PACIFIC BLUE METAL

ABN: 45 050 224 250

Extension of Farrawell's Quarry South Kempsey (DA T6-14-272)

Response to Submissions

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1. INTRODUCTION

This document has been compiled to provide a response to a range of issues provided by government agencies and private submissions that were lodged with Kempsey Shire Council (Council) regarding the proposed extraction area extension for Farrawell's Quarry (the Proposal) by Pacific Blue Metal Pty Ltd (the Applicant). The development application is referred to by Council as DA T6-14-272.

The *Environmental Impact Statement* (EIS) for the Proposal was submitted to Council and placed on public exhibition for a period of 30 days from 24 September 2014, during which Council received three separate government agency and two private submissions.

On 23 December 2014, Council provided the Applicant with the submissions provided by the Office of Environment and Heritage (OEH), Environment Protection Authority (EPA) and Council itself. Further to the government agency submissions, two private submissions were provided by Council to the Applicant on 4 February 2015. The information provided by Council regarding the two private submissions did not distinguish between each submission and based upon the similarities between the issues raised in each objection, this document has therefore defined the separate private submissions as a single entity, defined throughout this document as 'Private Submission".

Issues have been drawn from all submissions lodged and received by the Applicant. The issues raised in all submissions have been responded to in a combined response for each issue. Where warranted, some representative comments in the submissions have been paraphrased for clarity.

This document therefore responds to Council's consolidated comments and the detailed submissions, providing a rebuttal, where appropriate, to specific issues raised and outlining why the Proposal should be granted Development Consent.

This document provides the submissions and comments in the following format.

Section 1 Introduction to the Response to Submission document.

Section 2 Outlines the comments that have included within the submission(s) and provides the responses to these comments.

Section 3 Provides a conclusion to the document.

This document refers to information contained within the EIS that was submitted to Council on 3 September 2014 and is referred to as (RWC, 2014). This Response to Submissions document should be read in conjunction to RWC (2014), with the following information providing a summary of key terms referenced within this document.

- Development Consent DA T6-07-146 (Revision 06) – This consent is the current valid consent for the approved Farrawell's Quarry (further information is provided in Section 1.4.2 of RWC (2014).
- Development Consent DA T6-11-301 – This consent is the current valid consent for the approved Industrial Subdivision Development, in which the Quarry is located within the footprint of the subdivision (further information provided in Section 1.4.1 of RWC (2014).

2. RESPONSE TO ISSUES RAISED ABOUT THE PROPOSAL

2.1 INTRODUCTION

This section has been compiled by assembling extracts or paraphrased text from the submitted comments in the government agency and/or private submissions, together with the Applicant's response to each collective issue.

2.2 CURRENT EXTRACTION RATE

Representative Comment(s)

Consent Condition 2 of T6-07-146 (Rev 06) states that the quarry is permitted to operate for a period of four (4) years. Consent Condition 8(a) of T6-07-146 (Rev 06) states that a total extraction volume of 500,000m^3 of gravel may be extracted from the quarry (as well as an additional 90,000m^3 of stripped topsoil to be used in quarry rehabilitation).

In section 1.4.2 the EIS states that T6-07-146 (Rev 06) states that the approved maximum extraction and processing rate is 500,000 tonnes per year. 500,000m^3 is equal to approximately 1,200,000 tonnes of material. Therefore, Council expects that the maximum extraction rate would be approximately 300,000 tonnes per annum.

Could you please confirm the amount of material that is being extracted per annum.

Kempsey Shire Council

Response

Council is correct in its calculations that 1.2 million tonnes of material over 4 years (Condition 2 of DA T6-07-146) would equal 300 000tpa on average, however, fluctuations with market requirements (in particular the Pacific Highway upgrade projects) were also taken into account, resulting in a maximum yearly extraction and processing rate being up to 500 000tpa. In reality, for some years, production may be only 100 000tpa to 200 000tpa.

This upper production level of 500 000tpa was provided to permit the Quarry to provide its high quality resources to local and significant infrastructure projects within a relatively short period. It is confirmed that the maximum permissible extraction rate of 500 000 tonnes per year (equivalent to 200 000m^3) for the current Quarry (under Development Consent T6-07-146 (Rev 06)) would remain the same and not be modified as part of the Proposal.

2.3 NOISE, BLASTING AND VIBRATION

Representative Comment(s)

Request for additional independent noise and vibration studies to assess the potential impacts on nearby residences.

Private Submission

Response

As part of the application for development consent, an independent noise and vibration assessment was undertaken by Spectrum Acoustics (Spectrum, 2014), with their report produced in full as Appendix 6 of RWC (2014). The report concluded from modelling results that "there will be no exceedance of the adopted day time noise criterion at any residential receivers ... and predicted received noise and vibration levels as a result of blasting at the quarry were shown to be below the relevant criteria at all residential receivers."

Noting the above, it is deemed inappropriate to have additional independent noise and vibration studies undertaken when predicted noise levels and actual monitored blasting levels confirmed no exceedance of the relevant criteria. Notwithstanding this however, if a substantiated noise or vibration complaint is received, the Applicant would investigate the complaint and commission an independent noise and vibration study, if required.

Representative Comment(s)

Damage to dwellings and paths due to blast vibration.

Private Submission

Blasting causes noise amenity concerns and is impacting on resident health.

Private Submission

Damage to water pipes servicing the dwelling from the blasting results in higher water rates charges.

Private Submission

The Home Rectifier Builder could not carry out such required works unless a stop was applied to the blasting as this high vibration would totally undo the slab bonding as with the cracked block walls plus the ongoing damage creation, including the massive RTA/Alliance manmade 1.2m property flooding is re directed.

Private Submission

Response

Table 1 presents the results of all blast monitoring conducted at the Quarry since operations commenced in September 2013. Blast monitoring at the 'front gate' is conducted at the location displayed on **Figure 1**, being described as the western side of the Industrial Subdivision Access Road, opposite the gateway to the Quarry. Blasting is also monitored at Residence 6B on the western side of the Pacific Highway (and Macleay Valley Way), with the location displayed on Figure 4.3 of the EIS (RWC, 2014) (Reproduced as **Figure 2**). 'Farrawell's House' is located 50m east of the Industrial Subdivision Access road and southbound Pacific Highway entry ramp intersection.

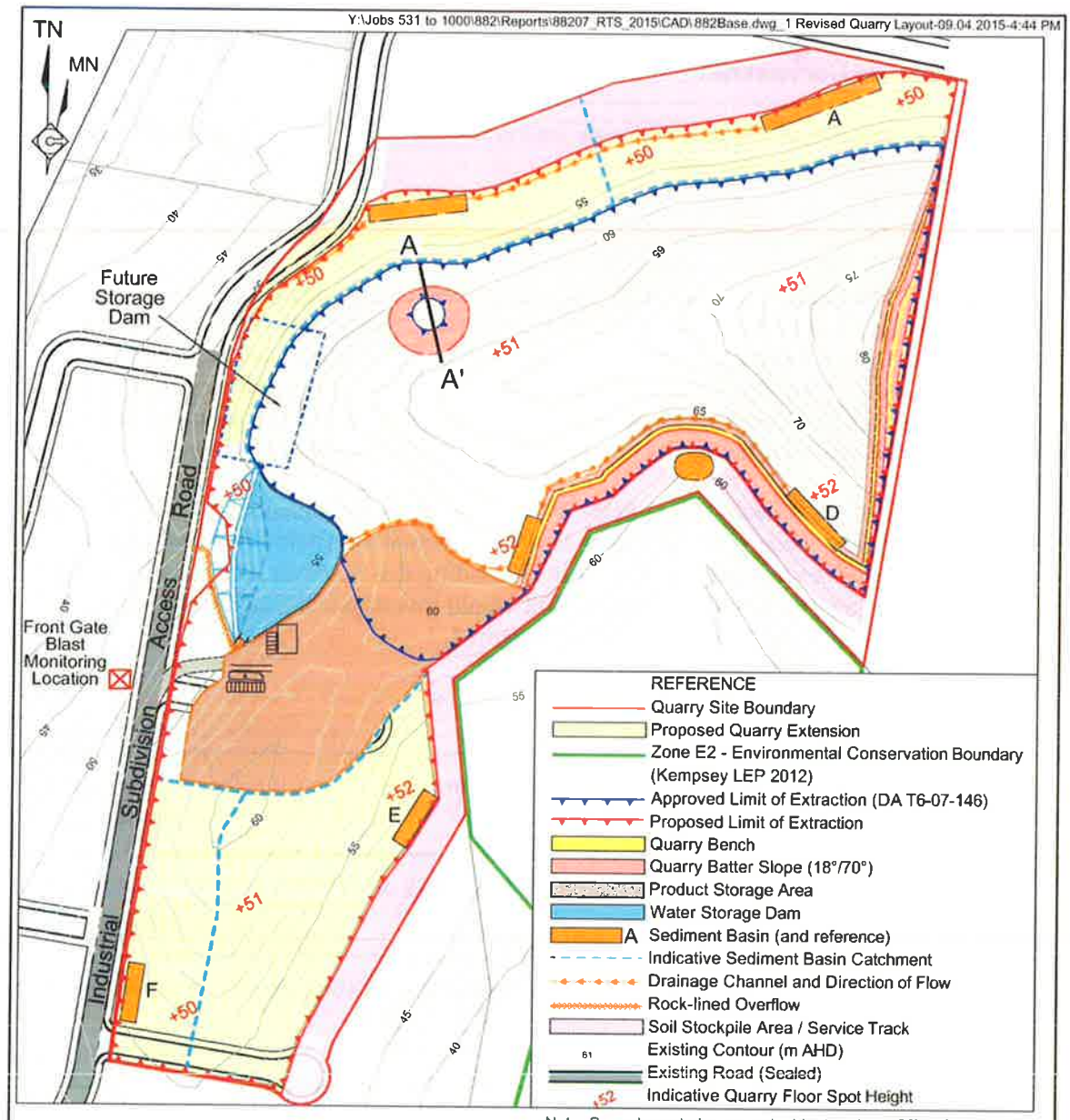

Figure 1
REVISED QUARRY SITE LAYOUT AND BLAST MONITORING SITE

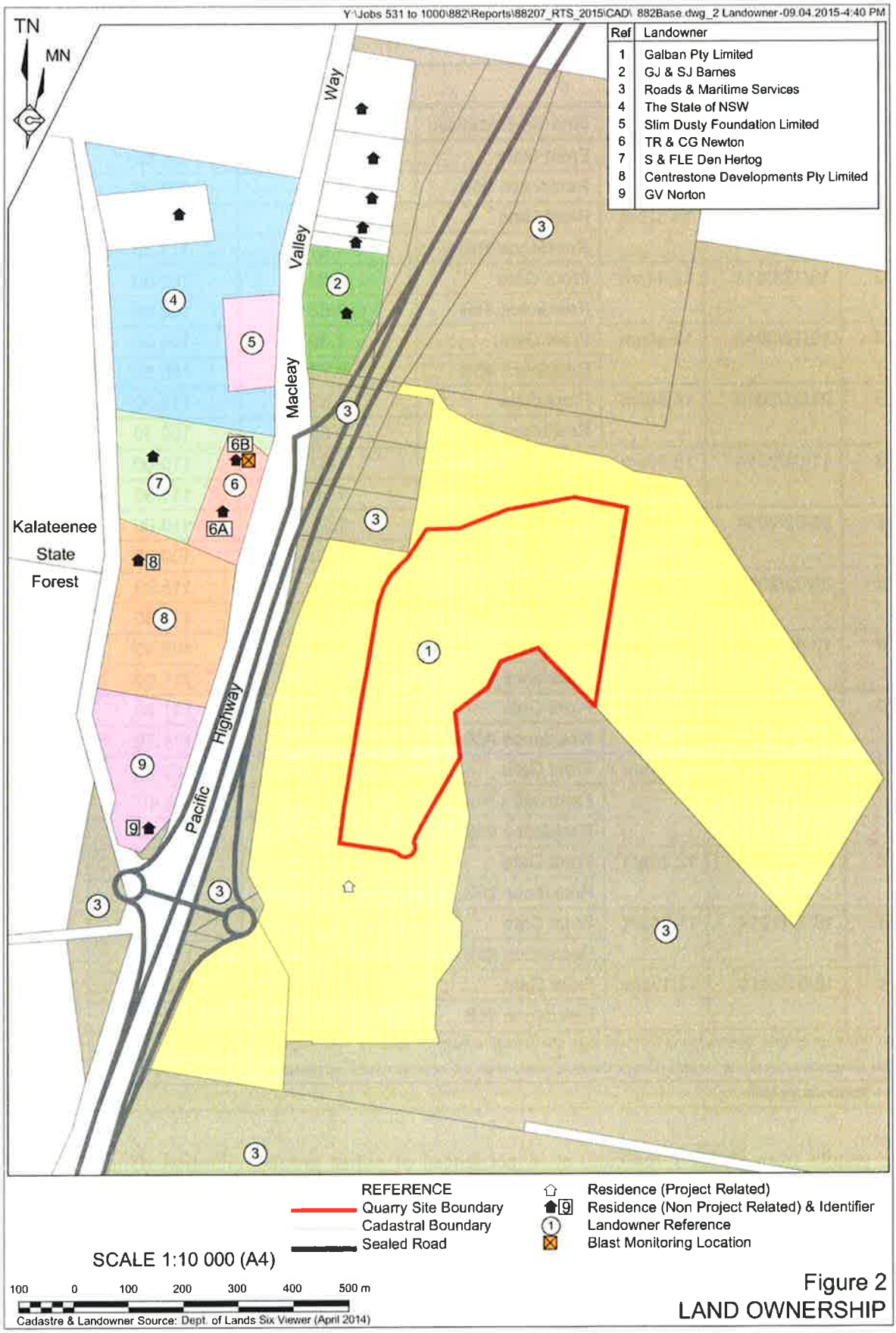

Figure 2
LAND OWNERSHIP

Table 1
Farrawell's Quarry Blast Monitoring Results Summary

Blast#	Blast Date	Time	Monitor Location	Ground Vibration (mm/sec)*	Airblast Overpressure (dB Lin Peak)#
P_001	30/10/2013	14.19pm	Front Gate	1.25	93.80
			Residence #6B	0.43	107.70
P_002	15/11/2013	13.52pm	Front Gate	1.85	114.40
			Residence #6B	0.69	113.80
P_003	13/12/2013	12.44pm	Front Gate	1.58	107.90
			Residence #6B	0.62	102.40
P_004	19/12/2013	12.48pm	Front Gate	2.38	104.30
			Residence #6B	0.73	106.80
P_005	21/01/2014	14.09pm	Front Gate	1.82	110.30
			Residence #6B	0.55	109.30
P_006	11/02/2014	13.20pm	Front Gate	1.52	110.00
			Residence #6B	1.13	111.90
P_007	28/02/2014	12.43pm	Front Gate	1.21	110.00
			Residence #6B	1.20	109.30
P_008	25/03/2014	13.48pm	Front Gate	1.81	115.90
			Residence #6B	1.27	111.30
P_009	13/06/2014	12.43pm	Front Gate	1.63	108.40
			Residence #6B	0.63	111.00
P_010	4/08/2014	13.27pm	Front Gate	1.13	111.30
			Residence #6B	0.74	111.50
P_011	18/09/2014	12.34pm	Front Gate	0.97	102.30
			Farrawell's House	1.60	95.40
			Residence #6B	1.38	103.30
P_012	21/10/2014	12.16pm	Front Gate	1.34	112.50
			Residence #6B	1.11	105.00
P_013	19/11/2014	11.05am	Front Gate	1.44	110.40
			Residence #6B	1.34	111.40
P_014	12/01/2015	12.15pm	Front Gate	1.79	110.90
			Residence #6B	1.39	114.80

*Ground Vibration criteria: 5mm/second for more than 5% of total number of blasts or 10mm/second at any time.
Airblast Overpressure criteria: 115bB (Linear Peak) for more than 5% of total number of blasts or 120 at any time.
Source – Pacific Blue Metal

As the results from **Table 1** indicate, no exceedances of either ground vibration of airblast overpressure have occurred at Residence #6B (or at the front gate) for any blasts initiated since quarry operations commenced. Noting that the vibration and airblast overpressure criteria have been established to ensure that vibration and overpressure effects do not impact upon health-related issues, structures including buildings and related infrastructure, it is highly unlikely that the continued use of blasting at the Quarry would result in any damage to dwellings, water pipes or concrete slabs if blasting effects continue to be below the prescribed criteria.

Representative Comment(s)

Concerns over the proposed depth of quarry in regards to vibrations when blasting occurs.

Private Submission

Response

As the Quarry progresses deeper, the airblast impacts from blasting would actually be reduced as the in situ quarry walls would provide a barrier, further shielding surrounding residences from airblast impacts.

In regards to vibration as the result of blasting at depth within the Quarry, there would be no difference between vibration levels currently experienced when blasts are undertaken at the current surface. Vibrations occurring as the result of blasting would not increase as a direct correlation of depth. Notwithstanding this however, all blasts would continue to be monitored at the blast monitoring locations identified on **Figures 1** and **2**.

2.4 ECOLOGY

Representative Comment(s)

An ecological assessment in regards to the current proposed development should be prepared. The ecological assessment should address the following:

- *biodiversity survey and assessment guidelines endorsed by the Office of Environment and Heritage (OEH);*
- *results of field investigations (no more than 3 years old);*
- *impacts on native old growth or hollowing bearing trees;*
- *impacts on microbat boxes provided on the site which were a consent condition of T6-07-146, including a map illustrating the current location of these boxes and the location they will be relocated to if impacted;*
- *impacts (direct and indirect) on adjoining land zoned 'E2 Environmental Conservation' under the Kempsey Local Environmental Plan (2013);*
- *Section 5A of the Environment Planning and Assessment Act 1979 (EP&A Act); and*
- *State Environmental Planning Policy No. 44- Koala Habitat Protection (SEPP 44).*

OEH and Council (repeated) Submission

If clearing of native vegetation is to be undertaken as part of the quarry expansions (and not under Development Consent T6-11-301 for the industrial Subdivision) then the development application for the quarry expansion should contain ... an ecological assessment report.

OEH Submission

Response

An ecological assessment of the remnant vegetation within the Quarry Site that is proposed to be removed as the result of the Proposal has been undertaken through a fauna assessment by Kendall and Kendall (Kendall, 2015) and a flora assessment by Idyll Spaces (Idyll, 2015).

These assessments, including the results of field investigations, the proposed implementation of management and mitigation measures, as well as an assessment of impacts are provided separately to this document as **Annexure 1** and **2** respectively.

Assessments of significance (7-part tests and Significant Impact Guidelines) were undertaken on the vulnerable and/or endangered species listed in **Table 2** that were predicted to occur within the Study Area as listed within the TSC and/or EPBC Acts.

Table 2
Species Assessed for their Significance

Species	TSC Act	EPBC Act
Flora		
Cryptostylis hunteriana	Vulnerable	Vulnerable
Cynanchum elegans	Vulnerable	Endangered
Parsonsia dorrigoensis	Vulnerable	Endangered
Fauna		
Glossy Black-cockatoo (*Calyptorhynchus lathami*)	Vulnerable	-
Square-tailed Kite (*Lophoictinia isura*)	Vulnerable	-
Powerful Owl (*Ninox strenua*)	Vulnerable	-
Masked Owl (*Tyto novaehollandiae*)	Vulnerable	-
Barking Owl (*Ninox connivens*)	Vulnerable	-
Little Lorikeet (*Glossopsitta pusilla*)	Endangered	-
Swift Parrot (*Lathamus discolor*)	Endangered	-
Regent Honeyeater (*Anthochaera phrygia*)	Endangered	-
Varied Sittella (*Daphoenositta chrysoptera*)	Vulnerable	-
Spotted-tailed Quoll (*Dasyurus maculatus*)	Vulnerable	-
Brush-tailed Phascogale (*Phascogale tapoatafa*)	Vulnerable	-
Squirrel Glider (*Petaurus norfolcensis*)	Vulnerable	-
Koala (*Phascolarctos cinereus*)	Vulnerable	-
Grey-headed Flying-fox (*Pteropus poliocephalus*)	Vulnerable	-
Eastern Free-tail-Bat (*Mormopterus norfolkensis*)	Vulnerable	-
Hoary Wattled Bat (*Chalinolobus nigrogriseus*)	Vulnerable	-
Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)	Vulnerable	-
Greater Broad-nosed Bat (*Scoteanax rueppellii*)	Vulnerable	-
Little Bentwing-bat (*Miniopterus australis*)	Vulnerable	-
Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*)	Vulnerable	-

Following the assessments of significance within the flora and fauna reports, it has been concluded that the clearing of approximately 4.5ha of remnant vegetation would be negligible on the existing vulnerable and/or endangered flora and fauna individuals, communities and/or populations.

The Kempsey Shire Council Koala Plan of Management (KSCKPoM) maps the study area as "Secondary B koala habitat" which is included as "preferred koala habitat" as identified in the KSCKPoM. The KSCKPoM requires that if it is proposed to remove preferred koala habitat then the compensation measures described in Section 4.12 (Appendix 6) apply. However when the subject site and adjoining areas to the north and south were zoned for industrial use, an area of land indicated on **Figure 1** as E2 "environmental conservation" (originally zoned as "7(b) – Environmental Protection (Habitat) Zone") was created. A Conservation Zone Management Plan was prepared in 2010 (GHD, 2010) as part of the Development Application for the Industrial Subdivision in order to conserve and protect this land. Following this land being conserved, this land was transferred to RMS by the landowner to manage the area identified as E2 "environmental conservation" area on **Figure 1** with RMS's substantial landholdings to the west (as compensation for vegetation removed to facilitate the new Pacific Highway construction works), in order to manage as a single Biodiversity Offset.

Noting the reservation of land within the E2 "environmental conservation" area originally was to provide compensatory habitat for clearing associated with the industrial subdivision development application that wholly encompasses the existing and proposed Quarry, it is therefore concluded that the area within the E2 "environmental conservation" Zone would continue to serve as a compensatory habitat for koala's based upon its proximity to the proposed areas of disturbance and the similarities of flora assemblages.

In conclusion, the flora and fauna assessments have ensured that the ecological assessment was undertaken in accordance with the current OEH survey and assessment guidelines as a result of field investigations undertaken in 2015 to assess the impact upon the natural and man-made hollow bearing structures as well as assessing the impacts upon the adjoining conservation land in accordance with the current planning principles. The results of these studies determined that no significant impact would occur on the local ecology as a result of the Proposal.

2.5 HERITAGE

Representative Comment(s)

OEH has provided their General Terms of Approval in regards to Aboriginal Heritage, requiring an Aboriginal Heritage Impact Permit (AHIP) to be obtained prior to any ground disturbance or any other works associated with the development.

OEH Submission

A site inspection undertaken on 16 October 2014 by OEH staff determined that the area cleared for inspection by the Archaeological consultant was insufficient to determine the presence or absence of Aboriginal objects at the location in question.

To ascertain whether any Aboriginal objects are present at the location, all leaf litter and detritus within the conserved area would need to be removed and a thorough assessment of the subsurface undertaken. In the event that any soil profile remained at the location, subsurface investigation would also be required to confirm or refute the presence of Aboriginal objects.

Given that such investigation could result in harm to a registered aboriginal object, OEH recommends that an AHIP is obtained. In this regard, any consent issued for the proposed development should be conditional upon the General Terms of Approval for Aboriginal cultural heritage.

OEH Submission

Response

Following an estimation of costs to undertake the field studies outlined by OEH, including costs attributable for the archaeologist and registered Aboriginal parties to undertake the removal of all detritus, surface and subsurface investigations that constitute an AHIP investigation, the process was deemed prohibitively expensive. As a result of this, the Applicant has therefore determined that the current identified area would now remain in situ with extraction activities to occur around the identified site and buffer area.

Therefore, with the encompassing buffer area remaining, **Figure 1** presents a revised cross-section of the proposed Quarry, highlighting how extraction activities would occur around the site and leave the remaining scatter site and buffer area as it currently stands.

2.6 TRAFFIC

The following comments were provided in correspondence from RMS dated 16 December 2014, provided to Council in response to the original correspondence sent to Council on 22 May 2014.

