

# ***Werris Creek Coal Mine Community Consultative Committee***

## **Eighteenth Meeting of the Committee**

**Whitehaven Coal Training Room, Werris Creek Coal Mine**

**10.00am Thursday 24<sup>th</sup> February 2011**

### **MINUTES**

#### **1. Record of Attendance:**

Present: Noel Taylor (Community Representative); Jill Coleman (Community Representative - Chair); Andrew Wright (Environmental Officer WCC); Mick Post (Project Manager WCC); Lisa Single (WCC Minute Taker);

Apologies: Ron Short (Community Representative); Lindsay Bridge (Community Representative); Chris Holley (Community Representative); Col Stewart (Liverpool Plains Shire Council); Ron Van Katwyk (Liverpool Plains Shire Council); Des George (Werris Creek Coal - WCC).

Jill Coleman was Chair person for this meeting in Ron Short's absence.

#### **2. New Matters for Discussion under General Business**

None.

#### **3. Matters Arising**

##### **a) Actions from Previous Meeting**

None.

##### **b) Other Matters Arising**

None.

#### **4. Minutes of Previous Meeting**

Minutes of the previous meeting 25<sup>th</sup> November 2010 were accepted as true representation of business conducted on day.

*Moved: Noel Taylor Seconded: Jill Coleman. Motion carried*

#### **5. Declaration of Pecuniary or other interests**

None declared.

## 6. Environmental Monitoring Report November, December 2010 and January 2011

**Weather Station** – Has been successfully relocated to the top of the overburden emplacement and has been 100% reliable since.

**Dust** – One elevated dust deposition result recorded in December at Railway View which is a company owned property. Other dust deposition and PM10/TSP results are within compliance.

**Noise** – There was one noise complaint regarding dozer operation at the Train Load Out area during the period from a resident in Werris Creek during a temperature inversion and a south westerly wind. Attended noise monitoring recorded elevated noise levels at Almawillee, Glenara and Railway Cottage in December 2010 due to windy conditions. Noise criteria in the consent are not applicable under adverse weather conditions such as temperature inversions or high winds. Other attended monitoring results were within compliance.

**Blasting** – 21 blasts during the period which were all within compliance. Ten blasting complaints during the period with four complaints for one blast on 10<sup>th</sup> November 2010. With this particular blast there had been wet weather in the lead up to the shot had so the blast had been loaded with a water resistant explosive into a drill pattern designed for dry explosives. Because the wet explosive is denser and has a higher energy content, changes were made to the initiation sequence to avoid overpressure issues but unfortunately resulted in higher than normal vibration levels. The blasting contractor has committed to design all blasts for wet weather so if weather conditions change on the day, it should minimise the effect on the blast design. The majority of the other blast complaints were from the one Werris Creek resident which WCC is continuing to work with this person's concerns regarding blasting at their property.

**Groundwater** – Water levels have risen across the whole district due to wet weather prior to Christmas. No triggers to groundwater response plan have been required.

**Surface water** – There were 11 discharge events, 6 due to wet weather and 5 controlled discharges. A wet weather discharge from SB2 on 16<sup>th</sup> November exceeded the Environmental Protection License pH upper limit of 8.5 by 0.09. DECCW considered the non-compliance as minor and of a short duration that resulted in no environmental harm and no further action is warranted. All other discharge events were within compliance.

**Complaints** – There were 14 complaints in total for the period. Ten complaints were for blasting, one noise complaint and three complaints were for lighting issues from a Kurrara Street and Coronation Avenue residents.

JC mentioned that one complaint referred to a blast that was delayed later than advertised in the Werris Creek Flyer. The Werris Creek Flyer gives an indicative time for blasts but if for production or environmental reasons that a blast is delayed, WCC protocol is that the nearest neighbours receive a phone call.

Motion moved to accept the Environmental Monitoring Report November, December 2010 & January 2011.

*Moved: Jill Coleman. Seconded: Noel Taylor. Motion Carried.*

## 7. General Business

### a. Whitehaven Letter Response to CCC Coal Train Dust Letter

The community members felt that there was no need to respond and looked forward to regular updates on the coal train dust minimization project and thanked Tony Haggarty for his response. Scope for measuring and monitoring coal train dust levels is currently being drafted.

### b. WCC Life of Mine Project Environmental Assessment Update

Public exhibition phase has closed. Werris Creek Coal has to respond to the 12 submissions that were made by the community and government. This report should be finalised to the Department of Planning in the next fortnight, with the subsequent assessment period taking 3 to 4 months.

**c. “History of Coal Mining at Werris Creek” Publication**

A draft of the “History of Coal Mining at Werris Creek” has been sent away to a publisher to have a draft copy formatted. JC presented example publications of what she thinks it could look like. A copy of the formatted “History of Coal Mining at Werris Creek” will be distributed to each member.

**Meeting Closed 10.55am.**

**Next Meeting was scheduled for 26<sup>th</sup> May 2011.**

**Copy to:**

Ron Short	Chairman and Community Representative
Chris Holley	Community Representative
Jill Coleman	Community Representative
Noel Taylor	Community Representative
Lindsay Bridge	Community Representative

Colin Phillips	DoP	Casper Dieben	Werris Creek Coal
Michael Lloyd	I&I NSW	Brian Cullen	Werris Creek Coal
Ron Van Katwyk	LPSC	Danny Young	Werris Creek Coal
Cr Col Stewart	LPSC	Mick Post	Werris Creek Coal
		Des George	Werris Creek Coal
		Andrew Wright	Werris Creek Coal



## **WERRIS CREEK COAL PTY LTD**

# **QUARTERLY ENVIRONMENTAL MONITORING REPORT**

**November & December 2010, January 2011**

This Environmental Monitoring Report covers the period 1<sup>st</sup> November 2010 to 31<sup>st</sup> January 2011 for the Werris Creek No.2 Coal Mine Community Consultative Committee.

The report includes environmental monitoring results from the on-site Weather Station, Air Quality, Noise, Blasting, Surface Water, Groundwater and Discharge Water Quality together with any community complaints received and general details on site environmental matters.

**Note:** Monitoring results with any non compliance of monitoring criteria are highlighted in **yellow**.

## CONTENTS

<b>1.0</b>	<b>METEOROLOGY.....</b>	<b>3</b>
1.1	WEATHER STATION AVAILABILITY .....	3
<b>2.0</b>	<b>AIR QUALITY .....</b>	<b>3</b>
2.1	HVAS (PM10) .....	3
2.1.1	Monitoring Data Results .....	3
2.1.2	Discussion - Compliance / Non Compliance .....	3
2.2	DEPOSITED DUST .....	3
2.2.1	Monitoring Data Results .....	3
2.2.2	Discussion - Compliance / Non Compliance .....	4
2.3	AIR QUALITY COMPLAINTS .....	4
<b>3.0</b>	<b>NOISE.....</b>	<b>4</b>
3.1	OPERATIONAL NOISE.....	4
3.1.1	Monitoring Data Results .....	5
3.1.2	Discussion - Compliance / Non Compliance .....	5
3.2	NOISE COMPLAINTS .....	5
<b>4.0</b>	<b>BLAST .....</b>	<b>6</b>
4.1	BLAST MONITORING .....	6
4.1.1	Monitoring Data Results .....	6
4.1.2	Discussion - Compliance / Non Compliance .....	6
4.2	BLAST COMPLAINTS .....	6
<b>5.0</b>	<b>WATER.....</b>	<b>6</b>
5.1	GROUND WATER.....	7
5.1.1	Monitoring Data Results .....	7
5.1.2	Discussion - Compliance / Non Compliance .....	7
5.2	SURFACE WATER .....	7
5.2.1	Monitoring Data Results .....	7
5.2.2	Discussion - Compliance / Non Compliance .....	7
5.3	SURFACE WATER DISCHARGES .....	7
5.3.1	Monitoring Data Results .....	7
5.3.2	Discussion - Compliance / Non Compliance .....	8
5.4	WATER COMPLAINTS.....	8
<b>6.0</b>	<b>COMPLAINTS SUMMARY.....</b>	<b>8</b>
<b>7.0</b>	<b>GENERAL .....</b>	<b>9</b>

## APPENDICES

Appendix 1.....	Dust Monitoring Results – PM10
Appendix 2.....	Dust Monitoring Results – Deposited Dust
Appendix 3.....	Noise Monitoring Results
Appendix 4.....	Blasting Monitoring Results
Appendix 5.....	Groundwater Monitoring Results
Appendix 6.....	Surface Water Monitoring Results
Appendix 7.....	Discharge Monitoring Results

## 1.0 METEOROLOGY

### 1.1 WEATHER STATION AVAILABILITY

At the start of December, the weather station upgrade and relocation was completed. For the majority of December and January there were two weather stations running real time in parallel to check consistency with data.

Weather data was available for 100% of November 2010.

Weather data was available for 100% of December 2010.

Weather data was available for 100% of January 2011.

## 2.0 AIR QUALITY

### 2.1 HVAS (PM10)

High Volume Air Sample (HVAS) monitoring for particulate matter less than 10 micron in size (PM10) and total suspended particulate (TSP) matter is conducted at five sites listed below.

- WCHV1 – “Cintra” PM10
- WCHV2 – “Tonsley Park” PM10
- WCHV3 – “Railway View” PM10
- WCHV4 – “Eurunderee” PM10
- WCHV5 – “Railway View” TSP

Sampling is scheduled for 24 hours every 6 days in accordance with Department of Environment, Climate Change and Water (DECCW) guidelines and results are reported as micro grams per cubic meter ( $\mu\text{g}/\text{m}^3$ ) of air sampled.

#### 2.1.1 Monitoring Data Results

The monthly average results for the last three months are provided in the table below, however see HVAS monitoring data under **Appendix 1** for individual results.

Monitor Location	November ( $\mu\text{g}/\text{m}^3$ )	December ( $\mu\text{g}/\text{m}^3$ )	January ( $\mu\text{g}/\text{m}^3$ )	Criteria ( $\mu\text{g}/\text{m}^3$ )
WCHV1	10.6	9.9	8.0	30
WCHV2	9.9	9.4	8.9	30
WCHV3	10.6	11.4	9.9	30
WCHV4	11.0	11.6	10.7	30
WCHV5	31.5	27.2	21.4	90

#### 2.1.2 Discussion - Compliance / Non Compliance

All 6 day PM10 24 hour average results were below the short term 24 hour impact criteria of  $50\mu\text{g}/\text{m}^3$ .

All PM10 sites monthly averages are below the long term impact annual criteria of  $30\mu\text{g}/\text{m}^3$ .

The TSP site is below the long term impact annual criteria of  $90\mu\text{g}/\text{m}^3$ .

## 2.2 DEPOSITED DUST

Deposited dust monitoring is for particulate matter generally greater than 30 micron in size which readily settles out of the air and is monitored at seven locations.

- WC2 – “Cintra”
- WC5 – “Railway View”
- WC7 – “Tonsley Park”
- WC8 – “Plain View”
- WC9 – “Marengo”
- WC10 – “Mountain View”

## WC11 – “Glenara”

Sampling is scheduled monthly in accordance with DECCW guidelines and results are reported as grams per metre squared per month (g/m<sup>2</sup>/month).

### 2.2.1 Monitoring Data Results

The monthly results for the last three months are provided in the table below; however **Appendix 2** has more information on Deposited Dust Monitoring Results.

Monitor Location	November (g/m <sup>2</sup> /month)	December (g/m <sup>2</sup> /month)	January (g/m <sup>2</sup> /month)	Criteria (g/m <sup>2</sup> /month)
WC2	2.0	0.6	1.5	3.6
WC5	1.0	3.9	0.7	3.6
WC7	0.9	0.6	0.7	3.6
WC8	1.0	0.6	0.6	3.6
WC9	0.8	7.8*	0.6	3.6
WC10	0.9	0.4	0.4	3.6
WC11**	2.1	1.6	1.0	3.6

\* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e bird droppings and insects) and is excluded from the average

\*\* – WC11 Glenara new dust deposition gauge installed in November 2010

### 2.2.2 Discussion - Compliance / Non Compliance

The majority of dust deposition gauges were below the monthly amenity criteria of 3.6g/m<sup>2</sup>/month. “Railway View” (WC5) was the exception with a high dust deposition result of 3.9 g/m<sup>2</sup>/month in December due to the close proximity of mine and predominant north westerly winds. There was one sample for “Marengo” (WC9) that has been excluded due to excessive organic material contamination.

## 2.3 AIR QUALITY COMPLAINTS

There were two blasting dust related complaints for the period from the same complainant. The first complaint raised general concern over dust from blasting activities and the impact that this could be having on her husband’s asthma. The second specific complaint for a blast on 21<sup>st</sup> January 2011 was about the size of the dust cloud generated. The dust plume was expected given the prevailing dry conditions and would have dispersed over WCC owned land to the north west due to the south easterly wind present. Specific actions taken in relation to these complaints are outlined in **Section 6**.

## 3.0 NOISE

### 3.1 OPERATIONAL NOISE

Monthly attended noise monitoring undertaken at the following locations:

- “Almawille”
- “Glenara”
- “Marengo” (project related)
- “Tonsley Park”
- “Cintra” (project related)
- “Bojba”
- “Greenslopes and Banool”; and
- “Kyooma”

Three sets of measurements are made at each location; one during the day time period (before 6pm); one during the evening period (from 6pm – 10pm) and one at night (after 10pm).

The noise emission criterion for WCC is 35dB(A) unless otherwise subject to a current, legally binding agreement between WCC and the occupant of the affected residential property.

WCC environmental protection license (EPL) conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where wind speeds are greater than 3m/s and/or there is a temperature inversion greater than +3°C/100m.

The Department of Planning and Department of Environment, Climate Change and Water approved a modification the WCC Noise Monitoring Protocol in November 2010 removing “Cintra” and “Marengo” (mine owned) properties and including two new privately owned properties of “Greenslopes and Banool” and “Kyooma”.

### 3.1.1 Monitoring Data Results

The three summary tables of the noise results from November, December and January below present noise levels only from Werris Creek Coal operations (not ambient noise); however see Monthly Noise Monitoring Reports under **Appendix 3** for more detail.

18<sup>th</sup> November 2010

Location	Day	Evening	Night	Criteria
“Almawillee”	Inaudible	Inaudible#	30	35
“Glenara”	25	Inaudible#	<30#	35
“Cintra”*	<b>40*</b>	<b>38#*</b>	<b>36*</b>	35
“Marengo”*	Barely audible*	30#*	<25*	35
“Tonsley Park”	34	31#	<24	35
“Railway Cottage”	Inaudible	Inaudible#	<30	35

\* - Project Related Property; Yellow Bold – WCC mining related noise exceedance; # - Temperature Inversion >3°C/100m or Wind Speed >3m/s

9<sup>th</sup> & 14<sup>th</sup> December 2010

Location	Day	Evening	Night	Criteria
“Almawillee”	30#	<b>38#</b>	34	35
“Glenara”	33#	<b>38#</b>	33	35
“Railway Cottage”	Inaudible#	<b>39#</b>	33	35
“Tonsley Park”	Inaudible#	Inaudible#	Inaudible#	35
“Greenslopes”	Inaudible#	Inaudible#	Inaudible#	35
“Kyooma”	Inaudible#	Inaudible#	Inaudible#	35

Yellow Bold – WCC mining related noise exceedance; # - Temperature Inversion >3°C/100m or Wind Speed >3m/s

21<sup>st</sup> & 22<sup>nd</sup> January 2011

Location	Day	Evening	Night	Criteria
“Almawillee”	Inaudible	Inaudible#	Inaudible#	35
“Glenara”	Inaudible	Inaudible#	Inaudible	35
“Railway Cottage”	Inaudible	Inaudible#	Inaudible	35
“Tonsley Park”	Inaudible	Inaudible#	Inaudible	35
“Greenslopes”	Inaudible	Inaudible#	Inaudible	35
“Kyooma”	<20	Inaudible#	Inaudible	35

Yellow Bold – WCC mining related noise exceedance; # - Temperature Inversion >3°C/100m or Wind Speed >3m/s

### 3.1.2 Discussion - Compliance / Non Compliance

There were no noise exceedances during November, December and January. However during November, for all three monitoring periods recorded elevated noise levels at “Cintra” (which is a mine owned property and not subject to noise criteria). During the December monitoring event, “Almawillee”, “Glenara” and “Railway Cottage” recorded elevated noise levels for the evening period due to a strong north westerly winds greater than 3m/s. Strong winds enhancing noise levels cannot be used to compare against criteria. There were no noise issues for the January monitoring event.

### 3.2 NOISE COMPLAINTS

There was one complaint for noise from Werris Creek Coal operations on 4<sup>th</sup> November 2010 by a resident of Coronation Ave in Werris Creek. On the particular evening there was a temperature inversion and south south westerly wind that would have propagated noise from mining operations towards Werris Creek township. WCC have commenced using the real time noise monitor to the north of the mine to measuring noise levels in the vicinity of Werris Creek and management of noise if required. Specific actions taken in relation to this complaint are outlined in **Section 6**.

## 4.0 BLAST

Blast monitoring is undertaken at “Glenala”, “Milbank”, “Werris Creek”, “Tonsley Park”, “Greenslopes and Banool” and “Cintra”. Compliance limits for blasting overpressure is 115dB(L) (and up to 120dB(L) for only 5% of blasts) and vibration is 5mm/s (and up to 10mm/s for only 5% of blasts). During the period a total of 25 blasts were fired by the blasting contractor, Orica Mining Services.

### 4.1 BLAST MONITORING

#### 4.1.1 Monitoring Data Results

A summary table of blasting results from November, December and January are provided below; however see blasting results database under **Appendix 4** for more detail.

Month	# of Blasts	Overpressure		Vibration	
		Max dB(L)	Location	Max mm/s	Location
November	10	115.5	“Cintra”*	2.39	“Cintra”*
December	6	113.8	“Cintra”*	1.32	“Tonsley Park”
January	5	114.2	“Cintra”*	1.47	“Cintra”*
<b>TOTAL/MAX</b>	21	115.5	“Cintra”*	2.39	“Cintra”*

\* Indicates project related properties not subject to blasting criteria

#### 4.1.2 Discussion - Compliance / Non Compliance

All blasts complied with licence limits with only one blast overpressure level above 115dB(L) and no blast vibration levels greater than 5mm/s. The one elevated blast overpressure result recorded at “Cintra” on 24<sup>th</sup> November is not subject to the blasting criteria as the property is mine owned. A number of blast monitors did not trigger during the period due to the overpressure and/or vibration levels from the blast being below the trigger level of the monitor. No blasts were missed.

### 4.2 BLAST COMPLAINTS

There were 10 complaints from six blasts undertaken by Werris Creek Coal. All blast complaints were from Werris Creek residents. All blast results from complaints were within compliance, with no results for the Werris Creek monitor above 111.9dB(L) and 0.37mm/s. Two blasts received multiple complainants, first instance on 10<sup>th</sup> November 2010 with four individual complainants and second occasion on 6<sup>th</sup> January 2011 with two individual complainants. The review of the blast on 10<sup>th</sup> November 2010 found that the shot was designed for dry conditions however wet weather prevailed at the time of firing requiring a change in the blast timing to slow down the blast to minimise fume and overpressure impacts but resulted in higher than normal vibration levels. To avoid recurrence of this, blasts will be designed for wet weather first and modified if conditions become dry. The review of the blast on 6<sup>th</sup> January 2011 found that the blast was fired during strong southerly winds which would of reinforced the overpressure impact experienced by residents in Werris Creek. WCC will in future review the need to fire blasts in strong southerly wind conditions to avoid reinforcement of overpressure impacts on residents in Werris Creek. The other four blast complaints were from the same Werris Creek resident, WCC have continued to work with this resident and have previously completed a structural inspection of damage at the property, established a Werris Creek blast monitoring location and started advertising blasting times in the “Werris Creek Flyer”. In addition, Orica Mining Services have commenced a review and audit into their blasting processes to identify if there are any specific causes to the particular complainants issues and whether shot designs could be modified to minimise or avoid impacts for this resident. Specific actions taken in relation to these complaints are outlined in **Section 6**.

## 5.0 WATER

Groundwater monitoring was undertaken on the 6<sup>th</sup> and 11<sup>th</sup> January 2011. Surface water monitoring was undertaken on the 8<sup>th</sup> December 2010. There were 11 surface water discharge events during the period.

## 5.1 GROUND WATER

Groundwater monitoring is undertaken to monitor if there are any impacts on groundwater quality and levels as a result of the Werris Creek Coal mine. WCC monitor 41 groundwater bores and piezometers in the vicinity of the mine, with the key aquifers being Quipolly Creek Alluvium (MW12 upstream and MW7 downstream) and Werrie Basalt (MW5 south and MW14 north).

### 5.1.1 Monitoring Data Results

Brief summary of groundwater monitoring results is provided below with detailed monitoring data outlined in **Appendix 5**.

Site	pH	EC	Dip	Change
<b>Quipolly Creek Alluvium</b>				
MW7	7.23	555	4.16	Negligible change in groundwater quality and level since September.
MW12	7.31	422	6.43	Groundwater EC freshened and level rose 1.16m since September.
<b>Werrie Basalt</b>				
MW5	7.01	2400	7.81	Groundwater level rose 0.6m and pH and EC rose since September.
MW14	7.03	1140	15.59	Groundwater level rose 0.3m but negligible change in quality since September.

### 5.1.2 Discussion - Compliance / Non Compliance

Continuing rainfall into November and December resulted in ongoing groundwater level rises across the area and for the bores next to Quipolly Creek to maintain existing high groundwater levels.

## 5.2 SURFACE WATER

Surface water monitoring is undertaken at key dirty and void water dams to monitor for potential contamination issues due to mining while the water is still onsite.

### 5.2.1 Monitoring Data Results

Summary of surface water quality monitoring results is provided below with detailed monitoring data outlined in **Appendix 6**.

Site	pH	EC	TSS	O&G	Change
<b>ONSITE</b>					
SB2	8.71	422	11	<5	pH and EC have increased. pH is outside the limit for discharge water quality.
SB9	7.84	170	23	<5	EC and TSS have increased. TSS is outside the limit for discharge water quality.
SB10	7.71	274	148	<5	EC has increased. TSS has decreased and outside the limit for discharge water quality.
VWD1	8.27	941	<5	<5	No change.
VWD2	8.80	646	8	<5	No change.
200ML	8.09	912	<5	<5	Not previously tested.
<b>OFFSITE</b>					
BGD	8.38	608	88	<5	Not previously tested.
QCU	7.58	593	70	<5	EC has increased. TSS has decreased.
QCD	7.02	560	<5	<5	EC has increased. pH and TSS has decreased.
WCU	7.79	667	56	<5	pH, EC and TSS have decreased.
WCD	7.49	177	14	<5	pH and EC have decreased.

### 5.2.2 Discussion - Compliance / Non Compliance

Surface water monitoring results were within the criteria of Site Water Management Plan response plan.

## 5.3 SURFACE WATER DISCHARGES

### 5.3.1 Monitoring Data Results

There were 6 wet weather discharge events and 5 controlled discharge events during the period. A summary of discharge monitoring results is provided below with detailed monitoring data outlined in **Appendix 7**.

Date	Site	pH	EC	TSS	O&G	Type	Compliance
2/11/2010	SB2	8.27	417	16	<5	Controlled	Compliant – Water quality within limits
11/11/2010	SB9	7.38	164	160	<5	Wet Weather	Compliant – Rainfall >39.2mm/5days
16/11/2010	SB2	8.59	397	11	<5	Wet Weather	NON COMPLIANT – Rainfall >39.2mm/5days but pH 0.09 > limit of 8.5
16/11/2010	SB9	7.53	157	26	5	Wet Weather	Compliant – Rainfall >39.2mm/5days and water quality within limits
23/11/2010	SB9	7.57	149	31	<5	Controlled	Compliant – Water quality within limits
29/11/2010	SB2	8.36	444	22	<5	Controlled	Compliant – Water quality within limits
10/12/2010	SB2	8.05	406	25	<5	Wet Weather	Compliant – Rainfall >39.2mm/5days and water quality within limits
10/12/2010	SB9	7.25	95	137	<5	Wet Weather	Compliant – Rainfall >39.2mm/5days
10/12/2010	SB10	7.22	179	314	<5	Wet Weather	Compliant – Rainfall >39.2mm/5days
15/12/2010	SB2	7.95	242	7	<5	Controlled	Compliant – Water quality within limits
18/12/2010	SB9	7.36	131	31	<5	Controlled	Compliant – Water quality within limits
<b>Criteria</b>		<b>8.5</b>	<b>N/A</b>	<b>50</b>	<b>10</b>		

### 5.3.2 Discussion - Compliance / Non Compliance

A wet weather discharge from SB2 on 16th November exceeded the Environmental Protection Licence pH upper limit of 8.5 by 0.09. DECCW considered the non-compliance as minor and of a short duration that resulted in no environmental harm and no further action is warranted. All other surface water discharge results were within WCC Environmental Protection Licence 12290 criteria and there were no impacts on water quality monitored in Quipolly and Werris Creeks' catchments as a result of the discharge events.

### 5.3 WATER COMPLAINTS

There were no water related complaints during the period.

## 6.0 COMPLAINTS SUMMARY

There were 14 complaints received during the reporting period and the details are summarized below. In total there were 16 issues raised – 10 related to blasting (from six separate blasts – two blasts resulted in multiple complainants), three related to lighting, two relating to dust from blasting and one related to noise. Eight of the complaints were raised by the one complainant with all complaints from Werris Creek residents.

Date	#	Complaint
4/11/2010	76	Noise complaint from Coronation Ave resident of Werris Creek regarding mining noise last night that he could hear from within his house. There was a mild temperature inversion and SSW wind blowing towards Werris Creek township.
8/11/2010	77	Blasting complaint from Kurrara St resident of Werris Creek regarding a blast from the previous Friday that badly shook the house and could feel the blast in the front lounge room. The blast results were in compliance.
10/11/2010	78	Blasting complaint from a resident of Werris Creek who felt the blast at their home and was the biggest blast they had ever felt. The blast results were in compliance. An Orica review of the blast identified that a change to the product type to minimise the fume and overpressure had resulted in the higher than normal vibration levels felt by northern residents.
10/11/2010	79	Blasting complaint from a resident of Werris Creek who felt the blast at their home and was the biggest blast they had ever felt. The blast results were in compliance. An Orica review of the blast identified that a change to the product type to minimise the fume and overpressure had resulted in the higher than normal vibration levels felt by northern residents.
10/11/2010	80	Blasting complaint from a resident of Werris Creek who felt the blast at their home and was the biggest blast they had ever felt. The blast results were in compliance. An Orica review of the blast identified that a change to the product type to minimise the fume and overpressure had resulted in the higher than normal vibration levels felt by northern residents.
10/11/2010	81	Blasting complaint from a resident of Werris Creek who felt the blast at their home and was the biggest blast they had ever felt. The blast results were in compliance. An Orica review of the blast identified that a change to the product type to minimise the fume and overpressure had resulted in the higher than normal vibration levels felt by northern residents.
7/12/2010	82	Lights shining brightly towards Kurrara St resident of Werris Creek. WCC would investigate and if required modify lighting plant locations to eliminate further issues.
21/12/2010	83	Blasting complaint from Kurrara St resident of Werris Creek stating that the blast shook her house and that the blast was late when in the "Werris Creek Flyer" it states blast will be between 1 and 1:30pm. Blast results were within compliance limits.
31/12/2010	84	Lights from coal stockpile beaming straight into town tonight from Coronation Ave resident of Werris Creek however since then there have not been any problems.
6/1/2011	85	Blasting complaint from Kurrara St resident of Werris Creek for Blast #1 6/1/11 at 1:30pm. Blast results were in compliance however strong SSE wind could have reinforced the air blast impact.
6/1/2011	86	Blasting complaint from Kurrara St resident of Werris Creek for Blast #1 6/1/11 at 1:30pm. Blast results were in compliance however strong SSE wind could have reinforced the air blast impact.

Date	#	Complaint
13/1/11	87	General blast and dust complaint forwarded by DECCW from a Kurrara St resident of Werris Creek alleging that the mine is doing nothing to fix the damage caused by blasting and the dust is affecting her husband's asthma. Structural Inspection report, blasting and dust results were sent to DECCW.
20/1/11	88	Lighting complaint from Kurrara St resident of Werris Creek about a bright light from the coal mine directed at her home the previous night between 12am and 1am. OCE confirmed that RL445m dump was used the previous night and on review the following day the lighting plant was facing west.
28/1/11	89	Complaint forwarded by DECCW on behalf of a Kurrara St resident of Werris Creek regarding blasting complaint for dust cloud on 21/1/11 that allegedly was able to be seen from 45km away by her husband and her doctor thought that it was a bush fire. Also the blast on 25/1/11 shook her house. Both blasts were in compliance.

## 7.0 GENERAL

Please feel free to ask any questions in relation to the information contained within this document during Item 7 of the meeting agenda.

Regards  
 Andrew Wright  
 Environmental Officer

**Appendix 1 – PM10 Dust Monitoring Data.**



## Environmental Division

### CERTIFICATE OF ANALYSIS

Work Order	: EN1002988	Page	: 1 of 7
Client	: ACIRL PTY LTD	Laboratory	: Environmental Division Newcastle
Contact	: GUNNEDAH LABORATORY	Contact	: Peter Keyte
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: gun.lab@alsglobal.com	E-mail	: peter.keyte@als.com.au
Telephone	: 02 6742 0058	Telephone	: 61-2-4968-9433
Facsimile	: 02 6742 0068	Facsimile	: +61-2-4968 0349
Project	: WERRIS CREEK HVAS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 14-DEC-2010
C-O-C number	: ----	Issue Date	: 14-DEC-2010
Sampler	: ----	No. of samples received	: 25
Site	: ----	No. of samples analysed	: 25
Quote number	: SY/261/10		

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 Accredited Laboratory 825

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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
Peter Keyte	Newcastle Manager	Newcastle

**Environmental Division Newcastle**

Part of the **ALS Laboratory Group**

5 Rosegum Road Warabrook NSW Australia 2304  
Tel. +61-2-4968 9433 Fax. +61-2-4968 0349 [www.alsglobal.com](http://www.alsglobal.com)

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## 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.

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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.

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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

- All filters were preweighed at ALS Muswellbrook, NATA accreditation number 15784.
- NATA accreditation is not held for results reported in  $\mu\text{g}/\text{m}^3$ , no blank corrections were used in calculation of TSP/PM10 results.



**Analytical Results**

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

				CINTRA 8369614	CINTRA 8369636	CINTRA 8369358	CINTRA 8369373	CINTRA 8369383
				28-OCT-2010 15:00	03-NOV-2010 15:00	09-NOV-2010 15:00	15-NOV-2010 15:00	21-NOV-2010 15:00
Compound	CAS Number	LOR	Unit	EN1002988-001	EN1002988-002	EN1002988-003	EN1002988-004	EN1002988-005
<b>EA143: Total Suspended Particulates</b>								
^ PM10	----	0.1	µg/m³	19.5	8.7	9.7	8.8	6.4
^ PM10 (mass per filter)	----	0.1	mg/filter	31.8	14.2	15.9	14.3	10.5



## Analytical Results

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

				EURUNDEREE 8369616	EURUNDEREE 8369637	EURUNDEREE 8369361	EURUNDEREE 8369376	EURUNDEREE 8369387
				28-OCT-2010 15:00	03-NOV-2010 15:00	09-NOV-2010 15:00	15-NOV-2010 15:00	21-NOV-2010 15:00
Compound	CAS Number	LOR	Unit	EN1002988-006	EN1002988-007	EN1002988-008	EN1002988-009	EN1002988-010
<b>EA143: Total Suspended Particulates</b>								
^ Total Suspended Particulates	----	0.1	µg/m <sup>3</sup>	----	9.7	15.8	9.1	7.4
^ PM10	----	0.1	µg/m <sup>3</sup>	12.8	----	----	----	----
^ Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	----	15.9	25.7	14.8	12.1
^ PM10 (mass per filter)	----	0.1	mg/filter	20.9	----	----	----	----



## Analytical Results

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

				RYAN 8369617	RYAN 8369639	RYAN 8369360	RYAN 8369375	RYAN 8369382
				28-OCT-2010 15:00	03-NOV-2010 15:00	09-NOV-2010 15:00	15-NOV-2010 15:00	21-NOV-2010 15:00
Compound	CAS Number	LOR	Unit	EN1002988-011	EN1002988-012	EN1002988-013	EN1002988-014	EN1002988-015
<b>EA143: Total Suspended Particulates</b>								
^ PM10	----	0.1	µg/m³	13.8	12.7	9.8	8.0	8.8
^ PM10 (mass per filter)	----	0.1	mg/filter	22.6	20.7	16.0	13.1	14.4



**Analytical Results**

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

				RYAN 8369615	RYAN 8369638	RYAN 8369359	RYAN 8369374	RYAN 8369388
				28-OCT-2010 15:00	03-NOV-2010 15:00	09-NOV-2010 15:00	15-NOV-2010 15:00	21-NOV-2010 15:00
Compound	CAS Number	LOR	Unit	EN1002988-016	EN1002988-017	EN1002988-018	EN1002988-019	EN1002988-020
<b>EA143: Total Suspended Particulates</b>								
^ Total Suspended Particulates	----	0.1	µg/m³	55.7	36.0	29.8	19.7	16.2
^ Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	90.8	58.8	48.6	32.2	26.4



**Analytical Results**

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

				PATTERSON 8369613	PATTERSON 8369611	PATTERSON 8369357	PATTERSON 8369372	PATTERSON 8369384
				28-OCT-2010 15:00	03-NOV-2010 15:00	09-NOV-2010 15:00	15-NOV-2010 15:00	21-NOV-2010 15:00
Compound	CAS Number	LOR	Unit	EN1002988-021	EN1002988-022	EN1002988-023	EN1002988-024	EN1002988-025
<b>EA143: Total Suspended Particulates</b>								
^ PM10	----	0.1	µg/m³	13.1	7.6	8.2	12.9	7.9
^ PM10 (mass per filter)	----	0.1	mg/filter	21.3	12.4	13.4	21.0	12.9



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: EN1100020</b>	Page	: 1 of 4
Client	: <b>WHITEHAVEN COAL MINING LIMITED</b>	Laboratory	: Environmental Division Newcastle
Contact	: RESULTS ADDRESS	Contact	: Peter Keyte
Address	: 5-7 TALBOT RD GUNNEDAH 2380	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: gunnedah.lab@alsglobal.com	E-mail	: peter.keyte@als.com.au
Telephone	: ----	Telephone	: 61-2-4968-9433
Facsimile	: ----	Facsimile	: +61-2-4968 0349
Project	: CINTRA	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 04-JAN-2011
Sampler	: ----	Issue Date	: 06-JAN-2011
Site	: ----		
Quote number	: ----	No. of samples received	: 6
		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



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**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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Peter Keyte	Newcastle Manager	Newcastle

**Environmental Division Newcastle**

Part of the **ALS Laboratory Group**

5 Rosegum Road Warabrook NSW Australia 2304

Tel. +61-2-4968 9433 Fax. +61-2-4968 0349 [www.alsglobal.com](http://www.alsglobal.com)

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## General Comments

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- EN1100020/001 - filter preweighed at ALS Muswellbrook, NATA accreditation number 15784.
- NATA accreditation is not held for results reported in  $\mu\text{g}/\text{m}^3$ . No atmospheric correction use in calculation of  $\mu\text{g}/\text{m}^3$  results.



**Analytical Results**

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

				WCHV1 8369643	WCHV1 369131	WCHV1 347413	WCHV1 347431	WCHV1 356068
				27-NOV-2010 15:00	03-DEC-2010 15:00	09-DEC-2010 15:00	15-DEC-2010 15:00	21-DEC-2010 15:00
Compound	CAS Number	LOR	Unit	EN1100020-001	EN1100020-002	EN1100020-003	EN1100020-004	EN1100020-005
<b>EA143: Total Suspended Particulates</b>								
^ PM10	----	0.1	µg/m <sup>3</sup>	10.8	9.9	7.7	12.4	8.8
^ PM10 (mass per filter)	----	0.1	mg/filter	17.6	16.1	12.6	20.2	14.3



### Analytical Results

Sub-Matrix: **FILTER**

Client sample ID

<b>WCHV1</b>	----	----	----	----
<b>356093</b>				

Client sampling date / time

27-DEC-2010 15:00	----	----	----	----
-------------------	------	------	------	------

Compound	CAS Number	LOR	Unit	EN1100020-006	----	----	----	----
----------	------------	-----	------	---------------	------	------	------	------

#### EA143: Total Suspended Particulates

^ PM10	----	0.1	µg/m <sup>3</sup>	<b>5.3</b>	----	----	----	----
^ PM10 (mass per filter)	----	0.1	mg/filter	<b>8.7</b>	----	----	----	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: EN1100204</b>	Page	: 1 of 3
Client	: <b>WHITEHAVEN COAL MINING LIMITED</b>	Laboratory	: Environmental Division Newcastle
Contact	: RESULTS ADDRESS	Contact	: Peter Keyte
Address	: 5-7 TALBOT RD GUNNEDAH 2380	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: gunnedah.lab@alsglobal.com	E-mail	: peter.keyte@als.com.au
Telephone	: ----	Telephone	: 61-2-4968-9433
Facsimile	: ----	Facsimile	: +61-2-4968 0349
Project	: WERRIS CREEK - HVAS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 27-JAN-2011
C-O-C number	: ----	Issue Date	: 02-FEB-2011
Sampler	: ALS GUNNEDAH	No. of samples received	: 4
Site	: CINTRA	No. of samples analysed	: 4
Quote number	: ----		

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



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**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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Petro Holowinskyj	Senior Analyst	Newcastle



## General Comments

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **NATA accreditation is not held for results reported in  $\mu\text{g}/\text{m}^3$ . Air volume data was provided by the client. No atmospheric correction used in calculation of  $\mu\text{g}/\text{m}^3$  results.**



## Analytical Results

Sub-Matrix: FILTER

Client sample ID

				CINTRA WCHV1 356086	CINTRA WCHV1 387806	CINTRA WCHV1 387829	CINTRA WCHV1 387844	----
				02-JAN-2011 09:25	08-JAN-2011 13:30	14-JAN-2011 09:35	20-JAN-2011 10:15	----
Compound	CAS Number	LOR	Unit	EN1100204-001	EN1100204-002	EN1100204-003	EN1100204-004	----
<b>EA143: Total Suspended Particulates</b>								
^ PM10	----	0.1	µg/m <sup>3</sup>	12.2	4.4	7.8	10.4	----
^ PM10 (mass per filter)	----	0.1	mg/filter	19.9	7.1	12.7	16.9	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: EN1100021</b>	Page	: 1 of 4
Client	: <b>WHITEHAVEN COAL MINING LIMITED</b>	Laboratory	: Environmental Division Newcastle
Contact	: RESULTS ADDRESS	Contact	: Peter Keyte
Address	: 5-7 TALBOT RD GUNNEDAH 2380	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: gunnedah.lab@alsglobal.com	E-mail	: peter.keyte@als.com.au
Telephone	: ----	Telephone	: 61-2-4968-9433
Facsimile	: ----	Facsimile	: +61-2-4968 0349
Project	: PATTERSON - TANSLEY PARK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 04-JAN-2011
C-O-C number	: ----	Issue Date	: 06-JAN-2011
Sampler	: ----	No. of samples received	: 6
Site	: ----	No. of samples analysed	: 6
Quote number	: ----		

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.

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- General Comments
- Analytical Results



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<u>Signatories</u>	<u>Position</u>	<u>Accreditation Category</u>
Peter Keyte	Newcastle Manager	Newcastle

**Environmental Division Newcastle**

Part of the **ALS Laboratory Group**

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Tel. +61-2-4968 9433 Fax. +61-2-4968 0349 [www.alsglobal.com](http://www.alsglobal.com)

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## General Comments

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^ = This result is computed from individual analyte detections at or above the level of reporting

- EN1100021/001 - filter preweighed at ALS Muswellbrook, NATA accreditation number 15784.
- NATA accreditation is not held for results reported in  $\mu\text{g}/\text{m}^3$ . No atmospheric correction used in calculation of  $\mu\text{g}/\text{m}^3$  results.



**Analytical Results**

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

				WCHV2 8369642	WCHV2 369130	WCHV2 347449	WCHV2 347430	WCHV2 356067
				27-NOV-2010 15:00	03-DEC-2010 15:00	09-DEC-2010 15:00	15-DEC-2010 15:00	21-DEC-2010 15:00
Compound	CAS Number	LOR	Unit	EN1100021-001	EN1100021-002	EN1100021-003	EN1100021-004	EN1100021-005
<b>EA143: Total Suspended Particulates</b>								
^ PM10	----	0.1	µg/m³	11.3	9.1	9.1	9.1	8.6
^ PM10 (mass per filter)	----	0.1	mg/filter	18.5	14.8	14.9	14.9	14.0



**Analytical Results**

Sub-Matrix: **FILTER**

Client sample ID

<b>WCHV2</b>	----	----	----	----
<b>356092</b>	----	----	----	----

Client sampling date / time

27-DEC-2010 15:00	----	----	----	----
-------------------	------	------	------	------

Compound	CAS Number	LOR	Unit	EN1100021-006	----	----	----	----
<b>EA143: Total Suspended Particulates</b>								
^ PM10	----	0.1	µg/m³	<b>3.4</b>	----	----	----	----
^ PM10 (mass per filter)	----	0.1	mg/filter	<b>5.5</b>	----	----	----	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: EN1100207</b>	<b>Page</b>	<b>: 1 of 3</b>
<b>Client</b>	<b>: WHITEHAVEN COAL MINING LIMITED</b>	<b>Laboratory</b>	<b>: Environmental Division Newcastle</b>
<b>Contact</b>	<b>: RESULTS ADDRESS</b>	<b>Contact</b>	<b>: Peter Keyte</b>
<b>Address</b>	<b>: 5-7 TALBOT RD GUNNEDAH 2380</b>	<b>Address</b>	<b>: 5 Rosegum Road Warabrook NSW Australia 2304</b>
<b>E-mail</b>	<b>: gunnedah.lab@alsglobal.com</b>	<b>E-mail</b>	<b>: peter.keyte@als.com.au</b>
<b>Telephone</b>	<b>: ----</b>	<b>Telephone</b>	<b>: 61-2-4968-9433</b>
<b>Facsimile</b>	<b>: ----</b>	<b>Facsimile</b>	<b>: +61-2-4968 0349</b>
<b>Project</b>	<b>: WERRIS CREEK - HVAS</b>	<b>QC Level</b>	<b>: NEPM 1999 Schedule B(3) and ALS QCS3 requirement</b>
<b>Order number</b>	<b>: ----</b>	<b>Date Samples Received</b>	<b>: 27-JAN-2011</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 01-FEB-2011</b>
<b>Sampler</b>	<b>: ALS GUNNEDAH</b>	<b>No. of samples received</b>	<b>: 4</b>
<b>Site</b>	<b>: RAILWAY VIEW TSP</b>	<b>No. of samples analysed</b>	<b>: 4</b>
<b>Quote number</b>	<b>: ----</b>		

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



WORLD RECOGNISED  
**ACCREDITATION**

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**Signatories**

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Petro Holowinskyj	Senior Analyst	Newcastle

**Environmental Division Newcastle**

Part of the **ALS Laboratory Group**

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## General Comments

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- EN1100207/001 - filter preweighed at ALS Muswellbrook, NATA accreditation number 15784.
- NATA accreditation is not held for results reported in  $\mu\text{g}/\text{m}^3$ . Air volume data was provided by the client. No atmospheric correction used in calculation of  $\mu\text{g}/\text{m}^3$  results.



**Analytical Results**

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

				RAILWAY VIEW TSP 8369650	RAILWAY VIEW TSP 387807	RAILWAY VIEW TSP 387830	RAILWAY VIEW TSP 387836	----
				02-JAN-2011 09:45	08-JAN-2011 13:45	14-JAN-2011 10:00	20-JAN-2011 10:55	----
Compound	CAS Number	LOR	Unit	EN1100207-001	EN1100207-002	EN1100207-003	EN1100207-004	----
<b>EA143: Total Suspended Particulates</b>								
^ Total Suspended Particulates	----	0.1	µg/m³	28.5	7.6	46.6	14.6	----
^ Total Suspended Particulates (mass per filter)	----	0.1	mg/filter	47.9	12.7	78.3	24.5	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: EN1100018</b>	Page	: 1 of 4
Client	: <b>WHITEHAVEN COAL MINING LIMITED</b>	Laboratory	: Environmental Division Newcastle
Contact	: RESULTS ADDRESS	Contact	: Peter Keyte
Address	: 5-7 TALBOT RD GUNNEDAH 2380	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: gunnedah.lab@alsglobal.com	E-mail	: peter.keyte@als.com.au
Telephone	: ----	Telephone	: 61-2-4968-9433
Facsimile	: ----	Facsimile	: +61-2-4968 0349
Project	: RAILWAY VIEW	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 04-JAN-2011
Sampler	: ----	Issue Date	: 06-JAN-2011
Site	: ----		
Quote number	: ----	No. of samples received	: 6
		No. of samples analysed	: 6

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**Signatories**

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<u>Signatories</u>	<u>Position</u>	<u>Accreditation Category</u>
Peter Keyte	Newcastle Manager	Newcastle



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- EN1100018/001 - filter preweighed at ALS Muswellbrook, NATA accreditation number 15784.
- NATA accreditation is not held for results reported in  $\mu\text{g}/\text{m}^3$ . No atmospheric correction used in calculation of  $\mu\text{g}/\text{m}^3$  results.



**Analytical Results**

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

				WCHV3 8369644	WCHV3 389132	WCHV3 347415	WCHV3 347433	WCHV3 356070
				27-NOV-2010 15:00	03-DEC-2010 15:00	09-DEC-2010 15:00	15-DEC-2010 15:00	21-DEC-2010 15:00
Compound	CAS Number	LOR	Unit	EN1100018-001	EN1100018-002	EN1100018-003	EN1100018-004	EN1100018-005
<b>EA143: Total Suspended Particulates</b>								
^ PM10	----	0.1	µg/m³	11.5	7.1	5.6	21.6	11.2
^ PM10 (mass per filter)	----	0.1	mg/filter	18.7	11.6	9.1	35.3	18.3



### Analytical Results

Sub-Matrix: **FILTER**

Client sample ID

<b>WCHV3</b>	----	----	----	----
<b>356076</b>				

Client sampling date / time

27-DEC-2010 15:00	----	----	----	----
-------------------	------	------	------	------

Compound	CAS Number	LOR	Unit	EN1100018-006	----	----	----	----
----------	------------	-----	------	---------------	------	------	------	------

#### EA143: Total Suspended Particulates

^ PM10	----	0.1	µg/m <sup>3</sup>	<b>3.2</b>	----	----	----	----
^ PM10 (mass per filter)	----	0.1	mg/filter	<b>5.3</b>	----	----	----	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: EN1100208</b>	<b>Page</b>	: 1 of 3
<b>Client</b>	<b>: WHITEHAVEN COAL MINING LIMITED</b>	<b>Laboratory</b>	: Environmental Division Newcastle
<b>Contact</b>	<b>: RESULTS ADDRESS</b>	<b>Contact</b>	: Peter Keyte
<b>Address</b>	<b>: 5-7 TALBOT RD GUNNEDAH 2380</b>	<b>Address</b>	: 5 Rosegum Road Warabrook NSW Australia 2304
<b>E-mail</b>	<b>: gunnedah.lab@alsglobal.com</b>	<b>E-mail</b>	: peter.keyte@als.com.au
<b>Telephone</b>	: ----	<b>Telephone</b>	: 61-2-4968-9433
<b>Facsimile</b>	: ----	<b>Facsimile</b>	: +61-2-4968 0349
<b>Project</b>	<b>: WERRIS CREEK - HVAS</b>	<b>QC Level</b>	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
<b>Order number</b>	: ----	<b>Date Samples Received</b>	: 27-JAN-2011
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 02-FEB-2011
<b>Sampler</b>	<b>: ALS GUNNEDAH</b>	<b>No. of samples received</b>	: 4
<b>Site</b>	<b>: EURUNDEREE</b>	<b>No. of samples analysed</b>	: 4
<b>Quote number</b>	: ----		

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**Signatories**

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Petro Holowinskyj	Senior Analyst	Newcastle

**Environmental Division Newcastle**

Part of the **ALS Laboratory Group**

5 Rosegum Road Warabrook NSW Australia 2304

Tel. +61-2-4968 9433 Fax. +61-2-4968 0349 [www.alsglobal.com](http://www.alsglobal.com)

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## General Comments

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- EN1100208/001 - filter preweighed at ALS Muswellbrook, NATA accreditation number 15784.
- NATA accreditation is not held for results reported in  $\mu\text{g}/\text{m}^3$ . Air volume data was provided by the client. No atmospheric corrections used in calculation of  $\mu\text{g}/\text{m}^3$ .



**Analytical Results**

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	EURUNDEREE 8363302	EURUNDEREE 387809	EURUNDEREE 387832	EURUNDEREE 387838	---
				02-JAN-2011 10:15	08-JAN-2011 14:45	14-JAN-2011 10:30	20-JAN-2011 11:30	---
				EN1100208-001	EN1100208-002	EN1100208-003	EN1100208-004	---
<b>EA143: Total Suspended Particulates</b>								
^ PM10	----	0.1	µg/m³	15.0	5.6	20.8	9.4	----
^ PM10 (mass per filter)	----	0.1	mg/filter	25.2	9.4	34.9	15.7	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: EN1100022</b>	<b>Page</b>	<b>: 1 of 4</b>
<b>Client</b>	<b>: WHITEHAVEN COAL MINING LIMITED</b>	<b>Laboratory</b>	<b>: Environmental Division Newcastle</b>
<b>Contact</b>	<b>: RESULTS ADDRESS</b>	<b>Contact</b>	<b>: Peter Keyte</b>
<b>Address</b>	<b>: 5-7 TALBOT RD GUNNEDAH 2380</b>	<b>Address</b>	<b>: 5 Rosegum Road Warabrook NSW Australia 2304</b>
<b>E-mail</b>	<b>: gunnedah.lab@alsglobal.com</b>	<b>E-mail</b>	<b>: peter.keyte@als.com.au</b>
<b>Telephone</b>	<b>: ----</b>	<b>Telephone</b>	<b>: 61-2-4968-9433</b>
<b>Facsimile</b>	<b>: ----</b>	<b>Facsimile</b>	<b>: +61-2-4968 0349</b>
<b>Project</b>	<b>: RYAN - TSP</b>	<b>QC Level</b>	<b>: NEPM 1999 Schedule B(3) and ALS QCS3 requirement</b>
<b>Order number</b>	<b>: ----</b>	<b>Date Samples Received</b>	<b>: 04-JAN-2011</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 06-JAN-2011</b>
<b>Sampler</b>	<b>: ----</b>	<b>No. of samples received</b>	<b>: 6</b>
<b>Site</b>	<b>: ----</b>	<b>No. of samples analysed</b>	<b>: 6</b>
<b>Quote number</b>	<b>: ----</b>		

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<u>Signatories</u>	<u>Position</u>	<u>Accreditation Category</u>
Peter Keyte	Newcastle Manager	Newcastle



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- EN1100022/001 filter preweighed at ALS Muswellbrook, NATA accreditation number 15784.
- NATA accreditation is not held for results reported in  $\mu\text{g}/\text{m}^3$ . No atmospheric correction used in calculation of  $\mu\text{g}/\text{m}^3$  results.



