Karuah East Quarry

EPBC Approval 2014/7282

Annual Compliance Report

July 2017

EPBC Approval 2014/7282

Karuah East Quarry

Annual Compliance Report

20 March 2015 – 26 April 2017

Declaration of Accuracy

In making this declaration, I am aware that section 490 and 491 of the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) make it an offence in certain circumstances to knowingly provide false or misleading information or documents. The offence is punishable on conviction by imprisonment or a fine, or both. I declare that all the information and documentation supporting this compliance report is true and correct in every particular. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Tim Grugeon
Environmental Officer

Gerard Bowen
Quarry Manager

Date 27/7/2017

Document Control:

Version	Description	Date	Author	Reviewers	Authorised
1.0	Draft	14 July 2017	T.Grugeon	G.Dressler	
2.0	Final	27 July 2017	T.Grugeon	G.Dressler	G.Bowen

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GLOSSARY / ABBREVIATIONS

Acronym / Term	Definition
ACR	Annual Compliance Report
Black-eyed Susan	*Tetratheca juncea*
BOAMP	Biodiversity Offset Area Management Plan
Department	Commonwealth Department of the Environment & Energy (formally known as Department of the Environment)
DPE	NSW Department of Planning and Environment
EPBC Act	Environment Protection and Biodiversity Act 1999
KEQ	Karuah East Quarry
Koala	*Phascolartos cinereus*
OEH	NSW Office of Environment and Heritage
PA	NSW Project Approval 09_0175
Small-flower Grevillea	*Grevillea parviflora* subsp. *Parviflora*
TjTMP	*Tetratheca juncea* Translocation Management Plan
Trailing Woodruff	*Asperula asthenes*

1. INTRODUCTION

Karuah East Quarry (KEQ) is an approved hard rock quarry located at Karuah in the Hunter Region, NSW. The project was approved by the NSW Planning Assessment Commission as a Part 3A Major Project on 17 June 2014 (Project Approval 09_0175). KEQ also received approval from the Commonwealth Department of Environment (the Department) on 20 March 2015 (EPBC 2014/7282).

Following approval from the NSW Planning Assessment Commission, referral under the Environment Protection and Biodiversity Act 1999 (EPBC Act) was made to the Department in July 2014. It was determined by the Commonwealth Minister in August 2014 that a controlled action under the EPBC Act requiring further assessment into the "listed threatened species and ecological communities" (Sections 18 and 18A, EPBC Act). In particular, the impacts on four species that were listed as "vulnerable" under the EPBC Act were identified for further assessment. These four species included:

- *Tetratheca juncea* (Black-eyed Susan) – Vulnerable;
- *Asperula asthenes* (Trailing Woodruff) – Vulnerable;
- *Grevillea parviflora* subsp. *Parviflora* (Small-flower Grevillea) - Vulnerable ; and
- *Phascolartos cinereus* (Koala) – Vulnerable.

The Black-eyed Susan, Trailing Woodruff and Small-flower Grevillea were identified in previous ecological studies as occurring within the project area (RPS, 2013) and surrounding vicinity. Koalas were previously identified in adjacent sites, but no individuals had been observed within the project site during the Environmental Assessment (ADWJ, 2013). It was estimated that approximately 24ha of Koala habitat was going to be directly impacted and the project was going to create a fragmentation of the adjacent Koala habitat (ELA, 2014).

Mitigation and management measures for the four identified species were considered and the EPBC 2014/7282 was approved with seventeen conditions.

1.1 Purpose and Scope

The purpose of the Annual Compliance Report (ACR) is to annually report compliance with the conditions stipulated in the EPBC 2014/7282. Specifically, the ACR is a requirement under Condition 12 of EPBC 2014/7282.

"Condition 12 Within three months of every 12 month anniversary of the commencement of construction, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval over the previous 12 months, including implementation of any management plan, as specified in the conditions. Documentary evidence providing proof of the date of publication must be provided to the Department at the same time as the compliance report is published. The compliance reports must remain on the website for 12 months from the date of publishing. Potential or actual contraventions of the conditions of the approval must be reported to the Department in writing within 2 business days of the person taking the action becoming aware of the potential or actual contravention. All contraventions must also be included in the compliance reports."

Construction of KEQ officially commenced on 27 April 2016. Anniversary of the commencement of construction will be on the 27 April each year thereafter.

As this is the first ACR for KEQ, this report will cover the period from the approval date of EPBC 2014/7282 (20 March 2015) to the end of the first year of construction (26 April 2017). This ACR will be publicly available by the 27 July 2017. Quarry operations did not commence during this reporting period.

Each of the 17 conditions of EPBC 2014/7282 have been assessed and reported in this ACR. The report has been prepared in accordance with the *Annual Compliance Report Guidelines* (Department of the Environment, 2014).

1.2 Key Dates

Table 1 Key Dates

Date	Activity
17 June 2014	PA 09_0175 (KEQ) approved by the NSW Planning Assessment Commission
20 March 2015	EPBC 2014/7282 approved
9 November 2015	Biodiversity Offset Area Management Plan finalised
16 March 2016	BOAMP approved by the Commonwealth Department of the Environment
27 April 2016	Commencement of construction
31 December 2034	NSW Project Approval 09_0175 expiry date
30 March 2045	EPBC 2014/7282 expiry date

2. COMPLIANCE ASSESSMENT

2.1 Compliance Status

All 17 conditions of EPBC 2014/7282 were assessed for compliance. Results are shown in Table 3. The assessment found the following:

- 11 conditions were found to be compliant;
- 4 conditions were found to be not applicable; and
- 2 conditions were found to be non-compliant.

Details of the following non-compliant conditions are contained within Section 2.2:

- Non-compliant – Condition 3; Permanent fencing could not be installed before clearing operations due to it been impractical. Temporary barriers and signage was used to delineate between the project area and offset areas during construction.
- Non-compliant – Condition 17; Condition was only partially met due to an administrative oversight. The BOAMP was published within one month of receiving approval from the Department, but the Department was not notified when this action was taken.

The definitions shown in Table 2 below were used to assess compliance.

Table 2 Status Definitions

Status	Definition
Compliant	'Compliance' is achieved when all the requirements of a condition have been met, including the implementation of management plans or other measures required by those conditions.
Non-compliant	A designation of 'non-compliance' should be given where the requirements of a condition or elements of a condition, including the implementation of management plans and other measures, have not been met.
Not applicable	A designation of 'not applicable ' should be given where the requirements of a condition or elements of a condition fall outside of the scope of the current reporting period. For example a condition which applies to an activity that has not yet commenced.

Table 3 Compliance Status

EPBC 2014/7282 Condition	Compliance Status	Comments
1. The person taking the action must not impact on any Black-eyed Susan or Trailing Woodruff outside the project area identified at Appendix A.	Compliant	Black-eyed Susan and Trailing Woodruff outside of the project area was not impacted during the clearing and construction activities.
2. The person taking the action must not impact on any habitat for the Koala outside the project area identified at Appendix B.	Compliant	Koala habitat was not disturbed outside of the project area during the reporting period.
3. Prior to the commencement of construction, the person taking the action must install fencing around the perimeter of the project area and identify signed no-go areas. Fencing and no go areas must be maintained for the life of the action.	Non-compliant	It was deemed to be impractical to install fencing prior to clearing, however, temporary barriers were used to delineate the offset areas. Barrier tape and "Keep Out Conservation Offset Area" signs were installed along the boundaries of the project area prior to clearing. It is anticipated that permanent, fauna friendly, chain wire fencing will be installed in the 2017-2018 period prior to the commencement of Quarry operations. The Department has recommended a variation is made to this condition. Refer to Section 2.2 for more details.
4. Prior to the commencement of construction and for the life of the action, all on-site personnel must be inducted on environmental sensitivities in the area, including the risk of Koala vehicle strike. Induction material is to be prepared by a suitably qualified ecologist.	Compliant	Karuah East Quarry site induction was completed prior to the commencement of construction. Sensitive environmental matters, including the risk posed to the welfare of wildlife (i.e. Koala) is covered in the site induction. The induction was prepared with assistance provided from qualified ecologists.
5. Should injury to Koalas occur, advice from a wildlife expert must be sought and action taken in accordance with that advice. Records of any Koala injury within the project area must be documented and maintained.	Not applicable	Condition not triggered. No injuries occurred to Koalas during the reporting period.

EPBC 2014/7282 Condition	Compliance Status	Comments
6. Within 48 hours before the clearing of vegetation, pre-clearance surveys must be undertaken by a suitably qualified ecologist to ensure the absence of the Koala in the project area. If any Koalas are found to be present, salvage and translocation must be undertaken by a suitably qualified ecologist.	Compliant	Pre clearing Koala surveys were undertaken within 24 hours of clearing operations by a qualified ecologist. Furthermore, as stipulated in Section 6.3.1 of the Landscape & Rehabilitation Management Plan (SLR, 2015) clearing operations were supervised by an ecologist. Koalas were not found at any time during clearing operations.
7. The person taking the action must comply with the offset conditions set out in the NSW Project Approval.	Compliant	A Biodiversity Offset Strategy as required under Schedule 3, Condition 28 of the NSW PA 09_0175 was implemented. As a requirement of the Biodiversity Offset Strategy (ELA, 2013), KEQ acquired Lot 5 DP 838128 in January 2016 to secure the offset area. As per Schedule 3, Condition 33 of the PA, a Biodiversity Offset Area Management Plan (BOAMP) addressing all the requirements of this condition had been prepared and implemented. The BOAMP was approved by the NSW DPE on 14 December 2015 and by the Commonwealth Department of the Environment on 16 March 2016 (refer to Condition 9 below). Furthermore, *Tetratheca juncea* (Black-eyed Susan) translocation program was implemented in accordance with the NSW Project Approval, the BOAMP and the *TjTMP*. All identified Black-eyed Susan within the project area were translocated in May 2016. A Section 69 Conservation Agreement is being developed in consultation with the NSW Office of Environment and Heritage (OEH) to create a long term security of the Biodiversity Offset Area (BOA).
8. Prior to the commencement of construction, to compensate for the impact to the Trailing Woodruff and habitat for the Koala, the person taking the action must secure suitable offset sites consistent with the Karuah East Quarry EPBC Act Assessment Report. In the case that offsets for the Trailing	Compliant	As per Section 7 of the KEQ EPBC Act Assessment Report (ELA, 2014), KEQ acquired Lot 5 DP 838128 in January 2016. This provided a total undisturbed area of approximately 135.57 ha to be utilised and secured for offset. After excluding Asset Protection Zones (APZ's), fire trails and powerline easements, this has given 131.49 ha of offset area. A Section 69 Conservation Agreement is been developed in consultation with the

EPBC 2014/7282 Condition	Compliance Status	Comments
Woodruff or habitat for the Koala consistent with those set out in the Karuah East Quarry EPBC Act Assessment Report cannot be secured, alternative offset sites must be secured, consistent with the EPBC Act Offsets Policy.		NSW Office of Environment and Heritage (OEH) to implement a long term security measure for the offset site.
9. Prior to the commencement of construction, the person taking the action must provide the Minister with a Biodiversity Area Offset Management Plan for approval. The Biodiversity Area Offset Management Plan must be consistent with the NSW Project Approval and include: a) survey information identifying the number of Trailing Woodruff present across all proposed offset sites; and b) details on the management and monitoring of the Trailing Woodruff , and corrective actions and contingency plans to be implemented where the re-establishment of the Trailing Woodruff fails to meet targets specified in the Karuah East Quarry EPBC Act Assessment Report. The approved Biodiversity Area Offset Management Plan must be implemented.	Compliant	The Department approved the BOAMP on 16 March 2016. The BOAMP had been developed to bring together the relevant approval conditions and requirements as stipulated in the NSW Project Approval (PA 09_0175), the Commonwealth EPBC 2014/7282, Biodiversity Offset Strategy (ELA, 2013) and the Statement of Commitments (Appendix 6, PA 09_0175). The background ecological assessments are described in detail in Section 2.3.4 of the BOAMP. Threatened flora specie locations, including Trailing Woodruff (*Asperual asthenes)*, are illustrated in Figure 2. The *Asperual asthenes* monitoring requirements are specifically addressed under Section 3.13 of the BOAMP. Contingency measures are detailed in Section 7 if targets are not met.
10. Within 30 days after the commencement of construction, the person taking the action must advise the Department in writing of the actual date of commencement of construction.	Compliant	The Department was notified on 23 May 2016. This was within 30 days after the commencement of construction.

EPBC 2014/7282 Condition	Compliance Status	Comments
11. The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plan, and make it available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.	Compliant	KEQ maintains records relating to EPBC 2014/7282 and associated conditions. KEQ did not receive any requests from the Department and no auditing was undertaken within the reporting period.
12. Within three months of every 12 month anniversary of the commencement of construction, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval over the previous 12 months, including implementation of any management plan, as specified in the conditions. Documentary evidence providing proof of the date of publication must be provided to the Department at the same time as the compliance report is published. The compliance reports must remain on the website for 12 months from the date of publishing. Potential or actual contraventions of the conditions of the approval must be reported to the Department in writing within 2 business days of the person taking the action becoming aware of the potential or actual contravention. All contraventions must also be included in the compliance reports.	Compliant	This ACR was prepared and published by 27 July 2017, which is within three months of the anniversary of the commencement of construction. The anniversary of the commencement of construction is 27 April.

EPBC 2014/7282 Condition	Compliance Status	Comments
13. Upon the direction of the Minister, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.	Not applicable	No direction has been provided by the Minister.
14. If the person taking the action wishes to carry out any activity otherwise than in accordance with the management plan as specified in the conditions, the person taking the action must submit to the Department for the Minister's written approval a revised version of that management plan. The varied activity shall not commence until the Minister has approved the varied management plan in writing. If the Minister approves the revised management plan, that management plan must be implemented in place of the management plan originally.	Not applicable	There have been no variations to the activity or intended management of the Biodiversity Offset Area within the reporting period.
15. If the Minister believes that it is necessary or convenient for the better protection of listed threatened species and ecological communities to do so, the Minister may request that the person taking the action make specified revisions to the management plan specified in the conditions and submit the revised management plan for the Minister's written approval. The person taking the action must comply with any such request. The	Not applicable	No request has been provided by the Minister.

EPBC 2014/7282 Condition	Compliance Status	Comments
revised approved management plan must be implemented. Unless the Minister has approved the revised management plan then the person taking the action must continue to implement the management plan originally approved, as specified in the conditions.		
16. If, at any time after 5 years from the date of this approval, the person taking the action has not substantially commenced the action, then the person taking the action must not substantially commence the action without the written agreement of the Minister.	Compliant	Construction of KEQ commenced on 27 April 2016. This was under 5 years from the approval date of EPBC 2014/7282.
17. Unless otherwise agreed to in writing by the Minister, the person taking the action must publish all management plans referred to in these conditions of approval on their website. Each management plan must be published on the website within 1 month of being approved. The person taking the action must notify the Department within 5 business days of publishing the management plan on their website and the management plan must remain on the website for the period this approval has effect.	Non-compliant	This is was an administrative non-compliance. The Department was not notified within 5 business days that this action was taken due to an oversight. However, the BOAMP as required under Condition 9 was published at http://hunterquarries.com.au/karuah-east-documents/ on 16 March 2016. This was published on the same day the approval for the BOAMP was received from Department. The BOAMP was also required to be published on the website to satisfy Schedule 5, Condition 11 of NSW's Project Approval (PA 09_0175). Refer to Section 2.2 for more details.

2.2 Non-compliance(s)

Two conditions were found to be non-compliant.

Non-compliance - Condition 3

Summary of Non-compliance
Permanent fencing could not be installed before the commencement of construction due to it been impractical. Vegetation needed to be cleared before fencing could be installed. However, temporary barriers and signage was used to delineate between the project area and offset areas during construction in accordance with Section 4.1, Statement of Commitments, NSW Project Approval (PA 09_0175).
Who detected the non-compliance?
Department of Environment and Energy
On what date(s) was the non-compliant detected?
The Department detected a possible non-compliance after Department representatives inspected the site on 18 October 2016.
Was the Department notified of the non-compliance?
No. KEQ was not aware that a potential non-compliance had occurred. KEQ was notified of a possible non-compliance in correspondence that was received from the Department on 23 November 2016. The correspondence was a follow up from a site inspection that was undertaken by the Department on 18 October 2016.
How was/will the non-compliance be corrected?
The Department understood the impractical nature of installing perimeter fence prior to construction. The Department has recommended that a variation be made to condition 3 to make the condition achievable. The variation is to give allowance for construction.
Who was/is responsible for correcting the non-compliance?
Quarry Manager and Environmental Officer, Karuah East Quarry
Date corrective measures were/will be commenced and/or completed or the timeframe for correction.
During April 2016, Karuah East Quarry attempted to achieve compliance with this condition by installing temporary barrier tape and signage around the perimeter of the project area prior to the commencement of construction. The boundary was marked with flagging tape by a register surveyor. It is anticipated that condition 3 will be amended as recommended by the Department by August 2017. Fencing contractors were engaged by Karuah East Quarry in July 2017 to install a permanent chain wire fence around the perimeter of the project area. It is anticipated that the install of this fence will commence in August 2017, prior to the commencement of Quarry operations.

Non-compliance - Condition 17

Summary of Non-compliance
Condition 17 was partially compliant. The BOAMP was published within one month of receiving approval from the Department, but notification to the Department was not made due to an administrative oversight.
Who detected the non-compliance?
Environmental Officer
On what date(s) was the non-compliant detected?
25 July 2017. The non-compliance was first noticed during the finalisation of this report.
Was the Department notified of the non-compliance?
Yes.
How was/will the non-compliance be corrected?
The Department was notified via phone on 26 July 2017 of this possible non-compliance. Advice was given to report this non-compliance in this ACR and to notify the Department once it had been published on the KEQ's website.
Who was/is responsible for correcting the non-compliance?
Environmental Officer, Karuah East Quarry
Date corrective measures were/will be commenced and/or completed or the timeframe for correction.
Corrective action was first put in place on 26 July 2017. Non-compliance will be reported in this ACR.

3. CONCLUSION

Since approval, KEQ has progressed to achieving the approval commitments. As at the end of the reporting period, the Quarry was still under construction.

Two conditions were found to be non-compliant during the reporting period. However, long term and short term impacts to the Black-eyed Susan, Trailing Woodruff, Small-flower Grevillea and the Koala were unlikely to have occurred due to these non-compliances. In particular, the non-compliance for condition 17 was related to an administrative task and it had no impact on the biodiversity. Karuah East Quarry took measures in attempt to achieve compliance with condition 3 and to minimise any impacts with offset areas. The offset areas were delineated prior to clearing and excavation with temporary barrier tape and signage.

Karuah East Quarry took measures to minimise any impacts and attempts to achieve compliance with condition 3 by delineating offset areas with temporary barrier fencing and signage during early clearing and excavation.

Karuah East Quarry are committed to improving biodiversity management outcomes as the Quarry progresses from construction to operations. It is anticipated that chain wire fencing will be installed around the perimeter of the project area in the second half of 2017 to protect the offset areas. Further progress will be made to adhere to the commitments in the BOAMP. A biodiversity offset area has

been established and a Section 69 Conservation Agreement with the NSW OEH is currently been finalised to provide a long term security for the offset area.

4. REFERENCES

ADW Johnson Pty Ltd (2013). *Environmental Assessment Report, Proposed Karuah East Hard Rock Quarry.* Prepared for Karuah East Quarry Pty Ltd, January 2013.

Eco Logical Australia (ELA) (2014). *EPBC Act Assessment Report: Karuah East Quarry – EPBC 2014/7282*. Prepared for Karuah East Quarry Pty Ltd, October 2014.

Firebird ecoSultants Pty Ltd (2015). Tetratheca juncea *Translocation Management Plan for the Karuah East Quarry Site.* Prepared for Karuah East Quarry Pty Ltd, August 2015.

Kleinfelder (2015). *Biodiversity Offset Area Management Plan: Karuah East Quarry Project*. Prepared for Karuah East Quarry Pty Ltd, January 2016.

SLR (2015). *Landscape and Rehabilitation Management Plan, Karuah East Quarry*. Prepared for Karuah East Quarry Pty Ltd, July 2015.

RPS Australia Pty Ltd (2013). *Terrestrial Ecology Survey and Assessment Report: Karuah East Quarry, Karuah NSW*. Prepared for Karuah East Quarry Pty Ltd, July 2013.

APPENDIX 1 – EPBC Approval 2014/7282

Australian Government
Department of the Environment

Approval

Karuah East Quarry, Pacific Highway, 3 km from Karuah, NSW (EPBC 2014/7282)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Proposed action

Person to whom the approval is granted	Karuah East Quarry Pty Ltd
Proponent's ACN	141 505 035
Proposed action	To develop a hard rock (andesite) quarry and associated infrastructure in the Lower North Coast, Pacific Highway, 3 km north of Karuah, NSW

Approval decision

Controlling Provision	Decision
Listed threatened species and communities (sections 18 & 18A)	Approved

Conditions of approval

This approval is subject to the conditions specified below.

Expiry date of approval

This approval has effect until 30 March 2045.

Decision-maker

name and position	Tim Wyndham Acting Assistant Secretary South-Eastern Australia Environment Assessments Branch
signature	
Date of decision	20.3.15

Conditions attached to the approval

Proposed project area

1. The person taking the action must not impact on any **Black-eyed Susan** or **Trailing Woodruff** outside the **project area** identified at **Appendix A.**

2. The person taking the action must not impact on any habitat for the **Koala** outside the **project area** identified at **Appendix B**.

Mitigation

3. Prior to the **commencement of construction**, the person taking the action must install fencing around the perimeter of the **project area** and identify signed **no-go areas**. Fencing and **no-go areas** must be maintained for the life of the action.

4. Prior to the **commencement of construction** and for the life of the action, all on-site personnel must be inducted on environmental sensitivities in the area, including the risk of **Koala** vehicle strike. Induction material is to be prepared by a **suitably qualified ecologist.**

5. Should injury to Koalas occur, advice from a **wildlife expert** must be sought and action taken in accordance with that advice. Records of any Koala injury within the **project area** must be documented and maintained.

6. Within 48 hours before the clearing of vegetation, pre-clearance surveys must be undertaken by a **suitably qualified ecologist** to ensure the absence of the **Koala** in the **project area**. If any **Koalas** are found to be present, **salvage and translocation** must be undertaken by a **suitably qualified ecologist**.

Offsets

7. The person taking the action must comply with the offset conditions set out in the **NSW Project Approval.**

8. Prior to the **commencement of construction**, to compensate for the impact to the **Trailing Woodruff** and habitat for the **Koala**, the person taking the action must secure suitable offset sites consistent with the **Karuah East Quarry EPBC Act Assessment Report.** In the case that offsets for the **Trailing Woodruff** or habitat for the **Koala** consistent with those set out in the **Karuah East Quarry EPBC Act Assessment Report** cannot be secured, alternative offset sites must be secured, consistent with the **EPBC Act Offsets Policy.**

9. Prior to the **commencement of construction**, the person taking the action must provide the **Minister** with a Biodiversity Area Offset Management Plan for approval. The Biodiversity Area Offset Management Plan must be consistent with the **NSW Project Approval** and include:

    a) **survey information** identifying the number of **Trailing Woodruff** present across all proposed offset sites; and

    b) details on the management and monitoring of the **Trailing Woodruff**, and corrective actions and **contingency plans** to be implemented where the re-establishment of the **Trailing Woodruff** fails to meet targets specified in the **Karuah East Quarry EPBC Act Assessment Report**.

    The approved Biodiversity Area Offset Management Plan must be implemented.

Administrative

10. Within 30 days after the **commencement of construction**, the person taking the action must advise the **Department** in writing of the actual date of **commencement of construction**.

11. The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plan, and make it available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be publicised through the general media.

12. Within three months of every 12 month anniversary of the **commencement of construction**, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval over the previous 12 months, including implementation of any management plan, as specified in the conditions. Documentary evidence providing proof of the date of publication must be provided to the Department at the same time as the compliance report is published. The compliance reports must remain on the website for 12 months from the date of publishing. Potential or actual contraventions of the conditions of the approval must be reported to the **Department** in writing within 2 business days of the person taking the action becoming aware of the potential or actual contravention. All contraventions must also be included in the compliance reports.

13. Upon the direction of the **Minister**, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.

14. If the person taking the action wishes to carry out any activity otherwise than in accordance with the management plan as specified in the conditions, the person taking the action must submit to the Department for the **Minister**'s written approval a revised version of that management plan. The varied activity shall not commence until the **Minister** has approved the varied management plan in writing. If the **Minister** approves the revised management plan, that management plan must be implemented in place of the management plan originally.

15. If the **Minister** believes that it is necessary or convenient for the better protection of listed threatened species and ecological communities to do so, the **Minister** may request that the person taking the action make specified revisions to the management plan specified in the conditions and submit the revised management plan for the **Minister's** written approval. The person taking the action must comply with any such request. The revised approved management plan must be implemented. Unless the **Minister** has approved the revised management plan then the person taking the action must continue to implement the management plan originally approved, as specified in the conditions.

16. If, at any time after 5 years from the date of this approval, the person taking the action has not **substantially commenced** the action, then the person taking the action must not **substantially commence** the action without the written agreement of the **Minister**.

17. Unless otherwise agreed to in writing by the **Minister**, the person taking the action must publish all management plans referred to in these conditions of approval on their website. Each management plan must be published on the website within 1 month of being approved. The person taking the action must notify the **Department** within 5 business days of publishing the management plan on their website and the management plan must remain on the website for the period this approval has effect.

Definitions:

Black-eyed Susan is the EPBC listed threatened species *Tetratheca juncea.*

Commencement of construction is the date that preparatory works are first undertaken, including but not limited to clearing of vegetation, the erection of any onsite temporary structures and the use of heavy duty equipment for the purpose of breaking the ground for infrastructure or earthworks. This does not include investigative activities such as accessing the site for surveying or planning purposes.

Contingency plans include compensatory measures such as additional direct offsets which would be required to meet the EPBC Act Offsets Policy.

Department means the Australian Government Department administering the *Environment Protection and Biodiversity Conservation Act 1999.*

EPBC Act Offsets Policy means the Australian Government policy document titled: *EPBC Act environmental offsets policy Department of the Environment, 2013 Policy guiding the use of offsets under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).*

Karuah East Quarry EPBC Act Assessment Report means the report prepared by Eco Logical Australia, October 2014.

Koala is the EPBC listed threatened species *Phascolarctos cinereus.*

Minister means the Australian Government Minister administering the *Environment Protection and Biodiversity Conservation Act 1999* and includes a delegate of the Minister.

No-go areas means areas adjacent to the **project area** containing habitat for EPBC listed threatened species, to be excluded from construction, vehicles, personnel and equipment.

NSW Project Approval means Project Approval number 09_0175, granted under section 75J of the *Environmental Planning and Assessment Act 1979* by the Minister for Planning to Karuah East Quarry Pty Ltd and dated 17 June 2014.

Project area means the Karuah East Hard Rock Quarry identified by the red line at Appendix A and Appendix B.

Salvage and translocation means the relocation of animals or plants from an area adversely affected by development to an area reserved or protected from ongoing impacts.

Substantially commence/d means the installation of any permanent infrastructure associated with the action excluding signage and fences.

Suitably qualified ecologist means an ecologist with relevant tertiary qualifications and at least 2 years of experience in koala surveying and salvage and translocation.

Survey information is data gathered by a **suitably qualified ecologist**.

Trailing Woodruff is the EPBC listed threatened species *Asperula asthenes.*

Wildlife expert means a practicing expert (such as a veterinarian) with qualifications in caring for injured wildlife and access to adequate equipment to provide appropriate care.

Appendix A – locations of the Black-eyed Susan and Trailing Woodruff in the **project area** and surrounding properties.

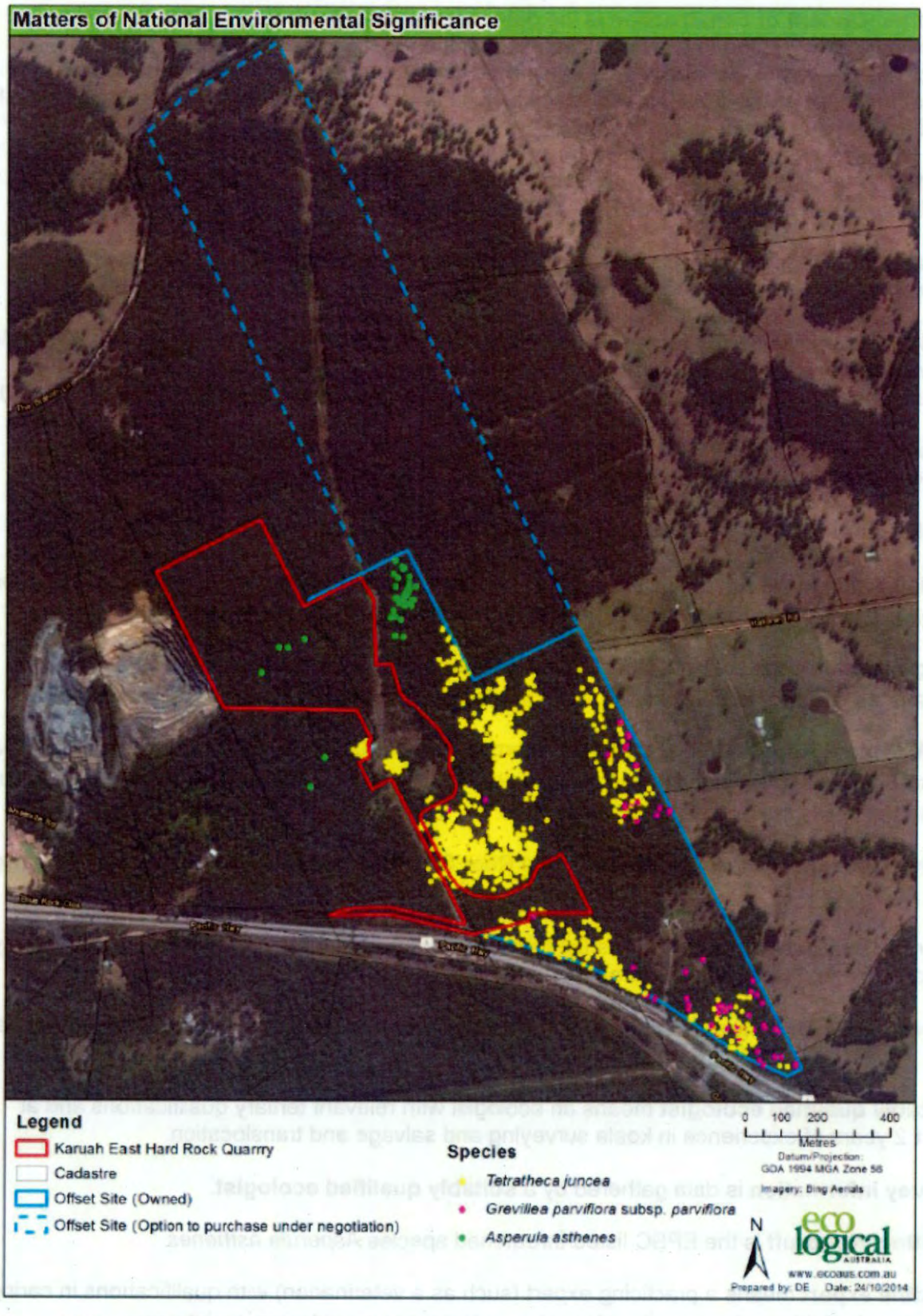


Figure 11 Threatened species recorded within the offset site

Appendix B – location of Koala habitat in the **project area** and surrounding properties

