Annual Review

Tarrawonga Coal Mine

Name of operation	Tarrawonga Coal Mine
Name of operator	Whitehaven Coal Mining Pty Ltd
Development consent/project approval number	PA 11_0047 MOD 1
Name of holder of development consent/project approval	Tarrawonga Coal Pty Ltd
Mining lease number	ML 1579, ML 1685, ML 1693
Name of holder of mining lease	Tarrawonga Coal Pty Ltd
Water licence number	WAL 31084
Name of holder of water licence	Whitehaven Coal
MOP start date	4/12/2015
MOP end date	30/11/2020
Annual review start date [1]	1/5/2015
Annual review end date	30/4/2016

I, Jamie Frankcombe, certify that this audit report is a true and accurate record of the compliance status of the Tarrawonga Coal Mine for the period 1st May 2015 until 30th April 2016, and that I am authorised to make this statement on behalf of Tarrawonga Coal Pty Ltd.

Note. a) The Annual Review is an 'environmental audit' for the purposes of section 122B (2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).

Name of authorised reporting officer	Jamie Frankcombe
Title of authorised reporting officer	DIRECTOR.
Signature of authorised reporting officer	
Date	19/10/2016.

[1] NSW Annual Review Guideline was released in October 2015

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1 STATEMENT OF COMPLIANCE

The compliance status of the Tarrawonga Coal Mine (TCM) as at 30th April 2016 is summarised in Table 1. Table 2 notes non-compliances that occurred during the reporting period, and non-compliances from previous reporting periods that still require management action. References to the Environment Protection Licence (EPL) are limited to those that relate to the Project Approval conditions, specifically Schedule 3 Condition 22, 28(c), 33, 39(c)(ii) and Schedule 5 Condition 10 (c) and (e).

Table 1 - Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	
PA 11_0047 MOD 1	No
EPL 12365 (applicable conditions as above)	Yes
ML 1579	Yes
ML 1693	Yes
ML 1685	Yes
WAL 31084	Yes

Compliance status key for Table 2

Risk level	Colour code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

Table 2 - Non-compliances

Relevant Approval	Condition Number	Condition Description (summary)	Compliance status	Comment	Where Addressed in Annual Review
PA11_0047	Schedule 2 # 2	Carry out project generally in accordance	Non-compliant	Refer following	Throughout AR
	Schedule 2 # 14	Surrender of DA-88-4-2005 by end of December 2013.	Non - Compliant	DA surrendered during reporting period following agreed timeframe with DP&E. DP&E provided a written response accepting the surrender of the DA; noting that TCM had met the requirements set out in the DA.	Section 11
	Schedule 2 # 18	Operation of plant and equipment	Non - Compliant	Sound power level testing identified that three excavators and one drill had results greater than the indicative levels identified in the EA. The incident was reported to DP&E upon receival of results; the results were received outside of the reporting period and subsequent notification and investigation were carried out outside of the reporting period.	Section 4.2 and Section 11
	Schedule 3 # 9	Attenuation of plant	Non-compliant	Sound power level testing identified that three excavators and one drill had results greater than the indicative levels identified in the EA. The incident was reported to DP&E upon receival of results; the results were received outside of the reporting period and subsequent notification and investigation were carried out outside of the reporting period.	Section 4.2 and Section 11
	Schedule 3 # 28	Operate a real time air dispersion modelling system	Non-compliant	Predictive air dispersion modelling required as part of the air quality management system was not operational during the period, however predictive	Section 11

Relevant Approval	Condition Number	Condition Description (summary)	Compliance status	Comment	Where Addressed in Annual Review
				meteorological forecasting is utilised at the site. The predictive air dispersion modelling is being developed as part of the preparation of the BTM Air Quality Management Strategy. DP&E are aware that this system is dependent upon the approval and implementation of the strategy. Non-compliance previously advised to DP&E via the 2014 Independent Environment Audit submission.	

2 INTRODUCTION

This is the tenth Annual Review (AR) formerly known as the Annual Environmental Management Report (AEMR) produced for the TCM, and it has been prepared in accordance with Condition 3 of Mining Lease (ML) 1579 and ML 1685 and Condition 4 of ML 1693 (Mining Act 1992), and Condition 4 (Schedule 5) of PA 11_0047, as modified. The current Mining Operations Plan for TCM was prepared under the new guidelines "ESG3: Mining Operations Plan (MOP) Guidelines". The AR follows the format required by the NSW Government Annual Review Guideline (October, 2015). Though primarily covering the period from 1st May 2015 to 30th April 2016 (the reporting period), where relevant the Annual Review provides information on historical aspects of the operations, longer term trends in environmental monitoring results and provides relevant information on activities to be undertaken during the ensuing period, i.e. from 1st May 2016 to 30th April 2017, or beyond.

2.1 Mine Contacts

The management personnel responsible for operational and environmental performance at the TCM and their relevant contact details are as follows:

- Mr Anthony Margetts, Manager Mining Engineering - retains statutory responsibility for mining activities at the site. Contact: (02) 6743 4000.
- Mr Nigel Wood, General Manager, Open Cut Operations - oversees Open Cut Operations for the Whitehaven Group. Contact: (02) 6741 9309.
- Mr Lachlan Johnson, Environmental Officer– oversees day to day environmental and rehabilitation performance across the site. Contact: (02) 6743 4000.

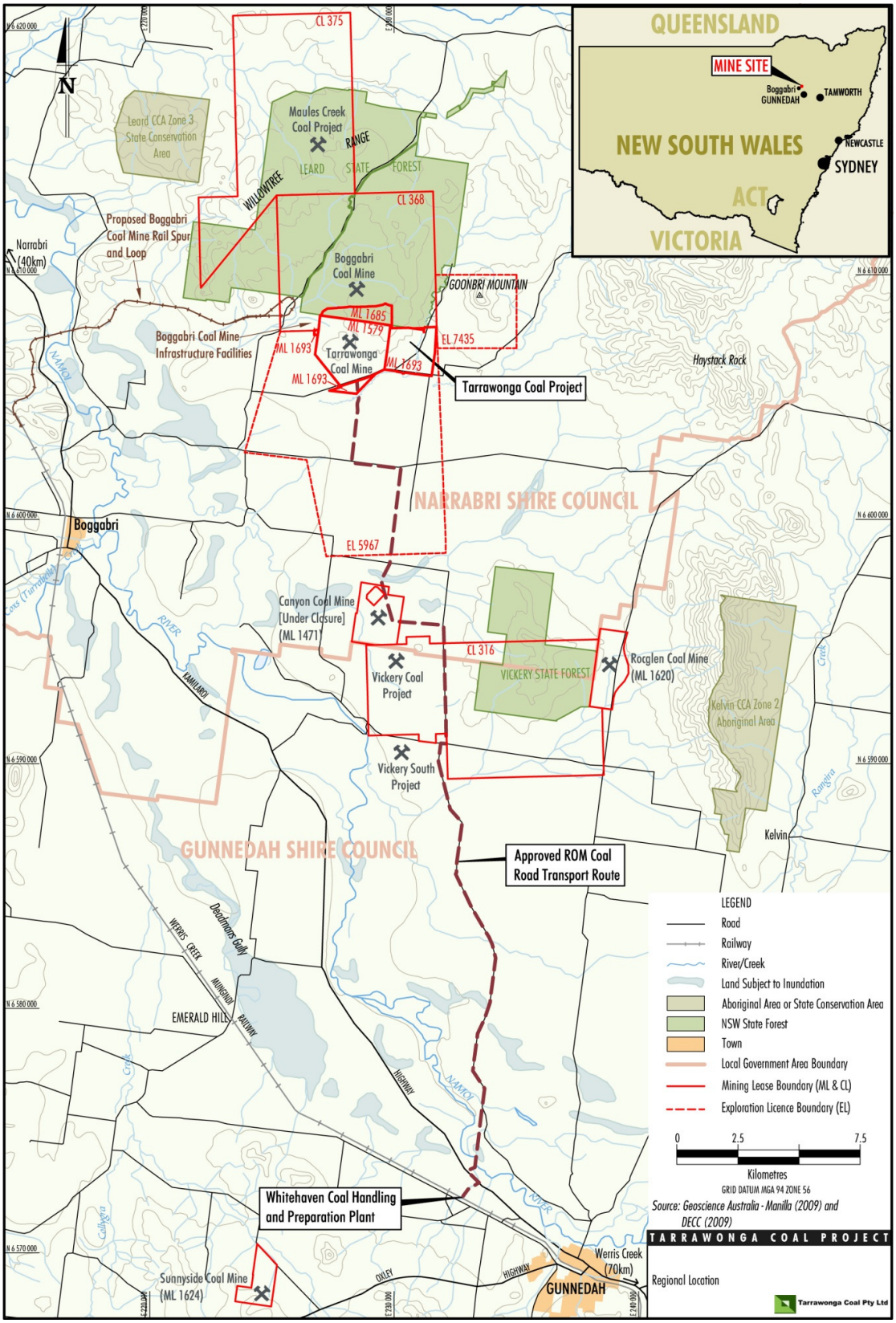

Figure 1 - Locality Plan

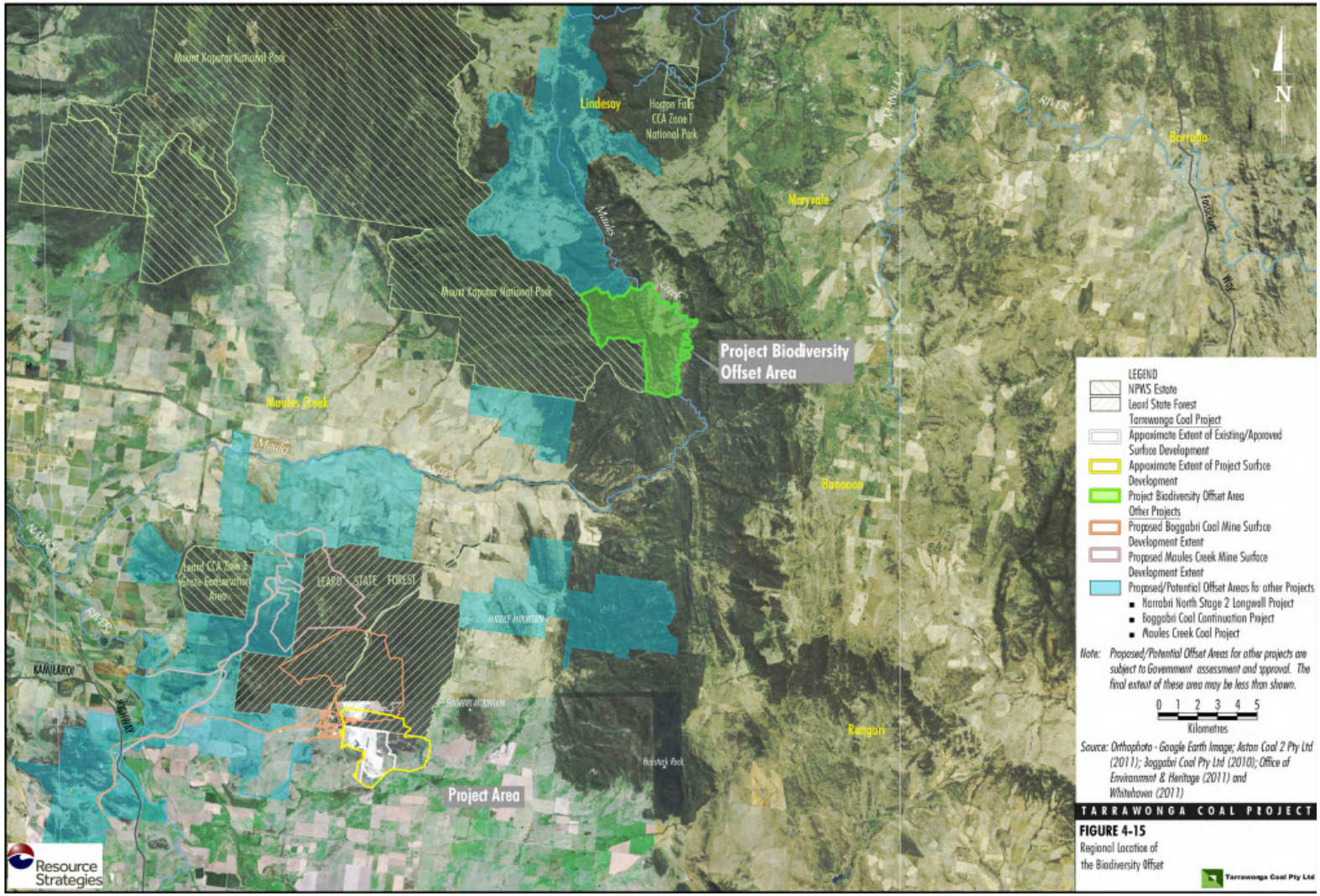

Figure 2 - Regional Location of Biodiversity Offset

Figure 3 – Regional Location of Biobank Site

3 APPROVALS

3.1 Tenements, Licences, and Approvals

Table identifies the approvals in place for the TCM at the end of the reporting period, the issuing / responsible Authority, dates of issue, expiry date and relevant comments.

Table 3 - Tenements, Licences and Approvals

Issuing / Responsible Authority	Type of Lease, Licence, Approval	Date of Issue	Expiry	Comments
Division of Resources and Energy (DRE)	Exploration Licence (EL 5967)	24/07/2002	23/07/2015	Renewal submitted July 2015 with acknowledgment received 23/7/2015; currently pending renewal approval.
Division of Resources and Energy (DRE)	Mining Lease (ML) 1579	03/04/2006	02/04/2027	Expires 21 years from commencement
Office of Environment & Heritage (OEH)	Environment Protection Licence (EPL) No. 12365 (Appendix 2)	09/01/2006	N/A	
NSW Department Primary Industry - Water	90BL253276 90BL253278 90BL253279 90BL253280 90BL254253 90BL254254 90BL254255 90BL254221 90BL254214 90BL255766 WAL31084	18/05/2006 18/05/2006 18/05/2006 18/05/2006 18/05/2006 18/05/2006 24/04/2007 05/04/2007 04/04/2007 19/08/2012 26/06/2012	Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity Perpetuity 25/06/2017	Monitoring bores 250ML Mining
Department of Planning & Environment (DP&E)	Project Approval PA 11_0047	22/01/2013	31/12/2030	Project Approval for LOM Extension Project. Expires December 2030
Department of the Environment	EPBC 2011/5923	11/03/2013	31/12/2053	Conditional Federal Project Approval for LOM Project
Division of Resources and Energy (DRE)	Mining Lease (ML) 1685	18/07/2013	14/11/2032	

Issuing / Responsible Authority	Type of Lease, Licence, Approval	Date of Issue	Expiry	Comments
Division of Resources and Energy (DRE)	Mining Lease (ML) 1693	14/10/2013	14/10/2034	Expires 21 years from commencement
Department of Planning & Environment (DP&E)	Notice of Modification of Project Approval PA11_0047	6/11/2014	31/12/2030	Modification to coal haulage tonnage to Gunnedah CHPP; no change to expiration of project approval.
Division of Resources and Energy (DRE)	Mining Operations Plan (MOP)	4/12/2015	30/11/2020	

4 OPERATIONS SUMMARY

4.1 Mining Operations

Table 4, presents the Production Summary at the end of the reporting period.

Table 4 – Production Summary

Material	Approved Limit	Previous Reporting Period (actual)	This Reporting Period (actual)	Next Reporting Period (forecast)
Waste Rock/Overburden (bcm)	n/a	19,273,391	19,996,819	20,000,000
ROM Coal/Ore (t)	3,000,000 (Project Approval PA11_0047) Coal Works >2,000,000 – 5,000,000T (EPL 12365)	2,383,715	2,236,642	2,300,000
Coarse Reject (t)	n/a	0	0	0
Fine Reject (Tailings) (t)	n/a	0	0	0
Saleable Product (t)	n/a	2,038,010	2,023,981	2,200,000
Gravel Production (t)	90,000 (Project Approval PA11)0047)	0	0	90,000[1]

[1] As per PA and MOP, subject to further mine plan consideration.

4.2 Other Operations

4.2.1 Hours of Operations

PA 11_0047 permits 24 hour operation of mining activities, and allows for changes to coal transportation following the commissioning of the Boggabri Rail Spur Line, and Boggabri CHPP. TCPL has made some minor changes to operating times to accommodate changes in the working roster for improved production and economic stability.

Open cut mining activities, including processing of coal, generally occurred between the hours of 6:30am and midnight Monday to Friday and between midnight and 3.00am Tuesday to Saturday. On occasion, Saturday and Sunday day shifts have been run to meet production deadlines.

4.2.2 Coal Haulage

For the reporting period there were 48,702 trucks movements to transport 2,100,733t along the approved haulage route from TCM to the Whitehaven Gunnedah CHPP. Combined haulage of ROM coal from TCM and Rocglen Coal Mine was 3,369,811t. Transport of coal from the site or receival of coal reject from the Whitehaven CHPP by truck has only occurred during the approved hours of:

(a) 6 am to 9.15 pm Monday to Friday;

(b) 7 am to 5.15 pm Saturday; and

(c) at no time on Sundays or public holidays.

4.2.3 Exploration

No exploration undertaken during the reporting period.

4.3 Next Reporting Period

4.3.1 Exploration

Exploration drilling will continue to be undertaken at the TCM to further assess the coal reserves within the tenements.

4.3.2 Mine Operations

The mine production rates are planned for approximately 2.3Mtpa of ROM coal and approximately 20 million bank cubic metres (Mbcm) of overburden during 2016.

Vegetation clearing activities in mining areas over the next reporting period will be conducted in accordance with the approved Biodiversity Management Plan and MOP. The clearing program will be undertaken during the annual ten week clearing campaign from the 15 February to the 30 April, except under exceptional circumstances and with the approval of the Secretary of the DP&E.

4.3.3 Overburden Emplacements

The northern emplacement will continue to develop to the east whilst the northern extension emplacement will merge with the Boggabri Coal emplacement in accordance with the Tarrawonga MOP, Common Boundary Integrated Management Plan and subsequent mine lease transferal. This is anticipated to occur at the end of the next reporting period.

4.3.4 Mining Fleet Upgrades

No variation to the operational fleet is anticipated during the next reporting period.

5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

Actions from the previous Annual Review are noted in Table 5.

Table 5 - Actions Required from the Previous Annual Review

Action Required from Previous Annual Review	Requested By	Action Taken by the Operator	Where Discussed in Annual Review
Inconsistencies identified in Rehabilitation Targets and Outcomes 2014/15 AEMR.	DRE	2014-15 AEMR revised and DRE advised via email of discrepancy reasoning	N/A
Inconsistency between the AEMR and MOP rehabilitation commitments.	DRE	2014-15 AEMR revised and DRE advised via email of discrepancy reasoning	N/A
Document volume of gravel extraction from site.	DP&E	Included in current Annual Review	S4.1
Document the measures that have been implemented for the control of weeds and feral pests and collecting and propagating seed.	DP&E	Included in current Annual Review	S6.2
Include a comprehensive review of the monitoring results and complaints records of the project over the past year for all environmental performance issues, which includes a comparison of the monitoring results against: • Relevant statutory requirements, limits or performance measures/criteria; • Monitoring results of previous years; • Relevant predictions of the EA.	DP&E	Included in current Annual Review	Throughout AR
Identify any trends in the monitoring data over the life of the project for all environmental performance issues.	DP&E	Included in current Annual Review	Throughout AR

Action Required from Previous Annual Review	Requested By	Action Taken by the Operator	Where Discussed in Annual Review
Identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies for all environmental performance issues.	DP&E	Included in current Annual Review	Throughout AR
Describe what measure will be implemented over the next year to improve environmental performance of the project for environmental performance issues.	DP&E	Included in current Annual Review	Throughout AR
Include a statement of compliance for each environmental performance issue.	DP&E	Included in current Annual Review	Throughout AR
Identify key activities for the next reporting period.	DP&E	Included in current Annual Review	Throughout AR

6 ENVIRONMENTAL PERFORMANCE

The following sub-sections document the implementation and effectiveness of the various control strategies adopted at the TCM, together with monitoring data for the reporting period. Life of mine monitoring data is included as Appendices in this AR, where relevant, to allow for discussion on longer-term trends.

6.1 Noise

6.1.1 Criteria

The Project Approval and EPL detail the noise criteria for site operations and coal haulage,

Noise compliance criteria are those of PA 11_0047 which are specified as follows:

Noise Criteria dB(A)

Location	Day, Evening & Night LAeq (15 min)	Night LAeq (1 min)
All other privately-owned residences	*35*	*45*

Road Traffic Noise Criteria dB(A) LAeq (1 hour)

Location	Day	Evening	Night
Any residence on privately-owned land	*60*	*60*	*55*

A number of other specific conditions (i.e. acquisition, monitoring protocols and cumulative impacts) are listed in PA 11_0047 and EPL 12365.

6.1.2 Environmental Management Measures

Routine attended noise monitoring programs were undertaken quarterly during the reporting period by Spectrum Acoustics. The noise monitoring sites are identified on Figure 4 and include the "Bungalow", "Barbers Lagoon" and "Matong" properties. Attended noise monitoring undertaken throughout the reporting period showed compliance with the limits specified in the project approval on all occasions.

A number of operational measures have been implemented on site to maintain compliance with limits; these include but are not limited to:

- Noise risk/response matrix;

- Automated SMS alarms notifying site personnel of elevated noise levels approaching noise criteria;
- Modification of operations in response unfavourable meteorological conditions and results;
- Reduction in fleet numbers during night time operation;
- Real-time noise monitor and web based repository.

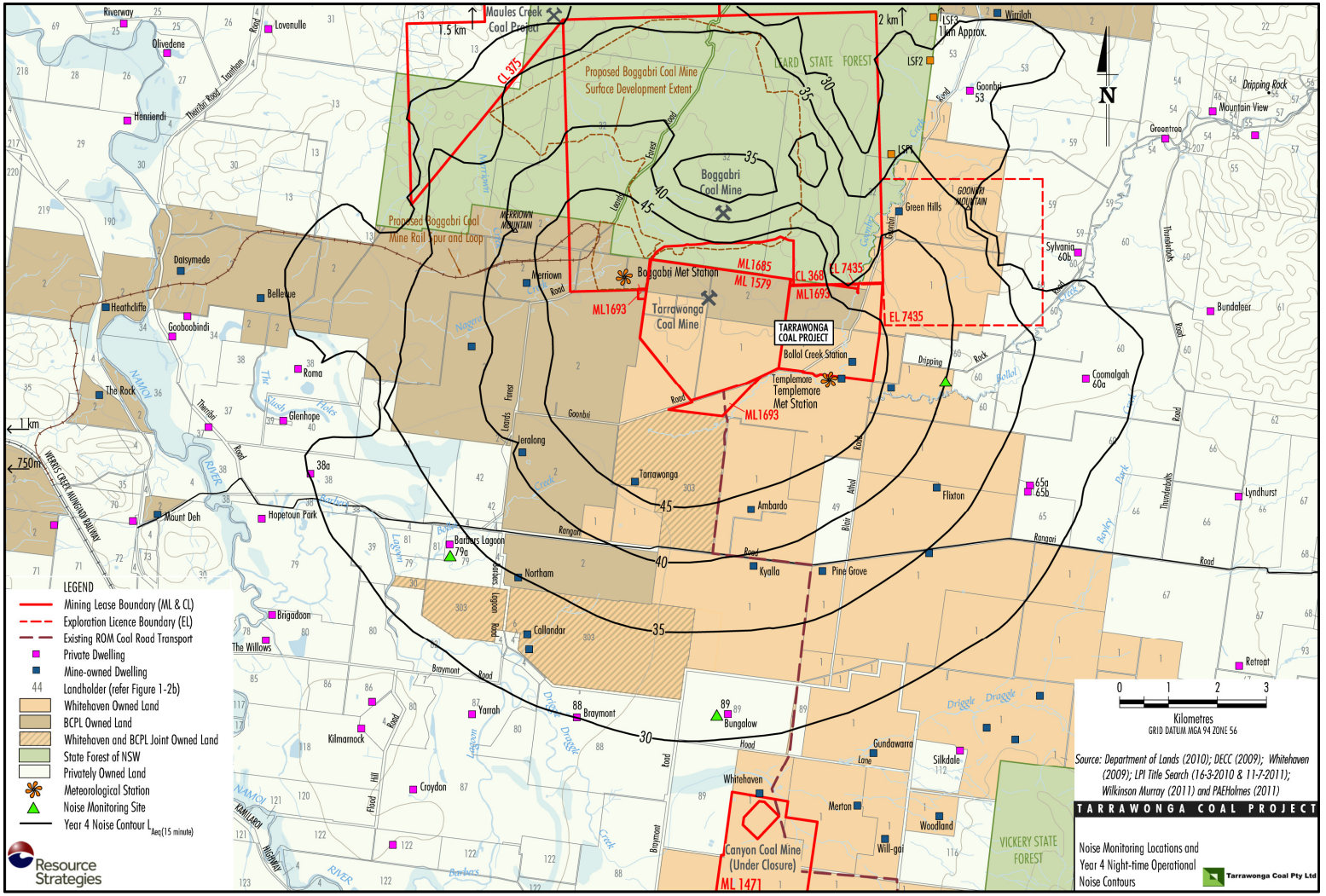

Figure 4 – Noise Monitoring Locations

In addition to the operational noise requirements, TCM monitors road transport noise along public sections of the coal haulage route, in accordance with the Tarrawonga and Rocglen Road Noise Management Plan This monitoring occurs at the privately owned residences on the "Weroona" property and "Brooklyn" property located off Blue Vale Road. Monitoring at these locations showed compliance on all occasions.

In accordance with the requirements of PA 11_0047 and EPL 12365, TCPL undertook real time noise monitoring during the reporting period. During this reporting period, TCM continued to implement the noise management procedures in relation to real time monitoring e.g. operational reviews.

Annual Sound Power Testing

Sound power level testing of fixed and mobile plant was undertaken during the reporting period; there was four individual pieces of plant that had SPL results which were greater than indicative levels identified in the EA. Table 6 provides a summary of the plant which had elevated results. All other plant on site was tested and was within the indicative levels identified in the EA. Whilst some plant may not have met the Indicative SPL specified in the Environmental Assessment, monthly attended monitoring results and the Annual Noise Validation Assessment shows that TCM is operating generally in accordance with the project approval noise affectation criteria. Sound power levels which did not meet indicative levels were reported to DP&E (refer Section 6.1.3).

Table 6 – Summary of Sound Power Level Exceedance

Plant Item	Actual Sound Power Level	Indicative Sound Power Level
Terex RH170 Excavator	117dB	115dB
Terex RH170 Excavator	118dB	115dB
Hitachi 1900 Excavator	118dB	114dB
Cubex QXR 1320 Drill	121dB	117dB

Annual Validation

The annual validation assessment of the TCM noise model determined that in all cases, the 90th percentile measured levels were within 2 dB of the predicted levels, which is at the lower end of the error margin for the Environmental Noise Model (ENM), and practical agreement between measured and predicted levels has been confirmed. Further, the 90th percentile measured levels show compliance with the noise criterion at all monitoring locations.

The 90th percentile measured and predicted levels are as follows:

Location	Measured	Predicted	Criterion
Coomalgah	30	32	35
Bungalow	33	31	35
Barber's Lagoon	32	34	35

6.1.3 Key Environmental Performance/Management Issues

Notification with regard to sound power levels was made to DP&E following the receipt of the results from the consultant. The investigation was undertaken immediately following the receival of results which occurred outside of the reporting period and the incident report has been provided to DP&E as part of the reporting process.

Attended noise monitoring indicates that results are generally consistent or below the predicted LAeq, 15 minute 10th Percentile Operational Noise from Project predicted in the 2011 Environmental Assessment. Any result greater than levels predicted in the EA remained within compliance criterion. Attended noise monitoring results at the monitoring locations show consistent trends within compliance limits.

The road noise monitoring results are consistent with the predictions of the Whitehaven ROM Coal Haulage Modification Environmental Assessment for the southern section of the approval transport route. No monitoring occurs on the northern section of the approved road transport route as the closet private receiver is over 4km away as identified in the EA. Road noise monitoring results at the monitoring locations show consistent trends within compliance limits

6.1.4 Proposed Improvements to Environmental Management

Submit a revised Noise Management Plan to DP&E to revise the management actions relating the plant sound power levels.

6.2 Blasting

6.2.1 Criteria

Blasting criteria for the TCM are noted in PA 11_0047 MOD 1, and Condition L5 of EPL 12365.

- Blasting must only be carried out between 9.00 am and 5.00 pm, Monday to Saturday inclusive. Blasting is not allowed on Sundays, public holidays or at any other time without the written approval of the Director-General.
- A maximum of one (1) blast per day, unless an additional blast is required following a blast misfire and a maximum of 4 blasts per week averaged over a calendar year for the project:

- For non-project related residences, the overpressure level from blasting operations must not:
    - exceed 115dB (Lin Peak) for more than 5% of the total number of blasts over a period of 12 months; or
    - exceed 120dB (Lin Peak) at any time.
- For non-project related residences, ground vibration peak particle velocity from the blasting operations must not:
    - exceed 5mm/s for more than 5% of the total number of blasts during each reporting period; and
    - exceed 10mm/s at any time, at any residence on privately-owned land.

6.2.2 Key Environmental Performance/Management Issues

During the reporting period, a total of 89 blasts were initiated (all of which were monitored). Seven (7) instances occurred where two or more blasts were required to be fired on one day due to safety reasons. When this occurred the appropriate notifications where undertaken. There were three instances of monitoring results exceeding 115 dB during the reporting period, occurring at the project-related "Tarrawonga". This exceedance falls within the allowable 5% of blasts in a 12 month period over 115 dB but not greater than 120 db. There were no instances of blast results exceeding 120 dB during this reporting period. The maximum recorded ground vibration during the reporting period was 1.38mm/s recorded at "Tarrawonga" on 20th April 2015. This is well inside the consent criteria of 5mm/s. Results during the reporting period tended downward (improvement) with fewer events greater than 115dB and 120dB. All blast monitoring results for the reporting period, including the time of initiation, have been included in Appendix 1.

The EA predicted that no exceedance of the blast criterion would occur at privately owned residences. Section 6.2.3 below outlines the status of Tarrawonga blast monitors and plans to have them relocated to private residences.

The maximum fume rating for the reporting period was classified as a 2B per the *Australian Explosives Industry And Safety Group Inc – Code of Practice: Prevention and Management of Blast Generated NOx Gases in Surface Blasting*. No instances were recorded of blast fume leaving the premises boundary.

6.2.3 Proposed Improvements to Environmental Management

The relocation of blast monitors as specified in the Blast Management Plan did not occur during the reporting period as agreement between WHC and the proposed private receivers was not reached. Negotiations with the nearest private property owners will continue with the aim to reach

agreement to relocate the two blast monitors from their current locations on project related land. Relocation of the monitors is anticipated during the next period.