**Analytical Results**

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

				WCTSP 8369645	WCTSP 369133	WCTSP 347414	WCTSP 347432	WCTSP 356069
				27-NOV-2010 15:00	03-DEC-2010 15:00	09-DEC-2010 15:00	15-DEC-2010 15:00	21-DEC-2010 15:00
Compound	CAS Number	LOR	Unit	EN1100022-001	EN1100022-002	EN1100022-003	EN1100022-004	EN1100022-005
<b>EA143: Total Suspended Particulates</b>								
^ Total Suspended Particulates	----	0.1	µg/m³	24.3	9.6	12.5	64.0	25.7
^ PM10 (mass per filter)	----	0.1	mg/filter	40.8	16.2	21.0	108	43.2



**Analytical Results**

Sub-Matrix: **FILTER**

Client sample ID

<b>WCTSP</b>	----	----	----	----
<b>356496</b>				

Client sampling date / time

27-DEC-2010 15:00	----	----	----	----
-------------------	------	------	------	------

Compound	CAS Number	LOR	Unit	EN1100022-006	----	----	----	----
<b>EA143: Total Suspended Particulates</b>								
^ Total Suspended Particulates	----	0.1	µg/m³	<b>9.6</b>	----	----	----	----
^ PM10 (mass per filter)	----	0.1	mg/filter	<b>16.2</b>	----	----	----	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: EN1100205</b>	Page	: 1 of 3
Client	: <b>WHITEHAVEN COAL MINING LIMITED</b>	Laboratory	: Environmental Division Newcastle
Contact	: RESULTS ADDRESS	Contact	: Peter Keyte
Address	: 5-7 TALBOT RD GUNNEDAH 2380	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: gunnedah.lab@alsglobal.com	E-mail	: peter.keyte@als.com.au
Telephone	: ----	Telephone	: 61-2-4968-9433
Facsimile	: ----	Facsimile	: +61-2-4968 0349
Project	: WERRIS CREEK - HVAS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 27-JAN-2011
C-O-C number	: ----	Issue Date	: 02-FEB-2011
Sampler	: ALS GUNNEDAH	No. of samples received	: 4
Site	: TONSLEY PARK	No. of samples analysed	: 4
Quote number	: ----		

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Petro Holowinskyj	Senior Analyst	Newcastle



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**Analytical Results**

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

				TONSLEY PARK 356094	TONSLEY PARK 387805	TONSLEY PARK 387828	TONSLEY PARK 387845	----
				02-JAN-2011 09:10	08-JAN-2011 13:20	14-JAN-2011 09:20	20-JAN-2011 09:45	----
Compound	CAS Number	LOR	Unit	EN1100205-001	EN1100205-002	EN1100205-003	EN1100205-004	----
<b>EA143: Total Suspended Particulates</b>								
^ PM10	----	0.1	µg/m³	20.0	4.5	8.9	7.7	----
^ PM10 (mass per filter)	----	0.1	mg/filter	32.6	7.4	14.5	12.5	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: EN1100019</b>	<b>Page</b>	<b>: 1 of 4</b>
<b>Client</b>	<b>: WHITEHAVEN COAL MINING LIMITED</b>	<b>Laboratory</b>	<b>: Environmental Division Newcastle</b>
<b>Contact</b>	<b>: RESULTS ADDRESS</b>	<b>Contact</b>	<b>: Peter Keyte</b>
<b>Address</b>	<b>: 5-7 TALBOT RD GUNNEDAH 2380</b>	<b>Address</b>	<b>: 5 Rosegum Road Warabrook NSW Australia 2304</b>
<b>E-mail</b>	<b>: gunnedah.lab@alsglobal.com</b>	<b>E-mail</b>	<b>: peter.keyte@als.com.au</b>
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<b>Facsimile</b>	<b>: ----</b>	<b>Facsimile</b>	<b>: +61-2-4968 0349</b>
<b>Project</b>	<b>: EURUNDEREE</b>	<b>QC Level</b>	<b>: NEPM 1999 Schedule B(3) and ALS QCS3 requirement</b>
<b>Order number</b>	<b>: ----</b>	<b>Date Samples Received</b>	<b>: 04-JAN-2011</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 06-JAN-2011</b>
<b>Sampler</b>	<b>: ----</b>	<b>No. of samples received</b>	<b>: 6</b>
<b>Site</b>	<b>: ----</b>	<b>No. of samples analysed</b>	<b>: 6</b>
<b>Quote number</b>	<b>: ----</b>		

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Peter Keyte	Newcastle Manager	Newcastle

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- EN1100019-001 - filter was preweighed at ALS Muswellbrook, NATA accreditation number 15784.
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## Analytical Results

Sub-Matrix: FILTER

Client sample ID

Client sampling date / time

				WCHV4 839646	WCHV4 389134	WCHV4 347416	WCHV4 347434	WCHV4 356071
				27-NOV-2010 15:00	03-DEC-2010 15:00	09-DEC-2010 15:00	09-DEC-2010 15:00	21-DEC-2010 15:00
Compound	CAS Number	LOR	Unit	EN1100019-001	EN1100019-002	EN1100019-003	EN1100019-004	EN1100019-005
<b>EA143: Total Suspended Particulates</b>								
^ PM10	----	0.1	µg/m <sup>3</sup>	19.7	11.5	8.5	10.2	7.9
^ PM10 (mass per filter)	----	0.1	mg/filter	33.1	19.3	14.3	17.1	13.3



### Analytical Results

Sub-Matrix: **FILTER**

Client sample ID

<b>WCHV4 356082</b>	----	----	----	----
-------------------------	------	------	------	------

Client sampling date / time

27-DEC-2010 15:00	----	----	----	----
-------------------	------	------	------	------

Compound	CAS Number	LOR	Unit	EN1100019-006	----	----	----	----
----------	------------	-----	------	---------------	------	------	------	------

#### EA143: Total Suspended Particulates

^ PM10	----	0.1	µg/m <sup>3</sup>	<b>2.6</b>	----	----	----	----
^ PM10 (mass per filter)	----	0.1	mg/filter	<b>4.4</b>	----	----	----	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: EN1100206</b>	Page	: 1 of 3
Client	: <b>WHITEHAVEN COAL MINING LIMITED</b>	Laboratory	: Environmental Division Newcastle
Contact	: RESULTS ADDRESS	Contact	: Peter Keyte
Address	: 5-7 TALBOT RD GUNNEDAH 2380	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: gunnedah.lab@alsglobal.com	E-mail	: peter.keyte@als.com.au
Telephone	: ----	Telephone	: 61-2-4968-9433
Facsimile	: ----	Facsimile	: +61-2-4968 0349
Project	: WERRIS CREEK - HVAS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 27-JAN-2011
C-O-C number	: ----	Issue Date	: 02-FEB-2011
Sampler	: ALS GUNNEDAH	No. of samples received	: 4
Site	: RAILWAY VIEW PM10	No. of samples analysed	: 4
Quote number	: ----		

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- General Comments
- Analytical Results



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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Petro Holowinskyj	Senior Analyst	Newcastle

**Environmental Division Newcastle**

Part of the **ALS Laboratory Group**

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- EN1100206/001 - filter preweighed at ALS Muswellbrook, NATA accreditation number 15784.
- NATA accreditation is not held for results reported in  $\mu\text{g}/\text{m}^3$ . Air volume data was provided by the client. No atmospheric corrections used in calculation of  $\mu\text{g}/\text{m}^3$  results.



**Analytical Results**

Sub-Matrix: FILTER

Client sample ID

<b>RAILWAY VIEW PM10 8363301</b>	<b>RAILWAY VIEW PM10 387808</b>	<b>RAILWAY VIEW PM10 387831</b>	<b>RAILWAY VIEW PM10 387837</b>	----
02-JAN-2011 09:55	08-JAN-2011 13:55	14-JAN-2011 10:15	20-JAN-2011 11:10	----

Client sampling date / time

<i>Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<b>EN1100206-001</b>	<b>EN1100206-002</b>	<b>EN1100206-003</b>	<b>EN1100206-004</b>	----
-----------------	-------------------	------------	-------------	----------------------	----------------------	----------------------	----------------------	------

**EA143: Total Suspended Particulates**

<b>^ PM10</b>	----	0.1	µg/m <sup>3</sup>	<b>16.4</b>	<b>5.0</b>	<b>18.8</b>	<b>5.9</b>	----
<b>^ PM10 (mass per filter)</b>	----	0.1	mg/filter	<b>26.7</b>	<b>8.1</b>	<b>30.6</b>	<b>9.6</b>	----

**Appendix 2 – Deposited Dust Monitoring Data.**



## Environmental Division

### CERTIFICATE OF ANALYSIS

<b>Work Order</b>	: <b>EN1002885</b>	<b>Page</b>	: 1 of 4
<b>Client</b>	: <b>ACIRL PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Newcastle
<b>Contact</b>	: <b>GUNNEDAH LABORATORY</b>	<b>Contact</b>	: Peter Keyte
<b>Address</b>	: 5-7 TALBOT RD GUNNEDAH NSW 2380	<b>Address</b>	: 5 Rosegum Road Warabrook NSW Australia 2304
<b>E-mail</b>	: gun.lab@alsglobal.com	<b>E-mail</b>	: peter.keyte@als.com.au
<b>Telephone</b>	: 02 6742 0058	<b>Telephone</b>	: 61-2-4968-9433
<b>Facsimile</b>	: 02 6742 0068	<b>Facsimile</b>	: +61-2-4968 0349
<b>Project</b>	: WERRIS CREEK	<b>QC Level</b>	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
<b>Order number</b>	: ----	<b>Date Samples Received</b>	: 01-DEC-2010
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 10-DEC-2010
<b>Sampler</b>	: ALS GUNNEDAH	<b>No. of samples received</b>	: 7
<b>Site</b>	: ----	<b>No. of samples analysed</b>	: 7
<b>Quote number</b>	: ----		

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 Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Peter Keyte	Newcastle Manager	Newcastle

#### Environmental Division Newcastle

Part of the **ALS Laboratory Group**

5 Rosegum Road Warabrook NSW Australia 2304  
Tel. +61-2-4968 9433 Fax. +61-2-4968 0349 [www.alsglobal.com](http://www.alsglobal.com)

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## 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 is not held for results reported in g/m<sup>2</sup>.mth.**



## Analytical Results

Sub-Matrix: DUST

Client sample ID

Client sampling date / time

				WCA7	WCA2	WCA5	WCA6	MOUNTAIN VIEW
				19-NOV-2010 13:15	19-NOV-2010 13:30	19-NOV-2010 13:45	19-NOV-2010 13:55	19-NOV-2010 14:15
Compound	CAS Number	LOR	Unit	EN1002885-001	EN1002885-002	EN1002885-003	EN1002885-004	EN1002885-005
<b>EA120: Ash Content</b>								
Ash Content	----	0.1	g/m <sup>2</sup> .month	0.5	1.2	0.6	0.9	0.7
Ash Content (mg)	----	1	mg	9	21	11	17	12
<b>EA125: Combustible Matter</b>								
Combustible Matter	----	0.1	g/m <sup>2</sup> .month	0.4	0.8	0.4	0.1	0.2
Combustible Matter (mg)	----	1	mg	8	15	8	1	4
<b>EA141: Total Insoluble Matter</b>								
Total Insoluble Matter	----	0.1	g/m <sup>2</sup> .month	0.9	2.0	1.0	1.0	0.9
Total Insoluble Matter (mg)	----	1	mg	17	36	19	18	16



## Analytical Results

Sub-Matrix: DUST

				Client sample ID	MARANGO	GLENARRA			
				Client sampling date / time	19-NOV-2010 14:35	19-NOV-2010 14:05	----	----	----
Compound	CAS Number	LOR	Unit	EN1002885-006	EN1002885-007	----	----	----	
<b>EA120: Ash Content</b>									
Ash Content	----	0.1	g/m <sup>2</sup> .month	0.4	1.4	----	----	----	
Ash Content (mg)	----	1	mg	7	25	----	----	----	
<b>EA125: Combustible Matter</b>									
Combustible Matter	----	0.1	g/m <sup>2</sup> .month	0.4	0.7	----	----	----	
Combustible Matter (mg)	----	1	mg	8	13	----	----	----	
<b>EA141: Total Insoluble Matter</b>									
Total Insoluble Matter	----	0.1	g/m <sup>2</sup> .month	0.8	2.1	----	----	----	
Total Insoluble Matter (mg)	----	1	mg	15	38	----	----	----	



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	: <b>EN1003071</b>	Page	: 1 of 4
Client	: <b>WHITEHAVEN COAL MINING LIMITED</b>	Laboratory	: Environmental Division Newcastle
Contact	: RESULTS ADDRESS	Contact	: Peter Keyte
Address	: 5-7 TALBOT RD GUNNEDAH 2380	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: gunnedah.lab@alsglobal.com	E-mail	: peter.keyte@als.com.au
Telephone	: ----	Telephone	: 61-2-4968-9433
Facsimile	: ----	Facsimile	: +61-2-4968 0349
Project	: WHITEHAVEN DUSTS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 22-DEC-2010
Sampler	: ----	Issue Date	: 05-JAN-2011
Site	: WERRIS CREEK		
		No. of samples received	: 7
Quote number	: SY/332/10	No. of samples analysed	: 7

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



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**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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Peter Keyte	Newcastle Manager	Newcastle

**Environmental Division Newcastle**

Part of the **ALS Laboratory Group**

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## 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 is not held for results reported in g/m<sup>2</sup>.mth. Period sampled: 19/11/2010 - 20/12/2010.**



## Analytical Results

Sub-Matrix: DUST

				Client sample ID	WC2	WC5	WC7	WC8	WC9
				Client sampling date / time	20-DEC-2010 10:50	20-DEC-2010 11:15	20-DEC-2010 10:30	20-DEC-2010 12:10	20-DEC-2010 12:50
Compound	CAS Number	LOR	Unit		EN1003071-001	EN1003071-002	EN1003071-003	EN1003071-004	EN1003071-005
<b>EA120: Ash Content</b>									
Ash Content	----	0.1	g/m <sup>2</sup> .month		0.4	3.4	0.6	0.6	6.6
Ash Content (mg)	----	1	mg		8	62	11	11	121
<b>EA125: Combustible Matter</b>									
Combustible Matter	----	0.1	g/m <sup>2</sup> .month		0.2	0.5	<0.1	<0.1	1.2
Combustible Matter (mg)	----	1	mg		3	9	<1	<1	22
<b>EA141: Total Insoluble Matter</b>									
Total Insoluble Matter	----	0.1	g/m <sup>2</sup> .month		0.6	3.9	0.6	0.6	7.8
Total Insoluble Matter (mg)	----	1	mg		11	71	11	11	143



**Analytical Results**

Sub-Matrix: DUST

Client sample ID

Client sampling date / time

				WC10	WC11	----	----	----
				20-DEC-2010 12:35	20-DEC-2010 12:25	----	----	----
Compound	CAS Number	LOR	Unit	EN1003071-006	EN1003071-007	----	----	----
<b>EA120: Ash Content</b>								
Ash Content	----	0.1	g/m <sup>2</sup> .month	0.4	0.9	----	----	----
Ash Content (mg)	----	1	mg	8	17	----	----	----
<b>EA125: Combustible Matter</b>								
Combustible Matter	----	0.1	g/m <sup>2</sup> .month	<0.1	0.7	----	----	----
Combustible Matter (mg)	----	1	mg	<1	13	----	----	----
<b>EA141: Total Insoluble Matter</b>								
Total Insoluble Matter	----	0.1	g/m <sup>2</sup> .month	0.4	1.6	----	----	----
Total Insoluble Matter (mg)	----	1	mg	8	30	----	----	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: EN1100161</b>	Page	: 1 of 4
Client	: <b>WHITEHAVEN COAL MINING LIMITED</b>	Laboratory	: Environmental Division Newcastle
Contact	: RESULTS ADDRESS	Contact	: Peter Keyte
Address	: 5-7 TALBOT RD GUNNEDAH 2380	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: gunnedah.lab@alsglobal.com	E-mail	: peter.keyte@als.com.au
Telephone	: ----	Telephone	: 61-2-4968-9433
Facsimile	: ----	Facsimile	: +61-2-4968 0349
Project	: WERRIS CREEK DUST	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 20-JAN-2011
C-O-C number	: ----	Issue Date	: 25-JAN-2011
Sampler	: CE, BG	No. of samples received	: 7
Site	: ----	No. of samples analysed	: 7
Quote number	: SY/332/10		

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



WORLD RECOGNISED  
**ACCREDITATION**

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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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Petro Holowinskyj	Senior Analyst	Newcastle



## General Comments

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

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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.

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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 is not held for results reported in g/m<sup>2</sup>.mth. Period sampled: 20/12/2010 - 19/01/2011.



## Analytical Results

Sub-Matrix: DUST

Client sample ID

Client sampling date / time

				WC2 CINTRA	WC5 RAILWAY VIEW	WC7 TONSLEY PARK	WC8 PLAIN VIEW	WC9 MARENGO
				19-JAN-2011 09:20	19-JAN-2011 09:45	19-JAN-2011 09:10	19-JAN-2011 09:35	19-JAN-2011 10:15
Compound	CAS Number	LOR	Unit	EN1100161-001	EN1100161-002	EN1100161-003	EN1100161-004	EN1100161-005
<b>EA120: Ash Content</b>								
Ash Content	----	0.1	g/m <sup>2</sup> .month	0.9	0.5	0.5	0.6	0.5
Ash Content (mg)	----	1	mg	16	9	9	10	9
<b>EA125: Combustible Matter</b>								
Combustible Matter	----	0.1	g/m <sup>2</sup> .month	0.6	0.2	0.2	<0.1	0.1
Combustible Matter (mg)	----	1	mg	10	3	4	1	1
<b>EA141: Total Insoluble Matter</b>								
Total Insoluble Matter	----	0.1	g/m <sup>2</sup> .month	1.5	0.7	0.7	0.6	0.6
Total Insoluble Matter (mg)	----	1	mg	26	12	13	11	10



**Analytical Results**

Sub-Matrix: DUST

Client sample ID

Client sampling date / time

				WC10 MOUNTAIN VIEW	WC11 GLENARA	----	----	----
				19-JAN-2011 10:00	19-JAN-2011 09:15	----	----	----
Compound	CAS Number	LOR	Unit	EN1100161-006	EN1100161-007	----	----	----
<b>EA120: Ash Content</b>								
Ash Content	----	0.1	g/m <sup>2</sup> .month	0.4	0.6	----	----	----
Ash Content (mg)	----	1	mg	7	11	----	----	----
<b>EA125: Combustible Matter</b>								
Combustible Matter	----	0.1	g/m <sup>2</sup> .month	<0.1	0.4	----	----	----
Combustible Matter (mg)	----	1	mg	<1	7	----	----	----
<b>EA141: Total Insoluble Matter</b>								
Total Insoluble Matter	----	0.1	g/m <sup>2</sup> .month	0.4	1.0	----	----	----
Total Insoluble Matter (mg)	----	1	mg	7	18	----	----	----

**Appendix 3 – Noise Monitoring Results.**



23 November 2010

Ref: 04035/3770

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: NOVEMBER 2010 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Thursday 18 November 2010.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Pty Ltd *"Noise Management Protocol"*. The locations are listed below and attached in **Figure 1**:

- "Almawillee"
- "Glenara"
- "Marengo"
- "Tonsley Park"
- "Cintra"
- "Railway Cottage" (previously denoted as "Fletcher")

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data shows that winds were light to moderate generally from the south during the day, dropping to calm in the evening before turning to the north north west during the night. The data showed a mild to strong temperature inversion for most of the evening and night.

The total measured Leq is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer *"Evaluator"* analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) L<sub>eq</sub>(15 min)** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

**Table 1**  
**WCC Noise Monitoring Results – 18 November 2010 (Day)**

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	2:28 pm	36	n/a	1.8/S	Birds & insects (36), traffic (20), WCC inaudible
Glenara	2:45 pm	40	n/a	4.0/SSW	Birds & insects (38), traffic (36), WCC (25) inaudible
Cintra	2:05 pm	42	n/a	3.6/S	WCC (40), birds & insects (37)
Marengo	3:30 pm	33	n/a	4.9/S	Birds & insects (33), WCC barely audible
Tonsley Park	3:55 pm	41	n/a	5.8/S	Traffic (39), birds & insects (35), WCC (34)
Railway Cottage	3:03 pm	44	n/a	5.4/S	Traffic (44), birds & insects (25), WCC inaudible

**Table 2**  
**WCC Noise Monitoring Results – 18 November 2010 (Evening)**

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	8:02 pm	46	>3	0.4/S	Frogs & insects (46), WCC inaudible
Glenara	8:20 pm	40	>3	Calm	Frogs & insects (40), WCC inaudible
Cintra	9:42 pm	38	>3	1.3/S	WCC (38), insects (28)
Marengo	8:59 pm	40	>3	Calm	Frogs & insects (40), WCC (30)
Tonsley Park	9:25 pm	42	>3	Calm	Frogs & insects (41), traffic (33), WCC (31)
Railway Cottage	8:38 pm	50	>3	Calm	Frogs & insects (50), traffic (35), WCC inaudible

**Table 3**  
**WCC Noise Monitoring Results – 18 November 2010 (Night)**

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	10:43 pm	41	<3	2.7/NNW	Frogs & insects (41), WCC (30)
Glenara	11:00 am	38	<3	3.1/NNW	Frogs & insects (36), traffic (32), WCC (<30)
Cintra	11:25 pm	42	<3	2.7/NNW	Frogs & insects (38), traffic (36), WCC (36)
Marengo	10:05 am	39	<3	0.9/S	Frogs & insects (39), WCC (<25)
Tonsley Park	11:43 pm	41	<3	2.2/NNW	Frogs & insects (41), WCC (<24)
Railway Cottage	10:25 pm	41	<3	2.2/NNW	Frogs & insects (40), traffic (35), WCC (<30)

The results shown in Tables 1-3 indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC where higher than the criterion of 35 dB(A) at the Cintra monitoring locations during the day, evening and night monitoring periods.

Cintra is a project related residence.

The noise at Cintra was related to emissions from the train loading facility including, dozer engine and track noise and trucks hauling coal.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Data from the mine operated weather station indicated that all of the elevated noise levels at Cintra during the evening were measured whilst there was a temperature inversion of greater than +3° C/100m in place.

Data from those times where WCC operations were audible were analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the Lmax criterion at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,  
SPECTRUM ACOUSTICS PTY LIMITED

Author:

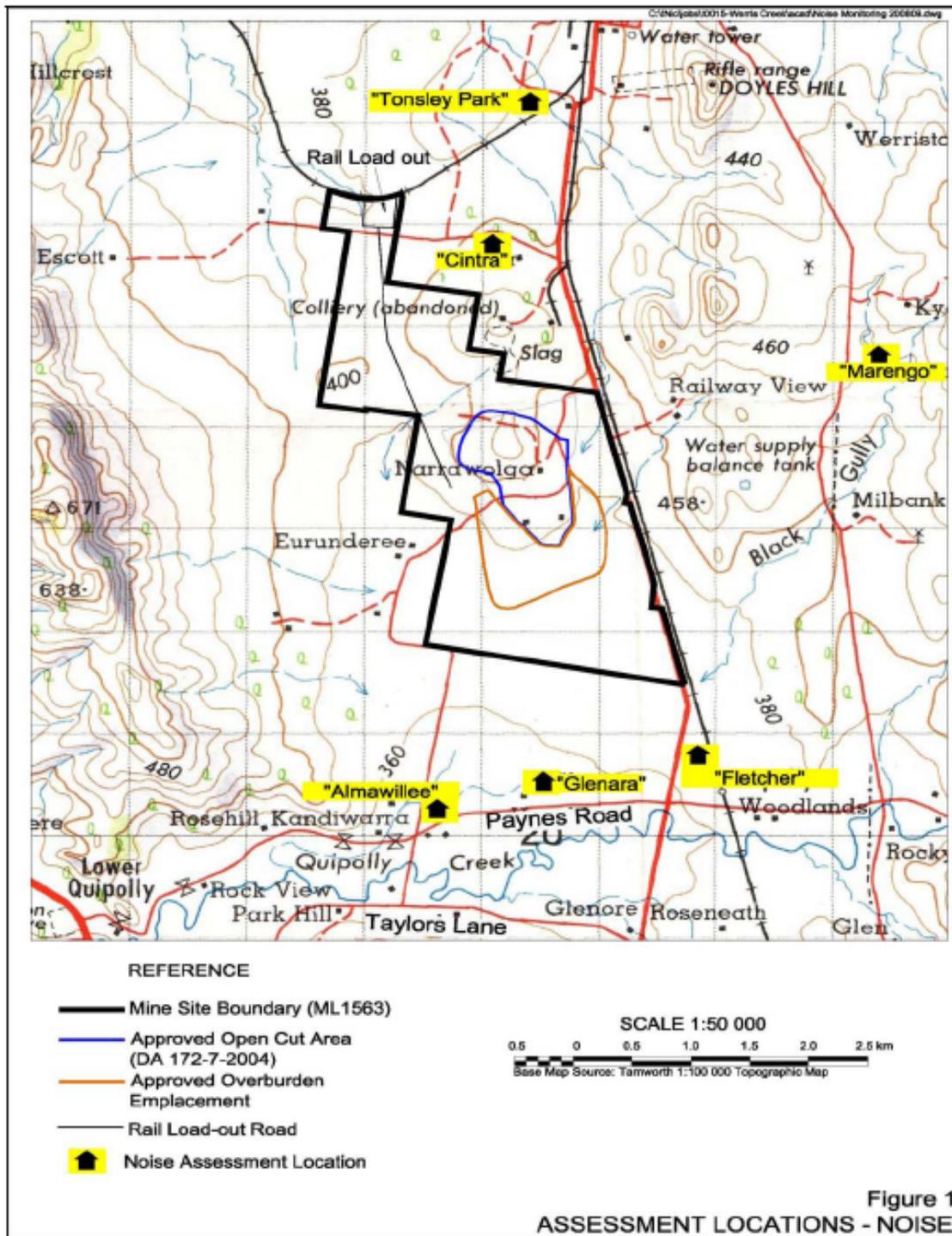


Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant





16 December 2010

Ref: 04035/3808

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: DECEMBER 2010 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Thursday 9 and Tuesday 14 December 2010. Rain during the night of 9 December caused the survey to be abandoned and recommenced, at the nearest opportunity, on 14 December.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Mine's Noise Management Plan (revised November 2010). The locations are listed below and attached in **Figure 1**:

- “Almawillee”
- “Glenara”
- “Railway Cottage” (previously denoted as “Fletcher”)
- “Tonsley Park”
- “Greenslopes/Banool”
- “Kyooma”

Three sets of measurements were made over the “circuit”, one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speed and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data shows that on December 9 winds were moderate from the north to north west. The data from the met station shows wind speeds were generally higher than 5m/s. Observations at ground level were that winds at this height were at lower speeds than this (range 2 to 4m/s).

On December 14 the wind was light from the north east to north west. The data showed a mild to strong temperature inversion for the duration of the night survey.

The total measured Leq noise level is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer “Evaluator” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) L<sub>eq</sub> (15 min)** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1 WCC Noise Monitoring Results – 9 December 2010 (Day)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	4:31 pm	44	n/a	7.6/NW	Birds & insects (43), wind (36), <b>WCC (30)</b>
Glenara	4:51 pm	46	n/a	7.0/NW	Birds & insects (45), tractor (35), <b>WCC (33)</b>
Railway Cottage	4:37 pm	46	n/a	7.6/NW	Traffic (44), insects (43), <b>WCC inaudible</b>
Tonsley Park	3:25 pm	41	n/a	7.2/NNW	Insects (38), train on loop (36), traffic (32), <b>WCC inaudible</b>
Greenslopes	3:54 pm	44	n/a	5.8/NW	Wind (41) traffic (40), train (30), <b>WCC inaudible</b>
Kyooma	4:15 pm	38	n/a	7.6/NW	Birds & insects (35), wind in trees (35), <b>WCC inaudible</b>

Table 2 WCC Noise Monitoring Results – 9 December 2010 (Evening)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	7:34 pm	43	Lapse	5.4/N	Birds & insects (39), horse (39), <b>WCC (38)</b>
Glenara	7:52 pm	50	Lapse	5.4/N	Birds & insects (50), <b>WCC (38)</b>
Railway Cottage	8:10 pm	47	Lapse	4.9/N	Birds & insects (44), traffic (43), <b>WCC (39)</b>
Tonsley Park	8:58 pm	41	Lapse	5.8/N	Birds & insects (39), railway works (37), <b>WCC inaudible</b>
Greenslopes	9:20 pm	42	Lapse	7.1/N	Insects (39), traffic (37), railway works (35), <b>WCC inaudible</b>
Kyooma	8:35 pm	36	Lapse	5.6/N	Insects (36), <b>WCC inaudible</b>

Table 3 WCC Noise Monitoring Results – 9 & 14 December 2010 (Night)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee*	10:36 pm	38	>3	2.2/NE	Insects (38), <b>WCC (34)</b>
Glenara*	10:19 pm	38	<3	0.9/NW	Insects (37), <b>WCC (33)</b> , traffic (30)
Railway Cottage*	10:01 pm	40	>3	0.4/NW	Insects & dogs (39), <b>WCC (33)</b>
Tonsley Park	10:25 pm	44	Lapse	7.6/N	Insects (42), railway works (40), traffic (30), <b>WCC inaudible</b>
Greenslopes	10:47 pm	40	Lapse	8.0/N	Insects (39), traffic (35), <b>WCC inaudible</b>
Kyooma	10:02 pm	37	Lapse	7.2/N	Insects (37), <b>WCC inaudible</b>

\*14 December

The results shown in Tables 1-3 indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC were higher than the criterion of 35 dB(A) at the Alkawillee, Glenara and Railway Cottage monitoring locations during the evening monitoring period on 9 December.

The noise at each of these monitoring locations was mainly related to engine noise from haul trucks.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where wind speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Data from the mine operated weather station indicated that all of the elevated noise levels during the evening on December 9 were measured whilst there was a wind speed of greater than 3m/s and, therefore, under non-compliant atmospheric conditions.

Data from those times where WCC operations were audible were analysed using the "Evaluator" software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the Lmax criterion at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,  
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant

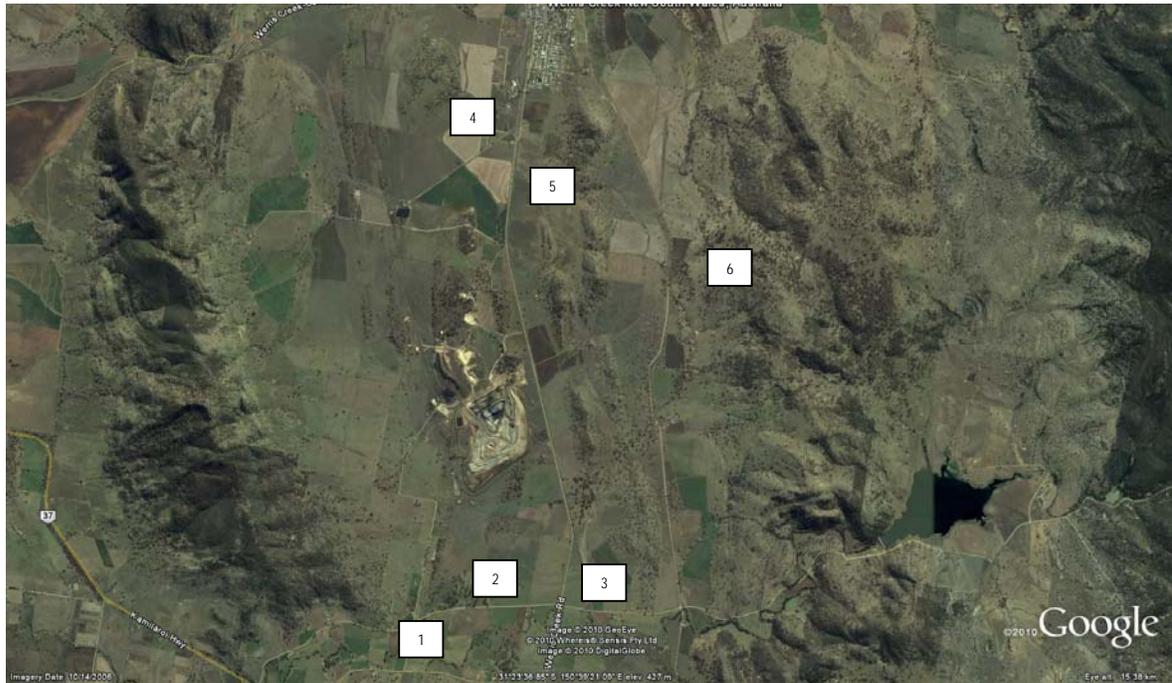


Figure 1 – Noise Monitoring Locations

Key

- 1 Alkawillee
- 2 Glenara
- 3 Railway Cottage
- 4 Tonsley Park
- 5 Greenslopes/Banool
- 6 Kyooma



25 January 2011

Ref: 04035/3851

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: JANUARY 2011 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Thursday 20 and Wednesday 21 January 2011.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Mine's Noise Management Plan (revised November 2010). The locations are listed below and attached in **Figure 1**:

- “Almawillee”
- “Glenara”
- “Railway Cottage” (previously denoted as “Fletcher”)
- “Tonsley Park”
- “Greenslopes/Banool”
- “Kyooma”

Three sets of measurements were made over the “circuit”, one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were only barely audible at the Kyooma monitoring location throughout the night survey.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speed and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data shows that on January 20 winds were moderate from the east to south east. The data from the met station shows wind speeds were generally higher than 5m/s. Observations at ground level were that winds at this height were at lower speeds than this (range 1 to 3m/s).

On January 21 the wind was light from the south south west. The data showed that there was no temperature inversion during the night survey.

The total measured Leq noise level is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A)  $L_{eq}$  (15 min)** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1 WCC Noise Monitoring Results – 21 January 2011 (Day)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	9:40 am	39	n/a	1.3/203	Birds & insects (38), traffic (30), <b>WCC inaudible</b>
Glenara	9:22 am	42	n/a	2.2/196	Birds & insects (41), traffic (35), <b>WCC inaudible</b>
Railway Cottage	9:05 am	37	n/a	2.7/202	Traffic (36), insects (30), <b>WCC inaudible</b>
Tonsley Park	8:22 am	46	n/a	1.5/170	Birds & insects (44), traffic (41), <b>WCC inaudible</b>
Greenslopes	8:02 am	42	n/a	2.0/179	Birds & insects (41) traffic (35), wind (30), <b>WCC inaudible</b>
Kyooma	8:45 am	35	n/a	1.8/177	Birds & insects (35), <b>WCC (&lt;20)</b>

Table 2 WCC Noise Monitoring Results – 20 January 2011 (Evening)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	8:22 pm	41	Lapse	5.6/129	Birds & insects (38), wind (35), traffic (32), <b>WCC inaudible</b>
Glenara	8:05 pm	42	Lapse	6.8/137	Birds & insects (39), traffic (37), wind (35), <b>WCC inaudible</b>
Railway Cottage	8:40 pm	66	Lapse	5.0/122	Train (66), birds & insects (40), traffic (39), <b>WCC inaudible</b>
Tonsley Park	7:45 pm	46	Lapse	7.7/133	Wind (42), birds & insects (40), train (40) <b>WCC inaudible</b>
Greenslopes	7:25 pm	42	Lapse	7.1/144	Traffic (38), wind (36), insects (34), <b>WCC inaudible</b>
Kyooma	9:03 pm	43	Lapse	4.6/118	Birds & insects (43), <b>WCC inaudible</b>

Table 3 WCC Noise Monitoring Results – 20 January 2011 (Night)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	10:36 pm	36	Lapse	3.9/97	Insects (35), traffic (31), <b>WCC inaudible</b>
Glenara	10:53 pm	39	Lapse	2.4/74	Birds & insects (38), traffic (34) <b>WCC inaudible</b>
Railway Cottage	11:10 pm	39	Lapse	1.9/51	Traffic (38), insects (30), <b>WCC inaudible</b>
Tonsley Park	10:18 pm	42	Lapse	2.7/115	Insects (42), traffic (32), <b>WCC inaudible</b>
Greenslopes	10:00 pm	44	Lapse	2.6/147	Insects (44), traffic (30), <b>WCC inaudible</b>
Kyooma	11:29 pm	35	Lapse	1.5/10	Insects (35), <b>WCC inaudible</b>

The results shown in Tables 1-3 indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC did not exceed the criterion of 35 dB(A)  $L_{eq}$  at any monitoring location during any evening monitoring.

At Tonsley Park the noise from trains on the WCC rail loop was measured at 40 dB(A)  $L_{eq}$  during the evening monitoring period. At this time a loaded train was initially at idle and then moved off from the

loop. WCC has an agreement in place with the landowner at Tonsley Park to allow for noise up to 45 dB(A) Leq (15 min).

Data from those times where WCC operations were audible were analysed using the "Evaluator" software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the Lmax criterion at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,  
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant



Figure 1 – Noise Monitoring Locations

Key

- 1 Alkawillee
- 2 Glenara
- 3 Railway Cottage
- 4 Tonsley Park
- 5 Greenslopes/Banool
- 6 Kyooma

**Appendix 4 – Blasting Monitoring Data.**

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results											
					Glenala		Marengo		Tonsley Park		Cintra		Werris Creek		COMPLIANCE	
					Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
344	5/11/2010	14:24	Strip 11	OB	<0.37	<111.9	NM	NM	0.58	95.8	0.92	112.2	<0.37	<111.9	10	120
345	3/11/2010	13:13	Strip 10	IB	<0.37	<111.9	NM	NM	0.42	101.7	0.6	93.3	<0.37	<111.9	10	120
346	5/11/2010	12:32	Strip 9	IB	<0.37	<111.9	NM	NM	0.8	100.6	0.47	112.2	<0.37	<111.9	10	120
347	5/11/2010	12:32	Strip 10	TR	<0.37	<111.9	NM	NM	0.8	100.6	0.47	112.2	<0.37	<111.9	10	120
348	10/11/2010	13:18	Strip 10	IB	<0.37	<111.9	NM	NM	1	99	2.39	104.9	<0.37	<111.9	10	120
349	15/11/2010	13:25	Strip 9	IB	<0.37	<111.9	NM	NM	0.53	102.8	0.52	108.6	<0.37	<111.9	10	120
350	18/11/2010	13:14	Strip 10	IB	<0.37	<111.9	NM	NM	0.8	104.6	0.4	99.3	<0.37	<111.9	10	120
351	23/11/2010	13:48	Strip 10	IB	<0.37	<111.9	NM	NM	0.78	105.6	1.37	114.8	<0.37	<111.9	10	120
352	24/11/2010	13:13	Strip 9		<0.37	<111.9	NM	NM	<0.37	<111.9	0.47	115.5	<0.37	<111.9	10	120
353	26/11/2010	13:13	Strip 10	IB	<0.37	<111.9	NM	NM	<0.37	<111.9	0.42	111.6	<0.37	<111.9	10	120
<b>TOTALS</b>	<b>NOVEMBER</b>	<b># BLAST</b>	<b>10</b>	<b>AVERAGE</b>	-	-	-	-	<b>0.71</b>	<b>101.3</b>	<b>0.80</b>	<b>108.5</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>5</b>	<b>115</b>
<b>TOTALS</b>	<b>NOVEMBER</b>	<b># BLAST</b>	<b>10</b>	<b>HIGHEST</b>	-	-	-	-	<b>1.00</b>	<b>105.6</b>	<b>2.39</b>	<b>115.5</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>10</b>	<b>120</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b># BLAST</b>	<b>79</b>	<b>AVERAGE</b>	<b>0.10</b>	<b>114.7</b>	<b>0.48</b>	<b>107.3</b>	<b>0.67</b>	<b>102.6</b>	<b>0.89</b>	<b>108.6</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>5</b>	<b>115</b>

KEY  
NT - Not Triggered  
NM - Not Monitored  
\* - Project Related Property

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results											
					Glenala		Marengo*		Tonsley Park		Cintra*		Werris Creek		COMPLIANCE	
					Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
354	1/12/2010	13:14	Strip 10	TS	<0.37	<111.9	NM	NM	0.77	109.0	0.53	107.2	<0.37	<111.9	10.00	120.0
355	2/12/2010	13:03	Strip 10	PS	<0.37	<111.9	NM	NM	1.32	95.6	0.75	91.7	<0.37	<111.9	10.00	120.0
356	3/12/2010	13:18	Strip 10	WE	<0.37	<111.9	NM	NM	<0.37	<111.9	<0.37	<111.9	<0.37	<111.9	10.00	120.0
357	8/12/2010	13:12	Strip 10	IB	<0.37	<111.9	NM	NM	<0.37	<111.9	<0.37	<111.9	<0.37	<111.9	10.00	120.0
358	10/12/2010	9:30	Strip 10	TS	<0.37	<111.9	NM	NM	0.38	98.5	0.62	101.7	<0.37	<111.9	10.00	120.0
359	20/12/2010	14:30	Strip 10	IB	<0.37	<111.9	NM	NM	<0.37	<111.9	0.12	113.8	<0.37	<111.9	10.00	120.0
<b>TOTALS</b>	<b>DECEMBER</b>	<b># BLAST</b>	<b>6</b>	<b>AVERAGE</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>-</b>	<b>-</b>	<b>0.82</b>	<b>101.0</b>	<b>0.51</b>	<b>103.6</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>DECEMBER</b>	<b># BLAST</b>	<b>6</b>	<b>HIGHEST</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>-</b>	<b>-</b>	<b>1.32</b>	<b>109.0</b>	<b>0.75</b>	<b>113.8</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>10.00</b>	<b>120.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b># BLAST</b>	<b>85</b>	<b>AVERAGE</b>	<b>0.10</b>	<b>114.7</b>	<b>0.48</b>	<b>107.3</b>	<b>0.69</b>	<b>102.5</b>	<b>0.85</b>	<b>108.0</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>5.00</b>	<b>115.0</b>

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Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results											
					Glenala		Marengo*		Tonsley Park		Cintra*		Werris Creek		COMPLIANCE	
					Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
1	6/01/2011	13:14	Strip 10	IB	<0.37	<111.9	NM	NM	0.42	109.1	0.78	113.7	<0.37	<111.9	10.00	120.0
2					<0.37	<111.9	NM	NM	<0.37	<111.9	<0.37	<111.9	<0.23	<109.9	10.00	120.0
3					<0.37	<111.9	NM	NM	0.55	104.5	1.47	109.3	<0.23	<109.9	10.00	120.0
4	25/01/2011	13:54	Strip 9	IB	<0.37	<111.9	NM	NM	0.38	108.4	0.42	114.2	<0.23	<109.9	10.00	120.0
5	21/01/2011	13:42	Strip 10	IB	<0.37	<111.9	NM	NM	<0.37	<111.9	<0.37	<111.9	<0.23	<109.9	10.00	120.0
<b>TOTALS</b>	<b>JANUARY</b>	<b># BLAST</b>	<b>5</b>	<b>AVERAGE</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>-</b>	<b>-</b>	<b>0.45</b>	<b>107.3</b>	<b>0.89</b>	<b>112.4</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>JANUARY</b>	<b># BLAST</b>	<b>5</b>	<b>HIGHEST</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>-</b>	<b>-</b>	<b>0.55</b>	<b>109.1</b>	<b>1.47</b>	<b>114.2</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>10.00</b>	<b>120.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b># BLAST</b>	<b>90</b>	<b>AVERAGE</b>	<b>0.10</b>	<b>114.7</b>	<b>0.48</b>	<b>107.3</b>	<b>0.66</b>	<b>103.0</b>	<b>0.85</b>	<b>108.5</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>5.00</b>	<b>115.0</b>

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**Appendix 5 – Groundwater Monitoring Data.**



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1100355</b>	Page	: 1 of 7
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Charlie Pierce
Address	: Unit 2, Lot 6 Industrial Close MUSWELLBROOK NSW, AUSTRALIA 2333	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney.enviro.services@alsglobal.com
Telephone	: +61 02 6542 2400	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 6543 4121	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 07-JAN-2011
Sampler	: BP	Issue Date	: 20-JAN-2011
Site	: ----		
Quote number	: BN/535/10	No. of samples received	: 7
		No. of samples analysed	: 7

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
- Descriptive Results



NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
James Thompson	Client Services Officer	ACIRL Sampling
Luke Witham	Senior Inorganic Chemist	Inorganics

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A Campbell Brothers Limited Company



## 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

- **EN055 - PG: Ionic Balance out of acceptable limits for sample 'MW3' due to analytes not quantified in this report.**
- **Field Tests, Field Observations and Flow Observations supplied by ALS ACIRL - Lithgow or Muswellbrook. NATA Accreditation No.15784.**
- **It has been noted that Reactive P is greater than Total P for various samples, however this difference is within the limits of experimental variation.**



## Analytical Results

Sub-Matrix: WATER				Client sample ID				
				Client sampling date / time				
				MW3	MW4	MW5	MW9	MW14
				06-JAN-2011 12:30	06-JAN-2011 14:10	06-JAN-2011 13:40	06-JAN-2011 11:00	06-JAN-2011 10:30
Compound	CAS Number	LOR	Unit	ES1100355-001	ES1100355-002	ES1100355-003	ES1100355-004	ES1100355-005
<b>AC01: Bore Data</b>								
Standing Water Level	----	0.01	m	<0.01	10.0	7.81	13.4	15.6
Stick up	----	0.01	m	95.0	0.64	1.17	1.07	1.04
<b>AC02: Sampling Data</b>								
Purge Type	----	-	-	Tap	Bail	Pump	Pump	Pump
Purge Volume	----	0.01	L	<0.01	<0.01	100	100	100
Pump Set Depth	----	0.1	m	<0.1	<0.1	215	220	220
<b>AC03: Field Tests</b>								
Electrical Conductivity (Non Compensated)	----	1	µS/cm	73	920	2230	689	1090
pH	----	0.01	pH Unit	7.02	7.53	7.01	7.32	7.03
Temperature	----	0.1	°C	26.1	22.4	22.3	22.3	22.3
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	52	985	2400	784	1140
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	10	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	29	429	314	306	446
Total Alkalinity as CaCO3	----	1	mg/L	29	429	314	316	446
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	7	47	35	19
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	<1	58	544	33	57
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	<1	67	171	52	77
Magnesium	7439-95-4	1	mg/L	<1	45	110	35	62
Sodium	7440-23-5	1	mg/L	<1	89	162	54	67
Potassium	7440-09-7	1	mg/L	<1	2	<1	<1	1
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.03	1.10	2.30	3.29	13.8
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.03	1.10	2.30	3.29	13.8
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								



## Analytical Results

Sub-Matrix: WATER

Client sample ID  
 Client sampling date / time

				MW3	MW4	MW5	MW9	MW14
				06-JAN-2011 12:30	06-JAN-2011 14:10	06-JAN-2011 13:40	06-JAN-2011 11:00	06-JAN-2011 10:30
Compound	CAS Number	LOR	Unit	ES1100355-001	ES1100355-002	ES1100355-003	ES1100355-004	ES1100355-005
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	1.2	0.5	0.6	2.6
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	0.8	2.3	2.8	3.9	16.4
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	<0.01	0.02	<0.01	<0.01	<0.01
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.02	<0.01	0.02	0.02	0.02
<b>EN055: Ionic Balance</b>								
^ Total Anions	----	0.01	meq/L	0.58	10.4	22.6	7.97	10.9
^ Total Cations	----	0.01	meq/L	<0.01	11.0	24.6	7.84	12.0
^ Ionic Balance	----	0.01	%	----	2.83	4.26	0.83	4.65



## Analytical Results

Sub-Matrix: WATER				Client sample ID		P1	P2			
				Client sampling date / time		06-JAN-2011 11:45	06-JAN-2011 13:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1100355-006	ES1100355-007					
<b>AC01: Bore Data</b>										
Standing Water Level		0.01	m	22.7	19.9	----	----	----	----	----
Stick up		0.01	m	0.92	1.01	----	----	----	----	----
<b>AC02: Sampling Data</b>										
Purge Type		-	-	Pump	Bail	----	----	----	----	----
Purge Volume		0.01	L	100	<0.01	----	----	----	----	----
Pump Set Depth		0.1	m	235	<0.1	----	----	----	----	----
<b>AC03: Field Tests</b>										
Electrical Conductivity (Non Compensated)		1	µS/cm	1480	929	----	----	----	----	----
pH		0.01	pH Unit	6.61	7.23	----	----	----	----	----
Temperature		0.1	°C	22.4	22.7	----	----	----	----	----
<b>EA010P: Conductivity by PC Titrator</b>										
Electrical Conductivity @ 25°C		1	µS/cm	1600	1100	----	----	----	----	----
<b>ED037P: Alkalinity by PC Titrator</b>										
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	368	334	----	----	----	----	----
Total Alkalinity as CaCO3		1	mg/L	368	334	----	----	----	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>										
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	95	59	----	----	----	----	----
<b>ED045G: Chloride Discrete analyser</b>										
Chloride	16887-00-6	1	mg/L	244	87	----	----	----	----	----
<b>ED093F: Dissolved Major Cations</b>										
Calcium	7440-70-2	1	mg/L	297	73	----	----	----	----	----
Magnesium	7439-95-4	1	mg/L	11	45	----	----	----	----	----
Sodium	7440-23-5	1	mg/L	39	88	----	----	----	----	----
Potassium	7440-09-7	1	mg/L	6	1	----	----	----	----	----
<b>EK055G: Ammonia as N by Discrete Analyser</b>										
Ammonia as N	7664-41-7	0.01	mg/L	0.03	0.15	----	----	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>										
Nitrite as N		0.01	mg/L	<0.01	<0.01	----	----	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>										
^ Nitrate as N	14797-55-8	0.01	mg/L	<0.01	3.25	----	----	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>										
Nitrite + Nitrate as N		0.01	mg/L	<0.01	3.25	----	----	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>										



**Analytical Results**

Sub-Matrix: **WATER**

			Client sample ID	P1	P2			
			Client sampling date / time	06-JAN-2011 11:45	06-JAN-2011 13:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1100355-006	ES1100355-007	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	1.2	----	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	<0.1	4.4	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.04	0.07	----	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	----	----	----
<b>EN055: Ionic Balance</b>								
^ Total Anions	----	0.01	meq/L	16.2	10.4	----	----	----
^ Total Cations	----	0.01	meq/L	17.6	11.2	----	----	----
^ Ionic Balance	----	0.01	%	4.30	3.88	----	----	----



## Analytical Results

### Descriptive Results

Sub-Matrix: **WATER**

<i>Method: Compound</i>	<i>Client sample ID - Client sampling date / time</i>	<i>Analytical Results</i>
<b>AC04: Field Observations</b>		
AC04: Appearance	MW3 - 06-JAN-2011 12:30	Clear
AC04: Appearance	MW4 - 06-JAN-2011 14:10	Clear
AC04: Appearance	MW5 - 06-JAN-2011 13:40	Clear
AC04: Appearance	MW9 - 06-JAN-2011 11:00	Clear
AC04: Appearance	MW14 - 06-JAN-2011 10:30	Clear
AC04: Appearance	P1 - 06-JAN-2011 11:45	Slight Turbid
AC04: Appearance	P2 - 06-JAN-2011 13:00	Clear
AC04: Odour	MW3 - 06-JAN-2011 12:30	Nil
AC04: Odour	MW4 - 06-JAN-2011 14:10	Nil
AC04: Odour	MW5 - 06-JAN-2011 13:40	Nil
AC04: Odour	MW9 - 06-JAN-2011 11:00	Nil
AC04: Odour	MW14 - 06-JAN-2011 10:30	Nil
AC04: Odour	P1 - 06-JAN-2011 11:45	Nil
AC04: Odour	P2 - 06-JAN-2011 13:00	Nil
AC04: Colour	MW3 - 06-JAN-2011 12:30	Clear
AC04: Colour	MW4 - 06-JAN-2011 14:10	Clear
AC04: Colour	MW5 - 06-JAN-2011 13:40	Clear
AC04: Colour	MW9 - 06-JAN-2011 11:00	Clear
AC04: Colour	MW14 - 06-JAN-2011 10:30	Clear
AC04: Colour	P1 - 06-JAN-2011 11:45	Light Brown
AC04: Colour	P2 - 06-JAN-2011 13:00	Clear



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	: <b>ES1100623</b>	Page	: 1 of 8
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Charlie Pierce
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney.enviro.services@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 1440	Date Samples Received	: 12-JAN-2011
C-O-C number	: ----	Issue Date	: 27-JAN-2011
Sampler	: ----	No. of samples received	: 12
Site	: ----	No. of samples analysed	: 11
Quote number	: SY/261/10		

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 Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
Celine Conceicao	Spectroscopist	Inorganics
Nanthini Coilparampil	Senior Inorganic Chemist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

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## 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

- **EK061: Poor matrix spike recovery for TKN due to sample matrix. Confirmed by re-extraction and re-analysis.**



## Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				MW7	MW1	MW6	MW8	MW10
				10-JAN-2011 15:00	11-JAN-2011 09:50	11-JAN-2011 10:40	11-JAN-2011 11:05	11-JAN-2011 14:00
				Client sampling date / time				
Compound	CAS Number	LOR	Unit	ES1100623-001	ES1100623-002	ES1100623-004	ES1100623-005	ES1100623-006
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.23	7.03	7.32	7.42	7.45
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	555	1130	1940	910	1990
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	165	494	681	277	337
Total Alkalinity as CaCO3	----	1	mg/L	165	494	681	277	337
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	32	7	32	42	45
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	53	64	255	101	423
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	39	114	61	55	112
Magnesium	7439-95-4	1	mg/L	18	51	75	27	109
Sodium	7440-23-5	1	mg/L	42	49	281	98	113
Potassium	7440-09-7	1	mg/L	1	2	<1	<1	<1
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Ammonia as N	7664-41-7	0.01	mg/L	0.07	0.14	0.07	0.04	0.02
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	0.16	0.05	<0.01	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	1.24	8.05	4.32	3.88	21.9
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	1.24	8.21	4.36	3.88	21.9
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	1.8	1.6	0.6	3.8
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	1.4	10.0	6.0	4.5	25.7
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.09	0.28	0.19	0.14	0.06
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.07	0.34	0.09	0.07	<0.01
<b>EN055: Ionic Balance</b>								
^ Total Anions	----	0.01	meq/L	5.46	11.8	21.5	9.26	19.6
^ Total Cations	----	0.01	meq/L	5.30	12.1	21.4	9.22	19.5



## Analytical Results

Sub-Matrix: **WATER**

				Client sample ID	MW7	MW1	MW6	MW8	MW10
				Client sampling date / time	10-JAN-2011 15:00	11-JAN-2011 09:50	11-JAN-2011 10:40	11-JAN-2011 11:05	11-JAN-2011 14:00
Compound	CAS Number	LOR	Unit		ES1100623-001	ES1100623-002	ES1100623-004	ES1100623-005	ES1100623-006
<b>EN055: Ionic Balance - Continued</b>									
^ Ionic Balance	----	0.01	%		1.47	1.05	0.10	0.25	0.23



## Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				MW12	MW13	MW15	MW16	MW17A
				11-JAN-2011 13:20	11-JAN-2011 12:15	11-JAN-2011 11:30	11-JAN-2011 13:10	11-JAN-2011 12:30
				Client sampling date / time				
Compound	CAS Number	LOR	Unit	ES1100623-007	ES1100623-008	ES1100623-009	ES1100623-010	ES1100623-011
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.31	7.16	7.37	7.16	7.22
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	422	896	1140	857	949
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	154	172	287	241	294
Total Alkalinity as CaCO3	----	1	mg/L	154	172	287	241	294
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	19	30	34	49	30
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	28	152	187	83	104
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	34	66	76	64	68
Magnesium	7439-95-4	1	mg/L	13	32	40	30	33
Sodium	7440-23-5	1	mg/L	33	54	98	59	73
Potassium	7440-09-7	1	mg/L	<1	1	<1	<1	<1
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.06	0.05	0.06	0.03
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.62	2.64	1.14	10.7	0.86
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.62	2.64	1.14	10.7	0.86
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.7	0.6	2.8	0.2
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	0.8	3.3	1.7	13.5	1.1
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.06	0.08	0.11	0.07	0.09
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.04	0.07	0.07	0.08	0.08
<b>EN055: Ionic Balance</b>								
^ Total Anions	----	0.01	meq/L	4.26	8.36	11.7	8.17	9.44
^ Total Cations	----	0.01	meq/L	4.20	8.31	11.4	8.27	9.29



## Analytical Results

Sub-Matrix: **WATER**

Client sample ID

Client sampling date / time

				MW12	MW13	MW15	MW16	MW17A
				11-JAN-2011 13:20	11-JAN-2011 12:15	11-JAN-2011 11:30	11-JAN-2011 13:10	11-JAN-2011 12:30
Compound	CAS Number	LOR	Unit	ES1100623-007	ES1100623-008	ES1100623-009	ES1100623-010	ES1100623-011
<b>EN055: Ionic Balance - Continued</b>								
^ Ionic Balance	----	0.01	%	0.76	0.26	1.48	0.58	0.84



## Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	MW17B				
			Client sampling date / time	11-JAN-2011 12:45				
Compound	CAS Number	LOR	Unit	ES1100623-012				
<b>EA005: pH</b>								
pH Value		0.01	pH Unit	7.91				
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C		1	µS/cm	2080				
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1				
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1				
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	363				
Total Alkalinity as CaCO3		1	mg/L	363				
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	39				
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	487				
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	39				
Magnesium	7439-95-4	1	mg/L	39				
Sodium	7440-23-5	1	mg/L	379				
Potassium	7440-09-7	1	mg/L	1				
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Ammonia as N	7664-41-7	0.01	mg/L	0.04				
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N		0.01	mg/L	<0.01				
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.24				
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N		0.01	mg/L	0.24				
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N		0.1	mg/L	0.4				
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N		0.1	mg/L	0.6				
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P		0.01	mg/L	<0.01				
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P		0.01	mg/L	<0.01				
<b>EN055: Ionic Balance</b>								
^ Total Anions		0.01	meq/L	21.8				
^ Total Cations		0.01	meq/L	21.6				



**Analytical Results**

Sub-Matrix: **WATER**

				Client sample ID				
				MW17B	----	----	----	----
				Client sampling date / time	11-JAN-2011 12:45	----	----	----
Compound	CAS Number	LOR	Unit	ES1100623-012	----	----	----	----
<b>EN055: Ionic Balance - Continued</b>								
^ Ionic Balance	----	0.01	%	0.35	----	----	----	----

**Appendix 6 – Surface Water Monitoring Data.**



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1025389</b>	Page	: 1 of 5
Client	: ACIRL PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Charlie Pierce
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney.enviro.services@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK SURFACE WATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 10-DEC-2010
Sampler	: ----	Issue Date	: 22-DEC-2010
Site	: ----		
Quote number	: SY/261/10	No. of samples received	: 14
		No. of samples analysed	: 14

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



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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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

**Environmental Division Sydney**  
Part of the **ALS Laboratory Group**

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---

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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



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB2	SB6	SB9	SB10	SD4
				Client sampling date / time	08-DEC-2010 12:45	08-DEC-2010 12:15	08-DEC-2010 13:50	08-DEC-2010 13:40	08-DEC-2010 13:10
Compound	CAS Number	LOR	Unit		ES1025389-001	ES1025389-002	ES1025389-003	ES1025389-004	ES1025389-005
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		8.71	8.16	7.84	7.71	9.18
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		422	582	170	274	196
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L		11	8	23	148	8
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		<0.01	1.13	0.01	0.02	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		0.04	17.8	0.21	2.33	0.03
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		0.04	18.9	0.22	2.35	0.03
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.9	4.3	1.0	1.6	1.3
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		0.9	23.2	1.2	4.0	1.3
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		0.04	0.09	0.19	0.18	0.76
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		<0.01	<0.01	0.04	0.17	0.64
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L		<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: WATER

		Client sample ID		SD5	VWD1	VWD2	BGD	QCU
		Client sampling date / time		08-DEC-2010 13:20	08-DEC-2010 12:55	08-DEC-2010 14:00	08-DEC-2010 13:30	08-DEC-2010 14:20
Compound	CAS Number	LOR	Unit	ES1025389-006	ES1025389-007	ES1025389-008	ES1025389-009	ES1025389-010
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	8.48	8.27	8.80	8.38	7.58
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	212	941	646	608	593
<b>EA025: Suspended Solids</b>								
^ Suspended Solids (SS)	----	5	mg/L	43	<5	8	88	70
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	0.06	0.05	0.03	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.06	3.30	2.01	0.66	0.15
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.06	3.36	2.06	0.69	0.15
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.9	1.2	0.9	1.9	0.9
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	3.0	4.6	3.0	2.6	1.0
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.81	<0.01	0.25	0.46	0.24
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.60	<0.01	<0.01	0.37	0.22
<b>EP020: Oil and Grease (O&amp;G)</b>								
Oil & Grease	----	5	mg/L	<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	QCD	WCU	WCD	200MLD	----
				Client sampling date / time	08-DEC-2010 14:40	08-DEC-2010 11:45	08-DEC-2010 11:30	08-DEC-2010 12:30	----
Compound	CAS Number	LOR	Unit		ES1025389-011	ES1025389-012	ES1025389-013	ES1025389-014	----
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		7.02	7.79	7.49	8.09	----
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		560	667	177	912	----
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L		<5	56	14	<5	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		0.02	0.02	<0.01	0.04	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		0.56	1.17	0.03	3.16	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		0.59	1.18	0.03	3.20	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.3	2.8	2.0	1.0	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		0.9	4.0	2.0	4.2	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		0.15	0.97	0.60	<0.01	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		0.03	0.68	0.60	<0.01	----
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L		<5	<5	<5	<5	----

## **Appendix 7 – Surface Water Discharge Monitoring Data**



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	: <b>ES1022072</b>	Page	: 1 of 3
<b>Client</b>	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
<b>Contact</b>	: <b>A WRIGHT</b>	Contact	: Charlie Pierce
<b>Address</b>	: Unit 2, Lot 6 Industrial Close MUSWELLBROOK NSW, AUSTRALIA 2333	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: awright@whitehavencoal.com.au	E-mail	: sydney.enviro.services@alsglobal.com
<b>Telephone</b>	: +61 02 6542 2400	Telephone	: +61-2-8784 8555
<b>Facsimile</b>	: +61 02 6543 4121	Facsimile	: +61-2-8784 8500
<b>Project</b>	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
<b>Order number</b>	: ----		
<b>C-O-C number</b>	: ----	<b>Date Samples Received</b>	: 03-NOV-2010
<b>Sampler</b>	: AW	<b>Issue Date</b>	: 10-NOV-2010
<b>Site</b>	: ----		
<b>Quote number</b>	: SY/261/10	<b>No. of samples received</b>	: 3
		<b>No. of samples analysed</b>	: 3

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
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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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

**Environmental Division Sydney**

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP020: LCS recovery for Oil and Grease falls outside ALS dynamic control limits. However, it is within the acceptance criteria based on ALS DQO. No further action is required.**



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB2	QCU	QCD		
				Client sampling date / time	02-NOV-2010 09:00	02-NOV-2010 09:15	02-NOV-2010 09:30	----	----
Compound	CAS Number	LOR	Unit		ES1022072-001	ES1022072-002	ES1022072-003	----	----
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		8.34	7.23	7.68	----	----
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		427	546	808	----	----
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	1	mg/L		20	1	10	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		<0.01	<0.01	<0.01	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		0.03	0.39	0.35	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		0.03	0.39	0.35	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.3	0.1	0.2	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		0.3	0.5	0.6	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		<0.01	0.08	0.11	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		<0.01	0.02	0.10	----	----
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L		<5	<5	<5	----	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	: <b>ES1023153</b>	<b>Page</b>	: 1 of 3
<b>Client</b>	: <b>ACIRL PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: A WRIGHT	<b>Contact</b>	: Charlie Pierce
<b>Address</b>	: 5-7 TALBOT RD GUNNEDAH NSW 2380	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: awright@whitehavencoal.com.au	<b>E-mail</b>	: sydney.enviro.services@alsglobal.com
<b>Telephone</b>	: 02 6742 0058	<b>Telephone</b>	: +61-2-8784 8555
<b>Facsimile</b>	: 02 6742 0068	<b>Facsimile</b>	: +61-2-8784 8500
<b>Project</b>	: WERRIS CREEK GROUNDWATER	<b>QC Level</b>	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
<b>Order number</b>	: ----	<b>Date Samples Received</b>	: 16-NOV-2010
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 23-NOV-2010
<b>Sampler</b>	: AW	<b>No. of samples received</b>	: 5
<b>Site</b>	: ----	<b>No. of samples analysed</b>	: 5
<b>Quote number</b>	: SY/261/10		

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:

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- Analytical Results



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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

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## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB9	QCU	QCD	WCU	WCD
				Client sampling date / time	11-NOV-2010 15:00	11-NOV-2010 17:00	11-NOV-2010 17:00	11-NOV-2010 16:00	11-NOV-2010 16:00
Compound	CAS Number	LOR	Unit		ES1023153-001	ES1023153-002	ES1023153-003	ES1023153-004	ES1023153-005
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		7.38	7.06	7.71	7.44	7.64
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		164	523	897	382	443
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	1	mg/L		160	63	9	504	1640
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		0.01	<0.01	<0.01	0.02	0.09
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		0.34	0.66	0.03	1.77	19.4
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		0.35	0.66	0.03	1.79	19.4
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.8	1.2	0.4	3.1	4.2
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		2.2	1.9	0.4	4.9	23.6
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		0.41	0.21	0.31	1.69	1.27
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		0.04	0.01	0.10	0.62	0.34
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L		<5	<5	<5	<5	<5



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	: <b>ES1023295</b>	<b>Page</b>	: 1 of 4
<b>Client</b>	: <b>ACIRL PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: A WRIGHT	<b>Contact</b>	: Charlie Pierce
<b>Address</b>	: 5-7 TALBOT RD GUNNEDAH NSW 2380	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	: awright@whitehavencoal.com.au	<b>E-mail</b>	: sydney.enviro.services@alsglobal.com
<b>Telephone</b>	: 02 6742 0058	<b>Telephone</b>	: +61-2-8784 8555
<b>Facsimile</b>	: 02 6742 0068	<b>Facsimile</b>	: +61-2-8784 8500
<b>Project</b>	: WERRIS CREEK SURFACE-WATER	<b>QC Level</b>	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
<b>Order number</b>	: ----	<b>Date Samples Received</b>	: 17-NOV-2010
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 24-NOV-2010
<b>Sampler</b>	: BP	<b>No. of samples received</b>	: 7
<b>Site</b>	: ----	<b>No. of samples analysed</b>	: 7
<b>Quote number</b>	: SY/261/10		

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

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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

- **EK071: It has been noted that RP is greater than TP for samples SB10, QCD and WCU, however this difference is within the limits of experimental variation.**



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB2	SB9	SB10	QCU	QCD
				Client sampling date / time	16-NOV-2010 12:35	16-NOV-2010 12:20	16-NOV-2010 11:50	16-NOV-2010 13:10	16-NOV-2010 13:20
Compound	CAS Number	LOR	Unit	ES1023295-001	ES1023295-002	ES1023295-003	ES1023295-004	ES1023295-005	
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit	8.59	7.53	7.49	8.20	7.57	
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm	397	157	276	316	488	
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	1	mg/L	11	26	108	6	19	
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.05	<0.01	<0.01	
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L	0.54	0.81	4.55	0.49	0.86	
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	0.54	0.81	4.60	0.49	0.86	
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.0	1.0	2.2	0.8	0.9	
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L	1.5	1.8	6.8	1.3	1.8	
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	0.02	0.06	0.13	0.09	0.18	
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	0.05	0.15	0.08	0.20	
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L	<5	5	11	<5	<5	



## Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	WCU	WCD			
			Client sampling date / time	16-NOV-2010 11:25	16-NOV-2010 11:15	----	----	----
Compound	CAS Number	LOR	Unit	ES1023295-006	ES1023295-007	----	----	----
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.79	7.69	----	----	----
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	370	426	----	----	----
<b>EA025: Suspended Solids</b>								
^ Suspended Solids (SS)	----	1	mg/L	56	690	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	0.11	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	1.07	10.5	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	1.07	10.6	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.1	3.2	----	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	2.2	13.8	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.52	0.54	----	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.58	0.46	----	----	----
<b>EP020: Oil and Grease (O&amp;G)</b>								
Oil & Grease	----	5	mg/L	7	<5	----	----	----



## Environmental Division

### CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1023868</b>	Page	: 1 of 3
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Charlie Pierce
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney.enviro.services@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 24-NOV-2010
C-O-C number	: ----	Issue Date	: 30-NOV-2010
Sampler	: AW	No. of samples received	: 4
Site	: ----	No. of samples analysed	: 4
Quote number	: SY/261/10		

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



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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	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

**Environmental Division Sydney**

Part of the **ALS Laboratory Group**

277-289 Woodpark Road Smithfield NSW Australia 2164

Tel. +61-2-8784 8555 Fax. +61-2-8784 8500 [www.alsglobal.com](http://www.alsglobal.com)

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## General Comments

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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.

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## Analytical Results

Sub-Matrix: WATER

		Client sample ID		SB9	SB2	QCU	QCD	----
		Client sampling date / time		23-NOV-2010 07:00	23-NOV-2010 07:15	23-NOV-2010 07:30	23-NOV-2010 07:45	----
Compound	CAS Number	LOR	Unit	ES1023868-001	ES1023868-002	ES1023868-003	ES1023868-004	----
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.57	8.64	7.27	7.54	----
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	149	411	428	563	----
<b>EA025: Suspended Solids</b>								
^ Suspended Solids (SS)	----	5	mg/L	31	13	<5	18	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01	0.02	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.19	<0.01	0.27	0.14	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.19	<0.01	0.27	0.16	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.2	0.8	0.6	0.7	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	1.4	0.8	0.9	0.9	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.24	0.17	0.20	0.31	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.05	<0.01	0.07	0.11	----
<b>EP020: Oil and Grease (O&amp;G)</b>								
^ Oil & Grease	----	5	mg/L	<5	<5	<5	<5	----



## Environmental Division

### CERTIFICATE OF ANALYSIS

<b>Work Order</b>	<b>: ES1024314</b>	<b>Page</b>	: 1 of 3
<b>Client</b>	<b>: ACIRL PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	<b>: A WRIGHT</b>	<b>Contact</b>	: Charlie Pierce
<b>Address</b>	<b>: Unit 2, Lot 6 Industrial Close MUSWELLBROOK NSW, AUSTRALIA 2333</b>	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	<b>: awright@whitehavencoal.com.au</b>	<b>E-mail</b>	: sydney.enviro.services@alsglobal.com
<b>Telephone</b>	<b>: +61 02 6542 2400</b>	<b>Telephone</b>	: +61-2-8784 8555
<b>Facsimile</b>	<b>: +61 02 6543 4121</b>	<b>Facsimile</b>	: +61-2-8784 8500
<b>Project</b>	<b>: WERRIS CREEK GROUNDWATER</b>	<b>QC Level</b>	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
<b>Order number</b>	<b>: ----</b>	<b>Date Samples Received</b>	: 30-NOV-2010
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	: 08-DEC-2010
<b>Sampler</b>	<b>: AW</b>	<b>No. of samples received</b>	: 3
<b>Site</b>	<b>: ----</b>	<b>No. of samples analysed</b>	: 3
<b>Quote number</b>	<b>: SY/261/10</b>		

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



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#### 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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

#### Environmental Division Sydney

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB2	QCU	QCD		
				Client sampling date / time	29-NOV-2010 10:15	29-NOV-2010 10:30	29-NOV-2010 11:00	----	----
Compound	CAS Number	LOR	Unit		ES1024314-001	ES1024314-002	ES1024314-003	----	----
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		8.36	7.02	7.69	----	----
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		444	591	866	----	----
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L		22	<5	14	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		<0.01	0.02	<0.01	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		0.01	0.88	0.15	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		0.01	0.90	0.15	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.7	0.9	0.6	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		0.7	1.8	0.8	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		<0.01	0.08	0.20	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		<0.01	0.04	0.08	----	----
<b>EP020: Oil and Grease (O&amp;G)</b>									
^ Oil & Grease	----	5	mg/L		<5	<5	<5	----	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1025669</b>	Page	: 1 of 4
Client	: ACIRL PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Charlie Pierce
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney.enviro.services@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 14-DEC-2010
Sampler	: AW	Issue Date	: 24-DEC-2010
Site	: ----		
Quote number	: SY/261/10	No. of samples received	: 7
		No. of samples analysed	: 7

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



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**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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

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Tel. +61-2-8784 8555 Fax. +61-2-8784 8500 [www.alsglobal.com](http://www.alsglobal.com)

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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



## Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				SB2	SB9	SB10	QCU	QCD
				10-DEC-2010 16:30	10-DEC-2010 16:15	10-DEC-2010 16:45	10-DEC-2010 17:00	10-DEC-2010 17:00
				Client sampling date / time				
Compound	CAS Number	LOR	Unit	ES1025669-001	ES1025669-002	ES1025669-003	ES1025669-004	ES1025669-005
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	8.05	7.25	7.22	7.84	7.66
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	406	95	179	286	240
<b>EA025: Suspended Solids</b>								
^ Suspended Solids (SS)	----	5	mg/L	----	137	----	----	----
Suspended Solids (SS)	----	5	mg/L	25	----	314	22	55
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.03
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.09	0.76	0.02	<0.01
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.09	0.76	0.02	0.03
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.0	1.6	<0.1	<0.1	1.5
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	1.0	1.7	0.8	<0.1	1.5
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.04	0.22	0.42	0.18	0.40
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.02	0.21	0.29	0.18	0.37
<b>EP020: Oil and Grease (O&amp;G)</b>								
^ Oil & Grease	----	5	mg/L	<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	WCU	WCD			
			Client sampling date / time	10-DEC-2010 18:00	10-DEC-2010 18:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1025669-006	ES1025669-007	----	----	----
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.67	7.69	----	----	----
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	299	273	----	----	----
<b>EA025: Suspended Solids</b>								
Suspended Solids (SS)	----	5	mg/L	65	305	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	0.01	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.19	1.78	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.19	1.79	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.4	2.2	----	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	1.6	4.0	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.59	0.69	----	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.56	0.64	----	----	----
<b>EP020: Oil and Grease (O&amp;G)</b>								
^ Oil & Grease	----	5	mg/L	<5	<5	----	----	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1025971</b>	<b>Page</b>	: 1 of 3
<b>Client</b>	<b>: ACIRL PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	<b>: A WRIGHT</b>	<b>Contact</b>	: Charlie Pierce
<b>Address</b>	<b>: 5-7 TALBOT RD GUNNEDAH NSW 2380</b>	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	<b>: awright@whitehavencoal.com.au</b>	<b>E-mail</b>	: sydney.enviro.services@alsglobal.com
<b>Telephone</b>	<b>: 02 6742 0058</b>	<b>Telephone</b>	: +61-2-8784 8555
<b>Facsimile</b>	<b>: 02 6742 0068</b>	<b>Facsimile</b>	: +61-2-8784 8500
<b>Project</b>	<b>: WERRIS CREEK SURFACE-WATER</b>	<b>QC Level</b>	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
<b>Order number</b>	<b>: ----</b>		
<b>C-O-C number</b>	<b>: ----</b>	<b>Date Samples Received</b>	: 16-DEC-2010
<b>Sampler</b>	<b>: BP</b>	<b>Issue Date</b>	: 10-JAN-2011
<b>Site</b>	<b>: ----</b>		
<b>Quote number</b>	<b>: SY/261/10</b>	<b>No. of samples received</b>	: 3
		<b>No. of samples analysed</b>	: 3

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- Analytical Results



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**Signatories**

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
Charlie Pierce	Laboratory Manager	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
James Thompson	Client Services Officer	ACIRL Sampling

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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

- **EK071: It has been noted that RP is greater than TP for various samples, however this difference is within the limits of experimental variation.**
- **Field Tests, Field Observations and Flow Observations supplied by ALS ACIRL - Lithgow or Muswellbrook. NATA Accreditation No.15784.**



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB	QCU	QCD		
				Client sampling date / time	15-DEC-2010 10:15	15-DEC-2010 10:40	15-DEC-2010 11:00	----	----
Compound	CAS Number	LOR	Unit		ES1025971-001	ES1025971-002	ES1025971-003	----	----
<b>AC03: Field Tests</b>									
pH	----	0.01	pH Unit		7.95	7.39	7.41	----	----
Temperature	----	0.1	°C		26.5	27.1	26.9	----	----
Electrical Conductivity (Temperature Compensated)	----	1	µS/cm		242	362	471	----	----
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L		7	<5	12	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		<0.01	<0.01	<0.01	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		0.01	0.11	0.15	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		0.01	0.11	0.15	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.2	0.8	0.7	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		0.2	0.9	0.8	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		0.04	0.18	0.24	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		0.05	0.16	0.29	----	----
<b>EP020: Oil and Grease (O&amp;G)</b>									
^ Oil & Grease	----	5	mg/L		<5	<5	<5	----	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	: <b>ES1026347</b>	Page	: 1 of 3
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Charlie Pierce
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney.enviro.services@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 21-DEC-2010
Sampler	: AW	Issue Date	: 07-JAN-2011
Site	: ----		
Quote number	: SY/261/10	No. of samples received	: 3
		No. of samples analysed	: 3

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 Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

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### **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



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB9	QCU	QCD		
				Client sampling date / time	18-DEC-2010 07:30	18-DEC-2010 08:00	18-DEC-2010 08:15	----	----
Compound	CAS Number	LOR	Unit		ES1026347-001	ES1026347-002	ES1026347-003	----	----
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		7.36	7.05	7.60	----	----
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		131	661	777	----	----
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L		31	<5	13	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		<0.01	<0.01	<0.01	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		0.02	0.80	0.30	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		0.02	0.80	0.30	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.1	<0.1	<0.1	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		1.1	0.8	0.3	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		0.11	0.07	0.12	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		0.07	0.05	0.11	----	----
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L		<5	<5	<5	----	----

# ***Werris Creek Coal Community Consultative Committee***

## **Nineteenth Meeting of the Committee**

### **Whitehaven Coal Training Room, Werris Creek Coal (WCC)**

**10.00am Thursday 26<sup>th</sup> May 2011**

## **MINUTES**

Community Consultative Committee (CCC) met at 9:30am prior to the meeting for a pit tour of the mine site to update committee members on the progress and status of operations onsite.

### **1. Record of Attendance:**

Present: Ron Short (Community Representative - Chair); Noel Taylor (Community Representative); Jill Coleman (Community Representative); Lindsay Bridge – arrived 10.45am (Community Representative); Col Stewart (Liverpool Plains Shire Council); Ron Van Katwyk (Liverpool Plains Shire Council); Andrew Wright (Environmental Officer WCC); Mick Post (Project Manager WCC); Des George (WCC); Lisa Single (WCC Minute Taker).

Apologies: Chris Holley (Community Representative).

### **2. New Matters for Discussion under General Business**

None.

### **3. Matters Arising**

#### **a) Actions from Previous Meeting**

None.

#### **b) Other Matters Arising**

### **Whitehaven Letter Response to CCC Coal Train Dust Letter**

At the previous meeting, the committee felt that there was no need to respond to Tony Haggarty's letter and looked forward to regular updates on the coal train dust minimization project. Proposals for measuring and monitoring coal train dust levels are currently being drafted.

### **4. Minutes of Previous Meeting**

Minutes of the previous meeting 24<sup>th</sup> February 2011 were accepted as true representation of business conducted on the day.

*Moved: Col Stewart; Seconded: Noel Taylor. Motion carried*

### **5. Declaration of Pecuniary or other interests**

None declared.

## 6. Environmental Monitoring Report February, March and April 2011

**Weather Station** – The weather station was 100% reliable during the period.

**Dust** – All monthly and annual average results for Particulate Matter <10µm (PM10)/Total Suspended Particulate (TSP) and Dust Deposition monitoring were below compliance levels. There was one daily (20<sup>th</sup> April 2011) PM10 result at “Cintra” above the PM10 daily limit. WCC owns “Cintra” and therefore dust compliance criteria do not apply. A PM10 and TSP sample was missed on 8<sup>th</sup> April 2011 due to a black out.

**Noise** – February attended noise monitoring was below compliance criteria. Elevated noise levels were recorded at “Tonsley Park”, “Greenslopes” and “Kyooma” during March attended noise monitoring due to presence of a temperature inversion. Elevated noise levels were recorded at “Tonsley Park” and “Greenslopes” during April attended noise monitoring due to presence of a temperature inversion. Noise criteria in the consent are not applicable under adverse weather conditions such as temperature inversions or high winds. WCC has a private agreement in place with “Almawillee”, “Glenara”, “Tonsley Park” and “Kyooma” for mining noise related impacts at those properties and the noise criteria does not apply.

**Blasting** – During the period a total of 21 blasts were fired by the blasting contractor, Orica Mining Services. All blasts complied with licence limits with no blasts overpressure level above 115dB(L) and no blast vibration levels greater than 5mm/s.

**Groundwater** – Groundwater levels have continuing to rise following the good rain late last year. Groundwater monitoring results were within the trigger levels of the Groundwater Response Plan.

**Surface water** – Surface water monitoring results were within the trigger levels of the Site Water Management Plan response plan.

**Surface Water Discharges** – There were no wet weather discharge events and four controlled discharge events during the period. All surface water discharge results were within WCC Environmental Protection Licence 12290 criteria and there were no impacts on water quality monitored in Quipolly and Werris Creeks’ catchments as a result of the discharge events.

**Complaints** – There were 21 complaints received during the reporting period with the details summarized below. In total there were 25 issues raised – 12 related to noise (from four separate complainants), five related to lighting, four related to blasting, two related to dust and two related to unauthorized access. There were nine different complainants during the period with 11 individual complaints originating from one complainant in Werris Creek.

There were 12 complaints for noise impacts from WCC operations, with 10 complaints from Werris Creek residents (seven from one complainant and three from another complainant) and two complaints were from the Quipolly area. The majority of the complaints occurred during adverse weather conditions (temperature inversions or high wind speeds) that could potentially enhance noise levels experience by the complainant. No exceedance of noise criteria was identified because noise levels measured under “enhancing” adverse weather conditions cannot be compared against the noise criteria. The majority of the complaints were in relation to noise from dozers (engine revs and track clatter) operating at the Rail Load Out facility which has had increased management focus to ensure operators adhere to the 1<sup>st</sup> gear reverse policy and for the next budget period a new dozer will be purchased to replace one of the existing dozers. In addition, WCC have commenced attended noise monitoring at two locations within Werris Creek and to date have confirmed noise levels from WCC operations are within compliance.

There were five complaints relating to lighting impacts from WCC with all complaints from the one complainant in Werris Creek. On each occasion WCC investigated and did not identified any

lighting plants that would be visible to Werris Creek as operations were either in pit or below the level of the ridge line between the open cut and Werris Creek. WCC are investigating the use of a camera to monitor light sources towards the mine site from the southern edge of Werris Creek. There were four complaints from two blasts undertaken by WCC. All blast complaints were from Werris Creek residents. The blast on the 9<sup>th</sup> February 2011 resulted in two complaints relating to the dust cloud generated by the blast. The blast was one of the largest ever fired by Werris Creek Coal and the prevailing dry weather prior to the blast would have resulted in increased dust generation. Any dust generated by the blast dissipated over WCC owned land. The blast on the 23<sup>rd</sup> February 2011 generated two complaints regarding vibrations experienced at the complainants' home resulting in window rattling. While it was a larger blast fired, it was not expected to cause any impacts because it was fired in the bottom of the pit. The blast results at all locations including Werris Creek were within compliance limits. The blasting contractor at WCC, Orica Mining Services has been requested to review the last 12 months of blasting complaints to identify any blast design/s that could be improved to reduce the potential for complaints.

Col Stewart asked if an identification label could be used to compare which complaints are from the various complainants instead of all complainants being labeled by their location. Andrew Wright said the suggestion will be adopted and a revised complaints table will be provided with the minutes.

Ron Short commented that he had anecdotally observed an increase in the frequency that noise is audible from the mining operations at his property. Also Ron Short commented that when the mine commenced that people in the Quipolly area were concerned about the loss of groundwater due to mining, however it is pleasing to see that it has not been a major issue.

Another community member asked a question about noise from dozer tracks.

Motion moved to accept the Environmental Monitoring Report February, March and April 2011.

*Moved: Ron Van Katwyk; Seconded: Jill Coleman. Motion Carried.*

## **7. General Business**

### **a. WCC Life of Mine Project Environmental Assessment Update**

WCC submitted the Response to Submissions report for the Life of Mine Project on 23<sup>rd</sup> March 2011. The Department of Planning was now undertaking the assessment phase of the project, with only the formal inquiry to date relating to the size of the Biodiversity Offset package.

### **b. "History of Coal Mining at Werris Creek" Publication**

All the committee had reviewed the formatted copy of the "History of Coal Mining at Werris Creek" and was happy with the quality and content of the document, and thought the personal story from Dora Koops (daughter of former Werris Creek Colliery Manager) was important. Amendments suggested by the committee to be made to the document:

- Any comments provided by Dora Koops including that the pit horses where bred at Curlewis and walked to Werris Creek;
- Change the photo on the front cover to a close up of the former boiler chimney of underground mine;
- Change the colour of pages where white text was on a black background;
- The font size in parts of the document were too small; and
- A couple of typographical errors with reference labels incorrectly formatted.

WCC have spent approximately \$8,000 on drafting and formatting the document to date and will cost approximately \$5,000 to publish 500 copies for the Werris Creek rail museum or other historical societies in the district to sell.

Motion moved to publish the "History of Coal Mining at Werris Creek".

*Moved: Lindsay Bridge; Seconded: Jill Coleman. Motion Carried.*

**c. Neville Davies**

A former neighbour of WCC, Neville Davies, which WCC purchased the property "Marengo" in May 2010 from him, had raised concerns that he could still feel blasts from the coal mine. Andrew Wright said that based on the relationship with Neville that if he had any concerns, he would not hesitate to make a complaint, however a phone call will be made to verify his concerns.

**d. Resignation of Ron Short as chairman and Community Representative on the WCC CCC**

Ron Short announced to the committee that due to other commitments that require him to be out of the district for extended periods, he will be resigning as the Chairman and as a Community Representative on the WCC CCC. Ron Short said that he had enjoyed his time on the committee, thanking the other community representatives for their efforts. Ron Short also commented that he appreciated the time and commitment that WCC had made to ensuring that the committee could function in a collaborative and effective manner. WCC thanked Ron Short for the kind words and in response said that Ron Short's efforts and the diligent manner in how he conducted himself as the Chairman as well as managing meetings since the inception as an inaugural committee member was a key reason for why the WCC enjoyed good relationships with the local community. While Ron Short's participation on the committee will be missed, WCC wish him all the best for his future endeavours. Ron Short said he will send his resignation letter to the Department of Planning and Andrew Wright will update the committee on the process to appoint the next Chairperson.

**Meeting Closed 10.55am.**

**Next Meeting was scheduled for 25<sup>th</sup> August 2011.**

**Copy to:**

Ron Short	Chairman and Community Representative
Chris Holley	Community Representative
Jill Coleman	Community Representative
Noel Taylor	Community Representative
Lindsay Bridge	Community Representative

Colin Phillips	DoP	Casper Dieben	Werris Creek Coal
Michael Lloyd	I&I NSW	Brian Cullen	Werris Creek Coal
Lindsay Fulloon	OEH	Danny Young	Werris Creek Coal
Ron Van Katwyk	LPSC	Mick Post	Werris Creek Coal
Cr Col Stewart	LPSC	Des George	Werris Creek Coal
		Andrew Wright	Werris Creek Coal

**POSTSCRIPT BUSINESS ARISING: Resignation of Chris Holley as a Community Representative on the WCC CCC**

During a phone call following the committee meeting, Chris Holley announced his resignation as a Community Representative on the WCC CCC. Chris Holley said that the pending grant for the expansion of the Werris Creek rail museum would see him as the President have to increase his time at the museum plus attending additional funding progress meetings in Sydney on a regular basis. WCC on behalf of the committee would like to thank Chris Holley for his service on the committee since the start as an inaugural member of the committee. Chris Holley advised that he will send a letter of resignation to the mine.



## **WERRIS CREEK COAL PTY LTD**

# **QUARTERLY ENVIRONMENTAL MONITORING REPORT**

**February, March and April 2011**

This Environmental Monitoring Report covers the period 1<sup>st</sup> February 2011 to 30<sup>th</sup> April 2011 for the Werris Creek No.2 Coal Mine Community Consultative Committee.

The report includes environmental monitoring results from the on-site Weather Station, Air Quality, Noise, Blasting, Surface Water, Groundwater and Discharge Water Quality together with any community complaints received and general details on site environmental matters.

**Note:** Monitoring results with any non compliance of monitoring criteria are highlighted in **yellow**.

## CONTENTS

<b>1.0</b>	<b>METEOROLOGY.....</b>	<b>3</b>
1.1	WEATHER STATION AVAILABILITY .....	3
<b>2.0</b>	<b>AIR QUALITY .....</b>	<b>3</b>
2.1	HVAS (PM10) .....	3
2.1.1	Monitoring Data Results .....	3
2.1.2	Discussion - Compliance / Non Compliance .....	3
2.2	DEPOSITED DUST .....	3
2.2.1	Monitoring Data Results .....	4
2.2.2	Discussion - Compliance / Non Compliance .....	4
2.3	AIR QUALITY COMPLAINTS .....	4
<b>3.0</b>	<b>NOISE.....</b>	<b>4</b>
3.1	OPERATIONAL NOISE.....	4
3.1.1	Monitoring Data Results .....	5
3.1.2	Discussion - Compliance / Non Compliance .....	5
3.2	NOISE COMPLAINTS .....	6
<b>4.0</b>	<b>BLAST .....</b>	<b>6</b>
4.1	BLAST MONITORING .....	6
4.1.1	Monitoring Data Results .....	6
4.1.2	Discussion - Compliance / Non Compliance .....	6
4.2	BLAST COMPLAINTS .....	6
<b>5.0</b>	<b>WATER.....</b>	<b>6</b>
5.1	GROUND WATER.....	7
5.1.1	Monitoring Data Results .....	7
5.1.2	Discussion - Compliance / Non Compliance .....	7
5.2	SURFACE WATER .....	7
5.2.1	Monitoring Data Results .....	7
5.2.2	Discussion - Compliance / Non Compliance .....	7
5.3	SURFACE WATER DISCHARGES .....	7
5.3.1	Monitoring Data Results .....	7
5.3.2	Discussion - Compliance / Non Compliance .....	8
5.3	WATER COMPLAINTS.....	8
<b>6.0</b>	<b>COMPLAINTS SUMMARY.....</b>	<b>8</b>
<b>7.0</b>	<b>GENERAL .....</b>	<b>9</b>

## APPENDICES

Appendix 1.....	Dust Monitoring Results – PM10
Appendix 2.....	Dust Monitoring Results – Deposited Dust
Appendix 3.....	Noise Monitoring Results
Appendix 4.....	Blasting Monitoring Results
Appendix 5.....	Groundwater Monitoring Results
Appendix 6.....	Surface Water Monitoring Results
Appendix 7.....	Discharge Monitoring Results

## 1.0 METEOROLOGY

### 1.1 WEATHER STATION AVAILABILITY

Weather data was available for 100% of February 2011.

Weather data was available for 100% of March 2011.

Weather data was available for 100% of April 2011.

## 2.0 AIR QUALITY

### 2.1 HVAS (PM10)

High Volume Air Sample (HVAS) monitoring for particulate matter less than 10 micron in size (PM10) and total suspended particulate (TSP) matter is conducted at five sites listed below.

- WCHV1 – “Cintra” PM10
- WCHV2 – “Tonsley Park” PM10
- WCHV3 – “Railway View” PM10
- WCHV4 – “Eurunderee” PM10
- WCHV5 – “Railway View” TSP

Sampling is scheduled for 24 hours every 6 days in accordance with Department of Environment, Climate Change and Water (DECCW) guidelines and results are reported as micro grams per cubic metre ( $\mu\text{g}/\text{m}^3$ ) of air sampled.

#### 2.1.1 Monitoring Data Results

The monthly average results for the last three months are provided in the table below; however see HVAS monitoring data under **Appendix 1** for individual results.

Monitor Location	February ( $\mu\text{g}/\text{m}^3$ )	March ( $\mu\text{g}/\text{m}^3$ )	April ( $\mu\text{g}/\text{m}^3$ )	Criteria ( $\mu\text{g}/\text{m}^3$ )
WCHV1	17.7	12.8	24.5	30
WCHV2	16.6	9.5	14.7	30
WCHV3	19.3	12.9	27.8	30
WCHV4	23.1	9.7	12.2	30
WCHV5	37.0	35.3	64.3	90

#### 2.1.2 Discussion - Compliance / Non Compliance

There was one PM10 24 hour exceedance at “Cintra” on 20<sup>th</sup> April 2011 recording  $51\mu\text{g}/\text{m}^3$ , given the north west to south westerly winds on that day, the dust levels were mostly likely to be as a result of activities at the Rail Load-out Facility. “Cintra” is a project related property and air quality criteria do not apply. All other 6 day PM10 24 hour results were below the short term 24 hour impact criteria of  $50\mu\text{g}/\text{m}^3$ .

All PM10 sites monthly averages are below the long term impact annual criteria of  $30\mu\text{g}/\text{m}^3$ .

The TSP site is below the long term impact annual criteria of  $90\mu\text{g}/\text{m}^3$ .

Due to a likely black out, the Railway View PM10 and TSP did not run on 8<sup>th</sup> April 2011 missing a 6 day sample that is not in compliance with EPL 12290.

## 2.2 DEPOSITED DUST

Deposited dust monitoring is for particulate matter generally greater than 30 micron in size which readily settles out of the air and is monitored at seven locations.

- WC2 – “Cintra”
- WC5 – “Railway View”
- WC7 – “Tonsley Park”
- WC8 – “Plain View”

WC9 – “Marengo”  
 WC10 – “Mountain View”  
 WC11 – “Glenara”

Sampling is scheduled monthly in accordance with DECCW guidelines and results are reported as grams per metre squared per month (g/m<sup>2</sup>/month).

### 2.2.1 Monitoring Data Results

The results for the last three months are provided in the table below; however **Appendix 2** has more information on Deposited Dust Monitoring Results.

Monitor Location	February (g/m <sup>2</sup> /month)	March (g/m <sup>2</sup> /month)	April (g/m <sup>2</sup> /month)	Criteria (g/m <sup>2</sup> /month)
WC2	1.4	1.6	1.5	3.6
WC5	0.8	1.6	1.1	3.6
WC7	0.6	0.7	0.6	3.6
WC8	0.7	0.7	1.1	3.6
WC9	0.4	0.9	0.5	3.6
WC10	1.2	2.2	c2.3	3.6
WC11	1.0	0.6	0.6	3.6

c - indicates sample is contaminated from a Non-Werris Creek Coal dust source and is not counted in the average

### 2.2.2 Discussion - Compliance / Non Compliance

All dust deposition gauge results were below the monthly amenity criteria of 3.6g/m<sup>2</sup>/month. There was one sample for “Mountain View” (WC9) that has been excluded due to excessive dust from non-mining sources.

### 2.3 AIR QUALITY COMPLAINTS

There were two dust related complaints for the period. The first complaint was from a Werris Creek resident that could see excessive dust coming from the mine on Monday 14<sup>th</sup> March 2011 at 6pm. On the evening of the complaint, there were very strong winds (peaking at 10.1m/s at 7:15pm) from the north west to the south west. The PM10 HVAS ran on the 15<sup>th</sup> March 2011, with “Cintra” recording the highest sample of 14µg/m<sup>3</sup> that is below the 24 hour criteria of 50µg/m<sup>3</sup>. The second complaint was from a Quipolly resident that observed dust from the mine in the early evening of 14<sup>th</sup> April 2011 drifting from the mine site. There was a temperature inversion present from 5pm onwards on the 14<sup>th</sup> April 2011, which appeared to be trapping dust and concentrating so that it was visible. The PM10 HVAS ran on 14<sup>th</sup> April 2011, with “Railway View” recording the highest sample of 39µg/m<sup>3</sup> that is below the 24 hour criteria of 50µg/m<sup>3</sup>. Specific actions taken in relation to these complaints are outlined in **Section 6**.

## 3.0 NOISE

### 3.1 OPERATIONAL NOISE

Monthly attended noise monitoring undertaken at the following locations:

- “Almawille” (private agreement);
- “Glenara” (private agreement);
- “Tonsley Park” (private agreement);
- “Railway Cottage”;
- “Greenslopes”;
- “Kyooma” (private agreement);
- Punyarra St, Werris Creek; and
- Kurrara St, Werris Creek.

Three sets of measurements are made at each location; one during the day time period (before 6pm); one during the evening period (from 6pm – 10pm) and one at night (after 10pm).

The noise emission criterion for WCC is 35dB(A) unless otherwise subject to a current, legally binding agreement between WCC and the occupant of the affected residential property.

WCC environmental protection licence (EPL) conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where wind speeds are greater than 3m/s and/or there is a temperature inversion greater than +3°C/100m.

Due to a number of complaints regarding noise from mining operations, the April 2011 monitoring period included monitoring at Kurrara St and Punyarra St (near Coronation Ave) in Werris Creek.

### 3.1.1 Monitoring Data Results

The results from February, March and April attended noise monitoring are outlined below for noise levels from Werris Creek Coal operations only (not ambient noise); however see Monthly Noise Monitoring Reports under **Appendix 3** for more detail.

24<sup>th</sup> February 2011

Location	Day	Evening	Night	Criteria
“Almawillee”*	Inaudible*	Inaudible <sup>#</sup> *	Inaudible <sup>#</sup> *	35
“Glenara”*	20	Inaudible <sup>#</sup>	<20	35
“Railway Cottage”	Inaudible	Inaudible <sup>#</sup>	Inaudible	35
“Tonsley Park”*	Inaudible*	25 <sup>#</sup> *	Inaudible*	35
“Greenslopes”	Inaudible	26 <sup>#</sup>	Inaudible	35
“Kyooma”*	27*	Inaudible <sup>#</sup> *	Inaudible*	35

\* - Project Related Property or Private Agreement; Yellow Bold – Elevated noise above criteria; # - Temperature Inversion >3°C/100m or Wind Speed >3m/s

25<sup>th</sup> March 2011

Location	Day	Evening	Night	Criteria
“Almawillee”*	Inaudible* <sup>#</sup>	Inaudible* <sup>#</sup>	Inaudible* <sup>#</sup>	35
“Glenara”*	<25 <sup>#</sup>	Inaudible <sup>#</sup>	Inaudible <sup>#</sup>	35
“Railway Cottage”	Inaudible <sup>#</sup>	Inaudible <sup>#</sup>	Inaudible <sup>#</sup>	35
“Tonsley Park”*	<25* <sup>#</sup>	<b>36*<sup>#</sup></b>	34* <sup>#</sup>	35
“Greenslopes”	<b>36<sup>#</sup></b>	<b>40<sup>#</sup></b>	<b>42<sup>#</sup></b>	35
“Kyooma”*	<b>37*<sup>#</sup></b>	<b>38*<sup>#</sup></b>	<b>38*<sup>#</sup></b>	35

\* - Project Related Property or Private Agreement; Yellow Bold – Elevated noise above criteria; # - Temperature Inversion >3°C/100m or Wind Speed >3m/s

29<sup>th</sup> & 30<sup>th</sup> April 2011

Location	Day	Evening	Night	Criteria
“Almawillee”*	Inaudible* <sup>#</sup>	Inaudible* <sup>#</sup>	30*	35
“Glenara”*	Inaudible* <sup>#</sup>	Inaudible* <sup>#</sup>	<25* <sup>#</sup>	35
“Railway Cottage”	Inaudible <sup>#</sup>	Inaudible <sup>#</sup>	Inaudible <sup>#</sup>	35
“Tonsley Park”*	Inaudible* <sup>#</sup>	33* <sup>#</sup>	<b>38*<sup>#</sup></b>	35
“Greenslopes”	Barely audible <sup>#</sup>	35 <sup>#</sup>	<b>39<sup>#</sup></b>	35
“Kyooma”*	Inaudible* <sup>#</sup>	Inaudible* <sup>#</sup>	Inaudible* <sup>#</sup>	35
Kurrara St	Inaudible <sup>#</sup>	32 <sup>#</sup>	34 <sup>#</sup>	35
Punyarra St	Inaudible <sup>#</sup>	32 <sup>#</sup>	34	35

\* - Project Related Property or Private Agreement; Yellow Bold – Elevated noise above criteria; # - Temperature Inversion >3°C/100m or Wind Speed >3m/s

### 3.1.2 Discussion - Compliance / Non Compliance

There were no noise exceedances during February, March and April.

Elevated noise levels were recorded at “Tonsley Park”, “Greenslopes” and “Kyooma” for the March monitoring period. The elevated noise levels did not result in an exceedance because of the adverse (noise enhancing) weather conditions at the time of monitoring.

Elevated noise levels were recorded at “Tonsley Park” and “Greenslopes” for the April monitoring period. The elevated noise levels did not result in an exceedance because of the adverse (noise enhancing) weather conditions at the time of monitoring.

WCC has a private agreement in place with “Almawillee”, “Glenara”, “Tonsley Park” and “Kyooma” for mining noise related impacts at those properties and the noise criteria does not apply.

### 3.2 NOISE COMPLAINTS

There were 12 complaints for noise impacts from Werris Creek Coal operations, with 10 complaints from Werris Creek residents (seven from one complainant and three from another complainant) and two complaints were from the Quipolly area. The majority of the complaints occurred during adverse weather conditions (temperature inversions or high wind speeds) that could potentially enhancing noise levels experience by the complainant. No exceedance of noise criteria was identified because noise levels measured under “enhancing” adverse weather conditions cannot be compared against the noise criteria. Each complaint was thoroughly investigated with meteorological conditions analysed, continuous noise monitoring data and audio reviewed and any mining (and other activities) documented. Specific actions taken in relation to these complaints are outlined in **Section 6**.

## 4.0 BLAST

Blast monitoring is undertaken at “Glenala”, “Talavera”, “Werris Creek”, “Tonsley Park”, “Greenslopes” and “Cintra”. Compliance limits for blasting overpressure is 115dB(L) (and up to 120dB(L) for only 5% of blasts) and vibration is 5mm/s (and up to 10mm/s for only 5% of blasts). During the period a total of 21 blasts were fired by the blasting contractor, Orica Mining Services.

### 4.1 BLAST MONITORING

#### 4.1.1 Monitoring Data Results

A summary table of blasting results from February, March and April are provided below; however see blasting results database under **Appendix 4** for more detail.

Month	# of Blasts	Overpressure		Vibration	
		Max dB(L)	Location	Max mm/s	Location
February	6	113.0	“Cintra”*	1.82	“Cintra”*
March	6	110.3	“Cintra”*	1.44	“Cintra” *
April	9	113.2	“Cintra”*	1.12	“Cintra”*
<b>TOTAL/MAX</b>	21	113.2	“Cintra”*	1.82	“Cintra”*

\* Indicates project related properties not subject to blasting criteria

#### 4.1.2 Discussion - Compliance / Non Compliance

All blasts complied with licence limits with no blasts overpressure level above 115dB(L) and no blast vibration levels greater than 5mm/s. A number of blast monitors did not trigger during the period due to the overpressure and/or vibration levels from the blast being below the trigger level of the monitor. No blasts were missed.

### 4.2 BLAST COMPLAINTS

There were four complaints from two blasts undertaken by Werris Creek Coal. All blast complaints were from Werris Creek residents. The blast on the 9<sup>th</sup> February 2011 resulted in two complaints relating to the dust cloud generated by the blast. The blast was one of the largest ever fired by Werris Creek Coal and the prevailing dry weather prior to the blast would have resulted in increased dust generation. Any dust generated by the blast dissipated over Werris Creek Coal owned land. The blast on the 23<sup>rd</sup> February 2011 generated two complaints regarding vibrations experienced at the complainants’ home resulting in window rattling. While it was a larger blast fired, it was not expected to cause any impacts because it was fired in the bottom of the pit. The blast results at all locations including Werris Creek were within compliance limits. The blasting contractor at Werris Creek Coal, Orica Mining Services has been requested to review the last 12 months of blasting complaints to identify any blast design/s that could be improved to reduce the potential for complaints. Specific actions taken in relation to these complaints are outlined in **Section 6**.

## 5.0 WATER

Groundwater monitoring was undertaken on the 15<sup>th</sup> & 16<sup>th</sup> March and 7<sup>th</sup> April 2011. Surface water monitoring was undertaken on the 3<sup>rd</sup> March 2011. There were four surface water discharge events during the period.

## 5.1 GROUND WATER

Groundwater monitoring is undertaken to monitor if there are any impacts on groundwater quality and levels as a result of the mining operations. Werris Creek Coal monitor 41 groundwater bores and piezometers in the vicinity of the mine, with the key aquifers being Quipolly Creek Alluvium (MW12 upstream and MW7 downstream) and Werrie Basalt (MW5 south and MW14 north).

### 5.1.1 Monitoring Data Results

Brief summary of groundwater monitoring results is provided below with detailed monitoring data outlined in **Appendix 5**.

Site	pH	EC	Dip	Change from Previous Quarter
<b>Quipolly Creek Alluvium</b>				
MW7	7.29	565	4.33	Level decreased 0.17m but negligible change in quality
MW12	7.35	418	6.13	Level increase 0.3m but negligible change in quality.
<b>Werrie Basalt</b>				
MW5	7.00	2390	7.19	Groundwater level rose 0.62m but negligible change in quality.
MW14	6.98	1020	15.29	Groundwater level rose 0.3m and EC decreased.

### 5.1.2 Discussion - Compliance / Non Compliance

Both aquifers are continuing to recharge and rise following the good rain late last year. Only MW7 went against the trend recording a small decrease indicating that further water level rises are dwindling, returning back to steady state fluctuations.

## 5.2 SURFACE WATER

Surface water monitoring is undertaken at key dirty and void water dams to monitor for potential contamination issues due to mining while the water is still onsite.

### 5.2.1 Monitoring Data Results

Summary of surface water quality monitoring results is provided below with detailed monitoring data outlined in **Appendix 6**.

Site	pH	EC	TSS	O&G	Change
<b>ONSITE</b>					
SB2	8.06	388	37	<5	pH and EC have decreased. TSS slightly increased.
SB9	8.00	149	30	<5	No significant change to water quality.
SB10	7.99	176	153	<5	No significant change to water quality.
VWD1	8.43	808	19	<5	No significant change to water quality.
VWD2	8.81	659	51	<5	No significant change to water quality.
200ML	8.31	830	11	<5	No significant change to water quality.
<b>OFFSITE</b>					
BGD	8.35	408	173	<5	EC has decreased with TSS has increased.
QCU	7.33	493	6	<5	EC, pH and TSS have decreased.
QCD	7.75	729	17	<5	EC, pH and TSS have increased.
WCU	7.62	1170	15	<5	EC has significantly increased.
WCD	8.23	1050	20	<5	pH and EC have significantly increased.

### 5.2.2 Discussion - Compliance / Non Compliance

Surface water monitoring results were within the trigger levels of the Site Water Management Plan response plan.

## 5.3 SURFACE WATER DISCHARGES

### 5.3.1 Monitoring Data Results

There were no wet weather discharge events and four controlled discharge events during the period. A summary of discharge monitoring results is provided below with detailed monitoring data outlined in **Appendix 7**.

Date	Site	pH	EC	TSS	O&G	Type	Compliance
7/3/2011	SB2	7.95	333	18	<5	Controlled	Compliant – water quality within criteria
7/3/2011	SB9	7.81	148	15	<5	Controlled	Compliant – water quality within criteria
12/4/2011	SB2	7.90	444	34	<5	Controlled	Compliant – water quality within criteria
12/4/2011	SB9	8.13	148	15	<5	Controlled	Compliant – water quality within criteria
<b>Criteria</b>		<b>8.5</b>	<b>N/A</b>	<b>50</b>	<b>10</b>		

### 5.3.2 Discussion - Compliance / Non Compliance

All surface water discharge results were within WCC Environmental Protection Licence 12290 criteria and there were no impacts on water quality monitored in Quipolly and Werris Creeks' catchments as a result of the discharge events.

