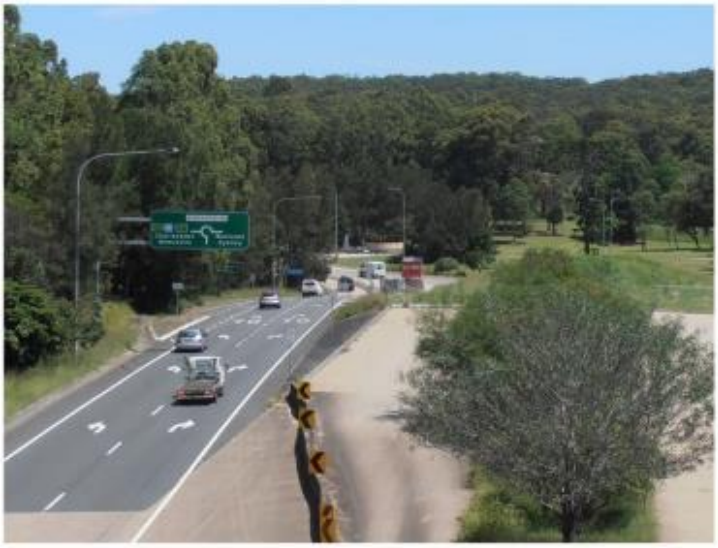

Aurecon Australasia Pty Ltd

Newcastle Inner City Bypass - Rankin Park to Jesmond
Biodiversity Offset Strategy

April 2018

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Appendices

Appendix A – Credit Report

1. Introduction

Roads and Maritime Services (Roads and Maritime) is seeking approval to construct the fifth section of the Newcastle Inner City Bypass between Rankin Park and Jesmond (the project). The approval is sought under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Newcastle Inner City Bypass is part of Roads and Maritimes' long-term strategy to provide an orbital road within Newcastle's road network to connect the Pacific Highway at Bennetts Green and the Pacific Highway at Sandgate.

In accordance with the requirements of the EP&A Act and EPBC Act, an environmental impact statement (EIS) was prepared by Roads and Maritime in November 2016 (*Newcastle Inner City Bypass – Rankin Park to Jesmond Environmental Impact Statement* (Roads and Maritime Services 2016) to assess the potential impacts of the project. The EIS was exhibited by the Department of Planning and Environment (DP&E) for 30 days from 16 November 2016 to 16 December 2016.

A Biodiversity Assessment Report (BAR) (GHD 2016a) was prepared to assess the potential impacts on the project on biodiversity to support the preparation of the EIS. A Biodiversity Offset Strategy (BOS) (GHD 2016b) was prepared which supports the BAR and outlines how the proponent intends to offset the impacts of the project.

Following exhibition of the EIS, receipt of submissions and further consultation with stakeholders a number of design refinements have been made to the project. These design refinements, in conjunction with adjustments to the vegetation mapping in the construction footprint, resulted in minor changes to the project's impact on biodiversity. As a result an updated BAR (GHD 2018) has been prepared. This BOS has been prepared in support of the updated BAR and follows the BOS format required by the Framework for Biodiversity Assessment (FBA) (OEH 2014).

2. Biodiversity credits

The credit calculator has been used in the BAR to determine the number and type of biodiversity credits required to offset impacts of the project. A copy of the biodiversity credit report is included in Appendix A. The BOS for the project would include the purchase and retirement of the following biodiversity credits as calculated in accordance with the FBA:

- 337 ecosystem credits for Blackbutt – Turpentine – Sydney Blue Gum mesic tall open forest on ranges of the Central Coast (HU782).
- 1182 ecosystem credits for Smooth-barked Apple – Red Bloodwood – Brown Stringybark – Hairpin Banksia heathy open forest of coastal lowlands (HU833).
- 228 ecosystem credits for Smooth-barked Apple –Turpentine –Sydney Peppermint heathy woodland on sandstone ranges of the Central Coast (HU841).
- 1098 ecosystem credits for Spotted Gum – Broad-leaved Mahogany – Grey Gum grass-shrub open forest on Coastal Lowlands of the Central Coast (HU804).
- 399 ecosystem credits for Spotted Gum – Red Ironbark –Grey Gum Shrub –grass open forest of the Lower Hunter (HU806).
- 12,690 species credits for Black-eyed Susan (*Tetratheca juncea*).

The above includes the number of species credits required to offset the impacts on threatened species and communities known or likely to occur in the construction footprint. Pre-clearing surveys to be carried out prior to construction, will confirm the number of threatened species (Black-eyed Susan clumps) impacted by the project and final credit requirements.

Biodiversity credits will be secured in accordance with the trading rules associated with the FBA. The project occurs across two IBRA subregions, these being Wyong and Lower Hunter. As the majority of the project occurs within the Wyong IBRA subregion, this was selected in the credit calculator. However, consultation with OEH (email dated 22 February 2017) confirmed credits can be secured from IBRA subregions that immediately adjoin both the Wyong and Lower Hunter IBRA subregions.