6.3 Air Quality

6.3.1 Criteria

The air quality criteria applicable to the TCM are specified in PA 11_0047 MOD 1 Schedule 3. Air quality criteria is summarised below:

- Acceptable mean annual increase in deposited dust – 2g/m2/month.
- Mean annual dust deposition (all sources) – 4g/m2/month.
- Mean annual TSP (all sources) concentration – 90 µg/m3.
- Mean annual PM10 particulate level – 30 µg/m3.
- 24 hour average PM10 particulate level – 50 µg/m3.

6.3.2 Environmental Management Measures

TCM employs a range of air pollution control measures including:

- modification of work practices where required including changing dumping strategies;
- temporary cessation of operational equipment;
- maintaining a real time SMS alarming system to key operational personnel;
- Use of trunks, branches and litter from clearing for mine site rehabilitation. No materials are burnt;
- Limiting groundcover removal in advance of mining consistent with operational requirements;
- Groundcover removal as part of the topsoil removal activities, rather than prior to topsoil removal;
- Where practicable, limiting soil stripping activities to periods when there is sufficient soil moisture to prevent significant dust lift-off and avoiding periods of high winds;
- Soil stripping using bulldozers, thereby eliminating the dust generated from elevated scrapers;
- Application of water to exposed surfaces, with emphasis on those areas subject to frequent vehicle/equipment movements which may cause dust generation and dispersal;
- Use of water injection on drilling rigs;
- Use of imported aggregates for blast hole stemming;
- Water application at the crusher and on the conveyor discharge point to the coal bin;

- Cessation of coal processing activities during periods of concurrent high winds and temperatures which cause coal dust dispersal, independent of water applications.
- ROM coal pad watering;
- Progressive shaping and rehabilitation of areas once they are no longer required for mining purposes;
- Speed limit restrictions on all vehicles and equipment on the mine site;
- Equipment exhaust positioning to avoid exhausts impinging on the ground and causing dust lift-off; and
- Use of covers on all product coal trucks. All coal haulage vehicles (road trucks only), including those operated by sub-contractors, are fitted with roll-over tarpaulins.
- Stabilisation trial of the southern face of the southern emplacement.
- TCM continues to liaise with Boggabri Coal Mine and Maules Creek Coal Mine during periods of elevated air quality events to manage cumulative impacts.

6.3.3 Air Quality Monitoring

Figure 5 identifies the locations of the various deposited dust gauges, TEOM and HVAS maintained during the reporting period.

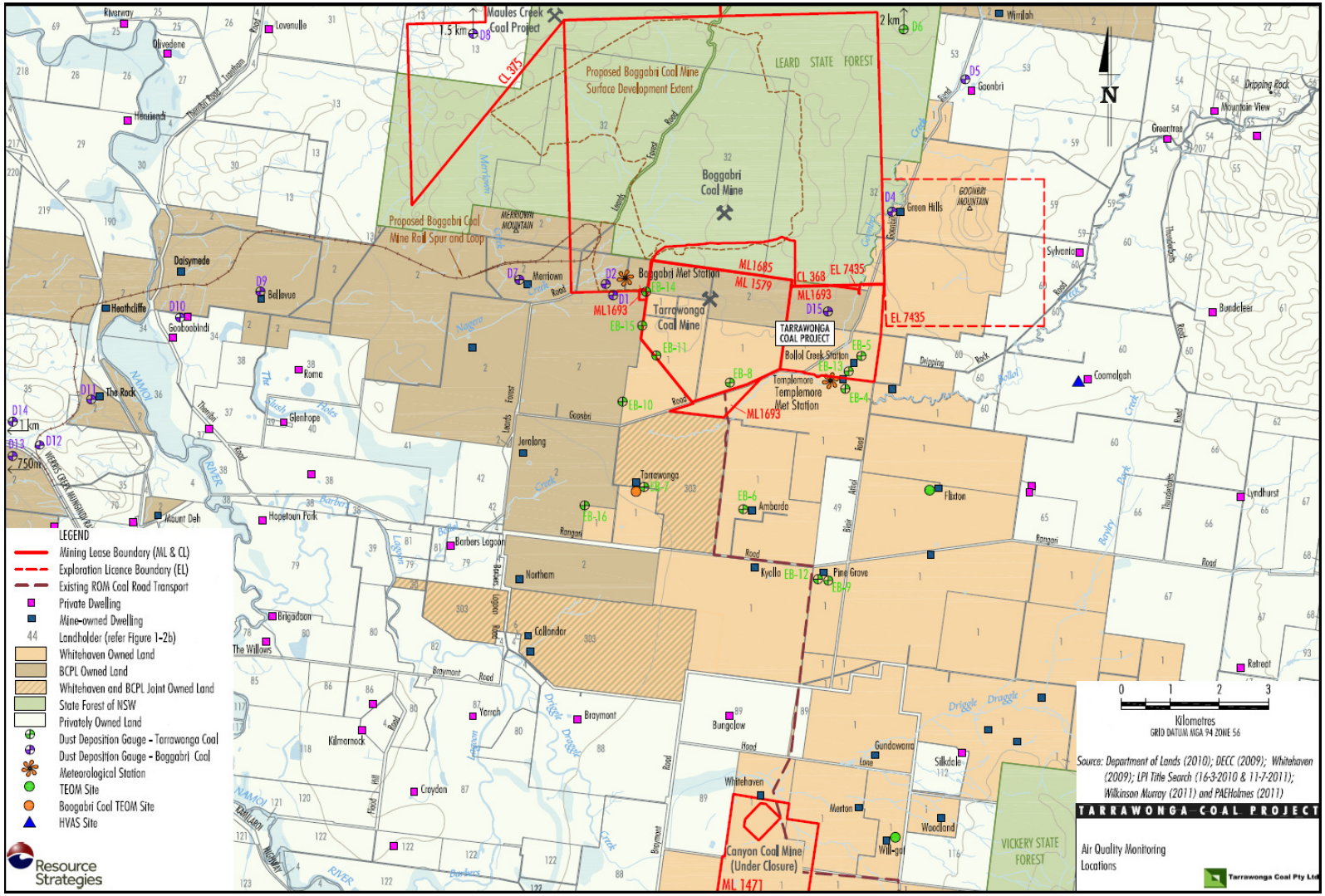

Figure 5 – Air Quality Monitoring Locations

A review of Table 7 shows that the annual average limit for deposited dust was exceeded at six monitoring locations; EB-4, EB-5, EB-6, EB-8, EB-10, EB-11, EB-15. These monitoring locations are all located on project related land and therefore the elevated levels are not non-compliant.

Results from previous monitoring periods in comparison to results recorded during this reporting period indicate that deposited dust results trended upwards with an increase in the number of monitoring locations exceeding the annual average limit. Dust is strictly managed per the environmental measures described in Section 6.3.2.

The EA predicted no exceedance of the deposited dust level criterion. Tarrawonga does not have dust monitors located on privately owned land.

Table 7 - Deposited Dust Monitoring Data Summary (May 2015 to April 2016)

MONTH	TEMPLEMORE (EB-4)[1]	BOLLOL CREEK STN (EB-5)[1]	AMBARDO (EB-6)[1]	TARRAWONGA (EB-7)[1]	THUIN (EB-8)[1]	PINE GROVE (EB-9)[1]	TARRAWONGA MINE (EB-10)[1]	TARRAWONGA MINE (EB-11)[1]	TARRAWONGA MINE (EB-14)[1]	TARRAWONGA MINE (EB-15)[1]	JERALONG NORTH (EB-16)[2]
May 2015	21.4	1.8	0.7	1.1	1.5	0.8	8.6	2.7	1.7	5.0	<0.01
June 2015	144	2.2	0.6	4.3	2.9	0.4	NS	9.5	1.2	4.5	0.4
July 2015	49.4	12.1	1.7	1.3	4.2	0.6	21.1	6.8	1.2	3.6	0.5
August 2015	10.2	5.3	1.6	1.0	10.1	2.1	7.3	2.4	3.9	15.4	0.5
September 2015	2.6	4.2	0.7	0.6	6.0	6.0	1.6	5.1	4.5	3.7	1.2
October 2015	NS	3.4	1.5	1.1	0.7	1.7	3.9	2.4	5.8	8.9	0.9
November 2015	22.9	4.8	0.9	1.2	8.6	1.7	17.0	6.0	2.8	2.9	10.7
December 2015	14	26	1.0	1.2	5.7	5.6	7.9	7.0	1.3	2.4	2.1
January 2016	11.1	2.9	38.6	1.5	4.8	2.6	6.0	0.0	6.2	4.1	1.3
February 2016	15.7	4	2.2	0.7	0.8	3.1	11.6	3.4	4.1	2.7	5.3
March 2016	NS	4.4	1.3	0.8	0.3	1.0	2.5	5.7	3.2	3.1	0.8
April 2016	10.6	2.2	0.9	0.7	2.1	1.0	1.2	2.3	1.9	4.9	0.9
ANNUAL AVERAGE	14.4	6.1	4.3	1.3	4.1	2.2	7.7	5.7	3.2	5.1	2.2
Long Term Average	4.8	3.1	1.5	1.2	2.6	1.1	4.4	2.3	2.9	5.3	2.7

NS – no sample due to blocked funnel or broken bottle.

[1] Project related land

[2] Owned by Boggabri Coal Mine.

TCM has one High Volume Air Sampler (HVAS - PM_{10}) which was located at the "Templemore" property (project related). This HVAS was relocated to the "Coomalgah" property in April 2016. The "Coomalgah" property is due east of the operation. The PM_{10} results for the reporting period show exceedance of the 24hr criteria on two occasions (see Figure 6); however results remain within the annual average criteria. The criteria for PM10 only relates to privately owned property and as the

results occurred on project related land they are not considered to be non-compliant exceedances. The annual average has decreased from 28.63µg/m^3 to 20.04µg/m^3 during the reporting period.

The EA predicted no exceedances of the 24hr average and annual criterion for PM10 at any privately owned residence. During the reporting period monitoring occurred for a short period of time at a privately owned residence with results indicating compliance with the criterion.

Emission contours shown in appendix d of the EA show that results recorded at the Templemore residence (project related land) are consistent with those predicted.

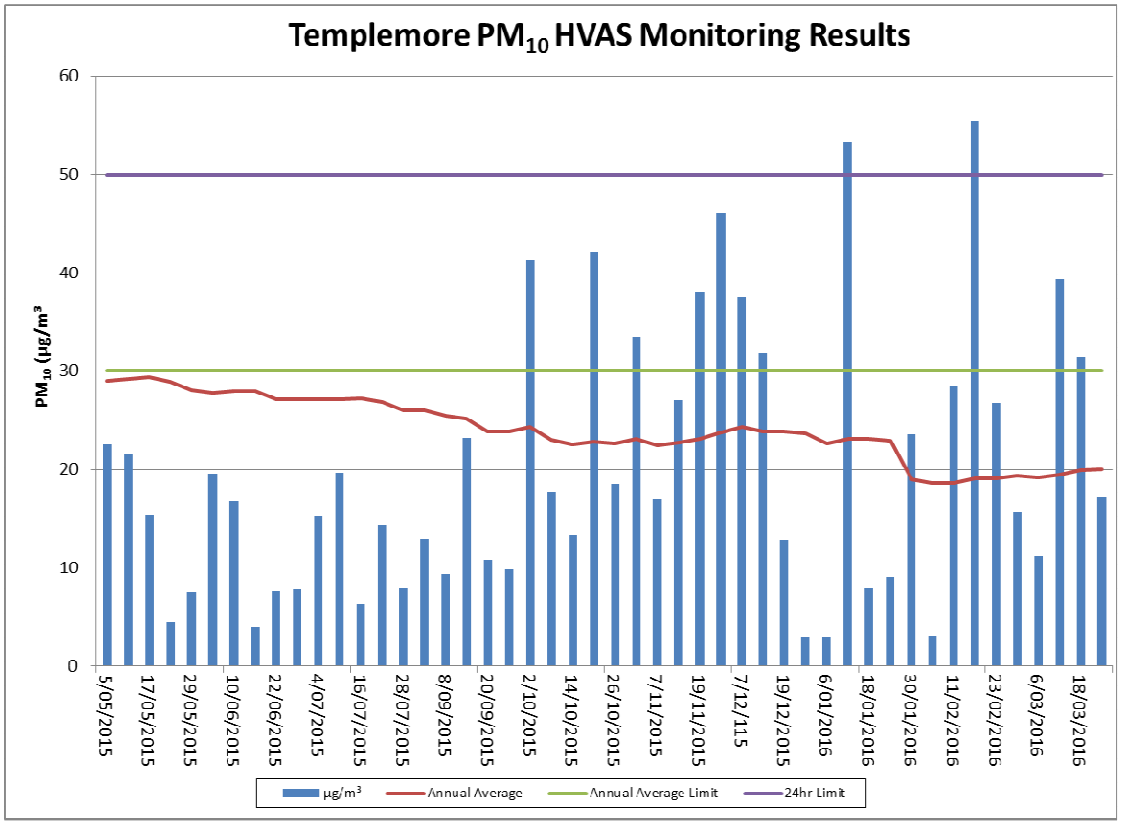

Figure 6 – Templemore HVAS Monitoring Data Summary (May 2015 to March 2016)

Total Suspended TSP is inferred from the measured PM10 data. Monitoring conducted at the TCM Templemore HVAS indicated the TSP rolling annual average remained well below the applicable criteria of 90 µg/m3. The TSP monitoring results are illustrated in Figure 7 below.

The EA predicted no exceedance of the annual average TSP criterion. TSP results inferred from PM10 data indicate that no exceedance of the criterion occurred during the reporting period.

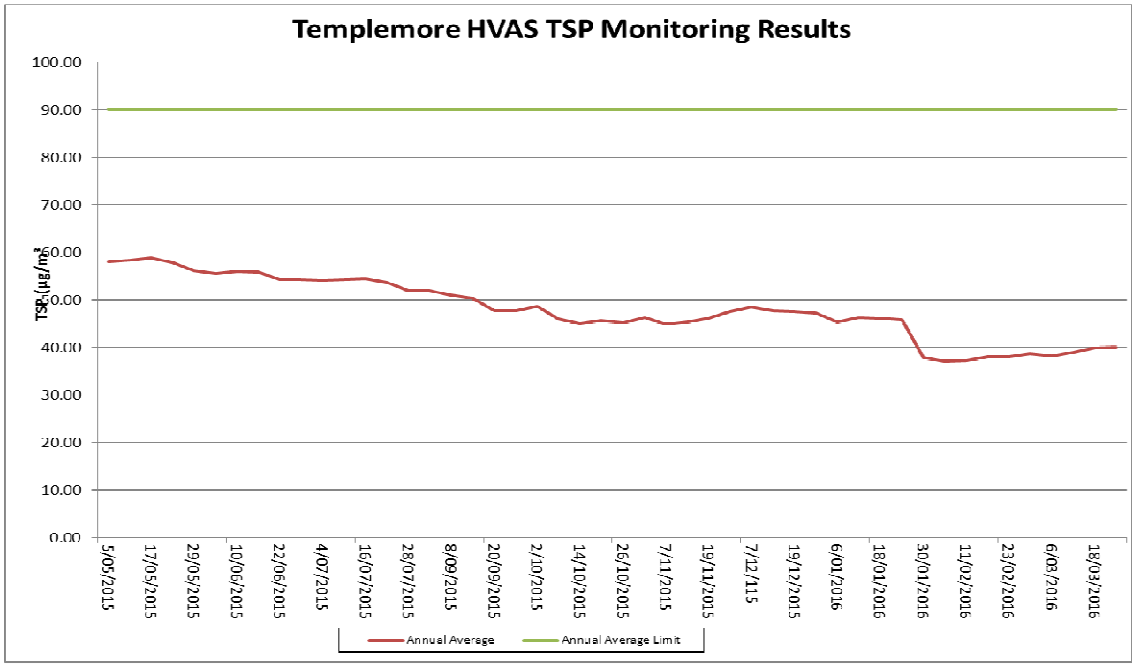

Figure 7 – Templemore HVAS TSP Monitoring Data Summary (May 2015 to March 2016)

Throughout the reporting period, real time PM_{10} TEOM (air quality) monitoring was conducted with a permanent monitoring station located at the nearby "Flixton" property and $PM_{2.5}$ TEOM located at "Wilgai" (Figure 5). Data is generated every 15 minutes and correlated against current weather conditions, with alarms notifying site personnel of elevated PM_{10} results when wind conditions and direction is indicative of potential mining influence on the monitor. Real-time monitoring is used as a management tool to facilitate in the day to day mine plan and operations and is not as a compliance monitor.

As there are no criteria of $PM_{2.5}$ no assessment was undertaken in the EA. Results recorded at the $PM_{2.5}$ monitor on the "Wilgai" property remain consistent with those recorded during previous reporting periods.

6.3.4 Key Environmental Performance/Management Issues

The stabilisation of the southern emplacement had limited success during the first trial. Limitations to the success of the trial have been attributed to poor seasonal conditions, seeding density and pasture mix choice. Further aerial seeding will be undertaken in the next reporting period, the details and results will be further discussed in the next Annual Review.

6.3.5 Proposed Improvements to Environmental Management

During the next reporting period the BTM Cumulative Air Quality Strategy is anticipated to be approved by DP&E with the predictive air dispersal modelling system to go live and provide information to Tarrawonga.

Additional aerial seeding of the southern emplacement as part of the stabilisation trial will be undertaken utilising the learnings of the first trial.

6.4 Biodiversity

6.4.1 Threatened Flora

Investigations undertaken by Geoff Cunningham Natural Resource Consultants Pty Ltd as part of the original Mine EIS identified no significant impact on threatened flora species, endangered ecological communities, endangered flora populations or critical habitat as a consequence of the development. Establishment of monitoring plots commenced in April 2007 and has continued as required. Over the life of the mine, a total of 28 quadrats are to be established across rehabilitation sites and control sites.

During the reporting period, vegetation monitoring was conducted during mid to late 2015 by Eco Logical Australia Pty Ltd. This monitoring comprised of:

- Multi-spectral imagery capture across the entire target area (including control areas) using 4-Band WorldView-2;
- Native vegetation monitoring.

Potential impacts noted in the EA included the clearing of Box-Gum Woodland EEC/CEEC and the groundwater dependent ecosystem - Bracteates Honey myrtle low riparian forest. These areas have not yet been cleared for mining purposes.

Remote sensing analysis

Changes in the 2014 and 2015 Normalised Differential Vegetation Index (NDVI) of multi-spectral imagery were assessed. Areas of significant increases or decreases in photosynthetically active biomass (PAB) across the site were associated with mine rehabilitation or clearing for the mine extension and associated activities.

Woodland Vegetation

Woodland vegetation monitoring showed an increase in native and exotic groundcover species diversity and cover in most plots, a result of wet conditions in the months preceding the survey. Canopy and midstorey cover remained stable however; shrub species diversity in the rehabilitation plots remains low.

Seed Collection

TCM implemented a quarterly seed assessment program designed to identify on a seasonal basis the life cycle stage and development of native plants across the Biodiversity Offset Area to identify what, where, when and how to target appropriate resources to collect seed for future revegetation programs. The format of the quarterly seed assessments are to ensure that timely and prioritised seed collection is implemented with the reporting to include spatial information that can be directly given to seed collection contractors to undertake the required works. Only appropriately experienced seed collection contractors who follow the Flora Bank guidelines are engaged to undertake the seed collection works at TCM.

TCM engaged contractors to collect seed from the onsite clearing area ahead of mining on 4th, 23rd and 24th February 2016 resulting in the collection of 577g of tree seed from 6 species, 541g of shrub seed from 4 species and 13g of native forb and vine seed. This seed will be germinated and propagated to supply future year's revegetation requirements.

Clearing

During the pre-clearance the survey undertaken in February, tylophera linearis which is listed under state and federal legislation as endangered and threatened respectively was identified in the Leard State Forest. Appropriate notifications were made to the Office of Environment and Heritage (OEH) and the Department of Environment (DotE) and subsequently a Significance Impact Assessment Report was prepared and submitted to DotE. A subsequent assessment of the condition indicated that all individuals were in an early growth phase, with no reproductive material observed, and as such they were not suitable for propagation or translocation. No other unidentified flora was observed.

6.4.2 Threatened Fauna

The annual terrestrial fauna and habitat monitoring of native vegetation areas was conducted between 14 and 15 July 2015 and between 13 and 14 October 2015. . Bird species diversity in winter and spring was reasonably steady in both rehabilitation sites between 2014 and 2015. Diversity has decreased substantially at the control sites between two winter monitoring periods. The reduction in species diversity may be as a result of disturbance to the possible source area (forest) to the north and mine-related noise.

Areas cleared for mining purposes which was predicted in the EA to displace threatened fauna is offset by the Willeroi West Offset property. The clearing undertaken in the LSF and predicted impacts is as per predictions in the EA. In accordance with the BMP hollow bearing trees which represent suitable habitat to a variety of native fauna are salvaged for reuse on rehabilitation areas.

No change to natural flow regime has occurred and Goonbri Creek realignment has not occurred. The EA also predicts impacts to groundwater dependent fauna at the time of Goonbri Creek realignment.

Clearing

During the clearing campaign a small number of fauna were observed and relocated to the designated fauna release site east of the operation in the Leard State Forest. No instances of injury or death of fauna were recorded. No unidentified species of fauna were observed.

6.4.3 Weeds

TCM implemented a quarterly weed inspection program that identifies the spatial location of weeds, determines the status (Weeds of National Significance, noxious and /or environmental), size of infestation and priority for control so that timely and prioritised weed control works can be scheduled quarterly to reflect seasonal conditions and growth stage. The format of the quarterly weed inspections reports include spatial information that can be provided directly to weed spraying contractors to undertake the required works. Only appropriately qualified and experienced weed contractors (AQF3 accreditation or higher for use of herbicide) are engaged to undertake the weed control works at TCM.

Targeted weed management within the mine leases included:

- Spot spraying of African Boxthorn within the ML;
- Spot spraying of general weeds and grasses around the administration office and workshops;
- Spot spraying of Prickly Pear, Bathurst Burr and Noogoora Burr within the ML;
- Continue to manage and control Prickly Pear plants with Cactoblastis and Cochineal; and
- Spraying of grasses along rip lines and mounded areas to reduce competition with planted tubestock in rehabilitation areas.

Key recommendations from the ELA report relating to weed control include weed management protocols to prevent further proliferation of Rhodes Grass, management of which will be undertaken during the upcoming reporting periods.

TCM engaged two rounds of weed control using contractors on the Willeroi Offset Area; the first in November 2015 resulting in approximately 20 individual Green Cestrum (W4) plants cut and painted and second round in December 2015 resulting in 55.3ha being sprayed for Sweet Briar (W4) and Coolatai Grass infestations.

6.4.4 Feral Animal Control

TCM implemented feral animal monitoring during 2015-2016 for the Willeroi Offset Area. Annual feral animal monitoring was undertaken in December 2015 using a combination of DPI listed feral animal monitoring techniques including sand pad/plots and transects. Sand pad monitoring identified that Eastern Grey Kangaroos as high abundance and Foxes as low abundance with other pest animals as scarce or not detected. Transect monitoring identified a very high number Goats as well as a number of Pigs present on Willeroi Offset. The results of the annual feral animal monitoring utilise known indices such as the DECCW/CSIRO "The Sand Plot Technique" to rate abundance and determine a population level rank (scare, low, medium and high) for a particular feral animal species. The population abundance and rank are then used in comparison to standards across NSW eucalypt forests and used to determine the frequency of control programs to be implemented on Willeroi by appropriately experienced feral animal management contractors.

No feral animal control programs were implemented on Willeroi during 2015-2016, however quarterly feral animal monitoring and control programs will be implemented as part of Whitehaven Coal Offset program (incorporating Willeroi) commencing from May 2016. Feral animals to be targeted in the forth-coming period will be Goats and Pigs.

The feral animal control program on TCM included 1080 fox baiting in September/October 2015 with sites strategically selected. Twenty-five percent of baits were taken and a further 10% were tampered with. The remaining baits were disposed of in accordance with the requirements.

Feral animals as per the predictions of the EA and are managed accordingly.

6.4.5 Key Environmental Performance/Management Issues

Narrabri Shire Council undertook annual weed inspections at TCM providing Noxious Weed Inspection Reports. The inspections noted that control of African Boxthorn was evident but required ongoing management and the common pear was not effectively being controlled by cochineal and that spot spraying would be required to commence further effective control. Both African Boxthorn and Common Pear have been addressed as per the requirements of the inspection report. Ongoing management continues to address new plants and regrowth.

6.4.6 Proposed Improvements to Environmental Management

Willeroi Biodiversity Offset Area

New monitoring programs such as quarterly weed inspections, quarterly feral animal monitoring and quarterly seed assessments will be implemented into 2016-2017 enabling timely, seasonal and prioritised works to occur. Quarterly feral animal control programs will be implemented in

2016/2017 targeting Foxes and Pigs with an additional dedicated Goat control program implemented on Willeroi from July to December 2016.

Areas of Willeroi Offset will be targeted for hazard reduction works in response to annual fuel load assessment as part of fire management and mitigation.

Tarrawonga Coal Mine

The monitoring program outlined in the Vertebrate Pest Management Plan will be implemented and documented. Findings will be used to improve the fox baiting program and determine necessity to undertake further feral animal control.

6.5 Aboriginal Heritage Management

6.5.1 Environmental Management Measures

A Cultural Heritage Assessment was completed in September 2011 as part of the Tarrawonga Coal Project EA by Kayandel Archaeological Services. A total of 57 sites (21 open artefacts, 11 scarred trees and 21 isolated artefacts) were located during the surveys of the Project Area. A revised Heritage Management Plan (HMP) was approved, as required in PA 11_0047, during this reporting period. An additional requirement of PA 11_0047 includes the development of an Aboriginal Cultural Heritage Strategy (ACHS) in conjunction with the Boggabri Coal Mine and Maules Creek Project. This Strategy remains under development following the completion of the Stage One Scoping Study.

To date, the measures in place to protect Aboriginal cultural heritage are considered satisfactory, with all measures identified in the EA, Project Approval and HMP in place. New procedures have been implemented to manage a significantly larger number of registered Aboriginal parties identified through the Tarrawonga Coal Project EA (refer to HMP).

6.5.2 Key Environmental Performance/Management Issues

The 12 monthly inspections of fenced sites were undertaken in June 2015. All sites were inspected with fencing and the sites considered being in satisfactory condition. In June 2015 Registered Aboriginal Parties were invited to attend site to record additional artefacts which had been identified during the Biodiversity and Cultural Heritage Audit undertaken by DP&E in February 2015. During this inspection an additional 10 artefacts were identified and recorded. The attending archaeologist provided a subsequent report to the Office of Environment and Heritage, detailing the additional artefacts associated with an existing identified archaeological site.

During the reporting period soil stripping monitoring activities were undertaken for both the Northern and Central pits in advance of mining activities. No unidentified artefacts were located during these activities.

6.5.3 Proposed Improvements to Environmental Management

Review of the Heritage Management Plan and submission of the Aboriginal Cultural Heritage Strategy to DP&E are proposed during the next reporting period.

6.6 Natural Heritage

There are no features of natural heritage within the Project Approval area and hence, no specific management procedures are required.

6.7 Spontaneous Combustion

6.7.1 Environmental Management Measures

TCM has a low percentage of inorganic sulphur and hence a low potential for exothermic oxidation reactions. In the event of spontaneous combustion TCM personnel are trained to watch for indications of spontaneous combustion. Any incident would be followed by excavation to identify the source and extinguishment through water saturation.

6.7.2 Performance/Management Issues

A low number of instances occurred where small amounts of coal smouldered; these instances were managed accordingly with no offsite impacts.

6.7.3 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

6.8 Bushfire Management

6.8.1 Environmental Management Measures

The existing Bushfire Management Plan was updated in April 2013, as required by Condition 59 of Schedule 3 of PA 11_0047. The plan identifies policies, procedures, responsibilities, equipment and equipment maintenance schedules, emergency response procedures and contact details in place for the TCM. The Plan was issued to both the Rural Fire Service and Narrabri Shire Council for reference, and is available on the Whitehaven website.

TCM maintains firebreaks around both its landholding and the mine area and maintains firefighting equipment as well as earthmoving equipment, a water truck etc. Any use of equipment for offsite bushfire control would be under the direction of the Rural Fire Service.

6.8.2 Key Environmental Performance/Management Issues

There was one instance in which TCM provided assistance to the RFS for a fire event outside of the project area.

6.8.3 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

6.9 Meteorological Data

Meteorological monitoring is conducted onsite in accordance with Schedule 3 Condition 30 of the PA 11_0047. Table 8 and Table 9 summarise the monthly meteorological conditions at TCM for the reporting period. The total annual rainfall for the reporting period was 503.2mm; this is significantly less than the annual average rainfall. The maximum rainfall was recorded during January 2016 (113.4 mm), which is significantly higher than the historical average. The months of June, September, October, February, March and April were well below historical monthly averages.

In the reporting period average temperatures were 18.5°C (2m) and 19.2°C (10), a minimum temperature of -4.1°C was recorded in July and a maximum temperature of 41.4°C in February. The temperature records and wind patterns are consistent with the long term climatic data recorded at nearby BOM sites. Prevailing winds were predominately from the south-east followed by the north westerlies, and south westerlies. Comparison of 2015 wind rosettes with data from the 2014 reporting period indicate similar patterns which are broadly comparable to patterns observed from previous years.