### 5.3 WATER COMPLAINTS

There were no water related complaints during the period.

### 6.0 COMPLAINTS SUMMARY

There were 21 complaints received during the reporting period with the details summarized below. In total there were 25 issues raised – 12 related to noise (from four separate complainants), five related to lighting, four related to blasting, two related to dust and two related to unauthorized access. There were nine different complainants during the period with 11 individual complaints originating from one complainant in Werris Creek.

#	Date	Location	Complaint	Investigation	Action Taken
90	3/2/11	Werris Creek	Noise from dozers on Product Coal Stockpile previous two nights. Loud shunting from coal train at Werris Creek Station.	Weather conditions could have enhanced noise towards Werris Creek. No unusual activities occurred at Train Loud Out with one dozer operating except when a second dozer is used during train loading. WCC does not manage trains at Werris Creek Station.	Coal Processing Manager to reinforce dozer first gear policy. Pacific National contact given for Werris Creek Station. Written response sent to Complainant.
91	8/2/11	Werris Creek	Lights directed at house last night from 11:30pm until about 5am. Noise from dozer at Train Load Out facility.	Weather conditions unlikely to enhance noise towards Werris Creek and dozers were complying with 1 <sup>st</sup> gear reverse policy. A cross section from the mine to Werris Creek showed that highest lighting plant would have been behind the hill and not visible to town.	Offer to Complainant to view lighting plant locations, a second engineer inspection and noise monitoring was declined. Written response provided to Complainant.
92	4/2/11	"Rosehill"	Tenant complained to property owner of general noise from the mine.	No specific event or date outlined.	Encouraged owners/tenants to register complaints as soon as possible.
93	9/2/11	Werris Creek	Blast created "massive black dust cloud".	Blast results were in compliance and weather conditions unlikely to have influenced blast result. The blast was one of the largest ever firer at WCC and the shot surface was dry and dusty. The through-seam style blast would likely have added to the black dust cloud, which would have dissipated out over WCC owned land.	Verbal and written response provided to Complainant.
94	9/2/11	Werris Creek	Blast caused significant shaking in their house and rattling windows and floor. Big blast dust cloud looked like a bush fire and had the shape of a nuclear mushroom cloud.	Blast results were in compliance and weather conditions unlikely to have influenced blast result. The blast was one of the largest ever firer at WCC and the shot surface was dry and dusty. The through-seam style blast would likely have added to the black dust cloud, which would have dissipated out over WCC owned land.	Written response sent to Complainant.
95	23/2/11	Werris Creek	Noise from Train Load Out Area due to dozers was excessive at 9:15pm. Children were observed riding bikes at the mine site entrance on the weekend.	Weather data indicated temperature inversion present however SE wind would limit noise enhancement. Dozers were operated in accordance with normal practice with one dozer operating in between trains.	Written response sent to Complainant. I&I NSW requested WCC to review site security.
96	23/2/11	Werris Creek	The blast frightened the husband by "shaking the house and rattling all the windows".	Blast results were in compliance. Shot was a larger blast but at bottom of pit.	Written response sent to Complainant.
97	23/2/11	Werris Creek	Blast "shook whole house" frightening his wife and himself.	Blast results were in compliance. Shot was a larger blast but at bottom of pit.	Written response sent to Complainant.
98	25/2/11	Werris Creek	Lights directed at house last night from midnight.	No change to lighting plants locations occurred. Highest lighting plant is at RL~410m behind ridge crest RL~423m preventing light towards Werris Creek.	Written response sent to Complainant.

#	Date	Location	Complaint	Investigation	Action Taken
99	28/2/11	Werris Creek	Children seen at mine site entrance and risk of unauthorized access.	Could not independently confirm the presence of children onsite.	Review security patrols. Review options for camera. Close gate during periods of limited operations.
100	7/3/11	Werris Creek	Lights shining brightly at her house only after 12:15am on 3rd & 4th March 2011.	The highest lighting plant is located on RL410m dump which is below the ridgeline RL423m which is between the mine and her house and therefore unlikely that any of the stationary lighting plants are causing the issue. A review of her complaints indicates lights only impact between 11pm and 2am. A review of train arrivals into Werris Creek station from the south was inconclusive.	A response letter was sent to the complainant.
101	10/3/11	Werris Creek	Noise was heard from the rail load out facility from 9pm to 1am and lights from the open cut area last night 9th March 2011.	There was one train arriving in that time period together with the weak inversion and south westerly winds it is possible that noise from the rail load out facility was audible at her residence. No change to the highest lighting plant which is below the ridgeline and unlikely to be the source of her lighting complaint.	Environmental Manager spoke to complainant at the time of her complaint.
102	14/3/11	Werris Creek	Excessive dust coming from mining operations blowing towards Werris Creek on Monday 6pm 14th March 2011.	Very strong south easterly winds started suddenly at 5:30pm. Mining operations were as protected in pit as possible and the dump was also in pit. Scrappers ended shift at 5:30pm. ARTC contractors were known to be operating on the rail line around that time.	Complainant to get photos developed and EO to organize meeting.
103	25/3/11	Werris Creek	Excessive noise from mining operations on 22nd, 23rd and 25th March.	All three nights had strong temperature inversions and south westerly winds which would enhance and propagate noise levels towards Werris Creek township. No exceedance of noise levels due to adverse weather conditions.	A response letter was sent to the complainant.
104	28/3/11	Werris Creek	Loud and annoying noise from the rail load-out facility from 9pm to 2:30am.	Weak to moderate inversion however north east to south easterly winds unlikely to propagate noise towards Werris Creek township. No trains, but coal haulage and one dozer operated until 3:30am.	Email response provided to DECCW. A response letter was sent to the complainant. Monthly attended noise monitoring to now include Kurrara St in Werris Creek.
105	30/3/11	Werris Creek	Excessive noise from the rail load-out facility until 11:30pm and lights from the "pit area" were very bright on Wednesday night 30th March 2011.	Strong temperature inversion present but moderate south east winds until 10pm, after which light winds changing between south east and north west. Unlikely that there were ongoing noise impacts but after 10pm possible as there was a train being loaded at that time. The highest lighting plant is unchanged located below the ridgeline and unlikely to be the source of her complaint.	Email response provided to DECCW. A response letter was sent to the complainant.
106	11/4/11	Werris Creek	Noise heard from mine during evening only 11/4/11 and specifically can hear dozer tracks.	North westerly winds and temperature inversion probably enhanced noise towards Werris Creek. Night shift mining locations were the quietest possible configuration.	Property immediately visited. Written response sent.
107	14/4/11	Werris Creek	Noise heard from mine during evening only 13/4/11 and specifically can hear dozer tracks.	North westerly winds and temperature inversion probably enhanced noise towards Werris Creek. Night shift mining locations were the quietest possible configuration.	Attended noise monitoring to be undertaken at residence in April. Written response sent.
108	14/4/11	"Wilminena"	Dust observed on 14/4/11 from the coal mine observed moving to the east.	Temperature inversion was present that evening trapping dust and concentrating so that it was visible. Wind was blowing away from complainant's residence.	Property immediately inspected and tank water sample taken for analysis of potable water quality. Written response sent.
109	20/4/11	"Hazeldene"	Noise heard from mine during evening only 20/4/11.	Westerly winds probably enhanced noise towards Quipolly. Night shift mining locations were the quietest possible configuration.	Property immediately visited. Written response sent.
110	28/4/11	Werris Creek	Noise heard from rail load out facility during evening and nights on weekend 16&17/4/11.	South easterly wind unlikely to enhance noise towards Werris Creek. Only operations were dozers working on coal stockpile. Continuous noise monitor measured levels with compliance criteria.	Attended noise monitoring to be undertaken at residence in April. Written response sent.

## 7.0 GENERAL

The second southern 200ML Dam cell was constructed and commissioned in April 2011.

The new Orica explosives loading facility was constructed and commissioned in April 2011.

In March approximately ~15ha of temporary rehabilitation (cover crop sown with oats) was completed and ~18ha of White Box Woodland rehabilitation was completed.

Approximately 11km of new fencing for the Biodiversity Offset Area was completed.

Please feel free to ask any questions in relation to the information contained within this document during Item 7 of the meeting agenda.

Regards  
Andrew Wright  
Environmental Officer

**Appendix 1 – PM10 Dust Monitoring Data.**



Site Date	WCHV1 Cintra	Monthly Monthly Average	Rolling Annual Average	WCHV2 Tonsley Park	Monthly Monthly Average	Rolling Annual Average	WCHV3 Railway View	Monthly Monthly Average	Rolling Annual Average	WCHV4 Eurunder ee	Monthly Monthly Average	Rolling Annual Average	WCTSP Railway View	Monthly Monthly Average	Rolling Annual Average	PM10 24hr Limit	M10 annual Average	SP annual Average
02-Apr-11	11		11.2	15		15.4	11		10.8	13		13.3	19		18.8	50	30	90
08-Apr-11	25		18.2	11		13.1			10.8	9		11.1			18.8	50	30	90
14-Apr-11	24		20.2	20		15.3	39		24.7	15		12.2	97		57.8	50	30	90
20-Apr-11	51		27.8	21		16.6	50		33.1	18		13.6	114		76.5	50	30	90
26-Apr-11	11	24.5	24.5	7	14.7	14.7	12	27.8	27.8	7	12.2	12.2	28	64.3	64.3	50	30	90
01-May-10			24.5			14.7			27.8			12.2			64.3	50	30	90
07-May-10			24.5			14.7			27.8			12.2			64.3	50	30	90
13-May-10			24.5			14.7			27.8			12.2			64.3	50	30	90
19-May-10			24.5			14.7			27.8			12.2			64.3	50	30	90
25-May-10		#DIV/0!	24.5		#DIV/0!	14.7		#DIV/0!	27.8		#DIV/0!	12.2		#DIV/0!	64.3	50	30	90
31-May-10			24.5			14.7			27.8			12.2			64.3	50	30	90
06-Jun-10			24.5			14.7			27.8			12.2			64.3	50	30	90
12-Jun-10			24.5			14.7			27.8			12.2			64.3	50	30	90
18-Jun-10			24.5			14.7			27.8			12.2			64.3	50	30	90
24-Jun-10		#DIV/0!	24.5		#DIV/0!	14.7		#DIV/0!	27.8		#DIV/0!	12.2		#DIV/0!	64.3	50	30	90
30-Jun-10			24.5			14.7			27.8			12.2			64.3	50	30	90
06-Jul-10			24.5			14.7			27.8			12.2			64.3	50	30	90
12-Jul-10			24.5			14.7			27.8			12.2			64.3	50	30	90
18-Jul-10			24.5			14.7			27.8			12.2			64.3	50	30	90
24-Jul-10		#DIV/0!	24.5		#DIV/0!	14.7		#DIV/0!	27.8		#DIV/0!	12.2		#DIV/0!	64.3	50	30	90
30-Jul-10			24.5			14.7			27.8			12.2			64.3	50	30	90
05-Aug-10			24.5			14.7			27.8			12.2			64.3	50	30	90
11-Aug-10			24.5			14.7			27.8			12.2			64.3	50	30	90
17-Aug-10			24.5			14.7			27.8			12.2			64.3	50	30	90
23-Aug-10		#DIV/0!	24.5		#DIV/0!	14.7		#DIV/0!	27.8		#DIV/0!	12.2		#DIV/0!	64.3	50	30	90
29-Aug-10			24.5			14.7			27.8			12.2			64.3	50	30	90
04-Sep-10			24.5			14.7			27.8			12.2			64.3	50	30	90
10-Sep-10			24.5			14.7			27.8			12.2			64.3	50	30	90
16-Sep-10			24.5			14.7			27.8			12.2			64.3	50	30	90
22-Sep-10		#DIV/0!	24.5		#DIV/0!	14.7		#DIV/0!	27.8		#DIV/0!	12.2		#DIV/0!	64.3	50	30	90
28-Sep-10			24.5			14.7			27.8			12.2			64.3	50	30	90
04-Oct-10			24.5			14.7			27.8			12.2			64.3	50	30	90
10-Oct-10			24.5			14.7			27.8			12.2			64.3	50	30	90
16-Oct-10			24.5			14.7			27.8			12.2			64.3	50	30	90
22-Oct-10		#DIV/0!	24.5		#DIV/0!	14.7		#DIV/0!	27.8		#DIV/0!	12.2		#DIV/0!	64.3	50	30	90
28-Oct-10			24.5			14.7			27.8			12.2			64.3	50	30	90
03-Nov-10			24.5			14.7			27.8			12.2			64.3	50	30	90
09-Nov-10			24.5			14.7			27.8			12.2			64.3	50	30	90
15-Nov-10			24.5			14.7			27.8			12.2			64.3	50	30	90
21-Nov-10		#DIV/0!	24.5		#DIV/0!	14.7		#DIV/0!	27.8		#DIV/0!	12.2		#DIV/0!	64.3	50	30	90
27-Nov-10			24.5			14.7			27.8			12.2			64.3	50	30	90
03-Dec-10			24.5			14.7			27.8			12.2			64.3	50	30	90
09-Dec-10			24.5			14.7			27.8			12.2			64.3	50	30	90
15-Dec-10			24.5			14.7			27.8			12.2			64.3	50	30	90
21-Dec-10		#DIV/0!	24.5		#DIV/0!	14.7		#DIV/0!	27.8		#DIV/0!	12.2		#DIV/0!	64.3	50	30	90
27-Dec-10			24.5			14.7			27.8			12.2			64.3	50	30	90
02-Jan-11			24.5			14.7			27.8			12.2			64.3	50	30	90
08-Jan-11			24.5			14.7			27.8			12.2			64.3	50	30	90
14-Jan-11			24.5			14.7			27.8			12.2			64.3	50	30	90
20-Jan-11		#DIV/0!	24.5		#DIV/0!	14.7		#DIV/0!	27.8		#DIV/0!	12.2		#DIV/0!	64.3	50	30	90
26-Jan-11			24.5			14.7			27.8			12.2			64.3	50	30	90
01-Feb-11			24.5			14.7			27.8			12.2			64.3	50	30	90
07-Feb-11			24.5			14.7			27.8			12.2			64.3	50	30	90
13-Feb-11			24.5			14.7			27.8			12.2			64.3	50	30	90
19-Feb-11		#DIV/0!	24.5		#DIV/0!	14.7		#DIV/0!	27.8		#DIV/0!	12.2		#DIV/0!	64.3	50	30	90
25-Feb-11			24.5			14.7			27.8			12.2			64.3	50	30	90
03-Mar-11			24.5			14.7			27.8			12.2			64.3	50	30	90
09-Mar-11			24.5			14.7			27.8			12.2			64.3	50	30	90
15-Mar-11			24.5			14.7			27.8			12.2			64.3	50	30	90
21-Mar-11			24.5			14.7			27.8			12.2			64.3	50	30	90
27-Mar-11		#DIV/0!	24.5		#DIV/0!	14.7		#DIV/0!	27.8		#DIV/0!	12.2		#DIV/0!	64.3	50	30	90
Min		11.2		7.0			10.8			6.6			18.8					
Max		50.5		20.5			50.0			17.8			114.0					
Capture		8%		8%			7%			8%			7%					

**Appendix 2 – Deposited Dust Monitoring Data.**

## Deposited Dust - Werris Creek Coal Mine 2010-2011

MONTH	WC-2 Cintra	WC-5 Railway View	WC-7 Tonsley Park	WC-8 Plain View	WC-9 Marengo	WC-10 Mountain View	WC-11 Glenara	ANNUAL AVERAGE LIMIT
April 2010	2.0	1.6	0.9	0.7	0.4			3.6
May 2010	1.2	1.0	1.0	c5.1*	0.4			3.6
June 2010	2.1	1.6	1.2	2.0	2.0			3.6
July 2010	0.7	0.8	0.7	0.5	0.4			3.6
August 2010	0.5	0.9	0.6	0.9	0.3	0.7		3.6
September 2010	1.4*	0.6	0.5	0.8	0.5	0.7		3.6
October 2010	6.6*	0.5	0.6	0.9	0.9	0.9		3.6
November 2010	2.0	1.0	0.9	1.0	0.8	0.9	2.1	3.6
December 2010	0.6	3.9	0.6	0.6	c7.8	0.4	1.6	3.6
January 2011	1.5	0.7	0.7	0.6	0.6	0.4	1.0	3.6
February 2011	1.4	0.8	0.6	0.7	0.4	1.2	1.0	3.6
March 2011	1.6	1.6	0.7	0.7	0.9	2.2	0.6	3.6
<b>ANNUAL AVERAGE</b>	<b>1.4</b>	<b>1.3</b>	<b>0.8</b>	<b>0.9</b>	<b>0.7</b>	<b>0.9</b>	<b>1.3</b>	<b>3.6</b>
<b>MINIMUM</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.3</b>	<b>0.4</b>	<b>0.6</b>	<b>3.6</b>
<b>MAXIMUM</b>	<b>2.1</b>	<b>3.9</b>	<b>1.2</b>	<b>2.0</b>	<b>2.0</b>	<b>2.2</b>	<b>2.1</b>	<b>3.6</b>

Note: All results are in the form of Insoluble Matter (g/m<sup>2</sup>/month)

c - indicates sample is contaminated from a Non-Werris Creek Coal dust source and is not counted in the average

\* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e bird droppings and insects) and is excluded from the average

## Deposited Dust - Werris Creek Coal Mine 2011-2012

MONTH	EPL #7	EPL #4	EPL #1	EPL #8	-	-	-	ANNUAL AVERAGE LIMIT
	WC-2 Cintra	WC-5 Railway View	WC-7 Tonsley Park	WC-8 Plain View	WC-9 Marengo	WC-10 Mountain View	WC-11 Glenara	
April 2011	1.5	1.1	0.6	1.1	0.5	c2.3	0.6	3.6
May 2011								3.6
June 2011								3.6
July 2011								3.6
August 2011								3.6
September 2011								3.6
October 2011								3.6
November 2011								3.6
December 2011								3.6
January 2012								3.6
February 2012								3.6
March 2012								3.6
<b>ANNUAL AVERAGE</b>	<b>1.5</b>	<b>1.1</b>	<b>0.6</b>	<b>1.1</b>	<b>0.5</b>	<b>#DIV/0!</b>	<b>0.6</b>	<b>3.6</b>
<b>MINIMUM</b>	<b>1.5</b>	<b>1.1</b>	<b>0.6</b>	<b>1.1</b>	<b>0.5</b>	<b>0.0</b>	<b>0.6</b>	<b>3.6</b>
<b>MAXIMUM</b>	<b>1.5</b>	<b>1.1</b>	<b>0.6</b>	<b>1.1</b>	<b>0.5</b>	<b>0.0</b>	<b>0.6</b>	<b>3.6</b>

Note: All results are in the form of Insoluble Matter (g/m2/month)

c - indicates sample is contaminated from a Non-Werris Creek Coal dust source and is not counted in the average

\* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e bird droppings and insects) and is excluded from the average

**Appendix 3 – Noise Monitoring Results.**



2 March 2011

Ref: 04035/3886

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: FEBRUARY 2011 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Thursday 24 February 2011.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Mine's Noise Management Plan (revised November 2010). The locations are listed below and attached in **Figure 1**:

- “Almawillee”
- “Glenara”
- “Railway Cottage” (previously denoted as “Fletcher”)
- “Tonsley Park”
- “Greenslopes/Banool”
- “Kyooma”

Three sets of measurements were made over the “circuit”, one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at low levels on occasion at various monitoring locations throughout the survey.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speed and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data shows that on February 24 winds were moderate from the south to south west during the day turning to the south east during the evening and early night. After midnight the wind decreased in strength and blew from the north east.

The data showed that there was a mild temperature inversion during the evening and early parts of the night survey.

The total measured Leq noise level is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) L<sub>eq</sub> (15 min)** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1 WCC Noise Monitoring Results – 24 February 2011 (Day)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	3:50 pm	43	n/a	1.1/208	Birds & insects (40), traffic (39), horse (30), <b>WCC inaudible</b>
Glenara	4:07 pm	37	n/a	1.8/191	Birds & insects (37), <b>WCC (20)</b>
Railway Cottage	3:33 pm	55	n/a	2.4/225	Traffic (55), insects (40), <b>WCC inaudible</b>
Tonsley Park	4:33 pm	34	n/a	2.1/217	Traffic (32), birds & insects (28), train (21), <b>WCC inaudible</b>
Greenslopes	4:55 pm	40	n/a	0.8/200	Insects (39), traffic (33), <b>WCC inaudible</b>
Kyooma	3:10 pm	38	n/a	2.4/179	Birds & insects (38), <b>WCC (27)</b>

Table 2 WCC Noise Monitoring Results – 24 February 2011 (Evening)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	8:22 pm	42	<3	4.2/116	Insects (42), traffic (25), cattle (24), <b>WCC inaudible</b>
Glenara	8:40 pm	48	<3	3.4/125	Insects (48), traffic (32), <b>WCC inaudible</b>
Railway Cottage	9:00 pm	52	>3	3.1/145	Traffic (50), insects (48), <b>WCC inaudible</b>
Tonsley Park	8:00 pm	46	<3	4.7/114	Insects (46), traffic (35) <b>WCC (25)</b>
Greenslopes	7:38 pm	62	<3	4.0/129	Insects (62), <b>WCC (26)</b>
Kyooma	9:24 pm	41	>3	3.9/117	Birds & insects (41), <b>WCC inaudible</b>

Table 3 WCC Noise Monitoring Results – 24/25 February 2011 (Night)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	10:01 pm	36	>3	3.9/125	Insects (35), traffic (28), <b>WCC inaudible</b>
Glenara	10:18 pm	47	<3	1.6/78	Insects (47), traffic (30) <b>WCC (&lt;20)</b>
Railway Cottage	10:37 pm	39	Lapse	2.1/81	Traffic (38), insects (30), <b>WCC inaudible</b>
Tonsley Park	12:29 am	43	Lapse	0.1/267	Insects (43), <b>WCC inaudible</b>
Greenslopes	12:10 am	44	Lapse	0.2/315	Insects (44), traffic (30), <b>WCC inaudible</b>
Kyooma	11:03 pm	50	Lapse	1.5/345	Insects (50), <b>WCC inaudible</b>

The results shown in Tables 1-3 indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC did not exceed the criterion of 35 dB(A) Leq at any monitoring location during any monitoring period.

Data from those times where WCC operations were audible were analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the Lmax criterion at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,  
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant



Figure 1 – Noise Monitoring Locations

Key

- 1 Alkawillee
- 2 Glenara
- 3 Railway Cottage
- 4 Tonsley Park
- 5 Greenslopes/Banool
- 6 Kyooma



31 March 2011

Ref: 04035/3930

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: MARCH 2011 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Friday 25 March 2011.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Mine's Noise Management Plan (revised November 2010). The locations are listed below and attached in **Figure 1**:

- “Almawillee”
- “Glenara”
- “Railway Cottage” (previously denoted as “Fletcher”)
- “Tonsley Park”
- “Greenslopes/Banool”
- “Kyooma”

Three sets of measurements were made over the “circuit”, one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm).

Meteorological data used in this report were supplied by the mine from their automatic weather stations. Wind speed and direction have been determined as the arithmetic average of the measurements, taken from the permanent weather station, over each monitoring period. The data show that on March 25 winds were light from the west during the day increasing in strength to come from the south during the evening before dropping in intensity from the south east at night.

Wind speed data is taken from the weather station at 10m above ground level as this relates to the noise propagation path.

The mine has a relocatable weather station which at the time of the survey was located at Tonsley Park (at r.l. 385.7m). The 2m temperature logger at the permanent weather station is at r.l. 445.5m. Temperature inversion information in this report has been calculated as an extrapolation as the difference between the temperature at these two stations.

The data showed that there was a mild to strong temperature inversion during the evening and night surveys.

The total measured Leq noise level is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer “Evaluator” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) L<sub>eq</sub> (15 min)** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the background level during the measurement and not measurable.

Table 1 WCC Noise Monitoring Results – 25 March 2011 (Day)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	4:37 pm	41	n/a	3.7/216	Birds & insects (40), wind (35), WCC inaudible
Glenara	4:20 pm	38	n/a	4.1/219	Birds & insects (38), WCC (<25)
Railway Cottage	4:02 pm	45	n/a	3.8/255	Wind in grass (43), traffic (39), insects (30), WCC inaudible
Tonsley Park	2:45 pm	42	n/a	3.7/251	Traffic (38), birds & insects (38), wind (33), WCC (<25)
Greenslopes	3:06 pm	46	n/a	3.8/250	Traffic (45), WCC (36), birds & insects (30)
Kyooma	3:38 pm	39	n/a	5.4/268	WCC (37), birds & insects (35)

Table 2 WCC Noise Monitoring Results – 25 March 2011 (Evening)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	9:25 pm	34	+4.1	4.2/186	Insects (34), traffic (25), WCC inaudible
Glenara	9:06 pm	44	+2.9	4.6/189	Insects (44), WCC inaudible
Railway Cottage	8:45 pm	48	+3.9	4.6/194	Traffic (47), insects (40), WCC inaudible
Tonsley Park	7:30 pm	44	+4.2	7.4/188	Birds & insects (40), traffic (40) WCC (36)
Greenslopes	7:53 pm	47	+4.2	6.5/180	Insects (44), traffic (41), WCC (40)
Kyooma	8:18 pm	41	+3.4	4.8/179	Birds & insects (38), WCC (38)

Table 3 WCC Noise Monitoring Results – 25/26 March 2011 (Night)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	12:10 am	32	+5.6	3.0/148	Traffic (29), insects (29), dogs (25), WCC inaudible
Glenara	11:19 pm	34	+6.1	2.2/143	Traffic (33), insects (30), WCC inaudible
Railway Cottage	11:03 pm	24	+6.3	3.0/160	Insects (24), WCC inaudible
Tonsley Park	10:18 pm	58	+9.4	2.4/163	Train (58), traffic (39), WCC (34), insects (33)
Greenslopes	10:00 pm	45	+9.5	2.5/168	WCC (42), traffic (41), insects (38)
Kyooma	10:42 pm	40	+9.4	3.0/159	WCC (38), insects (36)

The results shown in Tables 1-3 indicate that, under the operational and atmospheric conditions at the time, noise emissions from WCC were higher than 35 dB(A) Leq at Kyooma and Greenslopes during each of the day, evening and night time monitoring periods and at Tonsley Park during the night.

The elevated noise at each location was due to general mine hum and plant noise (haul trucks and dozers). Noise from dozers on the stockpile at the rail load out facility was also a contributor to the received noise at the Tonsley Park and Greenslopes monitoring locations during the day and evening.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Data from the mine operated weather station indicated that all of the elevated noise levels at each location during the evening and night were measured whilst there was a strong temperature inversion in place.

The elevated noise levels during the day at Kyooma and Greenslopes were measured whilst there was a westerly wind blowing at greater than 3m/s.

WCC has private agreements in place with the landowners at Kyooma, Tonsley Park and Alkawillee which allow for received noise levels between 35 and 40 dB(A) Leq (15 min) to be considered a noise management zone.

Data from those times where WCC operations were audible were analysed using the "Evaluator" software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the Lmax criterion at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,  
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant



Figure 1 – Noise Monitoring Locations

Key

- 1 Alkawillee
- 2 Glenara
- 3 Railway Cottage
- 4 Tonsley Park
- 5 Greenslopes/Banool
- 6 Kyooma



2 May 2011

Ref: 04035/3965

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: MAY 2011 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Friday 29 and Saturday 30 April 2011.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Mine's Noise Management Plan (revised November 2010). The locations are listed below and attached in **Figure 1**:

- “Almawillee”
- “Glenara”
- “Railway Cottage” (previously denoted as “Fletcher”)
- “Tonsley Park”
- “Greenslopes/Banool”
- “Kyooma”

Additional measurements were also made on the road side near residential locations in Punyarra Street and Kurrara Street, Werris Creek. These locations are shown in **Figure 2**.

Three sets of measurements were made over the “circuit”, one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm).

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speed and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data shows that on April 29 winds were moderate from the south east. The data from the met station shows wind speeds were generally higher than 5m/s during the day and evening. Observations at ground level were that winds at this height were at lower speeds than this (range 1 to 3m/s). The wind strength dropped during the night survey and swung to be more from the east.

The data showed that there was a temperature inversion for some parts of the night survey.

The total measured Leq noise level is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer “Evaluator” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) L<sub>eq</sub>(15 min)** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the background level during the measurement and not measurable.

Table 1 WCC Noise Monitoring Results – 29 April 2011 (Day)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	2:13 pm	39	n/a	5.8/147	Wind (36), birds & insects (35), WCC inaudible
Glenara	2:30 pm	45	n/a	5.6/149	Birds & insects (44), wind (35), traffic (30), WCC inaudible
Railway Cottage	1:54 pm	39	n/a	5.1/132	Traffic (39), WCC inaudible
Tonsley Park	2:55 pm	43	n/a	5.7/136	Traffic (41), birds & insects (39), WCC inaudible
Greenslopes	3:36 pm	55	n/a	5.3/139	Train (52), birds & insects (50) traffic (45), WCC barely audible
Kyooma	1:30 pm	40	n/a	5.8/157	Birds & insects (38), wind (36), WCC inaudible
Kurrara St	1:05 pm	52	n/a	6.9/152	Traffic (52), birds & insects (37), WCC inaudible
Punyarra St	3:15 pm	44	n/a	5.1/133	Insects (41), traffic (40), wind (35), WCC inaudible

Table 2 WCC Noise Monitoring Results – 29 April 2011 (Evening)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	7:00 pm	36	Lapse	6.0/134	Insects (35), traffic (30), WCC inaudible
Glenara	7:17 pm	38	Lapse	6.0/121	Traffic (38), insects (28), WCC inaudible
Railway Cottage	7:37 pm	41	Lapse	5.0/124	Insects (38), traffic (37), wind (30), WCC inaudible
Tonsley Park	9:18 pm	38	+2.1	3.5/133	Traffic (35), WCC (33), insects (31)
Greenslopes	8:57 pm	43	Lapse	3.8/147	Traffic (42), WCC (35), insects (32)
Kyooma	7:59 pm	37	Lapse	4.7/129	Insects (35), wind (32), WCC inaudible
Kurrara St	8:20 pm	36	Lapse	5.2/137	Traffic (32), WCC (32), insects (27)
Punyarra St	8:37 pm	60	Lapse	5.1/140	Insects (60), traffic (33), WCC (32)

Table 3 WCC Noise Monitoring Results – 29/30 April 2011 (Night)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	1:15 am	30	Lapse	2.6/121	WCC (30)
Glenara	12:57 am	36	Lapse	3.1/113	Traffic (36), WCC (<25)
Railway Cottage	12:37 am	29	+3.9	2.7/104	Traffic (29), WCC inaudible
Tonsley Park	11:15 pm	44	+3.2	2.6/136	Traffic (43), WCC (38), insects (30)
Greenslopes	10:57 pm	45	+4.7	1.8/122	Traffic (43), WCC (39), insects (34)
Kyooma	10:01 pm	25	+4.1	2.6/119	Insects (25), WCC inaudible
Kurrara St	10:21 pm	36	+3.1	1.9/129	WCC (34), traffic (30), insects (26)
Punyarra St	10:38 pm	39	+2.6	1.6/140	Traffic (36), WCC (34), insects (31)

The results shown in **Tables 1-3** indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC exceeded the criterion of 35 dB(A) Leq at the Tonsley Park and Greenslopes monitoring locations during the night monitoring period.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Data from the mine operated weather station indicated that all of the elevated noise levels were measured whilst there was a strong temperature inversion in place.

WCC has an agreement in place with the landowner at Tonsley Park to allow for noise up to 45 dB(A) Leq (15 min).

Data from those times where WCC operations were audible were analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the Lmax criterion at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,  
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant

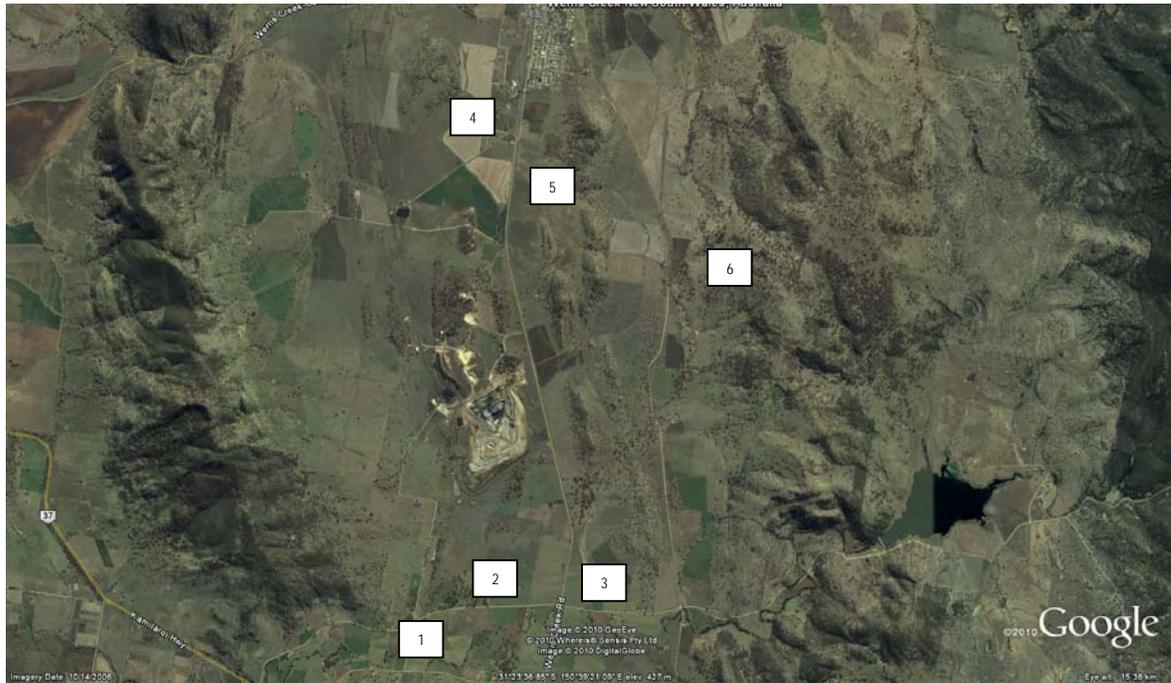


Figure 1 – Noise Monitoring Locations

Key

- 1 Alkawillee
- 2 Glenara
- 3 Railway Cottage
- 4 Tonsley Park
- 5 Greenslopes/Banool
- 6 Kyooma



Figure 2 – Additional Noise Monitoring Locations

Key

- 7 Kurarra Street
- 8 Punyarra Street

**Appendix 4 – Blasting Monitoring Data.**

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results											
					Glenala		Greenslopes		Tonsley Park		Cintra*		Werris Creek		COMPLIANCE	
					Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
11-06	1/02/2011	11:16	S9_10-15_300	IB	NM	NM	<0.37	<111.9	0.4	89.7	0.47	102	<0.37	<111.9	10.00	120.0
11-07	9/02/2011	13.51	S10_18_330TSB5	THRU S	NM	NM	<0.37	<111.9	1.1	108.8	1.82	113	0.51	94.1	10.00	120.0
11-08	14/02/2011	15.18	S9_6-7_Gseam	IB	NM	NM	0.7	110.1	0.65	109.5	0.75	111.5	<0.23	<109.9	10.00	120.0
11-09	17/02/2011	13.51	S10_8-9R_Ccoal	IB	NM	NM	<0.37	<111.9	<0.37	<111.9	<0.37	<111.9	<0.23	<109.9	10.00	120.0
11-10	23/02/2011	16.15	S9_8-12_Gcoal	IB	NM	NM	<0.37	<111.9	0.73	100.6	1.25	104.5	<0.23	<109.9	10.00	120.0
11-11	25/02/2011	15.34	S10_11-12R_Ccoal	IB	NM	NM	<0.37	<111.9	<0.37	<111.9	<0.37	<111.9	<0.23	<109.9	10.00	120.0
<b>TOTALS</b>	<b>FEBRUARY</b>	<b># BLAST</b>	<b>6</b>	<b>AVERAGE</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>0.70</b>	<b>110.1</b>	<b>0.72</b>	<b>102.2</b>	<b>1.07</b>	<b>107.8</b>	<b>0.51</b>	<b>94.1</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>FEBRUARY</b>	<b># BLAST</b>	<b>6</b>	<b>HIGHEST</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>0.70</b>	<b>110.1</b>	<b>1.10</b>	<b>109.5</b>	<b>1.82</b>	<b>113.0</b>	<b>0.51</b>	<b>94.1</b>	<b>10.00</b>	<b>120.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b># BLAST</b>	<b>96</b>	<b>AVERAGE</b>	<b>0.10</b>	<b>114.7</b>	<b>0.70</b>	<b>110.1</b>	<b>0.67</b>	<b>102.9</b>	<b>0.87</b>	<b>108.4</b>	<b>0.51</b>	<b>94.1</b>	<b>5.00</b>	<b>115.0</b>

**KEY**

NT - Not Triggered

NM - Not Monitored

\* - Project Related Property

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results											
					Glenala		Greenslopes		Tonsley Park		Cintra*		Werris Creek		COMPLIANCE	
					Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
11-12	4/03/2011	14.51	S10_11-12_Fcoal Pt1	IB	NM	NM	<0.37	<111.9	<0.37	<111.9	0.45	100.3	<0.23	<109.9	10.00	120.0
11-13	10/03/2011	13.22	S9_8-12_Gcoal Pt2	IB	NM	NM	1.01	101.5	0.73	99.3	0.8	102.2	0.42	94.2	10.00	120.0
11-14	17/03/2011	13.53	S10_11-12_Fcoal Pt2	IB	NM	NM	<0.37	<111.9	0.48	87.2	0.47	105.7	<0.23	<109.9	10.00	120.0
11-15	22/03/2011	13.12	S9_8-12_Gcoal Pt3	IB	NM	NM	1.07	99.7	1.01	94.2	1.44	101.5	0.48	99.8	10.00	120.0
11-16	24/03/2011	13.27	S10_11-13_DE coal	IB	NM	NM	<0.37	<111.9	<0.37	<111.9	<0.37	<111.9	<0.23	<109.9	10.00	120.0
11-17	29/03/2011	15.3	S9_13-15_Gcoal	IB	NM	NM	<0.37	<111.9	0.81	100.2	1.15	110.3	<0.23	<109.9	10.00	120.0
<b>TOTALS</b>	<b>MARCH</b>	<b># BLAST</b>	<b>6</b>	<b>AVERAGE</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>1.04</b>	<b>100.6</b>	<b>0.76</b>	<b>95.2</b>	<b>0.86</b>	<b>104.0</b>	<b>0.45</b>	<b>97.0</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>MARCH</b>	<b># BLAST</b>	<b>6</b>	<b>HIGHEST</b>	<b>&lt;0.37</b>	<b>&lt;111.9</b>	<b>1.07</b>	<b>101.5</b>	<b>1.01</b>	<b>100.2</b>	<b>1.44</b>	<b>110.3</b>	<b>0.48</b>	<b>99.8</b>	<b>10.00</b>	<b>120.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b># BLAST</b>	<b>102</b>	<b>AVERAGE</b>	<b>0.10</b>	<b>114.7</b>	<b>0.59</b>	<b>106.7</b>	<b>0.68</b>	<b>102.2</b>	<b>0.87</b>	<b>108.0</b>	<b>0.48</b>	<b>95.6</b>	<b>5.00</b>	<b>115.0</b>

**KEY**

NT - Not Triggered

NM - Not Monitored

\* - Project Related Property

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results													
					Glenala		Greenslopes		Tonsley Park		Cintra*		Werris Creek		Talavera		COMPLIANCE	
					Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
11-18	4/04/2011	13:40	S10_8-9_Deseam	IB	NM	NM	<0.37	<109.9	<0.20	<109.9	<0.37	<109.9	<0.20	<109.9	NM	NM	10.00	120.0
11-19	4/04/2011	13:40	S9_14-15_Fcoal	IB	NM	NM	<0.37	<109.9	<0.20	<109.9	<0.37	<109.9	<0.20	<109.9	NM	NM	10.00	120.0
11-20	7/04/2011	14:12	S9_13_Gcoal	IB	<0.37	<109.9	0.28	110.2	0.34	108.7	0.58	113.2	NM	NM	<0.37	<109.9	10.00	120.0
11-21	11/04/2011	15:22	S10_11-12_Fseam	IB	<0.37	<109.9	<0.37	<109.9	<0.20	<109.9	0.48	108.2	NM	NM	<0.37	<109.9	10.00	120.0
11-22	15/04/2011	13:17	S9_17_Gseam	IB	NM	NM	0.35	111.5	0.53	109.8	0.42	106.2	<0.20	<109.9	<0.37	<109.9	10.00	120.0
11-23	14/04/2011	13:16	S10_11-12_Fseam	IB	NM	NM	<0.37	<109.9	<0.20	<109.9	<0.37	<109.9	<0.20	<109.9	<0.37	<109.9	10.00	120.0
11-24	18/04/2011	13:18	S10_19_330	IB	NM	NM	0.29	110.7	0.27	106.7	0.42	110.4	<0.20	<109.9	<0.37	<109.9	10.00	120.0
11-25	21/04/2011	13:17	S11_12_385	OB	NM	NM	<0.37	<109.9	0.83	107.6	1.12	110.2	<0.20	<109.9	<0.37	<109.9	10.00	120.0
11-26	29/04/2011	13:12	S10_8-9_Deseam Pt2	IB	<0.37	<109.9	<0.37	<109.9	<0.20	<109.9	<0.37	<109.9	NM	NM	NM	NM	10.00	120.0
<b>TOTALS</b>	<b>APRIL</b>	<b># BLAST</b>	<b>9</b>	<b>AVERAGE</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>0.31</b>	<b>110.8</b>	<b>0.49</b>	<b>108.2</b>	<b>0.60</b>	<b>109.6</b>	<b>&lt;0.20</b>	<b>&lt;109.9</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>APRIL</b>	<b># BLAST</b>	<b>9</b>	<b>HIGHEST</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>0.35</b>	<b>111.5</b>	<b>0.83</b>	<b>109.8</b>	<b>1.12</b>	<b>113.2</b>	<b>&lt;0.20</b>	<b>&lt;109.9</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>10.00</b>	<b>120.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b># BLAST</b>	<b>9</b>	<b>AVERAGE</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>0.31</b>	<b>110.8</b>	<b>0.49</b>	<b>108.2</b>	<b>0.60</b>	<b>109.6</b>	<b>&lt;0.20</b>	<b>&lt;109.9</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>5.00</b>	<b>115.0</b>

**Appendix 5 – Groundwater Monitoring Data.**



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1105615</b>	Page	: 1 of 8
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Client Services
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 1698	Date Samples Received	: 17-MAR-2011
C-O-C number	: ----	Issue Date	: 24-MAR-2011
Sampler	: BPHILLIPS	No. of samples received	: 11
Site	: ----	No. of samples analysed	: 11
Quote number	: SY/261/10		

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 Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics
Luke Witham	Senior Inorganic Chemist	Sydney Inorganics
Phalak Inthaksone	Organics Co-ordinator	Sydney Organics

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## 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

- **ED093F: LCS recovery for Magnesium falls outside ALS Dynamic Control Limit. However, they are within the acceptance criteria based on ALS DQO. No further action is required.**
- **EG020: LCS recovery for vanadium fall outside ALS dynamic control limits. However, they are within the acceptance criteria based on ALS DQO. No further action is required.**
- **EK071: It has been noted that RP is greater than TP for sample MW10 and MW13, however this difference is within the limits of experimental variation.**



## Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				MW1	MW6	MW8	MW10	MW11
				16-MAR-2011 11:10	16-MAR-2011 12:00	16-MAR-2011 12:30	16-MAR-2011 09:40	16-MAR-2011 10:30
				Client sampling date / time				
Compound	CAS Number	LOR	Unit	ES1105615-001	ES1105615-002	ES1105615-003	ES1105615-004	ES1105615-005
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.01	7.25	7.58	7.34	7.53
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	1090	1780	868	1770	1060
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	547	655	293	334	408
Total Alkalinity as CaCO3	----	1	mg/L	547	655	293	334	408
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	7	34	39	48	25
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	68	262	108	406	123
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	128	78	76	115	70
Magnesium	7439-95-4	1	mg/L	60	87	45	112	55
Sodium	7440-23-5	1	mg/L	55	271	67	116	120
Potassium	7440-09-7	1	mg/L	1	<1	<1	<1	<1
<b>EG020T: Total Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.001	<0.001	<0.001	0.002
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	0.016	0.042	0.002	0.023	0.004
Cadmium	7440-43-9	0.0001	mg/L	0.0001	<0.0001	<0.0001	<0.0001	0.0003
Chromium	7440-47-3	0.001	mg/L	<0.001	0.002	0.025	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.028	0.016	0.004	0.001	0.023
Lead	7439-92-1	0.001	mg/L	0.008	0.001	<0.001	<0.001	0.003
Manganese	7439-96-5	0.001	mg/L	0.055	0.010	0.004	<0.001	0.002
Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.061	<0.001	<0.001
Vanadium	7440-62-2	0.01	mg/L	0.02	0.04	0.02	0.02	0.04
Zinc	7440-66-6	0.005	mg/L	0.098	0.059	0.007	<0.005	0.056
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Ammonia as N	7664-41-7	0.01	mg/L	1.61	0.16	0.13	0.07	0.29
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	0.10	<0.01	<0.01	<0.01	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>								



## Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

				MW1	MW6	MW8	MW10	MW11
				16-MAR-2011 11:10	16-MAR-2011 12:00	16-MAR-2011 12:30	16-MAR-2011 09:40	16-MAR-2011 10:30
Compound	CAS Number	LOR	Unit	ES1105615-001	ES1105615-002	ES1105615-003	ES1105615-004	ES1105615-005
<b>EK058G: Nitrate as N by Discrete Analyser - Continued</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	4.68	3.57	2.78	19.8	6.23
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	4.78	3.57	2.78	19.8	6.23
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	4.7	1.5	1.3	2.9	2.4
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	9.5	5.1	4.1	22.7	8.6
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.24	0.11	0.09	<0.01	0.08
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.24	0.06	0.02	0.01	0.04
<b>EN055: Ionic Balance</b>								
^ Total Anions	----	0.01	meq/L	13.0	21.2	9.73	19.1	12.1
^ Total Cations	----	0.01	meq/L	13.8	22.8	10.4	20.0	13.2
^ Ionic Balance	----	0.01	%	2.81	3.67	3.35	2.22	4.18
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				MW12	MW13	MW15	MW16	MW17A
				16-MAR-2011 14:20	16-MAR-2011 13:00	16-MAR-2011 14:00	16-MAR-2011 13:50	16-MAR-2011 13:15
				Client sampling date / time				
Compound	CAS Number	LOR	Unit	ES1105615-006	ES1105615-007	ES1105615-008	ES1105615-009	ES1105615-010
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.35	7.28	7.28	7.24	7.30
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	418	866	967	672	761
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	174	195	281	230	267
Total Alkalinity as CaCO3	----	1	mg/L	174	195	281	230	267
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	22	35	34	44	30
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	28	150	150	66	91
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	39	77	73	57	62
Magnesium	7439-95-4	1	mg/L	15	38	39	27	30
Sodium	7440-23-5	1	mg/L	37	50	100	55	70
Potassium	7440-09-7	1	mg/L	<1	<1	<1	<1	<1
<b>EG020T: Total Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.002	<0.001	0.002
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	0.012	0.026	0.023	0.016	0.019
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.042	0.006	0.008	0.032	0.008
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.003	0.008	0.004	0.002	0.002
Nickel	7440-02-0	0.001	mg/L	<0.001	0.001	<0.001	<0.001	<0.001
Vanadium	7440-62-2	0.01	mg/L	<0.01	0.01	0.02	0.01	0.02
Zinc	7440-66-6	0.005	mg/L	0.019	0.027	0.026	0.066	<0.005
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Ammonia as N	7664-41-7	0.01	mg/L	0.12	0.23	0.15	0.09	0.09
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>								



## Analytical Results

Sub-Matrix: WATER

Client sample ID  
 Client sampling date / time

				MW12	MW13	MW15	MW16	MW17A
				16-MAR-2011 14:20	16-MAR-2011 13:00	16-MAR-2011 14:00	16-MAR-2011 13:50	16-MAR-2011 13:15
Compound	CAS Number	LOR	Unit	ES1105615-006	ES1105615-007	ES1105615-008	ES1105615-009	ES1105615-010
<b>EK058G: Nitrate as N by Discrete Analyser - Continued</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	1.32	2.56	1.26	4.34	0.76
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	1.32	2.56	1.26	4.34	0.76
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.6	1.1	0.5	2.1	0.4
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	1.9	3.7	1.8	6.4	1.2
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.12	0.07	0.10	0.14	0.05
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.05	0.08	0.09	0.09	0.08
<b>EN055: Ionic Balance</b>								
^ Total Anions	----	0.01	meq/L	4.73	8.88	10.5	7.36	8.51
^ Total Cations	----	0.01	meq/L	4.80	9.10	11.2	7.45	8.65
^ Ionic Balance	----	0.01	%	0.74	1.23	2.87	0.58	0.78
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50



## Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	MW17B				
			Client sampling date / time	16-MAR-2011 13:30				
Compound	CAS Number	LOR	Unit	ES1105615-011				
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	8.32				
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	1920				
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1				
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	16				
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	327				
Total Alkalinity as CaCO3	----	1	mg/L	343				
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	39				
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	495				
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	27				
Magnesium	7439-95-4	1	mg/L	38				
Sodium	7440-23-5	1	mg/L	392				
Potassium	7440-09-7	1	mg/L	1				
<b>EG020T: Total Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001				
Beryllium	7440-41-7	0.001	mg/L	<0.001				
Barium	7440-39-3	0.001	mg/L	0.017				
Cadmium	7440-43-9	0.0001	mg/L	<0.0001				
Chromium	7440-47-3	0.001	mg/L	<0.001				
Cobalt	7440-48-4	0.001	mg/L	<0.001				
Copper	7440-50-8	0.001	mg/L	0.008				
Lead	7439-92-1	0.001	mg/L	<0.001				
Manganese	7439-96-5	0.001	mg/L	0.005				
Nickel	7440-02-0	0.001	mg/L	<0.001				
Vanadium	7440-62-2	0.01	mg/L	0.02				
Zinc	7440-66-6	0.005	mg/L	0.013				
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001				
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Ammonia as N	7664-41-7	0.01	mg/L	0.16				
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01				
<b>EK058G: Nitrate as N by Discrete Analyser</b>								



## Analytical Results

Sub-Matrix: **WATER**

Client sample ID

**MW17B**

Client sampling date / time

16-MAR-2011 13:30

Compound	CAS Number	LOR	Unit	ES1105615-011	----	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser - Continued</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.11	----	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.11	----	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.5	----	----	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	0.6	----	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.04	----	----	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.01	----	----	----	----
<b>EN055: Ionic Balance</b>								
^ Total Anions	----	0.01	meq/L	21.6	----	----	----	----
^ Total Cations	----	0.01	meq/L	21.6	----	----	----	----
^ Ionic Balance	----	0.01	%	0.05	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----



## Environmental Division

### CERTIFICATE OF ANALYSIS

<b>Work Order</b>	<b>: ES1105506</b>	Page	: 1 of 7
Client	: ACIRL PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Client Services
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 1698	Date Samples Received	: 16-MAR-2011
C-O-C number	: ----	Issue Date	: 24-MAR-2011
Sampler	: BP	No. of samples received	: 7
Site	: ----	No. of samples analysed	: 7
Quote number	: SY/261/10		

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
- Surrogate Control Limits



NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Spectroscopist	Sydney Inorganics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics

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## 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

- **EG020: LCS recoveries for some elements fall outside ALS Dynamic Control Limit. However, they are within the acceptance criteria based on ALS DQO. No further action is required.**
- **EK071: It has been noted that RP is greater than Tp for samples MW3 and MW4 however this difference is within the limits of experimental variation.**



## Analytical Results

Sub-Matrix: WATER

Compound	CAS Number	LOR	Unit	Client sample ID	MW3	MW4	MW5	MW9	MW14
				Client sampling date / time	15-MAR-2011 12:20	15-MAR-2011 13:40	15-MAR-2011 13:20	15-MAR-2011 11:10	15-MAR-2011 10:30
					ES1105506-001	ES1105506-002	ES1105506-003	ES1105506-004	ES1105506-005
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		6.52	7.41	7.00	7.22	6.98
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		2	874	2390	601	1020
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		<1	410	309	285	462
Total Alkalinity as CaCO3	----	1	mg/L		<1	410	309	285	462
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		<1	9	45	36	20
<b>ED045G: Chloride Discrete analyser</b>									
Chloride	16887-00-6	1	mg/L		<1	78	627	37	73
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L		<1	68	179	53	92
Magnesium	7439-95-4	1	mg/L		<1	43	106	32	63
Sodium	7440-23-5	1	mg/L		<1	94	162	58	72
Potassium	7440-09-7	1	mg/L		<1	2	<1	<1	1
<b>EG020T: Total Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L		0.007	0.092	0.013	0.012	0.021
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		<0.001	0.002	<0.001	0.001	0.002
Cobalt	7440-48-4	0.001	mg/L		<0.001	<0.001	<0.001	0.003	<0.001
Copper	7440-50-8	0.001	mg/L		0.003	0.035	0.002	0.003	0.005
Lead	7439-92-1	0.001	mg/L		0.009	0.010	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		0.080	0.051	0.010	0.010	0.040
Nickel	7440-02-0	0.001	mg/L		<0.001	0.002	<0.001	0.002	0.003
Vanadium	7440-62-2	0.01	mg/L		<0.01	0.02	0.02	0.02	0.01
Zinc	7440-66-6	0.005	mg/L		30.7	0.122	<0.005	<0.005	0.010
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>EK055A-NH4: Ammonium as N by FIA</b>									
Ammonium as N	----	0.01	mg/L		<0.01	0.10	0.01	<0.01	<0.01
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>									



## Analytical Results

Sub-Matrix: WATER

Client sample ID  
 Client sampling date / time

Compound	CAS Number	LOR	Unit	MW3	MW4	MW5	MW9	MW14
				15-MAR-2011 12:20	15-MAR-2011 13:40	15-MAR-2011 13:20	15-MAR-2011 11:10	15-MAR-2011 10:30
				ES1105506-001	ES1105506-002	ES1105506-003	ES1105506-004	ES1105506-005
<b>EK058G: Nitrate as N by Discrete Analyser - Continued</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.28	1.27	2.42	3.14	13.4
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.28	1.27	2.42	3.14	13.4
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.8	0.5	1.8	4.1
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	0.5	2.1	2.9	4.9	17.5
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	<0.01	0.03	0.12
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.02	0.02	<0.01	<0.01	<0.01
<b>EN055: Ionic Balance</b>								
^ Total Anions	----	0.01	meq/L	<0.01	10.6	24.8	7.50	11.7
^ Total Cations	----	0.01	meq/L	<0.01	11.0	24.7	7.77	12.9
^ Ionic Balance	----	0.01	%	----	2.19	0.22	1.76	4.81
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	111	129	131	115	120
Toluene-D8	2037-26-5	0.1	%	112	112	102	107	110
4-Bromofluorobenzene	460-00-4	0.1	%	106	104	102	100	103



## Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				P1	P2	---	---	---
				15-MAR-2011 11:50	15-MAR-2011 12:50	---	---	---
				Client sampling date / time				
Compound	CAS Number	LOR	Unit	ES1105506-006	ES1105506-007	---	---	---
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	6.58	7.25	---	---	---
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	1410	889	---	---	---
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	---	---	---
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	---	---	---
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	294	308	---	---	---
Total Alkalinity as CaCO3	----	1	mg/L	294	308	---	---	---
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	86	64	---	---	---
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	299	109	---	---	---
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	293	70	---	---	---
Magnesium	7439-95-4	1	mg/L	11	42	---	---	---
Sodium	7440-23-5	1	mg/L	43	91	---	---	---
Potassium	7440-09-7	1	mg/L	6	<1	---	---	---
<b>EG020T: Total Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	---	---	---
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	---	---	---
Barium	7440-39-3	0.001	mg/L	0.089	0.024	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	0.001	---	---	---
Cobalt	7440-48-4	0.001	mg/L	0.002	0.001	---	---	---
Copper	7440-50-8	0.001	mg/L	0.006	0.024	---	---	---
Lead	7439-92-1	0.001	mg/L	0.012	0.036	---	---	---
Manganese	7439-96-5	0.001	mg/L	1.04	0.065	---	---	---
Nickel	7440-02-0	0.001	mg/L	0.007	0.003	---	---	---
Vanadium	7440-62-2	0.01	mg/L	<0.01	0.03	---	---	---
Zinc	7440-66-6	0.005	mg/L	0.030	0.072	---	---	---
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	---	---	---
<b>EK055A-NH4: Ammonium as N by FIA</b>								
Ammonium as N	----	0.01	mg/L	0.12	0.02	---	---	---
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	---	---	---
<b>EK058G: Nitrate as N by Discrete Analyser</b>								



## Analytical Results

Sub-Matrix: **WATER**

				Client sample ID				
				P1	P2	---	---	---
				15-MAR-2011 11:50	15-MAR-2011 12:50	---	---	---
				Client sampling date / time		---	---	---
Compound	CAS Number	LOR	Unit	ES1105506-006	ES1105506-007	---	---	---
<b>EK058G: Nitrate as N by Discrete Analyser - Continued</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.03	3.36	---	---	---
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.03	3.36	---	---	---
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	1.8	---	---	---
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	<0.1	5.2	---	---	---
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.04	0.09	---	---	---
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	---	---	---
<b>EN055: Ionic Balance</b>								
^ Total Anions	----	0.01	meq/L	16.1	10.6	---	---	---
^ Total Cations	----	0.01	meq/L	17.6	11.0	---	---	---
^ Ionic Balance	----	0.01	%	4.51	1.86	---	---	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
C6 - C9 Fraction	----	20	µg/L	<20	<20	---	---	---
C10 - C14 Fraction	----	50	µg/L	<50	<50	---	---	---
C15 - C28 Fraction	----	100	µg/L	<100	<100	---	---	---
C29 - C36 Fraction	----	50	µg/L	<50	<50	---	---	---
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	---	---	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	130	129	---	---	---
Toluene-D8	2037-26-5	0.1	%	101	107	---	---	---
4-Bromofluorobenzene	460-00-4	0.1	%	99.0	103	---	---	---



### Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1108036</b>	Page	: 1 of 4
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Client Services
Address	: Unit 2, Lot 6 Industrial Close MUSWELLBROOK NSW, AUSTRALIA 2333	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 6542 2400	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 6543 4121	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 15-APR-2011
Sampler	: AW	Issue Date	: 27-APR-2011
Site	: ----		
Quote number	: SY/261/10	No. of samples received	: 1
		No. of samples analysed	: 1

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



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This document is issued in accordance with NATA accreditation requirements.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics
Wisam.Marassa	Metals Coordinator	Sydney Inorganics

**Environmental Division Sydney**  
Part of the **ALS Laboratory Group**

277-289 Woodpark Road Smithfield NSW Australia 2164  
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## General Comments

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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.

