

# **Appendix 6**

## **Biodiversity Offset Strategy**

prepared by

### **Niche Environment and Heritage**

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# **Part 9b**

## **Biodiversity Offset Strategy**

**State Significant Development No. 5765**

***Prepared by:***

**Niche Environment and Heritage Pty Ltd**

**March 2022**

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# Biodiversity Offset Strategy

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## **COMMONLY USED ACRONYMS AND UNITS**

BAR	Biodiversity Assessment Report
BBAM	BioBanking Assessment Methodology
BBCC	BioBanking Credit Calculator
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BCS	Biodiversity Conservation and Science Directorate
BCT	Biodiversity Conservation Trust
BOS	Biodiversity Offset Strategy
BVT	BioMetric Vegetation Type
CEEC	Critically Endangered Ecological Community
CMA	Catchment Management Authority
DPIE	Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
FBA	Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects
ha	Hectare/s
IBRA	Interim Biodiversity Region of Australian
LEP	Local Environmental Plan
MNES	Matters of National Environmental Significance listed under the EPBC Act
OEH	Office of Environment and Heritage
PCT	Plant Community Type
SEARS	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
TEC	Threatened Ecological Community as listed under schedules of the BC Act and or EPBC Act. Collective term to describe vulnerable, endangered and critically endangered ecological communities

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## EXECUTIVE SUMMARY

### Introduction

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by Bowdens Silver Pty Ltd (Bowdens Silver) to prepare a Biodiversity Offset Strategy (BOS) for the Bowdens Silver Project (the Project). The BOS should be read alongside the Biodiversity Assessment Report (BAR) for the Project prepared by EnviroKey (2022). Both documents have been prepared for the purpose of the Environmental Impact Statement for the Project prepared by R.W. Corkery & Co Pty Limited (RWC).

The Project is classified as State Significant Development (SSD). The Department of Planning, Industry & Environment (DPIE) has confirmed that the Project can be considered as a “pending or interim planning application” under the *Biodiversity Conservation (Savings and Transitional) Regulation 2017* and the environmental assessment may be undertaken under former legislation including the *NSW Threatened Species Conservation Act 1995* and former Section 5A of the *NSW Environmental Planning and Assessment Act 1979*. Accordingly, the BOS uses the Framework for Biodiversity Assessment (FBA) in accordance with the NSW Biodiversity Offsets Policy for Major Projects, consistent with the Secretary’s Environmental Assessment Requirements (SEARS) for the Project.

The BOS relies upon assessment completed for the BAR (EnviroKey, 2022) to outline the Project’s offset requirements, provides a brief review of options to satisfy the requirements and presents a strategy to demonstrate how the offset requirements will be met.

As clearing of vegetation would occur over approximately 12 years, a staged approach is proposed for offsetting whereby a tranche of offsetting would occur directly prior to each discrete stage of clearing. As a result, the offsetting obligations of the Project would be satisfied in three stages.

### Credit requirement

EnviroKey (2022) identifies that a total of 381.17 ha of native vegetation would be removed for the Project. The vegetation to be removed is a residual impact of the Project after measures to avoid or mitigate vegetation clearing have been considered and implemented. The vegetation clearing comprises 6 Plant Community Types (PCTs), resulting in a total credit requirement of 23,880 ecosystem credits, as presented in **Table ES1**.

EnviroKey (2022) also identified that species credits would be required for the Regent Honeyeater (29,350), Squirrel Glider (8,386) and Koala (9,910). Further information added in Dec 2021 identified that species credits would also be required for the Large-eared Pied Bat (4,391), *Swainsona recta* (104) and *Swainsona sericea* (972). More information on the assessed credit requirements is provided in EnviroKey (2022).

**Table ES1**  
**Summary of BBAM Credit Requirements**

<b>Vegetation Type</b>	<b>BBAM Credits required</b>
PCT 273: White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW	1,360.0
PCT 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	1,250.2
PCT 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	10,118.4
PCT 323: Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	6,959.0
PCT 324: Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes	4,150
PCT 358: Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion	42.0
<b>Total</b>	<b>23,880</b>

### Offsetting options and strategy

The NSW FBA and Biodiversity Offsets Policy for Major Projects allows for a number of options in regard to satisfying the offset requirements for the Project.