Table 8 – Tarrawonga Weather Station Meteorological Data

Month	*Minimum Air Temp (°C) 2m*	*Average Air Temp (°C) 2m*	*Maximum Air Temp(°C) 2m*	*Minimum Air Temp (°C) 10m*	*Average Air Temp (°C) 10m*	*Maximum Air Temp (°C) 10m*	*Minimum Wind Speed (m/s)*	*Average Wind Speed (m/s)*	*Maximum Wind Speed (m/s)*	*Prevailing Wind Direction*
May 2015	-2.6	12.9	26.0	1.1	14.0	25.5	0.0	1.6	7.5	SW
June 2015	-3.1	9.6	22.1	-1.1	10.9	21.3	0.0	1.3	4.8	NE/SW
July 2015	-4.1	8.3	20.5	-1.2	9.5	19.4	0.0	1.9	12.1	NW
August 2015	-3.4	10.1	26.3	-0.4	11.4	24.9	0.0	1.8	10.1	NW/SW
September 2015	-1.2	13.5	30.4	2.9	14.6	28.9	0.0	1.9	8.4	SW
October 2015	6.7	21.8	35.5	10.1	22.4	34.7	0.0	2.3	9.4	SE
November 2015	8.6	23.9	40.8	11.8	24.4	39.8	0.0	2.3	8.7	W
December 2015	11.6	25.2	37.5	13.8	25.3	36.3	0.0	2.7	9.6	SE
January 2016	12.1	25.2	40.4	13.6	25.3	38.7	0.0	2.5	8.5	SE
February 2016	10.6	26.2	41.4	14.1	26.6	40.0	0.0	2.7	9.6	SE
March 2016	8.9	24.5	36.4	12.2	25.0	35.5	0.0	2.2	8.8	SE
April 2016	6.6	20.4	34.1	9.3	21.4	32.7	0.0	2.0	6.8	SE
Average	**4.2**	**18.5**	**32.6**	**7.2**	**19.2**	**31.5**	**0.0**	**2.1**	**8.7**	
Minimum	**-4.1**	**8.3**	**20.5**	**-1.2**	**9.5**	**19.4**	**0.0**	**1.3**	**4.8**	
Maximum	**12.1**	**26.2**	**41.4**	**14.1**	**26.6**	**40.0**	**0.0**	**2.7**	**12.1**	

Total

Table 9 – Tarrawonga Weather Station Rainfall Data

Month	*Monthly Rainfall (mm)*	*Long Term Average* (mm)*	*Cumulative Rainfall (mm)*	*Number of Rain Days (≥1mm)*
May 2015	52.0	42.5	52.0	7
June 2015	45.8	43.6	97.8	4
July 2015	16.8	42.7	114.6	4
August 2015	51.2	41.3	165.8	3
September 2015	16.6	40.3	182.4	2
October 2015	21.6	55.1	204.0	2
November 2015	87.0	62.2	291.0	8
December 2015	57.6	70	348.6	7
January 2016	113.4	71.7	462.0	10
February 2016	1.2	67.3	463.2	1
March 2016	21.6	47.8	484.8	4
April 2016	18.4	37.2	503.2	2
Total	**503.2**	**621.7**	**503.2**	**54**

* Long term average is from Gunnedah Pool (Station 055023) 1877 - 2012

6.10 Waste

TCM continues to record waste streams which include:

- General domestic-type wastes from on-site buildings and routine maintenance consumables;
- Oils and grease;
- Sewage;
- Overburden and interburden;
- Mine equipment tyres; and
- Coarse and fine coal rejects from any coal preparation undertaken (CHPP from Tarrawonga ROM Coal).

Tarrawonga continues to aim to reduce waste via a number of initiatives including recycling (oils, greases, scrap steel, domestic recyclables) and increasing tyre life through employee education and training.

During the reporting period no incidents relating to waste management occurred.

6.11 Environmental Performance Summary

An environmental performance summary for TCM is presented in Table 10.

Table 10 - Environmental Performance

Aspect	Approval Criteria / EIS Prediction	Performance during the reporting period	Trend / Key Management Implications	Implemented / proposed management actions
Noise	Refer s6.1.3	Attended noise monitoring complaint. Sound power levels greater than the indicative levels identified in the EA.	Operation of equipment found to be in excess of SPL identified in the EA. Previous SPL results indicates that truck SPL remain compliant; however, the a portion of the excavator fleet has trended above the indicative levels in the EA.	Review and submission of Noise Management Plan addressing sound power levels of existing fleet.
Blast	Refer s6.2.2	Approval criteria met.	Nil	Nil
Air Quality	Refer s6.3.4	Approval criteria met.	Nil	Implementation of the predictive forecast air dispersal modelling system In conjunction with the BTM.
Biodiversity	Refer s6.4	Approval criteria met.	Nil	
Heritage	Refer s6.5.2	Approval criteria met.	Nil	Nil
Spontaneous Combustion	Refer s6.7.2	Approval criteria met.	Nil	Nil
Bushfire Management	Refer s6.8.2	Approval criteria met.	Nil	Nil

7 WATER MANAGEMENT

The mine lies within the catchment of the Namoi River. Locally, and within proximity of the project site, Goonbri Creek, Bollol Creek and Nagero Creek all provide flows to the Namoi River during runoff events. The design of sediment detention basins within the disturbed area of the mine aims to limit the opportunity of discharge of runoff from mine-disturbed area, i.e. after appropriate detention time to satisfy licensed discharge criteria.

Detailed Surface Water and Groundwater monitoring results are providing in Appendix 2 and Appendix 3 respectively.

7.1 Surface Water Management

All sediment basins, storage dams and associated banks and drains have been designed and constructed in accordance with the *Managing Urban Stormwater: Soils and Construction Vol 2E Mines and Quarries* (DECC, 2008) in conjunction with the references to Volume 1 (Landcom, 2004). Water within the Project Approval area is nominally classified either as "clean", "dirty", "contaminated" or "pit water" depending on the source of the flow and it's potential for physical or chemical contamination. The definition of these classifications follows:-

"***Clean Water***" comprises water that has not come in contact with mine disturbance and does not have potential to contain hydrocarbons.

"***Dirty Water***" comprises water that has come into contact with mine disturbance and does not have potential to contain hydrocarbons.

"***Pit Water***" comprises water contained within the open cut sump or pumped to the void water dam for containment and use for dust suppression across the site.

"***Contaminated Water***" comprises runoff water which could potentially contain hydrocarbons.

There are seven wet weather discharge points nominated in the current EPL 12365 (relevant to PA11_0047 Schedule 3 Condition 33, 39). These are SD9, SD16, SD17, SB14, SB22, SB23 and SB24.

At the end of the reporting period onsite water levels were at 183.4ML, down significantly from 299.6ML at the end of the previous reporting period. This drawdown is a result of increased water consumption for dust suppression associated with hot and dry conditions. A total of 473ML was used during the reporting period, an increase from the previous reporting period up from 414ML.

7.1.1 Surface Water Monitoring Results

TCM has a requirement to undertake surface water monitoring on a quarterly basis in addition to the monitoring of any wet weather discharge event. Surface water monitoring locations are shown on Figure 8.

Whilst there are no criteria or concentration limits specified for the quarterly surface water samples, the results do provide an indication as to the quality of waters on-site. The assessment of sediment load, salinity, pH, oil and grease and other monitoring parameters during these quarterly water monitoring events also provides an indication of the capacity for those storages to meet water quality criteria should a wet weather discharge occur, and if additional treatment methods would be warranted to minimise potential for a non-compliant discharge. All samples taken throughout the reporting period indicate consistency across all monitoring parameters (with the exception of TSS) with only slight fluctuations observed. Overall TSS has been variable due to timing of sampling which is impacted by inflows immediately before sampling.

Antimony, arsenic, molybdenum, selenium were monitored throughout the monitoring period. Results have remained consistently low and below thresholds outlined in the ANZECC Guidelines with no suggested trend of enrichment of these minerals in surface waters adjacent to the overburden emplacements.

Surface water monitoring results have shown generally consistent trends with previous reporting periods. No discharge of waters from site has occurred and therefore no trends can be concluded during this reporting period.

In comparison with the EA, the following assessments have been made:

- During the reporting period there were no discharges from site and no impact upon the downstream water quality.
- No instances of acid rock drainage have occurred.
- No irrigation activities have been undertaken on site.
- No flooding occurred in the Goonbri/Bollol Creek, Nagero Creek and Namoi River during the reporting period.
- Commitments made in the EA with regard to the surface water monitoring program are addressed in the updated draft Water Management Plan which had previously been submitted to DP&E for review. A revised WMP will be submitted to DP&E for approval during the next reporting period.

7.1.2 Discharges

There was no wet weather or controlled discharges during the reporting period.

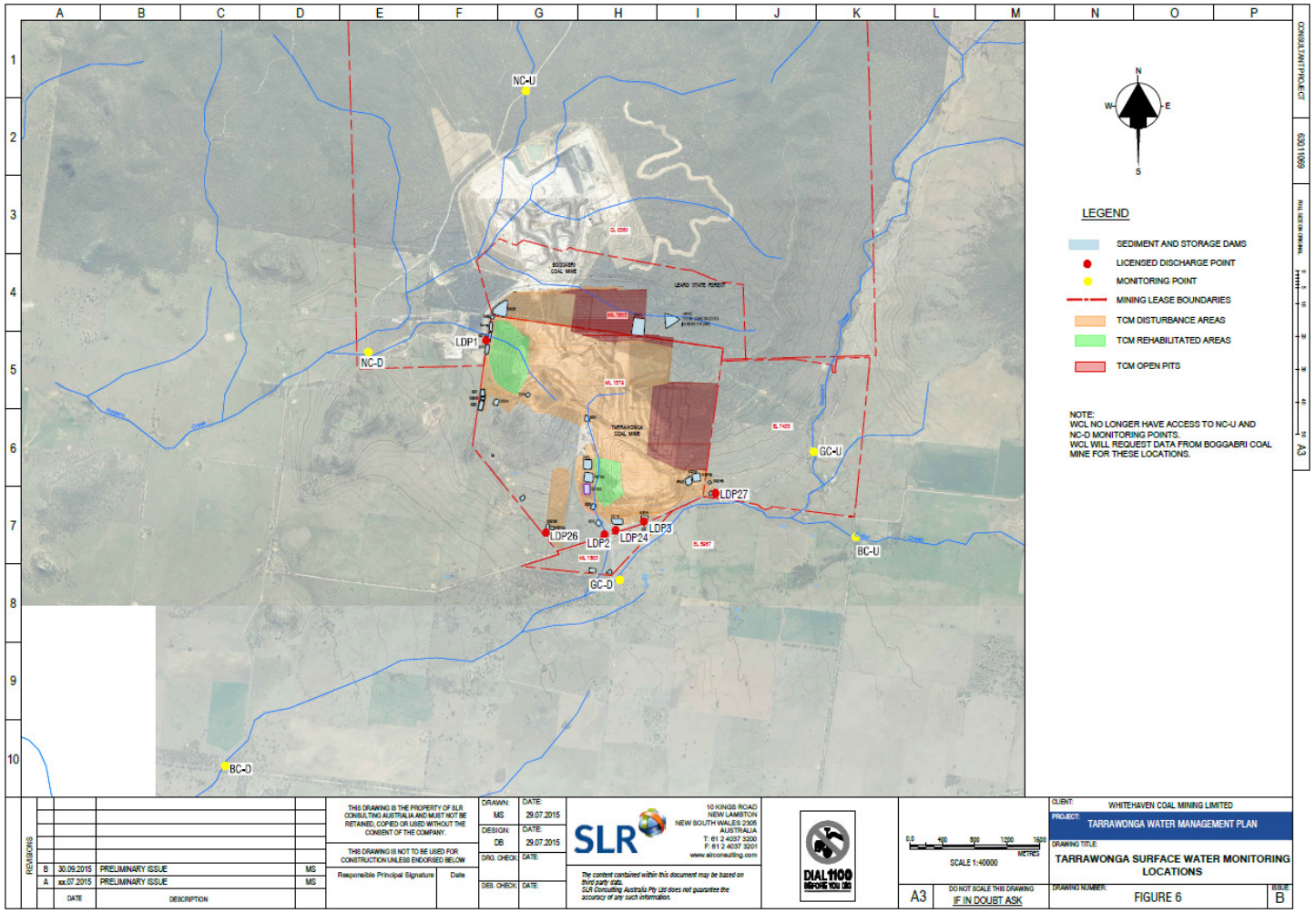

Figure 8 – Surface Water Monitoring Locations

7.2 Groundwater Management

7.2.1 Environmental Performance/Management

The mine's performance with respect to groundwater performance/management, the prevention of pollution, and the assessment of impacts on groundwater availability to other surrounding users, has been assessed through groundwater level and chemistry monitoring undertaken at a series of piezometers and bores within the Project Area and adjacent properties.

7.2.2 Groundwater Monitoring

The details of the groundwater monitoring program throughout the reporting period are listed in Table 11. Monitoring sites are shown on Figure 9.

Groundwater sampling and analysis was undertaken by ALS Acirl Pty Ltd during the reporting period. Water level data loggers, which store SWL data at 12 hourly intervals in MW1 and MW2 operated during the reporting period.

Table 11 - Groundwater Monitoring Points

Site ID (see Figure 5)	Registered Bore No. & Licence No	Property/ Location	Frequency		Purpose
			SWL*[2], EC*[3] and pH	Representative Metals and Ions	
MW1	GW967848 90BL253276	"Thuin"	Quarterly	Six monthly	To determine existing status and any impacts
MW2	GW967849 90BL253278	"Thuin"	Quarterly	Six monthly	
MW3*[1]	GW967860 90BL253841	"Nagero"	Quarterly	Six monthly	
MW4	GW967850 90BL253279	"Tarrawonga"	Quarterly	Six monthly	To determine existing status and any impacts
MW5	GW967851 90BL253280	"Thuin"	Quarterly	Six monthly	
MW6	GW967881 90BL254255	West of Boggabri Coal Infrastructure Area	Quarterly	Six monthly	
MW7	GW967883 90BL254254	"TCM"	Quarterly	Six monthly	
MW8	GW967882 90BL254253	"TCM"	Quarterly*[5]	Six monthly	
GW044997	GW044997 90BL102564	"Templemore"	Quarterly	Six monthly	
Templemore A	N/A	"Templemore"	Quarterly	Six monthly	
Templemore B	N/A	"Templemore"	Quarterly	Six monthly	To determine existing status and any impacts
GW031856	GW031856 90WA809087	"Ambardo"	Quarterly	Six monthly	

GW052266	GW052266 90BL116929	"Tarrawonga"	Quarterly	Six monthly	
TA60	90BL255930	"TCM"	Continuous	Nil	Vibrating Wire Piezometers
TA65	90BL255930	"TCM"	Continuous	Nil	
*[1] Non-Company owned bore		*[2] SWL – Standing Water Level		*[3] EC = Electrical Conductivity	

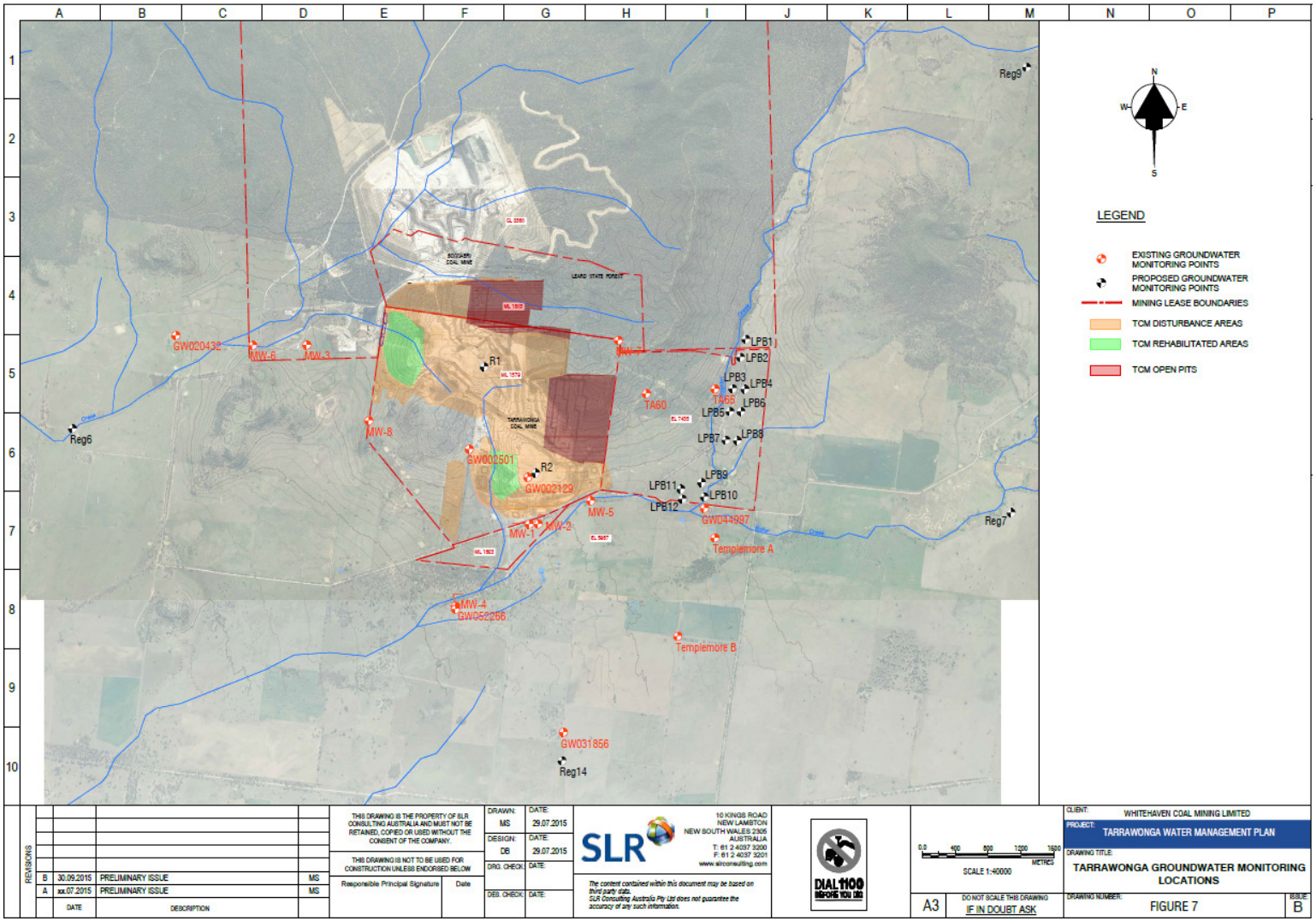

Figure 9 – Groundwater Monitoring Locations

Groundwater levels

Groundwater levels have remained relatively consistent at the majority of monitoring sites during the reporting period. GW044997 located on the "Templemore" property fell during the reporting period before levels stabilised. This site is an operational bore for stock and domestic use. Both Templemore B and GW031856 located on the Templemore and Ambardo properties respectively had SWL fluctuate throughout the reporting period. The Vibrating Wire Piezometers (VWP) in TA60 and TA65 has indicated continued reduced head pressure; the rate of depressurisation has declined during the reporting period.

Groundwater quality

Analysis of samples taken during the reporting period has shown that groundwater quality has remained generally in line with historical data at all locations monitored. Water quality has been compared to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000) (ANZECC) guidelines for stock watering (cattle).

7.2.3 Groundwater Management

At the end of the reporting period an estimated 23 ML of water was held in the pit from rainfall and groundwater seepage. Inflows into the open cut result from a combination of:

- Direct rainfall runoff and infiltration through the emplaced overburden which flows down-dip to the open cut sump(s); and
- Inflows from the exposed coal seam.

Contamination of groundwater is controlled by the management of chemical, oil and grease spills and storage, with:

- Vehicle maintenance carried out in designated areas;
- Any spills being cleaned up; and
- Fuels oil and grease being stored within a bunded area, constructed in accordance with AS 1940-2004 and/or EPA requirements.

Groundwater from surrounding bores is monitored on a regular basis to detect and assess any changes in groundwater quality or level that may be attributable to the mine.

The Tarrawonga Coal Project EA identified that there would be a reduction in the potentiometric head in the aquifers of the porous rock systems to the east and the north. The Vibrating Wire

Piezometer installed in TA60 and TA65 continue to demonstrate depressurisation as predicted as the mine moves toward the east.

Water extracted from the voids indicates that the inflows from the porous rock groundwater system to be less than the predicted 0.5ML per day average identified in the EA. Table 12 outlines the water take under WAL31084, noting that this volume includes surface water runoff collected from rain events.

The alluvial aquifer system has not yet been impacted.

No complaints have been received in relation to impacts upon any other groundwater users. This is consistent with the predictions of the EA; that no significant impact would therefore affect beneficial use of groundwater of other groundwater users.

7.2.4 Water Take

The water taken by the operation is summarised in Table 12.

Table 12 - Water Take

Water Licence Number	Water Sharing Plan, Source and Management Zone (as applicable)	Entitlement	Passive take/ inflows	Active Pumping	TOTAL
WAL 31084	NSW Murray Darling Basin Porous Rock Groundwater Sources Gunnedah - Oxley Basin Mdb Groundwater Source Gunnedah - Oxley Basin Mdb (Other) Management Zone	250 units	0	224.45ML[1]	224.45ML

[1] Includes in pit surface water runoff

7.2.5 Site Water Balance

Findings of the Site Water Balance undertaken in 2015 by SLR Consulting Australia indicate that TCM would be in a water deficit during both wet and dry years in regard to water inflows and outflows. It also predicts that only small quantities of externally sourced water would be required under periods of extended dry weather when water from sediment dams is used for operational purposes. These predictions are consistent with the actual outcomes observed during this monitoring period.

As seen in Table 13 there was a significant reduction in onsite water as a result of an increase in water use for operational purposes in response to extended dry weather.

The increase in pit water held in storage from the previous reporting period is a result of two aspects: the consolidation of site water resources at the end of the reporting period following dry weather and minimal drawdown on a particular pit water dam due to the current operational arrangement.

Table 13: Stored Water

	Volumes Held (m3)		Total Storage Capacity at the end of the Reporting Period (m3)
	Start of Reporting Period	At end of Reporting Period	
Storage Dams	56,816	0	110,053
Sediment Basins	171,069	58,335	178,527
Pit Water Storages	69,747	125,047	133,897

8 REHABILITATION

8.1 Rehabilitation Performance During the Reporting Period

8.1.1 Status of Mining and Rehabilitation

The status of mining and rehabilitation at the completion of the reporting period is presented in Table 14 and Figure 10**.**

Table 14 - Rehabilitation Status

Mine Area Type [1]	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
	2014/15 (ha)	2015/16 (ha)	2016 (ha)
Total Mine Footprint	485.1	578.6	586.8
Total Active Disturbance	443.1	527.4	535.6
Land Being Prepared for Rehabilitation	12.6	6.6	6.82
Land Under Active Rehabilitation	42.1	51.2	57.8
Completed Rehabilitation	0.0	0.0	0.0

[1] Refer Annual Review Guideline (p.11) for description of mine area types.

The MOP notes at the start of the MOP period a disturbance area of 582.39ha. This area is larger than the actual area disturbed as determined by surveyed area (in accordance with the AR Guidelines). Following a review of the MOP and the April end of month survey; it has been determined that the discrepancy lies in proposed/planned versus the actual disturbance undertaken.

8.1.2 Post Rehabilitation Land Uses

Woodland areas will be established on slopes and upper terraces of the Northern and Southern Emplacement Areas. Tree species selection and planting densities adjacent to Boggabri and Leard State Forest are being determined with consideration of required integration with the Boggabri waste emplacement area and Leard State Forest. Rehabilitation on the southern emplacement is immature and requires ongoing maintenance. Rehabilitation on the northern emplacement is further advanced, requires significantly less maintenance and is nearing the point where it could be considered that open woodland land use has been achieved. Rehabilitation has commenced adjacent to Boggabri and in the Leard State forest (ML1685) which has been undertaken in accordance with the MOP.

Rehabilitation on the northern emplacement area has not reached final completion however, is generally proceeding in accordance with predictions of the EA. Integration with Boggabri Coal's

waste emplacement is described in the MOP and will begin to occur during 2017 with rehabilitation activities to follow as per the MOP.

Rehabilitation on the southern emplacement has not advanced as predicted in the EA as a result of a number of factors including the postponement of the relocation of the infrastructure area, commencement of haulage of ROM coal to Boggabri Coal rail facility and subsequent construction of the services corridor. The further advancement of rehabilitation of the southern emplacement is described in the current MOP and future revision of the MOP.

No rehabilitation of agricultural lands has occurred.

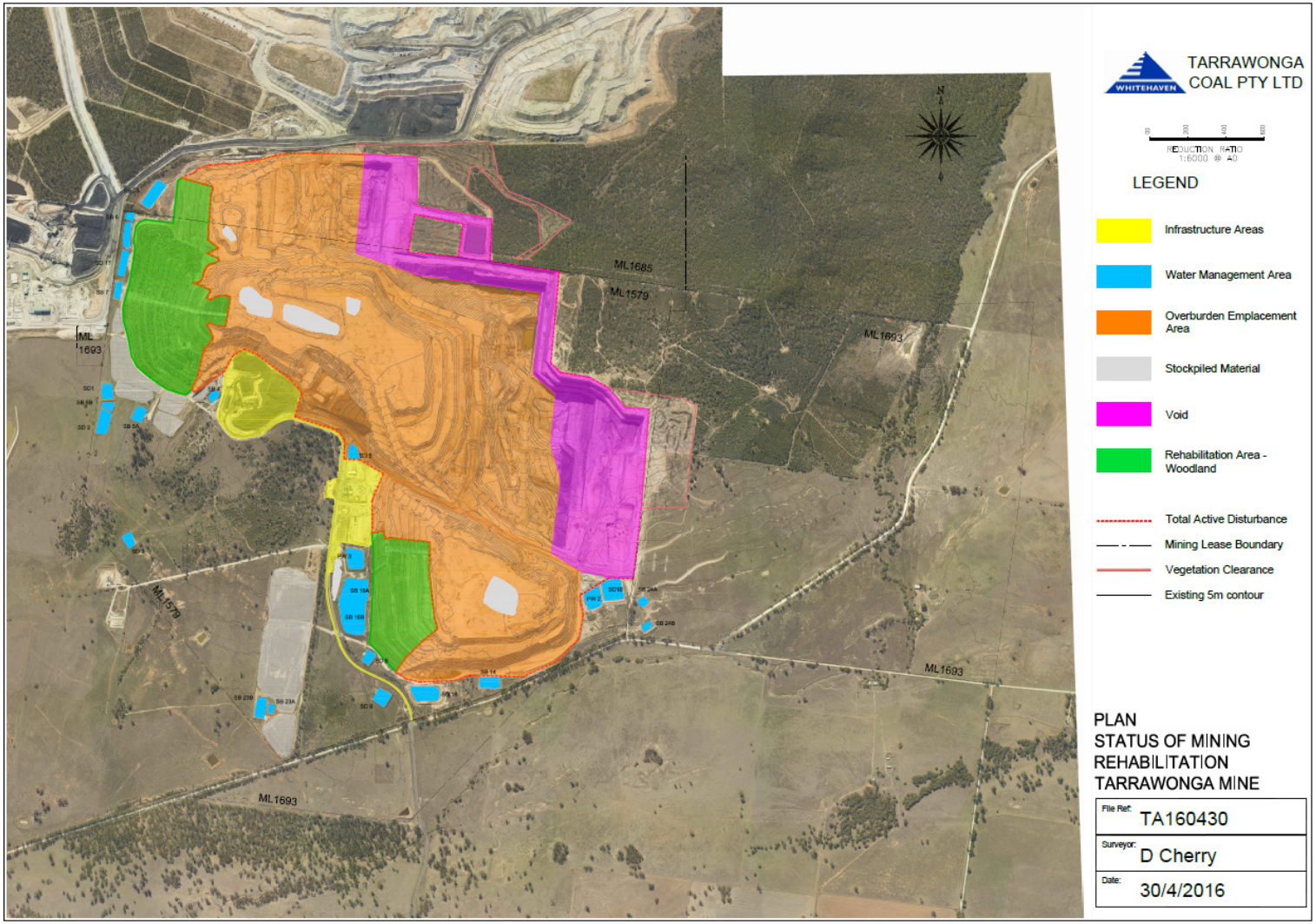

Figure 10 - Status of Mining and Rehabilitation

8.1.3 Rehabilitation Undertaken

During the reporting period rehabilitation activities were restricted to landform establishment and growth medium development activities focussing on the northern extension emplacement. A total of 6.6ha was shaped, top soiled and prepared for rehabilitation.

8.1.4 Rehabilitation Monitoring

Winter and spring monitoring programmes are undertaken on site in accordance the MOP (formerly the Rehabilitation Management Plan). Part of this monitoring provided an annual snapshot of the habitats available in these areas and habitat utilisation by fauna. This was then compared to baseline data collected from adjacent unaffected land surrounding the mine to determine its success and progression in regards to habitat value for native and threatened species. Monitoring undertaken during the reporting period indicates rehabilitation trending towards completion criteria.

8.1.5 Weeds Management

Monthly inspections of rehabilitation areas, as well as periodic general observations of the site, are undertaken in order to identify the presence of weeds. Where practicable weed infestations are managed with a combination of chemical, physical or biological controls. African Boxthorn is actively managed within the rehabilitation areas and is currently being controlled effectively with very few plants observed. The rehabilitation monitoring report identified Rhodes Grass in monitoring plots, for which a control program will be implemented in the upcoming reporting period.

8.1.6 Renovation or Removal of Buildings

No renovation or removal of buildings occurred during the reporting period.

8.1.7 Other Rehabilitation Undertaken

No additional rehabilitation of explorations areas, infrastructure, shafts, adits, dams, fence lines or bunds occurred during the reporting period.

8.1.8 Departmental Sign-off of Rehabilitated Areas

Departmental sign-off has not been requested for any rehabilitated areas.

8.1.9 Variations in Activities against MOP/RMP

A MOP was approved by DRE during the reporting period and covers operations at TCM from 2015-2020.

8.1.10 Trials, Research Projects and Initiatives

The direct seeding trial undertaking in the previous reporting period continues to be visually monitored for success. At this stage it is too early to determine success rates of the trial.

8.1.11 Key Issues to Achieving Successful Rehabilitation

The four key issues to achieving successful rehabilitation include:

- excessive erosion and sedimentation (e.g. gullying and sedimentation resulting in land stability and vegetation growth issues);
- weed and feral animal infestation;
- poor vegetation establishment and growth; and
- landform stability.

In cases where the performance is sub-optimal, additional management measures will be implemented (e.g. replanting, repairing landform and water management features, application of much/fertilisers, feral animal and weed control etc.). A Trigger Action Response Plan (TARP) for rehabilitation at the TCM has been included in the MOP, which outlines appropriate actions and varied responses that will be implemented as required.

8.2 Actions for Next Reporting Period

Rehabilitation in the upcoming reporting period will be limited to landform establishment within the northern extension emplacement. In accordance with the MOP an area of 6.82ha is to be shaped ahead of rehabilitation activities in CY2017. It is anticipated that the area (6.6ha) that was prepared for rehabilitation will transition to land under active rehabilitation during the next reporting period. Rehabilitation condition is monitored through monthly environmental inspections. The monitoring of rehabilitation condition involves the regular inspections of ground cover, trees and the presence of erosion and weeds. The Rehabilitation Monitoring program will be undertaken in winter and spring and will be reported in the next AR.

9 COMMUNITY

TCM maintains a designated complaints line. In the event of a complaint, details pertaining to the complainant, complaint and action taken are recorded. Each complaint is investigated and documented with individual complaint records maintained. Complaints were reported to the Community Consultative Committee and documented in the AR. The number of complaints has decreased since previous reporting period. Table 15 provides a comparison of complaints received over the last five AR reporting periods.

Table 15 – Complaints Summary and Trend

Category	2011/12	2012/13	2013/14	2014/15	2015/16
Air Quality	12	23	2	11	13
Traffic	4	8	3	0	0
Surface Water	0	1	0	0	0
Visual Amenity	0	1	0	0	0
Noise / Vibration	1	6	1	0	0
Blast	6	12	3	5	3
Other	4	4	2	2	0
TOTAL	24	55	11	18	16

* Tally of complaints does not necessarily equate to total complaints; some complaints received are for multiple categories.

The most common complaints were related to dust and blasting (including blast generated dust). During the reporting period 13 complaints were received in relation to air quality issues. Following a complaint, a site inspection was undertaken and operations were modified/ceased where appropriate and deemed to be contributing to elevated air quality levels.

Three complaints were received in relation to blasting including blast generated dust and road closure impacts. Each complaint was investigated and documented with feedback provided to the complainant.