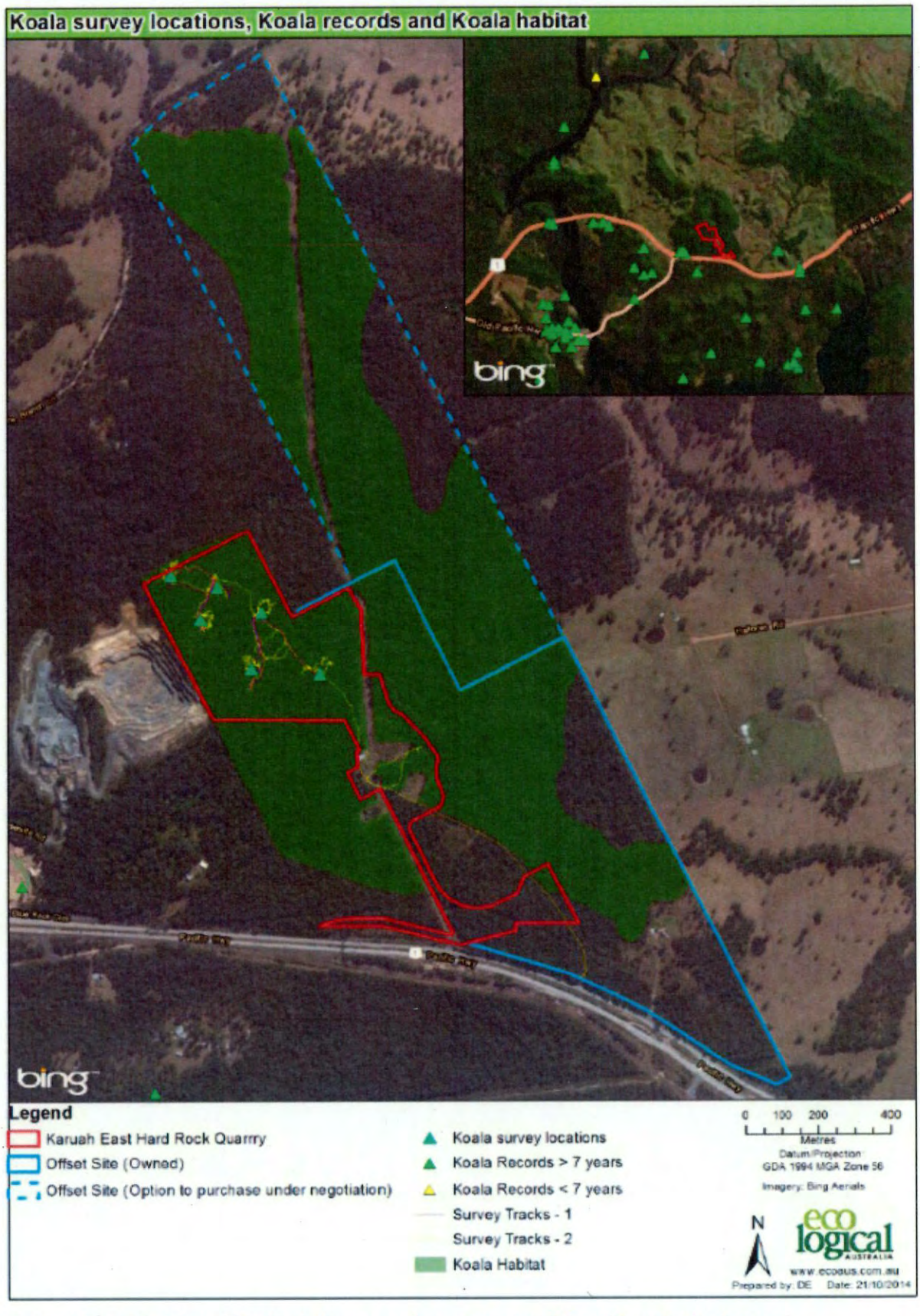
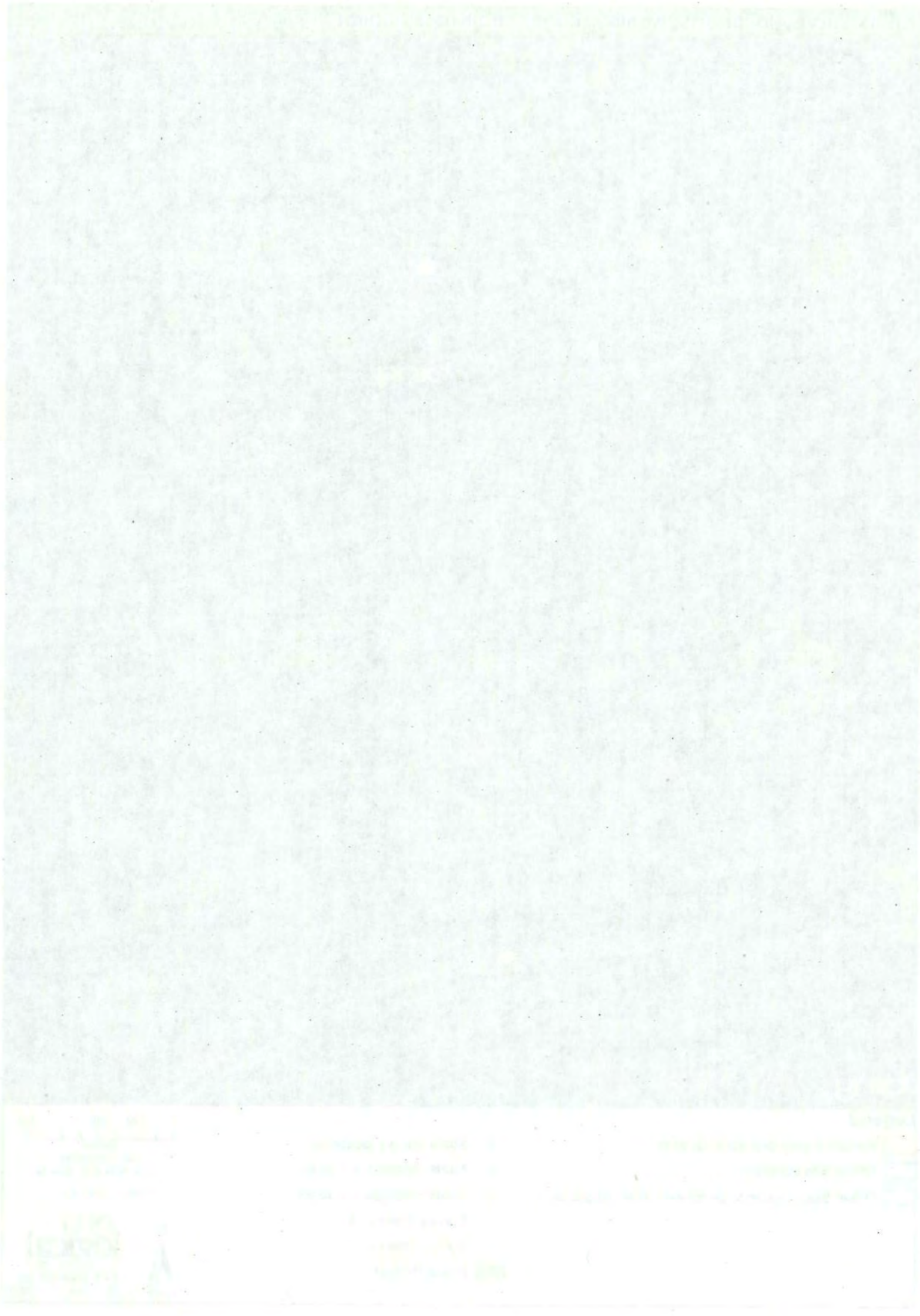


Figure 9 Koala habitat within both the quarry impact area and the adjacent offset areas



APPENDIX 2 – Project Approval 09_0175

Project Approval

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

As delegate of the Minister for Planning and Environment, the Planning Assessment Commission approves 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.

Alan Coutts
Member of the Commission

David Johnson
Member of the Commission

Sydney 17 June 2014

SCHEDULE 1

Application Number:	09_0175
Proponent:	Karuah East Quarry Pty Limited
Approval Authority:	Minister for Planning and Environment
Land:	Lot 12 DP 1024564 Lot 13 DP 1024564 Lot 202 DP 1042537 Lot 26 DP 1024341 Lot 27 DP 1024341 Lot 16 DP 1024564 Lot 17 DP 1024564
Project:	Karuah East Quarry Project

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DEFINITIONS

Annual review	The review required under 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 4
CCC	Community Consultative Committee
Conditions of this approval	Conditions contained in Schedules 1 to 5 inclusive
Council	Great Lakes Council
CPI	Australian Bureau of Statistics Consumer Price Index
Day	The period from 7.00 am to 6.00 pm Monday to Friday, and from 7.00 am to 1.00 pm on Saturday
DRE	Division of Resources and Energy within the Department of Trade and Investment, Regional Services and Infrastructure
EA	Environmental Assessment titled *Environmental Assessment Report, Proposed Karuah East Hard Rock Quarry*, prepared by ADW Johnson Pty Limited and dated 31 January 2013, including the response to submissions prepared by ADW Johnson Pty Limited and dated 31 May 2013 and the Preferred Project Report titled *Preferred Project Report Proposed Karuah East Quarry*, prepared by ADW Johnson Pty Limited and dated 30 July 2013
EPA	NSW Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence under the *POEO Act*
Extraction Area	Extraction Area shown in Figure 1 in Appendix 1
Feasible	Feasible relates to engineering considerations and what is practical to build
Incident	A set of circumstances that: • causes or threatens to cause material harm to the environment; and/or • breaches or exceeds the limits or performance measures/criteria in this approval
km	Kilometre
Land	As defined in the EP&A Act, except where 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
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 Environment, or delegate
NOW	NSW Office of Water
OEH	Office of Environment and Heritage
POEO Act	*Protection of the Environment Operations Act 1997*
Privately-owned land	Land that is not owned by a public agency or the Proponent (or its subsidiary)
Project	The development as described in the EA
Proponent	Karuah East Quarry Pty Limited, or its successors in title, or any other person who seeks to carry out the project
Quarrying operations	Includes the removal of overburden and extraction, processing, handling, storage and transportation of quarry products on the site
Quarry products	Extractive material which extracted from and transported from the 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 treatment or management of land disturbed by the project for the purpose of establishing an appropriately revegetated, safe, stable and non-polluting environment
RMS	Roads and Maritime Services

Secretary	Secretary of Planning and Environment, or nominee
Statement of commitments	The Proponent's commitments in Appendix 6
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.*
   - *The statement of commitments is reproduced in Appendix 6.*

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 Secretary 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 2034.

   Note: Under this approval, the Proponent is required to rehabilitate the site and carry out additional undertakings to the satisfaction of the Secretary. 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.

Production Limit

6. The Proponent shall not extract, process and transport more than 1.5 million tonnes of quarry products from the site in any calendar year.

Hours of Operation

7. The Proponent shall comply with the operating hours in Table 1.

Table 1: Operating hours

Activity	***Operating Hours***
Quarrying Operations	7.00 am to 6.00 pm, Monday to Friday; and 7.00 am to 1.00 pm, Saturdays. No quarrying operations on Sundays or Public Holidays.
Construction activities	7.00 am to 6.00 pm, Monday to Friday; and 8.00 am to 1.00 pm, Saturdays, unless noise from these activities does not exceed 35dB(A)$L_{Aeq(15\ min)}$ at any privately-owned residence.

Maintenance activities	24 hours a day, 7 days per week, providing maintenance activities are inaudible at any privately-owned residence

Note: This condition does not apply in the event of a direction from police or other relevant authority for safety or emergency reasons regarding works which may need to be undertaken to avoid loss of life, property loss and/or to prevent environmental harm.

STRUCTURAL ADEQUACY

8. 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.

Notes:

- *Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for proposed building works.*
- *Part 8 of the EP&A Regulation* sets out the requirements for the certification of the project.

DEMOLITION

9. 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

10. 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.

DEVELOPER CONTRIBUTIONS

11. The Proponent shall pay Council, in accordance with Council's *Great Lakes Wide Development Contributions Plan (November 2007) – Amended*:
    (a) a one-off Headquarters Building contribution of $1.00 per $1,000.00 of capital value of the project*;* and
    (b) annual road maintenance contributions of $.037 per tonne per km, for every tonne of quarry products transported from the site on local roads in accordance with Council's *Great Lakes Wide Development Contributions Plan (November 2007) – Amended.* Each payment must be:
        (i) paid to Council at the end of each calendar year;
        (ii) based on weighbridge records of the quantity of quarry products transported from the site; and
        (iii) increased annually over the life of the project in accordance with the CPI.

Note: If the parties are not able to agree on any aspect of the road maintenance contributions, either party may refer the matter to the Secretary for resolution.

OPERATION OF PLANT AND EQUIPMENT

12. 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

13. With the approval of the Secretary, 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

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

SCHEDULE 3
ENVIRONMENTAL PERFORMANCE CONDITIONS

IDENTIFICATION OF APPROVED LIMITS OF EXTRACTION

1. The Proponent shall, prior to carrying out quarrying operations on the site:
   (a) engage a registered surveyor to mark out the boundaries of the approved limits of extraction within the Extraction Area; and
   (b) submit a survey plan of the extraction boundaries,
   to the satisfaction of the Secretary.

2. The Proponent shall ensure that the extraction boundaries are clearly marked at all times while quarrying operations are being carried out, in a manner that allows the limits of extraction to be clearly identified.

NOISE

Operational Noise Criteria

3. The Proponent shall ensure that the operational noise generated by the project does not exceed the criteria in Table 2.

Table 2: Operational noise criteria (dB(A) $L_{Aeq(15\ min)}$)

Location	***Criteria (day)***
Residence on Lot 11 DP 1024564	43
A	40
B	37
G	38
All other residences	35

Notes:
- *Receiver locations are shown in Appendix 2.*
- *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.*
- *Appendix 4 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.*

However, the noise criteria in Table 2 do not apply if the Proponent has an agreement with the relevant landowner to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of the agreement.

Road Traffic Noise Criteria

4. The Proponent shall take all reasonable and feasible measures to ensure that the traffic noise generated by the project does not cause additional exceedances of the criteria in Table 3 at any residence on privately-owned land.

Table 3: Road traffic noise criteria (dB(A) $L_{Aeq(period)}$)

Road	***Criteria (day)***
Pacific Highway	60
Local roads	55

Cumulative Noise Criteria

5. The Proponent shall implement all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by adjacent quarrying operations does not cause any exceedances of the criteria in Table 4.

Table 4: Cumulative noise criteria (dB(A) $L_{Aeq(period)}$)

Location	***Criteria (day)***
F	50
G	50
All other privately-owned residences, except the residence on Lot 11	55

Notes:

- *Receiver locations are shown in Appendix 2.*
- *The structure used as a residence on Lot 11 is excluded from Table 4 because the other major contributor to cumulative noise totals is quarrying operations conducted on this Lot, under agreement with the Lot owner.*
- *Cumulative noise is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.*
- *Appendix 4 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.*

Operating Conditions

6. The Proponent shall:
   (a) implement best management practice, to minimise the construction, operational and traffic noise of the project;
   (b) minimise the noise impacts of the project during meteorological conditions when the noise limits in this approval do not apply; and
   (c) regularly assess noise monitoring data and relocate, modify, and/or stop operations on site to ensure compliance with the relevant conditions of this approval;
   (d) apply and enforce a speed limit of 40 km/hour for all project-related vehicles on site;
   (e) ensure that project-related trucks slowing to use the intersection of Branch Lane and Andesite Road do not use engine or compression braking systems,

   to the satisfaction of the Secretary.

Noise Management Plan

7. The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must:
   (a) be prepared by a suitably qualified expert whose appointment has been approved by the Secretary;
   (b) be prepared in consultation with EPA, and submitted to the Secretary for approval prior to the commencement of construction activities;
   (c) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this approval;
   (d) describe the proposed noise management system in detail; and
   (e) include a monitoring program that:
      - uses attended and unattended monitoring to evaluate the compliance of the project against the noise criteria in this approval;
      - evaluates and reports on:
        - the effectiveness of the on-site noise management system; and
        - compliance against the noise operating conditions; and
      - defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.

BLASTING

Blasting Criteria

8. The Proponent shall ensure that blasting on the site does not cause exceedances of the criteria in Table 5.

Table 5: 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 landowner or infrastructure provider/owner, and the Proponent has advised the Department in writing of the terms of this agreement.

Blasting Hours

9. The Proponent shall ensure that blasting on site is only carried out during the hours in Table 6.

Table 6: Blasting hours

Day	***Blasting hours***
Monday – Friday	9.00 am to 4.00 pm
Saturdays, Sundays and Public Holidays	No blasting

Blasting Frequency

10. The Proponent shall not carry out more than 2 blasts a week on the 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.

Operating Conditions

11. The Proponent shall:
    (a) implement best blast 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 blast;
    (b) schedule blasts to avoid the blasting schedule of any nearby quarrying operation;
    (c) operate a suitable system to enable the public to get up-to-date information on the proposed blasting schedule on the site, and
    (d) not undertake blasting within 500 metres of:
        (i) any public road without the approval of the relevant road authority; or
        (ii) 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 Secretary 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,

    to the satisfaction of the Secretary.

Blast Management Plan

12. The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be prepared by a suitably qualified expert whose appointment has been approved by the Secretary;
    (b) be prepared in consultation with Council and EPA, and submitted to the Secretary for approval prior to the commencement of construction activities;
    (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 protocol if blasting occurs within 500 metres of a public road;
    (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

13. 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 7 to 9 at any residence on privately-owned land.

Table 7: 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 8: 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 9: 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 7-9:

- [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 Secretary in consultation with EPA.*

Greenhouse Gas Emissions

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

Operating Conditions

15. The Proponent shall:
    (a) implement best management practice to minimise dust emissions by the project;
    (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 air quality criteria in this approval;
    (c) minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see note d under Tables 7-9); and
    (d) minimise surface disturbance of the site, other than as permitted under this approval.

Air Quality Management Plan

16. The Proponent shall prepare and implement an Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be prepared by a suitably qualified expert whose appointment has been approved by the Secretary;
    (b) be prepared in consultation with Council and EPA, and submitted for approval to the Secretary prior to the commencement of construction activities;
    (c) describe the measures that would be implemented to ensure:
        - compliance with the relevant air quality conditions of this approval;
        - best management practice is employed; and
        - the air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events;
    (d) describe the proposed air quality management system; and
    (e) include a 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;
        - effectively supports the air quality management system; and
        - evaluates and reports on the adequacy of the air quality management system.

METEOROLOGICAL MONITORING

17. 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.

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

18. 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

19. The Proponent shall comply with the discharge limits in any EPL, or with Section 120 of the POEO Act.

Effluent Management

20. The Proponent shall:
    (a) not irrigate, discharge or dispose of sewage or bathroom effluent from the site; and
    (b) operate and maintain a suitable effluent storage facility,
    to the satisfaction of Council and EPA.

Water Management Plan

21. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with the EPA and NOW by suitably qualified and experienced person/s whose appointment has been approved by the Secretary;
    (b) be submitted to the Secretary for approval prior to the commencement of construction activities;
    (c) include:
        (i) a Site Water Balance that includes details of:
            - sources and security of water supply, including contingency planning;
            - water use on site; and
            - measures that would be implemented to minimise use of clean water and maximise recycling of dirty water on the site;
        (ii) a Surface Water Management Plan, that includes:
            - 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 the site, including the design objectives and performance criteria for the:
                - clean water diversions;
                - erosion and sediment controls;
                - water storages (including Maximum Harvestable Rights requirements); and
                - control of water pollution from areas of the site that have been rehabilitated;
            - surface water impact assessment criteria, to be developed following analysis of baseline data, including trigger levels for investigating any potentially adverse surface water quality impacts;
            - a program to monitor:
                - any surface water discharges;
                - the effectiveness of the water management system;
                - surface water flows and quality in local watercourses; and
                - ecosystem health of local watercourses; and
            - an assessment of appropriate options to improve storage and retention times in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom);
        (iii) a Groundwater Monitoring Program that includes:
            - baseline data of groundwater levels surrounding the site;
            - groundwater impact assessment criteria, to be developed following analysis of baseline data, including trigger levels for investigating any potentially adverse groundwater impacts; and
            - a program to monitor and/or validate the impacts of the project on groundwater resources; and
        (iv) a Surface and Ground Water Response Plan that describes the measures and/or procedures that would be implemented to:
            - respond to any exceedances of the surface water impact assessment criteria and groundwater impact assessment criteria; and
            - mitigate and/or offset any adverse impacts on surface water and groundwater resources located within and adjacent to the site.

TRANSPORT

Roadworks

22. The Proponent shall, at its own cost, complete the following roadworks shown conceptually in Figure 2 of Appendix 1, prior to transporting quarry products from the site:
    (a) extending Blue Rock Close, with tar seal and appropriate pavement, road markings and advance warning signage, to the satisfaction of Council and RMS;
    (b) realigning and upgrading the Blue Rock Close/Andersite Road intersection with appropriate road markings, pavement thickening and advance warning signage, to the satisfaction of Council;

(c) upgrading the Branch Lane/Andersite Road intersection with appropriate road markings and advance warning signage, to the satisfaction of Council;
(d) constructing the site access road on Lots 12 and 13 DP 1024564 with appropriate pavement and advance warning signage, to the satisfaction of Council; and
(e) installing a wheel-wash facility on the site.

Monitoring of Product Transport

23. The Proponent shall:
(a) keep accurate records of:
- the amount of quarry products transported from the site (per calendar month and year); and
- the number of laden truck movements from the site (per hour, day, week, calendar month and year); and

(b) publish these records on its website quarterly.

Parking

24. The Proponent shall provide sufficient parking on-site for all project-related traffic, in accordance with Council's parking codes, to the satisfaction of the Secretary.

Operating Conditions

25. The Proponent shall ensure that all project-related heavy vehicles:
(a) enter and exit the site in a forward direction; and
(b) exit the site with loads covered.

Transport Management Plan

26. The Proponent shall prepare and implement a Transport Management Plan for the project to the satisfaction of the Secretary. This plan must:
(a) be prepared by a suitably qualified traffic consultant whose appointment has been approved by the Secretary;
(b) be prepared in consultation with RMS and Council, and submitted to the Secretary for approval prior to the commencement of construction activities;
(c) include a Driver Code of Conduct;
(d) describe the measures that would be implemented to ensure:
- compliance with the relevant conditions of this approval;
- that drivers of project-related heavy vehicles are aware of potential safety issues along the haulage routes; and
- that drivers of project-related heavy vehicles comply with the Driver Code of Conduct; and

(e) include a program to monitor the effectiveness of these measures.

LANDSCAPE

***Tetratheca Juncea* Translocation**

27. The Proponent shall develop and implement a translocation program for *Tetratheca juncea* to the satisfaction of the Secretary. This program must:
(a) be prepared in consultation with OEH, by a suitably qualified and experienced ecologist whose appointment has been approved by the Secretary;
(b) be submitted to the Secretary for approval prior to the commencement of construction activities that involve clearing of or potential harm to *Tetratheca juncea*;
(c) include measures for the translocation of all *Tetratheca juncea* stems in the area of disturbance to nearby areas with similar physical and biological habitat features;
(d) include a monitoring program to study the *Tetratheca juncea* stems before and after translocation;
(e) include short and long-term goals and performance criteria to measure the effectiveness of the program; and
(f) provide for the transfer of information obtained as a result of implementing the program to OEH and P&I.

Biodiversity Offset Strategy

28. The Proponent shall, prior to the commencement of vegetation clearing activities, finalise and implement the Biodiversity Offset Strategy, as described in the EA, summarised in Table 10 and shown conceptually in Figure 1 of Appendix 4, in consultation with OEH and Council, and to the satisfaction of the Secretary.

Table 10: Biodiversity Offset Strategy

Area	***Offset Type***	***Minimum Size (ha)***
Offset Area	Existing vegetation to be managed and enhanced	129.32 ha

Note: The Biodiversity Offset Strategy shall direct that the land proposed as the Biodiversity Offset shall be free of any dwelling-houses and associated sheds, bushfire asset protection zones and other related utilities or structures so as to preserve the integrity and function of that offset area. The Biodiversity Offset Strategy shall also provide details of the revegetation of any parts of the offset area that are cleared of native vegetation or are in an otherwise substantially modified state, other than required management trails and boundary fencing buffer distances.

.

Long Term Security of Offsets

29. The Proponent shall, within 12 months of the finalisation of the Biodiversity Offset Strategy, make suitable arrangements to provide appropriate long-term security for the offset area, in consultation with OEH and Council, and to the satisfaction of the Secretary.

Note: In order of preference, mechanisms to provide appropriate long term security to the land within the Biodiversity Offset Strategy include transfer to the National Park Estate, Biobanking Agreement, Voluntary Conservation Agreement, or restrictive covenant on land titles.

Rehabilitation Objectives

30. The Proponent shall rehabilitate the site to the satisfaction of the Secretary. This rehabilitation must:
(a) be generally consistent with the rehabilitation strategy as described in the EA and shown conceptually in Figure 1 in Appendix 5; and
(b) comply with the objectives in Table 11.

Table 11: Rehabilitation Objectives

Feature	***Objective***
Site (as a whole)	Safe, stable & non-polluting.
Surface Infrastructure	To be decommissioned and removed, unless the Secretary agrees otherwise.
Quarry Wall Benches	Landscaped and revegetated utilising native tree and understorey species, ensuring that the tree canopy is restored and integrated with the surrounding tree canopy.
Quarry Pit Floor	Landscaped and revegetated with wetland vegetation.
Other land affected by the project	Restore ecosystem function, including maintaining or establishing self-sustaining eco-systems comprised of: • native endemic species; and • a landform consistent with the surrounding environment.
Community	Ensure public safety. Minimise the adverse socio-economic effects associated with quarry closure.

Progressive Rehabilitation

31. The Proponent shall:
(a) rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance;

(b) take all reasonable and feasible measures to minimise the total area of the site exposed at any time; and
(c) implement interim rehabilitation strategies where areas prone to dust generation cannot yet be permanently rehabilitated.

Landscape and Rehabilitation Management Plan

32. The Proponent shall prepare and implement a Landscape and Rehabilitation Management Plan for the project to the satisfaction of the Secretary. This Plan would relate to the area of the quarry and all perimeter lands. This plan must:

a. be prepared by a suitably qualified expert whose appointment has been approved by the Secretary;
b. be prepared in consultation with OEH and Council, and submitted to the Secretary for approval prior to the commencement of construction activities;
c. describe how the implementation of the Tetratheca juncea Translocation Program would be integrated with the overall rehabilitation of the site;
d. describe the short, medium and long-term measures that would be implemented to:
    - manage remnant vegetation and habitat on the site; and
    - ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations of this approval.
e. include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, including triggers for any remedial action;
f. include a detailed description of the measures that would be implemented over the next 3 years (to be updated for each 3 year period following initial preparation of the plan), including the procedures to be implemented for:
    - ensuring compliance with the rehabilitation objectives and progressive rehabilitation obligations of this approval;
    - enhancing the quality of remnant vegetation and fauna habitat;
    - restoring native endemic vegetation and fauna habitat within the rehabilitation area, including details of the target revegetation communities of the rehabilitated landform;
    - coordinating the relocation of native fauna to protected habitats associated with pre-clearing fauna surveys;
    - 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 rehabilitation area;
    - collecting and propagating seed;
    - ensuring minimal environmental consequences for threatened species, populations and habitats;
    - minimising the impacts on native fauna on site, including the details and implementation of appropriate pre-clearance surveys;
    - minimising the impacts on fauna movement between undisturbed areas of the site and nearby vegetation (including potential fauna crossings);
    - controlling weeds and feral pests;
    - controlling erosion;
    - controlling access and providing for management trails; and
    - bushfire management and implementation of ecologically appropriate bushfire intervals.
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 Tetratheca juncea Translocation Program and rehabilitation of the site, and include a description of the contingency measures that would be implemented to mitigate these risks;
i. include details as to how the rehabilitated land would be permanently conserved and managed as part of the broader Biodiversity Offset Area approved in these conditions;
j. include details of who would be responsible for monitoring, reviewing, and implementing the plan; and

k. include details as to the timing of actions set-out in the plan

Biodiversity Offset Area Management Plan

33. The Proponent shall prepare and implement a Biodiversity Offset Area Management Plan for the project to the satisfaction of the Secretary. This Plan would relate to the area of the Biodiversity Offset Area required in these Conditions. This plan must:

a. be prepared by a suitably qualified expert whose appointment has been approved by the Secretary;
b. be prepared in consultation with OEH and Council, and submitted to the Secretary within 12-months of the approval of the Biodiversity Offset Strategy required in these conditions;
c. describe how the implementation of the Tetratheca juncea Translocation Program would be integrated with the Biodiversity Offset Area management;
d. describe the short, medium and long-term measures that would be implemented to manage remnant vegetation and habitat on the Biodiversity Offset Area;
e. include detailed performance and completion criteria for evaluating the performance of the conservation, restoration and management of the Biodiversity Offset Area, including triggers for any remedial action;
f. providing for the transfer of environmental resources from the approved disturbance area - including tree hollows, vegetative and soil resources - for beneficial reuse in the enhancement of the Biodiversity Offset Area;
g. providing for the incorporation of the final rehabilitated landform into the Biodiversity Offset Area and its management;
h. include a detailed description of the measures that would be implemented over the next 3 years (to be updated for each 3 year period following initial preparation of the plan), including the procedures to be implemented for:
    - enhancing the quality of remnant vegetation and fauna habitat;
    - restoring native endemic vegetation and fauna habitat within the parts of the Biodiversity Offset Area that are cleared or modified, including details of the target revegetation communities of the restored landform;
    - coordinating the relocation of native fauna to protected habitats associated with pre-clearing fauna surveys;
    - collecting and propagating seed;
    - maximising the protection and restoration of threatened species, populations and habitats in the Biodiversity Offset Area;
    - maximising fauna movement between the Biodiversity Offset Area and adjacent habitats;
    - controlling weeds and feral pests;
    - controlling erosion;
    - controlling access and providing for management trails; and
    - bushfire management and implementation of ecologically appropriate bushfire intervals.
i. include a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;
j. identify the potential risks to successful implementation of the Biodiversity Offset program, and include a description of the contingency measures that would be implemented to mitigate these risks;
k. include details of who would be responsible for monitoring, reviewing, and implementing the plan;
l. include details of the indicative costs of management actions; and
m. include details as to the timing of actions set-out in the plan

Conservation & Rehabilitation Bond

34. The Proponent shall lodge a Conservation and Rehabilitation Bond with P&I within 6 months of the approval of the Landscape and Rehabilitation Management Plan, 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 and Rehabilitation 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 disturbed areas of 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 Secretary.

Notes:

- *If capital and other expenditure required by the Landscape and Rehabilitation Management Plan is largely complete, the Secretary may waive the requirement for the 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 Secretary, then the Secretary will release the bond. If the Biodiversity Offset Strategy and rehabilitation of the site are not completed to the satisfaction of the Secretary, then the Secretary will call in all or part of the bond, and arrange for the completion of the relevant works.*
- *The component of the bond relating to the implementation of the Biodiversity Offset Strategy may be waived, if a separate arrangement is entered into between the Proponent and OEH which satisfactorily replaces that component,to the satisfaction of the Secretary.*

35. 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 Secretary. This review must:

(a) consider the performance of the implementation of the Biodiversity Offset Strategy and rehabilitation of the site to date;

(b) consider the effects of inflation; and

(c) calculate the cost of implementing the Biodiversity Offset Strategy and rehabilitating the disturbed areas of the site (taking into account the likely surface disturbance over the next 3 years of quarrying operations); and

HERITAGE

Heritage Management Plan

36. The Proponent shall prepare and implement a Heritage Management Plan for the project to the satisfaction of the Secretary. This plan must:

(a) be prepared by a suitably qualified expert whose appointment has been approved by the Secretary;

(b) be prepared in consultation with the local Aboriginal community and OEH, and submitted to the Secretary for approval prior to the commencement of construction activities;

(c) describe the measures that would be implemented to:

- monitor initial surface disturbance on site for Aboriginal cultural heritage sites or objects;
- manage the discovery of Aboriginal cultural heritage sites, objects or human remains on site; and
- ensure ongoing consultation with Aboriginal stakeholders in the conservation and management of Aboriginal cultural heritage values on site.

VISUAL

37. The Proponent shall:

(a) ensure that clearing vegetation from any visually prominent ridgeline is undertaken in a progressive manner, to provide for a maximum of 6 months of future quarrying operations; and

(b) mitigate the visual impact of the project through the progressive and early rehabilitation of the upper quarry benches in accordance with the objectives in Table 11,

to the satisfaction of the Secretary.

Advertising Signage

38. The Proponent shall not erect or display any advertising structure or sign on the site without the written approval of the Secretary.

Note: This condition does not apply to business identification, traffic management, and/or safety or environmental signs.

EMEGENCY AND HAZARDS MANAGEMENT

Dangerous Goods and Hazardous Materials

39. The Proponent shall ensure that the storage, handling, and transport of dangerous goods and hazardous materials is conducted in accordance with the relevant *Australian Standards*, particularly AS1940 and AS1596, and the *Dangerous Goods Code*.

Safety

40. The Proponent shall secure the site to ensure public safety at all times, to the satisfaction of the Secretary.

Bushfire Management

41. 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 and emergency services as much as possible if there is a fire in the surrounding area.

WASTE

42. 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 Secretary.

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 the landowner may ask the Secretary in writing for an independent review of the impacts of the project on its land.

   If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision the Proponent shall:
   (a) commission a suitably qualified, experienced and independent expert, whose appointment has been approved by the Secretary, to:
      - consult with the landowner to determine its 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 Secretary 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 Secretary.

   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 Secretary.

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 Secretary. This strategy must:
   (a) be submitted to the Secretary for approval prior to the commencement of construction activities;
   (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 consent 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 Secretary;
   to the satisfaction of the Secretary.

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 Secretary 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 Secretary. 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 the measures that would be implemented over the current calendar year to improve the environmental performance of the project.

Revision of Strategies, Plans and Programs

5. Within 3 months of:
   (a) the submission of an annual review under Condition 4 above;
   (b) the submission of an incident report under Condition 7 below;
   (c) the submission of an audit report under Condition 9 below; or
   (d) any modification to the conditions of this approval, (unless the conditions require otherwise),

   the Proponent shall review the strategies, plans, and programs required under this approval, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.

   Note: The purpose of this condition is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve environmental performance of the project.

Community Consultative Committee

6. The Proponent shall establish and operate a Community Consultative Committee (CCC) for the project. The CCC must:
   (a) be established and 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
   (b) be established prior to the commencement of construction activities,to the satisfaction of the Secretary.

   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 immediately notify the Secretary 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 Secretary 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 Secretary any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

Regular Reporting

8. The Proponent shall regularly report 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 12 months of the commencement of development on the site, and every 3 years thereafter, unless the Secretary 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 a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
   (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 Licence (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 Secretary.

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

ACCESS TO INFORMATION

11. The Proponent shall:
   (a) make the following information publicly available on its website:
      - the EA;
      - any statutory approvals for the project;
      - approved strategies, plans and/ 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 quarterly;
      - minutes of CCC meetings;
      - annual reviews;
      - any independent environmental audit, and the Proponent's response to the recommendations in any audit; and
      - any other matter required by the Secretary; and

   (a) keep this information up-to-date, to the satisfaction of the Secretary.