A BOS developed in accordance with the FBA will satisfy the biodiversity offsetting requirements of the EPBC Act and associated policies.

The BOS for the project aims to conserve an appropriate portion of land/s in a BioBanking agreement to suitably offset the impacts of the project.

3. Requirement to offset

This BOS documents the process for identifying and evaluating offset options that will be required for the project. Its describes several potential offset sites, including credit estimations for some of these sites. It sets out the pathway forward to securing and managing the final offset package.

Table 3-1 Offset requirements for the project

Plant Community Type (PCT)	Veg Type Code	Number of credits required
Ecosystem credits		
Smooth-barked Apple – Red Bloodwood –Brown Stringybark – hairpin Banksia heathy open forest of coastal lowlands	HU833	1182
Blackbutt – Turpentine – Sydney Blue Gum mesic tall open forest on ranges of the Central Coast	HU782	337
Spotted Gum –Red Ironbark – Grey Gum shrub-grass open forest of the Lower Hunter (EEC)	HU806	399
Spotted Gum – Broad-leaved Mahogany – Grey-gum grass –shrub open forest on Coastal Lowlands of the Central Coast	HU804	1098
Smooth-barked Apple – Turpentine – Sydney Peppermint heathy woodland on sandstone ranges of Central Coast	HU841	228
Species credits		
Black-eyed Susan (*Tetratheca juncea)*		12,690

4. Offset investigations

Under the FBA, ecosystem and species credit requirements identified for the project can be offset in a number of ways, including:

- Retiring credits via a BioBanking agreement
- Contributing money to supplementary measures
- Contributing money to a BioBanking fund

The BioBanking Fund has not been established and was not an option for this project at the time of writing. The Biodiversity Conservation Trust is currently establishing the Conservation Trust Fund in accordance with recent changes associated with the *Biodiversity Conservation Act 2016* (BC Act). The project was assessed using the FBA and associated trading rules which precludes this option at this stage. However, if the project can't secure all credits in accordance with the approach described in this BOS, the option of investment in the fund may be considered by Roads and Maritime in consultation with relevant approval authorities.

Where possible, the BOS will aim to match ecosystem and species credits on a 'like for like' basis through the retirement of biodiversity credits, in accordance with the credit profiles provided in the project's credit report (refer to Appendix A). Where this is not possible, the credit trading rules associated with FBA as applied to major projects can be used to source suitable credits and/ or supplementary measures will be investigated in consultation with the consent authority.

The results of GHD's investigation into credits currently available, and biobank sites that have commenced their BioBanking agreement assessments, indicates the project will be able to achieve the 'like for like' principle for many of the credit types requiring offsetting should Roads and Maritime secure the credits recommended in this BOS. This is the case for at least two of the vegetation types requiring offsetting, including the Lower Hunter Spotted Gum Ironbark Forest EEC.

The remaining three vegetation types will have a portion of the credits secured as 'like for like' and/ or will require the use of the trading rules. Details of the proposed credit trades are included in Table 4-1.

All credits for Black-eyed Susan (*Tetratheca juncea)* will be matched on a 'like for like' basis. The project will not be using supplementary measures.

The Biodiversity Offsets Policy for Major Projects (OEH, 2014) outlines four key steps (refer to Table 4-1) that are to be considered by the proponent before the project can use the variation to the trading rules associated with major projects. The following table summarises the process carried out to date to secure offsets for the project.

Table 4-1 Reasonable steps to secure offsets

Reasonable steps	Record of action taken
1. Check the BioBanking public register and place an expression of interest for credits wanted on it for at least six months	• GHD has undertaken a detailed review of properties currently available on the BioBanking public register for properties that meet the offsetting and biodiversity credit requirements of the project. • GHD has reviewed the expression of interest (EOI) website associated with the BioBanking public register to determine if any properties listed would have the potential to provide suitable biodiversity credits for the project. • Roads and Maritime Services also listed the project's likely credit requirements on the EOI website for a period of over six (6) months.
2. Liaise with an OEH office and relevant local councils to obtain a list of potential sites that meet the requirements for offsetting	• GHD has contacted relevant local officers from the OEH to identify any potential property owners who may be interested in placing their property under a BioBanking agreement. The OEH indicated the only properties they were aware of were already being considered by GHD for the project and that BioBanking assessments had commenced. GHD have also carried out a detailed review of potentially suitable properties in the region for the establishment of a biobank site, using broad scale vegetation mapping (LHCCREMS 2006) and aerial photography. The project is somewhat unique as it contains the eastern most distribution of the Lower Hunter Spotted Gum Ironbark Forest EEC as well as vegetation types influenced by sandstone. The analysis of the LHCCREMS suggested several properties would need to be purchased and secured via a BioBanking agreement to provide the necessary ecosystem credits for the project. This analysis also does not provide any information regarding the likely occurrence of *Tetratheca juncea* or otherwise. The project contains a significant number of *Tetratheca juncea* species credits and it would be ideal if these credits could be sourced from a site which could also provide some of the ecosystem credits required. • Additionally, GHD have identified a number of privately owned properties in the region which GHD and/or other consultancies have previously, or are currently preparing BioBanking Assessments for, which would be suitable for utilisation as a project biobank site/s and these have been included in our proposed credit trade approach accordingly.