Community contributions are managed in accordance the Whitehaven Coal Donations and Sponsorship Policy.

10 INDEPENDENT AUDIT

No independent audit was undertaken of TCM during the reporting period. The next independent audit is scheduled for July 2017. The most recent independent audit was undertaken in 2014. Outstanding items from the 2014 Audit Action Plan, and how they are being addressed, are summarised in Table 16 below.

Table 16 - 2014 Independent Audit - Outstanding Actions

Condition/Plan	Proposed Action	Status
PA 11_0047 Schedule 3 Condition 29	Review merit of "Wil-gai" as a control monitoring site.	Ongoing with the development of the AQMS.
PA 11_0047 Schedule 3 Condition 46	Provide security for the offset area as per consent condition.	Required by 31st December 2016.
PA 11_0047 Schedule 3 Condition 49	Lodge Conservation and Biodiversity Bond with the Department.	3 months post approval of the BMP incorporating the LSF BMS and implementation plans.
Air Quality Greenhouse Gas Management Plan	Inclusion of predictive air dispersal modelling.	Ongoing with the development of the BTM AQMS.

DPE commissioned Umwelt (Australia) Pty Limited (Umwelt) to assist in conducting a compliance audit of Tarrawonga Coal Mine in March 2015. The independent audit focused on biodiversity and Aboriginal cultural heritage management at TCM. TCM developed and submitted an Action Plan in response to the findings of the audit and has completed activities relating to the findings.

11 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

11.1 Reportable Incidents

Sound power levels results were reported to DP&E outside of this reporting period (May 2016); the testing of the applicable plant was undertaken in April 2016. An incident investigation report was subsequently provided to DP&E.

11.2 Non-compliances

Non-compliances with relevant approvals noted within Section 1 are outlined in Table 17.

Table 17 – Non-compliance Action Plan

Non - Compliance	Date / Location	Cause	Action Plan	Estimated Completion Date
Schedule 2 # 2	Reporting Period. TCM	Per below	Per below	Per below
Schedule 2 # 14 Surrender of DA-88-4-2005	December 2013	Administrative oversight.	DA surrendered during reporting period in accordance with timeframe agreed to with DP&E.	Complete
Schedule 2 # 18 Operations of plant and equipment – Sound Power Levels	13th, 14th April 2016	Equipment sound power levels above EA indicative levels	Review of Noise Management Plan and submission to DP&E.	30 September2016
Schedule 3 # 9 Attenuation of Plant	13th, 14th April 2016	Equipment sound power levels above those EA indicative levels.	Review of Noise Management Plan and submission to DP&E.	30 September 2016
Schedule 3 # 28 Operating Conditions – Air Quality: Operate a real time air dispersal modelling system.	During reporting period	Air Quality Management Strategy (AQMS) was not finalised. Ongoing development between Boggabri Coal Mine, Maules Creek Coal Mine and TCM.	Finalise AQMS during 2016. In accordance with the TCM AQMP, the predictive and real time air dispersion modelling will be implemented as part of the BTM AQMS.	AQMS submitted to DPE mid-2016. Installation of e-sampler June 2016. Third quarter 2016 model implemented and commissioned.

11.3 Regulatory Actions

Following the DPE Biodiversity and Aboriginal Archaeology Audit in February 2015, TCM received a penalty notice for a failure to implement the draft Biodiversity Management Plan. A warning letter was issued to TCM relating to Schedule 3 Conditions 39, 44, 49, 52 and Schedule 5 Condition 5, 10. Subsequent to receiving the penalty notice and warning letter following the Biodiversity and Cultural Heritage Audit TCM developed an action plan to address matters raised by DP&E. The action plan was submitted to DP&E; all actions have been completed.

12.0 Activities to be completed in the next reporting period

The following measures will be continued, or implemented, in the next reporting period:

- Review and revision of various Environmental Management Plans;
- Compliance with all relevant conditions of the lease, licences and consents;
- Undertake rehabilitation and mining activities in accordance the TCM MOP;
- The continuation of environmental monitoring and management;
- Implementation of approved Leard Forest Precinct Strategies including implementation of a predictive air quality modelling tool;
- Continued community liaison and engagement with local stakeholders.

Appendix 1

BLAST MONITORING DATA

Appendix 2

SURFACE WATER MONITORING DATA

Appendix 3

GROUNDWATER MONITORING DATA

Tarrawonga Coal Pty Ltd ACN 100 742 185

Environmental Blast Monitoring

*no monitor results obtained on basis of blast size (coal/parting shots)

SHOT NO	DATE	MONITOR LOCATION	PEAK GROUND PRESSURE (mm/s)	PEAK OVERPRESSURE (dBL)	TIME	Fume Rating
567	1/05/2015	Tarrawonga Station	0.1500	101.00	11:02:04	0
567	1/05/2015	Matong	0.2000	97.50	11:02:04	0
568	8/05/2015	Tarrawonga Station	0.2200	104.60	12:02:14	0
568	8/05/2015	Matong	0.6100	111.70	12:02:14	0
569	12/05/2015	Tarrawonga Station	0.1000	96.10	14:19:12	0
569	12/05/2015	Matong	0.0500	97.90	14:19:12	0
570	15/05/2015	Tarrawonga Station	0.6300	108.60	11:58:36	1a
570	15/05/2015	Matong	1.3800	110.60	11:58:36	1a
571	19/05/2015	Tarrawonga Station	0.0500	93.80	12:01:13	0
571	19/05/2015	Matong	0.0500	97.60	12:01:13	0
572	20/05/2015	Tarrawonga Station	0.1300	105.40	14:14:39	0
572	20/02/2015	Matong	0.0000	101.60	14:14:39	0
573	27/05/2015	Tarrawonga Station	0.5700	109.10	14:47:32	2a
573	27/05/2015	Matong	0.2600	101.30	14:47:32	2a
574	4/06/2015	Tarrawonga Station	0.2000	101.30	13:05:44	1a
574	4/06/2015	Matong	0.2300	102.80	13:05:44	1a
575	5/06/2015	Tarrawonga Station	0.0400	88.20	11:55:40	0
575	5/06/2015	Matong	0.0200	92.00	11:55:40	0
575	5/06/2015	Tarrawonga Station	0.1100	94.70	12:26:31	0
575	5/06/2015	Matong	0.0800	94.90	12:26:31	0
576	11/06/2015	Tarrawonga Station	0.3900	117.50	10:29:50	0
576	11/06/2015	Matong	0.2400	105.10	10:29:50	0
577	15/06/2015	Tarrawonga Station	0.7100	92.00	13:02:13	0
577	15/06/2015	Matong	0.9400	89.20	13:02:13	0
578	23/06/2015	Tarrawonga Station	0.5000	111.10	11:57:18	1b
578	23/06/2015	Matong	1.0500	110.50	11:57:18	1b
579	24/06/2015	Tarrawonga Station	0.1900	99.90	10:21:37	1b
579	24/06/2015	Matong	0.2000	93.90	10:21:37	1b
580	29/06/2015	Tarrawonga Station	0.1900	103.00	12:04:18	1a
580	29/06/2015	Matong	0.2800	101.40	12:04:18	1a
581	3/07/2015	Tarrawonga Station	0.2800	107.50	11:55:47	0
581	3/07/2015	Matong	0.5900	100.80	11:55:47	0
582	7/07/2015	Tarrawonga Station	0.1600	97.90	10:29:49	1a
582	7/07/2015	Matong	0.0800	92.90	10:29:49	0
583	10/07/2015	Tarrawonga Station	0.1000	107.30	10:24:36	0
583	10/07/2015	Matong	0.0500	94.70	10:24:36	0
584	15/07/2015	Tarrawonga Station	0.4300	109.30	12:57:50	0
584	15/07/2015	Matong	0.7600	106.80	12:57:50	0
585	23/07/2015	Tarrawonga Station	0.5100	98.80	12:14:05	0
585	23/07/2015	Matong	0.4400	103.00	12:14:05	0
586	28/07/2015	Tarrawonga Station	0.3500	101.50	12:00:51	0
586	28/07/2015	Matong	0.3400	95.90	12:00:51	0
587	5/08/2015	Tarrawonga Station	0.3600	104.50	10:29:21	0
587	5/08/2015	Matong	0.1900	101.40	10:29:21	0
588	6/08/2015	Tarrawonga Station	0.2500	99.50	12:03:22	1a
588	6/08/2015	Matong	0.2900	111.50	12:03:22	1a
589	13/08/2015	Tarrawonga Station	0.2300	101.60	10:02:35	0
589	13/08/2015	Matong	0.1300	98.60	10:02:35	0

Tarrawonga Coal Pty Ltd ACN 100 742 185

Environmental Blast Monitoring

*no monitor results obtained on basis of blast size (coal/parting shots)

SHOT NO	DATE	MONITOR LOCATION	PEAK GROUND PRESSURE (mm/s)	PEAK OVERPRESSURE (dBL)	TIME	Fume Rating
590	18/08/2015	Tarrawonga Station	0.1400	104.90	11:54:25	0
590	18/08/2015	Matong	0.1000	101.10	11:54:25	0
590	18/08/2015	Tarrawonga Station	0.4800	82.80	12:08:59	0
590	18/08/2015	Matong	0.6600	89.70	12:08:59	0
591	20/08/2015	Tarrawonga Station	0.3200	92.50	12:03:58	0
591	20/08/2015	Matong	0.5200	96.90	12:03:58	0
592	26/08/2015	Tarrawonga Station	0.3000	103.90	12:04:30	0
592	26/08/2015	Matong	0.3500	103.70	12:04:30	0
593	28/08/2015	Tarrawonga Station	0.4700	104.70	14:58:37	0
593	28/08/2015	Matong	0.8400	105.80	14:58:37	0
594	2/09/2015	Tarrawonga Station	0.3000	100.70	12:02:06	0
594	2/09/2015	Matong	0.3200	97.20	12:02:06	0
595	4/09/2015	Tarrawonga Station	0.5200	94.20	12:00:05	0
595	4/09/2015	Matong	0.6000	95.80	12:00:05	0
596	9/09/2015	Tarrawonga Station	0.2200	104.10	15:10:16	0
596	9/09/2015	Matong	0.1000	97.90	15:10:16	0
597	16/09/2015	Tarrawonga Station	0.4200	105.50	12:00:53	0
597	16/09/2015	Matong	0.4400	103.60	12:00:53	0
598	23/09/2015	Tarrawonga Station	0.4600	96.70	10:32:28	0
598	23/09/2015	Matong	0.2000	111.60	10:32:28	0
599	25/09/2015	Tarrawonga Station	0.5200	118.30	11:57:32	0
599	25/09/2015	Matong	1.1800	108.10	11:57:32	0
600	30/09/2015	Tarrawonga Station	0.2800	96.70	11:55:25	0
600	30/09/2015	Matong	0.4500	105.90	11:55:25	0
601	7/10/2015	Tarrawonga Station	0.1300	90.00	12:01:35	0
601	7/10/2015	Matong	0.0600	93.70	12:01:35	0
602	14/10/2015	Tarrawonga Station	0.3300	105.20	14:35:00	0
602	14/10/2015	Matong	0.1700	91.40	14:35:00	0
603	21/10/2015	Tarrawonga Station	0.1000	105.20	14:19:30	0
603	21/10/2015	Matong	0.0300	101.10	14:19:30	0
604	29/10/2015	Tarrawonga Station	0.7500	105.90	12:52:43	0
604	29/10/2015	Matong	0.6900	106.80	12:52:43	0
605	2/11/2015	Tarrawonga Station	0.0000	96.80	15:02:26	0
605	2/11/2015	Matong	0.0000	102.20	15:02:26	0
606	9/11/2015	Tarrawonga Station	0.3400	101.40	15:01:22	0
606	9/11/2015	Matong	0.5200	103.00	15:01:22	0
607	10/11/2015	Tarrawonga Station	0.1200	96.80	15:14:31	2a
607	10/11/2015	Matong	0.0700	99.60	15:14:31	2a
608	18/11/2015	Tarrawonga Station	0.4300	101.60	13:03:18	0
608	18/11/2015	Matong	0.5700	107.80	13:03:18	0
609	19/11/2015	Tarrawonga Station	0.1000	102.20	14:28:58	0
609	19/11/2015	Matong	0.0500	98.00	14:28:58	0
610	20/11/2015	Tarrawonga Station	0.4400	110.60	11:56:54	0
610	20/11/2015	Matong	0.4800	110.00	11:56:54	0
611	25/11/2015	Tarrawonga Station	0.3700	109.30	13:00:08	0
611	25/11/2015	Matong	0.5900	109.10	13:00:08	0
611	25/11/2015	Tarrawonga Station	0.4800	95.30	13:17:48	0
611	25/11/2015	Matong	0.5600	95.50	13:17:48	0

Tarrawonga Coal Pty Ltd ACN 100 742 185

Environmental Blast Monitoring

*no monitor results obtained on basis of blast size (coal/parting shots)

SHOT NO	DATE	MONITOR LOCATION	PEAK GROUND PRESSURE (mm/s)	PEAK OVERPRESSURE (dBL)	TIME	Fume Rating
612	27/11/2015	Tarrawonga Station	0.2500	103.90	12:16:40	0
612	27/11/2015	Matong	0.2900	105.60	12:16:40	0
613	4/12/2015	Tarrawonga Station	0.2400	96.30	11:58:16	0
613	4/12/2015	Matong	0.1300	97.30	11:58:16	0
614	8/12/2015	Tarrawonga Station	0.4300	102.50	10:30:05	0
614	8/12/2015	Matong	0.3500	102.80	10:30:05	0
615	11/12/2015	Tarrawonga Station	0.4000	109.20	9:57:12	0
615	11/12/2015	Matong	0.1800	106.00	9:57:12	0
616	15/12/2015	Tarrawonga Station	0.2700	99.00	12:06:43	0
616	15/12/2015	Matong	0.4800	106.10	12:06:43	0
616	15/12/2015	Tarrawonga Station			12:25:00	0
616	15/12/2015	Matong			12:25:00	0
617	16/12/2015	Tarrawonga Station	0.1600	101.60	12:01:07	0
617	16/12/2015	Matong	0.2300	105.40	12:01:07	0
618	23/12/2015	Tarrawonga Station	0.2400	100.20	11:52:47	2b
618	23/12/2015	Matong	0.5300	110.00	11:52:47	2b
619	30/12/2015	Tarrawonga Station	0.1000	96.40	12:08:41	0
619	30/12/2015	Matong	0.0800	91.10	12:08:41	0
620	5/01/2016	Tarrawonga Station	0.0800	89.30	14:25:51	0
620	5/01/2016	Matong	0.0500	91.40	14:25:51	0
621	8/01/2016	Tarrawonga Station	0.4300	109.80	11:55:11	0
621	8/01/2016	Matong	0.5300	105.90	11:55:11	0
622	11/01/2016	Tarrawonga Station	0.0500	100.10	14:22:28	0
622	11/01/2016	Matong	0.0200	100.10	14:22:28	0
623	13/01/2016	Tarrawonga Station	0.4700	111.40	11:56:58	0
623	13/01/2016	Matong	0.5000	111.60	11:56:58	0
624	15/01/2016	Tarrawonga Station	0.3400	106.20	11:54:43	0
624	15/01/2016	Matong	0.5200	108.20	11:54:43	0
625	20/01/2016	Tarrawonga Station	0.1500	96.50	14:50:49	0
625	20/01/2016	Matong	0.0600	95.00	14:50:49	0
626	25/01/2016	Tarrawonga Station	0.3600	99.60	12:03:53	0
626	25/01/2016	Matong	0.5400	104.10	12:03:53	0
627	3/02/2016	Tarrawonga Station	0.2300	99.80	16:52:59	0
627	3/02/2016	Matong	0.0600	101.00	16:52:59	0
628	5/02/2016	Tarrawonga Station	0.0400	94.60	10:40:29	0
628	5/02/2016	Matong	0.0400	103.80	10:40:29	0
628	5/02/2016	Tarrawonga Station	0.0400	101.20	11:13:33	0
628	5/02/2016	Matong	0.0300	111.50	11:13:33	0
629	10/02/2016	Tarrawonga Station	0.2200	100.30	12:12:24	0
629	10/02/2016	Matong	0.2500	106.40	12:12:24	0
630	12/02/2016	Tarrawonga Station	0.1000	64.60	11:54:20	0
630	12/02/2016	Matong	0.0700	93.20	11:54:20	0
631	17/02/2016	Tarrawonga Station	0.3400	105.10	14:24:44	0
631	17/02/2016	Matong	0.2300	98.70	14:24:44	0
632	23/02/2016	Tarrawonga Station	0.3400	109.10	15:54:14	0
632	23/02/2016	Matong	0.2100	105.00	15:54:14	0
633	26/02/2016	Tarrawonga Station	0.5400	105.30	12:22:03	0
633	26/02/2016	Matong	0.9100	104.60	12:22:03	0

Tarrawonga Coal Pty Ltd ACN 100 742 185

Environmental Blast Monitoring

*no monitor results obtained on basis of blast size (coal/parting shots)

SHOT NO	DATE	MONITOR LOCATION	PEAK GROUND PRESSURE (mm/s)	PEAK OVERPRESSURE (dBL)	TIME	Fume Rating
634	3/03/2016	Tarrawonga Station	0.1000	102.90	12:02:18	0
634	3/03/2016	Matong	0.1500	107.20	12:02:18	0
635	9/03/2016	Tarrawonga Station	0.0600	103.20	14:28:39	0
635	9/03/2016	Matong	0.0300	95.80	14:28:39	0
636	10/03/2016	Tarrawonga Station	0.6300	119.50	12:00:35	0
636	10/03/2016	Matong	0.8900	102.90	12:00:35	0
637	22/03/2016	Tarrawonga Station	0.1200	96.40	14:32:49	0
637	22/03/2016	Matong	0.0400	93.20	14:32:49	0
638	24/03/2016	Tarrawonga Station	0.1700	99.80	11:56:16	0
638	24/03/2016	Matong	0.2200	95.60	11:56:16	0
638	24/03/2016	Tarrawonga Station	0.3500	101.10	14:12:05	0
638	24/03/2016	Matong	0.4400	106.90	14:12:05	0
639	4/04/2016	Tarrawonga Station	0.4000	84.00	13:36:14	0
639	4/04/2016	Matong	0.6500	97.20	13:36:14	0
639	4/04/2016	Tarrawonga Station	0.4200	84.00	13:36:24	0
639	4/04/2016	Matong	0.6800	93.00	13:36:24	0
640	8/04/2016	Tarrawonga Station	0.2300	105.70	11:50:36	0
640	8/04/2016	Matong	0.4400	108.70	11:50:36	0
641	13/04/2016	Tarrawonga Station	0.3500	106.00	11:57:12	0
641	13/04/2016	Matong	0.3100	104.60	11:57:12	0
642	15/04/2016	Tarrawonga Station	0.1400	105.20	10:30:02	0
642	15/04/2016	Matong	0.0900	100.40	10:30:02	0
643	20/04/2016	Tarrawonga Station	0.1000	95.70	10:30:55	0
643	20/04/2016	Matong	0.0800	96.10	10:30:55	0
644	22/04/2016	Tarrawonga Station	0.1100	75.50	12:20:43	0
644	22/04/2016	Matong	0.1100	95.30	12:20:43	0
644	22/04/2016	Tarrawonga Station	0.0200	80.60	13:06:46	0
644	22/04/2016	Matong	0.0300	86.30	13:06:46	0
644	22/04/2016	Tarrawonga Station	0.0100	72.50	13:58:16	0
644	22/04/2016	Matong	0.0100	98.40	13:58:16	0
645	29/04/2016	Tarrawonga Station	0.3300	99.60	12:01:58	2b
645	29/04/2016	Matong	0.3900	102.40	12:01:58	2b

Quarterly Surface Water Monitoring Results

Sample No.	Date	Time	Sample Location	pH	EC (µS/cm)	Total Suspended Solids (mg/L)	Total Organic Carbon (TOC)	Grease & Oil (mg/L)	Antimony	Arsenic	Molybdenum	Selenium
	8 September 2006		SD5	6.5	930	144		<2				
	8 September 2006		SD6	7.5	310	104		<2				
	8 September 2006		SD8	8.9	190	25		<6				
	8 September 2006		SD9	9	285	1940		<2				
	11 January 2007		SD5	8.4	3750	20		<2				
	11 January 2007		SD8	8.2	420	84						
	11 January 2007		SD9	8.6	440	15		<2				
	11 January 2007		MV1	7.7	3970	293		<2				
	18 April 2007		SD1	8.6	605	86		<2				
	18 April 2007		SD2	8.5	395	102		<2				
	18 April 2007		SD8	8.6	270	36		<2				
	18 April 2007		SD9	8.4	310	133		<2				
	18 April 2007		SD20	9.1	520	80		<2				
	18 April 2007		MV	7.8	4260	<2		<2				
27514.01	25 July 2007	1510	SD1	7.5	990	23		<2				
27514.02	25 July 2007	1525	SB5	8	1150	17		<2				
27514.03	25 July 2007	1540	MV1	7.6	3130	15		30				
27514.04	25 July 2007	1550	SD8	8.1	260	25		<2				
27514.05	25 July 2007	1600	SD9	7.7	290	22		<2				
27514.06	25 July 2007	1605	SD5	8.4	3370	8		<2				
28415.01	31 October 2007	1545	SD9	7.8	310	16		<2				
28415.02	31 October 2007	1555	SD8	8.8	780	32		<2				
28415.03	31 October 2007	1610	SB5	8.9	1200	60		<2				
28415.04	31 October 2007	1620	SB8*	9	2000	110		<2				
28415.05	31 October 2007	1630	SB7	8.4	560	27		<2				
28415.06	31 October 2007	1640	MV	8.1	2780	45		<2				
28415.07	31 October 2007	1650	SD5	8.3	2620	44		<2				
29740.01	18 March 2008	1035	SD9	6.9	245	27		<2				
29740.02	18 March 2008	1050	SD8	8.4	1340	19		<2				
29740.03	18 March 2008	1110	SD5									
29740.04	18 March 2008	1120	SD20	7.4	385	44		<2				
29740.05	18 March 2008	1130	Pit Water Dam	8.4	1620	14		<2				
29740.06	18 March 2008	1145	MV	7.8	3110	10		<2				
29740.07	18 March 2008	1155	SB5	7.8	870	54		<2				
29740.08	18 March 2008	1200	SB7	7.5	365	387		<2				
29740.09	18 March 2008	1205	SD17	7.4	460	58		<2				
31188.01	22 August 2008	1350	SD9	7.9	275	35		<2				
31188.02	22 August 2008	1355	SD8	8.9	1450	20		<2				
31188.03	22 August 2008	1405	SB16	8.8	1440	16		<2				
31188.04	22 August 2008	1425	SD5	8.7	1310	35		<2				
31188.05	22 August 2008	1430	SB4	8.7	1980	31		<2				
31188.06	22 August 2008	1440	SB5	8.5	955	13		<2				
31188.07	22 August 2008	1455	Pit Water Dam	8.7	2420	17		<2				
31333.01	5 September 2008	1600	BCD	7.2	75	150		<2				
31333.02	5 September 2008	1025	DAM1	7.4	185	4930		<2				
31490.01	23 September 2008	1400	BCU	6.8	95	92		<2				
31490.02	23 September 2008	1545	BCD	6.7	115	107		<2				
31490.03	23 September 2008	1516	SD8	8.9	995	24		<2				
31490.04	23 September 2008	1450	SD17	8.3	720	456		<2				
31597.01	7 October 2008	930	SD17	8.2	735	75		<2				
31597.02	7 October 2008	950	SD8	8.9	775	22		<2				
31597.03	7 October 2008	1015	SB14	8.5	255	43		<2				
32277.01	15 December 2008	1114	SD17	7.4	435	152		<2				
32277.02	15 December 2008	1140	SD9	7.3	245	24		3				
32277.03	15 December 2008	1130	SD8	8.2	635	22		<2				
32277.04	15 December 2008	1207	BCD	6.9	135	30		<2				
32738.01	10 February 2009	0620	MV	8.2	3370	13		<2				
32738.02	10 February 2009	0638	SD8	8.9	790	11		<2				
32738.03	10 February 2009	0655	SD9	8.5	330	16		<2				
32738.04	10 February 2009	0646	SB14	8	380	32		<2				
32738.05	10 February 2009	0604	SB5	8.8	1070	7		<2				
32738.06	10 February 2009	0631	SB16	9	1200	6		<2				
ES0909243-001	24 June 2009	0910	SB7	8.21	401	90	6	<5				
ES0909243-002	24 June 2009	0925	SB5	8.62	1180	12	8	<5				
ES0909243-003	24 June 2009	0935	Pit water	8.87	2330	148	5	<5				
ES0909243-004	24 June 2009	0950	SD9	8.33	335	5	8	<5				
ES0909243-005	24 June 2009	1010	SD16	8.16	550	20	5	<5				
ES0909243-006	24 June 2009	1040	SB14	7.71	351	29	9	<5				
ES0912983-001	27 August 2009	1035	SB7	8.1	418	62	5	<10				
ES0912983-002	27 August 2009	1050	SB5	8.64	1210	29	8	<10				
ES0912983-003	27 August 2009	1145	Pit water	8.2	2580	264	6	<10				
ES0912983-004	27 August 2009	1105	SD9	8.36	389	12	8	<10				
ES0913144-001	31 August 2009	0905	SB14	8.73	342	56	10	<10				
ES0913144-002	31 August 2009	0915	SD16	8.3	547	158	5	<10				
ES0919560-001	22 December 2009	1030	NCD	7.8	137	164	16	19				
ES0919560-002	22 December 2009	1100	BCU	7.32	150	220	25	-				
ES0919560-003	22 December 2009	1125	BCD	7.04	146	32	43	-				
ES0919731-001	29 December 2009	1300	BCD	6.88	75	47	15					
ES0919731-002	29 December 2009	1310	NCD	6.73	143	32	10					
ES0919731-003	29 December 2009	1320	NCU	6.79	95	34	18					
ES0919731-004	29 December 2009	1350	SD14	8.12	1080	65	4					
ES0919731-005	29 December 2009	1405	SB14	7.41	374	128	19					
ES0919731-006	29 December 2009	1410	Goonbri Creek	7.02	60	38	12					

Sample No.	Date	Time	Sample Location	pH	EC (µS/cm)	Total Suspended Solids (mg/L)	Total Organic Carbon (TOC)	Grease & Oil (mg/L)	Antimony	Arsenic	Molybdenum	Selenium
ES1003581-001	25 February 2010	1400	SB7	8.14	197	194	3	5				
ES1003581-002	25 February 2010	1415	SB5	8.06	681	77	4	<5				
ES1003581-003	25 February 2010	1505	SD9	7.95	123	18	8	5				
ES1003581-004	25 February 2010	1445	SD16	8.49	734	257	3	<5				
ES1003581-005	25 February 2010	1455	SB14	8.03	232	40	6	<5				
ES1003581-006	25 February 2010	1530	SD2	8.37	276	15	<5	<5				
ES1009879-001	24 May 2010	1030	SB7	8.41	291	17	4	13				
ES1009879-001	24 May 2010	1045	SB5	8.59	531	48	5	13				
ES1009879-001	24 May 2010	1110	SD9	8.62	148	10	8	6				
ES1009879-001	24 May 2010	1125	SD16	8.93	810	9	4	8				
ES1009879-001	24 May 2010	1205	SB14	7.76	251	538	8	6				
ES1013265-001	6 July 2010	1130	SB14	8.09	245	95	5	<5				
ES1015929-001	9 August 2010	1245	SB16	8.39	1170	10	3	<5				
ES1015929-002	9 August 2010	1320	Pit water	7.07	1940	37	2	<5				
ES1015929-003	9 August 2010	1150	SD9	7.72	147	24	9	<5				
ES1015929-004	9 August 2010	1210	SD16	8.29	793	40	5	<5				
ES1015929-005	9 August 2010	1220	SB14	7.69	260	1300	6	<5				
ES1022163-001	2 November 2010	1610	SB7 (pre floc)	8.33	332	38	4	<5				
ES1022525-001	4 November 2010	1530	SB7 (post floc)	8.72	339	10	3	<5				
ES1022922-01	10 November 2010	940	SB16	9.19	1140	14	3	<5				
ES1022922-02	10 November 2010	1020	SD9	7.94	168	16	11	<5				
ES1022922-03	10 November 2010	1000	SD16	9.49	831	11	5	<5				
ES1022922-04	10 November 2010	1010	SB14	7.72	323	56	5	<5				
ES1105082-001	9 March 2011	1120	SD17	8.38	393	42	6	<5				
ES1105082-002	9 March 2011	0915	SB16	7.17	968	20	6	<5				
ES1105082-003	9 March 2011	1200	VOID	7.95	2540	78	6	<5				
ES1105082-004	9 March 2011	1050	SD9	7.98	186	30	11	<5				
ES1105082-005	9 March 2011	1110	SD16	8.71	762	27	5	<5				
ES1105082-006	9 March 2011	1015	SB14	8.17	361	43	6	<5				
ES1109209-001	3 May 2011	11:00	SD16	8.58	1020	22	6	<5	<0.001	0.002	0.014	<0.01
ES1109209-002	3 May 2011	11:20	SB14	7.9	434	24	6	<5	<0.001	0.002	0.004	<0.01
ES1109209-003	3 May 2011	10:40	SD17	8.92	2040	20	6	<5	<0.001	0.004	0.014	<0.01
ES1109209-004	3 May 2011	10:50	SB16	8.58	1030	13	4	<5	0.003	0.2	0.029	<0.01
-	3 May 2011	-	VOID	Dry								
ES1116908-001	4 August 2011	14:10	SD16	8.64	975	32	8	<5	<0.001	0.002	0.011	<0.01
ES1116908-002	4 August 2011	14:25	SB14	8.33	414	24	6	<5	<0.001	0.001	0.003	<0.01
ES1116908-003	4 August 2011	13:40	SD17	8.53	925	10	8	<5	<0.001	0.002	0.006	<0.01
ES1116908-004	4 August 2011	13:10	SB16	8.52	891	24	4	<5	0.004	0.002	0.028	<0.01
ES1116908-005	4 August 2011	13:10	VOID	8.52	2890	49	5	<5		0.015		
ES1124591-001	9 November 2011	13:00	SD16	9.03	791	20	7	<5	<0.001	0.003	0.010	<0.01
ES1124591-002	9 November 2011	12:30	SB14	7.84	431	20	5	<5	<0.001	0.002	0.004	<0.01
ES1124591-003	9 November 2011	13:20	SD17	8.39	448	56	6	<5	<0.001	0.002	0.003	<0.01
ES1124591-004	9 November 2011	11:10	SB16	8.39	646	6	3	<5	0.003	0.002	0.026	<0.01
ES1124591-005	9 November 2011	14:00	VOID	8.08	1790	158	3	<5				
ES1204830-001	29 February 2012	1240	SD16	7.96	365	34	2	<5	<0.001	0.001	0.009	<0.01
ES1204830-002	29 February 2012	1220	SB14	8.15	443	174	5	<5	<0.001	0.002	0.003	<0.01
ES1204830-003	29 February 2012	1145	SD17	8.23	434	18	7	<5	<0.001	0.003	0.004	<0.01
ES1204830-004	29 February 2012	1200	SB16	8.17	433	23	1	<5	0.001	0.001	0.012	<0.01
ES1204830-007	29 February 2012	1115	VOID	8.3	727	1620	2	<5		0.008		
ES1205971-001	9 March 2012	10:05	SB23 Pre-floc	7.84	148	70	4	<5				
ES1205971-002	10 March 2012	10:00	SB23 24hrs post floc	7.82	159	60	16	<5				
ES1205971-003	11 March 2012	9:30	SB23 48hrs post floc	7.75	158	61	16	<5				
ES1205277-001	2 March 2012	10:05	SD16 Pre-floc	8.17	351	16	2	<5				
ES1205277-002	2 March 2012	10:25	SB14 Pre-floc	8.13	452	50	5	<5				
ES1210729-001	2 May 2012	11:40	SD16	8.37	388	14	2	<5	<0.001	<0.001	0.008	<0.01
ES1210729-002	2 May 2012	12:00	SB14	9.08	1060	57	5	<5	<0.001	0.002	0.004	<0.01
ES1210729-003	2 May 2012	10:30	SD17	8.74	602	8	6	<5	<0.001	0.001	0.006	<0.01
ES1210729-004	2 May 2012	10:45	SB16	7.87	456	6	1	<5	0.001	0.001	0.013	<0.01
ES1210729-005	2 May 2012	10:00	VOID	8.26	2080	10	1	<5	0.002	0.009	0.048	<0.01
ES1210729-006	2 May 2012	11:15	GCR1	7.99	689	104	35	<5	<0.001	0.003	0.002	<0.01
ES1211990-001	11 May 2012	16:00	SB23		246	18	8	<5				
ES1212919-001	22 May 2012	1:50	SB24		373	42	11	<5				
ES1212919-002	22 May 2012	2:30	SB14		980	42	5	<5				
ES1212919-003	22 May 2012	2:55	SD16		400	35	2	<5				
ES1212919-004	22 May 2012	3:05	SD9		133	36	8	<5				
ES1212919-005	22 May 2012	3:25	SD17		618	20	6	<5				
ES1213239-001	28 May 2012	7:45	SD17	8.58	558	16	7	<5				
ES1213239-002	28 May 2012	8:05	SD9	7.97	136	37	8	<5				
ES1213239-003	28 May 2012	8:25	SB14	8.21	661	53	5	<5				
ES1213239-004	28 May 2012	8:40	SB24	8.21	351	42	11	<5				
ES1215160-001	18 June 2012	9:30	SB14	8.05	513	92	5	<5				
ES1215160-002	18 June 2012	9:30	SD16	8.13	445	25	4	<5				
ES1215160-003	18 June 2012	9:30	SD9	7.95	137	23	8	<5				
ES1215160-004	18 June 2012	9:30	SD17	8.54	533	14	6	<5				
ES1215160-005	18 June 2012	9:30	Canyon SD	8.13	304	87	9	<5				