APPENDIX 1
PROJECT LAYOUT

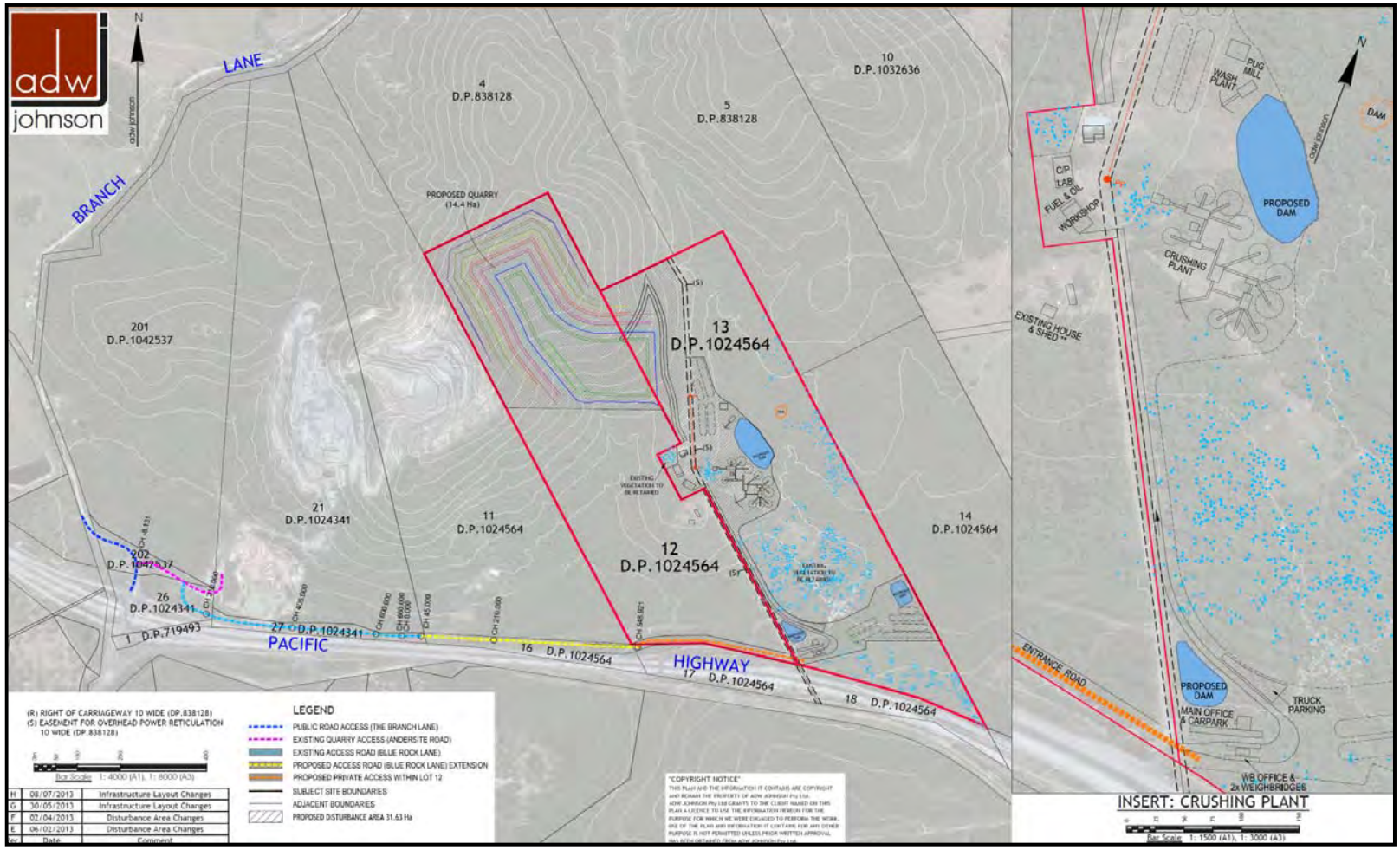

***Figure 1**: Project Layout*

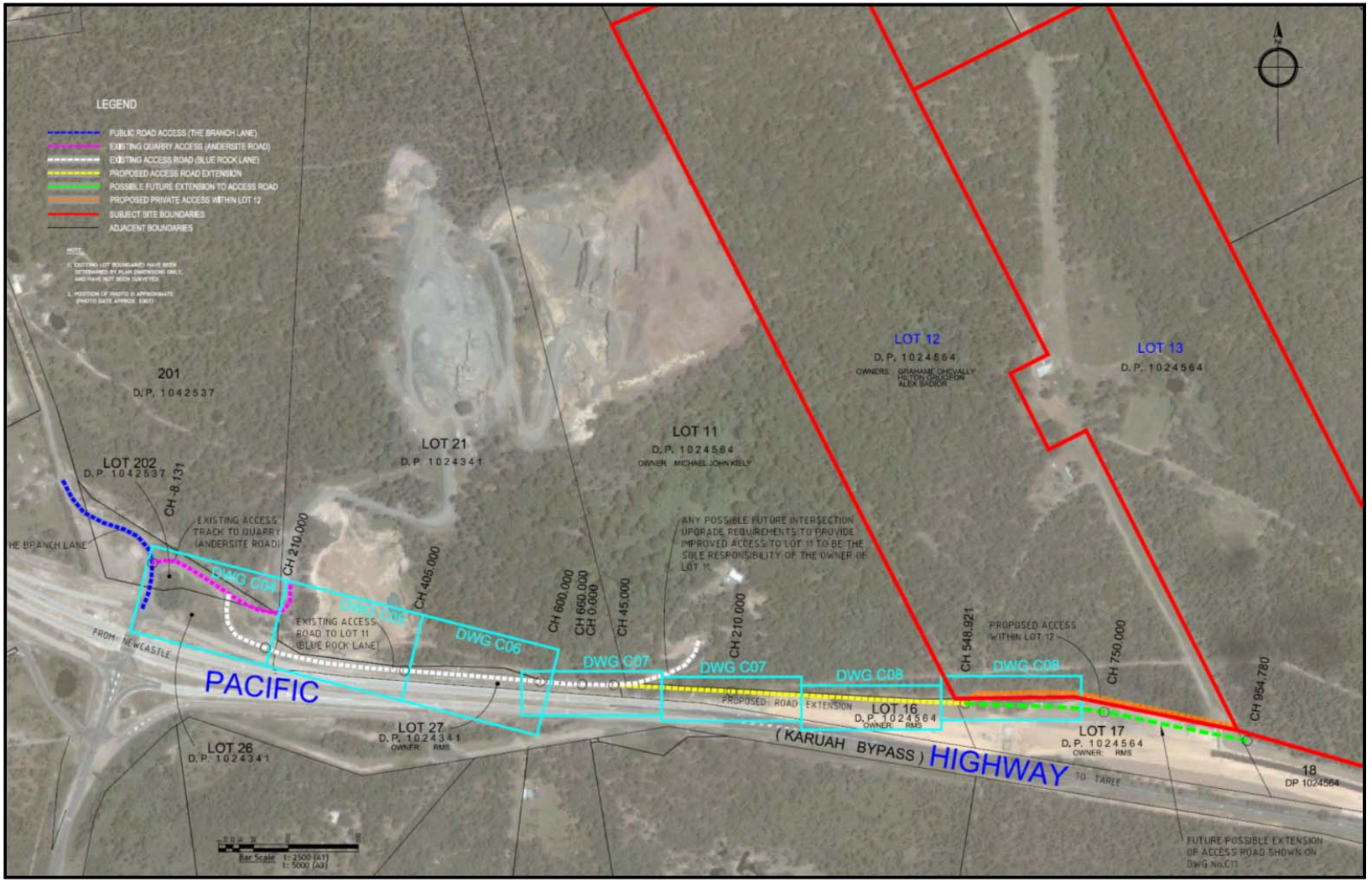

Figure 2: *Proposed roadworks*

APPENDIX 2
NOISE RECEIVER LOCATIONS

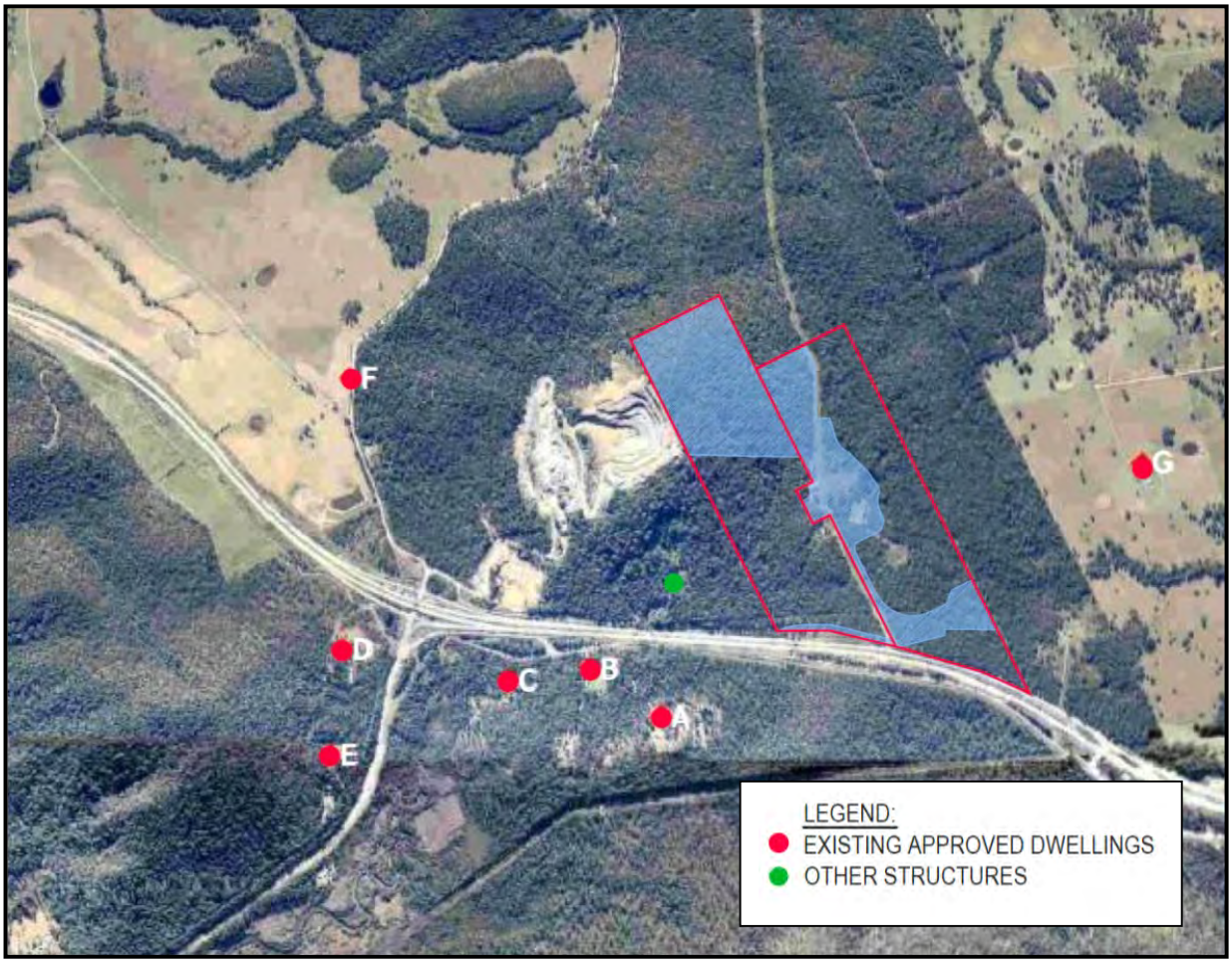

Figure 1: Closest residences

APPENDIX 3
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Tables 2 and 4 are to apply under all meteorological conditions except the following:
   (a) during periods of rain or hail; or
   (b) wind speeds greater than 3 m/s measured at 10 m above ground level.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station in the vicinity of the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this approval.

4. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

APPENDIX 4
CONCEPTUAL BIODIVERSITY OFFSET AREA

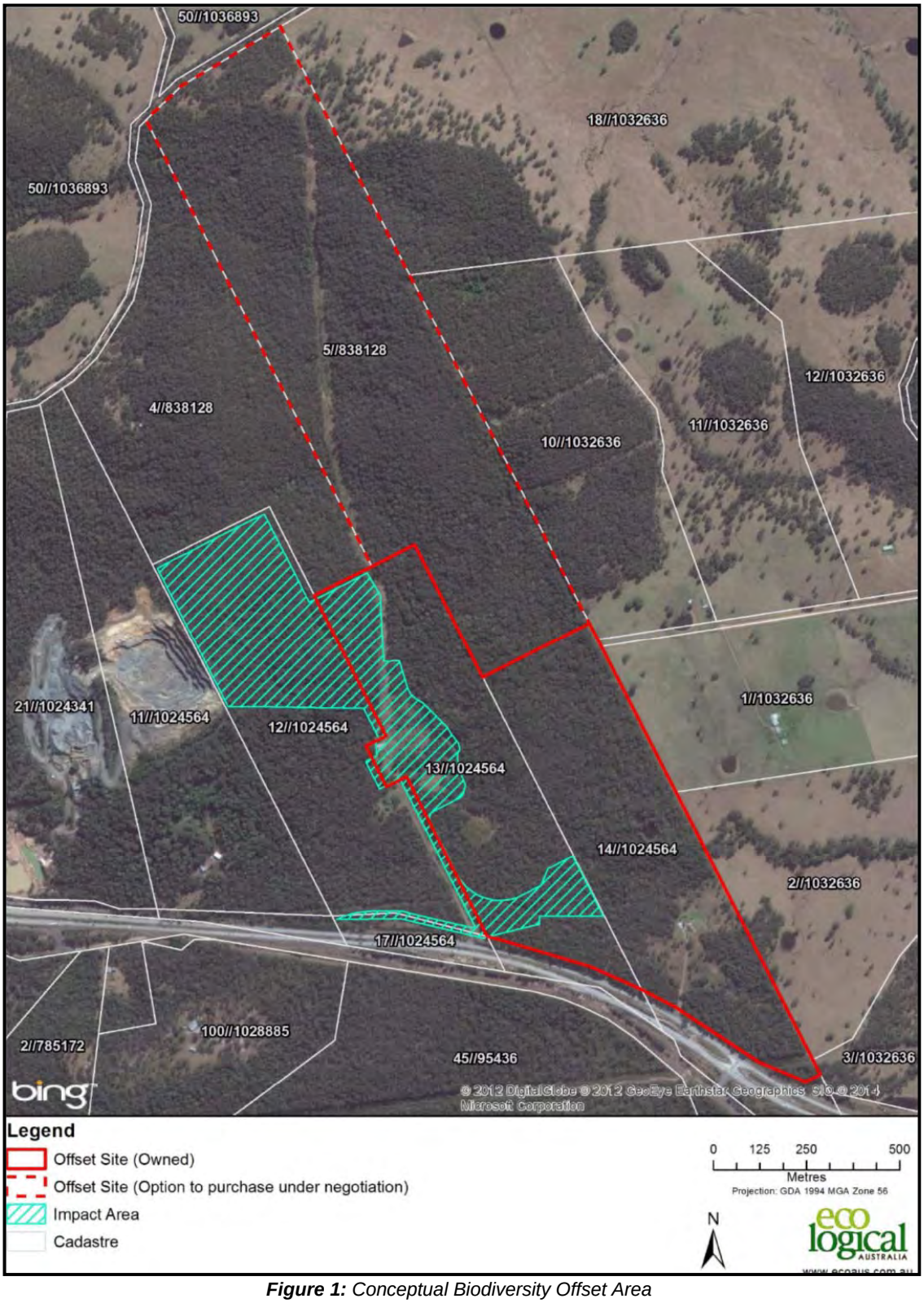

Figure 1: *Conceptual Biodiversity Offset Area*

APPENDIX 5
REHABILITATION STRATEGY

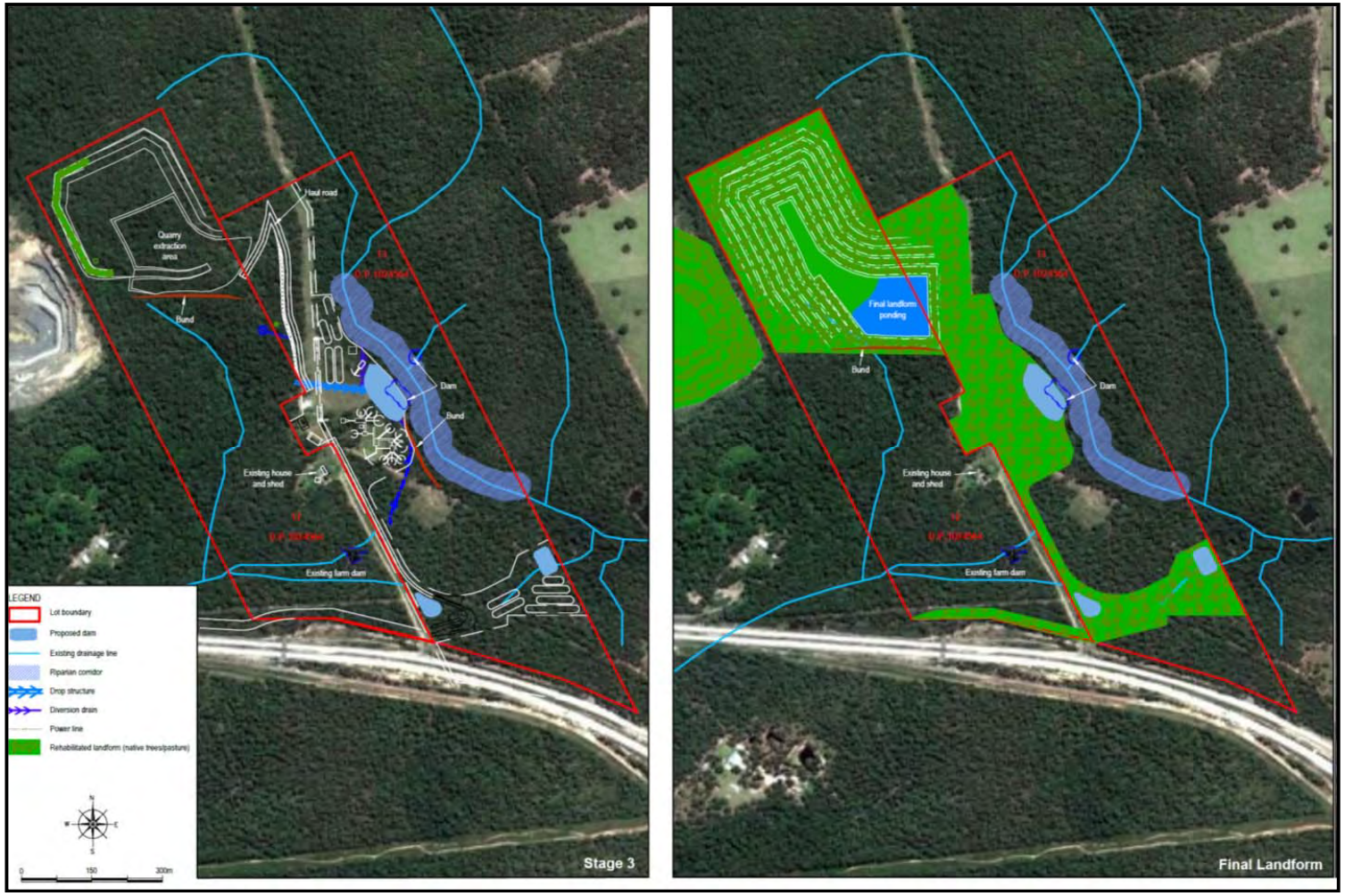

Figure 1: *Conceptual Rehabilitated Landform*

APPENDIX 6
STATEMENT OF COMMITMENTS

APPENDIX 6
STATEMENT OF COMMITMENTS

STATEMENT OF COMMITMENTS

The following section outlines the proponent's commitment to implement construction and operational strategies relating to environmental management and mitigation measures. This section details how the proposal and its environmental safeguards will be implemented and managed in an integrated and feasible manner.

1.0 PLANS, DOCUMENTS AND APPROVALS

The proposed development will be completed in accordance with the submitted plans and descriptions of the proposed development provided in the Environmental Assessment Report (31 January 2013) and the Preferred Project Report (30 July 2013).

Any changes to the proposed development will require further approval of the relevant authorities.

The proposed development will be carried out in accordance with all approvals granted by relevant authorities.

2.0 SUMMARY OF MANAGEMENT PLANS

The following management plans will be prepared prior to commencement of construction works:

- Construction Environmental Management Plan (CEMP);
- Environmental Management Plan (EMP). The EMP will ensure that the commitments made in the EA Report and Preferred Project Report and the requirements under subsequent approval and license conditions are fully implemented. The EMP will confirm who is responsible and when the commitments associated with the mitigation and monitoring strategies should be implemented/undertaken;
- Annual Environmental Management Report (AEMR);
- Pre clearing survey;
- Vegetation Management / Monitoring Plan;
- Conservation Management Plan;
- Soil Management Plan;
- Groundwater Monitoring Plan;
- Surface Water Management Plan (including erosion and sediment control and monitoring);
- Noise Monitoring Plan;

- Blasting Management Plan;
- Air Quality Monitoring Plan;
- Construction Traffic Management Plan;
- Environmental Management Strategy;
- Quarry Closure and Rehabilitation Plan; and
- Waste Management Plan.

3.0 SOIL AND WATER

3.1 Soil Management

Soil Management

The following will be undertaken:

- Topsoil will be stripped in accordance with the recommended stripping depth for each soil type, together with area of land and calculated volume which are provided in the table below;

Table 1 - Recommended Stripping Depths

Soil Type	Project Soil Name	Soil Layer	Recommended Stripping Depth (m)	Area (ha)	Volume (m^3)
1	Brown Chromosols	Topsoil	0.30	8.63	25,890
		Subsoil	0.90	8.63	77,670
2	Red Dermosols	Topsoil	0.10	4.55	4,550
		Subsoil	1.10	4.55	50,050
3	Leptic Tenosols	Topsoil	0.0	16.4	0
		Subsoil	0.0	16.4	0
Total Volume					**158,160**
Total Volume (10% handling loss allowance)					**142,344**

- Topsoil disturbance resulting from the excavation of the open cut pit will not be stripped. Areas to be disturbed within the infrastructure boundary will be stripped and stockpiled for re-use in rehabilitation for the area from where it was stripped;
- Only the sandy clay loam topsoil of Soil Type 1 will be used as the final surface topdressing in rehabilitation;

- Rehabilitation involving topsoil respreading will occur on the entire infrastructure area. The open cut footprint will be rehabilitated through direct tree planting and more specific rehabilitation measures; and

- Topsoil will be respread on final landforms at a minimum of 15cm, and an intermediate layer will be established at a minimum of 30cm.

Where topsoil stripping and transportation is required, the following topsoil handling techniques will be implemented to prevent excessive soil deterioration, note this also applies to subsoil stripping:

- Strip material to the depths stated in the table above, subject to further investigation as required;

- Topsoil will be maintained in a slightly moist condition during stripping. Material will not be stripped in either an excessively dry or wet condition;

- Place stripped material directly onto reshaped overburden and spread immediately to avoid the requirement for stockpiling;

- Clay material will be applied first to create an intermediate layer. The loam topsoil will then be spread to overlie this layer;

- The surface of soil stockpiles will be left in as coarsely structured a condition as possible in order to promote infiltration and minimise erosion until vegetation is established, and to prevent anaerobic zones forming;

- Maintain a maximum stockpile height of 3m;

- If long-term stockpiling is planned (i.e. greater than 12 months), stockpiles will be seeded and fertilised as soon as possible; and

- Prior to re-spreading stockpiled topsoil onto reshaped overburden an assessment of weed infestation on stockpiles will be undertaken to determine if individual stockpiles require herbicide application and/or "scalping" of weed species prior to topsoil spreading.

An inventory of available soil will be maintained to ensure adequate topsoil materials are available for planned rehabilitation activities.

The respread topsoil surface will be scarified prior to, or during seeding, to reduce run-off and increase infiltration.

3.2 Groundwater Management

- Prior to commencement of works, further investigation of groundwater conditions will be conducted in consultation with the NSW Office of Water;

- Benches and the pit floor will be graded to promote drainage toward the entrance to the pit;

- Minor seepage and ponding water from excessive rainfall will be managed by conventional drainage measures within the quarry such as periodic pumping out to the surrounding drainage controls. Water will be retained on site for quarry operations and for environmental mitigation;

- Only emergency vehicles repairs will be carried out onsite and any major vehicle repairs/maintenance will occur offsite;

- Refuelling will be undertaken in a designated non-permeable (compacted clay or concrete) area;

- Runoff water from the Project site will be collected and monitored for environmental mitigation to prevent chemicals and hydrocarbon pollutants such as petroleum, diesel, and oil seeping into the groundwater system;

- Fuel storage facilities will be installed in accordance with relevant statutory requirements. Handling and storage of fuel and oil within the project site will be in accordance with Australian Standards, AS 1940-2004 (Storage and Handling of Flammable and Combustible Liquids) and NSW Work Cover 2005 Code of Practice for Storage and Handling of Dangerous Goods to reduce the risk of any spills or environmental release. Above ground storage in a bunded facility will be used;

- Material Safety Data Sheets (MSDS) will be kept in the site safety system for all chemicals used on site. The MSDS will contain information on the environmental impacts of the use of certain chemicals and include detail on emergency response, clean up and disposal. Handling and storage of all chemicals within the project site will be in accordance with Dangerous Goods Act 1975 (NSW), and Australian standards, including AS 1940-2004 (Storage and Handling of Flammable and Combustible Liquids); and

- Quarry rehabilitation will use spoil, and clean fill fit for purpose and in accord with relevant statutory requirements.

Contingency, Monitoring and Reporting for Groundwater Management

Contingency Plans

Emergency Response Procedures will be developed and implemented for the proposed Karuah East quarry.

Contingency plans will be developed to address actions that are required where unforeseen events occur. Contingency plans will consider the following:

- Groundwater levels: If groundwater level monitoring indicates abrupt changes, additional investigations will be carried out to implement necessary measures; and

- Groundwater quality: In the event that the groundwater quality monitoring indicates a deteriorating change of groundwater quality in relation to the proposed quarrying

operations, the appropriate authority will be contacted to discuss the implementation of necessary measures.

Monitoring Plan

Monitoring of groundwater levels and groundwater quality will be conducted prior to the start of quarry operations. The existing monitoring bores at BH205, BH207, BH208 and BH303 will be used for monitoring groundwater of the quarry area.

New monitoring bores will be installed if any existing monitoring bores are destroyed during the quarry operations, or are subject to general failure. Surface runoff water will also be monitored.

Groundwater Levels

Groundwater levels will be monitored on a quarterly basis to identify any adverse impacts arising from the operation of the quarry in the future, and to identify long-term groundwater level trends.

Groundwater Quality

Groundwater samples will be collected for laboratory analysis on a 6-monthly basis. The groundwater quality results will be laboratory analysed for the parameters below and compared to background water quality results. The groundwater sampling will be carried out by an experienced groundwater professional or environmental scientist in accordance with Australian sampling standards.

The basic analyte and parameter suite applies to all samples. The additional extended analytic suite should apply annually together with the basic suite.

Basic Analytes and Parameters – 6 monthly (every sample):

- ph, Electrical Conductivity (EC), Total Dissolved Solids (TDS); Alkalinity;
- Total nitrogen, total phosphorus;
- Major ions, calcium, magnesium, sodium, potassium, chloride, sulphate, carbonate, bicarbonate;
- Total Petroleum Hydrocarbon (TPH); and
- BTEX (benzene, toluene, ethyl benzene, exylene).

Additional Analysis – 12 monthly (every second sample only):

- Nutrient suite: total nitrogen, nitrate, total Kjeldahl nitrogen, total phosphorus, phosphate;
- Metals (arsenic, cadmium, chromium, copper, lead, zinc, nickel, manganese, mercury, total iron, filterable iron);

- Polycyclic Aromatic Hydrocarbon (PAH); and
- Organophosphorus pesticides, phenoxy acid herbicides.

Reporting

The recording date, time and parameters of monitoring data will be collected and tabulated. All original laboratory reports will be maintained on file. Monitoring records will be kept until the closure stage of the quarry for inspection on request by government agencies.

3.3 Surface Water – Proposed Water Management System

The following surface water management measures will be implemented:

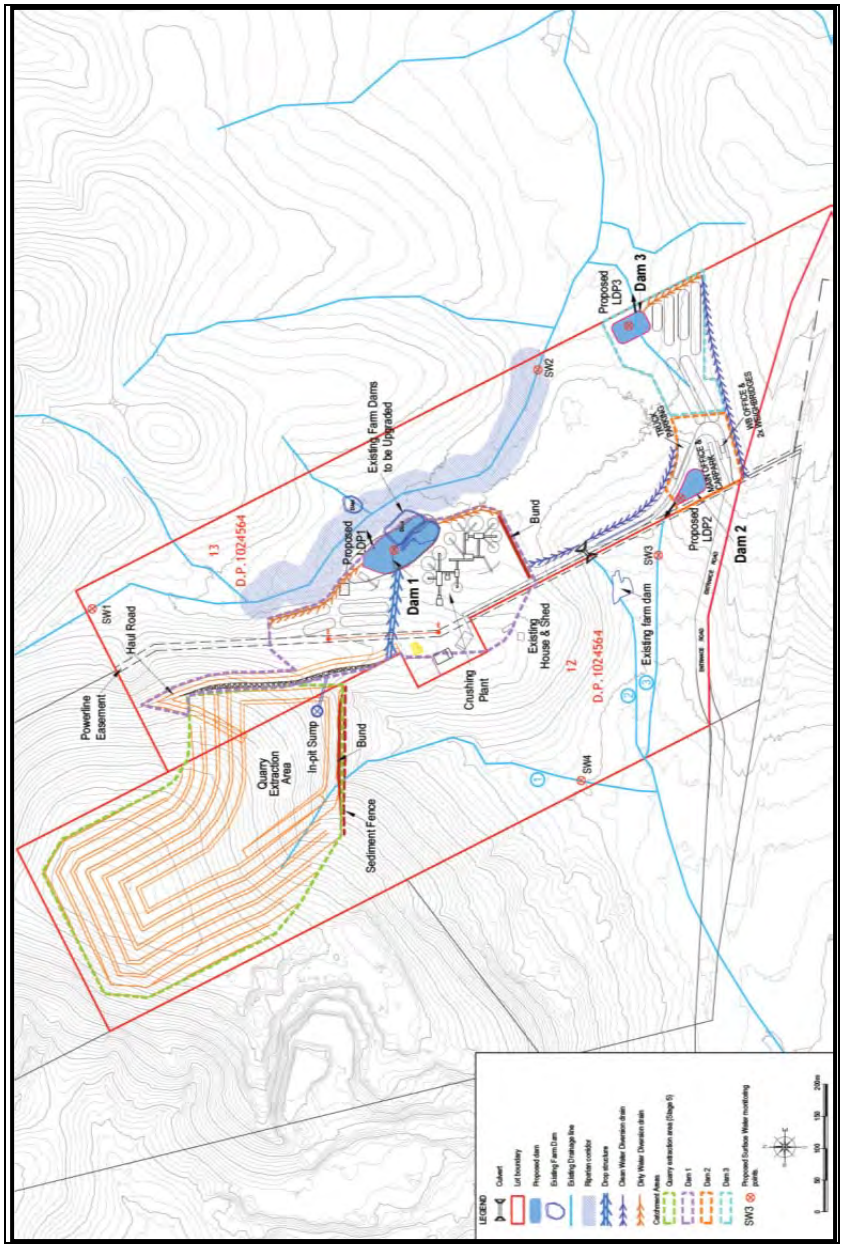

Figure 1: Surface Water Management Plan.

Quarry Extraction Area

- Runoff generated within the active quarry extraction area will be directed into an in-pit sump where it will be contained and pumped out as required so as not to impede quarrying activity;
- A bund and sediment fence will be maintained along the southern boundary of the quarry, to minimise the risk of sediment being washed downstream of the quarry;
- Construction of the quarry floor will be managed in such a way so as to direct all runoff to the in-pit sump. The location of this sump will change as quarrying progresses, however it will generally be located in the south east corner of the quarry;
- Water collected in the in-pit sump will be pumped out as required into a rock lined table drain adjacent to the main haul road. The water will flow down this drain to the main dirty water dam, Dam 1, via a rock lined drop structure; and
- Progressive rehabilitation of all formed surfaces, such as quarry benches and long term soil stockpiles, will occur wherever possible to reduce the amount of total suspended solids (TSS) in runoff from disturbed areas.

Dam 1 Catchment (crushing plant and product stockpiles)

- An existing farm dam will be upgraded and used as a sediment dam (Dam 1);
- The crushing plant area will be graded such that runoff from this area will flow into Dam 1;
- Water for haul road and some stockpile dust suppression, as well as for the crushing plant will be sourced from Dam 1; and
- A diversion bund will be constructed along the eastern boundary of this catchment area, to direct runoff from the area into Dam 1.

Dam 2 Catchment (product stockpiles and office infrastructure area)

- A second sediment dam, Dam 2, will be constructed adjacent to the main haul road to capture runoff from this area. Water collected in Dam 2 will be re-used for dust suppression on the product stockpiles.

Dam 3 Catchment (product stockpiles)

- A third sediment dam, Dam 3, will be constructed in the north east corner of the southern stockpile area. Water collected in dam 3 will be re-used for dust suppression on the adjacent product stockpiles.

During Construction

Sediment laden runoff from disturbed areas during construction will be managed by implementing the following erosion and sedimentation control principles:

- Conducting best practice land clearing procedures for all proposed disturbance areas;
- Minimising the disturbance footprint;
- Coordinating construction sequences to minimise exposure of disturbed soils to the elements;
- Separate/diversion of upslope 'clean' water catchment runoff prior to land disturbance;
- Ensuring sediment-laden runoff is treated via designated sediment control devices;
- Appropriate storage of topsoil stockpiles in areas away from roadways and other drainage lines;
- Revegetation of disturbed areas as soon as possible following the completion of construction activities; and
- Implementing an effective maintenance period.