Reasonable steps	Record of action taken
3. Consider properties for sale in the required area	• GHD completed a review of properties listed for sale within the Hunter and surrounding areas. It was determined that there was no suitable property for sale and that several properties would need to be purchased to satisfy the project's offset requirements. As mentioned, the project site is unique in that it contains the eastern most distribution of Lower Hunter Spotted Gum Ironbark EEC.
4. Provide evidence of why offset sites are not feasible; suitable evidence may include: the unwillingness of a landowner to sell or establish a biobank site.	• Given the availability of credits that are generally suitable for the project, the identification, purchase and establishment of additional biobank sites would be cost prohibitive in comparison to purchasing credits. • The nature of linear infrastructure means that impacts are often associated with many different vegetation types which is the case with the project. This makes securing all ecosystems on a 'like for like' basis a difficult exercise. Achieving this would require the purchase of additional properties and/or sourcing additional potential biobank site owners, further increasing the costs associated with securing the offsets. This is considered unnecessary considering the trading options identified. • The size of the project's impacts mean that large land holdings would be required for at least two of the vegetation types. A review of the properties for sale indicated there was no suitable properties available for sale of a sufficient size in the location where these vegetation types occur. • The need for a large quantity of *Tetratheca juncea* credits also adds a further layer of complexity associated with finding suitable offset sites. The project team has identified a suitable site during preparation of this BAR and the landowner has since completed and lodged a BioBanking agreement application with the OEH. It is likely that finding properties with the minimum number of *Tetratheca juncea* required would be difficult and may result in the purchase of several properties to offset this matter.

If insufficient credits are found, Roads and Maritime may be able to apply the FBA variation rules, which state that the consent authority may approve:

a. *A variation of the offset rules for matching ecosystem credits by allowing ecosystem credits created for a PCT for the same vegetation formation as the PCT to which the required ecosystem credit relates to be proposed as an offset, or*

b. *A supplementary measure to be proposed as an offset for the PCT where the PCT is associated with an EEC or CEEC, or*

c. *A variation of the offset rules for matching specie credits by allowing a different species to that impacted by the proposed development to be used to meet the offset requirement, or*

d. *A supplementary measure to be proposed as an offset for the species impacted by the development.*

As mentioned, the majority of the credit trades will occur within the ‘like for like’ parameters associated with the FBA. However, trades associated with three vegetation types (Smooth-barked apple Red bloodwood - Brown Stringybark (HU833), Smooth-barked apple - Turpentine - Syd Peppermint heathy woodland (HU841) and Blackbutt - Turpentine - Sydney Blue Gum mesic tall open forest (HU782)) will have only a portion of the credits secured on a ‘like for like’ basis and/or will require use of the variation to trading rules. These vegetation types are not associated with an EEC or CEEC.

5. Offset site identification

Based on preliminary estimation of the offset requirement, investigations into potential offset sites began early in the planning and assessment process. Initial investigations were focused on established biobank sites containing credits that are currently available on the open market. This review indicated there were seven existing biobanks sites with the potential to provide credits for the project.

Regional vegetation mapping (LHCCREMS 2006) and relevant literature were then used to identify potential offset sites. Roads and Maritime were also consulted to identify potential properties in their ownership likely to contain suitable credits. Roads and Maritime identified a site owned in the Lower Hunter which is likely to contain suitable credits, preliminary surveys and reporting has been carried out and is currently in review.

A total of eight separate biobank sites have been identified to provide biodiversity credits for this project as summarised in Table 5-1.

