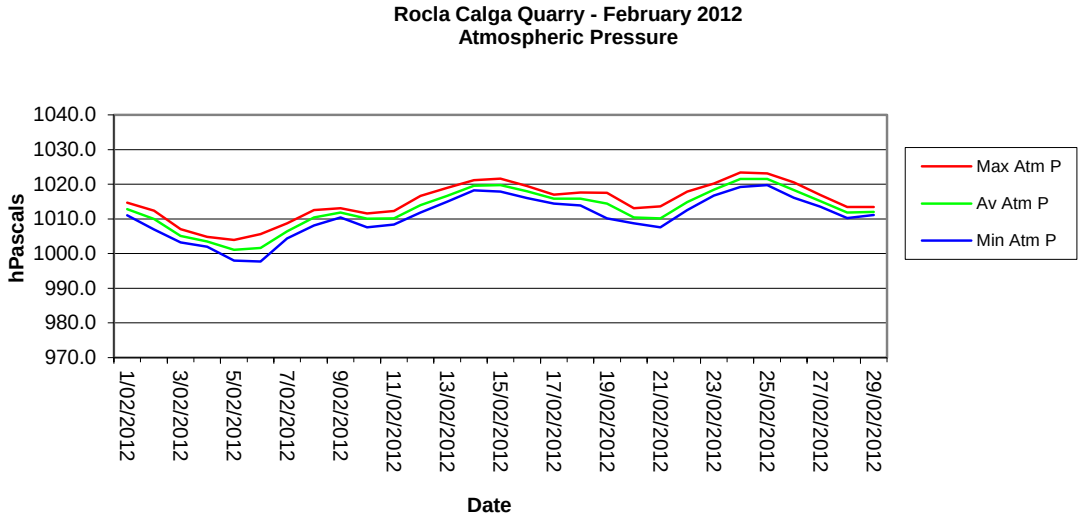


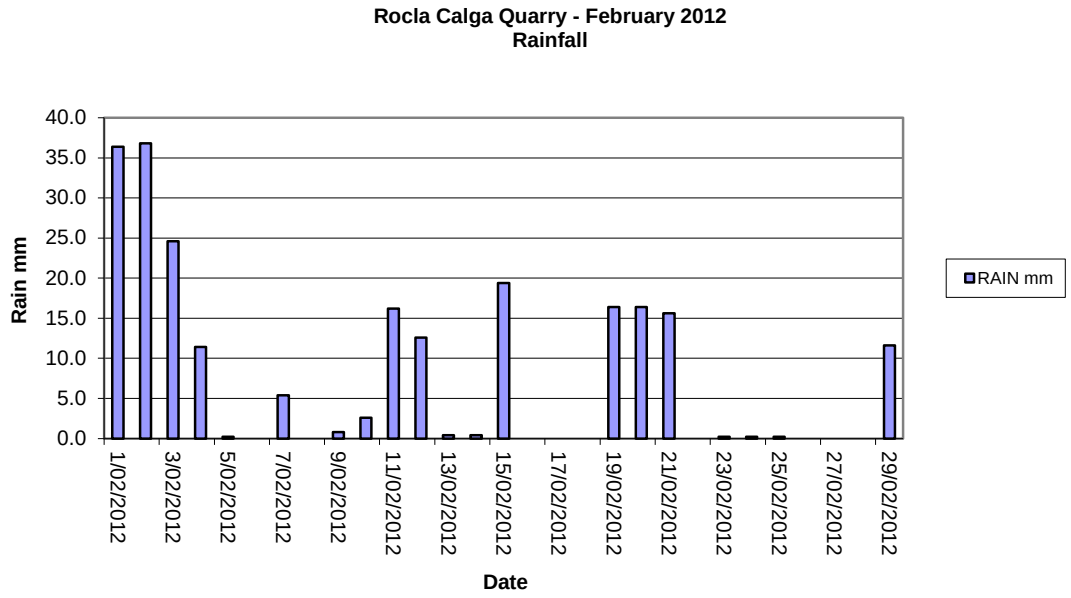


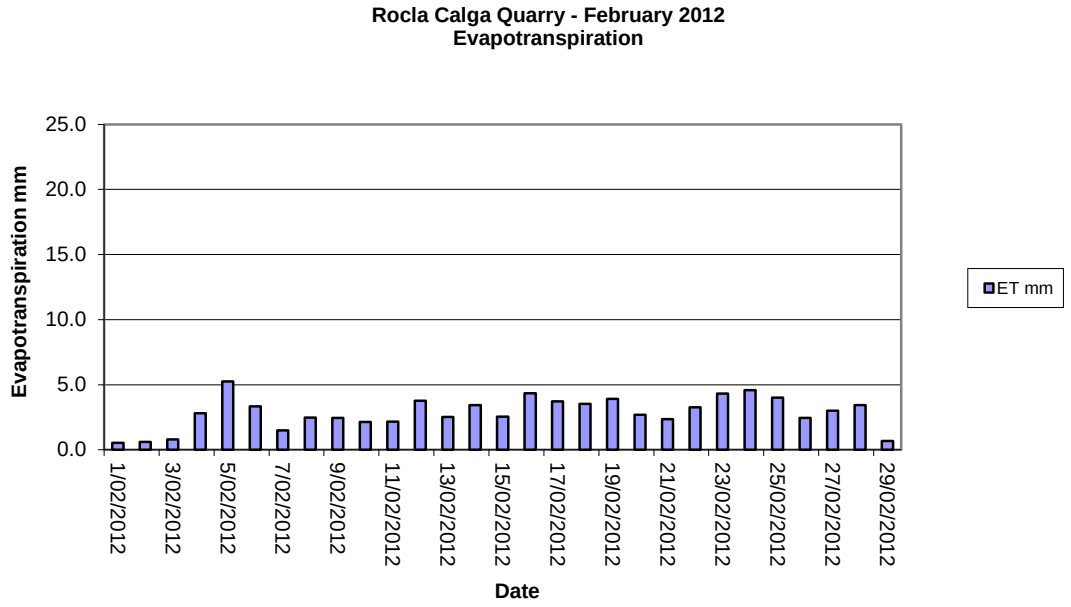


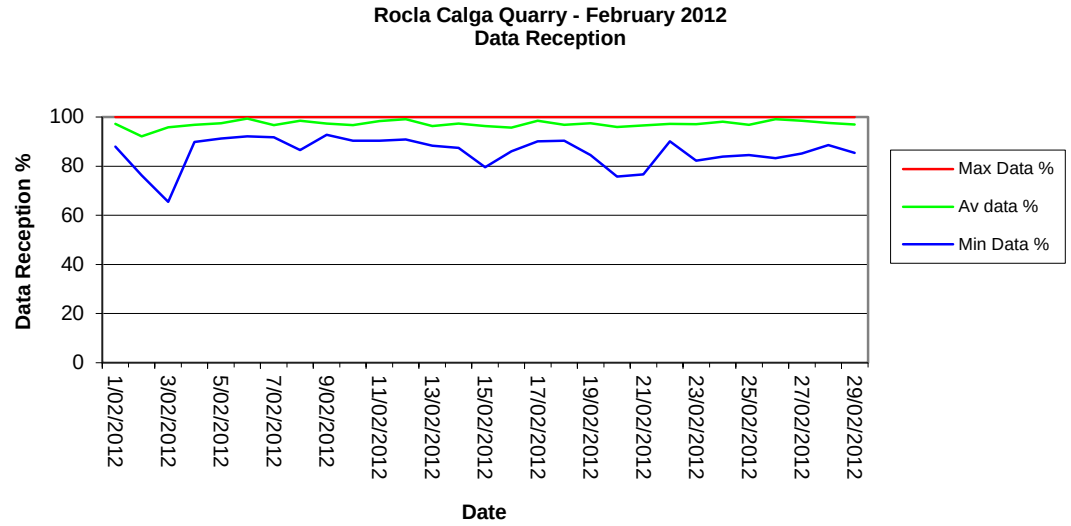

Rocla Calga Quarry - February 2012
Wind Speed
Wind Speed m/s
25
20
15
10
5
0
1/02/2012
3/02/2012
5/02/2012
7/02/2012
9/02/2012
11/02/2012
13/02/2012
15/02/2012
17/02/2012
19/02/2012
21/02/2012
23/02/2012
25/02/2012
27/02/2012
29/02/2012
Date
Max WS
Av WS
Min WS


Rocla Calga Quarry - February 2012
Solar Radiation
Solar Rad W/m2
1400
1200
1000
800
600
400
200
0
1/02/2012
3/02/2012
5/02/2012
7/02/2012
9/02/2012
11/02/2012
13/02/2012
15/02/2012
17/02/2012
19/02/2012
21/02/2012
23/02/2012
25/02/2012
27/02/2012
29/02/2012
Date
Max Solar Rad
Av Solar Rad
Min Solar Rad


