

Appendices

(Total No. of pages including blank pages = 312)

- Appendix 1 Project Approval PA10_0183 (44 pages)
- Appendix 2 Monitoring Data and Records (98 pages)
- Appendix 3 Final Assessment Report for the Pollution
Reduction Program at the Teralba Quarry -
September 2016 (46 pages)
- Appendix 4 2017 Internal Compliance Review (38 pages)
- Appendix 5 2017 Community Consultative Committee
Meeting Minutes (6 pages)
- Appendix 6 2017 Community Complaints Register
(4 pages)
- Appendix 7 2017 T.E.N.T.A.C.L.E. Incorporated
Rehabilitation Report (20 pages)
- Appendix 8 2017 Kendall and Kendall Ecological
Services – Annual Nesting Box Inspection
(54 pages)



This page has intentionally been left blank



Appendix 1

Project Approval PA10_0183

(Total No. of pages including blank pages = 44)



This page has intentionally been left blank

Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

As delegate of the Minister for Planning and Infrastructure, I approve the project application referred to in schedule 1, subject to the conditions in schedules 2 to 5.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

Sam Haddad
Director-General

Sydney 22nd February 2013

SCHEDULE 1

Application Number:	10_0183
Proponent:	Metromix Pty Limited
Approval Authority:	Minister for Planning and Infrastructure
Land:	Lot 1 DP 224037 Lot 2 DP 224037
Project:	Teralba Quarry Extension

TABLE OF CONTENTS

DEFINITIONS	3
ADMINISTRATIVE CONDITIONS	5
Obligation to Minimise Harm to the Environment	5
Terms of Approval	5
Limits on Approval	5
Surrender of Consents	6
Structural Adequacy	6
Demolition	6
Protection of Public Infrastructure	6
Planning Agreement	7
Road Maintenance	7
Operation of Plant and Equipment	7
Staged Submission of any Strategy, Plan or Program	7
Production Data	7
ENVIRONMENTAL PERFORMANCE CONDITIONS	8
Identification of Approved Limits of Extraction	8
Extraction Management	8
Noise	8
Blasting	10
Air Quality	11
Meteorological Monitoring	13
Soil & Water	13
Visual	14
Transport	15
Bushfire Management	16
Waste	16
Aboriginal Heritage	17
Landscape	17
ADDITIONAL PROCEDURES	20
Notification of Landowners	20
Independent Review	20
ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING	21
Environmental Management	21
Reporting	23
Independent Environmental Audit	23
Access to Information	23
APPENDIX 1: PROJECT SITE & LAND REFERENCE PLAN	24
APPENDIX 2: PROJECT LAYOUT PLANS	26
APPENDIX 3: STATEMENT OF COMMITMENTS	29
APPENDIX 4: TRANSPORT ROUTES	40
APPENDIX 5: BIODIVERSITY OFFSET STRATEGY	41
APPENDIX 6: REHABILITATION STRATEGY	42

DEFINITIONS

AM peak period	7:30 am to 9 am weekdays
Annual review	The review required by condition 4 of schedule 5
BCA	Building Code of Australia
Biodiversity offset strategy	The conservation and enhancement strategy described in the EA, and depicted conceptually in the figure in Appendix 5
CCC	Community Consultative Committee
Conditions of this approval	Conditions contained in schedules 1 to 5 inclusive
Council	Lake Macquarie City Council
CPI	Australian Bureau of Statistics Consumer Price Index
Department	Department of Planning and Infrastructure
Director-General	Director-General of the Department, or nominee
DRE	Division of Resources and Energy within the Department of Trade and Investment, Regional Services and Infrastructure
DPI	Department of Primary Industries within the Department of Trade and Investment, Regional Services and Infrastructure
EA	Environmental Assessment of the project titled <i>Environmental Assessment for the Teralba Quarry Extensions, Major Project Application No. 10_0183</i> , prepared by RW Corkery & Co Pty Limited and dated November 2011; and the <i>Teralba Quarry Extensions Response to Submissions</i> , prepared by RW Corkery & Co Pty Limited and dated June 2012
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPL	Environment Protection Licence under the <i>POEO Act</i>
Extraction Areas	The Southern, Southern Extension, Mid Pit and Northern Extension Extraction Areas shown on Figure 1 in Appendix 1
Feasible	Feasible relates to engineering considerations and what is practical to build
Haulage routes	The transport routes (see also Appendix 4) along which quarry products may be hauled from the site: <ul style="list-style-type: none"> • Route 1 – Northwestern Corridor: westwards along Rhondda Road, and then northwards along Wakefield Road and Northville Road to George Booth Drive; • Route 2 – Southwestern Corridor: westwards along Rhondda Road, and then southwards along Wakefield Road to the F3 Freeway; • Route 3 – Northeastern Corridor: northeast along Railway Street, Teralba, crossing the railway line, then southwards along York Street Teralba, then north-easterly along Five Islands Road to either The Esplanade or Lake Road; and • Route 4 – Southeastern Corridor: northeast along Railway Street, Teralba, crossing the railway line, then southwards along York Street Teralba and Toronto Road
km	kilometres
Land	As defined in the EP&A Act, except for where the term is used in the noise and air quality conditions in schedules 3 and 4 of this approval where it is defined to mean the whole of a lot, or contiguous lots, owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
m AHD	metres Australian Height Datum
Material harm to the environment	Actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial
Minister	Minister for Planning and Infrastructure, or delegate
Minor	Not very large, important or serious
Negligible	Small and unimportant, such as to be not worth considering
NOW	NSW Office of Water, within the Department of Primary Industries
OEH	Office of Environment and Heritage within the Department of Premier and Cabinet

Privately-owned land	Land that is not owned by a public agency or the Proponent (or its subsidiary)
PM peak period	4:30 pm to 6:00 pm weekdays
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
Project	The development as described in the EA
Proponent	Metromix Pty Limited, or any other person who seeks to carry out the development approved under this approval
Quarrying operations	Includes the removal of overburden and extraction, processing, handling, storage and transportation of extractive materials on site
Reasonable	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
Rehabilitation	The restoration of land disturbed by the project to a good condition, ensuring that it is safe, stable and non-polluting and appropriately revegetated
RMS	Roads and Maritime Services
Statement of commitments	The Proponent's commitments in Appendix 3
Site	The land listed under "Land" in schedule 1

SCHEDULE 2 ADMINISTRATIVE CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. In addition to meeting the specific performance criteria established under this approval, the Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any material harm to the environment that may result from the construction, operation, or rehabilitation of the project.

TERMS OF APPROVAL

2. The Proponent shall carry out the project generally in accordance with the:
 - (a) EA;
 - (b) statement of commitments; and
 - (c) conditions of this approval.

Notes:

- The general layout of the project is shown in Appendix 1 and Appendix 2.
- The statement of commitments is reproduced in Appendix 3.

3. If there is any inconsistency between the above documents, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.
4. The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
 - (a) any reports, strategies, plans, programs, reviews, audits or correspondence that are submitted in accordance with this approval; and
 - (b) the implementation of any actions or measures contained in these documents.

LIMITS ON APPROVAL

Quarrying Operations

5. The Proponent may carry out quarrying operations on the site until 31 December 2038.

Note: Under this approval, the Proponent is required to rehabilitate the site and carry out additional undertakings to the satisfaction of the Director-General. Consequently, this approval will continue to apply in all other respects other than the right to conduct quarrying operations until the rehabilitation of the site and those undertakings have been carried out to a satisfactory standard.

Extractive Material Limits

6. The Proponent shall not carry out quarrying operations below 20 m AHD in the Southern Extension Area or below 24 m AHD in the Mid Pit Extraction and Northern Extension Areas.

Note: This condition does not apply to the construction of any bores approved by NOW or pollution and sediment control structures described in the EA.

7. The Proponent shall not extract more than 1.2 million tonnes of extractive materials from the site in any calendar year.

Extractive Material Transport

8. The Proponent shall not:
 - (a) transport more than 1 million tonnes of quarry products from the site in any calendar year; or
 - (b) dispatch more than 326 laden trucks from the site on any day; or
 - (c) dispatch more than 241 laden trucks per day or 20 per hour westwards along Rhondda Road;
 - (d) dispatch more than 85 laden trucks per day or 8 per hour eastwards through Teralba;
 - (e) dispatch laden trucks for travel through Teralba between 6 pm and 6 am; or
 - (f) receive unladen trucks via the railway street entrance between 6 pm and 7 am.

9. The Proponent shall limit the total hourly truck dispatch rates from the site to the levels shown in Table 1.

Table 1 – Truck Dispatch Hours

Dispatch Period	Maximum Hourly Dispatch Rate
6:00 am – 7:00 am	Up to 28 loaded trucks
7:00 am – 6:00 pm	Up to 20 loaded trucks
6:00 pm – 5:00 am	Up to 6 loaded trucks
5:00 am – 6:00 am	Up to 12 loaded trucks

Note: Dispatch times and maximum hourly rates westwards along Rhondda Road or eastwards through Teralba are further limited by condition 8 above.

Receival of Concrete, Virgin Excavated Natural Material and Excavated Natural Material

10. The Proponent shall not receive on site more than 120 tonnes of recycled concrete per day or stockpile more than 2,500 tonnes of concrete material on the site.
11. The Proponent shall not receive on site more than 100,000 tonnes of virgin excavated natural material or excavated natural material in any calendar year.

SURRENDER OF CONSENTS

12. By the end of December 2013, or as otherwise agreed by the Director-General, the Proponent shall surrender the development consent (DA 130/42) for existing operations on the site in accordance with Section 104A of the EP&A Act.

Note: The conditions or other requirements of this project approval do not prevent the continued carrying out of development which may be undertaken pursuant to DA 130/42, prior to the surrender of that consent.

STRUCTURAL ADEQUACY

13. The Proponent shall ensure that any new buildings and structures, and any alterations, or additions to existing buildings and structures, are constructed:
- in accordance with the relevant requirements of the BCA; and
 - to the satisfaction of the Mine Subsidence Board.

Notes:

- Under *Part 4A of the EP&A Act*, the Proponent is required to obtain construction and occupation certificates for the proposed building works.
- Part 8 of the EP&A Regulation* sets out the requirements for the certification of the project.
- Under Section 15 of the *Mine Subsidence Compensation Act 1961* the Proponent is required to obtain approval from the Mine Subsidence Board for the construction, erection or alteration of any improvements on the site.

DEMOLITION

14. The Proponent shall ensure that all demolition work on site is carried out in accordance with *AS 2601-2001: The Demolition of Structures*, or its latest version.

PROTECTION OF PUBLIC INFRASTRUCTURE

15. The Proponent shall:
- repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the project; and
 - relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project.

PLANNING AGREEMENT

16. Within 12 months of the date of this approval, unless otherwise agreed by the Director-General, the Proponent shall enter into a planning agreement with the Council in accordance with Division 6 of Part 4 of the EP&A Act that provides for payment to the Council for road maintenance levies.

The agreement must include provision for those matters set out in condition 17 below.

If there is any dispute between the Proponent and Council relating to the preparation or implementation of the planning agreement, then either party may refer the matter to the Director-General for resolution.

ROAD MAINTENANCE

17. During the life of the project, for each calendar year, the Proponent shall pay Council \$0.066 per tonne per kilometre for every tonne of quarry products transported from the site on roads for which Council is liable for road maintenance funding. Each payment must be:
- (a) based on weighbridge records of the quantity of quarry products transported from the site;
 - (b) paid by the date required by the invoice issued by Council; and
 - (c) increased over the life of the project in accordance with the CPI.

OPERATION OF PLANT AND EQUIPMENT

18. The Proponent shall ensure that all plant and equipment used at the site is:
- (a) maintained in a proper and efficient condition; and
 - (b) operated in a proper and efficient manner.

STAGED SUBMISSION OF ANY STRATEGY, PLAN OR PROGRAM

19. With the approval of the Director-General, the Proponent may submit any strategy, plan or program required by this approval on a progressive basis.

Notes:

- *While any strategy, plan or program may be submitted on a progressive basis, the Proponent will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times; and*
- *If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.*

PRODUCTION DATA

20. The Proponent shall:
- (a) provide annual quarry production data to DRE using the standard form for that purpose; and
 - (b) include a copy of this data in the Annual Review (see condition 4 of schedule 5).

SCHEDULE 3 ENVIRONMENTAL PERFORMANCE CONDITIONS

IDENTIFICATION OF APPROVED LIMITS OF EXTRACTION

1. Prior to carrying out quarrying operations under this approval, the Proponent shall:
 - (a) engage a registered surveyor to mark out the boundaries of the approved limits of extraction within the Extraction Areas; and
 - (b) submit a survey plan of these boundaries to the Director-General.
2. While ever quarrying operations are being carried out, the Proponent shall ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify the limits of extraction within the Southern, Southern Extension, Mid Pit and Northern Extension Extraction Areas.

EXTRACTION MANAGEMENT

Operating Conditions

3. The Proponent must ensure that:
 - (a) the underlying historical coal workings within the Great Northern coal seam pose not greater than a negligible risk to the safety of quarry workers, including risks from sudden unplanned collapses, release of noxious gases or explosion of flammable gases; and
 - (b) quarrying operations pose not greater than a negligible risk to the heating or combustion of the underlying historical coal workings within the Great Northern coal seam.

Lower Level Extraction Management Plan

4. The Proponent shall prepare and implement a Lower Level Extraction Plan for all extraction activities within 17.5 vertical metres of historical coal workings within the Great Northern coal seam, to the satisfaction of the Director-General. This plan must:
 - (a) be submitted for approval to the Director-General prior to undertaking any such quarrying operations and within 12 months of the date of this approval;
 - (b) be prepared by suitably qualified persons approved by the Director-General;
 - (c) provide for the achievement of the measures set out in condition 3 above;
 - (d) describe the measures that would be implemented to ensure:
 - best management practice quarrying operations are being employed on site;
 - individual responsibilities of workers, contractors and management are detailed and understood; and
 - compliance with the relevant conditions of this approval;
 - (e) include a Spontaneous Combustion Management Plan, which has been prepared in consultation with DRE and Oceanic Coal Pty Ltd, to manage the potential risks and impacts of spontaneous combustion or heating of coal, and which:
 - includes a detailed assessment, of the risks of spontaneous combustion and subsurface heating for each of the existing and proposed Extraction Areas;
 - clearly identifies responsibilities to address management of spontaneous combustion and subsurface heating risks, for both day to day operations and long term management; and
 - includes appropriate short and long term contingency plans.

NOISE

Noise Criteria

5. The Proponent shall ensure that the noise generated by the project does not exceed the criteria in Table 2 at any residence on privately-owned land.

Table 2: Noise criteria dB(A)

Location	Day Shoulder 6 - 7 am	Day 7 am – 6 pm	Evening 6 – 10 pm	Night 10 pm – 6 am	
	<i>L_{Aeq}(15 min)</i>	<i>L_{Aeq}(15 min)</i>	<i>L_{Aeq}(15 min)</i>	<i>L_{Aeq}(15 min)</i>	<i>L_{A1}(1 min)</i>
A	38	38	37	35	45
B	42	46	36	35	45
C	42	42	35	35	45
D, E, G, H, I	35	35	35	35	45
F	37	38	38	35	45

Notes:

- Receiver locations are shown in Figure 2 Appendix 1.
- Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.

However, these criteria do not apply if the Proponent has a written agreement with the relevant landowner to exceed the criteria, and the Proponent has advised the Department in writing of the terms of this agreement.

Hours of Operation

6. The Proponent shall comply with the operating hours set out in Table 3.

Table 3: Operating Hours

Day	Receipt of Concrete or Virgin Excavated Natural Material	Loading and Dispatch of Quarry Trucks	Extraction and Processing Operations
Monday – Friday	7 am to 5 pm	4 am Monday to midnight Friday	7 am to 7 pm
Saturday	7 am to 2 pm	midnight Friday to 6 pm Saturday	7 am to 2 pm
Sundays and Public Holidays	None	None	None

Note: Maintenance activities may occur at any time provided they are inaudible at privately-owned residences.

Operating Conditions

7. The Proponent shall:
- implement best practice noise management to minimise the construction, operational and traffic noise of the project;
 - minimise the noise impacts of the project during meteorological conditions when the noise limits in this approval do not apply;
 - maintain the effectiveness of any noise suppression equipment on plant at all times and ensure defective plant is not used operationally until fully repaired;
 - regularly assess noise monitoring data and relocate, modify, and/or stop operations on site to ensure compliance with the relevant conditions of this approval; and
- to the satisfaction of the Director-General.

Noise Management Plan

8. The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan must:
- be submitted for approval to the Director-General within 4 months of the date of this approval;
 - describe the measures that would be implemented to ensure:
 - best management practice is being employed on site;
 - the noise impacts of the project are minimised during any meteorological conditions when the noise limits in this approval do not apply; and
 - compliance with the relevant conditions of this approval;
 - describe the proposed noise management system in detail; and
 - include a monitoring program that:

- is capable of regularly evaluating the performance of the project, including noisy individual items of plant, such as haulage trucks and the bulldozer;
- includes a protocol for determining any exceedances of the relevant conditions in this approval at locations listed in Table 2; and
- evaluates and reports on the effectiveness of the noise management system on site.

BLASTING

Blasting Criteria

- The Proponent shall ensure that the blasting on the site does not cause exceedances of the criteria in Table 4.

Table 4: Blasting criteria

Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance
Any residence on privately owned land, or any public infrastructure	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months

However, these criteria do not apply if the Proponent has a written agreement with the relevant owner or infrastructure provider/owner, and the Proponent has advised the Department in writing of the terms of this agreement.

Blasting Hours

- The Proponent shall only carry out blasting on site between 10 am and 4 pm Monday to Friday inclusive. No blasting is allowed on weekends or public holidays, or at any other time without the written approval of Director-General.

Blasting Frequency

- The Proponent shall not carry out more than 1 blast a day on site, unless an additional blast is required following a blast misfire.

Note: A blast may involve a number of explosions within a short period, typically less than two minutes.

Property Inspections

- If the Proponent receives a written request from the owner of any privately-owned land within 500 m of proposed blasting for a property inspection to establish the baseline condition of any buildings and/or structures on his/her land, or to have a previous property inspection report updated, then within 2 months of receiving this request the Proponent shall:
 - commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to:
 - establish the baseline condition of any buildings and/or structures on the land, or update the previous property inspection report; and
 - identify any measures that should be implemented to minimise the potential blasting impacts of the project on these buildings and/or structures; and
 - give the landowner a copy of the new or updated property inspection report.

Property Investigations

- If the owner of any privately-owned land claims that the buildings and/or structures on his/her land have been damaged as a result of blasting on site, then within 2 months of receiving this claim in writing from the landowner the Proponent shall:
 - commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties, to investigate the claim; and
 - give the landowner a copy of the property investigation report.

If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent shall repair the damages to the satisfaction of the Director-General.

If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Director-General for resolution.

Operating Conditions

14. During blasting operations, the Proponent shall:
 - (a) implement best management practice to:
 - protect the safety of people and livestock in the surrounding area;
 - protect public or private infrastructure/property in the surrounding area from any damage; and
 - minimise the dust and fume emissions of any blasting; and
 - (b) operate a suitable system to enable the public to get up-to-date information on the proposed blasting schedule on site, to the satisfaction of the Director-General.
15. The Proponent shall not undertake blasting within 500 metres of:
 - (a) any public road without the approval of Council; or
 - (b) any land outside the site not owned by the Proponent, unless:
 - the Proponent has a written agreement with the relevant landowner to allow blasting to be carried out closer to the land, and the Proponent has advised the Department in writing of the terms of this agreement, or
 - the Proponent has:
 - demonstrated to the satisfaction of the Director-General that the blasting can be carried out closer to the land without compromising the safety of the people or livestock on the land, or damaging the buildings and/or structures on the land; and
 - updated the Blast Management Plan to include the specific measures that would be implemented while blasting is being carried out within 500 metres of the land.

Blast Management Plan

16. The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Director-General. This plan must:
 - (a) be submitted to the Director-General for approval within 4 months from the date of project approval;
 - (b) be prepared in consultation with the Council and interested members of the local community potentially affected by blasting operations;
 - (c) describe the measures that would be implemented to ensure:
 - best management practice is being employed; and
 - compliance with the relevant conditions of this approval;
 - (d) include a road closure management plan for blasting within 500 metres of a public road, that has been prepared in consultation with Council;
 - (e) include a specific blast fume management protocol to demonstrate how emissions will be minimised including risk management strategies if blast fumes are generated; and
 - (f) include a monitoring program for evaluating the performance of the project including:
 - compliance with the applicable criteria; and
 - minimising fume emissions from the site.

AIR QUALITY

Air Quality Criteria

17. The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not exceed the criteria in Tables 5 to 7 at any residence on privately-owned land, or on more than 25% of any privately-owned land.

Table 5: Long-Term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging period	^d Criterion
Total suspended particulates (TSP)	Annual	^a 90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³

Table 6: Short Term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging period	^d Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³

Table 7: Long-Term Impact Assessment Criteria for Deposited Dust

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month

Notes to Tables 5-7:

- ^a Total impact (ie incremental increase in concentrations due to the project plus background concentrations due to all other sources);
- ^b Incremental impact (ie incremental increase in concentrations due to the project on its own);
- ^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.
- ^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Director-General in consultation with EPA.

Greenhouse Gas Emissions

18. The Proponent shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.

Operating Conditions

19. The Proponent shall:
- implement best management practice to minimise the dust emissions of the project;
 - regularly assess air quality monitoring data and relocate, modify, and/or stop operations on site as may be required to ensure compliance with the relevant conditions of this approval,
 - minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see Note d to Tables 5-7 above);
 - minimise any visible off-site air pollution; and
 - minimise surface disturbance of the site, other than as permitted under this approval.

Air Quality Management Plan

20. The Proponent shall prepare and implement an Air Quality Management Plan for the project to the satisfaction of the Director-General. This plan must:
- be prepared in consultation with Council, and submitted for approval to the Director-General within 4 months of the date of this approval;
 - describes the measures that would be implemented to ensure:
 - best management practice is employed;
 - the air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events; and
 - compliance with the relevant conditions of this approval;
 - describes the proposed air quality management system; and
 - includes an air quality monitoring program that:
 - is capable of evaluating the performance of the project;

- includes a protocol for determining any exceedances of the relevant conditions of approval;
- adequately supports the air quality management system; and
- evaluates and reports on the adequacy of the air quality management system.

METEOROLOGICAL MONITORING

21. For the life of the project, the Proponent shall ensure that there is a suitable meteorological station operating in the vicinity of the site that:
- complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline; and
 - is capable of continuous real-time measurement of temperature lapse rate, in accordance with the *NSW Industrial Noise Policy*, or as otherwise approved by EPA.

SOIL & WATER

Note: The Proponent is required to obtain the necessary water licences for the project under the Water Act 1912 and/or the Water Management Act 2000.

Water Supply

22. The Proponent shall ensure it has sufficient water during all stages of the project, and if necessary, adjust the scale of quarrying operations on site to match its available supply.

Surface Water Discharges

23. The Proponent shall ensure that all surface water discharges from the site comply with the discharge limits in any EPL which regulates water discharges from the site, or with section 120 of the POEO Act.

On-Site Sewage Management

24. The Proponent shall manage on-site sewage to the satisfaction of Council and the EPA.

Storage of Chemicals & Petroleum Products

25. The Proponent shall ensure that all chemicals and/or petroleum products on site are held in appropriately bunded areas with impervious flooring and sufficient capacity to contain 110% of the largest container stored within the bund, and in accordance with Australian Standard AS1940-2004, *The Storage and Handling of Flammable and Combustible Liquids*. The flooring and bund(s) shall be designed in accordance with:
- the requirements of relevant Australian Standards; and
 - DECC's *Storing and Handling Liquids: Environmental Protection – Participants Manual*.

Water Management Plan

26. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director-General. This plan must be prepared in consultation with Council and NOW by suitably qualified and experienced person/s whose appointment has been approved by the Director-General, and be submitted to the Director-General for approval within 6 months of the date of this approval and prior to any extraction activities within the Northern Extension area.

In addition to the standard requirements for management plans (see condition 3 of schedule 5), this plan must include a:

- (a) Site Water Balance that:
- includes details of:
 - sources and security of water supply, including contingency planning;
 - water use on site;
 - water management on site;
 - reporting procedures, including comparisons of the site water balance each calendar year; and
 - describes the measures that would be implemented to minimise clean water use on site;

- (b) Surface Water Management Plan, that includes:
- detailed baseline data on surface water flows and quality in the watercourses that could be affected by the project;
 - a detailed description of the surface water management system on site, including the:
 - clean water diversion systems;
 - erosion and sediment controls; and
 - water storages;
 - design objectives and performance criteria for proposed:
 - erosion and sediment control structures;
 - water storages; and
 - control of water pollution from rehabilitated areas of the site;
 - performance criteria, including trigger levels for investigating any potentially adverse impacts, for surface water quality of local watercourses and Lake Macquarie;
 - a program to monitor:
 - the effectiveness of the water management system;
 - surface water flows and quality in local watercourses and Lake Macquarie; and
 - ecosystem health of local watercourses and Lake Macquarie;
 - a plan to respond to any exceedances of the performance criteria, and mitigate and/or offset any adverse surface water impacts of the project; and
 - a detailed review the dirty water management system to:
 - determine whether the capacity, integrity, retention time and management of the system are sufficient to ensure that water discharged from the site meets the performance criteria and propose any upgrades necessary to meet these criteria;
 - assess appropriate options to improve storage and retention times in accordance with *The Blue Book - Managing Urban Stormwater (MUS): Soils and Construction (Landcom)*; and
- (c) Groundwater Management Plan, that includes:
- detailed baseline data on groundwater yield and quality in the area, that could be affected by the project;
 - groundwater assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts;
 - a program to monitor:
 - surface water inflows into the groundwater system beneath the site;
 - the impacts of the project on:
 - the local coal seam aquifer;
 - any groundwater bores on privately-owned land that could be affected by the project; and
 - groundwater dependent ecosystems; and
 - seepage/leachate from water storages or backfilled voids (including historical coal workings) on site; and
 - a plan to respond to any exceedances of the groundwater assessment criteria;

Note: The Director-General may require the Proponent to implement upgrades and other changes identified under paragraph (b), in accordance with condition 4 of schedule 2.

VISUAL

Protection of Ridgelines

27. The Proponent shall ensure that any clearing of visually prominent ridgeline vegetation is done in a progressive manner, so as to provide for a maximum of 6 months of future quarrying operations.
28. The Proponent shall ensure that the:
- (a) eastern facing quarry benches of the Southern Extension are vegetated with native endemic understory species and trees as soon as practicable following the completion of extraction of those benches; and
 - (b) revegetation of the quarry benches is managed to ensure that a tree canopy is regenerated, as soon as practicable, to be consistent with and visually integrated into the surrounding tree canopy,
- to the satisfaction of the Director-General.

Operating Conditions

29. The Proponent shall
- (a) implement all reasonable and feasible measures to minimise the visual impacts and any off-site lighting impacts of the project; and
 - (b) maintain and improve the effectiveness of the vegetated plantings on the quarry benches, over the life of the project.

Advertising Signage

30. The Proponent shall not erect or display any advertising structure(s) or signs on the site without the written approval of the Director-General.

Note: This condition does not require approval for any business identification, traffic management, and/or safety or environmental signs.

TRANSPORT

Intersection Investigation and Wheel Wash

31. Within 6 months of the date of this approval the Proponent shall:
- (a) commission a suitably qualified and experienced person endorsed by the Director-General to undertake a road safety audit report of the intersection of York Street and Anzac Parade in consultation with Council;
 - (b) submit the report and any recommendations to the Director-General for approval; and
 - (c) implement any recommendations of the road safety audit to upgrade the intersection of York Street and Anzac Parade to the satisfaction of Council.
32. The Proponent shall install truck wheel wash facilities within 6 months of the date of this approval at all quarry exits and following such installation, must ensure that all trucks have their tyres and vehicles cleaned of mud, dirt and dust prior to exiting the site, so as to avoid tracking dirt onto public roads, to the satisfaction of the Director-General.

Operating Conditions

33. The Proponent shall construct the tunnel and conveyor under Rhondda Road to the satisfaction of Council.
34. Within 6 months of the date of this approval, the Proponent shall cease transporting quarry material by truck between the quarry pits.
35. The Proponent may only transport quarry products from the site on the designated Haulage Routes (see Appendix 4), except in circumstances where the final destination of the quarry products can only be accessed by other roads.
36. The Proponent shall ensure that all heavy vehicles:
- (a) do not exceed an on-site speed limit of 30 km per hour;
 - (b) exiting the site to the east via the bottom gate (ie to Railway Street) during the Day Shoulder period do not exceed the on-site speed limit and minimise noise as far as reasonable between Railway Street and the end of the existing engineering works; and
 - (c) entering or leaving the site have their loads covered.
37. During the AM peak period and PM peak period, the Proponent shall implement all reasonable and feasible measures to minimise project-related traffic delays and congestion at the intersection of Toronto and Five Islands Roads and along York Street, to the satisfaction of the Director-General.
38. Only trucks owned by the Proponent, its shareholders or approved contractors and fitted with airbag suspension may transport quarry products from the site between 6 pm and 6 am.

Maintenance

39. The Proponent shall regularly maintain the pavement of the on-site road that connects to Railway Street to minimise dust generation and potholes, to the satisfaction of the Director-General.

Monitoring of Product Transport

40. The Proponent shall:
- (a) keep accurate records of:
 - the amount of quarry products transported from the site (monthly and annually); and
 - all laden truck movements from the site (hourly, daily, weekly, monthly and annually); and
 - (b) publish these records on its website on a quarterly basis.

Road Signage

41. Within 6 months of the date of this approval the Proponent shall install flashing lights within Northville Drive for the 40 km school zones outside of Barnsley and Edgeworth Heights Public Schools, to the satisfaction of RMS.
42. Prior to carrying out quarrying operations under this approval, the Proponent shall install "Trucks entering" warning signs 200 metres either side of the quarry entrances on public roads.

Parking

43. The Proponent shall provide sufficient parking on-site for all project-related traffic in accordance with Council's parking codes and in consultation with Council.

Transport Management Plan

44. The Proponent shall prepare and implement a Transport Management Plan for the project to the Director-General. This plan must:
- (a) be prepared by a suitably qualified traffic consultant in consultation with the RMS and Council, and submitted to the Director-General for approval within 4 months of the date of this approval;
 - (b) include a drivers' code of conduct for the project;
 - (c) describe the measures that would be implemented to ensure:
 - drivers are aware of potential safety issues along the haulage routes in particular near schools;
 - drivers of project-related vehicles comply with the drivers' code of conduct;
 - compliance with the relevant conditions of this approval; and
 - (d) include a program to monitor the effectiveness of the implementation of these measures.

BUSHFIRE MANAGEMENT

45. The Proponent shall:
- a) ensure that the project is suitably equipped to respond to any fires on site; and
 - b) assist the Rural Fire Service, emergency services and National Parks and Wildlife Service as much as possible if there is a fire in the surrounding area.

WASTE

46. Prior to importing any Virgin Excavated Natural Material or excavated natural material to the site, the Proponent must obtain a 'resource recovery exemption' under the POEO Act and provide evidence of this approval to the Department.
47. The Proponent shall:
- (a) minimise the waste generated by the project; and
 - (b) ensure that the waste generated by the project is appropriately stored, handled, and disposed of,
- to the satisfaction of the Director-General.

48. The Proponent shall prepare and implement a Waste Management Plan for the project to the satisfaction of the Director-General. This plan must:
- be prepared in consultation with DRE and Council, and submitted to the Director-General for approval prior within 4 months of the date of this approval;
 - identify the various waste streams of the project;
 - estimate the volumes of waste material that would be generated by the project, including recycled concrete brought on-site;
 - describe and justify the proposed strategy for disposing of this waste material, including recycled concrete brought on-site; and
 - include a program to monitor the effectiveness of these measures.

ABORIGINAL HERITAGE

Heritage Management Plan

49. The Proponent shall prepare and implement a Heritage Management Plan for the project to the satisfaction of the Director-General. This plan must:
- be prepared in consultation with Aboriginal stakeholders;
 - be submitted to the Director-General for approval prior to carrying out any development within the Northern Extension area or within 6 months of the date of this approval;
 - describe the measures that would be implemented for:
 - monitoring all new surface disturbance on site for unidentified Aboriginal objects;
 - managing the discovery of any human remains or previously unidentified Aboriginal objects on site; and
 - ensuring ongoing consultation with Aboriginal stakeholders in the conservation and management of any Aboriginal cultural heritage values on site.

LANDSCAPE

Fauna Habitat

50. The Proponent shall install 20 nest boxes for microbats, 20 nest boxes for Little Lorikeets and 30 nest boxes for Sugar Gliders. These boxes must be monitored and maintained regularly over the life of the project, and re-located or replaced if not used by targeted fauna for a period of 12 months.
51. The Proponent shall, wherever practicable, avoid clearing hollow-bearing trees. If clearing a hollow-bearing tree cannot be avoided, then its removal must be offset with an additional and comparable habitat structure within the site.

Biodiversity Offset Strategy

52. The Proponent shall implement the Biodiversity Offset Strategy, as described in the EA, summarised in Table 8 and shown conceptually in the figure in Appendix 5, to the satisfaction of the Director-General.

Table 8: Biodiversity Offset Strategy

Area	Offset Type	Minimum Size (ha)
Offset Area	Existing vegetation to be enhanced	142.6 ha
TOTAL		142.6

Long Term Security of Offsets

53. By the end of June 2014, unless the Director-General agrees otherwise, the Proponent shall enter into a conservation agreement pursuant to section 69B of the *National Parks and Wildlife Act 1974* for the Offset Area, which records the obligations assumed by the Proponent under the conditions of this approval in relation to this area, and shall register this agreement pursuant to section 69F of the *National Parks and Wildlife Act 1974*. The conservation agreement must remain in force in perpetuity.

If OEH is not prepared to enter into a conservation agreement, then to satisfy this condition, the Proponent may propose another conservation measure to secure the offset for approval by the Director-General.

Relocated Powerlines

54. The Proponent shall ensure that any relocation of existing powerlines on-site does not cause greater than minor environmental consequences within the Offset Area.

Rehabilitation Objectives

55. The Proponent shall rehabilitate the site to the satisfaction of the Director-General. This rehabilitation must be generally consistent with the proposed rehabilitation strategy in the EA and Appendix 6, and comply with the objectives in Table 9.

Table 9: Rehabilitation Objectives

Feature	Objective
Site (as a whole)	Safe, stable & non-polluting.
Surface Infrastructure	To be decommissioned and removed, unless the Director-General agrees otherwise.
Benched Quarry Walls	Landscaped and revegetated utilising native tree and understorey species, ensuring that the tree canopy is restored and integrated with the surrounding canopy to minimise visual impacts
Quarry Pit Floors and Silt Ponds	Landscaped and revegetated utilising native flora species and felled trees from clearing. Revegetation not required for existing and proposed industrial areas.
Other land affected by the project	Restore ecosystem function, including maintaining or establishing self-sustaining eco-systems comprised of: <ul style="list-style-type: none"> • native endemic species; and • a landform consistent with Figure 8 (Appendix 6) and the surrounding environment.

Progressive Rehabilitation

56. The Proponent shall rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim rehabilitation strategies shall be employed when areas prone to dust generation cannot yet be permanently rehabilitated.

Landscape Management Plan

57. The Proponent shall prepare and implement a Landscape Management Plan for the project to the satisfaction of the Director-General. This plan must:
- be prepared in consultation with DRE, DPI and Council;
 - be submitted to the Director-General for approval prior within 12 months of the date of this approval;
 - describe how the implementation of the Biodiversity Offset Strategy would be integrated with the overall rehabilitation of the site;
 - describe the short, medium and long term measures that would be implemented to:
 - manage remnant vegetation and habitat on site;
 - implement the Biodiversity Offset Strategy; and
 - ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations in this approval;
 - include detailed performance and completion criteria for evaluating the performance of the Biodiversity Offset Strategy and the rehabilitation of the site, including triggering remedial action (if necessary);
 - include a detailed description of the measures that would be implemented over the next 3 years, including the procedures to be implemented for:

- ensuring compliance with the rehabilitation objectives and progressive rehabilitation obligations in this approval;
 - enhancing the quality of remnant vegetation and fauna habitat;
 - restoring native endemic vegetation and fauna habitat within the biodiversity offset areas and rehabilitation area;
 - maximising the salvage of environmental resources within the approved disturbance area – including tree hollows, vegetative and soil resources – for beneficial reuse in the enhancement of the biodiversity areas or rehabilitation area;
 - collecting and propagating seed;
 - ensuring minimal environmental consequences for the local *Tetratheca juncea* population;
 - minimising the impacts on native fauna on site, including undertaking appropriate pre-clearance surveys;
 - controlling weeds and feral pests;
 - controlling erosion;
 - controlling access; and
 - bushfire management;
- (g) include a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;
- (h) identify the potential risks to successful implementation of the Biodiversity Offset Strategy and rehabilitation of the site, and include a description of the contingency measures that would be implemented to mitigate against these risks; and
- (i) include details of who would be responsible for monitoring, reviewing, and implementing the plan.

Conservation & Rehabilitation Bond

58. Within 6 months of the approval of the Landscape Management Plan, the Proponent shall lodge a Conservation and Rehabilitation Bond with the Department to ensure that the Biodiversity Offset Strategy and the rehabilitation of the site is implemented in accordance with the performance and completion criteria set out in the Landscape Management Plan. The sum of the bond shall be determined by:
- (a) calculating the cost of implementing the Biodiversity Offset Strategy over the next 3 years;
 - (b) calculating the cost of rehabilitating the site, taking into account the likely surface disturbance over the next 3 years of quarrying operations; and
 - (c) employing a suitably qualified quantity surveyor or other expert to verify the calculated costs,
- to the satisfaction of the Director-General.

Notes:

- *If capital and other expenditure required by the Landscape Management Plan is largely complete, the Director-General may waive the requirement for lodgement of a bond in respect of the remaining expenditure.*
 - *If the Biodiversity Offset Strategy and rehabilitation of the site area are completed to the satisfaction of the Director-General, then the Director-General will release the bond. If the Biodiversity Offset Strategy and rehabilitation of the site are not completed to the satisfaction of the Director-General, then the Director-General will call in all or part of the bond, and arrange for the completion of the relevant works.*
59. Within 3 months of each Independent Environmental Audit (see condition 9 of schedule 5), the Proponent shall review, and if necessary revise, the sum of the Conservation and Rehabilitation Bond to the satisfaction of the Director-General. This review must consider the:
- (a) effects of inflation;
 - (b) likely cost of implementing the Biodiversity Offset Strategy and rehabilitating the site (taking into account the likely surface disturbance over the next 3 years of the project); and
 - (c) performance of the implementation of the Biodiversity Offset Strategy and rehabilitation of the site to date.

SCHEDULE 4 ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

1. As soon as practicable after obtaining monitoring results showing an:
 - (a) exceedance of any relevant criteria in schedule 3, the Proponent shall notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the project is again complying with the relevant criteria; and
 - (b) an exceedance of the relevant air quality criteria in schedule 3, the proponent shall send a copy of the NSW Health fact sheet entitled "*Mine Dust and You*" (as may be updated from time to time) to the affected landowners and/or existing tenants of the land.

INDEPENDENT REVIEW

2. If an owner of privately-owned land considers the project to be exceeding the relevant criteria in schedule 3, then he/she may ask the Director-General in writing for an independent review of the impacts of the project on his/her land.

If the Director-General is satisfied that an independent review is warranted, then within 2 months of the Director-General's decision the Proponent shall:

- (a) commission a suitably qualified, experienced and independent expert, whose appointment has been approved by the Director-General, to:
 - consult with the landowner to determine his/her concerns;
 - conduct monitoring to determine whether the project is complying with the relevant criteria in schedule 3; and
 - if the project is not complying with these criteria, then identify the measures that could be implemented to ensure compliance with the relevant criteria; and
 - (b) give the Director-General and landowner a copy of the independent review.
3. If the independent review determines that the project is complying with the relevant criteria in schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.

If the independent review determines that the project is not complying with the relevant criteria in schedule 3, then the Proponent shall:

- (a) implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent expert, and conduct further monitoring until the project complies with the relevant criteria; or
- (b) secure a written agreement with the landowner to allow exceedances of the relevant criteria, to the satisfaction of the Director-General.

SCHEDULE 5 ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy must:
 - (a) be submitted to the Director-General for approval with 6 months of the date of this approval;
 - (b) provide the strategic framework for environmental management of the project;
 - (c) identify the statutory approvals that apply to the project;
 - (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;
 - (e) describe the procedures that would be implemented to:
 - keep the local community and relevant agencies informed about the operation and environmental performance of the project;
 - receive, handle, respond to, and record complaints;
 - resolve any disputes that may arise during the course of the project;
 - respond to any non-compliance; and
 - respond to emergencies; and
 - (f) include:
 - copies of any strategies, plans and programs approved under the conditions of this approval; and
 - a clear plan depicting all the monitoring required to be carried out under the conditions of this approval.

Adaptive Management

2. The Proponent shall assess and manage project-related risks to ensure that there are no exceedances of the criteria and/or performance measures in schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this approval and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.

Where any exceedance of these criteria and/or performance measures has occurred, the Proponent shall, at the earliest opportunity:

- (a) take all reasonable and feasible measures to ensure that the exceedance ceases and does not recur;
- (b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and
- (c) implement remediation measures as directed by the Director-General, to the satisfaction of the Director-General.

Management Plan Requirements

3. The Proponent shall ensure that the Management Plans required under this approval are prepared in accordance with any relevant guidelines, and include:
 - (a) detailed baseline data;
 - (b) a description of:
 - the relevant statutory requirements (including any relevant approval, licence or lease conditions);
 - any relevant limits or performance measures/criteria; and
 - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;
 - (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
 - (d) a program to monitor and report on the:
 - impacts and environmental performance of the project; and
 - effectiveness of any management measures (see (c) above);

- (e) a contingency plan to manage any unpredicted impacts and their consequences;
- (f) a program to investigate and implement ways to improve the environmental performance of the project over time;
- (g) a protocol for managing and reporting any:
 - incidents;
 - complaints;
 - non-compliances with statutory requirements; and
 - exceedances of the impact assessment criteria and/or performance criteria; and
- (h) a protocol for periodic review of the plan.

Note: The Director-General may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.

Annual Review

- 4. By the end of March each year, the Proponent shall review the environmental performance of the project to the satisfaction of the Director-General. This review must:
 - (a) describe the development (including rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;
 - (b) include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against:
 - the relevant statutory requirements, limits or performance measures/criteria;
 - the monitoring results of previous years; and
 - the relevant predictions in the EA;
 - (c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
 - (d) identify any trends in the monitoring data over the life of the project;
 - (e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and
 - (f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the project.

Revision of Strategies, Plans & Programs

- 5. Within 3 months of the submission of an:
 - (a) annual review under condition 4 above;
 - (b) incident report under condition 7 below;
 - (c) audit report under condition 9 below; and
 - (d) any modifications to this approval,the Proponent shall review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Director-General.

Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the project.

Community Consultative Committee

- 6. The Proponent shall establish and operate a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General. This CCC must be operated in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* (Department of Planning, 2007, or its latest version), and be operating within four months of the date of this approval.

Notes:

- *The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Proponent complies with this approval.*
- *In accordance with the guideline, the Committee should comprise an independent chair and appropriate representation from the Proponent, Council, recognised environmental groups and the local community.*

REPORTING

Incident Reporting

7. The Proponent shall notify, at the earliest opportunity, the Director-General and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the project, the Proponent shall notify the Director-General and any other relevant agencies as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent shall provide the Director-General and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

Regular Reporting

8. The Proponent shall provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval.

INDEPENDENT ENVIRONMENTAL AUDIT

9. Within a year of the commencement of development on site under this approval, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:
 - (a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;
 - (b) include consultation with the relevant agencies;
 - (c) assess the environmental performance of the project and whether it is complying with the relevant requirements in this approval and any relevant EPL and/or Water License (including any assessment, plan or program required under these approvals);
 - (d) review the adequacy of any approved strategy, plan or program required under the these approvals; and
 - (e) recommend measures or actions to improve the environmental performance of the project, and/or any assessment, plan or program required under these approvals.

Note: This audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Director-General.

10. Within 3 months of commissioning this audit, or as otherwise agreed by the Director-General, the Proponent shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.

ACCESS TO INFORMATION

11. Within 4 months of the date of this approval, the Proponent shall:
 - (a) make the following information publicly available on its website:
 - the EA;
 - current statutory approvals for the project;
 - approved strategies, plans or programs;
 - a summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval;
 - a complaints register, updated on a quarterly basis;
 - minutes of CCC meetings;
 - copies of any annual reviews (over the last 5 years);
 - any independent environmental audit, and the Proponent's response to the recommendations in any audit; and
 - any other matter required by the Director-General; and
 - (b) keep this information up-to-date, to the satisfaction of the Director-General.

APPENDIX 1 PROJECT SITE & LAND REFERENCE PLAN

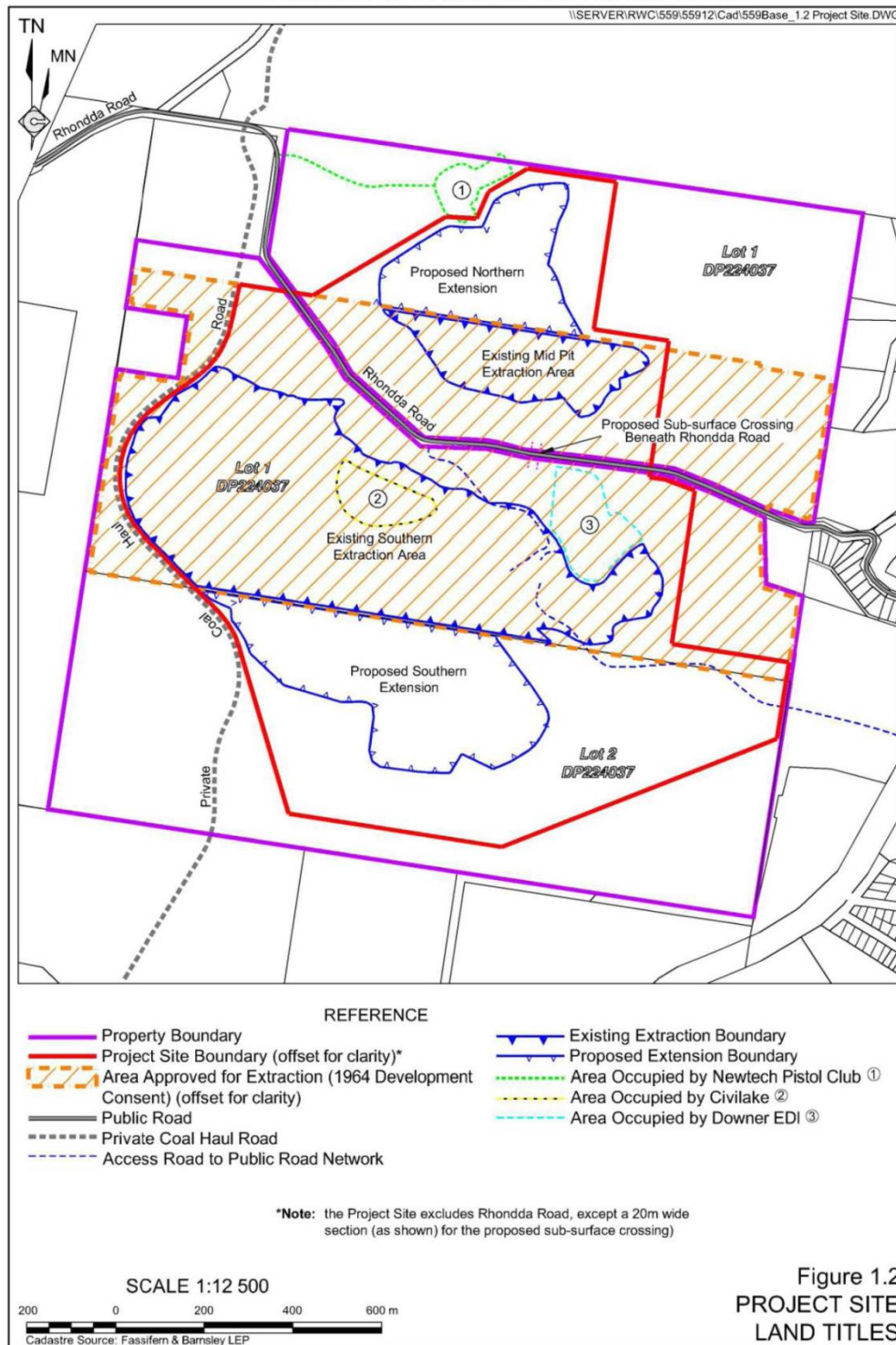


Figure 1: Property Descriptions (Lot and DP)

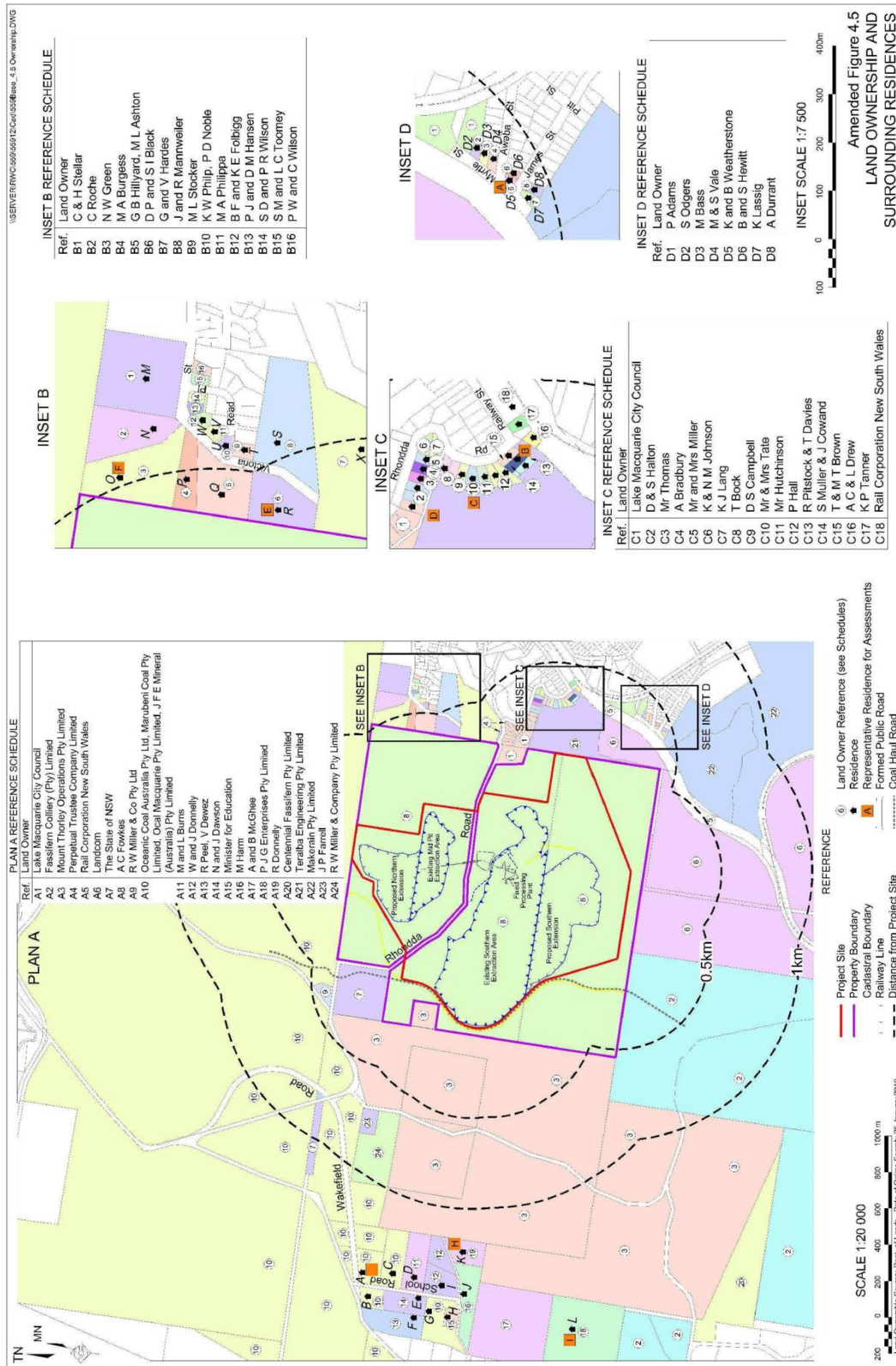


Figure 2: Site and Nearest Residential Receivers

APPENDIX 2 PROJECT LAYOUT PLANS

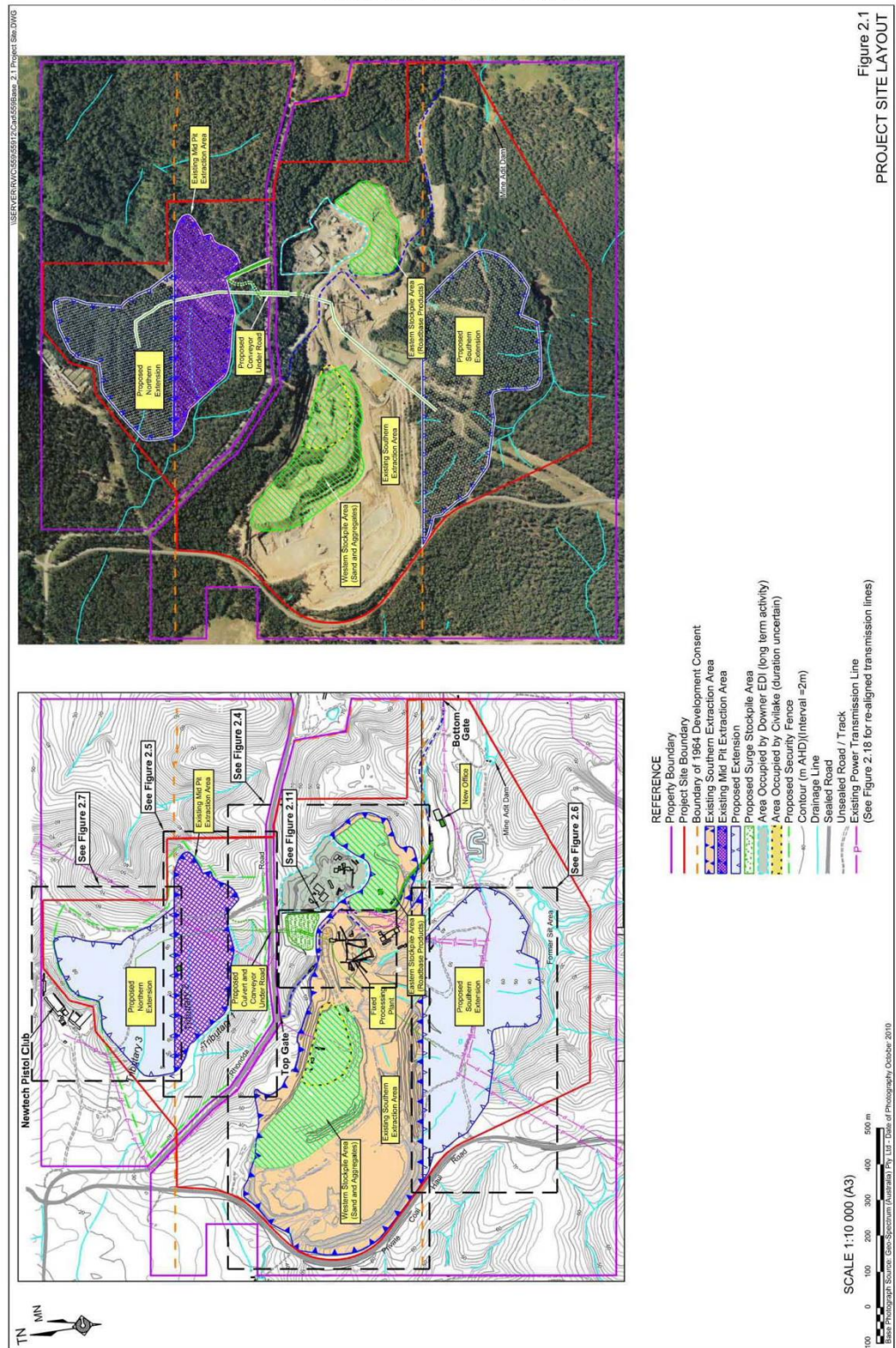


Figure 3: Extraction Area Dimensions and Site Features

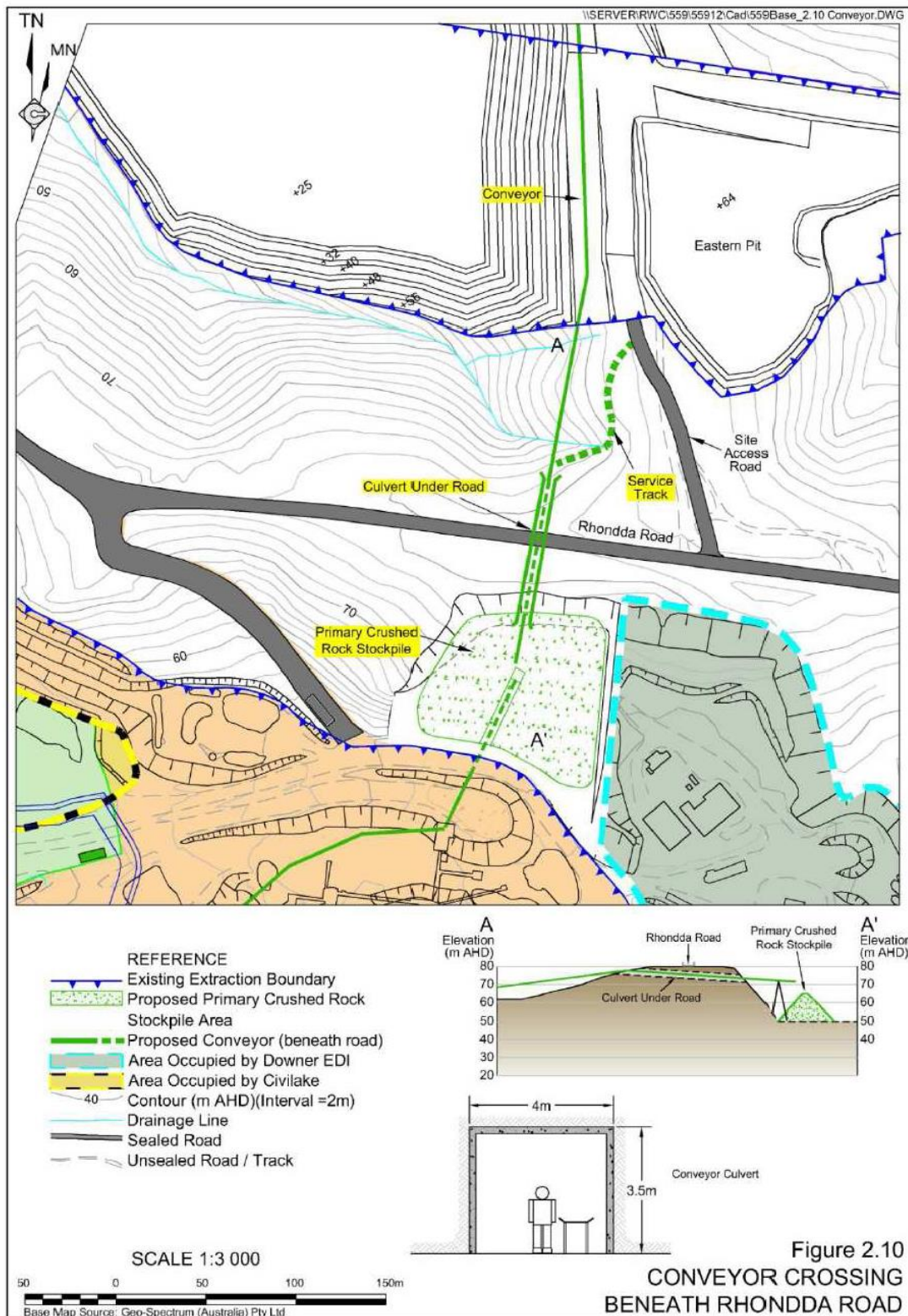


Figure 4: Conveyor crossing beneath Rhondda Road

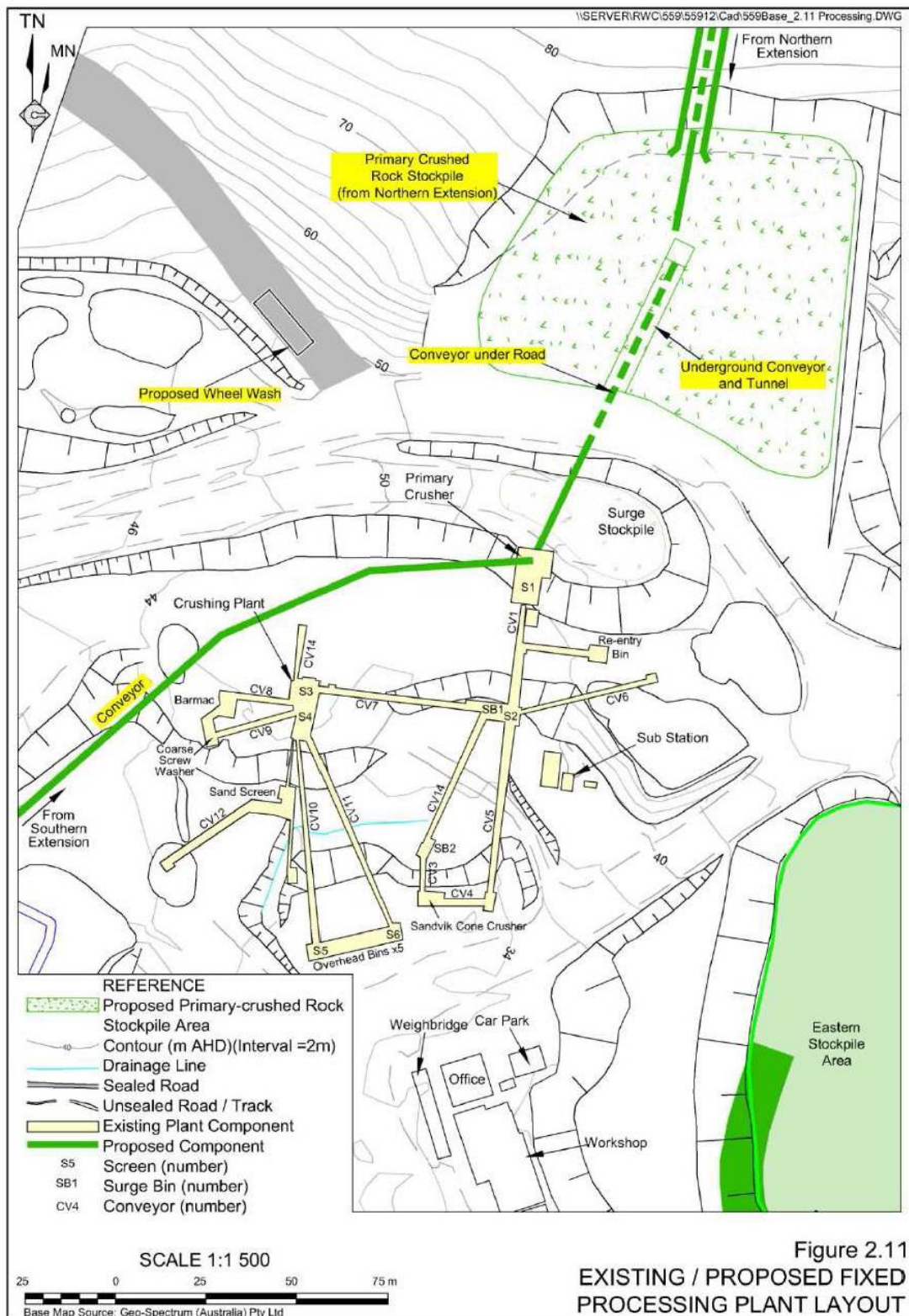


Figure 5: Existing / Proposed Fixed Processing Plant Layout

APPENDIX 3 STATEMENT OF COMMITMENTS

Desired Outcome	Action	Timing
1. Activities and Operations		
All approved activities are undertaken in the area(s) nominated on the approved plans and figures (unless moved slightly to avoid individual trees).	Clearly mark the boundary of each area of activity, i.e. the boundary of the Southern and Northern Extensions.	Prior to the commencement of quarrying operations.
2. Operating Hours		
Management of operations in accordance with the approved operating hours. (Note: No activities and operations are proposed on public holidays).	2.1 Undertake extraction and processing activities south of Rhondda Road between 6:00am and 8:00pm on Monday to Fridays and 6:00am to 2:00pm on Saturdays.	During operations.
	2.2 Undertake extraction and processing activities north of Rhondda Road between 7:00am and 8:00pm on Monday to Friday and 7:00am and 2:00pm on Saturdays.	During operations.
	2.3 Undertake product transportation activities 24hrs/day between 4:00am Monday to 6:00pm Saturday.	During operations.
	2.4 Undertake all blasts between 10:00am and 4:00pm Monday to Friday.	During operations.
	2.5 Restrict activities undertaken outside the hours identified in Commitments 2.1 and 2.2 to routine, low noise activities such as oil changes, minor welding and servicing of equipment.	During operations.
	2.6 The nominated operating hours above in Action 2.3 do not apply to the delivery of material if that material is requested by police, any emergency service or Council. Details of the circumstances of these requests would be provided to the Director-General and EPA within a reasonable period of the request(s).	During operations.
3. Waste Management		
Minimisation of general waste creation and maximisation of recycling, wherever possible.	3.1 Place all paper and general wastes originating from the site office, together with routine maintenance consumables from the daily servicing of equipment in garbage bins located adjacent to the site office and workshop.	Ongoing.
	3.2 Segregate waste into recyclables and non-recyclable materials for removal by a licensed contractor.	Ongoing.
Minimisation of the potential risk of environmental impact due to waste creation, storage and/or disposal.	3.3 Organise the regular collection of industrial wastes.	Monthly or as needs basis.
	3.4 Store waste oils and greases within the workshop area in either self-bunding containers or within suitably contained areas.	Ongoing.

