

# **Annexure 9**

## **Further Information on the Biodiversity Offset for the Teralba Quarry Extensions**

Number of pages including blank pages = 31



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## METROMIX PTY LTD TERALBA QUARRY EXTENSIONS FURTHER INFORMATION ON BIODIVERSITY OFFSET

### BACKGROUND

The biodiversity offset for the Teralba Quarry Extensions was initially proposed as part of the referral submitted on 9 June 2011 to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC). The area nominated (and shown in **Figure 1-A**) was assessed by DSEWPaC as appropriate and a condition of its acceptance that the Project was not a controlled action if undertaken in a particular manner.

The biodiversity offset presented in the *Environmental Assessment* (**Figure 1-B**) was almost identical to the version submitted to DSEWPaC (**Figure 1-A**). Only minor modifications were required to better accommodate one *Tetratheca juncea* clump and to adjust the boundary adjacent to the Northern Extension.

**Figure 1-C** entitled “Modified Biodiversity Offset” on page 5 of the Response to Submissions dated June 2012 nominates an area of 118ha comprising six individual but closely juxtaposed parcels of land within the land leased by Metromix for its quarry operations. The six individual areas were retained but their boundaries were slightly modified and individual areas recorded that total 118ha.

Since the completion and exhibition of the *Environmental Assessment*, and the completion of the Response to Submissions, the Department of Planning and Infrastructure has sought additional information to assist the Department to establish the suitability of the biodiversity offset for the areas of disturbance associated with the proposed quarry extensions. This response has been prepared to address the issues raised by the Department of Planning and Infrastructure in correspondence provided by Mr Colin Phillips.

### APPROACH TO IMPROVEMENT OR MAINTENANCE OF BIODIVERSITY VALUES

Metromix commissioned Eco Logical Australia Pty Limited to establish, through the Biobanking Assessment Methodology (BBAM), the areal extent of the biodiversity offset required for the Project to achieve the Improve or Maintain Objective nominated in the OEH interim policy. A summary of the ecosystem and species credits required (impact areas) and generated (offset areas) calculated by Eco Logical Australia using the BBAM are as follows and are shown in **Figure 1-C**. The assessment by Eco Logical Australia is attached as **Attachment 2** with the key outcomes summarised on Page A9-4.

**Ecosystem Credits Summary – Impact Area**

Vegetation type	Area (ha)	Credits required	Red flag
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	23.01	1,652	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	1.79	58	No
<b>Total</b>	<b>24.80</b>	<b>1,710</b>	

**Species Credits – Impact Area**

Common name	Scientific name	Extent of impact	Number of species credits required
Black-eyed Susan	Tetraloche juncea	75.00	1,103

**Ecosystem Credits Summary – Initial Offset Area (118ha)**

Vegetation type	Area (ha)	Credits required	Red flag
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	99.48	928	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	0.39	2	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	1.78	18	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	7.64	65	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	2.13	21	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	0.31	3	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	18.85	185	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	18.59	182	No
Smooth-barked Apple - Sydney Peppermint - Turpentine healthy open forest on plateau areas of the southern Central Coast, Sydney Basin	3.56	25	No
Sydney Blue Gum - White Mahogany shrubby tall open forest of coastal ranges of the southern North Coast	3.53	39	No
<b>Total</b>	<b>156.26</b>	<b>1,488</b>	

**Species Credits – Initial Offset Area (118ha)**

Common name	Scientific name	Extent of impact	Number of species credits required
Black-eyed Susan	Tetraloche juncea	159.00	954

As a result of the Improve and Maintain biometric assessment summarised above, Eco Logical Australia recommended the area of the Biodiversity Offset within the land leased by Metromix be increased to approximately 24ha. **Figure 1-D** displays the proposed final Biodiversity Offset to be relied upon for the Project. **Attachment 2** incorporates a figure displaying the additional areas included in the modified Biodiversity Offset re between **Figures 1-C** and **1-D**.

As a result of the increase in the area of the Final Biodiversity Offset to 142.6ha, Eco Logical conclude that the ecosystem and species credits for both the land to be cleared and the Final Biodiversity Offset are almost identical to a full Tier 1 – Improve or Maintain Outcome consistent with OEH’s Interim Policy for assessing and offsetting biodiversity impacts for Part 3A/Major Projects.. i.e the are no impacts to red flag areas and all impacts are fully offset.

The above deficit of 222 ecosystem credits and 149 species credits has been addressed in the Final Biodiversity Offset as follows.

1. The additional 24.2ha of land added to create the Final Biodiversity Offset (**Figure 1-D**) will provide an additional 225 credits i.e. based on the Spotted Gum Vegetation Community generating an average of 9.33 credits per hectare. This effectively eliminates the deficit.
2. The addition of one *Tetratheca juncea* clump will slightly reduce the credit deficit for this species, however, in reality it can be expected that further *Tetratheca* plants will be located in the Final Biodiversity Offset. In the event the quarry extensions are approved, Metromix would commission further surveys of the Final Biodiversity Offset to locate further *Tetratheca juncea* clumps. As previously noted in the Response to Submissions (Pages 4 and 25), concerns regarding the viability of *Tetratheca juncea* have been allayed by the fact that over 50 000 *Tetratheca juncea* plant clumps are now managed for conservation across its range, a significant increase from the number of clumps recorded in the 2001 LMCC *Tetratheca juncea* plan. It is recognised that the increase in records is partly a product of the additional surveys that have been undertaken to identify more plant clumps. Given the very high likelihood of further surveys of the enlarged Final Biodiversity Offset locating further *Tetratheca juncea*, the small deficit would be removed. Hence, the Improve or Maintain requirement for *Tetratheca juncea* would be achieved.

## CONNECTIVITY OF PROPOSED BIODIVERSITY OFFSET

**Figure 1-E** displays the remnant native vegetation/regrowth within and adjoining the land leased by Metromix for its Teralba Quarry. It is noteworthy that the extraction areas within the Teralba Quarry have been intentionally positioned “in the middle” of the subject land north and south of Rhondda Road to limit visibility of the extraction areas and to maintain fauna corridors around the extraction areas. It is noted from **Figure 1-E** that substantial areas of remnant native vegetation/regrowth are present immediately to the south, west and north of the subject land. In most cases, the vegetation is continuous across the subject boundaries. **Figure 1-F** (Land

Ownership) identifies that this adjoining land is currently owned by coal companies to the north (Oceanic Coal, et al.), west (Mount Thorley Operations) and south – part (Centennial Coal) who could be expected to rely upon these areas of land for offsets for other activities in the area noting, however, that open cut coal mining is currently not permissible in Lake Macquarie Local Government Area.

The remaining land to the south is owned by Landcom who could be expected, as a State Government instrumentality, to be required to provide protection in perpetuity for a proportion of this land and/or use it for offsets for various State Government projects in the western Lake Macquarie area.

In light of the above, the proposed biodiversity offset on land leased by Metromix is considered to have good connectivity with the surrounding remnant vegetation.

## **PROTECTION OF THE BIODIVERSITY OFFSET AND ZONING**

Metromix has requested from Lake Macquarie City Council a copy of the draft LEP to be exhibited in late 2012, however, their request has been denied. Consequently, reliance can only be placed upon the current Local Environmental Plan (2004). It is noteworthy that the zoning of the land shown on LEP 2004 (**Figure 1-G**) was compiled in conjunction with Lake Macquarie City Council in 2002 and 2003 in recognition of the valuable conglomerate resources adjacent to the existing approved quarry, i.e. to the north and south. Further, through these discussions Metromix effectively surrendered sections of the land approved for extraction in 1964 to maintain a wildlife corridor around the extraction area. It is clearly no coincidence that the proposed extensions to Teralba Quarry fit neatly within Zone 9 (Natural Resources).

It is acknowledged that a considerable proportion (approximately 106ha) of the Final Biodiversity Offset (covering 142.6ha) is located on land zoned 7(2) (Conservation Secondary) and 7(3) (Environmental General). Whilst the zoning could be considered to provide some protection for the remnant vegetation/regrowth on the land within the biodiversity offset, the LEP 2004 and potentially the new LEP will not achieve the level of maintenance and management required to achieve the standard of biodiversity required for a biodiversity offset. It is also recognised that the current and proposed zoning will not prevent the development in the future of the area for uses other than extractive industries that may require the clearing of part of the vegetation on the land leased by Metromix.