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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



## Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	MW 7				
			Client sampling date / time	13-APR-2011 15:00				
Compound	CAS Number	LOR	Unit	ES1108036-001				
<b>EA005: pH</b>								
pH Value		0.01	pH Unit	7.29				
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C		1	µS/cm	565				
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1				
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1				
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	181				
Total Alkalinity as CaCO3		1	mg/L	181				
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	32				
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	50				
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	41				
Magnesium	7439-95-4	1	mg/L	19				
Sodium	7440-23-5	1	mg/L	48				
Potassium	7440-09-7	1	mg/L	<1				
<b>EG020T: Total Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.001				
Beryllium	7440-41-7	0.001	mg/L	<0.001				
Barium	7440-39-3	0.001	mg/L	0.013				
Cadmium	7440-43-9	0.0001	mg/L	0.0001				
Chromium	7440-47-3	0.001	mg/L	<0.001				
Cobalt	7440-48-4	0.001	mg/L	<0.001				
Copper	7440-50-8	0.001	mg/L	<0.001				
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N		0.01	mg/L	<0.01				
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	1.08				
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N		0.01	mg/L	1.08				
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N		0.1	mg/L	0.6				
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N		0.1	mg/L	1.7				
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								



**Analytical Results**

Sub-Matrix: **WATER**

			Client sample ID	MW 7				
			Client sampling date / time	13-APR-2011 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1108036-001	----	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser - Continued</b>								
Total Phosphorus as P	----	0.01	mg/L	0.10	----	----	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.05	----	----	----	----
<b>EN055: Ionic Balance</b>								
^ Total Anions	----	0.01	meq/L	5.69	----	----	----	----
^ Total Cations	----	0.01	meq/L	5.71	----	----	----	----
^ Ionic Balance	----	0.01	%	0.19	----	----	----	----

**Appendix 6 – Surface Water Monitoring Data.**



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1104647</b>	Page	: 1 of 5
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Charlie Pierce
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney.enviro.services@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK SURFACE-WATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 1662	Date Samples Received	: 04-MAR-2011
C-O-C number	: ----	Issue Date	: 11-MAR-2011
Sampler	: BP	No. of samples received	: 14
Site	: ----	No. of samples analysed	: 14
Quote number	: SY/261/10		

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



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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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics

**Environmental Division Sydney**  
Part of the **ALS Laboratory Group**

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB2	SB6	SB9	SB10	VWD1
				Client sampling date / time	03-MAR-2011 13:10	03-MAR-2011 12:40	03-MAR-2011 12:10	03-MAR-2011 11:50	03-MAR-2011 13:20
Compound	CAS Number	LOR	Unit		ES1104647-001	ES1104647-002	ES1104647-003	ES1104647-004	ES1104647-005
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		8.06	7.76	8.00	7.99	8.43
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		388	434	149	176	808
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L		37	20	30	153	19
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		<0.01	0.24	0.01	<0.01	0.02
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		0.02	9.94	<0.01	0.17	0.81
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		0.02	10.2	0.02	0.17	0.84
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.1	3.1	<0.1	<0.1	<0.1
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		0.1	13.3	<0.1	0.2	0.8
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		<0.01	0.05	<0.01	0.07	<0.01
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		<0.01	<0.01	<0.01	0.05	<0.01
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L		<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				VWD2	BGD	QCU	QCD	WCU
				03-MAR-2011 12:30	03-MAR-2011 10:50	03-MAR-2011 11:10	03-MAR-2011 11:30	03-MAR-2011 10:20
				Client sampling date / time				
Compound	CAS Number	LOR	Unit	ES1104647-006	ES1104647-007	ES1104647-008	ES1104647-009	ES1104647-010
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	8.81	8.35	7.33	7.75	7.62
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	659	408	493	729	1170
<b>EA025: Suspended Solids</b>								
^ Suspended Solids (SS)	----	5	mg/L	51	173	6	17	----
Suspended Solids (SS)	----	5	mg/L	----	----	----	----	15
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	0.02	<0.01	<0.01	<0.01	0.03
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.07	0.54	0.12	3.38
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.04	0.07	0.54	0.12	3.41
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	1.6	<0.1	0.1	0.4
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	<0.1	1.7	0.5	0.2	3.8
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	<0.01	0.55	0.09	0.22	0.07
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	0.29	0.08	0.08	0.03
<b>EP020: Oil and Grease (O&amp;G)</b>								
Oil & Grease	----	5	mg/L	<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	WCD	200MLD	SD4	SD5	----
				Client sampling date / time	03-MAR-2011 10:00	03-MAR-2011 12:50	03-MAR-2011 13:40	03-MAR-2011 14:00	----
Compound	CAS Number	LOR	Unit		ES1104647-011	ES1104647-012	ES1104647-013	ES1104647-014	----
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		8.23	8.31	8.33	9.55	----
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		1050	830	220	250	----
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L		20	11	15	36	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		<0.01	0.02	<0.01	0.01	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		0.05	0.92	0.03	<0.01	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		0.05	0.94	0.03	0.02	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.1	0.4	0.6	1.0	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		0.2	1.3	0.6	1.0	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		0.23	0.09	0.78	0.24	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		0.14	<0.01	0.76	0.20	----
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L		<5	<5	<5	<5	----

## **Appendix 7 – Surface Water Discharge Monitoring Data**



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1104822</b>	Page	: 1 of 3
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Charlie Pierce
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney.enviro.services@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUND WATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 08-MAR-2011
Sampler	: AW	Issue Date	: 11-MAR-2011
Site	: ----		
Quote number	: SY/261/10	No. of samples received	: 4
		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
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**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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

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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



## Analytical Results

Sub-Matrix: WATER

		Client sample ID		SB2	SB9	QCU	QCD	----
		Client sampling date / time		07-MAR-2011 09:30	07-MAR-2011 09:00	07-MAR-2011 09:45	07-MAR-2011 10:00	----
Compound	CAS Number	LOR	Unit	ES1104822-001	ES1104822-002	ES1104822-003	ES1104822-004	----
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.95	7.81	7.04	7.77	----
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	333	148	414	686	----
<b>EA025: Suspended Solids</b>								
^ Suspended Solids (SS)	----	5	mg/L	18	15	6	17	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.03	0.57	0.12	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.03	0.57	0.12	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	1.4	0.4	0.2	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	0.3	1.4	1.0	0.3	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	<0.01	0.14	0.15	0.20	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.05	0.08	----
<b>EP020: Oil and Grease (O&amp;G)</b>								
Oil & Grease	----	5	mg/L	<5	<5	<5	<5	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1107777</b>	Page	: 1 of 3
Client	: ACIRL PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Client Services
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK DISCHARGE SAMPLES	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 13-APR-2011
Sampler	: BP	Issue Date	: 15-APR-2011
Site	: ----		
Quote number	: SY/261/10	No. of samples received	: 4
		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.

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Sarah Millington	Senior Inorganic Chemist	Sydney Inorganics

**Environmental Division Sydney**  
Part of the **ALS Laboratory Group**

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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



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	QCU	QCD	SB2	SB9	----
				Client sampling date / time	12-APR-2011 10:00	12-APR-2011 10:15	12-APR-2011 07:00	12-APR-2011 09:30	----
Compound	CAS Number	LOR	Unit	ES1107777-001	ES1107777-002	ES1107777-003	ES1107777-004	ES1107777-004	----
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit	7.37	7.93	7.90	8.13	8.13	----
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm	509	839	444	528	528	----
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L	31	8	34	20	20	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.03	0.12	0.12	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L	0.45	0.10	0.05	5.87	5.87	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L	0.8	0.5	0.8	9.0	9.0	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	0.10	0.20	0.08	0.04	0.04	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L	0.05	0.07	0.04	0.02	0.02	----
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L	<5	<5	<5	<5	<5	----

# ***Werris Creek Coal Mine Community Consultative Committee***

## **Twentieth Meeting of the Committee**

### **Whitehaven Coal Training Room, Werris Creek Coal Mine**

**10.00am Thursday 1<sup>st</sup> September 2011**

## **MINUTES**

### **1. Record of Attendance:**

Present: Jill Coleman (Community Representative - Chair); Noel Taylor (Community Representative); Lindsay Bridge (Community Representative); Des George (Werris Creek Coal - WCC); Robert George (Production Superintendent - WCC); Andrew Wright (Environmental Officer WCC and Minute Taker); Arief Martono (Orica); Murali Nagarajan (Orica); Anthony Green (Orica) and John Constable (Orica).

Apologies: Col Stewart (Liverpool Plains Shire Council); Ron Van Katwyk (Liverpool Plains Shire Council); Mick Post (Project Manager WCC).

In the absence of an appointed independent Chairperson, the Community Representatives nominated Jill Coleman as the Chairperson for today's meeting.

*Moved: Noel Taylor Seconded: Lindsay Bridge. Motion carried.*

### **2. New Matters for Discussion under General Business**

Representatives from WCC's contract blasting company, Orica have attended the meeting to discuss blasting practices and outcomes of investigations into the increase in the number of blasting complaints received during May to July 2011.

### **3. Matters Arising**

#### **a) Actions from Previous Meeting**

None.

#### **b) Other Matters Arising**

None.

### **4. Minutes of Previous Meeting**

Minutes of the previous meeting 26<sup>th</sup> May 2011 were accepted as true and accurate representation of business conducted on that day.

*Moved: Jill Coleman Seconded: Noel Taylor. Motion carried.*

### **5. Declaration of Pecuniary or other interests**

None declared.

## 6. Environmental Monitoring Report May, June and July 2011

**Weather Station** – A change in the information presented with actual meteorological data included. Jill Coleman asked how to interpret the wind rose diagrams, with May and June months dominated by south easterly winds and July predominately north westerly winds. The three month period was quite dry with just over 80mm of rainfall. The average lapse rate was positive indicating that temperature inversions were common over May, June and July.

**Dust** – The daily and monthly PM10 dust results for May and July were within compliance. However June PM10 dust results averaged above  $30\mu\text{g}/\text{m}^3$  at “Tonsley Park”, “Cintra” and “Railway View” with a number of days exceeding the PM10 24 hour limit of  $50\mu\text{g}/\text{m}^3$ . WCC own “Cintra” and “Railway View” properties and have commenced negotiations with the owners of “Tonsley Park” due to the potential for mining impacts. All dust deposition gauge results were below the monthly amenity criteria of  $3.6\text{g}/\text{m}^2/\text{month}$ . Two dust complaints were made during the period, one on behalf of residents of the subdivision north of Quirindi regarding a perceived increase in dust overtime and the other complaint by a passing motorist regarding dust from mining operations on 20<sup>th</sup> May. No dust monitoring is undertaken from the Quirindi Subdivision given that it is 8km from WCC, however dust monitoring results from adjacent properties to the mine do not demonstrate an increase in dust overtime. An inspection at the time of the complaint did not identify the source of dust but confirmed that drills were using water sprays and water carts were active onsite.

**Noise** – There were no noise exceedances during May, June and July however a number of elevated results due to noise enhancing temperature inversions were identified by attended monitoring at “Glenara”, “Almawillee”, “Greenslopes”, “Tonsley Park” and “Kyooma”. In total there were eight noise complaints for the period. Seven complaints were regarding dozer operations at the Train Load Out area from the one resident in Werris Creek. Additional noise monitoring to date have confirmed under even temperature inversion conditions that noise levels are within compliance limits. The other noise complaint was from a Quipolly resident regarding operational noise during a strong temperature inversion.

**Blasting** – There were 21 blasts during the period. “Greenslopes” is averaging 6.7% of blasts (since April 2011) over 115dB(L) and is currently exceeding the 5% limit due to the two blasts in June. The blasts on the 3<sup>rd</sup> June 2011 and 16<sup>th</sup> June 2011 both recorded elevated overpressure levels above 115dB(L) at Greenslopes and Cintra but less than 115dB(L) at Werris Creek. No blast exceeded the maximum blast overpressure limit of 120dB(L) during the period. These two blasts generated 30 of the 35 blasting complaints during the period. Orica representatives discussed the investigation into both blasts which found that the wet weather during May had contaminated the stemming material as well as that not enough stemming material was used in the weathered rock, resulting in “rifling” causing the high overpressure readings. WCC and the blasting contractor have implemented corrective actions to improve practices to minimise future elevated overpressure results from “rifling” events.

**Groundwater** – All groundwater levels decreased and both the pH and electrical conductivity increased during the period due to the drier prevailing conditions (less rainfall recharge of aquifers) since the start of the year when water tables were at the highest recorded levels.

**Surface Water** – No surface water monitoring results exceeded the trigger levels of the Site Water Management Plan response plan. There were no wet weather discharge events and four controlled discharge events during the period. All discharge events were within compliance.

**Complaints** – There were 46 complaints received during the period. There were 35 complaints related to blasting; 8 complaints related to noise, two complaints related to dust and one complaint related to lighting. There were 26 different complainants during the period with 12 individual complaints originating from one complainant in Werris Creek.

Motion moved to accept the Environmental Monitoring Report May, June and July 2011.

*Moved: Jill Coleman. Seconded: Noel Taylor. Motion Carried.*

## **7. General Business**

### **a. Community Consultative Committee Status**

Andrew Wright raised that WCC had been in discussions with Department of Planning and Infrastructure over replacing both the independent Chairperson and Community Representatives vacancies. Department of Planning and Infrastructure had canvassed a potential independent Chairperson and WCC were organizing a meeting to determine their availability. To date the Department of Planning and Infrastructure have not advertised for Community Representative nominations.

### **b. WCC Life of Mine Project Environmental Assessment Update**

Department of Planning and Infrastructure have provided WCC with an opportunity to comment on the draft Project Approval for the Life of Mine Project. When the Project Approval is approved, WCC will also need to apply for a new Mining Lease, Mining Operations Plan and Environmental Protection License variation. The next advancement of mining is estimated to be in two to three months time.

### **c. "History of Coal Mining at Werris Creek" Booklet**

Andrew Wright said that all comments on the draft booklet were back with the publisher/printer and hopes by the next meeting that the final published copy will be sent to all CCC members.

### **d. Orica Review of Blasting Practices at WCC**

Orica representatives helped explain the general process of blasting at WCC with on average 300 holes with between 50 and 100 tonnes of explosives per blast and that 11,000 tonnes of explosives used per year onsite. Orica representatives outlined the two main measures implemented to minimise overpressure levels by increasing the height of stemming in weathered overburden to 4m and a change in stemming supplier. Orica representatives explained that while all blasts had been within compliance limits, blast effects were being experienced by people within Werris Creek. Another investigation by Orica into minimizing vibration impacts looked into extending the duration of the blast to 3.5 seconds but reducing the peak vibration levels experienced by people. When the final investigation reports are available, WCC will make them publically available and place a note in the "Werris Creek Flyer". WCC may look other consultation methods to help allay any community fears into blasting impacts.

Jill Coleman asked if blasting was going to get worse for Werris Creek residents as the mine moves closer to the town. Andrew Wright said that the risk of complaints from Werris Creek residents will increase for the Life of Mine Project, however WCC was confident that improvements in blasting practices and design can be made to minimise any nuisance from blasts. Noel Taylor asked about gases that can be produced by blasting and whether they can be hazardous to your health. The Orica representatives said that nitrous oxide can be produced by the incomplete combustion of explosives during blasting, commonly called fume. All blasts aim to avoid fume generation, however if certain types of explosives mix with water during rain events, they can deteriorate and this is when fume occurs. The deterioration of explosives is similar to fertilizer when it becomes wet and dissolves because they are both ammonium nitrate products. The fume can only be hazardous at high concentrations right next to the blast, however within a couple of 100m any fume readily dilutes in the atmosphere and becomes harmless. The community representatives were happy with the information that Orica had provided them and that they felt they could better explain to the broader community that blasting practices were improving.

**Meeting Closed 11:00am.**

**Next Meeting was scheduled for 24<sup>th</sup> November 2011.**

**Copy to:**

Jill Coleman  
Noel Taylor  
Lindsay Bridge

Community Representative  
Community Representative  
Community Representative

Colin Phillips  
Michael Lloyd  
Ron Van Katwyk  
Cr Col Stewart

DoP  
I&I NSW  
LPSC  
LPSC

Casper Dieben  
Brian Cullen  
Danny Young  
Mick Post  
Des George  
Andrew Wright

Werris Creek Coal  
Werris Creek Coal



**WERRIS CREEK COAL PTY LTD**

**QUARTERLY ENVIRONMENTAL MONITORING  
REPORT**

**May, June & July 2011**

This Environmental Monitoring Report covers the period 1<sup>st</sup> May 2011 to 31<sup>st</sup> July 2011 for the Werris Creek No.2 Coal Mine Community Consultative Committee.

The report includes environmental monitoring results from the on-site Weather Station, Air Quality, Noise, Blasting, Surface Water, Groundwater and Discharge Water Quality together with any community complaints received and general details on site environmental matters.

**Note:** Monitoring results with any non compliance of monitoring criteria are highlighted in **yellow**.

**CONTENTS**

**1.0 METEOROLOGY..... 3**

    1.1 WEATHER STATION AVAILABILITY ..... 3

**2.0 AIR QUALITY ..... 3**

    2.1 HVAS (PM10) ..... 3

        2.1.1 Monitoring Data Results ..... 3

        2.1.2 Discussion - Compliance / Non Compliance ..... 4

    2.2 DEPOSITED DUST ..... 4

        2.2.1 Monitoring Data Results ..... 4

        2.2.2 Discussion - Compliance / Non Compliance ..... 4

    2.3 AIR QUALITY COMPLAINTS ..... 5

**3.0 NOISE..... 5**

    3.1 OPERATIONAL NOISE..... 5

        3.1.1 Monitoring Data Results ..... 5

        3.1.2 Discussion - Compliance / Non Compliance ..... 6

    3.2 NOISE COMPLAINTS ..... 6

**4.0 BLAST ..... 7**

    4.1 BLAST MONITORING ..... 7

        4.1.1 Monitoring Data Results ..... 7

        4.1.2 Discussion - Compliance / Non Compliance ..... 7

    4.2 BLAST COMPLAINTS ..... 8

**5.0 WATER..... 8**

    5.1 GROUND WATER..... 8

        5.1.1 Monitoring Data Results ..... 8

        5.1.2 Discussion - Compliance / Non Compliance ..... 8

    5.2 SURFACE WATER ..... 8

        5.2.1 Monitoring Data Results ..... 8

        5.2.2 Discussion - Compliance / Non Compliance ..... 9

    5.3 SURFACE WATER DISCHARGES ..... 9

        5.3.1 Monitoring Data Results ..... 9

        5.3.2 Discussion - Compliance / Non Compliance ..... 9

    5.3 WATER COMPLAINTS..... 9

**6.0 COMPLAINTS SUMMARY..... 9**

**7.0 GENERAL ..... 11**

**APPENDICES**

Appendix 1.....Dust Monitoring Results – PM10

Appendix 2.....Dust Monitoring Results – Deposited Dust

Appendix 3..... Noise Monitoring Results

Appendix 4..... Blasting Monitoring Results

Appendix 5..... Groundwater Monitoring Results

Appendix 6..... Surface Water Monitoring Results

Appendix 7..... Discharge Monitoring Results

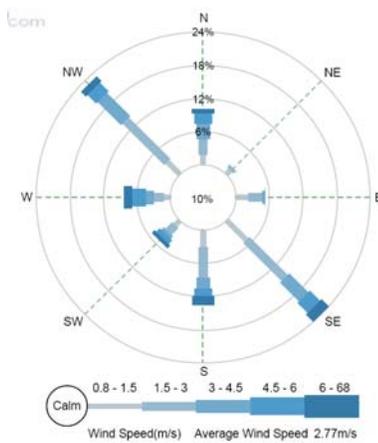
## 1.0 METEOROLOGY

### 1.1 WEATHER STATION

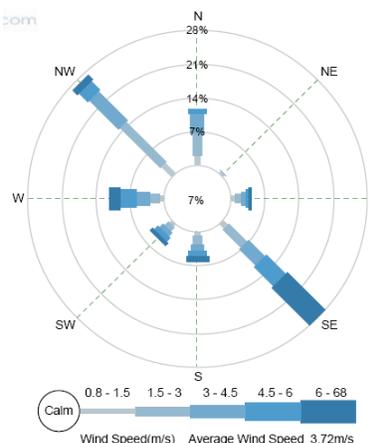
WCC collects meteorological data from the onsite weather station located on top level of the overburden emplacement and from the continuous noise monitoring trailer located in the Quipolly Valley during the period. The following table summarises temperature, inversion and rainfall data for May, June and July and wind data is presented below in windroses.

Month	Temp (°C) Trailer			Temp (°C) 10m Onsite			Lapse Rate (°C/100m)		Rainfall (mm)		
	Min	Avg	Max	Min	Avg	Max	Avg	90%	Onsite	Trailer	Annual*
May	-1.4	11.5	23.1	2.4	12.6	22.0	+1.3	+5.7	68.6	57.2	108.0
June	-4.9	8.5	18.8	0	10.6	17.9	+2.1	+7.5	10.6	10.0	118.6
July	-6.1	7.5	18.2	-0.1	9.8	17.9	+2.4	+8.6	4.8	5.6	123.4

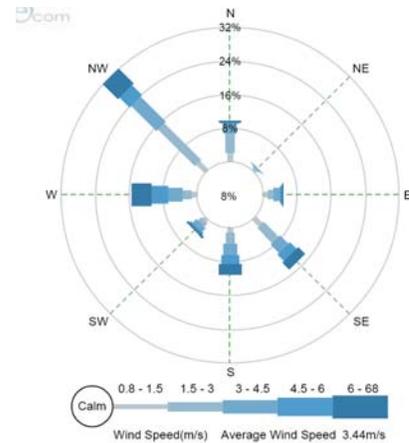
\* Annual cumulative total since April 2011 for onsite Weather Station



May 2011



June 2011



July 2011

The onsite weather station was fully available during the period.

## 2.0 AIR QUALITY

### 2.1 HVAS (PM10)

High Volume Air Sample (HVAS) monitoring for particulate matter less than 10 micron in size (PM10) and total suspended particulate (TSP) matter is conducted at five sites listed below.

- WCHV1 – “Cintra” PM10
- WCHV2 – “Tonsley Park” PM10
- WCHV3 – “Railway View” PM10
- WCHV4 – “Eurunderee” PM10
- WCHV5 – “Railway View” TSP

Sampling is scheduled for 24 hours every 6 days in accordance with Department of Environment, Climate Change and Water (DECCW) guidelines and results are reported as micro grams per cubic metre ( $\mu\text{g}/\text{m}^3$ ) of air sampled.

#### 2.1.1 Monitoring Data Results

The monthly average results for the last three months are provided in the table below; however see HVAS monitoring data under **Appendix 1** for individual results.

Monitor Location	May ( $\mu\text{g}/\text{m}^3$ )	June ( $\mu\text{g}/\text{m}^3$ )	July ( $\mu\text{g}/\text{m}^3$ )	Annual ( $\mu\text{g}/\text{m}^3$ )	Criteria ( $\mu\text{g}/\text{m}^3$ )
WCHV1	23.1	38.7	10.3	24.3	30
WCHV2	20.3	35.2	7.8	19.3	30
WCHV3	27.7	39.5	16.3	27.0	30
WCHV4	27.6	8.1	11.5	11.9	30
WCHV5	63.7	132.5	44.8	71.8	90

### 2.1.2 Discussion - Compliance / Non Compliance

While the monthly averages for May and July were below the compliance limit, there were a couple of elevated results for the 20<sup>th</sup> May at Cintra PM10  $34 \mu\text{g}/\text{m}^3$ , Tonsley Park PM10  $34 \mu\text{g}/\text{m}^3$ , Railway View PM10  $50 \mu\text{g}/\text{m}^3$ , Railway View TSP  $100 \mu\text{g}/\text{m}^3$  and for the 7<sup>th</sup> July at Railway View PM10  $35 \mu\text{g}/\text{m}^3$  and Railway View TSP on  $105 \mu\text{g}/\text{m}^3$  but all results were below the PM10 24 hour limit ( $50 \mu\text{g}/\text{m}^3$ ).

Twice during June, on 1<sup>st</sup> and 7<sup>th</sup> the PM10 24 hour limit ( $50 \mu\text{g}/\text{m}^3$ ) was exceeded at Tonsley Park potentially due to WCC dust emissions, while on the 13<sup>th</sup> was marginally below the  $50 \mu\text{g}/\text{m}^3$  limit. Both Cintra and Railway View on the 1<sup>st</sup> and 7<sup>th</sup> recorded elevated 24 hour results however both locations are mine owned. The PM10 and TSP results at Railway View recorded high levels on 1<sup>st</sup> and 13<sup>th</sup> when the winds were blowing away from the mine, indicating that the levels were from another source of dust (horses in same paddock).

The annual PM10 sites averages are below the long term impact annual criteria of  $30 \mu\text{g}/\text{m}^3$ .

The TSP site is below the long term impact annual criteria of  $90 \mu\text{g}/\text{m}^3$ .

The Railway View TSP did not run on 13<sup>th</sup> and run short on 1<sup>st</sup>, 7<sup>th</sup> and 19<sup>th</sup> recording excessive levels that maybe due to a technical fault with the unit. ACIRL have been asked to investigate hire options so the unit can be fixed.

## 2.2 DEPOSITED DUST

Deposited dust monitoring is for particulate matter generally greater than 30 micron in size which readily settles out of the air and is monitored at seven locations.

- WC2 – “Cintra”
- WC5 – “Railway View”
- WC7 – “Tonsley Park”
- WC8 – “Plain View”
- WC9 – “Marengo”
- WC10 – “Mountain View”
- WC11 – “Glenara”

Sampling is scheduled monthly in accordance with DECCW guidelines and results are reported as grams per metre squared per month ( $\text{g}/\text{m}^2/\text{month}$ ).

### 2.2.1 Monitoring Data Results

The results for the last three months are provided in the table below; however **Appendix 2** has more information on Deposited Dust Monitoring Results.

Monitor Location	May ( $\text{g}/\text{m}^2/\text{month}$ )	June ( $\text{g}/\text{m}^2/\text{month}$ )	July ( $\text{g}/\text{m}^2/\text{month}$ )	Annual ( $\text{g}/\text{m}^2/\text{month}$ )	Criteria ( $\text{g}/\text{m}^2/\text{month}$ )
WC2	0.6*	3.0	0.5	1.7	3.6
WC5	0.6	2.4	0.5	1.2	3.6
WC7	0.1	0.9	0.3	0.5	3.6
WC8	0.2	1.3	0.8	0.9	3.6
WC9	0.1	0.8	0.2	0.4	3.6
WC10	5.9*	0.8	0.9	0.9	3.6
WC11	0.2	1.4	0.6	0.7	3.6

\* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e bird droppings and insects) and is excluded from the average

## 2.2.2 Discussion - Compliance / Non Compliance

All dust deposition gauge results were below the monthly amenity criteria of 3.6g/m<sup>2</sup>/month. There was one sample each for “Cintra” (WC2) and “Mountain View” (WC9) that has been excluded due to excessive organic matter contamination.

## 2.3 AIR QUALITY COMPLAINTS

There were two dust related complaints for the period. The first complaint was a general complaint regarding the increase in dust from the mine over time viewed by the residents from the Barnes Subdivision south of Quipolly. From the investigation, it was decided that the perceived increase in dust could be due to the time of year resulting in more frequent temperature inversions in the mornings that concentrate dust so that it becomes visible but the overall daily dust emissions are at the same level and monitoring results confirm levels are still in compliance. However a review of water cart dust suppression usage (litres per cubic meter of material moved) had fallen compared to previous year even though the number and size of water carts had increased but WCC will keep a focus on this. The second dust complaint was for the 20<sup>th</sup> May when a motorist on Werris Creek Road alleged to have seen dust going across the road. An inspection did not identify significant dust however a drill and scrappers operating close to road. All drills operators confirmed that sprays were being utilised and a water cart was in use on the scrappers circuit. Specific actions taken in relation to these complaints are outlined in **Section 6**.

## 3.0 NOISE

### 3.1 OPERATIONAL NOISE

Monthly attended noise monitoring undertaken at the following locations:

- “Almawillee” (private agreement);
- “Glenara” (private agreement);
- “Tonsley Park” (private agreement);
- “Railway Cottage”;
- “Greenslopes”;
- “Kyooma” (private agreement);
- Punyarra St, Werris Creek; and
- Kurrara St, Werris Creek.

Three sets of measurements are made at each location; one during the day time period (before 6pm); one during the evening period (from 6pm – 10pm) and one at night (after 10pm).

The noise emission criterion for WCC is 35dB(A) unless otherwise subject to a current, legally binding agreement between WCC and the occupant of the affected residential property.

WCC environmental protection licence (EPL) conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where wind speeds are greater than 3m/s and/or there is a temperature inversion greater than +3°C/100m.

#### 3.1.1 Monitoring Data Results

The results for the last three months attended noise monitoring are outlined below for noise levels from Werris Creek Coal operations only (not ambient noise); however see Monthly Noise Monitoring Reports under **Appendix 3** for more detail.

Friday 20<sup>th</sup> & Saturday 21<sup>st</sup> May 2011

Location	Day	Evening	Night	Criteria
“Almawillee”*	Inaudible*#	35*#	32*#	35 dB(A) L <sub>eq</sub> 15min
“Glenara”*	Inaudible*#	38*#	32*#	35 dB(A) L <sub>eq</sub> 15min
“Railway Cottage”	Inaudible#	Inaudible#	25#	35 dB(A) L <sub>eq</sub> 15min
“Tonsley Park”*	28*	Inaudible*#	Inaudible*#	35 dB(A) L <sub>eq</sub> 15min
“Greenslopes”	<25	28#	Inaudible#	35 dB(A) L <sub>eq</sub> 15min
“Kyooma”*	31*	Inaudible*#	Inaudible*#	35 dB(A) L <sub>eq</sub> 15min
Kurrara St	Inaudible	Inaudible#	Inaudible#	35 dB(A) L <sub>eq</sub> 15min
Punyarra St	Inaudible	Inaudible#	Inaudible#	35 dB(A) L <sub>eq</sub> 15min

Rail Spur	26	55 dB(A) $L_{eq}$ 24hr
	65	80 dB(A) $L_{MAX}$

\* - Project Related Property or Private Agreement; Yellow Bold – Elevated noise above criteria; # - Temperature Inversion >3°C/100m or Wind Speed >3m/s

### Friday 24<sup>th</sup> & Saturday 25<sup>th</sup> June 2011

Location	Day	Evening	Night	Criteria
“Almawillee”*	<20*	<b>37</b> *#	<b>38</b> *#	35 dB(A) $L_{eq}$ 15min
“Glenara”*	<b>37</b> *#	33*#	<b>38</b> *#	35 dB(A) $L_{eq}$ 15min
“Railway Cottage”	Barely audible	<30#	32#	35 dB(A) $L_{eq}$ 15min
“Tonsley Park”*	Inaudible*	35*#	<b>38</b> *#	35 dB(A) $L_{eq}$ 15min
“Greenslopes”	Inaudible	<b>40</b> #	<b>45</b> #	35 dB(A) $L_{eq}$ 15min
“Kyooma”*	27*	<b>36</b> *#	35*#	35 dB(A) $L_{eq}$ 15min
Kurrara St	Inaudible	<30#	35#	35 dB(A) $L_{eq}$ 15min
Punyarra St	Inaudible	33#	34#	35 dB(A) $L_{eq}$ 15min
Rail Spur	Not Monitored			55 dB(A) $L_{eq}$ 24hr
	Not Monitored			80 dB(A) $L_{MAX}$

\* - Project Related Property or Private Agreement; Yellow Bold – Elevated noise above criteria; # - Temperature Inversion >3°C/100m or Wind Speed >3m/s

### Monday 25<sup>th</sup> & Tuesday 26<sup>th</sup> July 2011

Location	Day	Evening	Night	Criteria
“Almawillee”*	<20*#	32*#	33*#	35 dB(A) $L_{eq}$ 15min
“Glenara”*	34*#	30*#	34*#	35 dB(A) $L_{eq}$ 15min
“Railway Cottage”	32#	34#	34#	35 dB(A) $L_{eq}$ 15min
“Tonsley Park”*	Inaudible*#	Inaudible*#	Inaudible*#	35 dB(A) $L_{eq}$ 15min
“Greenslopes”	Inaudible#	31#	<b>36</b> #	35 dB(A) $L_{eq}$ 15min
“Kyooma”*	Inaudible*#	<b>37</b> *#	35*#	35 dB(A) $L_{eq}$ 15min
Kurrara St	Inaudible#	Inaudible#	Inaudible#	35 dB(A) $L_{eq}$ 15min
Punyarra St	Inaudible#	Inaudible#	Inaudible#	35 dB(A) $L_{eq}$ 15min
Rail Spur	NM			
	NM			

\* - Project Related Property or Private Agreement; Yellow Bold – Elevated noise above criteria; # - Temperature Inversion >3°C/100m or Wind Speed >3m/s

### 3.1.2 Discussion - Compliance / Non Compliance

There were no noise exceedances during May, June and July.

Elevated noise levels were recorded at “Glenara” for the May evening monitoring period. The elevated noise levels did not result in an exceedance because of the adverse (noise enhancing) weather conditions at the time of monitoring. WCC has a private agreement in place with “Glenara” for noise impacts.

Elevated noise levels were recorded at “Glenara” for day time period; “Almawillee”, “Greenslopes” and “Kyooma” for the evening period; and “Almawillee”, “Glenara”, “Tonsley Park” and “Greenslopes” for the night time period. The elevated noise levels did not result in an exceedance because of the adverse (noise enhancing) weather conditions at the time of monitoring. WCC has a private agreement in place with “Almawillee”, “Glenara”, “Tonsley Park” and “Kyooma” for noise impacts.

Elevated noise levels were recorded at “Kyooma” for the evening period; and “Greenslopes” for the night time period. The elevated noise levels did not result in an exceedance because of the adverse (noise enhancing) weather conditions at the time of monitoring. WCC has a private agreement in place with “Kyooma” for noise impacts.

WCC has a private agreement in place with “Almawillee”, “Glenara”, “Tonsley Park” and “Kyooma” for mining noise related impacts at those properties and the noise criteria does not apply.

### 3.2 NOISE COMPLAINTS

There were 8 complaints for noise impacts from Werris Creek Coal operations, with 7 complaints from the one Werris Creek resident and one complaint from a Quipolly resident. The majority of the complaints occurred during adverse weather conditions (temperature inversions or high wind speeds) that could potentially enhancing noise levels experience by the complainant. No exceedance of noise criteria was identified because noise levels measured under “enhancing” adverse weather conditions cannot be compared against the noise criteria. Each complaint was thoroughly investigated with meteorological conditions analysed, continuous noise monitoring data and audio reviewed and any mining (and other activities) documented. In addition, WCC

has been undertaking specific attended monitoring from Kurrara St, Werris Creek to determine noise levels from operations at the Rail Load-out Facility that have been the source of a number of noise complaints. To date, monitoring has found noise levels to be in compliance below 35dB(A). Specific actions taken in relation to these complaints are outlined in **Section 6**.

## 4.0 BLAST

Blast monitoring is undertaken at “Glenala”, “Talavera”, “Werris Creek”, “Tonsley Park”, “Greenslopes” and “Cintra”. Compliance limits for blasting overpressure is 115dB(L) (and up to 120dB(L) for only 5% of blasts) and vibration is 5mm/s (and up to 10mm/s for only 5% of blasts). During the period a total of 21 blasts were fired by the blasting contractor, Orica Mining Services.

### 4.1 BLAST MONITORING

#### 4.1.1 Monitoring Data Results

The summary tables of blasting results from May, June and July are provided below; however see blasting results database under **Appendix 4** for more detail.

May	Glenala		Greenslopes		Tonsley Park		Cintra*		Werris Creek		Talavera	
	mm/s	dB(L)	mm/s	dB(L)	mm/s	mm/s	dB(L)	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average	NM	NM	0.42	108.2	0.67	99.0	0.67	107.3	<0.20	<109.9	NM	NM
Monthly Maximum	NM	NM	0.42	108.2	0.95	102.5	0.97	110.1	<0.20	<109.9	NM	NM
Annual Average	<0.37	<109.9	0.36	109.5	0.58	103.6	0.63	108.5	<0.20	<109.9	<0.37	<109.9
Criteria	5	115	5	115	5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
# Triggered this Month	0/0		2/6		4/6		6/6		0/6		0/0	

June	Glenala		Greenslopes		Tonsley Park		Cintra*		Werris Creek		Werris Creek	
	mm/s	dB(L)	mm/s	dB(L)	mm/s	mm/s	dB(L)	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average	NM	NM	0.66	109.2	0.79	104.1	0.90	110.9	0.31	105.1	NM	NM
Monthly Maximum	NM	NM	1.05	115.8	1.12	113.1	1.92	117.4	0.42	111.7	NM	NM
Annual Average	<0.37	<109.9	0.54	108.7	0.73	101.5	0.78	109.1	0.31	105.1	<0.37	<109.9
Criteria	5	115	5	115	5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	0%	0%	0%	8.0%	0%	0%	0%	9.5%	0%	0%	0%	0%
# Triggered this Month	0/0		7/10		7/10		9/10		5/10		0/10	

July	Glenala		Greenslopes		Tonsley Park		Cintra*		Werris Creek		Werris Creek	
	mm/s	dB(L)	mm/s	dB(L)	mm/s	mm/s	dB(L)	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average	NM	NM	0.53	99.6	0.58	97.0	1.10	105.5	<0.20	<109.9	<0.37	<109.9
Monthly Maximum	NM	NM	0.65	110.6	0.72	106.9	1.25	114.0	<0.20	<109.9	<0.37	<109.9
Annual Average	<0.37	<109.9	0.48	106.9	0.63	102.1	0.82	108.3	0.31	105.1	<0.37	<109.9
Criteria	5	115	5	115	5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	0%	0%	0%	6.7%	0%	0%	0%	7.1%	0%	0%	0%	0%
# Triggered this Month	0/0		5/5		6/7		6/7		0/7		0/2	

\* Indicates project related properties not subject to blasting criteria

#### 4.1.2 Discussion - Compliance / Non Compliance

“Greenslopes” is averaging 6.7% of blasts (since April 2011) over 115dB(L) and is currently exceeding the 5% limit due to two blasts in June. The blasts on the 3<sup>rd</sup> June 2011 and 16<sup>th</sup> June 2011 both recorded elevated overpressure levels above 115dB(L) at Greenslopes and Cintra but less than the maximum blast overpressure limit of 120dB(L). Investigation into both blasts found that the wet weather during May had contaminated the stemming material resulting in “rifling” causing the high (loud) overpressure readings. WCC and the blasting contractor have implemented corrective actions to improve practices to minimise future elevated overpressure results due to contaminated stemming material. All blasts over the period complied with maximum license limits with no blasts overpressure level above 120dB(L) and no blast vibration levels greater than 10mm/s.

A number of blast monitors did not trigger during the period due to the overpressure and/or vibration levels from the blast being below the trigger level of the monitor. No blasts were missed.

## 4.2 BLAST COMPLAINTS

There were 35 complaints from six different blasts undertaken by Werris Creek Coal, with the blast on the 3<sup>rd</sup> June 2011 receiving 9 complaints and the blast on 16<sup>th</sup> June 2011 receiving 20 complaints. As described above, both these two blasts generated higher than normal overpressures levels however all results including the Werris Creek monitor were in compliance. Action taken for these two blasts to minimise recurrence of elevated overpressure were to change the stemming gravel supplier and improve management of stemming material during wet weather. Specific actions taken for all blasting complaints are outlined in **Section 6**.

## 5.0 WATER

The quarterly groundwater quality monitoring was undertaken on 17<sup>th</sup> and 18<sup>th</sup> May 2011. Surface Quarterly surface water monitoring was undertaken on 12<sup>th</sup> May 2011. There were four surface water discharge events during the period.

### 5.1 GROUND WATER

Groundwater monitoring is undertaken to monitor if there are any impacts on groundwater quality and levels as a result of the mining operations. Werris Creek Coal monitor 41 groundwater bores and piezometers in the vicinity of the mine, with the key aquifers being Quipolly Creek Alluvium (MW12 upstream and MW7 downstream) and Werrie Basalt (MW5 south and MW14 north).

#### 5.1.1 Monitoring Data Results

Brief summary of groundwater monitoring results is provided below with detailed monitoring data outlined in **Appendix 5**.

Site	pH	EC	Dip	Change from Previous Quarter
<b>Quipolly Creek Alluvium</b>				
MW7				Not sampled as no permission was given for access.
MW12	7.52	468	6.13	Groundwater level dropped 0.62m, pH rose 0.17 and EC rose 50.
<b>Werrie Basalt</b>				
MW5	7.11	2690	7.28	Groundwater level dropped 0.09m, pH rose 0.11 and EC rose 300.
MW14	7.21	1340	15.60	Groundwater level dropped 0.31m, pH rose 0.23 and EC rose 320.

#### 5.1.2 Discussion - Compliance / Non Compliance

All groundwater levels decreased and both the pH and electrical conductivity (EC) increased during the period due to the drier prevailing conditions since the start of the year. Groundwater levels at the start of the year were at record levels due to 2010 being a wet year. Mining continues not to impact on groundwater aquifers.

### 5.2 SURFACE WATER

Surface water monitoring is undertaken at key dirty and void water dams to monitor for potential contamination issues due to mining while the water is still onsite.

#### 5.2.1 Monitoring Data Results

Summary of surface water quality monitoring results is provided below with detailed monitoring data outlined in **Appendix 6**.

Site	pH	EC	TSS	O&G	Change
<b>ONSITE</b>					
SB2	8.12	545	36	<5	pH rose 0.06, EC rose 157, TSS & O&G negligible change.
SB9	7.95	634	28	<5	pH dropped 0.05, EC rose 485, TSS & O&G negligible change.
SB10	7.67	457	17	<5	pH dropped 0.32, EC rose 281, TSS dropped 146, O&G no change.
<b>OFFSITE</b>					
QCU	7.20	376	11	<5	pH dropped 0.13, EC dropped 117, TSS & O&G negligible change.
QCD	7.60	894	6	<5	pH rose 0.15, EC rose 165, TSS & O&G negligible change.
WCU	7.42	1500	6	<5	pH dropped 0.2, EC rose 330, TSS & O&G negligible change.
WCD	8.23	1400	24	<5	pH dropped 0.23, EC rose 350, TSS & O&G negligible change.

### 5.2.2 Discussion - Compliance / Non Compliance

Surface water monitoring results were within the trigger levels of the Site Water Management Plan response plan.

## 5.3 SURFACE WATER DISCHARGES

### 5.3.1 Monitoring Data Results

There were no wet weather discharge events and four controlled discharge events during the period. A summary of discharge monitoring results is provided below with detailed monitoring data outlined in **Appendix 7**.

Date	Site	pH	EC	TSS	O&G	Type	Compliance
1/6/2011	SB2	8.09	493	20	<5	Controlled	Compliant – water quality within limits
7/6/2011	SB9	7.72	666	8	<5	Controlled	Compliant – water quality within limits
16/6/2011	SB2	8.17	510	28	<5	Controlled	Compliant – water quality within limits
16/6/2011	SB9	8.05	712	<5	<5	Controlled	Compliant – water quality within limits
<b>Criteria</b>		<b>8.5</b>	<b>N/A</b>	<b>50</b>	<b>10</b>		

### 5.3.2 Discussion - Compliance / Non Compliance

All surface water discharge results were within WCC Environmental Protection Licence 12290 criteria and there were no impacts on water quality monitored in Quipolly and Werris Creeks' catchments as a result of the discharge events.

## 5.3 WATER COMPLAINTS

There were no water related complaints during the period.

## 6.0 COMPLAINTS SUMMARY

There were 46 complaints received during the period with the details summarized below. In total there were 35 complaints related to blasting; 8 complaints related to noise, two complaints related to dust and one complaint related to lighting. There were 26 different complainants during the period with 12 individual complaints originating from one complainant in Werris Creek.

#	Date	Location	Complaint	Investigation	Action Taken
111	10/5/11	Werris Creek (Complainant A)	Noise from loader, dozers and train shunting on 13 <sup>th</sup> , 14 <sup>th</sup> and 26 <sup>th</sup> April 2011 and 8 <sup>th</sup> May 2011.	13/4 & 14/4 & 8/5 Adverse met conditions could have enhanced RLO noise levels towards Werris Creek but not applicable against compliance criteria. 26/4 No activities onsite. Attended noise monitoring indicates levels within compliance.	Undertook attended noise monitoring in April 2011. Continuous noise monitor nearby at "Greenslopes". Written response to OEH and complainant provided.
112	11/5/11	"Hazeldene"	Terrible noise from mine on 10 <sup>th</sup> & 11 <sup>th</sup> May 2011.	Mining locations were elevated because no overburden inventory input. Adverse met conditions could have enhanced mining noise levels towards Werris Creek but not applicable against compliance criteria.	Continuous noise monitor to be relocated to "Hazeldene". Written response to complainant provided.
113	17/5/11	Barnes Subdivision South of Quirindi	Four individuals from the Barnes sub-division adjacent to golf course concerned at the amount of dust from mine in early mornings.	Temperature inversions in mornings concentrate dust so it is visible but overall daily dust emissions at same rate and monitoring result are still within compliance. Review of water cart dust suppression L/bcm fallen 17% compared to previous year even though water cart capacity (number and size) has increased over the past year.	Written response to complainant provided.
114	19/5/11	"Greenslopes"	Mine blast on 6 <sup>th</sup> May caused grayish dust cloud to blow over his property.	WCC did not blast on that date. Council quarry had been in use during that period.	Written response to complainant provided.
115	20/5/11	Anonymous	Werris Creek Road passerby had never seen dust so bad across the road coming from a drill.	Inspection by EO and Superintendent did not identify significant dust. Drill and scrappers located close to road. All drills were using dust sprays and wind was easterly blowing away from the road.	Written response to OEH provided.
116	19/5/11	Werris Creek	Complainant impacted by blast on 19 <sup>th</sup> May 2011 at 1:25pm.	Blast results were in compliance. Wind was a light SW towards Werris Creek.	Written response to OEH and complainant provided.