Desired Outcome	Action	Timing
4. Security and Safety		
All members of the public are safe when near Teralba Quarry.	4.1 Construct and maintain the perimeter fence around the Northern Extension.	Prior to commencement of clearing works.
	4.2 Maintain lockable gates at all entry/exit points. Lock gates outside of operational hours.	Ongoing.
	4.3 Erect security warning signs at strategic locations around and within the Project Site. The signs would identify the presence of earthmoving equipment, deep excavations and steep slopes.	Ongoing.
	4.4 Continue to induct employees in safe working practices and hold regular follow-up safety meetings and reviews.	Ongoing.
	4.5 Install bunds along the margins of all internal haul roads where those roads are positioned adjacent to steep slopes, adjacent to the boundary of the extraction area and adjacent to all other steep slopes.	Ongoing.
	4.6 Ensure all trucks from the Project Site are driven in a safe and courteous manner in accordance with Metromix's Driver Code of Conduct.	Ongoing.
5. Rehabilitation and Biodiversity Offset Management		
Create a stable final landform able to support a range of final land uses focused upon ecological corridors and ongoing industrial uses.	5.1 Retain 142.6ha of existing vegetation and remnant understorey vegetation as a legally protected biodiversity offset.	In perpetuity
Maintenance of long term ecological values within the Final Biodiversity Offset	5.2 Ensure that 142.6ha of retained vegetation within the Biodiversity Offset is legally protected through a Conservation Agreement pursuant to Section 69B of the <i>National Parks and Wildlife Act 1974</i> .	By 30 June 2014.
6. Groundwater		
Prevention of groundwater contamination.	6.1 Securely store all hydrocarbon products within designated and bunded areas – see Action 16.11.	Ongoing
	6.2 Refuel and maintain all earthmoving equipment within designated areas – see Action 16.11.	Ongoing
	6.3 Prepare a Groundwater Management Plan, including trigger levels for actions – see Action 16.3.	Ongoing
	6.4 Prepare a Spill Management Plan to address potentially significant hydrocarbon spills – see Action 16.11.	Ongoing
Continuous monitoring of groundwater throughout the life of the Project.	6.5 Develop and implement a monitoring program as part of the Soil and Water Management Plan.	Within 6 months of the receipt of project approval.

Desired Outcome	Action	Timing
6. Groundwater (Cont'd)		
Continuous monitoring of groundwater throughout the life of the Project. (Cont'd)	6.6 Monitor water quality at the Mine Adit Dam for pH levels, electrical conductivity, suspended solids, and oil and grease.	Monthly (subject to review).
	6.7 Record flows/discharges from the Mine Adit Dam as well as quarry water usage.	Continuous.
	6.8 Review monitoring results to identify trends which may indicate impacts and allow mitigation measures to be implemented, if required.	Annually.
	6.9 Ensure all monitoring data is incorporated into each Annual Environment Management Report for the Teralba Quarry.	Annually.
7. Surface Water		
Maintenance of surface water quality.	7.1 Conduct site clearing activities in accordance with the Blue Book (Landcom, 2004) guidelines for erosion and sediment control.	Ongoing.
	7.2 Establish a regular monitoring program to review the effectiveness of all erosion and sediment control mitigation measures.	Prior to commencement of clearing works.
	7.3 Incorporate an update of the current Water Management Plan (GHD, 2007) into the Soil and Water Management Plan to take into account the proposed Southern and Northern Extensions.	Within 6 months of date of project approval.
	7.4 Ensuring any off-site discharge is monitored and reported in accordance with Environment Protection Licence 536.	As Required.
	7.5 Conduct site clearing activities in accordance with the Blue Book (Landcom, 2004) guidelines for erosion and sediment control.	Ongoing.
	7.6 Establish a regular monitoring program to review the effectiveness of all erosion and sediment control mitigation measures.	Prior to commencement of clearing works.
	7.7 Incorporate an update of the current Water Management Plan (GHD, 2007) into the Soil and Water Management Plan to take into account the proposed Southern and Northern Extensions.	Within 6 months of date of project approval.
	7.8 Ensuring any off-site discharge is monitored and reported in accordance with Environment Protection Licence 536.	As Required.
Capture of sediment-laden water flows from project-related disturbance.	7.9 Provide sufficient storage during all stages of works to prevent discharge off-site of sediment-laden water in accordance with the Blue Book (Landcom, 2004) guidelines for sediment retention dams.	Ongoing.
	7.10 Inspect all sediment dams and maintain as necessary (keep records).	Monthly or following rainfall exceeding 100mm in 2 days.

Desired Outcome	Action	Timing
7. Surface Water (Cont'd)		
Capture of sediment-laden water flows from project-related disturbance. (Cont'd)	7.11 Remove accumulated sediment from sediment dams when storage capacity reduced by 25% - document activity in maintenance records.	Following routine inspection.
Prevention of hydrocarbon contamination of water on the Project Site.	7.12 Securely store all hydrocarbon products within designated and bunded areas.	Ongoing.
	7.13 Refuel all earthmoving equipment within designated areas (with spill control).	Ongoing.
Separation of groundwater and surface water flows	7.14 Construct a drain from Dam B directly to the nearby watercourse to divert surface flows away from the Mine Adit Dam.	Within 3 months of Project Approval or following advice from NOW whichever occurs sooner.
8. Terrestrial Flora and Fauna		
Minimisation of impacts on flora and fauna within the Project Site.	8.1 Prepare and implement a Site Vegetation Management Plan (as part of the overall Landscape Management Plan – see Commitment 16.7.	Within 12 months of the receipt of project approval.
	8.2 Clearly define the <i>Tetratheca juncea</i> sub-populations to be retained.	For the life of the Project.
	8.3 Continue the established rehabilitation practices in appropriate areas.	Ongoing.
	8.4 Retain the extracted topsoil and vegetation within the immediate area of <i>Tetratheca juncea</i> populations and relocate to easement locations.	During clearing.
	8.5 Transfer biomass directly from vegetation clearing operations to rehabilitation areas. If it is not possible to transfer directly, stockpile material.	Ongoing.
	8.6 Control noxious weeds at all times in accordance with a Weed Management Plan (to be incorporated into the site Vegetation Management Plan).	Following approval of Landscape Management Plan (see Action 16.7) and then ongoing.
	8.7 Install species specific nesting boxes for fauna species displaced following clearing activities, re 20 boxes for microbats, 20 boxes for Little Lorikeets and 30 boxes for Sugar Gliders.	Prior to commencement of activities in the Northern Extension.
9. Traffic and Transport		
Transport operations are undertaken with minimal impact on other road users and residents.	9.1 Limit laden quarry-related truck movement numbers through Teralba: — 9 per hour; and — 85 per day.	Ongoing.
	9.2 Ensure that no product trucks from Teralba Quarry travel eastward through Teralba between 6:00pm and 6:00am.	

Desired Outcome	Action	Timing
9. Traffic and Transport (Cont'd)		
	<p>9.3 Ensure all vehicles exiting the Project Site pass through a wheel-wash facility to remove dust generating material.</p> <p>9.4 Provide a contribution to Lake Macquarie City Council during the ongoing life of the quarry if a suitable project approval is granted.</p> <p>9.5 Prepare, implement and enforce 'Drivers Code of Conduct' addressing:</p> <ul style="list-style-type: none"> – times that trucks can operate, especially through Teralba – speed limits; – duty of care to other drivers and pedestrians; – complaints procedure; – covering loads; and – avoidance of exhaust brakes. 	<p>Prior to removal of product from within the extensions.</p> <p>Quarterly.</p> <p>Prepare within 4 months of receipt of project approval.</p>
Transport operations are undertaken with minimal impact on other road users and residents. (Cont'd)	<p>9.6 Undertake all transport activities in accordance with the project approval and Environment Protection Licence 536.</p> <p>9.7 Ensure that only trucks owned by Metromix, or its shareholders and those of accredited contractors using airbag suspension and other noise controls are used to transport products between 10:00pm and 6:00am.</p> <p>9.8 Ensure that all project-related vehicles are regularly serviced to ensure engine efficiencies are maintained at a standard that limits truck noise.</p>	Ongoing.
10. Noise and Vibration		
The Project is designed to minimise and/or mitigate noise emissions received at surrounding residences and other sensitive receivers.	<p>10.1 Ensure all mobile earthmoving equipment used on site is not fitted with high-frequency reversing alarms and is regularly serviced.</p> <p>10.2 Ensure all earthmoving equipment used on site (including temporary equipment) have sound power levels and frequency spectra consistent with those nominated in Section 6 of Spectrum Acoustics (2011).</p>	<p>Ongoing.</p> <p>When new or temporary equipment is brought to site.</p>
All activities are undertaken in such a manner as to reduce the noise level generated and minimise impacts on surrounding landholders and/or residents.	<p>10.3 Ensure that the eastern side of the Southern Extension is extracted in such a manner that the active extraction face is retained on the eastern face thereby providing a topographic barrier between operating earthmoving equipment and residences to the east.</p> <p>10.4 Construct a 5m high bund on the eastern edge of the Mid Pit Extraction Area.</p>	<p>Ongoing throughout the extraction operations in the Southern Extension area.</p> <p>During Mid Pit Extraction operations.</p>

Desired Outcome	Action	Timing
10. Noise and Vibration (Cont'd)		
All activities are undertaken in such a manner as to reduce the noise level generated and minimise impacts on surrounding landholders and/or residents. (Cont'd)	10.5 Limit transportation noise by ensuring: <ul style="list-style-type: none"> – all transport vehicles comply with the RTA's noise limits at all times; – only trucks fitted with airbag suspension be used to transport products from the quarry between 10:00pm and 6:00am; and – drivers comply with Code of Conduct. 	Ongoing
	10.6 Commission a noise monitoring program that comprises: <ul style="list-style-type: none"> – attended noise monitoring for the Southern and Northern Extensions; and – General noise monitoring. 	Ongoing
	10.7 Include a summary of all noise monitoring results in the AEMR.	Within the first 3 months of operations in the Southern and Northern Extensions
	10.8 Ensure all trucks departing the Project Site via the bottom gate travel at speeds <15km/hr.	Biannually for the first year of operation in the Southern and Northern Extensions, and further monitoring when substantiated complaints are filed.
	10.9 Review blast designs and modify, if required.	Annually.
		Ongoing.
		When blasting within 500m of any residence.
11. Air Quality		
Site activities are undertaken without exceeding DECCW air quality criteria or goals.	11.1 Minimise clearing ahead of extraction activities	Ongoing.
	11.2 Minimise the construction of minor roads and access tracks for soil stripping, extraction operations and rehabilitation.	Ongoing.
	11.3 Operate a water truck to manage dust suppression during periods of extended dry weather and/or high winds, or when dust nuisance has the potential to occur as a result of quarrying activities.	Ongoing.
	11.4 Stockpile material in sheltered locations away from sensitive receptors	Ongoing.
	11.5 Shield and/or suppress dust on conveyors and transfer points.	Ongoing.

Desired Outcome	Action	Timing
11. Air Quality (Cont'd)		
Site activities are undertaken without exceeding DECCW air quality criteria or goals. (Cont'd)	11.6 Limit internal road dust lift off by: <ul style="list-style-type: none"> – surfacing (and grading local) roads with appropriate materials; – enforcing a 30km/hr speed limit on all internal roads; – limiting load sizes to ensure that product does not extend over truck sidewalls; and – avoiding spillage during truck loading. 	Ongoing.
	11.7 Minimise dump heights from trucks, front-end loaders and conveyors.	Ongoing.
	11.8 Schedule blasts so that they do not occur during high wind situations.	Ongoing.
	11.9 Cease or modify activities on dry windy days when dust plumes are visible.	Ongoing.
	11.10 Water exposed areas not covered by gravel under dry and windy conditions when dust plumes are visible.	Ongoing.
	11.11 Adopt a complaints management system where all complaints are dealt with through investigation and implementation of corrective treatments.	Ongoing.
	11.12 Minimise truck queuing, unnecessary idling of trucks and unnecessary trips through logistical planning, where possible.	Ongoing.
	11.13 Ensure the on-site wheel wash reduces mud tracking along Railway Street.	Ongoing.
	11.14 Remove any mud tracking on Rhondda Road as a result of quarry movements.	Ongoing.
	11.15 Prepare and implement a Dust Management Plan for the quarry.	Within 4 months of the receipt of project approval.
Reduce the impact of Greenhouse Gas emissions from project related activities.	11.16 Minimise the impacts of greenhouse gases relating from diesel consumption by: <ul style="list-style-type: none"> – minimising the use of haul trucks through use of an overland conveyor; – reduce vehicle idling time; – maintaining optimum tyre pressures; and – the optimisation of haul routes to reduce transportation distance from the extraction areas. 	Ongoing.

Desired Outcome	Action	Timing
11. Air Quality (Cont'd)		
Record and monitor the local environment regarding dust impacts.	11.17 Minimise the impacts of greenhouse gases relating from electricity consumption by: <ul style="list-style-type: none"> – ensuring the most efficient crusher and other processing plant technology is used; – regularly inspecting the daily operations of lighting; and – implementing solar-powered lighting, where possible. 	Ongoing.
	11.18 Continue to monitor dust impacts through; <ul style="list-style-type: none"> – the existing five deposited dust gauges; and – on-site meteorological monitoring to record relevant parameters. 	Ongoing.
12. Visibility		
Reduce the impact of the Project on the visual amenity of private and public vantage points.	12.1 Ensure all vegetation is maintained outside the Southern and Northern Extensions to provide long term shielding.	Ongoing.
	12.2 Sequence extraction activities in the Southern Extension to limit exposure of western faces until vegetation is well established.	Years 3 to 11 (approx).
	12.3 Progressively establish vegetation on extraction faces at 50mAHD and above in western section of the Southern Extension.	Years 3 to 11 (approx).
	12.4 Advance extraction in the eastern section of the Southern Extension in strips parallel to north-south faces.	Years 22 to 30 (approx).
	12.5 Include Annual photographs of the progressive rehabilitation of quarry benches in each AEMR.	
13. Heritage		
Provide appropriate protection to existing and future identified Aboriginal artefacts.	13.1 Halt all works in the immediate area if cultural objects are found and contact a suitably qualified archaeologist and Aboriginal community representative.	Ongoing.
	13.2 Halt all works in the immediate area if human remains are found and contact NSW Police, Aboriginal community representative and OEH.	Ongoing.
	13.3 Maintain reasonable efforts to avoid impacts to Aboriginal cultural heritage values at all stages of the development works	Ongoing.
	13.4 Invite representatives of Local Aboriginal stakeholders to monitor initial ground disturbance activities.	Prior to soil stripping campaigns.
	13.5 Develop an Aboriginal Culture Educational Program for the induction of all personnel and contractors involved in the construction activities on site. Records are to be kept of which staff/contractors were inducted and when for the duration of the project. The program would be developed and implemented in collaboration with the local Aboriginal community.	Prior to first soil stripping campaign and then ongoing.

Desired Outcome	Action	Timing
13. Heritage (Cont'd)		
Provide appropriate protection to any non-Aboriginal artefacts identified in operational areas.	13.6 Halt all works in the immediate area if any non-Aboriginal artefacts are found and notify the Heritage Council of NSW.	Ongoing
14. Soils		
Prevent excessive soil deterioration during stripping and transportation.	14.1 Undertake soil stripping within slightly moist condition and avoid excessively wet or dry conditions. 14.2 Place stripped soil directly onto reshaped overburden or dedicated stockpile area. 14.3 Remove soil through grading or pushing soil into windrows with graders or dozers for later collection for loading into rear dump trucks by front-end loaders.	During soil stripping operations. During soil stripping operations. During stripping and transport operations.
Retention of soil viability until use in rehabilitation.	14.4 Leave the surface of soil stockpiles in as coarsely structured a condition as possible in order to promote infiltration and minimise erosion until vegetation is established. 14.5 Maintain a maximum stockpile height of 3m. Clayey soils would be stored in lower stockpiles for shorter periods of time compared to coarser textured sandy soils. 14.6 Seed soil stockpiles with sterile cover crop (and limited fertiliser) as soon as possible where stockpiling is planned. 14.7 Maintain an inventory of available soil to ensure adequate topsoil materials are available for planned rehabilitation activities. 14.8 Assess soil stockpiles for weed infestation to determine if stockpiles require weed removal applications before being re-spread onto reshaped overburden.	Immediately following stockpile construction. During staged Rehabilitation stages. Immediately following stockpile construction. Ongoing. During staged Rehabilitation stages.
Achieve a good soil cover for long term rehabilitation.	14.9 Spread topsoil to a minimum depth range of 0.1 m (steep slopes) to 0.2m (flatter areas). Specific topsoil respreading depths for different post mining landform elements would be specified in the Landscape Management Plan.	During staged Rehabilitation stages.
15. Bushfire Hazard		
Avoidance of any fires on site, particularly in native vegetation.	15.1 Adopt appropriate controls during re-fuelling. 15.2 Ensure fire extinguishers are fitted to all site vehicles. 15.3 Incorporate a Bushfire Management Plan in the overall Emergency Response Plan for the quarry.	Ongoing. Ongoing. Within 6 months of the receipt of project approval.

Desired Outcome	Action	Timing
16. Documentation and Further Approvals		
To provide site personnel with the necessary guidance on the expectations of Metromix management and the NSW Government and LMCC to achieve the required level of environmental performance.	16.1 Environmental Management Strategy.	Within 6 months of the receipt of project approval.
	16.2 Environmental Management Plan (EMP). Focus on the next 5 years.	Within 6 months of receipt of project approval.
	16.3 Soil and Water Management Plan. (Incorporating management, monitoring and contingency plans for soils, surface water and groundwater).	Within 6 months of the receipt of project approval.
	16.4 Noise and Blast Management Plan. (Incorporating a blast and noise monitoring component.)	Within 4 months of the receipt of project approval.
	16.5 Air Quality Management Plan. (Incorporating an air quality monitoring component.)	Within 4 months of receipt of project approval.
	16.6 Transport Management Plan.	Within 4 months of receipt of project approval.
	16.7 Landscape Management Plan. (Incorporating a Vegetation Management Plan for site rehabilitation and the on-site Biodiversity offset.)	Within 12 months of the receipt of project approval.
	16.8 Extraction Management Plan (for operations within 5 vertical metres of the Great North Coal Seam).	Prior to commencing any extraction within 5 vertical metres of the Great Northern Coal Seam.
	16.9 Heritage Management Plan.	Within 4 months of the receipt of project approval.
	16.10 Annual Environmental Management Report (AEMR).	Annually (by 31 March each year covering the previous calendar month) .
	16.11 Hydrocarbon Management Plan. (Incorporating the storage and use of fuel and spill management.)	Within 6 months of receipt of approval.
	16.12 Annual Production Statistics to the DTIRIS (Division of Resources and Energy).	Annually (by 31 July).
	16.13 Geotechnical Assessments and relevant design drawings for site structures and buildings (for submission to the Mines Subsidence Board).	Prior to construction of site infrastructure and buildings.

Desired Outcome	Action	Timing
16. Documentation and Further Approvals (Cont'd)		
Ensure planning is undertaken sufficiently ahead of quarry closure to achieve a smooth transition to the subsequent land uses	16.14 Prepare a Quarry Closure and Final Land Use Plans for the land within the Project Site that is to be developed for purposes other than nature conservation. The Plans would be prepared in consultation with the Lower Macquarie City Council	3 years prior to cessation of extraction north of Rhondda Road (approximately 2031) and south of Rhondda Road (approximately 2039).

APPENDIX 4 TRANSPORT ROUTES

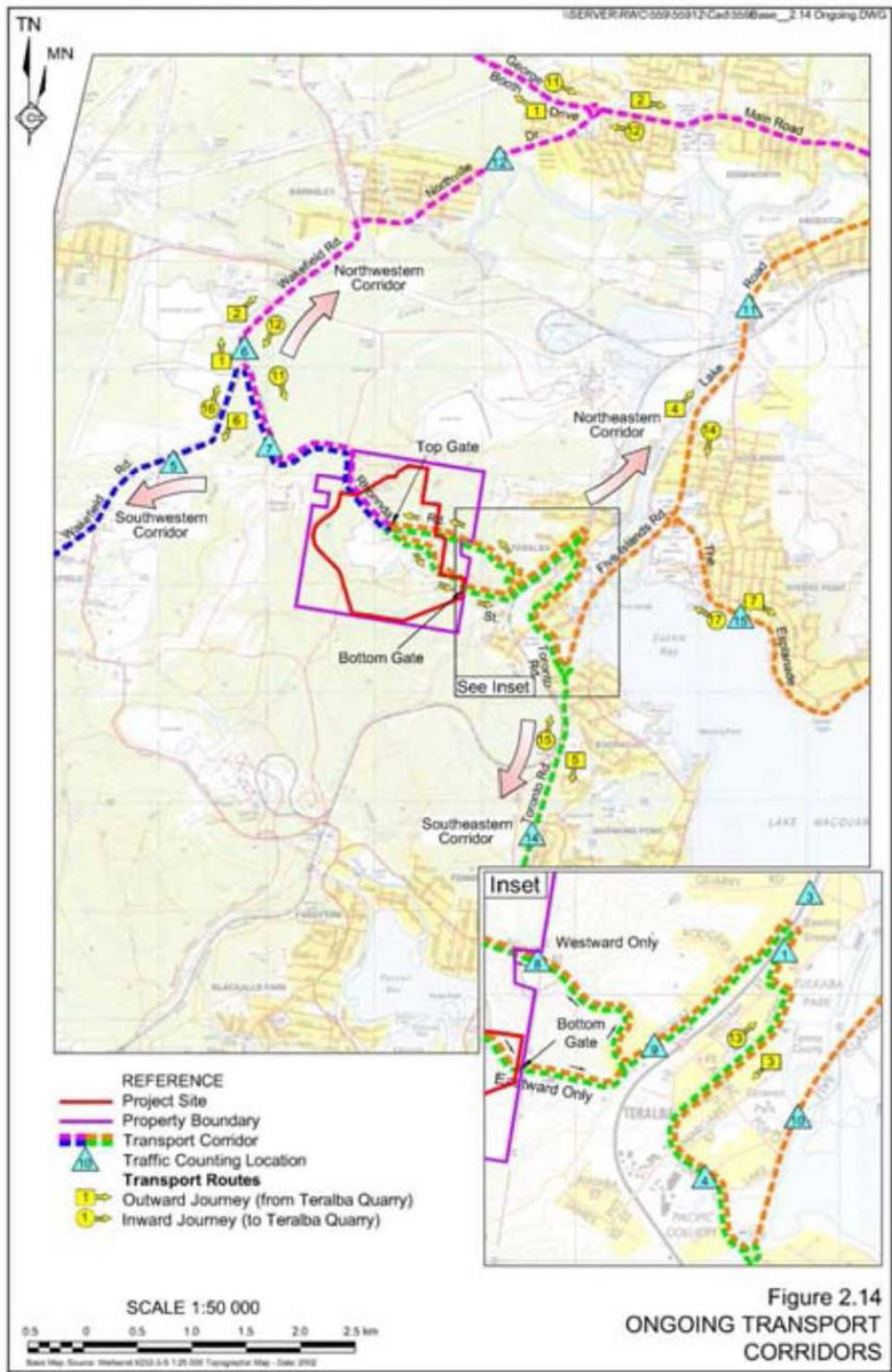


Figure 6: Transport Routes

APPENDIX 5
BIODIVERSITY OFFSET STRATEGY

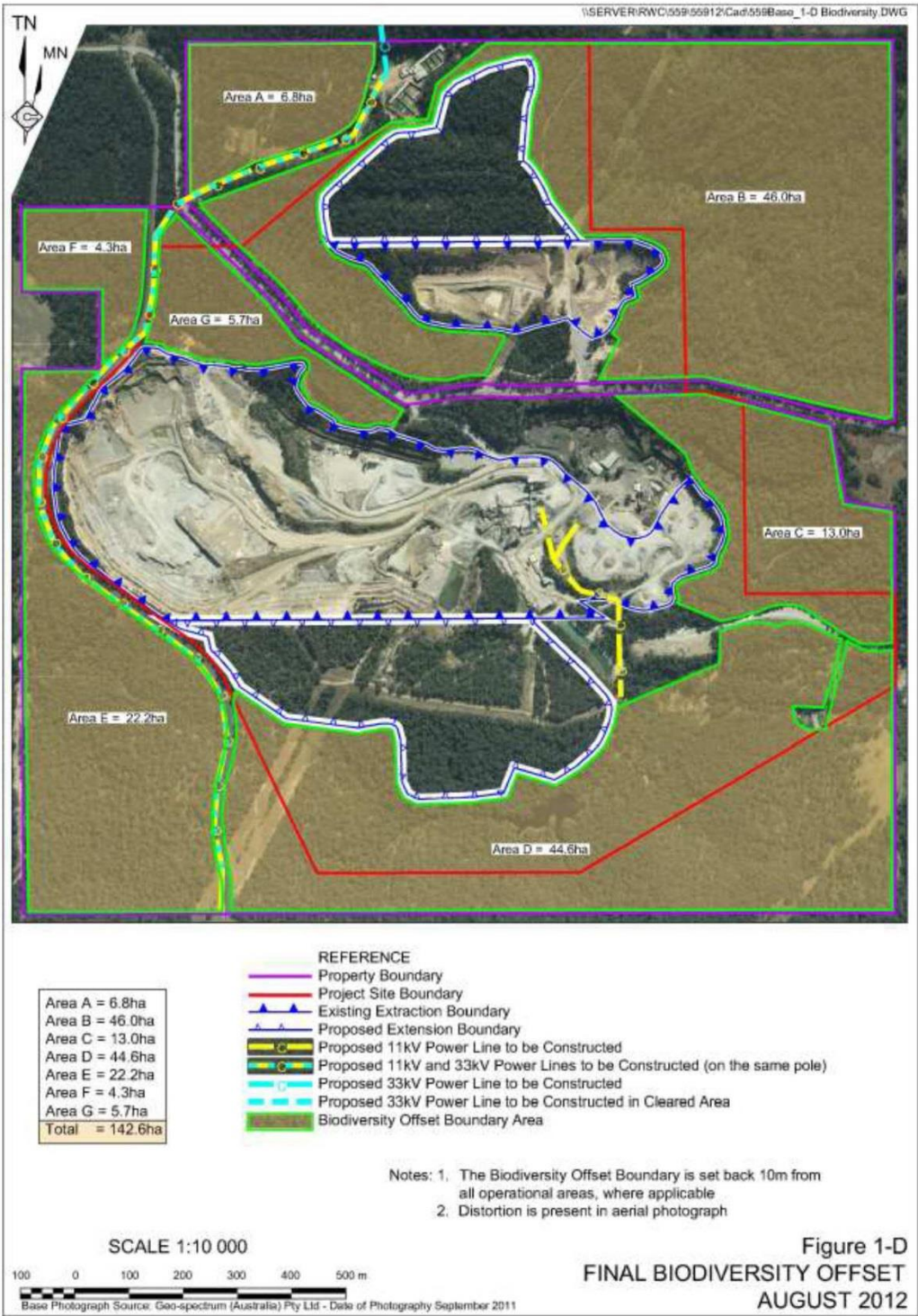


Figure 7: Biodiversity Offset

APPENDIX 6

REHABILITATION STRATEGY

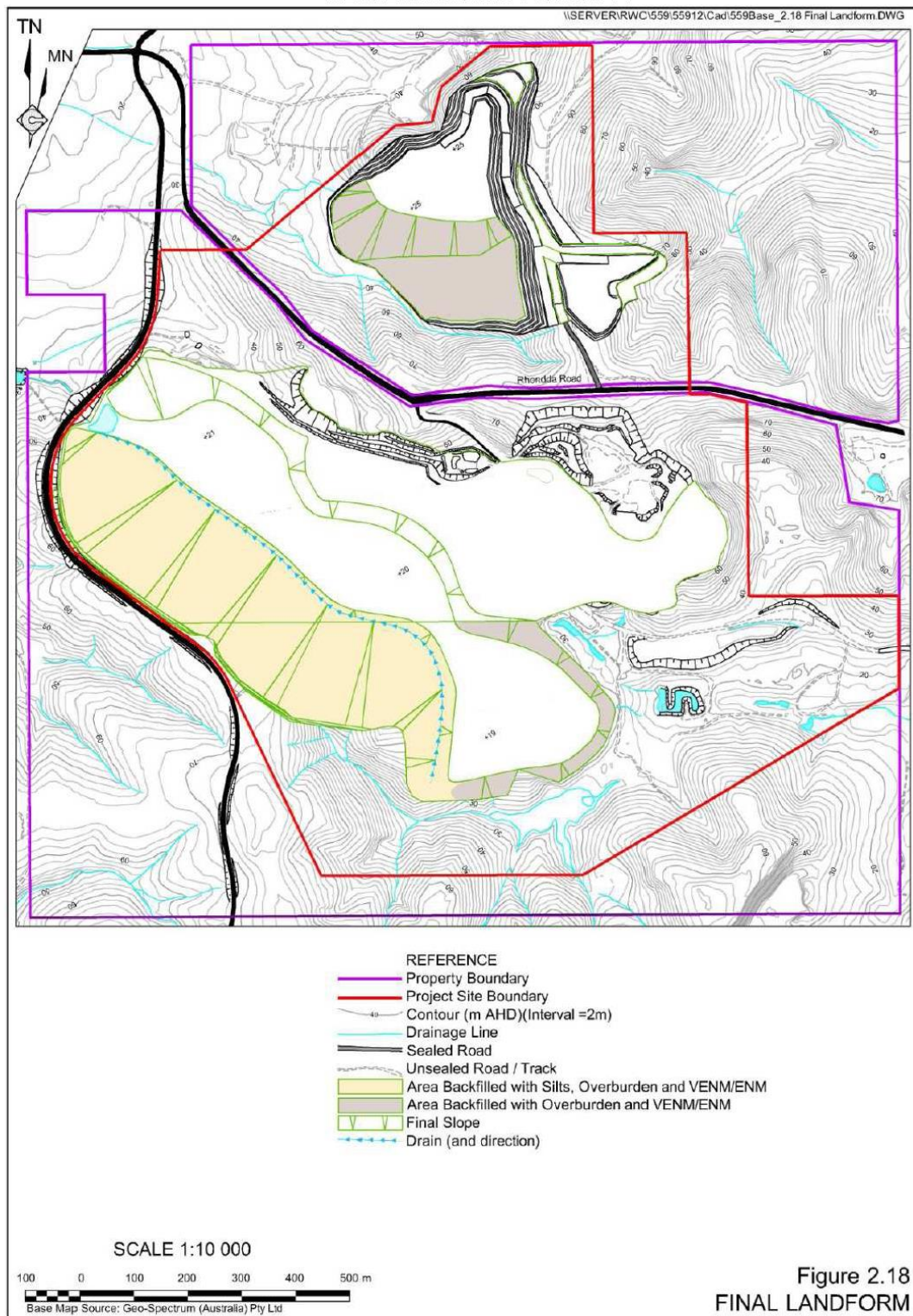


Figure 8: Indicative Final Landform

Appendix 2

Monitoring Data and Records

(Total No. of pages including blank pages = 98)

2016-2017 Annual Return for Extractive Materials.....A2-3

2017 Transportation MovementsA2-5

2017 Air Quality Monitoring.....A2-65

2017 Surface Water MonitoringA2-67

2017 Daily Rainfall MonitoringA2-73

2017 Noise Monitoring ReportA2-74

This page has intentionally been left blank

emailed
8.25 9/10/17



Planning &
Environment
Resources & Geoscience

Form S 1

RETURN FOR EXTRACTIVE MATERIALS: YEAR ENDED 30 JUNE 2017

Quote RIMS ID in all correspondence

Quarry Id: 1118 Rims ID: 400066

Operators Name: METROMIX PTY LTD
Address: PO BOX 1295
PARRAMATTA
NSW 2124

Email: bills@metromix.com.au

Quarry Name: TERALBA QUARRY
Quarry Location: RHONDDA RD

Inquiries please telephone:
(02) 4931 6435
Completed or Nil Returns
Fax - (02) 4931 6776
Email -
mineral.royalty@industry.nsw.gov.au
Postal Address (see address below)

Please amend name, postal
address and location of mine or
quarry if incorrect or incomplete

The return should be completed and forwarded to the **STATISTICAL OFFICER, ROYALTY & ADVISORY SERVICES, NSW PLANNING & ENVIRONMENT, PO BOX 344 HUNTER REGION MAIL CENTRE NSW 2310** on or before **31 October 2017**. If completion of the return is unavoidably delayed, an application for extension of time should be requested **before** the due date. If no work was done during the year, a **NIL** return must be forwarded.

The return should relate to the **above quarrying establishment**, and should cover the operations of quarrying and treatment (such as crushing, screening, washing etc.) carried out at or near the quarry. A return is required even if the operations are solely of a developmental nature, and whether the area being worked is held under a mining title or otherwise.

Zane West, Royalties and Advisory Services Manager

Please complete the following information to assist in identifying the location of the Quarry

Typical Geology conglomerate
Nearest Town to Quarry Teralba
Local Council Name Lake Macquarie
Deposited Plan and Lot Number/s of Quarry Lots 182 DP 224037
Email Address of Operator Bills@metromix.com.au
Name of Owner or Licensee Metromix
Postal Address of Licensee PO Box 1295 Parramatta NSW 2124
Licence/Lease Number/s (if any)
From Mineral Resources NSW (Industry & Investment NSW) N/A
From Department of Lands or other Department N/A

If any output was obtained from land NOT held under licence from the above Departments, state the Name/s and Address/es of the Owners of the land Graem Kenby - 25 Robinson St, Spalding WA 6530

- To the best of my knowledge, the particulars which have been entered in this return are correct and no blank spaces have been left where figures should have been inserted.
- SIGNATURE of PROPRIETOR or MANAGER W.S.H. DATE 3/10/17
- PERSON to be contacted if queries arise regarding this return William Sanderson
- NAME (Block letters) William Sanderson Telephone 0418 479 087



SALES During 2016-2017

Production information may be published in aggregated form for statistical reporting. However, production data for individual operations is kept strictly confidential.

Product	Description	Quantity Tonnes
Virgin Materials		
• Crushed Coarse Aggregates		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm		
Under 5mm		
Natural Sand		
Manufactured Sand		
Prepared Road Base & Sub Base		
Other Unprocessed Materials		
Recycled Materials		
• Crushed Coarse Aggregates		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm		
Under 5mm		
Natural Sand		
Manufactured Sand		
Prepared Road Base & Sub Base		6129
Other Unprocessed Materials		
• River Gravel	Conglomerate	
Over 30mm		127124
5mm to 30mm		349343
Under 5mm		
• Construction Sand	Excluding Industrial	161258
• Industrial Sand		
Foundry, Moulding		
Glass		
Other (Specify)		
• Dimension Stone	Building, Ornamental, Monumental	
Quarried in Blocks		
Quarried in Slabs		
• Decorative Aggregate	Including Terrazzo	
• Loam	Soil for Topdressing, Garden soil, Horticultural purposes)	/
• TOTAL SITE PRODUCTION		687725
• Gross Value (\$) of all Sales		16039825
• Type of Material	Conglomerate	
• Number of Full-Time Equivalent (FTE) Employees	Employees: 17	Contractors: 2

Annual Return Form

Table 2E: Total Number of Laden Trucks

TERALBA QUARRY		Month:		Jan-17		
		Daily Total		Westwards Daily		Eastwards Daily
Limits		326		241		85
Actuals						
1		-		-		-
2		-		-		-
3		37		9		28
4		23		13		10
5		21		11		10
6		19		6		13
7		1		-		1
8		-		-		-
9		54		33		21
10		81		52		29
11		61		32		29
12		77		43		34
13		65		36		29
14		14		9		5
15		-		-		-
16		53		32		21
17		81		52		29
18		65		38		27
19		80		42		38
20		53		25		28
21		19		16		3
22		-		-		-
23		102		65		37
24		82		55		27
25		59		42		17
26		-		-		-
27		26		20		6
28		8		5		3
29		-		-		-
30		54		33		21
31		74		41		33

Table 2A: Number of Laden Trucks - 6:00pm to 5:00am

TERALBA QUARRY			Month:		Jan-17			
		Daily Total		Westwards			Eastwards	
				Daily	Max Hourly		Daily	Max Hourly
Limits		66		66	6		0	0
Actuals								
1		-		-	-		-	-
2		-		-	-		-	-
3		-		-	-		-	-
4		-		-	-		-	-
5		-		-	-		-	-
6		-					-	-
7		-					-	-
8		-					-	-
9		-					-	-
10		3		3	3		-	-
11		3		3	3		-	-
12		2		2	2		-	-
13		3		3	3		-	-
14		3		3	3		-	-
15		-		-	-		-	-
16		1		1	1		-	-
17		6		6	6		-	-
18		6		6	4		-	-
19		6		6	3		-	-
20		6		6	3		-	-
21		5		5	5		-	-
22		-		-	-		-	-
23		3		3	2		-	-
24		8		8	5		-	-
25		9		9	5		-	-
26		-		-	-		-	-
27		6		6	5		-	-
28		3		1	3		-	-
29		-		-	-		-	-
30		5		5	5		-	-
31		2		2	2		-	-

Table 2B: Number of Laden Trucks - 5:00am to 6:00am

TERALBA QUARRY		Month:		Jan-17
		Westwards		Eastwards
		Max Hourly		Max Hourly
Limits*		12		0
Actuals				
1		-		-
2		-		-
3		-		-
4		-		-
5		-		-
6		-		-
7		-		-
8		-		-
9		3		-
10		-		-
11		-		-
12		1		-
13		-		-
14		-		-
15		-		-
16		3		-
17		-		-
18		-		-
19		-		-
20		-		-
21		-		-
22		-		-
23		4		-
24		1		-
25		1		-
26		-		-
27		-		-
28		-		-
29		-		-
30		3		-
31		6		-

* Condition 2 (9)

Table 2C: Number of Laden Trucks - 6:00am to 7:00am

TERALBA QUARRY		Month:		Jan-17	
		Westwards**		Eastwards**	
		Max Hourly		Max Hourly	
Limits*		28		8	
Actuals					
1		-		-	
2		-		-	
3		-		2	
4		2		2	
5		2		1	
6		-		2	
7		-		-	
8		-		-	
9		3		1	
10		3		-	
11		4		1	
12		1		1	
13		2		3	
14		-		-	
15		-		-	
16		4		-	
17		4		1	
18		4		3	
19		9		1	
20		-		-	
21		3		-	
22		-		-	
23		7		1	
24		5		3	
25		4		1	
26		-		-	
27		3			
28		-		1	
29		-		-	
30		5		2	
31		4		2	

* Condition 2 (9)

** Combined Maximum hourly No. of laden trucks = 28

Table 2D: Number of Laden Trucks - 7:00am to 6pm

TERALBA QUARRY			Month:		Jan-17	
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		305	220	20	85	8
Actuals						
1		-	-	-	-	-
2		-	-	-	-	-
3		35	9	3	26	5
4		19	11	2	8	2
5		18	9	2	9	3
6		17	6	2	11	3
7		1	-	-	1	1
8		-	-	-	-	-
9		47	27	8	20	4
10		75	46	8	29	6
11		53	25	6	28	5
12		72	39	7	33	6
13		57	31	7	26	4
14		11	6	2	5	2
15		-	-	-	-	-
16		45	24	5	21	4
17		70	42	7	28	5
18		52	28	5	24	6
19		64	27	7	37	7
20		47	19	5	28	6
21		11	8	2	3	1
22		-	-	-	-	-
23		87	51	8	36	6
24		65	41	8	24	6
25		44	28	6	16	4
26		-	-	-	-	-
27		17	11	3	6	2
28		4	2	1	2	1
29		-	-	-	-	-
30		39	20	5	19	3
31		60	29	5	31	6

** PLEASE NOTE: The Hilghted Max Hourly Movements Do Not Relate To Same One Hour Period

Table 2E: Total Number of Laden Trucks

TERALBA QUARRY						Month: Feb-17	
	Daily Total	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Westwards Daily	Eastwards Daily
		6pm to 5am	5am to 6am	6am to 7am	7am to 6pm		
		6	12	28	20		
Limits	326					241	85
Actuals							
1	84	6	2	5	12	43	41
2	84	4	3	10	10	41	43
3	81	3	5	11	11	38	43
4	25	4	-	2	5	19	6
5	-	-	-	-	-	-	-
6	80	5	2	9	9	56	24
7	77	5	-	7	12	45	32
8	68	3	2	3	10	32	36
9	70	3	2	5	12	52	18
10	89	3	1	9	13	61	28
11	21	4	1	2	4	20	1
12	-	-	-	-	-	-	-
13	79	6	2	3	11	49	30
14	79	5	1	4	13	49	30
15	67	-	9	6	12	36	31
16	71	4	3	7	10	48	23
17	84	5	3	4	13	44	40
18	24	5	-	1	5	22	2
19	-	-	-	-	-	-	-
20	73	5	3	4	14	55	18
21	150	4	-	9	19	106	44
22	166	5	-	10	20	113	53
23	145	4	-	5	20	106	39
24	115	5	-	6	17	78	37
25	38	6	1	3	10	27	11
26	-	-	-	-	-	-	-
27	59	6	4	4	7	46	13
28	32	-	3	6	5	19	13

1861

Table 2A: Number of Laden Trucks - 6:00pm to 5:00am

TERALBA QUARRY		Month:		Feb-17		
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		66	66	6	0	0
Actuals						
1		6	6	6	-	-
2		4	4	4	-	-
3		3	3	2	-	-
4		8	8	4	-	-
5		-	-	-	-	-
6		5	5	5	-	-
7		7	7	5	-	-
8		3	3	3	-	-
9		3	3	3	-	-
10		3	3	3	-	-
11		7	7	4	-	-
12		-	-	-	-	-
13		6	6	6	-	-
14		9	9	5	-	-
15		-	-	-	-	-
16		7	7	4	-	-
17		5	5	5	-	-
18		9	9	5	-	-
19		-	-	-	-	-
20		5	5	5	-	-
21		8	8	4	-	-
22		8	8	5	-	-
23		8	8	4	-	-
24		9	9	5	-	-
25		8	8	6	-	-
26		-	-	-	-	-
27		6	6	6	-	-
28		-	-	-	-	-
					-	-
					-	-
					-	-
					-	-

Table 2B: Number of Laden Trucks - 5:00am to 6:00am

TERALBA QUARRY		Month:		Feb-17	
		Westwards		Eastwards	
		Max Hourly		Max Hourly	
Limits*		12		0	
Actuals					
1		2		-	
2		3		-	
3		5		-	
4		-		-	
5		-		-	
6		2		-	
7		-		-	
8		2		-	
9		2		-	
10		1		-	
11		1		-	
12		-		-	
13		2		-	
14		1		-	
15		9		-	
16		3		-	
17		3		-	
18		-		-	
19		-		-	
20		3		-	
21		-		-	
22		-		-	
23		-		-	
24		-		-	
25		1		-	
26		-		-	
27		4		-	
28		3		-	
				-	
				-	
				-	
				-	

* Condition 2 (9)

Table 2C: Number of Laden Trucks - 6:00am to 7:00am

TERALBA QUARRY		Month:		Feb-17	
		Westwards**		Eastwards**	
		Max Hourly		Max Hourly	
Limits*		28		8	
Actuals					
1		4		1	
2		7		3	
3		5		6	
4		1		1	
5		-		-	
6		6		3	
7		4		3	
8		3		-	
9		4		1	
10		8		1	
11		1		1	
12		-		-	
13		2		1	
14		3		1	
15		4		2	
16		6		1	
17		3		1	
18		1		-	
19		-		-	
20		4		-	
21		7		2	
22		7		3	
23		4		1	
24		4		2	
25		2		1	
26		-		-	
27		4		-	
28		5		1	

* Condition 2 (9)

** Combined Maximum hourly No. of laden trucks = 28

Table 2D: Number of Laden Trucks - 7:00am to 6pm

TERALBA QUARRY		Month:		Feb-17		
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		305	220	20	85	8
Actuals						
1		71	31	5	40	7
2		67	27	4	40	6
3		62	25	6	37	8
4		15	10	3	5	2
5		-	-	-	-	-
6		64	43	6	21	5
7		63	34	8	29	6
8		60	24	4	36	7
9		60	43	7	17	5
10		76	49	9	27	6
11		11	11	4	0	0
12		-	-	-	-	-
13		68	39	7	29	5
14		65	36	6	29	7
15		52	23	7	29	5
16		54	32	5	22	5
17		72	33	8	39	6
18		14	12	5	2	1
19		-	-	-	-	-
20		61	43	12	18	5
21		133	91	13	42	8
22		148	98	16	50	8
23		132	94	14	38	8
24		100	65	13	35	7
25		26	16	6	10	4
26		-	-	-	-	-
27		45	32	6	13	3
28		23	11	3	12	2

** PLEASE NOTE: The Hilighted Max Hourly Movements Do Not Relate To Same One Hour Period

Table 2E: Total Number of Laden Trucks

TERALBA QUARRY							Month:	Mar-17
	Daily Total	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Westwards Daily	Eastwards Daily	
		6pm to 5am	5am to 6am	6am to 7am	7am to 6pm			
		6	12	28	20	241	85	
Limits	326							
Actuals								
1	38	1	2	5	6	14	24	
2	74	2	4	5	13	56	18	
3	57	5	-	4	9	31	26	
4	4	2	-	1	1	4	-	
5	-	-	-	-	-	-	-	
6	82	4	2	6	14	48	34	
7	129	3	1	8	18	92	37	
8	62	-	5	7	10	32	30	
9	106	2	4	10	17	63	43	
10	104	4	3	6	19	72	32	
11	39	6	-	5	7	32	7	
12	-	-	-	-	-	-	-	
13	104	3	5	9	13	70	34	
14	67	6	1	9	11	40	27	
15	28	-	2	7	3	16	12	
16	26	1	3	4	4	17	9	
17	26	5	2	-	7	20	6	
18	3	-	-	-	2	2	1	
19	-	-	-	-	-	-	-	
20	55	3	5	-	9	38	17	
21	142	4	2	6	20	98	44	
22	121	3	-	11	17	79	42	
23	93	4	3	3	16	60	33	
24	75	3	1	2	13	46	29	
25	24	4	-	4	5	19	5	
26	-	-	-	-	-	-	-	
27	81	4	5	4	10	60	21	
28	128	3	5	11	17	76	52	
29	108	6	-	9	16	69	39	
30	89	5	1	6	15	56	33	
31	63	5	-	4	9	43	20	

Table 2A: Number of Laden Trucks - 6:00pm to 5:00am

TERALBA QUARRY			Month:		Mar-17			
		Daily Total		Westwards			Eastwards	
				Daily	Max Hourly		Daily	Max Hourly
Limits		66		66	6		0	0
Actuals								
1		1		1	1		-	-
2		2		2	2		-	-
3		8		8	5		-	-
4		2		2	2		-	-
5		-		-	-		-	-
6		5		5	4		-	-
7		6		6	3		-	-
8		-		-	-		-	-
9		2		2	2		-	-
10		4		4	4		-	-
11		8		8	6		-	-
12		-		-	-		-	-
13		3		3	3		-	-
14		8		8	6		-	-
15		-		-	-		-	-
16		1		1	1		-	-
17		5		5	5		-	-
18		-		-	-		-	-
19		-		-	-		-	-
20		3		3	3		-	-
21		4		4	4		-	-
22		5		5	3		-	-
23		4		4	4		-	-
24		6		6	3		-	-
25		7		7	4		-	-
26		-		-	-		-	-
27		4		4	4		-	-
28		3		3	3		-	-
29		8		8	6		-	-
30		7		7	5		-	-
31		8		8	5		-	-

Table 2B: Number of Laden Trucks - 5:00am to 6:00am

TERALBA QUARRY		Month:		Mar-17
		Westwards		Eastwards
		Max Hourly		Max Hourly
Limits*		12		0
Actuals				
1		2		-
2		4		-
3		-		-
4		-		-
5		-		-
6		2		-
7		1		-
8		3		-
9		4		-
10		3		-
11		-		-
12		-		-
13		5		-
14		1		-
15		2		-
16		3		-
17		2		-
18		-		-
19		-		-
20		5		-
21		2		-
22		-		-
23		3		-
24		1		-
25		-		-
26		-		-
27		5		-
28		5		-
29		-		-
30		1		-
31		-		-

* Condition 2 (9)

Table 2C: Number of Laden Trucks - 6:00am to 7:00am

TERALBA QUARRY		Month:	Mar-17
		Westwards**	Eastwards**
		Max Hourly	Max Hourly
Limits*		28	8
Actuals			
1		4	1
2		4	1
3		4	-
4		1	-
5		-	-
6		6	-
7		8	-
8		5	2
9		7	3
10		4	2
11		2	3
12		-	-
13		7	2
14		8	1
15		7	-
16		4	-
17		-	-
18		-	-
19		-	-
20		-	-
21		6	-
22		10	1
23		3	-
24		2	-
25		3	1
26		-	-
27		3	1
28		8	3
29		8	1
30		5	1
31		3	1

* Condition 2 (9)

** Combined Maximum hourly No. of laden trucks = 28

Table 2D: Number of Laden Trucks - 7:00am to 6pm

TERALBA QUARRY		Month:		Mar-17	
	Daily Total	Westwards		Eastwards	
		Daily	Max Hourly	Daily	Max Hourly
Limits	305	220	20	85	8
Actuals					
1	30	7	2	23	5
2	63	46	12	17	6
3	45	19	4	26	5
4	1	1	1	-	-
5	-	-	-	-	-
6	69	35	9	34	8
7	114	77	14	37	6
8	52	24	6	28	4
9	90	50	13	40	6
10	91	61	13	30	7
11	26	22	6	4	2
12	-	-	-	-	-
13	87	55	10	32	7
14	49	23	6	26	6
15	19	7	2	12	3
16	18	9	2	9	2
17	19	13	5	6	2
18	3	2	1	1	1
19	-	-	-	-	-
20	47	30	8	17	4
21	130	86	12	44	8
22	105	64	9	41	8
23	83	50	11	33	5
24	66	37	11	29	5
25	13	9	4	4	3
26	-	-	-	-	-
27	68	48	9	20	4
28	109	60	10	49	8
29	91	53	9	38	8
30	75	43	10	32	6
31	51	32	7	19	4

** PLEASE NOTE: The Highlighted Max Hourly Movements Do Not Relate To Same One Hour Period

Table 2E: Total Number of Laden Trucks

TERALBA QUARRY						Month: Apr-17	
	Daily Total	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Westwards Daily	Eastwards Daily
		6pm to 5am	5am to 6am	6am to 7am	7am to 6pm		
		6	12	28	20		
Limits	326					241	85
Actuals							
1	21	3	2	2	6	12	9
2	-	-	-	-	-	-	-
3	56	2	8	6	9	35	21
4	39	2	2	5	7	25	14
5	79	2	5	8	13	40	39
6	91	5	1	5	13	52	39
7	124	4	-	10	17	84	40
8	38	3	1	7	10	28	10
9	-	-	-	-	-	-	-
10	79	4	4	5	12	45	34
11	116	5	-	8	16	81	35
12	99	4	1	10	15	71	28
13	87	3	-	7	11	59	28
14	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-
18	113	2	1	10	17	76	37
19	108	4	-	8	16	76	32
20	110	5	-	5	16	64	46
21	111	4	-	7	13	83	28
22	34	4	1	4	9	26	8
23	-	-	-	-	-	-	-
24	80	-	1	10	12	58	22
25	-	-	-	-	-	-	-
26	121	-	2	7	19	95	26
27	126	3	3	9	20	102	24
28	121	-	5	9	17	98	23
29	33	3	-	5	12	26	7
30	-	-	-	-	-	-	-

Table 2A: Number of Laden Trucks - 6:00pm to 5:00am

TERALBA QUARRY		Month:		Apr-17		
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		66	66	6	0	0
Actuals						
1		5	5	3	-	-
2		-	-	-	-	-
3		2	2	2	-	-
4		2	2	2	-	-
5		3	3	2	-	-
6		7	7	5	-	-
7		7	7	4	-	-
8		6	6	3	-	-
9		-	-	-	-	-
10		4	4	4	-	-
11		7	7	5	-	-
12		6	6	4	-	-
13		6	6	3	-	-
14		-	-	-	-	-
15		-	-	-	-	-
16		-	-	-	-	-
17		-	-	-	-	-
18		2	2	2	-	-
19		7	7	4	-	-
20		8	8	5	-	-
21		7	7	4	-	-
22		6	6	4	-	-
23		-	-	-	-	-
24		-	-	-	-	-
25		-	-	-	-	-
26		-	-	-	-	-
27		3	3	3	-	-
28		-	-	-	-	-
29		5	5	3	-	-
30		-	-	-	-	-

Table 2B: Number of Laden Trucks - 5:00am to 6:00am

TERALBA QUARRY		Month:		Apr-17
		Westwards		Eastwards
		Max Hourly		Max Hourly
Limits*		12		0
Actuals				
1		2		-
2		-		-
3		8		-
4		2		-
5		5		-
6		1		-
7		-		-
8		1		-
9		-		-
10		4		-
11		-		-
12		1		-
13		-		-
14		-		-
15		-		-
16		-		-
17		-		-
18		1		-
19		-		-
20		-		-
21		-		-
22		1		-
23		-		-
24		1		-
25		-		-
26		2		-
27		3		-
28		5		-
29		-		-
30		-		-

* Condition 2 (9)

Table 2C: Number of Laden Trucks - 6:00am to 7:00am

TERALBA QUARRY		Month:		Apr-17	
		Westwards**		Eastwards**	
		Max Hourly		Max Hourly	
Limits*		28		8	
Actuals					
1		1		1	
2		-		-	
3		5		1	
4		5		-	
5		6		2	
6		2		3	
7		8		2	
8		5		2	
9		-		-	
10		3		2	
11		7		1	
12		7		3	
13		6		1	
14		-		-	
15		-		-	
16		-		-	
17		-		-	
18		10		-	
19		5		3	
20		4		1	
21		5		2	
22		3		1	
23		-		-	
24		9		1	
25		-		-	
26		7		-	
27		8		1	
28		7		2	
29		4		1	
30		-		-	

* Condition 2 (9)

** Combined Maximum hourly No. of laden trucks = 28

Table 2D: Number of Laden Trucks - 7:00am to 6pm

TERALBA QUARRY			Month:		Apr-17			
		Daily Total		Westwards			Eastwards	
				Daily	Max Hourly		Daily	Max Hourly
Limits		305		220	20		85	8
Actuals								
1		12		4	4		8	2
2		-		-	-		-	-
3		40		20	6		20	4
4		30		16	5		14	4
5		63		26	7		37	8
6		78		42	8		36	7
7		107		69	11		38	6
8		24		16	6		8	5
9		-		-	-		-	-
10		66		34	7		32	7
11		101		67	12		34	8
12		82		57	10		25	6
13		74		47	8		27	5
14		-		-	-		-	-
15		-		-	-		-	-
16		-		-	-		-	-
17		-		-	-		-	-
18		100		63	14		37	7
19		93		64	11		29	8
20		97		52	10		45	7
21		97		71	10		26	4
22		23		16	6		7	3
23		-		-	-		-	-
24		69		48	8		21	5
25		-		-	-		-	-
26		112		86	16		26	5
27		111		88	16		23	4
28		107		86	14		21	5
29		23		17	9		6	3
30		-		-	-		-	-

** PLEASE NOTE: The Highlighted Max Hourly Movements Do Not Relate To Same One Hour Period

Table 2E: Total Number of Laden Trucks

TERALBA QUARRY						Month: May-17	
	Daily Total	Max Hourly Daily 6pm to 5am	Max Hourly Daily 5am to 6am	Max Hourly Daily 6am to 7am	Max Hourly Daily 7am to 6pm	Westwards Daily	Eastwards Daily
Limits	326	6	12	28	20	241	85
Actuals							
1	101	2	3	4	13	80	21
2	121	4	2	5	15	91	30
3	105	2	3	12	17	64	41
4	114	2	4	8	18	70	44
5	109	5	1	5	17	75	34
6	39	3	3	8	6	32	7
7	-	-	-	-	-	-	-
8	111	3	5	5	14	77	34
9	88	5	1	6	12	62	26
10	106	6	1	5	17	69	37
11	103	3	1	6	13	69	34
12	74	3	1	4	11	52	22
13	41	4	-	6	7	37	4
14	-	-	-	-	-	-	-
15	79	1	6	4	13	64	15
16	125	4	2	3	17	107	18
17	107	6	2	6	16	92	15
18	117	5	-	7	16	93	24
19	49	4	1	2	8	32	17
20	18	5	-	2	3	17	1
21	-	-	-	-	-	-	-
22	73	3	3	3	12	57	16
23	68	2	3	7	10	49	19
24	62	6	-	5	8	40	22
25	101	5	1	8	13	64	37
26	96	4	2	8	12	86	10
27	42	4	-	3	11	21	21
28	-	-	-	-	-	-	-
29	114	3	2	7	18	93	21
30	105	4	-	8	15	81	24
31	148	3	1	8	18	114	34

Table 2A: Number of Laden Trucks - 6:00pm to 5:00am

TERALBA QUARRY		Month:		May-17		
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		66	66	6	0	0
Actuals						
1		4	4	2	-	-
2		6	6	4	-	-
3		3	3	2	-	-
4		3	3	2	-	-
5		8	8	5	-	-
6		5	5	3	-	-
7		-	-	-	-	-
8		3	3	3	-	-
9		7	7	5	-	-
10		7	7	6	-	-
11		5	5	3	-	-
12		6	6	3	-	-
13		7	7	4	-	-
14		-	-	-	-	-
15		1	1	1	-	-
16		6	6	4	-	-
17		6	6	6	-	-
18		8	8	5	-	-
19		6	6	4	-	-
20		7	7	5	-	-
21		-	-	-	-	-
22		5	5	3	-	-
23		2	2	2	-	-
24		7	7	6	-	-
25		5	5	5	-	-
26		5	5	4	-	-
27		6	6	4	-	-
28		-	-	-	-	-
29		3	3	3	-	-
30		6	6	4	-	-
31		6	6	3	-	-

Table 2B: Number of Laden Trucks - 5:00am to 6:00am

TERALBA QUARRY		Month:		May-17
		Westwards		Eastwards
		Max Hourly		Max Hourly
Limits*		12		0
Actuals				
1		3		-
2		2		-
3		3		-
4		4		-
5		1		-
6		3		-
7		-		-
8		5		-
9		1		-
10		1		-
11		1		-
12		1		-
13		-		-
14		-		-
15		6		-
16		2		-
17		2		-
18		-		-
19		1		-
20		-		-
21		-		-
22		3		-
23		3		-
24		-		-
25		1		-
26		2		-
27		-		-
28		-		-
29		2		-
30		-		-
31		1		-

* Condition 2 (9)

Table 2C: Number of Laden Trucks - 6:00am to 7:00am

TERALBA QUARRY		Month:		May-17
		Westwards**		Eastwards**
		Max Hourly		Max Hourly
Limits*		28		8
Actuals				
1		4		-
2		4		1
3		10		2
4		7		1
5		4		1
6		6		2
7		-		-
8		5		-
9		6		-
10		5		-
11		6		-
12		3		1
13		6		-
14		-		-
15		4		-
16		2		1
17		5		1
18		5		2
19		-		2
20		2		-
21		-		-
22		3		-
23		5		2
24		4		1
25		6		2
26		7		1
27		3		-
28		-		-
29		7		-
30		7		1
31		8		-

* Condition 2 (9)

** Combined Maximum hourly No. of laden trucks = 28

Table 2D: Number of Laden Trucks - 7:00am to 6pm

TERALBA QUARRY			Month:		May-17			
		Daily Total		Westwards			Eastwards	
				Daily	Max Hourly		Daily	Max Hourly
Limits		305		220	20		85	8
Actuals								
1		90		69	10		21	5
2		108		79	14		29	6
3		87		48	14		39	8
4		99		56	13		43	8
5		95		62	10		33	8
6		23		18	5		5	1
7		-		-	-		-	-
8		98		64	12		34	6
9		74		48	8		26	4
10		93		56	10		37	8
11		91		57	9		34	7
12		63		42	8		21	5
13		28		24	6		4	1
14		-		-	-		-	-
15		68		53	11		15	4
16		114		97	15		17	4
17		93		79	14		14	5
18		102		80	13		22	4
19		40		25	5		15	4
20		9		8	2		1	1
21		-		-	-		-	-
22		62		46	10		16	3
23		56		39	8		17	4
24		50		29	5		21	4
25		87		52	8		35	6
26		81		72	11		9	2
27		33		12	3		21	8
28		-		-	-		-	-
29		102		81	16		21	4
30		91		68	11		23	5
31		133		99	16		34	7