Table 5-1 Table Biobank site summary

Site number	Brief description	Suitable vegetation types	Approximate area
1	An existing biobank site dominated by Spotted Gum Grey Ironbark Forest with Tallowwood - Brush Box - Sydney Blue Gum moist shrubby forest associated with moist gullies.	HU804	280 ha
2	An existing biobank site containing a mix of coastal vegetation types through to Spotted Gum - Grey Ironbark forest, Smooth-barked Apple - Red Bloodwood open forest and Tallowwood - Small-fruited Grey Gum dry grassy open forest.	HU833	240 ha
3	An existing biobank site dominated by Spotted Gum - Red Ironbark - Grey Gum shrub grass open forest (EEC).	HU806	48 ha
4	An existing biobank site. The site contains a mix of vegetation types associated with estuarine environments through to Red Bloodwood – Smooth-barked Apple heathy woodland and Spotted Gum Broad-leaved Mahogany Red Ironbark shrubby open forest. The site also contains a large number of *Tetratheca juncea*.	HU861	37.8 ha
5	An existing biobank site that borders site 4. The site contains a mix of vegetation types associated with estuarine environments through to Red Bloodwood – Smooth-barked Apple heathy woodland and Spotted Gum Broad-leaved Mahogany Red Ironbark shrubby open forest. The site also contains a large number of *Tetratheca juncea*.	HU793, HU804, HU861	81.5 ha
6	An existing biobank site dominated by Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter (EEC) and includes a small patch of Forest Red Gum grassy open forest on floodplains of the lower Hunter (EEC).	HU806	64.5 ha

Site number	Brief description	Suitable vegetation types	Approximate area
7	An existing biobank dominated by Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest. The site also include large patches of Grey Ironbark - Broad-leaved Mahogany - Forest Red Gum shrubby open forest on Coastal Lowlands of the Central Coast and White Mahogany - Spotted Gum - Grey Myrtle semi-mesic shrubby open forest of the central and lower Hunter Valley and a small patch of Sandpaper Fig - Whalebone Tree warm temperate rainforest.	HU804	241.1 ha
8	A site currently owned by Roads and Maritime which has lodged a BioBanking agreement application and is being reviewed for approval by the OEH. The site contains a mix of Smooth-barked Apple open forest and associated communities.	HU838, HU839, HU895.	20 ha

6. Proposed credit trades

The analysis of potential biobank sites available and potential biobank site owners who had expressed an interest in establishing a biobank site has enabled the project to consider the credit trades outlined in Table 6-1 as the preferred approach to offsetting the projects income. Roads and Maritime will now undertake a process to secure the credits required via entering into 'take up' agreements or similar with the relevant biobank site owners and to complete the establishment of the biobank site (Site 8) on lands they currently own. The agreements would include a provision to purchase the credits required from the BioBanking scheme before clearing commences, where possible. With regard to the Roads and Maritime biobank site, OEH is currently assessing the BioBanking application and the likely timing of its approval is unknown.

The trades proposed have sought to match directly "like tor like" or with a PCT permitted by the BioBanking credit report where possible. This approach has led to two of the vegetation types being impacted by the project (HU804 and HU806) being offset via a direct match or direct trade permitted under the BioBanking credit calculator results. This includes a direct trade for the only endangered ecological community (HU806) being impacted by the project.

The vegetation type, HU833, will be partially offset via a direct match and permitted trades. A portion of the offsets for HU833 will use the variation to the trading rules by trading with a PCT in the same formation with the same or greater percentage cleared. After the application of the variation to the trading rules there was still a shortfall of 288 credits for HU833. The project proposes to deliver a tier 3 supplementary measure in accordance with the NSW Biodiversity Offsets Policy for Major Projects (2014) to account for this shortfall. A tier 3 supplementary measure is an investment in 'actions that benefit threatened entities in the locality where the impact occurs'. In this case, the project will purchase and retire HU806 credits from the Hunter IBRA subregion as this PCT is a listed endangered ecological community in the subregion.

The remaining credit trades have used the variation to the trading rules by trading with a PCT in the same formation with the same or greater percentage cleared. This approach was necessary as suitable credits are not currently available on the open market and, based on existing information, won't be available within the time frame required for the projects approval. The use of this variation has led to a portion of HU782 and HU841 being offset with different PCTs. These vegetation types are not considered to be over cleared vegetation types in the catchment management authority (CMA) or endangered ecological communities.

The final trade for Black-eyed Susan (*Tetratheca juncea)* species credits is a direct match.

Table 6-1 Proposed credit trades

Vegetation type	Impact area (ha)	Credits required	Biobank site ID number	Credits available	Credit type being traded	Trading rules used
Smooth-barked apple Red bloodwood - Brown Stringybark (HU833)	19.1	1182	Site 2 (biobank approved)	279	HU833	Purchase and retire 279 credits (this portion of the credits required is a direct match)
			Site 5 (biobank approved)	293	HU861	Purchase and retire 293 credits (this trade uses the variation rules by trading with a PCT within the same formation with a higher percentage cleared)
			Site 5 (biobank approved)	42	HU793	Purchase and retire 42 credits (this trade uses the variation rules by trading with a PCT within the same formation with approx. the same percentage cleared)
			Site 8 (biobank assessment submitted for approval by OEH)	270	HU838, HU839 and HU895	Retire 270 credits (HU839 permitted trade from credit report. HU838 and HU895 trades uses the variation rules by trading with a PCT within the same formation and class with approx. the same percentage cleared)
			Site 6 (biobank approved)	298	HU806	Tier 3 investment under Supplementary measures - action to benefit threatened entity in locality
Smooth-barked apple - Turpentine - Syd Peppermint heathy woodland (HU841)	6.7	228	Site 4 (biobank approved)	183	HU861	Purchase and retire 183 credits (this trade uses the variation rules by trading with a PCT within the same formation with approx. the same percentage cleared)
			Site 5 (biobank approved)	45	HU861	Purchase and retire 45 credits (this trade uses the variation rules by trading with a PCT within the same formation with approx. the same percentage cleared)
Spotted Gum - Red Ironbark - Grey Gum shrub grass open forest (HU806) (EEC)	8.3	399	Site 3 (biobank approved)	350	HU806	Purchase and retire 350 credits (Direct match)
			Site 6 (biobank approved)	49	HU806	Purchase and retire 49 credits (Direct match)