#	Date	Location	Complaint	Investigation	Action Taken
117 & 118	1/6/2011 5:36pm	Werris Creek (Complainant A)	Noise from rail load out on the evenings of Friday 27 <sup>th</sup> and Monday 30 <sup>th</sup> May 2011.	One train on each evening was loaded. Temperature inversion present on 27/5 and high winds 30/5 however weather conditions would have limited noise propagation from RLO to Werris Creek. Noise levels not an exceedance of noise criteria due to adverse weather conditions.	Complainant's residence apart of attended noise monitoring program. Written response to OEHL and complainant provided.
119 to 127	3/6/2011 Various	Werris Creek	Blast #32 (32 S10-9-11-385) was fired at 13:07 on 3rd June 2011 in Strip 10 near to the natural surface on the western side of the pit resulted in loud noise and house shaking experienced.	Video confirmed that a hole "rifled"/stemming ejection due to stemming contamination from muddy bench conditions causing elevated overpressure. South westerly wind blowing towards Werris Creek could have enhanced overpressure effects of the blast. Blast monitoring results were in compliance at all community monitors albeit with two locations recording elevated results over 115dB.	Written response to OEHL and complainant provided. EO to inspect alleged house defects.
128	14/6/2011 1:16pm	Werris Creek	Blast #37 (37 S9-9-GCoal) was fired at 13:19 on 14th June 2011 in Strip 9 right in the bottom of the pit resulted in shaking his house, the worst blast yet. Complainant noticing new cracks in gyprock.	The blast was small and in pit, Blast Engineer would not of thought that it could cause any community issues. South easterly wind could have enhanced overpressure effects. Blast monitoring results were in compliance at all community monitors with none of the community monitors triggering a result.	Written response to OEHL and complainant provided. EO to inspect alleged house defects.
129	15/6/2011 9am	Werris Creek (Complainant A)	Lights from the mine were shining brightly at her property all night.	Light monitoring camera set up on southern edge of Werris Creek capture a bright light shining towards Werris Creek. Lighting plant was positioned on RL445m orientated north (Werris Creek is north-north east) and was relocated before next night shift.	Written response to complainant provided.
130	16/6/2011 11:21am	Werris Creek (Complainant A)	Noise from rail load out on the evenings of Thursday 9 <sup>th</sup> , Friday 10 <sup>th</sup> , Monday 13 <sup>th</sup> and Wednesday 15 <sup>th</sup> June 2011.	No trains during the evenings, however two trains finished being loaded late afternoon 13/6 & 15/6. Adverse weather conditions present on each day potentially influence noise propagation from RLO to Werris Creek. Noise levels not an exceedance of noise criteria due to adverse weather conditions.	OEHL requested specific attended monitoring during Train Loading from Kurrara St. Written response to OEHL and complainant provided.
131 to 148, 150 & 151	16/6/2011 Various	Werris Creek	Blast #36 (36 S12-13-385) was fired at 13:13 on 16 <sup>th</sup> June 2011 in Strip 12 near to the natural surface on the western side of the pit resulted in loud noise and house shaking experienced.	Video confirmed that a hole "rifled"/stemming ejection due to stemming contamination from muddy bench conditions causing elevated overpressure. Southerly wind blowing towards Werris Creek could have enhanced overpressure effects of the blast. Blast monitoring results were in compliance at all community monitors albeit with two locations recording elevated results over 115dB.	Written response to OEHL and complainant provided. Several investigations into blasting practices launched by Orica and Whitehaven Coal. EO to inspect alleged house defects.
149	20/6/2011 1:20pm	Werris Creek	Blast #35 (35 S12_3-4_385) was fired at 13:15 on 20th June 2011 in Strip 12 near to the natural surface on the very western edge of the open cut and shook the complainants house.	Given the rifling issues with the two previous (#36 on 16th June and #32 on 3rd June), this shot was loaded with an extra metre of stemming loaded into each hole. Also the shotfirers checked each hole with a pole to confirm that no holes have been under loaded with stemming due to slumping or hang ups within each hole and the blast initiation direction was changed orientated to the west. Blast monitoring results were in compliance at all community monitors around 6dB(L) less than previous blasts.	Written response to OEHL and complainant provided.
152	22/6/2011 2:15pm	Werris Creek	Blast #39 (S12_8-9_385) was fired at 13:17 on 22nd June 2011 in Strip 12 near to the natural surface towards the centre of the pit and shook the complainants house.	Blast monitoring results were in compliance at all community monitors. South westerly wind could have enhanced overpressure effects.	EO to inspect alleged house defects. Written response to complainant provided.
153	4/7/2011 10:30am	Werris Creek (Complainant A)	Noise from the coal loader 2 <sup>nd</sup> July from 7:12pm to 10:30pm was loud and pretty ordinary. However noise from the coal loader 3 <sup>rd</sup> July from 7:24pm until 2:20am was audible but at an acceptable level.	One train loaded each evening with dozers working until 4:30am and 5:30am respectively. Adverse weather conditions present on each day potentially influence noise propagation from RLO to Werris Creek. Noise levels not an exceedance of noise criteria due to adverse weather conditions.	OEHL requested additional specific attended monitoring during Train Loading from Kurrara St. Written response to OEHL and complainant provided.
154	4/7/2011 6:44pm	"Hazeldene"	Mine is very noisy on 4 <sup>th</sup> July 2011 as well as the week beginning 20 <sup>th</sup> June 2011.	Dump location was on the exposed eastern side of RL410m dump. Adverse weathers conditions could have enhanced mining noise levels towards Quipolly but not applicable against compliance criteria. Continuous noise monitor recorded elevated noise levels with mining noise a major component.	OCE relocated the dump back to protected centre of RL410m dump. The continuous noise monitor is stationed at complainant's residence "Hazeldene". Written response to complainant provided.

#	Date	Location	Complaint	Investigation	Action Taken
155	22/7/2011 10:30am	Werris Creek (Complainant A)	No issues with noise from the coal loader on 16 <sup>th</sup> and 18 <sup>th</sup> July however noise from the coal loader 17 <sup>th</sup> July from 11pm onwards was very loud.	One train loaded each evening with dozers working until 12am, 4am and 3:30am respectively. Adverse weather conditions present on 17 <sup>th</sup> and 18 <sup>th</sup> July only that could potentially influence noise propagation from RLO to Werris Creek. Noise levels not an exceedance of noise criteria due to adverse weather conditions.	OEH requested additional specific attended monitoring during Train Loading from Kurrara St. Written response to OEH and complainant provided.
156	26/7/2011 2:17pm	Werris Creek (Complainant A)	Complainant alleges WCC blasted at 2:03pm outside time advertised and WCC is not allowed to do that.	Blast #49 (S11_5-6_365 TSB9) fired at 1:44pm. Not sure of difference in time. Advertised blast times in Werris Creek Flyer are indicative while approved blasting hours are 9am to 5pm.	Written response to OEH, DoP and complainant provided.

## 7.0 GENERAL

Please feel free to ask any questions in relation to the information contained within this document during Item 7 of the meeting agenda.

Regards  
Andrew Wright  
Environmental Officer

**Appendix 1 – PM10 Dust Monitoring Data.**

Werris Creek Coal  
 HVAS Dust Monitoring  
 2011-2012

Site Date	WCHV1 Cintra	Monthly Monthly Average	Rolling Annual Average	WCHV2 Tonsley Park	Monthly Monthly Average	Rolling Annual Average	WCHV3 Railway View	Monthly Monthly Average	Rolling Annual Average	WCHV4 Eurunder ee	Monthly Monthly Average	Rolling Annual Average	WCTSP Railway View	Monthly Monthly Average	Rolling Annual Average	PM10 24hr Limit	PM10 Annual Average	TSP Annual Average
02-Apr-11	11		11.2	15		15.4	11		10.8	13		13.3	19		18.8	50	30	90
08-Apr-11	25		18.2	11		13.1			10.8	9		11.1			18.8	50	30	90
14-Apr-11	24		20.2	20		15.3	39		24.7	15		12.2	97		57.8	50	30	90
20-Apr-11	51		27.8	21		16.6	50		33.1	18		13.6	114		76.5	50	30	90
26-Apr-11	11	24.5	24.5	7	14.7	14.7	12	27.8	27.8	7	12.2	12.2	28	64.3	64.3	50	30	90
02-May-11	38		26.7	26		16.6	35		29.1	16		12.9	85		68.4	50	30	90
08-May-11	13		24.8	16		16.5	12		26.2	12		12.8	20		60.4	50	30	90
14-May-11	7		22.5	5		15.1	14		24.5	7		12.1	50		58.9	50	30	90
20-May-11	34		23.9	34		17.2	50		27.8	28		13.8	100		64.0	50	30	90
26-May-11	27	23.9	24.2	17	19.6	17.1	13	24.7	26.1	16.1	15.9	14.0	25.7	56.1	59.8	50	30	90
01-Jun-11	58		27.2	52		20.3	50		28.4	7.7		13.5	95		63.2	50	30	90
07-Jun-11	62		30.2	56		23.2	80		33.1	9		13.1	256		80.8	50	30	90
13-Jun-11	49		31.6	48		25.1	47		34.3	5.4		12.5			80.8	50	30	90
19-Jun-11	7		29.8	8		23.9	7		32.2	5.5		12.0	155		87.0	50	30	90
25-Jun-11	18	38.7	29.0	13	35.2	23.2	14	39.5	30.9	13.1	8.1	12.1	25	132.5	82.1	50	30	90
01-Jul-11	11		27.9	8		22.2	4		29.1	4		11.6	10.1		77.0	50	30	90
07-Jul-11	10		26.8	4		21.1	35		29.5	5		11.2	105		78.9	50	30	90
13-Jul-11	15		26.2	15		20.8	19		28.8	25		12.0	47.5		76.9	50	30	90
19-Jul-11	8		25.2	4		19.9	14		28.0	4		11.6	44.3		75.0	50	30	90
25-Jul-11	8	10.3	24.3	8	7.8	19.3	10	16.3	27.0	19	11.5	11.9	16.9	44.8	71.8	50	30	90
30-Jul-10			24.3			19.3			27.0	All		11.9			71.8	50	30	90
05-Aug-10			24.3			19.3			27.0			11.9			71.8	50	30	90
11-Aug-10			24.3			19.3			27.0			11.9			71.8	50	30	90
17-Aug-10			24.3			19.3			27.0			11.9			71.8	50	30	90
23-Aug-10		#DIV/0!	24.3		#DIV/0!	19.3		#DIV/0!	27.0		#DIV/0!	11.9		#DIV/0!	71.8	50	30	90
29-Aug-10			24.3			19.3			27.0			11.9			71.8	50	30	90
04-Sep-10			24.3			19.3			27.0			11.9			71.8	50	30	90
10-Sep-10			24.3			19.3			27.0			11.9			71.8	50	30	90
16-Sep-10			24.3			19.3			27.0			11.9			71.8	50	30	90
22-Sep-10		#DIV/0!	24.3		#DIV/0!	19.3		#DIV/0!	27.0		#DIV/0!	11.9		#DIV/0!	71.8	50	30	90
28-Sep-10			24.3			19.3			27.0			11.9			71.8	50	30	90
04-Oct-10			24.3			19.3			27.0			11.9			71.8	50	30	90
10-Oct-10			24.3			19.3			27.0			11.9			71.8	50	30	90
16-Oct-10			24.3			19.3			27.0			11.9			71.8	50	30	90
22-Oct-10		#DIV/0!	24.3		#DIV/0!	19.3		#DIV/0!	27.0		#DIV/0!	11.9		#DIV/0!	71.8	50	30	90
28-Oct-10			24.3			19.3			27.0			11.9			71.8	50	30	90
03-Nov-10			24.3			19.3			27.0			11.9			71.8	50	30	90
09-Nov-10			24.3			19.3			27.0			11.9			71.8	50	30	90
15-Nov-10			24.3			19.3			27.0			11.9			71.8	50	30	90
21-Nov-10		#DIV/0!	24.3		#DIV/0!	19.3		#DIV/0!	27.0		#DIV/0!	11.9		#DIV/0!	71.8	50	30	90
27-Nov-10			24.3			19.3			27.0			11.9			71.8	50	30	90
03-Dec-10			24.3			19.3			27.0			11.9			71.8	50	30	90
09-Dec-10			24.3			19.3			27.0			11.9			71.8	50	30	90
15-Dec-10			24.3			19.3			27.0			11.9			71.8	50	30	90
21-Dec-10		#DIV/0!	24.3		#DIV/0!	19.3		#DIV/0!	27.0		#DIV/0!	11.9		#DIV/0!	71.8	50	30	90
27-Dec-10			24.3			19.3			27.0			11.9			71.8	50	30	90
02-Jan-11			24.3			19.3			27.0			11.9			71.8	50	30	90
08-Jan-11			24.3			19.3			27.0			11.9			71.8	50	30	90
14-Jan-11			24.3			19.3			27.0			11.9			71.8	50	30	90
20-Jan-11		#DIV/0!	24.3		#DIV/0!	19.3		#DIV/0!	27.0		#DIV/0!	11.9		#DIV/0!	71.8	50	30	90
26-Jan-11			24.3			19.3			27.0			11.9			71.8	50	30	90
01-Feb-11			24.3			19.3			27.0			11.9			71.8	50	30	90
07-Feb-11			24.3			19.3			27.0			11.9			71.8	50	30	90
13-Feb-11			24.3			19.3			27.0			11.9			71.8	50	30	90
19-Feb-11		#DIV/0!	24.3		#DIV/0!	19.3		#DIV/0!	27.0		#DIV/0!	11.9		#DIV/0!	71.8	50	30	90
25-Feb-11			24.3			19.3			27.0			11.9			71.8	50	30	90
03-Mar-11			24.3			19.3			27.0			11.9			71.8	50	30	90
09-Mar-11			24.3			19.3			27.0			11.9			71.8	50	30	90
15-Mar-11			24.3			19.3			27.0			11.9			71.8	50	30	90
21-Mar-11			24.3			19.3			27.0			11.9			71.8	50	30	90
27-Mar-11		#DIV/0!	24.3		#DIV/0!	19.3		#DIV/0!	27.0		#DIV/0!	11.9		#DIV/0!	71.8	50	30	90
Min	6.8			3.8			4.2			4.1			10.1					
Max	62.2			55.9			80.4			27.6			256.0					
Capture	33%			33%			31%			33%			30%					

**Appendix 2 – Deposited Dust Monitoring Data.**

## Deposited Dust - Werris Creek Coal Mine 2011-2012

MONTH (g/m2/month)	EPL #7		EPL #4		EPL #1		EPL #8		-		-		-		ANNUAL AVERAGE LIMIT
	WC-2 Cintra		WC-5 Railway View		WC-7 Tonsley Park		WC-8 Plain View		WC-9 Marengo		WC-10 Mountain View		WC-11 Glenara		
	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	
April 2011	1.5	1.0	1.1	0.7	0.6	0.5	1.1	0.9	0.5	0.4	c2.3	1.6	0.6	0.6	3.6
May 2011	0.6*	0.2	0.6	0.3	0.1	0.1	0.2	0.2	0.1	0.1	5.9*	2.0	0.2	0.2	3.6
June 2011	3.0	1.8	2.4	1.5	0.9	0.5	1.3	0.8	0.8	0.5	0.8	0.4	1.4	0.8	3.6
July 2011	0.5	0.3	0.5	0.4	0.3	0.2	0.8	0.5	0.2	0.2	0.9	0.5	0.6	0.5	3.6
August 2011															3.6
September 2011															3.6
October 2011															3.6
November 2011															3.6
December 2011															3.6
January 2012															3.6
February 2012															3.6
March 2012															3.6
<b>ANNUAL AVERAGE</b>	<b>1.7</b>		<b>1.2</b>		<b>0.5</b>		<b>0.9</b>		<b>0.4</b>		<b>0.9</b>		<b>0.7</b>		<b>3.6</b>
<b>MINIMUM</b>	<b>0.5</b>		<b>0.5</b>		<b>0.1</b>		<b>0.2</b>		<b>0.1</b>		<b>0.8</b>		<b>0.2</b>		<b>3.6</b>
<b>MAXIMUM</b>	<b>3.0</b>		<b>2.4</b>		<b>0.9</b>		<b>1.3</b>		<b>0.8</b>		<b>0.9</b>		<b>1.4</b>		<b>3.6</b>

Note: All results are in the form of Insoluble Matter (g/m2/month)

c - indicates sample is contaminated from a Non-Werris Creek Coal dust source and is not counted in the average

\* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e bird droppings and insects) and is excluded from the average

**Appendix 3 – Noise Monitoring Results.**



24 May 2011

Ref: 04035/3980

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: MAY 2011 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Friday 20 and Saturday 21 May 2011.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Mine's Noise Management Plan (revised November 2010). The locations are listed below and attached in **Figure 1**:

- “Almawillee”
- “Glenara”
- “Railway Cottage” (previously denoted as “Fletcher”)
- “Tonsley Park”
- “Greenslopes/Banool”
- “Kyooma”

Additional measurements were also made on the road side near residential locations in Punyarra Street and Kurrara Street, Werris Creek. These locations are shown in **Figure 2**.

Three sets of measurements were made over the “circuit”, one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm).

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speed and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data shows that at the beginning of the survey on May 20 winds were light from the south west. Throughout the survey the winds varied to be generally from each of south westerly, south easterly, easterly and northerly directions.

The data showed that there was a strong temperature inversion from early evening which persisted throughout the night survey.

The total measured Leq noise level is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) L<sub>eq</sub> (15 min)** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the background level during the measurement and not measurable.

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	5:45 pm	37	n/a	3.2/134	Birds (37), <b>WCC inaudible</b>
Glenara	5:28 pm	38	n/a	3.1/141	Traffic (37), birds (30), <b>WCC inaudible</b>
Railway Cottage	5:12 pm	48	n/a	3.3/148	Traffic (48), <b>WCC inaudible</b>
Tonsley Park	3:25 pm	38	n/a	1.4/213	Traffic (37), birds & insects (30), <b>WCC (28)</b>
Greenslopes	3:45 pm	59	n/a	1.0/218	Traffic (58), birds & insects (50) <b>WCC (&lt;25)</b>
Kyooma	4:52 pm	39	n/a	2.8/190	Birds & insects (38), <b>WCC (31)</b>
Kurrara St	4:04 pm	45	n/a	0.7/239	Traffic (45), birds & insects (33), <b>WCC inaudible</b>
Punyarra St	4:21 pm	39	n/a	1.6/209	Traffic (39), birds (30), <b>WCC inaudible</b>

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	9:04 pm	36	+9	1.5/94	<b>WCC (35)</b> , insects (27)
Glenara	9:25 pm	40	+9	2.2/64	<b>WCC (38)</b> , insects (36)
Railway Cottage	8:46 pm	45	+9	1.9/102	Traffic (45), <b>WCC inaudible</b>
Tonsley Park	7:25 pm	46	+8	2.8/96	Train on spur (46*), <b>WCC inaudible</b> , insects (30)
Greenslopes	7:00 pm	49	+7	2.9/100	Birds (47), traffic (45), <b>WCC (28)</b>
Kyooma	8:23 pm	35	+9	2.0/94	Insects (35), <b>WCC inaudible</b>
Kurrara St	7:45 pm	40	+8	2.6/104	Train in town (40), insects (25), <b>WCC inaudible</b>
Punyarra St	8:02 pm	40	+9	2.3/91	Train in town (37), traffic (37), insects (30), <b>WCC inaudible</b>

\*see text below tables in relation to rail noise

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	12:32 am	32	+10	1.5/304	<b>WCC (32)</b> , insects (21)
Glenara	12:15 am	36	+10	1.2/267	Traffic (34), <b>WCC (32)</b>
Railway Cottage	12:55 am	34	+10	1.7/314	Traffic (33), insects (25), <b>WCC (25)</b>
Tonsley Park	10:00 pm	43	+10	1.8/23	Train in town (42), traffic (36), <b>WCC inaudible</b>
Greenslopes	10:18 pm	44	+10	0.9/352	Insects (43), traffic (37), <b>WCC inaudible</b>
Kyooma	11:10 pm	36	+10	2.1/38	Insects (36), <b>WCC inaudible</b>
Kurrara St	10:35 pm	43	+10	1.3/298	Train in town (43), insects (32), <b>WCC inaudible</b>
Punyarra St	10:52 pm	35	+10	1.4/319	Train in town (35), domestic noise (25), <b>WCC inaudible</b>

The results shown in **Tables 1-3** indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC exceeded the criterion of 35 dB(A) Leq at the Glenara monitoring location during the evening monitoring period.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where wind speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Data from the mine operated weather station indicated that all of the elevated noise levels were measured whilst there was a strong temperature inversion in place.

The train noise at Tonsley Park was measured whilst a train was on the Werris Creek mine rail spur and moving towards the main line. Coal loading was not being carried out during the course of the measurement.

The development consent for the mine has the following noise assessment criteria in relation to noise generated by shunting operations, 55 dB(A) Leq (24 hour) and 80 dB(A) Lmax. The measured train noise of 46 dB(A) Leq (15 min) equates to 26 dB(A) Leq (24 hour) which is significantly lower than the acceptable level from the development consent. The measured Lmax noise was 65 dB(A) from the train horn. This is also significantly lower than the acceptable level from the development consent.

Data from those times where WCC operations were audible were analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the Lmax criterion at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,  
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant



Figure 1 – Noise Monitoring Locations

Key

- 1 Alkawillee
- 2 Glenara
- 3 Railway Cottage
- 4 Tonsley Park
- 5 Greenslopes/Banool
- 6 Kyooma



Figure 2 – Additional Noise Monitoring Locations

Key

- 7 Kurarra Street
- 8 Punyarra Street



27 June 2011

Ref: 04035/4020

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: JUNE 2011 NOISE MONITORING RESULTS – WERRIS CREEK MINE

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Friday 24 and Saturday 25 June 2011.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Mine's Noise Management Plan (revised November 2010). The locations are listed below and attached in **Figure 1**:

- “Almawillee”
- “Glenara”
- “Railway Cottage” (previously denoted as “Fletcher”)
- “Tonsley Park”
- “Greenslopes/Banool”
- “Kyooma”

Additional measurements were also made on the road side near residential locations in Punyarra Street and Kurrara Street, Werris Creek. These locations are shown in **Figure 2**.

Three sets of measurements were made over the “circuit”, one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm).

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speed and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data shows that at the beginning of the survey on June 24 winds were light from the north north west. During the evening and night periods winds were calm.

The data showed that there was a strong temperature inversion from late afternoon which persisted throughout the night survey.

The total measured Leq noise level is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer “Evaluator” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall. The noise criterion for the operational phase of the WCC project is **35 dB(A) L<sub>eq</sub> (15 min)** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the ambient level during the measurement and not measurable.

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	3:14 pm	33	n/a	1.9/265	Birds (33), WCC (<20)
Glenara	5:23 pm	38	+5.6	1.3/329	<b>WCC (37)</b> , traffic (33)
Railway Cottage	2:55 pm	39	n/a	2.7/283	Traffic (39), birds (30), insects (24), <b>WCC barely audible</b>
Tonsley Park	1:35 pm	35	n/a	2.1/301	Train in Werris Ck (34), birds (26), <b>WCC inaudible</b>
Greenslopes	1:54 pm	42	n/a	1.7/279	Traffic (42), birds (32) <b>WCC inaudible</b>
Kyooma	2:33 pm	38	n/a	2.3/304	Birds (38), <b>WCC (27)</b>
Kurrara St	2:12 pm	40	n/a	2.4/323	Train in Werris Ck (38), traffic (34), birds (33), <b>WCC inaudible</b>
Punyarra St	1:15 pm	40	n/a	2.7/298	Traffic (36), train in Werris Ck (36), domestic noise (35), <b>WCC inaudible</b>

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	7:03 pm	38	+8.7	Calm	<b>WCC (37)</b> , traffic (31)
Glenara	7:20 pm	39	+8.8	Calm	Traffic (38), <b>WCC (33)</b>
Railway Cottage	7:43 pm	46	+8.5	Calm	Traffic (46), <b>WCC (&lt;30)</b>
Tonsley Park	9:25 pm	36	+8.8	0.1/324	<b>WCC (35)</b> , traffic (28)
Greenslopes	9:05 pm	42	+8.2	0.1/324	<b>WCC (40)</b> , traffic (37)
Kyooma	8:05 pm	36	+8.5	Calm	<b>WCC (36)</b>
Kurrara St	8:47 pm	41	+8.2	Calm	Train in Werris Ck (38), traffic (37), <b>WCC (&lt;30)</b>
Punyarra St	8:29 pm	43	+8.4	Calm	Trains in Werris Ck (42), traffic (36), <b>WCC (33)</b>

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	10:02 pm	40	+7.5	Calm	<b>WCC (38)</b> , traffic (34)
Glenara	10:19 pm	40	+7.5	0.1/324	<b>WCC (38)</b> , traffic (34)
Railway Cottage	10:44 pm	32	+7.7	0.1/178	<b>WCC (32)</b>
Tonsley Park	12:33 am	43	+7.4	0.1/62	Train loading (41), <b>WCC (38)</b>
Greenslopes	12:52 am	47	+8.5	Calm	<b>WCC (45)</b> , traffic (40), train on main line (35)
Kyooma	11:05 pm	35	+7.9	Calm	<b>WCC (35)</b>
Kurrara St	1.10 am	44	+8.5	Calm	Train in Werris Ck (44), <b>WCC (35)</b>
Punyarra St	11.33 pm	36	+9.2	Calm	<b>WCC (34)</b> , train in Werris Ck (32)

The results shown in **Tables 1 - 3** indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC exceeded the criterion of 35 dB(A) Leq at the Glenara monitoring location during the afternoon and night monitoring period, at Almawillee and Greenslopes during the evening and night, at Kyooma during the evening and Tonsley park during the night.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Data from the mine operated weather station indicated that all of the elevated noise levels were measured whilst there was a strong temperature inversion in place (i.e. >+3° C/100m) and, therefore, under non-compliant atmospheric conditions.

A train was being loaded at the mine loading facility from approximately 12.30 am on Saturday 25<sup>th</sup>. The noise from the train loading was measureable at Tonsley Park. At Kurrara Street the noise from train loading at the mine was not audible or measureable above noise from three locos at idle in the rail yards at Werris Creek which is part of the main rail line. Noise from the train loading was not audible at Greenslopes.

Data from those times where WCC operations were audible were analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC exceeded the Lmax criterion at the Greenslopes monitoring location. A noise level of 51 Lmax was attributable to an impact noise.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant

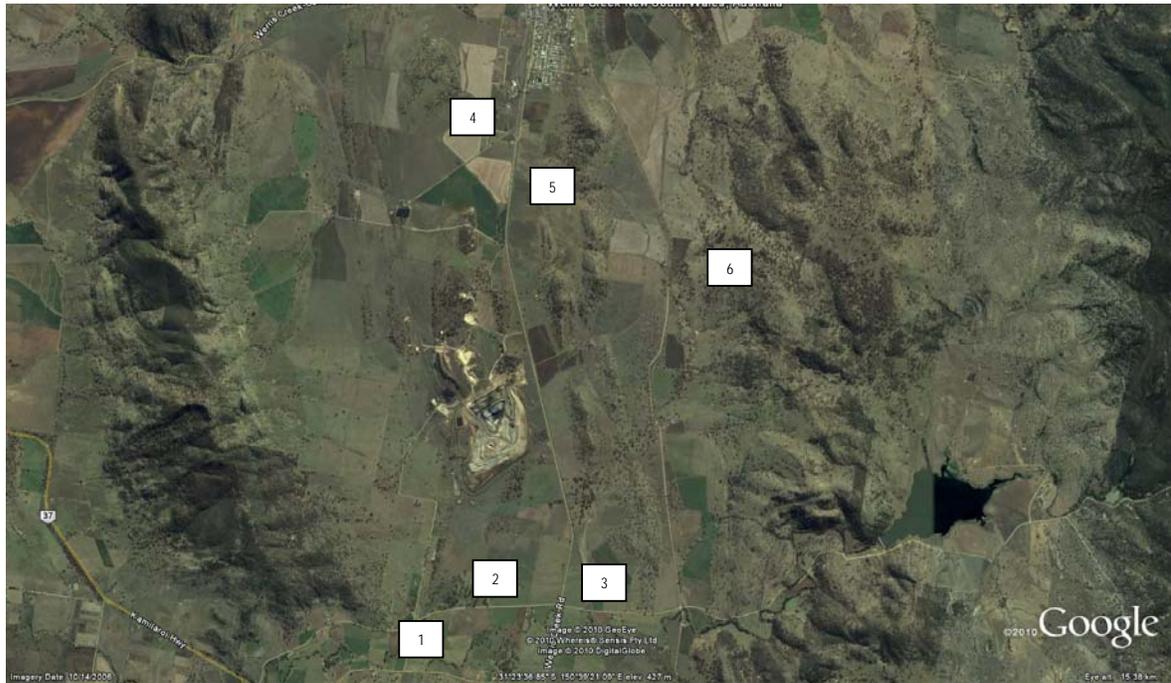


Figure 1 – Noise Monitoring Locations

Key

- 1 Alkawillee
- 2 Glenara
- 3 Railway Cottage
- 4 Tonsley Park
- 5 Greenslopes/Banool
- 6 Kyooma



Figure 2 – Additional Noise Monitoring Locations

Key

- 7 Kurarra Street
- 8 Punyarra Street



28 July 2011

Ref: 04035/4059

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: JULY 2011 NOISE MONITORING RESULTS – WERRIS CREEK MINE

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Monday 25 and Tuesday 26 July 2011.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Mine's Noise Management Plan (revised November 2010). The locations are listed below and attached in **Figure 1**:

- “Almawillee”
- “Glenara”
- “Railway Cottage” (previously denoted as “Fletcher”)
- “Tonsley Park”
- “Greenslopes/Banool”
- “Kyooma”

Additional measurements were also made on the road side near residential locations in Punyarra Street and Kurrara Street, Werris Creek. These locations are shown in **Figure 2**.

Three sets of measurements were made over the “circuit”, one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm).

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speed and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data shows that at the beginning of the survey on July 25 winds were moderate from the north west. During the evening and night periods winds persisted from the north west, dropping in intensity after midnight.

The data showed that there was a mild temperature inversion from early evening which persisted throughout the night survey.

The total measured Leq noise level is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall. The noise criterion for the operational phase of the WCC project is **35 dB(A)  $L_{eq}$  (15 min)** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the ambient level during the measurement and not measurable.

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	4:15 pm	44	n/a	6.9/313	Wind in trees (43), birds (38), WCC (<20)
Glenara	4:32 pm	45	n/a	5.8/320	Birds & insects (44), <b>WCC (34)</b> , traffic (30)
Railway Cottage	3:56 pm	47	n/a	7.1/311	Traffic (47), birds & insects (35), <b>WCC (32)</b>
Tonsley Park	2:10 pm	38	n/a	5.5/333	Birds & insects (36), traffic (30), domestic noise (30), <b>WCC inaudible</b>
Greenslopes	2:30 pm	48	n/a	6.7/320	Traffic (47), wind (40), birds (35) <b>WCC inaudible</b>
Kyooma	3:31 pm	46	n/a	6.6/314	Wind (45), birds (41), <b>WCC inaudible</b>
Kurrara St	2:50 pm	46	n/a	8.3/308	Trains in Werris Ck (43), traffic (43), dog (35), <b>WCC inaudible</b>
Punyarra St	3:07 pm	44	n/a	6.5/314	Trains in Werris Ck (40), domestic noise (38), dogs (38), traffic (38), <b>WCC inaudible</b>

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	9:18 pm	33	+1.6	3.8/334	<b>WCC (32)</b> , plane (25)
Glenara	9:35 pm	34	+1.3	3.9/330	Traffic (32), <b>WCC (30)</b>
Railway Cottage	9:00 pm	48	+2.0	4.2/318	Traffic (48), <b>WCC (34)</b>
Tonsley Park	7:00 pm	38	+1.5	5.9/307	Traffic (37), train (30), <b>WCC inaudible</b>
Greenslopes	7:25 pm	47	+1.5	4.5/303	Traffic (47), <b>WCC (31)</b>
Kyooma	8:30 pm	37	+3.9	5.0/306	<b>WCC (37)</b> , insects (25)
Kurrara St	7:48 pm	47	+1.5	4.4/306	Train in Werris Ck (46), traffic (40), <b>WCC inaudible</b>
Punyarra St	8:05 pm	43	+3.4	4.8/307	Trains in Werris Ck (43), traffic (30), <b>WCC inaudible</b>

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	12:50 am	33	+4.5	3.1/313	<b>WCC (33)</b>
Glenara	01:07 am	34	+4.2	3.1/329	<b>WCC (34)</b>
Railway Cottage	12:32 am	46	+4.4	3.5/313	Traffic (46), <b>WCC (34)</b>
Tonsley Park	10:00 pm	41	+1.3	3.8/321	Trains in Werris Ck (40), traffic (35), <b>WCC inaudible</b>
Greenslopes	10:20 pm	42	+1.8	3.4/323	Traffic (41), <b>WCC (36)</b>
Kyooma	11:17 pm	38	+2.8	1.9/324	Trains (36), <b>WCC (35)</b> ,
Kurrara St	10:57 pm	42	+1.8	3.0/315	Trains in Werris Ck (42), <b>WCC inaudible</b>
Punyarra St	10:57 pm	32	+2.5	3.0/315	Trains in Werris Ck (32), <b>WCC inaudible</b>

The results shown in **Tables 1 - 3** indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC exceeded the criterion of 35 dB(A) Leq at the Kyooma monitoring location during the evening monitoring period and Greenslopes during the night.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Data from the mine operated weather station indicated that all of the elevated noise levels were measured whilst there was a strong temperature inversion in place (i.e. >+3° C/100m) (Kyooma evening) and/or high winds (Kyooma evening and Greenslopes night). The elevated noise levels were, therefore, measured under non-compliant atmospheric conditions.

Data from those times where WCC operations were audible were analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the Lmax criterion at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,  
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant



Figure 1 – Noise Monitoring Locations

Key

- 1 Alkawillee
- 2 Glenara
- 3 Railway Cottage
- 4 Tonsley Park
- 5 Greenslopes/Banool
- 6 Kyooma



Figure 2 – Additional Noise Monitoring Locations

Key

- 7 Kurarra Street
- 8 Punyarra Street



22 July 2011

Ref: 04035/4049

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: JULY 2011 TRAIN NOISE MONITORING RESULTS – WERRIS CREEK MINE

This letter report presents the results of noise monitoring conducted adjacent to Kurrara Street residences, Werris Creek, on the evening of 13 July 2011 during train loading activities at the Werris Creek Coal Mine (WCC).

The noise monitoring was conducted at two locations shown in **Figure 1**. Location 1 is in a public reserve behind residences at the eastern end of Kurrara Street. Location 2 is closer to WCC and was used as a control point. A total of three fifteen-minute measurements was taken over a period of one hour with a Bruel & Kjaer 2260C (IEC Type 1) integrating sound level meter in accordance with relevance Australian Standards and guidelines.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speed and direction have been determined as the arithmetic average of the measurements over each monitoring period. The data shows that winds were in the range 3-4 m/s from the NW during the monitoring. Although WCC noise criteria do not apply for wind speeds greater than 3 m/s, measurement of environmental noise is valid up to wind speeds of 5 m/s. The measured noise sources and levels during the three measurements are summarised below.

### **Measurement 1 (Location 1, 6:43 pm)**

Total noise level was 42 dB(A), $L_{eq(15min)}$ . Contributing sources were local traffic (39 dB(A)), a train idling in Werris Creek (37 dB(A)) and WCC (32 dB(A)). Contributing sources at WCC included general hum<sup>1</sup>, including the dozers on the stockpile (31 dB(A)) and coal loading activities including the train (27 dB(A)). The total noise contribution from WCC was below the night time criterion of 35 dB(A), $L_{eq(15min)}$ . Impact noises from the initial contact of coal with empty wagons reached up to 41 dB(A), $L_{max}$  at the monitoring location, which is below the sleep disturbance criterion of 45 dB(A). Due to management practices at the coal stockpile, dozer track noise was minimal and barely audible at the monitoring location.

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<sup>1</sup> General hum from primarily the dozers working the coal stockpile. Mine hum from further south in the active open-cut area was not discernible but may have contributed at a level below 30 dB(A).



Figure 1 – Train Loading Noise Monitoring Location

**Measurement 2 (Location 2, 7:08 pm)**

Due to the influence of train noise from within Werris Creek, a measurement was taken at the southern end of West Street (to the west of Tonsley Park) in order to gain a clear measurement of site noise. The noise contribution from WCC at this location, which is much closer to the train loading point than the monitoring point in Werris Creek, was 33 dB(A), $L_{eq(15min)}$  which appeared to be dominated by dozers on the stockpile.

**Measurement 3 (Location 1, 7:41 pm)**

Total noise level was 41 dB(A), $L_{eq(15min)}$ . Contributing sources were local traffic (40 dB(A)), a train (different train to first measurement) idling in Werris Creek (32 dB(A)) and WCC (32 dB(A)). Contributing sources at WCC included general hum (open cut mining not discernible), including the dozers on the stockpile (31 dB(A)) and coal loading activities including the train (28 dB(A)). The noise contribution from WCC was below the night time criterion of 35 dB(A), $L_{eq(15min)}$ . Impact noises from the initial contact of coal with empty wagons again reached up to 41 dB(A), $L_{max}$  at the monitoring location, which is below the sleep disturbance criterion of 45 dB(A).

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,  
SPECTRUM ACOUSTICS PTY LIMITED



Neil Pennington  
B.Sc., B.Math.(Hons), MAAS MASA  
Principal / Director

**Appendix 4 – Blasting Monitoring Data.**

WERRIS CREEK COAL  
BLASTING DATABASE

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results													
					Glenala		Greenslopes		Tonsley Park		Cintra*		Werris Creek		Talavera		COMPLIANCE	
					Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
11-27	4/05/2011	13.12	S12_5-7_385	OB	NM	NM	0.42	108.2	0.38	102.5	0.54	110.1	<0.20	<109.9	NM	NM	10.00	120.0
11-28	13/05/2011	13.21	S10_slip_340	IB	NM	NM	0.42	108.2	0.38	102.5	0.54	110.1	<0.20	<109.9	NM	NM	10.00	120.0
11-29	13/05/2011	13.21	S10_4-7_320TSB6	TS	NM	NM	<0.37	<109.9	0.95	95.5	0.97	108.6	<0.20	<109.9	NM	NM	10.00	120.0
11-30	19/05/2011	13.22	S9_8-9_300	IB	NM	NM	<0.37	<109.9	0.95	95.5	0.97	108.6	<0.20	<109.9	NM	NM	10.00	120.0
11-31	23/05/2011	10.15	S10_8-12_Fcoal	IB	NM	NM	<0.37	<109.9	<0.37	<109.9	0.52	100.8	<0.20	<109.9	NM	NM	10.00	120.0
11-33	30/05/2011	13.35	S10_12_13_Fcoal pt2	IB	NM	NM	<0.37	<109.9	<0.37	<109.9	0.45	105.4	<0.20	<109.9	NM	NM	10.00	120.0
<b>TOTALS</b>	<b>MAY</b>	<b># BLAST</b>	<b>6</b>	<b>AVERAGE</b>	<b>NM</b>	<b>NM</b>	<b>0.42</b>	<b>108.2</b>	<b>0.67</b>	<b>99.0</b>	<b>0.67</b>	<b>107.3</b>	<b>&lt;0.20</b>	<b>&lt;109.9</b>	<b>NM</b>	<b>NM</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>MAY</b>	<b># BLAST</b>	<b>6</b>	<b>HIGHEST</b>	<b>NM</b>	<b>NM</b>	<b>0.42</b>	<b>108.2</b>	<b>0.95</b>	<b>102.5</b>	<b>0.97</b>	<b>110.1</b>	<b>&lt;0.20</b>	<b>&lt;109.9</b>	<b>NM</b>	<b>NM</b>	<b>10.00</b>	<b>120.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b># BLAST</b>	<b>15</b>	<b>AVERAGE</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>0.36</b>	<b>109.5</b>	<b>0.58</b>	<b>103.6</b>	<b>0.63</b>	<b>108.5</b>	<b>&lt;0.20</b>	<b>&lt;109.9</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>5.00</b>	<b>115.0</b>

WERRIS CREEK COAL  
BLASTING DATABASE

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results													
					Glenala		Greenslopes		Tonsley Park		Cintra*		Werris Creek		Talavera		COMPLIANCE	
					Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
11-32	3/06/2011	13:06	S11_8-11_385	OB	NM	NM	0.52	115.8	0.48	112.7	0.55	117.4	0.21	109.8	NM	NM	10.00	120.0
11-34	10/06/2011	13:10	S9_98-9_300	IB	NM	NM	<0.37	<109.9	0.45	99.9	0.60	107.0	<0.20	<109.9	NM	NM	10.00	120.0
11-35	16/06/2011	13:13	S12_11_385	OB	NM	NM	0.68	115.7	0.55	113.1	0.72	116.9	0.10	111.7	NM	NM	10.00	120.0
11-36	20/06/2011	13:15	S12_3-4_385	OB	NM	NM	1.05	110.1	1.12	103.1	NM	NM	0.42	105.6	<0.37	<109.9	10.00	120.0
11-37	14/06/2011	13:19	S9_9_300	IB	NM	NM	<0.37	<109.9	<0.37	<109.9	<0.37	<109.9	<0.20	<109.9	NM	NM	10.00	120.0
11-38	20/06/2011	13:15	S11_4-5_350Presplit	PS	NM	NM	1.05	110.1	1.12	103.1	NM	NM	0.42	105.6	<0.37	<109.9	10.00	120.0
11-39	22/06/2011	13:17	S12_8-9_385	OB	NM	NM	0.65	107.4	0.72	104.8	NM	NM	<0.20	<109.9	<0.37	<109.9	10.00	120.0
11-40	29/06/2011	13:14	S13_5-7_385	OB	NM	NM	0.07	110.1	<0.37	<109.9	0.70	114.0	<0.20	<109.9	NM	NM	10.00	120.0
11-41	24/06/2011	13:12	S11_3-5_385 Pt1	PS	NM	NM	0.57	95.0	1.07	91.9	1.92	99.1	0.42	92.9	NM	NM	10.00	120.0
11-42	30/06/2011	13:40	S10-9-10-Fcoal	IB	NM	NM	<0.37	<109.9	<0.37	<109.9	NM	NM	<0.20	<109.9	<0.37	<109.9	10.00	120.0
<b>TOTALS</b>	<b>JUNE</b>	<b># BLAST</b>	<b>10</b>	<b>AVERAGE</b>	<b>NM</b>	<b>NM</b>	<b>0.66</b>	<b>109.2</b>	<b>0.79</b>	<b>104.1</b>	<b>0.90</b>	<b>110.9</b>	<b>0.31</b>	<b>105.1</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>JUNE</b>	<b># BLAST</b>	<b>10</b>	<b>HIGHEST</b>	<b>NM</b>	<b>NM</b>	<b>1.05</b>	<b>115.8</b>	<b>1.12</b>	<b>113.1</b>	<b>1.92</b>	<b>117.4</b>	<b>0.42</b>	<b>111.7</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>10.00</b>	<b>120.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b># BLAST</b>	<b>25</b>	<b>AVERAGE</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>0.46</b>	<b>109.4</b>	<b>0.65</b>	<b>103.8</b>	<b>0.72</b>	<b>109.3</b>	<b>0.31</b>	<b>105.1</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b>%</b>	<b>&gt;115dB(L) or 5mm/s</b>	<b>25</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>8.0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>9.5%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>5%</b>	<b>5%</b>

WERRIS CREEK COAL  
BLASTING DATABASE

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results													
					Glenala		Greenslopes		Tonsley Park		Cintra*		Werris Creek		Talavera		COMPLIANCE	
					Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
11-43	1/07/2011	13:08	S11_2-4_350 W/R PS	PS	NM	NM	0.47	95.0	0.45	96.2	1.17	101.3	<0.20	<109.9	NM	NM	10.00	120.0
11-44	8/07/2011	13:25	S12_9-13_385	OB	NM	NM	NM	NM	0.52	106.9	1.22	114.0	<0.20	<109.9	<0.37	<109.9	10.00	120.0
11-45	6/07/2011	15:22	S10_9-11_Fseam Pt2	IB	NM	NM	NM	NM	<0.37	<109.9	<0.37	<109.9	<0.20	<109.9	<0.37	<109.9	10.00	120.0
11-46	13/07/2011	13:54	S10_6-8_300 TSB7	TS	NM	NM	0.50	99.0	0.57	94.7	0.8	102.2	<0.20	<109.9	NM	NM	10.00	120.0
11-47	14/07/2011	13:08	S11_7-9_350 PS	PS	NM	NM	0.37	93.4	0.67	94.7	0.9	101.3	<0.20	<109.9	NM	NM	10.00	120.0
11-48	19/07/2011	13:25	S11_7-8_365 TSB8	TS	NM	NM	0.65	110.6	0.72	106.3	1.25	106.3	<0.20	<109.9	NM	NM	10.00	120.0
11-49	26/07/2011	13:44	S11_5-6_365 TSB9	TS	NM	NM	0.65	99.9	0.57	83.0	1.25	107.8	<0.20	<109.9	NM	NM	10.00	120.0
<b>TOTALS</b>	<b>JULY</b>	<b># BLAST</b>	<b>7</b>	<b>AVERAGE</b>	<b>NM</b>	<b>NM</b>	<b>0.53</b>	<b>99.6</b>	<b>0.58</b>	<b>97.0</b>	<b>1.10</b>	<b>105.5</b>	<b>&lt;0.20</b>	<b>&lt;109.9</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>JULY</b>	<b># BLAST</b>	<b>7</b>	<b>HIGHEST</b>	<b>NM</b>	<b>NM</b>	<b>0.65</b>	<b>110.6</b>	<b>0.72</b>	<b>106.9</b>	<b>1.25</b>	<b>114.0</b>	<b>&lt;0.20</b>	<b>&lt;109.9</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>10.00</b>	<b>120.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b># BLAST</b>	<b>32</b>	<b>AVERAGE</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>0.48</b>	<b>106.9</b>	<b>0.63</b>	<b>102.1</b>	<b>0.82</b>	<b>108.3</b>	<b>0.31</b>	<b>105.1</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b>%</b>	<b>&gt;115dB(L) or 5mm/s</b>	<b>32</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>6.7%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>7.1%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>5%</b>	<b>5%</b>

**Appendix 5 – Groundwater Monitoring Data.**



## Environmental Division

### CERTIFICATE OF ANALYSIS

<b>Work Order</b>	<b>: ES1110417</b>	Page	: 1 of 6
Client	: ACIRL PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Client Services
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 1954	Date Samples Received	: 19-MAY-2011
C-O-C number	: ----	Issue Date	: 26-MAY-2011
Sampler	: BP	No. of samples received	: 11
Site	: ----	No. of samples analysed	: 11
Quote number	: SY/261/10		

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
- Descriptive Results



NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics
James Thompson	Client Services Officer	ACIRL Sampling
Sarah Millington	Senior Inorganic Chemist	Sydney Inorganics

**Environmental Division Sydney**  
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A Campbell Brothers Limited Company



## 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

- **Field Tests, Field Observations and Flow Observations supplied by ALS ACIRL - Lithgow or Muswellbrook. NATA Accreditation No.15784.**



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	MW1	MW6	MW8	MW10	MW11
				Client sampling date / time	18-MAY-2011 10:50	18-MAY-2011 11:30	18-MAY-2011 12:00	18-MAY-2011 09:30	18-MAY-2011 10:00
Compound	CAS Number	LOR	Unit	ES1110417-001	ES1110417-002	ES1110417-003	ES1110417-004	ES1110417-005	
<b>AC01: Bore Data</b>									
Standing Water Level	----	0.01	m	50.6	11.2	12.7	17.1	<0.01	
<b>AC02: Sampling Data</b>									
Purge Type	----	-	-	Bail	Bail	Tap	Tap	Tap	
<b>AC03: Field Tests</b>									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	1130	1730	1050	1080	1150	
pH	----	0.01	pH Unit	6.95	7.20	7.25	7.30	7.45	
Temperature	----	0.1	°C	20.1	20.0	20.2	16.0	19.1	
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit	7.42	7.64	7.61	7.93	7.91	
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm	1300	2060	1320	1310	1350	
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L	0.02	<0.01	<0.01	<0.01	<0.01	
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L	0.90	3.03	3.72	6.41	7.17	
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L	2.2	4.2	4.5	8.6	8.7	
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	0.25	0.14	0.03	0.13	0.18	
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L	0.21	0.05	0.02	0.02	0.03	



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	MW12	MW13	MW15	MW16	MW17A
				Client sampling date / time	18-MAY-2011 14:10	18-MAY-2011 13:00	18-MAY-2011 12:30	18-MAY-2011 14:00	18-MAY-2011 13:20
Compound	CAS Number	LOR	Unit	ES1110417-006	ES1110417-007	ES1110417-008	ES1110417-009	ES1110417-010	
<b>AC01: Bore Data</b>									
Standing Water Level	----	0.01	m	6.75	5.03	3.81	3.99	3.04	
<b>AC02: Sampling Data</b>									
Purge Type	----	-	-	Tap	Bail	Bail	Tap	Tap	
<b>AC03: Field Tests</b>									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	413	783	990	661	776	
pH	----	0.01	pH Unit	7.20	7.10	7.20	7.15	7.30	
Temperature	----	0.1	°C	20.7	21.5	20.1	19.7	21.0	
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit	7.52	7.40	7.66	7.57	7.65	
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm	468	968	1190	799	942	
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L	0.97	1.53	1.03	3.18	0.42	
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L	1.7	2.6	1.4	5.3	1.0	
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	0.10	0.17	0.22	0.15	0.32	
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L	0.05	0.06	0.07	0.06	0.08	



## Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	MW17B	---	---	---	---
			Client sampling date / time	18-MAY-2011 13:40	---	---	---	---
Compound	CAS Number	LOR	Unit	ES1110417-011	---	---	---	---
<b>AC01: Bore Data</b>								
Standing Water Level	----	0.01	m	8.83	---	---	---	---
<b>AC02: Sampling Data</b>								
Purge Type	----	-	-	0	---	---	---	---
<b>AC03: Field Tests</b>								
Electrical Conductivity (Non Compensated)	----	1	µS/cm	1890	---	---	---	---
pH	----	0.01	pH Unit	8.25	---	---	---	---
Temperature	----	0.1	°C	17.1	---	---	---	---
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	8.46	---	---	---	---
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	2350	---	---	---	---
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	---	---	---	---
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.04	---	---	---	---
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	0.8	---	---	---	---
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.08	---	---	---	---
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	---	---	---	---



## Analytical Results

### Descriptive Results

Sub-Matrix: **WATER**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>AC04: Field Observations</b>		
AC04: Appearance	MW1 - 18-MAY-2011 10:50	Clear
AC04: Appearance	MW6 - 18-MAY-2011 11:30	Clear
AC04: Appearance	MW8 - 18-MAY-2011 12:00	Clear
AC04: Appearance	MW10 - 18-MAY-2011 09:30	Clear
AC04: Appearance	MW11 - 18-MAY-2011 10:00	Clear
AC04: Appearance	MW12 - 18-MAY-2011 14:10	Clear
AC04: Appearance	MW13 - 18-MAY-2011 13:00	Clear
AC04: Appearance	MW15 - 18-MAY-2011 12:30	Clear
AC04: Appearance	MW16 - 18-MAY-2011 14:00	Clear
AC04: Appearance	MW17A - 18-MAY-2011 13:20	Clear
AC04: Appearance	MW17B - 18-MAY-2011 13:40	Clear
AC04: Odour	MW1 - 18-MAY-2011 10:50	Nil
AC04: Odour	MW6 - 18-MAY-2011 11:30	Nil
AC04: Odour	MW8 - 18-MAY-2011 12:00	Nil
AC04: Odour	MW10 - 18-MAY-2011 09:30	Nil
AC04: Odour	MW11 - 18-MAY-2011 10:00	Nil
AC04: Odour	MW12 - 18-MAY-2011 14:10	Nil
AC04: Odour	MW13 - 18-MAY-2011 13:00	Nil
AC04: Odour	MW15 - 18-MAY-2011 12:30	Nil
AC04: Odour	MW16 - 18-MAY-2011 14:00	Nil
AC04: Odour	MW17A - 18-MAY-2011 13:20	Nil
AC04: Odour	MW17B - 18-MAY-2011 13:40	Nil
AC04: Colour	MW1 - 18-MAY-2011 10:50	Clear
AC04: Colour	MW6 - 18-MAY-2011 11:30	Clear
AC04: Colour	MW8 - 18-MAY-2011 12:00	Clear
AC04: Colour	MW10 - 18-MAY-2011 09:30	Clear
AC04: Colour	MW11 - 18-MAY-2011 10:00	Clear
AC04: Colour	MW12 - 18-MAY-2011 14:10	Clear
AC04: Colour	MW13 - 18-MAY-2011 13:00	Clear
AC04: Colour	MW15 - 18-MAY-2011 12:30	Clear
AC04: Colour	MW16 - 18-MAY-2011 14:00	Clear
AC04: Colour	MW17A - 18-MAY-2011 13:20	Clear
AC04: Colour	MW17B - 18-MAY-2011 13:40	Clear



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1110289</b>	Page	: 1 of 5
Client	: ACIRL PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Client Services
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 1954	Date Samples Received	: 18-MAY-2011
C-O-C number	: ----	Issue Date	: 26-MAY-2011
Sampler	: BP	No. of samples received	: 7
Site	: ----	No. of samples analysed	: 7
Quote number	: SY/261/10		

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
- Descriptive Results



NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics
James Thompson	Client Services Officer	ACIRL Sampling

**Environmental Division Sydney**  
Part of the **ALS Laboratory Group**

277-289 Woodpark Road Smithfield NSW Australia 2164  
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## 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

- **Field Tests, Field Observations and Flow Observations supplied by ALS ACIRL - Lithgow or Muswellbrook. NATA Accreditation No.15784.**



## Analytical Results

Sub-Matrix: WATER

Client sample ID  
 Client sampling date / time

Compound	CAS Number	LOR	Unit	MW3	MW4	MW5	MW9	MW14
				17-MAY-2011 12:40	17-MAY-2011 14:00	17-MAY-2011 13:30	17-MAY-2011 11:40	17-MAY-2011 11:15
				ES1110289-001	ES1110289-002	ES1110289-003	ES1110289-004	ES1110289-005
<b>AC01: Bore Data</b>								
Standing Water Level	----	0.01	m	----	9.42	7.28	14.1	15.6
Stick up	----	0.01	m	----	----	1.15	1.07	1.07
<b>AC02: Sampling Data</b>								
Purge Type	----	-	-	Tap	Bail	Pump	Pump	Pump
Purge Volume	----	0.01	L	----	----	100	100	100
<b>AC03: Field Tests</b>								
Electrical Conductivity (Non Compensated)	----	1	µS/cm	37	944	2230	781	1080
pH	----	0.01	pH Unit	6.85	7.60	7.05	7.35	7.10
Temperature	----	0.1	°C	20.1	19.0	20.7	21.0	21.0
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.15	7.60	7.11	7.45	7.21
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	70	1130	2690	952	1340
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.18	0.95	2.06	3.21	11.0
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.18	0.95	2.06	3.21	11.0
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.1	0.3	0.3	1.0	1.7
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	0.3	1.2	2.4	4.2	12.7
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.10	0.28	0.01	0.06	0.05
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.02



## Analytical Results

Sub-Matrix: **WATER**

				Client sample ID				
				P1	P2	---	---	---
				17-MAY-2011 12:20	17-MAY-2011 13:00	---	---	---
				Client sampling date / time		---	---	---
Compound	CAS Number	LOR	Unit	ES1110289-006	ES1110289-007	---	---	---
<b>AC01: Bore Data</b>								
Standing Water Level	----	0.01	m	22.7	20.0	---	---	---
Stick up	----	0.01	m	0.92	1.01	---	---	---
<b>AC02: Sampling Data</b>								
Purge Type	----	-	-	Pump	Bail	---	---	---
Purge Volume	----	0.01	L	100	---	---	---	---
<b>AC03: Field Tests</b>								
Electrical Conductivity (Non Compensated)	----	1	µS/cm	1430	970	---	---	---
pH	----	0.01	pH Unit	6.60	7.30	---	---	---
Temperature	----	0.1	°C	22.3	21.0	---	---	---
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	6.81	7.43	---	---	---
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	1790	1210	---	---	---
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	---	---	---
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.01	3.19	---	---	---
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.01	3.19	---	---	---
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	1.1	---	---	---
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	<0.1	4.3	---	---	---
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	<0.01	0.09	---	---	---
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	0.01	---	---	---



## Analytical Results

### Descriptive Results

Sub-Matrix: **WATER**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
<b>AC04: Field Observations</b>		
AC04: Appearance	MW3 - 17-MAY-2011 12:40	Clear
AC04: Appearance	MW4 - 17-MAY-2011 14:00	Clear
AC04: Appearance	MW5 - 17-MAY-2011 13:30	Clear
AC04: Appearance	MW9 - 17-MAY-2011 11:40	Clear
AC04: Appearance	MW14 - 17-MAY-2011 11:15	Clear
AC04: Appearance	P1 - 17-MAY-2011 12:20	Clear
AC04: Appearance	P2 - 17-MAY-2011 13:00	Clear
AC04: Odour	MW3 - 17-MAY-2011 12:40	Nil
AC04: Odour	MW4 - 17-MAY-2011 14:00	Nil
AC04: Odour	MW5 - 17-MAY-2011 13:30	Nil
AC04: Odour	MW9 - 17-MAY-2011 11:40	Nil
AC04: Odour	MW14 - 17-MAY-2011 11:15	Nil
AC04: Odour	P1 - 17-MAY-2011 12:20	Nil
AC04: Odour	P2 - 17-MAY-2011 13:00	Nil
AC04: Colour	MW3 - 17-MAY-2011 12:40	Clear
AC04: Colour	MW4 - 17-MAY-2011 14:00	Clear
AC04: Colour	MW5 - 17-MAY-2011 13:30	Clear
AC04: Colour	MW9 - 17-MAY-2011 11:40	Clear
AC04: Colour	MW14 - 17-MAY-2011 11:15	Clear
AC04: Colour	P1 - 17-MAY-2011 12:20	Clear
AC04: Colour	P2 - 17-MAY-2011 13:00	Clear

**Appendix 6 – Surface Water Monitoring Data.**



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1109992</b>	Page	: 1 of 5
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Client Services
Address	: PO BOX 600 GUNNEDAH NSW, AUSTRALIA 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney@alsglobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK SURFACE-WATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 1935	Date Samples Received	: 13-MAY-2011
C-O-C number	: ----	Issue Date	: 20-MAY-2011
Sampler	: BP	No. of samples received	: 12
Site	: ----	No. of samples analysed	: 12
Quote number	: SY/261/10		

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 Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics

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Part of the **ALS Laboratory Group**

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## 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

- It has been noted that Reactive P is greater than Total P for SB10, however this difference is within the limits of experimental variation.