** PLEASE NOTE: The Hilighted Max Hourly Movements Do Not Relate To Same One Hour Period

Table 2E: Total Number of Laden Trucks

TERALBA QUARRY		Month: Jun-17					
	Daily Total	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Westwards Daily	Eastwards Daily
		6pm to 5am	5am to 6am	6am to 7am	7am to 6pm		
Limits	326	6	12	28	20	241	85
Actuals							
1	119	5	2	11	17	93	26
2	103	3	2	13	13	77	26
3	29	5	-	3	5	21	8
4	-	-	-	-	-	-	-
5	77	2	4	9	11	54	23
6	92	6	-	5	15	72	20
7	44	3	1	7	5	29	15
8	31	1	2	4	5	26	5
9	31	1	3	4	6	28	3
10	13	4	-	1	2	13	-
11	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-
13	71	3	2	4	10	56	15
14	59	6	1	4	12	45	14
15	95	4	3	3	16	72	23
16	111	5	1	3	18	70	41
17	24	4	-	1	7	16	8
18	-	-	-	-	-	-	-
19	45	2	5	3	6	36	9
20	76	3	2	9	11	47	29
21	112	5	1	5	18	67	45
22	82	5	-	2	12	50	32
23	65	3	2	8	9	41	24
24	34	4	-	6	6	30	4
25	-	-	-	-	-	-	-
26	103	3	6	4	17	65	38
27	83	3	1	5	17	57	26
28	114	1	7	9	15	49	65
29	82	6	-	3	14	40	42
30	80	4	1	7	11	49	31

1775

Table 2A: Number of Laden Trucks - 6:00pm to 5:00am

TERALBA QUARRY			Month:		Jun-17	
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits			66	66	6	0
Actuals						
1		5	5	5	-	-
2		4	4	3	-	-
3		6	6	5	-	-
4		-	-	-	-	-
5		4	4	2	-	-
6		6	6	6	-	-
7		3	3	3	-	-
8		1	1	1	-	-
9		1	1	1	-	-
10		6	6	4	-	-
11		-	-	-	-	-
12		-	-	-	-	-
13		3	3	3	-	-
14		6	6	6	-	-
15		5	5	4	-	-
16		5	5	5	-	-
17		7	7	4	-	-
18		-	-	-	-	-
19		2	2	2	-	-
20		3	3	3	-	-
21		7	7	5	-	-
22		8	8	5	-	-
23		5	5	3	-	-
24		8	8	4	-	-
25		-	-	-	-	-
26		3	3	3	-	-
27		5	5	3	-	-
28		1	1	1	-	-
29		9	9	6	-	-
30		7	7	4	-	-
					-	-

Table 2B: Number of Laden Trucks - 5:00am to 6:00am

TERALBA QUARRY		Month:		Jun-17
		Westwards		Eastwards
		Max Hourly		Max Hourly
Limits*		12		0
Actuals				
1		2		-
2		2		-
3		-		-
4		-		-
5		4		-
6		-		-
7		1		-
8		2		-
9		3		-
10		-		-
11		-		-
12		-		-
13		2		-
14		1		-
15		3		-
16		1		-
17		-		-
18		-		-
19		5		-
20		2		-
21		1		-
22		-		-
23		2		-
24		-		-
25		-		-
26		6		-
27		1		-
28		7		-
29		-		-
30		1		-
				-
				-

* Condition 2 (9)

Table 2C: Number of Laden Trucks - 6:00am to 7:00am

TERALBA QUARRY		Month:		Jun-17	
		Westwards**		Eastwards**	
		Max Hourly		Max Hourly	
Limits*		28		8	
Actuals					
1		8		3	
2		12		1	
3		2		1	
4		-		-	
5		7		2	
6		4		1	
7		6		1	
8		4		-	
9		3		1	
10		1		-	
11		-		-	
12		-		-	
13		4		-	
14		4		-	
15		2		1	
16		3		-	
17		-		1	
18		-		-	
19		3		-	
20		6		3	
21		4		1	
22		1		1	
23		7		1	
24		6		-	
25		-		-	
26		1		3	
27		4		1	
28		5		4	
29		3		-	
30		5		2	

* Condition 2 (9)

** Combined Maximum hourly No. of laden trucks = 28

Table 2D: Number of Laden Trucks - 7:00am to 6pm

TERALBA QUARRY		Month:		Jun-17		
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		305	220	20	85	8
Actuals						
1		101	78	15	23	7
2		84	59	9	25	5
3		20	13	5	7	3
4		-	-	-	-	-
5		60	39	9	21	5
6		81	62	12	19	3
7		33	19	5	14	3
8		24	19	4	5	2
9		23	21	6	2	1
10		6	6	2	-	-
11		-	-	-	-	-
12		-	-	-	-	-
13		62	47	8	15	5
14		48	34	9	14	4
15		84	62	12	22	4
16		102	61	11	41	8
17		16	9	4	7	3
18		-	-	-	-	-
19		35	26	6	9	2
20		62	36	6	26	5
21		99	55	12	44	7
22		72	41	8	31	4
23		50	27	5	23	5
24		20	16	5	4	2
25		-	-	-	-	-
26		90	55	12	35	7
27		72	47	10	25	7
28		97	36	7	61	8
29		70	28	8	42	6
30		65	36	8	29	6

** PLEASE NOTE: The Highlighted Max Hourly Movements Do Not Relate To Same One Hour Period

Table 2E: Total Number of Laden Trucks

TERALBA QUARRY						Month:	Jul-17
	Daily Total	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Westwards Daily	Eastwards Daily
		6pm to 5am	5am to 6am	6am to 7am	7am to 6pm		
Limits	326	6	12	28	20	241	85
Actuals							
1	33	6	1	2	7	15	18
2	-	-	-	-	-	-	-
3	92	3	3	3	16	58	34
4	94	5	-	8	12	61	33
5	82	5	2	5	13	51	31
6	109	1	4	8	14	78	31
7	89	5	-	8	10	55	34
8	48	4	1	4	11	28	20
9	-	-	-	-	-	-	-
10	103	3	4	8	19	57	46
11	93	4	-	8	12	38	55
12	71	5	1	4	10	50	21
13	71	5	-	2	10	39	32
14	86	5	-	6	14	54	32
15	22	3	-	4	3	18	4
16	-	-	-	-	-	-	-
17	62	4	1	6	8	46	16
18	88	4	-	11	11	63	25
19	115	5	4	6	16	62	53
20	98	3	3	8	13	69	29
21	156	1	4	7	20	120	36
22	38	5	4	4	7	29	9
23	-	-	-	-	-	-	-
24	101	2	6	7	15	60	41
25	114	4	1	11	20	57	57
26	130	5	3	10	20	80	50
27	95	5	2	8	16	74	21
28	94	5	2	8	15	73	21
29	23	5	-	1	6	18	5
30	-	-	-	-	-	-	-
31	62	4	5	4	8	42	20

2169

Table 2A: Number of Laden Trucks - 6:00pm to 5:00am

TERALBA QUARRY		Month:		Jul-17		
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		66	66	6	0	0
Actuals						
1		6	6	6	-	-
2		-	-	-	-	-
3		4	4	3	-	-
4		9	9	5	-	-
5		7	7	5	-	-
6		2	2	1	-	-
7		8	8	5	-	-
8		6	6	4	-	-
9		-	-	-	-	-
10		3	3	3	-	-
11		6	6	4	-	-
12		6	6	5	-	-
13		7	7	5	-	-
14		9	9	5	-	-
15		5	5	3	-	-
16		-	-	-	-	-
17		6	6	4	-	-
18		8	8	4	-	-
19		5	5	5	-	-
20		5	5	3	-	-
21		2	2	1	-	-
22		5	5	5	-	-
23		-	-	-	-	-
24		2	2	2	-	-
25		6	6	4	-	-
26		5	5	5	-	-
27		7	7	5	-	-
28		6	6	5	-	-
29		8	8	5	-	-
30		-	-	-	-	-
31		4	4	4	-	-

Table 2B: Number of Laden Trucks - 5:00am to 6:00am

TERALBA QUARRY		Month:		Jul-17	
		Westwards		Eastwards	
		Max Hourly		Max Hourly	
Limits*		12		0	
Actuals					
1		1		-	
2		-		-	
3		3		-	
4		-		-	
5		2		-	
6		4		-	
7		-		-	
8		1		-	
9		-		-	
10		4		-	
11		-		-	
12		1		-	
13		-		-	
14		-		-	
15		-		-	
16		-		-	
17		1		-	
18		-		-	
19		4		-	
20		3		-	
21		4		-	
22		4		-	
23		-		-	
24		6		-	
25		1		-	
26		3		-	
27		2		-	
28		1		-	
29		-		-	
30		-		-	
31		5		-	

* Condition 2 (9)

Table 2C: Number of Laden Trucks - 6:00am to 7:00am

TERALBA QUARRY		Month:	Jul-17
		Westwards** Max Hourly	Eastwards** Max Hourly
Limits*		28	8
Actuals			
1		1	1
2		-	-
3		1	2
4		6	2
5		4	1
6		7	1
7		6	2
8		2	2
9		-	-
10		7	1
11		3	5
12		4	-
13		2	-
14		6	-
15		3	1
16		-	-
17		5	1
18		10	1
19		3	3
20		7	1
21		6	1
22		3	1
23		-	-
24		4	3
25		6	5
26		7	3
27		6	2
28		6	2
29		1	-
30		-	-
31		3	1

* Condition 2 (9)

** Combined Maximum hourly No. of laden trucks = 28

Table 2D: Number of Laden Trucks - 7:00am to 6pm

TERALBA QUARRY			Month:		Jul-17	
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		305	220	20	85	8
Actuals						
1		24	7	2	17	5
2		-	-	-	-	-
3		82	50	9	32	8
4		77	46	7	31	5
5		68	38	9	30	5
6		95	65	11	30	6
7		73	41	8	32	7
8		37	19	7	18	5
9		-	-	-	-	-
10		88	43	11	45	8
11		79	29	5	50	8
12		60	39	7	21	4
13		62	30	6	32	7
14		71	39	8	32	8
15		13	10	3	3	1
16		-	-	-	-	-
17		49	34	6	15	3
18		69	45	9	24	6
19		100	50	11	50	8
20		82	54	8	28	5
21		143	108	16	35	8
22		25	17	5	8	3
23		-	-	-	-	-
24		86	48	8	38	7
25		96	44	12	52	8
26		112	65	12	47	8
27		78	59	16	19	4
28		78	59	11	19	4
29		14	9	5	5	2
30		-	-	-	-	-
31		49	30	5	19	4

** PLEASE NOTE: The Hilighted Max Hourly Movements Do Not Relate To Same One Hour Period

Table 2E: Total Number of Laden Trucks

TERALBA QUARRY						Month: Aug-17	
	Daily Total	Max Hourly Daily				Westwards Daily	Eastwards Daily
		6pm to 5am	5am to 6am	6am to 7am	7am to 6pm		
		6	12	28	20		
Limits	326					241	85
Actuals							
1	108	3	4	6	17	68	40
2	92	2	3	5	13	52	40
3	93	1	2	9	13	54	39
4	76	5	-	4	11	42	34
5	21	5	-	3	7	21	-
6	-	-	-	-	-	-	-
7	80	1	4	4	12	45	35
8	103	3	-	6	16	69	34
9	83	4	-	6	11	52	31
10	93	3	2	6	12	53	40
11	66	4	-	4	9	45	21
12	20	1	1	7	5	15	5
13	-	-	-	-	-	-	-
14	107	3	2	5	14	77	30
15	111	4	-	8	15	78	33
16	79	3	2	8	15	56	23
17	77	2	1	8	12	41	36
18	99	3	-	7	17	53	46
19	21	4	-	5	4	18	3
20	-	-	-	-	-	-	-
21	127	4	3	1	20	77	50
22	128	4	-	8	19	84	44
23	160	4	-	7	20	107	53
24	132	4	2	5	20	80	52
25	80	2	2	6	14	44	36
26	34	4	1	1	8	14	20
27	-	-	-	-	-	-	-
28	96	4	2	6	16	57	39
29	132	5	2	9	18	85	47
30	174	5	1	7	20	133	41
31	152	2	3	8	20	105	47

Table 2A: Number of Laden Trucks - 6:00pm to 5:00am

TERALBA QUARRY		Month:		Aug-17		
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits			66	66	6	0
Actuals						
1		3	3	3	-	-
2		3	3	2	-	-
3		1	1	1	-	-
4		9	9	5	-	-
5		8	8	5	-	-
6		-	-	-	-	-
7		5	5	4	-	-
8		6	6	3	-	-
9		6	6	4	-	-
10		5	5	3	-	-
11		7	7	4	-	-
12		2	2	2	-	-
13		-	-	-	-	-
14		5	5	3	-	-
15		6	6	4	-	-
16		3	3	3	-	-
17		4	4	2	-	-
18		5	5	3	-	-
19		4	4	4	-	-
20		-	-	-	-	-
21		4	4	4	-	-
22		7	7	4	-	-
23		7	7	4	-	-
24		6	6	4	-	-
25		4	4	2	-	-
26		6	6	4	-	-
27		-	-	-	-	-
28		6	6	4	-	-
29		7	7	5	-	-
30		8	8	5	-	-
31		2	2	2	-	-

Table 2B: Number of Laden Trucks - 5:00am to 6:00am

TERALBA QUARRY		Month:		Aug-17		
		Westwards			Eastwards	
		Max Hourly			Max Hourly	
Limits*		12			0	
Actuals						
1		4			-	
2		3			-	
3		2			-	
4		-			-	
5		-			-	
6		-			-	
7		4			-	
8		-			-	
9		-			-	
10		2			-	
11		-			-	
12		1			-	
13		-			-	
14		2			-	
15		-			-	
16		2			-	
17		1			-	
18		-			-	
19		-			-	
20		-			-	
21		3			-	
22		-			-	
23		-			-	
24		2			-	
25		2			-	
26		1			-	
27		-			-	
28		2			-	
29		2			-	
30		1			-	
31		3			-	

* Condition 2 (9)

Table 2C: Number of Laden Trucks - 6:00am to 7:00am

TERALBA QUARRY		Month:		Aug-17	
		Westwards**		Eastwards**	
		Max Hourly		Max Hourly	
	Limits*	28		8	
Actuals					
1		4		2	
2		3		2	
3		7		2	
4		2		2	
5		3		-	
6		-		-	
7		1		3	
8		5		1	
9		6		-	
10		3		3	
11		4		-	
12		5		2	
13		-		-	
14		4		1	
15		7		1	
16		7		1	
17		6		2	
18		6		1	
19		5		-	
20		-		-	
21		1		-	
22		5		3	
23		7		-	
24		4		1	
25		3		3	
26		-		1	
27		-		-	
28		6		-	
29		7		2	
30		5		2	
31		6		2	

* Condition 2 (9)

** Combined Maximum hourly No. of laden trucks = 28

Table 2D: Number of Laden Trucks - 7:00am to 6pm

TERALBA QUARRY			Month:		Aug-17	
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		305	220	20	85	8
Actuals						
1		95	57	11	38	7
2		81	43	7	38	8
3		81	44	6	37	8
4		63	31	7	32	6
5		10	10	7	-	-
6		-	-	-	-	-
7		67	35	8	32	6
8		91	58	10	33	6
9		71	40	7	31	6
10		80	43	9	37	7
11		55	34	6	21	6
12		10	7	5	3	1
13		-	-	-	-	-
14		95	66	12	29	5
15		97	65	12	32	6
16		66	44	12	22	3
17		64	30	7	34	6
18		87	42	9	45	8
19		12	9	4	3	1
20		-	-	-	-	-
21		119	69	12	50	8
22		113	72	16	41	8
23		146	93	14	53	8
24		119	68	13	51	8
25		68	35	8	33	7
26		26	7	3	19	5
27		-	-	-	-	-
28		82	43	13	39	8
29		114	69	13	45	7
30		158	119	16	39	6
31		139	94	16	45	8

** PLEASE NOTE: The Hilighted Max Hourly Movements Do Not Relate To Same One Hour Period

Table 2E: Total Number of Laden Trucks

TERALBA QUARRY						Month: Sep-17	
	Daily Total	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Westwards Daily	Eastwards Daily
		6pm to 5am	5am to 6am	6am to 7am	7am to 6pm		
		6	12	28	20	241	85
Limits	326						
Actuals							
1	114	2	3	5	17	63	51
2	26	5	-	3	5	21	5
3	-	-	-	-	-	-	-
4	141	4	4	12	18	108	33
5	98	5	-	8	11	64	34
6	125	-	2	12	17	83	42
7	108	5	3	12	18	64	44
8	113	3	1	10	16	64	49
9	29	4	1	4	7	24	5
10	-	-	-	-	-	-	-
11	107	2	6	9	14	76	31
12	105	3	1	9	16	80	25
13	73	4	2	7	11	51	22
14	76	4	2	5	11	47	29
15	100	6	1	8	16	66	34
16	23	4	-	3	9	19	4
17	-	-	-	-	-	-	-
18	97	3	5	7	14	53	44
19	117	4	1	12	14	58	59
20	104	4	-	11	16	56	48
21	139	4	-	10	20	107	32
22	97	6	-	7	16	54	43
23	32	4	-	6	8	28	4
24	-	-	-	-	-	-	-
25	86	4	3	4	12	51	35
26	131	4	-	8	20	68	63
27	175	5	-	11	20	107	68
28	132	4	-	10	20	74	58
29	98	4	-	5	15	70	28
30	16	4	1	-	4	14	2

Table 2A: Number of Laden Trucks - 6:00pm to 5:00am

TERALBA QUARRY		Month:		Sep-17	
	Daily Total	Westwards		Eastwards	
		Daily	Max Hourly	Daily	Max Hourly
Limits	66	66	6	0	0
Actuals					
1	3	3	2	-	-
2	9	9	5	-	-
3	-	-	-	-	-
4	4	4	4	-	-
5	9	9	5	-	-
6	-	-	-	-	-
7	5	5	5	-	-
8	6	6	3	-	-
9	7	7	4	-	-
10	-	-	-	-	-
11	2	2	2	-	-
12	5	5	3	-	-
13	5	5	4	-	-
14	4	4	4	-	-
15	8	8	6	-	-
16	7	7	4	-	-
17	-	-	-	-	-
18	3	3	3	-	-
19	7	7	4	-	-
20	8	8	4	-	-
21	8	8	4	-	-
22	7	7	6	-	-
23	7	7	4	-	-
24	-	-	-	-	-
25	4	4	4	-	-
26	7	7	4	-	-
27	7	7	5	-	-
28	7	7	4	-	-
29	7	7	4	-	-
30	6	6	4	-	-
				-	-
				-	-

Table 2B: Number of Laden Trucks - 5:00am to 6:00am

TERALBA QUARRY		Month:		Sep-17
		Westwards		Eastwards
		Max Hourly		Max Hourly
Limits*		12		0
Actuals				
1		3		-
2		-		-
3		-		-
4		4		-
5		-		-
6		2		-
7		3		-
8		1		-
9		1		-
10		-		-
11		6		-
12		1		-
13		2		-
14		2		-
15		1		-
16		-		-
17		-		-
18		5		-
19		1		-
20		-		-
21		-		-
22		-		-
23		-		-
24		-		-
25		3		-
26		-		-
27		-		-
28		-		-
29		-		-
30		1		-
				-

* Condition 2 (9)

Table 2C: Number of Laden Trucks - 6:00am to 7:00am

TERALBA QUARRY		Month: Sep-17	
		Westwards**	Eastwards**
		Max Hourly	Max Hourly
Limits*		28	8
Actuals			
1		4	1
2		3	-
3		-	-
4		12	-
5		6	2
6		11	1
7		8	4
8		5	5
9		4	-
10		-	-
11		9	-
12		6	3
13		5	2
14		5	-
15		6	2
16		2	1
17		-	-
18		5	2
19		9	3
20		8	3
21		8	2
22		3	4
23		6	-
24		-	-
25		4	-
26		4	4
27		5	6
28		6	4
29		5	-
30		-	-

* Condition 2 (9)

** Combined Maximum hourly No. of laden trucks = 28

Table 2D: Number of Laden Trucks - 7:00am to 6pm

TERALBA QUARRY			Month:		Sep-17	
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		305	220	20	85	8
Actuals						
1		103	53	9	50	8
2		14	9	4	5	4
3		-	-	-	-	-
4		121	88	15	33	6
5		81	49	7	32	5
6		111	70	10	41	7
7		88	48	10	40	8
8		96	52	9	44	7
9		17	12	5	5	2
10		-	-	-	-	-
11		90	59	12	31	7
12		90	68	12	22	5
13		59	39	9	20	4
14		65	36	6	29	5
15		83	51	10	32	6
16		13	10	8	3	1
17		-	-	-	-	-
18		82	40	10	42	8
19		97	41	7	56	8
20		85	40	8	45	8
21		121	91	17	30	7
22		83	44	9	39	8
23		19	15	7	4	1
24		-	-	-	-	-
25		75	40	7	35	8
26		116	57	12	59	8
27		157	95	13	62	8
28		115	61	13	54	8
29		86	58	11	28	4
30		9	7	4	2	1

** PLEASE NOTE: The Hilighted Max Hourly Movements Do Not Relate To Same One Hour Period

Table 2E: Total Number of Laden Trucks

TERALBA QUARRY						Month:	Oct-17	
		Daily Total	Max Hourly Daily 6pm to 5am	Max Hourly Daily 5am to 6am	Max Hourly Daily 6am to 7am	Max Hourly Daily 7am to 6pm	Westwards Daily	Eastwards Daily
Limits		326	6	12	28	20	241	85
Actuals								
1		-	-	-	-	-	-	-
2		-	-	-	-	-	-	-
3		81	2	5	7	13	49	32
4		90	2	2	8	11	60	30
5		146	4	-	6	19	115	31
6		133	4	-	6	18	99	34
7		28	4	-	1	7	20	8
8		-	-	-	-	-	-	-
9		61	2	4	4	9	34	27
10		67	1	4	7	10	43	24
11		105	-	7	4	14	72	33
12		126	4	2	8	17	74	52
13		89	4	2	10	11	49	40
14		27	4	-	1	6	21	6
15		-	-	-	-	-	-	-
16		70	2	6	4	12	41	29
17		131	4	1	7	16	63	68
18		113	5	1	4	16	59	54
19		127	5	-	8	20	92	35
20		47	5	1	7	7	36	11
21		18	3	-	1	7	15	3
22		-	-	-	-	-	-	-
23		64	2	5	8	10	37	27
24		94	4	1	6	15	58	36
25		132	4	1	9	17	76	56
26		87	5	-	7	11	44	43
27		51	3	1	3	7	41	10
28		20	5	-	2	3	18	2
29		-	-	-	-	-	-	-
30		114	2	4	6	16	67	47
31		107	5	1	8	14	91	16

2128

Table 2A: Number of Laden Trucks - 6:00pm to 5:00am

TERALBA QUARRY		Month:		Oct-17		
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		66	66	6	0	0
Actuals						
1		-	-	-	-	-
2		-	-	-	-	-
3		2	2	2	-	-
4		2	2	2	-	-
5		6	6	4	-	-
6		7	7	4	-	-
7		7	7	4	-	-
8		-	-	-	-	-
9		2	2	2	-	-
10		1	1	1	-	-
11		-	-	-	-	-
12		6	6	4	-	-
13		6	6	4	-	-
14		7	7	4	-	-
15		-	-	-	-	-
16		2	2	2	-	-
17		7	7	4	-	-
18		6	6	5	-	-
19		8	8	5	-	-
20		7	7	5	-	-
21		3	3	3	-	-
22		-	-	-	-	-
23		2	2	2	-	-
24		6	6	4	-	-
25		7	7	4	-	-
26		8	8	5	-	-
27		5	5	3	-	-
28		7	7	5	-	-
29		-	-	-	-	-
30		4	4	2	-	-
31		7	7	5	-	-

Table 2B: Number of Laden Trucks - 5:00am to 6:00am

TERALBA QUARRY		Month:		Oct-17
		Westwards		Eastwards
		Max Hourly		Max Hourly
Limits*		12		0
Actuals				
1		-		-
2		-		-
3		5		-
4		2		-
5		-		-
6		-		-
7		-		-
8		-		-
9		4		-
10		4		-
11		7		-
12		2		-
13		2		-
14		-		-
15		-		-
16		6		-
17		1		-
18		1		-
19		-		-
20		1		-
21		-		-
22		-		-
23		5		-
24		1		-
25		1		-
26		-		-
27		1		-
28		-		-
29		-		-
30		4		-
31		1		-

* Condition 2 (9)

Table 2C: Number of Laden Trucks - 6:00am to 7:00am

TERALBA QUARRY		Month:		Oct-17
		Westwards**		Eastwards**
		Max Hourly		Max Hourly
Limits*		28		8
Actuals				
1		-		-
2		-		-
3		6		1
4		6		2
5		4		2
6		5		1
7		-		1
8		-		-
9		3		1
10		6		1
11		2		2
12		5		3
13		4		6
14		1		1
15		-		-
16		3		1
17		6		1
18		2		2
19		7		1
20		7		-
21		1		-
22		-		-
23		8		-
24		5		1
25		5		4
26		3		4
27		2		1
28		2		-
29		-		-
30		5		1
31		7		1

* Condition 2 (9)

** Combined Maximum hourly No. of laden trucks = 28

Table 2D: Number of Laden Trucks - 7:00am to 6pm

TERALBA QUARRY			Month:		Oct-17	
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		305	220	20	85	8
Actuals						
1		-	-	-	-	-
2		-	-	-	-	-
3		67	36	7	31	7
4		78	50	8	28	5
5		134	105	15	29	4
6		120	87	13	33	6
7		20	13	5	7	3
8		-	-	-	-	-
9		51	25	6	26	4
10		55	32	8	23	5
11		94	63	11	31	7
12		110	61	9	49	8
13		71	37	6	34	6
14		19	14	5	5	2
15		-	-	-	-	-
16		58	30	6	28	7
17		116	49	8	67	8
18		102	50	8	52	8
19		111	77	12	34	8
20		32	21	5	11	3
21		14	11	5	3	3
22		-	-	-	-	-
23		49	22	5	27	7
24		81	46	9	35	6
25		115	63	11	52	8
26		72	33	8	39	8
27		42	33	6	9	2
28		11	9	3	2	1
29		-	-	-	-	-
30		100	54	9	46	8
31		91	76	13	15	3

** PLEASE NOTE: The Hilgited Max Hourly Movements Do Not Relate To Same One Hour Period

Table 2E: Total Number of Laden Trucks

TERALBA QUARRY						Month: Nov-17	
	Daily Total	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Westwards Daily	Eastwards Daily
		6pm to 5am	5am to 6am	6am to 7am	7am to 6pm		
		6	12	28	20		
Limits	326					241	85
Actuals							
1	126	4	1	6	17	86	40
2	126	3	1	8	19	87	39
3	116	5	1	7	15	64	52
4	39	3	1	6	10	33	6
5	-	-	-	-	-	-	-
6	43	3	2	5	7	28	15
7	81	1	3	5	12	50	31
8	71	4	2	8	11	60	11
9	120	3	1	10	20	79	41
10	128	5	-	9	20	80	48
11	41	4	-	3	9	31	10
12	-	-	-	-	-	-	-
13	119	3	4	10	14	87	32
14	141	-	4	11	20	101	40
15	163	4	1	9	20	108	55
16	111	5	-	10	15	79	32
17	114	3	1	10	16	69	45
18	31	4	-	5	6	22	9
19	-	-	-	-	-	-	-
20	97	4	-	7	18	71	26
21	86	3	1	8	13	56	30
22	109	2	2	11	14	69	40
23	103	4	1	9	14	68	35
24	114	3	1	7	18	92	22
25	23	4	-	3	4	17	6
26	-	-	-	-	-	-	-
27	104	2	4	8	16	79	25
28	96	3	2	9	11	54	42
29	114	4	1	6	17	71	43
30	98	5	-	8	12	71	27

2514

Table 2A: Number of Laden Trucks - 6:00pm to 5:00am

TERALBA QUARRY		Month:		Nov-17		
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		66	66	6	0	0
Actuals						
1		6	6	4	-	-
2		6	6	3	-	-
3		7	7	5	-	-
4		5	5	3	-	-
5		-	-	-	-	-
6		3	3	3	-	-
7		1	1	1	-	-
8		4	4	4	-	-
9		5	5	3	-	-
10		7	7	5	-	-
11		8	8	4	-	-
12		-	-	-	-	-
13		3	3	3	-	-
14		-	-	-	-	-
15		6	6	4	-	-
16		7	7	5	-	-
17		5	5	3	-	-
18		6	6	4	-	-
19		-	-	-	-	-
20		6	6	4	-	-
21		6	6	3	-	-
22		4	4	2	-	-
23		6	6	4	-	-
24		6	6	3	-	-
25		6	6	4	-	-
26		-	-	-	-	-
27		2	2	2	-	-
28		6	6	3	-	-
29		8	8	4	-	-
30		7	7	5	-	-
					-	-

Table 2B: Number of Laden Trucks - 5:00am to 6:00am

TERALBA QUARRY		Month:		Nov-17	
		Westwards		Eastwards	
		Max Hourly		Max Hourly	
Limits*		12		0	
Actuals					
1		1		-	
2		1		-	
3		1		-	
4		1		-	
5		-		-	
6		2		-	
7		3		-	
8		2		-	
9		1		-	
10		-		-	
11		-		-	
12		-		-	
13		4		-	
14		4		-	
15		1		-	
16		-		-	
17		1		-	
18		-		-	
19		-		-	
20		-		-	
21		1		-	
22		2		-	
23		1		-	
24		1		-	
25		-		-	
26		-		-	
27		4		-	
28		2		-	
29		1		-	
30		-		-	
				-	

* Condition 2 (9)

Table 2C: Number of Laden Trucks - 6:00am to 7:00am

TERALBA QUARRY		Month:		Nov-17	
		Westwards**		Eastwards**	
		Max Hourly		Max Hourly	
Limits*		28		8	
Actuals					
1		5		1	
2		7		1	
3		3		4	
4		5		1	
5		-		-	
6		5		-	
7		3		2	
8		8		-	
9		9		1	
10		6		3	
11		3		-	
12		-		-	
13		9		1	
14		9		2	
15		6		3	
16		8		2	
17		5		5	
18		4		1	
19		-		-	
20		5		2	
21		6		2	
22		9		2	
23		8		1	
24		5		2	
25		3		-	
26		-		-	
27		7		1	
28		7		2	
29		1		5	
30		7		1	

* Condition 2 (9)

** Combined Maximum hourly No. of laden trucks = 28

Table 2D: Number of Laden Trucks - 7:00am to 6pm

TERALBA QUARRY			Month:		Nov-17			
		Daily Total		Westwards			Eastwards	
				Daily	Max Hourly		Daily	Max Hourly
Limits		305		220	20		85	8
Actuals								
1		113		74	13		39	7
2		111		73	15		38	6
3		101		53	8		48	8
4		27		22	8		5	2
5		-		-	-		-	-
6		33		18	4		15	4
7		72		43	8		29	4
8		57		46	9		11	3
9		104		64	12		40	8
10		112		67	14		45	8
11		30		20	6		10	3
12		-		-	-		-	-
13		102		71	10		31	6
14		126		88	15		38	7
15		147		95	14		52	8
16		94		64	11		30	6
17		98		58	10		40	8
18		20		12	4		8	3
19		-		-	-		-	-
20		84		60	15		24	4
21		71		43	8		28	7
22		92		54	10		38	7
23		87		53	11		34	6
24		100		80	16		20	3
25		14		8	3		6	2
26		-		-	-		-	-
27		90		66	14		34	4
28		79		39	6		40	6
29		99		61	11		38	8
30		83		57	11		26	5

** PLEASE NOTE: The Hilighted Max Hourly Movements Do Not Relate To Same One Hour Period

Table 2E: Total Number of Laden Trucks

TERALBA QUARRY		Month: Dec-17					
	Daily Total	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Max Hourly Daily	Westwards Daily	Eastwards Daily
		6pm to 5am	5am to 6am	6am to 7am	7am to 6pm		
		6	12	28	20	241	85
Limits	326						
Actuals							
1	105	4	1	9	15	72	33
2	35	4	1	4	6	29	6
3	-	-	-	-	-	-	-
4	79	3	2	7	13	57	22
5	72	-	2	9	11	44	28
6	102	5	1	8	14	70	32
7	108	3	-	7	14	65	43
8	97	4	-	9	15	65	32
9	33	4	-	4	6	23	10
10	-	-	-	-	-	-	-
11	89	3	4	6	13	56	33
12	91	4	1	11	13	53	38
13	102	4	-	6	16	45	57
14	99	3	1	6	15	46	53
15	77	4	-	8	12	48	29
16	34	3	1	8	6	28	6
17	-	-	-	-	-	-	-
18	72	4	3	8	10	50	22
19	71	4	-	5	9	40	31
20	79	6	-	7	13	52	27
21	63	4	1	9	10	47	16
22	37	5	-	6	7	29	8
23	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-

1445

Table 2A: Number of Laden Trucks - 6:00pm to 5:00am

TERALBA QUARRY		Month:		Dec-17	
	Daily Total	Westwards		Eastwards	
		Daily	Max Hourly	Daily	Max Hourly
Limits	66	66	6	0	0
Actuals					
1	7	7	4	-	-
2	6	6	4	-	-
3	-	-	-	-	-
4	5	5	3	-	-
5	-	-	-	-	-
6	7	7	5	-	-
7	6	6	3	-	-
8	7	7	4	-	-
9	7	7	4	-	-
10	-	-	-	-	-
11	3	3	3	-	-
12	5	5	4	-	-
13	7	7	4	-	-
14	6	6	3	-	-
15	7	7	4	-	-
16	6	6	3	-	-
17	-	-	-	-	-
18	4	4	4	-	-
19	7	7	4	-	-
20	7	7	6	-	-
21	5	5	4	-	-
22	6	6	5	-	-
23	-	-	-	-	-
24	-	-	-	-	-
25	-	-	-	-	-
26	-	-	-	-	-
27	-	-	-	-	-
28	-	-	-	-	-
29	-	-	-	-	-
30	-	-	-	-	-
31	-	-	-	-	-

Table 2B: Number of Laden Trucks - 5:00am to 6:00am

TERALBA QUARRY		Month:		Dec-17
		Westwards		Eastwards
		Max Hourly		Max Hourly
Limits*		12		0
Actuals				
1		1		-
2		1		-
3		-		-
4		2		-
5		2		-
6		1		-
7		-		-
8		-		-
9		-		-
10		-		-
11		4		-
12		1		-
13		-		-
14		1		-
15		-		-
16		1		-
17		-		-
18		3		-
19		-		-
20		-		-
21		1		-
22		-		-
23		-		-
24		-		-
25		-		-
26		-		-
27		-		-
28		-		-
29		-		-
30		-		-
31		-		-

* Condition 2 (9)

Table 2C: Number of Laden Trucks - 6:00am to 7:00am

TERALBA QUARRY		Month:		Dec-17	
		Westwards**		Eastwards**	
		Max Hourly		Max Hourly	
Limits*		28		8	
Actuals					
1		7		2	
2		2		2	
3		-		-	
4		6		1	
5		8		1	
6		7		1	
7		7		-	
8		8		1	
9		3		1	
10		-		-	
11		6		-	
12		9		2	
13		3		3	
14		4		2	
15		6		2	
16		8		-	
17		-		-	
18		7		1	
19		3		2	
20		5		2	
21		7		2	
22		6		-	
23		-		-	
24		-		-	
25		-		-	
26		-		-	
27		-		-	
28		-		-	
29		-		-	
30		-		-	
31		-		-	

* Condition 2 (9)

** Combined Maximum hourly No. of laden trucks = 28

Table 2D: Number of Laden Trucks - 7:00am to 6pm

TERALBA QUARRY		Month:		Dec-17		
		Daily Total	Westwards		Eastwards	
			Daily	Max Hourly	Daily	Max Hourly
Limits		305	220	20	85	8
Actuals						
1		88	57	11	31	5
2		24	20	5	4	2
3		-	-	-	-	-
4		65	44	9	21	4
5		61	34	7	27	6
6		86	55	10	31	7
7		95	52	8	43	7
8		81	50	9	31	7
9		22	13	5	9	4
10		-	-	-	-	-
11		76	43	10	33	7
12		74	38	8	36	8
13		89	35	8	54	8
14		86	35	8	51	8
15		62	35	7	27	5
16		19	13	4	6	3
17		-	-	-	-	-
18		57	36	9	21	4
19		59	30	6	29	5
20		65	40	9	25	5
21		48	37	9	14	4
22		25	17	6	8	2
23		-	-	-	-	-
24		-	-	-	-	-
25		-	-	-	-	-
26		-	-	-	-	-
27		-	-	-	-	-
28		-	-	-	-	-
29		-	-	-	-	-
30		-	-	-	-	-
31		-	-	-	-	-

** PLEASE NOTE: The Hiligted Max Hourly Movements Do Not Relate To Same One Hour Period

Metromix Teralba Quarry - Deposited Dust Monitoring Results

Year	RHONDA RD			MYRTLE ST			HILLSIDE CRES			RODGERS ST			MARGARET ST		
	Total Insoluble Solids	Ash Fraction	% Ash	Total Insoluble Solids	Ash Fraction	% Ash	Total Insoluble Solids	Ash Fraction	% Ash	Total Insoluble Solids	Ash Fraction	% Ash	Total Insoluble Solids	Ash Fraction	% Ash
Units	gm ² /month	gm ² /month		gm ² /month	gm ² /month		gm ² /month	gm ² /month		gm ² /month	gm ² /month		gm ² /month	gm ² /month	
EPA Approved Level	4.0			4.0			4.0			4.0			4.0		
2004	1.3	0.9	73	0.9	0.6	70	2.5	1.3	68						
2005	1.4	0.9	69	1.3	0.7	58	1.4		54						
2006	1.0	0.6	67	2.0	1.1	50	0.9	0.5	57						
2007	1.1	0.7	65	0.9	0.5	56	1.0	0.5	56						
2008	1.0	0.6	61	0.9	0.5	65	1.0	0.5	50						
2009	1.4	0.9	63	1.4	1.0	65	2.1	1.3	54						
2010	1.1	0.8	72	0.7	0.5	74	1.0	0.4	44						
2011	1.0	0.7	73	1.1	0.5	51	1.1	0.5	53	1.0	0.7	80	0.8	0.7	74
2012	0.8	0.5	66	0.9	0.5	63	1.4	0.5	36	1.0	0.7	74	1.2	0.7	71
2013	1.0	0.7	73	0.9	0.6	68	1.3	0.5	39	1.0	0.7	77	1.3	0.8	64
2014	0.9	0.5	60	0.9	0.5	60	1.5	0.8	52	1.9	1.3	51	1.0	0.6	62
2015	1.0	0.5	50	1.7	1.2	68	1.7	1.0	54	0.9	0.6	66	1.0	0.7	64
2016	0.9	0.5	62	1.2	0.7	61	1.8	1.1	61	0.8	0.5	67	1.1	0.7	67
2017	0.9	0.5	49	1.5	1.0	62	2.0	1.1	53	1.8	1.1	57	1.2	0.7	58
Average (All Years)	1.0	0.6	64	1.2	0.7	62	1.4	0.7	52	1.2	0.8	67	1.1	0.7	65



2018 Results															
02-Jan-18	0.8	0.6	75	0.5	0.4	80	1.3	0.7	54	1.3	0.7	54	1.1	0.8	73
=Monitoring did not occur at this location until 2011.															

Teralba Quarry – PM10 Monitoring Data Summary

Date	Metromix PM10 24 Hr	Monthly Average	Year to Date Annual Vverage	24hr Max Criteria	Annual Average Max Criteria
6/01/2017	4		4.0	50	30
12/01/2017	21		12.5	50	30
18/01/2017	30		18.3	50	30
24/01/2017	27		20.5	50	30
30/01/2017	18	20.0	20.0	50	30
5/02/2017	16		19.3	50	30
11/02/2017	34		21.4	50	30
17/02/2017	20		21.3	50	30
23/02/2017	15	21.3	20.6	50	30
1/03/2017	4		18.9	50	30
7/03/2017	15		18.5	50	30
13/03/2017	21		18.8	50	30
19/03/2017	16		18.5	50	30
25/03/2017	16		18.4	50	30
31/03/2017	14	14.3	18.1	50	30
6/04/2017	3		17.1	50	30
12/04/2017	5		16.4	50	30
18/04/2017	10		16.1	50	30
24/04/2017	15		16.0	50	30
30/04/2017	4	7.4	15.4	50	30
6/05/2017	12		15.2	50	30
12/05/2017	14		15.2	50	30
18/05/2017	18		15.3	50	30
24/05/2017	10		15.1	50	30
30/05/2017	12	13.2	15.0	50	30
5/06/2017	6		14.6	50	30
11/06/2017	7		14.3	50	30
17/06/2017	14		14.3	50	30
23/06/2017	14		14.3	50	30
29/06/2017	21	12.4	14.5	50	30
5/07/2017	4		14.2	50	30
11/07/2017	8		14.0	50	30
17/07/2017	11		13.9	50	30
23/07/2017	18		14.0	50	30
29/07/2017	13	10.8	14.0	50	30
4/08/2017	2		14.0	50	30
10/08/2017	11		14.0	50	30
16/08/2017	27		14.0	50	30
22/08/2017	21		14.0	50	30
28/08/2017	10	14.2	14.0	50	30
3/09/2017	21		14.2	50	30
9/09/2017	25		14.5	50	30
15/09/2017	7		14.3	50	30
21/09/2017	21		14.4	50	30
27/09/2017	18	18.4	14.5	50	30
3/10/2017	12		14.5	50	30
9/10/2017	15		14.5	50	30
15/10/2017	8		14.3	50	30
21/10/2017	16		14.4	50	30
27/10/2017	12	12.6	14.3	50	30
2/11/2017	16		14.4	50	30
8/11/2017	9		14.3	50	30
14/11/2017	7		14.1	50	30
20/11/2017	3		13.9	50	30
26/11/2017	8	8.6	13.8	50	30
2/12/2017	9		13.7	50	30
8/12/2017	17		13.8	50	30
14/12/2017	26		14.0	50	30
20/12/2017	35		14.3	50	30
26/12/2017	14	20.2	14.3	50	30
Current 2017	PM10				
Average	14.3				
Standard Deviation	7.6				
Minimum	2.0				
Maximum	35.0				
Count	60				

Water Monitoring - Teralba Quarry - 2017 - EPA Point No.4 - Adit Overflow													
Sample No.	Sample Dates	EPA No4 - 135 ABCDE		EPA No4 - 137 ABCDE		EPA No4 - 138 ABCDE		EPA No4 - 139 ABCDE		EPA No4 - 140 ABCDE		EPA No4 - 141 ABCDE	
		Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)
Sample	Units												
pH	ph Unit	6.94		7.13		7.31		7.36		7.09		7.49	
Conductivity	µS/cm	2050		1930		1800		1840		1750		1730	
TSS	mg/L	20		18		11		5		8			
Oil & Grease	mg/L	<5		<5		<5		<5		<5		<5	
Aluminium	mg/L	0.25	<0.01	0.36	<0.01	0.31	<0.01	0.06	<0.01	0.02	<0.01	0.28	<0.01
Ammonia as N	mg/L	0.04		0.04		0.04		0.1		0.13		0.03	
Antimony	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	mg/L	0.003	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.001	<0.001	0.002	<0.001
Barium	mg/L	0.04	0.034	0.033	0.03	0.036	0.030	0.032	0.030	0.031	0.032	0.032	0.029
Beryllium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.16	0.15	0.1	0.11	0.11	0.12	0.12	0.12	0.13	0.11	0.11	0.12
Cadmium	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/L	55				50		48		46		44	
Chromium	mg/L	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.002	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	mg/L	0.68	<0.05	0.58	<0.05	0.89	<0.05	<0.05	<0.05	0.26	0.09	0.60	<0.05
Lead	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium	mg/L	0.034	0.034	0.023	0.016	0.029	0.026	0.03	0.03	0.034	0.032	0.032	0.03
Magnesium	mg/L	61	64	62	60	63	62	53	55	55	51	48	54
Manganese	mg/L	0.471	0.404	0.217	0.18	0.349	0.282	0.282	0.259	0.275	0.257	0.149	0.126
Mercury	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.001	0.005	0.004
Nickel	mg/L	0.009	0.006	0.008	0.008	0.009	0.007	0.005	0.006	0.005	0.005	0.007	0.005
Phosphorous as P	mg/L	0.02		0.01		0.01						<0.01	<0.025 mg/L ^c
Potassium	mg/L	8			8		7		7		8		8
Selenium	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silica as SiO2	mg/L	16.5	15	14.8	11.8	15.9	14.2	14.7	13.8	14.2	13.4	13.2	12.1
Silver	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005 mg/L
Sulfur as S	mg/L	85			98		97		82		92		79
Tin	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.002	<0.001
Titanium	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ID
Zinc	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.008 mg/L

Indicates result indicates results that varied between filtered and unfiltered samples

ND = Not Determined

NA = Not Applicable

^a Based on ANZECC Guidelines for Fresh and Marine Water Quality - Recreational Water Quality (ANZECC 2000) except where indicated

^b Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)

^c Based on ANZECC Guidelines for Fresh and Marine Water Quality - Livestock Water Quality (ANZECC 2000)

^d Based on ANZECC Guidelines for Fresh and Marine Water Quality - Irrigation Water Quality (ANZECC 2000)



Water Monitoring - Teralba Quarry - 2017 - EPA Point No.4 - Adit Overflow													
Sample No.	EPA No 4 - 142 ABCDE	EPA No 4 - 143 ABCDE	EPA No 4 - 144 ABCDE	EPA No 4 - 145 ABCDE	EPA No 4 - 146 ABCDE								
Dates	July 2017	August 2017	September 2017	October 2017	November 2017	December 2017							
Sample	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Guidelines
pH	7.77		7.28		7.46		7.42		7.19		7.15		6.5 to 8.5 units ^a
Conductivity	1950		1970		2520		2070		2050		2230		125 - 2200 µS/cm ^b
TSS	6		15		8		16		<5		<5		<50 mg/L ^a
Oil & Grease	<5		<5		<5		<5		<5		<5		<5 mg/L ^a
Ammonia as N	0.16	<0.01	0.22	<0.01	0.04		0.02	<0.01	0.06		0.09	<0.01	<0.05 mg/L
Antimony	0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001		<0.001	<0.001	<0.002 mg/L ^b
Arsenic	0.006	0.002	0.002	<0.001	0.001		0.001	<0.001	0.001		0.001	0.001	<0.013 mg/L
Barium	0.033	0.028	0.034	0.027	0.031		0.032	0.030	0.038		0.033	0.031	NA
Beryllium	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001		<0.001	<0.001	ID
Boron	0.5	0.11	0.16	<0.05	0.16		0.14	0.15	0.15		0.16	0.18	<0.37 mg/L
Cadmium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0002 mg/L
Calcium	41		46		56		56	46	56		56	60	NA
Chromium	<0.001	0.006	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001		<0.001	<0.001	<0.001 mg/L
Cobalt	<0.001	<0.001	0.002	<0.001	<0.001		<0.001	<0.001	<0.001		<0.001	<0.001	ID
Copper	0.001	0.003	0.002	0.001	0.001		0.001	<0.001	<0.001		<0.001	<0.001	<0.0014 mg/L
Iron	0.32	<0.05	0.50	<0.05	0.14		0.24	<0.05	0.23		0.27	<0.05	ID
Lead	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001		<0.001	<0.001	<0.0034 mg/L
Lithium	0.038	0.032	0.041	0.006	0.035		0.035	0.033	0.037		0.041	0.04	NA
Magnesium	56	50	63	60	73		60	56	62		66	58	NA
Manganese	0.155	0.122	0.160	0.116	0.068		0.123	0.116	0.333		0.272	0.250	<1.9 mg/L
Mercury	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0006 mg/L
Molybdenum	0.007	0.003	0.002	0.002	0.002		0.002	0.002	0.002		0.003	0.003	ID
Nickel	0.008	0.008	0.011	0.006	0.005		0.006	0.004	0.007		0.006	0.006	<0.011 mg/L
Phosphorous as P	0.02	8	<0.01	8	0.01		0.01	8	<0.01		<0.01	8	<0.025 mg/L ^c
Potassium	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01		<0.01	<0.01	NA
Selenium	12.8	12	13.0	14.5	13.1		13.5	13.1	13.9		15.4	14.9	<0.011 mg/L
Silicon as SiO2	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001		<0.001	<0.001	<0.0005 mg/L
Silver	<0.001	85	<0.001	105	118		118	102	<0.001		<0.001	118	NA
Sulfur as S	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001		<0.001	<0.001	ID
Tin	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01		<0.01	<0.01	NA
Titanium	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01		<0.01	<0.01	ID
Vanadium	<0.005	<0.005	0.012	0.005	0.008		0.008	<0.005	<0.005		<0.005	<0.005	<0.008 mg/L
Zinc	<0.005	<0.005	0.012	0.005	0.008		0.008	<0.005	<0.005		<0.005	<0.005	<0.008 mg/L

Water Monitoring - Teralba Quarry - 2017 - EPA Point No.5 - Overflow Dam B											
Sample No.	Dates	January 2017.		February 2017.		March 2017.		April 2017.		May 2017.	
		Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)
Sample	Units										
pH	ph Unit										
Conductivity	µS/cm	No Discharge		No Discharge		No Discharge		7.07		No Discharge	
TSS	mg/L							1030			
Oil & Grease	mg/L							<5			
Aluminium	mg/L							0.42	<0.01		
Ammonia as N	mg/L							0.05	<0.001		
Antimony	mg/L							<0.001	<0.001		
Arsenic	mg/L							0.007	0.001		
Barium	mg/L							0.067	0.027		
Beryllium	mg/L							<0.001	<0.001		
Boron	mg/L							0.14	0.14		
Cadmium	mg/L							<0.0001	<0.0001		
Calcium	mg/L							31	32		
Chromium	mg/L							<0.001	<0.001		
Cobalt	mg/L							0.013	0.001		
Copper	mg/L							0.002	<0.001		
Iron	mg/L							4.13	0.18		
Lead	mg/L							<0.001	<0.001		
Lithium	mg/L							0.016	0.013		
Magnesium	mg/L							33	32		
Manganese	mg/L							0.463	0.231		
Mercury	mg/L							<0.0001	<0.0001		
Molybdenum	mg/L							0.004	0.001		
Nickel	mg/L							0.011	0.004		
Phosphorous as P	mg/L										
Potassium	mg/L							5	5		
Selenium	mg/L							<0.01	<0.01		
Silica as SiO2	mg/L							25.3	22.5		
Silver	mg/L							<0.001	<0.001		
Sulfur as S	mg/L							46	46		
Tin	mg/L							<0.001	<0.001		
Titanium	mg/L							<0.01	<0.01		
Vanadium	mg/L							<0.01	<0.01		
Zinc	mg/L							<0.005	<0.005		

Indicates results that varied between filtered and unfiltered samples

ND = Not Determined

NA = Not Applicable

* Based on ANZECC Guidelines for Fresh and Marine Water Quality - Recreational Water Quality (ANZECC 2000) except where indicated

* Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)

* Based on ANZECC Guidelines for Fresh and Marine Water Quality - Livestock Water Quality (ANZECC 2000)

* Based on ANZECC Guidelines for Fresh and Marine Water Quality - Irrigation Water Quality (ANZECC 2000)



Water Monitoring - Teralba Quarry - 2017 - EPA Point No.5 - Overflow Dam B												
Sample No. Dates	Units	July 2017.		August 2017.		September 2017.		October 2017.		November 2017.		Guidelines
		Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	Total (Unfiltered)	Dissolved (Filtered)	
Sample												
pH		NO DISCHARGE		NO DISCHARGE		NO DISCHARGE		NO DISCHARGE		NO DISCHARGE		6.5 to 8.5 units ^a
Conductivity	µS/cm											125 - 2200 µS/cm ^b
TSS	mg/L											<50 ^c mg/L ^a
Oil & Grease	mg/L											<5 mg/L ^a
Aluminium	mg/L											<0.055 mg/L
Ammonia as N	mg/L											<0.02 mg/L ^b
Antimony	mg/L											ID
Arsenic	mg/L											<0.013 mg/L
Barium	mg/L											NA
Beryllium	mg/L											ID
Boron	mg/L											<0.37 mg/L
Cadmium	mg/L											<0.0002 mg/L
Calcium	mg/L											NA
Chromium	mg/L											<0.001 mg/L
Cobalt	mg/L											ID
Copper	mg/L											<0.0014 mg/L
Iron	mg/L											ID
Lead	mg/L											<0.0034 mg/L
Lithium	mg/L											NA
Magnesium	mg/L											NA
Manganese	mg/L											<19 mg/L
Mercury	mg/L											<0.0008 mg/L
Molybdenum	mg/L											ID
Nickel	mg/L											<0.011 mg/L
Phosphorous as P	mg/L											<0.025 mg/L ^c
Potassium	mg/L											NA
Selenium	mg/L											<0.011 mg/L
Silica as SiO ₂	mg/L											NA
Silver	mg/L											<0.0005 mg/L
Sulfur as S	mg/L											NA
Tin	mg/L											ID
Titanium	mg/L											NA
Vanadium	mg/L											ID
Zinc	mg/L											<0.008 mg/L

Indicates results that varied between filtered and unfiltered samples

ND = Not Determined

NA = Not Applicable

^a Based on ANZECC Guidelines for Fresh and Marine Water Quality - Recreational Water Quality (ANZECC 2000) except where indicated

^b Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)

^c Based on ANZECC Guidelines for Fresh and Marine Water Quality - Livestock Water Quality (ANZECC 2000)

^d Based on ANZECC Guidelines for Fresh and Marine Water Quality - Irrigation Water Quality (ANZECC 2000)

Date	Metromix Sample No.	pH	Suspended Solids (mg/L)	Comments
Jan-17	No Water Discharge at EPA Point 6			
Feb-17	No Water Discharge at EPA Point 6			
Mar-17	No Water Discharge at EPA Point 6			
Apr-17	No Water Discharge at EPA Point 6			
May-17	No Water Discharge at EPA Point 6			
Jun-17	No Water Discharge at EPA Point 6			
Jul-17	No Water Discharge at EPA Point 6			
Aug-17	No Water Discharge at EPA Point 6			
Sep-17	No Water Discharge at EPA Point 6			
Oct-17	No Water Discharge at EPA Point 6			
Nov-17	No Water Discharge at EPA Point 6			
Dec-17	No Water Discharge at EPA Point 6			

Date	Metromix Sample No.	pH	Suspended Solids (mg/L)	Comments
Jan-17	No Water Discharge at EPA Point 7			
Feb-17	No Water Discharge at EPA Point 7			
Mar-17	No Water Discharge at EPA Point 7			
Apr-17	No Water Discharge at EPA Point 7			
May-17	No Water Discharge at EPA Point 7			
Jun-17	No Water Discharge at EPA Point 7			
Jul-17	No Water Discharge at EPA Point 7			
Aug-17	No Water Discharge at EPA Point 7			
Sep-17	No Water Discharge at EPA Point 7			
Oct-17	No Water Discharge at EPA Point 7			
Nov-17	No Water Discharge at EPA Point 7			
Dec-17	No Water Discharge at EPA Point 7			

Metromix Teralba Quarry Daily Rainfall 2017

Date	Daily Rainfall (mm)											
	January	February	March	April	May	June	July	August	September	October	November	December
1	7	3.4	6.4	0	0	0	0	0	0	0	0	0
2	7	0.2	0.2	9	0	0	0	0	0	0	0	11.6
3	0	0	13.6	18.4	0.4	1.8	0	6.4	0	0	0	0
4	4.4	7.8	2.4	17.2	0.2	0	0	0.2	0	0	16.8	1.6
5	1.4	0	2	2.4	0	0	0	0	0	0	9.6	1
6	0	0	0	0	0	0	0	0	0	0	6.2	7
7	0	0.2	9.2	0	0	46.4	0	0	0	0	0.2	0
8	0	2.6	3	0	0	10.6	0	0	0	0	18	0
9	0	4.2	2.4	4.6	0	19	0	0	0	0.4	0.2	2.4
10	0	0	0.2	0.4	0	20	0	0	0	0.2	0	0
11	0	0	0	6.8	0	1.4	0.4	0	0	0	0	0
12	0	0	0	6.2	0.4	0	4.8	0	0	0.8	0	0
13	0	10.4	0	1.4	0	0	0.2	0	0	0	0	0
14	0	4.4	7	0	2.2	2.8	0	0	14.2	4.6	0	0
15	0	0.2	6.6	0	0.2	0.2	0	0	0	19.2	0	0
16	0	0	10	0	0	0	0	0	0	0	3	0
17	0	4.2	46.6	0	0	0.4	0	0	0	0	0	0
18	0	1	32.4	0	0	32	0	0	0	0.2	0.8	2.6
19	0.2	3.4	8.4	0	11.8	0.2	0	0	0	0	0.2	0.2
20	9.6	0	0	0	1.4	0.2	0	0	0	41.6	0	7
21	0	0	0.2	0	0.2	0	0	0	0	0.4	0	2.2
22	0	0	6.2	0	0	0	0	0	0	9.8	0	0
23	0	0	1.2	0	0	0	0	0	0	12.4	0	0
24	36	0	2.2	0	0.8	0	0	0	0	0	0	0
25	0	21.6	0	3.6	0	0	0	0	0	0	0	2.2
26	4.5	18.8	0	0.4	0	0	0	0	0	41.6	0	0.2
27	0	21.2	0	0	0	0	0	0	0	30.4	0	0
28	0	18.8	0	0	0	3.8	0	0	0	0	0	0
29	0		0	0	0	1.6	0	0	0	0	0	0
30	0		39.8	0	0	0.2	0	0	0	0	0	0.6
31	0.8		0.8		1.6		0	0		0		0
Monthly Total	70.9	122.4	222.4	70.4	19.2	140.6	5.4	6.6	14.2	161.6	55	38.6
	Annual Total											927.3

Note: Rainfall on three days in January 2017 was not recorded and therefore monthly and annual total may not be complete.





18 September 2017

Ref: 8413/7345

Metromix Pty Ltd
150 Rhondda Road
Teralba NSW 2284

AUGUST 2017 NOISE MONITORING RESULTS – TERALBA QUARRY

This letter report presents the results of attended noise monitoring conducted for the Metromix operated Teralba Quarry (TQ) commencing on Tuesday 29th and finishing on Thursday 31st of August, 2017. Noise monitoring was carried out in accordance with the conditions of the TQ Noise Management Plan (NMP) as shown in extract on page 2 (referenced from EPL 536).

Although the project approval nominates noise criteria at nine locations, Metromix recognises that meaningful monitoring data will continue to be collected from the closest locations to the active operational areas. As a result of this, and as outlined within the approved NMP, for periods when operations are confined to areas south of Rhondda Road, noise monitoring will be undertaken at Locations EPL-A, B, D, E and H.

Further to this, location EPL-C and EPL-F have been omitted from the noise monitoring programme given they are not required as other monitoring locations are nearby and closer to quarry related noise sources. This has been recognised by the EPA by the removal of these locations from the monitoring locations detailed in EPL 536. **Table 1** lists the address and coordinates of each noise monitoring location, with the relevant monitoring locations that were monitored during the August 2017 period highlighted in **bold**. The locations are shown on the figure in **Appendix I**.

Table 1 Noise Monitoring Locations (from PA 10-0183)			
Location in EPL	Address	Easting	Northing
EPL-A	Awaba Street, Teralba	369080	3651470
EPL-B ¹	Rhondda Road, Teralba	369250	6351915
EPL-C	Rhondda Road, Teralba ²	369205	6352015
EPL-D	Rhondda Road, Teralba	369150	6352135
EPL-E	Victoria Avenue, Teralba	369060	6352620
EPL-F	Victoria Avenue, Teralba ²	369130	6352945
EPL-H	School Road, Wakefield	366210	6352520

1. See text in relation to changes to monitoring location
2. Metromix has obtained permission for this monitoring location to be omitted.





Teralba Quarry Noise Monitoring – August 2017

It is noted that during the period when monitoring is undertaken at Location B, Metromix is required to provide a spotter to record the number of trucks departing from the Quarry and not the Teralba Business Park. Spectrum Acoustics personnel undertook identification of quarry trucks as part of the noise monitoring procedure.

As part of pre monitoring protocols Spectrum Acoustics notified, by letterbox drop, all landowners in the close vicinity of each site of the impending monitoring. The resident at Location B decided that after the day time survey on 30th August he didn't want the monitoring to be done near his residence. The remainder of the monitoring surveys were, therefore, undertaken at a point approximately 30m south (as shown in Appendix I).

The following presents noise related conditions of EPL 536 relevant to the compliance noise monitoring programme.