Representative Comment(s)

The response has not identified the peak traffic flows arising from the proposed development or provided an analysis of the subsequent impacts on intersections used to access the Pacific Highway.

RMS Submission

Whilst Roads and Maritime acknowledges that the interchange will likely be capable of accommodating the peak daily traffic generated by the proposed development, it remains unclear how the identified hourly rate of heavy vehicle movements will impact on the safety and efficiency of affected intersections, particularly during network peak periods.

RMS Submission

Response

R.W. Corkery & Co, on behalf of the Applicant, discussed this comment with RMS on 29 January 2015, with RMS agreeing that limited benefit would result from additional traffic counts and that is was deemed not necessary for any further traffic survey work to be undertaken. As part of these discussions, RMS outlined that its main area of concern was the length of the right turn bay from Macleay Valley Way onto the north-bound lanes of the Pacific Highway and the impact that queueing of quarry-related trucks within this right turn bay would have on the road network and other vehicles.

It has since been established that the Macleay Valley way right turn bay is approximately 140m in length. Based upon the Applicant's experience to date, when operating at high production rates and peak periods, it is rare for more than one truck to queue at any time within the right turn bay when waiting to enter the Pacific Highway. In order to ensure that quarry-related trucks do not queue within the right turn bay in a manner that will cause all queued traffic to exceed 140m, the Applicant has included within its updated Driver's Code of Conduct, a management measure to ensure that only two trucks are permitted within the right turn bay at

any one time. The second quarry-related truck entering the right turn bay would radio to the other trucks within the Quarry, advising them of the two truck maximum within the right turn bay has occurred and that no trucks exit the Quarry or turn right from the Macleay Valley Way roundabout (from the Industrial Subdivision Access Road) onto Macleay Valley Way until at least one truck has entered the northbound Pacific Highway on-ramp. The updated Driver's Code of Conduct has been included to this document as **Annexure 3**, with the additional text provided in red text and a figure to highlight the procedure. **Annexure 3** also includes a figure highlighting the procedures discussed.

Providing for a maximum of two quarry vehicles (each 19m long), as well as providing for a safe distance gap (7m), a maximum length of quarry-related trucks would equal 45m, providing for approximately 100m of space within the right turn bay for other road users.

The proposed management measure would permit the use of quarry-related trucks to utilise the Macleay Valley Way right turn bay onto the Pacific Highway whilst minimising the potential issues by quarry-related trucks so that it does not adversely impact upon other road users.

Representative Comment(s)

The response has identified that trucks will leave the quarry at 1.5 to 2 minute intervals. This is an average spacing equivalent to the nominated maximum of 40 loads per hour. Council may wish to condition a required minimum spacing for vehicles leaving the quarry and maximum permitted hourly/daily truck movements to minimise impacts on the road network. Compliance with such a condition could be monitored through the installation of vehicle counters at the quarry access and reported annually.

RMS Submission

Response

Noting the Applicant's experience to date, it has been established that it is rare for more than one truck to queue within the right turn bay from Macleay Valley Way when waiting to enter the Pacific Highway. The discussions held with RMS on 29 January 2015 has determined that the RMS would be comfortable with the inclusion of the previously discussed and appropriate management measures within the Driver's Code of Conduct, replacing the minimum truck spacing or vehicle counting system.

It is noted, however, that the requirement for the average number of trucks leaving the Quarry, including during peak periods, would be satisfied through the recording of truck movements within the Quarry's Annual Environmental Management Report.

Representative Comment(s)

A Driver's Code of Conduct could be prepared to address, but not be limited to, the following:

1. *A map of primary haulage routes highlighting critical locations;*
2. *Safety initiatives for trucks travelling through residential areas and school zones;*
3. *An induction process for vehicle operators;*
4. *Format of regular toolbox meetings;*

5. *A complaints resolution and disciplinary procedure; and*
6. *Any community consultation measures to address peak haulage periods.*

RMS Submission

Response

A Driver's Code of Conduct has been previously compiled for the Quarry, with the proposed additions outlined by RMS included within the modified Driver's Code of Conduct. A copy of the updated Drivers Code of Conduct has been attached to this document as **Annexure 3**, with additional information including the above RMS requirements presented in red text.

2.7 WATER

Representative Comment(s)

A Water Management Plan is required that addresses in detail the following broad elements.

- *Water balance;*
- *Erosion and Sediment Control;*
- *Surface Water Response Plan;*
- *Monitoring and Maintenance;*
- *Responsibilities for adherence to management measures outlined in the Water Management Plan; and*
- *Details of the timing of regular reviews of the Water Management Plan.*

Council Submission

Response

The requirement for a Water Management Plan was discussed between the Applicant and Council in January 2015, with the results of these discussions, as confirmed on 23 January 2015, determining that all elements outlined would be addressed within the overarching Environmental Management Plan (EMP) for the Quarry – a document that would be compiled and provided to Council following development consent being issued within the timeframes nominated in the respective development consent condition.

Representative Comment(s)

As with the Farrawell catchment including the old dam (now non existent) dirty water being directed on to the new bypass drainage system, All Of Which is then dumped from a 1200mm on to private property including i.e. 554a newtons property we end up with the total

Private Submission

Response

Figure 3 presents the flow of water from the Quarry's Water Storage Dam when water is discharged or overflow occurs. During water flow events, water from the Water Storage Dam flows from the 5m wide rock-lined horizontal spillway on its southern side, to a drain under the Industrial Subdivision Access Road, allowing runoff to continue on its natural drainage path towards the west.

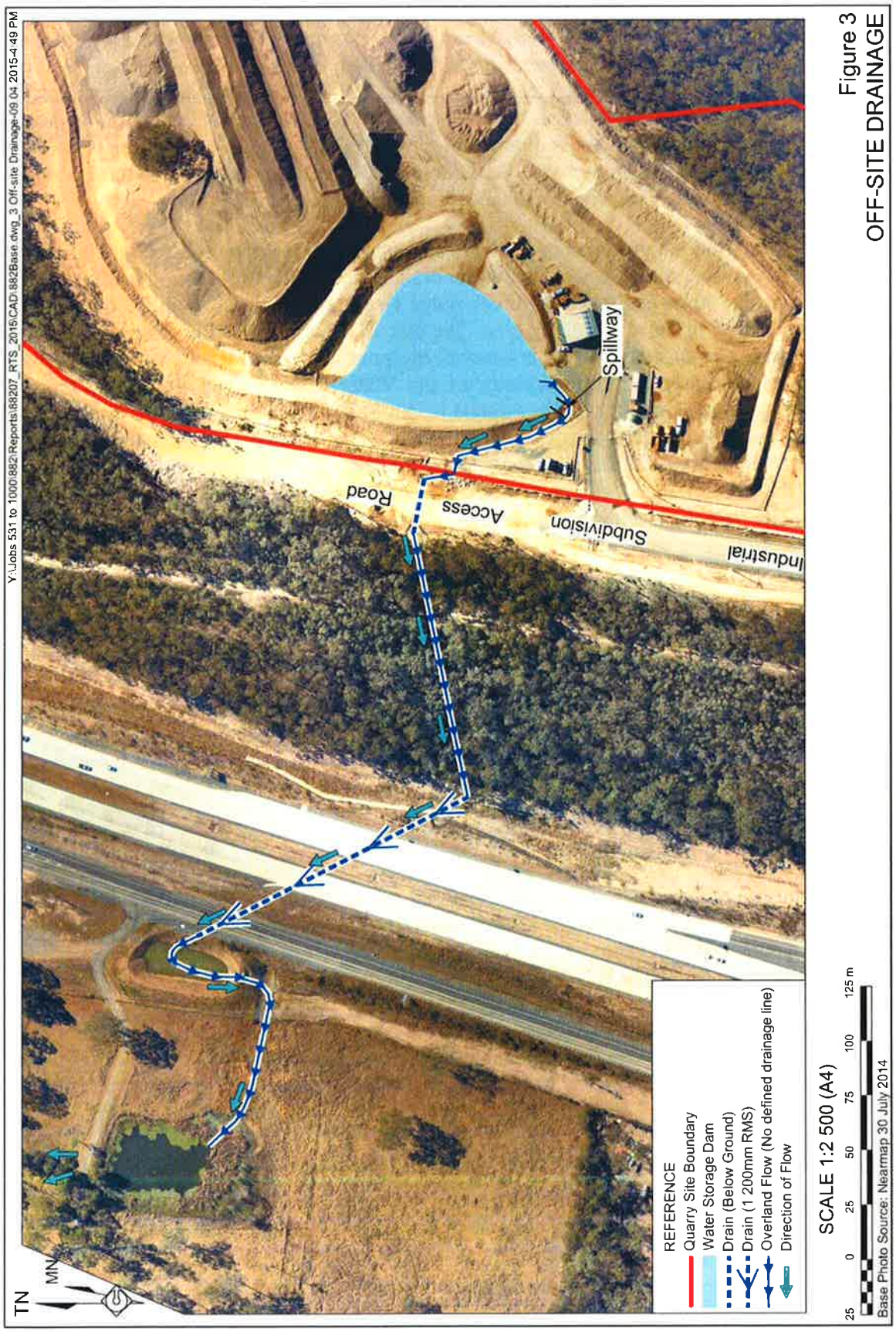

Figure 3
OFF-SITE DRAINAGE

Once exiting the drainage pipe beneath the Industrial Subdivision Access Road, water drains westward via overland flow (i.e. no defined drainage line) until it is intercepted by the new RMS-installed Pacific Highway drainage catchment system and directed towards a 1 200mm pipe, that directs all captured water from the eastern Pacific Highway catchment under the Pacific Highway and to a dedicated basin on the western side of the Pacific Highway. Overflowing water from this basin is directed over a rock-lined spillway and flows westwards along a natural drainage path to a private farm dam where water then flows via natural drainage lines towards the north behind private residences.

Whilst it is recognised that water from the current and proposed Quarry eventually would flow behind privately-owned residences along natural drainage lines, the pre-existing landform prior to quarrying would have continued to direct water along these natural drainage lines, based upon the topography of the surrounding area. The overall catchments to the eastern side of the Pacific Highway remain essentially the same as the pre-existing landform, with the primary difference being the single collection point of the Water Storage Dam within the Quarry, collecting the water and discharging via a single location. The final location of the water within the Quarry's footprint would ultimately remain in the same location (i.e. the natural drainage lines to the west of the Pacific Highway) if the Quarry did not exist and therefore, it is determined that the Quarry does not contribute to additional water flowing near the private residences. The retention and use of water within the Quarry may in fact reduce the contributions originating east of the Pacific Highway.

2.8 LICENSING

Representative Comment(s)

The EPA has reviewed the information provided and has determined that the EPA is able to amend Environmental Protection Licence 20018 for the proposal subject to a number of conditions.

EPA Submission

Response

The Applicant has separately discussed the proposed amendments to EPL 20018 with the EPA via a letter sent on 16 February 2015, addressing their comments within their submission provided to Council on 17 October 2014, with a reply received on 4 March 2015. The results of these discussions are summarised below and provided in full in **Annexure 4**.

It is anticipated that EPL 29018 would be updated and re-issued to PBM to include the below amendments. The EPA has also outlined within their response letter that they will re-issue the amended General Terms of Approval to Council from their original correspondence received on 17 October 2014.

Condition L2.4 (Water and/or Land Contamination Limits)

The EPA has acknowledged that pH within the Water Storage Dam consistently displayed levels between 4.8 and 5.0, however an amendment to the lower pH discharge limit was not supported by the EPA, with the current limits of 6.5 to 8.5 to remain.

As a result of this, PBM would now ensure that prior to discharge events, pH levels are adjusted to between 6.5 to 8.0, through the use of additives such as lime or another approved additive by the EPA. PBM is currently undertaking discussions with a water chemical engineer to correctly determine the dosage rates of gypsum or similar additives to ensure discharging water is compliant with the prescribed limits.

Condition L6.1 (Hours of Operation)

The EPA has accepted the request for Saturday hours of operation to be returned to 7:00am to 1:00pm to reflect the proposed hours of operation.

PBM requires no follow up to this amendment.

Special Condition 1 (Dust Management Plan)

The EPA is satisfied for the overarching *Environmental Management Plan* for Farrawell's Quarry to incorporate a section within the document entitled "Dust Management" and include, but limited to:

- detailed measures to address all the principal sources of dust, e.g. extraction, processing (handling/loading/crushing), stockpiling and storage and road transport. Dust control measures that represent both proactive and reactive management should be included;
- outline the required maintenance measures for dust suppression equipment (e.g. Conveyor Sprinklers, etc.).

The *Environmental Management Plan* is also to be submitted to the EPA prior to the commencement of quarrying activities under this approval/licence on the premises.

Furthermore, in the event of a substantiated complaint, the EPA will require the preparation of a dust monitoring program to be implemented, outlining: key performance indicator(s) that are quantifiable, measurable and auditable, monitoring method(s); location, frequency and duration of monitoring; and record keeping.

PBM would include all dust management requirements within the overarching *Environmental Management Plan*, to be submitted to Council following development consent being issued and in accordance with the timing as outlined within the relevant conditions.

Condition P1.1 (Discharges to Air and Water and Applications to Land)

Condition P1.1 is to be amended within EPL 20018 to include the Water Storage Dam as the single water discharge point from the Quarry, to match the information included within the EIS.

PBM requires no follow up to this amendment.

Condition L5 Blasting

Condition L5.1 is to be amended to include the option of prior email notification for blasting outside the nominated hours.

PBM requires no follow up to this amendment.

2.9 QUARRY LIFE

Representative Comment(s)

Concerns over the proposed quarry life.

Private Submission

Response

The proposed extension to the Quarry's life is a direct result of the identification of further, easily accessible, high quality resources that would continue to provide these resources necessary for the upgrade to the Pacific Highway and other local services and developments.

No significant modifications are proposed in regards to extraction methods or volumes, and noting the ongoing high environmental standard that the Quarry has previously operated to, it is anticipated that whilst an extension to the quarry footprint and overall extension to the life of the Quarry would result, no additional impacts are predicted at surrounding residences.

2.10 ECONOMIC

Representative Comment(s)

Difficulty in selling the property, and loss of property value, due to the proximity of the quarry to the dwelling and damage to the dwelling from blasting activities.

Private Submission

Response

It is unknown which owner in question is having difficulty selling their property due to the private nature of the submission but it is recognised that all privately-owned property is located a minimum distance of 300m to the west of the Quarry and, furthermore, is separated by the Pacific Highway and Macleay Valley Way.

In addition to this, all privately-owned residences are separated between the Pacific Highway and the Quarry by a stand of existing remnant vegetation of over 10m in height that prevents direct line of sight to the Quarry, as shown on **Plate 1.**

It is therefore argued, noting Section 2.3 of this document that identifies blasting not contributing to damage on any privately-owned property, that the current and proposed Quarry would not be a contributing factor to the loss of property values or difficulty in selling the property, resulting from the residences' proximity to the Quarry as blasting practices undertaken at Quarry.

Plate 1 **View to the southeast from in front of the closest private residence, looking towards the Pacific Highway (behind fence) and Farrawell's Quarry (behind trees). The road in the foreground is Macleay Valley Way (Photo E882D_094)**

3. CONCLUSION

The assembly of the responses to submissions in this document has re-enforced for the Applicant that the design of the Proposal as presented and assessed in the EIS is the most appropriate design to continue operations within the revised Quarry Site. The design and proposed method of operation reflects the zoning in which the Project Site is situated within and provides an adequate separation distance and compliance with all environmental and statutory requirements between the proposed activities and the surrounding community.

The Applicant intends to continue to operate the Quarry in a professional and proactive manner consistent with the approach and commitments presented in all project documentation to ensure that the Applicant continues to provide ongoing benefits to the local and regional community.

Annexures

(Total No. of pages including blank pages = 142)

Annexure 1 Fauna Assessment

Annexure 2 Flora Assessment

Annexure 3 Driver's Code of Conduct

Annexure 4 EPA Correspondence

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Annexure 1

Fauna Assessment

(Total No. of pages including blank pages = 102)

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Fauna Assessment, Farrawell's Quarry Extension, South Kempsey Updating and Review of Previous Fauna Assessment

Prepared by

Kendall & Kendall
Ecological Services Pty Ltd

March 2015

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Fauna Assessment, Farrawell's Quarry Extension, South Kempsey

Prepared for: R.W. Corkery & Co. Pty Limited

On behalf of: Pacific Blue Metal Pty Ltd

Prepared by: Kendall & Kendall
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March 2015

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COMMONLY USED ACRONYMS

EP&A Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environmental Protection & Biodiversity Conservation Act 1999
KSCKPoM	Comprehensive Koala Plan of Management for Eastern Portion of Kempsey LGA
KTPs	Key Threatening Processes
OEH	Office of the Environment and Heritage
PKH	preferred Koala habitat
SEPP 44	NSW State Environmental Planning Policy No.44
TSC Act	NSW Threatened Species Conservation Act 1995

1. INTRODUCTION

1.1 THE PROPOSAL

In December 2007, Kendall & Kendall Ecological Services Pty Ltd prepared a fauna assessment on part of Lot 101 Pacific Highway, Parish of Kalateenee for GHD Pty Ltd – Coffs Harbour. The proposal was to quarry "hard rock" material above the 60 m contour. The proposal was approved and the quarry is operational.

In January 2015, RW Corkery & Co Pty Ltd engaged Kendall & Kendall Ecological Services Pty Ltd to update the fauna assessment as the quarry operator, Pacific Blue Metal Pty Ltd ("The Applicant") now proposes to extend the quarry to cover the land immediately to the north and south of the existing quarry removing material between the 50 m contour and the 60 m contour. The floor of the currently approved quarry would also be lowe4red to 50 m AHD.

1.2 DEFINITIONS, LEGAL FRAMEWORK AND OBJECTIVES

Relevant legislation being:

- NSW *Environmental Planning and Assessment Act 1979* (EP&A Act);
- NSW *Threatened Species Conservation Act 1995* (TSC Act)
- NSW State Environmental Planning Policy No.44 – Koala Habitat Protection (SEPP 44); and
- Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act).

In a letter dated 7th November 2014, the NSW Office of the Environment and Heritage (OEH) made a number of recommendations to Kempsey Shire Council (the consent authority) in regard to issues that should be addressed in the ecological assessment, these being:

- Biodiversity and assessment guidelines endorsed by OEH;
- Results of field inspection (no less than 3 years old);
- Impacts on native old growth or hollow-bearing trees;
- Impacts on microbat boxes provided on the subject site in accordance with development consent 76-07-146 (original quarry approval);
- Impacts (direct and indirect) on adjoining land zoned E2 "environmental conservation" under the Kempsey Environmental Plan 2013";
- s5A of the EP&A Act; and
- State Environmental Planning Policy No. 44 – Koala Habitat Protection

Following discussions with Ms M Mills (OEH) on 6th February 2015, it was agreed that a comprehensive survey was not warranted as:

- recent searches of the OEH wildlife atlas and threatened species website using the region/habitat pathway searches did not reveal any threatened fauna species that would not have been targeted during the 2007 survey effort. It is noted that additional species have been added to the schedules of the TSC Act since the

preparation of the 2007 assessment, however, it is considered that the survey effort implemented would have meet the survey requirements for these species; and

- the 2007 survey effort was comprehensive and robust.

During the conversation with Ms M Mills, it was also agreed that the survey effort described in the methodology section below was sufficient additional survey effort for this assessment considering the survey effort previously implemented for the 2007 assessment.

1.3 STUDY AREA, SUBJECT AREA AND LOCALITY

For the purposes of this assessment, the 'Locality' is defined as being within 5 km radius of the Quarry. The 'Subject Area' relates directly to the proposed areas of disturbance associated with the Proposal, with the 'study area' incorporating the Subject Site plus a 50 m buffer zone.

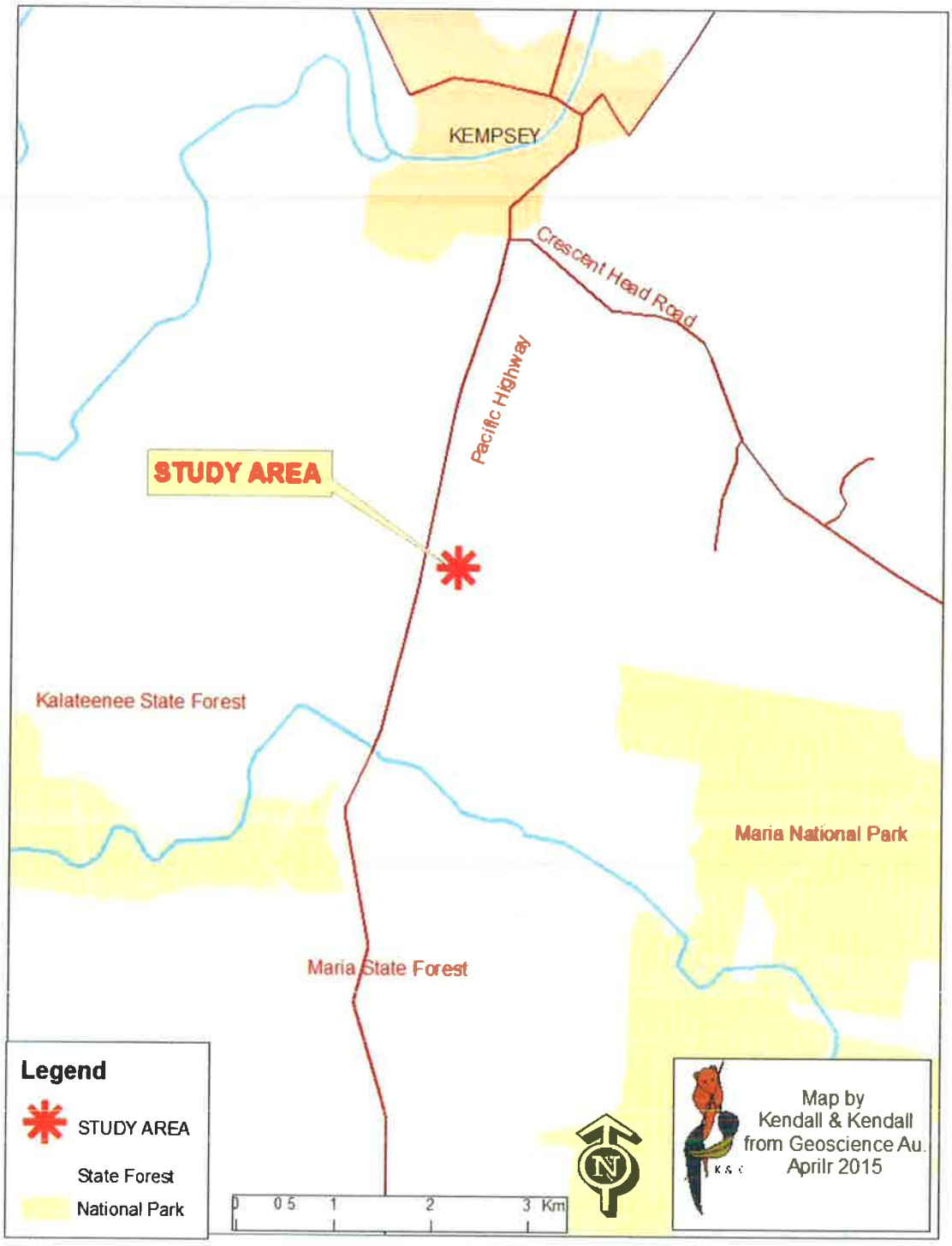


Figure 1 - Study area location

2. METHODOLOGY

2.1 BACKGROUND RESEARCH

2.1.1 OEH Threatened Species Website Search

A combined geographical and habitat search using the parameters of "Macleay/Hastings CMA" (geographical area) and the habitat type "Hunter-Macleay Dry Sclerophyll Forest".

This list is attached as a table in **Appendix 1**.

The individual species profiles, available on the OEH threatened species website, were also used to obtain more detailed habitat information. Based on the habitat requirements an assessment was made as to the possible occurrence of a listed species in **Appendix 1** occurring within the study area. In **Appendix 1** "Likelihood of occurrence of species" has been assessed as follows.