Surface Water Management – Final Landform

- Dams 1, 2 & 3 will remain in place for post-mining landuse. Consultation will be undertaken with relevant government agencies in relation to licensing conditions at that time; and
- If deemed necessary by the relevant government agency, the dams will be removed.

Dam Design

Each dam will be constructed to the following capacity in accordance with 'Blue Book' requirements:

Table 2 – Summary of Proposed Dams

Dam	Sediment Zone (ML)	Settling Zone (ML)	Additional water storage capacity (ML)	Total Capacity (ML)
Dam 1	3.4	5.4	3.6	12.4
Dam 2	0.4	0.9	0	1.3
Dam 3	0.6	1.7	0	2.3

Management and Maintenance of Dams

- In the event that water is required to be discharged offsite, the water will be tested prior to discharge to ensure appropriate discharge criteria are met, such as Total Suspended Solids (TSS) below a concentration of 50mg/L. Where this is not the case, water will be

treated, for example through the use of chemical flocculation, to achieve a suitable water quality; and

- An inspection of the sediment dams will be undertaken as part of the routine site environmental inspection program or following significant rainfall. Various information, such as the general condition of the dam, evidence of overflow, condition of downstream catchments, water colour, evidence of eroding surfaces and approximate retained capacity, will be recorded.

Mitigation Measures for Drainage Lines

- A sediment fence will be installed along the downstream side of the entire southern face of the quarry as a sediment control measure to minimise the transport of any sediment into the remaining section of the first order drainage line to the south of the extraction area;

  This drainage line will be reinstated as close as possible to its original path following completion of extraction activities at the quarry as part of the final rehabilitation of the site;
- A Site Water Management Plan (SWMP) for Karuah East will be prepared and include details on the drainage line rehabilitation works. Works within the restored drainage lines will be generally undertaken in accordance with Section 5.3.3 of the *Blue Book* (Volume 1) and the '*Guidelines for Controlled Activities – In-Stream Works'* (DWE, 2008) for watercourse rehabilitation and riparian zone rehabilitation. Key design elements of channel establishment works will include:

  - Implement temporary erosion controls to provide for the short-term stabilisation of the channel;

  - Design and construct the stream channel so that it will be stable for the long-term and minimizes the potential for the migration of any erosion upstream or downstream;

  - The drainage line will be re-instated as a compound channel with a main channel conveying the small to medium flows, and a floodplain used to convey the high overbank flows;

  - The main channel forming part of the re-instated central drainage line will be generally trapezoidal in shape with 3:1 (H:V) bank batters;

  - Natural meanders will be used instead of straight lines to reflect natural stream characteristics;

  - Where there are high erosive forces (such as high flow velocity or steep grades) the channel bed will be rock lined where required and constructed in accordance with the '*Blue Book'*, including the placement of appropriately sized rocks above a filter layer of suitable geotextile; and

  - Soil will be packed in between rocks to allow sedges and grasses to be established within the channel to provide for long-term channel stability.

Following earthworks and channel establishment, a riparian corridor will be established with a minimum width of 10 m, measured horizontally and at right angles to the flow from the top of both banks on the streams. Key design elements of the riparian corridor establishment will include:

- Implement temporary erosion controls to provide for the short-term stabilisation of the riparian corridor;
- Restore a vegetated riparian corridor along the stream channel (10 m from top of bank);
- Establish a diverse range of locally occurring vegetation species;
- Establish a full range of vegetation types, including trees, shrubs and grass covers;
- No exotics species are to be introduced; and
- Maintain the rehabilitated riparian corridor for two years after initial rehabilitation.

Licensed Discharge Point / Licensing Requirements

- A Licensed Discharge Point (LDP) will be installed is required at the outlets of Dam 1, Dam 2 and Dam 3. An application to the NSW OEH for the establishment of the LDP's will be made; and
- The controlled release of water will preferentially be made from Dam 1 and Dam 3. The water management system will be set up to allow for water to be pumped from Dam 2 to Dam 1 as required for release.

Site Water Balance

- The proposed dams will be built to at least the specified sizes (**Table 2** above), and made larger where practical in consultation with NOW;
- That controlled discharge of treated (e.g. flocculated) water be undertaken when total site storage levels are above 4.3ML, which would provide the capacity to contain more rainfall events and reduce wet weather discharges (this assumes the dams are built to the capacities presented in **Table 2** above); and
- All water usage will be monitored across the site to enable an update of the water balance using actual metered water usage data after 12 months of operation.

Site Water Management Plan

A Site Water Management Plan (SWMP) will be prepared following project approval in accordance with regulatory requirements and conditions of consent. The SWMP will be developed in accordance with the *Blue Book* (Volume 1 and Volume 2E).

The SWMP will incorporate the following:

- On-site soil and water management principles and objectives, including the following:
    - Containment of dirty water runoff from the active quarry area by directing this water into in-pit sumps;
    - Directing sediment-laden runoff from disturbance areas and rehabilitated areas into designated sediment control dams;
    - Installing temporary erosion and sediment control devices as required (i.e. sediment fences sand bag weirs) to minimise the discharge of sediment laden water from newly disturbed areas;
    - Diverting clean water runoff unaffected by the operations away from disturbed areas and offsite, where possible;
    - Maintaining sediment control structures to ensure that the designed capacities are maintained for optimum settling of sediments; and
    - Implementing an effective revegetation and maintenance program for the site.
- Identification of sources of sedimentation and erosion.
- Soil Best Management Practices (BMPs) to be implemented on-site, including:
    - quarry planning considerations (such as minimising disturbance);
    - topsoil/subsoil handling and stockpiling procedures; and
    - topsoil/subsoil respreading procedures.
- Water BMPs to be implemented on-site, including;
    - clean water diversions;
    - dirty water capture and treatment;
    - additional sediment protection measures to be employed during the life of the Project; and
    - maintenance of sediment control structures.
- Drainage line rehabilitation.
- Water monitoring procedures.
- Documentation and reporting procedures.

Surface Water Monitoring Program

A Surface Water Monitoring Program will be implemented to monitor both the surface water quality upstream and downstream of the site, and the effectiveness of the Site Water Management Plan, including:

- The results of Surface water monitoring undertaken during quarrying operations at Karuah East will be compared against the baseline data collected as part of the Surface Water Assessment;
- A baseline ecological health condition assessment of Yalimbah Creek will be undertaken prior to commencement of operations, and monitoring of Yalimbah Creek will continue as part of the annual ecological monitoring of offset areas;
- The following parameters (see Table 3 below) will be measured at each monitoring location via collection of a grab sample. The recorded values for the parameters measured will be assessed as a minimum against baseline water quality results as well as the ANZECC trigger values presented below, and plotted to identify any trends over time. The OEH will be notified in the event of increasing levels of any parameter; and
- The range of analytes measured will be reviewed following the first 12 months of monitoring and a diagnostic set of analytes adopted for ongoing monitoring.

Table 3 – Surface Water Monitoring Parameters

Parameter	Unit	ANZECC Guidelines[1]
pH (Field)	--	6.5 – 8.5
Conductivity (Field)	uS/cm	125 – 2200
Conductivity (Lab)	uS/cm	125 – 2200
Total Dissolved Solids	mg/L	-
Total Phosphorus	mg/L	0.025
Ammonia	mg/L	0.02
Nitrogen (Nitrate)	mg/L	0.350
Total Hardness (as CaCO3)	mg/L	--
Oil & Grease	mg/L	--
Arsenic	mg/L	0.024
Cadmium	mg/L	0.0002
Calcium	mg/L	--
Chromium	mg/L	0.001
Copper	mg/L	0.0014
Lead	mg/L	0.0034
Magnesium	mg/L	--
Manganese	mg/L	1.9
Nickel	mg/L	0.011
Potassium	mg/L	--
Sodium	mg/L	--

Parameter	Unit	ANZECC Guidelines[1]
Vanadium	Mg/L	--
Zinc	mg/L	0.0312

1Key default trigger values presented in ANZECC 2000 for slightly disturbed upland rivers in NSW.. Heavy metals based on hard water (120-179 mgCaCO3/L)

Surface water monitoring locations will be as follows:

- Dam 1;
- Dam 2;
- Dam 3;
- SW 1 & SW 2 - Existing second order drainage line (within Lot 13 flowing along the eastern boundary of the Study Area); both upstream and downstream of the quarry;
- SW 3 - Existing drainage line downstream of Dam 2; and
- SW 4 - Existing drainage line downstream of the quarry extraction area.

The table below identifies the monitoring point locations, the type of monitoring point, and the frequency of sampling.

Table 4 - Proposed Surface Water Monitoring Locations

Location	Type of Monitoring Point	Description of Location	Frequency
Dam 1	Water Quality	Proposed dam located in crushing plant area	Monthly, and within 24 hours of any discharge. Also prior to any controlled (i.e. planned) discharge.
Dam 2	Water Quality	Proposed dam located in western section of stockpile area	Monthly, and within 24 hours of any discharge. Also prior to any controlled (i.e. planned) discharge.
Dam 3	Water Quality	Proposed dam located in eastern section of stockpile area	Monthly and within 24 hours of any discharge. Also prior to any controlled (ie. planned) discharge.

Location	Type of Monitoring Point	Description of Location	Frequency
SW1	Water Quality	Existing second order drainage line upstream of site	Monthly (if creek flowing)
SW2	Water Quality	Existing second order drainage line downstream of site	Monthly (if creek flowing) and within 24 hours of any discharge.
SW3	Water Quality	Downstream of Dam 2	Monthly (if creek flowing) and within 24 hours of any discharge.
SW4	Water Quality	Downstream of quarry extraction area.	Monthly (if creek flowing).
Water management (erosion and sediment	Erosion and Sediment Control	All noted erosion and sediment control structures.	Monthly and after significant rainfall events.

Reporting of Monitoring Data

- Karuah East Quarry Pty Ltd will collate surface water analysis data and maintain an up to date record of analysis both in hard copy (laboratory reports) and electronic (results) format. These results will be interpreted as they are received in order to ensure appropriate operational guidance on maintaining water quality within desired parameters;
- The results of water quality analysis will be reported in the Annual Environmental Management Report (AEMR); and

In the event that an exceedance in surface water quality criteria is identified, the exceedance will need to be reported to the relevant agencies in accordance with the requirements of the EPL.

4. BIODIVERSITY & CONSERVATION OFFSET

4.1 Flora and Fauna

The following will be implemented by the proponent:

Vegetation Clearing Management

Site Survey and Exclusion Fencing

The extraction area/forest interface will be delineated to protect retained bushland areas on Lot 12 and 13. To achieve this, the quarry footprint boundary will be surveyed and pegged by a Registered Surveyor prior to the conduct of clearing operations. Plastic mesh fencing or star pickets and flagging tape will be installed along the extraction boundary for use as exclusion fencing. The fencing will function as a clearly marked 'exclusion' boundary for the machinery operations.

Permanent chain wire metal exclusion fencing will be installed around the entire perimeter of the quarry footprint (except at the designated aerial fauna crossings) prior to the commencement of quarry operations.

Clearing Protocol

The following protocol will be undertaken as part of the clearing activity on the subject site:

- All contractors conducting clearing, earth works or quarrying activities within the subject site will be informed of the restrictions to the clearing of vegetation outside the 'exclusion fencing'. A construction protocol will be prepared requiring all earthworks, machinery and personnel be strictly controlled and be restricted to the extraction footprint. No storage of materials, vehicle parking or other disturbance will be undertaken outside the exclusion fencing. Contractors will be supplied with the construction protocol regarding the clearing restrictions through a work site induction program;

- Trees will be felled away from the refined bushland on the subject site back into the extraction areas; and

- Domestic fauna *(ie. dogs)* will be prohibited from entering the subject site with Contractors.

Fauna Management

Pre Clearing Surveys

Where possible, vegetation clearing activity will be timed so as to avoid the following breeding periods for hollow dependant fauna:

- October – February (microbats); and

- June – August (large forest owls and microbats in torpor).

If restricting the clearing to these limited times is not found to be practical, then ecological pre-clearing surveys will be undertaken within two weeks prior to the commencement of the clearing.

If required, components of the pre clearing surveys will include:

Threatened Fauna Searches

Within one week prior to commencement of vegetation clearing, searches for signs of Threatened species occurring within the quarry footprint will be undertaken. These searches would include but not be limited to;

- Searches for nests of threatened raptors; and
- Searches for whitewash or other signs of roosting or nesting Powerful and Masked Owls.

If a threatened raptor or owl nest site is recorded within the subject site during the surveys, clearing activity will not take place in the vicinity of the nest (within 50 metres) until the nest is vacated by the affected species (including fledglings). Recorded nest sites would be subject to a monitoring program to ensure that no clearing activity is undertaken until the nest sites are vacated.

Small Mammal Trapping

Elliott trapping will be undertaken within one week prior to commencement of vegetation clearing over a 4 night period, targeting the Brush-tailed Phascogale (Phascogale tapoatafe) and Squirrel Glider (Petaurus norfolcensis). A total of 4 trap lines (equating to 160 arboreal Elliott trap and 400 terrestrial Elliott trap nights) will be established across the subject site (2 lines/stratification unit).

Stag Watching and Anabat Survey

A combined Stag Watching and Anabat survey would be conducted within the subject site over a 4 night period in an attempt to identify potential Microchiropteran bat roost trees. Should further investigations reveal the presence of a maternity colony, no clearing would be undertaken until after the completion of the breeding period (mid October – mid February inclusive).

Reporting

A report detailing the methods and results of the pre-clearing surveys will be prepared and submitted to OEH immediately prior to the commencement of the clearing operations.

Ecological Clearing Supervision

The removal of all identified hollow bearing trees will be undertaken with the presence of a qualified and suitably experienced fauna ecologist.

A tree felling protocol will be developed to minimise harm to hollow obligates during the clearing of trees for the proposal. The tree felling protocol will be developed by a suitably qualified and licenced ecologist with previous experience supervising felling trees. The tree felling protocol will comprise pre-felling identification and mapping of hollow bearing trees, inspections of trees on the day of clearing, procedures for the safe removal of fauna species

from trees prior to and post felling, a relocation/release procedure and a methodology for salvaging (and relocating) tree hollows where practicable.

The relevance of the marked hollow bearing trees and requirements for ecological clearing supervision and hollow resource recovery will be communicated to the clearing Contractor as part of a site induction program.

Nest Box Program

One nest box will be installed for each hollow to be lost as a result of the proposal. Softwood pine (plywood) nest boxes will be used and will be specifically designed for Threatened hollow obligates. Nest boxes will have swivel mounts and be fitted with screw lids to prevent damage from brushtail possums.

Nest boxes will be placed in retained habitats in the study area onto host trees that do not already support hollows at a minimum height of 3 metres (aboveground) in an orientation other than west and north-west to minimise exposure to the afternoon sun.

Nest boxes will be erected prior to the commencement of clearing operations and will be subject to 2 yearly maintenance for the life of the quarry.

Feral bees found to colonise the nest boxes will be eradicated by a specialist pest contractor.

Nest box installation will be supervised by a suitably experienced fauna ecologist.

Aerial Fauna Crossings

Two (2) dedicated aerial fauna crossings will be installed.

- The western aerial fauna crossing will to be located at the existing quarry haul road approximately 250 metres north east from the existing quarry site office; and
- The eastern aerial fauna crossing is proposed on Lot 13 along the north-south running access road.

The canopy bridges will comprise rope netting suspended across the entire width of the haul roads connected to two (2) poles placed on opposite side of the roads. The western canopy bridge would be approximately 40-45m in length and 50cm wide whilst the eastern canopy bridge would be approximately 55 metres in length and 50cm in width.

The netting of both canopy bridges would comprise 14mm diameter marine grade 'silver rope' in a flat lattice-work configuration (ie. analogous to a rope ladder laid horizontally).

The height of the poles and canopy crossing above the road surface would be between 6 – 12 metres, depending on the road profile.

Single strands of rope will extend from the timber poles into the canopy of adjacent trees to facilitate access by arboreal mammals.

The final design of the canopy rope bridges would be chosen as part of detailed design following project approval.

A twelve month monitoring program will be undertaken using a motion detecting camera system mounted on each pole at each of the two (2) aerial crossings.

Salvage and Relocation of Terrestrial Habitat Structures

Large fallen logs will be salvaged during the clearing operations and relocated into retained forested habitats on Lots 12 and 13.

Threatened Plant Populations

Salvage and Reintroduction

A salvage program for Tetratheca juncea will be implemented. The salvage program will compromise the excavation of clumps (along with rhizomes and surrounding root balls) proposed for removal and their reintroduction into prepared 'beds' within suitable habitats nearby.

Application for a Section 91 licence from OEH for the salvage program will be made and will be subject to a detailed Salvage Plan to be prepared by the Proponent (and endorsed by OEH and Department of Planning) prior to commencement of the works.

Monitoring

Threatened plant sub-populations of *Tetratheca juncea, Grevillea parviflora* subsp. *parviflora and Asperula asthenes* situated within retained bushland habitats on Lots 12-14 will be monitored annually by a suitably qualified and experienced botanist for the life of the quarry operation.

A Monitoring Plan will be prepared prior to the commencement of clearing activity to detail survey design, data collection and reporting. Adaptive management will be employed for the life of the quarry to respond to population issues that are identified, including weed control.

4.2 Biodiversity Offset Strategy

The proposed offset site is identified as Part Lot 13 DP 1024564, Lot 14 DP 1024546 and Lot 5 DP 838128 (provided that an option to purchase Lot 5 has been secured by the proponent). In the event that Lot 5 DP 838128 is unable to be secured by the proponent, the proponent will purchase an alternate offset site, which, combined with Lots 13 and 14, will provide a total biodiversity offset area of not less than 129.32 ha. The alternate offset site will be required to be agreed to by NSW OEH and be to the satisfaction of the Director-General.

The following will be undertaken by the proponent in relation to the proposed offset site identified as Part Lot 13 DP 1024564, Lot 14 DP 1024546 and Lot 5 DP 838128:

- Seasonal flora and fauna survey of the offset site will be undertaken in accordance with relevant OEH guidelines. In particular, seasonal survey for *tetratheca juncea* and *grevillea parviflora* ssp *parviflora* will be undertaken and reported to the NSW OEH;

- Prior to establishment of the proposed quarry, the proponent will purchase Lot 5 DP 838128 (provided than an option to purchase has been secured). In the event that Lot 5 DP 838128 is unable tobe secured by the proponent, as noted above, the proponent will purchase an alternate offset site (to be agreed to by NSW OEH and be to the satisfaction of the Director-General).

- Upon approval of the project, in consultation with the NSW OEH, the proponent will secure the offset lands via a Conservation Agreement under Part 4, Division 12 of the National Parks and Wildlife Act 1974;

- A Conservation Management Plan will be developed. The plan will:

  - Confirm required on ground works such as weed control, fencing, signage and pest control;

  - Confirm the timing / schedule of the abovementioned works; and

  - Specify restrictions to the existing two (2) residences of Lot 5 and Lot 14 (if purchase of Lot 5 is secured by the proponent). If an alternate offset site is provided instead of Lot 5 (as noted above) any restrictions on this land will be specified in the Conservation Management Plan.

- Monitoring of the offset land will be undertaken annually. Results of the monitoring will be used to provide input into the priority areas for the following year(s) of ground maintenance works.

5.0 NOISE, BLASTING AND VIBRATION

The following will be undertaken:

- Four (4) metre noise barriers will be included around stockpile and stacker locations to reduce noise emissions from mobile plant items in these areas;

- Noise compliance monitoring will be undertaken in accordance with conditions of consent by a suitably qualified acoustic expert. The monitoring will consider the performance of the quarry in relation to the project specific noise, vibration and blast criteria established in the SLR Noise and Blasting Impact Assessment (dated 2 November 2012);

- The proponent will not fire blasts at the existing quarry and the proposed Karuah East quarry at the same time;

- The proponent will implement a blasting program where nearby receivers are notified in advance of a blast;

- The following control measures for vibration will be undertaken:

- Reducing the maximum instantaneous charge (MIC) by using delays, reduced hole diameter and/or deck loading;
- Changing the burden and spacing by altering the drill pattern and/or delay layout or altering the hole inclination;
- Use the minimum practicable sub drilling which gives satisfactory toe conditions; and
- Investigate alternative rock breaking techniques.

- The following control measures for air blasting will be undertaken:
  - Reducing the maximum instantaneous charge (MIC) by using delays, reduced hole diameter and/or deck loading;
  - Ensure stemming depth and type is adequate;
  - Eliminate exposed detonating cord and secondary blasting;
  - Restrict blasting events to favorable weather conditions;
  - Orient quarry faces away from potentially sensitive receivers;
  - Use a hole spacing and burden which will ensure that the explosive force is just sufficient to break the ore to the required size; and
  - The proponent will take particular care where the face is already broken and consider deck loading where appropriate to avoid broken ground or cavities in the face.

6.0 TRANSPORT

Karuah East Quarry Pty Ltd will undertake the following road works as part of the proposed development:

- Upgrade and extend Blue Rock Lane;
- Realign Andesite Drive and Blue Rock Lane intersection; and
- Adjust road marking at Branch Lane and Andesite Road intersection.

The works will be undertaken in accordance with the upgrade plans prepared by GCA numbered C00-C27. Road construction and drainage works will comply with Great Lakes Council and NSW RMS standards.

7.0 AIR QUALITY & GREENHOUSE GAS EMISSION

7.1 Air Quality

The following will be undertaken:

- Air quality monitoring will be undertaken in accordance with conditions of consent by a suitably qualified acoustic expert. The monitoring will consider the performance of the quarry in relation to the criteria outlined in the SLR Air Quality Impact Assessment (dated July 2013);Haul Roads from the site to the Pacific Highway will be sealed;
- Watering of any unsealed roads – Level 1 Watering at 2L/m^2/hour;
- The crusher will be enclosed; and
- Stockpiles will be subject to both water spraying and wind breaks will be installed.

7.2 Greenhouse Gas

The following practices will be adopted to assist in the reduction of Greenhouse Gas emissions from operations at the project site:

Relating to diesel / petroleum consumption:

- Emissions from construction / transport vehicles and on site machinery will comply with the relevant Australian Standards;
- All vehicles and machinery will be regularly maintained to ensure proper and efficient working order and therefore minimise emissions;
- Optimum vehicle / equipment tire pressures will be maintained;
- Vehicle idling time will be reduced where possible;
- The finished site topography will ensure that no excessive engine use is required; and
- Optimisation of incline / decline of roads within the construction area on the project site will be considered to reduce transport distances for vehicles entering / exiting the project site.

Relating to electricity consumption:

- Use of efficient construction equipment technology;
- Use of efficient crushing and processing plant technology; and
- Continued monitoring of site electricity usage and review of techniques to reduce usage (if possible).

8.0 HERITAGE

The following will be will be adopted by the proponent.

8.1 Aboriginal Archaeology

- If Aboriginal site/s are identified in the study area during works, then all activity in the area will cease, the area cordoned off and contact made with the Office of Environment and Heritage Enviroline 131 555, a suitably qualified archaeologist and the relevant Aboriginal stakeholders, so that it can be adequately assessed and managed; and

- In the event that skeletal remains are uncovered, work will cease immediately in the vicinity and the site fenced. The proponent will need to contact the NSW Police Coroner to determine if the material is of Aboriginal origin. If determined to be Aboriginal, contact will be made with the OEH Enviroline 131 555 and relevant Aboriginal stakeholders in order to determine an action plan for the management of the skeletal remains prior to works re-commencing on site.

8.2 European Heritage

- If, during the course of development works, significant European cultural heritage material is uncovered, work will cease in that area immediately. The OEH will be notified and works only recommenced when an appropriate and approved management strategy has been instigated.

9.0 VISUAL

The following will be undertaken:

- Trees will be planted as soon as practical on the initial benches on the western face of the quarry; and

- The proposed infrastructure area will be painted in an appropriate colour to blend in with the natural surroundings.

10.0 ENVIRONMENTAL MANAGEMENT STRATEGY

The Environmental Management Strategy dated August 2011 developed by GSS Environmental for the Karuah East Quarry will be adopted & implemented in full by Karuah East Pty Ltd.

11.0 QUARRY CLOSURE & REHABILITATION

The Quarry Closure & Rehabilitation Plan dated November 2012 prepared by GSS Environmental for the Karuah East Quarry will be adopted and implemented in full by the proponent for the Karuah East Hard Rock Quarry (**Appendix H** of the EA Report dated 31 January 2013) will be adopted & implemented in full by Karuah East Pty Ltd.

11.1 Rehabilitation Management Plan

Until such time that extraction has ceased, rehabilitation will occur around the perimeter of the pit only along the benches and will not involve the pit floor. As the extraction progresses

through the resource, 15m wide benches will be left every 15m of depth to provide a horizontal platform on which native flora species will be established.

The revegetation program will re-establish native tree / shrub / ground cover and will stabilise reshaped and benched areas. Benches will be deep ripped to actively promote infiltration of water which will enhance soil moisture requirements for direct tree seeding and minimise surface runoff to underlying benches and the pit floor dirty water control system.

On completion of quarry operations, the pit floor will be re-shaped and revegetated with wetland plant species to form a free draining wetland environment.

Topsoil Management

Topsoil stripping within the disturbed area will be undertaken when the soil is in a slightly moist condition to reducing damage to soil structure. Stripped material will be placed directly onto the disturbed areas and spread immediately if excavation sequences, equipment scheduling and weather conditions permit.

A maximum stockpile height of 3m will be maintained to preserve viability and reduce soil deterioration.

Stockpiles will be protected with sediment fencing and planted with a sterile cover crop (annual species) to ensure stabilisation. Surface drainage in the vicinity of the stockpiles will be configured so as to direct any runoff around the stockpile.

Where the stockpile is not wholly contained within the "closed loop" water management system, temporary sediment control measures such as sand bags and silt fences will be used to prevent sediment from leaving the disturbed areas.

Topsoil will be re-spread in the reverse sequence to its removal, so that the organic layer, containing any seed or vegetation, is returned to the surface. Topsoil will be spread to a minimum depth of 50mm on 3:1 or steeper slopes and to a minimum depth of 150mm on flatter slopes.

Re-spread topsoil will be levelled to achieve an even surface, avoiding a compacted or an over-smooth finish.

Surface Preparation

Thorough site preparation will be undertaken to ensure rapid establishment and growth of seedlings. All areas proposed for seeding will be deep ripped to an approximate depth of 400 – 500mm.

Where ripping on slopes is required, the ripping will be undertaken around the contour of the land at right angles to water flow.

Direct Seeding

A mixture of native trees and shrubs endemic to the area will be sown onto the majority of the reshaped and benched pit areas following topdressing and site preparation.

The seed will be sourced from reputable seed supply agents. Native seed for revegetation of the quarry will be appropriately pre-treated in order to break dormancy restrictions.

The native tree and shrub seed mix will be sown at a total combined rate of approximately 6.3 kg/ha. Seed will be broadcast evenly onto topdressed areas. Seeding will be conducted in late spring, summer and early autumn.

Exotic pasture species (warm season perennial, cool season perennial, year long green perennial and annual) will be sown where the risk of erosion is less and on the more protected aspects of landforms.

All legumes will be inoculated and lime pelleted prior to seeding. Oats and/or rycorn/millet (depending on season) will be utilised as the cover crop species.

Revegetation activities will generally be undertaken in spring and autumn; however opportunistic revegetation will be undertaken if areas become available for sowing in summer or winter. After surface soil amelioration and tillage is completed for any given area, revegetation will commence as soon as practicable. The proposed method of sowing will be via conventional spreading using agricultural broadcasting equipment, or by hand if the terrain is difficult and machinery use is not possible.

Slope stabilising techniques such as hydro seeding and straw mulching will be undertaken on slopes exceeding 180 for enhancement of pasture germination.

Fencing and Weed Control

Fencing (or a similar barrier) will be erected and maintained to exclude and prohibit the movement of persons and vehicles into areas that have been rehabilitated. The fencing will be routinely checked and repaired where necessary. Signs will be placed in prominent locations to indicate areas that are undergoing rehabilitation.

Weed control will be undertaken on an "as required" basis should cyclical weed invasion events occur.

Rehabilitation Maintenance

All erosion and sediment control measures will be maintained in a functioning condition until individual areas have been deemed "successfully" rehabilitated. Structural soil conservation works will be inspected after high intensity rainfall so that de-silting and prompt repairs and/or replacement of damaged works can be initiated as required.

Rehabilitation Monitoring

Regular monitoring of the revegetated areas will be undertaken during the initial vegetation establishment period and beyond. The table below presents the monitoring program, including the specific aspects and elements to be monitored and frequencies for those various aspects.

Monitoring will be conducted periodically by independent, suitably qualified persons at locations which will be representative of the range of conditions on the rehabilitating areas. Annual reviews will be conducted of monitoring data to assess trends and monitoring program effectiveness. The outcome of these reviews will be included in each Annual Environmental Management Report (AEMR).

In addition to the rehabilitated areas, at least two reference sites will be monitored to allow a comparison of the development and success of the rehabilitation against a control. Reference sites indicate the condition of surrounding un-disturbed areas.

Table 5 - Proposed Rehabilitation Monitoring Program

Aspect of Rehabilitation	Elements to be Monitored	Monitoring Frequency
Ecosystem Establishment		
General Description	• Describe the vegetation in general terms, e.g. mixed eucalypt woodland with grass understorey and scattered shrubs, dense Acacia scrub, etc.	12 months after establishment and then every 2 years
2m x 2m quadrants	• Count the number of plants of all species, excluding grass. • Measure live vegetation cover for understorey and grasses (separately) using a line intercept method. • Record details of ground cover (litter, logs, rocks etc).	12 months after establishment and then every 2 years
20m x 10m plots	• Count, by species, all trees >1.6m tall. • Tag and measure DBH of trees >1.6m tall, to a maximum of 10 for any one species. • Record canopy cover over the whole 20m centreline when trees are tall enough. • Subjectively describe tree health, by species if relevant, noting signs of drought stress, nutrient deficiencies, disease and severe insect attack. Where health problems are noted record the percentage of unhealthy trees. • Record any new plant species not present in the smaller plots, including any problem and declared noxious weeds.	12 months after establishment and then every 2 years

Aspect of Rehabilitation	Elements to be Monitored	Monitoring Frequency
	• Take five surface soil samples (e.g. at approx. 5m intervals along the centreline) and bulk these for analyses of: PH, EC, chloride and sulfate; exchangeable Ca/Mg/K/Na; cation exchange capacity; particle size analysis and R1 dispersion index; 15 bar and field capacity moisture content; organic carbon; total and nitrate nitrogen; total and extractable phosphorus; Cu, Mn and Zn.	
50m transect	• Along the 50m erosion monitoring transect, record the location, number and dimension of all gullies >30cm wide and/or 30cm deep. • Erosion pins may be established in plots located in newer rehabilitation to record sheet erosion if present.	12 months after establishment and then every 2 years
Rehabilitation in general	• When traversing between monitoring plots, note the presence of species of interest not previously recorded (e.g. key functional or structural species, protected species, noxious weeds), as well as obvious problems including any extensive bare areas (e.g. those greater than 0.1ha). • Observation such as this can provide useful, broad scale information on rehabilitation success and problems.	12 months after establishment and then every 2 years
Photographic record	• For each 20m x 10m plot, a photograph should be taken at each end of the plot, along the centreline looking in.	12 months after establishment and then every 2 years
Habitat	• General observations relating to the availability and variety of food sources (e.g. flowering/ fruiting trees, presence of invertebrates etc). • Availability and variety of shelter (e.g. depth of leaf litter, presence of logs, hollows etc). • Presence/absence of free water in the rehabilitation areas.	12 months after establishment and then every 2 years
Fauna	• General observations of vertebrate species (including species of conservation significance). • Detailed fauna surveys including presence and approximate abundance and distribution of vertebrate species (focusing on species of	After rehabilitation is three years old undertake monitoring in every 2 years after establishment in both

Aspect of Rehabilitation	Elements to be Monitored	Monitoring Frequency
	conservation significance).	Autumn and Spring
Weeds and pests	• Species identity. • Approximate numbers/level of infestation. • Observation of impact on rehabilitation (if any).	Quarterly during the first two years and biannually after that. Inspections should be opportunistic after significant rainfall events.
Geotechnical Stability		
	• Assessment of the stability of batters and also looking at surface settlements (sink holes). In particular where these features could impact on the performance of any surface water management system. • Surface integrity of landform cover/capping (measurement of extent of integrity failure). • Presence/ absence of landform slumping.	Annually
Surface and Groundwater		
	• Groundwater quality and depth • Efficiency of landform surface water drainage systems (integrity of banks and drains). • Water quality including pH, EC and total suspended solids of water in water storages, and pits, sedimentation dams.	Quarterly or following rainfall events. Monitoring of receiving waters during a rainfall event which results in runoff.

11.2 Final Void Management

Void Water Quality

Water will only be permitted to accumulate in the void if it maintains a quality that does not compromise its intended final use or surrounding groundwater systems. The following aspects will be considered with respect to managing final void water quality:

- Concentration of elements resulting from the quarrying of material;
- Control of surface flow into the void; and

- Rainfall and evaporation.

Post closure a water monitoring program will remain in place to monitor any changes to chemistry within the void.

Void Slope Stability

The surrounding final slopes will be left in a condition where the risk of slope failure is minimised. This may require the benches to be battered back from the vertical to enable a stable overall slope angle.

The following will be considered when assessing the geotechnical stability of highwalls:

- Long term final void water levels;
- Height and inclination of slope and number and spacing of intermediate benches;
- Shear strength of the highwall soils and rocks;
- Density and orientation of fractures, faults, bedding planes, and any other discontinuities, and the strength along them; and
- The effects of the external factors, such as surface runoff.