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB2	SB9	SB10	SD4	SD5
				Client sampling date / time	12-MAY-2011 11:20	12-MAY-2011 10:40	12-MAY-2011 10:20	12-MAY-2011 12:30	12-MAY-2011 12:10
Compound	CAS Number	LOR	Unit	ES1109992-001	ES1109992-002	ES1109992-003	ES1109992-004	ES1109992-005	
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit	8.12	7.95	7.67	7.82	8.21	
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm	545	634	457	281	316	
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L	36	28	17	20	69	
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L	<0.01	0.21	<0.01	<0.01	<0.01	
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L	0.04	4.13	<0.01	<0.01	<0.01	
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	0.04	4.34	<0.01	<0.01	<0.01	
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.0	2.3	0.2	1.2	2.2	
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L	1.0	6.6	0.2	1.2	2.2	
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	<0.01	0.64	0.12	
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.02	0.60	0.07	
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L	<5	<5	<5	<5	<5	



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	VWD1	VWD2	200MLD	QCU	QCD
				Client sampling date / time	12-MAY-2011 11:50	12-MAY-2011 11:00	12-MAY-2011 11:40	12-MAY-2011 13:30	12-MAY-2011 13:50
Compound	CAS Number	LOR	Unit		ES1109992-006	ES1109992-007	ES1109992-008	ES1109992-009	ES1109992-010
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		7.90	7.64	7.81	7.20	7.60
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		1150	1220	1190	376	894
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L		8	14	28	11	6
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		0.04	0.36	0.22	<0.01	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		5.62	15.9	6.35	0.48	0.12
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		5.65	16.3	6.57	0.48	0.12
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		2.1	5.5	3.5	0.3	0.2
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		7.8	21.8	10.1	0.8	0.3
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L		<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	WCU	WCD			
			Client sampling date / time	12-MAY-2011 09:50	12-MAY-2011 09:30	----	----	----
Compound	CAS Number	LOR	Unit	ES1109992-011	ES1109992-012	----	----	----
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.42	8.00	----	----	----
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	1500	1400	----	----	----
<b>EA025: Suspended Solids</b>								
^ Suspended Solids (SS)	----	5	mg/L	6	24	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	4.44	0.61	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	4.44	0.61	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.5	0.4	----	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	5.9	1.0	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	----	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	----	----	----
<b>EP020: Oil and Grease (O&amp;G)</b>								
Oil & Grease	----	5	mg/L	<5	<5	----	----	----

## **Appendix 7 – Surface Water Discharge Monitoring Data**



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1111539</b>	Page	: 1 of 3
Client	: ACIRL PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Client Services
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 2032	Date Samples Received	: 02-JUN-2011
C-O-C number	: ----	Issue Date	: 06-JUN-2011
Sampler	: ----	No. of samples received	: 4
Site	: ----	No. of samples analysed	: 4
Quote number	: SY/261/10		

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



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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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics

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## 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



## Analytical Results

Sub-Matrix: WATER

		Client sample ID		SB2	QCU	QCD	ORICA DAM	----
		Client sampling date / time		01-JUN-2011 07:00	01-JUN-2011 07:30	01-JUN-2011 07:45	01-JUN-2011 09:50	----
Compound	CAS Number	LOR	Unit	ES1111539-001	ES1111539-002	ES1111539-003	ES1111539-004	----
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	8.09	7.37	7.98	7.46	----
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	493	465	830	198	----
<b>EA025: Suspended Solids</b>								
^ Suspended Solids (SS)	----	5	mg/L	20	8	16	494	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01	0.42	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.04	0.56	0.18	9.20	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.04	0.56	0.18	9.62	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.1	0.7	0.6	5.7	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>								
^ Total Nitrogen as N	----	0.1	mg/L	1.1	1.3	0.8	15.3	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.07	0.10	0.17	0.15	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	0.04	0.04	<0.01	----
<b>EP020: Oil and Grease (O&amp;G)</b>								
Oil & Grease	----	5	mg/L	<5	<5	<5	<5	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1112086</b>	<b>Page</b>	: 1 of 3
<b>Client</b>	<b>: ACIRL PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	<b>: A WRIGHT</b>	<b>Contact</b>	: Client Services
<b>Address</b>	<b>: PO BOX 600</b>	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
	<b>  GUNNEDAH NSW, AUSTRALIA 2380</b>		
<b>E-mail</b>	<b>: awright@whitehavencoal.com.au</b>	<b>E-mail</b>	: sydney@alsglobal.com
<b>Telephone</b>	: ----	<b>Telephone</b>	: +61-2-8784 8555
<b>Facsimile</b>	: ----	<b>Facsimile</b>	: +61-2-8784 8500
<b>Project</b>	<b>: WERRIS CREEK DISCHARGE SAMPLES</b>	<b>QC Level</b>	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
<b>Order number</b>	<b>: 2072</b>		
<b>C-O-C number</b>	: ----	<b>Date Samples Received</b>	: 08-JUN-2011
<b>Sampler</b>	<b>: BP</b>	<b>Issue Date</b>	: 10-JUN-2011
<b>Site</b>	: ----		
<b>Quote number</b>	<b>: SY/261/10</b>	<b>No. of samples received</b>	: 3
		<b>No. of samples analysed</b>	: 3

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



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**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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Nanthini Coilparampil	Senior Inorganic Chemist	Sydney Inorganics
Sarah Millington	Senior Inorganic Chemist	Sydney Inorganics

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## 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.

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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.

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- Spike failed for Total P due to matrix interference



## Analytical Results

Sub-Matrix: **WATER**

				Client sample ID	SB9	QCU	QCD		
				Client sampling date / time	07-JUN-2011 15:00	07-JUN-2011 10:00	07-JUN-2011 10:30	----	----
Compound	CAS Number	LOR	Unit		ES1112086-001	ES1112086-002	ES1112086-003	----	----
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		7.72	7.46	8.02	----	----
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		666	461	860	----	----
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L		8	12	12	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		0.15	<0.01	<0.01	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		6.88	0.50	0.13	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		7.04	0.50	0.13	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		2.9	0.6	0.4	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		9.9	1.1	0.5	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		0.09	0.10	0.08	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		<0.01	0.05	0.05	----	----
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L		<5	<5	<5	----	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1112878</b>	Page	: 1 of 3
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Client Services
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK DISCHARGE SAMPLES	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 2117	Date Samples Received	: 17-JUN-2011
C-O-C number	: ----	Issue Date	: 24-JUN-2011
Sampler	: BP	No. of samples received	: 4
Site	: ----	No. of samples analysed	: 4
Quote number	: SY/261/10		

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



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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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Sarah Millington	Senior Inorganic Chemist	Sydney Inorganics



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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

- **EK071G: It has been noted that Reactive P is greater than Total P on sample ID (QCU), however this difference is within the limits of experimental variation.**



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB2	SB9	QCD	QCU	----
				Client sampling date / time	16-JUN-2011 10:15	16-JUN-2011 10:00	16-JUN-2011 11:15	16-JUN-2011 11:45	----
Compound	CAS Number	LOR	Unit		ES1112878-001	ES1112878-002	ES1112878-003	ES1112878-004	----
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		8.17	8.05	8.04	7.44	----
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		510	712	915	479	----
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L		28	<5	18	12	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		<0.01	0.13	<0.01	<0.01	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		0.06	7.26	0.15	0.64	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		0.06	7.39	0.15	0.64	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.7	1.4	0.5	0.3	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		0.8	8.8	0.6	0.9	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		0.09	<0.01	0.07	0.03	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		<0.01	<0.01	0.03	0.04	----
<b>EP020: Oil and Grease (O&amp;G)</b>									
Oil & Grease	----	5	mg/L		<5	<5	<5	<5	----

# ***Werris Creek Coal Mine Community Consultative Committee***

## **Twenty First Meeting of the Committee**

### **Whitehaven Coal Training Room, Werris Creek Coal Mine**

**9:30am Thursday 24<sup>th</sup> November 2011**

## **MINUTES**

Community Consultative Committee (CCC) met at 9:30am prior to the meeting for a pit tour of the mine site however this was postponed until the next meeting due to wet weather.

### **1. Record of Attendance:**

Present: Jill Coleman (Community Representative - Chair); Noel Taylor (Community Representative); Andrew Wright (Environmental Officer WCC and Minute Taker); Col Stewart (Liverpool Plains Shire Council); Ron Van Katwyk (Liverpool Plains Shire Council); Mick Post (Project Manager WCC).

Apologies: Lindsay Bridge (Community Representative), Des George (Manager Mining Engineering WCC).

In the absence of an appointed independent Chairperson, the Community Representatives nominated Jill Coleman as the Chairperson for today's meeting.

### **2. New Matters for Discussion under General Business**

None.

### **3. Matters Arising**

#### **a) Actions from Previous Meeting**

Since the previous meeting, Whitehaven Coal management had met with a prospective candidate as the CCC Chairperson which they subsequently declined. Another candidate has been identified and a meeting will be organized in the near future.

#### **b) Other Matters Arising**

Noel Taylor raised that a couple of Quipolly residents had raised complaints with him. One resident from Taylors Lane had commented that in the last week that noise had been an issue and Noel Taylor said that on Monday 21<sup>st</sup> November 2011 evening that he had thought that the mine had been noisier than usual. Another resident on Paynes Lane had raised that they were receiving excessive coal dust. Andrew Wright said that he will follow up on these issues with the specific residents and formally register the complaints.

Noel Taylor said that he had attended a water sharing plan meeting for Quipolly Creek and the thought that he would share the information with the committee. Currently Quipolly Creek has an allocation of 800ML per annum divided between eight licenses, however over five years the NSW Office of Water want to reduce the total allocation to 73ML per annum. Noel Taylor said that Quipolly irrigators were quite concerned about the proposal.

#### 4. Minutes of Previous Meeting

Minutes of the previous meeting 1<sup>st</sup> September 2011 were accepted as true and accurate representation of business conducted on that day.

*Moved: Jill Coleman. Seconded: Noel Taylor. Motion carried.*

#### 5. Declaration of Pecuniary or other interests

None declared.

#### 6. Environmental Monitoring Report August, September and October 2011

**Meteorology** – August and September were dominated by winter north westerly winds with October dominated by south easterly winds. A total of 160.6mm of rain fell for the three month period.

**Dust** – All PM10 and TSP dust results were within compliance limits for August, September and October. All dust deposition gauge results were below the monthly criteria of 3.6g/m<sup>2</sup>/month except at WC11 “Glenara” which recorded excessive levels due to the recently plowed paddock next to the dust gauge. There was one dust related complaint for the period. A complainant on the 3<sup>rd</sup> August 2011 stated that the mine was in general very dusty and visually intrusive from the road which is affecting the sale of their property in Werris Creek.

**Noise** – There were no noise exceedances during August, September and October. During August, elevated noise levels due to mining operations were recorded at “Kyooma” and “Greenslopes” for the evening period; and “Greenslopes” and “Kurrara St” for the night time period. During September, elevated noise levels were recorded at “Greenslopes” for the evening period and “Kyooma” for the night time period. These elevated noise levels did not result in an exceedance because of the adverse (noise enhancing) weather conditions at the time of monitoring. There were 8 complaints for noise impacts from Werris Creek Coal operations, with 6 complaints from a Quipolly resident and 2 complaints from a Werris Creek resident. The majority of the complaints occurred during adverse weather conditions (temperature inversions or high wind speeds) that could enhance noise levels experience by the complainant. No exceedance of noise criteria was identified because noise levels measured under “enhancing” adverse weather conditions cannot be compared against the noise criteria. Each complaint was thoroughly investigated with meteorological conditions analysed, continuous noise monitoring data and audio reviewed and any mining (and other activities) documented. In addition, WCC has been undertaking specific attended monitoring from Kurrara St, Werris Creek to determine noise levels from operations at the Rail Load-out Facility that have been the source of a number of noise complaints. To date, monitoring has found noise levels to be in compliance and below 35dB(A).

**Blasting** – There were 21 blasts during the period. “Greenslopes” was averaging over 5% of blasts (since April 2011) greater than 115dB(L) due to the two blasts in June however, has now dropped back below 5% during October with no further blasts above 115d(B)L. All blasts over the period complied with maximum license limits (120d(B)L and 10mm/s) with no blast overpressure levels above 115dB(L) or vibration levels over 5mm/s for the three month period. There were 29 complaints from 10 different blasts undertaken by Werris Creek Coal, with the blasts on the 3<sup>rd</sup> August 2011 and 17<sup>th</sup> August receiving 10 complaints and 7 complaints respectively. These two blasts generated higher than normal vibration levels however all results including the Werris Creek monitor were in compliance. Whitehaven Coal is to review the recommendations from three blast investigations reports to determine if improvements to practices are required.

**Groundwater** – Groundwater levels generally decreased and the pH increased during the period due to the drier prevailing conditions since the start of the year. Groundwater levels at the start of the year were at record levels due to 2010 being a wet year. Mining continues not to impact on groundwater aquifers.

**Surface Water** – All onsite and offsite water quality is consistent with longer term averages and within the site water management plan trigger values. All surface water discharge results were within WCC Environmental Protection Licence 12290 criteria and there were no impacts on water quality monitored in Quipolly and Werris Creeks' catchments as a result of the discharge events.

**Complaints** – There were 39 complaints received during the period with the details summarized below. From the 39 complaints, there were 29 issues raised related to blasting; 8 issues related to noise, four issues with lights, one issue with dust and one related to coal spillage. There were 20 different complainants during the period with 7 complaints from one Werris Creek resident and 6 complaints from a Quipolly resident.

Motion moved to accept the Environmental Monitoring Report for August, September and October 2011.

*Moved: Ron Van Katwyk. Seconded: Noel Taylor. Motion Carried.*

## **7. General Business**

### **a. WCC Life of Mine Project Environmental Assessment Update**

On 25<sup>th</sup> October 2011, Department of Planning and Infrastructure approved MP10\_0059 for the WCC Life Of Mine Project. WCC are waiting to receive other approvals prior to advancing mining operations northwards. Andrew Wright committed to providing more detail on the mine plan and biodiversity offset area for the next CCC meeting.

### **b. "History of Coal Mining at Werris Creek" Booklet**

Andrew Wright provided CCC members with a revised draft of the "History of Coal Mining at Werris Creek" Booklet. CCC members were happy with the revised version which is easier to read than the previous version.

### **c. Werris Creek Coal Website**

Information on Werris Creek Coal including environmental and CCC documents are available on the Whitehaven Coal website under Environment and Werris Creek or at this link [http://www.whitehavencoal.com.au/operations/werris\\_creek\\_mine\\_environmental\\_management.cfm](http://www.whitehavencoal.com.au/operations/werris_creek_mine_environmental_management.cfm).

### **d. Quirindi Train Dust Monitoring**

Werris Creek Coal have established six dust deposition gauges at 13m, 20m and 30m east and west of the rail line in Quirindi. Monitoring results have only recently become available and will be included in future Environmental Monitoring Reports.

**Meeting Closed 10:30am.**

**Next Meeting was scheduled for Thursday 23<sup>rd</sup> February 2012.**

### **Copy to:**

Jill Coleman	Community Representative
Noel Taylor	Community Representative
Lindsay Bridge	Community Representative

Colin Phillips	DoP	Casper Dieben	Werris Creek Coal
Michael Lloyd	I&I NSW	Brian Cullen	Werris Creek Coal
Ron Van Katwyk	LPSC	Danny Young	Werris Creek Coal
Cr Col Stewart	LPSC	Mick Post	Werris Creek Coal
		Des George	Werris Creek Coal
		Andrew Wright	Werris Creek Coal



**WERRIS CREEK COAL PTY LTD**

**QUARTERLY ENVIRONMENTAL MONITORING  
REPORT**

**August, September and October 2011**

This Environmental Monitoring Report covers the period 1<sup>st</sup> August 2011 to 31<sup>st</sup> October 2011 for the Werris Creek No.2 Coal Mine Community Consultative Committee.

The report includes environmental monitoring results from the on-site Weather Station, Air Quality, Noise, Blasting, Surface Water, Groundwater and Discharge Water Quality together with any community complaints received and general details on site environmental matters.

**Note:** Monitoring results with any non compliance of monitoring criteria are highlighted in **yellow**.

## CONTENTS

<b>1.0</b>	<b>METEOROLOGY.....</b>	<b>3</b>
1.1	WEATHER STATION AVAILABILITY .....	3
<b>2.0</b>	<b>AIR QUALITY .....</b>	<b>3</b>
2.1	HVAS (PM10) .....	3
2.1.1	Monitoring Data Results .....	3
2.1.2	Discussion - Compliance / Non Compliance .....	4
2.2	DEPOSITED DUST .....	4
2.2.1	Monitoring Data Results .....	4
2.2.2	Discussion - Compliance / Non Compliance .....	4
2.3	AIR QUALITY COMPLAINTS .....	4
<b>3.0</b>	<b>NOISE.....</b>	<b>5</b>
3.1	OPERATIONAL NOISE.....	5
3.1.1	Monitoring Data Results .....	5
3.1.2	Discussion - Compliance / Non Compliance .....	6
3.2	NOISE COMPLAINTS .....	6
<b>4.0</b>	<b>BLAST .....</b>	<b>6</b>
4.1	BLAST MONITORING .....	7
4.1.1	Monitoring Data Results .....	7
4.1.2	Discussion - Compliance / Non Compliance .....	7
4.2	BLAST COMPLAINTS .....	7
<b>5.0</b>	<b>WATER.....</b>	<b>7</b>
5.1	GROUND WATER.....	7
5.1.1	Monitoring Data Results .....	8
5.1.2	Discussion - Compliance / Non Compliance .....	8
5.2	SURFACE WATER .....	8
5.2.1	Monitoring Data Results .....	8
5.2.2	Discussion - Compliance / Non Compliance .....	8
5.3	SURFACE WATER DISCHARGES .....	8
5.3.1	Monitoring Data Results .....	8
5.3.2	Discussion - Compliance / Non Compliance .....	9
5.3	WATER COMPLAINTS.....	9
<b>6.0</b>	<b>COMPLAINTS SUMMARY.....</b>	<b>9</b>
<b>7.0</b>	<b>GENERAL .....</b>	<b>11</b>

## APPENDICES

Appendix 1.....	Dust Monitoring Results – PM10
Appendix 2.....	Dust Monitoring Results – Deposited Dust
Appendix 3.....	Noise Monitoring Results
Appendix 4.....	Blasting Monitoring Results
Appendix 5.....	Groundwater Monitoring Results
Appendix 6.....	Surface Water Monitoring Results
Appendix 7.....	Discharge Monitoring Results

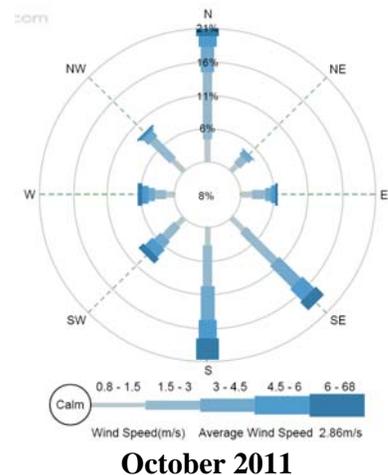
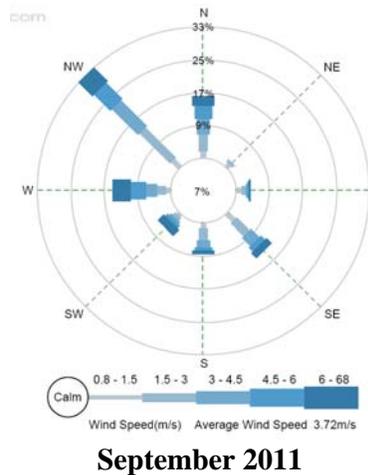
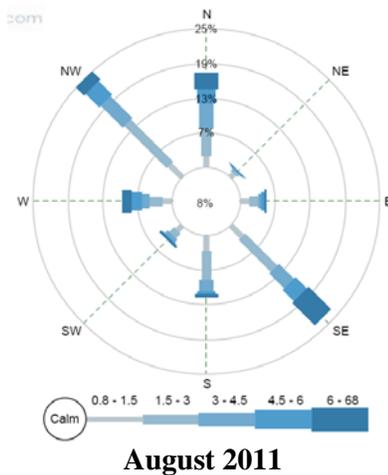
## 1.0 METEOROLOGY

### 1.1 WEATHER STATION

WCC collects meteorological data from the onsite weather station located on the top level of the overburden emplacement and from the continuous noise monitoring trailer located in the Quipolly Valley for August and September and at “Kyooma” for October. The following table summarises temperature, inversion and rainfall data for the last three months and wind data is presented below in windroses.

Month	Temp (°C) Trailer			Temp (°C) 10m Onsite			Lapse Rate (°C/100m)		Rainfall (mm)		
	Min	Avg	Max	Min	Avg	Max	Avg	90%	Onsite	Trailer	Annual*
August	-1.9	10.1	23.7	3.8	12.7	23.3	2.9	8.9	31.2	25.2	155.8
September	-1.0	12.8	29.2	4.6	15.3	28.0	+2.7	+9.3	65.6	61.2	237.2
October	1.2	17.0	29.0	6.8	16.9	29.1	-4.9	+3.0	77.8	34.6	316.4

\* Annual cumulative total since April 2011 for onsite Weather Station



The onsite weather station was fully available during the period.

## 2.0 AIR QUALITY

### 2.1 HVAS (PM10)

High Volume Air Sample (HVAS) monitoring for particulate matter less than 10 micron in size (PM10) and total suspended particulate (TSP) matter is conducted at five sites listed below.

- WCHV1 – “Cintra” PM10
- WCHV2 – “Tonsley Park” PM10
- WCHV3 – “Railway View” PM10
- WCHV4 – “Eurunderee” PM10
- WCHV5 – “Railway View” TSP

Sampling is scheduled for 24 hours every 6 days in accordance with Department of Environment, Climate Change and Water (DECCW) guidelines and results are reported as micro grams per cubic metre ( $\mu\text{g}/\text{m}^3$ ) of air sampled.

#### 2.1.1 Monitoring Data Results

The monthly average results for the last three months are provided in the table below; however see HVAS monitoring data under **Appendix 1** for individual results.

Monitor Location	August ( $\mu\text{g}/\text{m}^3$ )	September ( $\mu\text{g}/\text{m}^3$ )	October ( $\mu\text{g}/\text{m}^3$ )	Annual ( $\mu\text{g}/\text{m}^3$ )	Criteria ( $\mu\text{g}/\text{m}^3$ )
WCHV1	13.7	20.3	17.5	21.3	30
WCHV2	9.2	17.6	13.5	16.8	30
WCHV3	13.1	24.2	16.8	23.1	30
WCHV4	10.0	17.2	10.0	12.1	30
WCHV5	37.8	50.8	36.3	58.1	90

### 2.1.2 Discussion - Compliance / Non Compliance

The daily and monthly averages for August, September and October were all within the compliance limit. A regional dust event (not related to WCC) on 23<sup>rd</sup> September 2011 resulted in all HVAS to record elevated results.

The annual PM10 sites averages are below the long term impact annual criteria of  $30\mu\text{g}/\text{m}^3$ .

The TSP site is below the long term impact annual criteria of  $90\mu\text{g}/\text{m}^3$ .

## 2.2 DEPOSITED DUST

Deposited dust monitoring is for particulate matter generally greater than 30 micron in size which readily settles out of the air and is monitored at seven locations.

- WC2 – “Cintra”
- WC5 – “Railway View”
- WC7 – “Tonsley Park”
- WC8 – “Plain View”
- WC9 – “Marengo”
- WC10 – “Mountain View”
- WC11 – “Glenara”

Sampling is scheduled monthly in accordance with DECCW guidelines and results are reported as grams per metre squared per month ( $\text{g}/\text{m}^2/\text{month}$ ).

### 2.2.1 Monitoring Data Results

The results for the last three months are provided in the table below; however **Appendix 2** has more information on Deposited Dust Monitoring Results.

Monitor Location	August ( $\text{g}/\text{m}^2/\text{month}$ )	September ( $\text{g}/\text{m}^2/\text{month}$ )	October ( $\text{g}/\text{m}^2/\text{month}$ )	Annual ( $\text{g}/\text{m}^2/\text{month}$ )	Criteria ( $\text{g}/\text{m}^2/\text{month}$ )
WC2	0.8	1.5	1.1	1.7	3.6
WC5	0.9	1.4	1.2	1.2	3.6
WC7	0.4	1.2	0.9	0.5	3.6
WC8	1.1	1.4	0.5	0.9	3.6
WC9	0.5	0.5	0.8	0.4	3.6
WC10	0.5	0.5	0.8	0.9	3.6
WC11	c20.0	c19.8	1.0	0.7	3.6

c - sample contaminated with dust from a non-mining source and is excluded from the average

### 2.2.2 Discussion - Compliance / Non Compliance

All dust deposition gauge results were within the monthly criteria of  $3.6\text{g}/\text{m}^2/\text{month}$ . The August and September results for WC11 “Glenara” recorded excessive dust deposition results due to the plowing in an adjacent paddock to the gauge.

## 2.3 AIR QUALITY COMPLAINTS

There was one dust related complaints for the period. A complainant on the 3<sup>rd</sup> August 2011 stated that the mine was in general very dusty and visually intrusive from the road affecting the sale of their property in Werris Creek. Specific actions taken in relation to this complaint is outlined in **Section 6**.

### 3.0 NOISE

#### 3.1 OPERATIONAL NOISE

Monthly attended noise monitoring undertaken at the following locations:

- “Almawille” (private agreement);
- “Glenara” (private agreement);
- “Tonsley Park” (private agreement);
- “Railway Cottage”;
- “Greenslopes”;
- “Kyooma” (private agreement);
- Punyarra St, Werris Creek; and
- Kurrara St, Werris Creek.

Three sets of measurements are made at each location; one during the day time period (before 6pm); one during the evening period (from 6pm – 10pm) and one at night (after 10pm).

The noise emission criterion for WCC is 35dB(A) unless otherwise subject to a current, legally binding agreement between WCC and the occupant of the affected residential property.

WCC environmental protection licence (EPL) conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where wind speeds are greater than 3m/s and/or there is a temperature inversion greater than +3°C/100m.

##### 3.1.1 Monitoring Data Results

The results for the last three months attended noise monitoring are outlined below for noise levels from Werris Creek Coal operations only (not ambient noise); however see Monthly Noise Monitoring Reports under **Appendix 3** for more detail.

Thursday 11<sup>th</sup> & Friday 12<sup>th</sup> August 2011

Location	Day	Evening	Night	Criteria
“Almawille”*	*Inaudible	*Inaudible#	*27#	35 dB(A) $L_{eq}$ 15min
“Glenara”*	*<30	*Inaudible#	*29#	35 dB(A) $L_{eq}$ 15min
“Railway Cottage”	30#	Inaudible	28#	35 dB(A) $L_{eq}$ 15min
“Tonsley Park”*	*Inaudible#	*34#	*32#	35 dB(A) $L_{eq}$ 15min
“Greenslopes”	Barely audible#	<b>42#</b>	<b>38#</b>	35 dB(A) $L_{eq}$ 15min
“Kyooma”*	*28#	<b>*40#</b>	*35#	35 dB(A) $L_{eq}$ 15min
Kurrara St	33	34#	<b>38#</b>	35 dB(A) $L_{eq}$ 15min
Punyarra St	Inaudible#	30#	35#	35 dB(A) $L_{eq}$ 15min
Rail Spur	NM			55 dB(A) $L_{eq}$ 24hr
	NM			80 dB(A) $L_{MAX}$

\* - Project Related Property or Private Agreement; Yellow Bold – Elevated noise; # - Temperature Inversion >3°C/100m or Wind Speed >3m/s; NM – Not monitored

Wednesday 14<sup>th</sup> & Thursday 15<sup>th</sup> September 2011

Location	Day	Evening	Night	Criteria
“Almawille”*	*<25#	*32#	*32#	35 dB(A) $L_{eq}$ 15min
“Glenara”*	*barely audible#	*33#	*33#	35 dB(A) $L_{eq}$ 15min
“Railway Cottage”	Inaudible#	32#	Inaudible#	35 dB(A) $L_{eq}$ 15min
“Tonsley Park”*	*Inaudible#	*31#	*Inaudible#	35 dB(A) $L_{eq}$ 15min
“Greenslopes”	Inaudible#	<b>36#</b>	31#	35 dB(A) $L_{eq}$ 15min
“Kyooma”*	*<30#	*32#	<b>*41#</b>	35 dB(A) $L_{eq}$ 15min
Kurrara St	Inaudible#	32#	30#	35 dB(A) $L_{eq}$ 15min
Punyarra St	Inaudible#	Inaudible#	30#	35 dB(A) $L_{eq}$ 15min
Rail Spur	NM			55 dB(A) $L_{eq}$ 24hr
	NM			80 dB(A) $L_{MAX}$

\* - Project Related Property or Private Agreement; Yellow Bold – Elevated noise; # - Temperature Inversion >3°C/100m or Wind Speed >3m/s; NM – Not monitored

Monday 31<sup>st</sup> October & Tuesday 1<sup>st</sup> November 2011

Location	Day dB(A) L <sub>eq</sub> 15min	Criteria dB(A) L <sub>eq</sub>	Evening dB(A) L <sub>eq</sub>	Night dB(A) L <sub>eq</sub>	Criteria dB(A) L <sub>eq</sub>
		15min	15min	15min	15min
"Rosehill" R5	Inaudible#	35	Inaudible#	Inaudible	35
West Quipolly (R7, R8*, R9 & R22)	Inaudible#	37/36 <sup>1</sup>	Inaudible#	29	37/36 <sup>1</sup>
Central Quipolly (R10*, R11*)	Inaudible#	39	Inaudible#	<20	39
"Hazeldene" R24	Inaudible#	37	Inaudible#	Inaudible#	37
"Railway Cottage" R12	Inaudible#	38	Inaudible#	Inaudible#	38
"Talavera" R96	<30	38	Inaudible#	24#	37
"Kyooma" R98*	Barely Audible	36	Barely Audible#	23#	36
Kurrara St, WC	30	35	Inaudible	30#	35
Coronation Ave, WC	Inaudible	35	Inaudible	25#	35
"Greenslopes" R14	34	39	34	33#	39
South St, WC (R20*, R21*)	Inaudible#	39	30	34#	37
West St, WC (R103, R105, R3, R102, R101)	Inaudible#	35	Inaudible	Inaudible#	35
Rail Spur	NM				55 dB(A) L <sub>eq</sub> 24hr
	NM				80 dB(A) L <sub>MAX</sub>

WC – Werris Creek; \* - Project Related Property or Private Agreement; Yellow Bold – Elevated noise; # - Adverse weather with wind >3m/s; NM – Not monitored; 1 – R22 criteria is 36 dB(A) L<sub>eq</sub> 15min while R7, R8 and R9 is 37 dB(A) L<sub>eq</sub> 15min

### 3.1.2 Discussion - Compliance / Non Compliance

There were no noise exceedances during August, September and October. During August, elevated noise levels due to mining operations were recorded at "Kyooma" and "Greenslopes" for the evening period; and "Greenslopes" and "Kurrara St" for the night time period. During September, elevated noise levels were recorded at "Greenslopes" for the evening period and "Kyooma" for the night time period. These elevated noise levels did not result in an exceedance because of the adverse (noise enhancing) weather conditions at the time of monitoring.

On 25<sup>th</sup> October 2011, Department of Planning and Infrastructure approved PA10\_0059 for the WCC Life Of Mine Project which outlines revised noise criteria for a number of existing and new properties to be monitored for noise. For the October attended monitoring, the program was expanded from 8 locations to include 12 monitoring locations representative of 21 adjacent properties with the monitoring results and criteria outlined above.

### 3.2 NOISE COMPLAINTS

There were 8 complaints for noise impacts from Werris Creek Coal operations, with 6 complaints from a Quipolly resident and 2 complaints from a Werris Creek resident. The majority of the complaints occurred during adverse weather conditions (temperature inversions or high wind speeds) that could potentially enhancing noise levels experience by the complainant. No exceedance of noise criteria was identified because noise levels measured under "enhancing" adverse weather conditions cannot be compared against the noise criteria. Each complaint was thoroughly investigated with meteorological conditions analysed, continuous noise monitoring data and audio reviewed and any mining (and other activities) documented. In addition, WCC has been undertaking specific attended monitoring from Kurrara St, Werris Creek to determine noise levels from operations at the Rail Load-out Facility that have been the source of a number of noise complaints. To date, monitoring has found noise levels to be in compliance below 35dB(A). Specific actions taken in relation to these complaints are outlined in **Section 6**.

## 4.0 BLAST

Blast monitoring is undertaken at "Glenala", "Talavera", "Werris Creek", "Tonsley Park", "Greenslopes" and "Cintra". Compliance limits for blasting overpressure is 115dBL (and up to 120dBL for only 5% of blasts) and vibration is 5mm/s (and up to 10mm/s for only 5% of blasts). During the period a total of 21 blasts were fired by the blasting contractor, Orica Mining Services.

## 4.1 BLAST MONITORING

### 4.1.1 Monitoring Data Results

The summary tables of blasting results over the last three months are provided below; however see blasting results database under **Appendix 4** for more detail.

August	"Glenala"		"Greenslopes"		"Tonsley Park"		"Cintra"*		Werris Creek		"Talavera"	
	mm/s	dB(L)	mm/s	dB(L)	mm/s	mm/s	dB(L)	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average	NM	NM	0.91	86.7	1.03	98.4	1.65	104.3	0.79	98.0	0.54	94.3
Monthly Maximum	NM	NM	1.62	101.7	1.98	104.8	3.75	110.0	0.94	103.3	0.55	105.5
Annual Average	<0.37	<109.9	0.56	102.9	0.71	101.3	0.98	107.5	0.55	101.6	0.54	94.3
Criteria	5	115	5	115	5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	0%	0%	0%	5.7%	0%	0%	0%	5.6%	0%	0%	0%	0%
# Triggered this Month	0/0		5/5		8/8		8/8		3/8		2/3	

September	"Glenala"		"Greenslopes"		"Tonsley Park"		"Cintra"*		Werris Creek		"Talavera"	
	mm/s	dB(L)	mm/s	dB(L)	mm/s	mm/s	dB(L)	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average	NM	NM	1.58	100.9	1.08	98.4	2.31	104.0	0.62	99.1	0.47	111.0
Monthly Maximum	NM	NM	2.19	111.6	1.69	104.5	3.47	108.2	0.89	106.6	0.47	111.0
Annual Average	<0.37	<109.9	0.73	102.6	0.77	100.8	1.22	106.9	0.57	100.7	0.50	102.6
Criteria	5	115	5	115	5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	0%	0%	0%	5.1%	0%	0%	0%	5.1%	0%	0%	0%	0%
# Triggered this Month	0/0		4/4		4/4		3/3		4/4		1/1	

October	"Glenala"		"Greenslopes"		"Tonsley Park"		"Cintra"*		Werris Creek		"Talavera"	
	mm/s	dB(L)	mm/s	dB(L)	mm/s	mm/s	dB(L)	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average	NM	NM	0.75	93.9	0.78	103.1	1.24	108.9	0.30	99.5	0.67	102.2
Monthly Maximum	NM	NM	1.24	113.3	1.25	106.3	1.65	110.6	0.44	103.3	0.67	102.2
Annual Average	<0.37	<109.9	0.68	101.1	0.77	101.3	1.16	107.3	0.49	100.3	0.56	102.5
Criteria	5	115	5	115	5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	0%	0%	0%	4.2%	0%	0%	0%	4.7%	0%	0%	0%	0%
# Triggered this Month	0/0		5/7		5/7		3/3		4/7		1/4	

\* Indicates project related properties not subject to blasting criteria; Yellow Highlight – Elevated result.

### 4.1.2 Discussion - Compliance / Non Compliance

"Greenslopes" was averaging over 5% of blasts (since April 2011) greater than 115dB(L) due to the two blasts in June however, has now dropped back below 5% during October with no further blasts above 115dB(L). All blasts over the period complied with maximum license limits (120dB(L) and 10mm/s) with no blast overpressure levels above 115dB(L) or vibration levels over 5mm/s for the three month period.

A number of blast monitors did not trigger during the period due to the overpressure and/or vibration levels from the blast being below the trigger level of the monitor. No blasts were missed.

## 4.2 BLAST COMPLAINTS

There were 29 complaints from 10 different blasts undertaken by Werris Creek Coal, with the blasts on the 3<sup>rd</sup> August 2011 and 17<sup>th</sup> August receiving 10 complaints and 7 complaints respectively. These two blasts generated higher than normal vibration levels however all results including the Werris Creek monitor were in compliance. Whitehaven Coal is to review the recommendations from three blast investigations reports to determine if improvements to practices are required. Specific actions taken for all blasting complaints are outlined in **Section 6**.

## 5.0 WATER

The quarterly groundwater quality monitoring was undertaken on 12<sup>th</sup> and 13<sup>th</sup> September 2011. Surface Quarterly surface water monitoring was undertaken on 18<sup>th</sup> August 2011. There were four surface water discharge events during the period.

### 5.1 GROUND WATER

Groundwater monitoring is undertaken to monitor if there are any impacts on groundwater quality and levels as a result of the mining operations. Werris Creek Coal monitor 41 groundwater bores and piezometers in the

vicinity of the mine, with the key aquifers being Quipolly Creek Alluvium (MW12 upstream and MW7 downstream) and Werrie Basalt (MW5 south and MW14 north).

### 5.1.1 Monitoring Data Results

Brief summary of groundwater monitoring results is provided below with detailed monitoring data outlined in Appendix 5.

Site	pH	EC	Dip	Change from Previous Quarter
<b>Quipolly Creek Alluvium</b>				
MW7	7.36	603	4.29	Groundwater level rose 0.04m, pH rose 0.07 and EC increased 38.
MW12	7.52	468	6.13	Groundwater level dropped 1.21m, pH rose 0.04 and EC decreased 29.
<b>Werrie Basalt</b>				
MW5	7.80	1730	7.66	Groundwater level dropped 0.38m, pH rose 0.69 and EC decreased 960.
MW14	7.21	1340	15.60	Groundwater level dropped 0.53m, pH rose 0.35 and EC decreased 150.

### 5.1.2 Discussion - Compliance / Non Compliance

Groundwater levels generally decreased and the pH increased during the period due to the drier prevailing conditions since the start of the year. Groundwater levels at the start of the year were at record levels due to 2010 being a wet year. Mining continues not to impact on groundwater aquifers.

## 5.2 SURFACE WATER

Surface water monitoring is undertaken at key dirty and void water dams to monitor for potential contamination issues due to mining while the water is still onsite.

### 5.2.1 Monitoring Data Results

Summary of surface water quality monitoring results is provided below with detailed monitoring data outlined in Appendix 6.

Site	pH	EC	TSS	O&G	Change
<b>ONSITE</b>					
SB2	-	-	-	-	Dry – Not Sampled.
SB9	9.19	681	7	<5	Water level very low. pH rose 1.24, EC rose 47, TSS dropped 21, O&G no change.
SB10	8.00	416	70	<5	pH rose 0.33, EC dropped 41, TSS increased 63, O&G no change.
<b>OFFSITE</b>					
QCU	7.76	442	18	<5	pH rose 0.56, EC rose 66, TSS rose 11, O&G no change.
QCD	8.05	869	16	<5	pH rose 0.45, EC dropped 25, TSS rose 10, O&G no change.
WCU	8.01	1410	<5	<5	pH rose 0.59, EC dropped 90, TSS & O&G no change.
WCD	8.41	1370	26	<5	pH rose 41, EC dropped 30, TSS & O&G negligible change.

### 5.2.2 Discussion - Compliance / Non Compliance

All onsite and offsite water quality is consistent with longer term averages and within the site water management plan trigger values.

## 5.3 SURFACE WATER DISCHARGES

### 5.3.1 Monitoring Data Results

There were was one wet weather discharge event and three controlled discharge events during the period. A summary of discharge monitoring results is provided below with detailed monitoring data outlined in Appendix 7.

Date	Site	pH	EC	TSS	O&G	Compliance	Type
27/9/2011	SB9	8.16	683	6	<5	Water quality within compliance	Controlled
16/10/2011	SB9	7.72	658	6	<5	Water quality within compliance	Wet Weather
18/10/2011	SB9	7.77	641	16	<5	Water quality within compliance	Controlled
25/10/2011	SB10	7.43	352	<5	<5	Water quality within compliance	Controlled
<b>Criteria</b>		<b>8.5</b>	<b>N/A</b>	<b>50</b>	<b>10</b>		

### 5.3.2 Discussion - Compliance / Non Compliance

All surface water discharge results were within WCC Environmental Protection Licence 12290 criteria and there were no impacts on water quality monitored in Quipolly and Werris Creeks' catchments as a result of the discharge events.

### 5.3 WATER COMPLAINTS

There were no water related complaints during the period.

### 6.0 COMPLAINTS SUMMARY

There were 39 complaints received during the period with the details summarized below. In total there were 29 issues related to blasting; 8 issues related to noise, four issues with lights, one issue with dust and one related to coal spillage. There were 20 different complainants during the period with 7 complaints from one Werris Creek resident and 6 complaints from a Quipolly resident.

#	Date	Complainant	Complaint	Investigation	Action Taken
157	2/8/2011 10:15pm	L Quipolly	The trains and mine were very noisy tonight 2 <sup>nd</sup> August 2011 as well as last night 1 <sup>st</sup> August 2011.	Dump location was the centre of RL430m dump. Adverse weathers conditions could have enhanced mining noise levels towards Quipolly but not applicable against compliance criteria. Continuous noise monitor recorded elevated noise levels with mining noise a major component.	No other dump options so OCE instructed truck operators to keep revs below 1500 rpm. The continuous noise monitor is stationed at complainant's residence "Hazeldene". Written response to complainant provided.
158	3/8/2011 10:45am	T Werris Creek	The mine is in general very dusty and visually intrusive from the road and the dust some mornings causes a haze over the top of the mine.	No specific dates provided so no investigation undertaken.	A letter response will be provided to the complainant outlining rehabilitation and dust monitoring programs and results.
159 to 168	3/8/2011 Various	OEH/ Various (10 Werris Creek residents)	Blast #51 (S10_12-13_GCoal) was fired at 13:24 on 3 <sup>rd</sup> August 2011 in Strip 10 in the bottom of the pit resulted in higher than normal vibration causing excessive shaking of houses.	Blast performed as designed. Weather conditions did not enhance overpressure effects of the blast. Blast monitoring results were in compliance at all community monitors.	Written response to OEH and complainant provided. Several investigations into blasting practices launched by Orica and Whitehaven Coal. EO to inspect alleged house defects.
169	9/8/2011 8:30am	A Werris Creek	Lights shining into her backyard on Friday night 5 <sup>th</sup> August 2011 up until 11:30pm but by 12am they appeared to have been redirected in pit.	The Light camera on Friday night all night a light source moving around and varying in intensity. OCE Lighting Plant Set Up and Inspection form confirms that the lighting plant was set up correctly on the RL430m dump. Probable source of light was dozers working at the dump face.	Operators to confirm that lights are set up correctly on dozers. Written response to complainant provided.
170 to 175, 177	17/8/2011 Various	Various (7 Werris Creek residents)	Blast #55 (S10_14-15_GCoal) was fired at 10:39 on 17 <sup>th</sup> August 2011 in Strip 10 in the bottom of the pit resulted in higher than normal vibration causing excessive shaking of houses.	Blast performed as designed. Weather conditions did not enhance overpressure effects of the blast. Blast monitoring results were in compliance at all community monitors.	Written response to complainant provided. Several investigations into blasting practices launched by Orica and Whitehaven Coal. EO to inspect alleged house defects.
176	17/8/2011 8:23pm	L Quipolly	The mine is very noisy tonight 17 <sup>th</sup> August 2011 as well as the previous nights 15 <sup>th</sup> /16 <sup>th</sup> August 2011.	Dump location was the centre of RL430m dump. Adverse weathers conditions could have enhanced mining noise levels towards Quipolly but not applicable against compliance criteria. Continuous noise monitor recorded elevated noise levels with mining noise a major component.	PM & OCE relocated dump to RL300m in pit. The continuous noise monitor is stationed at complainant's residence "Hazeldene". Written response to complainant provided.
178	24/8/2011 9:33pm	L Quipolly	The mine is very noisy tonight 24 <sup>th</sup> August 2011 and that the mine might be able to do something about it.	Dump location was the centre of RL430m dump. Adverse weathers conditions could have enhanced mining noise levels towards Quipolly but not applicable against compliance criteria. Continuous noise monitor recorded elevated noise levels with mining noise a major component.	OCE relocated dump to RL360m in pit. The continuous noise monitor is stationed at complainant's residence "Hazeldene". Written response to complainant provided.

179	29/8/2011 7:45pm	L Quipolly	The mine is very noisy tonight 29 <sup>th</sup> August 2011.	Dump location was in pit to RL360m dump. Adverse weathers conditions could have enhanced mining noise levels towards Quipolly but not applicable against compliance criteria. Continuous noise monitor recorded elevated noise levels with mining noise a major component.	OCE requested Coal trucks to minimise revs to 1500 rpm when tipping off. The continuous noise monitor is stationed at complainant's residence "Hazeldene". Written response to complainant provided.
180	30/8/2011 3:46pm	U Werris Creek	Blast #58 (S10_16_GCoal) was fired at 15:42 on 30 <sup>th</sup> August 2011 in Strip 10 in the bottom of the pit resulted in higher than normal vibration causing excessive shaking of house.	Blast performed as designed. Weather conditions could have enhanced overpressure effects of the blast. Blast monitoring results were in compliance at all community monitors.	Written response to complainant provided. Several investigations into blasting practices launched by Orica and Whitehaven Coal. EO to inspect alleged house defects.
181 & 182	12/9/2011 Various	O & OEH/A Werris Creek	Blast #59 (S10_12_GCoal) was fired at 13:09 on 12 <sup>th</sup> September 2011 in Strip 10 in the bottom of the pit resulted in higher than normal vibration causing excessive shaking of house.	Blast performed as designed. Weather conditions were unlikely to enhance overpressure effects of the blast. Blast monitoring results were in compliance at all community monitors.	Written response to complainants provided. Several investigations into blasting practices launched by Orica and Whitehaven Coal.
183 & 184	16/9/2011 Various	L & M Quipolly	Blast #60 (S10_7-11_GCoal) was fired at 13:18 on 16 <sup>th</sup> September 2011 in Strip 10 in the bottom of the pit resulted in higher than normal vibration causing excessive shaking of house.	Blast performed as designed. Weather conditions could have enhanced overpressure effects of the blast. Blast monitoring results were in compliance at all community monitors.	Written response to complainants provided. Several investigations into blasting practices launched by Orica and Whitehaven Coal.
185 to 187	21/9/2011 Various	Anonymous, V & W Werris Creek	Blast #61 (S11_9-10_385) was fired at 14:10 on 21 <sup>st</sup> September 2011 in Strip 11 in the upper horizon of the pit resulted in higher than normal vibration causing excessive shaking of house.	Blast performed as designed. Weather conditions were unlikely to enhance overpressure effects of the blast. Blast monitoring results were in compliance at all community monitors.	Written response to complainants provided. Several investigations into blasting practices launched by Orica and Whitehaven Coal.
188	20/9/2011 10:00am	A/OEH Werris Creek	Rail Load Out was loud from 10:15pm to 12am and noisy until 3:30am on 20 <sup>th</sup> September 2011. Rail Load Out lights flashed all over the place at 2:40am on 20 <sup>th</sup> September 2011. On 16 <sup>th</sup> September 2011 at 11am, coal from truck "M21" fell onto Werris Creek Road in front of their vehicle.	One train loaded between 7pm and 9pm. South westerly wind and temperature inversion likely to enhance noise propagation to Werris Creek. Adverse weather conditions not applicable against compliance criteria. Lighting camera did not identify any lights from open cut on 20 <sup>th</sup> September and lighting plants set up to the west at Rail Load Out, dozers on stockpile were the only potential source of light. Based on the information provided by Mountain Industries, it is unlikely that coal could spill from the trailer of "M21" on 16 <sup>th</sup> September 2011, WCC was not able to confirm whether coal was actually spilled or not.	Written response to complainant provided. Mountain Industries to review induction and work method statement to strengthen tarping and cleaning off hang up coal procedures and haul route via Taylors Lane.
189	14/10/2011 10:02am	OEH/ Anonymous	Blast #66 (S11_11-14_Aseam) was fired at 13:09 on 13 <sup>th</sup> October 2011 was louder than normal.	All blast results were in compliance with blasting criteria and performed as designed. The weather conditions were unlikely to enhance overpressure effects of the blast towards Werris Creek.	Written response to OEH provided.
190	17/10/2011 9:47am	OEH/ Anonymous	Complainant alleged to OEH that a blast on either 11 <sup>th</sup> or 12 <sup>th</sup> October 2011 broke the windows of his step fathers home	WCC did not blast on 11 <sup>th</sup> or 12 <sup>th</sup> October 2011. Given the low levels of the blasts on 10 <sup>th</sup> and 13 <sup>th</sup> October, they were unlikely to have caused any windows to break.	Written response to OEH provided.
191	24/10/2011 9:47pm	L Quipolly	Complainant indicated that the mine was noisy tonight (Monday night 24 <sup>th</sup> October 2011) for the first time in many weeks. The noise wasn't unbearable but significantly noisier than last week.	Based on current in-pit blasted overburden inventory, the location of excavators and the in-pit dump location represents the "quietest" available configuration for mining operations. The prevailing northerly winds would have enhanced noise emissions towards the complainant's residence. The noise levels measured under adverse weather conditions (high winds) are not subject to noise criteria.	Letter response will be provided to the complainant.
192	25/10/2011 9:10am	X Quipolly	Complainant stated that the last couple of weeks there have been cracks appearing in her house in Quipolly and is most likely due to the mine's blasts.	No specific blasts or periods of blasts identified by the complainant.	EO inspected complainant's property and took photos of the building defects. Letter response will be provided to the complainant.