- "Known" - the species has been observed in the study area.
- "Likely" - there is a medium to high probability that a species occupies the study area.
- "Possible" - suitable habitat for a species may occur in the study area but there is insufficient information to categorise the species as likely or unlikely to occur.
- "Unlikely" - a low probability that a species occupies the study area.
- "Nil" - habitat in the study area is unsuitable for the species.

2.1.2 Wildlife Atlas Records

Records of fauna species were obtained under licence from a wildlife atlas database search (OEH 29th January 2015), the search provided records within a 10 km x 10 km grid centred on the study area. Those records which were located within the locality i.e. within 5 km of the study area and also listed in **Appendix 1** were used in this assessment. **Appendix 1** provides the number of wildlife atlas records within 5km of the study area for each species.

2.1.3 EPBC Act Protected Matters Searches

An updated search of the Department of the Environment's protected Matters Search Tool was conducted on the 9th March 2015. This search is attached as **Appendix 2**, irrelevant sections pertaining to flora species or marine species have not been included in the Appendix. The search included lists of threatened and migratory terrestrial fauna species listed under the provisions of the EPBC Act 1999.

2.2 FIELD SURVEY

2.2.1 2007 Field Survey

A comprehensive field survey was conducted in February/March 2007. Weather conditions during the field survey were conducive to fauna surveying. The field survey techniques were implemented:

- 50 ground placed Elliot (A) traps set over 4 nights;
- 20 arboreal placed Elliot (B) traps set over 4 nights;
- 12 pitfall traps set over four nights;
- 6 cage traps set over 4 nights;
- 50 hair tubes set in pairs (one on the ground and one in a tree) set over ten nights;
- 4 harp traps set over two nights at three sites (1 double);
- Koala scat searches;
- Nocturnal call playbacks of the powerful owl, masked owl, barking owl, yellow-bellied glider, Koala and squirrel glider on six nights;
- Spotlighting on 4 nights incorporating nocturnal herpetology searches;
- Anabat recording for microbats over 2 nights at 4 sites;
- Opportunistic identification of birds and bird calls;
- 2 diurnal herpetology searches; and
- Searching for sign of significant fauna.

Figure 2 displays the 2007 survey locations. It is considered that this survey effort meets the DEC 2004 assessment guidelines.

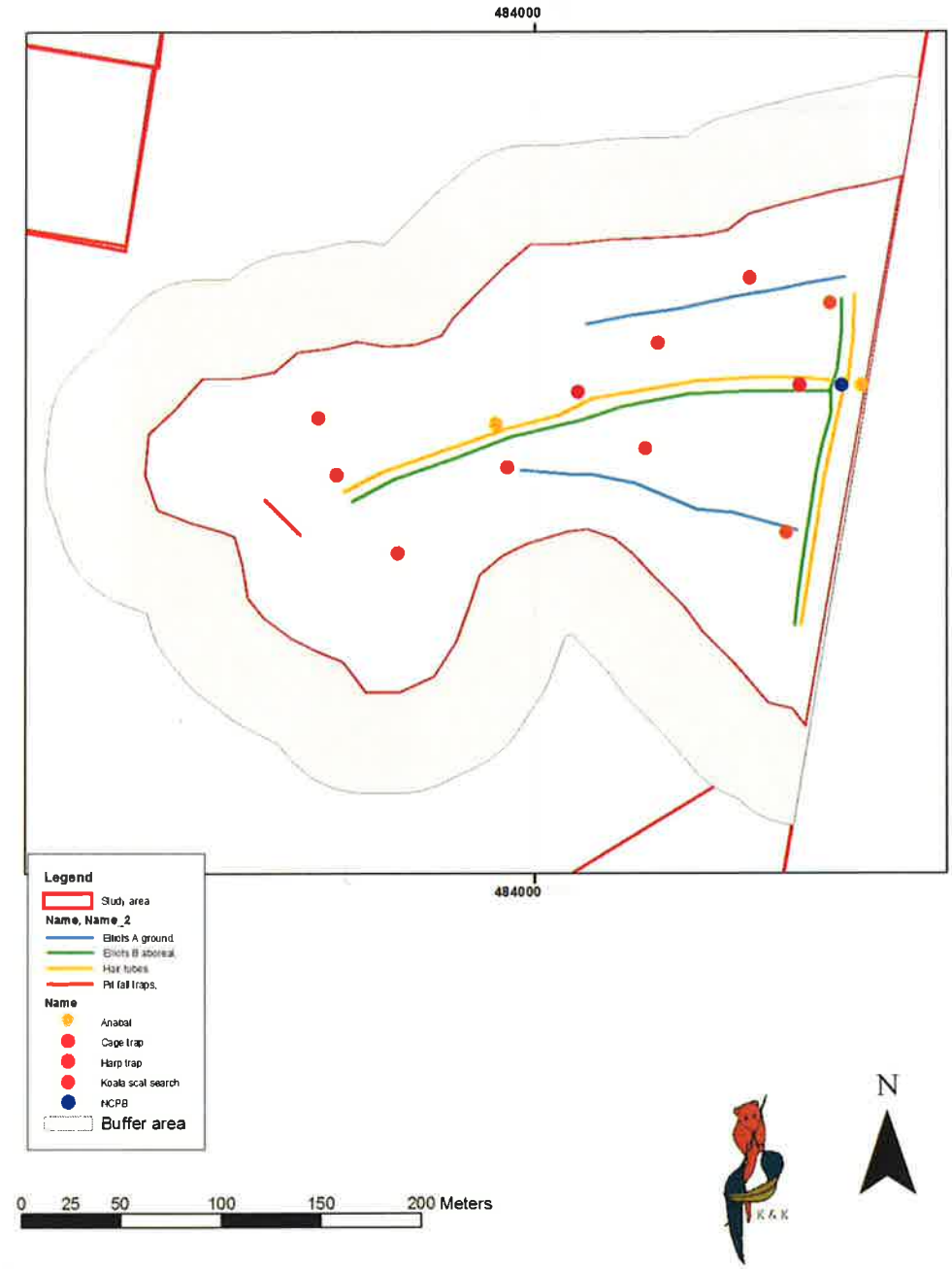
2.2.2 2015 Field Survey

Following discussions with Ms M Mills (OEH) on 6th February 2015 it was agreed that a comprehensive survey of the study area was not warranted as:

- recent searches of the OEH wildlife atlas and threatened species website using the region/habitat pathway searches did not reveal any threatened fauna species that would not have been targeted during the 2007 survey effort. (It is noted that additional species have been added to the schedules of the TSC Act since the preparation of the 2007 assessment, however, it is considered that the survey effort implemented would have meet the survey requirements for these species); and
- the 2007 survey effort was comprehensive and robust.

The following techniques were implemented in the two separate days and four separate nights:

- hollow-bearing tree watching from pre-dusk to 1.5 hours after sunset, by three observers on four separate nights targeting hollow-bearing trees identified in the 2007 assessment (11/2/2015, 16/2/2015, 2/3/2015 & 4/3/2015). The locations of the hollow-bearing trees observed are indicated on **Figure 3**;



Map produced by Kendall & Kendall from field data January 2007
Basemap 1:25,000 topomap Copyright to LIC Bathurst

Figure 2 - Location of survey methodologies implemented in 2007

Figure 3 - Locations of hollow-bearing trees and Koala SAT 2015 surveys

- Spot-lighting by foot and vehicle on four separate nights by three observers both on foot and in vehicle (11/2/2015, 16/2/2015, 2/3/2015 & 4/3/2015); and
- Searching for sign of fauna including herpetology searches and Koala SAT searches over 1.5 days (28/02/2015 & 1/03/2015).

The locations of the hollow-bearing tree watches and Koala SAT searches are displayed on **Figure 3**.

2.3 HABITAT DESCRIPTION

2.3.1 Vegetation description

As described above to determine the threatened fauna species that may occur within the study area, a combined geographical and habitat search using the parameters of "Macleay/Hastings CMA" (geographical area) and the habitat type "Hunter-Macleay Dry Sclerophyll Forest". Idyll Spaces (2015) confirmed the vegetation as Hunter-Macleay Dry Sclerophyll Forest in the accompanying flora assessment. Idyll Spaces (2015) determined that the Hunter-Macleay Dry Sclerophyll Forest within the study area could be classified as comprising three vegetation communities, which are used as a basis to describe the fauna habitat within the study area. Each of the three communities are described in Section 3.1.

2.3.2 Other habitat features

Whilst on site, the presence or absence of specific fauna habitat attributes was noted.

3. RESULTS - FAUNA

3.1 FAUNA HABITAT WITHIN THE STUDY AREA

The vegetation communities described by Idyll Spaces (2015) are used as a surrogate to describe the fauna habitat that occurs within the study area. In addition, other fauna habitat attributes are described.

3.1.1 Vegetation Communities of the study area

Of the three vegetation communities identified in the study area in 2007 by Elks (2007) only two remain, Community 1 *Corymbia maculata – Eucalyptus siderophloia* Open Forest, which occupied the bulk of the approved quarry area in 2007 has now been removed by the quarry (Idyll Spaces, 2015). Vegetation of the study area falls into one "Keith 2004" class being "Hunter Macleay Dry Sclerophyll Forest". The vegetation communities identified by Idyll Spaces (2015) within this class are as follows.

Community 2. Eucalyptus seeana – Eucalyptus globoidea Dry Open Forest

This community occurs on mid-slopes at about the 45-55m contours, mostly in moister areas associated with small drainage depressions. It is confined to parts of the buffer zone and does not occur in the subject site.

White stringybark *Eucalyptus globoidea* and Narrow-leaved Red Gum *E. seeana* are typically the dominant species, but Red Mahogany *E. resinifera* is also common in places. There are occasional Thick-leaved white mahogany *E. carnea*, Pink Bloodwood *Corymbia intermedia*, Grey ironbark *E. siderophloia* and Tallowwood *E. microcorys*. Black oak *Allocasuarina littoralis* and Baeckia *Babingtonia angusta* are the dominant midstratum species but Curricabark *Acacia Acacia concurrens,* Paperbark bottlebrush *Callistemon salignus* and Paperbark *Melaleuca nodosa* are common associates. The lower stratum is sparse to mid-dense and dominated by Wiry panic together with the sedges *Ptilothrix deusta* and *Lepidosperma laterale* (Idyll Spaces, 2015).

Community 3. Eucalyptus siderophloia – Eucalyptus carnea Dry Open Forest

This community occurs on drier midslopes below the 60 metre contour and occupies all of the subject site.

Northern grey ironbark *Eucalyptus siderophloia* and Thick-leaved white mahogany *E. carnea* are the dominant species, with occasional White stringybark *Eucalyptus globoidea*, Pink Bloodwood and Turpentine *Syncarpia glomulifera*. Midstratum vegetation consists of sparse Curricabark and Brush box *Lophostemon confertus* coppice, with occasional Baeckia and Paperbark (Idyll Spaces 2015).

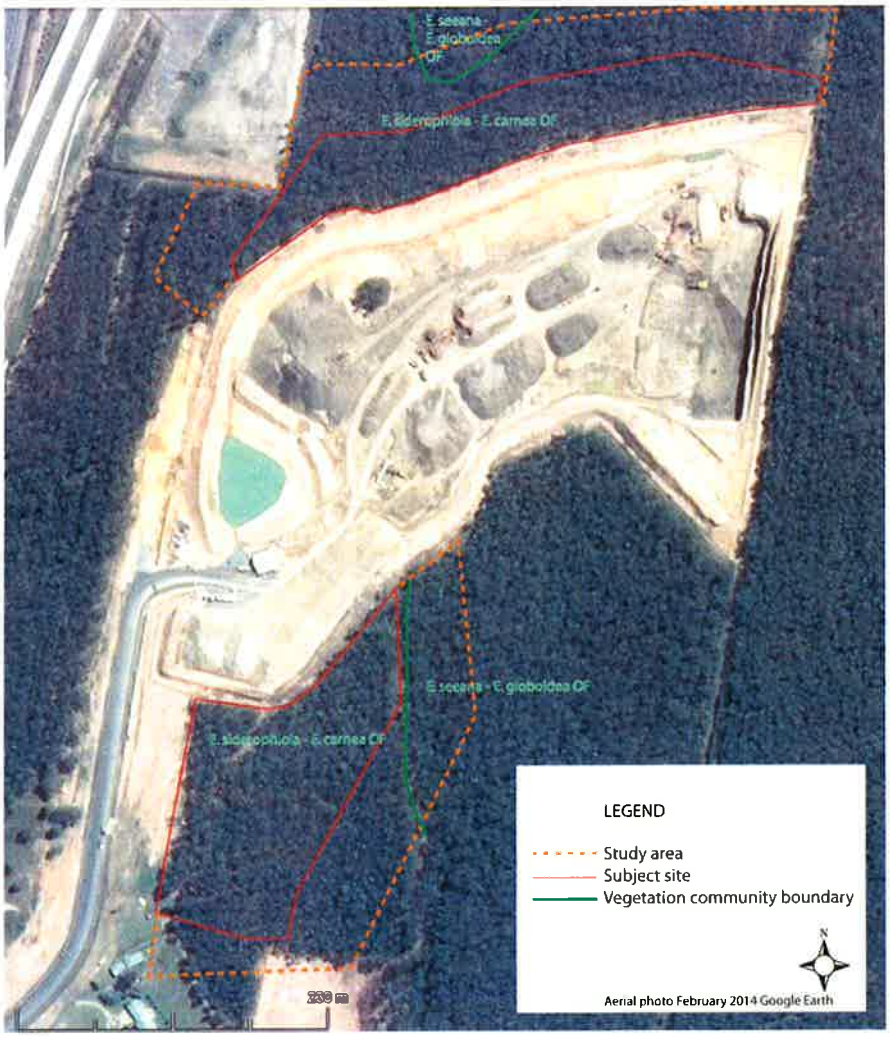


Figure 4 - Vegetation communities within the study area (Idyll Spaces 2015)

3.1.2 Other Fauna Habitat Attributes within the study area

3.1.2.1 Water

The study area does not contain any farm dams or creeklines, there is a sediment control dam within the quarry, apart from this dam the study area is not considered to contain water.

3.1.2.2 Specific Sheltering Resources

Eleven dead trees with apparent tree hollows have been identified within the subject site, their positions are indicated on **Figure 3**. The majority of these hollows are small and are considered suitable for use by microbats. There is an occasional medium sized hollow though these are considered sparse. There are also occasional larger hollow though these have been fire affected and are exposed providing little shelter or occur in dead stumps.

No caves, cliffs or rocky areas are known to occur within the study area.

Large woody debris is rare to absent.

3.1.2.3 Foraging Resources

The study area contains Tallowwood and Red Mahogany which are favoured Koala browse tree species, though these tree species are not considered by Idyll Spaces (2015) as dominant tress within the *Eucalyptus seeana – Eucalyptus globoidea* Dry Open Forest described by Idyll Spaces (2015).

The study area contains a range of species belonging to the Myrtaceae family including eucalypts and paperbarks that would contribute to nectar flows over different times of the year.

Black oak *Allocasuarina littoralis* is one of the dominant midstratum tree species within the *Eucalyptus seeana – Eucalyptus globoidea* Dry Open Forest described by Idyll Spaces (2015). Black oak is a favoured food tree species for the threatened Glossy Black-Cockatoo.

3.1.3 Existing Disturbance to Habitat

The author concurs with the observation by Idyll Spaces (2015) that:

> *There is evidence of a long period of disturbance from logging, grazing and frequent fire that has probably modified vegetation structure and floristics. Most trees are in the early mature to mature growth stages. There are occasional late mature trees but they are invariably small, contain few small hollows only and these are most often basal hollows associated with fire.*

3.2 2007 FAUNA FIELD SURVEY

In total, seventy-five vertebrate species were recorded on the study area, which included "probable identification" of 3 microbat species by analysis of ultrasonic call recordings, in addition unidentified microbats were recorded by spot-lighting and ultrasonic bat call analysis.

In total, within the study area:

- Fifty-one bird species were recorded;
- Twenty-two mammal species of which three were recordings of probable microbat species and four were introduced species; and
- Two reptile species were recorded.

No amphibian or fish species were recorded on the study area during the field survey.

Appendix 3 provides a list of all fauna species recorded on the study area during the 2007 survey.

3.3 2015 FAUNA FIELD SURVEY

Only one threatened species the Grey-headed Flying-fox (Pteropus poliocephalus), was recorded during the 2015 field survey and not recorded during the 2007 field survey.

Of note, during the hollow-bearing tree watch two microbats were observed which may have been roosting in hollow-bearing Tree No. 11 **Figure 3**.

3.4 TREATENED FAUNA SPECIES RECORDED WITHIN THE STUDY AREA

The following threatened microbat species listed on schedule 2 of the TSC Act 1995 were recorded during the 2007 field survey "Anabat" call analysis conducted by Mr. Glen Hoye, a recognised expert in this field. The species recorded being:

- East Coast Freetail-bat (*Mormopterus norfolkensis*) - Confident;
- Hoary Wattled Bat (*Chalinolobus nigrogriseus*) – Probable;
- Little Bent-wing Bat (*Miniopterus australis*) - Confident; &
- Eastern Bent-wing Bat (*Miniopterus schreibersii*) - Confident.

The Varied Sittella was recorded during the 2007 field survey. At that time, this species was not listed as threatened, but it has since been added to schedule 2 of the TSC Act (1995). As mentioned above the Grey-headed Flying-fox (Pteropus poliocephalus) was recorded during the 2007 field survey. Approximately five individuals were observed soon after sunset flying low over the subject site, none were observed foraging within the subject site although only a limited amount of blossom was observed.

3.4.1 Wildlife Corridor Values

A search of the Canri website (http://www.canri.nsw.gov.au/) on 20 March 2007 indicated that the study area does not occur within any regional or subregional wildlife corridor, or key habitat identified in the NSW NPWS key habitats and corridor study.

3.5 DATA BASE SEARCHES

3.5.1 OEH Threatened Species Website Search and Wildlife Atlas Search

Table 1 contains a list of threatened fauna species derived from **Appendix 1** and indicates those species considered as either possible or likely to occur within the study area. **Table 1** includes the number of wildlife atlas records recorded within 5 km of the study area, however these can only be considered indicative as the accuracy level for the atlas records may be greater than 5 km e.g. the closest Brush-tailed Phascogale record as an accuracy of within 10 km. **Table 1** also provides whether or not the species is predicted or known to occur in the Macleay Hastings CMA subregion, the habitat descriptions provided for each species in **Table 1** were obtained from the OEH individual species profiles.

Table 1 - Other Threatened Species Considered Possible to Occur within the study area

Scientific name	Common name	Status	No. of Wildlife atlas records within 5 km	Occurrence within sub-region	Habitat	Possibility
Lophoictinia isura	Square-tailed Kite	3	6	Known	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. Is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage. Appears to occupy large hunting ranges of more than 100km^2.	Possible
Calyptorhynchus lathami	Glossy Black-Cockatoo	3	7	Known	Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of she-oak species, particularly Black She-oak (*Allocasuarina littoralis*), Forest She-oak (*A. torulosa*) or Drooping She-oak (*A. verticillata*) occur. In the Riverina area, inhabits open woodlands dominated by Belah (*Casuarina cristata*). Feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites. One or two eggs are laid between March and August.	Likely
Glossopsitta pusilla	Little Lorikeet	3	8	Known	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophoras, Melaleucas and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity.	Possible
Lathamus discolor	Swift Parrot	2,4	0	Known	Migrates to the Australian south-east mainland between March and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum Corymbia maculata, Red Bloodwood C. gummifera, Mugga Ironbark E. sideroxylon, and White Box E. albens. Commonly used lerp infested trees include Grey Box E. microcarpa, Grey Box E. moluccana and Blackbutt E. pilularis. Return to some foraging sites on a cyclic basis depending on food availability.	Possible
Ninox connivens	Barking Owl	3	0	Known	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. Is flexible in its habitat use and hunting can extend in to closed forest and more open areas.	Possible

Status 1 = Critically Endangered (TSC Act), 2 = Endangered (TSC Act), 3 = Vulnerable (TSC Act), 4 = Endangered (EPBC Act)

Table 1 - Other Threatened Species Considered Possible to Occur within the study area (Cont'd)

Scientific name	Common name	Status	No. of Wildlife atlas records within 5 km	Occurrence within sub-region	Habitat	Possibility
Ninox strenua	Powerful Owl	3	5	Known	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation. The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. As most prey species require hollows and a shrub layer, these are important habitat components for the owl. Pairs of Powerful Owls will defend a large home range of 400-1450 ha. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old.	Possible
Tyto novaehollandiae	Masked Owl	3	2	Known	Pairs have a large home-range of 500 to 1000 ha. Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides.	Possible
Anthochaera phrygia	Regent Honeyeater	1,4	0	Known	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. The Regent Honeyeater is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes. When nectar is scarce lerp and honeydew comprise a large proportion of the diet. Insects make up about 15% of the total diet and are important components of the diet of nestlings. A shrubby understorey is an important source of insects and nesting material. There are three known key breeding areas, two of them in NSW - Capertee Valley and Bundarra-Barraba regions.	Possible
Daphoenositta chrysoptera	Varied Sittella	3	7	Known	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.	Known

Status 1 = Critically Endangered (TSC Act), 2 = Endangered (TSC Act), 3 = Vulnerable (TSC Act), 4 = Endangered (EPBC Act)

Table 1 - Other Threatened Species Considered Possible to Occur within the study area (Cont'd)

Scientific name	Common name	Status	No. of Wildlife atlas records within 5 km	Occurrence within sub-region	Habitat	Possibility
Dasyurus maculatus	Spotted-tailed Quoll	3	5	Known	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites. Mostly nocturnal, although will hunt during the day; spends most of the time on the ground, although also an excellent climber and may raid possum and glider dens and prey on roosting birds. Use "latrine sites" often on flat rocks. Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits and insects; also eats carrion and takes domestic fowl. Females occupy home ranges up to about 750 ha and males up to 3500 ha; usually traverse their ranges along densely vegetated creeklines.	Possible
Phascogale tapoatafa	Brush-tailed Phascogale	3	6	Known	Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest.	Possible
Phascolarctos cinereus	Koala	3	72	Known	Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.	Likely
Petaurus norfolcensis	Squirrel Glider	3	4	Known	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Live in family groups of a single adult male one or more adult females and offspring. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.	Possible
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	3	0	Predicted	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	Possible

Status 1 = Critically Endangered (TSC Act), 2 = Endangered (TSC Act), 3 = Vulnerable (TSC Act), 4 = Endangered (EPBC Act)

Table 1 - Other Threatened Species Considered Possible to Occur within the study area (Cont'd)

Scientific name	Common name	Status	No. of Wildlife atlas records within 5 km	Occurrence within sub-region	Habitat	Possibility
Mormopterus norfolkensis	Eastern Freetail-bat	3	5	Known	Occur in dry sclerophyll forest and woodland east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures.	Known
Chalinolobus nigrogriseus	Hoary Wattled Bat	3	0	*	In NSW the Hoary Wattled Bat occurs in dry open eucalypt forests, favouring forests dominated by Spotted Gum, boxes and ironbarks, and heathy coastal forests where Red Bloodwood and Scribbly Gum are common. Because it flies fast below the canopy level, forests with naturally sparse understorey layers may provide the best habitat. Roosts in hollows and rock crevices. Will occupy urban areas with suitable habitat.	Probable
Scoteanax rueppellii	Greater Broad-nosed Bat	3	1	Known	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 – 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.	Possible
Miniopterus australis	Little Bentwing-bat	3	21	Known	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.	Known
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	3	7	Known	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of maternity caves. Cold caves are used for hibernation in southern Australia. Breeding or roosting colonies can number from 100 to 150,000 individuals. Hunt in forested areas, catching moths and other flying insects above the tree tops.	Known

Status 1 = Critically Endangered (TSC Act), 2 = Endangered (TSC Act), 3 = Vulnerable (TSC Act), 4 = Endangered (EPBC Act)

3.5.2 EPBC Act Protected Matters Search – Threatened Fauna Species

A search of the Department of the Environment's Protected Matters Search Tool was conducted on the 9th March 2015 for the area 5 km surrounding the study area. This search is attached as **Appendix 2**, irrelevant sections pertaining to flora species or marine species have not been included in the Appendix.