Sample No.	Date	Time	Sample Location	pH	EC (µS/cm)	Total Suspended Solids (mg/L)	Total Organic Carbon (TOC)	Grease & Oil (mg/L)	Antimony	Arsenic	Molybdenum	Selenium
ES1217223-001	11 July 2012	4:33	NCD	7.19	174	150	19	<5				
ES1218109-001	20 July 2012	11:30	SB23-After Floc	7.92	254	16	3	<5				
ES1218108-001	23 July 2012	11:00	SD16-Background info water	8.02	450	25	3	<5				
ES1218108-002	23 July 2012	11:15	SD14-After floc	7.94	590	35	3	<5				
ES1219866-001	14 August 2012	10:40	SD16	8.1	454	<5	3	<5	<0.001	0.001	0.008	<0.01
ES1219866-002	14 August 2012	11:00	SB14	8.11	646	<5	7	<5	<0.001	0.002	0.007	<0.01
ES1219866-003	14 August 2012	10:00	SD17	8.08	465	<5	5	<5	<0.001	0.001	0.004	<0.01
ES1219866-004	14 August 2012	10:15	SB16	7.96	561	<5	2	<5	0.003	0.002	0.02	<0.01
ES1219866-005	14 August 2012	9:40	VOID	8.39	2220	<5	2	<5				
ES1219866-006	14 August 2012	11:40	GCR1	7.82	190	16	19	<5	<0.001	0.002	<0.001	<0.01
ES1219866-007	14 August 2012	11:20	GCR2	7.72	182	12	17	<5	<0.001	0.002	<0.001	<0.01
ES1227081-001	14 November 2012	11:10	SD16	9.84	679	100	6	<5	<0.001	0.004	0.01	<0.01
ES1227081-002	14 November 2012	10:40	SB14	8.85	890	24	3	<5	<0.001	<0.001	0.006	<0.01
ES1227081-003	14 November 2012	10:15	SD17	8.7	700	14	4	<5	<0.001	<0.001	0.006	<0.01
ES1227081-004	14 November 2012	10:00	SB16	8.69	707	76	1	<5	0.004	0.002	0.026	<0.01
ES1227081-005	14 November 2012	9:30	VOID	8.62	2870	10	<1	<5				
ES1302567-001	1 February 2013	15:10	SD9 pre floc	7.44	262	43	7	<5				
ES1302567-002	1 February 2013	13:10	SD9 post floc	7.39	267	82	8	<5				
ES1303969-001	20 February 2013	15:00	SD9-Pre Discharge	7.89	275	18	8	<5				
ES1305311-001	6 March 2013	10:40	SD16	7.69	252	288	5	<5	<0.001	0.005	0.001	<0.01
ES1305311-002	6 March 2013	11:00	SB14	7.81	378	99	4	<5	<0.001	0.001	0.002	<0.01
ES1305311-003	6 March 2013	10:20	SD17	8	229	91	4	<5	<0.001	<0.001	0.002	<0.01
ES1305311-004	6 March 2013	9:30	SB16A	8.01	365	240	4	<5	0.002	0.004	0.013	<0.01
ES1305311-005	6 March 2013	9:50	VOID	8.23	1620	16	2	<5				
ES1305311-006	6 March 2013	11:20	GCR1	7.43	126	106	5	<5	<0.001	<0.001	<0.001	<0.01
ES1305311-007	6 March 2013	11:40	GCR2	7.42	173	48	16	<5	<0.001	0.002	<0.001	<0.01
ES1312392-001	30 May 2013	11:20	SD16	8.16	341	100	7	<5	<0.001	0.003	0.003	<0.01
ES1312392-002	30 May 2013	11:00	SB14	8.42	538	38	6	<5	<0.001	0.002	0.003	<0.01
ES1312392-003	30 May 2013	10:00	SD17	8.47	334	49	6	<5	<0.001	0.002	0.003	<0.01
ES1312392-004	30 May 2013	10:30	SB16A	8.25	530	108	10	<5	0.004	0.004	0.018	<0.01
ES1312392-005	30 May 2013	9:30	VOID	8.51	3120	45	4	<5				
ES1317665-001	7 August 2013	10:20	SD16	8.49	390	7	6	<5	<0.001	0.001	0.003	<0.01
ES1317665-002	7 August 2013	10:40	SB14	8.96	570	8	7	<5	<0.001	<0.001	0.002	<0.01
ES1317665-003	7 August 2013	10:00	SD17	8.59	371	9	4	<5	<0.001	<0.001	0.003	<0.01
ES1317665-004	7 August 2013	9:30	SB16A	8.05	585	20	7	<5	0.005	0.003	0.022	<0.01
ES1317665-005	7 August 2013	11:30	VOID	8.35	2660	29	6	<5				
ES1317665-006	7 August 2013	11:00	TAR-GCD	7.4	155	52	16	<5	<0.001	0.002	<0.001	<0.01
ES1317665-007	7 August 2013	11:15	TAR-GCU	7.42	208	14	20	<5	<0.001	0.003	<0.001	<0.01
ES1324032-001	5 November 2013	9:35	SD16	9.42	538	29	15	<5	<0.001	0.004	0.004	<0.01
ES1324032-002	5 November 2013	9:35	SB14	8.55	1070	172	17	<5	<0.001	0.002	0.005	<0.01
ES1324032-003	5 November 2013	8:45	SD17	8.87	573	21	9	<5	<0.001	0.002	0.005	<0.01
ES1324032-004	5 November 2013	9:10	SB16A	8.8	918	38	8	<5	0.008	0.005	0.04	<0.01
ES1324032-005	5 November 2013	11:00	VOID	8.25	2530	11	29	<5		0.01		
ES1403679-001	20 February 2014	11:05	TAR-SD16	8.35	432	65	6	<5	<0.001	0.006	0.003	<0.01
ES1403679-002	20 February 2014	11:25	TAR-SB14	8.09	393	1280	8	<5	<0.001	0.005	<0.001	0.01
ES1403679-003	20 February 2014	10:45	TAR-SD17	8.79	712	46	8	<5	<0.001	0.002	0.007	<0.01
ES1403679-004	20 February 2014	9:10	TAR-SB16A	8.61	713	330	8	<5	0.004	0.01	0.023	<0.01
ES1403679-005	20 February 2014	10:15	TAR-VOID	8.63	1350	22	1	<5	0.007	0.026	0.101	<0.01
ES1403679-006	20 February 2014	11:45	TAR-GCU	6.69	115	433	23	<5	<0.001	0.005	0.001	<0.01
ES1410071-001	6 May 2014	10:15	TAR-SD16	8.12	404	19	3	21	<0.001	0.004	0.003	<0.01
ES1410071-002	6 May 2014	10:30	TAR-SB14	8.92	1980	10	4	5	<0.001	0.002	0.008	<0.01
ES1410071-003	6 May 2014	9:55	TAR-SD17	8.26	351	25	3	<5	<0.001	0.002	0.0002	<0.01
ES1410071-004	6 May 2014	10:50	TAR-SB16A	8.2	483	134	1	<5	0.003	0.008	0.02	<0.01
ES1410071-005	6 May 2014	11:10	TAR-VOID	8.31	3280	213	<1	<5		0.006		
ES1410071-006	6 May 2014	12:05	TAR-GCU	7.89	318	<5	14	<5	<0.001	0.002	0.001	<0.01
ES1410071-007	6 May 2014	11:45	TAR-GCD	7.88	301	<5	17	<5	<0.001	0.001	<0.001	<0.01
ES1417356-001	6 August 2014	10:45	TAR-SD16	8.7	439	5	6	<5	<0.001	0.002	0.002	<0.01
ES1417356-002	6 August 2014	11:10	TAR-SB14	8.67	1450	22	7	<5	<0.001	0.001	0.004	<0.01
ES1417356-003	6 August 2014	9:40	TAR-SD17	8.44	397	48	7	<5	<0.001	0.002	0.003	<0.01
ES1417356-004	6 August 2014	10:30	TAR-SB16A	8.25	609	63	8	<5	0.005	0.004	0.024	<0.01
ES1417356-005	6 August 2014	10:10	TAR-VOID	8.5	3260	515	16	<5				
ES1417356-006	6 August 2014	11:40	TAR-GCU	8.31	392	42	14	<5	<0.001	0.002	<0.001	<0.01
ES1424845-001	11 November 2014	11:15	TAR-SD16	8.7	507	14	6	<5	<0.001	0.002	0.004	<0.01
ES1424845-002	11 November 2014	11:35	TAR-SB14	8.85	1480	50	14	<5	<0.001	0.003	0.012	<0.01
ES1424845-003	11 November 2014	10:30	TAR-SD17	8.7	539	34	7	<5	<0.001	<0.001	0.005	<0.01
ES1424845-004	11 November 2014	10:50	TAR-SB16A	8.51	740	18	5	<5	0.006	0.003	0.032	<0.01
ES1424845-005	11 November 2014	9:40	TAR-GCU	7.7	549	1230	57	<5	<0.001	0.022	0.006	<0.01
ES1424845-006	11 November 2014	9:10	TAR-GCD	7.64	751	62	50	<5	<0.001	0.011	0.004	<0.01
ES1427251-001	8 December 2014	0:45	TAR-VOID	8.04	3060	170	<1	<5				
ES1504050-001	18 February 2015	10:10	TAR-SD16	8.19	451	16	4	<5	<0.001	0.004	0.006	<0.01
ES1504050-002	18 February 2015	10:30	TAR-SB14	8	626	12	4	<5	<0.001	0.004	0.005	<0.01
ES1504050-003	18 February 2015	9:30	TAR-SD17	8.13	313	123	5	<5	<0.001	0.007	0.006	<0.01
ES1504050-004	18 February 2015	9:50	TAR-SB16A	8.29	574	71	2	<5	0.003	0.007	0.025	<0.01
ES1504050-005	18 February 2015	11:40	TAR-GCU	7.43	242	86	6	<5	<0.001	0.01	0.02	<0.01
ES1504050-006	18 February 2015	12:00	TAR-GCD	7.22	444	748	26	<5	<0.001	0.016	0.002	<0.01
ES1504050-007	18 February 2015	10:45	TAR-VOID	8.72	3170	10	<1	<5				
ES1521532-001	7 May 2015	10:40	TAR-SD16	8.27	409	16	6	<5	<0.001	0.003	<0.001	<0.01
ES1521532-002	7 May 2015	10:55	TAR-SB14	8.85	1300	17	8	<5	<0.001	0.002	0.002	<0.01
ES1521532-003	7 May 2015	10:05	TAR-SD17	8.3	539	44	5	<5	0.001	0.003	0.007	<0.01

Sample No.	Date	Time	Sample Location	pH	EC (µS/cm)	Total Suspended Solids (mg/L)	Total Organic Carbon (TOC)	Grease & Oil (mg/L)	Antimony	Arsenic	Molybdenum	Selenium
ES1521532-004	7 May 2015	10:20	TAR-SB16A	8.19	571	44	2	<5	0.005	0.003	0.008	<0.01
ES1521532-005	7 May 2015	9:45	TAR-VOID	8.62	2910	5	5	<5				
ES1521532-006	7 May 2015	11:15	TAR-GCD	7.35	147	29	8	<5	<0.001	0.003	<0.001	<0.01
ES1528624-001	17 August 2015	11:10	TAR-SD16	8.43	426	19	4	8	<0.001	0.003	0.011	<0.01
ES1528624-002	17 August 2015	11:30	TAR-SB14	8.91	1070	7	5	<5	0.001	0.001	0.02	<0.01
ES1528624-003	17 August 2015	10:35	TAR-SD17	8.81	902	192	8	7	<0.001	0.002	0.043	<0.01
ES1528624-004	17 August 2015	10:55	TAR-SB16A	7.95	658	65	2	7	0.007	0.004	0.05	<0.01
ES1528624-005	17 August 2015	9:45	TAR-GCU	7.67	161	96	6	6	<0.001	0.004	0.001	<0.01
ES1528624-006	17 August 2015	10:10	TAR-GCD	7.59	202	35	7	<5	<0.001	0.007	<0.001	<0.01
ES1529602-001	27 August 2015	10:35	TAR-VOID	8.41	1020	49200	<20	6				
ES1236562-001	17/11/2015	13:20	TAR-SD16	8.9	440	10	6	<5	<0.001	0.004	0.004	<0.01
ES1236562-002	17/11/2015	13:05	TAR-SB14	8.21	455	100	9	<5	<0.001	0.003	0.005	<0.01
ES1236562-003	17/11/2015	12:25	TAR-SD17	7.98	361	191	10	<5	<0.001	0.004	0.004	<0.01
ES1236562-004	17/11/2015	12:45	TAR-SB16A	8.08	550	64	6	<5	0.001	0.002	0.048	<0.01
ES1236562-005	17/11/2015	10:30	TAR-VOID	8.36	1350	43	4	<5				
ES1236562-006	17/11/2015	9:30	TAR-GCU	7.47	157	33	15	<5	<0.001	0.006	<0.001	<0.01
ES1603268-001	11/02/2016	11:45	TAR-SD16	8.2	289	95	5	<5	<0.001	0.006	0.004	<0.01
ES1603268-002	11/02/2016	11:30	TAR-SB14	8.29	722	21	4	<5	<0.001	0.004	0.007	<0.01
ES1603268-003	11/02/2016	12:15	TAR-SD17	8.26	698	174	2	<5	0.002	0.007	0.014	<0.01
ES1603268-004	11/02/2016	11:10	TAR-SB16A	7.99	622	84	1	<5	0.002	0.003	0.035	<0.01
ES1603268-005	11/02/2016	10:50	TAR-VOID	8.28	882	53	<1	<5				
ES1603268-006	11/02/2016	10:00	TAR-GCD	7.45	159	129	10	<5	<0.001	0.01	0.002	<0.01

Wet Weather Discharge Results

Sample No.	Sample Location	Date	Time	pH	Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)	Grease & Oil (mg/L)	Total Organic Carbon (mg/L)	Comments
26194.01	BCU	1 March 2007	1600	6.8	165	193	<2		
26194.02	NCU	1 March 2007	1530	7.0	105	78	4		
26194.03	NCD	1 March 2007	1545	6.5	65	304	<2		
26194.04	BCD	2 March 2007	900	6.4	105	45	4		
26194.05	SD1	2 March 2007	1345	7.5	540	524	3		
26194.06	SD2	2 March 2007	1350	7.8	610	290	2		
27779.01	BCD	23 August 2007	1015	6.2	110	23	<2		
27779.02	SD8	23 August 2007	1035	6.8	475	5	<2		
27779.03	BCU	23 August 2007	1100	6.8	180	46	2		
29122.01	LDP3	17 January 2008	1420	7.3	570	100	<2		
29122.02	LDP1	17 January 2008	1500	7.6	425	837	<2		
29122.03	SD8	17 January 2008	1715	7.4	725	173	<2		
29297.01	BCU	6 February 2008	1505	7.1	120	20	<2		
29297.02	LDP2	6 February 2008	1525	7.4	220	42	<2		
29297.03	SD8	6 February 2008	1535	8.2	1170	26	<2		
29297.04	LDP1	6 February 2008	1615	7.9	420	476	<2		
29297.05	BCD	6 February 2008	1700	7.3	135	9	<2		
32813.01	BCU	17 February 2009	1418	6.8	275	35	<2		
32813.02	LDP2	17 February 2009	1510	7.1	90	22	<2		
32813.03	BCD	17 February 2009	1530	6.5	130	32	<2		
ES1000141-001	LDP24	4 January 2010	1600	7.3	729	51	<5	20	
ES1000141-002	NC-D	4 January 2010	1630	7.56	189	29	<5	28	
ES1000141-003	NC-U	4 January 2010	1725	7.42	181	68	<5	20	
ES1000141-004	BC-D	4 January 2010	1750	7.43	125	5	<5	35	
ES1002193	LDP24	8 February 2010	1055	7.63	633	242	7	3	
ES1002886-001	LDP1	15 February 2010	1315	7.56	252	1020	<5	4	
ES1002886-002	LDP2	15 February 2010	1350	7.18	55	75	<5	11	
ES1002886-003	LDP24	15 February 2010	1400	7.54	741	263	<5	7	
ES1002886-004	BCU	15 February 2010	1445	7.22	63	94	<5	13	
ES1002886-005	NCD	15 February 2010	1505	7.09	101	40	<5	19	
ES1002886-006	NCD	15 February 2010	1525	6.89	71	40	<5	26	
ES1002886-007	NCU	15 February 2010	1545	6.6	78	24	<5	30	
ES1006095-001	LDP24	31 March 2010	0850	7.95	816	23	<5	3	
ES1013940-001	LDP3	14 July 2010	1255	8.04	246	30	<5	7	
ES1015037-003	LDP3	28 July 2010	1354	7.71	74	41	<5	15	
ES1015037-001	NCU	28 July 2010	1312	8.05	26	1940	<5	10	
ES1015037-002	NCD	28 July 2010	1325	7.53	379	44	<5	16	
ES1015611-001	BCD	3 August 2010	1115	8.03	101	32	<5	28	
ES1016049-005	LDP3	10 August 2010	1300	6.76	233	2630	<5	<10	
ES1016049-001	NCU	10 August 2010	1200	7.51	34	766	<5	7	
ES1016049-002	NCD	10 August 2010	1215	7.14	72	616	<5	8	
ES1016049-004	BCU	10 August 2010	1250	6.66	65	94	<5	13	
ES1016049-003	BCD	10 August 2010	1230	6.7	78	39	<5	19	
ES1016144-001	LDP24	11 August 2010	1150	8.42	727	64	<5	4	
ES1016144-002	LDP2	11 August 2010	1200	7.27	116	28	<5	12	
ES1016962-001	LDP24	20 August 2010	1230	8.76	748	22	9	4	
ES1016962-002	LDP3	20 August 2010	1250	8.36	264	666	33	5	
ES1016962-003	BCD	20 August 2010	1310	8.29	115	26	22	32	
ES1017959-001	LDP24	2 September 2010	1620				<5		
ES1017959-002	LDP3	2 September 2010	1630				5		Resample for oil and grease only
ES1017959-003	BCD	2 September 2010	1600				<5		
ES1018430-002	LDP3	10 September 2010	1220	7.71	298	548	<5	5	
ES1018430-001	BCD	10 September 2010	1120	6.64	99	66	<5	22	
ES1018625-001	LDP3	15 September 2010	0820	7.63	272	231	5	5	
ES1018625-002	LDP24	15 September 2010	0840	8.52	795	21	<5	5	
ES1018625-003	LDP2	15 September 2010	0850	7.28	110	78	<5	19	
ES1023143-001	LDP3	12 October 2010	0930	6.75	98	58	6	17	
ES1023279-001	BCD	16 October 2010	1055	6.58	143	85	8	17	
ES1023279-002	NCD	16 October 2010	1115	6.86	140	118	<5	22	
ES1024688-001	LDP24	1 December 2010	1130	8.03	857	6	<5	6	
ES1025100-001	LDP3	3 December 2010	0800	7.64	321	122	<5	5	
ES1025103-001	BCD	6 December 2010	1420	6.72	152	46	<5	23	
ES1025678-001	LDP1	10 December 2010	1000	7.31	232	152	<5	14	
ES1025678-002	NCD	10 December 2010	1030	6.97	132	79	<5	15	
ES1025678-003	NCU	10 December 2010	1055	6.57	29	181	<5	10	
ES1025678-004	LDP24	10 December 2010	1140	8.14	800	45	<5	5	
ES1025678-005	LDP2	10 December 2010	1200	7.25	118	66	<5	10	
ES1025678-006	LDP3	10 December 2010	1210	6.9	77	156	<5	18	
ES1025678-007	BCD	10 December 2010	1230	6.83	77	65	<5	15	

Sample No.	Sample Location	Date	Time	pH	Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)	Grease & Oil (mg/L)	Total Organic Carbon (mg/L)	Comments
ES1119817-001	NCD	9 September 2011	1030	7.14	76	76	<5	14	38.2mm in the previous 24 hours. Reported to EPA.
ES1119817-002	LDP3	9 September 2011	1100	7.53	276	131	<5	9	
ES1119817-003	LDP2	9 September 2011	1110	7.1	43	50	<5	12	
ES1121350-001	LDP3	29 September 2011	1050	7.69	293	414	<5	5	38.6mm of rainfall on the day of discharge and 2.6mm on the previous day. Reported to EPA.
ES1121350-002	LDP2	29 September 2011	1100	7.13	91	228	<5	7	
ES1121350-003	NCD	29 September 2011	1115	6.98	48	144	<5	10	
ES1124940-001	LDP2	14 November 2011	1030	7.98	227	144	<5	10	34.0mm of rainfall on the previous day. Reported to EPA.
ES1124940-002	BCD	14 November 2011	1110	7.34	131	29	<5	35	
ES1125587-001	LDP24	18 November 2011	0910	7.52	596	64	<5	8	62.5mm of rainfall in preceding 5 days. Reported to EPA.
ES1125587-003	BCD	18 November 2011	1000	6.72	222	32	<5	87	
ES1125587-004	NCD	18 November 2011	1019	7	115	147	<5	26	
ES1125587-005	NCU	18 November 2011	1030	6.57	26	146	<5	7	
ES1125999-001	BCD	23 November 2011	1540	6.64	79	24	<5	27	41.4mm of rainfall on the day.
ES1125999-002	NCD	23 November 2011	1555	7.04	103	133	<5	20	
ES1125999-003	NCU	23 November 2011	1610	6.64	28	98	<5	10	
ES1125999-004	BCU	23 November 2011	1640	7.27	177	64	<5	28	
ES1126008-001	LDP1	24 November 2011	1025	7.7	304	620	<5	14	41.4mm of rainfall on previous day. Reported to EPA.
ES1202202-001	LDP26	31 January 2012	1145	7.74	188	1340	<5	6	37.6mm of rainfall in previous 5 days. Reported to EPA.
ES1202202-002	LDP2	31 January 2012	1130	7.39	48	116	<5	5	
ES1202202-003	LDP24	31 January 2012	1150	7.79	301	124	<5	4	
ES1202202-004	LDP3	31 January 2012	1200	7.92	356	1170	<5	3	
ES1202202-005	LDP27	31 January 2012	1220	7.28	76	37	<5	11	
ES1202202-006	BCU	31 January 2012	1355	6.76	306	584	<5	14	
ES1202202-007	NCU	31 January 2012	1430	7.23	174	78	<5	14	
ES1202202-008	NCD	31 January 2012	1450	7.13	167	132	<5	9	
ES1202506-001	GCDW	31 January 2012	0710	7.6	710	2720	<5	10	Non Licenced Discharge. Reported to EPA and Penalty Infringement Notices issued.
ES1202506-002	BCD	31 January 2012	1230	7.15	102	30	<5	13	
ES1204080-001	BCU	21 Feburary 2012	1020	7.91	633	6	<5	7	64.8mm of rainfall in preceding 5 days. This exceeds the 90%ile 5 day event criteria and therefore TSS exceedances were not reported to EPA.
ES1204080-002	GCD	21 Feburary 2012	1047	8.01	696	35	<5	11	
ES1204080-003	GCU	21 Feburary 2012	1100	7.59	401	12	<5	38	
ES1204080-004	LDP3	21 Feburary 2012	1115	8.07	661	193	<5	7	
ES1204080-005	LDP24	21 Feburary 2012	1125	7.64	339	59	<5	5	
ES1204080-006	LDP26	21 Feburary 2012	1140	7.6	137	396	<5	15	
ES1204197-001	BCD	21 Feburary 2012	1400	7.7	471	5	<5	24	
ES1204197-002	NCD	21 Feburary 2012	1425	8.17	903	29	<5	11	
ES1204197-003	NCU	21 Feburary 2012	1500	7.79	379	<5	<5	23	
ES1214029-001	NCD	4 June 2012	1100	7.67	345	30	<5	14	No Discharge
ES1217574-001	GCD	12 July 2012	0520	7.56	166	79	<5	23	Not reportable - rainfall exceeded 38.4mm (45.4mm)
ES1217574-002	GCU	12 July 2012	0540	7.04	103	388	<5	24	
ES1217574-003	BCD	12 July 2012	0610	7.2	147	122	<5	25	
ES1217577-001	LDP2	12 July 2012	1545	7.6	127	37	<5	10	
ES1217577-002	LDP26	12 July 2012	1600	7.86	234	910	<5	7	
ES1217577-003	LDP3	12 July 2012	1625	8.07	448	932	<5	5	
ES1302188-001	NCD	29 January 2013	1155	6.73	187	88	<5	38	No Discharge
ES1302188-002	NCU	29 January 2013	1211	6.9	158	7	<5	40	
ES1302188-003	BCD	29 January 2013	1225	6.68	167	45	<5	78	
ES1302188-004	GCD	29 January 2013	1240	7.01	143	116	<5	21	
ES1302188-005	GCU	29 January 2013	1252	6.9	112	32	<5	19	
ES1302188-006	BCU	29 January 2013	1312	6.99	188	72	<5	26	
ES1305146-001	LDP26	4 March 2013	1130	7.92	174	752	<5	4	Not reportable - rainfall exceeded 38.4mm (60.4mm)
ES1406432-001	TAR-NCU	21 March 2014	0100	6.93	34	160	<5	10	No Discharge
ES1406432-002	TAR-NCD	21 March 2014	0116	7.31	94	1370	<5	10	
ES1406545-001	TAR-NCD	25 March 2014	1330	7.04	166	631	<5	12	No Discharge
ES1406545-002	TAR-NCU	25 March 2014	1350	7.05	93	72	<5	17	
ES1407115-001	BCU	28 March 2014	0800	7.19	131	88	<5	13	Rainfall event exceeded 38.4mm, not reportable
ES1407115-002	GCD	28 March 2014	0818	7.24	97	219	<5	9	
ES1407115-003	GCU	28 March 2014	0842	7.18	97	89	<5	10	
ES1407115-004	LDP2	28 March 2014	0858	7.21	271	12	<5	16	
ES1407115-005	BCD	28 March 2014	0918	6.92	87	89	<5	14	
ES1407115-006	LDP1	28 March 2014	1058	8	358	137	<5	6	
ES1407115-007	NCD	28 March 2014	1128	7.12	188	103	<5	26	
ES1407115-008	NCU	28 March 2014	1142	6.99	121	26	<5	28	
ES1419360-001	NCD	27 August 2014	1255	7.39	193	839	<5	8	No Discharge
ES1406545-001	NCU	25 March 2015	1350	7.05	93	72	<5	17	No Discharge
ES1406545-002	NCD	25 March 2015	1330	7.04	166	631	<5	12	
ES1502387-001	NCD	28 January 2015	1228	7.01	189	348	<5	15	No Discharge
ES1520296-001	NCD	21 April 2015	1528	7.18	185	326	<5	8	No Discharge

Sample No.	Sample Location	Date	Time	pH	Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)	Grease & Oil (mg/L)	Total Organic Carbon (mg/L)	Comments
ES1520296-001	NCD	4 April 2015	1300	7.21	213	221	<5	9	No Discharge
ES1524346-001	NCD	17/6/15	1211	7.19	197	192	<5	8	No discharge
ES1529282-001	NCD	24 August 2015	1112	7.26	187	279	6	11	No discharge