## **TITLE COVENANT FOR BIODIVERSITY OFFSET STRATEGY**

Metromix proposes to arrange for a Section 88B covenant on the title of the subject land under the *Conveyancing Act 1919* to protect the Final Biodiversity Offset in perpetuity. Metromix's commitment for this covenant is included as Commitment 52 (see **Annexure 7** – Part 5 – see Page A9-7).

5. Rehabilitation and Biodiversity Offset Management			
Create a stable final landform able to support a range of final land uses focused upon ecological corridors and ongoing industrial uses.	5.1	Retain 142.6ha of existing vegetation and remnant understorey vegetation as a legally protected biodiversity offset.	In perpetuity.
Maintenance of long term ecological values within the Final Biodiversity Offset.	5.2	Ensure that 142.6ha of retained vegetation within the Biodiversity Offset is legally protected through a Section 88B covenant under the <i>Conveyancing Act 1919</i> and managed within the property.	Title covenant and purchase of the land is completed within 12 months of the receipt of project approval.

The owner of the land leased by Metromix, i.e. the Trust for A. C. Fowkes, has already accepted that the section of the land leased to Metromix needs to be set aside for the conservation of biodiversity on the subject land. Metromix is currently negotiating with the trustees of the subject land for a written agreement to the Final Biodiversity Offset displayed on **Figure 1-D**. Metromix has also commenced negotiations with the trustees to purchase the land.

### IN PERPETUITY FUNDING FOR THE MANAGEMENT OF THE BIODIVERSITY OFFSET

Metromix recognises that, in order for the Final Biodiversity Offset to be retained in perpetuity in a state that retains its biodiversity values, a fund needs to be established for its management beyond Metromix's involvement in the quarry – currently planned to approximately 2042. Metromix commissioned Eco Logical Australia to assist the Company to outline the management requirements and calculate the funding required for the in perpetuity management of the Final Biodiversity Offset (in accordance with the Biobanking in perpetuity management calculator tool). **Attachment 3** presents the calculation worksheet based on the OEH Worksheet which identifies the in perpetuity funds required would be approximately \$1.56 million, i.e. assuming a 5% rate of return. These funds provide for management of feral animals, weed control, periodic ecological burns (if required), access control (fence/gate maintenance, restoration of easement areas and other modified areas (but not quarry rehabilitation), annual reporting on implementation of management actions,

It is not economically possible for a company such as Metromix producing construction materials to put forward substantial funds in Year 1 as required under a Biobanking Agreement nominated by OEH. Metromix instead proposes that, during the operational life of the quarry (currently estimated at 30 years), it would maintain the biodiversity values within the Final Biodiversity Area through a program of fencing, weed and feral animal management consistent with the management undertaken by the Company over the past 20 years. The results of the biodiversity management would be recorded in each Annual Review. During the operational life of the quarry, Metromix proposes to establish a fund managed by the Company that enables approximately 10 cents per tonne to be set aside to allow the in-perpetuity funding nominated in **Attachment 3** to be accumulated annually throughout a period of 25 years, i.e. five years prior to the cessation of quarry-related activities.

Metromix would provide to the Department of Planning and Infrastructure, as part of its Annual Review, the status of the accumulated funds for this in-perpetuity funding.

Should the Department of Planning and Infrastructure consider it necessary, a bank guarantee could be arranged to provide for the shortfall of funds for the Final Biodiversity Offset management, commensurate with the extent of land clearance at any time throughout the life of the quarry. It is noteworthy that the eastern section of the Southern Extension is not to be cleared until approximately Years 22 to 24. Hence, the full allocation of the nominated funding would not be required until about Year 24.

## **RESPONSE TO DP&I QUESTIONS DATED 3 JULY 2012**

The following responses are provided to the questions provided by Colin Philips on 3 July 2012. It is noted that these questions have been answered, where appropriate, based upon the Final Biodiversity Offset (**Figure 1-D**).

1. How many hectares of the proposed BOS consist of rehabilitated lands? (Page 1-20 of the EA indicates 10.7 ha as being rehabilitated since 1992, but not all of these lands are included in the proposed BOS).

**Response:**

*7.64ha of the 10.7ha of the rehabilitated land within the Project Site is incorporated in the Final Biodiversity Offset. It is noteworthy that this area has already (after 18 years) attracted a high level of ecosystem credits reflecting the regular maintenance of this land the quality of the rehabilitation.*

2. How many hectares of the proposed BOS do not currently benefit from an "Environmental Protection" (7(2) or 7(3)) zoning under the Lake Macquarie LEP 2004?

**Response:**

*Figure 1-G reproduces the relevant section of LMCC LEP 2004 superimposed with the Final Biodiversity Offset to display the areas of the offset within Zones 7(2) and 7(3). In total, approximately 36ha or 25% of the Final Biodiversity Offset are not located within Zones 7(2) and 7(3).*

3. Page 5-50 of the EA indicates that "Data was collected in a Biometric format suitable for application of the bio banking methodology" and goes on to indicate that the data is presented in Kendall (2011). Can you direct me to this data in Kendall?



**Response:**

*The reference to Kendall (2011) was unfortunately incorrect. The reference should have been to Idyll Spaces (2011) i.e. Part 4 of the Specialist Consultant Studies Compendium. It is noted that the data collected by Idyll Spaces and included in Appendix 2 of that document was used (together with additional data collected by Eco Logical Australia) in the BBAM assessment included as Attachment 2 of this document.*

4. Has a Biobanking Assessment Methodology of the proposed BOS, or other BOS for the site, been undertaken?

**Response:**

*Yes – see Attachment 2.*

5. Comparison of Figure A2 on page 5 of the RTS with Figure 5.12 of the EA identifies some differences in the proposed BOS boundaries in the vicinity of the northern/mid extraction area. I believe the stated area remains at 118ha. Could you clarify this matter please?

**Response:**

*Metromix proposes to rely upon the Final Biodiversity Offset shown on Figure 1-D. Hence, consideration of differences with earlier figures is not required.*

6. Is it still proposed to install nest boxes suitable for the Little Lorikeet in an area of land that now seems not to be included in the proposed BOS?

**Response:**

*Yes – All nest boxes will be included within the Final Biodiversity Offset.*

7. Does Mr A. C. Fowkes own the land on which the BOS is proposed to be established?

**Response:**

*Mr Fowkes has recently died and the subject land is now being managed by trustees for the estate of Mr Fowkes. Metromix has commenced negotiations with the trustees to purchase the land.*

8. What form of protection is proposed for the BOS lands? e.g. VCA? hand over to NPWS?

**Response:**

*Response: Section 88B covenant under the Conveying Act 1919.*

9. Has Metromix received the feedback it was awaiting from neighbouring coal companies about the potential of integration of offset strategies? (see page 5-51 of the EA).

**Response:**

*Yes – Metromix has received feedback from the adjoining coal companies. Only one, westside, has a conservation agreement in place covering the area on **Figure I-H**. It is noteworthy that the three sections of the land which is the subject of the agreement are separated by distances of 750m to 1 550m and could not be readily integrated into.*

*The adjoining landholders have not yet made commitments regarding the vegetated land on their properties. Notwithstanding this, Metromix is supportive of an ongoing cooperative arrangement with these companies (and Landcom) to manage the vegetation in the area in a coordinated manner, particularly in close proximity to its boundaries the offset created by Metromix.*

**CONCLUSION**

Metromix has now established that the amended biodiversity offset covering 142.6ha is a suitable biodiversity offset for the proposed clearance of native vegetation on the land currently leased for the Teralba Quarry as it will effectively satisfy the Improve or Maintain requirement of OEH's interim policy. The nominated title covenant and regime for in-perpetuity funding for the biodiversity offset is considered appropriate and achievable for the Project.

Metromix would accept appropriate conditions on the project approval reflecting the above information.