The Grey-headed Flying-fox is listed in the threatened species section of **Appendix 2**, this species was recorded flying over the study area during the 2015 field survey. Other species listed in the threatened species section of **Appendix 2** are the:

- Regent Honeyeater (*Anthochaera phrygia*);
- Swift Parrot (*Lathamus discolor*);
- Spotted-tailed Quoll (*Dasyurus maculatus*); and
- Koala (*Phascolarctos cinereus*).

3.5.3 EPBC Act Protected Matters Search – Migratory Terrestrial and Wetland Species

The search of the Department of the Environment's Protected Matters Search Tool (9/3/2015) attached as **Appendix 2** lists migratory terrestrial species of those listed the following species are considered possible to occur within the study area:

- White-throated Needletail (*Hirundapus caudacutus*); and
- Rainbow Bee-eater (*Merops ornatus*).

Neither of these species was recorded during the 2007 or 2015 field surveys.

3.5.4 SEPP 44 Koala Habitat Protection

The main aim of SEPP 44 is

> "to encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koalas to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline."

Schedule 1 of SEPP 44 contains a list of local government areas to which the SEPP 44 applies; Kempsey LGA is included in the schedule.

A comprehensive Koala plan of management has been prepared for the eastern section of the Kempsey LGA. The plan being called the Comprehensive Koala Plan of Management for Eastern Portion of Kempsey LGA (KSCKPoM). As described in the KSCKPoM, the adoption of the plan replaces the requirement under SEPP 44 for proposed developments in Kempsey LGA to address Koala issues individually and sets out a framework for conserving Koalas in eastern portion of the Kempsey LGA.

The KSCKPoM maps the study area as "Secondary B Koala habitat" which is included in the "preferred Koala habitat (PKH)" identified in the KSCKPoM.

4. DISCUSSION

4.1 TYPE AND DEGREE OF IMPACTS DUE TO THE PROPOSAL

The author concurs with the description of the type and degree of impacts as described by Idyll Spaces (2015):

> The proposed works would involve the total removal of existing vegetation cover within the subject site (the extended quarry footprint). The approximate area of the vegetation community *Eucalyptus siderophloia – Eucalyptus carnea* Dry Open Forest that would be removed is 4.5 ha.
>
> Assessment of the nature and magnitude of the impact includes the following considerations:
>
> ***1. Pre-construction, construction and occupation/maintenance phases***
>
> It is envisaged that construction and occupation/maintenance phases would extend over an indefinite period.
>
> ***2. All on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones.***
>
> On-site impacts are described above. No off-site impacts are considered likely.
>
> ***3. All direct and indirect impacts***
>
> Direct impacts are expected to consist of removal of native vegetation cover over an area of approximately 4.5 ha.
>
> Indirect impacts are expected to be avoided by implementation of dust, sediment and erosion control measures.
>
> ***4. The frequency and duration of each known or likely impact/action***
>
> As for 1 above.
>
> ***5. The total impact which can be attributed to that action over the entire geographic area affected, and over time***
>
> As for 2 & 3 above.
>
> ***6. The sensitivity of the receiving environment***
>
> The receiving environment has been subjected to a long period of disturbance from logging, grazing, clearing and frequently fire. There is no evidence of indirect or off-site impacts arising from the existing quarry and no indication that the receiving environment might be unduly sensitive to the impacts of the proposal.
>
> ***7. The degree of confidence with which the impacts of the action are known and understood.***
>
> Actions of the type proposed have been frequently undertaken over a long period and their impacts are known and understood.

In regard to specific fauna habitat attributes the proposal will remove hollow-bearing trees and specific food resources for the possibly occurring Koala and Glossy Black-cockatoo.

4.2 IMPACTS ON ADJOINING ENVIRONMENTAL ZONED LAND, NESTING BOXES AND OLD GROWTH TREES

Figure 5 indicates that the majority of the extended quarry boundary does not adjoin the land zoned E2 – Environmental Conservation. In the area where there is a common boundary, the measures adopted by the Applicant will be in place to avoid indirect impacts of dust and sediment.

Figure 5 also displays the locations of nesting boxes previously installed, the locations of the boxes are some distance from the proposed quarry extensions therefore it is considered that the proposed quarry extension will not impact on the nesting boxes.

No old growth trees occur within the study area. The author concurs with the structural vegetation descriptions provided in the accompanying flora report by Idyll Spaces (2015):

> *There is evidence of a long period of disturbance from logging, grazing and frequent fire that has probably modified vegetation structure and floristics. Most trees are in the early mature to mature growth stages. There are occasional late mature trees but they are invariably small, contain few small hollows only and these are most often basal hollows associated with fire. Large woody debris is rare to absent."*

4.3 KEY THREATENING PROCESSES

A search was conducted of the list of key threatening processes (KTPs) on the OEH threatened species website on 13th March 2015. This list is attached as **Appendix 4**.

4.3.1 Contribution of the Proposal to Key Threatening Processes

The Proposal will further contribute to the following Key Threatening Processes (KTPs):

- Clearing of native vegetation;
- Removal of dead wood and dead trees; and
- Loss of hollow-bearing trees.

No Threat Abatement Plan has been prepared for the above KTPs. The 2007 assessment recommended the installation of twenty microbat nesting boxes to mitigate against the loss of tree hollows. These boxes have now been installed.

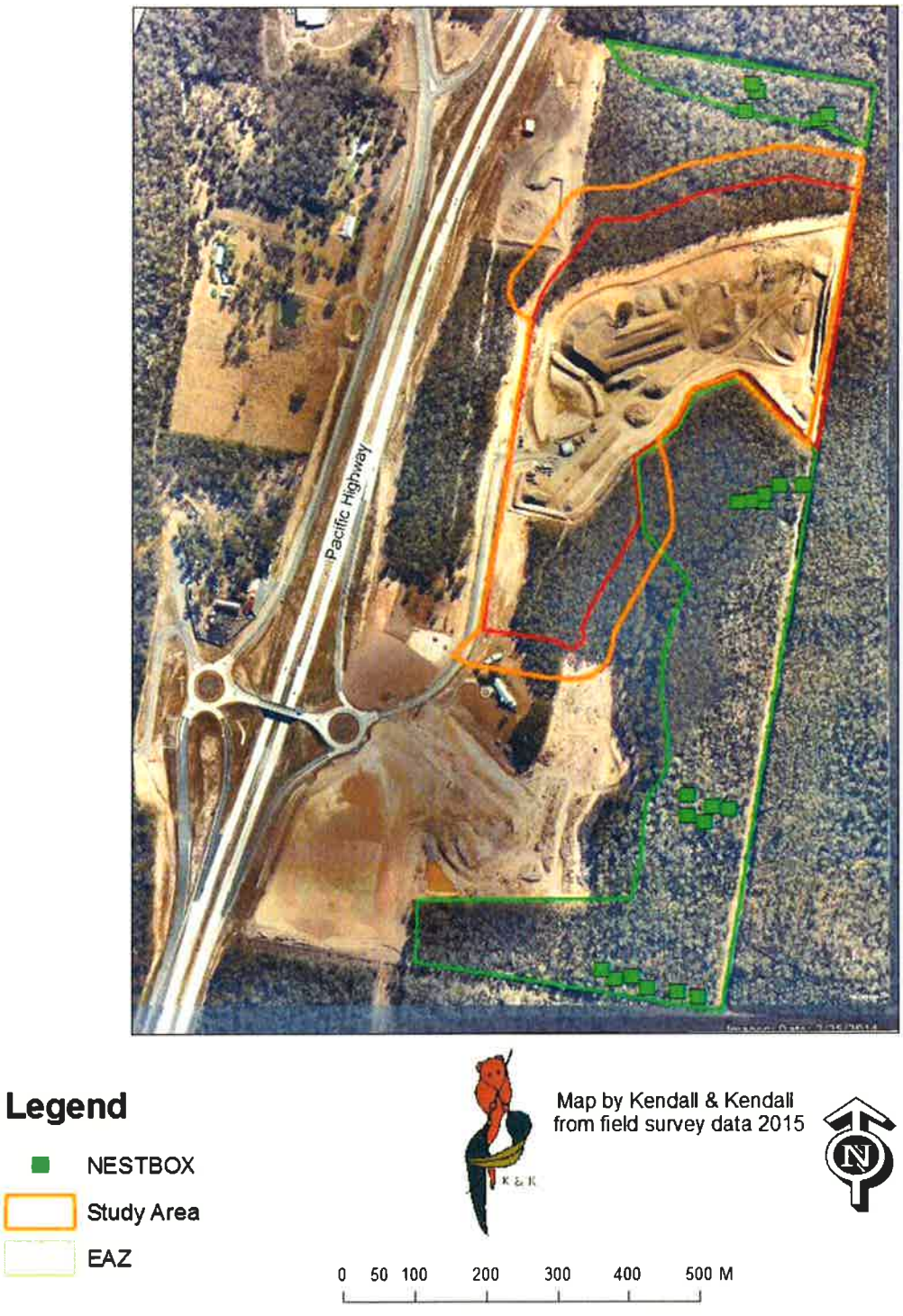


Figure 5 - Environmental zoned land and location of installed nesting boxes

4.3.2 Recovery Plans and the "Save Our Species" Program

Under amendments to the TSC Act 1995 it is no longer a statutory requirement that the OEH prepare recovery plans for threatened species.

To assist in the recovery of threatened species, OEH has adopted a conservation program called "Saving Our Species", which is designed to maximise the number of threatened species that can be secured in the wild in NSW for 100 years. Threatened species in NSW have been assigned to various management streams. The species assessed in this report fall into five management streams, being:

- Landscape;
- Site managed;
- Iconic;
- Partnership; and
- Data deficient species.

Landscape-managed species are those threatened species that are typically distributed widely across the landscape. Landscape-managed species can be best recovered through:

- Broad scale vegetation and habitat management programs, e.g. replanting or weeding;
- Land clearing controls;
- Water sharing plans for riparian and floodplain ecosystems and species that depend on them;
- Programs to manage coasts, estuaries and coastal wetlands; and
- The management of national parks and reserves.

Landscape-managed species known to occur within the study area or considered possible or likely to occur within the study area are the Square-tailed Kite, Barking Owl, Little Lorikeet, Swift Parrot, Powerful Owl, Masked Owl, Varied Sittella, Spotted-tailed Quoll, Brush-tailed Phascogale, Squirrel Glider, Eastern Pygmy-possum, Grey-headed Flying-fox, Yellow-bellied Sheathtail-bat, Eastern False Pipistrelle and Greater Broad-nosed Bat.

Site-managed species are those threatened species specific sites that have been identified in NSW for conservation management of the species. The study area is not identified as such a specific site for any threatened fauna species. Site-managed species known to occur within the study area or considered possible or likely to occur within the study area are the Glossy Black-cockatoo, Regent Honeyeater, Little Bentwing-bat, Eastern Bentwing-bat and Yellow-bellied Glider.

Partnership species - There are approximately 150 or 15 per cent of species in this management stream. These species:

- have less than 10% of their distribution in NSW
- are either common in other states or territories or programs for their management are coordinated by other jurisdictions.

The NSW Government will consider managing species that are nationally listed and have key populations in NSW in partnership with the leading jurisdiction. There is a probable Anabat recording identification of one partnership species attained during the 2007 field survey, this being the Hoary Wattled Bat.

Iconic species are important socially, culturally and economically, and the community expects them to be effectively managed and protected. The Koala, a species considered a possible occurrence within the study area is classified as an iconic species.

Data-deficient species are those species where is insufficient information available on these species to allocate them to another management stream. A species action statement has been prepared for each species, excluding those that are presumed extinct, that outlines:

- the research and survey actions for the Office of Environment and Heritage and partners such as universities and field naturalist groups; and
- key knowledge gaps that need to be filled.

One Data-deficient species, the Eastern Freetail-bat, is known to occur within the study area.

4.4 CRITICAL HABITAT

A search was conducted of the list of critical habitat register via the OEH threatened species website at

(http://www.nationalparks.nsw.gov.au/npws.nsf/Content/Critical+habitat+protection+by+doctype) which indicated the study area is not on the OEH TSC Act "Critical Habitat" register.

4.5 ASSESSMENT OF SIGNIFICANCE - TSC ACT - ASSESSMENT OF SIGNIFICANCE

The objective of s. 5A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), the *assessment of significance*, is to improve the standard of consideration afforded to threatened species, populations and ecological communities, and their habitats through the planning and assessment process, and to ensure that the consideration is transparent. The assessment of significance is known as the "7-part test".

Seven-part tests have been prepared for those species considered possible or likely to occur within the study area or have been recorded on the study area. The 7-part tests are attached as **Appendix 5**, species with similar habitat requirements or have similar animal behaviour are considered under one 7-part test.

4.6 EPBC ACT – MATTERS OF NATIONAL SIGNIFICANCE - THREATENED SPECIES, COMMUNITIES OR POPULATIONS

The Grey-headed Flying Fox was recorded flying over the study area during the 2015 field survey. This species is listed as vulnerable under the provisions of the EPBC Act. It is considered that the species would visit the site to forage on winter flowering trees belonging to Myrtaceae plant family. The study area is not a camp site for the Grey-headed Flying Fox, although a campsite occurs on the southern bank of the Macleay River in Kempsey approximately 5 km from the study area.

The Koala, listed as vulnerable under the provisions of the EPBC Act, is considered likely to occur within the study area, however the study area is not considered core Koala habitat due to a paucity of favoured Koala food tree species. The Koala is considered a likely occurrence as there are known Koala sub-populations occurring nearby and it is expected that from time to time that a Koala may venture into the study area.

The following species, listed under the provisions of the EPBC are considered possible to occur within the study area.

- Swift Parrot (*Lathamus discolor*).
- Regent Honeyeater (*Anthochaera phrygia*).
- Spotted-tailed Quoll (*Dasyurus maculatus*).

The Spotted-tailed Quoll is regarded as a possible occurrence within the study area as there are 5 wildlife atlas records within 5km of the study area, however four of these records have an accuracy code of 10km, and the other has an accuracy code of 100m but is over 20 years old.

The Swift Parrot and Regent Honeyeater are migratory species that range over a large area when they visit the NSW mid north coast, they may opportunistically visit the study area to forage on winter flowering trees belonging to Myrtaceae plant family.

Department of the Environment (1999) Matters of National Environmental Significance

Significant impact guidelines state:

> *An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:*
>
> *key source populations either for breeding or dispersal*
>
> *populations that are necessary for maintaining genetic diversity, and/or*
>
> *populations that are near the limit of the species range.*

The field surveys did not record any of the three above listed species within the study area and the study area does contain high number of wildlife atlas records. The study area does not contain important habitat attributes at a level sufficient to contribute significantly to a local population of the species. The study area is not identified in any recovery plan. As the study area does not contain a population that is a key source populations either for breeding or dispersal or is necessary for maintaining genetic diversity or is near the limit of the species range it is considered that the study area does contain or contribute to an important population of any of the above species.

In regard the above species loss of habitat within the study area will contribute to the process of potential "habitat loss" which contributes in a cumulative manner to a decrease in population size of fauna. Considering the size of the area of habitat to be removed compared to the area of potential habitat for the above species in the locality it is unlikely to cause a significant decrease in the size of a potential population.

(a) Does, will, or is the activity likely to lead to a long-term decrease in the size of a population/ *important population*?

For the reasons detailed above the activity is unlikely to lead to a long-term decrease in the size of a population/ *important population.*

(b) Does, will, or is the activity likely to reduce the area of occupancy of the species/*important population*?

For the reasons detailed above the activity is unlikely to reduce the area of occupancy of the species/*important population.*

(c) Does, will, or is the activity likely to fragment an existing population/*important population* into two or more populations?

For the reasons detailed above the activity is unlikely to fragment an existing population/*important population* into two or more populations.

(d) Does, will, or is the activity likely to adversely affect habitat critical to the survival of a species?

For the reasons detailed above the activity is unlikely to adversely affect habitat critical to the survival of a species.

(e) Does, will, or is the activity likely to disrupt the breeding cycle of a population/*important population*?

For the reasons detailed above the activity is unlikely to disrupt the breeding cycle of a population/*important population.*

(f) Does, will, or is the activity likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

For the reasons detailed above the activity is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

(g) Does, will, or is the activity likely to result in invasive species that are harmful to endangered/*vulnerable* species becoming established in the endangered/ *vulnerable* species' habitat?

For the reasons detailed above the activity is unlikely to result in invasive species that are harmful to endangered/*vulnerable* species becoming established in the endangered/ *vulnerable* species' habitat.

(h) Does, will, or is the activity likely to interfere with the recovery of the species?

For the reasons detailed above the activity is unlikely to interfere with the recovery of the species.

4.7 EPBC ACT: ADMINISTRATIVE GUIDELINES – MIGRATORY FAUNA

The search of the Department of the Environment's Protected Matters Search Tool (9 March 2015) (attached as **Appendix 2**) lists migratory terrestrial species of those listed the following species are considered possible to occur within the study area, namely:

- White-throated Needletail (*Hirundapus caudacutus*); and
- Rainbow Bee-eater (*Merops ornatus*).

The guidelines to the EPBC Act utilise the following tests to examine whether an action has, would have, or is likely to have a significant impact on a terrestrial migratory species listed (all of which are bird species) under the provisions of the EPBC Act 1999.

(a) Does, would, or is the activity likely to substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat of the migratory species?

No. The activity is not likely to substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat of the above migratory bird species or other migratory bird species as the area of habitat to be removed is minor compared to the area of habitat to be retained.

(b) Does, would, or is the activity likely to result in invasive species that is harmful to the migratory species becoming established in an area of important habitat of the migratory species?

No. The activity is not likely to result in invasive species that is harmful to the migratory species becoming established in an area of important habitat of the above migratory species.

(c) Does, would, or is the activity likely to seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the species?

No. The activity is not likely to seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the species of the above migratory species as the locality and surrounding habitat contains similar habitat to that within the study area.

4.8 SEPP 44 KOALA HABITAT ASSESSMENT

As stated in Section 3.5.4 a comprehensive Koala plan of management (KSCKPoM) has been prepared for the eastern section of the Kempsey LGA. As described in the KSCKPoM, the adoption of the plan replaces the requirement under SEPP 44 for proposed developments in Kempsey LGA to address Koala issues individually and sets out a framework for conserving Koalas in eastern portion of the Kempsey LGA.

The KSCKPoM maps the study area as "Secondary B Koala habitat" which is included in the "preferred Koala habitat (PKH)" identified in the KSCKPoM. The KSCKPoM requires that if it is proposed to remove PKH then the compensation measures described in Section 4.12 (**Appendix 6**) apply. However when the subject site and adjoining areas to the north and south were zoned for industrial use, an area of land indicated on **Figure 5** owned by the same landowner was zoned E2 "environmental conservation". The creation of the environmental zone was to provide compensatory habitat for clearing that was later approved as part of a development application to establish the industrial area and quarry.

5. RECOMMENDATIONS

5.1 CLEARING

It is recommended that:

- Habitat to be removed should be checked in the early morning by spotlight for the presence of Koalas prior to its removal, if a Koala is present the tree should not be removed until the Koala has vacated the tree.
- Clearing should be conducted in two stages firstly by clearing non-hollow-bearing trees and other vegetation, then waiting at least 24hrs before removing hollow-bearing trees so as to give the opportunity for hollow-dependent species to vacate the area after the initial disturbance.
- A licensed wildlife carer and/or ecologist should be on site during hollow-bearing tree removal to rescue any injured fauna found or capture and relocate non-injured fauna that are found in any felled trees to pre-determined habitat identified for fauna release. A local vet and wildlife carer should be contacted before clearing works start to ensure they are ready to provide appropriate care, if necessary.
- Removal of hollow-bearing trees should be conducted in a manner to cause minimal impact. Prior to removal the tree should be bumped at least three times to encourage fauna to leave tree if no fauna appear within 5 minutes then remove the tree.

6. CONCLUSION

It is concluded that application of the seven-part test and administrative guidelines indicate that the Proposal would not have a significant impact on threatened fauna species, populations or endangered communities, or their habitats, or critical habitat, and that a Species Impact Statement or referral to the Federal Environment Minister would not be required.

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Appendix 1 - Identification of Target Species

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Scientific name	Common name	Status	No. Wildlife atlas records within 5 km	Occurrence with sub-region	Habitat	Possibility of occurring within study area
Litoria brevipalmata	Green-thighed Frog	3	11	Known	Green-thighed Frogs occur in a range of habitats from rainforest and moist eucalypt forest to dry eucalypt forest and heath, typically in areas where surface water gathers after rain. Breeding occurs following heavy rainfall in late spring and summer, with frogs aggregating around grassy semi-permanent ponds and flood-prone grassy areas. The frogs are thought to forage in leaf-litter. study area does not contain preferred habitat.	Unlikely
Hoplocephalus bitorquatus	Pale-headed Snake	3	0	Predicted	The Pale-headed Snake is a highly cryptic species that can spend weeks at a time hidden in tree hollows. Found mainly in dry eucalypt forests and woodlands, cypress forest and occasionally in rainforest or moist eucalypt forest. In drier environments, it appears to favour habitats close to riparian areas. Shelters during the day between loose bark and tree-trunks, or in hollow trunks and limbs of dead trees. The main prey is tree frogs although lizards and small mammals are also taken.	Unlikely
Hieraaetus morphnoides	Little Eagle	3	0	Known	Occupies open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used.	Unlikely
Burhinus grallarius	Bush Stone-curlew	2	0	Known	Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates, such as frogs, lizards and snakes. Nest on the ground in a scrape or small bare patch.	Unlikely
Lophoictinia isura	Square-tailed Kite	3	6	Known	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. Is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage. Appears to occupy large hunting ranges of more than 100km^2.	Possible
Pandion cristatus	Eastern Osprey	3	0	Known	Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water.	Nil
Calyptorhynchus lathami	Glossy Black-Cockatoo	3	7	Known	Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of she-oak species, particularly Black She-oak (Allocasuarina littoralis), Forest She-oak (A. torulosa) or Drooping She-oak (A. verticillata) occur. In the Riverina area, inhabits open woodlands dominated by Belah (Casuarina cristata). Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites. One or two eggs are laid between March and August.	Likely

Scientific name	Common name	Status	No. Wildlife atlas records within 5 km	Occurrence with sub-region	Habitat	Possibility of occurring within study area
Glossopsitta pusilla	Little Lorikeet	3	8	Known	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophoras, Melaleucas and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity.	Possible
Lathamus discolor	Swift Parrot	2,4	0	Known	Migrates to the Australian south-east mainland between March and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum Corymbia maculata, Red Bloodwood C. gummifera, Mugga Ironbark E. sideroxylon, and White Box E. albens. Commonly used lerp infested trees include Grey Box E. microcarpa, Grey Box E. moluccana and Blackbutt E. pilularis. Return to some foraging sites on a cyclic basis depending on food availability.	Possible
Petroica phoenicea	Flame Robin	3	0	Predicted	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes.	Unlikely
Petroica boodang	Scarlet Robin	3	0	Known	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat.	Unlikely
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	3	0	Known	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	Unlikely
Chthonicola sagittata	Speckled Warbler	3	0	Predicted	The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area. The rounded, domed, roughly built nest of dry grass and strips of bark is located in a slight hollow in the ground or the base of a low dense plant, often among fallen branches and other litter. A side entrance allows the bird to walk directly inside. study area does not contain preferred habitat.	Unlikely

Scientific name	Common name	Status	No. Wildlife atlas records within 5 km	Occurrence with sub-region	Habitat	Possibility of occurring within study area
Ninox connivens	Barking Owl	3	0	Known	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. Is flexible in its habitat use and hunting can extend in to closed forest and more open areas.	Possible
Ninox strenua	Powerful Owl	3	5	Known	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation. The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. As most prey species require hollows and a shrub layer, these are important habitat components for the owl. Pairs of Powerful Owls will defend a large home range of 400-1450 ha. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old.	Possible
Tyto novaehollandiae	Masked Owl	3	2	Known	Pairs have a large home-range of 500 to 1000 ha. Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides.	Possible
Anthochaera phrygia	Regent Honeyeater	1,4	0	Known	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. The Regent Honeyeater is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes. When nectar is scarce lerp and honeydew comprise a large proportion of the diet. Insects make up about 15% of the total diet and are important components of the diet of nestlings. A shrubby understorey is an important source of insects and nesting material. There are three known key breeding areas, two of them in NSW - Capertee Valley and Bundarra-Barraba regions.	Possible
Daphoenositta chrysoptera	Varied Sittella	3	7	Known	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.	Known