Prior to closure, investigations will be undertaken to confirm the criteria above.

Control of Surface Inflow

Drainage will be directed away from the highwall face through the construction of interceptor channels around the perimeter of the highwall and spoon drains will be utilised on the upslope side of all benches.

The catchment area of the final void will be minimised by the installation of diversion drains.

Safety

The following will be considered at the time of closure to ensure that the void is left in a safe manner.

- All high will to be left geotechnically stable;
- A barrier at a safe distance from the perimeter of the void to prevent human access will be constructed. The highwall areas will be secured by the construction of a trench and a safety berm, as well as a security fence along the entire length of the remaining high wall;
- Suitable signs, clearly stating the risk to public safety and prohibiting public access will be erected at 50m intervals outside the safety fence;
- Surface runoff from land surrounding the void will be diverted from entering the void; and

- Shrub and/or tree planting along the outside edge of the bund wall will be implemented where practicable to lessen the visual impact of the wall, and will be in accordance with the agreed post mining rehabilitation criteria and land use.

Monitoring and Management

After decommissioning works have been undertaken, whether progressive or final, a monitoring program will be designed to demonstrate that the completion criteria have been met and that the site is not resulting in any off site effects.

Closure Liability

In accordance with the Department of Trade and Investment Regional Infrastructure and Services ESG1 – Rehabilitation Cost Estimate Guidelines, the closure liability for the Karuah East Quarry is **$468,134**.

12.0 WASTE MANAGEMENT

All waste or recyclable material will be handled as follows:

During Construction

Material Type

Excavation Material & Green Waste - Will be stockpiled on site in accordance with the quarry rehabilitation plan.

Bricks – Any remaining bricks will be removed from the site by a suitably qualified contractor and transported to a local crushing and recycling company.

Concrete - Any remaining concrete will be removed from the site by a suitably qualified contractor and transported to a crushing and recycling company.

Timber – Any excess timber will be removed from the site by a suitably qualified contractor and transported to a landscaping supply company for chipping and composting.

Plasterboard – Any excess plasterboard will be removed from the site by a suitably qualified contractor and taken to landscape supply company.

Metals – Any excess metal will be removed from the site by a suitably qualified contractor and transported to a metal recycling facility.

Other – Any other materials not noted above will be removed from the site by a suitably qualified contractor and transported to an appropriate facility.

During Operation

Quarry Activity

Excavation Material & Green Waste - Will be stockpiled on site in accordance with the quarry rehabilitation plan.

Bricks – Any remaining bricks will be removed from the site by a suitably qualified contractor and transported to a local crushing and recycling company.

Concrete - Any remaining concrete will be removed from the site by a suitably qualified contractor and transported to a crushing and recycling company.

Timber – Any excess timber will be removed from the site by a suitably qualified contractor and transported to a landscaping supply company for chipping and composting.

Metals – Any excess metal will be removed from the site by a suitably qualified contractor and transported to a metal recycling facility.

Other – Any other materials not noted above will be removed from the site by a suitably qualified contractor and transported to an appropriate facility.

General Waste & Recyclables from Staff within the Plant Area

Recyclables

Paper, cardboard, glass, aluminium & plastic

Temporary recycle bins will be provided within staff areas of the plant. Management will ensure that bins are regularly collected and transported to an appropriate recycling facility.

Non Recyclables

Food scraps and other waste

Temporary waste bins will be provided within staff areas of the plant. Management will ensure that bins are regularly collected and transported to an appropriate recycling facility.

Quarry Closure

Waste and recyclable material associated with the quarry closure and decommissioning will be undertaken in accordance with the Quarry Closure and Rehabilitation Plan. This will include:

Site Services

All services including power, water, data and telephone on the site will be isolated, disconnected and terminated to make them safe. All underground services will be made safe and left buried in the ground. Overhead power lines (where they are not used by others) will be removed and the materials (i.e. poles and wire) recovered for potential re-sale or recycling as applicable.

Infrastructure and Buildings

- All sumps will be de-watered and de-silted prior to the commencement of demolition. In addition all items of equipment will be de-oiled, degassed, depressurised and isolated and any hazardous materials (HAZMATs) removed from the site;

- All infrastructure, including the office buildings, workshops, parking areas, crushing plant, wash plant and product storage areas will be demolished and removed from the site. Where possible assets may be reused or sold to other operations. Otherwise they will be removed from the site by a suitably qualified contractor and transported to an appropriate recycling facility;

- The remaining items will be demolished, removed and transported from the site as required. All recoverable scrap steel will be sold and recycled, with the remaining non-recyclable wastes being taken to a licenced landfill. Prior to disposal, all wastes will be assessed and classified in accordance with *Waste Classification Guidelines (DECC, 2008);* and

- All concrete footings and pads will be broken up to at least 1.5m below the surface. The waste concrete will be crushed to produce an aggregate that can either be used on the site or sold for some other beneficial use.

Roadways, Car Parks and Hardstand

The roadways, car parks, and hardstand areas around the processing and administration areas will be ripped up. All areas will be reshaped, deep ripped, topsoiled and seeded in accordance with the rehabilitation plan.

Fuel Farm and Lubricant Storage Area

Leading up to closure, a preliminary sampling and analysis programme (Phase 1) will be implemented to determine whether a more detailed assessment (Phase 2 – detailed investigation of contamination involving drilling, etc) should be conducted.

13.0 HAZARDOUS MATERIALS / DANGEROUS GOODS

All fuel storage and storage of any required chemicals will be within the specified bunded area of the infrastructure plant.

Material Safety Data Sheets will be recorded in the site safety system for all chemicals used on site. This will contain information on the environmental impacts for the use of certain chemicals and include detail on emergency response, clean up and disposal should a highly unlikely event of a spill occur.

14.0 UTILITIES

The proposed development will comply with the requirements of the relevant utility authorities and evidence of the necessary approvals will be provided to the NSW DoPI prior to construction works.

15.0 OUTDOOR LIGHTING

All outdoor lighting associated with the proposed development will be designed to comply with the requirements of AS 4282, Control of Obtrusive Effects of Outdoor Lighting.

APPENDIX 3 – Biodiversity Offset Management Plan (Kleinfelder, 2015)

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Biodiversity Offset Area Management Plan

Karuah East Quarry Project

Karuah East Quarry Pty Ltd

November 2015

Biodiversity Offset Area Management Plan

Karuah East Quarry Project

Kleinfelder Document Number: WBA15R23074
Project No: 20161391

Prepared for:

KARUAH EAST QUARRY PTY LTD
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KARUAH NSW 2324

Document Control:

Version	Description	Date	Author	Reviewers	Authorised / Approved for issue
1.0	Draft	24 July 2015	A. Mulcahy	S. Schulz	-
1.1	Final draft for submission to DP&E	1 September 2015	A. Mulcahy	S. Schulz (Kleinfelder) M. Radnidge (ADW Johnson) B. Almond (Karuah East) C. Jones (SLR Consulting)	-
1.2	Revised to incorporate consultation with OEH and GLC	15 October 2015	A. Mulcahy	S. Schulz	-
1.3	Revised to incorporate DP&E comments	9 November 2015	A. Mulcahy	S. Schulz	-

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1. INTRODUCTION

1.1 BACKGROUND AND PROJECT OVERVIEW

Hunter Quarries currently extract hard black andesite material from its existing quarry operation located near Karuah, NSW (Lot 21 DP 1024341, Lot 11 DP 1024564 & part Lot 12 DP 1024564). Approval was granted for this designated development on the adjoining land by the Minister as State Significant Development on 3 June 2005.

The existing Karuah Quarry currently operates under development approval DA 265/2004 and is approved to extract up to 500,000 tonnes per annum of andesite basalt material suitable for use as road base, construction aggregate and concrete batching, among various other applications.

Following exploratory works adjacent to the existing approved quarry, additional resource has been identified to the east on land owned by the proponent. On 17 June 2014 the approval was granted by the Minister for Planning and Environment (PA 09_0175) for the extraction of this additional resource through the development of Karuah East, a stand-alone operation to the existing quarry.

Karuah East is located on Lots 12 and 13 DP 1024564, off the Pacific Highway approximately 3 km north of Karuah NSW within the Great Lakes Council (GLC) Local Government Area (LGA). The approved development includes the following key elements:

- Staged extraction of approximately 29 million tonnes of “andesite” over a 20 year timeframe (i.e. approximately 1.5 million tonnes of andesite per year);
- Removal and stockpiling of an estimated 380,000 m^3 of overburden (approximately 750,000 tonnes) from the quarry extraction area in accordance with the Landscape and Rehabilitation Management Plan (L&RMP) (SLR 2015) prepared for the project. Removal of overburden is not included in the proposed extraction rate of 1.5 million tonnes of andesite annually;
- Haulage of up to 1.5 million tonnes of andesite per year from the site to market by 25 to 30 tonne haul trucks via the Pacific Highway;
- Up to 216 truckloads per day (at maximum production);
- Implementation of water management and erosion and sediment control works to ensure no loss of sediment, dust minimisation and to control discharges from the site to ensure that all discharges are within acceptable volumetric and water quality criteria;

- Roadworks to secure access to the site including upgrade and extension of Blue Rock Close, realignment of Andesite Road and Blue Rock Close intersection and adjust road markings at Branch Lane and Andesite Road intersection;
- Employment of 28 on-site staff;
- Construction of new haul road and access through adjoining Roads and Maritime Service (RMS) land;
- Staged clearing;
- Drilling and blasting activities;
- Loading and hauling of extracted material;
- Crushing and screening of extracted material;
- Stockpiling of material on-site; and
- Location of plant on Lot 13 comprised of office buildings, workshops, parking areas, crushing plant, wash plant, weigh bridge and product storage areas.

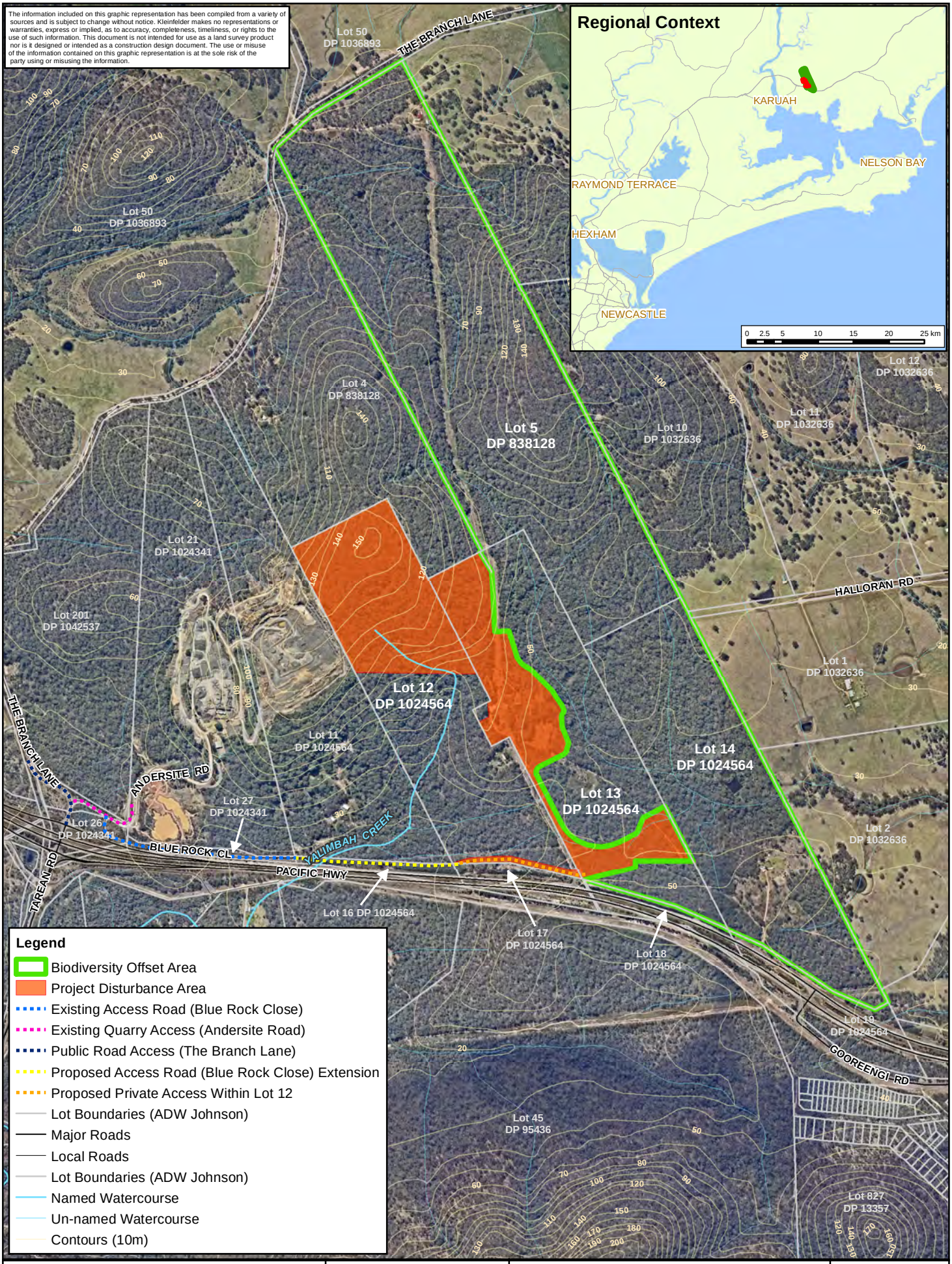
Figure 1 presents the Karuah East Quarry project disturbance area.

1.2 STATUTORY REQUIREMENTS

The statutory approvals for the Karuah East Quarry Project (KEQP) relevant to this Biodiversity Offset Area Management Plan (BOAMP) are shown in **Table 1**.

Table 1: Statutory approvals for the Karuah East Quarry Project relevant to this plan.

Reference	Approval Description	Date Approved	Legislation	Authority
PA 09_0175	State approval for the Karuah East Quarry Project	17 June 2014	Approved under Part 3A of EP&A Act 1979	Department of Planning and Environment (DP&E)
EPBC 2014/7282	Commonwealth approval for the action (Karuah East Quarry Project)	20 March 2015	Approved under Sections 130(1) and 133 of the EPBC Act 1999	Department of the Environment (DoTE)



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PROJECT REFERENCE: Karuah

DATE DRAWN: 15/10/2015 17:22Version 3

DRAWN BY: gjoyce

DATA SOURCE:
LPI - 2015
ADW Johnson - 2015
Nearmap - 2015

Karuah East Quarry and Biodiversity Offset Area

Karuah East Quarry Pty Ltd
Biodiversity Offset Area Management Plan
Karuah East Quarry Project

FIGURE:
1

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1.3 SCOPE AND REQUIREMENTS OF THE PLAN

This Biodiversity Offset Area Management Plan (BOAMP) has been prepared to satisfy relevant conditions of the Project Approval and EPBC Approval. Specifically, this plan addresses Schedule 3 Condition 33 of the Project Approval, and Conditions 7, 8 and 9 of the EPBC Approval. In addition to the above conditions, several sections of the statement of commitments also relate to biodiversity offsets. The relevant approval conditions, statement of commitments, and a section reference for where each item of the conditions is addressed within this plan are provided in **Appendix 1**.

The BOAMP only applies to lands within the biodiversity offset area (BOA) located on part Lot 13 and Lot 14 DP 1024564, and Lot 5 DP 838128 as detailed in the Biodiversity Offset Strategy (ELA 2013) and Appendix 4 of the Project Approval (see Section 2 for details). A separate Landscape and Rehabilitation Management Plan (L&RMP) has also been prepared as required under Schedule 3 Condition 32 of the Project Approval for biodiversity management of the Karuah East quarry and all perimeter lands (hereafter referred to as the 'project area').

1.4 OVERALL OBJECTIVES OF THE BOAMP

The overall objective of this BOAMP is to bring together relevant approval conditions and information from project documentation into a single source to improve the efficiency and effectiveness of offset area management to protect and improve vegetation condition and habitat. In particular this document will:

- Identify the land managed under this BOAMP;
- Identify, and where relevant incorporate, the various documents that pertain to the baseline environment and required management within the BOA;
- Provide a clear, concise, staged and instructional working document outlining the management strategies and actions for the BOA; and
- Outline monitoring, performance/ completion criteria, and reporting procedures for the BOA.

1.5 CONSULTATION AND PLAN DEVELOPMENT

Kleinfelder was engaged by Karuah East Quarries Pty Ltd (Karuah East) to prepare this plan.

This plan was submitted to DoTE, OEH and GLC for review and consultation as per Schedule 3 Condition 33(b) of the PA and Condition 9 of the EPBC approval, and has been subsequently amended to incorporate feedback received (**Appendix 2**). The BOAMP has also been submitted to DP&E for review, and has been subsequently amended to incorporate feedback received (**Appendix 2**).

1.6 ROLES AND RESPONSIBILITIES

Table 2 outlines the specific roles and responsibilities of Karuah East staff and contractors for the implementation of this BOAMP.

Table 2: Roles and responsibilities for BOAMP implementation

Role	Responsibilities
Quarry Manager	• To authorise this plan. • To provide the final authorised distribution of this management plan. • Organise revisions of this BOAMP as required (Section 6).
Quarry Manager (or delegate)	• Implement the management actions contained in this plan. • Maintain records of all activities within the offset area. • Inclusion of all relevant records and monitoring results within the Annual Review. • Ensure that all operations on site are undertaken in compliance with this management plan. • Ensure all site personnel have received the appropriate training for their responsibilities. • Provide feedback on the adequacy and effectiveness of this plan.
Staff and Contractors	• Report any incidences or complaints immediately to the Quarry Manager or delegate. • Ensure the implementation of this BOAMP with respect to their specific work practices. • Act in accordance with the management procedures or protocols outlined in this plan. • Ensure any potential or actual issues, including environmental incidents, are reported to the Quarry Manager or delegate in a timely manner.

2. BIODIVERSITY OFFSET AREA

2.1 LOCATION AND SURROUNDING LAND USES

The BOA for Karuah East is a 138.22 ha consolidated land parcel comprised of three lots:

- Lot 13 DP 1024564 (part) – 23.03 ha;
- Lot 14 DP 1024564 – 38.49 ha; and
- Lot 5 DP 838128 – 76.70 ha.

It is noted that the above areas are based on cadastre data supplied by ADW Johnson following recent survey by registered surveyors to accurately define the lot boundaries. As such, the total area of native vegetation within the BOA is larger than detailed in previous project documentation.

The BOA is located approximately 3 km north of Karuah NSW, and adjoins the eastern boundary of the project area (**Figure 1**). The BOA is located in a rural environment with surrounding lands zoned RU2 Rural Landscape under the Great Lakes Local Environmental Plan (LEP) 2014. The BOA is bounded by the Pacific Highway to the south, the project area to the south-west, and private landholdings to the north-west, north and east which comprise a mixture of forested and cleared grazing lands.

The BOA will not be subject to operational impacts from the adjoining Karuah East Quarry as all quarrying, processing and hauling activities are restricted entirely to the project area.

2.2 LAND TENURE AND SECURITY

Both Lot 13 and 14 DP 1024564 are currently owned by the Karuah East Quarry Pty Ltd. Lot 5 DP 838128 has also now been purchased by Karuah East Quarry Pty Ltd; the contracts have been exchanged with the vendor and a caveat has been lodged over the property. Settlement of the transaction for Lot 5 will occur on the 19 December 2015. Following settlement, Karuah East Quarry Pty Ltd will secure the BOA via a Conservation Agreement under Part 4, Division 12 of the *National Parks and Wildlife Act 1974* in consultation with OEH as per Schedule 3 Condition 29 of the Project Approval (see 'Finalisation Biodiversity Offset Strategy' letter for further details in **Appendix 2**).

2.3 BASELINE ENVIRONMENT

2.3.1 Land Use History

The majority of the BOA is vegetated with native forest (131.76 ha) with the remaining 6.46 ha consisting of cleared and modified lands that contain dams, existing dwellings, access roads, and infrastructure. The BOA has been previously subject to logging and cattle grazing regimes, although both practices have ceased on all three lots. A managed electricity easement bisects the northern portion of Lot 13 and the central portion of Lot 5. Two dwellings are present in the BOA, one on the southern portion of Lot 14 and at the northern end of Lot 5; there is a small cleared area surrounding each dwelling. A series of unsealed tracks (old logging and fire trails) occur across all lots within the BOA.

2.3.2 Climatic Information

The nearest Bureau of Meteorology (BOM) weather station which records long term climatic data is located approximately 17 km to the east of the BOA at Nelson Bay. This station holds climate records since 1881 and provides long term indications of weather in the area. A summary of the monthly temperature and rainfall averages in 2014 and long term historical averages in provided in **Table 3**.

Table 3: Climatic data from Nelson Bay weather station

Month	2014 Monthly Mean		Total Rainfall (mm)	Historical Averages		
	Min Temp (°C)	Max Temp (°C)		Min Temp (°C)	Max Temp (°C)	Rainfall Median (mm)
January	20.1	26.8	42.1	18.8	27.3	83.8
February	19.8	26.1	141.8	18.9	27	86.4
March	19.4	26.0	92.9	17.6	25.9	90.2
April	17.6	23.6	143.5	15.1	23.5	103.8
May	14.8	21.9	88.9	12.2	20.7	131.4
June	12.6	18.8	159.1	10	18.3	128.4
July	10.1	17.8	47.5	8.9	17.4	115
August	11.4	17.7	247.9	9.7	18.9	79.7
September	13.4	20.5	134.1	11.8	21.4	73.8
October	16.0	23.3	43.6	13.9	23.1	70.6
November	18.0	25.4	32.6	15.8	24.7	70.1
December	19.5	25.8	93.9	17.6	26.1	74.6
Average	**16.1**	**22.8**	**105.7**	**14.2**	**22.9**	**92.3**

2.3.3 Landform, Geology, Soils and Erosion

The BOA is situated in the Karuah River Basin and is overall undulating, but varies in slope and aspect considerably. Numerous steep, sometimes rocky, slopes and creek gullies are evident, particularly in the southern and central portions of Lot 5. The BOA generally has much lower relief in the southern portion (Lots 13 and 14) which is generally a south facing aspect toward the Pacific Highway with a more meandering watercourse and drainage line system (Bulga Creek and its tributaries). **Figure 1** provides the topography of the BOA.

The BOA is mapped as occurring on both residual and colluvial soil landscape groups, namely North Arm Cove and Gan Gan, described as supporting undulating to steep hills on ignimbrites of the Nerong Volcanics comprising ignimbrite, toscanite, dacite, andesite, conglomerate, sandstone and siltstone (Murphy 1995). This Nerong Volcanics soil landscape is characterised by colluvial (steeper slopes and ridgelines) and alluvial (lower elevations and watercourses) areas. The distribution of the dominant vegetation types supported in the BOA is closely related to the distribution of these two soil types.

2.3.4 Vegetation Communities, Threatened and Migratory Species

RPS Australia Pty Ltd (2013) conducted an ecological assessment of the proposed Karuah East Quarry project area and adjoining lands (Lots 12, 13 and 14 DP1024564). Additional ecological surveys were also conducted by Eco Logical Australia (ELA) across Lots 12-14 and Lot 5 DP 838128 to inform the preparation of the Biodiversity Offset Strategy (ELA 2013) and EPBC Act Assessment Report (ELA 2014). The following sections provide a summary of the biodiversity values identified within the BOA.

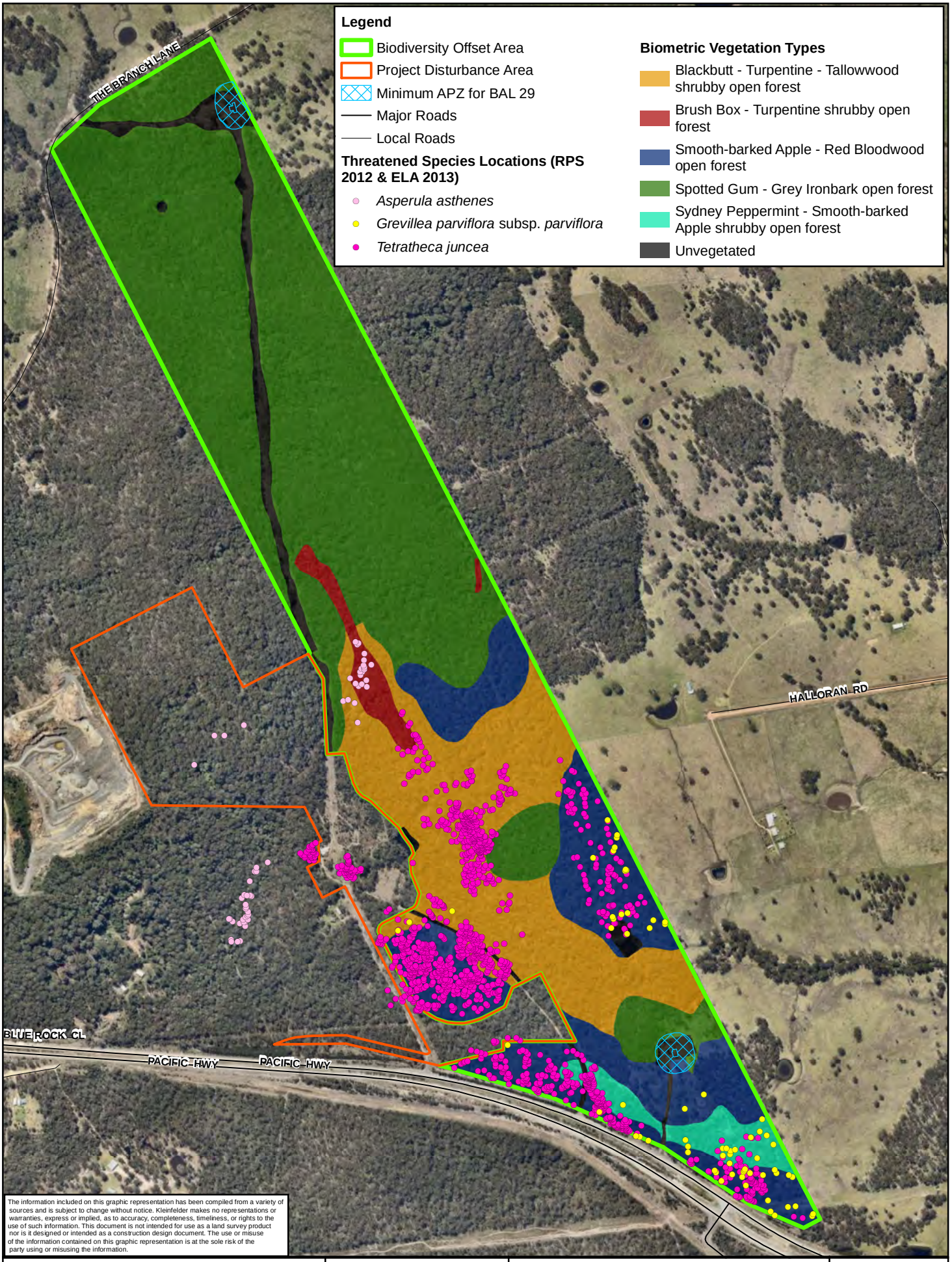
Vegetation Communities

ELA (2013) identified and mapped five biometric vegetation types in the BOA. A summary of the area (ha), and structure and floristics of each vegetation type recorded in the BOA is provided in **Table 4**. The distribution of these vegetation types is shown in **Figure 2**. None of the vegetation types recorded in either the project area or BOA are listed as threatened ecological communities under the NSW *Threatened Species Conservation Act* (TSC Act) 1995 or the Commonwealth *Environment Protection and Biodiversity Conservation Act* (EPBC Act) 1999.

Table 4: Summary of Vegetation Types in the BOA

Vegetation Type	Description (ELA 2013)	Area (ha)
Spotted Gum – Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	Remnant open forest, with a distinct sub-canopy and an understorey, scattered shrubs and predominantly native perennial grasses and forbs. A small area (0.83 ha) consists of previously cleared regrowth open forest with young saplings and taller shrubs to 3 - 5 m and sparsely scattered larger remnant trees. It contains a denser shrub layer and primarily native grasses as a ground cover; although	69.98

Vegetation Type	Description (ELA 2013)	Area (ha)
	introduced grass species are common. **Dominant species** Canopy: *Corymbia maculata* (Spotted Gum), *Eucalyptus paniculata* subsp. *paniculata* (Grey Ironbark), *Eucalyptus fibrosa* (Broad-leaved Ironbark), *Eucalyptus canaliculata* (Large-fruited Grey Gum) and *Eucalyptus acmenoides* (White Mahogany). Midstorey: *Allocasuarina torulosa* (Forest Oak). Groundcover: *Imperata cylindrica* (Blady Grass) and *Themeda australis* (Kangaroo Grass).	
Sydney Peppermint – Smooth barked Apple shrubby open forest on coastal hills and plains of the southern North Coast and northern Sydney Basin.	Remnant open forest vegetation with a sparse sub-canopy. A distinct but variable shrub layer was present, sometimes moderately dense. The groundcover layer was generally dominated by native grass species. **Dominant species** Canopy: *Eucalyptus piperita* (Sydney Peppermint), *Angophora costata* (Smooth-barked Apple) and *Corymbia gummifera* (Red Bloodwood). Midstorey: *Allocasuarina littoralis* (Black She-oak). Groundcover: *Imperata cylindrica*, *Entolasia stricta* and *Themeda australis*.	3.96
Smooth-barked Apple - Red Bloodwood open forest on coastal plains on the Central Coast, Sydney Basin	Remnant open forest with some large mature trees. Generally comprising a sparse sub-canopy, a variable shrub layer (often quite dense) and a grass dominated understorey predominantly native perennial grasses and forbs. A small area (3.02 ha) consists of previously cleared regrowth open forest with young saplings to 5 m and sparsely scattered larger trees. It contains a denser shrub layer and primarily native grasses as a ground cover; although introduced grass species are well established. **Dominant species** Canopy: *Angophora costata* (Smooth-barked Apple), *Corymbia gummifera* (Red Bloodwood), *Eucalyptus microcorys* (Tallowwood) and *Eucalyptus pilularis* (Blackbutt). Midstorey: *Allocasuarina littoralis* (Black She-oak). Groundcover: *Imperata cylindrica* and *Doryanthes excelsa* (Gymea Lily).	26.58
Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central North Coast	Remnant moderately tall moist open forest to forest vegetation including some areas of younger growth. A distinct but generally sparse sub-tree layer, as well as an often sparse shrub layer. Groundcover comprised of a combination of grasses and herbaceous species. **Dominant species** Canopy: *Eucalyptus pilularis* (Blackbutt), *Eucalyptus microcorys* (Tallowwood), *Syncarpia glomulifera* (Turpentine) and *Angophora costata* (Smooth-barked Apple). Midstorey: *Allocasuarina torulosa* (Forest Oak). Groundcover: *Themeda australis* (Kangaroo Grass), *Poa affinis*, *Imperata cylindrica* (Blady Grass) and *Doryanthes excelsa* (Gymea Lily).	28.30
Brush Box - Turpentine shrubby open forest of the coastal ranges of the North Coast	Remnant and regrowth of moderately tall open forest to forest, comprising a distinct sub-canopy of small trees (mesic). Numerous climbers and twiners throughout. A dense understorey of ferns, rushes, grasses and various herbs. **Dominant species** Canopy: *Lophostemon confertus* (Brush Box) and *Syncarpia glomulifera* (Turpentine). Midstorey: *Melaleuca styphelioides* (Prickly Paperbark), *Glochidion ferdinandi* (Cheese Tree) and *Livistona australis* (Cabbage Tree Palm). Groundcover: *Lomandra longifolia* (Spiny-headed Mat-rush), *Doodia aspera* (Rasp Fern) and **Lantana camara* (Lantana).	2.62
	Total	**131.44**



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DATA SOURCE:
LPI - 2015
ADW Johnson - 2015
EcoLogical - 2014
Nearmap - 2014

Vegetation Types and Threatened Species Locations

Karuah East Quarry Pty Ltd
Biodiversity Offset Area Management Plan
Karuah East Quarry Project

FIGURE:

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Threatened and Migratory Species

A total of three threatened flora species listed as Vulnerable under both the TSC Act and EPBC Act were recorded during surveys of the study area: *Tetratheca juncea* (Black-eyed Susan), *Grevillea parviflora* subsp. *parviflora* and *Asperula asthenes* (Trailing Woodruff). A summary of the population sizes and habitats in which these species occur within the project area and BOA is provided in **Table 5**. The locations of these threatened flora species are provided in **Figure 2**.

A total of five threatened fauna species listed as Vulnerable under the TSC Act were recorded during surveys of the study area: Powerful Owl (*Ninox strenua*), Varied Sittella (*Daphoenositta chrysoptera*), Glossy Black-Cockatoo (*Calyptorhynchus lathami*), Eastern Freetail-bat (*Mormopterus norfolkensis*) and Eastern False Pipistrelle (*Falsistrellus tasmaniensis*). An additional 15 threatened fauna species and four EPBC-listed migratory species were considered to potentially occur in the project area and surrounding lands (RPS 2013).

Table 5: Threatened flora species recorded in the project area and BOA

Species	Habitat	Population Size
Tetratheca juncea	Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central North Coast Smooth-barked Apple - Red Bloodwood open forest on coastal plains on the Central Coast, Sydney Basin. Sydney Peppermint – Smooth barked Apple shrubby open forest on coastal hills and plains of the southern North Coast and northern Sydney Basin.	6,567 clumps were recorded across study area. Of these, 243 clumps were recorded in the project area, and 6,324 occur in the BOA.
Grevillea parviflora subsp. *parviflora*	Smooth-barked Apple - Red Bloodwood open forest on coastal plains on the Central Coast, Sydney Basin. Sydney Peppermint – Smooth barked Apple shrubby open forest on coastal hills and plains of the southern North Coast and northern Sydney Basin.	At least 100 stems were recorded within the BOA. No stems were recorded within the project area.
Asperula asthenes	Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central North Coast Spotted Gum – Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	60 individuals were recorded in the project area. At least 120 individuals were recorded in the BOA, and 200+ individuals were recorded on Lot 12 outside the project area.