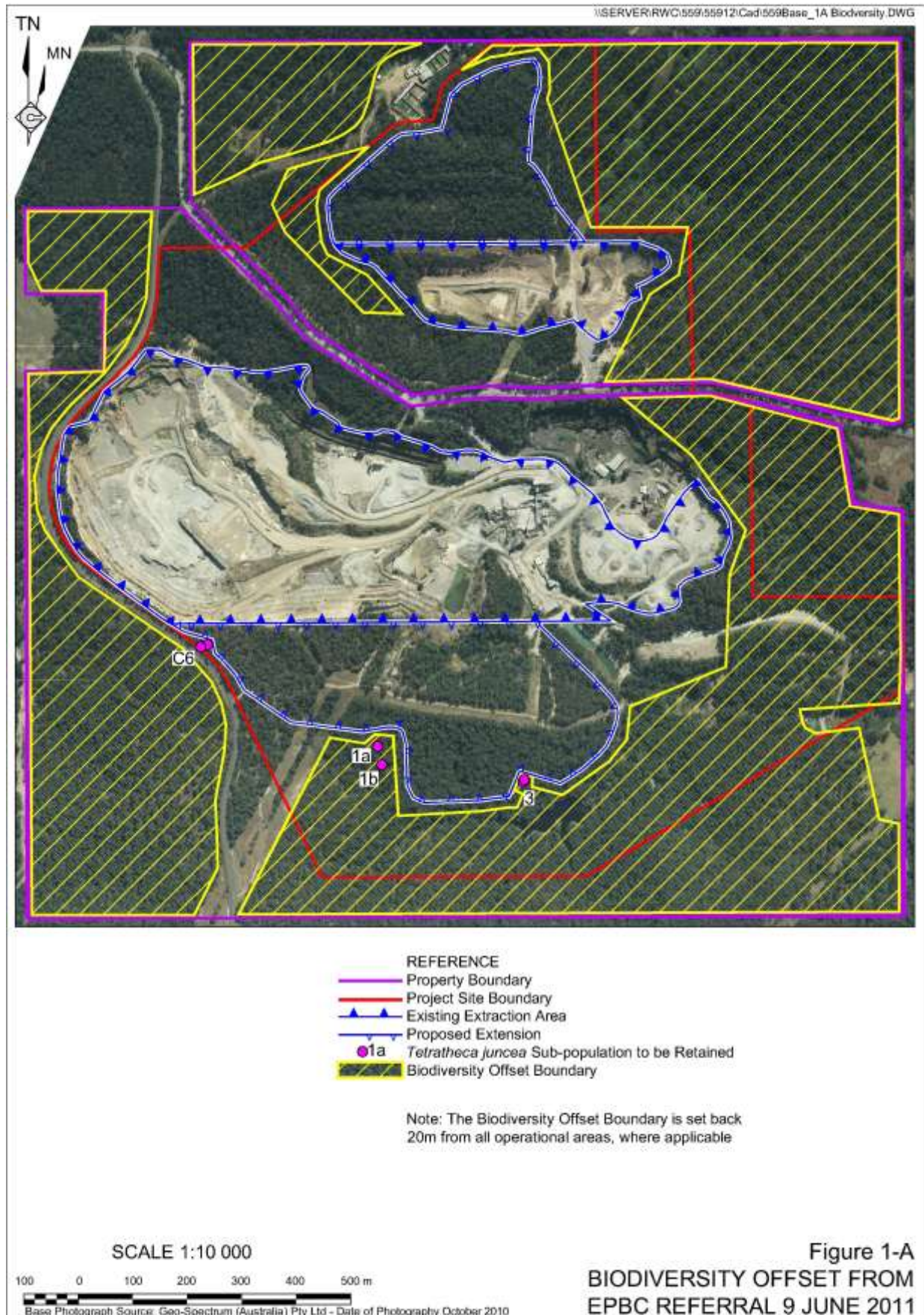
# **ATTACHMENT 1**

## **FIGURES**

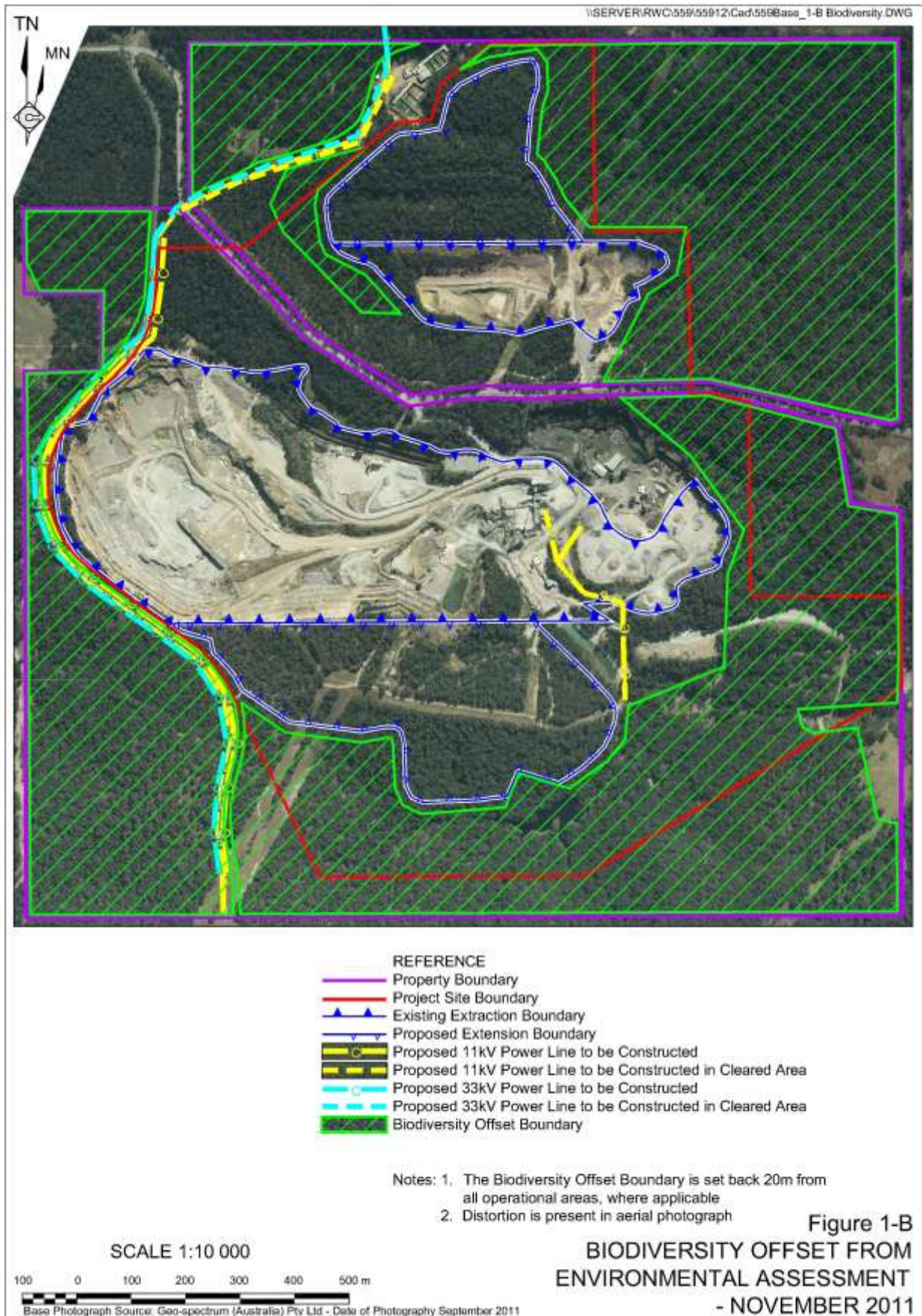
- Figure 1-A Biodiversity Offset from EPBC Referral – 9 June 2011
- Figure 1-B Biodiversity Offset from Environmental Assessment – November 2011
- Figure 1-C Modified Biodiversity Offset – Response to Submissions – June 2012
- Figure 1-D Final Biodiversity Offset – August 2012
- Figure 1-E Remnant Vegetation/Regrowth on Surrounding Properties
- Figure 1-F Land Ownership
- Figure 1-G LMCC LEP Zoning 2004
- Figure 1-H Westside Biodiversity Offset Areas