Scientific name	Common name	Status	No. Wildlife atlas records within 5 km	Occurrence with sub-region	Habitat	Possibility of occurring within study area
Dasyurus maculatus	Spotted-tailed Quoll	3	5	Known	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites. Mostly nocturnal, although will hunt during the day; spends most of the time on the ground, although also an excellent climber and may raid possum and glider dens and prey on roosting birds. Use "latrine sites" often on flat rocks. Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits and insects; also eats carrion and takes domestic fowl. Females occupy home ranges up to about 750 ha and males up to 3500 ha; usually traverse their ranges along densely vegetated creeklines.	Possible
Phascogale tapoatafa	Brush-tailed Phascogale	3	6	Known	Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest.	Possible
Planigale maculata	Common Planigale	3	0	Predicted	Common Planigales inhabit rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas where there is surface cover, and usually close to water.	Unlikely
Phascolarctos cinereus	Koala	3	72	Known	Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.	Possible
Petaurus norfolcensis	Squirrel Glider	3	4	Known	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Live in family groups of a single adult male one or more adult females and offspring. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.	Possible

Scientific name	Common name	Status	No. Wildlife atlas records within 5 km	Occurrence with sub-region	Habitat	Possibility of occurring within study area
Petaurus australis	Yellow-bellied Glider	3	1	Known	Den, often in family groups, in hollows of large trees. Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Feed primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Extract sap by incising (or biting into) the trunks and branches of favoured food trees, often leaving a distinctive "V"-shaped scar. Live in small family groups of two - six individuals and are nocturnal. Very mobile and occupy large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources.	Unlikely
Cercartetus nanus	Eastern Pygmy-possum	3	0	Predicted	Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes, soft fruits are eaten when flowers are unavailable. Also feeds on insects throughout the year. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum (Pseudocheirus peregrinus) dreys or thickets of vegetation, (eg. grass-tree skirts); nest-building appears to be restricted to breeding females; tree hollows are favoured but spherical nests have been found under the bark of eucalypts and in shredded bark in tree forks.	Unlikely
Aepyprymnus rufescens	Rufous Bettong	3	0	Predicted	Rufous Bettongs inhabit a variety of forests from tall, moist eucalypt forest to open woodland, with a tussock grass understorey. A dense cover of tall native grasses is the preferred shelter. They sleep during the day in cone-shaped nests constructed of grass in a shallow depression at the base of a tussock or fallen log. At night they feed on grasses, herbs, seeds, flowers, roots, tubers, fungi and occasionally insects.	Nil

Scientific name	Common name	Status	No. Wildlife atlas records within 5 km	Occurrence with sub-region	Habitat	Possibility of occurring within study area
Pteropus poliocephalus	Grey-headed Flying-fox	3	27	Known	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Individual camps may have tens of thousands of animals and are used for mating, birth and the rearing of young. Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines. Also forage in cultivated gardens and fruit crops and can inflict severe crop damage.	Known
Mormopterus norfolkensis	Eastern Freetail-bat	3	5	Known	Occur in dry sclerophyll forest and woodland east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures.	Known
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	3	0	Predicted	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	Possible
Kerivoula papuensis	Golden-tipped Bat	3	1	Known	Found in rainforest and adjacent sclerophyll forest. Roost in abandoned hanging Yellow-throated Scrubwren and Brown Gerygone nests located in rainforest gullies on small first- and second-order streams.	Unlikely
Falsistrellus tasmaniensis	Eastern False Pipistrelle	3	0	Predicted	Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy.	Unlikely
Miniopterus australis	Little Bentwing-bat	3	21	Known	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.	Known

Scientific name	Common name	Status	No. Wildlife atlas records within 5 km	Occurrence with sub-region	Habitat	Possibility of occurring within study area
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	3	7	Known	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of maternity caves. Cold caves are used for hibernation in southern Australia. Breeding or roosting colonies can number from 100 to 150,000 individuals. Hunt in forested areas, catching moths and other flying insects above the tree tops.	Known
Myotis macropus	Southern Myotis	3	3	Predicted	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	Unlikely
Scoteanax rueppellii	Greater Broad-nosed Bat	3	1	Known	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.	Possible
Chalinolobus nigrogriseus	Hoary Wattled Bat	3	0	*	In NSW the Hoary Wattled Bat occurs in dry open eucalypt forests, favouring forests dominated by Spotted Gum, boxes and ironbarks, and heathy coastal forests where Red Bloodwood and Scribbly Gum are common. Because it flies fast below the canopy level, forests with naturally sparse understorey layers may provide the best habitat. Roosts in hollows and rock crevices. Will occupy urban areas with suitable habitat.	Probable
Pseudomys gracilicaudatus	Eastern Chestnut Mouse	3	0	Predicted	In NSW the Eastern Chestnut Mouse is mostly found, in low numbers, in heathland and is most common in dense, wet heath and swamps. In the tropics it is more an animal of grassy woodlands.	Nil

* = The Hoary Wattled Bat is not predicted to occur within the Macleay Hastings subregion, however a "probable" Anabat identification of the species was attained during the 2007 field survey Status

1 = Critically Endangered (TSC Act), 2 = Endangered (TSC Act), 3 = Vulnerable (TSC Act), 4 = Endangered (EPBC Act)

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Appendix 2 - EPBC Act Protected Matters Search

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Australian Government
Department of the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 09/03/15 15:34:01

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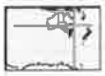
Coordinates
Buffer: 5.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	43
Listed Migratory Species:	33

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate.

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	4
Commonwealth Heritage Places:	1
Listed Marine Species:	34
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	2
State and Territory Reserves:	3
Regional Forest Agreements:	1
Invasive Species:	36
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat likely to occur within area
Diomedea epomophora epomophora Southern Royal Albatross [25996]	Vulnerable	Species or species habitat likely to occur within area
Diomedea epomophora sanfordi Northern Royal Albatross [82331]	Endangered	Species or species habitat likely to occur within area
Diomedea exulans antipodensis Antipodean Albatross [82269]	Vulnerable	Species or species habitat likely to occur within area
Diomedea exulans exulans Tristan Albatross [82337]	Endangered	Species or species habitat may occur within area
Diomedea exulans gibsoni Gibson's Albatross [82271]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta salvini Salvin's Albatross [82343]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris impavida Campbell Albatross [82449]	Vulnerable	Species or species habitat may occur within area
Fish		
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat known to occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus		
Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat likely to occur within area
Pseudomys novaehollandiae		
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
Allocasuarina defungens		
Dwarf Heath Casuarina [21924]	Endangered	Species or species habitat may occur within area
Arthraxon hispidus		
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana		
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Cynanchum elegans		
White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
Euphrasia arguta		
[4325]	Critically Endangered	Species or species habitat may occur within area
Parsonsia dorrigoensis		
Milky Silkpod [64684]	Endangered	Species or species habitat likely to occur within area
Phaius australis		
Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Streblus pendulinus		
Siah's Backbone, Sia's Backbone, Isaac Wood [21618]	Endangered	Species or species habitat likely to occur within area
Thesium australe		
Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Species or species habitat may occur within area
Natator depressus		
Flatback Turtle [59257]	Vulnerable	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat may occur within area

Extra Information

Places on the RNE

[Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Historic		
Kempsey Courthouse	NSW	Registered
Kempsey Post Office	NSW	Registered

State and Territory Reserves

[Resource Information]

Name	State
Kumbatine	NSW
LNE Special Management Zone No1	NSW
Maria	NSW

Regional Forest Agreements

[Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
North East NSW RFA	New South Wales

Invasive Species

[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine,		Species or species

Coordinates

-31.1 152.8333

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

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-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Geoscience Australia
-CSIRO
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

Appendix 3 - List of Fauna Species recorded during the 2007 Field Survey

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Class Name	Family Name	Common Name	Scientific Name
Reptilia	Varanidae	Lace Monitor	*Varanus varius*
Reptilia	Scincidae	Grass Skink	*Lampropholis delicata*
Aves	Accipitridae	Brown Goshawk	*Accipiter fasciatus*
Aves	Turnicidae	Painted Button-quail	Turnix varia
Aves	Charadriidae	Masked Lapwing	*Vanellus miles*
Aves	Columbidae	Bar-shouldered Dove	*Geopelia humeralis*
Aves	Columbidae	Peaceful Dove	*Geopelia striata*
Aves	Columbidae	Crested Pigeon	*Geophaps lophotes*
Aves	Cacatuidae	Yellow-tailed Black Cockatoo	*Calyptorhynchus unereus*
Aves	Psittacidae	Rainbow Lorikeet	*Trichoglossus naematodus*
Aves	Cuculidae	Brush Cuckoo	*Cacomantis variolosus*
Aves	Cuculidae	Shining Bronze-Cuckoo	*Chrysococcyx lucidus*
Aves	Cuculidae	Fan-tailed Cuckoo	*Cuculus flabelliformis*
Aves	Podargidae	Tawny Frogmouth	*Podargus strigoides*
Aves	Caprimulgidae	White-throated Nightjar	*Eurostopodus mystiralis*
Aves	Aegothelidae	Australian Owlet-nightjar	*Aegotheles cristatus*
Aves	Halcyonidae	Laughing Kookaburra	*Dacelo novaeguineae*
Aves	Halcyonidae	Sacred Kingfisher	*Todiramphus sanctus*
Aves	Climacteridae	White-throated Treecreeper	*Climacteris leucophaea*
Aves	Maluridae	Superb Fairy-wren	*Malurus cyaneus*
Aves	Maluridae	Variegated Fairy-wren	*Malurus lamberti*
Aves	Pardalotidae	Spotted Pardalote	*Pardalotus punctatus*
Aves	Acanthizidae	Striated Thornbill	*Acanthiza lineata*
Aves	Acanthizidae	Brown Thornbill	*Acanthiza pusilla*
Aves	Acanthizidae	White-throated Gerygone	*Gerygone olivacea*
Aves	Acanthizidae	White-browed Scrubwren	*Sericornis frontalis*
Aves	Meliphagidae	Eastern Spinebill	*Acanthorhynchus tenuirostris*
Aves	Meliphagidae	Yellow-faced Honeyeater	*Lichenostomus chrysops*
Aves	Meliphagidae	Scarlet Honeyeater	*Myzomela sanguinolenta*
Aves	Meliphagidae	Noisy Friarbird	*Philemon corniculatus*
Aves	Petroicidae	Eastern Yellow Robin	*Eopsaltria australis*
Aves	Petroicidae	Jacky Winter	*Microeca fascinans*
Aves	Eupetidae	Eastern Whipbird	*Psophodes olivaceus*
Aves	Neosittidae	Varied Sittella	*Daphoenositta chrysoptera*
Aves	Pachycephalidae	Grey Shrike-thrush	*Colluricincla harmonica*
Aves	Pachycephalidae	Golden Whistler	*Pachycephala pectoralis*
Aves	Pachycephalidae	Rufous Whistler	*Pachycephala rufiventris*
Aves	Dicruridae	Leaden Flycatcher	*Myiagra rubecula*
Aves	Dicruridae	Grey Fantail	*Rhipidura fuliginosa*
Aves	Dicruridae	Willie Wagtail	*Rhipidura leucophrys*
Aves	Campephagidae	Black-faced Cuckoo-shrike	*Coracina novaehollandiae*
Aves	Campephagidae	White-bellied Cuckoo-shrike	*Coracina papuensis*
Aves	Campephagidae	Cicardabird	*Coracina tenuirostris*
Aves	Oriolidae	Olive-backed Oriole	*Oriolus sagittatus*
Aves	Artamidae	Pied Butcherbird	*Cracticus mentalis*

Class Name	Family Name	Common Name	Scientific Name
Aves	Artamidae	Grey Butcherbird	*Cracticus torquatus*
Aves	Artamidae	Australian Magpie	*Gymnorhina tibicen*
Aves	Artamidae	Pied Currawong	*Strepera graculina*
Aves	Corvidae	Torresian Crow	*Corvus orru*
Aves	Estrildidae	Red-browed Finch	*Neochmia temporalis*
Aves	Dicaeidae	Mistletoebird	*Dicaeum hirundinaceum*
Aves	Hirundinidae	Welcome Swallow	Hirundo neoxena
Mammalia	Tachyglossidae	Short-beaked Echidna	*Tachyglossus aculeatus*
Mammalia	Dasyuridae	Brown Antechinus	*Antechinus stuartii*
Mammalia	Phalangeridae	Common Brushtail Possum	*Trichosurus vulpecula*
Mammalia	Macropodidae	Eastern Grey Kangaroo	*Macropus giganteus*
Mammalia	Macropodidae	Red-necked Wallaby	*Macropus rufogriseus*
Mammalia	Macropodidae	Swamp Wallaby	*Wallabia bicolor*
Mammalia	Muridae	Bush Rat	*Rattus fuscipes*
Mammalia	Canidae	Fox	*Vulpes vulpes*
Mammalia	Rhinolophidae	Eastern Horseshoe-bat (Probable)	Rhinolophus megaphyllus
Mammalia	Molossidae	East Coast Freetail-bat (Confident)	Mormopterus norfolkensis
Mammalia	Molossidae	Eastern Freetail-bat (Confident)	Mormopterus sp. 2
Mammalia	Vespertilionidae	Gould's Wattled Bat (Confident)	Chalinolobus gouldii
Mammalia	Vespertilionidae	Hoary Wattled Bat (Probable)	Chalinolobus nigrogriseus
Mammalia	Vespertilionidae	Little Bentwing-bat (Confident)	Miniopterus australis
Mammalia	Vespertilionidae	Eastern Bentwing-bat (Confident)	Miniopterus schreibersii oceanensis
Mammalia	Vespertilionidae	Eastern Broad-nosed Bat (Probable)	Scotorepens orion
Mammalia	Vespertilionidae	Coastal Broad-nosed Bat (Probable)	Scotorepens sp.
Mammalia	Vespertilionidae	Eastern Forest Bat (Confident)	Vespadelus pumilus
Mammalia	Vespertilionidae	Little Forest Bat (Confident)	Vespadelus vulturnus
Mammalia	Muridae	House Mouse	Mus musculus
Mammalia	Leporidae	Brown Hare	Lepus capensis
Mammalia	Leporidae	Rabbit	Oryctolagus cuniculus

Appendix 4 - TSC Act – Key Threatening Processes

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Aggressive exclusion of birds by noisy miners (*Manorina melanocephala*)

Alteration of habitat following subsidence due to longwall mining

Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands

Anthropogenic climate change

Bushrock removal

Clearing of native vegetation

Competition and grazing by the feral European rabbit (*Oryctolagus cuniculus*)

Competition and habitat degradation by feral goats (*Capra hircus*)

Competition from feral honey bees (*Apis mellifera*)

Death or injury to marine species following capture in shark control programs on ocean beaches

Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments

Forest Eucalypt dieback associated with over-abundant psyllids and bell miners

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition

Herbivory and environmental degradation caused by feral deer

Importation of red imported fire ants (*Solenopsis invicta*)

Infection by psittacine circoviral (beak and feather) disease affecting endangered psittacine species and populations

Infection of frogs by amphibian chytrid causing the disease chytridiomycosis

Infection of native plants by *Phytophthora cinnamomi*

Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae

Introduction of the large earth bumblebee (*Bombus terrestris*)

Invasion and establishment of exotic vines and scramblers

Invasion and establishment of Scotch broom (*Cytisus scoparius*)

Invasion and establishment of the cane toad (*Bufo marinus*)

Invasion of native plant communities by African Olive *Olea europaea* L. subsp. *cuspidata*

Invasion, establishment and spread of *Lantana camara*

Invasion of native plant communities by *Chrysanthemoides monilifera* (bitou bush and boneseed)

Invasion of native plant communities by exotic perennial grasses

Invasion of the yellow crazy ant (*Anoplolepis gracilipes* (Fr. Smith)) into NSW

Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants

Loss of hollow-bearing trees

Loss or degradation (or both) of sites used for hill-topping by butterflies

Predation and hybridisation of feral dogs (*Canis lupus familiaris*)

Predation by the European red fox (*Vulpes vulpes*)

Predation by the feral cat (*Felis catus*)

Predation by *Gambusia holbrooki* Girard, 1859 (plague minnow or mosquito fish)

Predation by the ship rat (*Rattus rattus*) on Lord Howe Island

Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)
Removal of dead wood and dead trees

Appendix 5 - Seven Part Tests

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Glossy Black-cockatoo (*Calyptorhynchus lathami*)

The Glossy Black-cockatoo is listed as vulnerable on Schedule 2 of the TSC Act.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

The Glossy Black-cockatoo is considered as possible to occur within the study area as the study area Black Oak (*Allocasuarina littoralis*) a specific food tree species of the species. It is considered tree hollows present on the subject site are not suitable as nesting sites for the Glossy Black-cockatoo.

The Glossy Black-cockatoo was not recorded on the study area during the field surveys.

There are 7 records of the Glossy Black-cockatoo occurring within 5km of the study area, on the OEH Wildlife Atlas (29/01/2015).

The following habitat description was attained from the OEH threatened species website individual species profile for the Glossy Black-cockatoo:

- Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of she-oak species, particularly Black She-oak (Allocasuarina littoralis), Forest She-oak (A. torulosa) or Drooping She-oak (A. verticillata) occur. Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites. One or two eggs are laid between March and August.

The study area is considered to contain foraging habitat but not breeding habitat for the Glossy Black-cockatoo.

The OEH threatened species website individual species profile for the Glossy Black-cockatoo identifies a number of threats to this species, two of which are relevant to this project being:

- Reduction of suitable habitat through clearing for development; and
- Decline in extent and productivity of sheoak foraging habitat due to feral herbivores.

The approximate area of habitat that would be affected by the proposal is 4.5 ha.

It is considered the removal of the relatively small area of foraging habitat by the proposal is unlikely to have an adverse effect on the life cycle of the Glossy Black-cockatoo to the extent that they would be likely to be placed at risk of local extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Endangered populations as listed on Part 2 of Schedule 1 of the TSC Act do not occur in the study area or locality.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

Maps indicating the extent of habitat are no longer readily available. However, as an indication of the extent, a previous assessment of this area by Elks (2007) found that there was approximately 6400ha of vegetation mapped as the class 'Hunter-Macleay Dry Sclerophyll Forest' in the locality (within 5km) of the study area, and at least 35,000ha within the region (http://maps.environment.nsw.gov.au/stateveg/, accessed 2007). The 4.5ha of habitat to be removed constitutes about 0.07% of that habitat locally, and about 0.01% of that habitat in the region. (Idyll Spaces 2015)

Habitat present on the subject site has been disturbed by frequent fire, grazing and clearing. (Idyll Spaces 2015)

The small area and location within the landscape are such that an area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Proposal. As a species capable of flight the proposal will not further fragment or isolate Glossy Black Cockatoo habitat.

The proposal will remove some potential foraging resource for the Glossy Black-cockatoo however its removal is not considered important for the long term survival of the species within the locality of the study area.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

Critical habitat as listed in the Register of Critical Habitat kept by the Director General of OEH does not occur in the study area.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan has been prepared for the Glossy Black-cockatoo.

The Glossy Black-cockatoo is recognised as a site-managed species in the OEH Save our Species Program, the study area is not identified management site within the program.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

As an area of native vegetation will be removed by the proposal it will contribute to the key threatening process of clearing of native vegetation however this contribution is considered small compared to the area of similar habitat that occurs in the locality.

Square-tailed Kite (*Lophoictinia isura*)

The Square-tailed Kite is listed as vulnerable on Schedule 2 of the TSC Act.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

The Square-tailed Kite was not recorded on the study area during the field surveys, there are six OEH wildlife atlas records within 5 km of the study area.

The Square-tailed Kite is found in a variety of timbered habitats including dry woodlands and open forests. It shows a particular preference for timbered watercourses. The species is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage. Appears to occupy large hunting ranges of more than 100km^2 (OEH 2015).

The approximate area of habitat that would be affected by the proposal is 4.5 ha.

As better quality habitat more expansive potential habitat for the Square-tailed Kite (which has a home range far greater in size than that of the study area) occurs within the locality, much of which is within conservation zones, it is unlikely that the lifecycle of the local Square-tailed Kite population would be disrupted by direct impacts of the proposal to the extent that it would be placed at risk of extinction.

(b) **in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.**

Endangered populations as listed on Part 2 of Schedule 1 of the TSC Act do not occur in the study area or locality.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

Maps indicating the extent of habitat are no longer readily available. However, as an indication of the extent, a previous assessment of this area by Elks (2007) found that there was approximately 6400ha of vegetation mapped as the class 'Hunter-Macleay Dry Sclerophyll Forest' in the locality (within 5km) of the study area, and at least 35,000ha within the region (http://maps.environment.nsw.gov.au/stateveg/, accessed 2007). The 4.5ha of habitat to be removed constitutes about 0.07% of that habitat locally, and about 0.01% of that habitat in the region (Idyll Spaces 2015).

Habitat present on the subject site has been disturbed by frequent fire, grazing and clearing. (Idyll Spaces 2015)

The small area and location within the landscape are such that an area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Proposal. As a species capable of flight the proposal will not further fragment or isolate Square-tailed Kite habitat.

The proposal will remove some potential foraging resource for the Square-tailed Kite however its removal is not considered important for the long term survival of the species within the locality of the study area.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

Critical habitat as listed in the Register of Critical Habitat kept by the Director General of OEH does not occur in the study area.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan has been prepared for the Square-tailed Kite.

The Square-tailed Kite is recognised as a landscape-managed species in the OEH Save our Species Program.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

As an area of native vegetation will be removed by the proposal it will contribute to the key threatening process of clearing of native vegetation however this contribution is considered small compared to the area of similar habitat that occurs in the locality.

Large Forest Owls - Seven-Part Test

Powerful Owl (*Ninox strenua*)

Masked Owl (*Tyto novaehollandiae*)

Barking Owl (*Ninox connivens*)

The above listed owl species are listed as vulnerable on Schedule 2 of the TSC Act.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

The Barking Owl inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. Is flexible in its habitat use and hunting can extend in to closed forest and more open areas. (OEH 2015).

The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation. The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. As most prey species require hollows and a shrub layer, these are important habitat components for the owl. Pairs of Powerful Owls will defend a large home range of 400-1450 ha. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. (OEH 2015).

Pairs of Masked Owls have a large home-range of 500 to 1000 ha. They live in dry eucalypt forests and woodlands from sea level to 1100 m. They are a forest owl, but often hunts along the edges of forests, including roadsides. (OEH 2015).

The above listed owl species were not recorded on the study area during the field surveys. Within 5 km of the study area there are:

- 5 OEH wildlife atlas records of the Powerful Owl;
- 2 OEH wildlife atlas records of the Masked Owl; and
- No OEH wildlife atlas records of the Barking Owl.

The study area is considered suitable potential foraging habitat for the above listed owl species, however tree hollows present within the subject site are not considered suitable as nesting sites for the above listed owl species.

The approximate area of habitat that would be affected by the proposal is 4.5 ha.

As the better quality habitat more expansive potential habitat for the above listed owl species (which have home ranges far greater in size than that of the study area) occurs within the locality, much of which is within conservation zones, it is unlikely that the lifecycle of the local above listed owl species population would be disrupted by direct impacts of the proposal to the extent that it would be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Endangered populations as listed on Part 2 of Schedule 1 of the TSC Act do not occur in the study area or locality.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

Maps indicating the extent of habitat are no longer readily available. However, as an indication of the extent, a previous assessment of this area by Elks (2007) found that there was approximately 6400ha of vegetation mapped as the class 'Hunter-Macleay Dry Sclerophyll Forest' in the locality (within 5km) of the study area, and at least 35,000ha within the region (http://maps.environment.nsw.gov.au/stateveg/, accessed 2007). The 4.5ha of habitat to be removed constitutes about 0.07% of that habitat locally, and about 0.01% of that habitat in the region (Idyll Spaces 2015).

Habitat present on the subject site has been disturbed by frequent fire, grazing and clearing (Idyll Spaces 2015).