Rocla Calga Quarry - February 2012
Atmospheric Pressure
hPascals
1040.0
1030.0
1020.0
1010.0
1000.0
990.0
980.0
970.0
1/02/2012
3/02/2012
5/02/2012
7/02/2012
9/02/2012
11/02/2012
13/02/2012
15/02/2012
17/02/2012
19/02/2012
21/02/2012
23/02/2012
25/02/2012
27/02/2012
29/02/2012
Date
Max Atm P
Av Atm P
Min Atm P


Rocla Calga Quarry - February 2012
Rainfall
Rain mm
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1/02/2012
3/02/2012
5/02/2012
7/02/2012
9/02/2012
11/02/2012
13/02/2012
15/02/2012
17/02/2012
19/02/2012
21/02/2012
23/02/2012
25/02/2012
27/02/2012
29/02/2012
Date
RAIN mm

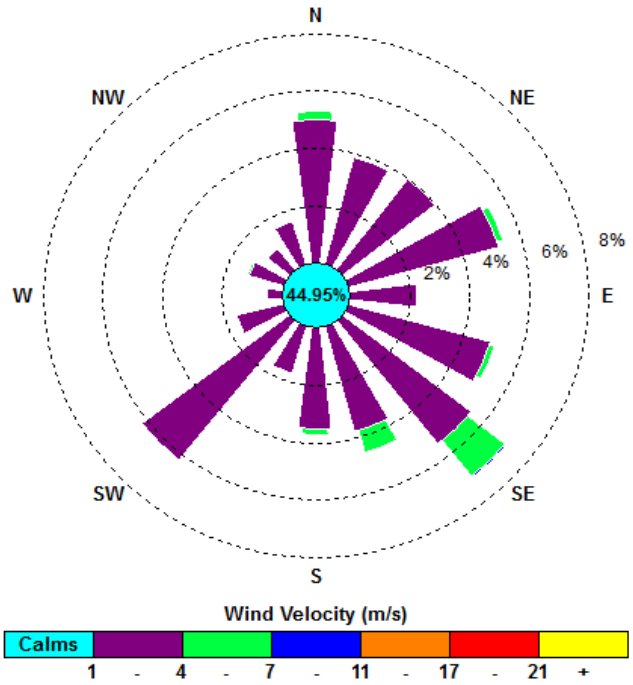

Rocla Calga Quarry - February 2012
Evapotranspiration
Evapotranspiration mm
25.0
20.0
15.0
10.0
5.0
0.0
1/02/2012
3/02/2012
5/02/2012
7/02/2012
9/02/2012
11/02/2012
13/02/2012
15/02/2012
17/02/2012
19/02/2012
21/02/2012
23/02/2012
25/02/2012
27/02/2012
29/02/2012
Date
ET mm


Rocla Calga Quarry - February 2012
Data Reception
Data Reception %
100
80
60
40
20
0
1/02/2012
3/02/2012
5/02/2012
7/02/2012
9/02/2012
11/02/2012
13/02/2012
15/02/2012
17/02/2012
19/02/2012
21/02/2012
23/02/2012
25/02/2012
27/02/2012
29/02/2012
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 February 2012 – 23:45, 29 February 2012



The predominant winds were from the SE, with strongest winds from the SE. The maximum wind speed was 26.4 m/s from the SW.

Appendix 1

Laboratory Certificates

CARBON BASED ENVIRONMENTAL

DEPOSITIONAL DUST MONITORING

Client: ..... **Rocla Calga Quarry** .....

Date Installed: 30.1.12

Date Collected: 2-3-12

Collection Start Time: 8.50

Collection Stop Time: 1.00

Sampled By: Leesa + deb

Sampling ID: .....

Site	Time Collected	Water Level (mL)	Insoluble Material (✓ = slight, ✓✓ = mod etc)				Water Turbidity	Water Colour	Stand Level (Y/N)	Funnel Level (Y/N)	New Funnel Diameter (mm)	Comments
			Insects	Bird droppings	Vegetation	Dust						
CD1	8.50	1999	✓			✓	C S T	C O Bn Gn Gy	Y	Y		replaced funnel
CD2C	12.30	1999	✓			✓	C S T	C O Bn Gn Gy	Y	Y		
CD3	10.20	1999	✓		✓	✓	C S T	C O Bn Gn Gy	Y	Y		
CD4	11.00	1999	✓		✓	✓	C S T	C O Bn Gn Gy	Y	Y		
CD5	12.00	1000	✓		✓	✓	C S T	C O Bn Gn Gy	Y	Y		Bottle fell over and lost some water
CD6	1.00	1999	✓			✓	C S T	C O Bn Gn Gy	Y	Y		
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				
							C S T	C O Bn Gn Gy				