Condition	Requirement																																			
L5.2	<p>The licensee must ensure that noise generated by the activities within the premises do not exceed the following criteria measured by dB(A) at any residence or privately owned land.</p> <table><tr><th>Location</th><th>Day Shoulder 6:00am - 7:00am</th><th>Day 7:00am - 6:00pm</th><th>Evening 6:00pm – 10:00pm</th><th>Night 10:00pm – 6:00am</th></tr><tr><td></td><td>L_{Aeq} (15 minute)</td><td>L_{Aeq} (15 minute)</td><td>L_{Aeq} (15 minute)</td><td>L_{Aeq} (15 minute) L_{A1}(1min)</td></tr><tr><td>EPL-A</td><td>38</td><td>38</td><td>37</td><td>35 45</td></tr><tr><td>EPL-B</td><td>42</td><td>46</td><td>36</td><td>35 45</td></tr><tr><td>EPL-C</td><td>42</td><td>42</td><td>35</td><td>35 45</td></tr><tr><td>EPL-D, EPL-E, EPL-H</td><td>35</td><td>35</td><td>35</td><td>35 45</td></tr><tr><td>EPL-F</td><td>37</td><td>38</td><td>38</td><td>35 45</td></tr></table> <p>Note: The licensee may provide to the EPA written evidence of any agreement with a landholder which is subject to the above noise limits. The written evidence may be submitted with a licence variation to remove the landholder from the above table.</p>	Location	Day Shoulder 6:00am - 7:00am	Day 7:00am - 6:00pm	Evening 6:00pm – 10:00pm	Night 10:00pm – 6:00am		L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute) L _{A1} (1min)	EPL-A	38	38	37	35 45	EPL-B	42	46	36	35 45	EPL-C	42	42	35	35 45	EPL-D, EPL-E, EPL-H	35	35	35	35 45	EPL-F	37	38	38	35 45
Location	Day Shoulder 6:00am - 7:00am	Day 7:00am - 6:00pm	Evening 6:00pm – 10:00pm	Night 10:00pm – 6:00am																																
	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute) L _{A1} (1min)																																
EPL-A	38	38	37	35 45																																
EPL-B	42	46	36	35 45																																
EPL-C	42	42	35	35 45																																
EPL-D, EPL-E, EPL-H	35	35	35	35 45																																
EPL-F	37	38	38	35 45																																
L5.3	<p>For the purposes of Condition L5.2:</p> <p>a) Day-Shoulder is defined as the period between 6am to 7am Monday to Saturday.</p> <p>b) Day is defined as:</p> <p>a. the period from 7am to 6pm Monday to Saturday; and</p> <p>b. the period from 8am to 6pm Sundays and Public Holidays.</p> <p>c) Evening is defined as the period from 6pm to 10pm.</p> <p>d) Night is defined as:</p> <p>a. the period from 10pm to 7am Monday to Saturday; and</p> <p>b. the period from 10pm to 8am Sundays and Public Holidays.</p>																																			
L5.4	<p>The contributed noise level from the premises must not exceed the noise limits specified within EPL 536 at the most noise-affected point on or within the boundary of any residential premises to the north and/or south of the premises, except as expressly provided by this licence, or by the EPA in writing.</p>																																			
L5.5	<p>The noise limits set out in conditions L5.2 apply under all meteorological conditions except for anyone of the following:</p> <p>a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or</p> <p>b) Stability category F temperature inversion conditions and wind speeds greater</p>																																			





Teralba Quarry Noise Monitoring – August 2017

	the 2 metres/second at 10 metres above ground level; or c) Stability category G temperature inversion conditions.																
L5.6	For the purpose of condition L5.5: a) the meteorological data to be used for determining meteorological conditions is the data recorded at the meteorological station identified in this licence as EPA Identification Point W1. b) Stability category temperature inversion conditions are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the <i>NSW industrial Noise Policy (EPA 2000)</i> Note: The weather station must be designed, commissioned and operated in a manner to obtain the necessary parameters required under the above condition.																
L5.7	To determine compliance: 1. With the $L_{Aeq}(15\text{ min})$ noise limits in condition L5.2, the licensee must locate noise monitoring equipment; a) approximately on the boundary, where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises; or, b) within 30 metres of a dwelling facade (but not closer than 3 metres) where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises; or where applicable c) within approximately 50 metres if the boundary of a national park or nature reserve. 2. With the $LA1(1\text{ minute})$ noise limits in condition L5.2, the noise monitoring equipment must be located within 1 metre of a dwelling facade. 3. With the noise limits in condition L5.2, the noise monitoring equipment must be located; a) at the most affected point at a location where there is no dwelling at the location, or b) at the most affected point within an area at a location prescribed by conditions L5.7 1(a) or L5.7 1(b).																
L5.8	A non-compliance will still occur where noise generated from the premises in excess of the appropriate noise limit is measured: a) at a location other than an area prescribed by the conditions of this licence, and /or b) at a point other than the most affected point at a location.																
L5.9	For the purpose of determining the noise generated at the premises the licensee must use a Class 1 or Class 2 noise monitoring device as defined by AS IEC61672.1 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by the EPA in writing.																
L5.10	For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.																
L7.1	<p>The licensee must comply with the operating hours specified in Column 2, Column 3, and Column 4 of the table below:</p> <table><tr><th>Day</th><th>Loading and Dispatch of Quarry Trucks</th><th>Extraction and Processing</th><th>Receipt of Concrete</th></tr><tr><td>Monday - Friday</td><td>4:00am Monday to midnight Friday</td><td>7:00am to 7:00pm</td><td>7:00am to 5:00pm</td></tr><tr><td>Saturday</td><td>Midnight Friday to 6:00pm Saturday</td><td>7:00am to 2:00pm</td><td>7:00am to 2:00pm</td></tr><tr><td>Sundays and Public Holidays</td><td>None</td><td>none</td><td>none</td></tr></table> <p>Note: Maintenance activities may occur at any time provided they are inaudible at privately-owned residence. *VENM = Virgin Excavated Natural Material **ENM = Excavated Natural Material</p>	Day	Loading and Dispatch of Quarry Trucks	Extraction and Processing	Receipt of Concrete	Monday - Friday	4:00am Monday to midnight Friday	7:00am to 7:00pm	7:00am to 5:00pm	Saturday	Midnight Friday to 6:00pm Saturday	7:00am to 2:00pm	7:00am to 2:00pm	Sundays and Public Holidays	None	none	none
Day	Loading and Dispatch of Quarry Trucks	Extraction and Processing	Receipt of Concrete														
Monday - Friday	4:00am Monday to midnight Friday	7:00am to 7:00pm	7:00am to 5:00pm														
Saturday	Midnight Friday to 6:00pm Saturday	7:00am to 2:00pm	7:00am to 2:00pm														
Sundays and Public Holidays	None	none	none														





NOISE MEASUREMENTS

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters” and have current NATA calibration. Field calibration of each instrument was carried out at the start and end of each monitoring period.

The noise monitoring was conducted in general accordance with the requirements of Section 9 of the NMP (Noise Monitoring Protocol and Evaluation of Compliance) as follows;

“Metromix proposes to adopt a noise monitoring protocol that provides feedback on the effectiveness of the noise control measures and demonstrate compliance with the conditions within the Project Approval 10_0183 and Environment Protection Licence 0536.

The approach to monitoring compliance is based substantially upon Metromix’s experience to date which has identified the on-site activities have not been the source of noise complaints or any recorded non-compliance. Hence, it is considered the monitoring program needs to reflect this fact.”

A-weighted noise levels were measured over 15 minute monitoring periods with data acquired at 1 second statistical intervals and the meter set to “fast” response. Each 1 second measurement is accompanied by a third-octave band spectrum from 20 - 20k Hz which is required for analysing INP ‘modifying factors’. Time based field notes allow for determination of the relative contributions to the overall noise level of all significant noise sources.

The worst case 15 minute Leq noise level for each monitoring period is shown in the tables below. Where the noise from TQ was audible, Bruel & Kjaer “Evaluator” analysis software was used to quantify the contributions of the quarry and other significant noise sources to the overall level. Quarry noise from TQ is shown in the tables in bold type. Where noise from TQ is listed as faintly audible, this means the noise levels from the quarry were at least 10 dB below the ambient level during the measurement and not measurable.

Noise levels were recorded for each of the L10, Leq, Lmax, L1, L90 and Lmin percentiles. All noise levels shown in the tables of results are in dB(A) Leq (15 min). Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request.

Meteorological data used in this report was obtained from the quarry-operated weather station at the site.

Noise Compliance Assessment

The results of the noise measurements undertaken throughout the various time periods are provided in **Tables 2 to 16**. EPL 536 refers to the various time periods as follows:

- a) Day-Shoulder is defined as the period between 6am to 7am Monday to Saturday.
- b) Day is defined as:





Teralba Quarry Noise Monitoring – August 2017

- (i) the period from 7am to 6pm Monday to Saturday; and
 - (ii) the period from 8am to 6pm Sundays and Public Holidays.
- c) Evening is defined as the period from 6pm to 10pm.
- d) Night is defined as:
- (i) the period from 10pm to 7am Monday to Saturday; and
 - (ii) the period from 10pm to 8am Sundays and Public Holidays.

Table 2 Teralba Quarry Noise Monitoring Results – 29 August 2017 Night					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	5:35 am	45	35	0.8 m/s 225°	Birds (43), industrial noise (38), traffic (35), TQ inaudible
B	4:30 am	36	35	0.9 m/s 235°	Traffic (34), birds (30), TQ inaudible
D	4:30 am	38	35	0.9 m/s 235°	Traffic (37), birds (31), TQ inaudible
E	5:35 am	36	35	0.8 m/s 225°	Birds (34), traffic (32), TQ inaudible
H	5:00 am	42	35	0.8 m/s 226°	Traffic (40), birds (39), TQ inaudible

Table 3 Teralba Quarry Noise Monitoring Results – 29 August 2017 Day Shoulder					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	6:45 am	45	38	0.4 m/s 278°	Birds (42), industrial noise (40), traffic (36), TQ inaudible
B	6:21 am	46	42	0.9 m/s 236°	Traffic (44), industrial noise (40), TQ (30)¹
D	6:39 am	46	35	0.4 m/s 272°	Traffic (46), birds (34), industrial noise (30), TQ inaudible
E	6:35 am	40	35	0.6 m/s 256°	Birds (38), traffic (32), TQ inaudible
H	6:00 am	47	35	0.8 m/s 231°	Traffic (44), birds (44), TQ inaudible
Note: 1 See text description and analysis					

Table 4 Teralba Quarry Noise Monitoring Results – 29 August 2017 Day					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	8:55 am	42	38	1.2 m/s 187°	Birds (38), industrial noise (37), traffic (36), domestic noise (30), TQ inaudible
B	7:15 am	48	46	0.6 m/s 250°	Industrial noise (46), traffic (42), birds (30), TQ (25)¹
D	7:05 am	46	35	0.5 m/s 261°	Traffic (44), birds (40), TQ (28) , industrial noise (28)
E	8:40 am	40	35	1.2 m/s 196°	Birds (39), traffic (30), TQ inaudible
H	7:02 am	47	35	0.5 m/s 261°	Traffic (44), birds (44), TQ inaudible
Note: 1 See text description and analysis					





Teralba Quarry Noise Monitoring – August 2017

Table 5 Teralba Quarry Noise Monitoring Results – 29 August 2017 Evening					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	9:05 pm	34	37	1.3 m/s 347°	Birds & insects (33), traffic (28), TQ inaudible
B	9:20 pm	41	36	1.1 m/s 340°	Traffic (41), TQ inaudible
D	7:23 pm	46	35	0.7 m/s 320°	Traffic (44), birds (42), TQ inaudible
E	6:47 pm	44	35	0.4 m/s 92°	Traffic (42), birds (40), insects (30), TQ inaudible
H	6:10 pm	37	35	0.7 m/s 133°	Traffic (34), birds (32), insects (30), TQ barely audible

Table 6 Teralba Quarry Noise Monitoring Results – 30 August 2017 Night					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	5:40 am	48	35	0.3 m/s 316°	Birds (47), traffic (40), industrial noise (25), TQ inaudible
B	4:30 am	60	35	0.4 m/s 211°	Traffic (60), birds (35), TQ inaudible
D	4:30 am	32	35	0.4 m/s 211°	Traffic (30), birds (28), TQ inaudible
E	5:35 am	41	35	0.3 m/s 316°	Birds (40), traffic (32), TQ inaudible
H	5:00 am	42	35	0.3 m/s 261°	Traffic (40), birds (38), TQ inaudible

Table 7 Teralba Quarry Noise Monitoring Results – 30 August 2017 Day Shoulder					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	6:45 am	48	38	0.4 m/s 76°	Birds (47), traffic (39), industrial noise (30), TQ inaudible
B	6:21 am	48	42	0.3 m/s 321°	Traffic (48), industrial noise (40), TQ (28)¹
D	6:40 am	47	35	0.4 m/s 54°	Traffic (46), birds (36), industrial noise (30), TQ inaudible
E	6:35 am	39	35	0.3 m/s 40°	Birds (38), traffic (32), trains (25), TQ inaudible
H	6:00 am	48	35	0.3 m/s 302°	Traffic (47), birds (40), TQ inaudible
Note: 1 See text description and analysis					





Teralba Quarry Noise Monitoring – August 2017

Table 8 Teralba Quarry Noise Monitoring Results – 30 August 2017 Day					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	7:00 am	47	38	0.7 m/s 190°	Birds (45), industrial noise (40), traffic (38), TQ inaudible
B	8:35 am	46	46	1.1 m/s 214°	Traffic (45), industrial noise (40), TQ (30)¹
D	7:05 am	41	35	0.7 m/s 197°	Traffic (40), birds (32), industrial noise (30), TQ occasionally audible
E	8:45 am	38	35	1.2 m/s 216°	Birds (38), traffic (25), TQ inaudible
H	7:00 am	50	35	0.7 m/s 190°	Traffic (48), birds (45), TQ inaudible
Note: 1 See text description and analysis					

Table 9 Teralba Quarry Noise Monitoring Results – 30 August 2017 Evening					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	9:05 pm	32	37	1.5 m/s 188°	Traffic (32), TQ barely audible
B	6:44 pm	41	36	1.5 m/s 182°	Traffic (39), train (34), domestic noise (33), TQ inaudible
D	7:19 pm	41	35	1.2 m/s 181°	Traffic (41), TQ inaudible
E	8:30 pm	38	35	1.1 m/s 195°	Traffic (38), trains (26), TQ inaudible
H	7:54 pm	33	35	1.3 m/s 190°	Traffic (31), birds (28), TQ inaudible

Table 10 Teralba Quarry Noise Monitoring Results – 31 August 2017 Night					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	5:38 am	44	35	2.4 m/s 235°	Traffic (41), birds (40), industrial noise (30), TQ inaudible
B	4:32 am	54	35	2.0 m/s 228°	Traffic (54), industrial noise (30), TQ inaudible
D	4:30 am	40	35	2.0 m/s 228°	Traffic (38), wind in trees (35), birds (30), TQ occasionally audible
E	5:35 am	41	35	2.4 m/s 235°	Birds (40), traffic (30), TQ (27)
H	5:00 am	38	35	2.1 m/s 232°	Frogs (36), traffic (32), TQ inaudible





Teralba Quarry Noise Monitoring – August 2017

Table 11 Teralba Quarry Noise Monitoring Results – 31 August 2017 Day Shoulder					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/direction	Identified Noise Sources (Leq (15 min))
A	6:38 am	39	38	2.4 m/s 234°	Traffic (34), birds (34), Industrial noise (33), TQ inaudible
B	6:20 am	45	42	2.7 m/s 236°	Traffic (42), wind (40), train (36), TQ inaudible
D	6:40 am	43	35	2.4 m/s 234°	Industrial noise (40), traffic (38), birds (30), trains (30), TQ inaudible
E	6:40 am	37	35	2.4 m/s 234°	Birds (36), traffic (30), TQ (<20)
H	6:00 am	45	35	2.3 m/s 234°	Birds (44), traffic (40), TQ inaudible

Table 12 Teralba Quarry Noise Monitoring Results – 31 August 2017 Day					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/direction	Identified Noise Sources (Leq (15 min))
A	7:00 am	42	38	2.1 m/s 234°	Traffic (40), birds (35), industrial noise (35), TQ inaudible
B	8:35 am	48	46	2.2 m/s 228°	Wind (45), traffic (42), birds (42), TQ (29) ¹
D	8:40 am	46	35	2.2 m/s 228°	Industrial noise (42), traffic (40), birds (40), TQ inaudible
E	10:10 am	38	35	2.0 m/s 202°	Birds (37), traffic (30), TQ inaudible
H	7:00 am	45	35	2.1 m/s 234°	Traffic (43), birds (40), TQ inaudible

Note: 1 See text description and analysis

Table 13 Teralba Quarry Noise Monitoring Results – 31 August 2017 Evening					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/direction	Identified Noise Sources (Leq (15 min))
A	8:05 pm	38	37	1.7 m/s 208°	Birds (35), traffic (34), TQ inaudible
B	7:30 pm	45	36	1.5 m/s 212°	Traffic (45), TQ inaudible
D	6:56 pm	43	35	1.5 m/s 212°	Traffic (42), wind (35), TQ inaudible
E	8:45 pm	32	35	1.8 m/s 228°	Traffic (32), TQ inaudible
H	6:28 pm	35	35	1.4 m/s 192°	Traffic (34), birds (30), TQ (<20)

The results shown in Tables 2 to 13 show that, under the operational and atmospheric conditions at the time of monitoring, noise emissions from TQ did not exceed the relevant criterion at any monitoring location during any part of the survey.

Monitoring location EPL-B is situated close to the corner of Rhondda Road and Railway Street. This monitoring location is included predominantly to measure quarry noise from emissions from trucks exiting the site along the private section of the access road (through the Teralba Business Park). From the monitoring location it was possible to determine which trucks were associated with the quarry and a dedicated spotter was not required during this monitoring period.





Teralba Quarry Noise Monitoring – August 2017

When measuring noise at the EPL-B location, the noise emissions from the exiting quarry trucks (whilst on the private section of the access road) was measured and the worst case 15 minute Leq noise level calculated based on the time each truck was on the private road. The worst case calculated Leq level for the trucks is that shown for Location B in Tables 2 to 13.

At location EPL-D the acoustic environment is significantly influenced by noise from traffic on Rhondda Rd, trains and other industries within the vicinity. Noise emissions from the batching plant which is located adjacent to TQ contributed to the received noise during some monitoring periods.

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

In addition to the operational noise, the noise from TQ must not exceed **45 dB(A) L1 (1 min)** within the night-time period i.e. between the hours of 10 pm and 7 am, in accordance with *Condition L4.1* of EPL 536. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the quarry. The compliance measurement locations are different for each of the operational and sleep disturbance noise. That is, the sleep disturbance criterion is typically applicable at 1m from the façade of a bedroom window.

To avoid undue disturbance to residents, the L1 (1 min) noise level from the operational measurements are used to show general compliance with the sleep disturbance criterion. That is, as the distance between the noise source and the operational noise monitoring location is significantly greater than the distance between the operational noise monitoring location and the sleep disturbance monitoring location (i.e. 1m from the facade of the house) there will be little variation in L1 (1 min) levels between the two monitoring locations. It must be noted, however, that the sleep disturbance criterion is to be measured near a bedroom window. As the internal layout of each residence is not known, to consider a worst case, a bedroom window is assumed to be facing the operational noise monitoring location.

The results of the sleep disturbance measurements are shown in **Tables 14 to 16**.

Table 14 Teralba Quarry (L1 (1min)) Noise Monitoring Results –29 August 2017 (Night)					
Location	Time	dB(A), L1 (1 minute)	Wind speed/ direction	LA1 source	Identified Quarry Sources (L1 (1 min))
A	5:35 am	55	0.8 m/s 225°	Birds	n/a
B	4:30 am	60	0.9 m/s 235°	Traffic	n/a
D	4:30 am	48	0.9 m/s 235°	Traffic	n/a
E	5:35 am	50	0.8 m/s 225°	Birds	n/a
H	5:00 am	60	0.8 m/s 226°	Birds	n/a





Teralba Quarry Noise Monitoring – August 2017

Table 15 Teralba Quarry (L1 (1min)) Noise Monitoring Results – 30 August 2017 (Night)					
Location	Time	dB(A), L ₁ (1minute)	Wind speed/ direction	L _{A1} source	Identified Quarry Sources (L ₁ (1 min))
A	5:40 am	58	0.3 m/s 316°	Birds	n/a
B	4:30 am	68	0.4 m/s 211°	Traffic	n/a
D	4:30 am	48	0.4 m/s 211°	Birds	n/a
E	5:35 am	50	0.3 m/s 316°	Birds	n/a
H	5:00 am	60	0.3 m/s 261°	Birds	n/a

Table 16 Teralba Quarry (L1 (1min)) Noise Monitoring Results – 31 August 2017 (Night)					
Location	Time	dB(A), L ₁ (1minute)	Wind speed/ direction	L _{A1} source	Identified Quarry Sources (L ₁ (1 min))
A	5:38 am	50	2.4 m/s 235°	Traffic	n/a
B	4:32 am	65	2.0 m/s 228°	Traffic	n/a
D	4:30 am	48	2.0 m/s 228°	Birds	n/a
E	5:35 am	49	2.4 m/s 235°	Birds	32 (reverse alarms)
H	5:00 am	42	2.1 m/s 232°	Frogs	n/a

As shown in Tables 14 to 16, during the night time measurement circuits the L1 (1 min) noise from TQ did not exceed 45 dB(A) at any monitoring location.

In summary the results of the noise monitoring programme have shown that the Teralba Quarry continues to operate within approved noise limits. No actions are recommended with respect to noise management at Teralba Quarry.

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

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

Author:

Ross Hodge
Acoustical Consultant

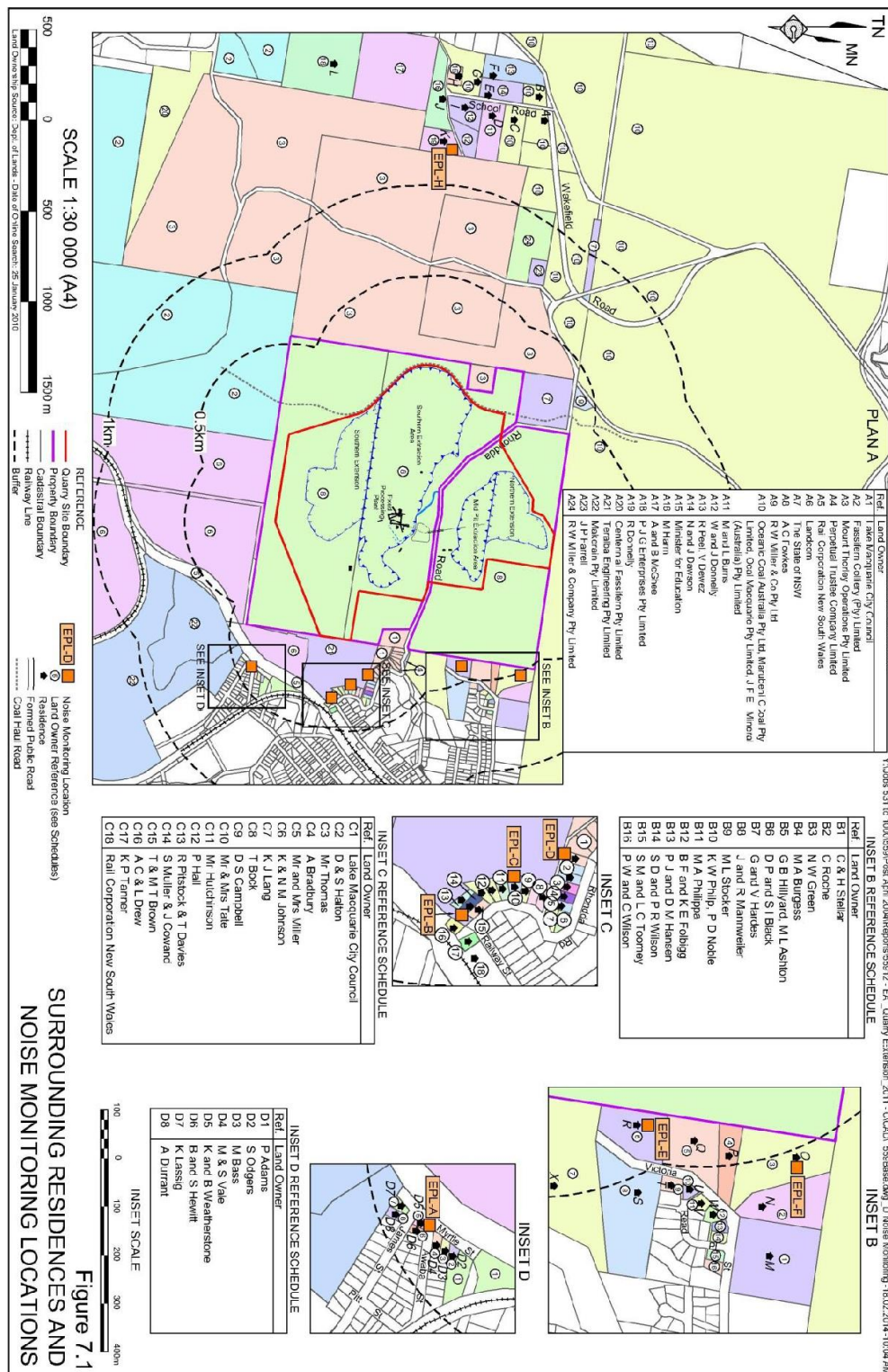
Review:

Neil Pennington
Acoustical Consultant





Teralba Quarry Noise Monitoring – August 2017





Location EPL – B Modified noise monitoring location



18 December 2017

Ref: 8413/7548

Metromix Pty Ltd
150 Rhondda Road
Teralba NSW 2284

NOVEMBER 2017 NOISE MONITORING RESULTS – TERALBA QUARRY

This letter report presents the results of attended noise monitoring conducted for the Metromix operated Teralba Quarry (TQ) commencing on Monday 27th and finishing on Wednesday 29th of November, 2017. Noise monitoring was carried out in accordance with the conditions of the TQ Noise Management Plan (NMP) as shown in extract on page 2 (referenced from EPL 536).

Although the project approval nominates noise criteria at nine locations, Metromix recognises that meaningful monitoring data will continue to be collected from the closest locations to the active operational areas. As a result of this, and as outlined within the approved NMP, for periods when operations are confined to areas south of Rhondda Road, noise monitoring will be undertaken at Locations EPL-A, B, D, E and H.

Further to this, location EPL-C and EPL-F have been omitted from the noise monitoring programme given they are not required as other monitoring locations are nearby and closer to quarry related noise sources. This has been recognised by the EPA by the removal of these locations from the monitoring locations detailed in EPL 536. **Table 1** lists the address and coordinates of each noise monitoring location, with the relevant monitoring locations that were monitored during the November 2017 period highlighted in **bold**. The locations are shown on the figure attached at the end of this report. Details of quarry operating locations and plant operating times are also appended to this report.

Table 1 Noise Monitoring Locations (from PA 10-0183)			
Location in EPL	Address	Easting	Northing
EPL-A	Awaba Street, Teralba	369080	3651470
EPL-B ¹	Rhondda Road, Teralba	369250	6351915
EPL-C	Rhondda Road, Teralba ²	369205	6352015
EPL-D	Rhondda Road, Teralba	369150	6352135
EPL-E	Victoria Avenue, Teralba	369060	6352620
EPL-F	Victoria Avenue, Teralba ²	369130	6352945
EPL-H	School Road, Wakefield	366210	6352520

1. See text in relation to changes to monitoring location

2. Metromix has obtained permission for this monitoring location to be omitted.





Teralba Quarry Noise Monitoring – November 2017

It is noted that during the period when monitoring is undertaken at Location B, Metromix is required to provide a spotter to record the number of trucks departing from the Quarry and not the Teralba Business Park. Spectrum Acoustics personnel undertook identification of quarry trucks as part of the noise monitoring procedure.

As part of pre monitoring protocols Spectrum Acoustics notified, by letterbox drop, all landowners in the close vicinity of each site of the impending monitoring. The resident at Location B notified Metromix during the August 2017 survey that he didn't want the monitoring to be done near his residence. This survey was therefore undertaken at a point approximately 30m south (as shown in Appendix I).

The following presents noise related conditions of EPL 536 relevant to the compliance noise monitoring programme.

Condition	Requirement																																			
L5.2	<p>The licensee must ensure that noise generated by the activities within the premises do not exceed the following criteria measured by dB(A) at any residence or privately owned land.</p> <table><tr><th>Location</th><th>Day Shoulder 6:00am - 7:00am</th><th>Day 7:00am - 6:00pm</th><th>Evening 6:00pm – 10:00pm</th><th>Night 10:00pm – 6:00am</th></tr><tr><td></td><td>L_{Aeq} (15 minute)</td><td>L_{Aeq} (15 minute)</td><td>L_{Aeq} (15 minute)</td><td>L_{Aeq} (15 minute)</td></tr><tr><td>EPL-A</td><td>38</td><td>38</td><td>37</td><td>35 45</td></tr><tr><td>EPL-B</td><td>42</td><td>46</td><td>36</td><td>35 45</td></tr><tr><td>EPL-C</td><td>42</td><td>42</td><td>35</td><td>35 45</td></tr><tr><td>EPL-D, EPL-E, EPL-H</td><td>35</td><td>35</td><td>35</td><td>35 45</td></tr><tr><td>EPL-F</td><td>37</td><td>38</td><td>38</td><td>35 45</td></tr></table> <p>Note: The licensee may provide to the EPA written evidence of any agreement with a landholder which is subject to the above noise limits. The written evidence may be submitted with a licence variation to remove the landholder from the above table.</p>	Location	Day Shoulder 6:00am - 7:00am	Day 7:00am - 6:00pm	Evening 6:00pm – 10:00pm	Night 10:00pm – 6:00am		L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	EPL-A	38	38	37	35 45	EPL-B	42	46	36	35 45	EPL-C	42	42	35	35 45	EPL-D, EPL-E, EPL-H	35	35	35	35 45	EPL-F	37	38	38	35 45
Location	Day Shoulder 6:00am - 7:00am	Day 7:00am - 6:00pm	Evening 6:00pm – 10:00pm	Night 10:00pm – 6:00am																																
	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)																																
EPL-A	38	38	37	35 45																																
EPL-B	42	46	36	35 45																																
EPL-C	42	42	35	35 45																																
EPL-D, EPL-E, EPL-H	35	35	35	35 45																																
EPL-F	37	38	38	35 45																																
L5.3	<p>For the purposes of Condition L5.2:</p> <p>a) Day-Shoulder is defined as the period between 6am to 7am Monday to Saturday.</p> <p>b) Day is defined as:</p> <p>a. the period from 7am to 6pm Monday to Saturday; and</p> <p>b. the period from 8am to 6pm Sundays and Public Holidays.</p> <p>c) Evening is defined as the period from 6pm to 10pm.</p> <p>d) Night is defined as:</p> <p>a. the period from 10pm to 7am Monday to Saturday; and</p> <p>b. the period from 10pm to 8am Sundays and Public Holidays.</p>																																			
L5.4	<p>The contributed noise level from the premises must not exceed the noise limits specified within EPL 536 at the most noise-affected point on or within the boundary of any residential premises to the north and/or south of the premises, except as expressly provided by this licence, or by the EPA in writing.</p>																																			
L5.5	<p>The noise limits set out in conditions L5.2 apply under all meteorological conditions except for anyone of the following:</p> <p>a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or</p> <p>b) Stability category F temperature inversion conditions and wind speeds greater</p>																																			





Teralba Quarry Noise Monitoring – November 2017

	the 2 metres/second at 10 metres above ground level; or c) Stability category G temperature inversion conditions.																
L5.6	<p>For the purpose of condition L5.5:</p> <p>a) the meteorological data to be used for determining meteorological conditions is the data recorded at the meteorological station identified in this licence as EPA Identification Point W1.</p> <p>b) Stability category temperature inversion conditions are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the <i>NSW industrial Noise Policy (EPA 2000)</i></p> <p>Note: The weather station must be designed, commissioned and operated in a manner to obtain the necessary parameters required under the above condition.</p>																
L5.7	<p>To determine compliance:</p> <p>1. With the $L_{Aeq(15\ min)}$ noise limits in condition L5.2, the licensee must locate noise monitoring equipment;</p> <p>a) approximately on the boundary, where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises; or,</p> <p>b) within 30 metres of a dwelling facade (but not closer than 3 metres) where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises; or where applicable</p> <p>c) within approximately 50 metres if the boundary of a national park or nature reserve.</p> <p>2. With the $LA1(1\ minute)$ noise limits in condition L5.2, the noise monitoring equipment must be located within 1 metre of a dwelling facade.</p> <p>3. With the noise limits in condition L5.2, the noise monitoring equipment must be located;</p> <p>a) at the most affected point at a location where there is no dwelling at the location, or</p> <p>b) at the most affected point within an area at a location prescribed by conditions L5.7 1(a) or L5.7 1(b).</p>																
L5.8	<p>A non-compliance will still occur where noise generated from the premises in excess of the appropriate noise limit is measured:</p> <p>a) at a location other than an area prescribed by the conditions of this licence, and /or</p> <p>b) at a point other than the most affected point at a location.</p>																
L5.9	<p>For the purpose of determining the noise generated at the premises the licensee must use a Class 1 or Class 2 noise monitoring device as defined by AS IEC61672.1 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by the EPA in writing.</p>																
L5.10	<p>For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.</p>																
L7.1	<p>The licensee must comply with the operating hours specified in Column 2, Column 3, and Column 4 of the table below:</p> <table><tr><th>Day</th><th>Loading and Dispatch of Quarry Trucks</th><th>Extraction and Processing</th><th>Receipt of Concrete</th></tr><tr><td>Monday - Friday</td><td>4:00am Monday to midnight Friday</td><td>7:00am to 7:00pm</td><td>7:00am to 5:00pm</td></tr><tr><td>Saturday</td><td>Midnight Friday to 6:00pm Saturday</td><td>7:00am to 2:00pm</td><td>7:00am to 2:00pm</td></tr><tr><td>Sundays and Public Holidays</td><td>None</td><td>none</td><td>none</td></tr></table> <p>Note: Maintenance activities may occur at any time provided they are inaudible at privately-owned residence.</p> <p>*VENM = Virgin Excavated Natural Material</p> <p>**ENM = Excavated Natural Material</p>	Day	Loading and Dispatch of Quarry Trucks	Extraction and Processing	Receipt of Concrete	Monday - Friday	4:00am Monday to midnight Friday	7:00am to 7:00pm	7:00am to 5:00pm	Saturday	Midnight Friday to 6:00pm Saturday	7:00am to 2:00pm	7:00am to 2:00pm	Sundays and Public Holidays	None	none	none
Day	Loading and Dispatch of Quarry Trucks	Extraction and Processing	Receipt of Concrete														
Monday - Friday	4:00am Monday to midnight Friday	7:00am to 7:00pm	7:00am to 5:00pm														
Saturday	Midnight Friday to 6:00pm Saturday	7:00am to 2:00pm	7:00am to 2:00pm														
Sundays and Public Holidays	None	none	none														





NOISE MEASUREMENTS

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters" and have current NATA calibration. Field calibration of each instrument was carried out at the start and end of each monitoring period.

The noise monitoring was conducted in general accordance with the requirements of Section 9 of the NMP (Noise Monitoring Protocol and Evaluation of Compliance) as follows;

"Metromix proposes to adopt a noise monitoring protocol that provides feedback on the effectiveness of the noise control measures and demonstrate compliance with the conditions within the Project Approval 10_0183 and Environment Protection Licence 0536.

The approach to monitoring compliance is based substantially upon Metromix's experience to date which has identified the on-site activities have not been the source of noise complaints or any recorded non-compliance. Hence, it is considered the monitoring program needs to reflect this fact."

A-weighted noise levels were measured over 15 minute monitoring periods with data acquired at 1 second statistical intervals and the meter set to "fast" response. Each 1 second measurement is accompanied by a third-octave band spectrum from 20 - 20k Hz which is required for analysing INP 'modifying factors'. Time based field notes allow for determination of the relative contributions to the overall noise level of all significant noise sources.

The worst case 15 minute Leq noise level for each monitoring period is shown in the tables below. Where the noise from TQ was audible, Bruel & Kjaer "Evaluator" analysis software was used to quantify the contributions of the quarry and other significant noise sources to the overall level. Quarry noise from TQ is shown in the tables in bold type. Where noise from TQ is listed as faintly audible, this means the noise levels from the quarry were at least 10 dB below the ambient level during the measurement and not measurable.

Noise levels were recorded for each of the L10, Leq, Lmax, L1, L90 and Lmin percentiles. All noise levels shown in the tables of results are in dB(A) Leq (15 min). Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request.

Meteorological data used in this report was obtained from the quarry-operated weather station at the site.

Noise Compliance Assessment

The results of the noise measurements undertaken throughout the various time periods are provided in **Tables 2 to 16**. EPL 536 refers to the various time periods as follows:

- a) Day-Shoulder is defined as the period between 6am to 7am Monday to Saturday.
- b) Day is defined as:





Teralba Quarry Noise Monitoring – November 2017

- (i) the period from 7am to 6pm Monday to Saturday; and
 - (ii) the period from 8am to 6pm Sundays and Public Holidays.
- c) Evening is defined as the period from 6pm to 10pm.
- d) Night is defined as:
- (i) the period from 10pm to 7am Monday to Saturday; and
 - (ii) the period from 10pm to 8am Sundays and Public Holidays.

Table 2 Teralba Quarry Noise Monitoring Results – 27 November 2017 Night					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	5:33 am	46	35	0.8 / 206	Birds (45), industrial noise (37), TQ inaudible
B	4:36 am	58	35	0.6 / 245	Trains (58), birds (47), TQ inaudible
D	4:33 am	40	35	0.6 / 245	Traffic (39), birds (35), TQ inaudible
E	5:37 am	51	35	0.8 / 206	Birds (50), traffic (41), TQ inaudible
H	5:01 am	45	35	0.6 / 231	Birds (44), Traffic (37), TQ inaudible

Table 3 Teralba Quarry Noise Monitoring Results – 27 November 2017 Day Shoulder					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	6:43 am	51	38	1.0 / 183	Birds (51), industrial noise (36), TQ inaudible
B	6:23 am	49	42	0.7 / 232	Industrial noise (46), Traffic (43), birds (43), TQ (31) ¹
D	6:43 am	48	35	1.0 / 183	Traffic (45), birds (44), industrial noise (35), TQ inaudible
E	6:33 am	48	35	0.8 / 161	Traffic (46), Birds (42), TQ inaudible
H	6:01 am	52	35	1.2 / 176	Birds (52), traffic (38), TQ inaudible
Note: 1 See text description and analysis					

Table 4 Teralba Quarry Noise Monitoring Results – 27 November 2017 Day					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	7:03 am	44	38	0.9 / 182	Traffic (41), birds (37), industrial noise (36), TQ inaudible
B	9:17 am	56	46	Calm	Traffic (50), train (49), birds (49), Industrial noise (41), TQ (26) ¹
D	9:00 am	46	35	0.6 / 133	Traffic (44), birds (41), TQ inaudible
E	7:00 am	50	35	0.9 / 182	Birds (48), traffic (44), TQ inaudible
H	10:30 am	42	35	1.6 / 63	Insects (39), traffic (35), industry (34), TQ inaudible
Note: 1 See text description and analysis					





Teralba Quarry Noise Monitoring – November 2017

Table 5 Teralba Quarry Noise Monitoring Results – 27 November 2017 Evening					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	8:52 pm	50	37	Calm	Birds & insects (47), traffic (47), TQ inaudible
B	7:58 pm	70	36	0.7 / 55	Insects (70), train (55), TQ inaudible
D	7:10 pm	45	35	2.2 / 24	Traffic (45), TQ inaudible
E	7:45 pm	52	35	Calm	Insects (51), traffic (42), TQ inaudible
H	7:20 pm	47	35	1.2 / 30	Birds (46), plane (37), insects (35), TQ barely audible (<25)

Table 6 Teralba Quarry Noise Monitoring Results – 28 November 2017 Night					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	5:44 am	45	35	0.6 / 185	Birds (43), industrial noise (37), traffic (36), TQ inaudible
B	4:36 am	51	35	0.6 / 201	Birds (50), traffic (42), TQ inaudible
D	4:30 am	37	35	0.6 / 201	Traffic (36), birds (29), TQ inaudible
E	5:36 am	48	35	1.0 / 186	Birds (48), traffic (36), TQ inaudible
H	5:00 am	45	35	1.0 / 175	Birds (43), traffic (38), TQ inaudible

Table 7 Teralba Quarry Noise Monitoring Results – 28 November 2017 Day Shoulder					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	6:45 am	46	38	Calm	Birds (44), industrial noise (38), TQ inaudible
B	6:40 am	49	42	Calm	Industry (48), Traffic (40), TQ inaudible
D	6:22 am	53	35	Calm	Traffic (51), birds (45), TQ inaudible
E	6:35 am	55	35	Calm	Traffic (55), Birds (40), TQ inaudible
H	6:01 am	49	35	Calm	Birds (48), traffic (40), TQ inaudible

Table 8 Teralba Quarry Noise Monitoring Results – 28 November 2017 Day					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/ direction	Identified Noise Sources (Leq (15 min))
A	3:05 pm	49	38	1.6 / 105	Wind (46), insects (42), industrial noise (40), TQ inaudible
B	4:39 pm	52	46	2.2 / 120	Traffic (50), birds (42), industrial noise (42), TQ inaudible
D	4:35 pm	48	35	2.2 / 120	Traffic (48), TQ inaudible
E	7:30 am	53	35	0.6 / 226	Birds (51), Insects (47), traffic (37), TQ inaudible
H	3:00 pm	43	35	1.6 / 105	Insects (40), traffic (36), birds (34), TQ inaudible





Teralba Quarry Noise Monitoring – November 2017

Table 9 Teralba Quarry Noise Monitoring Results – 28 November 2017 Evening					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/direction	Identified Noise Sources (Leq (15 min))
A	6:56 pm	46	37	1.4 / 114	Dog (44), plane (41), traffic (37), TQ barely audible
B	6:03 pm	52	36	1.7 / 135	Traffic (49), train (46), wind (44), TQ inaudible
D	6:04 pm	43	35	1.7 / 135	Traffic (41), insects (37), TQ inaudible
E	7:02 pm	48	35	1.4 / 114	Traffic (38), trains (26), TQ inaudible
H	7:36 pm	42	35	1.2 / 186	Insects (41), birds (33), TQ inaudible

Table 10 Teralba Quarry Noise Monitoring Results – 29 November 2017 Night					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/direction	Identified Noise Sources (Leq (15 min))
A	5:40 am	45	35	0.7 / 138	Birds (43), traffic (36), industrial noise (35), TQ inaudible
B	4:36 am	54	35	1.0 / 138	Insects (54), industrial noise (38), TQ inaudible
D	4:30 am	35	35	1.0 / 138	Traffic (34), insects (26), TQ inaudible
E	5:37 am	51	35	0.7 / 138	Birds (50), traffic (41), TQ inaudible
H	5:02 am	46	35	0.9 / 131	Birds (46), traffic (34), TQ inaudible

Table 11 Teralba Quarry Noise Monitoring Results – 29 November 2017 Day Shoulder					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/direction	Identified Noise Sources (Leq (15 min))
A	6:48 am	48	38	0.5 / 147	Traffic (47), traffic (37), Industrial noise (36), TQ inaudible
B	6:42 am	47	42	0.8 / 131	Industry (45), traffic (41), TQ inaudible
D	6:24 am	46	35	0.8 / 129	Traffic (42), birds (40), Industrial noise (34), TQ inaudible
E	6:35 am	52	35	1.0 / 139	Birds (51), traffic (41), TQ inaudible
H	6:03 am	49	35	0.6 / 136	Birds (47), traffic (42), TQ inaudible

Table 12 Teralba Quarry Noise Monitoring Results – 29 November 2017 Day					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/direction	Identified Noise Sources (Leq (15 min))
A	7:07 am	48	38	0.8 / 147	Insects (44), birds (42), traffic (37), industrial noise (36), TQ inaudible
B	4:33 pm	60	46	1.8 / 153	Train (57), traffic (56), TQ inaudible
D	9:37 am	55	35	1.5 / 123	Traffic (52), birds (52), TQ inaudible
E	7:04 am	51	35	0.8 / 147	Birds (47), traffic (45), insects (44), TQ inaudible
H	11:13 am	50	35	1.9 / 128	Birds (49), Traffic (41), TQ inaudible
Note: 1 See text description and analysis					





Teralba Quarry Noise Monitoring – November 2017

Table 13 Teralba Quarry Noise Monitoring Results – 29 November 2017 Evening					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed/direction	Identified Noise Sources (Leq (15 min))
A	6:39 pm	44	37	1.3 / 124	Traffic (41), birds (37), plane (36), TQ inaudible
B	6:03 pm	48	36	1.3 / 120	Traffic (44), wind (43), birds (40), TQ inaudible
D	6:00 pm	39	35	1.3 / 120	Traffic (38), birds (31), TQ inaudible
E	6:37 pm	47	35	1.3 / 124	Birds (46), traffic (37), TQ inaudible
H	7:23 pm	41	35	1.3 / 126	Birds (41), traffic (27), TQ (28)

The results shown in Tables 2 to 13 show that, under the operational and atmospheric conditions at the time of monitoring, noise emissions from TQ did not exceed the relevant criterion at any monitoring location during any part of the survey.

Monitoring location EPL-B is situated close to the corner of Rhondda Road and Railway Street. This monitoring location is included predominantly to measure quarry noise from emissions from trucks exiting the site along the private section of the access road (through the Teralba Business Park). From the monitoring location it was possible to determine which trucks were associated with the quarry and a dedicated spotter was not required during this monitoring period.

When measuring noise at the EPL-B location, the noise emissions from the exiting quarry trucks (whilst on the private section of the access road) was measured and the worst case 15 minute Leq noise level calculated based on the time each truck was on the private road. The worst case calculated Leq level for the trucks is that shown for Location B in Tables 2 to 13.

At location EPL-D the acoustic environment is significantly influenced by noise from traffic on Rhondda Rd, trains and other industries within the vicinity. Noise emissions from the batching plant which is located adjacent to TQ contributed to the received noise during some monitoring periods.

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

In addition to the operational noise, the noise from TQ must not exceed **45 dB(A) L1 (1 min)** within the night-time period i.e. between the hours of 10 pm and 7 am, in accordance with *Condition L4.1* of EPL 536. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the quarry. The compliance measurement locations are different for each of the operational and sleep disturbance noise. That is, the sleep disturbance criterion is typically applicable at 1m from the façade of a bedroom window.

To avoid undue disturbance to residents, the L1 (1 min) noise level from the operational measurements are used to show general compliance with the sleep disturbance criterion. That is, as the distance between the noise source and the operational noise monitoring location is significantly greater than the distance between the operational noise monitoring location and the sleep disturbance monitoring location (i.e. 1m from the facade of the house) there will be little variation in L1 (1 min) levels between the two monitoring locations. It must be noted, however, that the sleep disturbance





Teralba Quarry Noise Monitoring – November 2017

criterion is to be measured near a bedroom window. As the internal layout of each residence is not known, to consider a worst case, a bedroom window is assumed to be facing the operational noise monitoring location.

The results of the sleep disturbance measurements are shown in **Tables 14 to 16**.

Table 14 Teralba Quarry (L1 (1min)) Noise Monitoring Results – 27 November 2017 (Night)					
Location	Time	dB(A), L ₁ (1minute)	Wind speed/ direction	L _{A1} source	Identified Quarry Sources (L ₁ (1 min))
A	5:33 am	57	0.8 / 206	Birds	n/a
B	4:36 am	59	0.6 / 245	Traffic	n/a
D	4:33 am	62	0.6 / 245	Traffic	n/a
E	5:37 am	56	0.8 / 206	Birds	n/a
H	5:01 am	65	0.6 / 231	Birds	n/a

Table 15 Teralba Quarry (L1 (1min)) Noise Monitoring Results – 28 November 2017 (Night)					
Location	Time	dB(A), L ₁ (1minute)	Wind speed/ direction	L _{A1} source	Identified Quarry Sources (L ₁ (1 min))
A	5:44 am	64	0.6 / 185	Birds	n/a
B	4:36 am	61	0.6 / 201	Traffic	n/a
D	4:30 am	68	0.6 / 201	Birds	n/a
E	5:36 am	59	1.0 / 186	Birds	n/a
H	5:00 am	67	1.0 / 175	Birds	n/a

Table 16 Teralba Quarry (L1 (1min)) Noise Monitoring Results – 29 November 2017 (Night)					
Location	Time	dB(A), L ₁ (1minute)	Wind speed/ direction	L _{A1} source	Identified Quarry Sources (L ₁ (1 min))
A	5:40 am	61	0.7 / 138	Birds	n/a
B	4:36 am	63	1.0 / 138	Traffic	n/a
D	4:30 am	66	1.0 / 138	Birds	n/a
E	5:37 am	58	0.7 / 138	Birds	n/a
H	5:02 am	66	0.9 / 131	Birds	n/a

As shown in Tables 14 to 16, during the night time measurement circuits the L₁ (1 min) noise from TQ did not exceed 45 dB(A) at any monitoring location.

In summary the results of the noise monitoring programme have shown that the Teralba Quarry continues to operate within approved noise limits. No actions are recommended with respect to noise management at Teralba Quarry.





Teralba Quarry Noise Monitoring – November 2017

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

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

Author:

A handwritten signature in black ink, appearing to read 'Neil Pennington'.

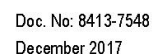
Neil Pennington MAIP, MAAS
Acoustical Consultant

Review:

A handwritten signature in black ink, appearing to read 'Ross Hodge'.

Ross Hodge MAAS
Acoustical Consultant







Teralba Quarry Noise Monitoring – November 2017



Location EPL – B Modified noise monitoring location



Location of quarrying activities during the survey.



Teralba Quarry Noise Monitoring – November 2017

Noise Monitoring Information																	
Hours of Operational Plant				Location & Hours of Operational Mobile Plant													
Date	Fixed Wet	Fixed Dry	Pugmill	Downer	EX001	RD001	RD003	AD001	WL001	WL002	WL003	DR001	WC001	WC002	Hire DZ	Hire EX	Hire AD
				Asphalt Plant	85 Tonne Excavator	60 Tonne Rigid Dumper	40 Tonne Rigid Dumper	40 Tonne Articulated Dumper	Wheel Loader	Wheel Loader	Wheel Loader	Drill	35 Tonne Water Cart	On Road Water Cart	D11 Dozer	30 Tonne Excavator	40 Tonne Articulated Dumper
																AHD 64	
27-Nov	0700-1900	N/A	First Load 700 Last Load 1330	First Load 730 Last Load 1230	AHD 57 to 0700 to 1700	AHD 57 to Dump Hooper 0700 - 1700 10 hrs	N/A	From Bins to Stockpile areas 0700 to 1900	Sales Yard and Boot Area AHD 50 to AHD 55 0430 to 1900	Sales Yard and Boot Area AHD 50 to AHD 55 0700 to 1700	N/A	N/A	0700 to 1700	N/A	N/A	1500 to 1700	AHD 57 to Dump Hooper 0700 - 1700
28-Nov	0700-1900	N/A	First Load 1130 Last Load 1430	First Load 735 Last Load 1335	AHD 20 to 0700 to 1700	AHD 20 to Dump Hooper 0700 - 1700 10 hrs	N/A	From Bins to Stockpile areas 0700 to 1900	Sales Yard and Boot Area AHD 50 to AHD 55 0530 to 1700	Sales Yard and Boot Area AHD 50 to AHD 55 0700 to 1700	Sales Yard and Boot Area AHD 50 to AHD 55 0700 to 1700	N/A	0700 to 1700	N/A	N/A	0700 to 1700	AHD 20 to Dump Hooper 0700 - 1700
29-Nov	0700-1900	N/A	First Load 700 Last Load 1345	First Load 700 Last Load 1320	AHD 20 to 0700 to 1730	AHD 20 to Dump Hooper 0700 - 1730 10 hrs	N/A	From Bins to Stockpile areas 0700 to 1900	Sales Yard and Boot Area AHD 50 to AHD 55 0530 to 1730	N/A	Sales Yard and Boot Area AHD 50 to AHD 55 0700 to 1700	N/A	0700 to 1700	N/A	N/A	N/A	AHD 20 to Dump Hooper 0700 - 1730

Noise source locations and operational hours.



Appendix 3

Final Assessment Report for the Pollution Reduction Program at the Teralba Quarry - September 2016

(Total No. of pages including blank pages = 46)



This page has intentionally been left blank



METROMIX

METROMIX PTY LTD

ABN: 39 002 886 839

Environmental Protection Licence 536

Final Assessment Report for the Pollution Reduction Program

at the

Teralba Quarry

Prepared by:



R.W. CORKERY & CO. PTY. LIMITED

September 2016

This page has intentionally been left blank





METROMIX

ABN: 39 002 886 839

Environmental Protection Licence 536

Final Assessment Report for the Pollution Reduction Program

at the

Teralba Quarry

Prepared for:

Metromix Pty Ltd
ABN: 39 002 886 839
PO Box 3016
TERALBA NSW 2284

Telephone: (02) 4950 6640
Facsimile: (02) 4958 7201
Email: Bills@metromix.com.au

Prepared by:

R.W. Corkery & Co. Pty. Limited
Geological & Environmental Consultants
ABN: 31 002 033 712

Brooklyn Office:

1st Floor, 12 Dangar Road
PO Box 239
BROOKLYN NSW 2083

Telephone: (02) 9985 8511
Facsimile: (02) 6361 3622
Email: brooklyn@rwcorkery.com

Orange Office:

62 Hill Street
ORANGE NSW 2800

Telephone: (02) 6362 5411
Facsimile: (02) 6361 3622
Email: orange@rwcorkery.com

Brisbane Office:

Suite 5, Building 3
Pine Rivers Office Park
205 Leitchs Road
BRENDAL QLD 4500

Telephone: (07) 3205 5400
Facsimile: (02) 6361 3622
Email: brisbane@rwcorkery.com

Ref No. 559/44

September 2016



This Copyright is included for the protection of this document

COPYRIGHT

**© R.W. Corkery & Co. Pty Limited 2016
and
© Metromix Pty Ltd 2016**

All intellectual property and copyright reserved.

Apart from any fair dealing for the purpose of private study, research, criticism or review, as permitted under the Copyright Act, 1968, no part of this report may be reproduced, transmitted, stored in a retrieval system or adapted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without written permission. Enquiries should be addressed to R.W. Corkery & Co. Pty Limited.



CONTENTS

	Page
1. POLLUTION STUDIES AND REDUCTION PROGRAM.....	1
1.1 INTRODUCTION	1
1.2 ENVIRONMENT PROTECTION LICENCE 536 CONDITIONS	1
1.3 SURFACE WATER MONITORING LOCATION CONTEXT	4
2. POLLUTION REDUCTION PROGRAM RESULTS	8
2.1 INTRODUCTION	8
2.2 PHYSICAL PARAMETERS	8
2.3 EPL 4 MONITORING RESULTS	10
2.4 EPL 5 MONITORING RESULTS	13
3. CONCLUSION	17
4. ONGOING MONITORING	17

FIGURES

Figure 1	Teralba Quarry Water Management A4 Full Colour	2
Figure 2	EPL Water Monitoring Locations – EPL 4 and EPL 5	5

TABLES

Table 1	Statistical Analysis - Water Quality at EPA Point 4 - Physical Parameters - September 2013 to August 2016	9
Table 2	Statistical Analysis - Water Quality at EPA Point 5 - Physical Parameters - September 2013 to August 2016	9
Table 3	Statistical Analysis - Water Quality at EPA Point 4 - Dissolved (filtered) Samples - September 2013 to August 2016	11
Table 4	Statistical Analysis - Water Quality at EPA Point 4 - Total (unfiltered) Samples - September 2013 to August 2016	11
Table 5	Statistical Analysis - Water Quality at EPA Point 5 - Dissolved (filtered) Samples - September 2013 to August 2016	15
Table 6	Statistical Analysis - Water Quality at EPA Point 5 - Total (unfiltered) Samples - September 2013 to August 2016	16

This page has intentionally been left blank

1. POLLUTION STUDIES AND REDUCTION PROGRAM

1.1 INTRODUCTION

In accordance with *Conditions U1.1 and U1.2* of Environment Protection Licence (EPL) 536 (updated 13 November 2015), the following information provides the consolidated results of surface water monitoring undertaken at monitoring locations EPL Points 4 and 5 (EPL 4 and EPL 5) within the Teralba Quarry between September 2013 and August 2016 (the “monitoring period”)¹. This assessment report has been prepared for review by the Environment Protection Authority (EPA) to satisfy *Condition U1.3* of EPL 536 and presents an assessment of pollutants² detected in the discharges at EPL 4 and EPL 5 in accordance with ANZECC water quality guidelines. The monitoring results have been reviewed in order to establish which analytes nominated in *Condition U1.2* of EPL 536 remain appropriate for ongoing monitoring at EPL 4 and EPL 5.

This information expands upon the previously submitted “*Initial Report for Condition U1.1 and U1.2 for Environment Protection Licence 536*” and “*Second Report for Conditions U1.1, U1.2 and U1.3 for Environment Protection Licence 536*”, prepared by R.W. Corkery and Co Pty Limited (RWC) and supplied to the EPA in August 2014 and April 2015 respectively. The information provides an understanding of the surface water environment within the Teralba Quarry and an analysis of the potential impacts that the ongoing discharge of mine water³ and Quarry is having on the quality and quantity of water flowing towards Lake Macquarie. **Figure 1** presents the water management structures at the Teralba Quarry including the unnamed watercourse from the Quarry towards Lake Macquarie. The watercourse then traverses the Teralba residential area through a concrete drain referred to as “Murphs Drain”.

1.2 ENVIRONMENT PROTECTION LICENCE 536 CONDITIONS

The following presents the conditions of EPL 536 relevant to this assessment report.

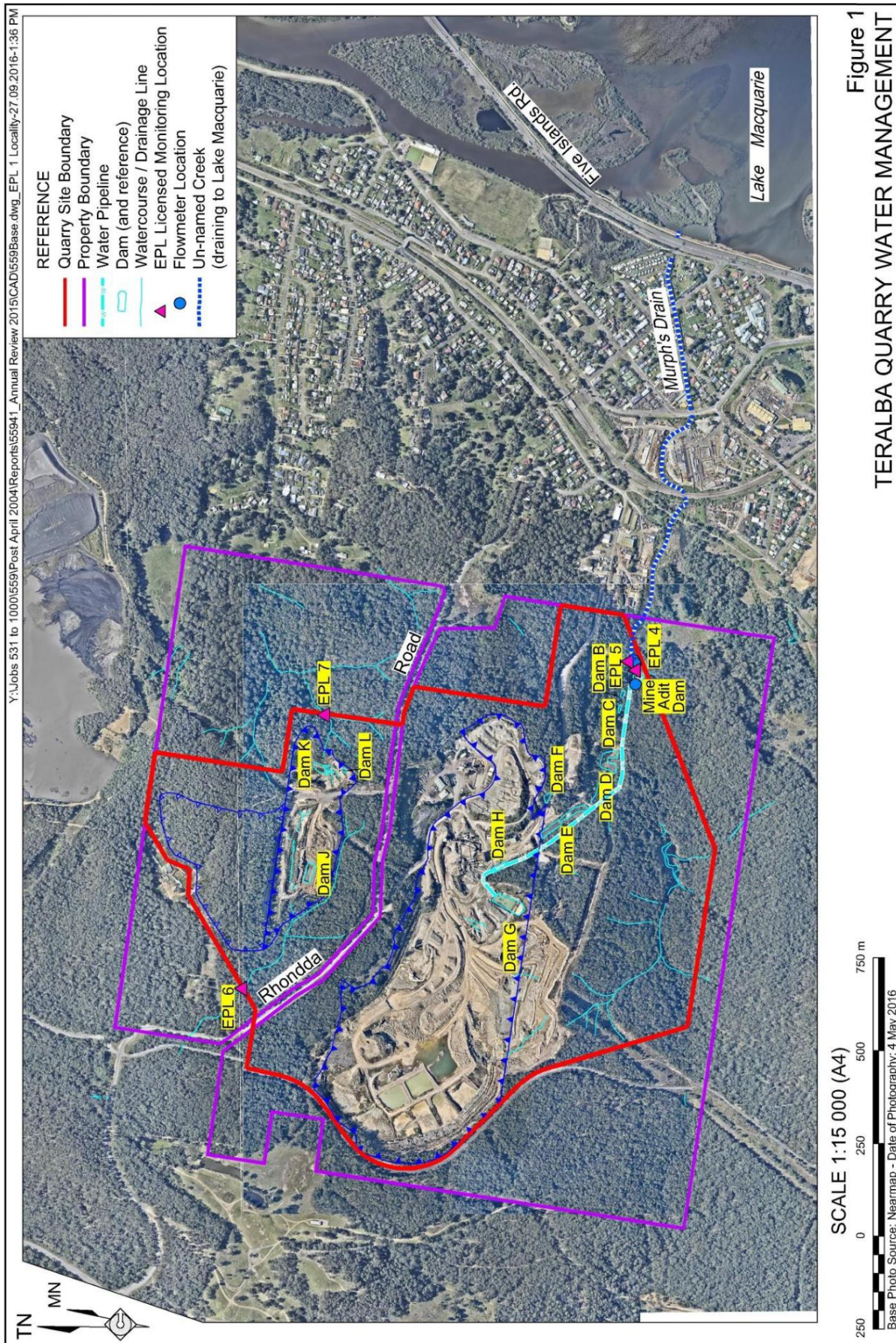
Condition U1.1

“At Points 4 and 5, the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1 of the table below. The licensee must use the corresponding units of measure, sampling frequency, and sampling method specified opposite in Columns 2, 3, and 4 respectively.”

¹ It is noted that *Condition U1.2* requires 24 months of data for comparison purposes, however, 38 months of data of data has been provided.

² It is noted that *Condition U1.2* refers to all analytes as pollutants, however it is noted that this includes parameters such as pH, electrical conductivity and elements such as calcium. For consistency, all analytes are referred to as pollutants in this report.

³ The Mine Adit Dam essentially collects groundwater originating from a number of former underground coal mines together with small quantities of seepage from the Teralba Quarry.



Pollutant	Unit of Measure	Frequency	Sample Method
Aluminium (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Antimony (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Arsenic (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Barium (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Beryllium (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Boron (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Cadmium (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Chromium (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Cobalt (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Copper (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Iron (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Lead (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Lithium (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Magnesium (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Manganese (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Mercury (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Molybdenum (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Nickel (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Selenium (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Silver (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Silica (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Silver (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Tin (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Titanium (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Vanadium (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Zinc (Total and dissolved)	micrograms per litre	monthly during discharge	grab sample
Calcium	milligrams per litre	monthly during discharge	grab sample
Conductivity	microsiemens per centimetre	Special Frequency 1	grab sample
Nitrogen (ammonia)	milligrams per litre	monthly during discharge	grab sample
Oil and grease	milligrams per litre	Special Frequency 1	grab sample
Phosphorus	milligrams per litre	monthly during discharge	grab sample
Potassium	milligrams per litre	monthly during discharge	grab sample
Sulfur	milligrams per litre	monthly during discharge	grab sample
Total Suspended Solids	milligrams per litre	Special Frequency 1	grab sample
pH		Special Frequency 1	grab sample

Condition U1.2

"The monitoring program for the specified pollutants must be conducted for 24 months, commencing on the date of issue of this licence.

Upon completion of the first 6 months of monitoring, all results must be submitted for review to the EPA's Regional Manager-Hunter at PO Box 488G Newcastle 2300. All monitoring results must be submitted on the seventh monitoring month and no later than 30 January 2015.

Metals not detected during the first 6 months of monitoring may be removed from this PRP. The licensee may formally request the removal of non-detected metals by submitting an application to vary this licence. The licensee must provide appropriate documentation in support of this application.

To avoid any doubt, unless a variation been granted in writing by the EPA, all metals listed in this PRP must be monitored during the full two year period."

Condition U1.3

Upon completion of this 24 month monitoring program, the licensee must within two months conduct an assessment of metals detected in the discharges in accordance with ANZECC water quality guidelines. The licensee must provide this assessment report within one month following the completion of the assessment and include all sampling results from the study.

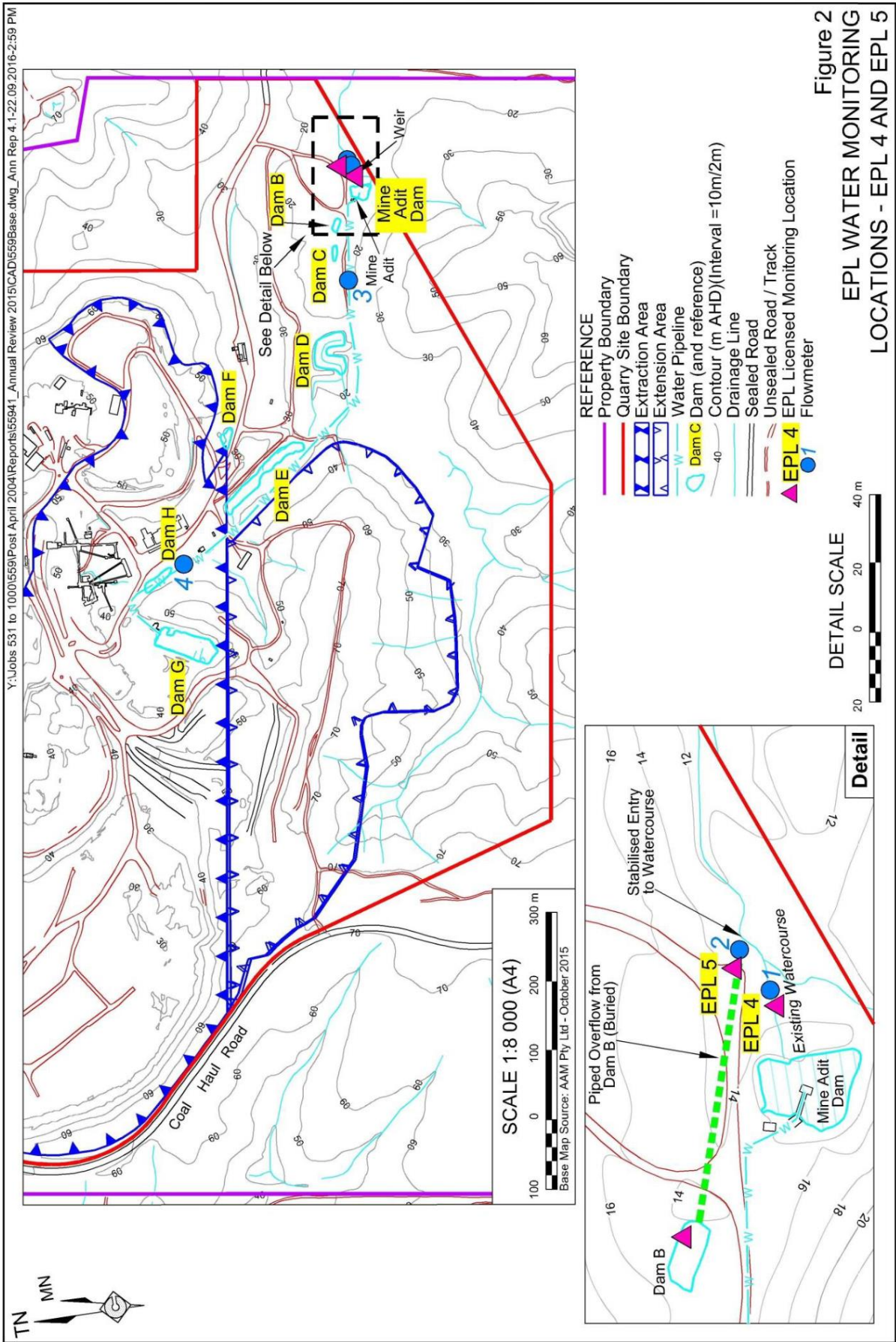
The assessment report and the sampling results, including any recommendations and actions must be submitted to the EPA Regional Manager-Hunter at PO Box 48G Newcastle NSW 2300 no later than 30 October 2016.