The small area and location within the landscape are such that an area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Proposal. As species capable of flight the proposal will not further fragment or isolate owl habitat.

The proposal will remove some potential foraging resource for the above listed owl species however its removal is not considered important for the long term survival of the species within the locality of the study area.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

Critical habitat as listed in the Register of Critical Habitat kept by the Director-General of OEH does not occur in the study area.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

A draft recovery plan exists for the large forest owls; the plan does not provide specific objectives or recovery actions in relation to proposals such as quarries, however they both provide examples of conservation protocols have been applied on various projects, which include:

- protection of large hollow trees;
- pre-clearing surveys; and
- erection of artificial hollows in adjoining forest.

No relevant threat abatement plan has been prepared for recognised threats to the Masked Owl. In regard to the Powerful Owl predation by foxes on fledglings is recognised as a threatening process and a threat abatement plan has been prepared for control of foxes. The threat abatement plan primarily prescribes control measures; the plan does not contain relevant information in relation to the Proposal. Furthermore it is considered that the proposal will not further increase the potential impact of predation by the fox on native species.

The above listed owl species are recognised as a landscape-managed species in the OEH Save our Species Program.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

As an area of native vegetation will be removed by the proposal it will contribute to the key threatening process of clearing of native vegetation however this contribution is considered small compared to the area of similar habitat that occurs in the locality.

Little Lorikeet (*Glossopsitta pusilla*), Swift Parrot (*Lathamus discolor*) and Regent Honeyeater (*Anthochaera phrygia*)

The Little Lorikeet is listed as vulnerable on Schedule 2 of the TSC Act.

The Swift Parrot and Regent Honeyeater are listed as endangered on Schedule 1 of the TSC Act.

(a) **in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.**

The above listed bird species were not recorded on the study area during the field surveys. Within 5 km of the study area there are eight OEH wildlife atlas records of the Little Lorikeet and no records of either the Swift Parrot or Regent Honeyeater.

The Little Lorikeet forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophoras, Melaleucas and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. (OEH 2015).

The Swift Parrot migrates to the Australian south-east mainland between March and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum Corymbia maculata, Red Bloodwood C. gummifera, Mugga Ironbark E. sideroxylon, and White Box E. albens. Commonly used lerp infested trees include Grey Box E. microcarpa, Grey Box E. moluccana and Blackbutt E. pilularis. Return to some foraging sites on a cyclic basis depending on food availability. (OEH 2015).

The Regent Honeyeater inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. The Regent Honeyeater is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes. When nectar is scarce lerp and honeydew comprise a large proportion of the diet. Insects make up about 15% of the total diet and are important components of the diet of nestlings. A shrubby understorey is an important source of insects and nesting material. There are three known key breeding areas, two of them in NSW - Capertee Valley and Bundarra-Barraba regions. (OEH 2015).

The study area is considered suitable potential foraging habitat for the above listed bird species, however tree hollows present within the subject site are not considered suitable as nesting sites for the Little Lorikeet as they do not occur within preferred breeding habitat. The Swift Parrot breeds only in Tasmania and the study area is not within the well recorded known breeding sites for the Regent Honeyeater.

The approximate area of habitat that would be affected by the proposal is 4.5 ha.

As the better quality habitat more expansive potential foraging habitat for the above listed bird species (which have home ranges far greater in size than that of the study area) occurs within the locality, much of which is within conservation zones, it is unlikely that the lifecycle of the local above listed bird species population would be disrupted by direct impacts of the proposal to the extent that it would be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Endangered populations as listed on Part 2 of Schedule 1 of the TSC Act do not occur in the study area or locality.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

Maps indicating the extent of habitat are no longer readily available. However, as an indication of the extent, a previous assessment of this area by Elks (2007) found that there was approximately 6400ha of vegetation mapped as the class 'Hunter-Macleay Dry Sclerophyll Forest' in the locality (within 5km) of the study area, and at least 35,000ha within the region (http://maps.environment.nsw.gov.au/stateveg/, accessed 2007). The 4.5ha of habitat to be removed constitutes about 0.07% of that habitat locally, and about 0.01% of that habitat in the region. (Idyll Spaces 2015)

Habitat present on the subject site has been disturbed by frequent fire, grazing and clearing. (Idyll Spaces 2015)

The small area and location within the landscape are such that an area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Proposal. As species capable of flight the proposal will not further fragment or isolate bird habitat.

The proposal will remove some potential foraging resource for the above listed bird species however its removal is not considered important for the long term survival of the species within the locality of the study area.

(e) **whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),**

Critical habitat as listed in the Register of Critical Habitat does not occur in the study area.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

Recovery plans have not been prepared for the above listed bird species.

The Little Lorikeet and Swift Parrot have been assigned to the "Landscape-managed Species" stream within the OEH "Save our Species" program.

The Regent Honeyeater has been assigned to the "Site-managed Species" stream within the OEH "Save our Species" program. The study area is not a designated site for the conservation management of the Regent Honeyeater.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

As an area of native vegetation will be removed by the proposal it will contribute to the key threatening process of clearing of native vegetation however this contribution is considered small compared to the area of similar habitat that occurs in the locality.

Varied Sittella (*Daphoenositta chrysoptera*)

The Varied Sittella is listed as vulnerable on Schedule 2 of the TSC Act.

(a) **in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.**

The Varied Sittella was recorded within the study area during the 2007 field survey.

The Varied Sittella inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. It feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. (OEH 2015).

The approximate area of habitat that would be affected by the proposal is 4.5 ha.

As suitable more expansive potential habitat for the Varied Sittella (which has a home range far greater in size than that of the study area) occurs within the locality (much of which is national park estate) it is unlikely that the lifecycle of the Varied Sittella local population would be disrupted by impacts of the proposal to the extent that it would be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Endangered populations as listed on Part 2 of Schedule 1 of the TSC Act do not occur in the study area or locality.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action,

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

Maps indicating the extent of habitat are no longer readily available. However, as an indication of the extent, a previous assessment of this area by Elks (2007) found that there was

approximately 6400ha of vegetation mapped as the class 'Hunter-Macleay Dry Sclerophyll Forest' in the locality (within 5km) of the study area, and at least 35,000ha within the region (http://maps.environment.nsw.gov.au/stateveg/, accessed 2007). The 4.5ha of habitat to be removed constitutes about 0.07% of that habitat locally, and about 0.01% of that habitat in the region. (Idyll Spaces 2015)

Habitat present on the subject site has been disturbed by frequent fire, grazing and clearing. (Idyll Spaces 2015)

The small area and location within the landscape are such that an area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Proposal. As species capable of flight the proposal will not further fragment or isolate bird habitat.

The proposal will remove some potential foraging resource for the Varied Sittella however its removal is not considered important for the long term survival of the species within the locality of the study area. The area of habitat to be removed does not contain sufficient habitat to be considered important for the long-term survival of the species in the locality.

(e) **whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),**

Critical habitat as listed in the Register of Critical Habitat does not occur in the study area.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

A recovery plan has not been prepared for the Varied Sittella. No relevant threat abatement plan exists for the key threatening process that may affect the Square-tailed Kite. Under amendments to the TSC Act (1995) it is no longer a statutory requirement that the OEH prepare recovery plans for threatened species.

The Varied Sittella has been assigned to the "Landscape Species" stream within the OEH "Save our Species" program.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

As an area of native vegetation will be removed by the proposal it will contribute to the key threatening process of clearing of native vegetation however this contribution is considered small compared to the area of similar habitat that occurs in the locality.

Spotted-tailed Quoll (*Dasyurus maculatus*)

The Spotted-tailed Quoll is listed as vulnerable on Schedule 2 of the TSC Act.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

The Spotted-tailed Quoll was not recorded during the field surveys. There are five OEH wildlife atlas (29/01/2015) records of the species within 5 km of the study area.

The Spotted-tailed Quoll has been recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites. Mostly nocturnal, although will hunt during the day; spends most of the time on the ground, although also an excellent climber and may raid possum and glider dens and prey on roosting birds. Use "latrine sites" often on flat rocks. Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits and insects; also eats carrion and takes domestic fowl. Females occupy home ranges up to about 750 ha and males up to 3500 ha; usually traverse their ranges along densely vegetated creeklines.

The Spotted-tailed Quoll is regarded as a possible occurrence within the study area as there are 5 wildlife atlas records within 5km of the study area, however four of these records have an accuracy code of 10 km, and the other has an accuracy code of 100m but is over 20 years old.

The approximate area of habitat that would be affected by the proposal is 4.5 ha.

It is not considered that the tree hollows present within the subject site are suitable sheltering or nesting sites for the Spotted-tailed Quoll and there is a paucity of logs within the study area.

- Considering:
- The age and accuracy of the OEH records;
- Lack of suitable sheltering and breeding sites; and
- the relatively large home range of the species compared to the size of the area of habitat to be removed

it is considered unlikely that the proposal would have an adverse effect on the life cycle of the Spotted-tailed Quoll to the extent that a viable local potential population of the species would be likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Endangered populations as listed on Part 2 of Schedule 1 of the TSC Act do not occur in the study area or locality.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

Maps indicating the extent of habitat are no longer readily available. However, as an indication of the extent, a previous assessment of this area by Elks (2007) found that there was approximately 6400ha of vegetation mapped as the class 'Hunter-Macleay Dry Sclerophyll Forest' in the locality (within 5km) of the study area, and at least 35,000ha within the region (http://maps.environment.nsw.gov.au/stateveg/, accessed 2007). The 4.5ha of habitat to be removed constitutes about 0.07% of that habitat locally, and about 0.01% of that habitat in the region. (Idyll Spaces 2015)

Habitat present on the subject site has been disturbed by frequent fire, grazing and clearing. (Idyll Spaces 2015)

The small area and location within the landscape are such that an area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Proposal.

The proposal will remove some potential foraging resource for the Spotted-tailed Quoll however its removal is not considered important for the long term survival of the species within the locality of the study area.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

Critical habitat as listed in the Register of Critical Habitat kept by the Director General of OEH does not occur in the study area.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan or relevant threat abatement plan exists for the Spotted-tailed Quoll.

The Spotted-tailed Quoll has been assigned to the "Landscape Species" stream within the OEH "Save our Species" program. .

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

As an area of native vegetation will be removed by the proposal it will contribute to the key threatening process of clearing of native vegetation however this contribution is considered small compared to the area of similar habitat that occurs in the locality.

Brush-tailed Phascogale (*Phascogale tapoatafa*) and Squirrel Glider (*Petaurus norfolcensis*)

The Brush-tailed Phascogale and Squirrel Glider are listed as vulnerable on Schedule 2 of the TSC Act.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Neither the Brush-tailed Phascogale nor the Squirrel Glider was recorded during the field surveys.

The Brush-tailed Phascogale prefers dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest. (OEH 2015).

The Squirrel Glider inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Live in family groups of a single adult male one or more adult females and offspring. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein. (OEH 2015).

There are six records of the Brush-tailed Phascogale and four records of the Squirrel Glider occurring within 5km of study area on the OEH wildlife atlas (29/01/2015) .

There may be the occasional tree hollow of suitable size for use by either the Brush-tailed Phascogale or Squirrel Glider though it is considered that the density of such sized hollows within the subject site is too low to provide likely roosting or nesting habitat for either species. Both species regularly move between tree hollows within their home ranges K. Kendall pers obs), a presumed predator avoidance behaviour.

The approximate area of habitat that would be affected by the proposal is 4.5 ha.

Considering the relatively large home range of the species compared to the size of the area of habitat to be removed it is considered unlikely that the proposal would have an adverse effect on the life cycle of the either the Brush-tailed Phascogale or Squirrel Glider to the extent that a viable local potential population of either species would be likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Endangered populations as listed on Part 2 of Schedule 1 of the TSC Act do not occur in the study area or locality.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

Maps indicating the extent of habitat are no longer readily available. However, as an indication of the extent, a previous assessment of this area by Elks (2007) found that there was approximately 6400ha of vegetation mapped as the class 'Hunter-Macleay Dry Sclerophyll Forest' in the locality (within 5km) of the study area, and at least 35,000ha within the region (http://maps.environment.nsw.gov.au/stateveg/, accessed 2007). The 4.5ha of habitat to be removed constitutes about 0.07% of that habitat locally, and about 0.01% of that habitat in the region. (Idyll Spaces 2015)

Habitat present on the subject site has been disturbed by frequent fire, grazing and clearing. (Idyll Spaces 2015)

The small area and location within the landscape are such that an area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Proposal.

The proposal will remove some potential foraging resource for both the Brush-tailed phascogale and the Squirrel Glider and may remove the odd suitably sized tree hollow that could be potential breeding and sheltering habitat. However its removal is not considered important for the long term survival of the species within the locality of the study area.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

Critical habitat as listed in the Register of Critical Habitat kept by the Director General of DECCW does not occur in the study area.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan or relevant threat abatement plan exists for either the Brush-tailed Phascogale or Squirrel Glider.

Both the Brush-tailed Phascogale and Squirrel Glider have been assigned to the "Landscape Species" stream within the OEH "Save our Species" program.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

As an area of native vegetation will be removed by the proposal it will contribute to the key threatening process of clearing of native vegetation however this contribution is considered small compared to the area of similar habitat that occurs in the locality.

Koala (*Phascolarctos cinereus*)

The Koala is listed as vulnerable on Schedule 2 of the TSC Act.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

The Koala was not recorded during the field surveys.

The Koala inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size. (OEH 2015).

There are 72 records of the Koala occurring within 5km of the study area on the OEH wildlife atlas (29/01/2015).

The Koala threatened species profile indicates that the study area would provide suitable habitat for the species. The following habitat description was attained from the OEH threatened species website individual species profile for the Koala:

> Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.

The approximate area of habitat that would be affected by the proposal is 4.5 ha.

Considering the relatively large home range of the species compared to the size of the area of habitat to be removed and that the study area does contains a limited number of preferred Koala food tree species it is considered unlikely that the Proposal would have an adverse effect on the life cycle of the Koala to the extent that a viable local potential population of the species would be likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Endangered populations as listed on Part 2 of Schedule 1 of the TSC Act do not occur in the study area or locality.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

Maps indicating the extent of habitat are no longer readily available. However, as an indication of the extent, a previous assessment of this area by Elks (2007) found that there was approximately 6400ha of vegetation mapped as the class 'Hunter-Macleay Dry Sclerophyll Forest' in the locality (within 5km) of the study area, and at least 35,000ha within the region (http://maps.environment.nsw.gov.au/stateveg/, accessed 2007). The 4.5ha of habitat to be removed constitutes about 0.07% of that habitat locally, and about 0.01% of that habitat in the region. (Idyll Spaces 2015)

Habitat present on the subject site has been disturbed by frequent fire, grazing and clearing. (Elks 2015)

The small area and location within the landscape are such that an area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Proposal.

The proposal will remove some potential foraging resource for the Koala however its removal is not considered important for the long term survival of the species within the locality of the study area.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

Critical habitat as listed in the Register of Critical Habitat kept by the Director General of DECCW does not occur in the study area.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

A recovery plan has been prepared for the Koala. It is considered the Proposal is not inconsistent with the objections or recommended actions of the plan.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

As an area of native vegetation will be removed by the proposal it will contribute to the key threatening process of clearing of native vegetation however this contribution is considered small compared to the area of similar habitat that occurs in the locality.

Grey-headed Flying-fox (*Pteropus poliocephalus*)

The Grey-headed Flying-fox is listed as vulnerable on Schedule 2 of the TSC Act.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

The Grey-headed Flying-fox was recorded within the study area during the 2015 field survey.

The Grey-headed Flying Fox is recorded within 5km of the study area on the OEH Wildlife Atlas (29/01/2015).

The Grey-headed Flying-fox threatened species profile indicates that the study area would provide suitable habitat for the species. The following habitat description was attained from the OEH threatened species website individual species profile for the Grey-headed Flying-fox:

- Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Individual camps may have tens of thousands of animals and are used for mating, birth and the rearing of young. Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines. Also forage in cultivated gardens and fruit crops and can inflict severe crop damage.

The OEH threatened species profile for the Grey-headed Flying Fox indicates that the study area would provide suitable foraging habitat for the Grey-headed Flying-fox. It is considered that the study area would not provide suitable habitat as a grey-headed flying-fox camp. There is currently a camp of the species on the southern bank of the Macleay river in Kempsey.

The approximate area of habitat that would be affected by the proposal is 4.5 ha.

Considering the relatively small size of the area of foraging habitat to be removed it is considered unlikely that the proposal would have an adverse effect on the life cycle of this far ranging species to the extent that a viable local potential population of the species would be likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Endangered populations as listed on Part 2 of Schedule 1 of the TSC Act do not occur in the study area or locality.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

Maps indicating the extent of habitat are no longer readily available. However, as an indication of the extent, a previous assessment of this area by Elks (2007) found that there was approximately 6400ha of vegetation mapped as the class 'Hunter-Macleay Dry Sclerophyll Forest' in the locality (within 5km) of the study area, and at least 35,000ha within the region (http://maps.environment.nsw.gov.au/stateveg/, accessed 2007). The 4.5ha of habitat to be removed constitutes about 0.07% of that habitat locally, and about 0.01% of that habitat in the region. (Elks 2015)

Habitat present on the subject site has been disturbed by frequent fire, grazing and clearing. (Elks 2015)

The small area and location within the landscape are such that an area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Proposal.

The proposal will remove some potential foraging resource for the Grey-headed Flying-fox however its removal is not considered important for the long term survival of the species within the locality of the study area.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

Critical habitat as listed in the Register of Critical Habitat kept by the Director General of OEH does not occur in the study area.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan or relevant threat abatement plan exists for the Grey-headed Flying-fox.

The OEH threatened species profiles for the Grey-headed Flying-fox identifies 31 priority actions, none of which have relevance to the Project.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

As an area of native vegetation will be removed by the proposal it will contribute to the key threatening process of clearing of native vegetation however this contribution is considered small compared to the area of similar habitat that occurs in the locality.

Microbats that include tree hollows as breeding sites

Eastern Free-tail-Bat (*Mormopterus norfolkensis*)

Hoary Wattled Bat (*Chalinolobus nigrogriseus*)

Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)

Greater Broad-nosed Bat (*Scoteanax rueppellii*)

The above listed microbat species are listed as vulnerable on Schedule 2 of the TSC Act.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Anabat call analysis provided a "confident" call identification of a Eastern Free-tail-Bat and a "probable" call identification of the Hoary Bat during the 2007 field survey, neither of the other above listed microbat species were recorded during the field survey.

The Eastern Free-tail-Bat occur in dry sclerophyll forest and woodland east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures. (OEH 2015).

In NSW the Hoary Wattled Bat occurs in dry open eucalypt forests, favouring forests dominated by Spotted Gum, boxes and ironbarks, and heathy coastal forests where Red Bloodwood and Scribbly Gum are common. Because it flies fast below the canopy level, forests with naturally sparse understorey layers may provide the best habitat. Roosts in hollows and rock crevices. Will occupy urban areas with suitable habitat. (OEH 2015).

The Yellow-bellied Sheathtail-bat roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. (OEH 2015).

The Greater Broad-nosed Bat Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species. (OEH 2015).

Of the above listed bat species only the Greater Broad-nosed Bat has been recorded within 5km of the study area on the OEH wildlife atlas (29/01/2015), there being one record.

The OEH threatened species website search indicates that the Yellow-bellied Sheathtail-bat is predicted to occur within the Macleay Hastings subregion of the Hunter CMA.

Habitat for the above listed microbats is widespread in the locality and the region.

Potential foraging, breeding and sheltering habitat for the above listed microbat species is widespread in the locality and in the region.

The approximate area of habitat that would be affected by the proposal is 4.5 ha.

Provided that the recommended ameliorative measures are implemented it is considered that, as the size of the habitat to be removed is small compared to the home ranges of the above listed microbats and the area of habitat to be retained, it is unlikely that the Proposal would have an adverse effect on the life cycle of the above listed microbats to the extent that a viable local population of the species would be likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Endangered populations as listed on Part 2 of Schedule 1 of the TSC Act do not occur in the study area or locality.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

Maps indicating the extent of habitat are no longer readily available. However, as an indication of the extent, a previous assessment of this area by Elks (2007) found that there was approximately 6400ha of vegetation mapped as the class 'Hunter-Macleay Dry Sclerophyll Forest' in the locality (within 5km) of the study area, and at least 35,000ha within the region (http://maps.environment.nsw.gov.au/stateveg/, accessed 2007). The 4.5ha of habitat to be removed constitutes about 0.07% of that habitat locally, and about 0.01% of that habitat in the region. (Elks 2015)

Habitat present on the subject site has been disturbed by frequent fire, grazing and clearing. (Elks 2015)

The small area and location within the landscape are such that an area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Proposal.

The proposal will remove some potential foraging resource for the above listed bat species and also remove tree hollows that may be suitable sheltering and breeding habitat for the above listed bat species however as similar habitat is widespread in the locality and protected in conservation areas the habitat to be removed is not considered important for the long term survival of the species within the locality of the study area.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

Critical habitat as listed in the Register of Critical Habitat kept by the Director General of DECCW does not occur in the study area.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan or relevant threat abatement plan exists for the above listed microbats.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

As an area of native vegetation will be removed by the proposal it will contribute to the key threatening process of clearing of native vegetation however this contribution is considered small compared to the area of similar habitat that occurs in the locality.

Microbats that include caves and overhangs as breeding sites

Little Bentwing-bat (Miniopterus australis)

Eastern Bentwing-bat (Miniopterus schreibersii oceanensis)

The above listed microbat species are listed as vulnerable on Schedule 2 of the TSC Act.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Anabat call analysis provided a "confident" call identifications of a both the Little Bentwing-bat and Eastern Bentwing-bat during the 2007 field survey.

The Little Bentwing-bat occupies moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats. (OEH 2015).

Caves are the primary roosting habitat of the Eastern Bentwing-bat, but they also use derelict mines, storm-water tunnels, buildings and other man-made structures. They form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of

maternity caves. Cold caves are used for hibernation in southern Australia. Breeding or roosting colonies can number from 100 to 150,000 individuals. Hunt in forested areas, catching moths and other flying insects above the tree tops. (OEH 2015).

The study area does not contain suitable sheltering or breeding habitat.

Potential foraging habitat for the above listed microbat species is widespread in the locality and in the region. The approximate area of habitat that would be affected by the proposal is 4.5 ha.

As the size of the habitat to be removed is small compared to the home ranges of the above listed microbats and the area of habitat to be retained, it is unlikely that the Proposal would have an adverse effect on the life cycle of the above listed microbats to the extent that a viable local population of the species would be likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Endangered populations as listed on Part 2 of Schedule 1 of the TSC Act do not occur in the study area or locality.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

Maps indicating the extent of habitat are no longer readily available. However, as an indication of the extent, a previous assessment of this area by Elks (2007) found that there was approximately 6400ha of vegetation mapped as the class 'Hunter-Macleay Dry Sclerophyll Forest' in the locality (within 5km) of the study area, and at least 35,000ha within the region (http://maps.environment.nsw.gov.au/stateveg/, accessed 2007). The 4.5ha of habitat to be removed constitutes about 0.07% of that habitat locally, and about 0.01% of that habitat in the region. (Elks 2015)

Habitat present on the subject site has been disturbed by frequent fire, grazing and clearing. (Elks 2015)

The small area and location within the landscape are such that an area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Proposal.

The proposal will remove some potential foraging resource for the above listed bat species however as similar habitat is widespread in the locality and protected in conservation areas the habitat to be removed is not considered important for the long term survival of the species within the locality of the study area.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

Critical habitat as listed in the Register of Critical Habitat kept by the Director General of DECCW does not occur in the study area.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan or relevant threat abatement plan exists for the above listed microbats.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

As an area of native vegetation will be removed by the proposal it will contribute to the key threatening process of clearing of native vegetation however this contribution is considered small compared to the area of similar habitat that occurs in the locality.