193	18/10/2011 3:25pm	A/OEH Werris Creek	Complainant stated that Monday night 17 <sup>th</sup> October was impacted by intrusive lighting from the overburden dump from 9:10pm until 0:30am in bursts of 15 to 20 minutes at a time. Also the train shunting noise was loud all evening until 0:30am.	Lighting camera did not identify any lights from the overburden dump area on 17 <sup>th</sup> and 18 <sup>th</sup> October. There were no trains loaded or on the WCC rail spur during the time period, indicating that the source of the rail shunting noise was from ARTC/Pacific National rail yards at Werris Creek.	A written response sent to OEH and the complainant.
194	26/10/2011 12:26pm	A/OEH Werris Creek	Sunday and Monday mornings 23 <sup>rd</sup> and 24 <sup>th</sup> October at 1:15am and 1:45am respectively there was a lot of noise and very bright lights from the coal loader. Also on 25 <sup>th</sup> October from 7:45pm to 1:45am the noise from the coal loader and the train was amazing loud.	Lighting camera did not identify any lights from the overburden dump area on 23 <sup>rd</sup> and 24 <sup>th</sup> October. There were no trains loaded 23 <sup>rd</sup> October but a train was loaded on 24 <sup>th</sup> October at 1:15am and 25 <sup>th</sup> October at 6:27pm. The meteorological conditions in the early mornings of the 23 <sup>rd</sup> and 24 <sup>th</sup> October were unlikely to have enhanced noise emissions from WCC, however the prevailing wind direction on 25 <sup>th</sup> October could have enhanced noise emissions from WCC.	A written response sent to OEH and the complainant.
195	28/10/2011 4:11pm	A/OEH Werris Creek	Complainant alleged that a loud blast shook the whole house on Thursday 27 <sup>th</sup> October 2011 at 1:27pm and the coal mine closed the Werris Creek Road for 20 minutes while blasting.	All blast results were in compliance with blasting criteria and performed as designed. The weather conditions could have enhanced overpressure effects of the blast towards Werris Creek. Discussions with onsite personnel involved with the road closure said that the road was closed for 12 minutes.	A written response sent to OEH and the complainant.

## 7.0 GENERAL

Please feel free to ask any questions in relation to the information contained within this document during Item 7 of the meeting agenda.

Regards  
Andrew Wright  
Environmental Officer

**Appendix 1 – PM10 Dust Monitoring Data.**

Werris Creek Coal  
 HVAS Dust Monitoring  
 2011-2012

Site Date	WCHV1 Cintra	Monthly Monthly Average	Rolling Annual Average	WCHV2 Tonsley Park	Monthly Monthly Average	Rolling Annual Average	WCHV3 Railway View	Monthly Monthly Average	Rolling Annual Average	WCHV4 Eurunder ee	Monthly Monthly Average	Rolling Annual Average	WCTSP Railway View	Monthly Monthly Average	Rolling Annual Average	PM10 24hr Limit	PM10 Annual Average	TSP Annual Average
02-Apr-11	11		11.2	15		15.4	11		10.8	13		13.3	19		18.8	50	30	90
08-Apr-11	25		18.2	11		13.1			10.8	9		11.1			18.8	50	30	90
14-Apr-11	24		20.2	20		15.3	39		24.7	15		12.2	97		57.8	50	30	90
20-Apr-11	51		27.8	21		16.6	50		33.1	18		13.6	114		76.5	50	30	90
26-Apr-11	11	24.5	24.5	7	14.7	14.7	12	27.8	27.8	7	12.2	12.2	28	64.3	64.3	50	30	90
02-May-11	38		26.7	26		16.6	35		29.1	16		12.9	85		68.4	50	30	90
08-May-11	13		24.8	16		16.5	12		26.2	12		12.8	20		60.4	50	30	90
14-May-11	7		22.5	5		15.1	14		24.5	7		12.1	50		58.9	50	30	90
20-May-11	34		23.9	34		17.2	50		27.8	28		13.8	100		64.0	50	30	90
26-May-11	27	23.9	24.2	17	19.6	17.1	13	24.7	26.1	16.1	15.9	14.0	25.7	56.1	59.8	50	30	90
01-Jun-11	58		27.2	52		20.3	50		28.4	7.7		13.5	95		63.2	50	30	90
07-Jun-11	62		30.2	56		23.2	80		33.1	9		13.1	256		80.8	50	30	90
13-Jun-11	49		31.6	48		25.1	47		34.3	5.4		12.5			80.8	50	30	90
19-Jun-11	7		29.8	8		23.9	7		32.2	5.5		12.0	155		87.0	50	30	90
25-Jun-11	18	38.7	29.0	13	35.2	23.2	14	39.5	30.9	13.1	8.1	12.1	25	132.5	82.1	50	30	90
01-Jul-11	11		27.9	8		22.2	4		29.1	4		11.6	10.1		77.0	50	30	90
07-Jul-11	10		26.8	4		21.1	35		29.5	5		11.2	105		78.9	50	30	90
13-Jul-11	15		26.2	15		20.8	19		28.8	25		12.0	47.5		76.9	50	30	90
19-Jul-11	8		25.2	4		19.9	14		28.0	4		11.6	44.3		75.0	50	30	90
25-Jul-11	8	10.3	24.3	8	7.8	19.3	10	16.3	27.0	19	11.5	11.9	16.9	44.8	71.8	50	30	90
31-Jul-11	9		23.6	11		18.9	10		26.2	15		12.1	24.5		69.3	50	30	90
06-Aug-11	9		23.0	10		18.5	12		25.5	20		12.5	31.3		67.4	50	30	90
12-Aug-11	21		22.9	12		18.2	17		25.1	7		12.2	38.7		66.0	50	30	90
18-Aug-11	5		22.1	2		17.5	13		24.6	3		11.8	46.8		65.1	50	30	90
24-Aug-11	25	13.7	22.2	11	9.2	17.3	13	13.1	24.1	5	10.0	11.6	47.8	37.8	64.4	50	30	90
30-Aug-11	30		22.5	21		17.4	22		24.0	13		11.6	47		63.7	50	30	90
05-Sep-11	15		22.2	12		17.2	32		24.4	15		11.8	65		63.7	50	30	90
11-Sep-11	5		21.6	5		16.8	6		23.7	5		11.5	14		61.8	50	30	90
17-Sep-11	12		21.2	18		16.8	15		23.4	17		11.7	37		60.9	50	30	90
23-Sep-11	41	20.3	21.9	32	17.6	17.3	46	24.2	24.1	36	17.2	12.5	91	50.8	62.0	50	30	90
29-Sep-11	8		21.5	7		17.0	8		23.6	7		12.3	16		60.4	50	30	90
05-Oct-11	27		21.6	17		17.0	16		23.3	10		12.2	36		59.6	50	30	90
11-Oct-11	22		21.6	11		16.8	32		23.6	7		12.1	67		59.8	50	30	90
17-Oct-11	15		21.4	12		16.7	10		23.2	11		12.0	19		58.5	50	30	90
23-Oct-11	16	17.5	21.3	21	13.5	16.8	18	16.8	23.1	16	10.0	12.1	44	36.3	58.1	50	30	90
29-Oct-11			21.3			16.8			23.1			12.1			58.1	50	30	90
04-Nov-11			21.3			16.8			23.1			12.1			58.1	50	30	90
10-Nov-11			21.3			16.8			23.1			12.1			58.1	50	30	90
16-Nov-11			21.3			16.8			23.1			12.1			58.1	50	30	90
22-Nov-11		#DIV/0!	21.3		#DIV/0!	16.8		#DIV/0!	23.1		#DIV/0!	12.1		#DIV/0!	58.1	50	30	90
28-Nov-10			21.3			16.8			23.1			12.1			58.1	50	30	90
04-Dec-10			21.3			16.8			23.1			12.1			58.1	50	30	90
10-Dec-10			21.3			16.8			23.1			12.1			58.1	50	30	90
16-Dec-10			21.3			16.8			23.1			12.1			58.1	50	30	90
22-Dec-10		#DIV/0!	21.3		#DIV/0!	16.8		#DIV/0!	23.1		#DIV/0!	12.1		#DIV/0!	58.1	50	30	90
28-Dec-10			21.3			16.8			23.1			12.1			58.1	50	30	90
03-Jan-11			21.3			16.8			23.1			12.1			58.1	50	30	90
09-Jan-11			21.3			16.8			23.1			12.1			58.1	50	30	90
15-Jan-11			21.3			16.8			23.1			12.1			58.1	50	30	90
21-Jan-11		#DIV/0!	21.3		#DIV/0!	16.8		#DIV/0!	23.1		#DIV/0!	12.1		#DIV/0!	58.1	50	30	90
27-Jan-11			21.3			16.8			23.1			12.1			58.1	50	30	90
02-Feb-11			21.3			16.8			23.1			12.1			58.1	50	30	90
08-Feb-11			21.3			16.8			23.1			12.1			58.1	50	30	90
14-Feb-11			21.3			16.8			23.1			12.1			58.1	50	30	90
20-Feb-11		#DIV/0!	21.3		#DIV/0!	16.8		#DIV/0!	23.1		#DIV/0!	12.1		#DIV/0!	58.1	50	30	90
26-Feb-11			21.3			16.8			23.1			12.1			58.1	50	30	90
04-Mar-11			21.3			16.8			23.1			12.1			58.1	50	30	90
10-Mar-11			21.3			16.8			23.1			12.1			58.1	50	30	90
16-Mar-11			21.3			16.8			23.1			12.1			58.1	50	30	90
22-Mar-11			21.3			16.8			23.1			12.1			58.1	50	30	90
28-Mar-11		#DIV/0!	21.3		#DIV/0!	16.8		#DIV/0!	23.1		#DIV/0!	12.1		#DIV/0!	58.1	50	30	90
Min	4.5			2.2			4.2			2.7			10.1					
Max	62.2			55.9			80.4			36.2			256.0					
Capture	57%			57%			56%			57%			54%					

**Appendix 2 – Deposited Dust Monitoring Data.**

## Deposited Dust - Werris Creek Coal Mine 2011-2012

MONTH (g/m2/month)	EPL #7		EPL #4		EPL #1		EPL #8		-		-		-		ANNUAL AVERAGE LIMIT
	WC-2 Cintra		WC-5 Railway View		WC-7 Tonsley Park		WC-8 Plain View		WC-9 Marengo		WC-10 Mountain View		WC-11 Glenara		
	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	
April 2011	1.5	1.0	1.1	0.7	0.6	0.5	1.1	0.9	0.5	0.4	c2.3	1.6	0.6	0.6	3.6
May 2011	c0.6*	0.2	0.6	0.3	0.1	0.1	0.2	0.2	0.1	0.1	5.9*	2.0	0.2	0.2	3.6
June 2011	3.0	1.8	2.4	1.5	0.9	0.5	1.3	0.8	0.8	0.5	0.8	0.4	1.4	0.8	3.6
July 2011	0.5	0.3	0.5	0.4	0.3	0.2	0.8	0.5	0.2	0.2	0.9	0.5	0.6	0.5	3.6
August 2011	0.8	0.6	0.9	0.7	0.4	0.3	1.1	0.8	0.5	0.4	0.5	0.4	c20	c17.6	3.6
September 2011	1.5	1.0	1.4	0.9	1.2	0.8	1.4	1.0	0.5	0.5	0.5	0.3	c19.8	c17.1	3.6
October 2011	1.1	0.8	1.2	0.8	0.9	0.5	0.5	0.5	0.8	0.5	0.8	0.5	1.0	0.8	3.6
November 2011															3.6
December 2011															3.6
January 2012															3.6
February 2012															3.6
March 2012															3.6
<b>ANNUAL AVERAGE</b>	<b>1.4</b>		<b>1.2</b>		<b>0.6</b>		<b>0.9</b>		<b>0.5</b>		<b>0.7</b>		<b>0.8</b>		<b>3.6</b>
<b>MINIMUM</b>	<b>0.5</b>		<b>0.5</b>		<b>0.1</b>		<b>0.2</b>		<b>0.1</b>		<b>0.5</b>		<b>0.2</b>		<b>3.6</b>
<b>MAXIMUM</b>	<b>3.0</b>		<b>2.4</b>		<b>1.2</b>		<b>1.4</b>		<b>0.8</b>		<b>0.9</b>		<b>1.4</b>		<b>3.6</b>

Note: All results are in the form of Insoluble Matter (g/m2/month)

c - indicates sample is contaminated from a Non-Werris Creek Coal dust source and is not counted in the average

\* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e bird droppings and insects) and is excluded from the average

**Appendix 3 – Noise Monitoring Results.**



15 August 2011

Ref: 04035/4083

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: AUGUST 2011 NOISE MONITORING RESULTS – WERRIS CREEK MINE

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Thursday 11 and Friday 12 August 2011.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Mine's Noise Management Plan (revised November 2010). The locations are listed below and attached in **Figure 1**:

- “Almawillee”
- “Glenara”
- “Railway Cottage” (previously denoted as “Fletcher”)
- “Tonsley Park”
- “Greenslopes/Banool”
- “Kyooma”

Additional measurements were also made on the road side near residential locations in Punyarra Street and at the reserve behind houses in Kurrara Street, Werris Creek. These locations are shown in **Figure 2**.

Three sets of measurements were made over the “circuit”, one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm).

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speed and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data shows that at the beginning of the survey on August 11 winds were moderate from the north west. During the evening and night periods winds dropped in intensity and became variable from the north west to the south east.

The data showed that there was a moderate to strong temperature inversion from early evening which persisted throughout the night survey.

The total measured Leq noise level is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall. The noise criterion for the operational phase of the WCC project is **35 dB(A) L<sub>eq</sub> (15 min)** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the ambient level during the measurement and not measurable.

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	4:38 pm	38	n/a	2.3/222	Birds (35), traffic (33), tractor (28), dogs (27), WCC inaudible
Glenara	4:20 pm	36	n/a	2.9/272	Birds (34), traffic (32), WCC (<30)
Railway Cottage	2:30 pm	49	n/a	4.6/294	Traffic (48), birds (43), WCC (30)
Tonsley Park	3:58 pm	39	n/a	3.3/282	Birds (39), train in werris creek (28), WCC inaudible
Greenslopes	3:40 pm	46	n/a	3.7/284	Traffic (43), rail works (43),birds (30) WCC barely audible
Kyooma	2:55 pm	50	n/a	4.3/296	Birds (50), WCC (28)
Kurrara St	8:35 am (12/8)	43	n/a	0.3/180	Traffic (40), rail works (40), WCC (33), birds (29)
Punyarra St	3:19 pm	45	n/a	3.9/290	Trains in Werris Ck (40), domestic noise (38), dogs (38), traffic (38), WCC inaudible

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	7:38 pm	32	+4.0	2.4/179	Traffic (29), irrigator (29), WCC inaudible
Glenara	7:55 pm	33	+4.3	2.3/170	Traffic (33), WCC inaudible
Railway Cottage	7:20 pm	36	+2.7	2.8/185	Traffic (36), WCC inaudible
Tonsley Park	8:17 pm	37	+5.4	2.2/168	WCC (34), traffic (33), plane (28)
Greenslopes	8:35 pm	43	+5.7	1.1/156	WCC (42), traffic (35)
Kyooma	9:35 pm	40	+7.2	0.9/162	WCC (40)
Kurrara St	8:54 pm	38	+6.8	2.2/168	Traffic (36), WCC (34)
Punyarra St	9:13 pm	36	+6.7	0.5/181	Traffic (33), WCC (30), domestic noise (30)

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	12:10 am	27	+8.4	0.5/202	WCC (27)
Glenara	12:27 am	30	+8.2	0.6/108	WCC (29), traffic (23)
Railway Cottage	12:50 am	28	+8.2	1.0/300	WCC (28)
Tonsley Park	10:02 pm	38	+7.4	0.8/154	Traffic (36), WCC (32)
Greenslopes	10:22 pm	40	+7.4	0.8/207	WCC (38), traffic (35)
Kyooma	11:05 pm	35	+7.9	0.9/291	WCC (35)
Kurrara St	11:45 pm	38	+8.1	1.0/174	WCC (38)
Punyarra St	11:25 pm	40	+7.7	0.6/274	Traffic (37), WCC (35), domestic noise (30)

The results shown in **Tables 1 - 3** indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC exceeded the criterion of 35 dB(A) Leq at the Greenslopes monitoring location during the evening and night, the Kyooma monitoring location during the evening and the Kurrara Street monitoring location during the night.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Data from the mine operated weather station indicated that all of the elevated noise levels were measured whilst there was a strong temperature inversion in place (i.e. >+3° C/100m). The elevated noise levels were, therefore, measured under non-compliant atmospheric conditions.

Data from those times where WCC operations were audible were analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the Lmax criterion at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,  
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant



Figure 1 – Noise Monitoring Locations

Key

- 1 Alkawillee
- 2 Glenara
- 3 Railway Cottage
- 4 Tonsley Park
- 5 Greenslopes/Banool
- 6 Kyooma



Figure 2 – Additional Noise Monitoring Locations

Key

- 7 Kurarra Street
- 8 Punyarra Street



16 September 2011

Ref: 04035/4117

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

**RE: SEPTEMBER 2011 NOISE MONITORING RESULTS – WERRIS CREEK MINE**

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Wednesday 14 and Thursday 15 September 2011.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Mine's Noise Management Plan (revised November 2010). The locations are listed below and attached in **Figure 1**:

- "Almawillee"
- "Glenara"
- "Railway Cottage" (previously denoted as "Fletcher")
- "Tonsley Park"
- "Greenslopes/Banool"
- "Kyooma"

Additional measurements were also made on the road side near residential locations in Punyarra Street and at the reserve behind houses in Kurrara Street, Werris Creek. These locations are shown in **Figure 2**.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm).

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speed and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data shows that at the beginning of the survey on September 14 winds were moderate from the west north west to north west. During the evening and night periods winds dropped in intensity and became variable from the north west to the north.

The data showed that there was a moderate to strong temperature inversion from early evening which persisted throughout the night survey.

The total measured Leq noise level is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall. The noise criterion for the operational phase of the WCC project is **35 dB(A) L<sub>eq</sub> (15 min)** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the ambient level during the measurement and not measurable.

Table 1 WCC Noise Monitoring Results – 14 September 2011 (Day)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	4:42 pm	34	n/a	5.7/299	Wind (31), birds (30), WCC (<25)
Glenara	4:23 pm	41	n/a	5.7/303	Wind in trees (38), birds (36), traffic (32), WCC barely audible
Railway Cottage	5:00 pm	38	n/a	4.8/283	Traffic (38), birds (28), WCC inaudible
Tonsley Park	2:40 pm	39	n/a	4.4/293	Traffic (39), WCC inaudible
Greenslopes	3:00 pm	46	n/a	4.5/299	Traffic (45), birds (40), WCC inaudible
Kyooma	4:00 pm	42	n/a	5.3/308	Birds (42), WCC (<30)
Kurrara St	3:18 pm	44	n/a	5.1/302	Traffic (43), birds (36), WCC inaudible
Punyarra St	3:35 pm	40	n/a	3.8/289	Traffic (38), birds (33), trains (32), WCC inaudible

Table 2 WCC Noise Monitoring Results – 15 September 2011 (Evening)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	9:43 pm	32	+11.1	2.7/342	WCC (32), frogs (24)
Glenara	9:22 pm	36	+10.0	3.1/333	Traffic (33), WCC (33)
Railway Cottage	7:15 pm	46	+8.0	3.4/305	Traffic (46), WCC (32)
Tonsley Park	8:57 pm	31	+10.6	3.1/330	WCC (31)
Greenslopes	8:37 pm	40	+10.3	3.0/325	Traffic (38), WCC (36)
Kyooma	7:35 pm	32	+9.9	3.6/303	WCC (32)
Kurrara St	8:18 pm	36	+9.5	3.2/317	Birds (33), WCC (32), traffic (28)
Punyarra St	8:01 pm	40	+9.8	2.9/315	Traffic (39), trains (32), WCC inaudible

Table 3 WCC Noise Monitoring Results – 14/15 September 2011 (Night)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	12:15 am	32	+10.0	0.7/97	WCC (32)
Glenara	11:56 pm	34	+9.7	0.1/23	WCC (33), traffic (27)
Railway Cottage	12:35 am	28	+10.4	0.9/132	Traffic (28), WCC inaudible
Tonsley Park	11:30 pm	41	+9.5	2.0/303	Trains (41), WCC inaudible
Greenslopes	11:11 pm	31	+9.9	2.0/310	WCC (31)
Kyooma	10:10 pm	41	+11.3	2.2/335	WCC (41)
Kurrara St	10:53 pm	38	+9.9	2.0/320	Trains (38), WCC (30)
Punyarra St	10:35 pm	38	+11.2	1.9/333	Traffic (35), trains (35), WCC (30)

The results shown in **Tables 1 - 3** indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC exceeded the criterion of 35 dB(A) Leq at the Greenslopes monitoring location during the evening and at Kyooma monitoring location during the night.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Data from the mine operated weather station indicated that all of the elevated noise levels were measured whilst there was a strong temperature inversion in place (i.e. >+3° C/100m). The elevated noise levels were, therefore, measured under non-compliant atmospheric conditions.

Data from those times where WCC operations were audible were analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the Lmax criterion at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,  
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant

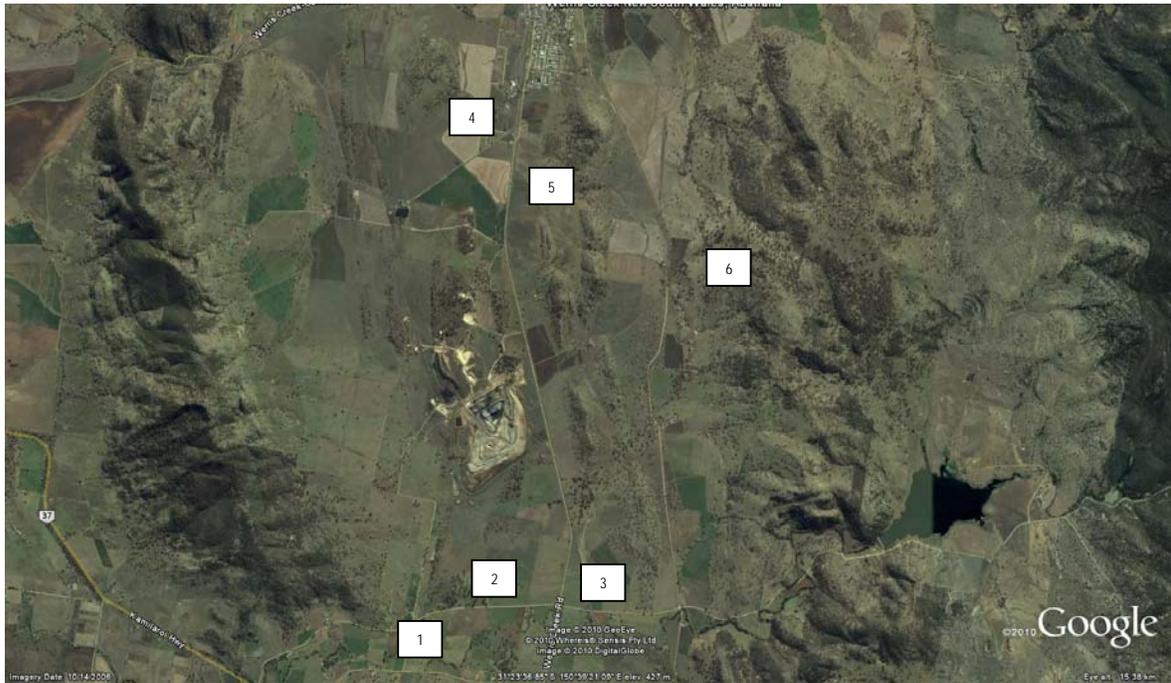


Figure 1 – Noise Monitoring Locations

Key

- 1 Alkawillee
- 2 Glenara
- 3 Railway Cottage
- 4 Tonsley Park
- 5 Greenslopes/Banool
- 6 Kyooma



Figure 2 – Additional Noise Monitoring Locations

Key

- 7 Kurarra Street
- 8 Punyarra Street



3 November 2011

Ref: 04035/4173

Werris Creek Coal  
 1435 Werris Creek – Quirindi Road  
 Werris Creek NSW 2341

**RE: OCTOBER 2011 NOISE MONITORING RESULTS – WERRIS CREEK MINE**

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Monday 31<sup>st</sup> October and Tuesday 1<sup>st</sup> November, 2011.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Project Approval PA10\_0059. The monitoring locations and noise criteria for each are detailed below in extract from the Approval and shown on the attached **Figure 1**. The actual monitoring locations representative of the various receptor areas are shown in bold and underlined in the extract below (note that R18 is now mine owned).

<i>Location</i>	<i>Day dB(A) L<sub>Aeq</sub>(15 min)</i>	<i>Evening &amp; Night dB(A) L<sub>Aeq</sub>(15 min)</i>	<i>Night dB(A) L<sub>A1</sub> (1 min)</i>
R18	40	37	45
R10, <b><u>R11, R14</u></b>	39	39	45
<b><u>R20</u></b> , R21	39	37	45
<b><u>R12</u></b>	38	38	45
<b><u>R96</u></b>	38	37	45
R7, R8, <b><u>R9, R24</u></b>	37	37	45
R22, <b><u>R98</u></b>	36	36	45
All other privately-owned land, (incl. <b><u>R5, R103</u></b> and <b><u>locations in Werris Creek</u></b> )	35	35	45

*Notes: To interpret the locations referred to in the table, see **Figure 1**; and  
 Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.*

Three sets of measurements were made over the “circuit”, one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). Note that the day time circuit was commenced on the afternoon of October 31 and completed during the morning of November 1.

Attended noise monitoring was conducted with a Brüel & Kjær Type 2250 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters” and has current NATA calibration. Field calibration is carried out at the start and end of each monitoring period. A-weighted noise levels were measured over 15-minute periods with data acquired at 1-second statistical intervals and the meter set to “fast” response. Each one-second measurement is accompanied by a third-octave band spectrum from 20 - 20k Hz which is required for analysing INP ‘modifying factors’. Time based field notes allow for determination of the relative contributions to the overall noise level of all significant noise sources.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speed and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data show that throughout the survey on October 31 (and early morning of November 1) winds were moderate, generally from the south. During the evening and night periods the wind dropped in intensity. Wind speeds measured at approximately 2m above ground level (with a hand held anemometer) were consistently lower than those at the automatic weather station. The data showed that a temperature inversion was not a significant feature of the atmosphere throughout the night survey.

The total measured Leq noise level is shown in the tables below. Where the noise from WCC was audible Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall. Mine noise from WCC is shown in the tables in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the ambient level during the measurement and not measurable. All noise levels shown are in dB(A) Leq (15 min) unless otherwise shown.

Table 1 WCC Noise Monitoring Results – 31 October (pm) and 1 November (am) 2011 (Day)						
Location	Time	dB(A), Leq	Criterion dB(A) Leq	Inversion °C/ 100m	Wind speed/ dir	Identified Noise Sources
R5 Rosehill	3:05 pm	43	35	n/a	6.5/175	Birds (42), traffic (35), WCC inaudible
R9 Gedhurst	3:22 pm	42	37	n/a	6.2/186	Birds (42), traffic (30), WCC inaudible
R11 Glenara	3:40 pm	42	39	n/a	6.6/201	Traffic (38), wind (37), birds (37), WCC inaudible
R12 Railway Cottage	4:18 pm	37	38	n/a	6.5/197	Traffic (37), WCC inaudible
R14 Greenslopes	7:09 am	39	39	n/a	0.6/353	Traffic (36), WCC (34), insects (32)
R20 Tonsley Park	4:40 pm	48	39	n/a	7.0/192	Traffic (46), train (41), birds (40), WCC inaudible
R24 Hazeldene	4:00 pm	40	37	n/a	6.0/185	Traffic (39), birds (32), WCC inaudible
R96 Kyooma	8:07 am	43	38	n/a	1.4/237	Birds (43), WCC barely audible
R98 Talavera	8:30 am	40	36	n/a	0.9/298	Birds (40), WCC (<30)
R103 Parsons	5:10 pm	45	35	n/a	6.7/193	Train in Werris Creek (45), WCC inaudible
Kurrara St	7:28 am	43	35	n/a	1.5/258	Birds & insects (42), train (34), traffic (33), WCC (30)

Coronation Avenue	7:46 am	44	35	n/a	1.6/253	Birds (44), road works (35), WCC inaudible
<b>Table 2</b> <b>WCC Noise Monitoring Results – 31 October (Evening)</b>						
Location	Time	dB(A), Leq	Criterion dB(A) Leq	Inversion °C/ 100m	Wind speed/ dir	Identified Noise Sources
R5 Rosehill	6:48 pm	37	35	n/a	5.0/183	Birds & insects (35), traffic (32), WCC inaudible
R9 Gedhurst	7:07 pm	35	37	n/a	3.9/173	Birds (35), traffic (25), WCC inaudible
R11 Glenara	7:25 pm	40	39	n/a	3.7/161	Birds (39), traffic (33), WCC inaudible
R12 Railway Cottage	8:00 pm	38	38	n/a	3.7/186	Traffic (37), birds & insects (30), WCC inaudible
R14 Greenslopes	9:01 pm	46	39	n/a	2.8/172	Traffic (45), WCC (34), insects (33)
R20 Tonsley Park	9:20 pm	43	37	n/a	2.2/194	Insects (42), traffic (33), train (33), WCC (30)
R24 Hazeldene	7:42 pm	39	37	n/a	3.8/166	Birds & insects (39), traffic (28), WCC inaudible
R96 Kyooma	6:00 pm	40	37	n/a	5.6/195	Birds (40), WCC barely audible
R98 Talavera	6:23 pm	36	36	n/a	5.8/190	Birds (36), WCC inaudible
R103 Parsons	9:40 pm	44	35	n/a	2.9/193	Train (43), insects (37), WCC inaudible
Kurrara St	8:25 pm	45	35	n/a	2.2/172	Frogs (43), traffic (38), birds (35), domestic noise (36), WCC inaudible
Coronation Avenue	8:42 pm	47	35	n/a	2.5/179	Insects (46), dogs (39), traffic (32), WCC inaudible

<b>Table 3</b> <b>WCC Noise Monitoring Results – 31 October (pm) and 1 November (am) (Night)</b>						
Location	Time	dB(A), Leq	Criterion dB(A) Leq	Inversion °C/ 100m	Wind speed/ dir	Identified Noise Sources
R5 Rosehill	10:02 pm	30	35	n/a	2.5/199	Traffic (29), insects (22), WCC inaudible
R9 Gedhurst	10:21 pm	30	37	n/a	2.9/199	WCC (29), insects (22)
R11 Glenara	10:38 pm	27	39	n/a	3.2/197	Insects (25), traffic (22), WCC (<20)
R12 Railway Cottage	11:12 pm	21	38	n/a	3.2/183	Insects (21), WCC inaudible
R14 Greenslopes	12:26 am	34	39	n/a	4.4/181	WCC (33), insects (27)
R20 Tonsley Park	12:50 am	34	37	n/a	3.9/196	WCC (34), insects (21)
R24 Hazeldene	10:55 pm	40	37	n/a	3.1/187	Traffic (39), birds (32), WCC inaudible
R96 Kyooma	11:54 pm	25	37	n/a	3.6/175	WCC (23), insects (20)
R98 Talavera	11:33 pm	26	36	n/a	3.1/167	WCC (24), insects (22)
R103 Parsons	1:10 am	43	35	n/a	3.7/195	Train (43), WCC inaudible
Kurrara St	1:30 am	47	35	n/a	3.9/185	Frogs (47), train (37), WCC (30)
Coronation Avenue	1:50 am	30	35	n/a	4.1/181	Train (28), WCC (25)

The results shown in **Tables 1 - 3** indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC did not exceed the relevant criterion at any monitoring location at any time during the survey.

Data from those times where WCC operations were audible were analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) L1 (1 min)** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit the L1 (1 min) noise from WCC did not exceed the criterion at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,  
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant

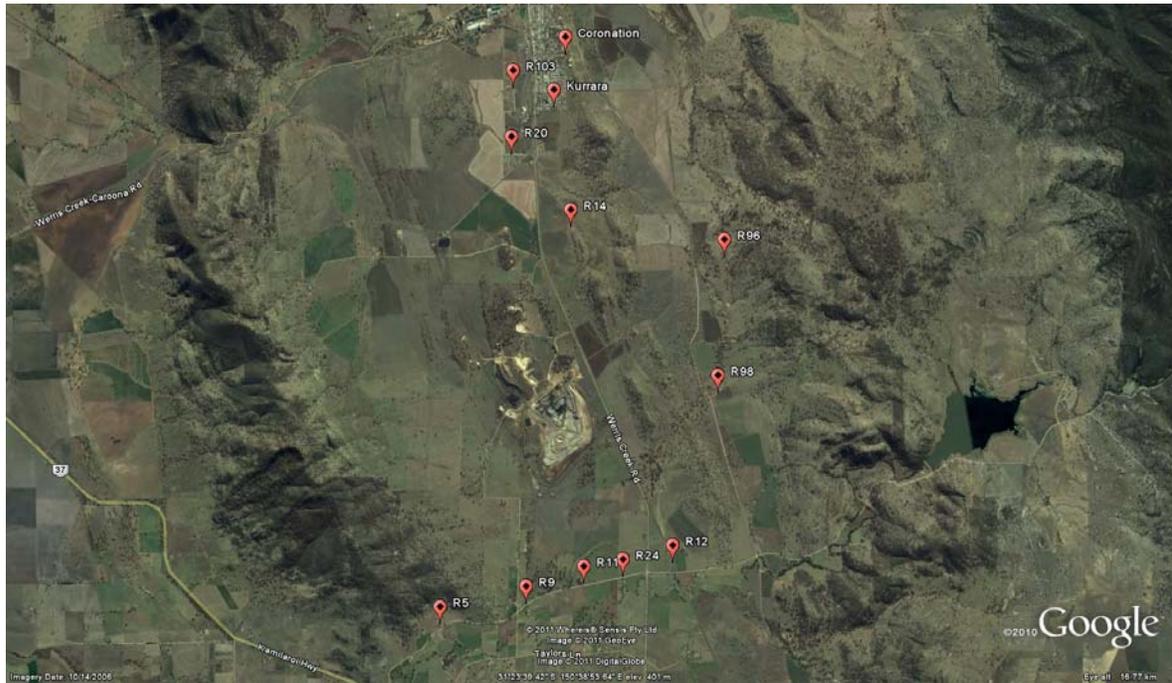


Figure 1 – Noise Monitoring Locations

**Appendix 4 – Blasting Monitoring Data.**

WERRIS CREEK COAL  
BLASTING DATABASE

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results													
					Glenala		Greenslopes		Tonsley Park		Cintra*		Werris Creek		Talavera		COMPLIANCE	
					Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
11-50	1/08/2011	13:12	S13_9-13_385	OB	NM	NM	0.77	83.0	0.50	99.4	1.12	108.6	<0.20	<109.9	NM	NM	10.00	120.0
11-51	3/08/2011	13:20	S10_12-13_Gcoal	IB	NM	NM	NM	NM	1.79	101.5	3.75	108.0	0.94	101.4	0.52	83.0	10.00	120.0
11-52	5/08/2011	13:23	S11_3-4_365 TSB10	TS	NM	NM	0.87	101.7	0.67	97.4	1.92	104.5	<0.20	<109.9	NM	NM	10.00	120.0
11-53	11/08/2011	13:22	S13_7-8_385	OB	NM	NM	NM	NM	0.40	94.7	0.80	101.7	<0.20	<109.9	<0.37	<109.9	10.00	120.0
11-54	10/08/2011	13:08	S11_9-10_350 P/S	PS	NM	NM	0.55	83.0	0.62	99.9	1.05	101.3	<0.20	<109.9	NM	NM	10.00	120.0
11-55	17/08/2011	10:38	S10_14-15_Gcoal	IB	NM	NM	1.62	83.0	1.98	96.8	2.20	101.3	0.69	89.4	NM	NM	10.00	120.0
11-56	25/08/2011	13:15	S10_18_Gcoal	IB	NM	NM	0.72	83.0	0.72	93.0	1.12	99.1	<0.20	<109.9	NM	NM	10.00	120.0
11-58	30/08/2011	15:42	S10_16_Gcoal	IB	NM	NM	NM	NM	1.59	104.8	1.90	110.0	0.73	103.3	0.55	105.5	10.00	120.0
<b>TOTALS</b>	<b>AUGUST</b>	<b># BLAST</b>	<b>8</b>	<b>AVERAGE</b>	<b>NM</b>	<b>NM</b>	<b>0.91</b>	<b>86.7</b>	<b>1.03</b>	<b>98.4</b>	<b>1.73</b>	<b>104.3</b>	<b>0.79</b>	<b>98.0</b>	<b>0.54</b>	<b>94.3</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>AUGUST</b>	<b># BLAST</b>	<b>8</b>	<b>HIGHEST</b>	<b>NM</b>	<b>NM</b>	<b>1.62</b>	<b>101.7</b>	<b>1.98</b>	<b>104.8</b>	<b>3.75</b>	<b>110.0</b>	<b>0.94</b>	<b>103.3</b>	<b>0.55</b>	<b>105.5</b>	<b>10.00</b>	<b>120.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b># BLAST</b>	<b>40</b>	<b>AVERAGE</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>0.56</b>	<b>102.9</b>	<b>0.71</b>	<b>101.3</b>	<b>1.00</b>	<b>107.5</b>	<b>0.55</b>	<b>101.6</b>	<b>0.54</b>	<b>94.3</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b>%</b>	<b>&gt;115dB(L) or 5mm/s</b>	<b>40</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>5.7%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>5.6%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>5%</b>	<b>5%</b>

WERRIS CREEK COAL  
BLASTING DATABASE

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results													
					Glenala		Greenslopes		Tonsley Park		Cintra*		Werris Creek		Talavera		COMPLIANCE	
					Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
11-57	5/09/2011	13:10	S10_11_Gcoal	IB	NM	NM	1.07	83.0	1.22	96.2	1.55	101.3	0.42	95.4	NM	NM	10.00	120.0
11-59	12/09/2011	13:10	S10_12_Gcoal	IB	NM	NM	1.82	111.6	0.82	104.5	NM	NM	0.89	106.6	0.47	111.0	10.00	120.0
11-60	16/09/2011	13:18	S10_7-11_Gcoal	IB	NM	NM	1.22	99.0	0.60	89.4	1.92	102.6	0.58	92.9	NM	NM	10.00	120.0
11-61	21/09/2011	14:10	S11_9-10_365 TSB11	TS	NM	NM	2.19	109.8	1.69	103.4	3.47	108.2	0.58	101.4	NM	NM	10.00	120.0
11-62	29/09/2011	13:29	S11_18-22_375	OVBD	NM	NM	0.07	111.4	0.72	105.2	0.52	105.4	<0.20	<109.9	<0.37	<109.9	10.00	120.0
11-63	28/09/2011	13:15	S11_11-14_350 P/S Pt1	PS	NM	NM	0.85	83	1.07	95.5	NM	NM	0.34	97.3	<0.37	<109.9	10.00	120.0
<b>TOTALS</b>	<b>SEPTEMBER</b>	<b># BLAST</b>	<b>6</b>	<b>AVERAGE</b>	<b>NM</b>	<b>NM</b>	<b>1.20</b>	<b>99.6</b>	<b>1.02</b>	<b>99.0</b>	<b>1.87</b>	<b>104.4</b>	<b>0.56</b>	<b>98.7</b>	<b>0.47</b>	<b>111.0</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>SEPTEMBER</b>	<b># BLAST</b>	<b>6</b>	<b>HIGHEST</b>	<b>NM</b>	<b>NM</b>	<b>2.19</b>	<b>111.6</b>	<b>1.69</b>	<b>105.2</b>	<b>3.47</b>	<b>108.2</b>	<b>0.89</b>	<b>106.6</b>	<b>0.47</b>	<b>111.0</b>	<b>10.00</b>	<b>120.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b># BLAST</b>	<b>46</b>	<b>AVERAGE</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>0.67</b>	<b>102.4</b>	<b>0.76</b>	<b>101.0</b>	<b>1.14</b>	<b>107.0</b>	<b>0.55</b>	<b>100.6</b>	<b>0.50</b>	<b>102.6</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b>%</b>	<b>&gt;115dB(L) or 5mm/s</b>	<b>46</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>4.9%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>5.0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>5%</b>	<b>5%</b>

WERRIS CREEK COAL  
BLASTING DATABASE

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results													
					Glenala		Greenslopes		Tonsley Park		Cintra*		Werris Creek		Talavera		COMPLIANCE	
					Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
11-64	4/10/2011	13:13	S11_11-14_350 P/S Pt2	PS	NM	NM	1.24	83	<0.37	<109.9	1.65	106.5	0.29	94.2	NM	NM	10.00	120.0
11-65	10/10/2011	13:16	S11_3-4_350 TSB12	THRU	NM	NM	<0.37	<109.9	0.45	103.1	NM	NM	<0.20	<109.9	0.67	102.2	10.00	120.0
11-66	13/10/2011	13:09	S11_11-14_350 Aseam	IB	NM	NM	0.87	83	0.92	99.0	1.07	109.6	0.44	98.9	NM	NM	10.00	120.0
11-67	14/10/2011	13:20	S13_2-3_385 + rocks	OVBD	NM	NM	<0.37	<109.9	<0.37	<109.9	NM	NM	<0.20	<109.9	<0.37	<109.9	10.00	120.0
11-68	19/10/2011	13:24	S11_16-17_370	IB	NM	NM	0.35	79.5	0.67	104.0	1.00	110.6	<0.20	<109.9	NM	NM	10.00	120.0
11-69	27/10/2011	13:27	S12S13_20-22_375	OVBD	NM	NM	0.7	113.3	1.25	106.3	NM	NM	0.24	103.3	<0.37	<109.9	10.00	120.0
11-70	31/10/2011	14:02	S11_14_15_370	IB	NM	NM	0.57	110.6	0.60	103.1	NM	NM	0.21	101.4	<0.37	<109.9	10.00	120.0
<b>TOTALS</b>	<b>OCTOBER</b>	<b># BLAST</b>	<b>7</b>	<b>AVERAGE</b>	<b>NM</b>	<b>NM</b>	<b>0.75</b>	<b>93.9</b>	<b>0.78</b>	<b>103.1</b>	<b>1.24</b>	<b>108.9</b>	<b>0.30</b>	<b>99.5</b>	<b>0.67</b>	<b>102.2</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>OCTOBER</b>	<b># BLAST</b>	<b>7</b>	<b>HIGHEST</b>	<b>NM</b>	<b>NM</b>	<b>1.24</b>	<b>113.3</b>	<b>1.25</b>	<b>106.3</b>	<b>1.65</b>	<b>110.6</b>	<b>0.44</b>	<b>103.3</b>	<b>0.67</b>	<b>102.2</b>	<b>10.00</b>	<b>120.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b># BLAST</b>	<b>53</b>	<b>AVERAGE</b>	<b>&lt;0.37</b>	<b>&lt;109.9</b>	<b>0.68</b>	<b>101.1</b>	<b>0.77</b>	<b>101.3</b>	<b>1.16</b>	<b>107.3</b>	<b>0.49</b>	<b>100.3</b>	<b>0.56</b>	<b>102.5</b>	<b>5.00</b>	<b>115.0</b>
<b>TOTALS</b>	<b>ANNUAL</b>	<b>%</b>	<b>&gt;115dB(L) or 5mm/s</b>	<b>53</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>4.2%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>4.7%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>5%</b>	<b>5%</b>

**Appendix 5 – Groundwater Monitoring Data.**









Walk O  
 c  
 A:R  
 W:R:R:K:GROUN:WAT:R

4



	M	M	M	M	M	M
005 pH by	0.0	7.04	7.54	7.00	7.55	7.71
0.0 n activity by	0.00	74	<0.01	<0.01	<0.01	<0.01
act loc n activity @ 5'						
K057G-Nit ite as N by	0.00	0.05	0.00	0.00	0.50	0.00
Nit ite as N						
K05 G-Nit ite p us Nit at as N (N x) by	0.00	0.05	0.00	0.00	0.80	0.00
Nit ite as N						
K0 G-ta K-sh Nit: g n by	0.0	0.1	0.4	0.7	0.0	0.0
ta K-sh Nit: g n as N						
K0 G-ta Nit: g n as N (KN N x) by	0.0	0.0	0.0	0.7	0.0	0.0
ta Nit: g n as N						
K0 7G-ta h sph: us as	0.00	0.00	0.00	0.14	0.14	0.01
ta h sph: us as						
K07 G-actv h sph: us as	0.00	0.07	0.07	0.00	0.00	0.01
actv h sph: us as						

Walk O  
 c  
 A:R  
 W:R:R:K:GROUN:WAT:R

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	M	M	M	M	M	M
005 pH by	0.0	7.07	7.40	7.00	7.40	7.70
0.0 n activity by	0.00	74	<0.01	<0.01	<0.01	<0.01
act loc n activity @ 5'						
K057G-Nit ite as N by	0.00	0.05	0.00	0.00	0.50	0.00
Nit ite as N						
K05 G-Nit ite p us Nit at as N (N x) by	0.00	0.05	0.00	0.00	0.80	0.00
Nit ite as N						
K0 G-ta K-sh Nit: g n by	0.0	0.1	0.4	0.7	0.0	0.0
ta K-sh Nit: g n as N						
K0 G-ta Nit: g n as N (KN N x) by	0.0	0.0	0.0	0.7	0.0	0.0
ta Nit: g n as N						
K0 7G-ta h sph: us as	0.00	0.00	0.00	0.14	0.14	0.01
ta h sph: us as						
K07 G-actv h sph: us as	0.00	0.07	0.07	0.00	0.00	0.01
actv h sph: us as						

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WALK 0  
 A/R  
 W/R



	M14	M15	M16	M17	M18
005 pH by	7.7	7.0	7.0	7.5	7.5
0.0 n activity by	0.0	0.0	<0.0	<0.0	0.0
act loc n activity @ 5'	μV/D	μV/D	μV/D	μV/D	μV/D
K05 G - Nit at as N by	0.0	0.0	4.0	0.0	0.0
Nit at as N	0.0	0.0	4.0	0.0	0.0
K05 G - Nit it p us Nit at as N (N x) by	0.0	0.0	4.0	0.0	0.0
Nit it as N	0.0	0.0	4.0	0.0	0.0
K0 G - ta K ah Nit g n by	0.0	7.0	0.5	0.0	4.5
ta K ah Nit g n as N	0.0	7.0	0.5	0.0	4.5
K0 G - ta Nit g n as N (KN N x) by	0.4	0.0	5.0	0.0	5.4
ta Nit g n as N	0.4	0.0	5.0	0.0	5.4
K0 7G - ta h sph us as by	0.0	0.0	0.0	0.0	0.4
ta h sph us as	0.0	0.0	0.0	0.0	0.4
K07 G - actv h sph us as by	0.0	0.0	0.0	0.04	0.0
actv h sph us as	0.0	0.0	0.0	0.04	0.0

WALK 0  
 A/R  
 W/R



	M14	M15	M16	M17	M18
005 pH by	7.0	7.0	7.0	7.5	7.5
0.0 n activity by	0.0	0.0	<0.0	<0.0	0.0
act loc n activity @ 5'	μV/D	μV/D	μV/D	μV/D	μV/D
K057G - Nit it as N by	0.0	0.0	5.0	0.0	0.0
Nit it as N	0.0	0.0	5.0	0.0	0.0
K05 G - Nit at as N by	0.0	0.0	5.0	0.0	0.0
Nit at as N	0.0	0.0	5.0	0.0	0.0
K05 G - Nit it p us Nit at as N (N x) by	0.0	0.0	5.0	0.0	0.0
Nit it as N	0.0	0.0	5.0	0.0	0.0
K0 G - ta K ah Nit g n by	0.0	0.7	0.0	0.0	0.0
ta K ah Nit g n as N	0.0	0.7	0.0	0.0	0.0
K0 G - ta Nit g n as N (KN N x) by	0.0	0.0	0.0	0.0	0.0
ta Nit g n as N	0.0	0.0	0.0	0.0	0.0
K0 7G - ta h sph us as by	0.0	0.0	0.0	0.0	0.4
ta h sph us as	0.0	0.0	0.0	0.0	0.4
K07 G - actv h sph us as by	0.0	0.0	0.0	0.0	0.0
actv h sph us as	0.0	0.0	0.0	0.0	0.0

**Appendix 6 – Surface Water Monitoring Data.**



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1118021</b>	Page	: 1 of 5
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Client Services
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK SURFACE-WATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 2451	Date Samples Received	: 19-AUG-2011
C-O-C number	: ----	Issue Date	: 26-AUG-2011
Sampler	: BP	No. of samples received	: 12
Site	: ----	No. of samples analysed	: 12
Quote number	: SY/261/10		

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 Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics

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## 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

- **EK061G/067G: LOR raised for TKN TP analysis on various sample due to sample matrix**
- **EP020, LCS recovery for ( Oil and Grease ) fall outside ALS dynamic control limits. However, they are within the acceptance criteria based on ALS DQO. No further action is required.**
- **LCS recovery for NoX falls outside ALS dynamic control limits. However, they are within the acceptance criteria based on ALS DQO. No further action is required.**



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB6	SB9	SB10	SD4	SD5
				Client sampling date / time	18-AUG-2011 11:00	18-AUG-2011 10:30	18-AUG-2011 10:10	18-AUG-2011 11:50	18-AUG-2011 12:10
Compound	CAS Number	LOR	Unit	ES1118021-001	ES1118021-002	ES1118021-003	ES1118021-004	ES1118021-005	
<b>EA005P: pH by PC Titrator</b>									
pH Value	----	0.01	pH Unit	8.07	9.19	8.00	8.37	7.95	
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm	778	681	416	306	343	
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L	78	7	70	46	56	
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L	0.08	0.12	<0.01	<0.01	<0.01	
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L	25.3	3.67	<0.01	0.02	0.02	
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	25.4	3.79	<0.01	0.02	0.02	
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<1.0	0.9	<0.1	<0.1	1.0	
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L	25.4	4.7	<0.1	<0.1	1.0	
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	<0.10	<0.01	0.04	0.49	0.26	
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	<0.01	0.37	0.16	
<b>EP020: Oil and Grease (O&amp;G)</b>									
^ Oil & Grease	----	5	mg/L	<5	<5	<5	<5	<5	



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	VWD1	VWD2	200MLD - NORTH	QCU	QCD
				Client sampling date / time	18-AUG-2011 11:40	18-AUG-2011 10:50	18-AUG-2011 11:20	18-AUG-2011 09:40	18-AUG-2011 10:00
Compound	CAS Number	LOR	Unit		ES1118021-006	ES1118021-007	ES1118021-008	ES1118021-009	ES1118021-010
<b>EA005P: pH by PC Titrator</b>									
pH Value	----	0.01	pH Unit		8.19	8.21	8.29	7.76	8.05
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		1050	996	1040	442	869
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L		11	6	8	18	16
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		0.03	0.09	0.08	<0.01	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		3.80	4.24	4.98	0.31	0.15
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		3.83	4.33	5.06	0.31	0.15
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.4	3.4	1.8	<0.1	<0.1
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		4.2	7.7	6.9	0.3	0.2
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		<0.01	<0.10	<0.10	0.09	0.05
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		<0.01	<0.01	<0.01	0.02	0.04
<b>EP020: Oil and Grease (O&amp;G)</b>									
^ Oil & Grease	----	5	mg/L		<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: **WATER**

				Client sample ID	WCU	WCD			
				Client sampling date / time	18-AUG-2011 09:00	18-AUG-2011 08:30	----	----	----
Compound	CAS Number	LOR	Unit		ES1118021-011	ES1118021-012			
<b>EA005P: pH by PC Titrator</b>									
pH Value	----	0.01	pH Unit		8.01	8.41	----	----	----
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		1410	1370	----	----	----
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	5	mg/L		<5	26	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		0.02	0.02	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		3.28	0.71	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		3.30	0.73	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.3	0.2	----	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L		3.6	0.9	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		0.08	0.24	----	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		0.03	0.05	----	----	----
<b>EP020: Oil and Grease (O&amp;G)</b>									
^ Oil & Grease	----	5	mg/L		<5	<5	----	----	----

## **Appendix 7 – Surface Water Discharge Monitoring Data**