- Credit purchase and retirement from offset sites secured by biobanking (now Stewardship) agreements. Purchase of credits provides funding for in-perpetuity management and protection for conservation purposes.
- Rehabilitation of mine sites.
- Contributing money to supplementary measures.
- Payments into a fund.

To satisfy the majority of the Project's offset requirements Bowdens Silver propose to establish or facilitate the establishment of Biodiversity Offset Sites using Biodiversity Stewardship Agreements within permissible IBRA subregions and where like-for-like offsets can be obtained under the rules of the NSW FBA. It is noted that this is the preferred/optimum option for offsetting by NSW DPIE.

The Biodiversity Offset Sites would be established under a Biodiversity Stewardship Agreement either on land within or adjacent to the Mine Site (on-site offsets) or on other freehold land within the region where offsets can be sourced under the FBA rules (off-site offsets).

### On-site offsets

The proposed on-site offset consists of 36 Lots with a combined area of 795 ha (currently comprising 721 ha of native vegetation). These lands are located within and adjacent to the proposed Mine Site and are either owned by Bowdens Silver or are subject to purchase agreements which are already in place.

Overall, the 9,848 credits created at the on-site offset sites meet 41% of the Project's overall ecosystem credit offset requirement and 65% of the Stage 1 requirements. An additional 14,032 ecosystem credits are required from off-site offsets to meet the Project's overall offset requirement while an additional 5,320 credits are required to meet the Stage 1 offset credit requirement.

### **Off-site offsets**

To date the off-site offset sites have not been finalised, however, significant work has been completed in order to inform the offset strategy.

A desktop assessment was carried out to identify candidate properties for the establishment of offset sites. The desktop assessment involved the following.

- Analysis of vegetation mapping (DPIE, 2018) throughout the permissible offset areas comprising the IBRA subregions of Capertee Valley, Capertee Uplands, Wollemi and Inland Slopes.
- Identification of land holdings with large areas of mapped native vegetation (c.1000 ha) including large areas of Box Gum Woodland PCTs.
- After consideration of the above, properties that were in close proximity to Regent Honeyeater, Koala and Squirrel Glider records according to the NSW Wildlife Atlas were prioritised.

The process described above resulted in a short-list of ten properties for which relevant landholders were contacted with an expression of interest. Of the ten properties identified, 7 landholders have so far expressed interest in the creation of a stewardship site which would be facilitated by the Applicant.

Given the extent of native vegetation within the identified properties it is likely that the residual offset obligation would be met through establishment of one or two of the ten candidate properties. Upon confirmation of the available off-site offset areas, further fieldwork would be undertaken to determine the ecosystem and species credits that would be generated at these sites.

If necessary, any residual offset requirements would be satisfied by purchasing available credits from the market, through payment into the NSW Biodiversity Conservation Trust Fund or through supplementary measures, subject to agreement.

### **Credit conversions**

The credit requirement for the Project has been determined in Biobanking credits in accordance with the FBA requirements. Establishment of in-perpetuity offset sites (formally Biobanking sites but now Biodiversity Stewardship Sites) in NSW can now only be done using the Biodiversity Assessment Method (BAM) and therefore, a conversion from Biobanking credits to BAM credits would be required and would be conducted by DPIE.

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# 1. INTRODUCTION

## 1.1 BACKGROUND AND LEGISLATIVE FRAMEWORK

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by Bowdens Silver Pty Ltd (Bowdens Silver) to prepare a Biodiversity Offset Strategy (BOS) for the Bowdens Silver Project (the Project). The BOS should be read alongside the Biodiversity Assessment Report (BAR) for the Project prepared by EnviroKey (2022). Both documents have been prepared for the purpose of the Environmental Impact Statement for the Project prepared by R.W. Corkery & Co Pty Limited (RWC).