Turbidity: C=Clear, S= Slight, T=Turbid (CIRCLE)

Colour: C=Clear, O=Orange, Bn=Brown, Gn=Green, Gy = Grey (CIRCLE)

Report broken funnels and replacement diameters

Signed: _____

ALS Group
Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EN1200866**	Page	: 1 of 4
Client	: **CARBON BASED ENVIRONMENTAL**	Laboratory	: Environmental Division Newcastle
Contact	: MS RENAE MIKKA	Contact	: Peter Keyte
Address	: 47 BOOMERANG ST CESSNOCK NSW, AUSTRALIA 2325	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: cbased1@bigpond.com	E-mail	: peter.keyte@als.com.au
Telephone	: +61 49904443	Telephone	: 61-2-4968-9433
Facsimile	: +61 02 49904442	Facsimile	: +61-2-4968 0349
Project	: ROCLA CALGA DUSTS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 02-MAR-2012
Sampler	: CBE	Issue Date	: 13-MAR-2012
Site	: ----		
		No. of samples received	: 6
Quote number	: ----	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dianne Blane	Laboratory Supervisor	Newcastle

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **Analysis as per AS3580.10.1-2003. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.**

Analytical Results

Sub-Matrix: DUST

Compound	CAS Number	LOR	Unit	Client sample ID: CD1 30/01/12 - 02/03/12	CD2C 30/01/12 - 02/03/12	CD3 30/01/12 - 02/03/12	CD4 30/01/12 - 02/03/12	CD5 30/01/12 - 02/03/12
Client sampling date / time				02-MAR-2012 13:00	02-MAR-2012 13:00	02-MAR-2012 13:00	02-MAR-2012 13:00	02-MAR-2012 13:00
				EN1200866-001	EN1200866-002	EN1200866-003	EN1200866-004	EN1200866-005
EA120: Ash Content								
Ash Content	----	0.1	g/m².month	5.3	1.6	0.7	0.1	0.1
Ash Content (mg)	----	1	mg	99	30	13	2	2
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m².month	0.3	0.3	<0.1	0.2	0.2
Combustible Matter (mg)	----	1	mg	6	5	<1	3	3
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m².month	5.6	1.9	0.7	0.3	0.3
Total Insoluble Matter (mg)	----	1	mg	105	35	13	5	5

Analytical Results

Sub-Matrix: **DUST**

Compound	CAS Number	LOR	Unit	Client sample ID: CD6 30/01/12 - 02/03/12	----	----	----	----
				Client sampling date / time: 02-MAR-2012 13:00	----	----	----	----
				EN1200866-006	----	----	----	----
EA120: Ash Content								
Ash Content	----	0.1	g/m².month	0.2	----	----	----	----
Ash Content (mg)	----	1	mg	4	----	----	----	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m².month	<0.1	----	----	----	----
Combustible Matter (mg)	----	1	mg	<1	----	----	----	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m².month	0.2	----	----	----	----
Total Insoluble Matter (mg)	----	1	mg	4	----	----	----	----

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: Carbon Based Environmental Pty Ltd	LABORATORY BATCH NO.:
POSTAL ADDRESS: 47 Boomerang St CESSNOCK NSW 2325	SAMPLERS:Carbon Based Environmental Pty Ltd
SEND REPORT TO: Colin Davies, Renae Mikka SEND INVOICE TO: Carbon Based Environmental	PHONE: 0439604443 FAX: 0249904442 E-MAIL: cbased@bigpond.com, cbased1@bigpond.com
DATA NEEDED BY: 7 working days REPORT NEEDED BY: 7 working days	REPORT FORMAT: HARD: Yes FAX: DISK: BULLETIN BOARD: E-MAIL: Yes
PROJECT ID: Rocla Calga Dusts QUOTE NO.: SY/269/10	QC LEVEL: QCS1: QCS2: QCS3: Yes QCS4:
P.O. NO.: COMMENTS/SPECIAL HANDLING/STORAGE OR DIPOSAL:	
FOR LAB USE ONLY **also email cbased1@bigpond.com**	
COOLER SEAL	
Yes ..... No ..... Total unless specified 07 30.1.12	
Broken ..... Intact ... off 2-3-12	
COOLER TEMP: deg.C	