1.3 SURFACE WATER MONITORING LOCATION CONTEXT

Figure 2 presents an overview of the EPL 4 and EPL 5 and their interaction with other sediment dams and the water pipeline between the Mine Adit Dam and Dam G.

EPL 4 is located on the northern side of an historic and flooded Mine Adit Dam that was originally associated with the Oceanic Coal's Westside Colliery (Teralba and Northern Extended Collieries) and Coal and Allied's Northern Colliery (formerly known as Rhondda Colliery) that targeted the Fassifern Seam and Great Northern Coal Seam. The Westside Colliery is in fact connected underground with other nearby mines such as Rhondda Colliery, the owners of which (Coal and Allied) held an EPL 3139 that required the monitoring of the discharge from the Mine Adit Dam until early 2013.

The Mine Adit Dam continuously discharges water from the underground voids (groundwater) to the at-surface Mine Adit Dam that flows eastwards for a distance of approximately 40m along an unnamed watercourse to the eastern boundary of the Teralba Quarry and then towards Lake Macquarie. Groundwater from the underground coal workings is referred to as "surface water" once reaching the Mine Adit Dam. The water in the Mine Adit Dam is either pumped to Dam G for Metromix's use or allowed to flow off site (see **Figure 2**).



EPL 5 is located at the end of a pipe from Dam B (see **Figure 2**) which is the overflow point from the surface water management system within the Teralba Quarry on the southern side of Rhondda Road. No surface water from the Quarry is able to flow into the Mine Adit Dam although it is recognised that a very small proportion of the groundwater flow entering the Mine Adit Dam is seepage from the Southern Extraction Area and the current silt cells. All surface water within the catchment south of Rhondda Road is collected and directed through a series of on-site sediment dams (Dam F to Dam B) and is discharged into the unnamed drainage channel via an outlet pipe from Dam B, effectively mixing with the water overflowing from the Mine Adit Dam before flowing eastwards approximately 2km until its confluence with Lake Macquarie.

Plates 1 to 4 display photographs of the Mine Adit Dam and Dam B and the locations of the discharge points at EPL 4 and EPL 5.

Further information regarding the context, background and interactions between the Teralba Quarry and Rhondda Colliery is available within the *Teralba Quarry Extensions Environmental Assessment* (RWC, 2011) along with their differing water catchments with no additional information provided further in this document.

The Teralba Quarry utilises water from the Mine Adit Dam (see **Figure 2**) as the main water source for washing purposes and other related activities such as wheel washing and dust control. The extraction of this water is licenced by DPI Water (Licence No. 20BL173206) with the maximum quantity of water extracted being 1 407ML per year for dewatering and “Industrial – Sand and Gravel” uses.



Plate 1: Mine Adit Dam
(E559Z_03)

Plate 2: Mine Adit Dam Overflow Point
(E559AC_025)



Plate 3: Dam B
(E559Z_05)

Plate 4: Overflow Point (EPL 5)
(E559AC_026)



2. POLLUTION REDUCTION PROGRAM RESULTS

2.1 INTRODUCTION

In August 2013, Metromix committed to undertaking a ‘pollution study’ of water from the Mine Adit, a proportion of which eventually enters Lake Macquarie, to determine the levels of suspended and dissolved metals. The results of monitoring undertaken between September 2013 and August 2016 at EPL 4 and EPL 5 as part of this ‘pollution study’ are provided in **Appendix 1**. The following section contains a statistical presentation and summary of the data presented in **Appendix 1**. The statistical methods employed for the presentation are consistent with an assessment under the Australian Guidelines for Water Quality Monitoring and Reporting (NWQMS, 2000) and ANZECC methodology for comparing test site data (e.g. EPA 4 and EPA 5) with trigger values. The trigger values utilised in this assessment were obtained from ANZECC and are for the protection of the aquatic ecosystem environmental value, as these trigger values offer the highest level of protection for the identified environmental values (aquatic ecosystem, visual amenity and secondary contact recreation), for the water type (waterway affected by urban development). This water type has previously been determined by the former Department of Environment, Climate Change and Water for the Lake Macquarie and Tuggerah Lakes catchments. The level of protection (95% of species), is that for a “slightly/moderately disturbed” system, in accordance with NSW policy.

The summary data is presented in terms of minimum, 20th percentile, median, 80th percentile and maximum values. For the purpose of assessment, this review follows guidance contained in ANZECC, whereby the median value from sample concentrations collected as part of the program is compared with the relevant guideline trigger value, published in Table 3.4.1 of ANZECC and applied at the 95% species protection level (NWQMS, 2000). There are several pollutants included within the Pollution Reduction Program that do not have guideline trigger levels available within Table 3.4.1 of ANZECC (NWQMS, 2000). The data available for these pollutants is presented in this assessment report, however it is noted that these pollutants are mostly ‘naturally occurring’ and are not generally considered as ‘pollutants’ in the common use of the term. Elements such as calcium and magnesium are vital in natural ecosystems and therefore value of any assessment of these ‘pollutants’ is limited.

It is noted that *Condition U1.1* was modified to remove requirements to monitor antimony, barium, beryllium, boron, molybdenum, silicon, sulfur, silver and titanium as of 1 June 2015. However, Metromix has continued to monitor these pollutants and the results presented in the following subsection include a summary of these.

The results for dissolved fractions of the assessed pollutants are the focus for the purpose of assessment of compliance in this assessment as the dissolved toxicant fraction is considered the most bio-available and significantly influences the toxicity effects on aquatic biota. This is consistent with the ANZECC guidelines (NWQMS, 2000).

2.2 PHYSICAL PARAMETERS

The monitoring results for the following physical parameters recorded at EPL 4 and EPL5 are presented in **Table 1** and **Table 2**, respectively.

- pH – the range of results for pH at EPL 4 was 6.84 to 8.20 while pH at EPL 5 ranged from 7.25 to 8.06.

Table 1
Statistical Analysis - Water Quality at EPA Point 4 - Physical Parameters - September 2013 to August 2016

Analyte	Unit	Guideline * Trigger Value	LOR	Minimum Record	20th Percentile Record	Median Record	80th Percentile Record	Maximum Record	Total Records	Number Records Below LOR	Percentage of Records Below LOR
pH	pH Unit	6.5 to 8.5 units	<0.01	6.84	7.18	7.40	7.74	8.20	38	0	0%
Conductivity	µS/cm	125 - 2200 ^b	<1	1460	1784	1885	2124	2480	38	0	0%
TSS	mg/L	<50	<5	6.0	6	8	14.8	35	38	19	50%
Oil & Grease	mg/L	5	<5	NR	NR	NR	NR	NR	25	25	100%
NR = No Result - all results below Limit of Recording											

Table 2
Statistical Analysis - Water Quality at EPA Point 5 - Physical Parameters - September 2013 to August 2016

Analyte	Unit	Guideline * Trigger Value	LOR	Minimum Record	20th Percentile Record	Median Record	80th Percentile Record	Maximum Record	Total Records	Number Records Below LOR	Percentage of Records Below LOR
pH	pH Unit	6.5 to 8.5 units	<0.01	7.25	7.49	7.73	7.94	8.06	19	0	0.0%
Conductivity	µS/cm	125 - 2200 ^b	<1	834	936	1120	1506	1910	19	0	0.0%
TSS	mg/L	<50	<5	6	6	10	18	25	19	12	63.2%
Oil & Grease	mg/L	5	<5	NR	NR	NR	NR	NR	12	12	100.0%
NR = No Result - all results below Limit of Recording											

- Electrical conductivity – the median result for electrical conductivity at EPL 4 was 1 875µS/cm while the median result at EPL 5 was 1 090µS/cm.
- Total Suspended Solids (TSS) - the median result for TSS at EPL 4 was 8mg/L while the median result for TSS at EPL 5 was 10mg/L.
- Oil and Grease – There has been no records of oil and grease at either location.

These results indicate that pH at EPL 5 does not vary as greatly as it does at monitoring location EPL 4 however all results remain within the guideline trigger levels. Electrical conductivity at EPL 5 is lower than that at EPL 4 with electrical conductivity at EPL 4 exceeding the guideline trigger value for some samples. This was not reflected at EPL 5 where all samples were within the guideline trigger levels for electrical conductivity. All results are below the guideline trigger levels for TSS. The median value for TSS is similar at both locations and slightly higher at EPL 5, however the 80th percentile and maximum value at EPL 4 is higher than at EPL 5.

2.3 EPL 4 MONITORING RESULTS

The monitoring results for dissolved pollutants sampled at EPL 4 are presented in **Table 3**, while the results for total pollutants sampled at EPL 4 are presented in **Table 4**.

It is noted that the monitoring results for the following pollutants were not recorded above the laboratory limit of recording for any monitored samples.

- Antimony
- Lead
- Mercury
- Tin
- Titanium

In addition, the monitoring results for the following pollutants were only recorded above the limit of recording for a limited number of samples.

- Aluminium (13.2% of samples)
- Beryllium (2.6% of samples)
- Cadmium (5.3% of samples)
- Chromium (5.3% of samples)
- Cobalt (23.7% of samples)
- Copper (10.5% of samples)
- Phosphorous (20.0% of samples)
- Selenium (2.7% of samples)
- Vanadium (5.4% of samples)
- Zinc (27.0% of samples)
- Iron (28.9 % of samples)

The calculated median value (excluding those below the limit of recording) was below the nominated guideline trigger value (where available) for each of these pollutants except for ammonia (recorded above the limit of recording for 15 of 38 samples), chromium (recorded above the limit of recording for 2 of 38 samples) and silver (recorded above the limit of recording for 3 of 37 samples). It is noted that the three results above the guideline trigger for silver were all at the limit of recording and recorded between September and November 2013. There were no records above the limit of recording during 2014, 2015 or 2016. Of the two records above the limit of recording for chromium, one was at the limit of recording and the second (0.022mg/L) is considered to be an outlier and not reflective of conditions at EPL 4. The median value for ammonia is only slightly above the guideline trigger value at EPL 4.

Table 3
Statistical Analysis - Water Quality at EPA Point 4 - Dissolved (filtered) Samples - September 2013 to August 2016

Analyte	Unit	Guideline Trigger Value *	LOR	Minimum Record	20th Percentile Record	Median Record	80th Percentile Record	Maximum Record	Number Records Below LOR	Total Records	Percentage of Records Below LOR
Aluminium	mg/L	0.055	<0.01	0.01	0.01	0.02	0.04	0.04	33	38	86.8%
Ammonia as N	mg/L	0.02	<0.01	0.01	0.02	0.03	0.05	0.06	11	26	42.3%
Antimony	mg/L	ID	<0.001	NR	NR	NR	NR	NR	38	38	100.0%
Arsenic	mg/L	0.013	<0.001	0.001	0.001	0.001	0.002	0.008	17	38	44.7%
Barium	mg/L	NA	<0.001	0.022	0.026	0.029	0.034	0.046	1	38	2.6%
Beryllium	mg/L	ID	<0.001	0.001	0.001	0.001	0.001	0.001	37	38	97.4%
Boron	mg/L	0.37	<0.05	0.13	0.15	0.17	0.18	0.25	1	38	2.6%
Cadmium	mg/L	0.0002	<0.0001	0.00010	0.00012	0.00015	0.00018	0.00020	36	38	94.7%
Calcium	mg/L	NA	<1	34	40.6	45	53.4	60	0	34	0.0%
Chromium	mg/L	0.001	<0.001	0.001	0.0052	0.0115	0.0178	0.022	36	38	94.7%
Cobalt	mg/L	ID	<0.001	0.001	0.001	0.001	0.001	0.001	29	38	76.3%
Copper	mg/L	0.0014	<0.001	0.0010	0.0010	0.0010	0.0010	0.0010	34	38	89.5%
Iron	mg/L	ID	<0.05	0.05	0.06	0.08	0.11	0.25	27	38	71.1%
Lead	mg/L	0.0034	<0.001	NR	NR	NR	NR	NR	38	38	100.0%
Lithium	mg/L	NA	<0.001	0.03	0.036	0.0375	0.043	34	2	38	5.3%
Magnesium	mg/L	NA	<1	36	43	48	54	74	1	36	2.8%
Manganese	mg/L	1.9	<0.001	0.0164	0.0772	0.21	0.2456	0.376	1	38	2.6%
Mercury	mg/L	0.0006	<0.0001	NR	NR	NR	NR	NR	38	38	100.0%
Molybdenum	mg/L	ID	<0.001	0.001	0.002	0.002	0.003	0.004	2	37	5.4%
Nickel	mg/L	0.011	<0.001	0.002	0.003	0.005	0.005	0.027	0	37	0.0%
Phosphorous as P	mg/L	0.025	<0.01	0.02	0.02	0.02	0.02	0.02	4	5	80.0%
Potassium	mg/L	NA	<1	6	6	8	9	11	0	25	0.0%
Selenium	mg/L	0.011	<0.01	0.01	0.01	0.01	0.01	0.01	36	37	97.3%
Silicon as SiO ₂	mg/L	NA	<0.1	5.1	14.3	14.8	15.4	18.6	0	34	0.0%
Silver	mg/L	0.00005	<0.001	0.001	0.001	0.001	0.001	0.001	34	37	91.9%
Sulfur as S	mg/L	NA	<1	53	65.8	70.5	80	115	0	30	0.0%
Tin	mg/L	ID	<0.001	<0.001	NR	NR	NR	NR	37	37	100.0%
Titanium	mg/L	NA	<0.01	<0.01	NR	NR	NR	NR	37	37	100.0%
Vanadium	mg/L	ID	<0.01	0.01	0.01	0.01	0.01	0.01	35	37	94.6%
Zinc	mg/L	0.008	<0.005	0.005	0.005	0.0055	0.008	0.014	27	37	73.0%

NR = No Result - all results below Limit of Recording ID = Insufficient Data NA = Not Applicable

Table 4
Statistical Analysis - Water Quality at EPA Point 4 - Total (unfiltered) Samples - September 2013 to August 2016

Analyte	Unit	Guideline Trigger Value *	LOR	Minimum Record	20th Percentile Record	Median Record	80th Percentile Record	Maximum Record	Total Records	Number Records Below LOR	Percentage of Records Below LOR
Aluminium	mg/L	0.055	<0.01	<0.01	0.01	0.022	0.06	0.108	38	1	2.6%
Ammonia as N	mg/L	0.02	<0.01	<0.01	0.01	0.02	0.04	0.06	31	10	32.3%
Antimony	mg/L	ID	<0.001	<0.001	0.002	0.002	0.002	0.002	38	37	97.4%
Arsenic	mg/L	0.013	<0.001	<0.001	0.001	0.001	0.002	0.002	38	14	36.8%
Barium	mg/L	NA	<0.001	<0.001	0.023	0.028	0.03	0.0358	38	1	2.6%
Beryllium	mg/L	ID	<0.001	<0.001	NR	NR	NR	NR	38	38	100.0%
Boron	mg/L	0.37	<0.05	<0.05	0.12	0.16	0.17	0.2	38	1	2.6%
Cadmium	mg/L	0.0002	<0.0001	<0.0001	0.0001	0.0001	0.0001	0.0001	38	37	97.4%
Calcium	mg/L	NA	<1	<1	36	40.2	44.5	51.2	22	0	0.0%
Chromium	mg/L	0.001	<0.001	<0.001	0.001	0.001	0.002	0.006	38	32	84.2%
Cobalt	mg/L	ID	<0.001	<0.001	0.001	0.001	0.001	0.001	38	25	65.8%
Copper	mg/L	0.0014	<0.001	<0.001	0.001	0.001	0.003	0.015	38	32	84.2%
Iron	mg/L	ID	<0.05	<0.05	0.028	0.11	0.27	0.424	36	1	2.8%
Lead	mg/L	0.0034	<0.001	<0.001	0.001	0.0056	0.0125	0.0194	38	36	94.7%
Lithium	mg/L	NA	<0.001	0.029	0.036	0.039	0.042	0.049	38	1	2.6%
Magnesium	mg/L	NA	<1	32	45	48	55	71	36	1	2.8%
Manganese	mg/L	1.9	<0.001	0.034	0.1184	0.223	0.2698	0.408	38	1	2.6%
Mercury	mg/L	0.0006	<0.0001	0	NR	NR	NR	NR	38	38	100.0%
Molybdenum	mg/L	ID	<0.001	0.002	0.002	0.003	0.003	0.004	36	1	2.8%
Nickel	mg/L	0.011	<0.001	0.002	0.004	0.004	0.005	0.032	37	0	0.0%
Phosphorous as P	mg/L	0.025	<0.01	0.01	0.016	0.02	0.028	0.06	34	20	58.8%
Potassium	mg/L	NA	<1	6	7.4	8	10	12	23	0	0.0%
Selenium	mg/L	0.011	<0.01	0.02	0.02	0.02	0.02	0.02	37	36	97.3%
Silicon as SiO ₂	mg/L	NA	<0.1	12	14.08	14.8	16.08	70.8	35	0	0.0%
Silver	mg/L	0.00005	<0.001	0.001	0.001	0.001	0.001	0.001	37	36	97.3%
Sulfur as S	mg/L	NA	<1	56	65	69	84.4	101	19	0	0.0%
Tin	mg/L	ID	<0.001	0.002	0.002	0.002	0.002	0.002	37	36	97.3%
Titanium	mg/L	NA	<0.01	0.01	0.014	0.02	0.02	0.02	37	34	91.9%
Vanadium	mg/L	ID	<0.01	0.01	0.014	0.02	0.02	0.02	37	34	91.9%
Zinc	mg/L	0.008	<0.005	0.006	0.006	0.006	0.009	0.261	36	25	69.4%

NR = No Result – all results below Limit of Recording
ID = Insufficient Data
NA = Not Applicable

The calculated median value (excluding those below the limit of recording) was either below the nominated guideline trigger value or there is no available trigger for comparison for each of the following pollutants.

- | | | |
|-------------|-------------|--------------|
| • Boron | • Arsenic | • Barium |
| • Magnesium | • Calcium | • Lithium |
| • Nickel | • Manganese | • Molybdenum |
| • Sulfur | • Potassium | • Silicon |

The results for total pollutants (**Table 4**) are generally consistent with those presented in **Table 2** for dissolved pollutants including records of chromium and silver which were above the guideline trigger value for the few samples that were above the limit of recording. These results are not statistically significant and are not representative of conditions at EPL 4.

It is noted that the median values for total aluminium and copper exceed the guideline trigger values at EPL 4. However, this is not a bio-available fraction and possibly absorbed onto particulate matter in the sample.

2.4 EPL 5 MONITORING RESULTS

Monitoring at EPL 5 was less frequent over the period of the Pollution Reduction Program as occurrences of water discharged at this location was not as frequent as that at the EPL 4 (Mine Adit Dam). In total, 19 samples were available for analysis, however a result for each pollutant is not available for each sample. The monitoring results for dissolved pollutants sampled at EPL 5 are presented in **Table 5**, while the results for total pollutants sampled at EPL 5 are presented in **Table 6**.

It is noted that the monitoring results for the following pollutants were not recorded above the laboratory limit of recording for any monitored samples.

- | | | | |
|-------------|-----------|---------------|------------|
| • Beryllium | • Lead | • Phosphorous | • Silver |
| • Chromium | • Mercury | • Selenium | • Titanium |

In addition, the monitoring results for the following pollutants were only recorded above the limit of recording for a limited number of samples.

- | | |
|--------------------------------|-------------------------------|
| • Aluminium (31.6% of samples) | • Cobalt (5.3% of samples) |
| • Ammonia (27.3% of samples) | • Tin (5.6% of samples) |
| • Antimony (16.7% of samples) | • Vanadium (11.1% of samples) |
| • Cadmium (5.3% of samples) | • Zinc (30.8% of samples) |

The calculated median value (excluding those below the limit of recording) was below the nominated guideline trigger value or there is no available trigger for comparison for each of the following pollutants.

- | | | | |
|-----------|-------------|--------------|-------------|
| • Arsenic | • Copper | • Manganese | • Potassium |
| • Barium | • Iron | • Molybdenum | • Silicon |
| • Boron | • Lithium | • Nickel | • Sulfur |
| • Calcium | • Magnesium | | |

The median value did not exceed the guideline trigger values at EPL 5 for all assessed dissolved pollutants, where a trigger value is available, except for ammonia for which the median record is at the guideline trigger level. The results for ammonia at EPL 5 are consistent with the results recorded at EPL 4 and indicate that elevated levels of ammonia are not a result of quarrying activities.

The results for total pollutants (**Table 6**) are generally consistent with those presented in **Table 5** for dissolved pollutants excluding single samples of lead and silver that exceeded the guideline triggers but are not representative of conditions at monitoring location EPL 5 given that all remaining samples were below the limit of recording.

It is noted that the median values for total chromium and zinc are equal to the guideline trigger values, while median results for total aluminium, copper and phosphorous exceed the guideline trigger values at EPL 5. However, this is not a bio-available fraction and possibly absorbed onto particulate matter in the sample. It is assumed that the high level of phosphorous suspended in samples is a result of fertiliser application within the Quarry. The dissolved fraction is below the limit of recording for all available samples. This exceedance is not considered significant given that the marine environment would contain relatively high levels of this element.

Table 5
Statistical Analysis - Water Quality at EPA Point 5 - Dissolved (filtered) Samples - September 2013 to August 2016

Analyte	Unit	Guideline Trigger Value	LOR	Minimum Record	20th Percentile Record	Median Record	80th Percentile Record	Maximum Record	Total Records	Number Records Below LOR	Percentage of Records Below LOR
Aluminium	mg/L	0.055	<0.01	0.01	0.01	0.02	0.02	0.96	19	13	68.4%
Ammonia as N	mg/L	0.02	<0.01	0.01	0.014	0.02	0.026	0.03	11	8	72.7%
Antimony	mg/L	ID	<0.001	0.001	0.0014	0.002	0.002	0.002	18	15	83.3%
Arsenic	mg/L	0.013	<0.001	0.001	0.002	0.002	0.0046	2	19	6	31.6%
Barium	mg/L	NA	<0.001	0.017	0.0212	0.026	0.0284	0.035	19	0	0.0%
Beryllium	mg/L	ID	<0.001	NR	NR	NR	NR	NR	19	19	100.0%
Boron	mg/L	0.37	<0.05	0.06	0.07	0.09	0.106	0.18	19	1	5.3%
Cadmium	mg/L	0.0002	<0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	19	18	94.7%
Calcium	mg/L	NA	<1	21	26.2	31	33.8	42	12	0	0.0%
Chromium	mg/L	0.001	<0.001	NR	NR	NR	NR	NR	19	19	100.0%
Cobalt	mg/L	ID	<0.001	0.009	0.009	0.009	0.009	0.009	19	18	94.7%
Copper	mg/L	0.0014	<0.001	0.001	0.001	0.001	0.001	0.002	19	11	57.9%
Iron	mg/L	ID	<0.05	0.06	0.06	0.09	0.12	1.06	19	11	57.9%
Lead	mg/L	0.0034	<0.001	NR	NR	NR	NR	NR	19	19	100.0%
Lithium	mg/L	NA	<0.001	0.011	0.0114	0.0135	0.0194	0.028	19	1	5.3%
Magnesium	mg/L	NA	<1	23	27.2	32	43.2	49	18	0	0.0%
Manganese	mg/L	1.9	<0.001	0.008	0.0252	0.0915	0.2018	1.67	19	1	5.3%
Mercury	mg/L	0.0006	<0.0001	NR	NR	NR	NR	NR	18	18	100.0%
Molybdenum	mg/L	ID	<0.001	0.001	0.002	0.002	0.0036	0.009	19	1	5.3%
Nickel	mg/L	0.011	<0.001	0.002	0.003	0.0035	0.004	0.006	18	0	0.0%
Phosphorous as P	mg/L	0.025	<0.01	NR	NR	NR	NR	NR	2	2	100.0%
Potassium	mg/L	NA	<1	5	5.2	6.5	7	11	12	0	0.0%
Selenium	mg/L	0.011	<0.01	NR	NR	NR	NR	NR	18	18	100.0%
Silicon as SiO ₂	mg/L	NA	<0.1	6.5	7.8	12.1	15.2	20.4	17	1	5.9%
Silver	mg/L	0.00005	<0.001	NR	NR	NR	NR	NR	18	18	100.0%
Sulfur as S	mg/L	NA	<1	34	41.4	47	68.2	71	15	0	0.0%
Tin	mg/L	ID	<0.001	0.02	0.02	0.02	0.02	0.02	18	17	94.4%
Titanium	mg/L	NA	<0.01	NR	NR	NR	NR	NR	18	18	100.0%
Vanadium	mg/L	ID	<0.01	0.007	0.0082	0.01	0.0118	0.013	18	16	88.9%
Zinc	mg/L	0.008	<0.005	0.005	0.0056	0.006	0.008	0.011	13	9	69.2%
NR = No Result - all results below Limit of Recording											NA = Not Applicable
ID = Insufficient Data											

Table 6
Statistical Analysis - Water Quality at EPA Point 5 - Total (unfiltered) Samples - September 2013 to August 2016

Analyte	Unit	Guideline Trigger Value	LOR	Minimum Record	20th Percentile Record	Median Record	80th Percentile Record	Maximum Record	Total Records	Number Records Below LOR	Percentage of Records Below LOR
Aluminium	mg/L	0.055	<0.01	0.02	0.076	0.36	0.768	6.46	19	2	11%
Ammonia as N	mg/L	0.02	<0.01	0.01	0.016	0.02	0.03	0.08	18	9	50%
Antimony	mg/L	ID	<0.001	0.001	0.001	0.001	0.0012	0.002	18	13	72%
Arsenic	mg/L	0.013	<0.001	0.001	0.002	0.003	0.004	2	19	3	16%
Barium	mg/L	NA	<0.001	0.025	0.0266	0.03	0.033	0.066	19	0	0%
Beryllium	mg/L	ID	<0.001	NR	NR	NR	NR	NR	18	18	100%
Boron	mg/L	0.37	<0.05	0.06	0.07	0.1	0.116	0.15	19	1	5%
Cadmium	mg/L	0.0002	<0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	19	18	95%
Calcium	mg/L	NA	<1	22	24	31.5	35.4	44	14	0	0%
Chromium	mg/L	0.001	<0.001	0.001	0.001	0.001	0.0028	0.007	18	10	56%
Cobalt	mg/L	ID	<0.001	0.001	0.0016	0.002	0.0052	0.01	19	15	79%
Copper	mg/L	0.0014	<0.001	0.001	0.001	0.002	0.002	0.005	19	3	16%
Iron	mg/L	ID	<0.05	0.14	0.24	0.48	0.82	7.28	19	0	0%
Lead	mg/L	0.0034	<0.001	0.005	0.005	0.005	0.005	0.005	19	18	95%
Lithium	mg/L	NA	<0.001	0.002	0.012	0.014	0.02	0.031	19	0	0%
Magnesium	mg/L	NA	<1	24	28	34	45.6	51	18	0	0%
Manganese	mg/L	1.9	<0.001	0.029	0.0588	0.097	0.2184	1.8	19	0	0%
Mercury	mg/L	0.0006	<0.0001	NR	NR	NR	NR	NR	18	18	100%
Molybdenum	mg/L	ID	<0.001	0.001	0.002	0.003	0.004	0.009	19	1	5%
Nickel	mg/L	0.011	<0.001	0.003	0.0034	0.004	0.0056	0.008	18	0	0%
Phosphorous as P	mg/L	0.025	<0.01	0.02	0.02	0.03	0.05	0.07	18	7	39%
Potassium	mg/L	NA	<1	5	6	6.5	8	11	14	0	0%
Selenium	mg/L	0.011	<0.01	NR	NR	NR	NR	NR	18	18	100%
Silicon as SiO ₂	mg/L	NA	<0.1	8.6	10.2	12.8	14.16	22.8	17	0	0%
Silver	mg/L	0.00005	<0.001	0.001	0.001	0.001	0.001	0.001	18	17	94%
Sulfur as S	mg/L	NA	<1	32	42.6	52	59	76	12	0	0%
Tin	mg/L	ID	<0.001	0.01	0.012	0.015	0.018	0.02	18	16	89%
Titanium	mg/L	NA	<0.01	0.01	0.01	0.01	0.01	0.01	18	17	94%
Vanadium	mg/L	ID	<0.01	0.006	0.0066	0.0085	0.0172	0.028	18	14	78%
Zinc	mg/L	0.008	<0.005	0.006	0.006	0.008	0.0096	0.012	13	8	62%

ID = Insufficient Data

NR = No Result - all results below Limit of Recording

NA = Not Applicable

3. CONCLUSION

Water testing at Metromix's Teralba Quarry has demonstrated that the Quarry operations have not adversely impacted the water quality in the surrounding and downstream areas of the Quarry.

With respect to dissolved pollutants, the results collected from 38 months of sampling and analysis indicate virtually no exceedances of guideline trigger values. The dissolved pollutant fraction is considered the most bioavailable and significantly influences the toxicity effects on aquatic biota arising from concentrations in waters (NWQMS, 2000). There were generally no exceedances of the guideline trigger values for dissolved pollutants at monitoring location EPL 5, from where water discharged from the Quarry flows to Lake Macquarie. The only exceedance noted was the result for dissolved chromium and silver at EPL 4 on one occasion. However, these records are considered outliers and not representative given that the majority of samples were below the limit of recording for these pollutants.

The results of sampling and analyses for the total or suspended fraction of pollutants indicates some exceedances of guideline trigger values. However, it should be noted that these results are derived from analyses of unfiltered samples and may be due to the presence of colloidal material. In addition, TSS concentrations for all samples are well below the guideline values suggesting that, despite some exceedance of trigger values, it is doubtful that discharge from EPA 4 and EPA 5 significantly contribute to the total load of metals in the receiving system.

4. ONGOING MONITORING

The analysis of 38 months of sampling data at monitoring locations EPL 4 and EPL 5 indicate that the majority of pollutants included in the monitoring undertaken for the Pollution Reduction Program are either not present in significant concentrations or were below the limit of recording. The assessment has concluded that the water flowing from the underground mine network (monitored at EPL 4) and from the southern side of Teralba Quarry (EPL 5) has not adversely impacted the water quality at these locations or within Lake Macquarie.

It is therefore recommended that monitoring of all pollutants included in the current program ceases from November 2016. The surface water monitoring program for Teralba Quarry will be modified to be consistent with the requirements of *Condition M2.3* of EPL 536 which requires monthly monitoring at EPL 4 and monitoring daily during discharge at EPL 5. The following pollutants will be monitored, consistent with *Condition M2.3*.

- pH
- Electrical Conductivity
- Oil and grease
- Total suspended solids

Upon confirmation that the EPA is satisfied with the assessment presented above and the ongoing monitoring program, an application to vary EPL 536 would be prepared and submitted to the EPA to remove or suitably vary *Condition U1.1*, *Condition U1.2* and *Condition U1.3*.

This page has intentionally been left blank

Appendix 1

Monitoring Data EPL 4 and EPL 5

(Total No. of pages including blank pages = 16)

This page has intentionally been left blank

Table A1 Water Quality - EPL Point No. 4 (Adit) - Physical Parameters

Sample	Guideline Trigger Value	Unit	2013				2014													
			September	October	November	December	January	February	March	April	May	June	July	August - 1	August - 2	August - 3	September	October	November	December
9	pH	ph Unit	7.7	7.8	7.3	7.1	7.7	7.48	7.32	7.34	7.54	7.79	7.41	7.56	7.54	7.59	7.4	7.6	7.13	7.63
125 - 2200 ^b	Conductivity	µS/cm	2180	2410	2210	1890	1940	2170	2100	2010	1850	1860	1910	2000	1890	1840	1640	1780	1820	1870
<50	TSS	mg/L	<5	<5	<5	26	6	<5	6	<5	10	6	<5	35	6	<5	8	<5	<5	6
5	Oil & Grease	mg/L	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	<5	<5	<5	<5	<5
NR = No Result ND = No Discharge																				

NR = No Result
ND = No Discharge

Table A1 - Water Quality - EPL Point No. 4 (Adit) - Physical Parameters (Cont'd)

Sample	Guideline Trigger Value	Unit	2015												2016							
			January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August
6.5 to 8.5 units	pH	ph Unit	7.34	7.34	7.35	7.39	7.12	7.15	7.28	7.23	7.37	7.37	7.03	7.03	6.92	6.84	8.16	8.09	8.04	8.13	8.08	8.2
125 - 2200 ^b	Conductivity	µS/cm	1840	1820	1850	1900	1460	1770	1780	2200	2400	2480	2140	2030	1710	1790	1880	1760	1900	1880	1700	2060
<50	TSS	mg/L	11	<5	19	<5	11	<5	6	<5	<5	<5	12	8	12	35	<5	<5	<5	7	6	<5
5	Oil & Grease	mg/L	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
NR = No Result																						
ND = No Discharge																						

NR = No Result
ND = No Discharge

Table A2 - Water Quality - EPA Point No. 5 (Dam B) - Physical Parameters

Sample	Guideline Trigger Value	Unit	2013				2014													
			September	October	November	December	January	February	March	April	May	June	July	August - 1	August - 2	August - 3	September	October	November	December
6.5 to 8.5 units	pH	ph Unit	ND	ND	8.0	7.7	ND	ND	7.5	7.9	7.5	8.01	8.06	8.0	7.8	7.6	7.25	7.7	ND	ND
125 - 2200 ^b	Conductivity	µS/cm	ND	ND	1600	1660	ND	ND	1490	834	1150	1120	1910	1530	1090	1280	1090	991	ND	ND
<50	TSS	mg/L	ND	ND	25	6	ND	ND	<5	19	10	<5	<5	<5	<5	<5	14	6	ND	ND
5	Oil & Grease	mg/L	ND	ND	NR	NR	ND	ND	NR	NR	NR	NR	NR	<5	<5	<5	<5	<5	ND	ND
NR = No Result																				
ND = No Discharge																				

NR = No Result
ND = No Discharge

Table A2 - Water Quality - EPA Point No. 5 (Dam B) - Physical Parameters (Cont'd)

Sample	Guideline Trigger Value	Unit	2015				2016				2017			
			January	February	March	April	May	June	July	August	September	October	November	December
6.5 to 8.5 units	pH	ph Unit	ND	7.73	7.9	7.74	7.44	7.89	7.33	ND	ND	ND	ND	ND
125 - 2200 ^b	Conductivity	µS/cm	ND	839	1130	874	929	1390	1050	ND	ND	ND	ND	ND
<50	TSS	mg/L	ND	<5	<5	<5	6	<5	<5	ND	ND	ND	ND	ND
5	Oil & Grease	mg/L	ND	<5	<5	<5	<5	<5	<5	ND	ND	ND	ND	ND

NR = No Result
ND = No Discharge



This page has intentionally been left blank
This page has intentionally been left blank

Table A3 - Water Quality - EPA Point No. 4 (Addit) - Dissolved (Filtered) Samples

Page 1 of 2

Sample	Guideline Trigger Value	Unit	2013				2014																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
			September	October	November	December	January	February	March	April	May	June	July	August - 1	August - 2	August - 3	September	October	November	December																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Aluminium	0.055	mg/L	NR	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Key

*All values sourced from Table 3.4.1 ANZECC except where indicated

ID = Insufficient Data

NA = Not Applicable

ND = No Discharge

NR = No Result

a Environment Protection Licence 536

b Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)

c Sourced from <http://www.environment.nsw.gov.au/leof/LakeMacquarie/report-03.htm#support11> (doi 20161404)



This page has intentionally been left blank
This page has intentionally been left blank

Table A3 - Water Quality - EPA Point No. 4 (Adit) - Dissolved (Filtered) Samples (Cont'd)

Page 2 of 2

Sample	Guideline Trigger Value	Unit	2015												2016											
			January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August				
Aluminium	0.055	mg/L	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
Ammonia as N	0.02 ^a	mg/L	NR	0.03	0.02	0.06	0.06	0.01	0.01	0.04	NR	0.03	0.06	0.04	NR	NR	NR	NR	NR	NR	NR	NR				
Antimony	ID	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Arsenic	0.013	mg/L	<0.001	0.001	<0.001	0.008	<0.001	0.002	0.001	<0.001	0.001	<0.001	0.003	0.002	<0.001	0.001	<0.001	<0.001	<0.001	0.001	0.001	0.002				
Barium	NA	mg/L	0.032	0.033	0.030	0.029	0.022	0.031	0.030	0.029	0.026	0.027	0.034	0.036	0.026	0.034	0.041	0.045	0.046	0.038	0.039	0.039				
Beryllium	ID	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Boron	0.37	mg/L	0.15	0.16	0.17	0.18	0.14	0.16	0.16	0.21	0.25	0.24	0.18	0.17	0.2	0.15	0.17	0.17	0.14	0.17	0.15	0.18				
Cadmium	0.0002	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0002				
Calcium	NA	mg/L	NR	43	40	40	36	45	40	54	54	57	49	59	44	42	NR	57	50	47	44	48				
Chromium	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.022	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Cobalt	ID	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Copper	0.0014	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Iron	ID	mg/L	<0.05	0.07	0.06	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	0.11	0.25	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
Lead	0.0034	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Lithium	NA	mg/L	0.034	0.038	0.038	0.042	0.033	0.038	0.042	0.043	0.048	0.048	0.048	0.047	0.036	0.037	0.037	0.031	0.03	0.036	0.031	0.038				
Magnesium	NA	mg/L	NR	46	42	45	38	46	39	57	65	65	51	54	43	50	46	52	49	46	45	54				
Manganese	1.9	mg/L	0.25	0.277	0.219	0.218	0.189	0.244	0.260	0.246	0.184	0.129	0.376	0.212	0.2	0.361	0.023	0.030	0.043	0.027	0.032	0.075				
Mercury	0.0006	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Molybdenum	ID	mg/L	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.004	0.001	0.003	0.003	0.002	0.003	0.002	0.002				
Nickel	0.011	mg/L	0.005	0.005	0.004	0.004	0.003	0.003	0.005	0.005	0.005	0.027	0.005	0.006	0.003	0.007	0.003	0.003	0.002	0.002	0.002	0.003				
Phosphorous as P	0.025 ^c	mg/L	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR				
Potassium	NA	mg/L	NR	NR	NR	NR	6	NR	NR	NR	NR	NR	8	8	NR	9	7	9	6	6	6	8				
Selenium	0.011	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
Silicon as SiO2	NA	mg/L	NR	13.9	14.3	15.4	NR	14.4	5.1	14.6	13.8	14.5	15.4	15.3	16.4	14.4	16.5	18.2	18.6	14.9	16.3	13.4				
Silver	0.00005	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Sulfur as S	NA	mg/L	NR	70	NR	NR	53	71	NR	NR	115	NR	84	71	78	72	77	70	65	68	66	80				
Tin	ID	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Titanium	NA	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
Vanadium	ID	mg/L	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
Zinc	0.008	mg/L	<0.005	<0.005	0.006	<0.005	0.014	<0.005	<0.005	0.005	0.005	<0.005	<0.005	0.007	<0.005	<0.005	0.007	0.008	0.008	<0.005	<0.005	<0.005				

Key

*All values sourced from Table 3.4.1 ANZECC except where indicated

ID = Insufficient Data

NA = Not Applicable

NR = No Result

a Environment Protection License 536

b Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)

c Sourced from <http://www.environment.nsw.gov.au/teol/LakeMacquarie/report-03.htm#support11> (do 20161404)



This page has intentionally been left blank
This page has intentionally been left blank

Table A4 - Water Quality - EPA Point No. 4 (ADIT) - Total (Filtered) Samples

Page 1 of 2

Sample	Guideline Trigger Value*	Unit	2013				2014													
			September	October	November	December	January	February	March	April	May	June	July	August - 1	August - 2	August - 3	September	October	November	December
Aluminium	0.055	mg/L	NR	0.04	0.05	0.11	0.14	0.04	0.08	0.07	0.07	0.07	0.01	0.27	0.10	0.03	0.15	0.02	0.04	0.14
Ammonia as N	0.02 ^b	mg/L	0.03	NR	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	NR	<0.01	0.03	0.05	<0.01	<0.01	NR	NR	0.02	NR
Antimony	ID	mg/L	NR	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	0.013	mg/L	NR	0.002	0.001	0.002	0.003	0.002	0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.001	0.002	<0.001	0.002	0.001
Barium	NA	mg/L	NR	0.025	0.029	0.030	0.031	0.029	0.027	0.028	0.032	0.028	0.034	0.029	0.025	0.028	0.027	0.030	0.028	0.030
Beryllium	ID	mg/L	NR	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	0.37	mg/L	NR	0.21	0.23	0.17	0.18	0.22	0.19	0.2	0.17	0.14	0.17	0.16	0.16	0.15	0.13	0.12	0.17	0.17
Cadmium	0.0002	mg/L	NR	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	NA	mg/L	52	60	56	43	47	48	45	46	44	40	46	44	44	NR	36	NR	41	NR
Chromium	0.001	mg/L	NR	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.006	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.002
Cobalt	ID	mg/L	NR	<0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.002	<0.001	<0.001	0.001	0.001	0.001	0.001
Copper	0.0014	mg/L	NR	0.003	<0.001	<0.001	<0.001	0.001	0.001	<0.001	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	ID	mg/L	NR	0.06	0.07	0.45	0.33	0.32	0.29		0.42	0.26	0.16	0.73	0.27	0.14	0.5	0.11	0.29	0.29
Lead	0.0034	mg/L	NR	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium	NA	mg/L	NR	0.044	0.042	0.048	0.038	0.042	0.036	0.04	0.039	0.035	0.036	0.034	0.034	0.039	0.038	0.038	0.037	0.036
Magnesium	NA	mg/L	NR	7.1	66	46	46	55	56	52	45	46	47	50	51	45	39	45	46	NR
Manganese	1.9	mg/L	NR	0.054	0.12	0.303	0.223	0.234	0.194	0.161	0.269	0.252	0.273	0.285	0.177	0.214	0.231	0.162	0.229	0.221
Mercury	0.0006	mg/L	NR	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	ID	mg/L	NR	0.003	0.002	0.003	0.002	0.002	0.002	0.003	0.003	0.002	0.003	0.002	0.002	0.003	0.003	NR	0.003	0.003
Nickel	0.011	mg/L	0.006	0.005	0.004	0.004	0.005	0.004	0.005	0.005	0.005	0.004	0.002	0.006	0.004	0.005	0.004	NR	0.004	0.005
Phosphorous as P	0.025 ^c	mg/L	<0.01	NR	<0.01	<0.01	0.02	NR	<0.01	0.02	<0.01	<0.01	<0.01	0.06	0.02	<0.01	<0.01	NR	0.05	<0.01
Potassium	NA	mg/L	9	11	10	7	8	9	10	9	8	7	8	8	8		6	NR	8	NR
Selenium	0.011	mg/L	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NR	<0.01	<0.01
Silicon as SiO2	NA	mg/L	14.1	14.4	15.3	14.5	16.7	14.5	15	16	15.7	15	15.5	16.4	12.0	14.6	14.7	NR	14.8	NR
Silver	0.00005	mg/L	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NR	<0.001	<0.001
Sulfur as S	NA	mg/L	82	101	94	65	75	80	84	85	66	68	65	69	68	61	56	NR	68	NR
Tin	ID	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NR	<0.001	<0.001
Titanium	NA	mg/L	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NR	<0.01	<0.01
Vanadium	ID	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NR	<0.01	<0.01
Zinc	0.008	mg/L	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	0.006	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	NR	<0.005	<0.005

Key

NR = No Discharge
NA = Not Applicable
NR = No Result

a Based on ANZECC Guidelines for Fresh and Marine Water Quality - Recreational Water Quality (ANZECC 2000) except where indicated

b Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)

c Based on ANZECC Guidelines for Fresh and Marine Water Quality - Livestock Water Quality (ANZECC 2000)

d Based on ANZECC Guidelines for Fresh and Marine Water Quality - Irrigation Water Quality (ANZECC 2000)



This page has intentionally been left blank
This page has intentionally been left blank

Table A4 - Water Quality - EPA Point No. 4 (ADIT) - Total (Filtered) Samples (Cont'd)

Page 2 of 2

Sample	Guideline Trigger Value	Unit	2015												2016							
			January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August
Aluminium	0.055	mg/L	0.14	0.04	0.08	0.07	0.07	0.07	0.01	0.27	0.10	0.03	0.15	0.02	0.42	1.28	0.06	0.05	0.01	4.88	0.05	0.06
Ammonia as N	0.02 ^b	mg/L	<0.01	<0.01	0.03	<0.01	NR	<0.01	0.03	0.05	<0.01	<0.01	NR	NR	<0.01	0.04	NR	0.07	0.06	0.04	0.12	0.02
Antimony	ID	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001
Arsenic	0.013	mg/L	0.003	0.002	0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.001	0.002	<0.001	0.002	0.004	0.001	<0.001	<0.001	0.002	<0.001	0.002
Barium	NA	mg/L	0.031	0.029	0.027	0.028	0.032	0.028	0.034	0.029	0.025	0.028	0.027	0.030	0.031	0.054	0.041	0.048	0.051	0.157	0.041	0.044
Beryllium	ID	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	0.37	mg/L	0.18	0.22	0.19	0.2	0.17	0.14	0.17	0.16	0.16	0.15	0.13	0.12	0.18	0.22	0.17	0.22	0.16	0.19	0.15	0.18
Cadmium	0.0002	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Calcium	NA	mg/L	47	48	45	46	44	40	46	44	44	NR	36	NR	NR	NR	NR	NR	NR	NR	NR	NR
Chromium	0.001	mg/L	<0.001	<0.001	<0.001	0.006	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.006	0.001	<0.001
Cobalt	ID	mg/L	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.002	<0.001	<0.001	0.001	0.001	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	0.0014	mg/L	<0.001	0.001	0.001	<0.001	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	0.047	<0.001	<0.001
Iron	ID	mg/L	0.33	0.32	0.29		0.42	0.26	0.16	0.73	0.27	0.14	0.5	0.11	0.49	2.84	0.11	0.11	0.13	0.11	0.23	0.14
Lead	0.0034	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.024	<0.001	<0.001
Lithium	NA	mg/L	0.038	0.042	0.036	0.04	0.039	0.035	0.036	0.034	0.034	0.039	0.038	0.038	0.036	0.04	0.039	0.032	0.031	0.042	0.029	0.041
Magnesium	NA	mg/L	46	55	56	52	45	46	47	50	51	45	39	45	50	44	48	53	52	47	46	55
Manganese	1.9	mg/L	0.223	0.234	0.194	0.161	0.269	0.252	0.273	0.285	0.177	0.214	0.231	0.162	0.228	0.408	0.035	0.046	0.052	0.034	0.068	0.092
Mercury	0.0006	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	ID	mg/L	0.002	0.002	0.002	0.003	0.003	0.002	0.003	0.002	0.002	0.003	0.003	NR	0.003	0.003	0.003	0.003	0.002	0.003		0.003
Nickel	0.011	mg/L	0.005	0.004	0.005	0.005	0.005	0.004	0.002	0.006	0.004	0.005	0.004	NR	0.004	0.01	0.004	0.002	0.003	0.032	0.002	0.004
Phosphorous as P	0.025 ^c	mg/L	0.02	NR	<0.01	0.02	<0.01	<0.01	<0.01	0.06	0.02	<0.01	<0.01	NR	<0.01	0.04	0.02	0.02	0.02	<0.01	<0.01	NR
Potassium	NA	mg/L	8	9	10	9	8	7	8	8	8	NR	6	NR	8	NR	NR	NR	NR	NR	NR	NR
Selenium	0.011	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NR	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silicon as SiO2	NA	mg/L	16.7	14.5	15	16	15.7	15	15.5	16.4	12.0	14.6	14.7	NR	16.4	19.2	16	18.5	18.6	70.8	13.9	13.7
Silver	0.00005	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NR	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfur as S	NA	mg/L	75	80	84	85	66	68	65	69	68	61	56	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tin	ID	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001
Titanium	NA	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NR	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
Vanadium	ID	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NR	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Zinc	0.008	mg/L	0.006	<0.005	<0.005	0.006	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NR	0.006	0.014	0.007	0.006	0.007	0.261	0.006	<0.005

Key

ND = No Discharge

NA = Not Applicable

NR = No Result

a Based on ANZECC Guidelines for Fresh and Marine Water Quality - Recreational Water Quality (ANZECC 2000) except where indicated

b Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)

c Based on ANZECC Guidelines for Fresh and Marine Water Quality - Livestock Water Quality (ANZECC 2000)

d Based on ANZECC Guidelines for Fresh and Marine Water Quality - Irrigation Water Quality (ANZECC 2000)



This page has intentionally been left blank
This page has intentionally been left blank

Table A5 - Water Quality - EPA Point No. 5 (Dam B) - Dissolved (Filtered) Samples

Page 1 of 2

Sample	Guideline Trigger Value*	Unit	2013				2014											
			September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December
Aluminium	0.055	mg/L	ND	ND	0.02	<0.01	ND	ND	<0.01	0.01	<0.01	<0.01	0.96	<0.01	0.01	<0.01	<0.01	<0.01
Ammonia as N	0.02b	mg/L	ND	ND	<0.01	<0.01	ND	ND	<0.001	<0.01	0.02	<0.01	<0.01	0.03	<0.01	<0.01	0.01	NR
Antimony	ID	mg/L	ND	ND	0.002	0.002	ND	ND	NR	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	0.013	mg/L	ND	ND	0.005	0.005	ND	ND	0.002	0.002	<0.001	<0.001	<0.001	<0.001	0.002	0.001	0.002	0.003
Barium	NA	mg/L	ND	ND	0.023	0.032	ND	ND	0.031	0.020	0.028	0.028	0.017	0.026	0.025	0.025	0.019	0.022
Beryllium	ID	mg/L	ND	ND	<0.001	<0.001	ND	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	0.37	mg/L	ND	ND	0.10	0.12	ND	ND	0.18	0.07	0.10	0.06	<0.05	0.09	0.07	0.11	0.07	0.10
Cadmium	0.0002	mg/L	ND	ND	<0.0001	<0.0001	ND	ND	0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	NA	mg/L	ND	ND	27	34	ND	ND	NR	21	26	30	42	34	29	32	NR	NR
Chromium	0.001	mg/L	ND	ND	<0.001	<0.001	ND	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ID	mg/L	ND	ND	<0.001	<0.001	ND	ND	0.009	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	0.0014	mg/L	ND	ND	<0.001	0.001	ND	ND	0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	ID	mg/L	ND	ND	<0.05	0.06	ND	ND	0.06	<0.05	<0.05	<0.05	1.06	<0.05	<0.05	0.09	<0.05	0.09
Lead	0.0034	mg/L	ND	ND	<0.001	<0.001	ND	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium	NA	mg/L	ND	ND	0.026	0.028	ND	ND	0.026	0.012	0.013	0.011	<0.001	0.016	0.013	0.015	0.014	0.015
Magnesium	NA	mg/L	ND	ND	41	46	ND	ND	48	23	29	32	49	42	32	39	23	NR
Manganese	1.9	mg/L	ND	ND	<0.001	0.151	ND	ND	1.67	0.024	0.231	0.090	0.008	0.019	0.111	0.326	0.027	0.171
Mercury	0.0006	mg/L	ND	ND	<0.001	<0.001	ND	ND	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	ID	mg/L	ND	ND	0.009	0.006	ND	ND	0.002	0.005	0.002	0.002	<0.001	0.002	0.003	0.002	0.004	0.001
Nickel	0.011	mg/L	ND	ND	0.006	0.004	ND	ND	NR	0.003	0.004	0.002	0.005	0.004	0.004	0.003	0.004	0.003
Phosphorous as P	0.025c	mg/L	ND	ND	<0.01	<0.01	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Potassium	NA	mg/L	ND	ND	10	7	ND	ND	NR	7	6	6	11	7	5	7	NR	NR
Selenium	0.011	mg/L	ND	ND	<0.01	<0.01	ND	ND	NR	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silicon as SiO2	NA	mg/L	ND	ND	6.5	8.2	ND	ND	NR	7.4	15.2	15.2	13.0	9.8	12.5	14.3	7.1	NR
Silver	0.00005	mg/L	ND	ND	<0.001	<0.001	ND	ND	NR	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfur as S	NA	mg/L	ND	ND	71	68	ND	ND	NR	39	47	46	71	58	44	58	48	NR
Tin	ID	mg/L	ND	ND	ND	ND	ND	ND	NR	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.001	<0.001
Titanium	NA	mg/L	ND	ND	<0.001	<0.001	ND	ND	NR	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	ID	mg/L	ND	ND	<0.01	<0.01	ND	ND	NR	<0.005	<0.005	<0.005	0.013	<0.005	<0.005	0.007	<0.01	<0.01
Zinc	0.008	mg/L	ND	ND	<0.01	<0.01	ND	ND	NR	0.006	0.005	NR	NR	NR	NR	NR	<0.005	<0.005

Key
 ND = No Discharge
 NA = Not Applicable
 NR = No Result
 a Based on ANZECC Guidelines for Fresh and Marine Water Quality - Recreational Water Quality (ANZECC 2000) except where indicated
 b Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)
 c Based on ANZECC Guidelines for Fresh and Marine Water Quality - Livestock Water Quality (ANZECC 2000)
 d Based on ANZECC Guidelines for Fresh and Marine Water Quality - Irrigation Water Quality (ANZECC 2000)



This page has intentionally been left blank
This page has intentionally been left blank

Table A5 - Water Quality - EPA Point No. 5 (Dam B) - Dissolved (Filtered) Samples (Cont'd)

Page 2 of 2

			2015												2016							
Sample	Guideline Trigger Value	Unit	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August
Aluminium	0.055	mg/L	ND	ND	<0.01	0.01	<0.01	<0.01	0.96	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	ND	ND	ND	ND	ND	ND	ND
Ammonia as N	0.02 ^b	mg/L	ND	ND	<0.001	<0.01	0.02	<0.01	<0.01	0.03	<0.01	<0.01	0.01	NR	NR	ND	ND	ND	ND	ND	ND	ND
Antimony	ID	mg/L	ND	ND	NR	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.013	mg/L	ND	ND	0.002	0.002	<0.001	<0.001	<0.001	<0.001	0.002	0.001	0.002	0.003	<0.001	ND	ND	ND	ND	ND	ND	ND
Barium	NA	mg/L	ND	ND	0.031	0.020	0.028	0.028	0.017	0.026	0.025	0.025	0.019	0.022	0.035	ND	ND	ND	ND	ND	ND	ND
Beryllium	ID	mg/L	ND	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	ND	ND
Boron	0.37	mg/L	ND	ND	0.18	0.07	0.10	0.06	<0.05	0.09	0.07	0.11	0.07	0.10	0.08	ND	ND	ND	ND	ND	ND	ND
Cadmium	0.0002	mg/L	ND	ND	0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	ND	ND
Calcium	NA	mg/L	ND	ND	NR	21	26	30	42	34	29	32	NR	NR	33	ND	ND	ND	ND	ND	ND	ND
Chromium	0.001	mg/L	ND	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	ND	ND
Cobalt	ID	mg/L	ND	ND	0.009	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	ND	ND
Copper	0.0014	mg/L	ND	ND	0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	ND	ND	ND	ND	ND	ND	ND
Iron	ID	mg/L	ND	ND	0.06	<0.05	<0.05	<0.05	1.06	<0.05	<0.05	0.09	<0.05	0.09	<0.05	ND	ND	ND	ND	ND	ND	ND
Lead	0.0034	mg/L	ND	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	ND	ND
Lithium	NA	mg/L	ND	ND	0.026	0.012	0.013	0.011	<0.001	0.016	0.013	0.015	0.014	0.015	0.013	ND	ND	ND	ND	ND	ND	ND
Magnesium	NA	mg/L	ND	ND	48	23	29	32	49	42	32	39	23	NR	35	ND	ND	ND	ND	ND	ND	ND
Manganese	1.9	mg/L	ND	ND	1.67	0.024	0.231	0.090	0.008	0.019	0.111	0.326	0.027	0.171	0.078	ND	ND	ND	ND	ND	ND	ND
Mercury	0.0006	mg/L	ND	ND	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	ND	ND	ND	ND	ND	ND	ND
Molybdenum	ID	mg/L	ND	ND	0.002	0.005	0.002	0.002	<0.001	0.002	0.003	0.002	0.004	0.001	0.001	ND	ND	ND	ND	ND	ND	ND
Nickel	0.011	mg/L	ND	ND	NR	0.003	0.004	0.002	0.005	0.004	0.004	0.003	0.004	0.003	0.004	ND	ND	ND	ND	ND	ND	ND
Phosphorous as P	0.025 ^c	mg/L	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND
Potassium	NA	mg/L	ND	ND	NR	7	6	6	11	7	5	7	NR	NR	5	ND	ND	ND	ND	ND	ND	ND
Selenium	0.011	mg/L	ND	ND	NR	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ND	ND	ND	ND	ND	ND	ND
Silicon as SiO2	NA	mg/L	ND	ND	NR	7.4	15.2	15.2	13.0	9.8	12.5	14.3	7.1	NR	15.8	ND	ND	ND	ND	ND	ND	ND
Silver	0.00005	mg/L	ND	ND	NR	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	ND	ND
Sulfur as S	NA	mg/L	ND	ND	NR	39	47	46	71	58	44	58	48	NR	44	ND	ND	ND	ND	ND	ND	ND
Tin	ID	mg/L	ND	ND	NR	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	ND	ND
Titanium	NA	mg/L	ND	ND	NR	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ND	ND	ND	ND	ND	ND	ND
Vanadium	ID	mg/L	ND	ND	NR	<0.005	<0.005	<0.005	0.013	<0.005	<0.005	0.007	<0.01	<0.01	<0.01	ND	ND	ND	ND	ND	ND	ND
Zinc	0.008	mg/L	ND	ND	NR	0.006	0.005	NR	NR	NR	NR	NR	<0.005	<0.005	0.006	ND	ND	ND	ND	ND	ND	ND
Key																						
ND = No Discharge																						
NA = Not Applicable																						
NR = No Result																						

1a Based on ANZECC Guidelines for Fresh and Marine Water Quality - Recreational Water Quality (ANZECC 2000) except where indicated
1b Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)
1c Based on ANZECC Guidelines for Fresh and Marine Water Quality -Livestock Water Quality (ANZECC 2000)
1d Based on ANZECC Guidelines for Fresh and Marine Water Quality -Irrigation Water Quality (ANZECC 2000)

Key
ND = No Discharge
NA = Not Applicable
NR = No Result
a Based on ANZECC Guidelines for Fresh and Marine Water Quality - Recreational Water Quality (ANZECC 2000) except where indicated
b Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)
c Based on ANZECC Guidelines for Fresh and Marine Water Quality - Livestock Water Quality (ANZECC 2000)
d Based on ANZECC Guidelines for Fresh and Marine Water Quality - Irrigation Water Quality (ANZECC 2000)



This page has intentionally been left blank
This page has intentionally been left blank

Table A6 - Water Quality - EPA Point No. 5 (Dam B) - Total (Filtered) Samples

				2013					2014									
Sample	Guideline Trigger Value*	Unit	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December
Aluminium	0.055	mg/L	ND	ND	0.67	0.10	ND	ND	<0.01	0.86	0.48	0.19	6.46	0.05	0.22	0.07	0.72	0.36
Ammonia as N	0.02 ^b	mg/L	ND	ND	<0.01	<0.01	ND	ND	<0.001	<0.01	0.02	<0.01	<0.01	0.03	<0.01	<0.01	0.01	NR
Antimony	ID	mg/L	ND	ND	0.002	0.001	ND	ND	NR	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Arsenic	0.013	mg/L	ND	ND	0.006	0.004	ND	ND	0.002	0.003	0.001	<0.001	0.003	<0.001	0.003	0.002	0.003	0.004
Barium	NA	mg/L	ND	ND	0.027	0.034	ND	ND	0.033	0.025	0.032	0.030	0.066	0.029	0.028	0.025	0.026	0.026
Beryllium	ID	mg/L	ND	ND	<0.001	<0.001	ND	ND	NR	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	0.37	mg/L	ND	ND	0.15	0.13	ND	ND	0.14	0.06	0.11	0.06	<0.05	0.1	0.08	0.12	0.08	0.10
Cadmium	0.0002	mg/L	ND	ND	<0.0001	<0.0001	ND	ND	0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	NA	mg/L	ND	ND	33	35	ND	ND	NR	24	31	34	44	37	31	32	22	NR
Chromium	0.001	mg/L	ND	ND	<0.001	<0.001	ND	ND	<0.001	0.004	0.001	0.001	0.007	0.001		<0.001	0.001	0.001
Cobalt	ID	mg/L	ND	ND	0.001	<0.001	ND	ND	0.010	<0.001	0.002	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	0.0014	mg/L	ND	ND	0.002	0.002	ND	ND	0.001	0.002	0.002	0.001	0.005	<0.001	0.002	<0.001	0.002	0.001
Iron	ID	mg/L	ND	ND	0.76	0.21	ND	ND	0.29	0.92	0.78	0.26	7.28	0.19	0.34	0.48	0.76	0.63
Lead	0.0034	mg/L	ND	ND	<0.001	<0.001	ND	ND	<0.001	<0.001	<0.001	<0.001	0.005	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium	NA	mg/L	ND	ND	0.026	0.031	ND	ND	0.028	0.013	0.014	0.012	0.002	0.016	0.016	0.013	0.016	0.014
Magnesium	NA	mg/L	ND	ND	47	45	ND	ND	48	25	32	35	51	41	33	37	25	NR
Manganese	1.9	mg/L	ND	ND	0.079	0.184	ND	ND	1.80	0.051	0.255	0.097	0.094	0.029	0.116	0.341	0.064	0.228
Mercury	0.0006	mg/L	ND	ND	<0.001	<0.001	ND	ND	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	ID	mg/L	ND	ND	0.009	0.006	ND	ND	0.003	0.006	0.002	0.002	<0.001	0.004	0.004	0.002	0.004	0.002
Nickel	0.011	mg/L	ND	ND	0.008	0.004	ND	ND	NR	0.004	0.006	0.003	0.006	0.005	0.005	0.004	0.005	0.004
Phosphorous as P	0.025 ^c	mg/L	ND	ND	<0.01	<0.01	ND	ND	NR	0.05	0.07	0.03	<0.01	0.05	<0.01	0.02	0.04	0.02
Potassium	NA	mg/L	ND	ND	10	8	ND	ND	NR	6	6	6	11	6	5	7	6	NR
Selenium	0.011	mg/L	ND	ND	<0.01	<0.01	ND	ND	NR	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silicon as SiO2	NA	mg/L	ND	ND	10.1	8.6	ND	ND	NR	11.4	18.5	11.4	14.0	10.2	12.8	14	10.2	NR
Silver	0.00005	mg/L	ND	ND	<0.001	<0.001	ND	ND	NR	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfur as S	NA	mg/L	ND	ND	76	60	ND	ND	NR	49	54	50	73	55	42	54	45	NR
Tin	ID	mg/L	ND	ND	ND	ND	ND	ND	NR	<0.01	0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.001	<0.001
Titanium	NA	mg/L	ND	ND	<0.001	<0.001	ND	ND	NR	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	ID	mg/L	ND	ND	0.01	<0.01	ND	ND	NR	0.006	0.007	<0.005	0.028	<0.005	<0.005	<0.005	<0.01	<0.01
Zinc	0.008	mg/L	ND	ND	<0.01	<0.01	ND	ND	NR	0.006	0.009	NR	NR	NR	NR	NR	<0.005	<0.005
Key																		
ND = No Discharge																		
NA = Not Applicable																		
NR = No Result																		
a Based on ANZECC Guidelines for Fresh and Marine Water Quality - Recreational Water Quality (ANZECC 2000) except where indicated																		
b Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)																		
c Based on ANZECC Guidelines for Fresh and Marine Water Quality - Livestock Water Quality (ANZECC 2000)																		
Based on ANZECC Guidelines for Fresh and Marine Water Quality - Irrigation Water Quality (ANZECC 2000)																		