Vegetation type	Impact area (ha)	Credits required	Biobank site ID number	Credits available	Credit type being traded	Trading rules used
Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest (HU804)	15.4	1098	Site 1 (biobank approved)	842	HU804	Purchase and retire 842 credits (Direct match)
			Site 7 (biobank approved)	256	HU804	Purchase and retire 256 credits (Direct match)
Blackbutt - Turpentine - Sydney Blue Gum mesic tall open forest (HU782)	4.8	337	Site 5 (approved biobank)	328	HU804	Purchase and retire 328 credits (this trade uses the variation rules by trading with a PCT within the same formation and vegetation class with about the same percentage cleared)
			Site 4 (approved biobank)	9	HU804	Purchase and retire 9 credits (this trade uses the variation rules by trading with a PCT within the same formation with about the same percentage cleared)
Totals	**54.3**	**3244**		**3244**		
Tetratheca juncea	846 (individuals)	12,690	Site 5 (biobank approved)			Purchase and retire 12,690 credits (Direct match)

Note: The proposed trades using the variation trading rules generally include the same suite of ecosystem predicted threatened species as those vegetation types being impacted by the project.

6.1 Offsets for MNES

The offsets proposed have also considered the offset requirements for MNES. The project includes direct impacts to about 43.4 hectares of foraging habitat for the Grey-headed Flying-fox. This equates to about 2,593 credits. The biobank sites chosen all include suitable foraging habitat for this species and will achieve a 'like for like' outcome in terms of the offsets for this species. The biobank sites have an average credit generation rate of 7.5 credits per hectare which means approximately 346 hectares of suitable foraging habitat would be secured via a BioBanking agreement covenant and managed for conservation in perpetuity.

The project also includes impacts to 846 clumps of Black-eyed Susan (*Tetratheca juncea)* which equates to 12,690 credits or 15 credits per individual. As one clump of *Tetratheca juncea* generates seven credits according to the BBAM, at least 1,812 individual clumps of *Tetratheca juncea* would be conserved via a BioBanking agreement with the population managed for conservation in perpetuity. The biobank proposed for this trade (Site 5) has a total of 2,722 individuals present on site which equates to 19,326 credits. This is more than adequate to offset the projects impact to this species.

7. Securing biodiversity credits – next steps

The majority of the credits required by the project will be secured from existing biobank sites. However, Site 6, will require completion of the BioBanking agreement process to enable the credits the project requires to be available. The actions required to secure and retire the necessary credits include:

1. For established biobank sites (sites 1, 2, 3, 4, 5, 6 and 7):
   - Negotiate a 'take-up' agreement (or similar) with each biobank site owner. This agreement will outline the number and type of credits to be purchased as well as the credit price.
   - Purchase and secure the credits.
   - Retire the credits for conservation as required by project approvals.
2. For biobank sites being assessed by OEH (site 8):
   - Roads and Maritime to receive draft BioBanking Agreement for review and signing to confirm the number and type of credits available.
   - BioBanking Agreement to be countersigned by the Minister (or delegate).
   - Retire the credits for conservation as required by project approvals.

Completing the above listed activities in accordance with the details included in Table 6-1 would see the minimum number and type of credits retired to offset the projects impacts.

7.1 Contingency

Should any of the proposed credit trades not be secured by Roads and Maritime (e.g. credits sold to a 3rd party as they are not secured, credit price could not be agreed etc.) Roads and Maritime would consider the following alternatives to secure any potential shortfall in credits:

- The purchase and retirement of biodiversity credits from alternative biobank sites that are not yet gazetted. It is anticipated that additional biobank sites may be added to the biobanking register prior to construction commencing. These would be reviewed by RMS to assess the potential suitability of credits available and credits would be secured if required.
- Investigate additional lands owned by Roads and Maritime for their ability to provide suitable credits for the project and place these lands under a BioBanking agreement. Credits would be retired if required.
- The use of supplementary measures. The FBA and the Offsets Policy for MNES both include the provision for the use of Supplementary Measures should there be a shortfall in securing direct offsets. The Offsets Policy for MNES dictates that supplementary measures can only be used to offset a maximum of 10% of a projects offset obligations and as the project is impacting on foraging habitat for the Grey-headed Flying-fox the use of supplementary measures would be limited to a maximum of 10% accordingly.
- Investigate the viability of investing into the Conservation Trust Fund.