Australian Laboratory Services Pty Ltd

SAMPLE DATA				CONTAINER DATA		ANALYSIS REQUIRED																								
SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	NO.	Insoluable Solids	Ash Residue	Combustable Matte																						NOTES
CD1	Dust	23.12				x	x	x																						
CD2c	Dust	↓				x	x	x																						
CD3	Dust					x	x	x																						
CD4	Dust					x	x	x																						
CD5	Dust					x	x	x																						
CD6	Dust	↓				x	x	x																						

RELINQUISHED BY:		RECEIVED BY		
NAME : Colin Davies	DATE: 2-3-12	NAME : CS	DATE: 2/3/12	METHOD OF SHIPMENT
OF: Carbon Based Environmental	TIME:	OF: ALS	TIME: 16:45	CONSIGNMENT NOTE NO.
NAME :	DATE:	NAME :	DATE:	TRANSPORT CO. NAME.
OF:	TIME:	OF:	TIME:	

*Container Type and Preservative Codes: P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Acid Rinced Jar; S = Solvent Washed Acid Rinced Glass Bottle; VC = Hydrochloric Acid Preserved Vial; VS = Sulfuric Acid Preserved Vial; BS = Sulfuric Acid Preserved Glass Bottle; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; O = Other.

AUSTRALIAN LABORATORY SERVICES P/L

CARBON BASED ENVIRONMENTAL PTY LIMITED

Todays Collection	
Time Start:	9-30
Time Finish:	12-10

Client : Rocla Calga

Project :

SURFACE WATERS

Date: 2-3-12

Site	Flow Rate	Odour	Sampling Time	Water Turbidity	Water Colour	Comments
A	Still	NIL	9-50	(C) S T	(C) LO O B G	
B	FAST	NIL	10-10	C (S) T	C (LO) O B G	
C				C S T	C LO O B G	NO ACCESS
D	FAST	NIL	12-10	C (S) T	(C) LO O B G	
F	Still	NIL	9-30	(C) S T	(C) LO O B G	
				C S T	C LO O B G	
				C S T	C LO O B G	
				C S T	C LO O B G	
				C S T	C LO O B G	
				C S T	C LO O B G	

Turbidity: C=Clear, S= Slight, T=Turbid (CIRCLE)

Colour: C=Clear, LO=Light Orange, O=Orange, B=Brown, G=Green (CIRCLE)

Signed: SMy

Sampled by: Leesa + deb

ALS Group
Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1204893**	Page	: 1 of 3
Client	: **CARBON BASED ENVIRONMENTAL**	Laboratory	: Environmental Division Sydney
Contact	: MS RENAE MIKKA	Contact	: Client Services
Address	: 47 BOOMERANG ST CESSNOCK NSW, AUSTRALIA 2325	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: cbased1@bigpond.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 49904443	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 49904442	Facsimile	: +61-2-8784 8500
Project	: ROCLA QUARRY	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 02-MAR-2012
Sampler	: CBE	Issue Date	: 12-MAR-2012
Site	: ----		
		No. of samples received	: 4
Quote number	: SY/269/10 V2	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Dianne Blane	Laboratory Supervisor	Newcastle
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA015: TDS by method EA-015 may bias high for various samples due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.**

Analytical Results

Sub-Matrix: WATER				Client sample ID	A	B	D	F	-----
				Client sampling date / time	02-MAR-2012 15:00	02-MAR-2012 15:00	02-MAR-2012 15:00	02-MAR-2012 15:00	----
Compound	CAS Number	LOR	Unit		ES1204893-001	ES1204893-002	ES1204893-003	ES1204893-004	----
EA005: pH									
pH Value	----	0.01	pH Unit		5.66	6.73	6.74	5.98	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		50	82	49	70	----
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	GIS-210-010	10	mg/L		58	80	70	49	----
EA025: Suspended Solids									
Suspended Solids (SS)	----	5	mg/L		10	6	40	48	----
EP020: Oil and Grease (O&G)									
Oil & Grease	----	5	mg/L		<5	<5	<5	<5	----