2.3.5 Introduced Species

Weeds

RPS (2013) recorded a total of seven exotic species within the project area. Two of these species are listed as noxious under the *Noxious Weeds Act 1993*, one of which (*Lantana camara* (Lantana)) is applicable to the Great Lakes Council control area (**Table 6**). Lantana is also listed as a Weed of National Significance (WoNS). ELA (2013) recorded a number of other exotic species within the offset area which have also been listed in **Table 6**; none of these species are listed as noxious (with the exception of Lantana). All noxious weeds and

other environmental weeds which represent a threat to the integrity of the ecological values within the BOA will be the focus of management actions.

Table 6: Exotic species recorded in the study area (RPS 2013; ELA 2013)

Scientific Name	Common Name	Control Class (NW Act 1993)
Andropogon virginicus	Whisky Grass	-
Axonopus fissifolius	Narrow-leafed Carpet Grass	-
Bidens pilosa	Cobblers Pegs	-
Briza maxima	Quaking Grass	-
Hypochaeris radicata	Catsear	-
Lantana camara	Lantana	Class 4
Melinis repens	Red Natal Grass	-
Paspalum dilatatum	Paspalum	-
Pennisetum clandestinum	Kikuyu	-
Plantago lanceolata	Lamb's Tongues	-
Senna pendula var. *glabrata*	Cassia	Class 4
Setaria sphacelata	South African Pigeon Grass	-
Solanum nigrum	Black-berry Nightshade	-
Stellaria media	Common Chickweed	-
Verbena bonariensis	Purpletop	-

Vertebrate Pests

No vertebrate pest species were recorded during field surveys of the BOA by RPS (2013) or ELA (2013). However, **Table 7** provides a list of vertebrate pest species which may occur in the BOA. These pest species will be the focus of monitoring and management actions.

Table 7: Vertebrate pest species which may occur in the BOA

Scientific Name	Common Name
Canis lupus familiaris	Wild Dog*
Felis catus	Cat
Lepis capensis	Brown Hare
Oryctolagus cuniculus	Rabbit*
Sus scrofa	Feral Pig*
Vulpes vulpes	Red Fox
**Declared pests under the Local Land Services Act 2013*	

2.3.6 Additional Baseline Surveys

It is noted that additional baseline surveys of the BOA will be undertaken to satisfy relevant approval conditions and to supplement the information provided in the previous sections. Condition 9 of the EPBC Approval (2014/7282) states that the BOAMP must include:

> *"Survey information identifying the number of Trailing Woodruff present across all proposed offset sites"* [prior to the commencement of construction] *(p.3).*

Appendix 6 of the Project Approval (i.e. statement of commitments) also states that:

> *"Seasonal flora and fauna survey of the offset site will be undertaken in accordance with relevant OEH guidelines. In particular, seasonal survey for* Tetratheca juncea *and* Grevillea parviflora *subsp.* parviflora *will be undertaken and reported to the OEH" (p.47).*

In consideration of the surveys that have already been undertaken in the BOA by RPS (2013) and ELA (2013, 2014) (including vegetation mapping and plots; targeted surveys for *Tetratheca juncea* and *Grevillea parviflora* subsp. *parviflora* on Lots 13 and 14), the following surveys will be undertaken prior to the commencement of clearing and construction:

- Targeted surveys for *Tetratheca juncea* and *Grevillea parviflora subsp. parviflora* on Lot 5;
- Targeted for *Asperula asthenes* within areas of potential habitat (ELA 2014) across the BOA;
- Fauna surveys across the BOA in accordance with *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (DEC 2004);

At this stage, these additional surveys are scheduled to be undertaken in September/October 2015. These data will be provided as an addendum to this plan and the results will be incorporated into the Conservation Agreement to be prepared for the BOA.

2.4 MANAGEMENT ZONE STRATIFICATION

Management zones within the BOA are based on the current vegetation types as mapped by ELA (2013). The majority of the management zones consist of remnant forest vegetation, while the remaining zones comprise relatively small areas of cleared land or regenerating forest. Over time as natural regeneration progresses and management actions are undertaken, the management zone boundaries may change as the cleared areas regenerate to a similar composition to the adjoining forest types.

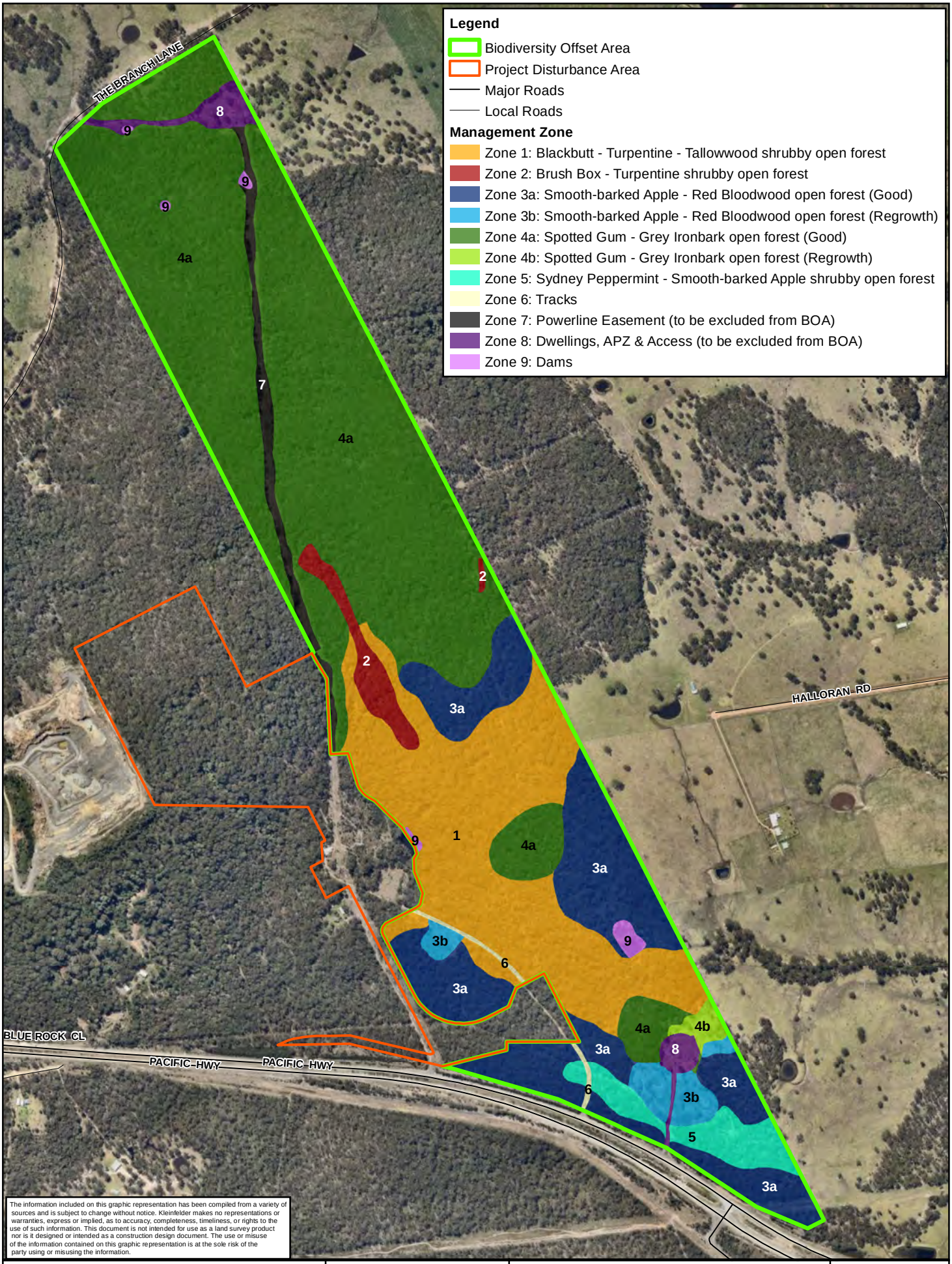
It is also noted that the BOA contains small areas of land that do not contribute to biodiversity conservation (i.e. powerline easement, existing dwellings and access tracks). These areas

have been delineated as separate management zones (**Table 8**), and it is intended that these management zones will be excised from the Conservation Agreement to be prepared for the BOA. Excluding these areas, the BOA contains a total of 131.44 ha of native vegetation.

Irrespective of the management zone, the majority of management practices are relevant across the entire BOA. **Figure 3** and **Table 8** illustrate the BOA management zones.

Table 8: Management zones within the BOA

Management Zone	Vegetation Type	Condition	Objective	Area (ha)
1	Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central North Coast	Moderate/ good	Conserve and maintain	28.30
2	Brush Box - Turpentine shrubby open forest of the coastal ranges of the North Coast	Moderate/ good	Conserve and maintain	2.62
3a	Smooth-barked Apple - Red Bloodwood open forest on coastal plains on the Central Coast, Sydney Basin	Moderate/ good	Conserve and maintain	23.69
3b	Smooth-barked Apple - Red Bloodwood open forest on coastal plains on the Central Coast, Sydney Basin	Moderate/ good (modified regrowth)	Allow natural regeneration to adjoining forest communities	2.89
4a	Spotted Gum – Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	Moderate/ good	Conserve and maintain	69.19
4b	Spotted Gum – Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	Moderate/ good (modified regrowth)	Allow natural regeneration to adjoining forest communities	0.79
5	Sydney Peppermint – Smooth barked Apple shrubby open forest on coastal hills and plains of the southern North Coast and northern Sydney Basin.	Moderate/ good	Conserve and maintain	3.96
Total area of native vegetation				**131.44**
6	Access tracks	N/A	Maintain to enable access for management activities	0.48
7	Powerline easement	N/A	Managed powerline easement	3.12
8	Excluded dwellings and associated asset protection zones (APZs), and access tracks	N/A	Dwellings, APZs, access tracks and managed grassland	2.48
9	Dams	N/A	Conserve and maintain	0.70
Total area of dams, cleared land, and land to be excised				**6.78**
Total				**138.22**



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LPI - 2015
ADW Johnson - 2015
EcoLogical - 2014
Nearmap - 2015

Management Zones

Karuah East Quarry Pty Ltd
Biodiversity Offset Area Management Plan
Karuah East Quarry Project

FIGURE:
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3. MANAGEMENT STRATEGIES

This section details the management measures to protect and manage the native vegetation and habitat within the BOA (**Table 9**). Short, medium and long-term measures to be implemented across the BOA are described for each management strategy. For the purpose of this plan, short-term measures will be undertaken within year 1, medium-term measures apply to years 2 and 3, and long-term measures apply to year 4 onwards. The timing and any specific reporting requirements of management actions are detailed in **Table 9**. Monitoring and maintenance requirements are also specified for each management strategy.

Implementation of the short-term measures (i.e. year 1) will commence upon authorisation of this plan. The long-term management measures will be implemented for the life of the quarry operation (including all rehabilitation works; approx. 20 years); post operations management will be in accordance with the Conservation Agreement. Performance and completion criteria relating to each management action are provided in **Section 4**, and the overall reporting framework for the BOAMP is outlined in **Section 5**.

Table 9: Management measures to be implemented within the BOA

Action	Management Approach and Procedures	Timing	Reporting/ Records
3.1 CULTURAL HERITAGE MANAGEMENT **Objective**: To preserve and protect Aboriginal and European cultural heritage values within the BOA.			
Record and manage newly identified cultural heritage objects	• To be undertaken as per the Cultural Heritage Management Plan (CHMP).	As required	As per CHMP
Risk assessment to avoid disturbance to cultural heritage objects	• All staff and subcontractors undertaking any management activities in the BOA that may uncover cultural heritage items (e.g. access track maintenance) must be made aware of this potential risk and to adhere to the procedures outlined in the CHMP.	As required	Induction/ toolbox records
3.2 FENCING, GATES AND SIGNAGE **Objective**: To exclude stock, limit access, maintain biodiversity values (including protecting threatened species), protect cultural heritage values, enhance revegetation, and notify the presence of the offset area and conservation values.			
Fence mapping	• Map the locations of existing boundary and internal fencing, including fencing types and gates. • Identify locations requiring fencing and gate installation/ repairs • Identify redundant internal fencing to be removed.	Year 1	Baseline addendum report

Action	Management Approach and Procedures	Timing	Reporting/ Records
Boundary fencing, gates and signage installation/ repairs	• Install post and wire fencing (minimum three strand) at required locations around BOA perimeter (with the exception of the project area/ BOA interface – see L&RMP for details on fencing for this boundary). • Plain wire should be used instead of barbed wire to reduce injuries to native fauna moving between the BOA and adjacent lands, except for boundaries adjoining stock grazing properties (i.e. eastern boundary of BOA). • Repair any breaks in boundary fencing. • Install signage at appropriate locations around the BOA perimeter (primarily at access points) which indicate land ownership and tenure (i.e. Conservation Area).	Year 1	Maintain records of installation/ repair dates, locations, and personnel
Redundant fencing removal	• Remove any internal stock exclusion fencing. • Retain timber posts where possible for habitat.	Years 2-3	Maintain records of fencing removal dates, quantity removed, and locations
Fencing inspections	• Inspections of boundary fencing will be undertaken as part of annual monitoring to identify maintenance requirements and record fencing activities undertaken in previous year. • The effectiveness of fencing in excluding stock and unauthorised activities (e.g. rubbish dumping) will also be evaluated during annual monitoring and any additional controls will be identified if required.	Annually for life of quarry (LOQ)	Annual monitoring report
Fencing maintenance	• Maintain boundary fencing as directed by annual inspection results.	As required for LOQ	Maintain records of fencing maintenance dates, locations and personnel
3.3 ACCESS TRACKS **Objective**: To provide suitable access for emergency vehicles and approved management/ maintenance activities, and to minimise erosion and sedimentation within the BOA.			
Access track mapping and assessment	• Map all internal access tracks. • Identify access tracks to be retained and maintained, and any repairs/ upgrades required. • Identify redundant access tracks to be rehabilitated.	Year 1	Baseline addendum report
Access track repairs	• Undertake track repairs as specified in the baseline track mapping and assessment. • Generally, track repairs will consist of rectifying any riling or scouring through grading, compacting and filling.	Years 2-3	Maintain records of track repairs including dates, locations and personnel

Action	Management Approach and Procedures	Timing	Reporting/ Records
Redundant access track rehabilitation	• Install suitable delineation, barriers and/ or signage to ensure redundant tracks are not used. • Where possible and appropriate, habitat features such as logs and branches salvaged during clearing of the project area will be placed along redundant tracks to reduce erosion/ sedimentation and promote natural regeneration (see **Section 3.8** for further details). • Assisted natural regeneration is the preferred method for rehabilitation of redundant tracks (as they occur within/ next to remnant vegetation). The adequacy of natural regeneration and the subsequent need for any supplementary planting would be determined through annual inspections.	Years 2-3	Maintain records of track rehabilitation including dates, locations and personnel
Access track inspections	• Inspections of retained and redundant access tracks will be undertaken as part of annual monitoring to identify maintenance requirements and record maintenance activities undertaken in previous year.	Annually for LOQ	Annual monitoring report
Track maintenance	• Maintain access tracks as directed by annual inspection results.	Annually following initial track repairs/ upgrades for LOQ	Maintain records of track repairs including dates, locations and personnel
3.4 EROSION, SEDIMENTATION AND SOIL MANAGEMENT **Objective**: To improve/ maintain the soil profile, protect cultural objects and promote natural regeneration in the BOA.			
Erosion and sedimentation mapping	• Map areas of active erosion and sedimentation in the BOA. • Prioritise erosion sites requiring repair depending on size and severity of impacts.	Year 1	Baseline addendum report
Erosion repair and management	• Undertake erosion repair and management as specified in the baseline erosion mapping and assessment. • Generally, erosion control will consist of stabilising soil erosion (e.g. installing jute matting over affected areas; placing logs or branches on affected areas to reduce surface water velocity) and minimising sediment-laden run-off (e.g. installing sediment control devices such as silt fencing or coir logs).	Years 2-3	Maintain records of erosion management activities including dates, locations and personnel
Erosion inspections	• Inspections of erosion sites will be undertaken as part of annual monitoring to identify maintenance requirements and record maintenance activities undertaken in previous year.	Annually for LOQ	Annual monitoring report
Maintenance	• Undertake repair and management of erosion sites as directed by annual inspection results.	Annually for LOQ	Maintain records of erosion repairs including dates, locations and personnel

Action	Management Approach and Procedures	Timing	Reporting/ Records
3.5 EXISTING DWELLINGS **Objective**: To manage potential indirect impacts from continued occupation of existing dwellings within the BOA.			
Exclusion of existing dwellings from BOA	• Two existing dwellings currently occur within the BOA on Lot 14 and Lot 5. These dwellings and associated access tracks will be excised from the Conservation Agreement (**Figure 4**). These excised areas only include the existing dwellings, access tracks, cleared land surrounding the dwellings, and provision for an Asset Protection Zone (APZ) for each dwelling. Karuah East will retain ownership of these excised lands for the life of the project.	Year 1	-
Restrictions and management of dwellings	• All tenants will be informed of the BOA adjoining the dwellings and associated access restrictions that apply to this land. • No domestic animals will be permitted at the two dwellings. • Noxious weeds must be managed within the excised areas in accordance with **Section 3.10**. • Fencing will be installed around the excised dwellings and associated access tracks in conjunction with the boundary fencing detailed in **Section 3.2** and as shown on **Figure 4**. • Signage will also be installed at appropriate locations near the dwellings to indicate land ownership and tenure of the adjoining BOA.	Year 1	Maintain records of fencing installation, dates and personnel
Inspections	• Inspections of the dwellings, access tracks, and asset protection zones (APZs) will be undertaken as part of annual monitoring to identify maintenance requirements. These inspections will focus on fencing, weeds, and unauthorised access/ disturbance.	Annually for LOQ	Annual monitoring report
Maintenance	• The cleared land surrounding each dwelling will be maintained as managed grassland for bushfire protection purposes (i.e. APZs). Mowing/ slashing of the APZ areas should be undertaken every three months.	Annually for LOQ	Maintain records of maintenance activities

Action	Management Approach and Procedures	Timing	Reporting/ Records
3.6 SEED COLLECTION AND PROPAGATION **Objective**: To collect native seed and plant material for propagation and revegetation purposes in a sustainable manner.			
Seed and/ or plant material collection	It is proposed that native seed and plant material be collected from the BOA for revegetation works within both the BOA (if required) and rehabilitation areas in the project area over the life of the quarry. Seed collection will be undertaken through the following protocol to ensure sustainable and appropriate use of these resources: • Native species to be collected will be those listed for revegetation areas within the BOA (**Section 3.7**) and rehabilitation areas in the project area (see L&RMP). • Seed collection and storage will be supervised by suitably trained personnel consistent with the relevant Florabank guidelines and codes of practice (available at https://www.florabank.org.au/). • Only the minimum quantity of seed or plant material required for rehabilitation will be collected; • A maximum of 20% of fruit and 10% of plant material will be collected from any one plant annually (i.e. larger seed quantities should be obtained by collecting from more plants); • No collection of seed or plant material from threatened flora species listed under the TSC Act or EPBC Act, or schedule 13 protected native plants under the *National Parks and Wildlife Act 1974* will be undertaken unless the appropriate permits or licences have been secured; and • Records of all seed collection activities within the offset area, including dates, locations, species collected, and quantity of plant material/seed/fruit, will be maintained. • Where seed cannot be sourced from the BOA, a seed mix containing locally endemic species will be purchased from a local seed supplier.	As required for revegetation	Maintain all seed collection records as described
Propagation	• Propagation of stock from seed will be undertaken by suitably trained personnel with appropriate facilities (i.e. nursery) to maximise germination and seedling survival. • Records on germination and propagation success rates (i.e. proportion of seed that germinates) will be maintained.	As required for revegetation	Maintain records on quantity of propagated stock, and propagation success rates

Action	Management Approach and Procedures	Timing	Reporting/ Records
3.7 REVEGETATION AND REGENERATION **Objective**: To establish native vegetation in cleared/modified areas and enhance the condition of remnant and regrowth vegetation in the BOA.			
Confirm extent of revegetation areas	• At this stage no areas within the BOA have been identified as requiring active revegetation as the BOA consists of either self-sustaining forest or areas with the capacity for natural regeneration. However, during the baseline surveys the extent of any areas assessed as not having the capacity to naturally regenerate and require active revegetation will be accurately mapped by a suitably qualified ecologist so that the quantity of seed, plant material or tubestock required for revegetation can be determined. • Generally, the need for any supplementary planting or revegetation across the BOA would be determined through annual monitoring in order to assess the adequacy of natural regeneration. • The two small cleared areas surrounding the existing dwellings will be excised from the BOA and will not be revegetated (**Section 3.5**). Additionally, no revegetation is to occur along the powerline easement which extends through the BOA as this will be managed by the electricity service provider (Essential Energy) (**Figure 4**). • Should any revegetation be required within the BOA, the target vegetation communities, suitable native species for planting, and approximate densities will be specified for each revegetation area in the BOA and included in the baseline report/ annual monitoring report.	Year 1, prior to revegetation	Baseline addendum report
Revegetation of cleared or modified areas	Revegetation will be undertaken as follows: • Site preparation of revegetation areas will first be undertaken if required, including weed control (**Section 3.10**), erosion control/ soil stabilisation (**Section 3.4**) and herbivore exclusion fencing (or tree guards). • Revegetation efforts will focus on establishing the canopy and midstorey layers as understorey species are likely to regenerate once a canopy is established. Subsequent revisions of this plan should include a list of suitable shrub and ground cover species to be established in these areas if required. • Revegetation can be undertaken using one of three methods (or a combination of these): (1) brush-matting; (2) direct seeding; (3) propagation and planting. These methods are described in **Appendix 3**.	As directed by annual monitoring	Maintain records on quantity of seed/ brush applied or seedlings planted, dates, locations and personnel
Revegetation maintenance	Revegetation areas will be maintained as follows: • Weed control around plants every three months for the first year after revegetation. • Reinstating and maintaining tree guards or herbivore exclusion fencing (if used) every three months for the first year after revegetation. • All tubestock plantings shall be initially watered in, watered on three separate occasions within the first month after planting, and then as required (in consideration of weather conditions). • Any other maintenance as directed by annual inspection results (see below).	After revegetation	Maintain records including works undertaken, dates, locations and personnel

Action	Management Approach and Procedures	Timing	Reporting/ Records
Revegetation monitoring	• Inspections of revegetation areas will be undertaken as part of annual monitoring to evaluate the success of revegetation works undertaken, and identify maintenance requirements for the following year.	Annually for 3 years after revegetation	Annual monitoring report
3.8 HABITAT AUGMENTATION **Objective**: To offset the loss of fauna habitat features in the project area, and enhance habitat in the BOA.			
Salvage and redistribution of habitat resources	The L&RMP details pre-clearing and clearing protocols, including salvage of resources during clearing. Where possible seed/ brush material and habitat resources including hollows, logs and large limbs will be salvaged and incorporated into the rehabilitation and/ or BOA. The redistribution of resources in the BOA will be undertaken as follows under the supervision of a suitably qualified ecologist: • Hollow logs and other large organic debris cleared from the project area will be stockpiled and either spread on rehabilitated areas immediately after redistribution of topsoil, or reinstated within the BOA where possible. Logs and large debris should only be salvaged and redistributed into the BOA where the transfer process will have minimal disturbance to the recipient area (e.g. placed along the project area/ BOA boundary; or transported to cleared revegetation areas, edges of the powerline easement or redundant access tracks). These resources must not be placed in areas where threatened flora species are present (see **Figure 2**). • Where possible, hollows should be salvaged from felled habitat trees by cutting at least 100 mm beyond the deepest point of the hollow and then stored in a dry safe place, or transported directly to the BOA for installation (see below).	Years 1-3	Maintain records on number/ quantity and locations of logs, branches and hollows salvaged and redistributed into BOA
Nest box installation	• Unless the hollows are salvaged and installed, one nest box will be installed in the BOA for each hollow lost (1:1 ratio) during clearing of the project area. The number of nest boxes required will be determined during clearing (see L&RMP for procedures). • Based on the vegetation types present it is likely that >30 hollows would be removed. As such, it is proposed that 30 nest boxes be installed within the offset area prior to vegetation clearing to provide sheltering/ nesting habitat for displaced fauna (including threatened species). The remaining nest boxes required would be installed within three months following completion of vegetation clearing. • A range of nest box designs will be installed to provide suitable habitat for the suite of hollow-dependent fauna (incl. threatened species, e.g. Squirrel Glider) known or likely to occur in the BOA. Nest boxes will be manufactured to an industry-accepted standard (e.g. designs in Franks and Franks 2003), which are typically made from plywood. • Nest box installation will be undertaken or supervised by a suitably qualified and experienced ecologist to ensure appropriate site selection and installation techniques. • Nest boxes and salvaged hollows will be installed at appropriate locations in the BOA on trees that do not already support hollows at a minimum height of three metres, preferably in a north or west orientation (based on recent nest box research undertaken by Kleinfelder (2015)) or at an aspect suitable for target species.	Year 1	Maintain records of number of nest boxes installed, designs used, and location of each nest box.

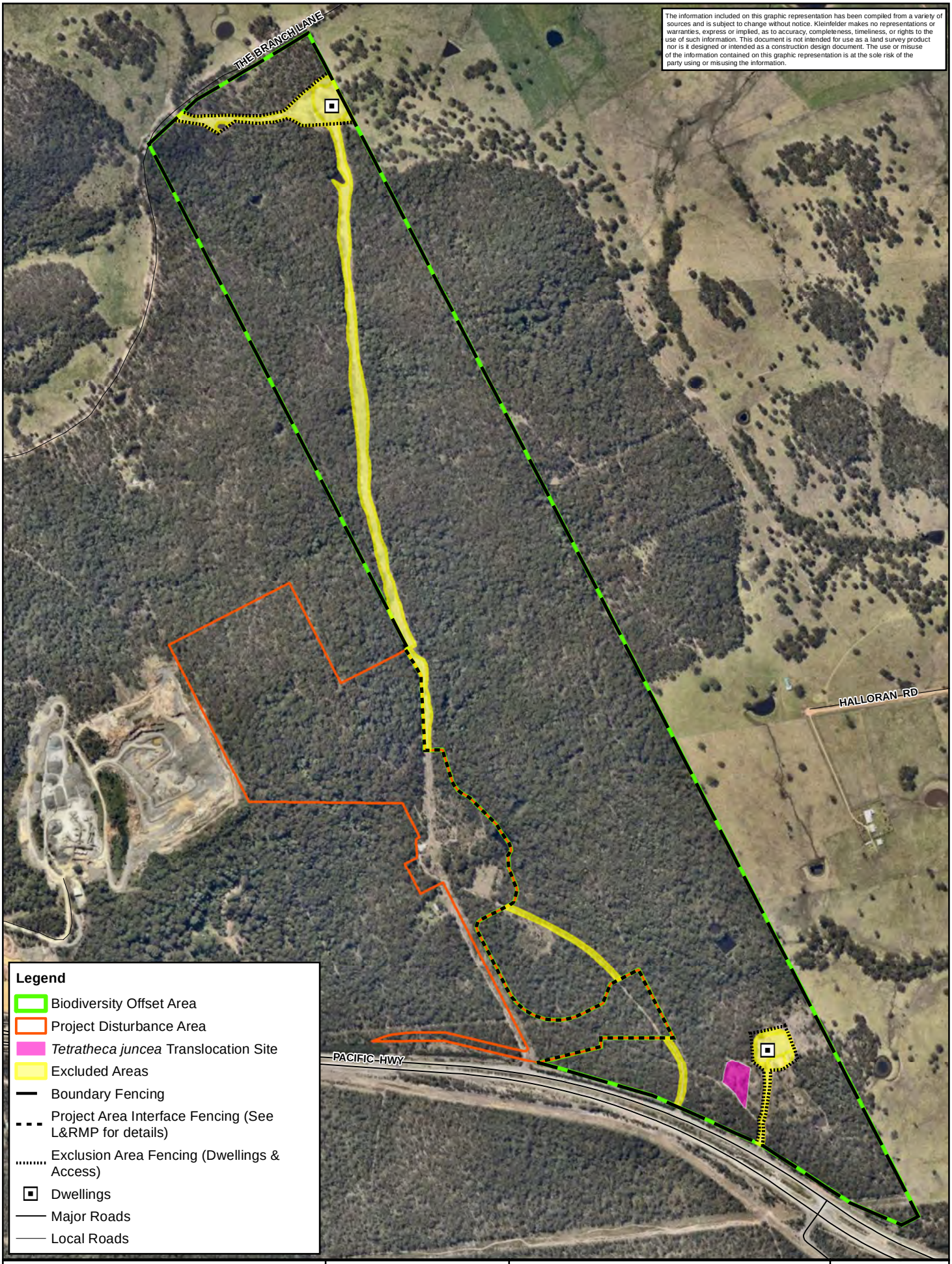
Action	Management Approach and Procedures	Timing	Reporting/ Records
Nest box monitoring and maintenance	• Nest boxes will be inspected and maintained every two years following installation. • Each nest box will be inspected to determine if any repairs or replacement is required. • If feral bees (or other pest animal species) are found to colonise the nest boxes they will be eradicated by a specialist pest contractor.	Every two years following installation for LOQ	Annual monitoring report
3.9 THREATENED FLORA TRANSLOCATION **Objective**: To translocate existing *Tetratheca juncea* clumps from the project area to the BOA.			
Tetratheca juncea translocation	A *Tetratheca juncea* Translocation Program (TjTP) has been prepared for the project. A total of 243 *Tetratheca juncea* clumps previously recorded within the project area will be translocated from the project area to a site within the BOA (see **Figure 4** for location). The translocation site will be accessed via an existing track (also shown on **Figure 4**). The following measures will be implemented to ensure the TjTP is effectively integrated as part of the biodiversity management of the BOA: • Following translocation, the access track to the translocation site will be delineated with fencing (or similar) at the entrance of the site to prevent vehicle access. • Weed control within the translocation site will be undertaken in accordance with the methods specified in the TjTP (i.e. the weed control protocol in **Section 3.10** of this plan is superseded by the TjTP for the translocation site). • All other management actions detailed in this plan including seed collection, revegetation, and habitat augmentation will be excluded from the translocation site unless otherwise specified in the TjTP.	Prior to clearing and construction	As per TjTP
3.10 WEED CONTROL **Objective**: To reduce the spread and establishment of weeds and reduce the extent of existing weed infestations to maintain biodiversity values (including protecting threatened species) and promote natural regeneration in the BOA.			
Baseline weed mapping	• Under the *Noxious Weeds Act 1993*, there are statutory requirements for landholders to control weed species listed as noxious. A list of all weed species recorded in the BOA and adjoining lands during previous surveys is provided in **Section 2.3.5**. • Baseline weed mapping will be undertaken to determine the current extent and density of noxious and significant environmental weed infestations in the BOA. This mapping will be undertaken by a suitably qualified and experienced ecologist or bush regenerator. • Weed infestations will be prioritised for control based on a number of criteria, including weed species, risk of further spread, size/ density of patch, and access. Weed infestations with threatened flora species present/ nearby (*Tetratheca juncea*, *Grevillea parviflora* subsp. *parviflora* and *Asperula asthenes*) will be the first priority for control to ensure the protection and enhancement of these populations in the BOA.	Year 1	Baseline addendum report

Action	Management Approach and Procedures	Timing	Reporting/ Records
Weed control within 20 m of threatened flora	• For each planned weed control area within 20 m of threatened flora locations, threatened flora must be delineated/ marked prior to control works by a suitably qualified botanist. The weed management contractor will then be briefed regarding the delineation measures, approved control methods, and any no-go areas. A map of threatened flora locations relevant to the planned weed control area must be provided to the weed control contractor. • Only manual removal weed methods are permitted within 20 m of threatened flora species unless otherwise specified in inspection/ monitoring report recommendations. Weed control undertaken within 20 m of threatened flora will be supervised by a suitably qualified botanist or bush regenerator with proven experience in threatened plant identification. • No chemical control (spraying) is to be undertaken within 20 m of threatened flora species. However, where large infestations occur the cut-and-poison method of chemical application can be used (as specified within inspection/ monitoring reports).	Post weed mapping and prior to any weed control works within the BOA. Commence year 2, then annually for LOQ	Maintain records of pre-weed treatment surveys
Weed control	• Weed control within the BOA will focus on environmental and noxious weeds as directed by recommendations from the baseline assessment/ ongoing monitoring, • Weed management will be conducted by suitably qualified and experienced bush regenerators. All personnel undertaking weed control in the BOA must be made aware of the environmental sensitivities present in the area, in particular threatened flora species. • Weed control will generally be undertaken using a combination of manual removal and targeted chemical application using an appropriate herbicide (e.g. glyphosate). • Chemical methods should only be used for larger weed outbreaks and/ or where there is minimal risk for indirect impacts on native vegetation. Any weed infestations in which large areas of native understorey vegetation are present will not be treated with herbicide spraying. • Preferred chemical application methods for the most abundant target species in the BOA (i.e. Lantana) is splatter gun application, or cut-and-poison. • Follow-up control will be conducted approximately 3 months after primary control of each weed patch; this will involve a systematic sweep through the area to treat all regrowth and other target weeds using a combination of hand removal and targeted chemical application. The frequency of further follow-up control of each area would be determined by monitoring.	Commence year 2, then annually for LOQ	Maintain records on weed control methods, locations, dates, person hours works, chemical types and quantities used, and approximate area treated.
Weed monitoring	• Weed mapping for the BOA will be undertaken every two years and compared to the previous mapping to assess changes in the extent and density of target weeds. • Monitoring results will be used to develop a control strategy for the following two years, identifying target locations and timing for primary and follow-up control.	Every two years from baseline survey for LOQ	Annual monitoring report