Appendix 6 - Section 4.12 of the Comprehensive Koala Plan of Management for Eastern Portion of Kempsey LGA

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m) Fencing

Fencing (notwithstanding provisions of the *Swimming Pools Act 1992)* on land mapped as or determined to be core koala habitat, must not inhibit the movement of koalas by virtue of providing regularly spaced gaps or other measures which result in a minimum 250mm ground clearance being achieved.

n) Road design standards

Road design standards and/or approved vehicle calming devices must be incorporated into any development proposal on land mapped as or determined to be core koala habitat such that motor vehicles are restricted to a maximum speed of 40km/hour within the development area.

o) Rezoning

Upon assessment of a DA or rezoning application, Council should consider the merit of rezoning for environment protection of all or a part of any land that has been identified as core koala habitat.

4.12 Habitat Compensation Measures

a) Loss of koala habitat must be compensated via the securement of a corresponding measure of land that equates to no less than two times the total area to be affected by vegetation removal. Habitat Compensation should be undertaken on the same site as clearing where possible;

b) The Habitat Compensation Measures must take the form of a valid legally binding agreement between the proponent of the development and any person being the lawful owner of land that is (preferably) within a KMA, or otherwise on land to which the plan applies, to the satisfaction of Council. Consideration will be given to habitat compensation measures taking place outside the CKPoM boundary, but within the Kempsey Shire LGA, on a case by case basis, if the proponent can sufficiently demonstrate securement of appropriate habitat quality and area as per c) below, as well as evidence of a koala population on or near the habitat compensation site;

c) For purposes of a) and b) above, the area to be secured as compensation must comprise no more than half existing preferred koala habitat, the remaining area comprising cleared or partially cleared land for revegetation purposes;

d) Secured existing preferred koala habitat must be at least of equivalent habitat value to koalas as that to be impacted by development. If the land to be secured is of a lesser quality to that subject to impact, enhancement of the secured existing habitat will also be required;

e) Cleared, or partially cleared land for revegetation purposes must be planted out with a species mix to establish a vegetation community (including an appropriate understorey, midstorey and overstorey) equivalent to the area being disturbed. The proportion of preferred koala feed trees in the vegetation community must be equivalent to that being disturbed, or 15%, whichever is the larger. Half of all replanted preferred koala feed trees must be tallowwood.

f) Areas being the subject of the compensation measures must be protected by a valid legally binding agreement, that ensures the protection of the habitat compensation area in perpetuity through the rezoning of land for habitat protection and/or the application of restrictive covenants on title. Development Consent must be conditional upon the agreement being in place (ie signed registered or otherwise as per the legal requirements of the relevant agreement) prior to any work related to the Development Application occurring on the site, or where the proposed development involves the erection of a building, prior to the release of the Occupation Certificate. The agreement must include, to the satisfaction of Council, a Vegetation Management Plan, that specifies details of:

   (i) pre-revegetation forest cover and composition;

   (ii) post-revegetation forest cover and composition targets;

   (iii) the species to be planted (all should be endemic natives not horticultural hybrids), number of trees/plants to be planted, location and density of replanted vegetation;

(iv) PKFTs seedlings must be of a minimum size and maturity to best ensure survival. Any loss of seedlings within the agreed maintenance period must be replaced by the applicant.

(v) details of the sourcing of all seedlings (demonstrating local seedstock has been used);

(vi) bush regeneration methods, timeframes and objectives;

(vii) a schedule of management, monitoring and maintenance activities to ensure establishment and ongoing protection and management of replanted vegetation;

(viii) the length of proposed monitoring and management periods, the timing of key milestones, and reporting requirements;

(ix) provisions for planting mortality replacements; and

(x) responsible parties for undertaking and funding all works and activities included in the plan.

g) All costs associated with enacting the valid legally binding agreement, including funding and maintenance of the revegetation component, must be borne by the applicant; and

h) Landholders will be invited to register their land with Council as a potential site for use as a habitat compensation area and a register of same will be maintained by Council.

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Annexure 2

Flora Assessment

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Flora Assessment, Farrawell's Quarry Extension, South Kempsey

Prepared for

RW Corkery & Co Pty Limited

and

Pacific Blue Metal Pty Ltd

Idyll Spaces Environmental Consultants

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24 February 2015

The information presented in this report is, in the opinion of the author, a true and accurate record based on an objective study undertaken in response to a brief provided by the client. While every attempt has been made to ensure the accuracy and objectivity of the report, the variability of the natural environment and the paucity of comparative research data may require that professional judgement be applied in reaching conclusions. Any opinions expressed in the report are the professional opinions of the author. They are not intended to advocate any specific Proposal or position.

G.N. Elks, B.Sc (Botany) M.Litt (Ecology) MECA.

Contents

Figures and Tables

Executive Summary

This report was commissioned by R W Corkery Pty Limited on behalf of Pacific Blue Metal Pty Ltd (PBM) to assess the impacts on flora of the proposed Farrawell's Quarry Extension at Lot 2 DP 1194582 adjacent to the Pacific Highway 5km south of Kempsey, NSW as the result of Council's and OEH's comments to an Environmental Impact Statement submitted by PBM on 22 August 2014. It re-surveys and updates a previous assessment for the currently approved quarry (Elks 2007).

Of the three vegetation communities identified in the study area in 2007, the *Corymbia maculata – Eucalyptus siderophloia* Open Forest, which occupied the bulk of the approved quarry area in 2007, has been removed by quarrying. The remaining two communities are *Eucalyptus seeana – E. globoidea* Dry Open Forest and *E. siderophloia – E. carnea* Dry Open Forest.

There is one record of threatened flora in the locality held in the NSW Wildlife Atlas, the *Threatened Species Conservation Act 1995* (TSC Act) listed Vulnerable aquatic flora species, *Maundia triglochinoides*. The species is assessed as unlikely to occur due to absence of suitable habitat in the study area.

Nine *Environment Protection and Biodiversity Conservation 1999* (EPBC Act) listed threatened plant species, or their habitats, are predicted to occur within 5km of the Quarry on the basis of computer modelling, although none have been detected in this locality. Of these, three species are assessed as possible occurrences in *E. siderophloia – E. carnea* Dry Open Forest of the study area: *Cryptostylis hunteriana, Cynanchum elegans* and *Parsonsia dorrigoensis*. No vegetation community of the study area is listed as threatened under state or federal jurisdictions.

It is concluded from the application of the 7-part Test (TSC Act) and an assessment against the Significant Impact Guidelines (EPBC Act) that the Proposal to extend Farrawell's Quarry in the manner proposed would not be likely to have a significant impact on threatened species, populations or ecological communities, or their habitats, or critical habitat, and that a Species Impact Statement or referral to the Federal Environment Minister would not be required.

Introduction

Background

In December 2006, Kendall & Kendall Ecological Services Pty Ltd engaged Mr Greg Elks of Idyll Spaces to undertake a flora survey and assessment on part of Lot 101 Pacific Highway, Parish of Kalateenee for GHD Pty Ltd. It was proposed at the time that part of the lot above the 60m contour would be quarried for road construction materials. The impacts of that Proposal on flora were assessed in Elks (2007).

In January 2015, RW Corkery & Co Pty Ltd engaged Greg Elks to update the flora assessment as requested by OEH in their response comments to an Environmental Impact Statement submitted in September 2014 (RWC, 2014).

The proposed extension of the quarry, the 'Proposal', would extend the existing quarry workings into two adjacent areas located approximately between the 50 and 60 metre contours, these being to the north and extreme south of the existing quarry (see **Figure 1**). The floor of the currently approved quarry would also be lowered to 50m AHD.

Locality

The locality is defined for this study as being within 5km of the Quarry with the proposed Quarry extensions referred to as the "study area". It is primarily undulating forested land used previously for forestry, with occasional clearings and some cattle grazing.

The size of the locality was chosen to include adequate data records from an area of similar vegetation. It includes parts of the Maria River and Kalateenee State Forests and the Maria River National Park.

Study area

The study area is located within Lot 2 DP 1194582, east of the Pacific Highway 5km south of Kempsey, NSW.

It occurs on forested midslopes between approximately 40m and 60m AHD. Soils have developed on an underlying geology of metamorphosed sediments.

The study area includes the footprint of the proposed quarry extension plus a buffer zone of 50 metres within adjoining forest vegetation (**Figure 1**).

Subject Site

The subject site is the area to be directly affected by the proposed extension, which is located in two separate parts in the north and extreme south of the existing approved quarry and between the existing quarry and (approximately) the 50m contour (**Figure 1**).

Methods

Review of previous studies

A flora and fauna assessment of Lot 101, undertaken in 2002 by Kendall & Kendall Ecological Services Pty Ltd as part of a Local Environmental Study, was reviewed for relevant information including flora species occurrences and vegetation mapping.

Information in a previous study by Elks (2007) was examined for relevance and updated where appropriate.

Database searches for Threatened species records

Records of threatened species, populations or communities as listed under the TSC Act known to occur within a square of 0.1degrees (approximately 10km x 10km) centred on the study area were extracted from the Wildlife Atlas database (http://www.bionet.nsw.gov.au/, 2 February 2015).

Predicted occurrences of threatened plant species, communities or species habitat listed under the EPBC Act were obtained from the Department of Environment and Heritage database (http://www.environment.gov.au/topics/about-us/legislation/environment-protection-and-biodiversity-conservation-act-1999/protected, 2 February 2015)

Threatened species recovery or threat abatement plans, preliminary determinations and habitat data for threatened flora was obtained from the OEH Threatened Species website (http://www.environment.nsw.gov.au/threatenedspecies/).

Field Survey

Initial survey of the study area was undertaken by G.Elks over 5 hours on 23 January 2007 utilising four randomly located 0.04ha survey plots and four 30 minute random meanders.

Additional survey for this updated assessment utilised that data plus two x 2 hour random meanders undertaken in February 2015 to compile a comprehensive species list, delineate vegetation community boundaries and undertake a targeted search for flora of conservation significance.

An additional 0.04ha survey plot was undertaken to characterise small areas of vegetation confined to the 50m buffer zone and not adequately sampled in the 2007 survey.

Limitations

The effectiveness of the 2007 flora survey was limited by preceding dry weather conditions and paucity of fertile plant material.

That limitation was not evident during the 2015 survey as above good rainfall had fallen in preceding months and fertile plant material was common.

Results

Threatened flora species, populations and endangered communities, or their habitats, or critical habitat occurring or predicted to occur in the locality

One record for *Maundia triglochinoides*, a Vulnerable aquatic flora species, is the only TSC Act Threatened flora record in the locality held in the Wildlife Atlas.

The Wildlife Atlas database lists the following Endangered Ecological Communities (EECs) as occurring in the region:

- Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions
- Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion
- Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion
- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions

No Endangered Flora Populations or Critical Habitat are listed for the locality.

Nine EPBC Act listed threatened plant species, or their habitats, are predicted to occur on the basis of computer modelling, although none have been detected in the locality:

- *Allocasuarina defungens*
- *Arthraxon hispidus*
- *Cryptostylis hunteriana*
- *Cynanchum elegans*
- *Euphrasia arguta*
- *Parsonsia dorrigoensis*
- *Phaius australis*
- *Streblus pendulinus*
- *Thesium australe*

Vegetation communities of the study area

Of the three vegetation communities identified in the study area in 2007, only two remain (Figure 1), with Community 1 - *Corymbia maculata – Eucalyptus siderophloia* Open Forest, which occupied the bulk of the approved quarry area in 2007, now removed as the result of approved quarrying activities. The remaining two communities are:

Community 2. *Eucalyptus seeana – Eucalyptus globoidea* Dry Open Forest

This community occurs on mid-slopes at about the 45-55m contours, mostly in moister areas associated with small drainage depressions. It is confined to parts of the buffer zone and does not occur in the subject site.

There is evidence of a long period of disturbance from logging, grazing and frequent fire that has probably modified vegetation structure and floristics. Most trees are in the early mature to mature growth stages. There are occasional late mature trees but they are invariably small, contain few small hollows only and these are most often basal hollows associated with fire. Large woody debris is rare to absent.

White stringybark *Eucalyptus globoidea* and Narrow-leaved Red Gum *E. seeana* are typically the dominant species, but Red Mahogany *E. resinifera* is also common in places. There are occasional Thick-leaved white mahogany *E. carnea*, Pink Bloodwood *Corymbia intermedia*, Grey ironbark *E. siderophloia* and Tallowwood *E. microcorys*.

Black oak *Allocasuarina littoralis* and Baeckia *Babingtonia angusta* are the dominant midstratum species but Curricabark *Acacia Acacia concurrens,* Paperbark bottlebrush *Callistemon salignus* and Paperbark *Melaleuca nodosa* are common associates.

The lower stratum is sparse to mid-dense and dominated by Wiry panic together with the sedges *Ptilothrix deusta* and *Lepidosperma laterale.*

There is an Endangered Population of *E. seeana* within the Greater Taree Local Government Area but the species not listed as being of conservation concern with the Kempsey LGA.

The community has floristic similarities with the vegetation type *'Narrow-leaved Red Gum woodlands of the lowlands of the North Coast'* but because of its canopy density, shrubby sclerophyllous understorey and semi-continuous grass cover falls within the vegetation class *'Hunter-Macleay Dry Sclerophyll Forests'* rather than *'Coastal Valley Grassy Woodlands'*(Keith 2004). *'Narrow-leaved Red Gum woodlands of the lowlands of the North Coast'* are listed as the Endangered Ecological Community (EEC) *'Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion'* (Biometric 2015) but Community 2 is assessed below as unlikely to form part of that EEC.

Community 3. *Eucalyptus siderophloia – Eucalyptus carnea* Dry Open Forest

This community occurs on drier midslopes below the 60 metre contour and is the only vegetation community remaining on the subject site.

There is evidence of a long period of disturbance from logging, grazing and frequent fire that has probably modified vegetation structure and floristics. Most trees are in the early mature to mature growth stages. There are occasional late mature trees but they are invariably small, contain few

small hollows only and these are most often basal hollows associated with fire. Large woody debris is rare to absent.

Northern grey ironbark *Eucalyptus siderophloia* and Thick-leaved white mahogany *E. carnea* are the dominant species, with occasional White stringybark *Eucalyptus globoidea*, Pink Bloodwood and Turpentine *Syncarpia glomulifera.*

Midstratum vegetation consists of sparse Curricabark and Brush box *Lophostemon confertus* coppice, with occasional Baeckia and Paperbark.

The community has floristic similarities with the vegetation type *'Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the North Coast'* within the vegetation class *'Hunter – Macleay Dry Sclerophyll Forest'* (Keith 2004). Spotted Gum does not occur in this mapped community in the study area, but did occur in the *Corymbia maculata – Eucalyptus siderophloia* Dry Open Forest that adjoined Community 2 upslope but had been previously cleared for quarrying. *Eucalyptus siderophloia – Eucalyptus carnea* Dry Open Forest can be considered as ecotonal between *Corymbia maculata – Eucalyptus siderophloia* Dry Open Forest and *Eucalyptus seeana – Eucalyptus globoidea* Dry Open Forest

Figure 1. Aerial photograph showing vegetation communities, study area and subject site

Table 1. Likelihood of occurrence of threatened flora

Scientific name	TSC Act status	EPBC Act status	Detectability	Occurrence in locality	Habitat	Likelihood of occurrence in study area
Maundia triglochinoides	Vulnerable	not listed	Nov-Jan	known (1 record)	Swamps or shallow fresh water on clay	nil-habitat requirements not met
Allocasuarina defungens	Endangered	Endangered	All year	predicted	Mainly tall heath on sand, but can also occur on clay soils and sandstone on exposed coastal hills or headlands adjacent to sandplains.	Unlikely - not detected by targeted search, associated vegetation classes do not occur in study area
Arthraxon hispidus	Vulnerable	Vulnerable	Nov-May	predicted	Moist sites on edges of rainforest or in wet eucalypt forest	Unlikely - not detected by targeted search, associated vegetation classes do not occur in study area
Cryptostylis hunteriana	Vulnerable	Vulnerable	Nov - Feb	predicted	Swamp heath on sandy soils.	**Possible** - Community 3 is an associated vegetation type
Cynanchum elegans	Vulnerable	Endangered	All year	predicted	Rainforest gullies, scrub, scree slopes	**Possible** - Community 3 is an associated vegetation type
Euphrasia arguta	Critically Endangered	Critically Endangered	(Oct)-Jan-April	predicted	Eucalypt forest with a mixed grass and shrub understorey	Unlikely - not detected by targeted search, associated vegetation classes do not occur in study area
Parsonsia dorrigoensis	Vulnerable	Endangered	All year	predicted	Subtropical or warm temperate rainforest and tall eucalypt forest	**Possible** - Community 3 is an associated vegetation type
Phaius australis	Endangered	Endangered	September & October but morphology indicative	predicted	Swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas	Unlikely - not detected by targeted search, associated vegetation classes do not occur in study area
Streblus pendulinus	not listed	Endangered	All year	predicted	Warmer rainforests, chiefly along watercourses	nil-habitat requirements not met
Thesium australe	Vulnerable	Vulnerable	Flowering (mid-Summer) but morphology indicative	predicted	Grassland, grassy open forest or woodland on fertile or moderately fertile soils and coastal headlands, often in association with Kangaroo Grass	Unlikely - not detected by targeted search, associated vegetation classes do not occur in study area

Discussion

Likelihood of occurrence of threatened species and communities in the study area

Likelihood of occurrence of species has been assessed as follows:

"Known" - the species has been observed in the study area;
"Likely" - there is a medium to high probability that a species occupies the study area;
"Possible" - suitable habitat for a species may occur in the study area but there is insufficient information to categorise the species as likely or unlikely to occur;
"Unlikely" - a low probability that a species occupies the study area;
"Nil" - habitat in the study area is unsuitable for the species.

No threatened flora species have been detected in the study area.

One threatened flora species, *Maundia triglochinoides,* has been recorded in the locality but habitat is not suitable in the study area.

Of the ten threatened flora species predicted to occur within the study area, three are assessed as possible occurrences in Community 3 of the study area as assessed in Table 1. These species are:

- *Cryptostylis hunteriana* Vulnerable (TSC & EPBC Acts);
- *Cynanchum elegans* Vulnerable (TSC Act) Endangered (EPBC Act); and
- *Parsonsia dorrigoensis* Vulnerable (TSC Act) Endangered (EPBC Act).

No vegetation community of the study area is listed as threatened under state or federal jurisdictions.

Although Community 2 has floristic similarities with the EEC *'Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion'*, that EEC is *'associated with clay loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains'* (Scientific Committee 17/12/04). Soils underlying Community 2 in the study area are mapped as the Euroka soil landscape (Atkinson 1999), which is an erosional landscape characterised by shallow soils and localised seasonal waterlogging. The slope and elevation of the study area are such that periodic inundation is most unlikely. Community 2 is therefore unlikely to meet the edaphic and locational requirements of the EEC. Floristic similarities between Community 2 and the EEC are likely to be a result of similarities in soil texture and drainage rather than soil landscape.

This is also reflected in the floristic differences between the EEC and Community 2. These differences include the occurrence of 16 (of a total of 36) species recorded in Community 2 that are not recorded in the EEC (Keith and Scott 2005). These species include the dominant tree *E. globoidea*, the trees *E. carnea, E. microcorys* and *Lophostemon confertus*, the dominant midstratum species *Allocasuarina littoralis* and *Babingtonia angusta* and common ground layer species *Ptilothrix deusta* and *Lepidosperma laterale.*

Type and degree of impacts

The Proposal would involve the total removal of existing vegetation cover within the subject site (the quarry footprint). The approximate area of the vegetation community *Eucalyptus siderophloia – Eucalyptus carnea* Dry Open Forest that would be affected is 4.5 hectares.

Assessment of the nature and magnitude of the impact includes the following considerations:

1. Pre-construction, construction and occupation/maintenance phases

It is envisaged that construction and occupation/maintenance phases would extend over the proposed 15 – 20 years Quarry life.

2. All on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones.

On-site impacts involve the total removal of existing vegetation cover within the subject site. No off-site impacts are considered likely.

3. All direct and indirect impacts

Direct impacts are expected to consist of loss of native vegetation cover over an area of approximately 4.5 hectares.

Indirect impacts are expected to be avoided by implementation of dust, sediment and erosion control plans.

4. The frequency and duration of each known or likely impact/action

It is envisaged that likely impacts would occur once, at the time of vegetation clearance.

5. The total impact which can be attributed to that action over the entire geographic area affected, and over time

On-site impacts are described above. No off-site impacts are considered likely.

Direct impacts are expected to consist of loss of native vegetation cover over an area of approximately 4.5 hectares.

Indirect impacts are expected to be avoided by implementation of dust, sediment and erosion control plans.

6. The sensitivity of the receiving environment

The receiving environment has been subjected to a long period of disturbance from logging, grazing, clearing and frequent fire. There is no evidence of indirect or offsite impacts arising from the existing quarry and no indication that the receiving environment might be unduly sensitive to the impacts of the Proposal.

7. The degree of confidence with which the impacts of the action are known and understood.

Actions of the type proposed have been frequently undertaken over a long period and their impacts are known and understood.

TSC Act - Assessment of Significance

The TSC Act Assessment of Significance (i.e. the 7-part Test) outlines factors to be considered when determining whether an action, development or activity is likely to significantly affect threatened species, populations or ecological communities, or their habitats.

The subject species are ***Cryptostylis hunteriana, Cynanchum elegans*** and ***Parsonsia dorrigoensis.***

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

The proposed action would result in clearing of a 4.5 hectare patch of native vegetation in a largely forested landscape. Vegetation in this area has been modified by logging, grazing, and frequent fire over a long period.

The habitat of the study area is possible habitat only for ***Cryptostylis hunteriana, Cynanchum elegans*** and ***Parsonsia dorrigoensis.*** There is no known local record or population of the species, viable or otherwise. It is therefore unlikely that the life cycle of ***Cryptostylis hunteriana, Cynanchum elegans*** or ***Parsonsia dorrigoensis*** would be dependent on or impacted by factors that may operate within the small area of disturbed vegetation that would be modified by the Proposal, or that the Proposal would have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Endangered populations as listed under the *TSC Act* do not occur in the study area or locality.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

No endangered ecological community or critically endangered ecological community as listed under the *TSC Act* occurs in the study area.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

Maps indicating the extent of habitat are no longer readily available. However, as an indication of the extent, a previous assessment of this area (Elks 2007) found that there was approximately 6400ha of vegetation mapped as the class 'Hunter-Macleay Dry Sclerophyll Forest' in the locality (within 5km) of the study area, and at least 35,000ha within the region (http://maps.environment.nsw.gov.au/stateveg/, accessed 2007).

The 4.5ha of habitat to be removed constitutes about 0.07% of that habitat locally, and about 0.01% of that habitat in the region.

Both the habitat to be affected and the habitat to remain is unlikely to contain ***Cryptostylis hunteriana, Cynanchum elegans*** and ***Parsonsia dorrigoensis*** and has been modified by logging, grazing and frequent fire.

The small area and the distribution of the impacts of the Proposal are such that an area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the Proposal.

The modified condition, small area and distribution of the habitat to be removed in comparison to that to be retained indicates that it is unlikely to be of importance for the long-term survival of ***Cryptostylis hunteriana, Cynanchum elegans*** or ***Parsonsia dorrigoensis*** in the study area or locality, should they occur there.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

Critical habitat as listed in the Register of Critical Habitat kept by the Office of Environment and Heritage (OEH) does not occur in the study area.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plans for ***Cryptostylis hunteriana, Cynanchum elegans*** or ***Parsonsia dorrigoensis*** are listed on the OEH website.

There are no relevant threat abatement plans listed on the OEH website.

Recommended recovery strategies listed in the Priority Action Statement are not relevant as they apply only to known populations of ***Cryptostylis hunteriana*** and to known habitat for ***Cynanchum elegans.***

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity includes native vegetation clearance, which is recognised as a key threatening process.

As no threat abatement plan has yet been prepared by the NSW National Parks and Wildlife Service, it is not possible to review the proposed activity in light of the plan. Notwithstanding this, clearing of native vegetation may be considered as a threatening process in a generic sense *ie:* is the Proposal likely to have a significant effect on threatened species, populations or ecological communities, or their habitats, and in particular, would it:

- cause fragmentation of ecological communities;
- reduce the viability of ecological communities by disrupting ecological functions;
- result in the destruction of habitat and loss of biological diversity; and
- lead to soil and bank erosion, increased salinity and loss of productive land.