OF CUSTODY DOCUMENTATION

Australian Laboratory Services Pty Ltd

Carbon Based Environmental Pty Ltd	LABORATORY BATCH NO.:
POSTAL ADDRESS: 47 Boomerang St CESSNOCK NSW 2325	SAMPLERS: Carbon Based Environmental Pty Ltd
SEND REPORT TO: Colin Davies, Renae Mikka SEND INVOICE TO: Carbon Based Environmental	PHONE: 0439604443 FAX: 0249904442 E-MAIL: cbased@bigpond.com, cbased1@bigpond.com
DATA NEEDED BY: 7 working days REPORT NEEDED BY: 7 working days	REPORT FORMAT: HARD: Yes FAX: DISK: BULLETIN BOARD: E-MAIL: Yes
PROJECT ID: Rocla Quarry QUOTE NO.: SY/ 269/10	QC LEVEL: QCS1: QCS2: QCS3: Yes QCS4:
P.O. NO.: COMMENTS/SPECIAL HANDLING/STORAGE OR DIPOSAL:	ANALYSIS REQUIRED

FOR LAB USE ONLY	
COOLER SEAL	also email results to cbased1@bigpond.com
Yes ...... No	Total unless specified
Broken ...... Intact ...	
COOLER TEMP: deg.C	

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	NO.	Ph	EC	TSS	TDS	O + G	NOTES
A	Water	2-3-12				x	x	x	x	x	
B	Water	↓				x	x	x	x	x	
~~C~~	~~Water~~					~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	
D	Water					x	x	x	x	x	
F	Water	↓				x	x	x	x	x	

Environmental Division
Sydney
Work Order
ES1204893

Telephone : +61-2-8784 8555

RELINQUISHED BY:		RECEIVED BY		
NAME : Colin Davies	DATE: 2-3-12	NAME : CC	DATE: 2/3/12	METHOD OF SHIPMENT
OF: Carbon Based Environmental	TIME:	OF: ALS	TIME: 16:45	CONSIGNMENT NOTE NO.
NAME :	DATE:	NAME :	DATE:	
OF:	TIME:	OF:	TIME:	TRANSPORT CO. NAME.

*Container Type and Preservative Codes: P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Acid Rinced Jar; S = Solvent Washed Acid Rinced Glass Bottle; VC = Hydrochloric Acid Preserved Vial; VS = Sulfuric Acid Preserved Vial; BS = Sulfuric Acid Preserved Glass Bottle; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; O = Other.

AUSTRALIAN LABORATORY SERVICES P/L

CARBON BASED ENVIRONMENTAL PTY LIMITED

Todays Collection	
Time Start:	9.00
Time Finish:	

Date: 2-3-12

Client : Rocla Calga

Project :

GROUNDWATERS

Site	DEPTH	Odour	Water Turbidity	Water Colour	1		2		Downloaded Logger? (Y/N)
					pH	EC	pH	EC	
CQ1			C S T	C LO O B G					
CQ3	9.85	NIL	C S T	C LO O B G	6.73	151.9us	6.69	150.5us	run over
CQ4	9.23	NIL	C S T	C LO O B G	4.99	102.1us	4.91	119.0us	not working
CQ5	5.26	NIL	C S T	C LO O B G	4.76	176.0us	4.72	176.7us	yes
CQ6	9.81	NIL	C S T	C LO O B G	4.71	233.1us	4.76	235.6us	
CQ7	5.66	NIL	C S T	C LO O B G	5.52	193.3us	5.09	196.5us	
CQ8	9.04	NIL	C S T	C LO O B G	4.56	199.3us	4.57	201.1us	Not Working
CQ9	8.45	NIL	C S T	C LO O B G	5.07	135.2us	4.98	140.4us	yes
CQ10	21.48	NIL	C S T	C LO O B G	5.90	230.6us	5.82	219.1us	
CQ11S	8.75	NIL	C S T	C LO O B G	4.69	243.2us	4.61	243.1us	yes
CQ11D	10.06	NIL	C S T	C LO O B G	5.03	194.3us	5.01	192.4us	Not working
CQ12	3.40	NIL	C S T	C LO O B G	4.47	179.6us	4.56	180.6us	yes
CQ13	11.05	NIL	C S T	C LO O B G	4.86	328.4us	4.91	325.4us	yes
CP3	7.49	NIL	C S T	C LO O B G	4.71	201.3us	4.77	200.2us	yes
CP4	4.04	NIL	C S T	C LO O B G	4.83	296.4us	4.41	303.4us	
CP5	4.98	NIL	C S T	C LO O B G	4.93	318.4us	4.61	321.4us	
CP6	7.41	NIL	C S T	C LO O B G	4.44	319.4us	4.35	320.4us	
CP7	0.67	NIL	C S T	C LO O B G	6.19	365.4us	6.33	369.4us	
CP8			C S T	C LO O B G					
MW7		NIL	C S T	C LO O B G	4.68	154.0us	4.65	152.0us	
MW8	5.87	NIL	C S T	C LO O B G	4.94	123.4us	4.70	123.0us	Not Working
MW9	21.10	NIL	C S T	C LO O B G	5.19	118.7us	4.76	115.4us	not working
MW10	11.43	NIL	C S T	C LO O B G	16.47us	4.47	4.46	166.9us	NOT WORKING
MW13	7.27	NIL	C S T	C LO O B G	4.65	135.4us	4.59	138.2us	yes
MW16	7.89	NIL	C S T	C LO O B G	4.54	153.4us	4.53	154.6us	