The Project is classified as State Significant Development (SSD). The Department of Planning, Industry & Environment (DPIE) has confirmed that the Project can be considered as a “pending or interim planning application” under the *Biodiversity Conservation (Savings and Transitional) Regulation 2017* and the environmental assessment may be undertaken under former legislation including the *NSW Threatened Species Conservation Act 1995* and former Section 5A of the *NSW Environmental Planning and Assessment Act 1979*. Accordingly, the BOS uses the Framework for Biodiversity Assessment (FBA) in accordance with the NSW Biodiversity Offsets Policy for Major Projects, consistent with the Secretary’s Environmental Assessment Requirements (SEARS) for the Project.

## 1.2 OFFSETS REQUIRED FOR THE PROJECT

The FBA sets out a methodology to assess the residual impacts of Major Projects on biodiversity after avoiding and mitigating potential impacts, resulting in a specific offsetting requirement for each impacted Plant Community Type (PCT) which includes provision for associated ecosystem credit threatened fauna species, and separate requirements for species credit threatened species (generally species which cannot be linked to specific PCTs). Note that some species have both ecosystem and species credit requirements (e.g. the species credit component where important breeding habitat is not easily linked to PCTs).

The Project BAR (EnviroKey, 2022) outlines the methods used for determination of the offset requirement for the Project after consideration of the proposed disturbance footprint totalling 381.17ha of native vegetation comprising 6 PCTs. The required Biobanking (BBAM) offset credits are presented in **Table 1** and **Table 2** below and **Annexure 2** representing PCTs and species credit threatened species habitat to be cleared.

## 1.3 COMMONWEALTH OFFSET REQUIREMENTS

Offsets are required under the EPBC Act for threatened biodiversity that are significantly impacted by a project. The following EPBC Act listed threatened biodiversity has been considered to be potentially significantly impacted by the Project (EnviroKey, 2022 and see **Table 1** and **Table 2**). It is noted that assessments of significance generally do not consider all mitigation measures or any offsetting in determining the outcome.

- White Box Yellow Box Blakely’s Red Gum Woodland (Box Gum Woodland); and
- Regent Honeyeater.

**Table 1**  
**Ecosystem credit offset requirement for the Project**

<b>Plant Community Type (PCT)</b>	<b>Threatened Ecological Community Status and relevant Act</b>	<b>BBAM Credits required</b>
PCT 273: White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW.	N/A	1,360.0
PCT 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion.	Endangered (BC Act) Critically Endangered (EPBC Act) White Box Yellow Box Blakely's Red Gum Woodland and considered significantly impacted (EnviroKey, 2022)	1,250.2
PCT 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion.	Endangered (BC Act) Critically Endangered (EPBC Act) White Box Yellow Box Blakely's Red Gum Woodland and considered significantly impacted (EnviroKey, 2022)	10,118.4
PCT 323: Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion.	N/A	6,959.0
PCT 324: Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes.	N/A	4,150.0
PCT 358: Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion.	N/A	42.0
		<b>23,880</b>

**Table 2**  
**Species credit offset requirement for the Project**

<b>Species</b>	<b>Act required under</b>	<b>BBAM Credits required</b>
Regent Honeyeater	NSW EP&A Act and Commonwealth EPBC Act (significantly impacted)	29,350
Squirrel Glider	NSW EP&A Act	8,386
Koala	NSW EP&A Act	9,910
Large-eared Pied Bat	NSW EP&A Act	4,391
<i>Swainsona recta</i>	NSW EP&A Act	104
<i>Swainsona sericea</i>	NSW EP&A Act	972

An approval bilateral agreement is in place between the NSW and the Commonwealth which allows for significantly impacted threatened species listed under the EPBC Act to be offset via the NSW FBA and Biodiversity Offsets Policy for Major Projects. Therefore, the strategy presented herein which addresses the State offset requirements also applies to the significantly impacted threatened biodiversity under the EPBC Act.