8. BioBanking covenant and management actions

8.1 Approach

Entering into a BioBanking agreement places a conservation covenant over the land, regardless of zoning. This covenant is the strongest conservation covenant available on private lands and extinguishes all land uses other than conservation. The following describes the actions that would be required for ongoing management of an offset site. A Management Actions Plan (MAP) (prepared in accordance with the BioBanking Methodology), detailing rehabilitation activities and an associated management program, would be prepared and included in the final BioBanking agreement. The MAP forms the basis of the funds required to be placed in the BioBanking Trust when purchasing the credits. The BioBanking Trust then funds the biobank site owner to implement the MAP.

Biobank sites may have two types of management actions applied:

- Standard Management Actions
- Site Specific Management Actions

Standard management actions are those actions required on an offset site to improve vegetation condition when entering into a BioBanking agreement. The standard management actions for all BioBanking properties are:

- Management of grazing for conservation
- Weed control
- Management of fire for conservation
- Management of human disturbance
- Retention of regrowth and remnant native vegetation
- Replanting or supplementary planting where natural regeneration would not be sufficient (note: it is anticipated that natural regeneration would be sufficient for the proposed biobank sites and hence supplementary plantings are not required)
- Retention of dead timber
- Erosion control
- Retention of rocks

Based on the habitat resources within the site and the suite of threatened species which are predicted to occur, the credit calculator nominates management actions that would be required to alleviate site-specific threats. Undertaking these actions is over and above the minimal requirements for a biobank site. Additional management actions that are likely to be required at the preferred biobank sites are summarised below:

- Feral animal control (pigs, horses)
- Exclude miscellaneous feral species
- Control of feral and/or overabundant native herbivores (e.g. rabbit, goats, deer etc.)
- Maintain or reintroduce flow regimes (aquatic flora)

The MAP will identify site specific vegetation rehabilitation and management actions appropriate for the proposed offset site which would be completed during the preparation of the BioBanking agreement.

8.2 Monitoring of the offset site

The purchase of credits includes two components:

- Part A being the cost of rehabilitation and management
- Part B being the 'profit' to the relevant landowner

The Part A funds are the equivalent of all costs associated with the rehabilitation, management and monitoring of the biobank site/s in perpetuity.

The BioBanking methodology includes preparation of a MAP for each biobank site. The methodology also includes a credit pricing tool which places a commercial value for completing each of the actions listed in the MAP. These funds are held by the BioBanking Trust and managed by OEH. The funds are provided to the land owner on an annual basis for the amount equivalent to works required in that year. The biobank owner is then required to submit standard reports, outlining the works completed, their success and monitoring results. OEH then review the reports and, if works have been completed satisfactorily, provide the next payment for the following years work. The OEH also include site visits as part of their auditing process.

9. References

DSEWPaC (2012), *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy.* www.environment.gov.au/system/files/resources/12630bb4.../offsets-policy_2.pdf

NSW OEH (2014), *NSW Biodiversity Offsets Policy for Major Projects*. http://www.environment.nsw.gov.au/resources/biodiversity/140672biopolicy.pdf

NSW OEH (2014), *Framework for Biodiversity Assessment.* http://www.environment.nsw.gov.au/resources/biodiversity/140675fba.pd

GHD (2016a), *Newcastle Inner City Bypass, Rankin Park to Jesmond, Technical Paper 1 – Biodiversity Assessment Report*.

GHD (2016b), *Newcastle Inner City Bypass, Rankin Park to Jesmond, Biodiversity Offset Strategy*.

GHD (2018), *Newcastle Inner City Bypass, Rankin Park to Jesmond, Technical Paper 1 – Biodiversity Assessment Report*.

Roads and Maritime Services (2016), *Newcastle Inner City Bypass – Rankin Park to Jesmond Environmental Impact Statement*

Appendices

Appendix A – Credit Report

Biodiversity credit report

This report identifies the number and type of biodiversity credits required for a major project.