Turbidity: C=Clear, S= Slight, T=Turbid (CIRCLE)

Colour: C=Clear, LO=Light Orange, O=Orange, B=Brown, G=Green (CIRCLE)

pH/EC meter #:

Signed: [signature]

Sampled by: Leesa & deb

Appendix 2

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

Peats Ridge, New South Wales
February 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	We	16.7	17.1	12.4	2.8					17.2	97	8	SE	9		16.1	96	8	ESE	9	
2	Th	15.6	17.2	20.8	1.6					16.8	98	8	NE	4		16.0	95	8	S	4	
3	Fr	14.8	19.8	44.6	1.4					16.1	90	8	S	4		19.6	92	8	SSW	4	
4	Sa	15.6	24.2	3.0	0.2					18.1	95	8	E	4		23.3	66	3	ESE	9	
5	Su	15.4	28.1	0	2.4					20.1	93	2	ESE	4		27.3	68	2	E	9	
6	Mo	17.7	24.8	0	4.8					23.0	81	1	S	28		22.9	73	7	SE	19	
7	Tu	17.5	21.0	2.8	2.4					18.5	95	8	SE	4		20.8	83	8	SE	4	
8	We	16.5	22.4	0.2	1.8					17.9	94	8	S	4		22.0	70	6	ESE	9	
9	Th	15.1	23.4	0	1.6					19.2	90	6	SE	4		22.0	74	7	E	19	
10	Fr	16.9	24.0	15.2	4.0					20.0	81	7	NE	19		21.4	81	8	E	4	
11	Sa	16.0	23.8	6.0	2.0					18.3	92	7	S	4							
12	Su	13.1	25.4	4.6	3.0					18.6	80	1	W	4		25.3	66	3	NE	9	
13	Mo	15.4	23.2	11.2	4.8					18.3	98	8	WNW	4		23.0	70	3	E	9	
14	Tu	14.8	22.9	1.2	3.2					17.4	98	7	NE	4		22.8	71	5	E	9	
15	We	14.8	23.3	12.8	2.6					18.7	94	7	E	4		21.6	74	3	E	4	
16	Th	13.8	25.8	0.6	2.0					20.5	80	4				25.0	57	5	NNE	4	
17	Fr	13.8	27.0	0	4.4					22.6	71	1	NE	4		26.5	55	5	NE	4	
18	Sa	17.4	27.0	0	3.2					21.4	78	2	W	4		25.6	70	6	E	4	
19	Su	17.1	27.8	0	5.0					19.0	96	3	ENE	4		27.1	62	6	ENE	4	
20	Mo	17.7	25.8	20.0	3.8					19.8	92	7	WSW	4		24.8	72	7	S	4	
21	Tu	16.8	22.8	18.6	3.6					17.8	96	8	S	9		22.6	73	6	S	9	
22	We	14.8	23.7	1.4	1.4					16.9	86	6	SW	4		22.8	62	7	S	4	
23	Th	14.2	27.8	0	2.2					19.8	87	1	SE	4		26.4	55	3	W	4	
24	Fr	14.9	27.7	0	3.8					22.8	73	0	ENE	9		27.1	56	0	ESE	9	
25	Sa	14.8	26.1	0	5.2					20.9	86	3	NE	4		24.6	71	5	NE	4	
26	Su	19.0	26.1	0	4.8					21.6	86	6	NNE	4		24.6	73	8	NW	4	
27	Mo	18.4	28.7	0	1.4					21.4	86	7	NNW	4		27.6	67	7	E	9	
28	Tu	20.0	30.3	0	3.0					24.6	74	5	NE	4		30.3	53	8	W	6	
29	We	19.9	21.1	0.2	3.4					20.3	99	8	S	4		20.0	95	8	SW	4	
Statistics for February 2012																					
Mean		16.2	24.4		3.0					19.6	88	5		5		23.5	71	5		6	
Lowest		13.1	17.1		0.2					16.1	71	0	#	4		16.0	53	0	#	4	
Highest		20.0	30.3	44.6	5.2					24.6	99	8	S	28		30.3	96	8	#	19	
Total				175.6	85.8																

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.