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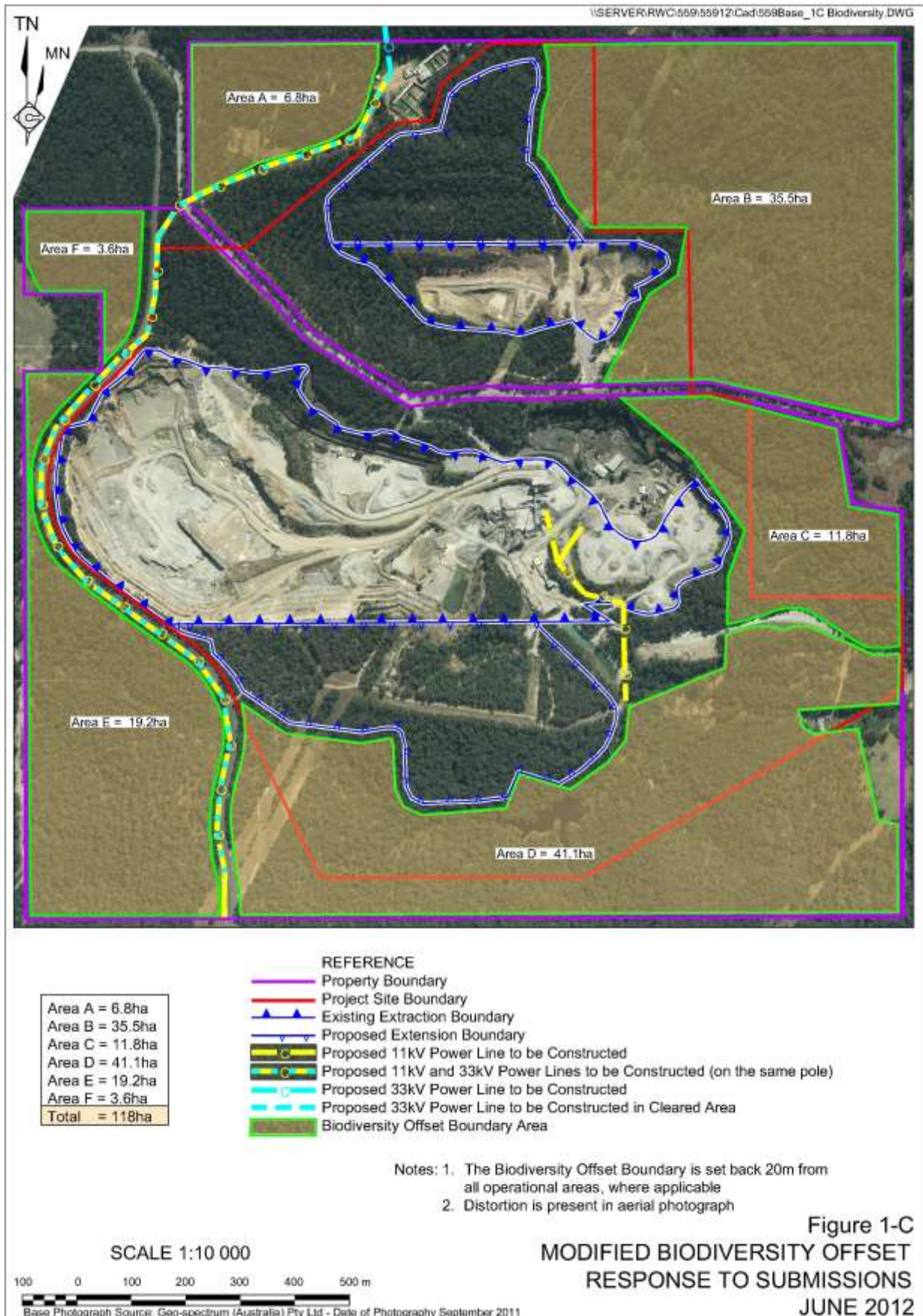