Key

ND = No Discharge

NA = Not Applicable

NR = No Result

^a Based on ANZECC Guidelines for Fresh and Marine Water Quality - Recreational Water Quality (ANZECC 2000) except where indicated

^b Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)

^c Based on ANZECC Guidelines for Fresh and Marine Water Quality - Livestock Water Quality (ANZECC 2000)

^d Based on ANZECC Guidelines for Fresh and Marine Water Quality - Irrigation Water Quality (ANZECC 2000)



This page has intentionally been left blank
This page has intentionally been left blank

Table A6 - Water Quality - EPA Point No. 5 (Dam B) - Total (Filtered) Samples (Cont'd)

Sample	Guideline Trigger Value	Unit	2015												2016							
			January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August
Aluminium	0.055	mg/L	ND	0.79	0.4	0.78	0.48	0.12	0.02	ND	ND	ND	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND
Ammonia as N	0.02 ^b	mg/L	ND	0.01	<0.01	0.02	0.08	0.02	0.02	ND	ND	ND	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND
Antimony	ID	mg/L	ND	<0.001	0.001	<0.001	<0.001	0.001	<0.001	ND	ND	ND	ND	ND	<0.001	ND	ND	ND	ND	ND	ND	ND
Arsenic	0.013	mg/L	ND	0.004	0.002	0.006	0.002	0.001	0.001	ND	ND	ND	ND	ND	<0.001	ND	ND	ND	ND	ND	ND	ND
Barium	NA	mg/L	ND	0.033	0.029	0.030	0.032	0.030	0.028	ND	ND	ND	ND	ND	0.037	ND	ND	ND	ND	ND	ND	ND
Beryllium	ID	mg/L	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	<0.001	ND	ND	ND	ND	ND	ND	ND
Boron	0.37	mg/L	ND	0.07	0.09	0.07	0.06	0.10	0.10	ND	ND	ND	ND	ND	0.11	ND	ND	ND	ND	ND	ND	ND
Cadmium	0.0002	mg/L	ND	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	ND	ND	ND	ND	ND	<0.0001	ND	ND	ND	ND	ND	ND	ND
Calcium	NA	mg/L	ND	23	24	NR	NR	36	30	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND
Chromium	0.001	mg/L	ND	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	<0.001	ND	ND	ND	ND	ND	ND	ND
Cobalt	ID	mg/L	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	<0.001	ND	ND	ND	ND	ND	ND	ND
Copper	0.0014	mg/L	ND	0.002	0.002	0.002	0.002	0.001	<0.001	ND	ND	ND	ND	ND	0.001	ND	ND	ND	ND	ND	ND	ND
Iron	ID	mg/L	ND	1.00	0.43	0.88	0.71	0.14	0.34	ND	ND	ND	ND	ND	0.15	ND	ND	ND	ND	ND	ND	ND
Lead	0.0034	mg/L	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	<0.001	ND	ND	ND	ND	ND	ND	ND
Lithium	NA	mg/L	ND	0.011	0.018	0.012	0.012	0.023	0.012	ND	ND	ND	ND	ND	0.014	ND	ND	ND	ND	ND	ND	ND
Magnesium	NA	mg/L	ND	24	28	31	28	46	33	ND	ND	ND	ND	ND	35	ND	ND	ND	ND	ND	ND	ND
Manganese	1.9	mg/L	ND	0.110	0.05	0.074	0.209	0.029	0.212	ND	ND	ND	ND	ND	0.086	ND	ND	ND	ND	ND	ND	ND
Mercury	0.0006	mg/L	ND	<0.0001	<0.0001	<0.0001	<0.0001	NR	<0.0001	ND	ND	ND	ND	ND	<0.0001	ND	ND	ND	ND	ND	ND	ND
Molybdenum	ID	mg/L	ND	0.003	0.004	0.002	0.002	0.003	0.001	ND	ND	ND	ND	ND	0.002	ND	ND	ND	ND	ND	ND	ND
Nickel	0.011	mg/L	ND	0.004	0.006	0.003	0.003	0.004	0.003	ND	ND	ND	ND	ND	0.004	ND	ND	ND	ND	ND	ND	ND
Phosphorous as P	0.025 ^c	mg/L	ND	0.03	0.02	0.02	0.03	<0.01	<0.01	ND	ND	ND	ND	ND	<0.01	ND	ND	ND	ND	ND	ND	ND
Potassium	NA	mg/L	ND	7	7	NR	NR	8	5	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND
Selenium	0.011	mg/L	ND	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ND	ND	ND	ND	ND	<0.01	ND	ND	ND	ND	ND	ND	ND
Silicon as SiO2	NA	mg/L	ND	22.8	10.4	13.9	14.0	9.3	19.2	ND	ND	ND	ND	ND	14.2	ND	ND	ND	ND	ND	ND	ND
Silver	0.00005	mg/L	ND	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	<0.001	ND	ND	ND	ND	ND	ND	ND
Sulfur as S	NA	mg/L	ND	32	NR	32	NR	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND
Tin	ID	mg/L	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	ND	ND	ND	<0.001	ND	ND	ND	ND	ND	ND	ND
Titanium	NA	mg/L	ND	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ND	ND	ND	ND	ND	<0.01	ND	ND	ND	ND	ND	ND	ND
Vanadium	ID	mg/L	ND	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ND	ND	ND	ND	ND	<0.01	ND	ND	ND	ND	ND	ND	ND
Zinc	0.008	mg/L	ND	0.008	<0.01	<0.005	0.006	0.012	<0.005	ND	ND	ND	ND	ND	<0.005	ND	ND	ND	ND	ND	ND	ND

Key

ND = No Discharge

NA = Not Applicable

NR = No Result

a Based on ANZECC Guidelines for Fresh and Marine Water Quality - Recreational Water Quality (ANZECC 2000) except where indicated

b Based on ANZECC Guidelines slightly disturbed lowland river ecosystems in south-east Australia (ANZECC 2000)

c Based on ANZECC Guidelines for Fresh and Marine Water Quality - Livestock Water Quality (ANZECC 2000)

d Based on ANZECC Guidelines for Fresh and Marine Water Quality - Irrigation Water Quality (ANZECC 2000)



This page has intentionally been left blank

Appendix 4

2017 Internal Compliance Review







(Total No. of pages including blank pages = 38)



This page has intentionally been left blank

Part 1 - Project Approval 10_0183

Colour Code for Compliance Assessment

-  Compliant
-  Compliant Ongoing / In Progress
-  Non-compliant
-  Administrative Non-Compliance
-  Noted / Not Applicable / Not Yet Applicable
-  Not Activated / Not Yet Activated

Part 1 - Project Approval 10_0183

Condition No.	Project Approval condition	Verification	Comments	Compliance
	SCHEDULE 2			
	ADMINISTRATIVE CONDITIONS			
	OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT			
1.	In addition to meeting the specific performance criteria established under this approval, the Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any material harm to the environment that may result from the construction, operation, or rehabilitation of the project.			Noted
	TERMS OF APPROVAL			
2.	The Proponent shall carry out the project generally in accordance with the: (a) EA; (b) statement of commitments; and (c) conditions of this approval. <i>Notes:</i> <ul style="list-style-type: none"> The general layout of the project is shown in Appendix 1 and Appendix 2. The statement of commitments is reproduced in Appendix 3. 	<ul style="list-style-type: none"> Environmental Assessment, Nov 2011 Environmental Assessment, Section 6 Statement of Commitments, Nov 2011 Project Approval 10_0183 	The Teralba Quarry Extension project is being developed generally in accordance with the Environmental Assessment November 2011, the conditions of Project Approval and general layout of the project Appendix 1 and Appendix 2 of the Project Approval.	Compliant Ongoing
3.	If there is any inconsistency between the above documents, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.			Noted
4.	The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of: (a) any reports, strategies, plans, programs, reviews, audits or correspondence that are submitted in accordance with this approval; and (b) the implementation of any actions or measures contained in these documents.		Metromix has prepared and submitted the reports, strategies, plans, programs, reviews, audits required by the conditions of this Project Approval.	Compliant Ongoing
	LIMITS ON APPROVAL			
	Quarrying Operations			
5.	The Proponent may carry out quarrying operations on the site until 31 December 2038. <i>Note: Under this approval, the Proponent is required to rehabilitate the site and carry out additional undertakings to the satisfaction of the Director-General. Consequently, this approval will continue to apply in all other respects other than the right to conduct quarrying operations until the rehabilitation of the site and those undertakings have been carried out to a satisfactory standard.</i>			Noted

Condition No.	Project Approval condition	Verification	Comments	Compliance										
	Extractive Material Limits													
6.	The Proponent shall not carry out quarrying operations below 20m AHD in the Southern Extension Area or below 24 m AHD in the Mid Pit Extraction and Northern Extension Areas. <i>Note: This condition does not apply to the construction of any bores approved by NOW or pollution and sediment control structures described in the EA.</i>		Quarrying operations have not occurred to below 20m AHD in the Southern Extraction or Southern Extension Area, or below 24 m AHD in the Mid Pit Extraction and Northern Extension Areas.	Compliant Ongoing										
7.	The Proponent shall not extract more than 1.2 million tonnes of extractive materials from the site in any calendar year.		Extraction of materials from the Teralba Quarry site was less than 1.2 million tonnes from January 2017 to December 2017.	Compliant										
	Extractive Material Transport													
8.	The Proponent shall not: (a) transport more than 1 million tonnes of quarry products from the site in any calendar year; or (b) dispatch more than 326 laden trucks from the site on any day; or (c) dispatch more than 241 laden trucks per day or 20 per hour westwards along Rhondda Road; (d) dispatch more than 85 laden trucks per day or 8 per hour eastwards through Teralba; (e) dispatch laden trucks for travel through Teralba between 6 pm and 6 am; or (f) receive un-laden trucks via the Railway Street entrance between 6 pm and 7 am.	<ul style="list-style-type: none">Teralba Truck Movements, January 2017 to December 2017	Transport of extracted materials from the Teralba Quarry between January 2017 and December 2017 indicated: (a) less than 1 million tonnes of extracted material was transported from the site between January 2017 and December 2017 (b) laden trucks dispatched from the Teralba Quarry site did not exceed 326 on any day; (c) laden trucks travelling westwards along Rhondda Road did not exceed 241 per day or 20 per hour period; (d) laden trucks travelling eastwards through Teralba did not exceed 85 per day. (e) laden trucks have not travelled eastward through Teralba prior to 6 am; (f) un-laden trucks were not received via the Railway Street entrance between 6 pm and 7 am.	Compliant										
9.	The Proponent shall limit the total hourly truck dispatch rates from the site to the levels shown in Table 1. <i>Table 1 – Truck Dispatch Hours</i> <table><tr><th>Dispatch Period</th><th>Max Hourly Dispatch</th></tr><tr><td>6:00am – 7:00am</td><td>Up to 28 loaded trucks</td></tr><tr><td>7:00am – 6:00pm</td><td>Up to 20 loaded trucks</td></tr><tr><td>6:00pm – 5:00am</td><td>Up to 6 loaded trucks</td></tr><tr><td>5:00am – 6:00am</td><td>Up to 12 loaded trucks</td></tr></table> <i>Note: Dispatch times and maximum hourly rates westwards along Rhondda Road or eastwards through Teralba are further limited by condition 8 above.</i>	Dispatch Period	Max Hourly Dispatch	6:00am – 7:00am	Up to 28 loaded trucks	7:00am – 6:00pm	Up to 20 loaded trucks	6:00pm – 5:00am	Up to 6 loaded trucks	5:00am – 6:00am	Up to 12 loaded trucks		Hourly dispatch rates were at or within project approval rates in 2017.	Compliant
Dispatch Period	Max Hourly Dispatch													
6:00am – 7:00am	Up to 28 loaded trucks													
7:00am – 6:00pm	Up to 20 loaded trucks													
6:00pm – 5:00am	Up to 6 loaded trucks													
5:00am – 6:00am	Up to 12 loaded trucks													

Condition No.	Project Approval condition	Verification	Comments	Compliance
	Receival of Concrete, Virgin Excavated Natural Material and Excavated Natural Material			
10.	The Proponent shall not receive on site more than 120 tonnes of recycled concrete per day or stockpile more than 2,500 tonnes of concrete material on the site.		. On EPA Licence No 13015 (former Civil Lake site) Material concrete washout was received in Nov and Dec, 1 983 tonnes	Compliant
11.	The Proponent shall not receive on site more than 100,000 tonnes of virgin excavated natural material or excavated natural material in any calendar year.		No VENM or ENM received from January 2017 to December 2017.	Compliant
	SURRENDER OF CONSENTS			
12.	By the end of December 2013, or as otherwise agreed by the Director-General, the Proponent shall surrender the development consent (DA 130/42) for existing operations on the site in accordance with Section 104A of the EP&A Act. <i>Note: The conditions or other requirements of this project approval do not prevent the continued carrying out of development which may be undertaken pursuant to DA 130/42, prior to the surrender of that consent.</i>	Letter to DP&I re Surrender of DA 130/42 , 23 Dec 2013	Metromix surrendered DA 130/42 on 23 December 2013.	Compliant
	STRUCTURAL ADEQUACY			
13.	The Proponent shall ensure that any new buildings and structures, and any alterations, or additions to existing buildings and structures, are constructed: a) in accordance with the relevant requirements of the BCA; and b) to the satisfaction of the Mine Subsidence Board.		No new buildings constructed on site between January 2017 and December 2017.	Not Applicable
	DEMOLITION			
14.	The Proponent shall ensure that all demolition work on site is carried out in accordance with AS 2601-2001: The Demolition of Structures, or its latest version.		No demolition of buildings or structures occurred between January 2017 and December 2017.	Not Applicable
	PROTECTION OF PUBLIC INFRASTRUCTURE			
15.	The Proponent shall: (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the project; and (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project.		No public infrastructure has been damaged or relocated as a result of the project between January 2017 and December 2017.	Not Activated
	PLANNING AGREEMENT			
16.	Within 12 months of the date of this approval, unless otherwise agreed by the Director-General, the Proponent shall enter into a planning agreement with the Council in accordance with Division 6 of Part 4 of the EP&A Act that provides for payment to the Council for road maintenance levies. The agreement must include provision for those matters set out in condition 17 below. If there is any dispute between the Proponent and Council relating to the preparation or implementation of the planning agreement, then either party may refer the matter to the Director-General for resolution.	<ul style="list-style-type: none"> Project Approval 10_0183, granted 22 Feb 2013 	<p>Metromix has consulted with the Council in relation to a planning agreement in accordance with Division 6 of Part 4 of the EP&A Act that provides for payment to the Council for road maintenance levies.</p> <p>Metromix agreed to pay the Council the \$0.066/t/km plus rise and fall.</p>	Compliant

Condition No.	Project Approval condition	Verification	Comments	Compliance
	ROAD MAINTENANCE			
17.	During the life of the project, for each calendar year, the Proponent shall pay Council \$0.066 per tonne per kilometre for every tonne of quarry products transported from the site on roads for which Council is liable for road maintenance funding. Each payment must be: (a) based on weighbridge records of the quantity of quarry products transported from the site; (b) paid by the date required by the invoice issued by Council; and (c) increased over the life of the project in accordance with the CPI.		Six monthly payments to council are in place and a voluntary planning agreement has been registered on the title.	Compliant Ongoing
	OPERATION OF PLANT AND EQUIPMENT			
18.	The Proponent shall ensure that all plant and equipment used at the site is: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.		Metromix has a workshop on-site and the Metromix plant and equipment used on site is maintained and operated in a proper and efficient condition	Compliant Ongoing
	STAGED SUBMISSION OF ANY STRATEGY, PLAN OR PROGRAM			
19.	With the approval of the Director-General, the Proponent may submit any strategy, plan or program required by this approval on a progressive basis. <i>Notes:</i> <ul style="list-style-type: none"> While any strategy, plan or program may be submitted on a progressive basis, the Proponent will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times; and If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program. 	<ul style="list-style-type: none"> Environmental Management Strategy, Aug 2013 Air Quality Management Plan, Sep 2013 Blast Management Plan, Sep 2013 Noise Management Plan, Nov 2013 Transport Management Plan, Sep 2013 Waste Management Plan, Sep 2013 Water Management Plan, 2016 Landscape Management Plan Heritage Management Plan Lower Level Management Plan 2016 	All required Management Plans have been finalised. Each plan is reviewed on an annual basis.	Compliant Ongoing
	PRODUCTION DATA			
20.	The Proponent shall: (a) provide annual quarry production data to DRE using the standard form for that purpose; and (b) include a copy of this data in the Annual Review (see condition 4 of		Annual production data for July 2016 to June 2017 was reported to the DRG and the data will be included in the Annual Review (see Appendix 2).	Compliant Ongoing

Condition No.	Project Approval condition	Verification	Comments	Compliance
	schedule 5).			
	SCHEDULE 3			
	ENVIRONMENTAL PERFORMANCE CONDITIONS			
	IDENTIFICATION OF APPROVED LIMITS OF EXTRACTION			
1.	Prior to carrying out quarrying operations under this approval, the Proponent shall: (a) engage a registered surveyor to mark out the boundaries of the approved limits of extraction within the Extraction Areas; and (b) submit a survey plan of these boundaries to the Director-General.	<ul style="list-style-type: none"> Boundary Survey Plan, Southern Extension, Moutrie Survey, Jun 2013 Compendium of Documents for DP&I, Sep 2013 	The boundaries of the approved limits of extraction for the Teralba Quarry lease activities have been marked out by a registered surveyor and the boundaries marked with coloured poles for the various activity areas.	Compliant
2.	While ever quarrying operations are being carried out, the Proponent shall ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify the limits of extraction within the Southern, Southern Extension, Mid Pit and Northern Extension Extraction Areas.		<p>The boundaries of the approved limits of the Teralba Quarry lease activities have been marked with coloured poles for the various areas:</p> <ul style="list-style-type: none"> White poles - Stage 1A, Yellow poles – quarry extraction limits Blue poles - Pugmill Area Green poles – Downer EDI <p>Signage is to be placed on the posts to specifically identify each of the active areas of works within the Teralba Quarry lease boundaries.</p>	Compliant Ongoing
	EXTRACTION MANAGEMENT			
	Operating Conditions			
3.	The Proponent must ensure that: (a) the underlying historical coal workings within the Great Northern coal seam pose not greater than a negligible risk to the safety of quarry workers, including risks from sudden unplanned collapses, release of noxious gases or explosion of flammable gases; and (b) quarrying operations pose not greater than a negligible risk to the heating or combustion of the underlying historical coal workings within the Great Northern coal seam.	<ul style="list-style-type: none"> Teralba Quarry Extension Geotechnical Assessment, Mar 2006 Preliminary comments on Quarry Operations – Interactions with On-site Coal Resource, 28 Nov 2012 Lower Level Extraction Plan, September 2016. 	The management of the Teralba Quarry operations above the underlying historical coal workings within the Great Northern coal seam address the requirements that the safety of quarry workers, including risks from sudden unplanned collapses, release of noxious gases or explosion of flammable gases and the risk of heating or combustion of the underlying historical coal workings within the Great Northern coal seam, are considered and management measures implemented to ensure negligible risk.	Noted
	Lower Level Extraction Management Plan			
4.	The Proponent shall prepare and implement a Lower Level Extraction Plan for all extraction activities within 17.5 vertical metres of historical coal workings within the Great Northern coal seam, to the satisfaction of the Director-General. This plan must: (a) be submitted for approval to the D-G prior to undertaking any such quarrying operations and within 12 months of the date of this approval; (b) be prepared by suitably qualified persons approved by the Director-General;	<ul style="list-style-type: none"> Lower Level Extraction Plan, September 2016 Teralba Quarry Extension Geotechnical Assessment, Mar 2006 	A Lower Level Extraction Management Plan was completed in 2016 and approved in November 2016. Extraction above the coal seam commenced in early 2017.	Compliant

Condition No.	Project Approval condition	Verification	Comments	Compliance																														
	<p>(c) provide for the achievement of the measures set out in condition 3 above;</p> <p>(d) describe the measures that would be implemented to ensure:</p> <ul style="list-style-type: none"> • best management practice quarrying operations are being employed on site; • individual responsibilities of workers, contractors and management are detailed and understood; and • compliance with the relevant conditions of this approval; <p>(e) include a Spontaneous Combustion Management Plan, which has been prepared in consultation with DRE and Oceanic Coal Pty Ltd, to manage the potential risks and impacts of spontaneous combustion or heating of coal, and which:</p> <ul style="list-style-type: none"> • includes a detailed assessment, of the risks of spontaneous combustion and subsurface heating for each of the existing and proposed Extraction Areas; • clearly identifies responsibilities to address management of spontaneous combustion and subsurface heating risks, for both day to day operations and long term management; and • includes appropriate short and long term contingency plans. 	<ul style="list-style-type: none"> • Preliminary comments on Quarry Operations – Interactions with On-site Coal Resource, 28 Nov 2012 																																
	NOISE																																	
5.	<p>The Proponent shall ensure that the noise generated by the project does not exceed the criteria in Table 2 at any residence on privately-owned land.</p> <p><i>Table 2: Noise criteria dB(A)</i></p> <table border="1"> <thead> <tr> <th>Location</th><th>Day 6-7am</th><th>Day 7am-6pm</th><th>Evening 6-10pm</th><th>Night 10pm-6am</th></tr> </thead> <tbody> <tr> <td>A</td><td>38</td><td>38</td><td>37</td><td>35</td></tr> <tr> <td>B</td><td>42</td><td>46</td><td>36</td><td>35</td></tr> <tr> <td>C</td><td>42</td><td>42</td><td>35</td><td>35</td></tr> <tr> <td>D, E, G, H, I</td><td>35</td><td>35</td><td>35</td><td>35</td></tr> <tr> <td>F</td><td>37</td><td>38</td><td>38</td><td>35</td></tr> </tbody> </table> <p><i>Notes:</i></p> <ul style="list-style-type: none"> • Receiver locations are shown in Figure 2 Appendix 1. • Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. <p>However, these criteria do not apply if the Proponent has a written agreement with the relevant landowner to exceed the criteria, and the Proponent has advised the Department in writing of the terms of this agreement.</p>	Location	Day 6-7am	Day 7am-6pm	Evening 6-10pm	Night 10pm-6am	A	38	38	37	35	B	42	46	36	35	C	42	42	35	35	D, E, G, H, I	35	35	35	35	F	37	38	38	35	EPL condition L5.1	<p>Noise monitoring was conducted for the Teralba Quarry in August and November 2017.</p> <p>Landowners at 8 Rhondda Rd (Location C) and 63 Victoria St (Location F) Teralba agreed not to continue monitoring at their address, however, reserve the right to request the re-instatement of noise monitoring if required.</p>	Compliant
Location	Day 6-7am	Day 7am-6pm	Evening 6-10pm	Night 10pm-6am																														
A	38	38	37	35																														
B	42	46	36	35																														
C	42	42	35	35																														
D, E, G, H, I	35	35	35	35																														
F	37	38	38	35																														

Condition No.	Project Approval condition	Verification	Comments	Compliance																
	Hours of Operation																			
6.	<div>The Proponent shall comply with the operating hours set out in <i>Table 3: Operating Hours</i></div> <table><tr><th>Day</th><th>Receipt of Concrete or VENM</th><th>Loading/Dispatch of trucks</th><th>Extraction & Processing Operations</th></tr><tr><td>Mon-Fri</td><td>7am – 5pm</td><td>4am Monday to Midnight Friday</td><td>7am – 7pm</td></tr><tr><td>Saturday</td><td>7am – 2pm</td><td>Midnight Friday to 6pm Saturday</td><td>7am – 2pm</td></tr><tr><td>Sundays and Public Holidays</td><td>None</td><td>None</td><td>None</td></tr></table> <div>Note: Maintenance activities may occur at any time provided they are inaudible at privately-owned residences.</div>	Day	Receipt of Concrete or VENM	Loading/Dispatch of trucks	Extraction & Processing Operations	Mon-Fri	7am – 5pm	4am Monday to Midnight Friday	7am – 7pm	Saturday	7am – 2pm	Midnight Friday to 6pm Saturday	7am – 2pm	Sundays and Public Holidays	None	None	None		All activities at the Teralba Quarry occurred within the approved operating hours during the period from 1 January 2017 to 31 December2017.	Compliant
Day	Receipt of Concrete or VENM	Loading/Dispatch of trucks	Extraction & Processing Operations																	
Mon-Fri	7am – 5pm	4am Monday to Midnight Friday	7am – 7pm																	
Saturday	7am – 2pm	Midnight Friday to 6pm Saturday	7am – 2pm																	
Sundays and Public Holidays	None	None	None																	
	Operating Conditions																			
7.	<div>The Proponent shall:</div> <div>(a) implement best practice noise management to minimise the construction, operational and traffic noise of the project;</div> <div>(b) minimise the noise impacts of the project during meteorological conditions when the noise limits in this approval do not apply;</div> <div>(c) maintain the effectiveness of any noise suppression equipment on plant at all times and ensure defective plant is not used operationally until fully repaired;</div> <div>(d) regularly assess noise monitoring data and relocate, modify, and/or stop operations on site to ensure compliance with the relevant conditions of this approval; to the satisfaction of the Director-General.</div>	<div>• Noise Management Plan Nov 2013</div>	<div>The Noise Management Plan Section 8 outlines control measures to be implemented and describes the noise management practices to be implemented on the site:</div> <div>(a) Section 8.4 addresses noise management associated with Traffic Operations (e.g. beepers have been removed and vehicles and equipment fitted with quackers to reduce noise emissions);</div> <div>(b) Section 8.5 addresses operational noise management under adverse weather conditions;</div> <div>(c) Section 8.3 addresses effectiveness of any noise suppression equipment on plant and maintenance to ensure defective plant is not operated until it is fully repaired.</div> <div>(d) Section 9 outlines Evaluation of Compliance</div>	Compliant																
	Noise Management Plan																			
	<div>The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan must:</div> <div>(a) be submitted for approval to the Director-General within 4 months of the date of this approval;</div> <div>(b) describe the measures that would be implemented to ensure:</div> <div><div>• best management practice is being employed on site;</div><div>• the noise impacts of the project are minimised during any meteorological conditions when the noise limits in this approval do not apply; and</div><div>• compliance with the relevant conditions of this approval; (c) describe</div></div>	<div>• Noise Management Plan, 31 Jul 2013</div> <div>• Letter form DP&I re Comments on Noise Management Plan, 15 Aug 2013</div> <div>• Noise Management Plan dated Nov 2013</div> <div>• Letter from DP&I re Approval of Noise Management Plan, 16 Jan 2014</div>	<div>A Noise Management Plan was prepared and submitted to DP&I on 31 July 2013.</div> <div>(a) The Noise Management Plan was submitted to DP&I on 31 July 2013 and the revised Plan approved on 16 January 2014;</div> <div>(b) Noise Management Plan Section 8 describes Control Measures for noise from the quarry and transport operations, and management under adverse weather conditions. Section 9 describes Noise Monitoring Protocol and Evaluation of Compliance.</div> <div>(c) Noise Management Plan describes the overall noise management system</div>	Compliant																

Condition No.	Project Approval condition	Verification	Comments	Compliance												
	the proposed noise management system in detail; and (d) include a monitoring program that: <ul style="list-style-type: none">is capable of regularly evaluating the performance of the project, including noisy individual items of plant, such as haulage trucks and the bulldozer;includes a protocol for determining any exceedances of the relevant conditions in this approval at locations listed in Table 2; andevaluates and reports on the effectiveness of the noise management system on site.		(d) Noise Management Plan Section 9 describes Noise Monitoring Protocol and Evaluation of Compliance. (e) Noise Management Plan Section 9 addresses Corrective and Preventative Actions and Section 11 address Information and Communication and Incident Reporting.													
	BLASTING															
	Blasting Criteria															
9.	<p>The Proponent shall ensure that the blasting on the site does not cause exceedances of the criteria in Table 4.</p> <p><i>Table 4: Blasting criteria</i></p> <table><tr><th>Location</th><th>Airblast Overpressure (dB(Lin Peak))</th><th>Ground Vibration (mm/s)</th><th>Allowable Exceedance</th></tr><tr><td></td><td>120</td><td>10</td><td>0%</td></tr><tr><td></td><td>115</td><td>5</td><td>5% of the total number of blasts over a 12 mth period</td></tr></table> <p>However, these criteria do not apply if the Proponent has a written agreement with the relevant owner or infrastructure provider / owner, and the Proponent has advised the Department in writing of the terms of this agreement.</p>	Location	Airblast Overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable Exceedance		120	10	0%		115	5	5% of the total number of blasts over a 12 mth period		<p>35 blasts were conducted between January 2017 and December 2017 all of which were monitored. However, blast 35 in December 2017 had only one blast monitor in place when fired. Compliance with the blast criteria is inferred from the monitored results and the historic blast results from that location. There were no recorded overpressure results greater than 115dB(L) and no vibration measurements recorded greater than 5mm/s.</p> <p>No agreements have been made with any relevant landowners in relation to blasting.</p>	Compliant
Location	Airblast Overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable Exceedance													
	120	10	0%													
	115	5	5% of the total number of blasts over a 12 mth period													
	Blasting Hours															
10.	The Proponent shall only carry out blasting on site between 10 am and 4 pm Monday to Friday inclusive. No blasting is allowed on weekends or public holidays, or at any other time without the written approval of Director-General.	<ul style="list-style-type: none">Blast Monitoring Results Teralba Quarry, 2016	All blasts conducted at the Teralba Quarry have occurred between 10:00am and 4:00pm, i.e. between 10:07am and 3.13.pm (see Table 4-8).	Compliant												
	Blasting Frequency															
11.	The Proponent shall not carry out more than 1 blast a day on site, unless an additional blast is required following a blast misfire. <i>Note: A blast may involve a number of explosions within a short period, typically less than two minutes.</i>	<ul style="list-style-type: none">Blast Monitoring Results Teralba Quarry, 2016	All blast conducted in 2017 were single blasts.	Compliant												

Condition No.	Project Approval condition	Verification	Comments	Compliance
	Property Inspections			
12.	<p>If the Proponent receives a written request from the owner of any privately-owned land within 500 m of proposed blasting for a property inspection to establish the baseline condition of any buildings and/or structures on his/her land, or to have a previous property inspection report updated, then within 2 months of receiving this request the Proponent shall:</p> <p>(a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to:</p> <ul style="list-style-type: none"> establish the baseline condition of any buildings and/or structures on the land, or update the previous property inspection report; and identify any measures that should be implemented to minimise the potential blasting impacts of the project on these buildings and/or structures; and <p>(b) give the landowner a copy of the new or updated property inspection report.</p>		No blasting has occurred within 500m of any buildings and/or structures on privately owned land.	Not Activated
	Property Investigations			
	<p>If the owner of any privately-owned land claims that the buildings and/or structures on his/her land have been damaged as a result of blasting on site, then within 2 months of receiving this claim in writing from the landowner the Proponent shall:</p> <p>(a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties, to investigate the claim; and</p> <p>(b) give the landowner a copy of the property investigation report.</p> <p>If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent shall repair the damages to the satisfaction of the Director-General.</p> <p>If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Director-General for resolution.</p>			Not Activated
	Operating Conditions			
14.	<p>During blasting operations, the Proponent shall:</p> <p>(a) implement best management practice to:</p> <ul style="list-style-type: none"> protect the safety of people and livestock in the surrounding area; protect public or private infrastructure/property in the surrounding area from any damage; and minimise the dust and fume emissions of any blasting; and <p>(b) operate a suitable system to enable the public to get up-to-date information on the proposed blasting schedule on site, to the satisfaction of the Director-General.</p>	<ul style="list-style-type: none"> Blast Management Plan, Sep 2013 	<p>The Blast Management Plan provides</p> <p>(a) Section 7 Surrounding Residences and Potential Blast-Related Impacts and Section 8 Control Measures for properties, safety, fly-rock / dust / fume management, and airblast overpressure;</p> <p>(b) Section 14 addresses Publication of Blast Information on the Metromix website and monitoring results will also be presented at CCC Meetings.</p>	Compliant

Condition No.	Project Approval condition	Verification	Comments	Compliance
15.	<p>The Proponent shall not undertake blasting within 500 metres of:</p> <p>(a) any public road without the approval of Council; or</p> <p>(b) any land outside the site not owned by the Proponent, unless:</p> <ul style="list-style-type: none"> the Proponent has a written agreement with the relevant landowner to allow blasting to be carried out closer to the land, and the Proponent has advised the Department in writing of the terms of this agreement, or the Proponent has: <ul style="list-style-type: none"> demonstrated to the satisfaction of the D-G that the blasting can be carried out closer to the land without compromising the safety of the people or livestock on the land, or damaging the buildings and/or structures on the land; and updated the Blast Management Plan to include the specific measures that would be implemented while blasting is being carried out within 500 metres of the land. 		<p>Blasting did not occur between January 2017 and December 2017:</p> <p>(a) within 500m of a public Road; or</p> <p>(b) within 500m of any residences or any land or buildings / structures outside the Teralba Quarry site operations owned by the Metromix.</p>	Compliant
	Blast Management Plan			
16.	<p>The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Director-General. This plan must:</p> <p>(a) be submitted to the Director-General for approval within 4 months from the date of project approval;</p> <p>(b) be prepared in consultation with the Council and interested members of the local community potentially affected by blasting operations;</p> <p>(c) describe the measures that would be implemented to ensure:</p> <ul style="list-style-type: none"> best management practice is being employed; and compliance with the relevant conditions of this approval; <p>(d) include a road closure management plan for blasting within 500 metres of a public road, that has been prepared in consultation with Council;</p> <p>(e) include a specific blast fume management protocol to demonstrate how emissions will be minimised including risk management strategies if blast fumes are generated; and</p> <p>(f) include a monitoring program for evaluating the performance of the project including:</p> <ul style="list-style-type: none"> compliance with the applicable criteria; and minimising fume emissions from the site. 	<ul style="list-style-type: none"> Letter to DP&I re Submission of Blast Management Plan, 6 Sep 2013 Blast Management Plan, Sep 2013 Letter from DP&I re Approval of Blast Management Plan, 10 Oct 2013 	<p>A Blast Management Plan was prepared to satisfy Project Approval Schedule 3 condition 16 and submitted to DP&I on 6 September 2013. DP&I approved the Blast Management Plan on 10 October 2013:</p> <p>(a) Blast Management Plan submitted to DP&I on 6 September 2013;</p> <p>(b) The Blast Management Plan was prepared in consultation with the Lake Macquarie City Council and residents of Teralba (Rhondda Road, Watkins Lane, Rodgers Street, Railway Street, Pitt Street, Myrtle Street and James Street);</p> <p>(c) Blast Management Plan Section 8 presented Control Measures;</p> <p>(d) Blast Management Plan Section 7.2.4 states <i>"there will no need to close Rhondda Road for short periods during a blast as the closest blasting location is 11prox.. 400m north of the closest blasting within the Southern Extension."</i></p> <p>(e) Blast Management Plan Section 7.2.5 addresses blast fume potential and management;</p> <p>(f) Blast Management Plan Section 9 provides blast and fume monitoring and Section 10 addresses Evaluation of Compliance. Blast contractors failed to check that all blast monitors were in blast prior to initiating a blast on 15 December 2017. Blast monitoring at Location 1 (of two locations) did not occur during this blast event.</p>	Administrative Non-Compliance

Condition No.	Project Approval condition	Verification	Comments	Compliance																							
	AIR QUALITY																										
	Air Quality Criteria																										
17.	<p>The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not exceed the criteria in Tables 5 to 7 at any residence on privately- owned land, or on more than 25% of any privately-owned land.</p> <p>Table 5: Long-Term Impact Assessment Criteria for Particulate Matter</p> <table><tr><td>Pollutant</td><td>Averaging Period</td><td>Criterion</td></tr><tr><td>Total Suspended Particulates</td><td>Annual</td><td>90µg/m3</td></tr><tr><td>Particulate Matter <10 µm (PM10)</td><td>Annual</td><td>30 µg/m3</td></tr></table> <p>Table 6: Short Term Impact Assessment Criteria for Particulate Matter</p> <table><tr><td>Pollutant</td><td>Averaging Period</td><td>Criterion</td></tr><tr><td>Particulate Matter <10 µm (PM10)</td><td>24 hour</td><td>50 µg/m3</td></tr></table> <p>Table 7: Long-Term Impact Assessment Criteria for Deposited Dust</p> <table><tr><td>Pollutant</td><td>Averaging Period</td><td>Max increase in Deposited Dust Level</td><td>Max Total Deposited Dust Level</td></tr><tr><td>Deposited dust</td><td>Annual</td><td>2g/m2/mth</td><td>4g/m2/mth</td></tr></table> <p>Notes to Tables 5-7:</p> <p>a - Total impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to all other sources);</p> <p>b - Incremental impact (i.e. incremental increase in concentrations due to the project on its own);</p> <p>c - Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.</p> <p>d - Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Director-General in consultation with EPA.</p>	Pollutant	Averaging Period	Criterion	Total Suspended Particulates	Annual	90µg/m3	Particulate Matter <10 µm (PM10)	Annual	30 µg/m3	Pollutant	Averaging Period	Criterion	Particulate Matter <10 µm (PM10)	24 hour	50 µg/m3	Pollutant	Averaging Period	Max increase in Deposited Dust Level	Max Total Deposited Dust Level	Deposited dust	Annual	2g/m2/mth	4g/m2/mth	<ul style="list-style-type: none">Air Quality Management Plan, Section 8, Sep 2013	<p>The Air Quality Management Plan Section 8 presents potential dust sources and key control procedures and measures adopted for the management of particulate matter emissions generated by the project to ensure dust emissions from the Teralba Quarry activities do not exceed the criteria in Tables 5 to 7 at any residence on privately-owned land.</p> <p>The Air Quality Management Plan Section 9 describes the Air Quality Monitoring program to be conducted:</p> <ul style="list-style-type: none">Five (5) dust deposition gauges are located to the east of the Teralba Quarry and on the outskirts of Teralba:<ul style="list-style-type: none">Hillside Crescent (established June 2004)Myrtle Street (established June 2004)Rhondda Road (established June 2004)Rodgers Street (established April 2011)Margaret Street (established April 2011)A High Volume Air Sampler (HVAS) with PM₁₀ was installed at Rodgers St, Teralba in July 2014.	Compliant
Pollutant	Averaging Period	Criterion																									
Total Suspended Particulates	Annual	90µg/m3																									
Particulate Matter <10 µm (PM10)	Annual	30 µg/m3																									
Pollutant	Averaging Period	Criterion																									
Particulate Matter <10 µm (PM10)	24 hour	50 µg/m3																									
Pollutant	Averaging Period	Max increase in Deposited Dust Level	Max Total Deposited Dust Level																								
Deposited dust	Annual	2g/m2/mth	4g/m2/mth																								
	Greenhouse Gas Emissions																										
18	<p>The Proponent shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.</p>			Noted																							

Condition No.	Project Approval condition	Verification	Comments	Compliance
	Operating Conditions			
19	<p>The Proponent shall:</p> <p>(a) implement best management practice to minimise the dust emissions of the project;</p> <p>(b) regularly assess air quality monitoring data and relocate, modify, and/or stop operations on site as may be required to ensure compliance with the relevant conditions of this approval,</p> <p>(c) minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see Note d to Tables 5-7 above);</p> <p>(d) minimise any visible off-site air pollution; and</p> <p>(e) minimise surface disturbance of the site, other than as permitted under this approval.</p>	<ul style="list-style-type: none"> Air Quality Management Plan, Sep 2013 	<p>(a) the measures established over many years by Metromix are generally consistent with best management practices and have been adopted in the Air Quality Management Plan. These measures have been effective in controlling dust from the quarry activities. Some additional controls (not necessarily consistent with best management practice) have been effective in controlling dust emissions from the Quarry Site to acceptable levels.</p> <p>(b) If monitoring results approach the criteria identified in Project Approval Schedule 3 condition 17, the Quarry Manager or Quarry Supervisor will review:</p> <p>i) the meteorological data for the corresponding period;</p> <p>ii) the locations and duration of activities on site during the corresponding period;</p> <p>and</p> <p>iii) data on activities at the nearby asphalt plant.</p> <p>If Teralba Quarry is determined to be the source of the elevated dust levels, the Quarry Manager will initiate corrective and preventative actions. Metromix will report the event to the EPA in accordance with the Pollution Incident Response Management Plan as soon as practicable after the incident and a report submitted to the DP&I and EPA within 7 days of the exceedance in accordance with Project Approval Schedule 5 condition 7.</p> <p>(c) An automated meteorological station is installed on the Teralba Quarry site. The station retrieves data from the logger and transmits it directly to a computer at the quarry site office.</p> <p>(d) During periods of high wind speeds Teralba Quarry activities capable of generating dust are curtailed in the higher exposed areas. Water is applied to internal roads and blasts are not scheduled or initiated.</p> <p>(e) When areas within the Quarry Site are no longer required for operational purposes, they are rehabilitated in accordance with the Landscape Management Plan.</p>	Compliant

Condition No.	Project Approval condition	Verification	Comments	Compliance
	Air Quality Management Plan			
20	<p>The Proponent shall prepare and implement an Air Quality Management Plan for the project to the satisfaction of the Director-General. This plan must:</p> <p>(a) be prepared in consultation with Council, and submitted for approval to the Director-General within 4 months of the date of this approval;</p> <p>(b) describes the measures that would be implemented to ensure:</p> <ul style="list-style-type: none"> best management practice is employed; the air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events; and compliance with the relevant conditions of this approval; <p>(c) describes the proposed air quality management system; and</p> <p>(d) includes an air quality monitoring program that:</p> <ul style="list-style-type: none"> is capable of evaluating the performance of the project; includes a protocol for determining any exceedances of the relevant conditions of approval; adequately supports the air quality management system; and evaluates and reports on the adequacy of the air quality management system. 	<ul style="list-style-type: none"> Letter from DP&I re Comments on Air Quality Management Plan, 15 Aug 2013 Letter to DP&I re Air Quality Management Plan, 6 Sep 2013 Air Quality Management Plan, Sep 2013 Letter from DP&I re Approval of Air Quality Management Plan, 10 Oct 2013 	<p>The Air Quality Management Plan was prepared to satisfy this Project Approval condition and was approved by DP&I on 10 October 2013:</p> <p>(a) The Air Quality Management Plan was prepared in consultation with Lake Macquarie City Council and a draft copy of the Plan provided to Council for review and comment on 26 June 2013.</p> <p>Informal discussions were also held with the EPA, particularly with respect to the proposed air quality monitoring program and locations and type of air quality monitoring.</p> <p>(b) measures implemented are:</p> <ul style="list-style-type: none"> consistent with best management practices effective in controlling dust from the quarry activities; during periods of high wind speeds (typically from the western quadrant): Teralba Quarry activities capable of generating dust are curtailed in the higher exposed areas. monitoring results are assessed by the Quarry Manager or Quarry Supervisor for compliance with relevant conditions; <p>(c) the Air Quality Management Plan presents the air quality management system for the Teralba Quarry;</p> <p>(d) Sections 9, 10 and 11 address air quality monitoring and compliance</p>	Compliant
	METEOROLOGICAL MONITORING			
21	<p>For the life of the project, the Proponent shall ensure that there is a suitable meteorological station operating in the vicinity of the site that:</p> <ul style="list-style-type: none"> complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline; and is capable of continuous real-time measurement of temperature lapse rate, in accordance with the NSW Industrial Noise Policy, or as otherwise approved by EPA. 	<ul style="list-style-type: none"> Environment Protection Licence No. 536 	<p>The Environment Protection Licence No. 0536 condition M5 describes the requirements for a meteorological station to be available on the Teralba Quarry site.</p> <p>A meteorological monitoring station is located in a satisfactory location on the Northern Extension Area and measures wind speed and direction, temperature, rainfall and relative humidity.</p> <p>The station results are relayed to the computer system in the Teralba Quarry office and are continuously available for on site management of activities.</p> <p>In the period between the 3 and 21 November 2017 the humidity reading on the weather station failed and a replacement part had to be sourced. Review of</p>	Administrative Non-Compliance

Condition No.	Project Approval condition	Verification	Comments	Compliance
			humidity readings from earlier in the year indicated that several of the results were anomalous and therefore considered to be inaccurate.	
	SOIL & WATER			
	<i>Note: The Proponent is required to obtain the necessary water licences for the project under the Water Act 1912 and/or the Water Management Act 2000</i>		Metromix holds Water Access Licence 208L173206 for 1407ML/a for water pumped from Dam A.	Compliant
	Water Supply			
22	The Proponent shall ensure it has sufficient water during all stages of the project, and if necessary, adjust the scale of quarrying operations on site to match its available supply.		Sufficient water supply for the Teralba Quarry activities is available from the Mine Audit of the historic underground coal workings.	Compliant
	Surface Water Discharges			
23	The Proponent shall ensure that all surface water discharges from the site comply with the discharge limits in any EPL which regulates water discharges from the site, or with Section 120 of the POEO Act.	<ul style="list-style-type: none"> Environment Protection Licence No. 536 	The Environment Protection Licence No. 0536 Variation condition P1.2, identifies EPA approved water discharge points 4 and 5 to be monitored monthly or during discharge (when water is available) for pH, EC, and total suspended solids (TSS), points 6 and 7 monitored within 8 hours of commencement of discharge for pH, EC and TSS, and volume discharged from point 7.	Noted Compliant
	On-Site Sewage Management			
24	The Proponent shall manage on-site sewage to the satisfaction of Council and the EPA.		Onsite sewage is treated in an onsite sewerage / wastewater treatment plant that has no discharge to the environment.	Compliant
	Storage of Chemicals & Petroleum Products			
25	<p>The Proponent shall ensure that all chemicals and/or petroleum products on site are held in appropriately bunded areas with impervious flooring and sufficient capacity to contain 110% of the largest container stored within the bund, and in accordance with Australian Standard AS1940-2004 -The Storage and Handling of Flammable and Combustible Liquids. The flooring and bund(s) shall be designed in accordance with:</p> <ul style="list-style-type: none"> the requirements of relevant Australian Standards; and DECC's Storing and Handling Liquids: Environmental Protection – Participants Manual. 		<p>Petroleum products on site (diesel and oils) are held in appropriately bunded areas with impervious flooring and sufficient capacity to contain 110% of the largest container stored within the bund (in accordance with AS1940-2004 and the DECC <i>Storing and Handling Liquids: Environmental Protection Manual</i>).</p> <p>Waste oil is placed in the bunded waste oil tank and the waste oil collected for recycling by Trans-Pacific.</p>	Compliant
	Water Management Plan			
26	The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director-General. This plan must be prepared in consultation with Council and NOW by suitably qualified and experienced person/s whose appointment has been approved by the Director-General, and be submitted to the Director-General for approval within 6 months of the date of this approval and prior to any extraction activities within the Northern Extension area. In addition to the standard requirements for management plans (see	<ul style="list-style-type: none"> Water Management Plan, 2016 	<p>The Water Management Plan was prepared in consultation with the Lake Macquarie City Council , DPI – Water.</p> <p>Metromix received approval of Water Management Plan in December 2016.</p>	Compliant

Condition No.	Project Approval condition	Verification	Comments	Compliance
	condition 3 of schedule 5), this plan must include:			
26	<p>(a) Site Water Balance that:</p> <ul style="list-style-type: none"> includes details of: <ul style="list-style-type: none"> sources and security of water supply, including contingency planning; water use on site; water management on site; reporting procedures, including comparisons of the site water balance each calendar year; and describes the measures that would be implemented to minimise clean water use on site; 	<ul style="list-style-type: none"> Water Management Plan, Section 7.4, Aug 2013 Specialist Consultant Studies Compendium for the Teralba Quarry Extensions EA, Jun 2012 Part 3 –Surface Water Assessment –BMT-WBM Pty Ltd (2011) NOW Licence No. 20BL173206, 	<p>(a) The site water balance was prepared as part of the Environmental Assessment for the project:</p> <ul style="list-style-type: none"> Water Management Plan Section 7.3.1 addresses Water Supply - potable water is sourced directly from the local water mains. Non-potable water is extracted under NOW Licence No. 20BL173206 from the Mine Audit Dam A; Flow monitoring (from the installed water flow meters) and water quality data collected is reported as part of the EPL Annual Return and Annual Review under the Project Approval; Water is recirculated throughout the operation of the processing plant, with waste water or slurry pumped to the silt cells for settlement. 	Compliant
26	<p>(b) Surface Water Management Plan, that includes:</p> <ul style="list-style-type: none"> detailed baseline data on surface water flows and quality in the watercourses that could be affected by the project; a detailed description of the surface water management system on site, including the: <ul style="list-style-type: none"> clean water diversion systems; erosion and sediment controls; and o water storages; design objectives and performance criteria for proposed: <ul style="list-style-type: none"> erosion and sediment control structures; water storages; and control of water pollution from rehabilitated areas of the site; performance criteria, including trigger levels for investigating any potentially adverse impacts, for surface water quality of local watercourses and Lake Macquarie; a program to monitor: <ul style="list-style-type: none"> the effectiveness of the water management system; surface water flows and quality in local watercourses and Lake Macquarie; and ecosystem health of local watercourses and Lake Macquarie; a plan to respond to any exceedances of the performance criteria, and mitigate and/or offset any adverse surface water impacts of the project; and a detailed review the dirty water management system to: <ul style="list-style-type: none"> determine whether the capacity, integrity, retention time and management of the system are sufficient to ensure that water discharged from the site meets the performance criteria and propose 	Water Management Plan, Section 7.3, Aug 2013	<p>(b) Surface Water Management has been prepared as part of the Water Management Plan Section 7:</p> <ul style="list-style-type: none"> Section 7.1.3 addresses Existing Surface Water Quality Section 7.1 addresses Site Water Management and Section 8 addresses clean water diversion and erosion and sediment controls Section 8 addresses design objectives and performance criteria for site water management; Section 9.2 addresses performance criteria, including trigger levels performance criteria, including trigger levels; Section 9.3 addresses monitoring locations and frequency; Section 11 outlines corrective and preventative actions to respond to any exceedances of the performance criteria; Section 10 provides a review of the dirty water management system, and Section 8 outlines options to improve storage and retention times in accordance with The Blue Book 	Compliant

Condition No.	Project Approval condition	Verification	Comments	Compliance
	any upgrades necessary to meet these criteria; <ul style="list-style-type: none"> ○ assess appropriate options to improve storage and retention times in accordance with The Blue Book - Managing Urban Stormwater (MUS): Soils and Construction (Landcom); and 			
26	<p>(c) Groundwater Management Plan, that includes:</p> <ul style="list-style-type: none"> • detailed baseline data on groundwater yield and quality in the area, that could be affected by the project; • groundwater assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts; • a program to monitor: <ul style="list-style-type: none"> ○ surface water inflows into the groundwater system beneath the site; ○ the impacts of the project on: <ul style="list-style-type: none"> - the local coal seam aquifer; - any groundwater bores on privately-owned land that could be affected by the project; and - groundwater dependent ecosystems; and • seepage/leachate from water storages or backfilled voids (including historical coal workings) on site; and • a plan to respond to any exceedances of the groundwater assessment criteria; <p><i>Note: The Director-General may require the Proponent to implement upgrades and other changes identified under paragraph (b), in accordance with condition 4 of schedule 2.</i></p>	Water Management Plan, Section 7.2, Aug 2013	<p>(c) A Groundwater Management Plan has been incorporated in the Water Management Plan Section 7.2:</p> <ul style="list-style-type: none"> • Sections 7.2.1 to 7.2.3 outline baseline groundwater yield and quality in the area of the Teralba Quarry; • Section 9.3 outlines the monitoring program for surface water inflows, local seam aquifers, groundwater bores and groundwater dependent ecosystems; • Section 11 outlines corrective and preventative actions to respond to any exceedances of the groundwater assessment criteria; 	Compliant
	VISUAL			
	Protection of Ridgelines			
27	The Proponent shall ensure that any clearing of visually prominent ridgeline vegetation is done in a progressive manner, so as to provide for a maximum of 6 months of future quarrying operations.		The Teralba Quarry plan for the clearance of ridgeline vegetation is cognisant of the visual impact associated with the ridgelines and progressive minimal clearing is being practised in relation to the extension works to reduce potential impact.	Compliant Ongoing
28	<p>The Proponent shall ensure that the:</p> <p>(a) eastern facing quarry benches of the Southern Extension are vegetated with native endemic understory species and trees as soon as practicable following the completion of extraction of those benches; and</p> <p>(b) revegetation of the quarry benches is managed to ensure that a tree canopy is regenerated, as soon as practicable, to be consistent with and visually integrated into the surrounding tree canopy, to the satisfaction of the Director-General.</p>		<p>(a) Works on the eastern faces of the Southern Extension Area (Stage 1A) commenced in December 2013.</p> <p>(b) Regeneration of native endemic understorey and tree canopy will commence on the western benches in Stage 1B (North) of the Southern Extension when the recovery of resource is complete from the upper face areas.</p>	In Progress

Internal Compliance Review – Teralba Quarry

February 2018

Condition No.	Project Approval condition	Verification	Comments	Compliance
	Operating Conditions			
29	The Proponent shall (a) implement all reasonable and feasible measures to minimise the visual impacts and any offsite lighting impacts of the project; and (b) maintain and improve the effectiveness of the vegetated plantings on the quarry benches, over the life of the project.		(a) Visual impacts of the quarry operations have been minimised for the Southern Extension Area quarry works and there are no offsite lighting impacts from the current works; (b) Revegetation of the completed areas of the Teralba Quarry appears consistent with the surrounding tree canopy.	Compliant Ongoing
	Advertising Signage			
30	The Proponent shall not erect or display any advertising structure(s) or signs on the site without the written approval of the Director-General. <i>Note: This condition does not require approval for any business identification, traffic management, and/or safety or environmental signs.</i>		Signs erected at the entrance to the Teralba Quarry site are only related to the company identification, safety and environment, and traffic signs.	Compliant
	TRANSPORT			
	Intersection Investigation and Wheel Wash			
31	Within 6 months of the date of this approval the Proponent shall: (a) commission a suitably qualified and experienced person endorsed by the Director-General to undertake a road safety audit report of the intersection of York Street and Anzac Parade in consultation with Council; (b) submit the report and any recommendations to the Director-General for approval; and (c) implement any recommendations of the road safety audit to upgrade the intersection of York Street and Anzac Parade to the satisfaction of Council.	<ul style="list-style-type: none"> Project Approval 10_0183, granted 22 Feb 2013 Guide to Road Safety Part 6: Road Safety Audit, Austroads, 2009 Guidelines for Road Safety Audit Practices, RMS, 2011 Letter to DP&I re Road Safety Audit Report, 14 Aug 2013 	(a) GTA Consultants (Ken Hollyoak – suitably qualified and experienced traffic consultant) undertook a road safety audit for the intersection of York Street and Anzac Parade Teralba in consultation with Lake Macquarie City Council; (b) The Road Safety Audit Report and consequent letters were submitted to the Director-General; (c) The road safety audit identified primary issues that would be addressed by Council as part of their ongoing maintenance and cannot be reasonably related to the operations at Metromix.	Compliant
32	The Proponent shall install truck wheel wash facilities within 6 months of the date of this approval at all quarry exits and following such installation, must ensure that all trucks have their tyres and vehicles cleaned of mud, dirt and dust prior to exiting the site, so as to avoid tracking dirt onto public roads, to the satisfaction of the Director-General.		Wheel wash facilities are installed at the quarry exits (bottom/top wheel washes) to ensure truck tyres are cleaned of mud, dirt and dust prior to exiting the site, to avoid tracking dirt onto public roads. Additional sprays were installed on the Top Exit Truck Wheelwash during the second half of 2016 and additional hard pavements were also completed in the second half of 2016 prior to the Top Gate Wheel Washes.	
	Operating Conditions			
33	The Proponent shall construct the tunnel and conveyor under Rhondda Road to the satisfaction of Council.		The commencement of quarrying of the Northern Extension, that will require the construction of a tunnel and conveyor under Rhondda Road, will not occur until 2022-2024.	Not Yet Applicable
34	Within 6 months of the date of this approval, the Proponent shall cease transporting quarry material by truck between the quarry pits.		Transport of quarry materials between the Northern and Southern Extension pits ceased on 22 August	Compliant

Condition No.	Project Approval condition	Verification	Comments	Compliance
			2013.	
35	The Proponent may only transport quarry products from the site on the designated Haulage Routes (see Appendix 4), except in circumstances where the final destination of the quarry products can only be accessed by other roads.		Transport of products from the Teralba Quarry site only occurs on the designated Haulage Routes identified in the Project Approval in Appendix 4 and the Traffic Management Plan.	Compliant
36	The Proponent shall ensure that all heavy vehicles: (a) do not exceed an on-site speed limit of 30 km per hour; (b) exiting the site to the east via the bottom gate (i.e. to Railway Street) during the Day Shoulder period do not exceed the on-site speed limit and minimise noise as far as reasonable between Railway Street and the end of the existing engineering works; and (c) entering or leaving the site have their loads covered.		(a) On-site is limited to 30kph as noted by signage; (b) Exit speed to Railway Street is limited to 30kph; (c) all trucks leaving the Teralba Quarry site were observed to have their loads covered.	Compliant
37	During the AM peak period and PM peak period, the Proponent shall implement all reasonable and feasible measures to minimise project-related traffic delays and congestion at the intersection of Toronto and Five Islands Roads and along York Street, to the satisfaction of the Director-General.	<ul style="list-style-type: none"> Traffic Management Plan, Oct 2013 Teralba Quarry Truck Movements 	Hourly truck rates are managed to minimise project-related traffic delays and congestion at the intersection of Toronto and Five Islands Roads and along York Street.	Compliant
38	Only trucks owned by the Proponent, its shareholders or approved contractors and fitted with airbag suspension may transport quarry products from the site between 6 pm and 6 am.		All trucks owned by Metromix, and its approved contractors and fitted with airbag suspension.	Compliant
	Maintenance			
39	The Proponent shall regularly maintain the pavement of the on-site road that connects to Railway Street to minimise dust generation and potholes, to the satisfaction of the Director-General.		The pavement of the on-site road (after the wheel wash) that connects to Railway Street is well maintained.	Compliant Ongoing
	Monitoring of Product Transport			
40	The Proponent shall: (a) keep accurate records of: <ul style="list-style-type: none"> the amount of quarry products transported from the site (monthly and annually); and all laden truck movements from the site (hourly, daily, weekly, monthly and annually); and (b) publish these records on its website on a quarterly basis.	<ul style="list-style-type: none"> Traffic Management Plan, Oct 2013 Teralba Quarry Truck Movements www.metromix.com.au 	(a) Quarry product records are maintained on Monthly Transport Tonnages for Council charges (tonnage is not reported on the website as it is considered confidential information) but is available to the CCC and in Annual Review; (b) All laden truck movements from the site are recorded in accordance with this condition; (c) Truck movements recorded on placed on the Metromix website typically on a monthly basis.	Compliant
	Road Signage			
41	Within 6 months of the date of this approval the Proponent shall install flashing lights within Northville Drive for the 40 km school zones outside of Barnsley and Edgeworth Heights Public Schools, to the satisfaction of RMS.	<ul style="list-style-type: none"> Letter from DP&I re Project Approval Schedule 3 condition 41, 15 Aug 2013 	RMS did not support the installation of flashing lights at school zones by parties other than RMS. DP&I accepted that Metromix did not have to implement this condition.	Not Applicable
42	Prior to carrying out quarrying operations under this approval, the Proponent shall install "Trucks entering" warning signs 200 metres either side of the quarry entrances on public roads.		"Trucks entering" warning signs have been erected 200 metres either side of the quarry entrances on public roads.	Compliant

Condition No.	Project Approval condition	Verification	Comments	Compliance
	Parking			
43	The Proponent shall provide sufficient parking on-site for all project-related traffic in accordance with Council's parking codes and in consultation with Council.		No Council Parking Code was available for the Teralba Quarry site. Metromix has adequate parking on site for all project-related traffic.	Compliant
	Transport Management Plan			
44	The Proponent shall prepare and implement a Transport Management Plan for the project to the Director-General. This plan must: (a) be prepared by a suitably qualified traffic consultant in consultation with the RMS and Council, and submitted to the Director-General for approval within 4 months of the date of this approval; (b) include a drivers' code of conduct for the project; (c) describe the measures that would be implemented to ensure: • drivers are aware of potential safety issues along the haulage routes in particular near schools; • drivers of project-related vehicles comply with the drivers' code of conduct; • compliance with the relevant conditions of this approval; and (d) include a program to monitor the effectiveness of the implementation of these measures.	<ul style="list-style-type: none"> Transport Management Plan, Oct 2013 	<p>A Traffic Management Plan was prepared in June 2013 to satisfy this condition and was approved by DP&I on 10 October 2013:</p> <p>(a) The Traffic Management Plan was prepared by GTA Consultants in conjunction with R W Corkery & Co, in consultation with the RMS and Lake Macquarie City Council;</p> <p>(b) Traffic Management Plan Appendix 1 provides the Drivers Code of Conduct;</p> <p>(c) Traffic Management Plan Section 6.2 describes Competence Training and Awareness that includes site traffic rules, safe site delivery, Drivers Code of Conduct, maximum hourly despatch rates and operation and maintenance of wheel washes.</p> <p>(d) Traffic Management Plan Section 8 describes Performance and Monitoring of the truck and transport management plan requirements.</p> <p>There were no identified departures from the Teralba Quarry Driver's Code of Conduct during the period from January 2017 to December 2017.</p>	Compliant
	BUSHFIRE MANAGEMENT			
45	The Proponent shall: a) ensure that the project is suitably equipped to respond to any fires on site; and b) assist the Rural Fire Service, emergency services and National Parks and Wildlife Service as much as possible if there is a fire in the surrounding area.	<ul style="list-style-type: none"> Bushfire Management Plan, Feb 2014 	A Bushfire Management Plan for the Teralba Quarry was approved in 2014 by the Department of Planning.	Compliant
	WASTE			
46	Prior to importing any Virgin Excavated Natural Material or excavated natural material to the site, the Proponent must obtain a 'resource recovery exemption' under the POEO Act and provide evidence of this approval to the Department.	<ul style="list-style-type: none"> Waste Management Plan, Oct 2013 	A 'Resource recovery exemption' under the <i>Protection of the Environment Operations Act 1997</i> will be obtained when VENM/ ENM is required for the site.	Not Activated
47	The Proponent shall: (a) minimise the waste generated by the project; and (b) ensure that the waste generated by the project is appropriately stored,	<ul style="list-style-type: none"> Waste Management Plan, Oct 2013 	The waste generated by the project is appropriately stored and handled on site. All waste is segregated into separate bins, containers or tanks and the wastes are collected for recycling/disposal by Trans- Pacific	Compliant