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L										
ANZECC Guideline - stock drinking water								**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**						**1000**								**1500**	**400**		**4000**			
THUIN																																														
MW1	2-Jun-06		7.77	8.50	7.48				0.006																6330	92	138	1710	43		2680	424				772										
MW1	11-Jan-07		8.49	9.22	7.12				0.001				<0.0001	<0.005		<0.006		<0.001		0.026			0.11	<0.0001	2410	26	33	554	18		346	145				684										
MW1	18-Apr-07		6.77	7.50																																										
MW1	9-Jul-07		7.23	7.96	7.30	2440	17.4		<0.001				<0.0001	<0.005		0.0005		<0.001		0.008			0.09	<0.0001	2500	21	29	504	25		385	143				614							3.1	<20	380
MW1	10-Jul-07		7.18	7.91																																									
MW1	18-Jul-07		7.18	7.91																																									
MW1	7-Aug-07	1250	7.01	7.74																																									
MW1	22-Aug-07	1355	6.93	7.66																																									
MW1	5-Sep-07	1005	6.97	7.70																																									
MW1	24-Sep-07	1320	6.93	7.66																																									
MW1	11-Oct-07	1110	6.91	7.64																																									
MW1	26-Nov-07	1400	6.89	7.62																																									
MW1	29-Jan-08	1430	6.82	7.55																																									
MW1	4-Mar-08	1210	6.87	7.60																																									
MW1	23-Apr-08	1240	6.94	7.67	7.30	3100	21.3		<0.001				<0.00005	<0.01		0.002		0.0036		0.01			0.007	0.0002	3120	46	50	614	29		567	247				665								<0.025	0.027
MW1	21-Aug-08	1251	7.00	7.73																																									
MW1	29-Oct-08	1615	7.07	7.82	7.80	3430	21.6		0.001				0.00023	0.015		0.13		0.37		0.03			0.22	<0.0001	3500	44	51	670	32		680	210				690								<0.025	<0.100
MW1	29-Jan-09	1030	7.08	7.73																																									
MW1	17-Jun-09			7.87	7.20	5470	19.8		0.001	0.091	<0.001		<0.0001	0.013	0.001	0.047	0.71	0.008	0.103	0.009		<0.01	0.019	<0.0001	3870	46	61	762	28	41.2	777	167	<1	<1	725	725	39.9	1.58	<0.01				2320			
MW1	11-Sep-09	1344	7.23	7.90																																									
MW1	14-Dec-09	1000	7.23	7.90	7.5	4670	17.5	<0.01	0.001					<0.005		0.014	<0.05	0.001	0.131	0.038			0.048	<0.0001	7.83	4510	70	95	875	28	50.1	882	234	<1	<1	780	780	45.3	4.99		<0.01	0.2	0.2				
MW1	25-Feb-10	1025	7.17	7.84																																									
MW1	11-May-10	1045	7.46	8.13	7.56	4330	22.6		0.001	0.075	<0.001		0.0001	0.002	0.002	0.011	0.88	0.005	0.204	0.009		<0.01	0.012	<0.0001		4090	43	60	779	26	41.7	795	229	<1	<1	694	694	41	0.75	0.16				1850			
MW1	30-Aug-10	1010	7.47	8.14	7.47	3890	21.5																																							
MW1	9-Nov-10	1050	7.45	8.12	7.06	3170	24.6																																							
MW1	10-Mar-11	1310	7.38	8.05	7.1	3280	23.7	0.04	0.002					0.003		0.063	0.3	0.006	0.035	0.006			0.016	<0.0001	7.26	3650	44	62	771	29	41.6	839	210	<1	<1	658	658	41.2	0.49		<0.01	0.09	0.09				
MW1	6-Jun-11	1110	7.20	7.87	7.2	3110	19.9																																							
MW1	6-Sep-11	1050	7.19	7.86	7.09	3200	22.5	0.1	0.003	0.057	<0.001		0.0001	0.002	0.002	0.019	0.99	0.01	0.193	0.005		<0.01	0.014	<0.0001	7.72	3990	41	56	739	26	39.5	774	246	<1	<1	620	620	39.3	0.12	<0.01	<0.01	0.04	0.04	2080			
MW1	7-Dec-11	1020	7.09	7.76	7.16	3150	20.1																																							
MW1	13-Mar-12	1100	6.90	7.57	7.44	3140	21.9	0.12	<0.001	0.067	<0.001		<0.0001	0.003	<0.001	0.081	0.23	0.001	0.028	0.009		<0.01	0.027	<0.0001	7.78	3590	44	58	758	30	40.7	748	232	<1	<1	629	629	38.5	2.76	<0.01	<0.01	0.12	0.12	2040			
MW1	13-Jun-12	1100	6.53	7.20	7.37	3730	20.3																																							
MW1	4-Sep-12	1220	6.41	7.08	7.44	3340	20.8	0.03	<0.001	0.069	<0.001		<0.0001	0.005	<0.001	0.09	0.2	0.003	0.067	0.007		<0.01	0.067	<0.0001	7.8	3570	39	55	662	26	35.9	676	212	<1	<1	681	681	37.1	1.62	<0.01	<0.01	0.06	0.06	2090			
MW1	27-Nov-12	1020	6.25	6.92	7.54	3140	20.8																																							
MW1	20-Mar-13	1055	6.15	6.82	7.52	3180	21.9	0.05	0.002	0.055	<0.001		<0.0001	0.007	<0.001	0.1	0.25	0.008	0.031	0.016		<0.01	0.125	<0.0001	7.65	3400	35	48	700	25	36.8	575	182	<1	<1	690	690	33.8	4.2	0.08	<0.01	0.1	0.1	1830			
MW1	11-Jul-13	1040	6.18	6.85	7.49	3110	20.1																																							
MW1	5-Sep-13	1120	6.14	6.81	7.48	3040	21.4	0.15	<0.001	0.058	<0.001	0.06	<0.0001	0.003	<0.001	0.113	0.24	0.005	0.088	0.012	<0.01	<0.01	0.079	<0.0001	7.99	3330	31	44	677	27	35.3	586	205	<1	<1	672	672	34.2	1.52	0.02				1900			
MW1	22-Nov-13	1100	5.95	6.62	7.6	3140	20.8																																							
MW1	20-Feb-14	1100	6.08	6.75	7.5	3150	20.2	1.23	0.001	0.062	<0.001	<0.05	0.0004	0.023	0.001	0.487	2.49	0.031	0.073	0.016	<0.01	<0.01	0.624	<0.0001	7.65	3440	29	45	710	30	36.8	516	195	<1	<1	624	624	31.1	8.39	0.07				1800			
MW1	27-May-14	0950	6.25	6.92	7.6	3140	20.7																																							
MW1	9-Sep-14	1040	6.26	6.83	7.7	3220	20.2	0.13	0.002					0.01		0.058	0.53	0.006	0.077	0.009			0.098		7.97	3320	29	40	594	24	31.2	520	206	<1	<1	714	714	33.2	3.19		<0.01	0.17	0.17				
MW1	20-Nov-14	0945	6.36	7.03	7.7	3190	21.6																																							
MW1	26-Feb-15	1110	6.39	7.06	7.6	3170	27.7	0.08	0.001	0.056	<0.001		<0.0001	0.004	<0.001	0.045	0.3	0.003	0.078	0.009	<0.01	<0.01	0.118	<.00001	7.13	800	34	45	634	22	33.5	551	210	<1	<1	739	739	34.7	1.71	0.05	<0.01	0.15	0.15	1700			
MW1	26-May-15	1005	6.47	7.14	7.5	3210	19.2																																							
MW1	27-Aug-15	1200	6.51	7.18	7.6	3280	18.5	0.1	0.001	0.066	<0.001	<0.05	<0.0001	<0.001	<0.001	0.026	0.18	<0.001	0.019	0.004	<0.01	<0.01	0.073	<0.0001	8.03	3440	28	42	651	22	33.7	<1	225	<1	<	636	636	30.1	5.68	0.06	<0.01	0.11	0.11	1900			
MW1	4-Dec-16	1100	6.59	7.26	7.7	3270	21																																							
MW1	24-Feb-16	1130	6.59	7.26	7.6	3290	23.2	0.02	0.001	0.061	<0.001	<0.05	<0.0001	<0.001	<0.001	0.032	0.12	0.001	0.016	0.006	<0.01	<0.01	0.049	<0.0001	8.09	3400	40	48	715	24	37.7	582	233	<1	<1	686	686	35	3.66	0.1	<.01	0.15	15	1950			
THUIN																																													
MW2	2-Jun-06		3.63	4.40	7				<0.001																5440	132	106	1400	14		2230	475				432										
MW2	11-Jan-07		3.85	4.62	6.8				0.002				0.0001										0.09	<0.0001		511	1	<1	101	1		25.1	9				176										
MW2	18-Apr-07		2.83	3.60																																									
MW2	9-Jul-07		3.39	4.16	7.15	446	18.8		0.002				0.0002	<0.005		0.003		<0.001		0.002			0.233	<0.0001		496	<1	<1	99	1		27.2	11				175							7.89	<20	250
MW2	10-Jul-07		3.45	4.22																																									
MW2	18-Jul-07		3.52	4.29																																									
MW2	7-Aug-07	1245	3.58	4.35																																									
MW2	22-Aug-07	1350	3.55	4.32																																									
MW2	5-Sep-07	1040	3.57	4.34																																									
MW2	24-Sep-07	1315	3.57	4.34																																									
MW2	11-Oct-07	1105	3.60	4.37																																									
MW2	26-Nov-07	1355	3.91	4.68																																									
MW2	29-Jan-08	1435	3.48	4.25																																									
MW2	4-Mar-08	1200	3.46	4.23																																									
MW2	23-Apr-08	1115	3.73	4.50	7.3	400	19.9		0.005				0.00018	0.11		0.13		0.14		0.15			0.37	0.0004		440	8.9	5.8	99	17		39	10				165								<0.025	<0.1
MW2	21-Aug-08	1244	3.74	4.51																																									
MW2	29-Oct-08	1655	3.59	4.37	6.9	600	19.2		0.008				0.00007	0.026		0.027		0.061		0.031			0.17	0.0002		620	6.8	7.1	120	6.8		93	27				180								<0.025	<0.100
MW2	29-Jan-09	1040	3.73	4.51																																									
MW2	17-Jun-09		3.69	4.53	7.7	660	19.1		0.006	0.311	0.004		0.0002	0.025	0.052	0.047	32.6	0.052	1.54	0.041		0.08	0.172	0.0005		602	1	1	128	2	5.76	59	<10	<1	<1	195	195	5.57	1.62	0.1				1540			
MW2	11-Sep-09	1348	4.01	4.8																																									
MW2	14-Dec-09	1100	3.72	4.51	7.7	691	18.3	<0.01	<0.001					<0.001		<0.001	<0.05	<0.001	0.018	<0.001			<0.005	<0.0001	7.5	640	2	1	134	2	6.07	55.3	12.8	<1	<1	202	202	5.86	1.73		<0.01	0.45	0.45				
MW2	25-Feb-10	1029	1.72	2.51																																									
MW2	11-May-10	1115	2.15	2.94	7.61	717	22.3		0.014	0.441	0.006		0.0002	0.071	0.058	0.073	88.3	0.071	1.06	0.094		0.13	0.3	0.0002		618	2	1	129	2	5.84	76.7	24.3	<1	<1	149	149	5.66	1.6	0.01				780			
MW2	30-Aug-10	1020	2.10	2.89	7.4	590	20.5																																							
MW2	9-Nov-10	1040	2.22	3.01	7.32	513	24.1																																							
MW2	10-Mar-11	1330	2.96	3.75	7.31	566	24.2	0.28	0.001					0.001		0.018	0.3	0.002	0.018	0.006			0.045	0.0001	7.23	457	2	2	124	2	5.69	69	24	<1	<1	156	156	5.57	1.02		<0.01	0.07	0.07				
MW2	6-Jun-11	1130	2.86	3.65	7.3	553	20.3																																							
MW2	6-Sep-11	1120	2.95	3.74	6.9	585	19.8	1.93	<0.001	0.016	<0.001		<0.0001	0.002	<0.001	0.005	1.76	0.001	0.028	0.003		<0.01	0.021	<0.0001	7.33	692	3	3	144	2	6.71	92	32	<1	<1	169	169	6.64	0.5	<0.01	<0.01	0.02	0.02	340			
MW2	7-Dec-11	1040	2.71	3.5	7.08	600	19.2																																							
MW2	13-Mar-12	1130	2.38	3.17	7.06	912	22	0.3	<0.001	0.012	<0.001		<0.0001	0.002	<0.001	0.002	0.28	<0.001	0.058	0.004		<0.01	0.01	<0.0001	7.41	1060	12	10	224	4	11.3	164	50	<1	<1	232	232	10.3	4.44	0.03	<0.01	0.05	0.05	640			
MW2	13-Jun-12	1120	3.13	3.92	7.02	1320	20																																							

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																	Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L											
ANZECC Guideline - stock drinking water								**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**					**1000**								**1500**	**400**		**4000**			
MW2	4-Sep-12	1250	3.11	3.9	7.07	1260	19.7	3.48	0.001	0.034	<0.001		<0.0001	0.002	0.002	0.009	2.86	0.003	0.145	0.004		<0.01	0.075	0.0002	7.47	1310	20	17	252	5	13.5	221	68	<1	<1	319	319	14	1.99	<0.01	<0.01	0.06	0.06	802			
MW2	27-Nov-12	1035	3.42	4.21	7.29	905	19.1																																							
MW2	20-Mar-13	1115	2.82	3.61	7.39	670	22.7	1.3	0.002	0.022	<0.001		<0.0001	<0.001	0.004	0.036	0.88	0.006	0.293	0.005		<0.01	0.078	0.0002	6.9	686	3	3	150	3	7	95	26	<1	<1	179	179	6.8	1.41	0.04	<0.01	0.05	0.05	376			
MW2	11-Jul-13	1050	3.64	4.43	7.03	739	19.8																																							
MW2	5-Sep-13	1130	3.45	4.24	6.78	680	19.8	6.39	0.001	0.1	0.039	<0.001	<0.0001	0.005	0.002	0.037	5.54	0.006	0.134	0.006	<0.01	0.02	0.095	0.0002	7.46	674	2	2	142	3	6.52	83	28	<1	<1	173	173	6.38	1.01	0.04				389			
MW2	22-Nov-13	1120	3.68	4.47	6.9	694	19.4																																							
MW2	20-Feb-14	1120	3.72	4.51	7.4	675	21.2	1.32	0.001	0.06	0.012	<0.001	<0.0001	0.004	<0.001	0.055	1.32	0.006	0.058	0.004	<0.01	<0.01	0.08	<0.0001	7.01	694	2	2	155	3	7.08	85	27	<1	<1	171	171	6.38	5.2	<0.01				395			
MW2	27-May-14	10.20	3.35	4.14	7.4	618	20.9																																							
MW2	9-Sep-14	1040	3.48	4.29	7.6	845	21.4	14.8	0.004					0.01			11.8	0.01	0.22	0.012			0.086	<0.0001	7.27	615	<1	<1	131	2	5.75	57	19	<1	<1	219	219	6.38	5.25		<0.01	0.08	0.08				
MW2	20-Nov-14	1005	3.63	4.42	7.4	615	20.4																																							
MW2	26-Feb-15	1110	3.32	4.11	7.3	495	21.6	0.01	0.002	0.007	<0.001	0.05	<0.0001	<0.001	0.001	0.006	0.75	0.001	0.066	0.002	<0.01	<0.01	0.027	<0.0001	7.59	567	<1	<1	113	2	4.97	27	16	<1	<1	214	214	5.37	3.97	0.02	<0.01	0.02	0.02	306			
MW2	26-May-15	1025	3.44	4.23	7.2	522	19.7																																							
MW2	27-Aug-15	1225	3.46	4.25	7.1	540	18	0.87	0.002	0.015	<0.001	<0.05	<0.0001	<0.001	<0.001	0.006	0.69	0.001	0.035	0.002	<0.01	0.01	0.028	<0.0001	7.32	538	1	1	119	1	5.33	28	13	<1	<	188	188	4.82	5.04	0.04	<0.01	<0.01	0.02	298			
MW2	4-Dec-15	1120	3.49	4.28	7.1	528	20.2																																							
MW2	24-Feb-16	1150	3.62	4.41	7	562	21.4	0.48	0.002	0.008	<0.001	<0.05	<0.0001	<0.001	<0.001	0.032	0.45	<0.001	0.038	0.002	<0.01	<0.01	0.016	<0.0001	7.38	575	2	2	131	2	6.01	37	3.1	<1	<1	209	209	5.66	3	<0.01	<0.01	0.03	0.03	305			

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L		pH - Lab	EC - Lab - µs/cm	Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L											
ANZECC Guideline - stock drinking water								**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**						**1000**								**1500**	**400**		**4000**			
NAGERO																																															
MW3	2-Jun-06		15.08		7.65		20		<0.001																	1525	25	10	356	4		139	16				642											
MW3	15-Oct-06		15.71		7.85		23.1																			1534																					
MW3	11-Jan-07		15.89		7.66		24.9		<0.001					<0.001		0.006		<0.001		0.004							1600	19	7	381	4		127	4				696											
MW3	9-Jun-07		15.9		7.69		19.7		<0.001				<0.0001	<0.005		<0.001		<0.001		0.01			0.1				1028	15	5	389	3			3				673											
MW3	5-Oct-07		15.6		6.8		19.8																			1710																					
MW3	8-Jan-08		15.01		7.9		23.8																			1620																					
MW3	23-Apr-08		14.05		7.8		23.5																			1740																					
MW3	10-Jul-08		14.08		7.8		19																			1630																					
MW3	29-Oct-08		13.85		7.8		22.8																			1770																					
MW3	20-Jan-09		13.3		7.8		21.7																			1770																					
MW3	22-Apr-09		13.78		7.9		21.8																			1780																					
MW3	22-Jul-09		14.13		7.9		21.2																			1780																				890		
MW3	12-Nov-10		14.65		8		23.1																			1800																				890		
MW3	15-Feb-10		14.24		7.9	1440	21.5																			1440																				720		
MW3	16-Apr-10		13.21		8	1440	23.3																			1440																				720		
MW3	19-Jul-10		12.7		7.8	1700	20.3		0.002				<0.0001	<0.001		0.003	0.27	<0.001		0.003			0.013		7.93	1730	12	4	479	3	21.8	104	<1	<1	<1	871	871	20.3	3.56	0.17	<0.01	<0.01	<0.01	1020			
MW3	26-Oct-10		12.2		7.83	1730	21.7																																								
MW3	28-Jan-11		11.7		7.35	1750	26.1		0.001				<0.0001	<0.005		<0.001	0.16	<0.001		0.003			0.005		7.6	1740	10	4	436	3	19.8	108	<1	<1	<1	815	815	19.3	1.27	0.33	<0.01	<0.01	<0.01				
MW3	2-May-11		11.92		8.05	1760	22.2																																								
MW3	18-Jul-11		11.95		7.9	1760	20.8		<0.001				0.0001	0.003		<0.001	<0.005	<0.001		0.004			0.017		7.96	1840	11	4	3	454	20.7	104	<1	<1	<1	798	798	18.9	4.55	0.33	<0.01	0.02	0.02	1060			
MW3	24-Oct-11		12.1		8.08	1810	23.5																																								
MW3	18-Jan-12		11.25		6.86	1670	23.6		0.002				<0.0001	0.004		0.001	0.49	<0.001		0.007			0.02		7.63	1690	29	9	5	410	20.2	112	40	<1	<1	715	715	18.3	4.82	0.14	<0.01	<0.01	<0.01				
MW3	1-May-12		10.4		7.18	1840	22.5																																							
MW3	23-Jul-12		9.9		7.56	1700	20.6		<0.001				<0.0001	0.001		<0.001	<0.05	<0.001		0.004			0.01		8.05	1730	19	5	398	4	18.8	104	35	<1	<1	765	765	19	0.52	0.31	<0.01	0.02	0.02	1010			
MW3	23-Oct-12		9.84		7.66	1900	21.7																																							
MW3	7-Mar-13		10.02		7.25	1650	21.9		0.001				<0.0001	0.008		0.001	0.17	<0.001		0.013			0.022		7.68	1830	18	5	470	4	21.9	103	31	<1	<1	815	815	19.8	4.79	0.17	<0.01	<0.01	<0.01	1190			
MW3	16-May-13		10.12		7.78	1730	20.7																																							0.86		
MW3	21-Aug-13		10.23		7.57		20.1		0.003				<0.0001	<0.001		<0.001	<0.05	<0.001		0.002			0.008		7.93	2020	12	4	504	4	23	284	52	<1	<1	592	592	20.9	4.58	0.23	<0.01	<0.01	<0.01				
MW3	14-Nov-13		10.39		8.13	1820	23.6																																						0.91		
MW3	3-Feb-14		10.3		8.41	1.87	23.3		0.001				<0.0001	<0.001		0.002	<0.05	<0.001		0.002			0.013		7.76	2140	17	5	464	4	21.5	319	60	<1	<1	477	477	19.8	4.23	0.12	<0.01	0.12	0.12		0.93		
MW3	17-Jul-14		10.00		7.98	2150																																								
MW3	29-Jan-15		10.47						0.001				<0.0001		<0.001	0.001	<0.05	<0.001		0.002			0.026		7.92	2050	17	5	436	3	20.3	369	74	<1	<	398	398	20.5	0.66	0.2	<0.01	0.02	0.02				
MW3	19-May-15		10.05		7.96	1790	21.9																																							
MW3	13-Aug-15		9.55				20.2		<0.001				<0.0001	<0.001		0.028	<0.05	<0.001		0.003			0.584		7.96	2060	15	5	403	3	18.8	285	78	<1	<1	451	451	18.7	0.2	0.32	<0.01	0.02	0.02				
MW3	30-Nov-15		9.28		7.22		23.2																																							
MW3	24-Feb-16		9.37		6.93		22.9		<0.001				<0.0001	<0.001		<0.001	<0.05	<0.001		0.002			0.014		7.94	2050	17	5	450	3	20.9	397	83	<1	<1	348	348	19.9	2.49	0.22	<0.01	<0.01	<0.01				
TARRAWONGA																																														
MW4	2-Jun-06		8.8	9.5	7				0.006																	3290	157	118	614	19		905	155				1010											
MW4	9-Sep-06		8.6	9.3																																										
MW4	11-Jan-07		8.67	9.37	7.06				0.004				0.0003	<0.005		0.011		0.029		0.014			0.1	<0.0001		3430	152	103	594	17		787	143				1050											
MW4	9-Jul-07		9.13	9.83	6.82	5410	18.9		0.001				0.0004	<0.005		0.008		0.011		0.011			0.13	<0.0001		5400	211	166	829	16		1480	235				989							0.6	<20	330	
MW4	18-Jul-07		9.18	9.88																																									
MW4	7-Aug-07	1305	9.17	9.87																																									
MW4	22-Aug-07	1340	9.17	9.87																																									
MW4	5-Sep-07	1000	9.21	9.91																																									
MW4	24-Sep-07	1310	9.03	9.73																																									
MW4	11-Oct-07	1055	8.97	9.67																																									
MW4	26-Nov-07	1350	9.06	9.76																																									
MW4	29-Jan-08	1425	9.1	9.8																																									
MW4	4-Mar-08	1150	9.17	9.87																																									
MW4	4-Apr-08	1220	9.15	9.85																																									
MW4	23-Apr-08	1015	9.18	9.88	7.1	5160	18		0.004				0.0015	0.042		0.29		0.44		0.16			0.62	0.001		4960	210	158	802	21		1240	317				995								<0.025	<0.1	
MW4	21-Aug-08	1230	9.31	10.01																																									
MW4	29-Oct-08	1740	9.28	9.98	7	5740	22.2		0.001				0.00009	0.008		0.008		0.18		0.016			0.2	<0.0001		5800	220	170	840	23		1400	280				980								<0.025	<0.100	
MW4	29-Jan-09	0900	9.29	9.96																																									
MW4	17-Jun-09			10.05	6.8	5400	21.5		0.007	1.16	0.003		0.0004	0.023	0.015	0.207	24.9	0.106	1.82	0.055		0.04	0.278	0.0004		4920	189	147	755	16	54.8	1160	156	<1	<1	977	977	55.6	0.8	<0.01				2980			
MW4	28-Aug-09	1215	9.48	10.1																																									
MW4	14-Dec-09	0900	9.52	10.14	6.94	5060	25.6	<0.01	0.001					<0.005		0.001	<0.05	<0.001	0.671	0.016			0.114	<0.0001	7.35	5040	187	149	746	16	54.5	64.1	31.6	<1	<1	783	783	45.3	3.41		0.02	0.45	0.48				
MW4	25-Feb-10	1330	9.68	10.3																																									
MW4	11-May-10	1000	9.66	10.28	7.58	5660	21.8		0.012	1.84	0.006		0.0006	0.033	0.03	0.17	25.3	0.138	1.26	0.096		0.08	0.238	0.0002		5210	149	115	821	14	53	1180	200	<1	<1	942	942	56.2	3.01	0.02				3120			
MW4	30-Aug-10	0940	9.69	10.31	7.33	4740	20																																							
MW4	9-Nov-10	0940	9.61	10.23	6.9	3810	24.4																																							
MW4	10-Mar-11	1130	9.31	9.93	7.18	3060	24.9	0.77	<0.001					0.005		0.084	1.08	0.15	0.188	0.014			0.801	<0.0001	7.37	3460	78	63	741	11	41.6	730	87	<1	<1	893	893	40.2	1.61		0.04	0.38	0.41				
MW4	6-Jun-11	1000	9.42	10.04	7.25	3080	18.7																																							
MW4	6-Sep-11	0950	9.46	10.08	7.12	3196	21	0.65	<0.001	0.146	<0.001		<0.0001	0.001	0.002	0.008	0.7	0.006	0.175	0.006		<0.01	0.418	<0.0001	7.77	3910	74	58	702	10	39.3	700	104	<1	<1	861	861	39.1	0.15	0.2	<0.01	0.43	0.43				
MW4	7-Dec-11	0940	9.35	9.97	7.1	3180	20.5																																							
MW4	13-Mar-12	0940	9.36	9.98	7.6	2580	22.1	0.16	<0.001	0.159	<0.001		<0.0001	<0.001	<0.001	0.01	0.3	<0.001	0.017	0.004		<0.01	0.27	<0.001	8.01	3690	90	64	759	13	43.1	700	103	<1	<1	898	898	39.8	3.92	<0.01	<0.01	0.85	0.85	2130			
MW4	13-Jun-12	0935	9.22	9.84	7.52	3850	20.6																																							
MW4	4-Sep-12	1120	9.11	9.73	7.72	3410	21.8	0.07	<0.001	0.167	<0.001		<0.0001	<0.001	<0.001	0.058	0.44	0.005	0.116	0.007		<0.01	0.513	<0.0001	7.98	3770	82	65	664	12	38.6	674	108	<1	<1	962	962	40.5	2.37	0.02	0.02	1.04	1.06	2170			
MW4	27-Nov-12	0920	8.94	9.56	7.74	3440	21.7																																							
MW4	20-Mar-13	0945	8.92	9.54	7.53	3420	21.6	0.27	0.001	0.156	<0.001		<0.0001	0.011	<0.001	0.05	0.4	0.006	0.158	0.01		<0.01	0.338	<0.0001	7.65	3730	104	73	672	12	40.7	652	49	<1	<1	880	880	37	4.78	0.02	<0.01	1.68	1.68	2020			
MW4	11-Jul-13	940	8.87	9.49	7.76	3410	20.9																																							
MW4	5-Sep-13	950	8.83	9.45	7.63	3560	21.8	0.21	<0.001	<0.05	0.182	<0.001	0.0002	0.001	0.005	0.144	0.68	0.018	0.282	0.008	<0.01	<0.01	0.453	<0.0001	7.99	3950	110	81	704	15	43.2	745	110	<1	<1	908	908	41.4	2	0.09				2260			
MW4	22-Nov-13	940	8.61	9.23	7.6	3720	21.7																																							
MW4	24-Feb-14	940	8.74	9.36	7.6	3920	21.4	0.14	<0.001	<0.05	0.166	<0.001	0.0003	0.005	<0.001	0.128	1.22	0.006	0.116	0.007	<0.01	<0.01	0.444	<0.0001	7.98	3890	93	78	644	15	39.5	676	113	<1	<1	875	875	38.9	0.68	0.06				2010			
MW4	27-May-14	930	8.78	9.4	7.6	3840	21.3																																							
MW4	9-Sep-14	0940	8.76	9.38	7.2	4090	20.5	0.13	<0.001					0.003		0.057	0.86	0.007	0.235	0.008			0.334	<0.0001	7.83	4170	108	79	597	11	38.1	679	118	<1	<1	1020	1020	42	4.83		0.2	0.54	0.74				
MW4	20-Nov-14	0930	8.72	9.34	7.3	3970	21.8																																							

ANNUAL REVIEW
2015/2016

TARRAWONGA COAL PTY LTD
Groundwater Monitoring Data

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																		Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L											
ANZECC Guideline - stock drinking water								**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**						**1000**									**1500**	**400**		**4000**			
MW4	26-Feb-15	930	8.71	9.33	7.3	4030	21.6	0.13	<0.001	0.159	<0.001	<0.05	<0.0001	0.002	0.002	0.033	3.4	0.02	0.373	0.007	<0.01	<0.01	0.244	<0.0001	7.7	4430	131	107	687	14	45.6	786	132	<1	<1	1090	1090	46.7	1.23	0.18	0.01	0.97	0.98	2200			
MW4	26-May-15	940	8.93	9.55	7.3	4120	20.7																																								
MW4	27-Aug-15	1000	8.85	9.47	7.2	4340	19.5	0.02	<0.001	0.159	<0.001	<0.05	<0.0001	<0.001	<0.001	0.004	1.21	0.002	0.359	0.004	<0.01	<0.01	0.149	<0.0001	7.72	4680	123	107	719	14	46.6	711	151	<1	<1	870	870	40.6	6.85	0.56	<0.01	0.6	0.6	2550			
MW4	4-Dec-15	1000	8.85	9.47	7.3	4410	21.1																																							
MW4	24-Feb-16	930	8.86	9.48	7.4	4450	21.7	0.2	0.003	0.18	0.002	<0.05	0.0004	0.003	0.003	0.02	1.84	0.014	0.46	0.006	<0.01	<0.01	0.209	<0.0001	7.85	4650	156	119	767	17	51.4	899	152	<1	<1	988	988	48.3	3.1	2.22	<0.01	0.07	0.07	2610			