Date of report: 28/11/2017 Time: 11:29:27AM Calculator version: v4.0

Major Project details

Proposal ID:

Proposal name:

Proposal address:

Proponent name:

Proponent address:

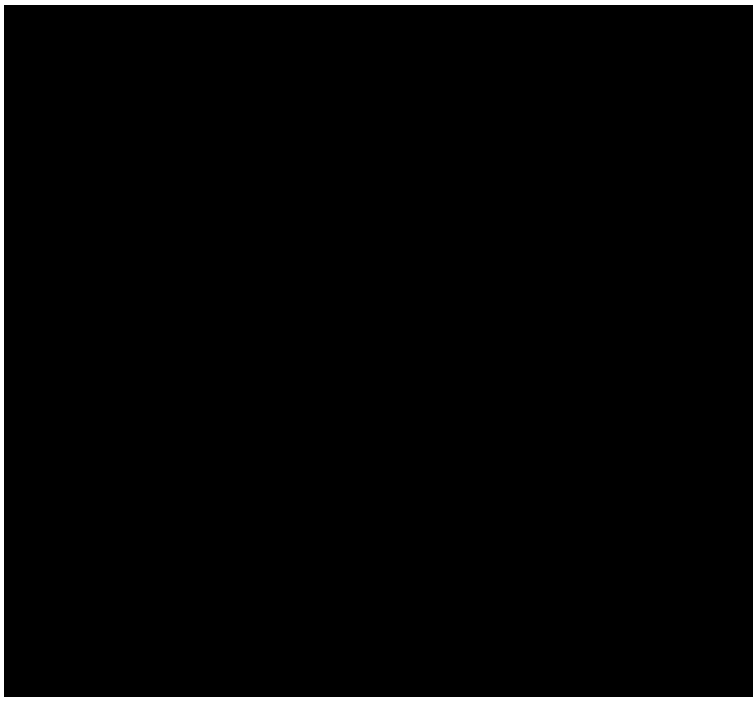
Proponent phone:

Assessor name:

Assessor address:

Assessor phone:

Assessor accreditation:



Summary of ecosystem credits required

Plant Community type	Area (ha)	Credits created
Blackbutt - Turpentine - Sydney Blue Gum mesic tall open forest on ranges of the Central Coast	4.80	337.00
Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands	19.10	1,182.00
Smooth-barked Apple - Turpentine - Sydney Peppermint heathy woodland on sandstone ranges of the Central Coast	6.70	228.02
Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest	15.40	1,098.00
Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter	8.30	398.64
Total	54.30	3,244

Credit profiles

1. Blackbutt - Turpentine - Sydney Blue Gum mesic tall open forest on ranges of the Central Coast, (HU782)

Number of ecosystem credits created	337
IBRA sub-region	Wyong

Offset options - Plant Community types	Offset options - IBRA sub-regions
Blackbutt - Turpentine - Sydney Blue Gum mesic tall open forest on ranges of the Central Coast, (HU782) Flooded Gum - Brush Box - Tallowwood mesic tall open forest on ranges of the lower North Coast, (HU783)	Wyong and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

2. Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest, (HU804)

Number of ecosystem credits created	1,098
IBRA sub-region	Wyong

Offset options - Plant Community types	Offset options - IBRA sub-regions
Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest, (HU804) Melaleuca decora low forest of the central Hunter Valley, Sydney Basin Bioregion, (HU564) Slaty Red Gum grassy woodland on hinterland foothills of the southern North Coast, (HU619) Grey Ironbark - Broad-leaved Mahogany - Forest Red Gum shrubby open forest on Coastal Lowlands of the Central Coast, (HU802) Spotted Gum - Broad-leaved Mahogany - Grey Gum grass - shrub open forest on Coastal Lowlands of the Central Coast, (HU803) Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter, (HU806) Red Ironbark - Spotted Gum - Prickly-leaved Paperbark shrubby open forest of the Lower Hunter, (HU807) Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the lower Hunter, (HU814) Spotted Gum - Narrow-leaved Ironbark-Red Ironbark shrub - grass open forest of the central and lower Hunter, (HU815) Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter, (HU816) Grey Box - Grey Gum - Rough-barked Apple - Blakely's Red Gum grassy open forest of the central Hunter, (HU822)	Wyong and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

3. Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter, (HU806)

Number of ecosystem credits created	399
IBRA sub-region	Wyong

Offset options - Plant Community types	Offset options - IBRA sub-regions
Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter, (HU806) Melaleuca decora low forest of the central Hunter Valley, Sydney Basin Bioregion, (HU564) Slaty Red Gum grassy woodland on hinterland foothills of the southern North Coast, (HU619) Grey Ironbark - Broad-leaved Mahogany - Forest Red Gum shrubby open forest on Coastal Lowlands of the Central Coast, (HU802) Spotted Gum - Broad-leaved Mahogany - Grey Gum grass - shrub open forest on Coastal Lowlands of the Central Coast, (HU803) Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest, (HU804) Red Ironbark - Spotted Gum - Prickly-leaved Paperbark shrubby open forest of the Lower Hunter, (HU807) Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the lower Hunter, (HU814) Spotted Gum - Narrow-leaved Ironbark-Red Ironbark shrub - grass open forest of the central and lower Hunter, (HU815) Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter, (HU816) Grey Box - Grey Gum - Rough-barked Apple - Blakely's Red Gum grassy open forest of the central Hunter, (HU822)	Wyong and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

4. Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands, (HU833)

Number of ecosystem credits created	1,182
IBRA sub-region	Wyong

Offset options - Plant Community types	Offset options - IBRA sub-regions
Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands, (HU833) Scribbly Gum - Smooth-barked Apple - Red Bloodwood shrubby forest of the Lower Hunter, Sydney Basin Bioregion, (HU715) Red Bloodwood - Sydney Peppermint - Podocarpus spinulosus shrubby open forest of the southern Central Coast, (HU839) Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast, (HU850) Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast, (HU852)	Wyong and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

5. Smooth-barked Apple - Turpentine - Sydney Peppermint heathy woodland on sandstone ranges of the Central Coast, (HU841)

Number of ecosystem credits created	184
IBRA sub-region	Wyong

Offset options - Plant Community types	Offset options - IBRA sub-regions
Smooth-barked Apple - Turpentine - Sydney Peppermint heathy woodland on sandstone ranges of the Central Coast, (HU841) Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion, (HU595) Smooth-barked Apple - Sydney Peppermint - Turpentine heathy open forest on plateaux areas of the Sydney Basin Bioregion, (HU622) Scribbly Gum - Smooth-barked Apple - Red Bloodwood shrubby forest of the Lower Hunter, Sydney Basin Bioregion, (HU715) Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands, (HU833) Grey Ironbark - Broad-leaved Mahogany - Smooth-barked Apple coastal headland low open forest of the Central Coast, (HU834) Smooth-barked Apple open forest on coastal lowlands of the Central Coast, (HU835) Narrow-leaved Ironbark - Yellow bloodwood - Rough-barked Apple shrubby open forest on sandstone ranges of the Sydney Basin, (HU837) Smooth-barked Apple - Swamp Mahogany - Red Mahogany - Cabbage Palm open forest on lowlands of the Central Coast, (HU838) Red Bloodwood - Sydney Peppermint - Podocarpus spinulosus shrubby open forest of the southern Central Coast, (HU839) Sydney Peppermint - Silvertop Ash - Gymea Lilly ferny woodland on lowlands of the Central Coast, (HU846) Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast, (HU850) Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast, (HU852) Scribbly Gum - Red Bloodwood - Old Man Banksia heathy woodland of southern Central Coast, (HU856) Red Bloodwood - Smooth-barked Apple - Scribbly Gum - Old Man Banksia heathy woodland on sandstone ranges of the Central Coast, (HU857) Smooth-barked Apple - Cabbage Palm - Broad-leaved Mahogany woodland on Wallarah Peninsular, (HU895)	Wyong and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

6. Smooth-barked Apple - Turpentine - Sydney Peppermint heathy woodland on sandstone ranges of the Central Coast, (HU841)

Number of ecosystem credits created	44
IBRA sub-region	Wyong

Offset options - Plant Community types	Offset options - IBRA sub-regions
Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion, (HU595) Smooth-barked Apple - Sydney Peppermint - Turpentine heathy open forest on plateaux areas of the Sydney Basin Bioregion, (HU622) Scribbly Gum - Smooth-barked Apple - Red Bloodwood shrubby forest of the Lower Hunter, Sydney Basin Bioregion, (HU715) Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands, (HU833) Grey Ironbark - Broad-leaved Mahogany - Smooth-barked Apple coastal headland low open forest of the Central Coast, (HU834) Smooth-barked Apple open forest on coastal lowlands of the Central Coast, (HU835) Narrow-leaved Ironbark - Yellow bloodwood - Rough-barked Apple shrubby open forest on sandstone ranges of the Sydney Basin, (HU837) Smooth-barked Apple - Swamp Mahogany - Red Mahogany - Cabbage Palm open forest on lowlands of the Central Coast, (HU838) Red Bloodwood - Sydney Peppermint - Podocarpus spinulosus shrubby open forest of the southern Central Coast, (HU839) Smooth-barked Apple - Turpentine - Sydney Peppermint heathy woodland on sandstone ranges of the Central Coast, (HU841) Sydney Peppermint - Silvertop Ash - Gymea Lilly ferny woodland on lowlands of the Central Coast, (HU846) Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast, (HU850) Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast, (HU852) Scribbly Gum - Red Bloodwood - Old Man Banksia heathy woodland of southern Central Coast, (HU856) Red Bloodwood - Smooth-barked Apple - Scribbly Gum - Old Man Banksia heathy woodland on sandstone ranges of the Central Coast, (HU857) Smooth-barked Apple - Cabbage Palm - Broad-leaved Mahogany woodland on Wallarah Peninsular, (HU895)	Wyong and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Summary of species credits required

Common name	Scientific name	Extent of impact Ha or individuals	Number of species credits created
Black-eyed Susan	Tetratheca juncea	846.00	12,690

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
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