## 2. OFFSET STRATEGY

### 2.1 AVAILABLE OFFSETTING OPTIONS

The NSW FBA and Biodiversity Offsets Policy for Major Projects allow for a number of options in regard to satisfying the offset requirement for the Project (see a to d below). These are hierarchical in terms of preference and include:

- a) Offsetting through a site secured by a biobanking (now Stewardship<sup>1</sup>) agreement. Biobanking (now Stewardship) agreements specify the number and type of biodiversity credits generated through the landowner's management actions to conserve and improve biodiversity values in-perpetuity. The Applicant purchases the number and type of biodiversity credits required to compensate for the loss of biodiversity on the development site and then 'retires' those credits. Retiring credits involves removing them from the market so they cannot be traded against another impact on biodiversity.

Applicants also have the option of establishing a biobank (now Stewardship) site on their own land to fulfil their offset requirement consistent with the above.

Where feasible offsets must be 'like for like' with the following rules applied to credit trading under the FBA:

- Ecosystem credits: like-for-like offsets must be the same plant community type or a plant community type in the same vegetation class that has undergone a similar or greater amount of clearing since European inhabitation and must be sourced from the same or adjacent IBRA sub-region (see **Figure 1** and **Annexure 3** Credit profile for a list of applicable vegetation types).
  - Species credit threatened species: like-for-like offsets must be the same threatened species (anywhere in NSW).
  - Variations to the above rules: where a proponent is unable to locate a suitable like-for-like offset site they may apply the FBA variation rules (subject to regulatory approval) which allow for some level of departure away from like-for-like offsets.
- b) Rehabilitation of mine sites: Rehabilitation involves restoring biodiversity values on mine sites after mining activities have ceased (note – this does not change any typical consent condition or requirement to rehabilitate areas under relevant planning controls) and typically satisfies only a very small proportion of offsetting.
  - c) Contributing money to supplementary measures: If appropriate offsets are not feasible, subject to regulatory approval, Applicants can provide funds for supplementary measures for conservation activities targeted to impacted PCTs or threatened species.
  - d) Payments into a fund: The fund was only recently established under the recent BC Act – payments into the fund are now considered an option for offsetting.

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<sup>1</sup> The Biobanking scheme under the TSC Act has been repealed and replaced with the BC Act which allows for creation of Stewardship offset sites as opposed to Biobanking offset sites. See Section 2.3. References to Biobanking sites have been replaced (or are followed by reference to) Stewardship sites within this report.

## 2.2 OVERVIEW OF OFFSET STRATEGY

To satisfy the majority of the Project's offset requirements Bowdens Silver propose to establish or facilitate the establishment of Biodiversity Offset Sites (see option a in Section 2.1 above) using Biodiversity Stewardship Agreements within permissible IBRA subregions and where like-for-like offsets can be obtained under the rules of the NSW FBA. It is noted that this is the preferred/optimum option for offsetting by NSW DPIE. At this stage, no departure from the like-for-like rules to take advantage of the variation rules is anticipated to be required.

The following IBRA subregions can be used for sourcing offset credits for ecosystem credits under the FBA (**Figure 1**):

- Capertee Valley (impacted IBRA subregion)
- Capertee Uplands
- Wollemi
- Inland Slopes

Biodiversity Offsets Sites will be established in two areas:

- On land already owned or secured by the Applicant within or adjacent to the Mine Site (referred to hereafter as on-site offsets)
- on land further from the mine on freehold land owned by private landholders (referred to hereafter as off-site offsets).

This BOS demonstrates how the identified offset sites collectively would satisfy the offset requirements for the Project. The strategy to satisfy any residual offset requirement (**Table 6**) would be to purchase available credits from the market or payment into the NSW Biodiversity Conservation Trust Fund. If required, supplementary measures would be investigated in consultation with the NSW Biodiversity, Conservation and Science Directorate (BCS).

Due to recent legislation changes the Biobanking (BBAM) credit obligations outlined within this report will need to be converted into BAM credits (see Section 2.3).