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L											
ANZECC Guideline - stock drinking water								**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**						**1000**								**1500**	**400**		**4000**			
TEMPLEMORE																																														
MW5	2-Jun-06		2.78	3.4	6.9				0.006																1530	17	13	373	6		169	138				472											
MW5	9-Sep-06		2.98	3.6																																										
MW5	11-Jan-07		3.56	4.18	7.25				0.003				<0.0001	<0.001		<0.001		<0.001		0.013			0.09		4870	44	49	1070	13		1060	435				836											
MW5	18-Apr-07		2.98	3.6																																										
MW5	10-Jul-07		3.85	4.47	7.59	1360	19.7		0.002				<0.0001	<0.005		0.001		<0.001		0.009			0.111	<0.0001	1930	14	15	13	5		291	161				380								1.32	<20	3490
MW5	18-Jul-07		3.87	4.49																																									
MW5	7-Aug-07	1230	3.92	4.54																																									
MW5	22-Aug-07	1500	3.88	4.5																																									
MW5	5-Sep-07	1200	3.84	4.46																																									
MW5	24-Sep-07	1410	3.86	4.48																																									
MW5	11-Oct-07	1200	3.91	4.53																																									
MW5	26-Nov-07	1515	3.94	4.56																																									
MW5	29-Jan-08	1520	3.06	3.68																																									
MW5	4-Mar-08	1405	3.01	3.63																																									
MW5	4-Apr-08	1200	3.07	3.69																																									
MW5	23-Apr-08	1500	3.15	3.77	7.9	3550	19.9		0.012				0.00017	0.006		0.027		0.054		0.042			0.11	<0.0001	3260	29	33	696	13		553	332				630											
MW5	21-Aug-08	1305	3.10	3.72																																										
MW5	29-Oct-08	1840	2.97	3.59	7.3	3300	19.1		0.008				<0.00005	0.005		0.004		0.018		0.007			0.028	<0.0001	3400	21	24	640	11		560	290				680									<0.025	0.57
MW5	29-Jan-09	1050	3.12	3.73																																										
MW5	17-Jun-09		3.33	4.18	7.7	2390	19.6		0.012	0.054	<0.001		<0.0001	0.002	0.003	0.02	1.66	0.019	0.586	0.006		<0.01	0.105	<0.0001	2120	13	15	485	8	23.2	315	120	<1	<1	486	486	21.1	4.6	0.07				1370			
MW5	14-Sep-09	1314	3.52	4.32																																										
MW5	14-Dec-09	1200	3.76	4.56	7.21	6900	28.4	0.04	0.016					<0.001		0.002	0.19	<0.001	1.4	0.022			0.078	<0.0001	7.44	7460	9	106	1870	28	91	1720	678	<1	<1	1110	1110	84.9	3.44		<0.01	<0.01	<0.01					
MW5	25-Feb-10	1035	2.91	3.71																																									
MW5	11-May-10	1145	3	3.8	7.73	6590	22		0.032	0.426	0.001		0.009	0.024	0.032	0.07	23	0.068	1.59	0.071		0.05	0.277	<0.0001		5920	38	70	1210	17	60.5	1260	491	<1	<1	838	838	62.4	1.53	0.1				3630			
MW5	30-Aug-10	1210	2.6	3.4	7.85	1740	22.8																																							
MW5	9-Nov-10	1115	2.48	3.28	7.35	2620	24.1																																							
MW5	10-Mar-11	1400	2.51	3.31	7.39	1917	25.2	0.81	0.01					0.001		0.03	0.79	0.007	0.64	0.003			0.139	<0.0001	7.69	1980	11	13	474	8	22.4	396	150	<1	<1	416	416	22.6	0.49		<0.01	0.11	0.11					
MW5	6-Jun-11	1200	2.47	3.27	7.45	1032	20.8																																							
MW5	6-Sep-11	1240	2.7	3.5	7.39	1910	22.6	6.24	0.012	0.051	<0.001		<0.0001	0.004	0.001	0.006	4.1	0.004	0.081	0.005		<0.01	0.032	<0.0001	7.89	2310	10	11	501	7	23.4	385	177	<1	<1	427	427	23.1	0.6	0.11	<0.01	0.04	0.04	1360			
MW5	7-Dec-11	1100	1.96	2.76	7.36	2275	20.5																																							
MW5	13-Mar-12	1320	1.28	2.08	7.52	1110	25.1	1.91	0.006	0.027	<0.001		<0.0001	0.002	<0.001	0.005	1.2	<0.001	0.122	0.003		0.01	0.02	<0.0001	7.78	1250	8	7	292	5	13.8	262	45	<1	<1	269	269	13.7	0.33	<0.01	<0.01	0.43	0.43	736			
MW5	13-Jun-12	1150	1.58	2.38	7.81	977	20.3																																							
MW5	4-Sep-12	1320	1.46	2.26	7.63	1980	20.1	7.89	0.016	0.056	<0.001		<0.0001	0.004	<0.001	0.014	5.13	0.007	0.073	0.004		<0.01	0.086	<0.0001	7.92	2120	9	11	473	8	22.1	380	146	<1	<1	439	439	22.5	0.93	<0.01	<0.01	<0.01	<0.01	1400			
MW5	27-Nov-12	1105	1.84	2.64	7.65	2650	22.5																																							
MW5	20-Mar-13	1300	1.94	2.74	7.54	1430	24.7	0.53	0.011	0.029	<0.001		<0.0001	0.002	<0.001	0.054	0.56	0.008	0.33	0.004		<0.01	0.158	<0.0001	7.61	1520	7	8	321	6	15.1	236	46	<1	<1	323	323	14.1	3.57	0.08	<0.01	0.06	0.06	956			
MW5	11-Jul-13	1120	2.26	3.06	7.62	846	21.5																																							
MW5	5-Sep-13	1200	2.45	3.25	7.55	1640	21.8	4.62	0.011	0.12	0.038	<0.001	<0.0001	0.003	<0.001	0.062	3.25	0.009	0.07	0.004	<0.01	<0.01	0.118	<0.0001	8.07	1810	5	7	406	8	18.7	287	115	<1	<1	396	396	18.4	0.73	0.02				1040			
MW5	22-Nov-13	1155	2.76	3.56	7.7	2430	21.1																																							
MW5	20-Feb-14	1145	3.01	3.81	7.9	1790	22.7	2.6	0.014	<0.05	0.039	<0.001	0.0004	0.01	0.002	0.166	2.68	0.024	0.232	0.007	<0.01	<0.01	0.46	<0.0001	7.77	1850	7	8	394	6	18.3	282	111	<1	<1	377	377	17.8	1.34	<0.01				964			
MW5	27-May-14	11.50	2.77	3.57	7.7	925	22.5																																							
MW5	9-Sep-14	1500	2.80	3.6	7.7	2130	20.5	12.7	0.014					0.009		0.059	8.81	0.016	0.379	0.019			0.141	<0.0001	7.99	2200	7	8	462	8	21.3	319	159	<1	<1	476	476	21.8	1.23		0.02	0.65	0.67				
MW5	20-Nov-14	1240	3.00	3.8	7.8	3020	22.3																																							
MW5	26-Feb-15	1155	3.18	3.97	7.8	1890	23.7	1.18	0.01	0.026	<0.001	<0.05	<0.0001	<0.001	<0.001	0.005	0.74	<0.001	0.044	0.002	<0.01	<0.01	0.04	<0.0001	8.15	2060	5	6	399	6	18.2	299	130	<1	<1	433	433	19.8	4.09	0.01	<0.01	0.14	0.14	1060			
MW5	26-May-15	1240	3.29	4.08	7.8	2120	21.3																																							
MW5	27-Aug-15	1250	3.19	3.98	7.7	2110	19.7	1.29	0.023	0.051	<0.001	<0.05	<0.0001	<0.001	<0.001	0.002	1.67	<0.001	0.373	0.002	<0.01	<0.01	0.036	<0.0001	8.08	2210	8	9	465	6	21.5	262	174	<1	<1	424	424	19.5	4.92	0.04	<0.01	0.02	0.02	1300			
MW5	4-Dec-15	1200	3.29	4.08	7.7	3070	21.2																																							
MW5	24-Feb-16	1215	3.36	4.15	7.7	2060	23.5	0.95	0.01	0.036	<0.001	<0.05	<0.0001	<0.001	<0.001	0.013	0.79	0.002	0.209	0.003	<0.01	<0.01	0.071	<0.0001	7.76	2230	12	13	519	7	24.4	361	184	<1	<1	471	471	23.4	2.04	0.09	<.01	0.24	0.24	1180			
NAGERO																																														
MW6	2-Jun-06		8.34	9	7.3				<0.001																2030	59	29	440	8		308	55				720											
MW6	9-Sep-06		8.84	9.5																																										
MW6	11-Jan-07		9.15	9.81	6.89				<0.001				<0.0001	<0.005		<0.001		<0.001		0.011			0.08	<0.0001		2030	62	30	426	7		252	51				724											
MW6	10-Jul-07		9.37	10.03	7.5	2060	18.1		0.0005				0.00005	0.0025		0.001		0.0005		0.004			0.01	0.00005		2000	58	27	411	8		283	47				666								5.99			
MW6	18-Jul-07		9.35	10.01																																										
MW6	7-Aug-07	1105	9.32	9.98																																										
MW6	22-Aug-07	1320	9.29	9.95																																										
MW6	5-Sep-07	1110	9.31	9.97																																										
MW6	24-Sep-07	1250	9.07	9.73																																										
MW6	11-Oct-07	1035	9.16	9.82																																										
MW6	26-Nov-07	1325	9.17	9.83																																										
MW6	29-Jan-08	1400	9.06	9.72																																										
MW6	4-Mar-08	1125	8.815	9.475																																										
MW6	22-Apr-08	1700	8.62	9.28	7.1	2000	21.1		0.001				<0.00005	0.001		0.002		0.0031		0.006			0.005	<0.0001		2120	64	29	391	9.8		273	51				670									<0.025	<0.1
MW6	21-Aug-08	1051	8.545	9.205																																										
MW6	29-Oct-08	1530	8.48	9.15	7.1	2050	23.9		0.001				0.00005	0.003		0.003		0.077		0.004			0.034	<0.0001		2100	60	27	380	8.5		280	50				680									<0.025	0.18
MW6	29-Jan-09	1010	8.33	9.1																																										
MW6	14-Sep-09	1246	8.65	9.43																																										
MW6	14-Dec-09	1130	8.86	9.64	7.13	2112	23.4	<0.01	<0.001					<0.005		<0.001	<0.05	0.002	0.336	0.008			0.01	<0.0001	7.3	2100	56	26	385	8	21.9	252	39.4	<1	<1	652	652	21	2.24		0.02	0.53	0.55				
MW6	25-Feb-10	1010	8.84	9.62																																										
MW6	11-May-10	1515	8.3	9.08	7.56	2360	21.5		<0.001	0.193	<0.001		<0.0001	0.002	0.002	0.002	2.13	0.006	0.278	0.003		<0.01	0.008	<0.0001		2030	56	26	380	7	21.6	261	42.2	<1	<1	645	645	21.1	1.14	<0.01				1160			
MW6	30-Aug-10	1230	8	8.78	7.2	1927	23.8																																							
MW6	9-Nov-10	1015	7.72	8.5	7.03	1835	24.3																																							
MW6	10-Mar-11	1220	7.41	8.19	7.08	1783	24	0.15	<0.001					0.002		0.034	0.32	0.015	0.047	0.003			0.216	<0.0001	7.53	1790	55	27	406	9	22.9	293	42	<1	<1	627	627	21.7	2.61		0.03	0.97	1				
MW6	6-Jun-11	1040	7.44	8.22	7.15	1670	19.6																																							
MW6	6-Sep-11	1020	Piezo damaged																																											
MW6	7-Dec-11	1000	Piezo damaged																																											
MW6	13-Mar-12	1030	5.74	6.52	7.49	1840	23.4	0.15	<0.001	0.125	<0.001		<0.0001	0.002	<0.001	0.009	0.12	0.001	0.013	0.004		<0.01	0.071	<0.0001	7.68	1980	55	24	390	9	21.9	262	46	<1	<1	624	624	20.8	2.54	<0.01	<0.01	1.44	1.44	1150			

ANNUAL REVIEW
2015/2016

TARRAWONGA COAL PTY LTD
Groundwater Monitoring Data

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																	Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L											
ANZECC Guideline - stock drinking water								**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**						**1000**								**1500**	**400**		**4000**			
MW6	13-Jun-12	1025	5.87	6.65	7.45	2040	21.3																																							
MW6	4-Sep-12	1150	5.58	6.36	7.82	1840	22	0.09	<0.001	0.143	<0.001		<0.0001	<0.001	<0.001	0.012	0.18	0.003	0.013	0.003		<0.01	0.072	<0.0001	8.08	1990	53	25	381	8	21.5	276	39	<1	<1	681	681	22.2	1.69	<0.01	<0.01	1.13	1.13	1210			
MW6	27-Nov-12	0950	5.55	6.33	7.6	1817	21.1																																							
MW6	20-Mar-13	1025	5.75	6.53	7.46	343	22.8	0.49	0.001	0.037	<0.001		<0.0001	0.003	<0.001	0.081	0.56	0.009	0.095	0.006		0.02	0.402	<0.0001	7.43	351	12	3	49	8	3.18	16	28	<1	<1	106	106	3.15	0.44	0.23	0.1	0.6	0.7	252			
MW6	11-Jul-13	1020	5.88	6.66	7.62	452	20.8																																							
MW6	5-Sep-13	1105	5.96	6.74	7.21	465	21.3	0.86	<0.001	0.08	0.038	<0.001	<0.0001	0.002	<0.001	0.075	0.93	0.006	0.058	0.005	<0.01	0.02	0.151	<0.0001	7.8	496	18	3	75	10	4.66	25	60	<1	<1	132	132	4.59	0.74	0.09				327			
MW6	22-Nov-13	1255	5.85	6.63	7.2	486	20.8																																							
MW6	24-Feb-14	1050	5.84	6.62	7.8	215	22.1	0.48	<0.001	<0.05	0.02	<0.001	<0.0001	0.008	0.001	0.045	0.5	0.004	0.094	0.005	<0.01	0.02	0.185	<0.0001	7.51	212	8	1	29	8	1.95	5	26	<1	<1	66	66	2		0.35				182			
MW6	27-May-14	12.40	5.64	6.42	7.5	360	22.1																																							
MW6	9-Sep-14	1010	5.54	6.32	7.6	845	21.4	1.63	0.002					0.005		0.006	1.55	0.016	0.154	0.012			0.13	<0.0001	7.61	854	24	7	140	8	8.07	83	46	<1	<1	274	274	8.77	4.22		<0.01	<0.01	<0.01				
MW6	20-Nov-14	1140	5.55	6.33	7.5	712	21.6																																							
MW6	26-Feb-15	1040	5.64	6.43	7.6	543	22.2	0.13	<0.01	0.036	<0.01	<0.05	<0.0001	0.001	<0.001	0.012	0.32	0.002	0.059	0.007	<0.01	<0.01	0.238	<0.0001	7.67	617	25	5	89	10	5.79	43	42	<1	<1	173	173	5.54	2.11	0.06	<0.01	0.62	0.62	353			
MW6	26-May-15	1135	5.65	6.44	7.5	692	19.7																																							
MW6	27-Aug-15	NO ACCESS																																												
MW6	4-Dec-15	1035	5.4	6.18	7.8	946	21.2																																							
MW6	24-Feb-16	1025	5.38	6.16	7.6	1012	21.2	0.31	0.002	0.083	<0.001	0.06	<0.0001	0.004	<0.001	0.018	1.94	0.006	0.063	0.01	<0.01	<0.01	0.211	<0.0001	7.85	1080	41	12	203	10	12.1	125	46	<1	<1	327	327	11	4.73	0.09	<0.01	0.98	0.98	620			

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																	Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations					Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L										
ANZECC Guideline - stock drinking water								**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**						**1000**								**1500**	**400**		**4000**			
TARRAWONGA MINE																																														
MW7	2-Jun-06		73.47	74.3	7.2				0.002																	2250	45	43	536	12		202	34				1100										
MW7	9-Sep-06		79.67	80.5																																										
MW7	11-Jan-07		76.17	77	7.32				<0.001				<0.0001	<0.005		<0.001		<0.001		0.005			0.05	<0.0001		1960	23	36	459	8		189	22				935										
MW7	18-Apr-07		76.07	76.9																																										
MW7	10-Jul-07		77.06	77.89	7.24	2250	18.7		<0.001				<0.0001	<0.005		0.001		<0.001		0.018			0.106	<0.0001		2270	35	36	458	10		170	23				998								4.38	<20	410
MW7	18-Jul-07		77.1	77.93																																									
MW7	7-Aug-07	1340	78.29	79.12																																									
MW7	22-Aug-07	1430	78.45	79.28																																									
MW7	5-Sep-07	1140	78.6	79.43																																									
MW7	24-Sep-07	1350	78.56	79.39																																									
MW7	11-Oct-07	1140	78.72	79.55																																									
MW7	26-Nov-07	1440	79.34	80.17																																									
MW7	29-Jan-08	1500	79.8	80.63																																									
MW7	4-Mar-08	1335	80.27	81.10																																									
MW7	22-Apr-08	1200	80.85	81.68	7.6	2440	21.9		<0.001				0.00014	0.004		0.033		0.25		0.017			0.12	<0.0001		2370	52	45	483	11		188	5				1050										
MW7	21-Aug-08	1526	83.74	84.57																																										
MW7	29-Oct-08	0915	85.99	86.81	7.4	2310	24.8		0.001				0.00006	0.005		0.014		0.088		0.009			0.099	<0.0001		2300	48	44	470	13		180	24				990									<0.025	0.3
MW7	28-Jan-09	1615	86.99	87.8																																										
MW7	17-Jun-09	0915	86.45	87.5	7.4	2440	20.7		<0.001	0.2	<0.001		<0.0001	0.001	<0.001	0.057	0.43	0.054	0.047	0.007		<0.01	0.13	<0.0001		2280	46	44	481	11	27.1	169	16	<1	<1	1050	1050	26.1	1.96	0.17				1430			
MW7	27-Aug-09	1225	89.99	91.04																																										
MW7	23-Dec-09	1355	89.53	90.58	7.55	2230	27.4	0.03	<0.001					<0.001		0.002	0.26	0.004	0.075	0.007			0.015	<0.0001	7.49	2240	5	46	556	9	28.5	182	17.1	<1	<1	1050	1050	26.5	3.58		<0.01	<0.01	<0.01				
MW7	25-Feb-10	1355	89.64	90.69																																										
MW7	11-May-10	1400	89.85	90.9	8.32	2950	23.9		<0.001	0.227	<0.001		<0.0001	<0.001	<0.001	0.009	1.5	0.046	0.11	0.017		<0.01	0.054	<0.0001		2330	42	41	478	9	26.5	182	15.9	<1	<1	1010	1010	25.6	1.72	0.45				1380			
MW7	30-Aug-10	1400	90.48	91.53	7.52	2385	24.7																																								
MW7	10-Nov-10	0900	90.38	91.43	7.47	2010	26																																								
MW7	14-Mar-11	1210	90.95	92	7.24	2075	26.2	0.2	<0.001					<0.001	0.094		0.74	0.036	0.155	0.01			0.274	<0.0001	7.57	2220	41	41	493	11	27.1	225	23	<1	<1	951	951	25.8	2.43		<0.01	0.07	0.07				
MW7	21-Jun-11	1400	91.31	92.36	7.55	2180	22.3																																								
MW7	8-Sep-11	0950	92.49	93.54	7.35	2160	22.5	0.09	0.001	0.18	<0.001		<0.0001	<0.001	<0.001	0.006	0.41	0.028	0.059	0.007		<0.01	0.047	<0.0001	7.84	2550	10	36	545	10	27.4	255	29	<1	<1	936	936	26.5	1.66	0.55	<0.01	0.02	0.02	1510			
MW7	9-Dec-11	1000	93.89	94.94	7.7	2200	26.8																																								
MW7	19-Mar-12	1345	95.05	96.10	7.25	2460	24.9	0.31	<0.001	0.186	<0.001		<0.0001	0.002	<0.001	0.032	0.61	0.065	0.059	0.009		<0.01	0.085	<0.0001	7.82	2650	35	34	622	11	31.9	321	45	<1	<1	991	991	29.8	3.34	0.52	<0.01	0.03	0.03	1590			
MW7	14-Jun-12	1040	97.70	98.75	7.6	2900	23.6																																								
MW7	6-Sep-12	1150	98.95	100.00	7.33	2730	25.2	0.52	0.002	0.205	<0.001		<0.0001	0.002	<0.001	0.088	2.84	0.114	0.057	0.005		<0.01	0.19	<0.0001	7.93	2840	18	21	678	8	32.3	342	50	<1	<1	1140	1140	33.5	1.79	0.61	<0.01	0.05	0.05	1760			
MW7	28-Nov-12	0945	101.99	103.04																																										
MW7	20-Mar-13	1200	102.49	103.54																																										
MW7	11-Jul-13	1315	103.65	104.7																																										
MW7	5-Sep-13	1325	103.65	104.7																																										
MW7	22-Nov-13	1025	103.43	104.48																																										
MW7	20-Feb-14	1000	103.55	104.6																																										
MW7	27-May-14	1310	103.96	105.01																																										
MW7	9-Sep-14	1300	103.84	104.89																																										
MW7	20-Nov-14	1040	104.01	105.06																																										
MW7	26-Feb-15	1300	104.09	105.14																																										
MW7	26-May-15	1050	104.67	105.46																																										
MW7	27-Aug-15	1050	104.26	105.05																																										
MW7	4-Dec-15	1310	104.35	105.14																																										
MW7	24-Feb-16	1050	104.77	105.56																																										
TARRAWONGA MINE																																															
MW8	2-Jun-06		13.06	13.8	6.7				<0.001																	2240	161	48	298	9		426	46				588										
MW8	9-Sep-06		13.16	13.9																																										
MW8	11-Jan-07		13.41	14.15	6.7				<0.001				<0.0001	<0.005		0.002		0.001		0.007			0.16	<0.0001		2260	180	53	319	7		411	80				587										
MW8	18-Apr-07		12.86	13.6																																										
MW8	9-Jul-07		13.62	14.36	6.8	2530	18.9		<0.001				<0.0001	<0.005		0.005		0.004		0.006			0.102	<0.0001		2610	196	55	308	8		483	80				616								7.77	<20	250
MW8	18-Jul-07		13.67	14.41																																										
MW8	7-Aug-07	1325	13.66	14.4																																										
MW8	22-Aug-07	1415	13.66	14.4																																										
MW8	5-Sep-07	1130	13.72	14.46																																										
MW8	24-Sep-07	1340	13.64	14.38																																										
MW8	11-Oct-07	1120	13.63	14.37																																										
MW8	26-Nov-07	1410	13.69	14.43																																										
MW8	29-Jan-08	1445	13.54	14.28																																										
MW8	4-Mar-08	1220	13.56	14.3																																										
MW8	22-Apr-08				Bore blocked no sample																																											
MW8	21-Aug-08	1510	13.78	14.52																																										
MW8	29-Oct-08	1030	13.85	14.59	Bore blocked no sample																																										
MW8	28-Jan-09	1600	13.85	14.6																																										
MW8	17-Jun-09		14.02	14.77	Unable to sample - casing blocked																																										
MW8	27-Aug-09	1145	14.02	14.77																																										
MW8	23-Dec-09	1415	14.1	14.85	Unable to sample - casing blocked																																										
MW8	25-Feb-10	1520	13.8	14.55																																										
MW8	11-May-10	1440	13.72	14.47	Unable to sample - casing blocked																																										
MW8	30-Aug-10	1420	13.71	14.46	Unable to sample - casing blocked																																										
MW8	9-Nov-10	1255	13.74	14.49	Unable to sample - casing blocked																																										
MW8	14-Mar-11	1120	14.12	14.87	Unable to sample - casing blocked																																										
MW8	21-Jun-11	1420	13.62	14.37	Unable to sample - casing blocked																																										
MW8	8-Sep-11	1030	13.80	14.55	Unable to sample - casing blocked																																										
MW8	9-Dec-11	1040	13.24	13.99	Unable to sample - casing blocked																																										
MW8	14-Mar-12	1235	12.57	13.32	Unable to sample - casing blocked																																										
MW8	14-Jun-12	1115	12.76	13.51	Blocked 3.2 down pipe																																										
MW8	6-Sep-12	1220	12.63	13.38	Blocked 3.2 down pipe																																										

ANNUAL REVIEW
2015/2016

TARRAWONGA COAL PTY LTD
Groundwater Monitoring Data

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																	Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L										
ANZECC Guideline - stock drinking water								**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**						**1000**								**1500**	**400**		**4000**			
MW8	28-Nov-12	1005	12.79	13.54	Blocked about 3m down pipe																																								
MW8	20-Mar-13	1230	12.68	13.43	Blocked 3.2 down pipe																																									
MW8	11-Jul-13	1230	12.95	13.7																																									
MW8	5-Sep-13	1300	13.00	13.75																																									
MW8	22-Nov-13	1045	13.01	13.76																																									
MW8	20-Feb-14	1040	13.07	13.82																																									
MW8	27-May-14	1330	13.00	13.75																																									
MW8	9-Sep-14	1240	13.13	13.88																																									
MW8	20-Nov-15	1110	13.22	13.97																																									
MW8	26-Feb-15	1315	13.27	14.02																																									
MW8	26-May-15	1110	13.43	14.22																																									
MW8	27-Aug-15	1115	13.43	14.22																																									
MW8	4-Dec-15	1330	13.46	14.25																																									
MW8	24-Feb-16	1100	13.49	14.28																																									

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L											
ANZECC Guideline - stock drinking water								**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**					**1000**								**1500**	**400**		**4000**			
TEMPLEMORE																																														
GW044997	2-Jun-06		6.19	6.4	6.9				0.001																	3000	112	102	544	4		758	170				768										
GW044997	11-Jan-07		6.62	6.83	6.95				0.009				<0.0001	<0.005		0.001		<0.001		0.002			0.04	<0.0001		1570	45	36	298	1		200	55				495										
GW044997	10-Jul-07		6.7	6.91	7.06	785	17.1		0.009				0.0002	<0.005		0.001		<0.001		0.001			0.088	<0.0001		1590	46	41	270	1		211	84				441							9	<20	740
GW044997	18-Jul-07		6.73	6.94																																									
GW044997	7-Aug-07	1130	6.79	7																																									
GW044997	22-Aug-07	1505	6.76	6.97																																								
GW044997	5-Sep-07	1205	6.83	7.04																																								
GW044997	24-Sep-07	1415	6.62	6.83																																								
GW044997	11-Oct-07	1210	6.73	6.94																																								
GW044997	26-Nov-07	1525	7.05	7.26																																								
GW044997	29-Jan-08	1525	6.44	6.65																																								
GW044997	4-Mar-08	1410	6.23	6.44																																								
GW044997	4-Apr-08	1140	6.295	6.505																																								
GW044997	22-Apr-08	1615	6.31	6.52	7	3370	21.8		0.007				<0.00005	<0.001		0.005		0.0003		0.012			0.008	<0.0001		3150	135	125	461	1.7		656	276				585									<0.025	<0.1
GW044997	21-Aug-08	1410	6.81	7.02																																									
GW044997	29-Oct-08	1815	6.86	7.06	Bore blocked, no sample																																									
GW044997	29-Jan-09	1130	7	7.2																																									
GW044997	17-Jun-09		7.52	7.77	7.1	3580	18.9		0.066	0.523	<0.001		0.0003	0.001	0.002	0.134	46.9	0.016	0.204	0.006		0.09	0.327	0.0001		3350	112	111	486	8	36	626	132	<1	<1	693	693	34.2	2.53	2.93				2020			
GW044997	28-Aug-09	1240	7.85	8.05																																									
GW044997	23-Dec-09	1130	7.97	8.17	6.95	3050	24.2	0.02	0.008					<0.001		0.005	0.07	<0.0010	0.021	0.004			0.065	<0.0001	6.87	3050	40	118	546	3	35.5	636	203	<1	<1	517	517	32.5	4.4		0.22	21	21.2			
GW044997	25-Feb-10	1040	7.81	8.01																																									
GW044997	11-May-10	1200	7.98	8.18	7.49	3720	22.7		0.018	0.258	<0.001		<0.0001	<0.001	<0.001	0.014	7.2	0.002	0.04	0.006		0.04	0.048	<0.0001		3480	114	119	434	2	34.4	640	192	<1	<1	593	593	33.9	0.66	2.03				1770			
GW044997	30-Aug-10	1120	7.91	8.11	6.82	3720	22.2																																							
GW044997	9-Nov-10	1140	7.8	8	6.8	3010	24.2																																							
GW044997	14-Mar-11	1040	7.25	7.45	6.83	1670	25.9	0.04	0.002					<0.001		0.013	<0.05	<0.001	0.004	<0.001			0.032	<0.0001	7.15	1620	131	67	160	2	19.1	333	87	<1	<1	410	410	19.4	0.84		<0.01	1.8	1.8			
GW044997	6-Jun-11	1320	8.02	8.22	7.3	1514	16.8																																							
GW044997	6-Sep-11	1220	8.73	8.93	6.98	1525	16.7	0.05	0.002	0.174	<0.001		<0.0001	<0.001	<0.001	0.01	<0.05	<0.001	0.007	<0.001		0.02	0.047	<0.0001	7.64	1830	122	58	174	2	18.5	308	110	<1	<1	400	400	19	1.31	0.51	<0.01	1.43	1.43	1000			
GW044997	7-Dec-11	1130	8.32	8.52	7.27	1545	20.6																																							
GW044997	13-Mar-12	1230	5.1	5.3	No sample - pump not operational																																									
GW044997	14-Jun-12	940	5.18	5.38																																									
GW044997	6-Sep-12	1100	4.8	5	7.95	1750	17.5	0.02	0.002	0.128	<0.001		<0.0001	<0.001	<0.001	0.011	0.07	<0.001	0.005	<0.001		0.01	0.027	<0.0001	7.69	1840	120	56	211	2	19.8	323	147	<1	<1	409	409	20.3	1.29	0.05	<0.01	5	5	1130			
GW044997	27-Nov-12	1145	5.04	5.24	7.61	1665	24.6																																							
GW044997	21-Mar-13	1230	5.78	5.98																																									
GW044997	11-Jul-13	1205	6.37	6.57																																									
GW044997	5-Sep-13	1145	6.65	6.85																																									
GW044997	22-Nov-13	1140	6.87	7.07																																									
GW044997	20-Feb-14	1205	6.93	7.13																																									
GW044997	27-May-14	1210	8.05	8.25																																									
GW044997	9-Sep-14	1120	7.99	8.19																																									
GW044997	20-Nov-14	1215	8.56	8.76																																									
GW044997	26-Feb-15	1355	8.61	8.81																																									
GW044997	26-May-15	1200	8.74	8.94																																									
GW044997	27-Aug-15	1315	10.67	10.87																																									
GW044997	4-Dec-15	1140	10.43	10.63																																									
GW044997	24-Feb-16	1300	10.72	10.92																																									
AMBARDO																																														
GW031856	2-Jun-06		15.76	16.4	7.3				<0.001				<0.0001	<0.001		0.036		0.001		0.001			0.126	<0.0001		1150	50	33	156	3		105	22				459								<20	<50
GW031856	11-Jan-07		19.1	19.74	7.27	910	23.1		<0.001				<0.0001	<0.005		0.005		<0.001		<0.001			<0.005	<0.0001		1080	47	30	164	3		75	18				457							3.37	<20	<50
GW031856	10-Jul-07		15.51	16.15	7.9	1080	13.5		<0.001				<0.0001	<0.005		0.008		0.0005		0.0005			2.29	0.00005		1180	48	34	162	3		94.8	20				440							3.11	10	25
GW031856	22-Apr-08	1650			7.4	1090	19.8		0.001				<0.00005	<0.001		0.008		0.0004		0.003			0.048	<0.0001		1060	50	33	145	3.6		106	18				480								<0.025	<0.1
GW031856	29-Oct-08	1225																																											
GW031856	10-Feb-09	0915	17.85	18.49	7.3	1090	26.9		0.002				<0.00005	0.003		0.009		0.0006		0.002			0.26	<0.0001		1100	51	30	150	2.8		81	19				440								<0.025	<0.025
GW031856	17-Jun-09	1005			7.4	1170	20.1		0.001	0.156	<0.001		<0.0001	<0.001	<0.001	0.004	0.06	<0.001	0.001	<0.001		<0.01	0.037	<0.0001		1110	51	33	149	3	11.8	92	15	<1	<1	453	453	12	0.52	<0.01				704			
GW031856	11-Sep-09	1330	15.51	16.28																																									
GW031856	23-Dec-09	1450	18.4		7.73	1029	29.3	0.01	0.001					<0.001		0.001	<0.05	0.001	0.012	0.001			0.205	<0.0001	7.45	1060	40	34	169	3	12.2	92.2	17.4	<1	<1	422	422	11.4	3.24		<0.01	0.14	0.14			
GW031856	25-Feb-10	1245	16.31	16.91	7.61	1240	25.3	<0.01	0.001					<0.005		0.002	<0.05	<0.001	0.001	<0.001			0.014	<0.0001	7.54	1110	47	34	160	3	12.2	90.8	17.6	<1	<1	436	436	11.6	2.42		<0.01	0.19	0.19			
GW031856	11-May-10	1310	16.58	17.18	8.2	1292	14.9		<0.001	0.15	<0.001		0.0002	<0.001	<0.001	0.116	<0.05	0.006	<0.001	<0.001		<0.01	0.51	<0.0001		1140	49	32	154	3	11.9	91.8	16.8	<1	<1	431	431	11.5	1.45	0.02				576			
GW031856	30-Aug-10	1310	15.35	15.95	7.35	1106	18.2	<0.01	<0.001					<0.001		0.008	<0.05	<0.001	0.009	<0.001			1.88	<0.0001	7.33	1140	49	33	159	3	12.2	98	20	<1	<1	426	426	11.7	1.99		<0.01	0.24	0.24			
GW031856	10-Nov-10	1310	15.52	16.12	7.08	990	27.8	<0.01	0.001					<0.005		0.014	<0.05	<0.001	0.004	<0.001			1.26	<0.0001	7.42	1160	22	33	163	3	11	103	18	<1	<1	440	440	12.1	4.84		<0.01	0.2	0.2			
GW031856	14-Mar-11	1250	19.71	20.31	7.19	945	26.5	<0.01	<0.001					0.001		0.004	<0.05	<0.001	<0.001	<0.001			0.015	<0.0001	7.46	887	45	30	151	3	11.4	92	20	<1	<1	414	414	11.3	0.4		<0.01	0.2	0.2			
GW031856	7-Jun-11	1430	16.08	16.68	7.35	929	19.2																																							
GW031856	9-Sep-11	1150	15.49	16.09	7.33	970	17	<0.01	<0.001	0.146	<0.001		<0.0001	<0.001	<0.001	0.005	<0.05	<0.001	<0.001	0.001		<0.01	1.25	<0.0001	7.71	1120	52	35	161	3	12.6	109	22	<1	<1	412	412	11.8	3.22	<0.01	<0.01	0.16	0.16	620			
GW031856	7-Dec-11	1230	15.65	16.25	7.64	940	20.9																																							
GW031856	19-Mar-12	1150	15.1	15.7	7.27	1070	24.3	0.02	0.002	0.161	<0.001		<0.0001	0.002	<0.001	0.012	0.06	<0.001	0.002	<0.001		0.02	0.034	<0.0001	7.82	1110	53	34	155	3	12.3	106	23	<1	<1	421	421	11.9	1.55	<0.01	<0.01	0.27	0.27	666			
GW031856	14-Jun-12	1210	16.04	16.64	7.57	1170	25.1																																							
GW031856	19-Sep-12	1040	16.6	17.2	7.39	1060	21.2	0.01	0.001	0.176	<0.001		<0.0001	<0.001	<0.001	0.012	0.29	0.002	0.004	<0.001		0.01	0.027	<0.0001	7.84	1160	48	33	158	4	12.1	115	21	<1	<1	410	410	11.9	0.86	<0.01	<0.01	0.17	0.17	670			
GW031856	27-Nov-12	1230	16	16.6	7.43	1048	25.4																																							
GW031856	21-Mar-13	1300	15.7	16.3	7.42	1020	24.2	<0.01	0.001	0.166	<0.001		<0.0001	0.003	<0.001	0.027	<0.05	0.006	0.005	<0.001		0.01	0.193	<0.0001	7.78	1100	49	32	157	3	12	90	21	<1	<1	435	435	11.7	1.31	<0.01	<0.01	0.22	0.22	640			
GW031856	11-Jul-13	850	17.47	18.07	7.54	1064	19.6																																							
GW031856	5-Sep-13	915	17.2	17.8	7.56	1070	19.2	<0.01	<0.001	<0.05	0.141	<0.001	<0.0001	<0.001	<0.001	0.005	0.06	<0.001	0.002	<0.001	<0.01	<0.01	0.017	<0.0001	7.92	1130	49	33	158	4	12.1	100	20	<1	<1	432	432	11.9	1.08	<0.01				660			
GW031856	22-Nov-13	900	15.88	16.48	7.6	1120	24.9																																							
GW031856	24-Feb-14	1020	15.1	15.7	7.7	1120	24.5	<0.01	0.001	<0.05	0.156	<0.001	<0.0001	<0.001	<0.001	0.007	<0.05	<0.001	<0.001	<0.001	<0.01	0.01	0.138	<0.0001	7.84	1150	48	32	155	3	11.8	99	22	<1	<1	430	430	11.8	<0.01	0.02				684			
GW031856	27-May-14	1050	15.20	15.8	7.5	1097	20.1																																							
GW031856	9-Sep-14	900	14.70	15.3	7.3	1120	18	<0.01	0.002					0.002		0.006	0.12		<0.001	<0.001			0.056	<0.0001	7.82	1140	46	30	142	3	11	101	23	<1	<1	388	388	11.1	0.31		<0.01	0.2	0.2			
GW031856	20-Nov-14	0845	15.87	16.47	7.2	1120	24.5																																							
GW031856	26-Feb-15	1000	15.6	16.2	7.5	1090	25.6	<0.01	0.001	0.143	<0.001	<0.05	<0.0001	<0.001	<0.001	<0.001	<0.05		<0.001	0.001	<0.01	0.01	0.197	<0.0001	7.94	1220	48	33	150	3	11.7	99	22	<1	<1	478	478	12.8	4.47	0.02	<0.01	0.21	0.21	570			