Condition No.	Project Approval condition	Verification	Comments	Compliance
	handled, and disposed of, to the satisfaction of the Director-General.		Waste contractors, and One Steel Metal Recycling Services.	
48	<p>The Proponent shall prepare and implement a Waste Management Plan for the project to the satisfaction of the Director-General. This plan must:</p> <p>(a) be prepared in consultation with DRE and Council, and submitted to the Director-General for approval prior within 4 months of the date of this approval;</p> <p>(b) identify the various waste streams of the project;</p> <p>(c) estimate the volumes of waste material that would be generated by the project, including recycled concrete brought on-site;</p> <p>(d) describe and justify the proposed strategy for disposing of this waste material, including recycled concrete brought on-site; (e) include a program to monitor the effectiveness of these measures.</p>	<ul style="list-style-type: none"> Waste Management Plan, Oct 2013 	<p>The Waste Management Plan was approved by DP&I on 10 Oct 2013:</p> <p>(a) DRE and Council were consulted during preparation of the Waste Management Plan;</p> <p>(b) Waste streams from the Teralba Quarry are identified in Table 7.1 of the Waste Management Plan;</p> <p>(c) Section 8 of the Waste Management Plan discusses estimated waste volumes that would be generated by the project;</p> <p>(d) Section 9 of the Waste Management Plan describes the waste control measures and management strategies;</p> <p>(e) Section 10 describes monitoring and evaluation of compliance.</p>	Compliant
	ABORIGINAL HERITAGE			
	Heritage Management Plan			
49	<p>The Proponent shall prepare and implement a Heritage Management Plan for the project to the satisfaction of the Director-General. This plan must:</p> <p>(a) be prepared in consultation with Aboriginal stakeholders; (b) be submitted to the Director-General for approval prior to carrying out any development within the Northern Extension area or within 6 months of the date of this approval;</p> <p>(c) describe the measures that would be implemented for:</p> <ul style="list-style-type: none"> monitoring all new surface disturbance on site for unidentified Aboriginal objects; managing the discovery of any human remains or previously unidentified Aboriginal objects on site; and ensuring ongoing consultation with Aboriginal stakeholders in the conservation and management of any Aboriginal cultural heritage values on site. 	<ul style="list-style-type: none"> Heritage Management Plan, Aug 2013 Letter from DP&I re Comments on the Aboriginal Heritage Management Plan, 16 January 2014 	<p>An Aboriginal Heritage Management Plan was prepared in June 2013 to satisfy the requirements of this condition. The plan was submitted to DP&I in August 2013.</p> <p>(a) Letters were sent by registered mail to Aboriginal stakeholders on 15 May 2013 requesting review of the Plan. No responses were received;</p> <p>(b) The draft Aboriginal Heritage Management Plan was prepared and submitted to DP&I within 6 months of the date of this approval. (It is noted that no development of the Northern Extension had occurred at the date of this review).</p> <p>(c) Comments on the Aboriginal Heritage Management Plan were received from DP&I on 16 January 2014. Updated and approved by DPE on 19 September 2014.</p>	Compliant
	LANDSCAPE			
	Fauna Habitat			
50	<p>The Proponent shall install 20 nest boxes for microbats, 20 nest boxes for Little Lorikeets and 30 nest boxes for Sugar Gliders. These boxes must be monitored and maintained regularly over the life of the project, and re-located or replaced if not used by targeted fauna for a period of 12 months.</p>	<ul style="list-style-type: none"> Environmental Assessment Specialist Consultant Studies Compendium Volume 1 Part 5 	<p>Nesting boxes were installed in late 2014 for three fauna species potentially displaced following clearing activities (namely 20 boxes for microbats, 20 boxes for Little Lorikeets and 30 boxes for Sugar Gliders). Metromix commissioned Kendall and Kendall to undertake an inspection and report upon the use of the boxes since 2014 (see Pages A2-95 – A2-140).</p>	Compliant

Condition No.	Project Approval condition	Verification	Comments	Compliance									
51	The Proponent shall, wherever practicable, avoid clearing hollow-bearing trees. If clearing a hollow bearing tree cannot be avoided, then its removal must be offset with an additional and comparable habitat structure within the site.		The Stripping Plan Procedure was implemented before any clearance occurred in the Southern Extension Area Stage 1A. Clearing conducted for the commencement of the Stage 1A involved the protection of a hollow-bearing tree near the boundary of the extraction activity..	Compliant Ongoing									
	Biodiversity Offset Strategy												
52	<div><div>The Proponent shall implement the Biodiversity Offset Strategy, as described in the EA, summarised in Table 8 and shown conceptually in the figure in Appendix 5, to the satisfaction of the Director-General. <i>Table8: Biodiversity Offset Strategy</i></div><table><tr><td>Area</td><td>Offset Type</td><td>Minimum Size (ha)</td></tr><tr><td>Offset Area</td><td>Existing Vegetation to be enhanced</td><td>142.6ha</td></tr><tr><td>Total</td><td></td><td>142.6ha</td></tr></table></div>	Area	Offset Type	Minimum Size (ha)	Offset Area	Existing Vegetation to be enhanced	142.6ha	Total		142.6ha	<ul style="list-style-type: none">Environmental Assessment, Section 2.17Project Approval Appendix 5	This condition is the subject of a modification application that is currently being assessed by DPE. It is currently expected that final Biodiversity Offset Strategy would be prepared and submitted by 30 June 2018 and the strategy would be implemented by 31 December 2018.	Not Yet Activated
Area	Offset Type	Minimum Size (ha)											
Offset Area	Existing Vegetation to be enhanced	142.6ha											
Total		142.6ha											
	Long Term Security of Offsets												
53	By the end of June 2014, unless the Director-General agrees otherwise, the Proponent shall enter into a conservation agreement pursuant to section 69B of the National Parks and Wildlife Act 1974 for the Offset Area, which records the obligations assumed by the Proponent under the conditions of this approval in relation to this area, and shall register this agreement pursuant to section 69F of the National Parks and Wildlife Act 1974. The conservation agreement must remain in force in perpetuity. If OEH is not prepared to enter into a conservation agreement, then to satisfy this condition, the Proponent may propose another conservation measure to secure the offset for approval by the Director-General.		As per Condition 53, it is anticipated that the Biodiversity Offset Strategy would be implemented by 31 December 2018.	In Progress									
	Relocated Power-lines												
54	The Proponent shall ensure that any relocation of existing power- lines on-site does not cause greater than minor environmental consequences within the Offset Area.		Relocation of power lines is planned to occur in 2018/2019 as the development of the Southern section progresses.	Noted									

Condition No.	Project Approval condition	Verification	Comments	Compliance	
	Rehabilitation Objectives				
55	The Proponent shall rehabilitate the site to the satisfaction of the Director-General. This rehabilitation must be generally consistent with the proposed rehabilitation strategy in the EA and Appendix 6, and comply with the objectives in Table 9.	Environmental Assessment Project Approval – Appendix 6	Works currently in progress are consistent with those required to achieve the required final landform. Rehabilitation of former silt cells and upper benches of Stage 1B has commenced and is consistent with these objectives.	Noted	
	Feature				Objective
	Site (as a whole)				Safe, stable & non-polluting
	Surface Infrastructure				To be decommissioned and removed unless the D-G agrees otherwise.
	Bench Quarry Walls				Landscaped and revegetated utilising native tree and understorey species, ensuring that the tree canopy is restored and integrated with the surrounding canopy to minimise visual impacts.
	Quarry Pit Floor and Silt Ponds				Landscaped and revegetated utilising native flora species and felled trees from clearing.
	Other Land Affected by the Project	Restore ecosystem function, including maintaining or establishing self-sustaining eco-systems comprised of: <ul style="list-style-type: none">• native endemic species: and• a landform consistent with Figure 8 (Appendix 6) and the surrounding environment.			
	Progressive Rehabilitation				
56	The Proponent shall rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim rehabilitation strategies shall be employed when areas prone to dust generation cannot yet be permanently rehabilitated.		The Teralba Quarry disturbed areas are being progressively rehabilitated as is demonstrated by the restored areas to the southeast of the active work areas near the underground mine audit.	Compliant Ongoing	
	Landscape Management Plan				
57	The Proponent shall prepare and implement a Landscape Management Plan for the project to the satisfaction of the Director- General. This plan must: (a) be prepared in consultation with DRE, DPI and Council; (b) be submitted to the Director-General for approval prior within 12 months of the date of this approval; (c) describe how the implementation of the Biodiversity Offset Strategy would be integrated with the overall rehabilitation of the site;	Landscape Management Plan dated January 2014.	A Landscape Management Plan dated January 2014 has been prepared for submission to the DP&I: (a) Following discussions held with DP&I in July 2013 consultation with Lake Macquarie City Council, Department of Primary Industries Catchment and Lands Division and Hunter-Central Rivers Catchment Management Authority, Division of Resources and Energy, and the Office of Environment and Heritage has occurred for development of the Landscape Management Plan;	Compliant Ongoing	

Condition No.	Project Approval condition	Verification	Comments	Compliance
	<p>(d) describe the short, medium and long term measures that would be implemented to:</p> <ul style="list-style-type: none"> manage remnant vegetation and habitat on site; implement the Biodiversity Offset Strategy; and ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations in this approval; <p>(e) include detailed performance and completion criteria for evaluating the performance of the Biodiversity Offset Strategy and the rehabilitation of the site, including triggering remedial action (if necessary);</p> <p>(f) include a detailed description of the measures that would be implemented over the next 3 years, including the procedures to be implemented for:</p> <ul style="list-style-type: none"> ensuring compliance with the rehabilitation objectives and progressive rehabilitation obligations in this approval; enhancing the quality of remnant vegetation and fauna habitat; restoring native endemic vegetation and fauna habitat within the biodiversity offset areas and rehabilitation area; maximising the salvage of environmental resources within the approved disturbance area – including tree hollows, vegetative and soil resources – for beneficial reuse in the enhancement of the biodiversity areas or rehabilitation <ul style="list-style-type: none"> area; collecting and propagating seed; ensuring minimal environmental consequences for the local <i>Tetratheca juncea</i> population; minimising the impacts on native fauna on site, including undertaking appropriate pre-clearance surveys; controlling weeds and feral pests; controlling erosion; controlling access; and bushfire management; <p>g) include a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;</p> <p>h) identify the potential risks to successful implementation of the Biodiversity Offset Strategy and rehabilitation of the site, and include a description of the contingency measures that would be implemented to mitigate against these risks; and</p> <p>i) include details of who would be responsible for monitoring, reviewing, and implementing the plan.</p>		<p>(b) A Landscape Management Plan was submitted to the DP&I by 22 February 2014 and approved on 19 September 2014;</p> <p>(c) Landscape Management Plan Section 10 addresses how the implementation of the Biodiversity Offset Strategy will be integrated with the overall rehabilitation of the site;</p> <p>(d) Landscape Management Plan Section 12 describes the short, medium and long term measures for management of remnant vegetation and habitat on site, implementation of the Biodiversity Offset Strategy, and compliance with the rehabilitation objectives and progressive rehabilitation obligations;</p> <p>(e) Landscape Management Plan Section 16 addresses Rehabilitation Performance and Completion Criteria;</p> <p>(f) Landscape Management Plan Section 14 describes landscape management measures and procedures to be implemented over 2014 to 2017 to comply with the requirements of the Project Approval requirements;</p> <p>(g) Landscape Management Plan Section 15, and Monitoring and Evaluation and Section 17 address Evaluation of Compliance;</p> <p>(h) Landscape Management Plan Section 11 addresses Rehabilitation and Biodiversity Offset Strategy Risks;</p> <p>(i) Landscape Management Plan Section 6 includes details of personnel roles and responsibilities for monitoring, reviewing, and implementing the plan.</p>	

Condition No.	Project Approval condition	Verification	Comments	Compliance
	Conservation & Rehabilitation Bond			
58	<p>Within 6 months of the approval of the Landscape Management Plan, the Proponent shall lodge a Conservation and Rehabilitation Bond with the Department to ensure that the Biodiversity Offset Strategy and the rehabilitation of the site is implemented in accordance with the performance and completion criteria set out in the Landscape Management Plan. The sum of the bond shall be determined by: (a) calculating the cost of implementing the Biodiversity Offset Strategy over the next 3 years;</p> <p>(b) calculating the cost of rehabilitating the site, taking into account the likely surface disturbance over the next 3 years of quarrying operations; and</p> <p>(c) employing a suitably qualified quantity surveyor or other expert to verify the calculated costs, to the satisfaction of the Director-General.</p> <p>Notes:</p> <ul style="list-style-type: none"> If capital and other expenditure required by the Landscape Management Plan is largely complete, the Director-General may waive the requirement for lodgement of a bond in respect of the remaining expenditure. If the Biodiversity Offset Strategy and rehabilitation of the site area are completed to the satisfaction of the Director-General, then the Director-General will release the bond. If the Biodiversity Offset Strategy and rehabilitation of the site are not completed to the satisfaction of the Director-General, then the Director-General will call in all or part of the bond, and arrange for the completion of the relevant works. 		<p>The Rehabilitation Bond was lodged in October 2016. Metromix has received an extension to lodge the Conservation Bond within 6 weeks of approval of the Biodiversity Offset strategy.</p>	In Progress
59	<p>Within 3 months of each Independent Environmental Audit (see condition 9 of schedule 5), the Proponent shall review, and if necessary revise, the sum of the Conservation and Rehabilitation Bond to the satisfaction of the Director-General. This review must consider the:</p> <p>(a) effects of inflation;</p> <p>(b) likely cost of implementing the Biodiversity Offset Strategy and rehabilitating the site (taking into account the likely surface disturbance over the next 3 years of the project); and</p> <p>(c) performance of the implementation of the Biodiversity Offset Strategy and rehabilitation of the site to date.</p>		<p>Metromix is yet to receive formal acceptance of the Independent Audit Report from DPE. The relevant bonds will be reviewed at this time.</p>	In Progress

Condition No.	Project Approval condition	Verification	Comments	Compliance
	SCHEDULE 4 ADDITIONAL PROCEDURES			
	NOTIFICATION OF LANDOWNERS			
1	As soon as practicable after obtaining monitoring results showing an: (a) exceedance of any relevant criteria in schedule 3, the Proponent shall notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the project is again complying with the relevant criteria; and (b) an exceedance of the relevant air quality criteria in schedule 3, the proponent shall send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and/or existing tenants of the land.			Not Activated
	INDEPENDENT REVIEW			
2	If an owner of privately-owned land considers the project to be exceeding the relevant criteria in schedule 3, then he/she may ask the Director-General in writing for an independent review of the impacts of the project on his/her land. If the Director-General is satisfied that an independent review is warranted, then within 2 months of the Director-General's decision the Proponent shall: (a) commission a suitably qualified, experienced and independent expert, whose appointment has been approved by the Director-General, to: <ul style="list-style-type: none"> consult with the landowner to determine his/her concerns; conduct monitoring to determine whether the project is complying with the relevant criteria in schedule 3; and if the project is not complying with these criteria, then identify the measures that could be implemented to ensure compliance with the relevant criteria; and (b) give the Director-General and landowner a copy of the independent review.			Not Activated
3	If the independent review determines that the project is complying with the relevant criteria in schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General. If the independent review determines that the project is not complying with the relevant criteria in schedule 3, then the Proponent shall: (a) implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent expert, and conduct further monitoring until the project complies with the relevant criteria; or (b) secure a written agreement with the landowner to allow exceedances of the relevant criteria, to the satisfaction of the Director-General.			Noted

Condition No.	Project Approval condition	Verification	Comments	Compliance
	SCHEDULE 5 ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING			
	ENVIRONMENTAL MANAGEMENT			
	Environmental Management Strategy			
1	<p>The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy must:</p> <p>(a) be submitted to the Director-General for approval with 6 months of the date of this approval;</p> <p>(b) provide the strategic framework for environmental management of the project;</p> <p>(c) identify the statutory approvals that apply to the project;</p> <p>(d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;</p> <p>(e) describe the procedures that would be implemented to:</p> <ul style="list-style-type: none"> keep the local community and relevant agencies informed about the operation and environmental performance of the project; receive, handle, respond to, and record complaints; resolve any disputes that may arise during the course of the project; respond to any non-compliance; and respond to emergencies; and <p>(f) include:</p> <ul style="list-style-type: none"> copies of any strategies, plans and programs approved under the conditions of this approval; and a clear plan depicting all the monitoring required to be carried out under the conditions of this approval. 	<ul style="list-style-type: none"> Environmental Management Strategy, Aug 2013 (Approved by DPE on 16 January 2014) 	<p>An Environmental Management Strategy was prepared to satisfy Project Approval Schedule 5 condition 1 and submitted to DP&I on 22 August 2013. DP&I approved the Environmental Management Strategy on 16 January 2014:</p> <p>(a) the Environmental Management Strategy was submitted to DP&I on 22 August 2013;</p> <p>(b) EMS Section 2 addresses the Strategic Framework for environmental management;</p> <p>(c) EMS Section 3 identifies Legal and Other Requirements for the Teralba Quarry;</p> <p>(d) EMS Section 14 addresses Roles and Responsibilities of all key personnel involved in the environmental management of the Teralba Quarry;</p> <p>(e) the EMS describes procedures for:</p> <ul style="list-style-type: none"> Section 11 Stakeholder and Community Consultation and Section 13 Publication of Information; Section 9 Complaints Handling and Dispute Resolution; Section 7 Corrective and Preventative Actions; Section 10 Emergency Response and ; <p>(f) Section 3.3 Environmental Management Plans, and Section 5 Monitoring.</p>	Compliant
	Adaptive Management			
2	<p>The Proponent shall assess and manage project-related risks to ensure that there are no exceedances of the criteria and/or performance measures in schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this approval and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.</p> <p>Where any exceedance of these criteria and/or performance measures has occurred, the Proponent shall, at the earliest opportunity:</p> <p>(a) take all reasonable and feasible measures to ensure that the exceedance ceases and does not recur;</p> <p>(b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and</p> <p>(c) implement remediation measures as directed by the Director-General, to the satisfaction of the Director-General.</p>			Noted

Condition No.	Project Approval condition	Verification	Comments	Compliance
	Management Plan Requirements			
3	<p>The Proponent shall ensure that the Management Plans required under this approval are prepared in accordance with any relevant guidelines, and include:</p> <p>(a) detailed baseline data;</p> <p>(b) a description of:</p> <ul style="list-style-type: none"> the relevant statutory requirements (including any relevant approval, licence or lease conditions); any relevant limits or performance measures/criteria; and the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures; <p>(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;</p> <p>(d) a program to monitor and report on the:</p> <ul style="list-style-type: none"> impacts and environmental performance of the project; and effectiveness of any management measures (see (c) above); <p>(e) a contingency plan to manage any unpredicted impacts and their consequences;</p> <p>(f) a program to investigate and implement ways to improve the environmental performance of the project over time;</p> <p>(g) a protocol for managing and reporting any:</p> <ul style="list-style-type: none"> incidents; complaints; non-compliances with statutory requirements; and exceedances of the impact assessment criteria and/or performance criteria; and <p>(h) a protocol for periodic review of the plan.</p> <p><i>Note: The Director-General may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</i></p>	<ul style="list-style-type: none"> Project Approval references: Schedule 3 condition 20 - Air Quality Management Plan Schedule 3 condition 16 - Blast Management Plan Schedule 3 condition 49 - Heritage Management Plan Schedule 3 condition 57 – Landscape Management Plan (draft) Schedule 3 condition 44 - Transport Management Plan Schedule 3 condition 48 - Waste Management Plan Schedule 3 condition 26 - Water Management Plan 	<p>The Management Plans required under this Project Approval have been prepared generally in accordance with the guidelines outlined in Project Approval Schedule 5 condition 3. The requirements are addressed under the following section headings in each Plan:</p> <p>(a) baseline data - Existing Environment and Potential Impacts and Environmental Assessment Appendices;</p> <p>(b) relevant statutory requirements - Legal and Other Requirements; relevant limits or performance measures/criteria and specific performance indicators – Existing Environment and Potential Impacts;</p> <p>(c) description of the management measures to be implemented – Control Measures;</p> <p>(d) program to monitor and report on impacts and environmental performance – Monitoring Program; and effectiveness of any management measures – Evaluation of Compliance ;</p> <p>(e) contingency plan to manage unpredicted impacts and their consequences – Corrective and Preventative Actions;</p> <p>(f) program to investigate and implement ways to improve the environmental performance</p> <p>(g) a protocol for managing and reporting any:</p> <ul style="list-style-type: none"> incidents – Incident Reporting; complaints – Complaints Handling and Response; non-compliances with statutory requirements – Evaluation of Compliance; exceedances of the impact assessment criteria and/or performance criteria - Evaluation of Compliance and Corrective and Preventative Measures; <p>(h) a protocol for periodic review of the plan – Plan Review.</p>	Compliant

Condition No.	Project Approval condition	Verification	Comments	Compliance
	Annual Review			
4	<p>By the end of March each year, the Proponent shall review the environmental performance of the project to the satisfaction of the Director-General. This review must:</p> <p>(a) describe the development (including rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year; (b) include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against:</p> <ul style="list-style-type: none"> the relevant statutory requirements, limits or performance measures/criteria; the monitoring results of previous years; and the relevant predictions in the EA; <p>(c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;</p> <p>(d) identify any trends in the monitoring data over the life of the project;</p> <p>(e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and</p> <p>(f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the project.</p>	2016 Annual Review	<p>The fourth Annual Review for the Teralba Quarry Extensions was submitted to DPE on ????.</p> <p>All nominated contents are included in the document.</p>	Compliant
	Revision of Strategies, Plans & Programs			
5	<p>Within 3 months of the submission of an:</p> <p>(a) annual review under condition 4 above; (b) incident report under condition 7 below; (c) audit report under condition 9 below; and (d) any modifications to this approval, the Proponent shall review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Director-General.</p> <p><i>Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the project.</i></p>		Metromix routinely reviews all management in May/June each year. All strategies, plans, and programs will be reviewed once DPE accepts the Teralba Quarry audit report.	Compliant







Condition No.	Project Approval condition	Verification	Comments	Compliance
	Community Consultative Committee			
6	<p>The Proponent shall establish and operate a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General. This CCC must be operated in general accordance with the Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects (Department of Planning, 2007, or its latest version), and be operating within four months of the date of this approval. <i>Notes:</i></p> <ul style="list-style-type: none"> <i>The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Proponent complies with this approval.</i> <i>In accordance with the guideline, the Committee should comprise an independent chair and appropriate representation from the Proponent, Council, recognised environmental groups and the local community.</i> 	<ul style="list-style-type: none"> CCC Meeting Minutes 20 April 2016 CCC Meeting Minutes 9 November 2016 (see Appendix 4) 	<p>The establishment of the Community Consultative Committee (CCC) occurred later than four months after the date of this approval.</p> <p>The non-compliance arose principally Metromix experienced difficulties in attracting community representation onto the committee as evidenced from the consultation records. The first meeting of the CCC was held on 2 September 2013.</p>	<p>Not Compliant (date for CCC establishment)</p> <p>Compliant (for operation of CCC)</p>
	REPORTING			
	Incident Reporting			
7	<p>The Proponent shall notify, at the earliest opportunity, the Director-General and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment.</p> <p>For any other incident associated with the project, the Proponent shall notify the Director-General and any other relevant agencies as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent shall provide the Director-General and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.</p>		<p>No incidents that caused or threatened to cause material environmental harm occurred between January 2017 and December 2017.</p> <p>Two administrative non-compliance issues were notified too DPE on 22 December 2017. The EPA was also notified of one of these issues based on the advice of the DPE compliance team.</p>	Not Activated
	Regular Reporting			
8	The Proponent shall provide regular reporting on environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval.	www.metromix.com.au/	Metromix updates the website for Teralba Quarry on a monthly basis.	Compliant
	INDEPENDENT ENVIRONMENTAL AUDIT			
9	<p>Within a year of the commencement of development on site under this approval, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:</p> <p>(a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;</p> <p>(b) include consultation with the relevant agencies;</p> <p>(c) assess the environmental performance of the project and whether it is complying with the relevant requirements in this approval and any relevant EPL and/or Water License (including any assessment, plan or program required under these approvals);</p>	Letter from DP&I re Approval of Independent Auditor, 14 Jan 2014 and 2016	<p>The first Independent Environmental Audit was conducted within 1 year of commencement of development by Trevor Brown endorsed by the Director-General on 14 January 2014.</p> <p>The second Independent Environmental Audit was conducted within 3 years of the first review by Trevor Brown endorsed by the Director-General on 15 December 2016</p>	Compliant

Condition No.	Project Approval condition	Verification	Comments	Compliance
	(d) review the adequacy of any approved strategy, plan or program required under the these approvals; and (e) recommend measures or actions to improve the environmental performance of the project, and/or any assessment, plan or program required under these approvals. <i>Note: This audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Director-General.</i>			
10	Within 3 months of commissioning this audit, or as otherwise agreed by the Director-General, the Proponent shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.		The first Independent Environmental Audit was submitted to the DPE in March 2014 together with the required response. The second Independent Environmental Audit was submitted to the DPE in February 2017 together with the required response.	Compliant
	ACCESS TO INFORMATION			
11	Within 4 months of the date of this approval, the Proponent shall: (a) make the following information publicly available on its website: <ul style="list-style-type: none"> the EA; current statutory approvals for the project; approved strategies, plans or programs; a summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval; a complaints register, updated on a quarterly basis; minutes of CCC meetings; copies of any annual reviews (over the last 5 years); any independent environmental audit, and the Proponent's response to the recommendations in any audit; and any other matter required by the Director-General; and (b) keep this information up-to-date, to the satisfaction of the Director-General.	www.metromix.com.au/	The following information is publicly available on Metromix' website: <ul style="list-style-type: none"> Environmental Protection License 536 Teralba Quarry Project Approval 10_0183 Response To EA Submissions Environmental Assessment, Nov 2011 Specialist Consultant Studies Compendium Volume 1 and Volume 2, Nov 2011 Community Consultative Committee (CCC) Minutes Environmental Management Strategy Air Quality Management Plan Blast Management Plan Heritage Management Plan Landscape Management Plan Bushfire Management Plan Noise Management Plan Transport Management Plan Waste Management Plan Water Management Plan Community Complaints Non Compliances Monitoring results 	Compliant Ongoing

Part 2 Statement of Commitments

Note: All commitments that are duplicates (or with similar/identical outcomes) of the Conditions within PA10_0183 have been removed as part of the 2016 Annual Review.

Colour Code for Compliance Assessment

-  Compliant
-  Compliant Ongoing / In Progress
-  Non-compliant
-  Administrative Non-Compliance
-  Noted / Not Applicable / Not Yet Applicable
-  Not Activated / Not Yet Activated

Part 2 - Statement of Commitments

(Environmental Assessment Section 6 - Statements of Commitment, November 2011)

SoC No.	Action	Timing	Verification	Comment	Compliance
1	Activities and Operations				
	All approved activities are undertaken in the area(s) nominated on the approved plans and figures (unless moved slightly to avoid individual trees).				
2	Operating Hours				
	Management of operations in accordance with the approved operating hours. (Note: No activities and operations are proposed on public holidays).				
2.2	Undertake extraction and processing activities north of Rhondda Road between 7:00am and 8:00pm on Monday to Friday and 7:00am and 2:00pm on Saturdays.	During operations		Quarry operations north of Rhondda Road ceased in August 2013 and are not planned to re-commence until Year 9-10 (i.e. about 2022).	Not Yet Active
2.4	Undertake all blasts between 10:00am and 4:00pm Monday to Friday.	During operations	<ul style="list-style-type: none"> Blast Monitoring Records 2014 	Blasts are only conducted between 10:00am and 4:00pm Monday to Friday.	Compliant
2.5	Restrict activities undertaken outside the hours identified in Commitments 2.1 and 2.2 to routine, low noise activities such as oil changes, minor welding and servicing of equipment.	During operations		Activities undertaken outside of the Hours of Work required under the Project Approval are not associated with resource extraction or transport of product.	Compliant
2.6	The nominated operating hours above in Action 2.3 do not apply to the delivery of material if that material is requested by police, any emergency service or Council. would be provided to the D-G and EPA within a reasonable period of the request.	Details of the circumstances of these requests			Noted
4	Security and Safety				
	All members of the public are safe when near Teralba Quarry.				
4.1	Construct and maintain the perimeter fence around the Northern Extension.	Prior to commencement of clearing works		Extraction not yet commenced in the Northern Extension	Compliant
4.2	Maintain lockable gates at all entry/exit points. Lock gates outside of operational hours	Ongoing		Lockable gates have been installed and maintained at the entry and exit points from the Teralba Quarry sites.	Compliant
4.3	Erect security warning signs at strategic locations around and within the Project Site. The signs would identify the presence of earthmoving equipment, deep excavations and steep slopes.	Ongoing		Security warning signs are present around the site to warn of earthmoving equipment/vehicle movements, deep excavations and steep slopes of quarry excavation areas.	Compliant
4.4	Continue to induct employees in safe working practices and hold regular follow-up safety meetings and reviews.	Ongoing		Induction of employees in relation to safety and safe working practices occurs for all employees with follow-up Toolbox talks and meetings conducted to maintain employee awareness.	Compliant

Internal Compliance Review – Teralba Quarry

February 2018

SoC No.	Action	Timing	Verification	Comment	Compliance
4.5	Install bunds along the margins of all internal haul roads where those roads are positioned adjacent to steep slopes, adjacent to the boundary of the extraction area and adjacent to all other steep slopes	Ongoing		Internal roads have the boundary of the access routes marked to provide guidance to drivers in relation to safe distances from slopes adjacent to extraction areas.	Compliant
6	Groundwater				
Continuous monitoring of groundwater throughout the life of the Project.					
6.8	Review monitoring results to identify trends which may indicate impacts and allow mitigation measures to be implemented, if required.	Annually		All monitoring data is reviewed annually during preparation of the Annual Review Report for the Teralba Quarry.	Compliant Ongoing
6.9	Ensure all monitoring data is incorporated into each Annual Environment Management Report for the Teralba Quarry.	Annually		All monitoring data will be incorporated into the Annual Review Report for the Teralba Quarry	Compliant Ongoing
7	Surface Water				
Capture of sediment-laden water flows from project related disturbance					
Prevention of hydrocarbon contamination of water on the Project Site.					
7.12	Securely store all hydrocarbon products within designated and bunded areas.	Ongoing		Diesel storage for use on the Teralba Quarry site is adjacent to the workshop area in two (2) bunded aboveground tanks.	Compliant
Separation of groundwater and surface water flows.					
7.14	Construct a drain from Dam B directly to the nearby watercourse to divert surface flows away from the Mine Adit Dam.	Within 3 months of Project Approval or following advice from NOW whichever occurs sooner.		A discharge point has been established from Dam B to the nearby watercourse to divert surface water flows away from the Mine Adit Dam A.	Compliant
10	Noise and Vibration				
All activities are undertaken in such a manner as to reduce the noise level generated and minimise impacts on surrounding landholders and/or residents.					
10.4	Construct a 5m high bund on the eastern edge of the Mid Pit Extraction Area.	During Mid Pit Extraction operations.		No Mid-Pit extraction activities have been conducted since August 2013.	Not Active
All activities are undertaken in such a manner as to reduce the noise level generated and minimise impacts on surrounding landholders and/or residents.					
10.6	Commission a noise monitoring program that comprises: – attended noise monitoring for the Southern and Northern Extensions; and – General noise monitoring.	Within the first 3 months of operations in the Southern and Northern Extensions	<ul style="list-style-type: none">Noise Management Plan, Section 9, 16 Jan 2014	Noise monitoring is outlined in the Noise Management Plan: <ul style="list-style-type: none">Independent monitoring is required to be undertaken during the first 2 years of operations at 6 monthly intervals coinciding with wind blowing in a predominantly eastern and western direction. Monitoring was only undertaken on two occasions during 2016.The frequency of monitoring will then revert to annual monitoring during a period of wind blowing from the western quadrant towards residences in Teralba.	Compliant Noted

Internal Compliance Review – Teralba Quarry

February 2018

SoC No.	Action	Timing	Verification	Comment	Compliance
10.9	Review blast designs and modify, if required.	When blasting within 500m of any residence.		No blasting has occurred throughout 2017 within 500m of any residence.	Noted
11	Air Quality				
Site activities are undertaken without exceeding DECCW air quality criteria or goals.					
11.12	Minimise truck queuing, unnecessary idling of trucks and unnecessary trips through logistical planning, where possible.	Ongoing.		Planning of truck loading and transport from the Teralba Quarry site reduces the queuing of trucks on site and unnecessary idling of trucks.	Compliant
11.13	Ensure the on-site wheel wash reduces mud tracking along Railway Street.	Ongoing.		Wheel washes have been installed before the exit to Railway Street from the Teralba Quarry (bottom wheel wash) to reduce the potential for mud tracking onto the public road.	Compliant Ongoing
11.14	Remove any mud tracking on Rhondda Road as a result of quarry movements.	Ongoing.		Wheel washes have been installed at the exit to Rhondda Road from the Teralba Quarry (top wheel wash) to reduce the potential for mud tracking onto the public road. Additional sprays and hard pavement surfaces were installed in 2016 to help reduce the potential for mud tracking onto the public road.	Compliant Ongoing
12	Visibility				
Reduce the impact of the Project on the visual amenity of private and public vantage points					
12.1	Ensure all vegetation is maintained outside the Southern and Northern Extensions to provide long term shielding.	Ongoing		The planning for the development of the Southern Extension Area has commenced and the vegetation on the eastern side of the Area has been retained to provide a visual screen.	Compliant Ongoing
12.2	Sequence extraction activities in the Southern Extension to limit exposure of western faces until vegetation is well established.	Years 3 to 11 (approx).			Not Yet Activated
12.3	Progressively establish vegetation on extraction faces at 50mAHD and above in western section of the Southern Extension.	Years 3 to 11 (approx).			Not Yet Activated
12.4	Advance extraction in the eastern section of the Southern Extension in strips parallel to north-south faces.	Years 22 to 30 (approx).			Not Yet Activated
13	Heritage				
Provide appropriate protection to existing					
13.5	Provide appropriate protection to any non-Aboriginal artefacts identified in operational areas.			No non-Aboriginal items had been identified in operational areas.	Noted
13.6	Halt all works in the immediate area if any non-Aboriginal artefacts are found and notify the Heritage Council of NSW.	Ongoing			Noted

SoC No.	Action	Timing	Verification	Comment	Compliance
Achieve a good soil cover for long term rehabilitation.					
14.9	Spread topsoil to a minimum depth range of 0.1 m (steep slopes) to 0.2m (flatter areas). Specific topsoil resspreading depths for different post mining landform elements would be specified in the Landscape Management Plan.	During staged Rehabilitation stages.	<ul style="list-style-type: none">Landscape Management Plan (draft), Section 16, Feb 2014	The evaluation of rehabilitation described in the Landscape Management Plan, Section 17, requires topsoil to be spread to a minimum depth range of 0.1 m (steep slopes) to 0.2m (flatter areas).	Compliant Ongoing
15	Bushfire Hazard				
Avoidance of any fires on site, particularly in native vegetation					
15.1	Adopt appropriate controls during re-fuelling.	Ongoing			Compliant Ongoing
15.2	Ensure fire extinguishers are fitted to all site vehicles.	Ongoing		All site vehicles have fire extinguishers installed.	Compliant
16	Documentation and Further Approvals				
To provide site personnel with the necessary guidance on the expectations of Metromix management and the NSW Government and LMCC to achieve the required level of environmental performance.					
16.13	Geotechnical Assessments and relevant design drawings for site structures and buildings (for submission to the Mines Subsidence Board).	Prior to construction of site infrastructure and buildings.		No buildings or structures had been constructed prior to this review so no design drawings for site structures and buildings (for submission to the Mines Subsidence Board) had been required.	Noted
Ensure planning is undertaken sufficiently ahead of quarry closure to achieve a smooth transition to the subsequent land uses					
16.14	Prepare a Quarry Closure and Final Land Use Plans for the land within the Project Site that is to be developed for purposes other than nature conservation. The Plans would be prepared in consultation with the Lower Macquarie City Council.	3 years prior to cessation of extraction north of Rhondda Road (approximately 2031) and south of Rhondda Road (approximately 2039).			Not Yet Activated

Appendix 5

2017 Community Consultative Committee Meeting Minutes

(Total No. of pages including blank pages = 6)



This page has intentionally been left blank

**MINUTES OF MEETING
TERALBA QUARRY
COMMUNITY CONSULTATIVE COMMITTEE (CCC)**

DATE: Wednesday 11 October 2017

MEETING COMMENCED: 3.56pm

PRESENT:

Member Name	Organisation
Margaret MacDonald-Hill (MMH)	Independent Chair
Cr Wendy Harrison (WH)	Lake Macquarie City Council
Colin Wright (CW)	Community Representative
Richard Metcalf (RM)	Teralba Public School
William (Bill) Sanderson (BS)	Metromix
Nick James (NJ)	Metromix

IN ATTENDANCE:

Name	Organisation
Lisa Andrews	Independent Minute Taker

APOLOGIES:

Nil

ITEM	ACTION
1.0 Welcome and introductions Margaret MacDonald-Hill, opened the meeting and welcomed those present.	
2.0 Declaration of interest MMH advised there was no change to her previous declarations; appointed by the Secretary of the Department of Planning and Environment as the Independent Chair for Teralba Quarry and a Board Member on the Mine Subsidence Board. Hard copies of the Code of Conduct and Pecuniary/Non-Pecuniary Interest forms were distributed to CCC members for completion and return to the chair.	Chair will scan completed forms and return to members
3.0 Confirmation of Previous Minutes MMH asked that the previous minutes of Wednesday 9 November 2016 be confirmed. One typographical change to the date in "Next Meeting" – change from 26 April 2016 to 26 April 2017.	Moved: CW Seconded: WH

<p>4.0 Business Arising from Previous Minutes</p> <p>RM advised that the school crossing has been fixed up by Council and there is no additional work to be carried out. Discussions took place regarding repositioning the access point, police presence, driver behaviour etc. RM stated that there are not enough pedestrian numbers to qualify for a crossing guard, however, the school has its own safety requirements in place, including staff wearing fluoro vests, who are assisting in keeping students safe.</p>	
<p>5.0 Correspondence</p> <p>Out – 17/11/16 – Email - Department of Planning & Environment Guidelines for State Significant Developments.</p>	
<p>6.0 Reports</p> <p>WS started his presentation (copy attached) with photographs from a recent trip to Victoria, Canada of the Butchart Gardens, which were rehabilitated from an old limestone quarry and receives up to 2 million visitors per year.</p> <ul style="list-style-type: none"> • VPA – Road Contribution (signed by both the Council and Metromix) due to be registered by 30 November. It was held up by an indemnity agreement between the Landowner and Metromix. • Northern Pit – At this stage the northern pit will not be progressing. • Biodiversity – On the 24th of August 2017, legislation was changed to allow the Biodiversity Offset to proceed. Metromix are currently looking to undertake a minor modification to the Project Approval to allow for the purchases of biodiversity credits. 	
<p>A 2016 summary of activities was provided, which included statistics on:</p> <ol style="list-style-type: none"> 1. Production (801,000 tonnes) 2. No of Blasts (39) 3. Continued with Financial Support of Teralba Primary School, the Teralba Bowling Club and the Variety Bash 4. Community Complaints 5. Non Compliances 6. On Going Monitoring 7. Lower Level Management Plan in Place 8. On Going Rehabilitation & Weeding Program 	
<p>A briefing was provided on the outcome of the 2014 to 2016 Independent Environmental Audit. Following the audit the Department of Planning & Environment sort clarification from Metromix on some issues and the company is currently preparing a response for the Department's consideration.</p>	
<p>A further briefing was provided on the 2016 Annual Environmental Review</p>	
<p>Extraction Pit – Stage 1B – comparison photographs were shown.</p>	
<p>Rehabilitation Growth – photographs were included of 2015 and 2017 rehabilitation areas. Soil conditions are very dry due to the current weather cycle.</p>	
<p>Year to date – September 2017 Summary:</p> <ol style="list-style-type: none"> 1. Production (462,000 tonnes – YTD) 2. No of Blasts 28 (YTD) 3. Community Complaints 4. Non Compliances 5. Extraction 6. Rehabilitation 	

<p>PROPOSED 2018 ACTIVITIES</p> <p>1. Modification to Project Approval Plan to modify the extraction sequence at the quarry to suit the quality of the reserves. Currently working on a proposal to take to both Council and DP&E to modify the Project Approval. Photographs and drone footage shown to CCC members of: 1 – Pit Plan 2 – Aerial View 3 – Cross Sections 4 – Drone’s perspective</p> <p>2. Rehabilitation The plan is to plant out the benches facing the North West in the Autumn of 2018 and continue rehabilitation works over the silt cell one.</p>	
<p>GENERAL BUSINESS CW advised that he has recently moved address and enquired if he was still able to sit on the CCC. MMH advised that he was appointed by DP&E as a member of the committee and was welcome to stay on.</p> <p>MMH gave a briefing on DP&E’s Community Consultative Guidelines for State Significant Developments, released in November 2016. Advising of changes to meeting practices and governance requirements:</p> <ul style="list-style-type: none"> • The guidelines cover all State Significant Projects • Committees to be set up early in the assessment process • Strengthening of procedures for establishment and operation of CCCs with improved governance, transparency & accountability standards • Introduction of a new code of conduct and declarations of pecuniary/non-pecuniary interests for all members • DP&E will recruit and appointment Independent Chairpersons and their alternate from a pool of qualified people (currently advertising) • Increase in community membership from 5 up to 7 • Alternates require DP&E approval • Chairs to provide an annual report to DP&E on the operation of the CCC to be published on its website • Minutes: Draft minutes will be issued within 1 week of the meeting. Members have 1 week to provide any comment and within 2 weeks, the draft minutes will be posted on the company website • Observers – Chair now required to consult with CCC members 	
<p>NEXT MEETING The meeting schedule for 2018 was discussed and agreed:</p> <ul style="list-style-type: none"> ➤ Wednesday 2 May 2018 commencing 4pm at Club Macquarie. ➤ Wednesday 17 October 2018 commencing at 4pm at Club Macquarie. <p>MMH: Thanked all for their attendance and wished all a Merry Christmas and a Happy New Year.</p>	

Meeting closed at 4.50pm

This page has intentionally been left blank

Appendix 6

2017 Community Complaints Register

(Total No. of pages including blank pages = 4)

This page has intentionally been left blank

2017. Community Complaints

Date	Issue/s	Outcome
January 2017	Nil Received	
February 2017	Nil Received	
March 2017	Nil Received	
April 2017	Nil Received	
May 2017	Nil Received	
May 2017	Nil Received	
May 2017	Nil Received	
June 2017	Nil Received	
July 2017	Nil Received	
August 2017	Member of the public who resides on Railway St complained of the noise monitoring consultant being parked in front of his house early in the morning.	Agreed with resident to monitor elsewhere. Resident was satisfied with outcome.
September 2017	Nil Received	
October 2017	Nil Received	
November 2017	Nil Received	
December 2017	Nil Received	

This page has intentionally been left blank

Appendix 7

2017 T.E.N.T.A.C.L.E. Incorporated Rehabilitation Report

(Total No. of pages including blank pages = 20)



This page has intentionally been left blank

T.E.N.T.A.C.L.E INC.

The Education Network Training Applying Conserving Landbased Ecosystems

Bushland Regeneration Service

ABN: 39 738 451 129

Coordinator & Director – Christy Woolcock

Treasurer – Sue McDonnell

METROMIX TERALBA BUSH REGENERATION

End of year report

2017



Prepared by Alexander Oates-Power

This page has intentionally been left blank

Metromix Teralba, Annual Bush Regeneration Report 2017

Table of Contents

Introduction	2
Background	2
Aims	3
Objectives	3
Hours Worked	4
Herbicide Used	4
Methods	4
Observations	5
Birds	5
Reptiles	5
Marsupials	5
Tetratheca	6
Dipodium	6
Bush Regeneration	7
Areas Worked	8
Revegetation	9
Species Planted	10
Trees	10
Shrubs	10
Grasses	10
Conclusion	11
Photo Documentation	12

Metromix Teralba, Annual Bush Regeneration Report 2017

INTRODUCTION

The following report details methods and purpose, hours worked, weeds controlled, results, observations and recommendations from bush regeneration work completed by Tentacle Inc. at Teralba Metromix quarry & biodiversity offset/Biobanking area.

BACKGROUND

Works by Tentacle Incorporated were carried out in accordance with all current applicable legislation including:

- Environmental Protection and Biodiversity Conservation Act 1999
- Pesticides Act 1995
- Protection of Environment Operations Act 1997
- National Parks and Wildlife Act 1974
- Threatened Species Conservation Act 1995
- Lake Macquarie City Councils Local Environmental Plan 2012

All works were compliant with the conditions of the National Parks and Wildlife Services checklist, for bush regeneration activities in the habitat of threatened species, endangered populations and endangered ecological communities.

Bush regeneration techniques applied were conformed to the best practice guidelines outlined within the Bush Regenerators handbook (National Trust of Australia, NSW 1991).

The rehabilitation works aim to improve the overall natural condition of the site by controlling invasive weed species. The rehabilitation of native vegetation will increase biodiversity within the designated area. Improved native vegetation communities will also protect waterways from increased sedimentation by enhancing erosion control and protecting and conserving the habitat for native and threatened flora and fauna.

The works will improve the overall site condition encouraging an increase in native biodiversity.

Metromix Teralba, Annual Bush Regeneration Report 2017

AIMS

The aims of the project are to restore and maintain ecosystem health by aiding the natural regeneration of indigenous plants and their communities. To manage the habitat for increased native biodiversity across the site by reducing the population and abundance of weed species.

These works are performed in the best interest of Metromix's BioBanking initiative by maintaining areas of healthy vegetative status and improving those that are degraded.

The aims of the project were to reduce noxious weeds, Environmental weeds, Weeds of National Significance and target weeds that were identified by the Tentacle team.

Target species this year have been:

Lantana (<i>Lantana camara</i>)	Camphor Laurel (<i>Cinnamomum camphora</i>)
Crofton weed (<i>Ageratina adenophora</i>)	Asparagus Fern (<i>Asparagus aethiopicus</i>)
Pampas grass (<i>Cortaderia selloana</i>)	Ochna (<i>Ochna serrulata</i>)
Wild tobacco (<i>Solanum mauritianum</i>)	Cassia (<i>Senna pendula</i> var. <i>glabrata</i>)
Narrow-leaf Privet (<i>Ligustrum sinense</i>)	Bitou bush (<i>Chrysanthemoides monilifera</i>)

OBJECTIVES

The Objectives of the project are to remove the target weed species allowing the increase of biodiversity of endemic species using industry standard bush regeneration techniques for when topsoil is taken and stored there will be a healthy soil seed bank for later use in the rehabilitation proses undertaken by Metromix. To continually maintain and monitor areas that have been previously weeded and to improve the zones categorized by Eco Logical Australia in their Biobank Agreement Credit Assessment report of 2014. To plant 8160 assorted native plant species as part of Metromix's rehabilitation program to reestablish the previously mined areas to their former state.

Metromix Teralba, Annual Bush Regeneration Report 2017

HOURS WORKED

A total of **1103.5** hours have been worked at Metromix Teralba by the Tentacle Inc. staff performing environmental restoration and bush regeneration activities over 2017.

HERBICIDE USED

A total of **5.75** Liters of Roundup Biactive® Herbicide has been used for the treatment of woody and other environmental weeds this year. Roundup Biactive® Herbicide was selected as the preferred form of chemical control as it designed to be used in environmentally sensitive areas.

METHODS

In order to successfully remove the wide range of weed species on the site, several bush regeneration techniques were used.

These techniques were chosen based on 3 main basis:

- Success of destroying the plant
- Time taken to conduct the required technique
- Impacts the method will have on a the surrounding native flora and fauna

These methods chosen to remove weeds include:

- The use of the cut/scrape and paint, splatter gun/spraying chemical weed control via the application of Roundup Biactive® Herbicide
- Hand removal (Hand pulling, Crowning)
- Seed head removal

Metromix Teralba, Annual Bush Regeneration Report 2017

OBSERVATIONS

A number of observations have been made this year by the Tentacle team to give an idea of the diverse fauna living in the area.

These Species include:

Birds

Common Name	Scientific name
Australian Brushturkey	<i>Alectura lathami</i>
Brown cuckoo-dove	<i>Macropygia amboinensis</i>
Spotted Pardalote	<i>Pardalotus punctatus</i>
Golden Whistler	<i>Pachycephala pectoralis</i>
White Bellied Sea Eagle	<i>Haliaeetus leucogaster</i>
Eastern Whipbird	<i>Psophodes olivaceus</i>
White-browed scrubwren	<i>Sericornis frontalis</i>
Wedge-tailed Eagle	<i>Aquila audax</i>
White-headed pigeon	<i>Columba leucomela</i>
Sulphur-crested cockatoo	<i>Cacatua galerita</i>
Laughing Kookaburra	<i>Dacelo novaeguineae</i>
Australian Raven	<i>Corvus coronoides</i>
Masked Plover	<i>Vanellus miles</i>
Yellow-tailed black cockatoo	<i>Calyptorhynchus funereus</i>
Australian Magpie	<i>Cracticus tibicen</i>
Hawk	(Unidentified)



Figure 1: Photo of a Joseph's coat moth caterpillar (*Agarista agricola*)
Date taken: 9/05/2017

Reptiles

Common Name	Scientific name
Marsh Snake	<i>Hemiaspis signata</i>
Red-bellied black snake	<i>Pseudechis porphyriacus</i>
Jacky Dragon	<i>Amphibolurus muricatus</i>

Marsupials

Common Name	Scientific name
Swamp Wallaby	<i>Wallabia bicolor</i>
Brown Antechinus	<i>Antechinus stuartii</i>
Ringtail Possum	<i>Pseudocheirus peregrinus</i>
Long-nosed bandicoot	<i>Perameles nasuta</i>



Figure 2: Photo of a Swamp wallaby (*Wallabia bicolor*)
Date taken: 10/05/2017

Metromix Teralba, Annual Bush Regeneration Report 2017

Tetratheca

The endemic *Tetratheca jencea* that were translocated in 2015 are continuing to survive with no new reported deaths, 75% of the original recorded populations still being alive.



Figure 3: *Tetratheca jencea* - Date taken: 16/11/2017

Dipodium

While examining the Tetratheca, the Tentacle team came across 5 plants of *Dipodium variegatum* flowering, a native orchid found along the east coast of New South Wales.



Figure 4: *Dipodium variegatum* flowering in the Tetratheca translocation area. - Date taken: 16/11/2017

Metromix Teralba, Annual Bush Regeneration Report 2017

BUSH REGENERATION

Approximately 86800m² has been worked this year in the removal of weeds such as Lantana, Pampas grass and Privet, creating a more sustainable ecosystem within the treated areas. Sections of Lantana were treated with the use of a splatter gun which has had a 95% success rate in the treated areas, allowing to more easily access areas that were previously unaccessible.

Two days were spent removing Pampas grass from the mining grounds as the plant has the ability to produce 100,000 windborne seeds per flower head. All seed heads were bagged then removed from site, then treated with Glyphosate. 100% of the Pampas grasses treated have been successfully killed.

One day was spent at the Nelson Bay sand quarry to splatter gun and spray two large sand dunes and surrounding areas that were infested with Bitou bush (*Chrysanthemoides monilifera*).

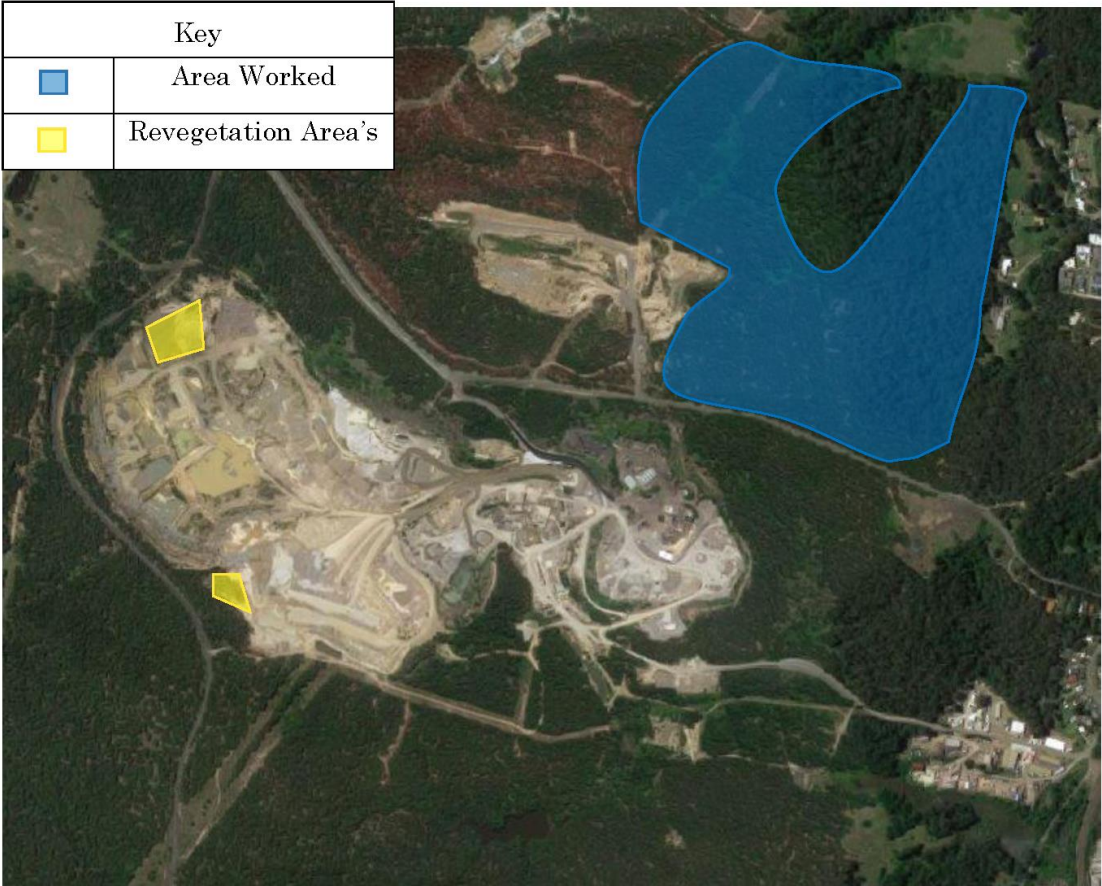


Figure 5: One of the sand dunes that were splatter gunned to treat Bitou bush at the Nelson Bay sand quarry. Date taken: 7/08/2017

Metromix Teralba, Annual Bush Regeneration Report 2017

AREAS WORKED

Map	This map depicts the Areas worked in 2017.
-----	--



Metromix Teralba, Annual Bush Regeneration Report 2017

REVEGETATION

A total of 8160 assorted trees, shrubs and grass species were planted in the revegetation areas marked on the site map as a part of Metromix's rehabilitation program to reestablish the areas to their former state. Revegetating the areas previously mined helps to revitalize habitats and increases the strength of the ecosystem thus creating a more diverse environment for native fauna. Hydraflo wetting agent was used to aid in the rewetting of the soil as it eliminates localized dry spots and increases the uniformity of wetting throughout the soil profile. All plants have shown great success with a 95% survival rate since the planting commenced.



Figure 6: Bottom revegetation area after all plants have been planted.
Date taken: 13/12/2017

Metromix Teralba, Annual Bush Regeneration Report 2017

Species Planted

Trees

Plant Species	Number Planted
<i>Corymbia maculata</i>	120
<i>Eucalyptus acmenoides</i>	120
<i>Eucalyptus paniculata</i>	120
<i>Eucalyptus umbra</i>	120
<i>Eucalyptus punctata</i>	120

Shrubs

Plant Species	Number Planted
<i>Angophora costata</i>	120
<i>Acacia implexa</i>	200
<i>Acacia ulicifolia</i>	200
<i>Podolobium ilicifolium</i>	200

Grasses

Plant Species	Number Planted
<i>Entolasia stricta</i>	1848
<i>Imperata cylindrica</i>	1800
<i>Themeda australis</i>	3192

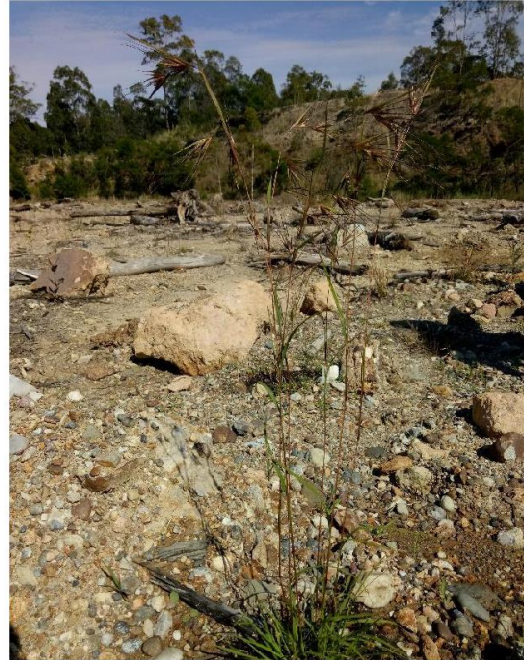


Figure 7: A healthy *Themeda australis* that is seeding.
Date taken: 16/11/2017



Figure 8: Before photo of the 8160 plants in their tubes.
Date taken: 25/09/2017

Metromix Teralba, Annual Bush Regeneration Report 2017

CONCLUSION

In conclusion the aim and objectives have been met, the removal of target weed species allowing the increase of biodiversity of endemic species has been achieved. A great deal of Lantana and other target weeds have been cleared this year, creating a more sustainable ecosystem within the treated areas.

Large areas of Lantana will need to be treated with the use of a splatter gun next year as the areas are primarily Lantana with minimal natives. Secondary weeding will need to be done next year in the areas worked to insure that Lantana does not have the chance to reestablish in the clears zones. The sand quarry at Nelson Bay may need secondary weeding to make sure Bitou bush (*Chrysanthemoides monilifera*) does not retake the areas treated.

The planting of 8160 various plants was successful with only 5% of losses, continuous watering will need to be done until the plants have better established to prevent any deaths. Weeding will need to be done in the large bottom section of the revegetation area as weeds have already started to emerge, weeding will give a better chance to the planted natives to survive, giving them more room to expand and not have to compete with the weeds.

The *Tetratheca juncea* that were transplanted have continued to thrive with no new reported deaths. Further monitoring will be completed in the future to see whether it has populated the surrounding areas and to see whether any deaths have occurred.

Metromix Teralba, Annual Bush Regeneration Report 2017

PHOTO DOCUMENTATION



Figure 9: Before photo of the bottom revegetation area.
Date taken: 25/09/2017



Figure 10: After photo of the bottom revegetation area.
Date taken: 13/10/2017

Metromix Teralba, Annual Bush Regeneration Report 2017



Figure 11: After photo of the top shelf of the southern revegetation area.
Date taken: 16/11/2017



Figure 12: After photo of the bottom shelf of the southern revegetation area.
Date taken: 16/11/2017

2017 Plantings – Teralba Quarry

Numbers	Species
	Trees
120	Spotted Gum
120	White Mahogany
120	Grey Ironbark
120	Broad Leaf White Mahogany
120	Grey Gum
	Shrubs
120	Smooth Bark Apple
200	Hickory Wattle
200	Prickly Moses
200	Shaggy Peas
	Grasses
1848	Wiry Panic
1800	Blady Grass
3192	Kangaroo Grass

NC JUPP & VF JUPP t/a Riverdene
80 Allyn River Road
East Gresford NSW 2311
Ph 0249389280 Fx 0249389110

DELIVERY DOCKET - CUSTOMER COPY

ABN 57 487 712 097

DATE	01-Mar-2017	INVOICE NO	5528
------	-------------	------------	------

PROJECT ORDER No	mETROMIX
------------------	----------

INVOICE TO
Tetracle Incorporated c/ Christy Woolcock

REFERENCE
revised 10/10/2016 for Autumn 2017

DESCRIPTION	Available Stock	QTY Supplied	Delivery Date
ASSORTED TREES SPECIES (MINI TUBES) X 600			
CORYMBIA MACULATA TUBES	120	120	
EUCALYPTUS ACMENOIDES TUBES	120	120	
EUCALYPTUS PANICULATA TUBES	120	120	
EUCALYPTUS UMBRA TUBES	120	120	
EUCALYPTUS PUNCTATA TUBE	120	120	
ASSORTED SHRUB SPECIES (MINI TUBES) X 720			
ANGOPHORA COSTATA TUBE	120	120	
ACACIA IMPLEXA TUBE	200	200	
ACACIA ULICIFOLIA TUBES	200	200	
PODOLOBIUM TUBE POTS	200	200	
GRASSES X 6840 MINI TUBES			
ENTOLASIA STRICTA TUBES	1848	1,848	
IMPERATA CYLINDRICA TUBES	1800	1,800	
THEMEDA AUSTRALIS TUBES	3192	3,192	
HYDRAFLO	2	2	

RECEIVED BY
DATE

This page has intentionally been left blank

Appendix 7

2017 T.E.N.T.A.C.L.E. Incorporated Rehabilitation Report

(Total No. of pages including blank pages = 20)



This page has intentionally been left blank

T.E.N.T.A.C.L.E INC.

The Education Network Training Applying Conserving Landbased Ecosystems

Bushland Regeneration Service

ABN: 39 738 451 129

Coordinator & Director – Christy Woolcock

Treasurer – Sue McDonnell

METROMIX TERALBA BUSH REGENERATION

End of year report

2017



Prepared by Alexander Oates-Power

This page has intentionally been left blank

Metromix Teralba, Annual Bush Regeneration Report 2017

Table of Contents

Introduction	2
Background	2
Aims	3
Objectives	3
Hours Worked	4
Herbicide Used	4
Methods	4
Observations	5
Birds	5
Reptiles	5
Marsupials	5
Tetratheca	6
Dipodium	6
Bush Regeneration	7
Areas Worked	8
Revegetation	9
Species Planted	10
Trees	10
Shrubs	10
Grasses	10
Conclusion	11
Photo Documentation	12

Metromix Teralba, Annual Bush Regeneration Report 2017

INTRODUCTION

The following report details methods and purpose, hours worked, weeds controlled, results, observations and recommendations from bush regeneration work completed by Tentacle Inc. at Teralba Metromix quarry & biodiversity offset/Biobanking area.

BACKGROUND

Works by Tentacle Incorporated were carried out in accordance with all current applicable legislation including:

- Environmental Protection and Biodiversity Conservation Act 1999
- Pesticides Act 1995
- Protection of Environment Operations Act 1997
- National Parks and Wildlife Act 1974
- Threatened Species Conservation Act 1995
- Lake Macquarie City Councils Local Environmental Plan 2012

All works were compliant with the conditions of the National Parks and Wildlife Services checklist, for bush regeneration activities in the habitat of threatened species, endangered populations and endangered ecological communities.

Bush regeneration techniques applied were conformed to the best practice guidelines outlined within the Bush Regenerators handbook (National Trust of Australia, NSW 1991).