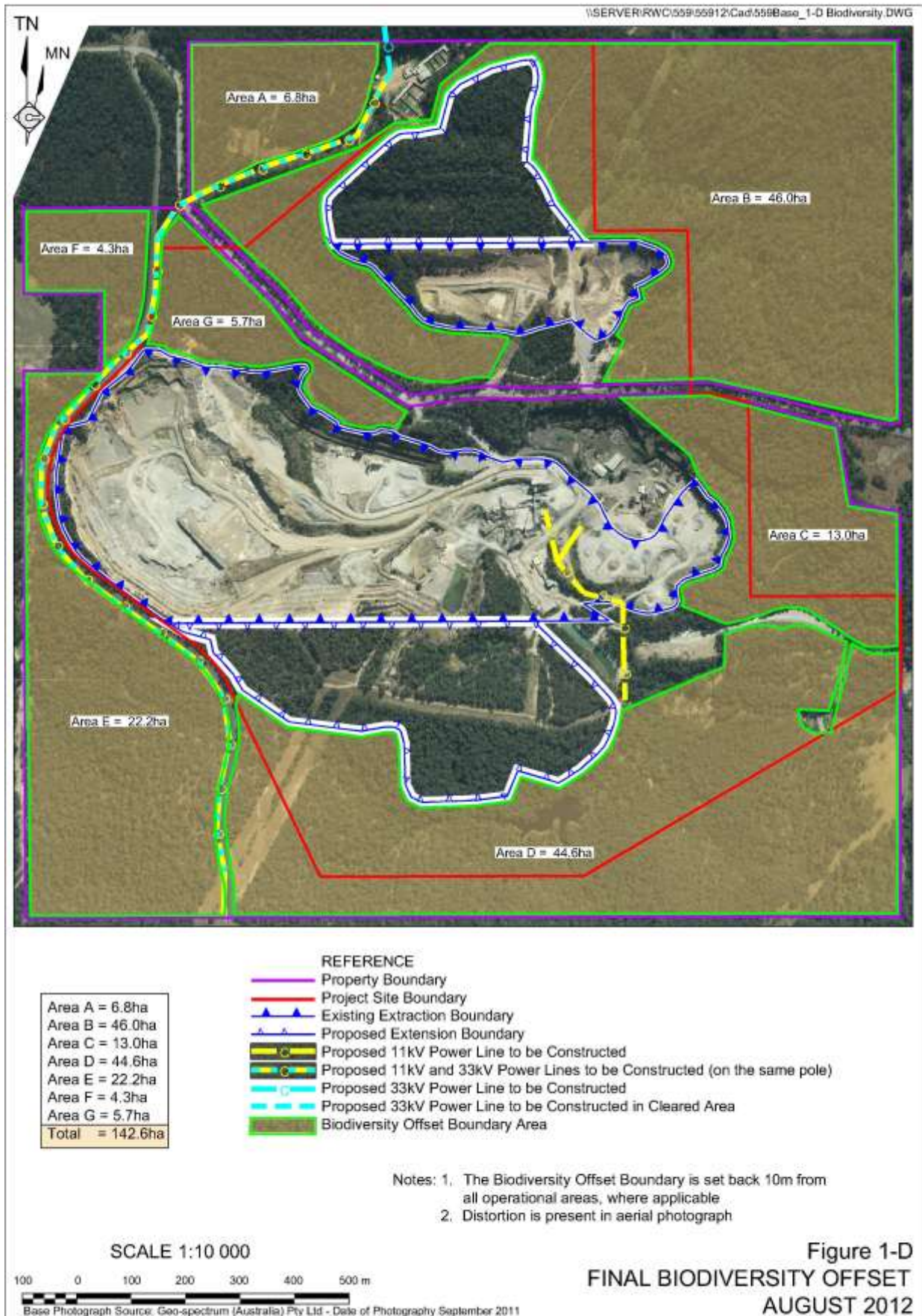








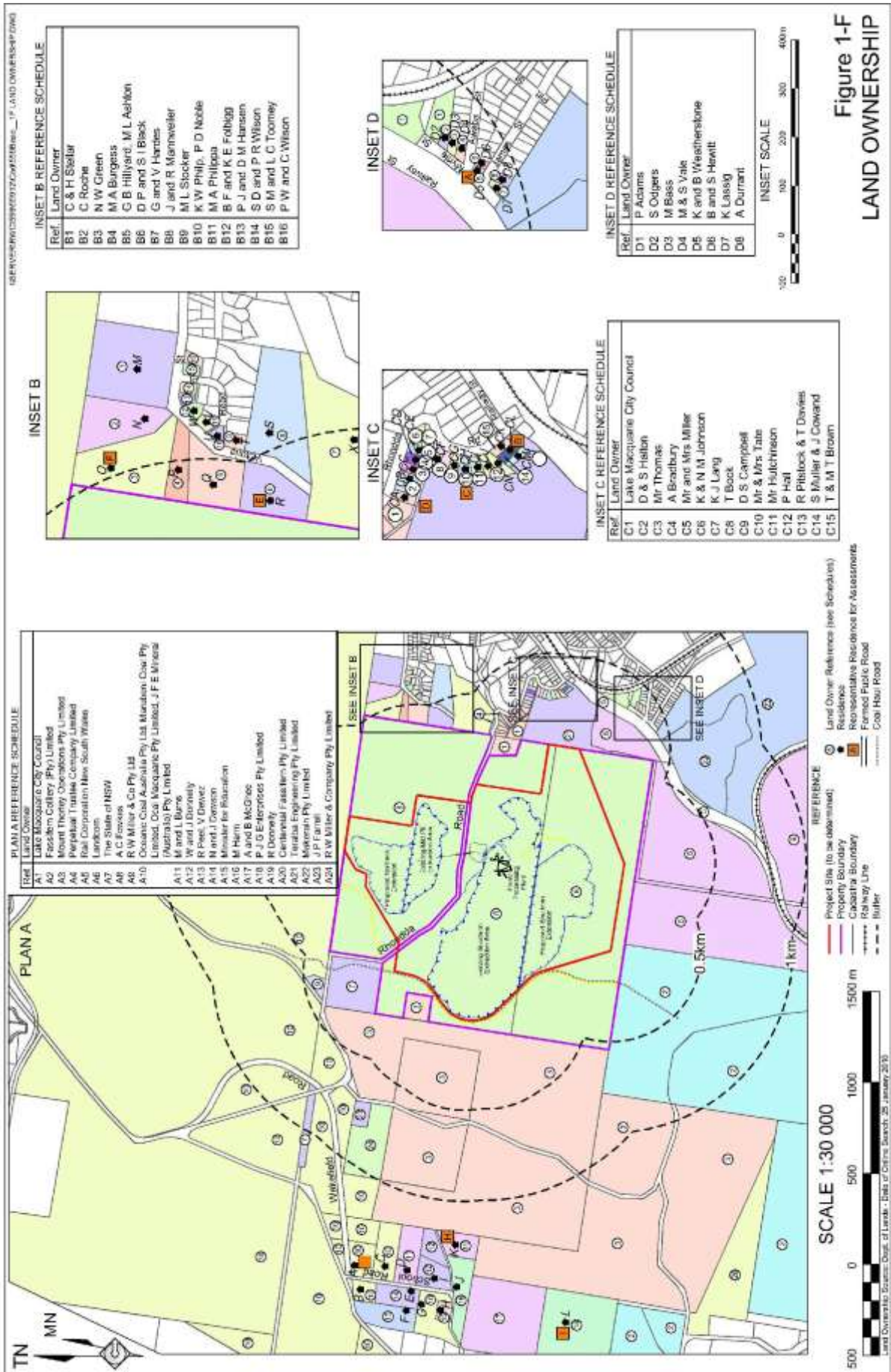




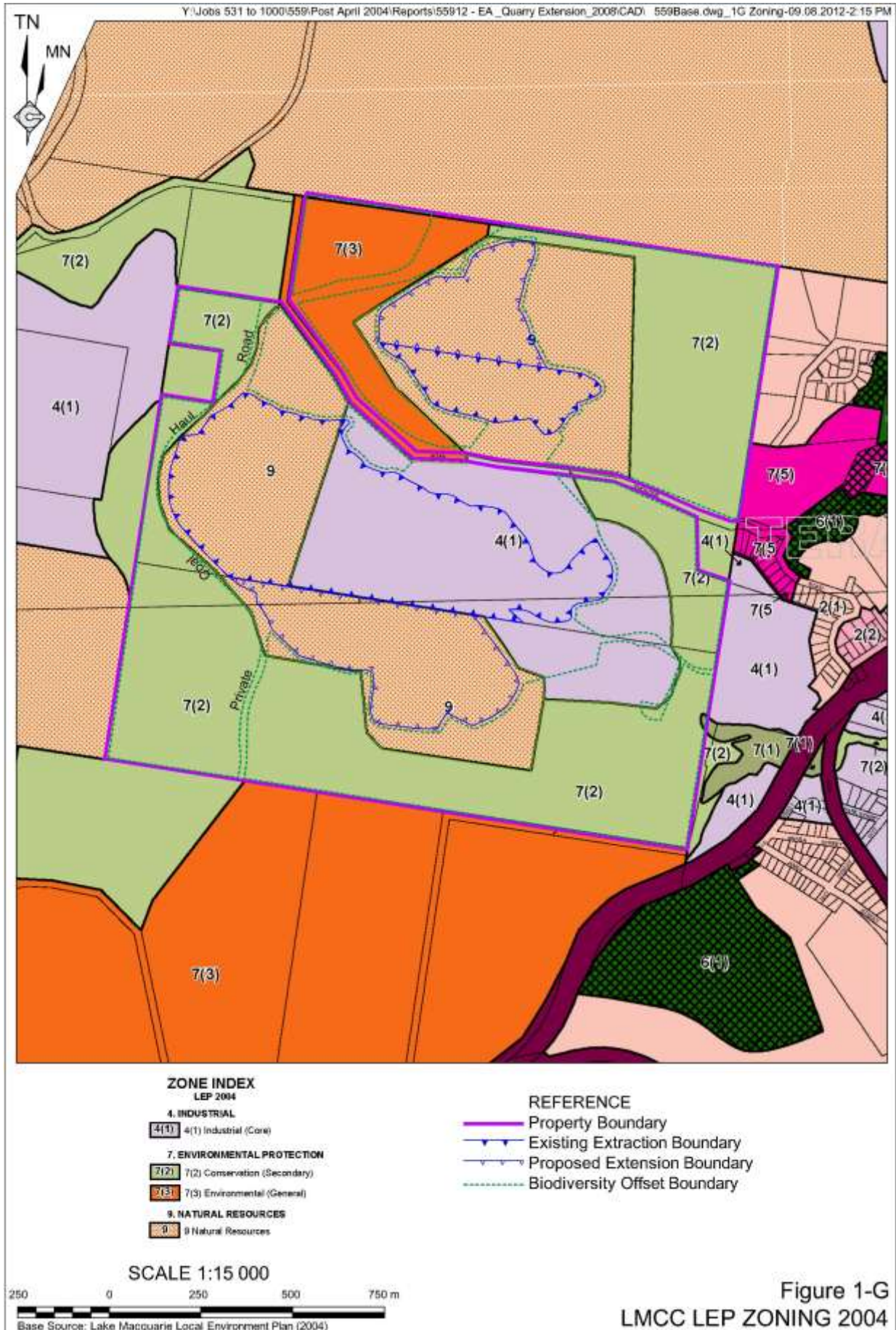




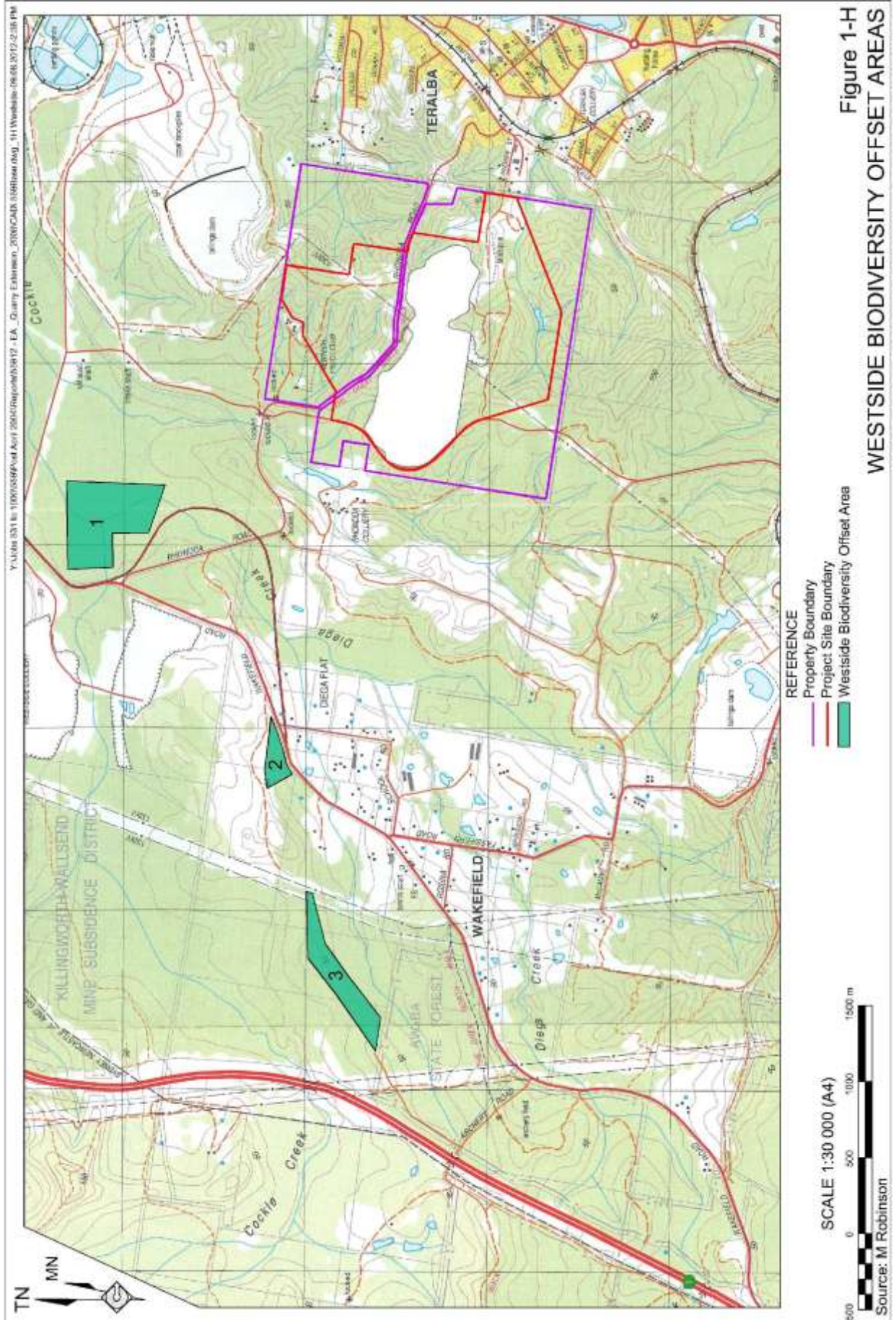












# **ATTACHMENT 2**

## **BIOBANKING CREDIT CALCULATOR**

*Prepared by*

*Eco Logical Australia Pty Ltd*

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## BioBanking Credit Calculator



### BioBanking credit report - Impact Area

This report identifies the number and type of credits required at a DEVELOPMENT SITE.

Date of report: 2/08/2012

Time: 12:13:27PM

Tool version: 2.0

#### Development details

**Proposal ID:** 0032/2012/0289D  
**Proposal name:** Teralba Development Assessment  
**Proposal address:** Rhondda Road Teralba NSW  
**Proponent name:** **Metromix Pty Ltd**  
**Proponent address:** Rhondda Road, Teralba NSW  
**Proponent phone:** 02 4950 6640  
**Assessor name:** Darren James  
**Assessor address:** PO Box 12 Sutherland NSW 1499  
**Assessor phone:** 8536 8618  
**Assessor accreditation:** 0032

#### Improving or maintaining biodiversity

An application for a red flag determination is required for the following red flag areas

Red flag	Reason
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The application for a red flag determination should address the criteria set out in the BioBanking Assessment Methodology. Please note that a biobanking statement cannot be issued unless the determination is approved.

#### Additional information required for approval:

- Change to percent cleared for a vegetation type/s
- Use of local benchmark
- Change negligible loss
- Expert report
- Predicted threatened species not on site
- Change threatened species response to gain (Tg value)

**Ecosystem credits summary - Impact Area**

Vegetation type	Area (ha)	Credits required	Red flag
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	23.01	1,652	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	1.79	58	No
<b>Total</b>	24.80	1,710	

**Credit profiles**

**1. Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin, (HU631)**

Number of ecosystem credits required	1,710
CMA sub-region	Wyang
Minimum percent native vegetation cover class	31-70%
Minimum adjacent remnant area class	>100 ha

Offset options - vegetation types	Offset options - CMA sub-regions
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin, (HU631)	Wyang
Broad-leaved Stringybark - Blakely's Red Gum grassy woodlands of the gorges and upper Hunter Valley, North Coast, (HU517)	Stanthorpe Plateau

**Species credits - Impact Area**

Common name	Scientific name	Extent of impact	Number of species credits required
Black-eyed Susan	Tetradlea juncea	75.00	1,103



## BioBanking Credit Calculator

### BioBanking credit report - Initial Offset Area



Office of  
Environment  
& Heritage

This report identifies the number and type of credits required at a BIOBANK SITE.