ANNUAL REVIEW
2015/2016

TARRAWONGA COAL PTY LTD
Groundwater Monitoring Data

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																	Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L											
ANZECC Guideline - stock drinking water					No process			**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**						**1000**									**1500**	**400**		**4000**			
GW031856	26-May-15	1345	15.07	15.67																																										
GW031856	27-Aug-15	900	15.1	15.7	6.9	1120	14.7	0.01	0.001	0.126	<0.001	<0.05	<0.0001	<0.001	<0.001	0.022	0.19	0.003	0.002	0.001	<0.01	<0.01	0.348	<0.0001	7.8	1120	49	35	157	2	12.2	66	23	<1	<1	406	406	10.4	7.71	0.04	<0.01	0.21	0.21	592			
GW031856	4-Dec-15	905	18.77	19.37	7	1118	22.1																																								
GW031856	24-Feb-16	955	17.83	18.43	7.1	1117	23.8	0.01	0.002	0.154	<0.001	<0.05	<0.0001	<0.001	<0.001	0.007	0.09	<0.001	0.005	<0.001	<0.01	0.01	0.035	<0.0001	7.89	1140	57	38	173	3	13.6	75	23	<1	<1	454	454	11.7	7.53	0.05	<0.01	0.21	0.21	656			

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L										
ANZECC Guideline - stock drinking water								**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**						**1000**								**1500**	**400**		**4000**			
TARRAWONGA																																														
GW052266	2-Jun-06		7.67	8.1	7.9				<0.001																1360	17	13	301	5		134	65				488										
GW052266	11-Jan-07		8.94	9.37	7.58				<0.001				<0.0001	<0.005		<0.001		<0.001		<0.001			0.02	<0.0001	1950	45	29	389	8		362	126				457										
GW052266	10-Jul-07		7.92	8.35	8.01	1330	13.3		<0.001				<0.0001	<0.005		<0.001		<0.001		<0.001			0.01	<0.0001	1480	23	14	315	6		170	79				435								10.61	<20	250
GW052266	18-Jul-07		7.97	8.4																																									
GW052266	7-Aug-07	1300	7.94	8.37																																									
GW052266	22-Aug-07	1335	7.95	8.38																																									
GW052266	5-Sep-07	0955	8.02	8.45																																									
GW052266	24-Sep-07	1305	7.92	8.35																																									
GW052266	11-Oct-07	1050	7.9	8.33																																									
GW052266	26-Nov-07	1345	8	8.43																																									
GW052266	29-Jan-08	1420	8.01	8.44																																									
GW052266	4-Mar-08	1145	8.04	8.47																																									
GW052266	4-Apr-08	1210	8	8.43																																									
GW052266	22-Apr-08	0915	8.04	8.47	7.2	1230	20.6		<0.001				<0.00005	<0.001		<0.001		0.0002		0.006			<0.005	<0.0001	1250	94	48	110	4.5		131	19				465									<0.025	<0.1
GW052266	21-Aug-08	1225	5.86	6.29																																									
GW052266	29-Oct-08	1725			8.7	1600	28.4		<0.001				<0.00005	0.002		0.001		0.0003		<0.001			0.013	0.0006	1600	19	17	270	6.5		220	93				450									<0.025	<0.100
GW052266	28-Aug-09	1205	9.7	10.13																																									
GW052266	14-Dec-09	0840	11.3	11.35	7.4	922	23.3	<0.01	0.003					<0.001		0.003	<0.05	<0.001	0.006	0.003			0.018	<0.0001	7.51	838	55	16	84	<1	7.72	64.1	31.6	<1	<1	252	252	7.51	1.36		<0.01	6.09	6.09					
GW052266	25-Feb-10	1320	10.44	10.49																																									
GW052266	11-May-10	0940	10.43	10.48	8.23	954	18.6		0.002	0.078	<0.001		<0.0001	<0.001	<0.001	0.002	0.54	0.002	0.017	0.004		0.01	0.024	<0.0001		813	54	16	80	<1	7.52	68.3	34	<1	<1	241	241	7.46	0.42	0.05				446				
GW052266	16-Aug-10	1450	9.71	10.21	7.4	860	18.7																																							
GW052266	9-Nov-10	0900	10.53	10.58	6.98	817	24.1																																							
GW052266	10-Mar-11	1045	10.51	11.01	7.04	786	23.5	0.15	0.004					<0.001		0.024	1.28	0.002	0.034	0.001			0.103	<0.0001	7	640	53	17	94	1	8.2	72	34	<1	<1	262	262	7.98	1.34		0.34	4.32	4.66					
GW052266	6-Jun-11	0930	10.19	10.24	7.05	663	20.2																																							
GW052266	6-Sep-11	0920	10.51	10.56	6.94	714	20.2	0.96	0.003	0.106	<0.001		<0.0001	0.002	<0.001	0.009	2.63	0.002	0.085	0.008		0.02	0.061	<0.0001	7.48	823	57	16	90	<1	8.08	71	38	<1	<1	260	260	7.99	0.53	0.14	<0.01	6.35	6.35	464				
GW052266	7-Dec-11	0910	10.55	10.60	6.95	705	20.6																																							
GW052266	13-Mar-12	0900	9.18	9.23	7.04	784	21.6	0.03	0.002	0.086	<0.001		<0.0001	<0.001	<0.001	0.113	0.1	0.003	0.005	0.012		0.02	0.15	<0.0001	7.54	821	57	17	99	<1	8.55	68	37	<1	<1	267	267	8.44	0.65	<0.01	<0.01	5.92	5.92	498				
GW052266	13-Jun-12	900	8.38	8.43	7.05	837	20.4																																							
GW052266	4-Sep-12	1040	7.91	7.96	7.41	780	22.4	0.04	0.003	0.078	<0.001		<0.0001	<0.001	<0.001	0.018	0.92	0.002	0.03	<0.001		0.01	0.068	<0.0001	7.56	802	50	17	93	<1	7.94	76	32	<1	<1	260	260	8	0.42	0.07	0.01	5.53	5.54	562				
GW052266	27-Nov-12	0850	8.00	8.05	7.28	750	22																																							
GW052266	20-Mar-13	0915	9.24	9.29	7.18	740	21.4	0.02	0.004	0.072	<0.001		<0.0001	<0.001	<0.001	0.034	0.16	0.002	0.007	0.001		0.01	0.176	<0.0001	7.13	798	54	17	89	<1	7.97	80	28	<1	<1	244	244	7.71	1.58	0.02	<0.01	5.9	5.9	326				
GW052266	11-Jul-13	0920	7.79	7.84	7.25	822	18.1																																							
GW052266	5-Sep-13	935	8.29	8.34	7.09	590	22.4	1.02	0.002	<0.05	0.091	<0.001	<0.0001	0.004	0.002	0.324	1.72	0.006	0.036	0.009	<0.01	0.02	0.19	<0.0001	7.62	782	48	16	95	<1	7.84	73	35	<1	<1	238	238	7.54	1.94	<0.01				493				
GW052266	22-Nov-13	0920	7.84	7.89	7.2	670	21.8																																							
GW052266	24-Feb-14	910	7.74	7.79	7	727	21.2	0.2	0.002	<0.05	0.072	<0.001	<0.0001	0.001	<0.001	0.112	0.86	0.007	0.03	0.003	<0.01	0.01	0.152	<0.0001	7.48	737	42	14	83	<1	6.86	66	33	<1	<1	203	203	6.6	1.87	0.05				514				
GW052266	27-May-14	900	7.68	7.73	7.2	692	20.6																																							
GW052266	9-Sep-14	920	7.73	7.78	7.4	684	20.6	0.22	0.0001					<0.001		0.007	3.63	<0.001	0.318	0.003			0.048	<0.0001	7.83	693	34	12	82	<1	6.25	66	34	<1	<1	222	222	7.01	4.83		<0.01	1.75	1.75					
GW052266	20-Nov-14	0910	7.77	7.82	7.2	748	21.5																																							
GW052266	26-Feb-15	900	7.51	7.56	7.2	752	21.6	0.44	0.006	0.086	<0.001	<0.05	<0.0001	0.001	0.001	0.012	22.9	0.002	0.141	0.008	<0.01	0.03	0.214	<0.0001	7.13	800	47	15	89	1	7.48	62	81	<1	<1	168	168	9.56	14.2	0.54	0.74	5.12	5.86	430				
GW052266	26-May-15	915	7.75	7.8	7.3	713	20.2																																							
GW052266	27-Aug-15	925	7.76	7.81	7.2	707	19.7	0.06	<0.001	0.049	<0.001	<0.05	<0.0001	<0.001	<0.001	0.006	16	<0.001	0.273	0.002	<0.01	<0.01	0.093	<0.0001	7.61	712	40	15	85	2	6.98	48	36	<1	<1	218	218	6.46	3.85	0.19	0.03	0.46	0.49	380				
GW052266	4-Dec-15	930	7.83	7.88	7.1	734	20.5																																							
GW052266	24-Feb-16	900	7.86	7.91	7	752	21.7	0.14	0.007	0.084	<0.001	<0.05	<0.0001	<0.001	<0.001	0.008	30.6	<0.001	0.096	<0.001	<0.01	0.03	0.067	<0.0001	7.5	508	52	15	90	<1	7.74	56	37	<1	<1	219	219	7.74	3.82	0.1	<0.01	6.21	6.21	508				
TEMPLEMORE A																																														
Templemore A	18-Jul-07		8.61	9.07																																									
Templemore A	7-Aug-07	1135	11.33	11.79																																									
Templemore A	22-Aug-07	1515	12.08	12.54																																									
Templemore A	5-Sep-07	1208	12.09	12.55																																									
Templemore A	24-Sep-07	1420	12.22	12.68																																									
Templemore A	11-Oct-07	1215	12.08	12.54																																									
Templemore A	26-Nov-07	1530	12.09	12.55																																									
Templemore A	29-Jan-08	1540	12.05	12.51																																									
Templemore A	4-Mar-08	1420	12.07	12.53																																									
Templemore A	4-Apr-08	1145	9.16	9.62																																									
Templemore A	21-Aug-08	1325	8.68	9.14																																									
Templemore A	29-Jan-09	1118	7.84	8.3																																									
Templemore A	17-Jun-09		8.65	9.39	7.7	1640	19.7		0.003	0.132	<0.001		<0.0001	<0.001	<0.001	0.021		0.002	0.247	0.002		<0.01	0.02	<0.0001	0.16	1500	165	42	106	1	16.3	228	56	<1	<1	426	426	16.1	0.7	0.01				1000				
Templemore A	28-Aug-09	1242	8.92	9.4																																									
Templemore A	23-Dec-09	1110	10.1	10.58	7.2	1473	24	<0.01	0.002					<0.001		0.007	<0.05	<0.001	0.013	0.001			0.025	<0.0001	7.54	1400	72	41	125	1	12.4	246	79	<1	<1	241	241	13.6	4.61		0.07	3.25	3.32					
Templemore A	25-Feb-10	1055	9.16	9.64																																									
Templemore A	11-May-10	1230	9.12	9.6	7.92	1083	21.2		0.004	0.21	<0.001		0.0001	<0.001	<0.001	0.011	0.11	<0.001	1.9	0.006		0.01	0.019	<0.0001		1600	152	38	105	3	15.4	241	68.3	<1	<1	376	376	15.7	1.13	3.1				906				
Templemore A	30-Aug-10	1100	9.19	9.67	7.77	1590	22.1																																							
Templemore A	9-Nov-10	1130	9.24	9.72	7.67	1485	23.7																																							
Templemore A	14-Mar-11	1020	9.44	9.92	7.35	1486	24.8	0.02	0.003					<0.001		0.011	0.76	<0.001	3.31	0.005			0.079	<0.0001	7.56	1420	175	41	120	4	17.4	297	49	<1	<1	402	402	17.4	0.03		<0.01	0.09	0.09					
Templemore A	6-Jun-11	1255	9.36	9.84	7.45	1392	20.2																																							
Templemore A	6-Sep-11	1150	9.5	9.98	7.61	1395	21.8	0.08	0.004	0.266	<0.001		<0.0001	<0.001	<0.001	0.004	0.1	<0.001	1.81	0.004		<0.01	0.033	<0.0001	8.04	1670	169	41	120	3	17.1	285	62	<1	<1	405	405	17.4	0.9	1.37	0.12	0.46	0.58	790				
Templemore A	9-Dec-11	1120		No access to well - paddock flooded																																										
Templemore A	13-Mar-12	1200	2.7	3.18	7.62	960	22.9	0.1	0.003	0.093	<0.001		<0.0001	<0.001	<0.001	<0.001	0.11	<0.001	0.006	<0.001		<0.01	0.023	<0.0001	7.79	988	92	25	74	8	10.1	103	59	<1	<1	222	222	9.98	0.6	0.04	0.01	19.7	19.7	578				
Templemore A	13-Jun-12	1250	3.28	3.76	7.31	826	20.2																																							
Templemore A	6-Sep-12	1000	3.59	4.07	7.32	816	20.1	0.05	0.002	0.071	<0.001		<0.0001	<0.001	<0.001	0.017	0.09	<0.001	0.008	<0.001		<0.01	0.026	<0.0001	7.67	820	80	22	54	4	8.25	103	66	<1	<1	203	203	8.34	0.48	<0.01	<0.01	2.79	2.79	500				
Templemore A	27-Nov-12	1130	3.85	4.33	7.42	812	21.1																																							
Templemore A	21-Mar-13	1210	4.31	4.79	7.67	943	21.8	1.68	0.003	0.114	<0.001		0.0001	0.001	0.001	0.142	2.56	0.01	0.501	0.005		<0.01	0.279	<0.0001	7.75	1020	97	24	60	9	9.66	116	74	<1	<1	242	242	9.65	0.06	2.75	3.32	0.18	3.5	614				
Templemore A	11-Jul-13	1120	5.34	5.82	7.68	1162	19.2																																							
Templemore A	5-Sep-13	1220	4.29	4.77	7.57	1150	20.4	0.07	0.003	<0.05	0.119	<0.001	<0.0001	<0.001	<0.001	0.068	0.12	0.003	0.688	0.003	<0.01	<0.01	0.103	<0.0001	7.96	1240	119	30	93	5	12.6	175	96	<1	<1	284	284	12.6	0.1	0.07				765				
Templemore A	22-Nov-13	1215	7.5	7.98	7.7	1189	19.8																																							

ANNUAL REVIEW
2015/2016

TARRAWONGA COAL PTY LTD
Groundwater Monitoring Data

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																		Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L											
ANZECC Guideline - stock drinking water								**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**						**1000**								**1500**	**400**		**4000**			
Templemore A	20-Feb-14	1220	4.41	4.89	7.7	1110	20.7	0.23	0.004	<0.05	0.1	<0.001	<0.0001	0.001	<0.001	0.105	0.75	0.012	0.432	0.005	<0.01	<0.01	0.204	<0.0001	7.71	1150	104	27	80	6	11	150	84	<1	<1	272	272	11.4	1.63	4.83				669			
Templemore A	27-May-14	1130	4.57	5.05	7.6	1281	20																																							
Templemore A	9-Sep-14	1210	4.31	4.79	7.8	1150	19.3	0.02	0.004					<0.001		0.012	0.86	<0.001	0.011	<0.001			0.031	<0.0001	7.98	1190	105	26	78	2	10.8	164	98	<1	<1	272	272	12	5.3		<0.01	2.6	2.6				
	20-Nov-14	1300	4.78	5.26	7.9	1117	21.2																																							
Templemore A	26-Feb-15	1340	5.27	5.75	7.9	1100	23.7	0.2	0.003	0.079	<0.001	<0.05	<0.0001	<0.001	<0.001	0.015	0.22	<0.001	0.1	0.002	<0.01	<0.01	0.064	<0.0001	7.69	1210	109	27	84	4	11.4	157	105	<1	<1	242	242	12.9	13.7	0.73	0.14	0.3	0.44	674			
Templemore A	26-May-15	1300	5.59	6.07	7.9	1125	19.4																																							
Templemore A	27-Aug-15	1335	5.64	6.12	7.9	1180	18.4	0.04	0.002	0.077	<0.001	<0.05	<0.0001	<0.001	<0.001	0.019	0.05	<0.001	0.014	<0.001	<0.01	<0.01	0.034	<0.0001	8.03	1190	113	27	87	3	11.7	134	82	<1	<1	264	264	10.8	4.28	0.04	<0.01	0.93	0.93	755			
Templemore A	4-Dec-15	1215	5.77	6.25	7.8	1192	22.7																																							
Templemore A	24-Feb-16	1245	6.08	6.56	7.8	1234	22.5	0.03	0.004	0.105	<0.001	<0.05	<0.0001	<0.001	<0.001	0.012	0.11	0.001	0.415	0.001	<0.01	<0.01	0.037	<0.0001	8.09	1300	147	30	102	4	14.3	176	88	<1	<1	340	340	13.6	2.71	0.5	0.44	<0.01	0.27	668			

Sample Location	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																	Mercury (Hg) - mg/L	pH - Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N -mg/L	Nitrate as N - mg/L	Nitrite + Nitrate as N - mg/L	Total Dissolved Solids	Dissolved oxygen	TPH C6-C9	TPH C10-C36
					pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Boron (B) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Selenium (Se) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L											
ANZECC Guideline - stock drinking water								**5**	**0.5**				**0.1**	**1**	**1**	**1**		**0.1**		**1**			**20**	**0.002**			**1000**						**1000**								**1500**	**400**		**4000**			
TEMPLEMORE B																																															
Templemore B	18-Jul-07		9.89	9.89																																											
Templemore B	7-Aug-07	1145	8.14	8.14																																											
Templemore B	22-Aug-07	1525	8.31	8.31																																											
Templemore B	5-Sep-07	1211	8.17	8.17																																											
Templemore B	24-Sep-07	1425	8.05	8.05																																											
Templemore B	11-Oct-07	1220	8.09	8.09																																											
Templemore B	26-Nov-07	1535	7.9	7.9																																											
Templemore B	29-Jan-08	1545	8.13	8.13																																											
Templemore B	4-Mar-08	1425	8.44	8.44																																											
Templemore B	4-Apr-08	1150	8.42	8.42																																											
Templemore B	21-Aug-08	1329	10.55	10.55																																											
Templemore B	29-Jan-09	1145	15.5	15.5																																											
Templemore B	17-Jun-09		9.49	9.63	7.3	1810	19.5		0.002	0.145	<0.001		<0.0001	<0.001	<0.001	0.055	<0.05	<0.001	0.008	<0.001		0.01	0.052	<0.0001		1700	118	52	175	2	17.9	240	106	<1	<1	419	419	17.4	1.46	<0.01				1080			
Templemore B	28-Aug-09	1250	12.69	12.83																																											
Templemore B	23-Dec-09	1040	15.84	15.98	6.75	1491	24.4	<0.01	0.003					<0.001		0.022	<0.05	<0.001	0.003	0.002			0.068	<0.0001	7.44	1420	31	31	221	2	13.8	196	134	<1	<1	291	291	14.1	1.29		<0.01	0.74	0.74				
Templemore B	25-Feb-10	1112	9.36	9.5																																											
Templemore B	11-May-10	1250	10.52	10.66	8.01	1722	22.2		0.002	0.059	<0.001		<0.0001	<0.001	<0.001	0.007	0.11	<0.001	0.024	<0.001		0.01	0.02	<0.0001		1540	85	30	194	2	15.1	204	129	<1	<1	328	328	15	0.48	0.02				854			
Templemore B	30-Aug-10	1145	17.65	17.79	7.23	1532	23.8																																									
Templemore B	9-Nov-10	1215	9.94	10.08	7.19	1405	24.8																																									
Templemore B	14-Mar-11	0940	17.11	17.25	7.21	1460	24.7	0.28	0.002					<0.001		0.055	0.43	0.003	0.034	0.002			0.185	<0.0001	7.28	1400	97	37	200	2	16.6	264	136	<1	<1	339	339	17	1.3		<0.01	2.85	2.85				
Templemore B	6-Jun-11	1230	10.42	10.56	7.3	1370	21.5																																									
Templemore B	8-Sep-11	1100	13.56	13.7	7.12	1387	20.8	0.03	0.003	0.076	<0.001		<0.0001	<0.001	<0.001	0.015	<0.05	<0.001	0.005	<0.001		0.01	0.019	<0.0001	7.54	1630	62	38	202	2	15.1	254	137	<1	<1	325	325	16.5	4.62	0.03	<0.01	0.73	0.73	982			
Templemore B	7-Dec-11	1150	10.53	10.67	7.21	1360	21																																									
Templemore B	13-Mar-12	1250	9.58	9.72	7.28	1680	23	0.07	0.002	0.09	<0.001		<0.0001	<0.001	<0.001	0.013	0.1	<0.001	0.004	<0.001		0.02	0.036	<0.0001	7.7	1790	116	42	228	2	19.2	307	142	<1	<1	338	338	18.4	2.24	0.11	<0.01	3.37	3.37	1040			
Templemore B	13-Jun-12	1220	10.51	10.65	7.34	1704	20.8																																									
Templemore B	4-Sep-12	1350	8.28	8.42	7.3	1770	21.4	0.05	0.002	0.099	<0.001		<0.0001	<0.001	<0.001	0.01	0.1	<0.001	0.005	<0.001		0.01	0.072	<0.0001	7.63	1920	110	46	248	2	20.1	326	181	<1	<1	364	364	20.2	0.31	<0.01	<0.01	7.25	7.25	1200			
Templemore B	27-Nov-12	1200	7.65	7.79	7.37	1611	21.8																																									
Templemore B	20-Mar-13	1330	12.36	12.5	7.29	1570	22.4	0.04	0.004	0.069	<0.001		<0.0001	<0.001	<0.001	0.019	0.09	0.001	0.012	<0.001		0.01	0.064	<0.0001	7.51	1700	94	36	235	2	17.9	255	137	<1	<1	335	335	16.7	3.41	0.03	<0.01	4.44	4.44	886			
Templemore B	11-Jul-13	1145	6.08	6.22	7.22	1523	21.7																																									
Templemore B	5-Sep-13	1240	6.1	6.24	7.24	1470	22.3	0.28	0.003	0.06	0.076	<0.001	<0.0001	<0.001	<0.001	0.046	0.3	0.002	0.035	<0.001	<0.01	0.02	0.148	<0.0001	7.79	1620	78	32	230	2	16.6	242	158	<1	<1	304	304	16.2	1.18	0.03				988			
Templemore B	22-Nov-13	1235	7.89	8.03	7.4	1483	20.7																																								
Templemore B	20-Feb-14	1240	8.31	8.45	7.5	1400	21.6	0.1	0.004	0.06	0.061	<0.001	<0.0001	<0.001	<0.001	0.045	0.38	0.005	0.022	0.002	<0.01	0.02	0.129	<0.0001	7.47	1470	69	29	204	1	14.7	199	142	<1	<1	293	293	14.4	1.03	0.02				829			
Templemore B	27-May-14	1110	10.51	10.65	7.4	1566	19.7																																								
Templemore B	9-Sep-14	1220	6.38	6.52	7.4	1390	21.5	0.05	0.004					<0.001		0.007	0.07	<0.001	0.004	<0.001			0.028	0.0001	7.7	1480	63	25	192	1	13.6	195	141	<1	<1	325	325	14.9	4.76		<0.01	2.3	2.3				
Templemore B	20-Nov-14	1330	6.96	7.1	7.4	1523	22.3																																								
Templemore B	26-Feb-15	1220	7.58	7.72	7.4	1450	23.6	0.15	0.003	0.064	<0.001	<0.05	<0.0001	<0.001	<0.001	0.01	0.2	<0.001	0.013	0.002	<0.01	0.01	0.078	<0.0001	7.89	1580	70	30	205	2	14.9	211	144	<1	<1	328	328	15.5	1.9	0.09	<0.01	2.38	2.38	955			
Templemore B	26-May-15	1320	8.37	8.51	7.4	1453	20.6																																								
Templemore B	27-Aug-15	1400	8.03	8.17	7.3	1480	19.2	0.03	0.003	0.061	<0.001	<0.05	<0.0001	<0.001	<0.001	0.006	0.07	0.003	0.005	<0.001	<0.01	0.02	0.046	<0.0001	7.73	1520	74	31	202	1	15	179	158	<1	<1	286	286	14	3.43	0.04	<0.01	2.07	2.07	826			
Templemore B	4-Dec-15	1230	10.98	11.12	7.3	1572	22.8																																								
Templemore B	24-Feb-16	1330	10.77	10.91	7.2	1465	23.4	0.31	0.004	0.069	<0.001	<0.05	<0.0001	<0.001	<0.001	0.007	1.7	<0.001	0.005	<0.001	<0.01	0.01	0.046	<0.0001	7.77	1510	82	32	219	1	16.3	214	158	<1	<1	307	307	15.5	2.56	0.05	<0.01	0.21	0.21	874			

Denotes dissolved metals