Action	Management Approach and Procedures	Timing	Reporting/ Records
3.11 VERTEBRATE PEST MANAGEMENT **Objective**: To reduce the abundance of vertebrate pests across the BOA to maintain biodiversity values (including protecting threatened species) and promote natural regeneration in the BOA.			
Baseline vertebrate pest assessment	Under the *Rural Lands Protection Act 1998*, there are requirements for landholders to continually supress and destroy pest animals on their lands. A pest animal control program is to be implemented in the BOA to supress and prevent an increase in pest populations. A baseline assessment of vertebrate pest presence/ abundance and impacts will be undertaken using at least one of the following methods: • Conducting searches and spotlighting, and mapping evidence of pest species across BOA (e.g. rabbit warrens, pig scratching); • Standard 'sand plots'; • Installing remote motion sensing camera traps at a minimum of five locations across the BOA for a two-week period. The assessment will primarily target the pest species listed in **Section 2.3.5**. The results of this assessment will then be used to determine the key vertebrate pest species and locations to be targeted during the control program for the next two years.	Year 1	Baseline addendum report
Vertebrate pest control	The specific approach to vertebrate pest management within the BOA will be determined by the baseline assessment/ ongoing monitoring; the following general procedures are outlined: • All vertebrate pest control will be conducted in accordance with *Humane Pest Animal Control: Codes of Practice* (DPI 2014). • All vertebrate pest control works must be undertaken by suitably qualified and experienced personnel. • If pest control is required it would generally involve a routine (six monthly) baiting program. • Other control methods such as shooting or trapping can also be used if deemed necessary or appropriate with advice from OEH or the Local Land Service. • Control of over-abundant native herbivores (e.g. kangaroos) can only be undertaken with approval by way of a Section 121 licence issued under the NPW Act. Should monitoring indicate that an over-abundance of native herbivores is affecting the biodiversity values of the BOA, OEH must be consulted for further advice.	From Year 2 for LOQ	Maintain records for all vertebrate pest control works including timing/dates of works, techniques used, data on kills or baits taken.
Monitoring	• Monitoring of vertebrate pests will be undertaken using the same methods, locations and effort as the baseline assessment unless otherwise recommended in the annual monitoring reports. This will enable results to be accurately compared to the baseline assessment.	Every two years from baseline survey for LOQ	Annual monitoring report

Action	Management Approach and Procedures	Timing	Reporting/ Records
3.12 FIRE MANAGEMENT **Objective**: To provide suitable access for emergency vehicles and regulate the fire regime within the BOA to maintain and enhance biodiversity values, and minimise effects on regeneration/ revegetation success.			
Fire management strategy	A Fire Management Strategy will be prepared in consultation with the NSW RFS to provide detail on bushfire management and controlled ecological burning to be undertaken within the BOA. The strategy will include: • Stratifying the BOA into ecological burn management units (i.e. management zones) based on recommended burn frequencies for vegetation types (*Guidelines for Ecologically Sustainable Fire Management*, NSW Biodiversity Strategy, (2003)) and fire tolerance of threatened flora species present based appropriate literature sources. • Fire exclusion areas (e.g. revegetation areas) will be identified. • Procedures and timing for implementing controlled burning, including protocol for bushfire emergencies. • Identifying access points and tracks to be maintained within the BOA to facilitate emergency vehicle access.	Year 1	Fire management strategy
Bushfire mitigation	• Measures to manage the risk of unplanned fires resulting from the adjoining quarry operations are detailed in the L&RMP.	At all times for LOQ	N/A
3.13 ECOLOGICAL MONITORING **Objective:** To regularly assess the status of key ecological values within the BOA, such that edge effects from adjoining lands and management actions can be evaluated, and where necessary actions implemented to improve conservation values.			
Additional baseline surveys	The following additional baseline surveys will be undertaken prior to the commencement of clearing and construction as discussed in **Section 2.3.6**: • Targeted surveys for *Tetratheca juncea* and *Grevillea parviflora* subsp. *parviflora* on Lot 5; • Targeted surveys for *Asperula asthenes* within areas of potential habitat (ELA 2014) across the BOA; • Fauna surveys across the BOA in accordance with *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (DEC 2004); At this stage, these additional surveys are scheduled to be undertaken in September/October 2015. These data will be provided as an addendum to this plan and the results will be incorporated into the Conservation Agreement to be prepared for the BOA.	Prior to clearing	Baseline addendum report
Overview of ecological monitoring program	In addition to the inspections and monitoring requirements specified in the previous sections, the following key ecological values will also be monitored within the BOA: • Vegetation condition; and • Threatened flora populations. The vegetation condition and threatened flora monitoring to be undertaken in the BOA forms part of a broader monitoring program for the quarry detailed in the L&RMP. As such, the monitoring methods specified in the L&RMP will also be used in the BOA to ensure consistency (see below).	-	-

Action	Management Approach and Procedures	Timing	Reporting/ Records
Vegetation and threatened flora monitoring	One monitoring point per 10 hectares (i.e. 13 monitoring points) will be permanently established across the BOA (with a capped star picket), with at least one monitoring point per vegetation type. The monitoring points will also be established in locations that target boundaries with different land uses (e.g. quarry; grazing land) to detect edge effects; weed infested areas; and threatened flora populations. A qualitative assessment of vegetation condition and photo monitoring would be undertaken at the monitoring points. At each monitoring point, the following data would be collected: • Vegetation type and structure, including dominant species in each stratum; • General health of vegetation, including evidence of foliage die-off; • Weed species and abundance; and • Any management issues or indirect impacts from the project area or adjoining lands. A minimum of six of these monitoring sites will be established in areas where *Tetratheca juncea, Grevillea parviflora* subsp. *parviflora* and *Asperula asthenes* occur in close proximity to the BOA boundary (i.e. two sites for each species). At these sites, all threatened flora individuals within 10 m of the monitoring point (i.e. 20 m diameter) will be recorded. The location of each clump/ stem would be recorded with a GPS and permanently marked with a steel peg (positioned 20 cm to the south of each clump to avoid damaging plants); a metal tag will be attached to each peg which provides a unique ID number. The size, number of stems, and presence of flowers/ fruit will be recorded for each clump. Annual collection of these data will enable changes in population size and health to be assessed over time. Baseline monitoring will be undertaken in September/October 2015 prior to the commencement of clearing. Subsequent annual monitoring should be undertaken in spring to coincide with the flowering times of threatened flora species in the BOA.	Annually for LOQ	Annual monitoring report
Asperula asthenes population census	Condition 9 of the EPBC Act Approval requires corrective actions to be implemented where management actions (primarily weed control) fail to meet targets relating to an increase in the *Asperula asthenes* population size/ extent in the BOA (see **Section 4** for target). It is expected that a discernible increase in population size of *Asperula asthenes* following weed control would not occur for at least 5-10 years. As such, it is recommended that a population census of *Asperula asthenes* be undertaken across the BOA in year 10. The results will then be compared to the target, and if the target is not reached contingency measures detailed in **Section 7** will be implemented.	Year 10	Annual monitoring report



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DRAWN BY: gjoyce
DATA SOURCE:
LPI - 2015
ADW Johnson - 2015
Nearmap - 2014

Management Actions

Karuah East Quarry Pty Ltd
Biodiversity Offset Area Management Plan
Karuah East Quarry Project

FIGURE:
4

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4. PERFORMANCE AND COMPLETION CRITERIA

Table 10 provides the performance and completion criteria for all management actions described in **Section 3**. Where performance criteria are not achieved, potential causes will be investigated; corrective actions required to achieve the criteria and/or justification why criteria have not been achieved must then be provided as part of annual reporting.

Table 10: Performance and completion criteria

Action	Performance Criteria			Completion Criteria
	Year 1	Years 2-3	Years 4-20	
CULTURAL HERITAGE MANAGEMENT				
Record and manage newly identified cultural heritage objects	Undertaken in accordance with CHMP			Undertaken in accordance with CHMP
Risk assessment to avoid disturbance to cultural heritage objects	All management activities undertaken in accordance with CHMP			All management activities undertaken in accordance with CHMP
FENCING, GATES AND SIGNAGE				
Fence mapping	Completed by end of year 1	-	-	Mapping completed
Boundary fencing, gates and signage installation/ repairs	Completed by end of year 1	-	-	Completed in accordance with fence mapping
Redundant fencing removal	Completed by end of year 3		-	Completed in accordance with fence mapping
Fencing inspections	-	Completed annually		Annual inspections completed and maintenance recommendations implemented
Fencing maintenance	Boundary fencing in place and signage present			Boundary fencing, gates and signage maintained for LOQ
ACCESS TRACKS				
Access track mapping and assessment	Completed by end of year 1	-	-	Mapping completed
Access track repairs	Completed by end of year 3. Track repair does not impact on ecological values and is restricted to defined limits.		-	Completed in accordance with track mapping and assessment
Redundant access track rehabilitation	Completed by end of year 3.		-	Redundant tracks are stable and vegetated
Access track inspections	-	Completed annually		Annual inspections completed

Action	Performance Criteria			Completion Criteria
	Year 1	Years 2-3	Years 4-20	
Track maintenance	-	-	Management actions implemented within 6 months of inspection. Track maintenance does not impact on ecological values and is restricted to defined limits.	Access tracks maintained in suitable condition for LOQ
EROSION, SEDIMENTATION AND SOIL MANAGEMENT				
Erosion and sedimentation mapping	Completed by end of year 1	-	-	Mapping completed
Erosion repair and management	Completed by end of year 3. Repair of erosion within BOA does not impact on ecological values.		-	Completed in accordance with track mapping and assessment
Erosion inspections	-	Completed annually		Completed annually
Maintenance	-	-	Management actions implemented within 6 months of inspection. Erosion repair does not impact on ecological values.	Access tracks maintained in suitable condition for LOQ
EXISTING DWELLINGS				
Exclusion of existing dwellings from Conservation Agreement	Completed by end of year 1	-	-	Existing dwellings are excised from Conservation Agreement
Fencing and signage installation	Completed by end of year 1	-	-	Completed in accordance with fence mapping
Inspections	Completed annually			Annual inspections completed and maintenance recommendations implemented
Maintenance and weed control	-	Boundary fencing in place and signage present. No noxious weeds present within excised areas. No unauthorised disturbance outside of excised areas in the BOA.		Maintenance records complete and retained
SEED COLLECTION AND PROPAGATION				
Seed and/ or plant material collection	Seed collection undertaken in accordance with **Section 3.6**.			Records complete and retained.
Propagation	Records on seed germination success rates retained.			Records complete and retained.
REVEGETATION AND REGENERATION*				
Confirm extent of revegetation areas	Completed by end of year 1	-	-	Mapping completed

Action	Performance Criteria			Completion Criteria
	Year 1	Years 2-3	Years 4-20	
Revegetation of cleared or modified areas (if required)	Revegetation completed as directed by recommendations from annual monitoring. Native species used is consistent with surrounding vegetation (i.e. target vegetation communities). Stem densities of canopy and midstorey species similar to surrounding vegetation after three years.			Revegetation areas stable and species composition consistent with surrounding vegetation
Revegetation maintenance (if required)	-	Maintenance implemented as directed by inspection recommendations.		Revegetation areas maintained for a minimum three year period
Revegetation monitoring (if required)	Completed annually			Completed annually Records complete and retained.
HABITAT AUGMENTATION				
Salvage and redistribution of habitat resources	Redistribution of salvaged resources does not impact on ecological values of BOA, including threatened flora		-	Records complete and retained
Nest box installation	30 nest boxes installed in BOA prior to commencement of clearing. Remaining nest boxes installed within three months following completion of clearing.	-	-	All nest boxes in place within BOA
Nest box monitoring and maintenance	-	Nest boxes inspected every two years. Repairs/ maintenance implemented within 6 months of biennial inspection.		Nest boxes maintained for LOQ
THREATENED FLORA TRANSLOCATION				
Tetratheca juncea translocation	Translocation completed by end of year 1	Maintenance and monitoring undertaken in accordance with the TjTP		As per the TjTP
WEED CONTROL				
Baseline weed mapping	Completed by end of year 1	-	-	Mapping completed
Delineation of threatened flora prior to weed control works	No impacts on threatened flora populations within BOA from weed control activities.			Undertaken prior to any weed control works within 20 m of threatened flora locations for LOQ. Records complete and retained.

Action	Performance Criteria			Completion Criteria
	Year 1	Years 2-3	Years 4-20	
Weed control	-	20% reduction in extent or density (cover) of target weeds per year compared to baseline mapping. Weed control activities do not impact on ecological values.	5% reduction in extent or density (cover) of target weeds per year for years 4-10 or until weed cover is less than 10% compared to baseline mapping. Maintain or reduce extent or density of target weeds to less than 10% from year 10 to quarry closure. Weed control activities do not impact on ecological values.	Weed control completed and reported with targets met.
Weed monitoring	-	Completed annually		Completed and reported annually
VERTEBRATE PEST MANAGEMENT				
Baseline vertebrate pest assessment	Completed by end of year 1	-	-	Baseline assessment completed
Vertebrate pest control	-	No non-target species affected by control works. Reduction in abundance of target species across BOA compared to baseline assessment.		Vertebrate pest control completed at least annually and reported
Monitoring	-	Completed biennially (every two years)		Completed biennially
FIRE MANAGEMENT				
Fire management strategy	Completed by end of year 1	Fire management strategy implemented, reviewed and updated as necessary.		Fire management strategy prepared and implemented. Records complete and retained.
Bushfire mitigation	Bushfire mitigation measures in the L&RMP adhered to at all times			N/A
ECOLOGICAL MONITORING				
Additional baseline surveys	Completed prior to clearing	-		Completed
Vegetation and threatened flora monitoring	Baseline ecological monitoring undertaken prior to clearing in year 1	Less than 10% decline in *Tetratheca juncea, Grevillea parviflora* subsp. *parviflora* and *Asperula asthenes* population sizes (at monitoring sites) compared to baseline assessment. No major changes in vegetation health or condition across BOA.		All annual monitoring events completed and reported for LOQ
Asperula asthenes population census	-	Survey completed during year 10. Increase in Asperula asthenes population size is consistent with the predicted conservation gain in the EPBC Act Assessment Report (ELA 2014) - i.e. 60 individuals or 50% increase from the original population size.		Survey completed and results reported. Target achieved.

*Criteria relating to revegetation within the project area is outlined in the Landscape and Rehabilitation Management Plan (L&RMP).

5. REPORTING

Baseline Monitoring Report

Additional baseline surveys of the BOA will be undertaken in spring 2015 to satisfy relevant approval conditions and to supplement the information provided in the previous sections (see **Section 2.3.6** for further details). It is also proposed that all other baseline mapping and assessments detailed in **Section 3** will also be undertaken at this time.

A baseline monitoring report will be prepared as an addendum to this plan. Subsequent annual monitoring results will be compared to the baseline data in this report to evaluate performance and completion criteria. The baseline report will include indicative costings of all management actions to be implemented for a 20 year period; these costings will also be used to assist in calculating the Conservation and Rehabilitation Bond required under Schedule 3 Condition 34 of the Project Approval.

Annual Reporting

Reporting for the Karuah East Quarry Project will occur through an Annual Review (Schedule 5 Condition 4 of the Project Approval). The following summarises the reporting requirements of this BOAMP that would be incorporated into the Annual Review:

- Description of works undertaken within the BOA during the previous year and those expected in the coming year, with reference to:
    - Fencing, rubbish, erosion, and access tracks;
    - Fire management;
    - Habitat augmentation works;
    - Revegetation works;
    - Pest and weed management; and
    - Inspection and monitoring results.
- Evaluation of works completed against performance and completion criteria;
- Identify any non-compliance and describe actions to ensure compliance;
- Identify trends in the in the monitoring data over the life of the project;
- Identify any discrepancies between predicted and actual impacts from the adjoining quarry and the potential cause of significant discrepancies and
- Measures to be undertaken to improve environmental performance of the project.

6. REVIEW AND CONTINUOUS IMPROVEMENT

The BOAMP will be reviewed every three years as per Schedule 3 Condition 33(h) of the Project Approval to identify trends and opportunities for improvement. This program would aim to ensure continual improvement and best practice management through evaluating the effectiveness of management actions against the performance criteria. Where this review leads to any revisions or updates to the BOAMP, then within 4 weeks of the review the revised plan must be submitted to DP&E for approval.

An Inspection and Reporting Proforma to be used in the review of the implementation of this plan is included in **Appendix 4**. The proforma provides a list of all management actions and associated performance criteria for the first three year review period and is intended to be updated for each reporting period. Information gathered from this audit will improve the management strategies within this BOAMP.

7. RISK ASSESSMENT AND CONTINGENCY PLAN

Table 11 outlines the potential risks to successful implementation of the management program detailed in **Section 3** and contingency measures that will be implemented to mitigate these risks.

Table 11: Potential risks and contingency measures for management plan implementation

Potential Risks	Contingency Measures
General non-compliance with management procedures in Section 3	• All staff and contractors must be inducted before conducting management activities within the BOA, and must be familiar with the relevant procedures in this plan. • Monitoring and the annual review required under Schedule 5 Condition 4 of the Project Approval will identify if management actions have not been undertaken in accordance with the plan or fail to achieve performance criteria. • Corrective actions will be stipulated as part of the annual review.
Unauthorised access or disturbance impacting on ecological values in BOA	• Investigate and determine unauthorised access points or source(s) of disturbance. • Re-instate exclusion measures (i.e. fencing, gates, signage) where required. • If necessary, increase frequency of inspections of exclusion measures to verify corrective actions are adequate.
Plant species mix of revegetation areas not consistent with final land use objectives	• Annual monitoring will identify where species composition is not consistent with this plan and provide detailed actions to rectify, which will include removing of all unsuitable species used in revegetation areas and reinstating suitable species.
Failure of revegetation works	• Annual monitoring will identify failed revegetation efforts, investigate potential causes, and provide detailed actions to rectify, including replanting/re-seeding.
Vegetation condition and/or threatened flora impacted during redistribution of habitat resources (e.g. logs) in the BOA	• Annual monitoring will identify if resource redistribution has impacted on ecological values and will detail actions to rectify. Corrective actions may include removal of logs/branches, or supplementary revegetation works.
Vegetation condition and/or threatened flora populations impacted during weed control activities in the BOA	• Annual monitoring will identify if weed control has impacted on threatened flora or vegetation condition within the BOA and will detail actions to rectify. Corrective actions may include revision of weed control procedures, or revegetation works.
Inadvertent disturbance to translocated *Tetratheca juncea*	• Annual monitoring will identify if any inadvertent disturbance has occurred within the *Tetratheca juncea* translocation site and will detail actions to rectify. Corrective actions may include re-instating / strengthening exclusion measures, or revegetation works.
Non-target fauna species affected by vertebrate pest control program	• All vertebrate pest control works must be undertaken by suitably qualified and experienced personnel, and in accordance with best practice guidelines including the *Humane Pest Animal Control: Codes of Practice* (DPI 2014). • Baiting programs will include methods to minimise the possibility affecting non-target fauna species by adhering to the most current and best practice guidelines.
Bushfire impacting on early stages of revegetation or high frequency fire impacting ecological values in the BOA	• A Fire Management Strategy will be prepared and implemented for the BOA. • Annual monitoring will identify any bushfire impacts to early revegetation areas and recommend specific actions rectify the loss and further mitigate bushfire risks.
Extreme natural weather events	• If any extreme weather events occur the regular monitoring events will detect impacts and recommend appropriate mitigation measures.
Increase in *Asperula asthenes* population size does not achieve predicted target (see **Sections 3.13** and **4**)	• Population census of *Asperula asthenes* will be completed during year 10 to determine if the target increase in population size has been achieved. Should the target not be achieved at year 10, the annual report will include specific actions to rectify, which may include further targeted weed control, protection from herbivores, or propagation and planting of *Asperula asthenes*.

8. REFERENCES

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APPENDIX 1. RELEVANT APPROVAL CONDITIONS

Condition	Condition Requirement	Section where Addressed
NSW Project Approval (09_0175)		
33	**Biodiversity Offset Area Management Plan** The Proponent shall prepare and implement a Biodiversity Offset Area Management Plan for the project to the satisfaction of the Secretary. This Plan would relate to the area of the Biodiversity Offset Area required in these Conditions. This plan must: a. be prepared by a suitably qualified expert whose appointment has been approved by the Secretary; b. be prepared in consultation with OEH and Council, and submitted to the Secretary within 12-months of the approval of the Biodiversity Offset Strategy required in these conditions;	This Biodiversity Offset Area Management Plan has been prepared by Kleinfelder and has been submitted to the Secretary for approval.
	c. describe how the implementation of the *Tetratheca juncea* Translocation Program would be integrated with the Biodiversity Offset Area management;	Section 3.9
	d. describe the short, medium and long-term measures that would be implemented to manage remnant vegetation and habitat on the Biodiversity Offset Area;	Section 3
	e. include detailed performance and completion criteria for evaluating the performance of the conservation, restoration and management of the Biodiversity Offset Area, including triggers for any remedial action;	Section 4
	f. providing for the transfer of environmental resources from the approved disturbance area - including tree hollows, vegetative and soil resources – for beneficial reuse in the enhancement of the Biodiversity Offset Area;	Section 3.8 (also see L&RMP)
	g. providing for the incorporation of the final rehabilitated landform into the Biodiversity Offset Area and its management;	Addressed in L&RMP
	h. include a detailed description of the measures that would be implemented over the next 3 years (to be updated for each 3 year period following initial preparation of the plan), including the procedures to be implemented for:	Section 3
	• enhancing the quality of remnant vegetation and fauna habitat;	Section 3
	• restoring native endemic vegetation and fauna habitat within the parts of the Biodiversity Offset Area that are cleared or modified, including details of the target revegetation communities of the restored landform;	Sections 3.6, 3.7 and 3.8
	• coordinating the relocation of native fauna to protected habitats associated with pre-clearing fauna surveys;	Section 3.8 and addressed in L&RMP
	• collecting and propagating seed;	Section 3.6
	• maximising the protection and restoration of threatened species, populations and habitats in the Biodiversity Offset Area;	Section 3

Condition	Condition Requirement	Section where Addressed
	• maximising fauna movement between the Biodiversity Offset Area and adjacent habitats;	Section 3.2
	• controlling weeds and feral pests;	Sections 3.10 and 3.11
	• controlling erosion;	Section 3.4
	• controlling access and providing for management trails; and	Section 3.3
	• bushfire management and implementation of ecologically appropriate bushfire intervals.	Section 3.12
	i. include a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;	Section 3 (monitoring) and Section 4 (performance and completion criteria)
	j. identify the potential risks to successful implementation of the Biodiversity Offset program, and include a description of the contingency measures that would be implemented to mitigate these risks;	Section 7
	k. include details of who would be responsible for monitoring, reviewing, and implementing the plan;	Section 1.6
	l. include details of the indicative costs of management actions; and	Section 5 (to be provided in the baseline addendum report)
	m. include details as to the timing of actions set-out in the plan.	Section 3
EPBC Approval (EPBC 2014/7282)		
7	**Offsets** The person taking the action must comply with the offset conditions set out in the NSW Project Approval.	See above
8	Prior to the commencement of construction, to compensate for the impact to the Trailing Woodruff and habitat for the Koala, the person taking the action must secure suitable offset sites consistent with the Karuah East Quarry EPBC Act Assessment Report. In the case that offsets for the Trailing Woodruff or habitat for the Koala consistent with that set out in the Karuah East Quarry EPBC Act Assessment Report cannot be secured, alternative offset sites must be secured, consistent with the EPBC Act Offsets Policy.	See 'Biodiversity Offset Strategy Finalisation' letter submitted in conjunction with this plan
9	Prior to the commencement of construction, the person taking the action must provide the Minister with a Biodiversity Area Offset Management Plan for approval. The Biodiversity Area Offset Management Plan must be consistent with the NSW Project Approval and include:	This plan (see above)
	(a) survey information identifying the number of Trailing Woodruff present across all proposed offset sites; and	Sections 2.3.6 and 5 (to be provided in the baseline addendum report)
	(b) details on the management and monitoring of the Trailing Woodruff, and corrective actions and contingency plans to be implemented where the re-establishment of the Trailing Woodruff fails to meet targets specified in the Karuah East Quarry EPBC Act Assessment Report.	Sections 3.10, 3.13, 4 and 7

Condition	Condition Requirement	Section where Addressed
Statement of Commitments (Appendix 6 of Project Approval)		
Section 4.1, page 45	**Nest Box Program** One nest box will be installed for each hollow to be lost as a result of the proposal. Softwood pine (plywood) nest boxes will be used and will be specifically designed for Threatened hollow obligates. Nest boxes will have swivel mounts and be fitted with screw lids to prevent damage from brushtail possums. Nest boxes will be placed in retained habitats in the study area onto host trees that do not already support hollows at a minimum height of 3 metres (aboveground) in an orientation other than west and north-west to minimise exposure to the afternoon sun. Nest boxes will be erected prior to the commencement of clearing operations and will be subject to 2 yearly maintenance for the life of the quarry. Feral bees found to colonise the nest boxes will be eradicated by a specialist pest contractor. Nest box installation will be supervised by a suitably experienced fauna ecologist.	Section 3.8 and Appendix 3
Section 4.1, page 46	**Monitoring** Threatened plant sub-populations of *Tetratheca juncea*, *Grevillea parviflora* subsp. *parviflora* and *Asperula asthenes* situated within retained bushland habitats on Lots 12-14 will be monitored annually by a suitably qualified and experienced botanist for the life of the quarry operation. A Monitoring Plan will be prepared prior to the commencement of clearing activity to detail survey design, data collection and reporting. Adaptive management will be employed for the life of the quarry to respond to population issues that are identified, including weed control.	Section 3.13
Section 4.2	The proposed offset site is identified as Part Lot 13 DP 1024564, Lot 14 DP 1024546 and Lot 5 DP 838128 (provided that an option to purchase Lot 5 has been secured by the proponent). In the event that Lot 5 DP 838128 is unable to be secured by the proponent, the proponent will purchase an alternate offset site, which, combined with Lots 13 and 14, will provide a total biodiversity offset area of not less than 129.32 ha. The alternate offset site will be required to be agreed to by NSW OEH and be to the satisfaction of the Director-General.	N/A (Lot 5 purchased, see 'Biodiversity Offset Strategy Finalisation' letter submitted in conjunction with this plan)
	The following will be undertaken by the proponent in relation to the proposed offset site identified as Part Lot 13 DP 1024564, Lot 14 DP 1024546 and Lot 5 DP 838128: • Seasonal flora and fauna survey of the offset site will be undertaken in accordance with relevant OEH guidelines. In particular, seasonal survey for *Tetratheca juncea* and *Grevillea parviflora* subsp. *parviflora* will be undertaken and reported to the NSW OEH;	Sections 2.3.6 and 5
	• Prior to establishment of the proposed quarry, the proponent will purchase Lot 5 DP 838128 (provided than an option to purchase has been secured). In the event that Lot 5 DP 838128 is unable to be secured by the proponent, as noted above, the proponent will purchase an alternate offset site (to be agreed to by NSW OEH and be to the satisfaction of the Director-General).	See 'Biodiversity Offset Strategy Finalisation' letter submitted in conjunction with this plan
	• Upon approval of the project, in consultation with the NSW OEH, the proponent will secure the offset lands via a Conservation Agreement under Part 4, Division 12 of the National Parks and Wildlife Act 1974;	Section 2.2

Condition	Condition Requirement	Section where Addressed
	• A Conservation Management Plan will be developed. The plan will:	This plan
	○ Confirm required on ground works such as weed control, fencing, signage and pest control; ○ Confirm the timing / schedule of the abovementioned works; and	Section 3
	○ Specify restrictions to the existing two (2) residences of Lot 5 and Lot 14 *(*if purchase of Lot 5 is secured by the proponent). If an alternate offset site is provided instead of Lot 5 (as noted above) any restrictions on this land will be specified in the Conservation Management Plan.	Section 3.5
	• Monitoring of the offset land will be undertaken annually. Results of the monitoring will be used to provide input into the priority areas for the following year(s) of ground maintenance works.	Section 3

APPENDIX 2. CORRESPONDENCE

Kleinfelder Australia Pty Ltd
ABN: 23 146 082 500
PO Box 585
Warners Bay NSW 2282
T| 1300 881 869 **F|** 1300 881 035
www.kleinfelder.com/australia

1 September 2015
Document No: WBA15R22982

Attention: Secretary of Planning and Environment, or nominee
Department of Planning and Environment
23-33 Bridge Street
Sydney NSW 2000

Subject: Finalisation of Biodiversity Offset Strategy for the Karuah East Quarry Project (09_0175)

The Karuah East Quarry Project was subject to an assessment under part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The project was approved by the Planning Assessment Commission on 17 June 2014 subject to conditions set out in Schedules 2 to 5 of the Project Approval (Application Number: 09_0175).

Schedule 3, Condition 28 of the Project Approval states:

> *The Proponent shall, prior to the commencement of vegetation clearing activities, finalise and implement the Biodiversity Offset Strategy, as described in the EA, summarised in Table 10 and shown conceptually in Figure 1 of Appendix 4, in consultation with OEH and Council, and to the satisfaction of the Secretary.*

Table 10: Biodiversity Offset Strategy

Area	Offset Type	Minimum Size (ha)
Offset Area	Existing vegetation to be managed and enhanced	129.32 ha

Note: The Biodiversity Offset Strategy shall direct that the land proposed as the Biodiversity Offset shall be free of any dwelling-houses and associated sheds, bushfire asset protection zones and other related utilities or structures so as to preserve the integrity and function of that offset area. The Biodiversity Offset Strategy shall also provide details of the revegetation of any parts of the offset area that are cleared of native vegetation or are in an otherwise substantially modified state, other than required management trails and boundary fencing buffer distances.

The Biodiversity Offset Strategy (Eco Logical Australia [ELA] 2013) assessed and proposed part Lot 13 and Lot 14 DP 1024564 (both owned by the proponent), and Lot 5 DP 838128 (option to purchase was under negotiation at the time of assessment) as a biodiversity offset for the project as shown in Figure 1, Appendix 4 of the Project Approval (see attached). As Lot 5 had not been purchased by the proponent at the time of assessment,

Condition 28 was included in the Project Approval to ensure that Lot 5 (or an equivalent offset area if Lot 5 could not be purchased) was secured prior to any vegetation clearing.

The proponent has now purchased Lot 5 DP 838128 (1517 The Branch Lane, Karuah). The proponent has exchanged contracts with the vendor and lodged a caveat over the property (see attached correspondence); settlement of the transaction will occur on 19 December 2015. Following settlement, the proponent will secure the offset area via a Conservation Agreement under Part 4, Division 12 of the *National Parks and Wildlife Act 1974* in consultation with NSW Office of Environment and Heritage (OEH) (as per Schedule 3 Condition 29 of the Project Approval).

The purchase of Lot 5 DP 838128 thus provides an offset consistent with that assessed in the Biodiversity Offset Strategy (ELA 2013) and as required in the Project Approval. As such, this purchase of Lot 5 is considered to effectively finalise the Biodiversity Offset Strategy for the project and satisfy Schedule 3 Condition 28 of the Project Approval.

It is noted that Schedule 3 Condition 28 also requires that the Biodiversity Offset Strategy shall direct the offset area must be free of dwellings, APZs and other infrastructure, as well as provide details for the revegetation of any cleared or modified land within the offset area. The proponent is committed to undertaking these actions, and the details of these actions are provided as part of the Biodiversity Offset Area Management Plan (Schedule 3 Condition 33 of the Project Approval); this plan has been submitted concurrently with this letter to DPE and OEH for review and consultation.

If you have any questions regarding the above, please contact me on the details provided on Page 1.