Date of report: 2/08/2012

Time: 12:48:53PM

Tool version: 2.0

#### Biobank details

**Proposal ID:** 0032/2012/0290B  
**Proposal name:** Teralba Biobank Assessment  
**Proposal address:** Rhondda Road Teralba NSW

**Proponent name:** **Metromix Pty Ltd**  
**Proponent address:** Rhondda Road, Teralba NSW  
**Proponent phone:** 02 4950 6640

**Assessor name:** Darren James  
**Assessor address:** PO Box 12 Sutherland NSW 1499  
**Assessor phone:** 8536 8618  
**Assessor accreditation:** 0032

#### Additional information required for approval:

- Use of local benchmark
- Expert report
- Change threatened species response to gain (Tg value)

**Ecosystem credits summary - Initial Offset Area (118ha)**

<b>Vegetation type</b>	<b>Area (ha)</b>	<b>Credits required</b>	<b>Red flag</b>
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	99.48	928	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	0.39	2	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	1.78	18	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	7.64	85	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	2.13	21	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	0.31	3	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	18.85	185	No
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	18.59	182	No
Smooth-barked Apple - Sydney Peppermint - Turpentine heathy open forest on plateaux areas of the southern Central Coast, Sydney Basin	3.56	25	No
Sydney Blue Gum - White Mahogany shrubby tall open forest of coastal ranges of the southern North Coast	3.53	39	No
<b>Total</b>	<b>156.26</b>	<b>1,488</b>	

**Credit profiles**

**1. Sydney Blue Gum - White Mahogany shrubby tall open forest of coastal ranges of the southern North Coast, (HU638)**

Number of ecosystem credits required	39
CMA sub-region	Wyong
Minimum percent native vegetation cover class	31-70%
Minimum adjacent remnant area class	>100 ha

**2. Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin, (HU631)**

Number of ecosystem credits required	367
CMA sub-region	Wyong
Minimum percent native vegetation cover class	31-70%
Minimum adjacent remnant area class	

**3. Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin, (HU631)**

**RESPONSE TO SUBMISSIONS**

*Report No. 559/20*

**METROMIX PTY LIMITED**

*Teralba Quarry Extensions*

*Response Date: August 2012*

Number of ecosystem credits required	1,057
CMA sub-region	Wyong
Minimum percent native vegetation cover class	31-70%
Minimum adjacent remnant area class	>100 ha

**4. Smooth-barked Apple - Sydney Peppermint - Turpentine heathy open forest on plateaux areas of the southern Central Coast, Sydney Basin, (HU622)**

Number of ecosystem credits required	25
CMA sub-region	Wyong
Minimum percent native vegetation cover class	31-70%
Minimum adjacent remnant area class	>100 ha