The rehabilitation works aim to improve the overall natural condition of the site by controlling invasive weed species. The rehabilitation of native vegetation will increase biodiversity within the designated area. Improved native vegetation communities will also protect waterways from increased sedimentation by enhancing erosion control and protecting and conserving the habitat for native and threatened flora and fauna.

The works will improve the overall site condition encouraging an increase in native biodiversity.

Metromix Teralba, Annual Bush Regeneration Report 2017

AIMS

The aims of the project are to restore and maintain ecosystem health by aiding the natural regeneration of indigenous plants and their communities. To manage the habitat for increased native biodiversity across the site by reducing the population and abundance of weed species.

These works are performed in the best interest of Metromix's BioBanking initiative by maintaining areas of healthy vegetative status and improving those that are degraded.

The aims of the project were to reduce noxious weeds, Environmental weeds, Weeds of National Significance and target weeds that were identified by the Tentacle team.

Target species this year have been:

Lantana (<i>Lantana camara</i>)	Camphor Laurel (<i>Cinnamomum camphora</i>)
Crofton weed (<i>Ageratina adenophora</i>)	Asparagus Fern (<i>Asparagus aethiopicus</i>)
Pampas grass (<i>Cortaderia selloana</i>)	Ochna (<i>Ochna serrulata</i>)
Wild tobacco (<i>Solanum mauritianum</i>)	Cassia (<i>Senna pendula</i> var. <i>glabrata</i>)
Narrow-leaf Privet (<i>Ligustrum sinense</i>)	Bitou bush (<i>Chrysanthemoides monilifera</i>)

OBJECTIVES

The Objectives of the project are to remove the target weed species allowing the increase of biodiversity of endemic species using industry standard bush regeneration techniques for when topsoil is taken and stored there will be a healthy soil seed bank for later use in the rehabilitation proses undertaken by Metromix. To continually maintain and monitor areas that have been previously weeded and to improve the zones categorized by Eco Logical Australia in their Biobank Agreement Credit Assessment report of 2014. To plant 8160 assorted native plant species as part of Metromix's rehabilitation program to reestablish the previously mined areas to their former state.

Metromix Teralba, Annual Bush Regeneration Report 2017

HOURS WORKED

A total of **1103.5** hours have been worked at Metromix Teralba by the Tentacle Inc. staff performing environmental restoration and bush regeneration activities over 2017.

HERBICIDE USED

A total of **5.75** Liters of Roundup Biactive® Herbicide has been used for the treatment of woody and other environmental weeds this year. Roundup Biactive® Herbicide was selected as the preferred form of chemical control as it designed to be used in environmentally sensitive areas.

METHODS

In order to successfully remove the wide range of weed species on the site, several bush regeneration techniques were used.

These techniques were chosen based on 3 main basis:

- Success of destroying the plant
- Time taken to conduct the required technique
- Impacts the method will have on a the surrounding native flora and fauna

These methods chosen to remove weeds include:

- The use of the cut/scrape and paint, splatter gun/spraying chemical weed control via the application of Roundup Biactive® Herbicide
- Hand removal (Hand pulling, Crowning)
- Seed head removal

Metromix Teralba, Annual Bush Regeneration Report 2017

OBSERVATIONS

A number of observations have been made this year by the Tentacle team to give an idea of the diverse fauna living in the area.

These Species include:

Birds

Common Name	Scientific name
Australian Brushturkey	<i>Alectura lathami</i>
Brown cuckoo-dove	<i>Macropygia amboinensis</i>
Spotted Pardalote	<i>Pardalotus punctatus</i>
Golden Whistler	<i>Pachycephala pectoralis</i>
White Bellied Sea Eagle	<i>Haliaeetus leucogaster</i>
Eastern Whipbird	<i>Psophodes olivaceus</i>
White-browed scrubwren	<i>Sericornis frontalis</i>
Wedge-tailed Eagle	<i>Aquila audax</i>
White-headed pigeon	<i>Columba leucomela</i>
Sulphur-crested cockatoo	<i>Cacatua galerita</i>
Laughing Kookaburra	<i>Dacelo novaeguineae</i>
Australian Raven	<i>Corvus coronoides</i>
Masked Plover	<i>Vanellus miles</i>
Yellow-tailed black cockatoo	<i>Calyptorhynchus funereus</i>
Australian Magpie	<i>Cracticus tibicen</i>
Hawk	(Unidentified)



Figure 1: Photo of a Joseph's coat moth caterpillar (*Agarista agricola*)
Date taken: 9/05/2017

Reptiles

Common Name	Scientific name
Marsh Snake	<i>Hemiaspis signata</i>
Red-bellied black snake	<i>Pseudechis porphyriacus</i>
Jacky Dragon	<i>Amphibolurus muricatus</i>



Figure 2: Photo of a Swamp wallaby (*Wallabia bicolor*)
Date taken: 10/05/2017

Marsupials

Common Name	Scientific name
Swamp Wallaby	<i>Wallabia bicolor</i>
Brown Antechinus	<i>Antechinus stuartii</i>
Ringtail Possum	<i>Pseudocheirus peregrinus</i>
Long-nosed bandicoot	<i>Perameles nasuta</i>

Metromix Teralba, Annual Bush Regeneration Report 2017

Tetratheca

The endemic *Tetratheca jencea* that were translocated in 2015 are continuing to survive with no new reported deaths, 75% of the original recorded populations still being alive.



Figure 3: *Tetratheca jencea* - Date taken: 16/11/2017

Dipodium

While examining the *Tetratheca*, the Tentacle team came across 5 plants of *Dipodium variegatum* flowering, a native orchid found along the east coast of New South Wales.



Figure 4: *Dipodium variegatum* flowering in the *Tetratheca* translocation area. - Date taken: 16/11/2017

Metromix Teralba, Annual Bush Regeneration Report 2017

BUSH REGENERATION

Approximately 86800m² has been worked this year in the removal of weeds such as Lantana, Pampas grass and Privet, creating a more sustainable ecosystem within the treated areas. Sections of Lantana were treated with the use of a splatter gun which has had a 95% success rate in the treated areas, allowing to more easily access areas that were previously unaccessible.

Two days were spent removing Pampas grass from the mining grounds as the plant has the ability to produce 100,000 windborne seeds per flower head. All seed heads were bagged then removed from site, then treated with Glyphosate. 100% of the Pampas grasses treated have been successfully killed.

One day was spent at the Nelson Bay sand quarry to splatter gun and spray two large sand dunes and surrounding areas that were infested with Bitou bush (*Chrysanthemoides monilifera*).

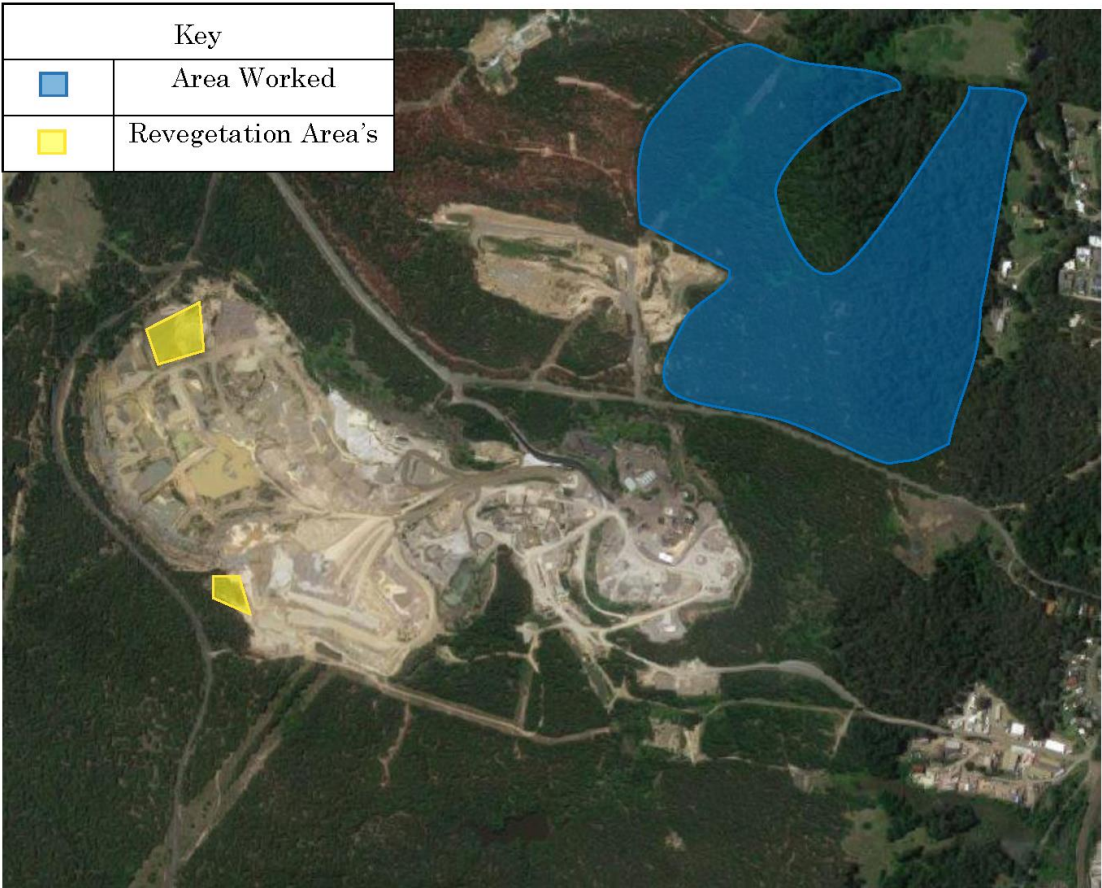


Figure 5: One of the sand dunes that were splatter gunned to treat Bitou bush at the Nelson Bay sand quarry. Date taken: 7/08/2017

Metromix Teralba, Annual Bush Regeneration Report 2017

AREAS WORKED

Map	This map depicts the Areas worked in 2017.
-----	--



Metromix Teralba, Annual Bush Regeneration Report 2017

REVEGETATION

A total of 8160 assorted trees, shrubs and grass species were planted in the revegetation areas marked on the site map as a part of Metromix's rehabilitation program to reestablish the areas to their former state. Revegetating the areas previously mined helps to revitalize habitats and increases the strength of the ecosystem thus creating a more diverse environment for native fauna. Hydraflo wetting agent was used to aid in the rewetting of the soil as it eliminates localized dry spots and increases the uniformity of wetting throughout the soil profile. All plants have shown great success with a 95% survival rate since the planting commenced.



Figure 6: Bottom revegetation area after all plants have been planted.
Date taken: 13/12/2017

Metromix Teralba, Annual Bush Regeneration Report 2017

Species Planted

Trees

Plant Species	Number Planted
<i>Corymbia maculata</i>	120
<i>Eucalyptus acmenoides</i>	120
<i>Eucalyptus paniculata</i>	120
<i>Eucalyptus umbra</i>	120
<i>Eucalyptus punctata</i>	120

Shrubs

Plant Species	Number Planted
<i>Angophora costata</i>	120
<i>Acacia implexa</i>	200
<i>Acacia ulicifolia</i>	200
<i>Podolobium ilicifolium</i>	200

Grasses

Plant Species	Number Planted
<i>Entolasia stricta</i>	1848
<i>Imperata cylindrica</i>	1800
<i>Themeda australis</i>	3192

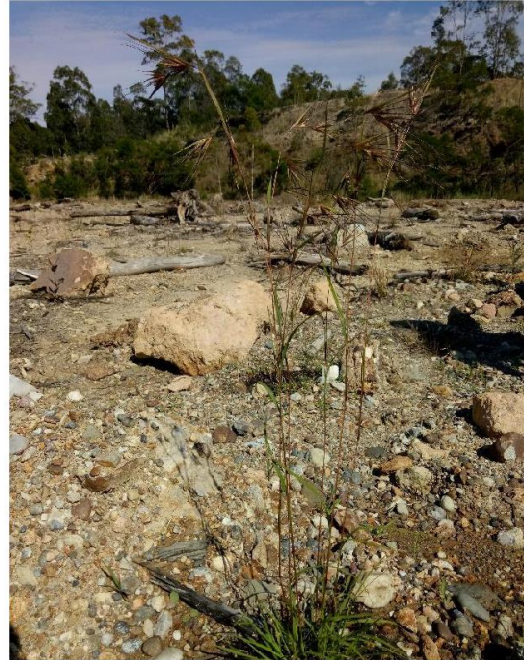


Figure 7: A healthy *Themeda australis* that is seeding.
Date taken: 16/11/2017



Figure 8: Before photo of the 8160 plants in their tubes.
Date taken: 25/09/2017

Metromix Teralba, Annual Bush Regeneration Report 2017

CONCLUSION

In conclusion the aim and objectives have been met, the removal of target weed species allowing the increase of biodiversity of endemic species has been achieved. A great deal of Lantana and other target weeds have been cleared this year, creating a more sustainable ecosystem within the treated areas.

Large areas of Lantana will need to be treated with the use of a splatter gun next year as the areas are primarily Lantana with minimal natives. Secondary weeding will need to be done next year in the areas worked to insure that Lantana does not have the chance to reestablish in the clears zones. The sand quarry at Nelson Bay may need secondary weeding to make sure Bitou bush (*Chrysanthemoides monilifera*) does not retake the areas treated.

The planting of 8160 various plants was successful with only 5% of losses, continuous watering will need to be done until the plants have better established to prevent any deaths. Weeding will need to be done in the large bottom section of the revegetation area as weeds have already started to emerge, weeding will give a better chance to the planted natives to survive, giving them more room to expand and not have to compete with the weeds.

The *Tetratheca juncea* that were transplanted have continued to thrive with no new reported deaths. Further monitoring will be completed in the future to see whether it has populated the surrounding areas and to see whether any deaths have occurred.

Metromix Teralba, Annual Bush Regeneration Report 2017

PHOTO DOCUMENTATION



Figure 9: Before photo of the bottom revegetation area.
Date taken: 25/09/2017



Figure 10: After photo of the bottom revegetation area.
Date taken: 13/10/2017

Metromix Teralba, Annual Bush Regeneration Report 2017



Figure 11: After photo of the top shelf of the southern revegetation area.
Date taken: 16/11/2017



Figure 12: After photo of the bottom shelf of the southern revegetation area.
Date taken: 16/11/2017

2017 Plantings – Teralba Quarry

Numbers	Species
	Trees
120	Spotted Gum
120	White Mahogany
120	Grey Ironbark
120	Broad Leaf White Mahogany
120	Grey Gum
	Shrubs
120	Smooth Bark Apple
200	Hickory Wattle
200	Prickly Moses
200	Shaggy Peas
	Grasses
1848	Wiry Panic
1800	Blady Grass
3192	Kangaroo Grass

NC JUPP & VF JUPP t/a Riverdene
80 Allyn River Road
East Gresford NSW 2311
Ph 0249389280 Fx 0249389110

DELIVERY DOCKET - CUSTOMER COPY

ABN 57 487 712 097		DATE 01-Mar-2017	INVOICE NO 5528
INVOICE TO Tetracle Incorporated c/ Christy Woolcock		PROJECT ORDER No	mETROMIX
		REFERENCE revised 10/10/2016 for Autumn 2017	

DESCRIPTION	Available Stock	QTY Supplied	Delivery Date
ASSORTED TREES SPECIES (MINI TUBES) X 600			
CORYMBIA MACULATA TUBES	120	120	
EUCALYPTUS ACMENOIDES TUBES	120	120	
EUCALYPTUS PANICULATA TUBES	120	120	
EUCALYPTUS UMBRA TUBES	120	120	
EUCALYPTUS PUNCTATA TUBE	120	120	
ASSORTED SHRUB SPECIES (MINI TUBES) X 720			
ANGOPHORA COSTATA TUBE	120	120	
ACACIA IMPLEXA TUBE	200	200	
ACACIA ULICIFOLIA TUBES	200	200	
PODOLOBIUM TUBE POTS	200	200	
GRASSES X 6840 MINI TUBES			
ENTOLASIA STRICTA TUBES	1848	1,848	
IMPERATA CYLINDRICA TUBES	1800	1,800	
THEMEDA AUSTRALIS TUBES	3192	3,192	
HYDRAFLO	2	2	

RECEIVED BY
DATE

This page has intentionally been left blank

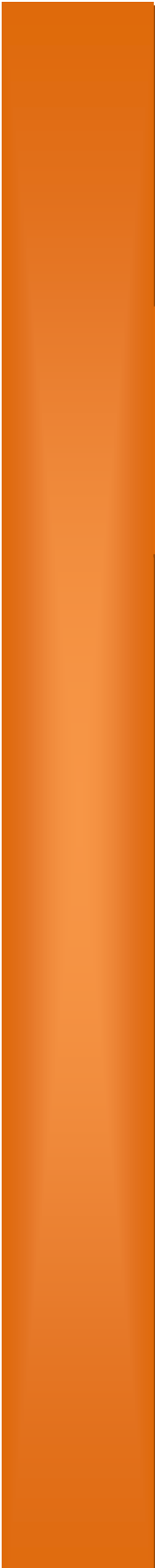
Appendix 8

2017 Kendall and Kendall Ecological Services – Annual Nesting Box Inspection

(Total No. of pages including blank pages = 54)



This page has intentionally been left blank



Teralba Quarry Extension Project Approval 50 - Annual Nesting Box Inspection

Prepared by

**Kendall & Kendall
Ecological Services Pty Ltd**

December 2017

This page has intentionally been left blank

Introduction

Kendall & Kendall Ecological Services Pty Ltd was engaged by Metromix Pty Ltd to install 70 nest boxes at the Teralba Quarry. The requirement to install the boxes is a condition (Condition 50) of the project approval issued by the Minister for Planning and Infrastructure on 22nd February 2013. This report refers to the third annual field inspection.

The Condition

Condition 50 of the project approval states:

- The Proponent shall install 20 nest boxes for microbats, 20 nest boxes for Little Lorikeets and 30 nest boxes for Sugar Gliders. These boxes must be monitored and maintained regularly over the life of the project, and re-located or replaced if not used by targeted fauna for a period of 12 months.

The Boxes

Three types of boxes were installed, these being suitable for:

- Little Lorikeet (20 boxes);
- Squirrel Glider (30 boxes); and
- Microbats (20)

During the field work conducted for the project assessment Little Lorikeets were observed flying over the study area, one species of hollow-dependant threatened microbat was recorded within the study area. The field surveys did not record the Squirrel Glider within the study area however they are known to occur in the locality.

The boxes were installed on the following dates:

- 28/04/2014 & 31/4/2014;
- 22/9/14, 24 & 25/9/2014.

Nesting Box Installation and Location

The maps in Appendix 1 indicate the location of the installed boxes.

Appendix 2 includes details of each of the nesting boxes inspected each box has been given a number which relates to the number for that box on the maps provided in Appendix 1.

First Annual Nesting Box Inspection

No Squirrel Gliders, Little Lorikeets or microbats or positive evidence of use of these species was observed in the nesting boxes.

A number of boxes were being used by Sugar Gliders and other boxes contained eucalypt leaves that had been placed in the boxes by animals some of the leaves contained nesting depressions. Two of the boxes have been colonised by feral honey bees.

Of concern 16 of the boxes placed in the vicinity of the Newtech Pistol Club were missing.

Second Annual Nesting Box Inspection

No Squirrel Gliders, Little Lorikeets or microbats or positive evidence of use of these species was observed in the nesting boxes.

Feral honey bees had abandoned hives that they had established in two of the boxes as observed during the first annual nesting box inspection.

A number of boxes were being used by Sugar Gliders and other boxes contained eucalypt leaves that had been placed in the boxes by animals some of the leaves contained nesting depressions. A brown antechinus was observed in one of the boxes that had been filled with leaves. A white-throated treecreeper was observed flying out of a nesting box as the box was being inspected.

It was noted that two boxes had been destroyed by a bush fire.

Third Annual Nesting Box Inspection

The missing eighteen boxes referred to above were replaced during the field inspection. None of these were replaced in the vicinity of the gun club where 16 boxes are previously gone missing.

During the inspection numbered tags (from "1" to "70") were nailed to the trees in which there were nesting boxes. The numbers referred to in Appendix 1 , Appendix 2 & Appendix 3 are the tag numbers.

Appendix 1 provides maps of the locations of the nesting boxes inspected and the locations of the replaced nesting boxes. The maps are also intended to be an aid in the finding the boxes during subsequent inspections.

Appendix 2 provides the GDA (map reference location of the nesting boxes), the type of nesting box and the tree species as well as a photograph.

Appendix 3 provides the observations of the third annual nesting box inspection.

The nesting boxes were inspected over the period of 30/10/17, 31/10/17 and 2/11/17.

No Squirrel Gliders, Little Lorikeets or microbats or positive evidence of use of these species was observed in the nesting boxes.

Feral honey bees were not evident in any of the nesting boxes.

A number of boxes were being used by Sugar Gliders and other boxes contained eucalypt leaves that had been placed in the boxes by animals some of the leaves contained nesting depressions. A bird egg shell was collected and identified as a possible white-throated treecreeper shell.

Recommendations

1. The need to re-locate or replace boxes if they are not used by targeted fauna for a period of 12 months is reviewed.

In light of the fact that:

- No target species has yet to be observed using the nesting boxes; and
 - Squirrel Gliders were not recorded within the project area during the environmental assessment fauna surveys and that Little Lorikeets were only observed flying over the project area and not foraging, sheltering or nesting within the project area. The intent of the installation of the Squirrel Glider and Little Lorikeet boxes was to enhance habitat values and subsequently connectivity across the project area.
2. It is recommended that inspections of the use of the nesting boxes be conducted biannually and that every other alternate year the integrity of the boxes be observed from the ground. Furthermore it is recommended that if in the future inspections the target species are still absent from the project area that the need for further inspections be reviewed.

In regard to the 2016 inspection recommendations:

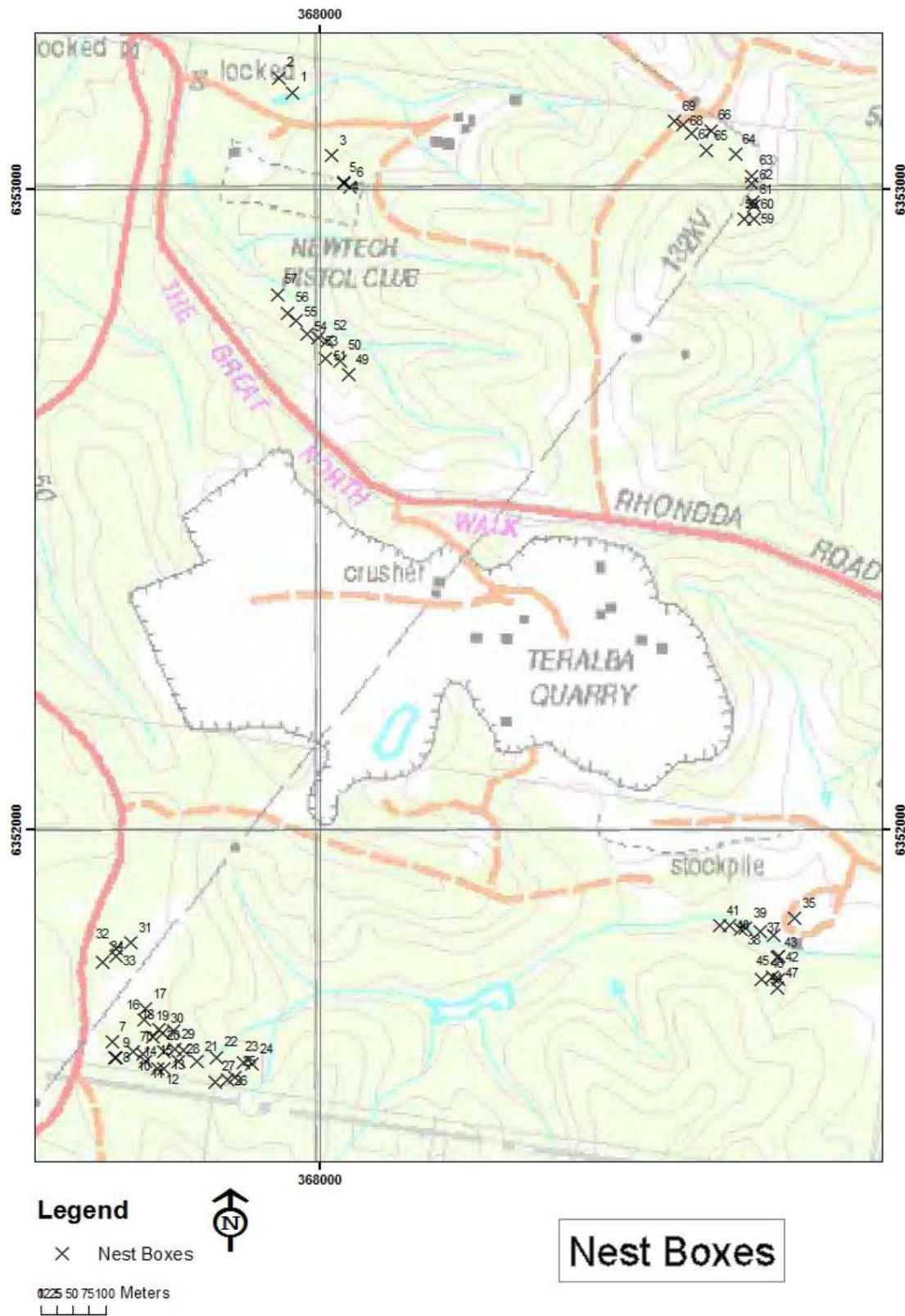
- five additional nesting boxes for each target species have been purchased and are now stored on site so that if a box is found to be missing or damaged during subsequent inspections it can be readily be replaced;
- a numbered metal tag has been nailed to each tree to assist in locating each nesting box during inspections;
- the dangerous tree near Tree No. 35 has been removed.

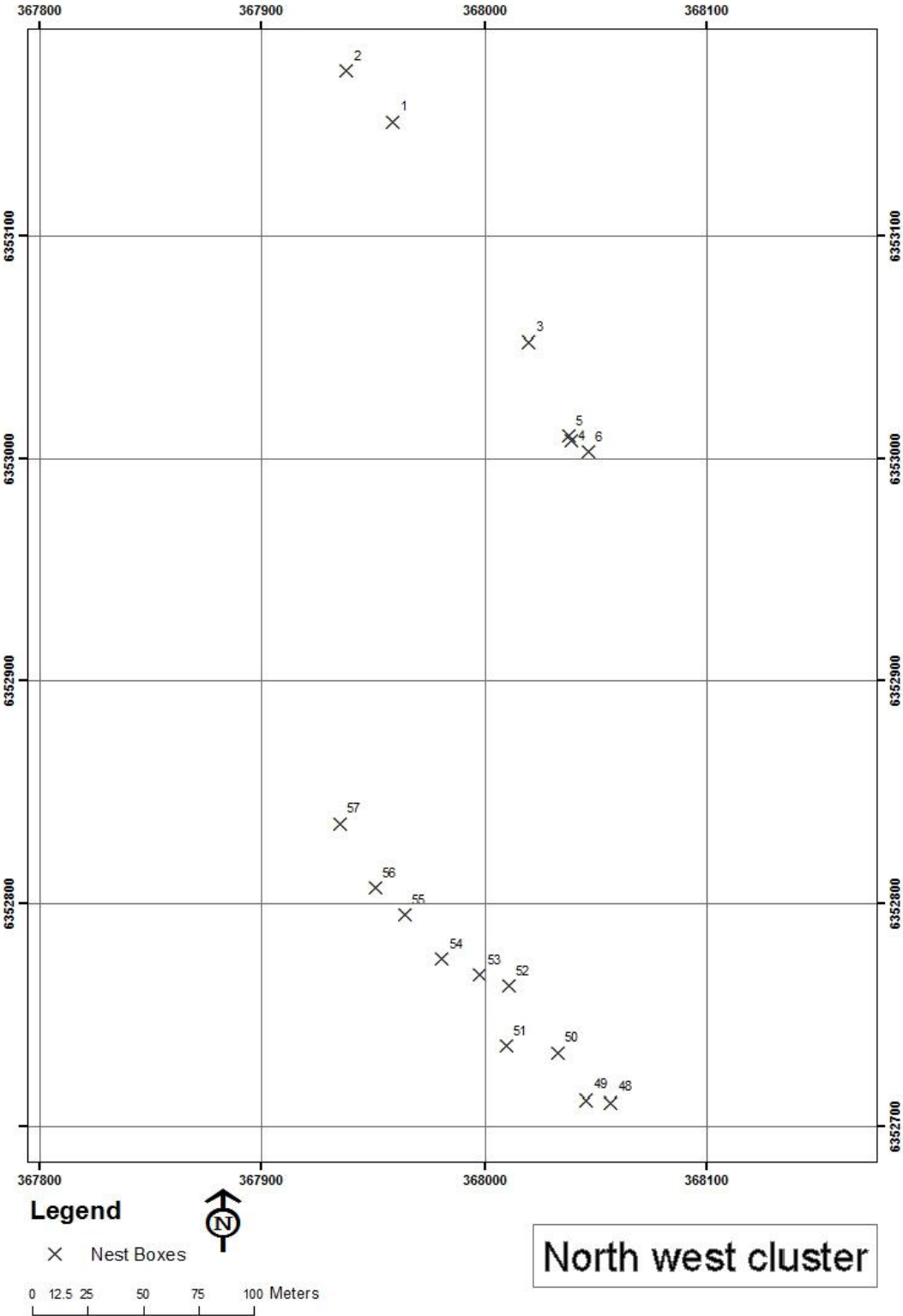
Keith Kendall

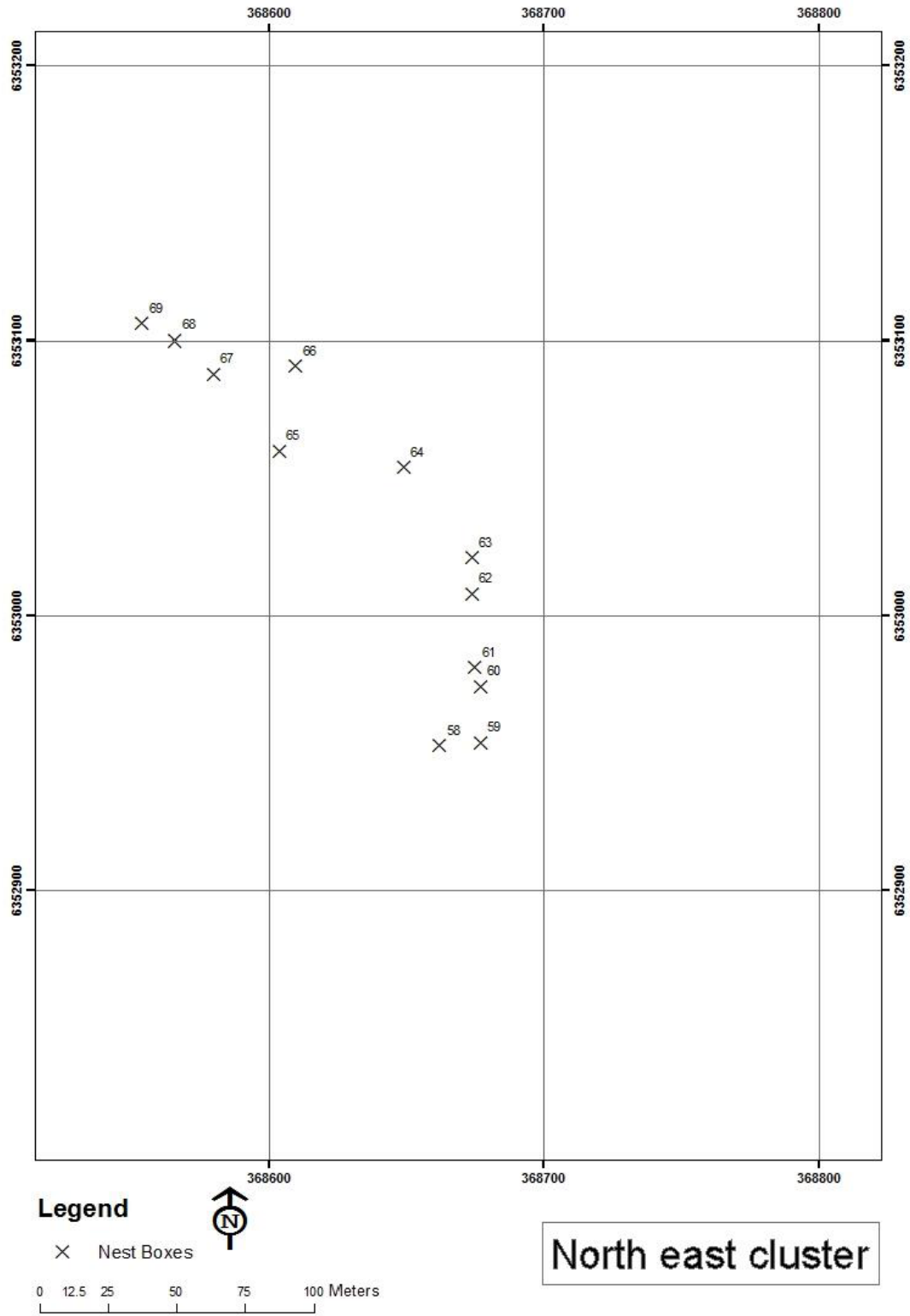
Kendall & Kendall Ecological Services Pty Ltd

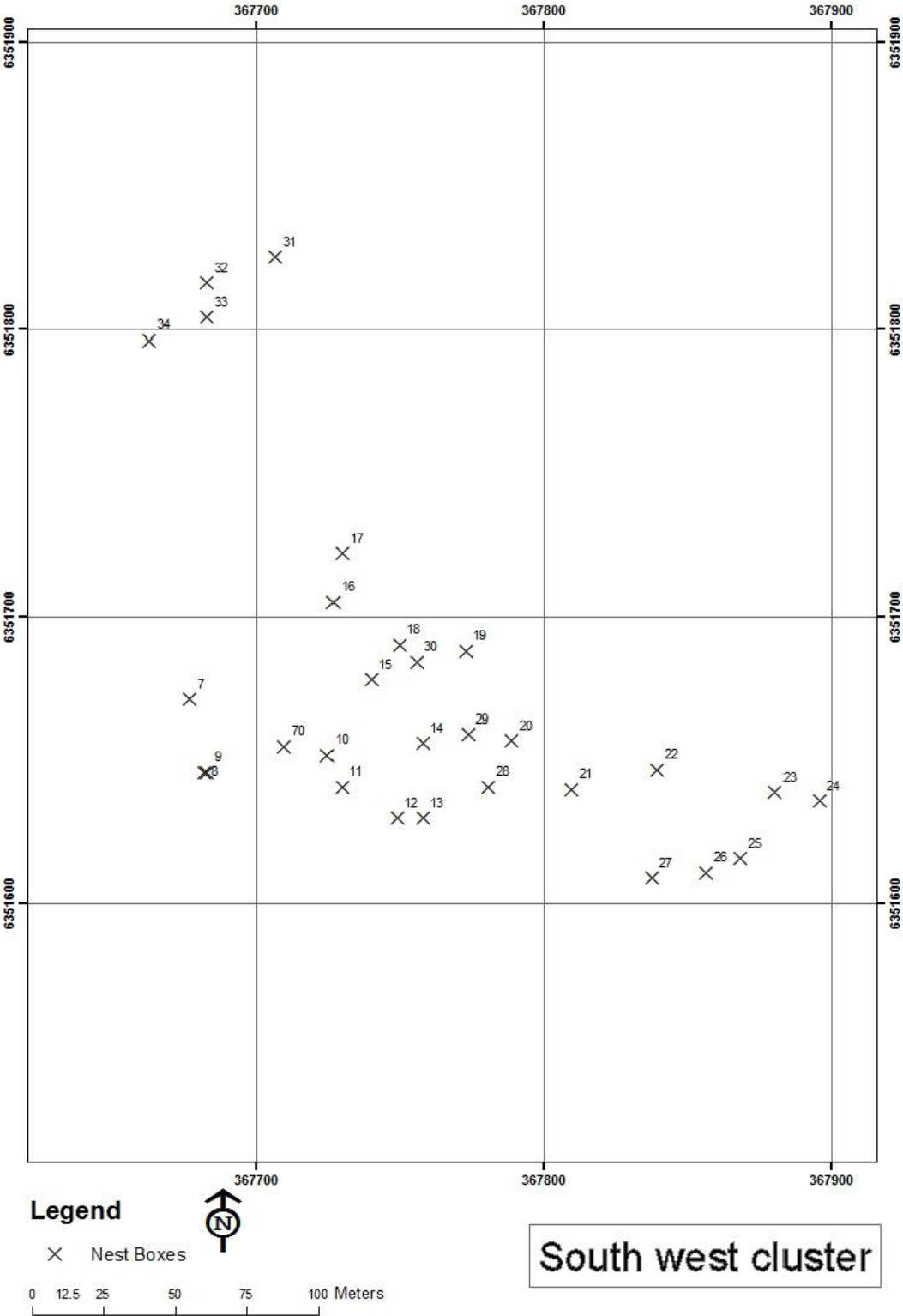
19th December 2017

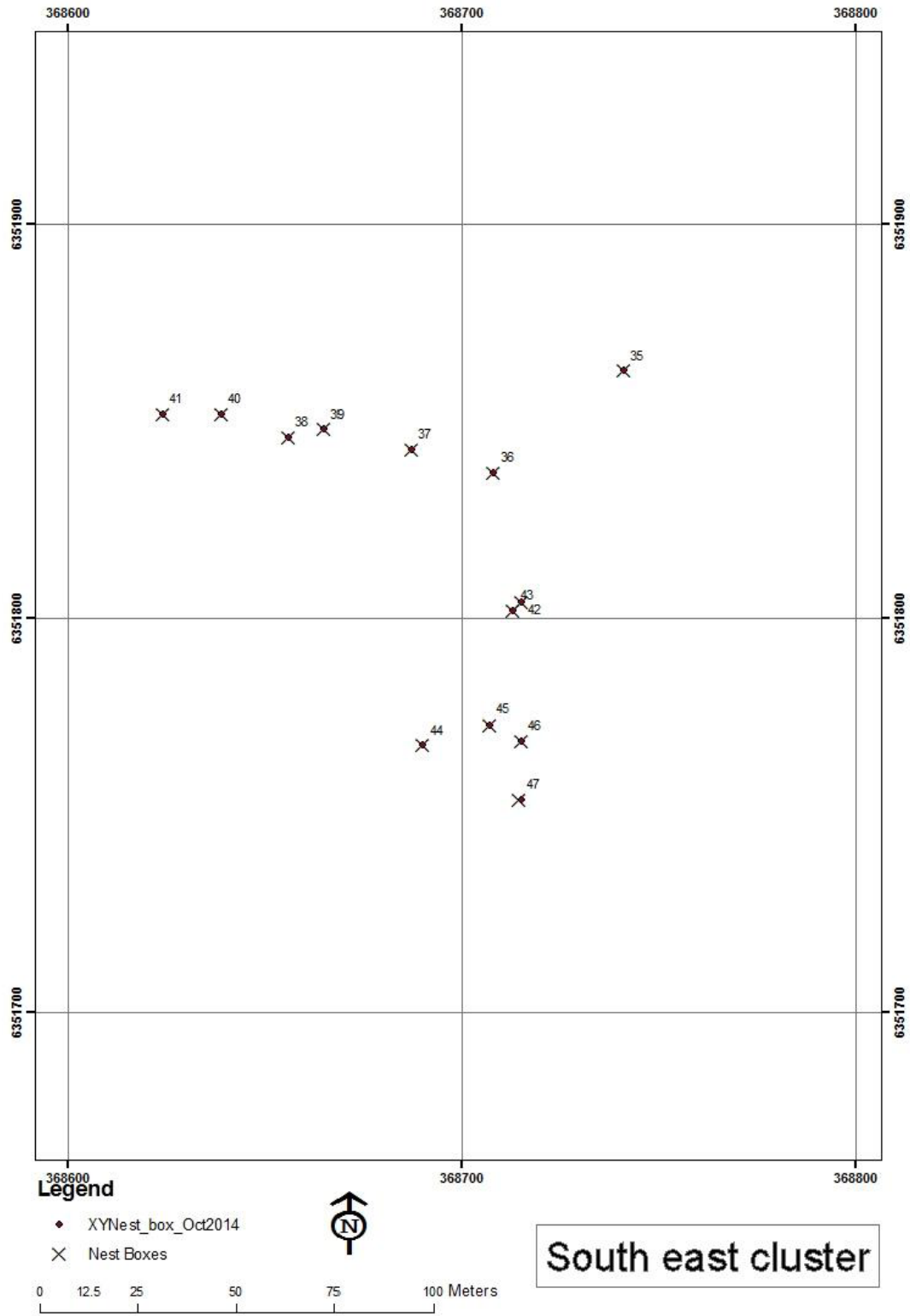
Appendix 1 - Nesting Box Location Maps











Appendix 2 - Nesting Box Details

Tag 1
Little Lorikeet Box in Spotted Gum
GDA 367959 6353151



Tag 2
Little Lorikeet Box in Stringybark
GDA 367938 6353174



Tag 3
Little Lorikeet Box in Spotted Gum
GDA 368020 6353052



Tag 4
Little Lorikeet Box in Spotted Gum
GDA 368039 6353008



Tag 5

Photo 4818
Little Lorikeet Box in Spotted Gum
GDA 368038 6353010



Tag 6

Little Lorikeet Box in Spotted Gum
GDA 368047 6353003



Tag 7

Squirrel Glider Box in Stringybark
GDA 367677 6351671



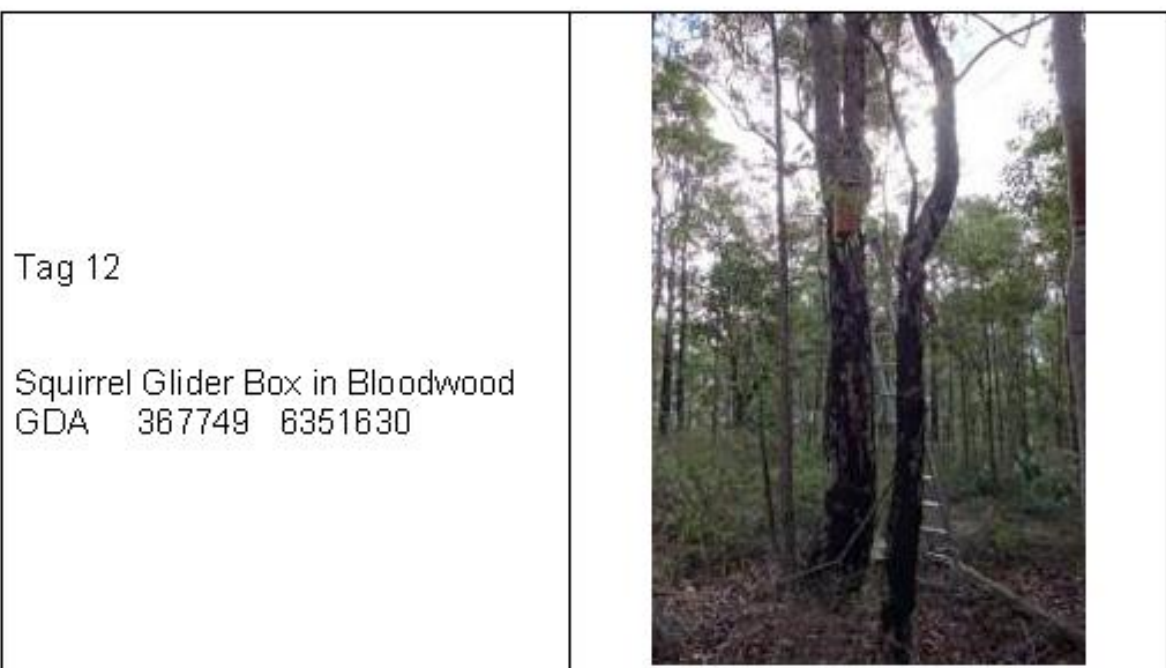
Tag 8

Microbat Box in Bloodwood
GDA 367682 6351646



<p>Tag 9</p> <p>Squirrel Glider Box in Stringybark GDA 367683 6351646</p>	
---	--

<p>Tag 10</p> <p>Squirrel Glider Box in Stringybark GDA 367725 6351652</p>	
--	---



Tag 13


Microbat Box in Stringybark
GDA 367758 6351630



Tag 14

Squirrel Glider Box in Stringybark
GDA 367758 6351656



<p>Tag 15</p> <p>Microbat Box in Bloodwood GDA 367740 6351678</p>	
---	--

<p>Tag 16</p> <p>Squirrel Glider Box in Bloodwood GDA 367727 6351705</p>	
--	--

Tag 17

Little Lorikeet Box in Bloodwood
GDA 367730 6351722



Tag 18

Little Lorikeet Box in Bloodwood
GDA 367750 6351690



Tag 19

Little Lorikeet Box in Bloodwood
GDA 367773 6351688



Tag 20

Little Lorikeet Box in Stringybark
GDA 367789 6351657



Tag 21

Little Lorikeet Box in Stringybark
GDA 367810 6351640



Tag 22

Little Lorikeet Box in Stringybark
GDA 367840 6351647



Tag 23

Little Lorikeet Box in Stringybark
GDA 367881 6351639



Tag 24

Little Lorikeet Box in Stringybark
GDA 367896 6351636



Tag 25

Little Lorikeet Box in Stringybark
GDA 367869 6351616



Tag 26

Little Lorikeet Box in Stringybark
GDA 367857 6351611



Tag 27

Little Lorikeet Box in Stringybark
GDA 367838 6351609



Tag 28

Little Lorikeet Box in Bloodwood
GDA 367781 6351641



Tag 29

Little Lorikeet Box in Bloodwood
GDA 367774 6351659



Tag 30

Little Lorikeet Box in Bloodwood
GDA 367756 6351684



Tag 31

Squirrel Glider Box in Spotted Gum
GDA 367707 6351825



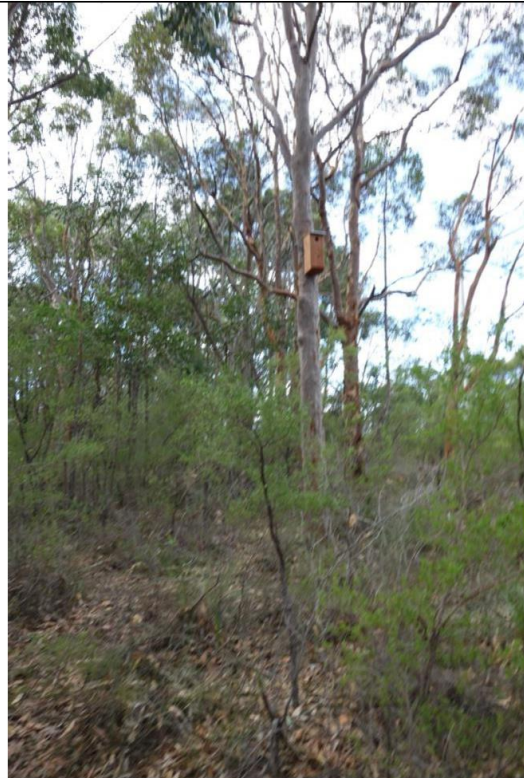
Tag 32

Squirrel Glider Box in Spotted Gum
GDA 367683 6351816



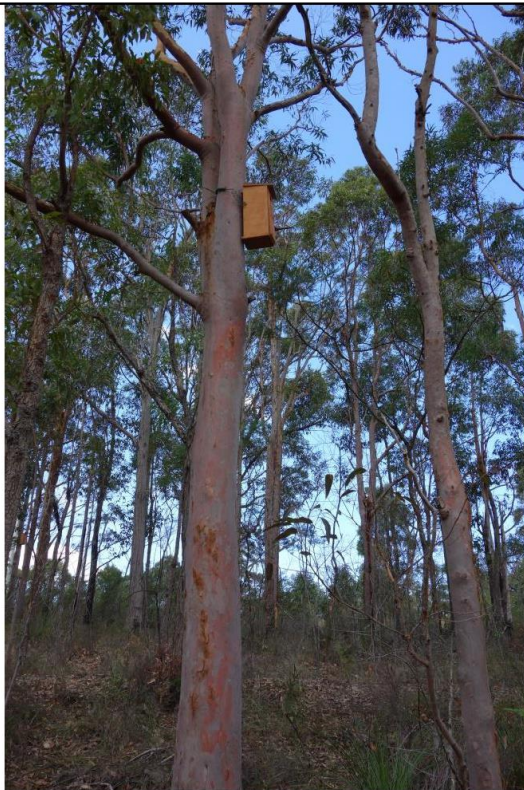
Tag 33

Squirrel Glider Box in Spotted Gum
GDA 367683 6351804



Tag 34

Squirrel Glider Box in Spotted Gum
GDA 367663 6351796



Tag 35

Squirrel Glider Box in Grey Gum
GDA 368741 6351863



Tag 36

Microbat Box in Stringybark
GDA 368708 6351837



Tag 37

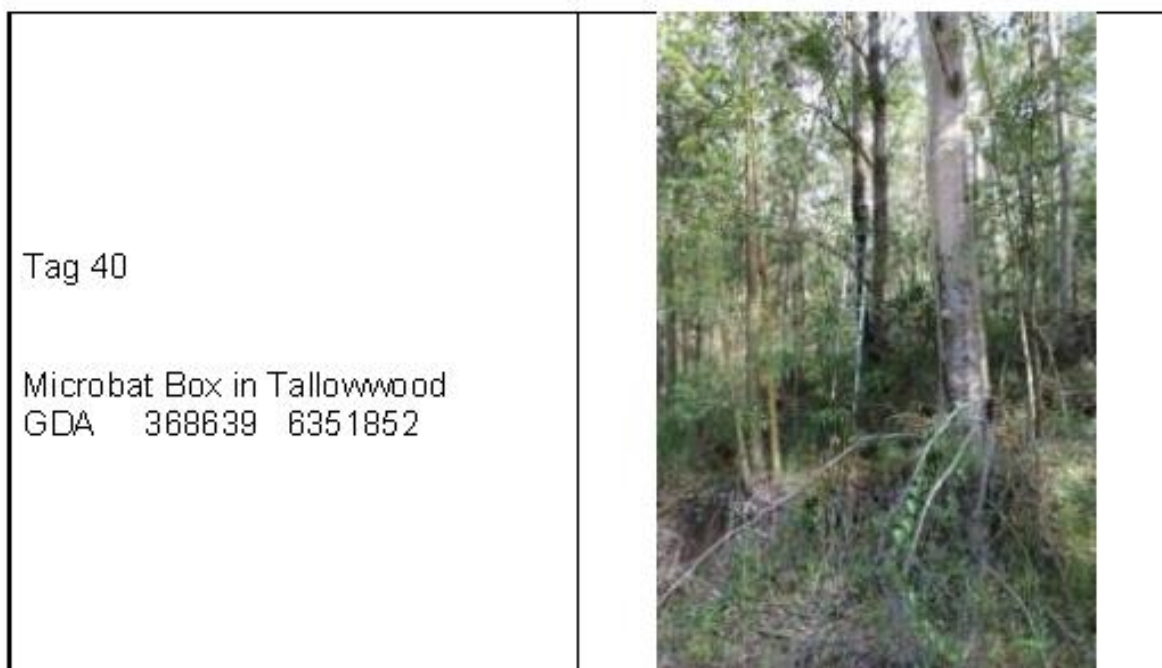
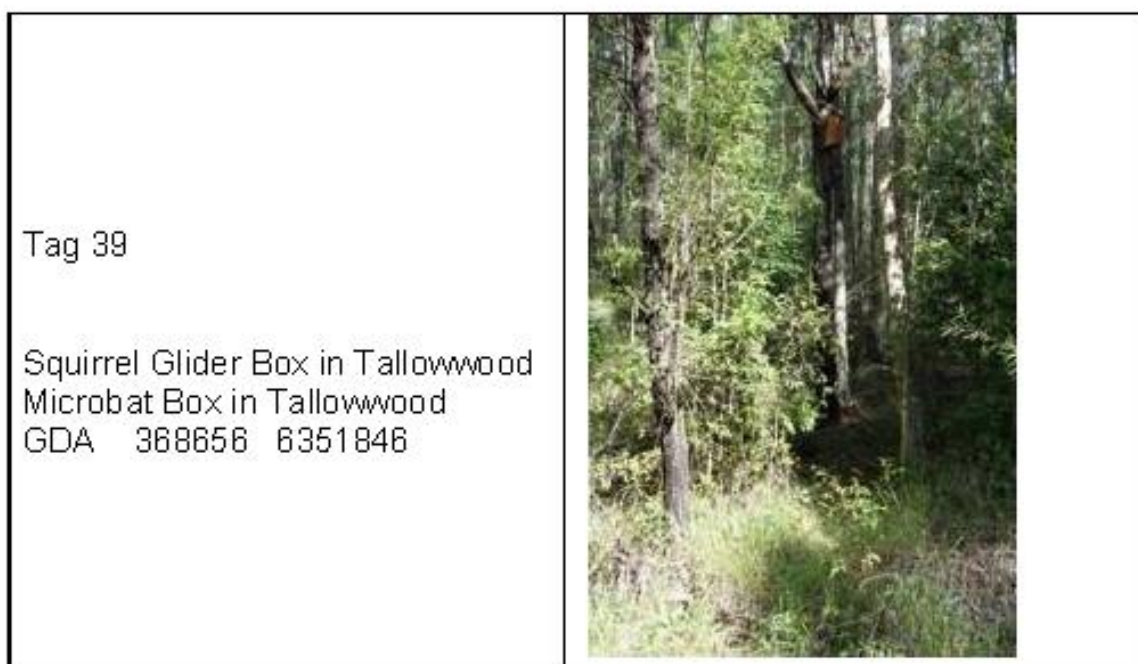
Squirrel Glider Box in Grey Gum
GDA 368687 6351843



Tag 38

Microbat Box in Stringybark
GDA 368665 6351848





Tag 41

Squirrel Glider Box in Tallowwood
GDA 368624 6351852



Tag 42

Microbat Box in Stringybark
GDA 368715 6351804



<p>Tag 43</p> <p>Squirrel Glider Box in Stringybark GDA 368713 6351802</p>	
<p>Tag 44</p> <p>Squirrel Glider Box in Spotted Gum GDA 368690 6351768</p>	

Tag 45

Squirrel Glider Box in Tallowwood
GDA 368707 6351773



Tag 46

Microbat Box in Spotted Gum
GDA 368715 6351769



Tag 47

Squirrel Glider Box in Spotted Gum
GDA 368713 6351753



Tag 48

Microbat Box in Stringybark
GDA 368057 6352711





Tag 49

Microbat Box in Stringybark
GDA 367683 6351804
GDA 368046 6352712



Tag 50
Microbat Box in Tallowwood
GDA 368033 6352733



<p>Tag 51</p> <p>Microbat Box in Stringybark GDA 368010 6352736</p>	
<p>Tag 52</p> <p>Microbat Box in Tallowwood GDA 368011 6352763</p>	

Tag 53


Microbat Box in Ironbark
GDA 367998 6352768



Tag 54

Microbat Box in Stringybark
GDA 367981 6352775



<p>Tag 55</p> <p>Microbat Box in Stringybark GDA 367964 6352795</p>	
<p>Tag 56</p> <p>Microbat Box in Stringybark GDA 367951 6352807</p>	

Tag 57

Microbat Box in Ironbark
GDA 367935 6352836



Tag 58

Squirrel Glider Box in Ironbark
GDA 368662 6352953



Tag 59

Squirrel Glider Box in Ironbark
GDA 368677 6352954



Tag 60

Squirrel Glider Box in Tallowwood
GDA 368677 6352974



Tag 61

Squirrel Glider Box in Tallowwood
GDA 368675 6352981



Tag 62

Squirrel Glider Box in Ironbark
GDA 368674 6353008



Tag 63

Squirrel Glider Box in Ironbark
GDA 368674 6353021



Tag 64

Squirrel Glider Box in Stringybark
GDA 368649 6353054



Tag 65


Squirrel Glider Box in Ironbark
GDA 368604 6353060



Tag 66

Squirrel Glider Box in Tallowwood
GDA 368610 6353091



<p>Tag 67</p> <p>Squirrel Glider Box in Spotted Gum GDA 368580 6353088</p>	
<p>Tag 68</p> <p>Squirrel Glider Box in Spotted Gum GDA 368566 6353100</p>	

Tag 69

Squirrel Glider Box in Stringybark
GDA 368554 6353106



Tag 70

Microbat Box in Stringybark
GDA 367710 6351655



Appendix 3 - Second Annual Nesting Box Inspection

Cluster	Number	Box type / Tree species	GDA	Observation
North west	Tag 1	Little Lorieet Box in Spotted Gum	GDA 367959 6353151	Ants
North west	Tag 2	Little Lorieet Box in Stringybark	GDA 367938 6353174	Leaves
North west	Tag 3	Little Lorieet Box in Spotted Gum	GDA 368020 6353052	2 Sugar gliders
North west	Tag 4	Little Lorieet Box in Spotted Gum	GDA 368039 6353008	Leaves with depression
North west	Tag 5	Little Lorieet Box in Spotted Gum	GDA 368038 6353010	Leaves and ants
North west	Tag 6	Little Lorieet Box in Spotted Gum	GDA 368047 6353003	1 Sugar glider
South west	Tag 7	Squirrel Glider Box in Stringybark	GDA 367677 6351671	Bird egg shell
South west	Tag 8	Microbat Box in Bloodwood	GDA 367682 6351646	
South west	Tag 9	Squirrel Glider Box in Stringybark	GDA 367683 6351646	
South west	Tag 10	Squirrel Glider Box in Stringybark	GDA 367725 6351652	Leaves
South west	Tag 11	Microbat Box in Bloodwood	GDA 367730 6351641	
South west	Tag 12	Squirrel Glider Box in Bloodwood	GDA 367749 6351630	Leaves with depression
South west	Tag 13	Microbat Box in Stringybark	GDA 367758 6351630	
South west	Tag 14	Squirrel Glider Box in Stringybark	GDA 367758 6351656	
South west	Tag 15	Microbat Box in Bloodwood	GDA 367740 6351678	
South west	Tag 16	Squirrel Glider Box in Bloodwood	GDA 367727 6351705	
South west	Tag 17	Little Lorieet Box in Bloodwood	GDA 367730 6351722	Reinstalled box at new location
South west	Tag 18	Little Lorieet Box in Bloodwood	GDA 367750 6351690	Reinstalled box at new location
South west	Tag 19	Little Lorieet Box in Bloodwood	GDA 367773 6351688	Reinstalled box at new location
South west	Tag 20	Little Lorieet Box in Stringybark	GDA 367789 6351657	Reinstalled box at new location
South west	Tag 21	Little Lorieet Box in Stringybark	GDA 367810 6351640	Reinstalled box at new location
South west	Tag 22	Little Lorieet Box in Stringybark	GDA 367840 6351647	Reinstalled box at new location
South west	Tag 23	Little Lorieet Box in Stringybark	GDA 367881 6351639	Reinstalled box at new location
South west	Tag 24	Little Lorieet Box in Stringybark	GDA 367896 6351636	Reinstalled box at new location
South west	Tag 25	Little Lorieet Box in Stringybark	GDA 367869 6351616	Reinstalled box at new location
South west	Tag 26	Little Lorieet Box in Stringybark	GDA 367857 6351611	Reinstalled box at new location

Cluster	Number	Box type / Tree species	GDA	Observation
South west	Tag 27	Little Lorikeet Box in Stringybark	GDA 367838 6351609	Reinstalled box at new location
South west	Tag 28	Little Lorikeet Box in Bloodwood	GDA 367781 6351641	Reinstalled box at new location
South west	Tag 29	Little Lorikeet Box in Bloodwood	GDA 367774 6351659	Reinstalled box at new location
South west	Tag 30	Little Lorikeet Box in Bloodwood	GDA 367756 6351684	Reinstalled box at new location
South west	Tag 31	Squirrel Glider Box in Spotted Gum	GDA 367707 6351825	Reinstalled box at new location
South west	Tag 32	Squirrel Glider Box in Spotted Gum	GDA 367683 6351816	Reinstalled box at new location
South west	Tag 33	Squirrel Glider Box in Spotted Gum	GDA 367683 6351804	Reinstalled box at new location
South west	Tag 34	Squirrel Glider Box in Spotted Gum	GDA 367663 6351796	Reinstalled box at new location
South east	Tag 35	Squirrel Glider Box in Grey Gum	GDA 368741 6351863	
South east	Tag 36	Microbat Box in Stringybark	GDA 368708 6351837	
South east	Tag 37	Squirrel Glider Box in Grey Gum	GDA 368687 6351843	Nil
South east	Tag 38	Squirrel Glider Box in Tallowwood	GDA 368656 6351846	Leaves
South east	Tag 39	Microbat Box in Stringybark	GDA 368665 6351848	
South east	Tag 40	Microbat Box in Tallowwood	GDA 368639 6351852	
South east	Tag 41	Squirrel Glider Box in Tallowwood	GDA 368624 6351852	
South east	Tag 42	Microbat Box in Stringybark	GDA 368715 6351804	
South east	Tag 43	Squirrel Glider Box in Stringybark	GDA 368713 6351802	
South east	Tag 44	Squirrel Glider Box in Spotted Gum	GDA 368690 6351768	Leaves
South east	Tag 45	Squirrel Glider Box in Tallowwood	GDA 368707 6351773	3 Sugar gliders
South east	Tag 46	Microbat Box in Spotted Gum	GDA 368715 6351769	
South east	Tag 47	Squirrel Glider Box in Spotted Gum	GDA 367707 6351825	
North west	Tag 48	Microbat Box in Stringybark	GDA 368057 6352711	
North west	Tag 49	Microbat Box in Stringybark	GDA 368046 6352712	
North west	Tag 50	Microbat Box in Tallowwood	GDA 368033 6352733	
North west	Tag 51	Microbat Box in Stringybark	GDA 368010 6352736	
North west	Tag 52	Microbat Box in Tallowwood	GDA 368011 6352763	
North west	Tag 53	Microbat Box in Ironbark	GDA 367998 6352768	
North west	Tag 54	Microbat Box in Stringybark	GDA 367981 6352775	
North west	Tag 55	Microbat Box in Stringybark	GDA 367964 6352795	

Cluster	Number	Box type / Tree species	GDA	Observation
North west	Tag 56	Microbat Box in Stringybark	GDA 367951 6352807	
North west	Tag 57	Microbat Box in Ironbark	GDA 367935 6352836	
North east	Tag 58	Squirrel Glider Box in Ironbark	GDA 368662 6352953	
North east	Tag 59	Squirrel Glider Box in Ironbark	GDA 368677 6352954	2 Sugar gliders
North east	Tag 60	Squirrel Glider Box in Tallowwood	GDA 368677 6352974	
North east	Tag 61	Squirrel Glider Box in Tallowwood	GDA 368675 6352981	Leaves
North east	Tag 62	Squirrel Glider Box in Ironbark	GDA 368674 6353008	
North east	Tag 63	Squirrel Glider Box in Ironbark	GDA 368674 6353021	Leaves with depression
North east	Tag 64	Squirrel Glider Box in Stringybark	GDA 368649 6353054	
North east	Tag 65	Squirrel Glider Box in Ironbark	GDA 368604 6353060	2 Sugar gliders
North east	Tag 66	Squirrel Glider Box in Tallowwood	GDA 368610 6353091	2 Sugar gliders
North east	Tag 67	Squirrel Glider Box in Spotted Gum	GDA 368580 6353088	
North east	Tag 68	Squirrel Glider Box in Spotted Gum	GDA 368566 6353100	Leaves with depression
North east	Tag 69	Squirrel Glider Box in Stringybark	GDA 368554 6353106	
South west	Tag 70	Microbat Box in Stringybark	GDA 367710 6351655	