Sincerely,

A. Mulcahy

Aaron Mulcahy
Ecologist
Kleinfelder Australia Pty Ltd

APPENDIX 4
CONCEPTUAL BIODIVERSITY OFFSET AREA

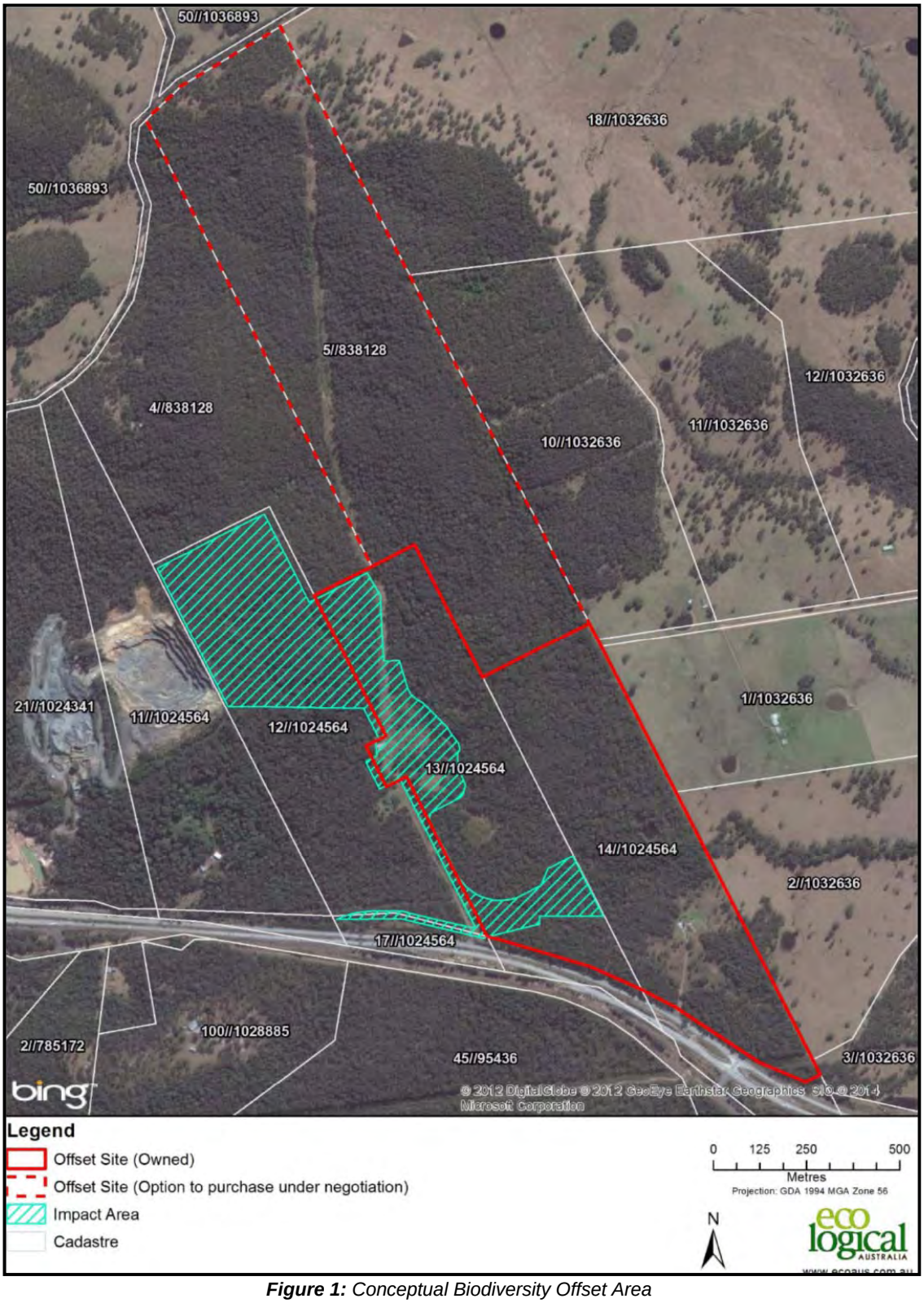

Figure 1: *Conceptual Biodiversity Offset Area*

McDONALD JOHNSON
LAWYERS

14 Watt Street
PO Box 673 NEWCASTLE 2300
DX 7824 NEWCASTLE
T 02 4926 1944
F 02 4926 4113
E craigd@mcdj.com.au
W www.mcdonaldjohnson.com.au
OUR REF: CGD:EW:64764
YOUR REF:
7 July 2015

BY EMAIL: ba@gwhbuild.com.au
Mr Blake Almond
Business Development
Hunter Quarries Pty Limited

Dear Blake

Re: Branch Land Pty Ltd atf Kestral Avenue Unit Trust Purchase from Pirillo
Property: 1517 The Branch Lane, Karuah

I refer to your email today and confirm Contracts were exchanged in this matter on 19 June 2015.

I attach copies of the following:

1. Front page of the Contract;
2. Folio Identifier 5/838128; and
3. Letter from Land Titles Office dated 26 June 2015 confirming registration of your Caveat.

Please let me know if you need anything else.

Yours faithfully
McDONALD JOHNSON

Craig Doyle - Partner
Accredited Specialist in Business
Law and Commercial Litigation

Encl.

Contract for the sale of land – 2005 edition

TERM	MEANING OF TERM	
Vendor's agent	[redacted]	Tel: [redacted] Fax: [redacted] Ref: [redacted]
Co-agent	N/A	
Vendor(s)	**VITO PIRILLO** c/o- 9 Royal Place, Bardwell Park	ACN: ----
Vendor's Solicitor	**J.S. Pinto & Co.** PO Box 326, Petersham NSW 2049 Level 1, 82-86 New Canterbury Road, Petersham	Tel: 9560 0977 Fax: 9569 0822 Ref: 14764
Completion date	6 months after the contract date (clause 15).	
Land (Address, plan details and title reference)	**1517 THE BRANCH LANE, KARUAH NSW** Registered Lot 5 in Deposited Plan 838128 Folio Identifier: 5/838128	
Tenancy	☒ VACANT POSSESSION ☐ subject to existing tenancies	
Improvements	☒ House ☐ garage ☐ carport ☐ home unit ☐ carspace ☐ none ☐ other:	
Attached copies	☒ Documents in the List of Documents as marked or as numbered: see page 2	
	☐ Other documents:	

A real estate agent is permitted by *legislation* to fill up the items in this box in a sale of residential property.

Inclusions	☐ blinds	☐ curtains	☐ insect screens	☐ stove
	☐ built-in wardrobes	☐ dishwasher	☐ light fittings	☐ pool equipment
	☐ clothes line	☐ fixed floor coverings	☐ range hood	☐ TV antenna
	☐ other:			
Exclusions				
Purchaser(s)	**BRANCH LAND PTY LTD atf Kestral Avenue Unit Trust** C/o- PO Box 3042, Thornton			ACN: 126281703
Purchaser's Solicitor	**McDonald Johnson Lawyers** PO Box 673, Newcastle NSW 2300			Tel: 4926 ~~7254~~ 1944 Fax: 4926 4113 Ref:
Price Deposit Balance	$ **1,000,000.00** $ ~~**100,000.00**~~ 50,000 RELEASED FORTHWITH $ ~~**900,000.00**~~ 950,000			(10% of the price, unless otherwise stated)
Contract date	19 JUNE 2015			(if not stated, the date this contract was made)

Vendor(s) VITO PIRILLO BY HIS ATTORNEYS UNDER POA BK 4652 No 101

Witness

GST AMOUNT (optional)
The price includes GST of:
$ (to be advised if any)

Purchaser(s) ☐ JOINT TENANTS ☐ tenants in common ☐ in unequal shares

Witness

Tax information (the parties promise this is correct as far as each party is aware)

Vendor duty is payable	☐ NO	☐ yes in full	☐ yes to an extent
Deposit can be used to pay vendor duty	☐ NO	☐ yes	
Land tax is adjustable	☐ NO	☒ yes	
GST: Taxable supply	☐ NO	☐ yes in full	☐ yes to an extent
Margin scheme will be used in making the taxable supply	☐ NO	☐ yes	

This sale is not a taxable supply because (one or more of the following may apply) the sale is:
- ☐ not made in the course or furtherance of an enterprise that the vendor carries on (section 9-5(b))
- ☐ by a vendor who is neither registered nor required to be registered for GST (section 9-5(d))
- ☐ GST-free because the sale is the supply of a going concern under section 38-325
- ☐ GST-free because the sale is subdivided farm land or farm land supplied for farming under Subdivision 38-O
- ☐ input taxed because the sale is of eligible residential premises (sections 40-65, 40-75(2) and 195-1)

HOLDER OF STRATA OR COMMUNITY TITLE RECORDS – Name, address and telephone number
N/A

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 5/838128

SEARCH DATE	TIME	EDITION NO	DATE
26/6/2015	2:50 PM	7	20/11/2013

LAND

LOT 5 IN DEPOSITED PLAN 838128
AT KARUAH
LOCAL GOVERNMENT AREA GREAT LAKES
PARISH OF CARRINGTON COUNTY OF GLOUCESTER
TITLE DIAGRAM DP838128

FIRST SCHEDULE

VITO PIRILLO (T 6721647)

SECOND SCHEDULE (3 NOTIFICATIONS)

---

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 BK 1106 NO 716 LAND EXCLUDES MINERALS
* 3 AJ605366 CAVEAT BY BRANCH LAND PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

McDonald Johnson PRINTED ON 26/6/2015

Box : 582W

SERVICE FIRST REGISTRATION PTY LTD
P.O. Box 784 QVB
Sydney 1230

NSW GOVERNMENT | Land & Property Information
A division of the Department of Finance & Services
1 Prince Albert Rd
Sydney NSW 2000
Ph 1300 052 637
Fax (02) 9233 4357
www.lpi.nsw.gov.au

Date: 26/6/2015

REGISTRATION NOTICE

THE UNDERMENTIONED DEALING(S) WERE REGISTERED/RECORDED ON 26/6/2015

DEALING NUMBERS: AJ605366 X

LODGMENT INVOICE NUMBER: C634256

YOUR REFERENCE: MCDON- BRANCH

TITLE REFERENCE(S): 5/838128

REGISTRAR GENERAL

McDONALD JOHNSON
LAWYERS

14 Watt Street
PO Box 673 NEWCASTLE 2300
DX 7824 NEWCASTLE
T 02 4926 1944
F 02 4926 4113
E craigd@mcdj.com.au
W www.mcdonaldjohnson.com.au
OUR REF: CGD:CLC:64764
29 June 2015

BY EMAIL: gc@gwhbuild.com.au
Mr Grahame Chevalley
Branch Land Pty Ltd

Dear Grahame

Re: Branch Land Pty Ltd atf Kestral Avenue Unit Trust Purchase from Pirillo
Property: 1517 The Branch Lane, Karuah

We enclose a copy of a self explanatory letter we have received from J S Pinto & Co Solicitors dated 29 June 2015.

You will see that you may have access to the property to measure and survey; however, no chemicals are to be used, no drilling is to occur and Mr Pinto does not want you to move or treat any part of the land.

Please let us know if this is acceptable or whether we should ask the Vendor for some specific consents.

Yours faithfully
McDONALD JOHNSON

Craig Doyle - Partner
Accredited Specialist in Business
Law and Commercial Litigation

Encl.

J.S. PINTO & CO.
Solicitors and Barristers

ABN 17 807 801 173

FAMILY
CONTRACT
PROPERTY
CORPORATE
COMMERCIAL
DEVELOPMENT
CONVEYANCING
PROBATE
WILLS & ESTATES
TAX PLANNING
ESTATE PLANNING

Suite 1, Level 1,
82-86 New Canterbury Rd
Petersham NSW 2049

All correspondence to:
PO Box 326,
PETERSHAM NSW 2049

Tel: 02 9560 0977
Fax: 02 9569 0822

Email address:
plnto.lawyers@gmail.com

Principal:
Joseph Pinto
B.COM LLB

LANGUAGES SPOKEN
English
Portuguese

COVER OF EXCELLENCE™

Liability limited by a Scheme approved under Professional Standards Legislation.

Our Ref: 14764:JP:tr
Contact: Joseph Pinto
Your Ref:

29 June 2015

URGENT

Messrs. McDonald Johnson
Lawyers
PO Box 673,
Newcastle NSW 2300

Fax: 4926 4113

Dear Sir or Madam,

RE: Pirillo sale to Branch Lane Pty Ltd
PROPERTY: 1517 The Branch Lane, Karuah

We refer to the above matter and to your letter dated 24th June, 2015 and advise that our client consents to access to measure and survey ONLY.
NO chemicals are to be used, NO Drilling and CAN NOT move or treat any part of the land.

Yours faithfully,
J.S. PINTO & CO.

J. Pinto

NSW GOVERNMENT | Office of Environment & Heritage

Your reference: MP09-0175
Our reference: DOC15/369200-7
Contact: Steve Lewer, 4927 3158

Mr Blake Almond
Business Development
Hunter Quarries
PO Box 3284
THORNTON NSW 2322

Dear Mr Almond

RE: HUNTER QUARRIES MANAGEMENT PLANS AND BIODIVERSITY OFFSET STRATEGY – KARUAH EAST QUARRY SITE

Thank you for forwarding the Management Plans and Biodiversity Offset Strategy for the Karuah East Quarry project (MP09-0175) for our records; specifically the following plans:

- Landscape and Rehabilitation Management Plan
- Heritage Management Plan
- Biodiversity Offset Area Management Plan
- Biodiversity Offset Strategy – Finalisation Letter
- *Tetratheca juncea* Translocation Management Plan.

The Office of Environment and Heritage (OEH) understands that it was a requirement of the project approval issued by the Department of Planning and Environment (DPE) to produce the above documents in consultation with OEH. OEH encourages the development of such plans to ensure that proponents have determined how they will meet their statutory obligations and designated environmental objectives. However, OEH typically does not extensively review environmental management plans nor approve or endorse these documents. OEH's role is to set environmental objectives for environmental/conservation management, not to be directly involved in the development of strategies to achieve those objectives. However, in this instance OEH offers the following brief comments on the following management plans:

Biodiversity Offset Strategy – Finalisation Letter

As part of the review of the Preferred Project Report for Karuah East Quarry, OEH provided comment on the proposed biodiversity offset strategy - 'Karuah East Quarry Biodiversity Offset Strategy' (EcoLogical July 2013), which used the BioBanking Assessment Methodology (BBAM) to test its adequacy. OEH noted that the proposed offset contained 129.3 hectares of remnant vegetation in moderate to good condition, that included 'Spotted Gum-Grey Ironbark foothills forest', 'Smooth-barked Apple-Red Bloodwood Forest', 'Blackbutt-Turpentine-Tallowwood sheltered forest', 'Sydney Peppermint-Smooth-barked Apple shrubby Forest' and 'Brush Box-Tallowwood wet forest'. The proposed offsets would would include three lots; Part Lot 13 DP 1024564 and Lot 14 DP 1024564, which are currently owned by Hunter Quarries, and an adjacent lot, Lot 5 DP 838128 which was under negotiation for purchase. Under BBAM, OEH acknowledged that the proposed offset generally compensated for most of the affected ecosystem and species credits, except for the 0.4 hectares of Dry Rainforest. However, in terms of the overall adequacy of the offset proposal for the three lots combined, OEH noted an overall 4:1 offset ratio and that the lack of dry rainforest in the offset is to

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Level 4/26 Honeysuckle Drive Newcastle NSW 2300
rog.hcc@environment.nsw.gov.au
ABN 30 841 387 271
www.environment.nsw.gov.au

a certain extent offset by the presence of 30 hectares of moist forest of other types in the offset lands. As such, OEH supported the proposed biodiversity offset strategy presented in the PPR, providing that Lot 5 was included in the proposal.

The project was approved by DPE on the 17 June 2014 subject to a number of conditions as set out in Schedules 2 to 5 of the Project Approval. Condition 28, which deals with the biodiversity offset strategy, specifically states that "*The Proponent shall, prior to the commencement of vegetation clearing activities, finalise and implement the Biodiversity Offset Strategy, as described in the EA, summarised in Table 10* [shown below] *and shown conceptually in Figure 1 of Appendix 4, in consultation with OEH and Council, and to the satisfaction of the Secretary*".

Table 10: Biodiversity Offset Strategy

Area	***Area Offset Type Minimum Size***	***Minimum Size (ha)***
Offset Area	Existing vegetation to be managed and enhanced	129.32 ha

Note: The Biodiversity Offset Strategy shall direct that the land proposed as the Biodiversity Offset shall be free of any dwelling-houses and associated sheds, bushfire asset protection zones and other related utilities or structures so as to preserve the integrity and function of that offset area. The Biodiversity Offset Strategy shall also provide details of the revegetation of any parts of the offset area that are cleared of native vegetation or are in an otherwise substantially modified state, other than required management trails and boundary fencing buffer distances.

Correspondence titled '*Finalisation of Biodiversity Offset Strategy for the Karuah East Quarry Project (09_0175)*' by Kleinfelder Australia Pty Ltd (dated 13 July 2015), indicates that Lot 5 (as per above) has now been purchased by Hunter Quarries. This correspondence states the proponent has exchanged contracts with the vendor and that settlement of the transaction will occur on 19 December 2015. As such OEH concurs with this letter that the purchase of Lot 5 DP 838128, along with Part Lot 13 DP 1024564 and Lot 14 DP 1024564 now effectively finalises the Biodiversity Offset Strategy as per Condition 28. Kleinfelder have also confirmed that the biodiversity offset is free of dwellings, asset protection zones and other infrastructure, as required under Condition 28.

OEH notes that the proponent intends to secure the biodiversity offset via a Conservation Agreement, under Part 4, Division 12 of the *National Parks and Wildlife Act 1974*, which will be done in consultation of OEH. OEH confirms that this meets the 'long term security' obligations as set out in Condition 29 of the Project Approval.

Biodiversity Offset Management Plan

OEH has briefly reviewed the 'Biodiversity Offset Plan' (prepared by Kleinfelder and dated September 2015). In general, this plan generally address the appropriate management strategies, performance criteria and reporting requirements OEH would expect from such a document. However, OEH notes that this plan will be subject to the management requirement and expectations required for a Conservation Agreement, which is the mechanism the proponent is utilising to secure the offset in the long-term. As such, OEH's Conservation Partnership staff will review this document in detail as part of the Conservation Agreement application and process. Ultimately, this plan will need to be compliant with their requirements.

***Tetratheca juncea* Translocation Management Plan**

Generally, OEH is not supportive of translocation programs given the uncertainty of their effectiveness, with respect to securing and/or maintaining the long-term conservation of the species being impacted upon. However, in this instance, OEH notes that biodiversity offset area (discussed above) adequately compensates for the impacts of the proposed quarry on *Tetratheca juncea* (i.e. the proposed offset area contains *Tetratheca juncea* 'species credits' commensurate with that required under BBAM) and the proposed translocation program is essentially targeting plants that would have been cleared under the proposal. Therefore, OEH sees some merit in the project particularly from view of testing current translocation techniques and strategies for the species. As such, OEH would like to be kept informed of the progress of the translocation project, receive updates and be sent a copy of the final report.

OEH has briefly reviewed the 'Tetratheca juncea Translocation Management Plan' (prepared by Firebird and dated August 2015) and is of the opinion it adequately details the proposal. OEH notes that Firebird state that OEH gave an undertaking we would review the plan and sign-off on the report, as stated in Table 2-1 of the plan, however, OEH does not have a sign-off role as we are not the consent authority for the project. OEH is content with providing consultative advice.

If you require any further information regarding this matter please contact Steve Lewer, Regional Biodiversity Conservation Officer, on 4927 3158.

Yours sincerely

23 SEP 2015

RICHARD BATH
Senior Team Leader Planning, Hunter Central Coast Region
Regional Operations

Aaron Mulcahy

From: Mathew Bell <Mathew.Bell@greatlakes.nsw.gov.au>
Sent: Thursday, 1 October 2015 9:19 AM
To: Wayne Burgess
Subject: FW: Biodiversity and Landscape Draft Plans - comments

Wayne,

Certain conditions (namely **Schedule 3; Conditions 28, 29, 32 and 33**) have been applied to the consent for the Karuah East Quarry that requires Council input from a biodiversity and landscape/ rehabilitation perspective.

I have been referred the following documents:

- *Finalisation of Biodiversity Offset Strategy for the Karuah East Quarry* - letter from Kleinfelder, dated 13 July 2015
- *Biodiversity Offset Area Management Plan* by Kleinfelder, dated September 2015
- *Karuah East Quarry Project Landscape and Rehabilitation Management Plan* by SLR, dated September 2015

I have reviewed these documents and provide the following commentary:

- *Finalisation of Biodiversity Offset Strategy for the Karuah East Quarry* - letter from Kleinfelder, dated 13 July 2015

  We recognise that evidence has been presented that the foreshadowed acquisition of Lot 5 DP838128 is being progressed. This, with land on part Lot 13 DP1024564 and 14 DP 1024564, combines to achieve the minimum size of the offset area required for the approved development (>129.32-ha) and which is set-out in Condition 28. We understand that the offset will be secured by a Conservation Agreement pursuant to the NP&W Act 1979. Whilst we would have preferred dedication to a public authority for in-perpetuity conservation management, the proposed mechanism is a satisfactory, permanent protection mechanism, in our opinion.

  Kleinfelder notes in their report, that: "*The purchase of Lot 5 DP838128 thus provides an offset consistent with that assessed in the Biodiversity Offset Strategy (ELA 2013) and as required in the Project Approval. As such, this purchase of Lot 5 is considered to effectively finalise the Biodiversity Offset Strategy for the project and satisfy Schedule 3 Condition 28 of the Project Approval*."

  We concur that the requirements of Schedule 3 Condition 28 are in the process of being completed to our satisfaction. The offset area for the approved development will comprise all of Lot 5 DP838128, all of Lot 14 DP1024564 and certain nominated parts of Lot 13 DP1024564.

  I would note that it should be recognised that Council will seek to rezone the offset area to the highest level of environmental conservation zoning (E2) at the first available opportunity to recognise the use of the offset lands for biodiversity protection in the applicable Local Environmental Plan (Great Lakes LEP 2014).

- *Biodiversity Offset Area Management Plan* by Kleinfelder, dated September 2015

  Table 8 in the *Biodiversity Offset Area Management Plan [BOAMP]* by Kleinfelder, dated September 2015,notes that: **Management Zone 8 Excluded dwellings and access tracks** (2.14-ha) is to be excluded from the BOA. This is appropriate.

  Further, the **Management Zone 7 powerline easement** (2.93-ha) is a permanently altered and maintained landscape and should also be excluded from the BOA.

Management Zones 7 and 8 do not contribute to biodiversity conservation. In fact, Management Zone 7 (and its occupation) represent a long-term threat potentially to biodiversity conservation of the offset area.

Thus, the effective BOA is **130.5-hectares** not the 135.57-hectares as reported in the BOAMP. The excluded Management Zones should not form part of the calculation of the area of the BOA. The BOAMP should be amended in this regard.

The Management Strategies set-out in the BOAMP seem appropriate.

Further, the Performance and Completion Criteria in the BOAMP seem appropriate.

As mentioned above, Council will seek to rezone the BOA to E2 under the Great Lakes LEP to recognise the offset area in our planning scheme. We would also appreciate the provision of any copies of implementation reports and the outcomes of any three-yearly reviews of BOAMP.

We have no further comments to the BOAMP and are content that the relevant condition has been satisfied (subject to amending the BOAMP to reflect the Management Zones 7 and 8 do not form part of the offset area calculations).

- *Karuah East Quarry Project Landscape and Rehabilitation Management Plan* by SLR, dated September 2015

We are satisfied that the LRMP is suitably adequate and deals with the key issues associated with pre-clearing, clearing, weed and pest management and progressive and final rehabilitation. These are all significant site issues.

We are particularly satisfied that critical site resources such as hollow logs, hollow limbs, mulch from clearing, topsoil, etc, from approved clearing areas are proposed to be utilised as habitat furniture and site stabilisation and rehabilitation.

The LRMP does not deal with how the final rehabilitated landform would be secured (that is, that the restoration achieved would be consolidated in the long-term). Perhaps a s88B instrument or Conservation Agreement is required to ensure that the progressive and closure rehabilitation outcomes are secured.

Further, there is no calculation of the quantum of a conservation bond to ensure that the rehabilitation is achieved in the event that the current or future registered proprietor fails to deliver on the outcomes. An adequate conservation bond is imperative to ensuring a suitable outcome. We understand that there is a separate process for the determination of this bond.

Obviously, the Plan is only as good as its implementation. We would appreciate being provided copies of any implementation reports for progressive landscaping and rehabilitation of this landform.

Thanks for the opportunity to provide comments to these plans.

Regards

Mat

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2.8 Biodiversity Offset Area Management Plan (BOAMP)

Under Schedule 3, Condition 33 of the Project Approval 09_0175, KEQ is required to prepare and implement a Biodiversity Offset Area Management Plan to the satisfaction of the Secretary. Refer to the table below for the applicable approval requirements, the relevant sections in the submitted MP and the Department's review comments.

09_0175 Requirement	Section	Review Comment	Further Action
The Proponent shall prepare and implement a Biodiversity Offset Area Management Plan for the project to the satisfaction of the Secretary. This Plan would relate to the area of the Biodiversity Offset Area required in these Conditions. This plan must:			
a. be prepared by a suitably qualified expert whose appointment has been approved by the Secretary;	N/A	Requirement has been met satisfactorily.	NFA
b. be prepared in consultation with OEH and Council, and submitted to the Secretary within 12-months of the approval of the Biodiversity Offset Strategy required in these conditions;	Appendix 2	Requirement has been met satisfactorily.	NFA
c. describe how the implementation of the Tetratheca juncea Translocation Program would be integrated with the Biodiversity Offset Area management;	Section 3.9	Requirement has been met satisfactorily.	NFA
d. describe the short, medium and long-term measures that would be implemented to manage remnant vegetation and habitat on the Biodiversity Offset Area;	Section 3	Requirement has been met satisfactorily. Table 9 includes management approaches and associated time.	NFA
e. include detailed performance and completion criteria for evaluating the performance of the conservation, restoration and management of the Biodiversity Offset Area, including triggers for any remedial action;	Section 4 & 7	Requirement has been met satisfactorily.	NFA
f. providing for the transfer of environmental resources from the approved disturbance area - including tree hollows, vegetative and soil resources – for beneficial reuse in the enhancement of the Biodiversity Offset Area;	Section 3.8	Requirement has been met satisfactorily.	NFA
g. providing for the incorporation of the final rehabilitated landform into the Biodiversity Offset Area and its management;		Requirement has been met satisfactorily.	NFA
h. include a detailed description of the measures that would be implemented over the next 3 years (to be updated for each 3 year period following initial preparation of the plan), including the procedures to be implemented for: • *enhancing the quality of remnant vegetation and fauna habitat;* • *restoring native endemic vegetation and fauna habitat*	Section 3	Requirement has been met satisfactorily.	NFA

09_0175 Requirement	Section	Review Comment	Further Action
within the parts of the Biodiversity Offset Area that are cleared or modified, including details of the target revegetation communities of the restored landform; • *coordinating the relocation of native fauna to protected habitats associated with pre-clearing fauna surveys;* • *collecting and propagating seed;* • *maximising the protection and restoration of threatened species, populations and habitats in the Biodiversity Offset Area;* • *maximising fauna movement between the Biodiversity Offset Area and adjacent habitats;* • *controlling weeds and feral pests;* • *controlling erosion;* • *controlling access and providing for management trails; and* • *bushfire management and implementation of ecologically appropriate bushfire intervals.*			
i. include a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;	Section 3 & 4	Requirement has been met satisfactorily.	NFA
j. identify the potential risks to successful implementation of the Biodiversity Offset program, and include a description of the contingency measures that would be implemented to mitigate these risks;	Section 7	Requirement has been met satisfactorily.	NFA
k. include details of who would be responsible for monitoring, reviewing, and implementing the plan;	Section 1.6	Requirement has been met satisfactorily.	NFA
l. include details of the indicative costs of management actions; and	Section 5	The Department encourages the proponent to submit the Addendum report in order to finalise requirements of the Management Plan.	Submit Addendum Report
m. include details as to the timing of actions set-out in the plan	Section 3	Requirement has been met satisfactorily.	NFA
Other			
	Appendix 4	Page 45 BOAMP Section 3.8 – Year 1 performance criteria – remaining nest boxes installed within one year, following completion of clearing. Missing word ‘year’.	
		Pg 14 – table 8 – Management zone 9 - Dams: the Department would not object to dams being included within the boundaries of the BOA.	
		The Department notes that the BOA will not be finally in the ownership of the proponent until 19 December 2015.	

APPENDIX 3. REVEGETATION METHODOLOGY

Revegetation Methods

Revegetation efforts will focus on establishing the canopy and midstorey layers as understorey species are likely to regenerate once a canopy is established. Revegetation will be undertaken using one of three methods (or a combination of these): (1) brush-matting; (2) direct seeding; (3) propagation and planting. These methods are outlined below:

Brush Matting

Brush matting involves collecting branches and plants with mature seed and applying them to revegetation areas. This method facilitates direct seeding, provides a protected microclimate for developing seedlings, adds nutrients to the soil, and minimises erosion. Large branches and whole plants are preferred for matting because they will not move in the wind.

Brush matting for revegetation in the BOA will primarily be collected and stored during clearing of the adjacent project area. When collecting brush material from the BOA, care will be taken so to not collect heavily in one area or too frequently; a maximum of 20% of fruit and 10% of plant material will be collected from any one plant within a one-year period.

Where possible individual plant species will be harvested when they are bearing mature seed. Bradysporous (seed retaining) species are best harvested and spread in autumn whereas geosporous (seed shedding) species are best harvested immediately prior to annual seed release in late spring.

Direct Seeding

Seed for direct seeding will be sourced locally from within the BOA as per **Section 3.6**, and will be treated and sown in the soil rather than broadcast where feasible. Harvesting of mature seed and direct sowing into areas requiring revegetation at the most appropriate time of year (usually autumn or spring) will be undertaken.

Propagation and Planting

Seed will be collected from the BOA and supplied to a local nursery for propagation. Planting programs in the BOA would be best undertaken between March and October for optimum seedling establishment success.

APPENDIX 4. INSPECTION AND REPORTING PROFORMA

The following table is a guide for annual reviews/ independent audits for the first three-year implementation period.

BOAMP Section	Management Strategy	Action	Performance Criteria		Description of Current Achievements To Date	Met/ Not Met
			Year 1	Years 2-3		
3.1	Cultural Heritage Management	Record and manage newly identified cultural heritage objects	Undertaken in accordance with CHMP			
		Risk assessment to avoid disturbance to cultural heritage objects	All management activities undertaken in accordance with CHMP			
3.2	Fencing, Gates and Signage	Fence mapping	Completed by end of year 1	-		
		Boundary fencing, gates and signage installation/ repairs	Completed by end of year 1	-		
		Redundant fencing removal	Completed by end of year 1			
		Fencing inspections	Completed annually			
		Fencing maintenance	-	Boundary fencing in place and signage present		
3.3	Access Tracks	Access track mapping and assessment	Completed by end of year 1	-		
		Access track repairs (initial)	Completed by end of year 3. Track repair does not impact on ecological values and is restricted to defined limits.			
		Redundant access track rehabilitation	Completed by end of year 3.			
		Access track inspections	-	Completed annually		
		Track maintenance	-	-		

BOAMP Section	Management Strategy	Action	Performance Criteria		Description of Current Achievements To Date	Met/ Not Met
			Year 1	Years 2-3		
3.4	Erosion, Sedimentation and Soil Management	Erosion and sedimentation mapping	Completed by end of year 1	-		
		Erosion repair and management	Completed by end of year 3. Repair of erosion within BOA does not impact on ecological values.			
		Erosion inspections	-	Completed annually		
		Maintenance	-	-		
3.5	Existing Dwellings	Exclusion of existing dwellings from Conservation Agreement	Completed by end of year 1	-		
		Fencing and signage installation	Completed by end of year 1	-		
		Inspections	Completed annually			
		Maintenance	-	Boundary fencing in place and signage present. No noxious weeds present within excised areas. No unauthorised disturbance outside of excised areas in the BOA.		
3.6	Seed Collection and Propagation	Seed and/ or plant material collection	Seed collection undertaken in accordance with **Section 3.6**.			
		Propagation	Records on seed germination success rates retained.			
3.7	Revegetation and Regeneration	Confirm extent of revegetation areas	Completed by end of year 1	-		
		Revegetation of cleared or modified areas (if required)	Revegetation completed as directed by recommendations from annual monitoring. Native species used is consistent with surrounding vegetation (i.e. target vegetation communities). Stem densities of canopy and midstorey species similar to surrounding vegetation after three years.			

BOAMP Section	Management Strategy	Action	Performance Criteria		Description of Current Achievements To Date	Met/ Not Met
			Year 1	Years 2-3		
		Revegetation maintenance (if required)	Maintenance implemented as directed by inspection recommendations.			
		Revegetation monitoring (if required)	Completed annually			
3.8	Habitat Augmentation	Salvage and redistribution of habitat resources	Redistribution of salvaged resources does not impact on ecological values of BOA, including threatened flora			
		Nest box installation	30 nest boxes installed in BOA prior to commencement of clearing. Remaining nest boxes installed within three months following completion of clearing.	-		
		Nest box monitoring and maintenance	-	Nest boxes inspected every two years. Repairs/ maintenance implemented within 6 months of biennial inspection.		
3.9	Threatened Flora Translocation	*Tetratheca juncea* translocation	Translocation completed by end of year 1 (prior to clearing)	Maintenance and monitoring undertaken in accordance with the TjTP		
3.10	Weed Control	Baseline weed mapping	Completed by end of year 1	-		
		Delineation of threatened flora prior to weed control works	No impacts on threatened flora populations within BOA from weed control activities.			
		Weed control	-	20% reduction in extent or density (cover) of target weeds per year compared to baseline mapping. Weed control activities do not impact on ecological values.		
		Weed monitoring	-	Completed annually		
3.11	Vertebrate Pest	Baseline vertebrate pest assessment	Completed by end of year 1	-		

BOAMP Section	Management Strategy	Action	Performance Criteria		Description of Current Achievements To Date	Met/ Not Met
			Year 1	Years 2-3		
	Management	Vertebrate pest control	-	No non-target species affected by control works. Reduction in abundance of target species across BOA compared to baseline assessment.		
		Monitoring	-	Completed biennially		
3.12	Fire Management	Fire management strategy	Completed by end of year 1	Fire management strategy implemented, reviewed and updated as necessary.		
		Bushfire mitigation	Bushfire mitigation measures in the L&RMP adhered to at all times			
3.13	Ecological Monitoring	Additional baseline surveys	Completed prior to clearing	-		
		Vegetation and threatened flora monitoring	Baseline ecological monitoring undertaken prior to clearing in year 1	Less than 10% decline in *Tetratheca juncea, Grevillea parviflora* subsp. *parviflora* and *Asperula asthenes* population sizes (at monitoring sites) compared to baseline assessment. No major changes in vegetation health or condition across BOA.		
		Asperula asthenes population census	-	-		