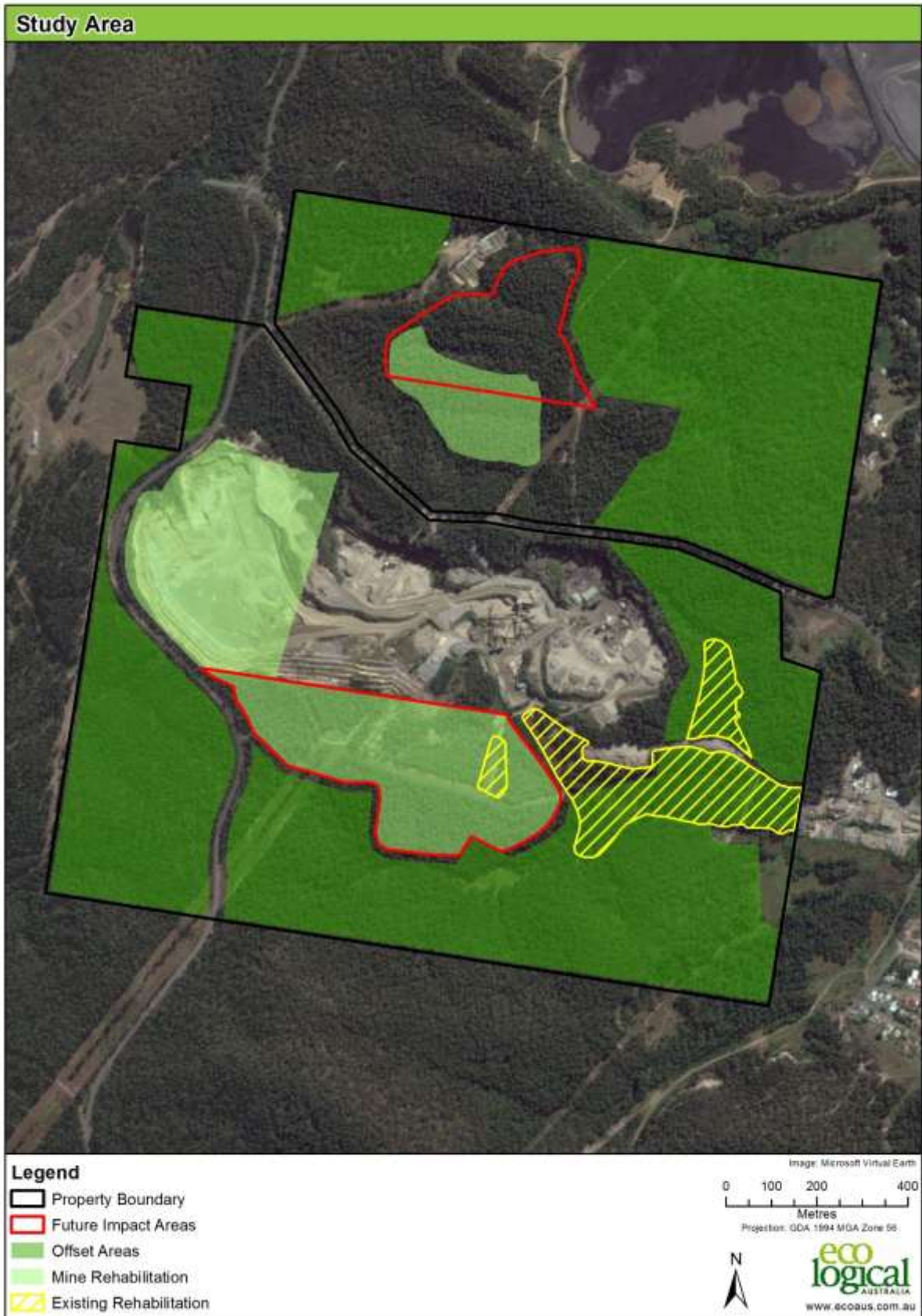
**Species credits - Initial Offset Area (118ha)**

Common name	Scientific name	Extent of impact	Number of species credits required
Black-eyed Susan	Tetratheca juncea	159.00	954

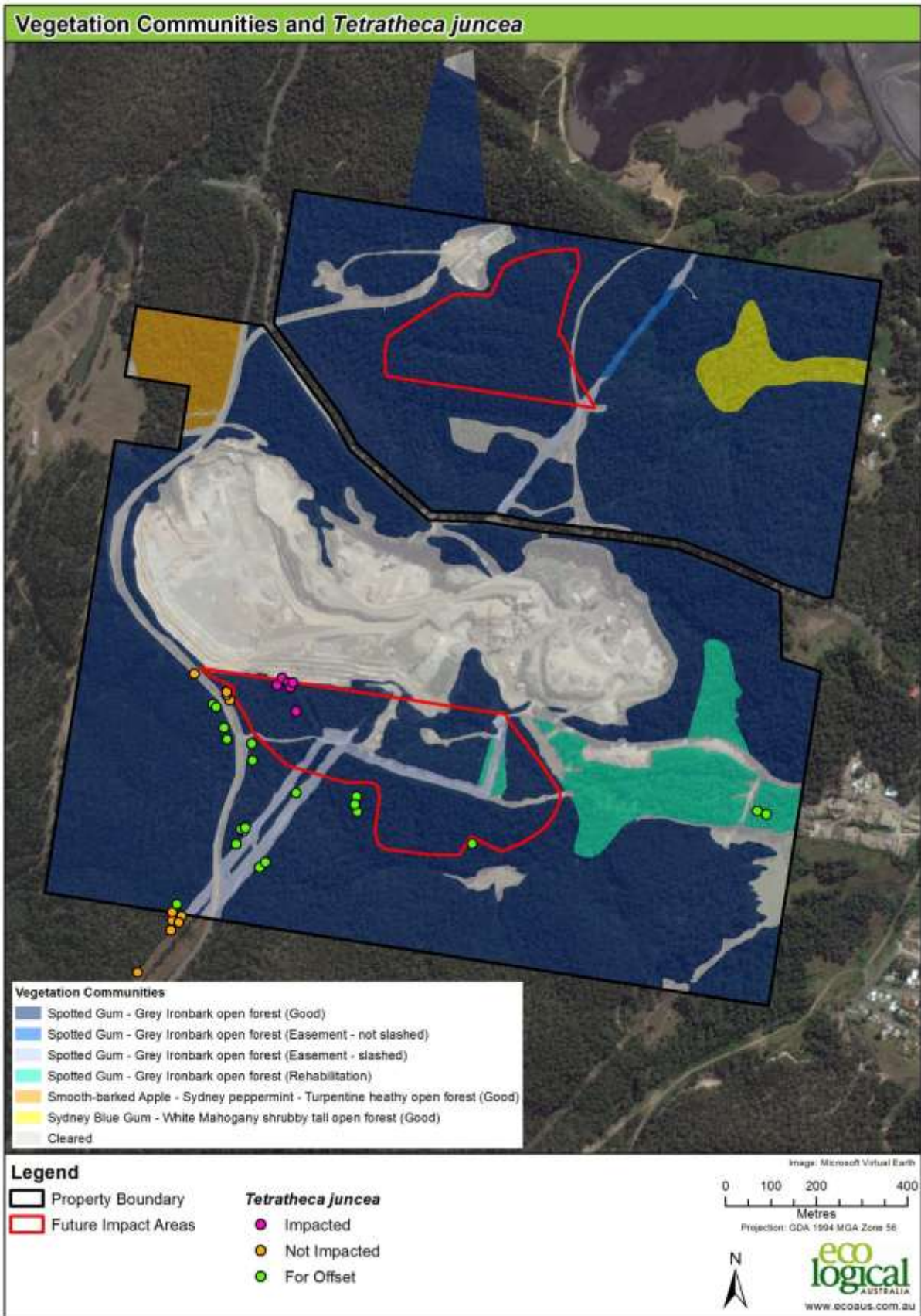
**Additional management actions**

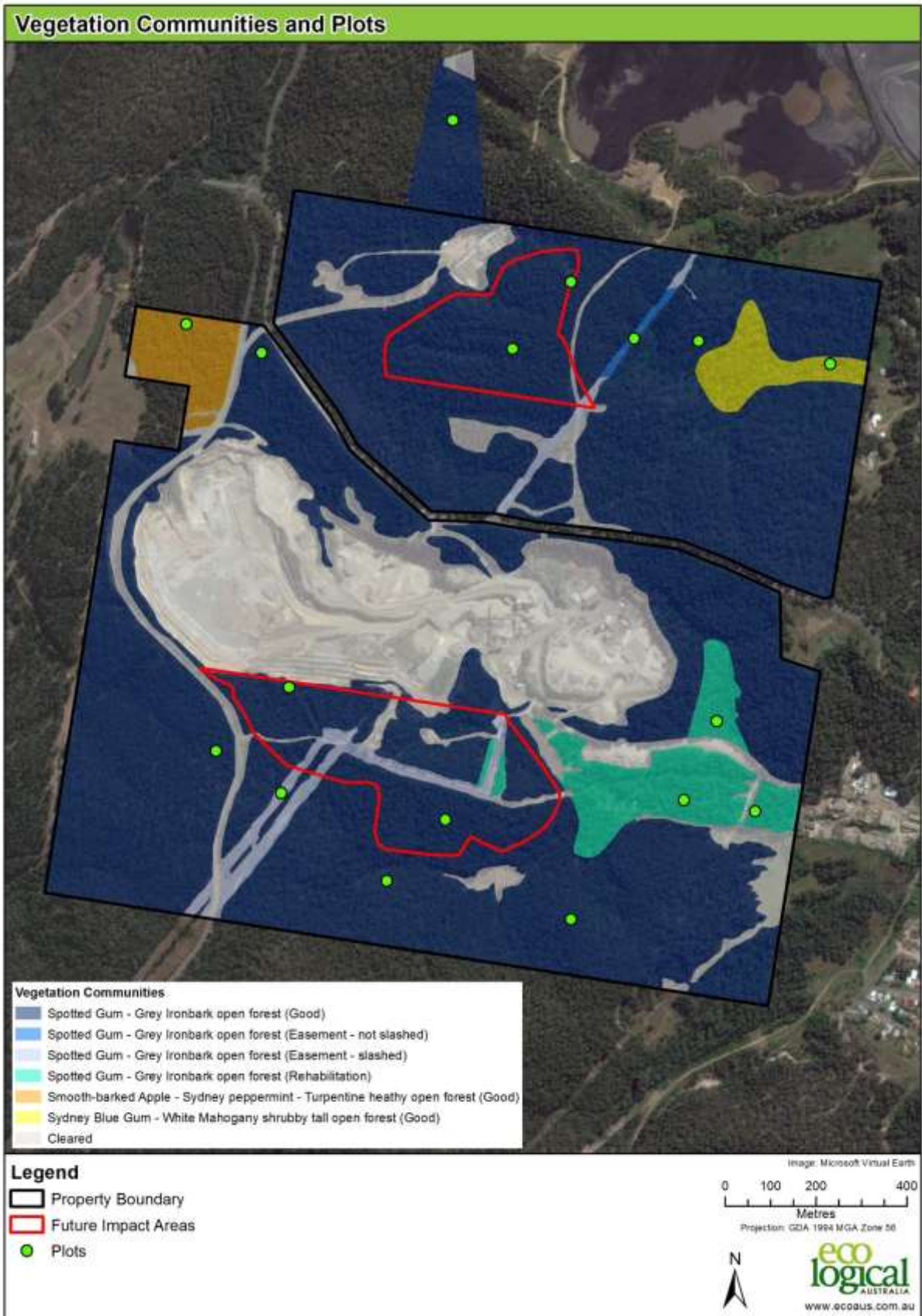
Additional management actions are required for:

Vegetation type or threatened species	Management action details
Smooth-barked Apple - Sydney Peppermint - Turpentine heathy open forest on plateaux areas of the southern Central Coast, Sydney Basin	Cat and/or Fox control
Smooth-barked Apple - Sydney Peppermint - Turpentine heathy open forest on plateaux areas of the southern Central Coast, Sydney Basin	Exclude miscellaneous feral species
Smooth-barked Apple - Sydney Peppermint - Turpentine heathy open forest on plateaux areas of the southern Central Coast, Sydney Basin	Feral and/or native herbivore control/ exclusion (eg rabbit, goats, deer etc)
Smooth-barked Apple - Sydney Peppermint - Turpentine heathy open forest on plateaux areas of the southern Central Coast, Sydney Basin	Maintain or reintroduce flow regimes (aquatic flora)
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	Cat and/or Fox control
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	Exclude miscellaneous feral species
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	Feral and/or native herbivore control/ exclusion (eg rabbit, goats, deer etc)
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	Maintain or reintroduce flow regimes (aquatic flora)
Sydney Blue Gum - White Mahogany shrubby tall open forest of coastal ranges of the southern North Coast	Cat and/or Fox control
Sydney Blue Gum - White Mahogany shrubby tall open forest of coastal ranges of the southern North Coast	Exclude miscellaneous feral species
Sydney Blue Gum - White Mahogany shrubby tall open forest of coastal ranges of the southern North Coast	Feral and/or native herbivore control/ exclusion (eg rabbit, goats, deer etc)
Sydney Blue Gum - White Mahogany shrubby tall open forest of coastal ranges of the southern North Coast	Maintain or reintroduce flow regimes (aquatic flora)

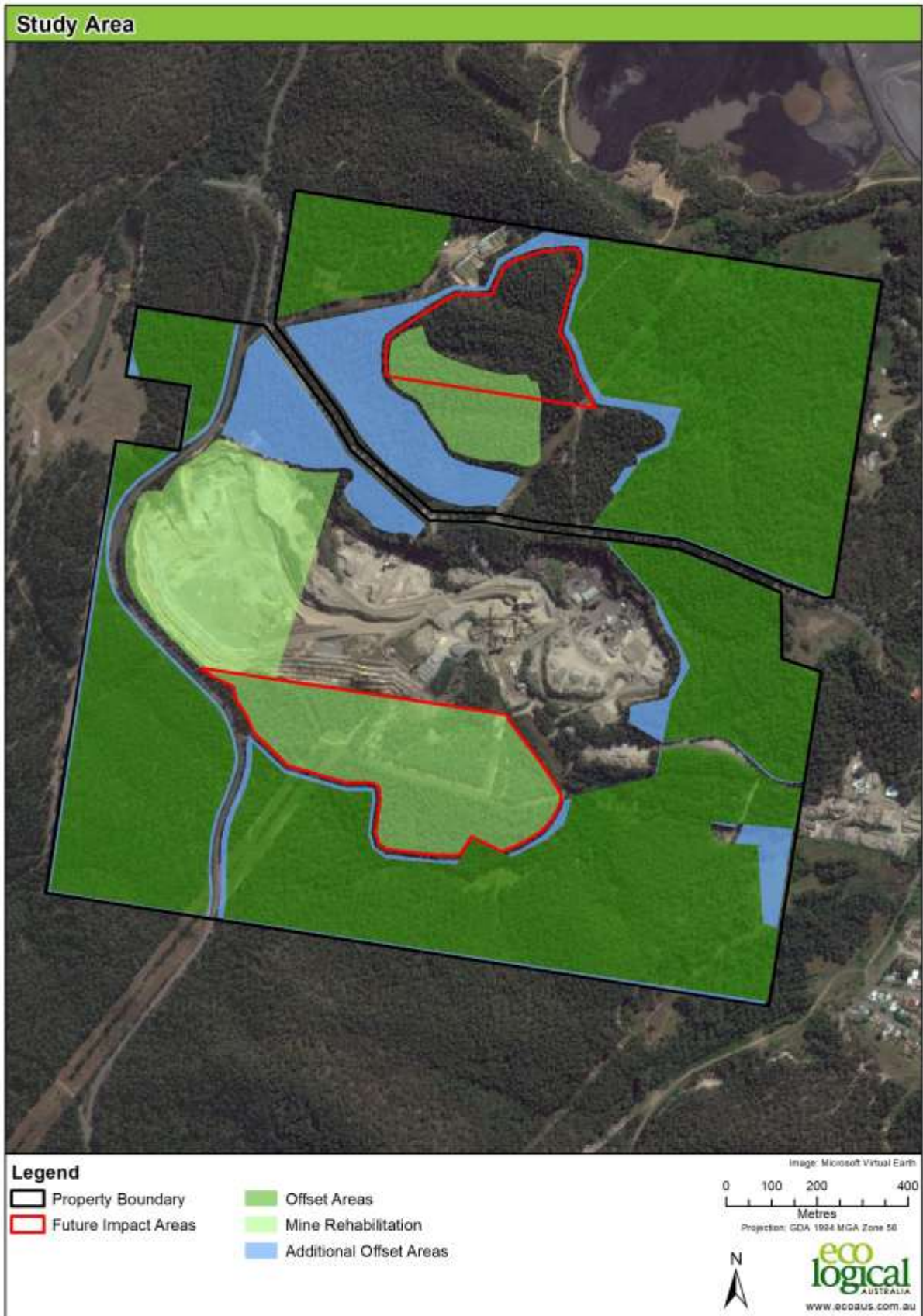














Biometric Vegetation type	Area Impacted (ha)	Plots (No./Req)	Credits Required	Credits Required per Hectare	Area of Rehabilitation (ha)	Mine Rehabilitation	Credits Generated per hectare	Credits Required After Mine Rehabilitation	Condition	Area for Offset (ha)	Plots (No./Req)	Offset Area	Credits Generated per hectare
Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	24.8	4/4	1710	69	37.44	367	10	1343	Good	99.48	6/5	928	9.33
									Existing Rehab Area	7.64	3/3	85	11.13
									Easement (Not slashed)	0.39	1/1	2	5.13
									Easement (slashed)	1.78	1/1	18	10.11
									Cleared	2.44		24	9.84
Smooth-barked Apple - Sydney Peppermint - Turpentine heathy open forest on plateaux areas of the southern Central Coast, Sydney Basin										3.56	1/2	25	7.02
Sydney Blue Gum - White Mahogany shrubby tall open forest of coastal ranges of the southern North Coast										3.53	1/2	39	11.05
										118.82	13/14	1121	9.43
<b>Scientific name</b>	<b>Common name</b>		<b>Credits Required</b>	<b>Credits Generated</b>									
Tetratheca juncea	Black-eyed Susan		1103	954									

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# **ATTACHMENT 3**

## **BIOBANKING CREDIT CALCULATOR**

*Prepared by*

*Eco Logical Australia Pty Ltd*

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