Based on this assessment it is considered that the Proposal would not be likely to further fragment ecological communities, disrupt ecological functions, result in the loss of biological diversity or lead to erosion, and therefore would not increase the impact of a key threatening process.

EPBC Act – Administrative Guidelines

The Significant Impact Guidelines to the EPBC Act examine whether an action has, would have, or is likely to have a significant impact on a threatened species or community.

The following consideration of the Guidelines indicate that the Proposal would not be likely to have a significant impact on ***Cryptostylis hunteriana, Cynanchum elegans*** or ***Parsonsia dorrigoensis***.

For the Vulnerable species ***Cryptostylis hunteriana*** assessed as possibly occurring in the study area, an action is only likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it would impact on an 'important population' of the species.

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal;
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range.

As there are no indications that ***Cryptostylis hunteriana*** occurs in the study area or locality, important populations are considered unlikely to occur in the study area, and the Guidelines indicate that the Proposal would not be likely to have a significant impact.

For the Endangered species ***Cynanchum elegans*** and ***Parsonsia dorrigoensis*** assessed as possibly occurring in the study area, an action is only likely to have a significant impact on an Endangered species if there is a real chance or possibility that it will:

- lead to a long-term decrease in the size of a population;
- reduce the area of occupancy of the species;
- fragment an existing population into two or more populations;

- adversely affect habitat critical to the survival of a species;
- disrupt the breeding cycle of a population;
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat;
- introduce disease that may cause the species to decline, or
- interfere with the recovery of the species.

As there are no indications (other than a predictive model) that ***Cynanchum elegans*** or ***Parsonsia dorrigoensis*** individuals or populations occur in the study area or locality, it is unlikely that the Proposal would decrease the size, reduce the area of occupancy, fragment or disrupt the breeding cycle of a population. Similarly, it is unlikely that the Proposal would reduce the area of occupancy, adversely affect habitat critical for survival, affect the availability or quality of habitat, establish invasive species, introduce disease or interfere with the recovery of those species.

Conclusions

It is concluded from the application of the TSC 7-part Test and the EPBC Significant Impact Guidelines that the Proposal would not be likely to have a significant impact on threatened species, populations or ecological communities, or their habitats, or critical habitat, and that a Species Impact Statement or referral to the Federal Environment Minister would not be required.

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Photographs

On left, *E. siderophloia – E. carnea* Open Forest showing small late mature tree with basal fire damage in foreground; on right, *E. seeana – E. globoidea* Open Forest in Plot 6.

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Appendices

Appendix 1. Community species list and plot data

Appendix 2. GPS track of survey locations

Appendix 1. Community species list

CLASS/Subclass/Family	*Scientific name*	Common name	Cover/abundance in Community	
FILICOPSIDA			**2**	**3**
Pteridaceae	*Cheilanthes austrotenuifolia*	Rock fern		1
Lindsaeaceae	*Lindsaea microphylla*	Lacy Wedge Fern	1	
MAGNOLIOPSIDA				
Magnoliidae				
Acanthaceae	*Brunoniella australis*	Blue Trumpet	2	
Acanthaceae	*Pseuderanthemum variabile*	Pastel Flower	1	
Asteraceae	*Ozothamnus diosmifolius*		2	2
Asteraceae	*Vernonia cinerea*		1	2
Bignoniaceae	*Pandorea pandorana*	Wonga Wonga Vine		1
Casuarinaceae	*Allocasuarina littoralis*	Black Sheoak	3	1
Casuarinaceae	*Allocasuarina torulosa*	Forest Oak		1
Convolvulaceae	*Polymeria calycina*		2	
Dilleniaceae	*Hibbertia obtusifolia*	Hoary guinea flower	1	
Fabaceae (Faboideae)	*Desmodium varians*	Slender Tick-trefoil	1	2
Fabaceae (Faboideae)	*Glycine clandestina*		1	2
Fabaceae (Faboideae)	*Hardenbergia violacea*	False Sarsaparilla	1	
Fabaceae (Faboideae)	*Jacksonia scoparia*	Dogwood		2
Fabaceae (Mimosoideae)	*Acacia concurrens*	Curracabah	2	3
Fabaceae (Mimosoideae)	*Acacia falcata*	Sickle wattle		1
Goodeniaceae	*Goodenia bellidifolia*		2	1
Lobeliaceae	*Pratia purpurascens*	Whiteroot	2	
Myrtaceae	*Babingtonia angusta*		3	1
Myrtaceae	*Callistemon salignus*	Paperbark bottlebrush	2	
Myrtaceae	*Corymbia intermedia*	Pink Bloodwood	2	1
Myrtaceae	*Eucalyptus carnea*	Thick-leaved Mahogany	1	4
Myrtaceae	*Eucalyptus globoidea*	White Stringybark	4	2
Myrtaceae	*Eucalyptus microcorys*	Tallowwood	1	
Myrtaceae	*Eucalyptus resinifera*	Red Mahogany	3	
Myrtaceae	*Eucalyptus seeana*	Narrow-leaved Red Gum	3	
Myrtaceae	*Eucalyptus siderophloia*	Grey Ironbark	1	4
Myrtaceae	*Lophostemon confertus*	Brush Box	2	2
Myrtaceae	*Melaleuca nodosa*	Prickly paperbark	2	1
Myrtaceae	*Syncarpia glomulifera*	Turpentine		2
Pittosporaceae	*Billardiera scandens*	Appleberry		1
Proteaceae	*Persoonia sp*	Geebung	1	
Sapindaceae	*Dodoneaea triquetra*	Hop bush		1
Thymeleaceae	*Pimelea linifolia*	Rice flower	1	

CLASS/Subclass/Family	*Scientific name*	Common name	Cover/abundance in **Community**	
Liliidae				
Cyperaceae	*Lepidosperma laterale*	Sword sedge	2	2
Cyperaceae	*Ptilothrix deusta*	Horned sedge	3	
Iridaceae	*Patersonia sericea*	Purple flag	2	1
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush	2	2
Phormiaceae	*Dianella caerulea*	Blue Flax-lily	2	
Poaceae	*Aristida vagans*			1
Poaceae	*Cymbopogon refractus*	*Barbed-wire grass*		1
Poaceae	*Digitaria sp*		2	2
Poaceae	*Entolasia stricta*	Wiry Panic	4	2
Poaceae	*Eragrostis elongata*			2
Poaceae	*Imperata cylindrica*	Blady Grass	2	1
Poaceae	*Panicum simile*	Two-colour Panic	1	1

Species list from 2007 & 2015 plot data and opportunistic records from 2015 random meanders.

Cover abundance:
1 = <5% cover, uncommon; 2 = <5% cover, common; 3 = >5-25%; 4 = >25-50%.

Flora Plot Data

date	plot	easting	northing	stratum	height(m)	cover(%)	Dominant Species
23/01/07	1	484020	6566560	tallest	25	45	Eucalyptus globoidea
	1			mid	3	30	Lophostemon confertus, Acacia concurrens
	1			ground	0.6	30	Entolasia stricta
23/01/07	2	484130	6556490	tallest	30	55	Eucalyptus carnea, Corymbia maculata
	2			mid	3	20	Acacia concurrens
	2			ground	0.6	20	Entolasia stricta
23/01/07	3	484170	6556710	tallest	25	30	Eucalyptus carnea, Eucalyptus siderophloia
	3			ground	0.3	10	Entolasia stricta, Eragrostis sp
23/01/07	4	484010	6556610	tallest	25	40	Corymbia maculata
	4			mid1	10	5	Lophostemon confertus
	4			mid2	3	25	Lophostemon confertus, Acacia concurrens
	4			ground	0.6	30	Entolasia stricta
23/01/07	5	484020	6556590	tallest	20	30	Eucalyptus seeana, Eucalyptus carnea
	5			mid1	3	25	Lophostemon confertus, Acacia concurrens
	5			mid2	1	10	Ozothamnus diosmifolius
	5			ground	0.6	40	Entolasia stricta
							Datum:agd66 z56
date	plot	lat	long	stratum	height(m)	cover(%)	Dominant Species
04/02/15	6	31.1247	152.8321	tallest	20	30	E. globoidea, E. resinifera
	6			mid 1	10	30	Allocasuarina littoralis, Acacia concurrens
				mid 2	2	20	Babingtonia angusta
	6			ground	0.6	50	Entolasia stricta

-31.124774 152.832155

Appendix 2. GPS track of survey locations

Annexure 3

Driver's Code of Conduct

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Revision 2
Revision Date 17/03/14
Next Review Date 17/3/16

LEVEL 2 INDUCTION - DELIVERY TRUCK OPERATORS / DRIVERS CODE OF CONDUCT

Note: If you are a direct employee of Pacific Blue Metal, Interjet or Great Lakes Aggregate, please ensure you have also completed the company induction.

1. All drivers must be inducted to site.
2. Pacific Blue Metal - Farrawells Site has a fully operational Work Health and Safety Management Plan to provide a healthy and safe workplace for employees, subcontractors and visitors.
3. All people at Pacific Blue Metal - Farrawells Site are subject to the authority of the Quarry Manager & Site Supervisor.
4. A copy of a Certificate of Currency for Insurances must be provided to the head office.
5. Pre-start checks must be conducted on vehicles prior to use to ensure they are roadworthy. Ensure any issues found are reported immediately to the Quarry Manager or Site Supervisor.
6. Observe and obey all road rules including Heavy Vehicle legislation requirements.
7. Abide by respective RMS load limits.
8. Seat belts to be worn at all times when vehicle is moving.
9. Only use mobile phones in an approved mobile phone cradle while driving.
10. Be aware of safe work practices when loading and unloading.
11. Restrict speed to 30 km/hr along the Industrial Access Road and 20 km/hr within the Quarry Site.
12. Ensure loads are properly contained within truck bodies and side rails and tailgates are clean. All loads **must** be covered prior to leaving the Industrial Access Road.
13. Observe quarry entry and exit hours:
    - Monday to Friday 7.00am – 5.00pm
    - Saturday 7.00am – 1.00pm

    Trucks are not to enter or leave the site outside of these hours.
14. Obey Safety and Procedural signs posted within the quarry and any direction given by the Site Supervisor or Quarry Manager.
15. If equipped with UHF Radio switch to channel 12, maintain a listening watch and make other traffic aware of your position in the quarry.
16. Compulsory radio calls are as per signs:
    1. On entering the Quarry Access Road **"Truck entering the quarry"**
    2. On departing the Quarry gates **"Truck leaving the quarry"**
17. Safety footwear and hi-vis clothing must be worn at all times whilst on site. Other personal protective equipment must be worn where requested by signage or procedure. Hard hats must be worn in the vicinity of the crushing plant when it is operating. Specifically prohibited are wearing thongs.

18. Illegal drugs or alcohol are not to be consumed whilst working. Inform your Supervisor if taking any prescribed or over the counter drugs, where your ability to carry out your duties safely may be impaired. PBM Group has drug and alcohol testing on a random basis and a "for cause" basis (see Drug and Alcohol Policy for details).

19. All hazards are to be reported to your Site Supervisor. All incidents resulting in injury, damage to property or significant near misses are to be reported to your Site Supervisor. To notify an accident or emergency, you must contact the Site Supervisor. This can be done by UHF CH 12, Phone 0428 684 030, inform an operator of mobile plant, or proceeding directly to the site office. In all cases, you must state "emergency, emergency, emergency" name, location, and details of the emergency.

20. In the event of an emergency, all persons within Pacific Blue Metal - Farrawells Site will be notified by UHF Radio, mobile phone or Quarry Staff, and will assemble at the safe area / emergency evacuation area at the site office.

21. First aid kit is located in the site office. If first aid is required, contact the site supervisor 0428 684 030 or UHF CH 12, who will organise a First Aid Officer.

22. Quarry equipment has right of way at all times.

23. If leaving the cabin of your truck when either getting loaded or within 20m of mobile equipment, you must advise the operator of the mobile quarry plant of your intentions so that he/she are aware of where you intend to walk.

24. If on foot, you are not to approach within 20m of mobile plant until you have notified the operator and the operator has acknowledged your intent and bought the machine to a halt and engaged the park brake.

25. Spills must be cleaned up immediately using spill kits provided. Where there is the potential for a pollution incident to occur ensure the head office has been notified (as per the Pollution Incident Response Management Plan). They will then follow the correct actions for management of the situation.

26. All driving behaviour will be seen by the general public i.e. speeding, inappropriate driving in residential and school zones, with breaches potentially resulting in a complaint being received by the company. Should this happen, the driver may be subject to disciplinary action.

27. When entering the Pacific Highway from Macleay Valley Way, only two delivery trucks are permitted within the right turn bay at any one time. In the event a delivery truck becomes the second truck in the right turn bay, the driver of the second delivery truck must alert the Quarry on UHF CH 12 and other delivery drivers potentially leaving the Quarry to ensure that no additional trucks enter the Macleay Valley Way roundabout (from the Industrial Subdivision Access Road) until at least one delivery truck has entered the Pacific Highway on-ramp.

Duty of Care and Due Diligence

WHS Act 2011 states that all workers including employees, visitors, subcontractors have a duty of care, which means they must:

- Take reasonable care for your own health and safety and that of your co-workers
- Not do anything that adversely affects the health and safety of others
- Not fail to do something which causes the health or safety of others to be affected
- Comply with all instructions, including policies and procedures given to the person from the company (now called a person conducting a business or undertaking.)

Due diligence means that the Officers of the company have to make sure that the company complies with its legal WHS obligations. ("Officers of the company" is a definition used under Corporations Law which means people like Company Directors.)

Instructions for Using Tally Clerk:

1. Approach the weighbridge slowly and wait for "Proceed" signal to be displayed on the electronic display.
2. Proceed at a slow steady speed, no faster than walking pace.
3. Continue until "Stop" signal is displayed on the board.
4. Collect docket from printer.
5. Ensure load is covered before moving from weighbridge.

Note: If you proceed too quickly the system will give an error. Follow instructions given on the display. If in doubt contact Site Supervisor on 0428 684 030 or UHF CH 12.

The Work Health and Safety Induction requirements have been explained to me. I understand these requirements and also that compliance with these requirements is a condition of entry into Pacific Blue Metal - Farrawells Site.		
DATE OF INDUCTION	**INDUCTEE : NAME**	**INDUCTEE : SIGNATURE**
Witnessed on behalf of the Quarry Manager:		

Competency Assessment

Name of Inductee:	
Signature:	

Assessment Marked by:

Name:	**Signature:**
Result:	**/5**

Please circle the correct answer:

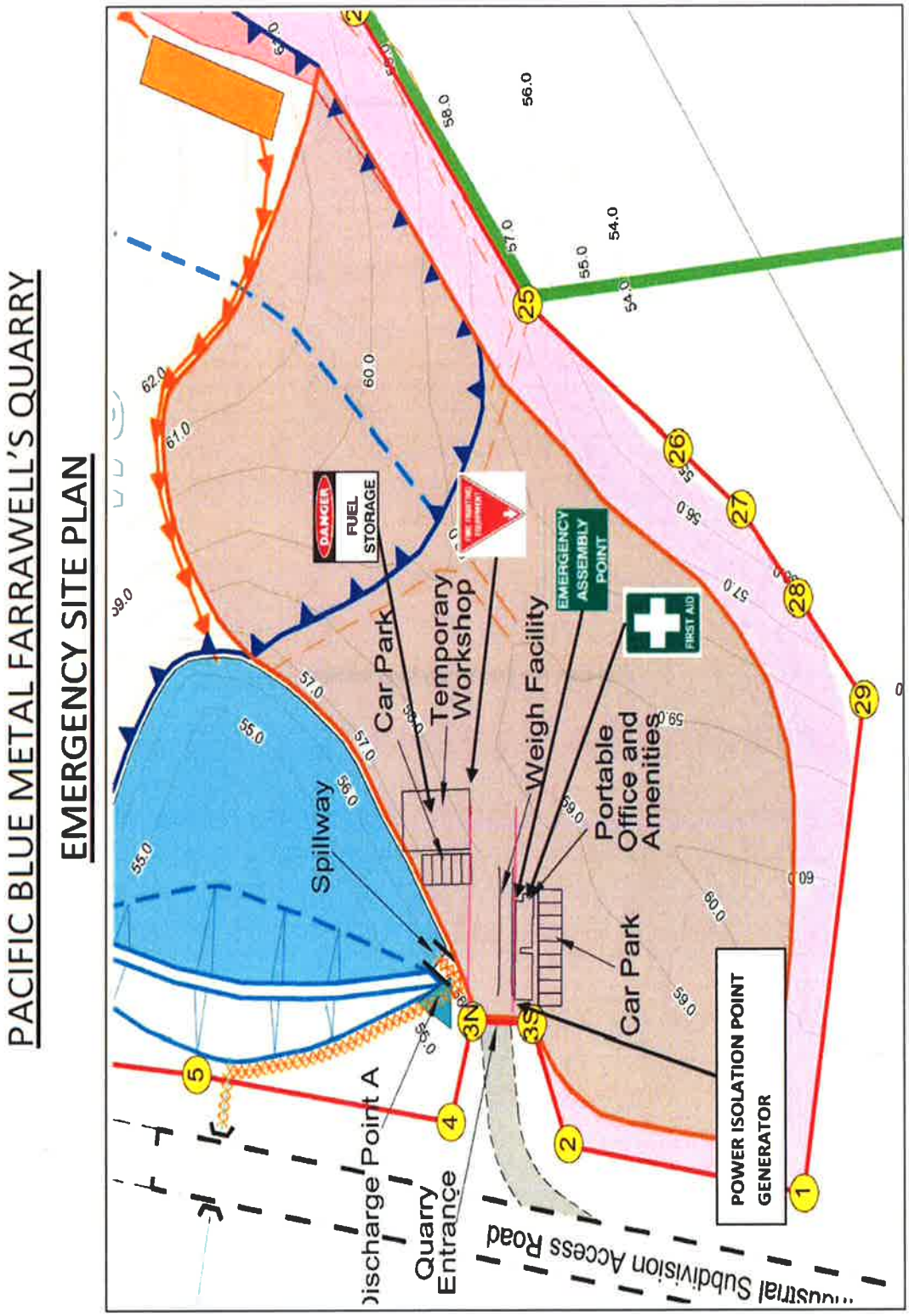
1. Farrawells quarry hours of operation are:
   a). Monday to Wednesday 7.00am to 3.00pm
   b). Monday to Friday 7.00am to 5.00pm and Saturday 7.00am to 1.00pm
   c). Monday to Saturday 7.00am to 5.00pm

2. Speed limits are:
   a). 30 km/hr on Industrial access road and 20 km/h within the Quarry Site.
   b). 50 km/hr around the site
   c). Same as road speed limits
   d). Whatever you think is a safe speed

3. Mandatory PPE on site is (circle 2 answers):
   a). Safety footwear and hi-vis clothing to be worn at all times
   b). Hard hats when in the vicinity of the crushing plant when it is operating
   c). Thongs
   d). Hard hats at all times

4. Who has right of way on site at all times:
   a). Whoever is driving the largest vehicle
   b). Quarry equipment
   c). Pedestrians
   d). Visitors

5. After collecting your docket from Tally Clerk what must you do before leaving the weighbridge:
   a). Cover your load
   b). Look at the view
   c). Wait for the proceed signal
   d). Check the weather forecast


PACIFIC BLUE METAL FARRAWELL'S QUARRY
EMERGENCY SITE PLAN
DANGER
FUEL STORAGE
Car Park
Temporary Workshop
Weigh Facility
EMERGENCY ASSEMBLY POINT
FIRST AID
Portable Office and Amenities
Car Park
POWER ISOLATION POINT
GENERATOR
Spillway
Discharge Point A
Quarry Entrance
Industrial Subdivision Access Road
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Annexure 4

EPA Correspondence

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EPA NSW

RECEIVED 04 MAR 2015 BY:

RECEIVED 04 MAR 2015 BY:

Our reference: EF13/3955 DOC15/49819-01
Contact: Peter Lynch 6640 2502
Date: 2 March 2015

02 MAR 2015

Rob Corkery
Principal/Managing Director
R.W. Corkery & Co. Pty. Limited
1st Floor, 12 Dangar Road,
BROOKLYN NSW 2083

Dear Mr Corkery,

Farrawell's Quarry Extension – Proposed Environment Protection Licence 20018 Amendment

I refer to your email transmission of 16 February 2015 to the Environment Protection Authority (EPA) concerning the General Terms of Approval (GTAs) of 17 October 2014 for the proposed Development Application for Farrawell's Quarry.

***Condition L2.4* (Water and/or Land Contamination Limits)**

The EPA acknowledges your advice that the pH of water within the final sediment control dam within the quarry have consistently measured pH values of between 4.8 and 5.0 and these measurements are consistent with other measurements taken both downstream of the quarry and in adjacent catchments.

As previously discussed the EPA will not lower the pH limitfor the discharge point to below a pH of 6.5. The level of investigation required to provide confidence that a lower pH was not detrimental would be extensive and unlikely to clearly support a change to the standard pH discharge limits. The EPA will not be amending the GTAs in relation to *Condition L2.4.*

In light of the pH levels reported in the final sediment control dam within the quarry,the EPA seeks written advice from Pacific Blue Metal Pty Limited (PBM) on the current method of pH adjustment from the final sediment control dam. Please provide this written advice by 1 April 2015.

Condition L6.1 (Hours of Operation)

The EPA accepts the request for Saturday hours of operation to be returned to 7:00 am to 1:00 pm, provided this does not conflict with the existing Development Consent for Farrawell's Quarry.

Special Condition 1 (Dust Management Plan)

The EPA understands that Kempsey Shire Council has confirmed that it will be imposing a condition for the applicant to prepare and submit an Environmental Management Plan (EMP) for the entire quarry. The EPA concurs with the request that the Dust Management Plan be incorporated into the EMP for the ongoing operation of the quarry.

Email: north.coast@epa.nsw.gov.au
PO Box 498, Grafton NSW 2460
49 Victoria Street, Grafton NSW 2460
Tel: (02) 6640 2500 Fax: (02) 6640 2539
ABN 43 692 285 758
www.epa.nsw.gov.au

The Dust Management Plan, as nominated in Special Condition 1 of the General Terms of Approval will be amended to require the Environmental Management Plan for the quarry to contain a section entitled "Dust Management".

The section entitled "Dust Management" must include, but is not limited to:

- *detailed measures to address all the principal sources of dust, e.g. extraction, processing (handling/loading/crushing), stockpiling and storage and road transport. Dust control measures that represent both proactive and reactive management should be included.*
- *. Outline the required maintenance measures for dust suppression equipment (e.g. Conveyor Sprinklers, etc.).*

Due date: The Environmental Management Plan is to be submitted to the EPA prior to the commencement of quarrying activities under this approval/licence on the premises.

In the event of a substantiated complaint the EPA will require the preparation of a dust monitoring program to be implemented, outlining: key performance indicator(s) that are quantifiable, measurable and auditable; monitoring method(s); location, frequency and duration of monitoring; and, record keeping.

Discharges to Air and Water and Applications to Land

Condition P1.1 will be amended as follows:

P1.1 The following monitoring / discharge point referred to in the table below are identified in the EPA's general terms of approval, or a licence under the Protection of the Environment Operations Act 1997, for the purposes of the monitoring and/or setting of limits for any application of solids or liquids to the monitoring / discharge point.

Water and land

EPA Identification no.	***Type of Monitoring Point***	***Type of Discharge Point***	***Location Description***
Discharge Point 1	*Water*	*Water*	*Water Storage Dam as in Figure 4.5 of EIS, Farrawells Quarry Extension.*

L5. Blasting.

The EPA concurs with your comments concerning prior written notification. The General Terms of Approval will be amended to:

L5.1 Blasting operations at the premises may only take place between 09:00 to 15:00 Monday to Friday.

(Where compelling safety reasons exist, the Authority may permit a blast to occur outside the above mentioned hours. Prior written (email/facsimile) notification of any such blast must be made to the Authority).

The EPA will be writing to council to seek to re-issue the GTAs for the proposed Development Application for Farrawell's Quarry.

If you have any questions regarding this matter, please contact Peter Lynch on 02 6640 2502.

Yours sincerely

Graeme Budd
Head Environmental Management Unit North Coast
Environment Protection Authority

CC Kempsey Shire Council

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