IDCJDW2110.201202 Prepared at 13:01 UTC on 21 Mar 2012

Gosford, New South Wales
February 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	We	18.3	19.3	10.2			SSE	26	10:34	18.3	99		S	6		17.5	100		SSE	9	
2	Th	16.9	19.1	23.8			S	20	00:34					Calm		17.6	100		SE	7	
3	Fr	16.4	22.0	50.2			NNW	17	00:04	17.8	100		NNW	2		21.9	98			Calm	
4	Sa	17.7	26.1	2.2			W	20	08:28	20.6	98		W	7		25.5	66		SE	6	
5	Su	15.4	28.2	0.2			E	22	12:28	21.7	98			Calm		26.4	70		ENE	9	
6	Mo	17.0	25.5	0			E	50	20:00	23.4	94		SE	13		23.7	78		SE	15	
7	Tu	19.2	23.9	6.8			SSW	48	22:57	21.0	98		SE	9		23.0	77		ESE	13	
8	We	18.5	25.4	0.2			SE	24	10:59	20.8	98			Calm		23.9	66		ESE	9	
9	Th	16.1	26.0	0			NE	35	15:50	22.6	84		SE	6		23.9	65		ESE	11	
10	Fr	17.7	25.7	0			E	28	12:42	21.9	88		NNW	9		22.8	78		N	7	
11	Sa	17.4	25.0	4.6			SE	28	13:56	20.0	98			Calm		16.5	94		SSE	13	
12	Su	11.6	26.6	29.6			E	26	14:30	18.9	98			Calm		25.2	62		NNE	9	
13	Mo	16.3	25.7	5.6			ESE	20	15:31	20.8	99		NNE	2		24.5	67		E	6	
14	Tu	15.1	25.2	0			SE	24	15:36	19.7	100			Calm		23.4	65		E	9	
15	We	15.6	25.6	0.4			N	19	15:40	19.1	100			Calm		23.5	66		E	6	
16	Th	14.4	26.9	0.6			ENE	24	15:38	21.7	95		NNE	6		25.7	52		E	11	
17	Fr	13.5	28.2	0			NNE	22	12:27	20.7	98			Calm		24.6	71		E	9	
18	Sa	17.4	26.2	0			SE	22	14:06	23.0	81		ESE	7		25.3	74		SE	15	
19	Su	16.3	28.7	0			W	31	21:58	22.5	98			Calm		28.0	67		ENE	9	
20	Mo	18.1	26.9	27.6			ESE	20	13:14	21.4	99		SE	4		25.7	69		SE	9	
21	Tu	18.7	24.7	50.2			S	35	16:24	19.6	99		SSE	7		23.5	75		SE	17	
22	We	15.4	24.6	7.8			SE	26	09:56	19.5	88			Calm		24.3	68		ESE	11	
23	Th	14.1	28.2	0			ENE	20	13:08	20.5	98		NE	2		27.2	59		NE	9	
24	Fr	14.2	28.4	0			ENE	22	16:21	20.9	99		NE	4		27.5	42		ENE	7	
25	Sa	14.6	26.2	0			NNE	28	14:45	20.8	98		ESE	2		25.4	71		NE	13	
26	Su	19.6	27.8	0			N	19	23:12	22.6	98		NE	2		26.6	78		ENE	6	
27	Mo	18.8	29.6	0			ESE	20	14:07	21.0	100		N	2		28.4	63		ENE	9	
28	Tu	19.6	32.3	0			N	26	13:33	22.6	100			Calm		31.5	42		NNW	13	
29	We	21.2	23.3	0			SSE	17	14:54	21.2	100		SE	7		23.1	96		SSE	7	
Statistics for February 2012																					
Mean		16.7	25.9							20.9	96			3		24.3	71			9	
Lowest		11.6	19.1							17.8	81			Calm		16.5	42			Calm	
Highest		21.2	32.3	50.2			E	50		23.4	100		SE	13		31.5	100		SE	17	
Total				220.0																	

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.

IDCJDW2048.201202 Prepared at 13:00 UTC on 21 Mar 2012