## 2.3 CREDIT CONVERSIONS

As outlined in Section 1.2, the credit requirement for the Project has been determined in Biobanking credits as per the FBA requirements. However, in-perpetuity offset sites (formally Biobanking sites but now Biodiversity Stewardship Sites) in NSW can now only be established using the present BAM system which creates BAM credits. As BBAM and BAM currencies are generated from different scoring and measurement systems a conversion from BBAM credits into BAM credits will be required during Project approval. The conversion will be undertaken by the NSW BCS. Presently, the offset scoring has been completed using the FBA and associated Biobanking methodology in order to satisfy the FBA.

## 2.4 STAGED OFFSET APPROACH AND TIMING

Impacts from the Project via clearing of vegetation would occur over approximately 12 years. Therefore, a staged offsetting approach for the Project was discussed and agreed to on 28 May 2019 with the former NSW OEH whereby a tranche of offsetting would occur directly prior to each discrete stage of clearing. The stages summarised in **Table 3** and illustrated in **Figure 2** have been identified for impacts and offsetting.

**Table 3**  
**Staged offset requirement**

Stage	Year from commencement	Deadline for credit retirement	Clearing area (native vegetation only)	Proportion of overall clearing/ offset requirement (approx.)
Stage 1	0-1	Within 12 months of project commencement	233.03 ha	61.14 %
Stage 2	3-4	Before any clearing in year 3	77.53 ha	20.34 %
Stage 3	6-12	Before any clearing in year 6	70.61 ha	18.52 %

The overall credit requirement for the project as presented in **Table 1** and **Table 2**, has been split into the three stages outlined in **Table 3** above (see **Annexure 1**).

The majority of the proposed offset sites referred to within this report will require further assessment and the processing of a Stewardship site application to allow for the purchase and/or retirement of biodiversity credits. For this reason, an interim period of 12 months between Project commencement and credit retirement is sought for Stage 1, consistent with other approvals of this nature.

### 3. ON-SITE OFFSET SITES

#### 3.1 OFFSET SITE DESCRIPTION AND LOCATION

A series of offset sites would be used to generate credits to satisfy the offset requirements for the Project. A summary of details for the on-site offset sites is provided below (**Table 4**). Details of the on-site offset sites are illustrated in **Figure 3**.

**Table 4**  
**On-site offset site summary**

Offset site name/number	Property features	Location	Land Ownership
On-site offset sites	36 lots surrounding the proposed mine site. Majority of the site is within the Capertee Valley IBRA subregion.	20-30 km south-east of Mudgee, NSW.	Majority of on-site offset areas are already owned by the Applicant. Property purchase agreements are in place for any additional privately-owned land. Some lots are Crown land or land owned by Mid-Western Regional Council (paper roads).

Minor changes to the presented on-site offset site boundaries may occur as the offset sites are assessed. Additional on-site or near-site areas are also likely to be included within the overall offset strategy based on preliminary offset site investigations during 2021.

#### 3.2 ON-SITE OFFSET SITES TITLE DETAILS

The on-site offset consists of 36 Lots (**Table 5**) with a combined area of 795 ha (currently comprising 721 ha of native vegetation). The majority of these Lots are located within and adjacent to the proposed Mine Site and are either owned by Bowdens Silver Mine or are subject to purchase agreements which are already in place. Crown land or lots owned by Mid-Western Regional Council have been included, however, it is noted that securing the land for the purpose of offsetting would require landowner consent or purchase of these lots. These lands constitute a very small portion of the identified offset lands.

#### 3.3 ON-SITE OFFSET SITE ECOSYSTEM CREDIT ASSESSMENT

On-site offset sites were surveyed using the FBA methodology which has allowed for vegetation community determination, mapping of vegetation zones (**Figure 3**) and determination of credit yields (see **Annexure 4**). Sixty-two BBAM plots conducted within the on-site offset areas (primarily by Eco Logical Australia in 2014) were utilised to inform the credit assessment. The biodiversity offset areas and associated credit calculations will continue to be updated as the BOS is refined and finalised.

**Table 5**  
**Lots and DPs of offset areas**

Lot number(s)	DP number
<b>On-site offset site</b>	
1	572701
107, 61, 71, 76, 178, 3	755412
115, 127, 161, 119, 140, 29, 116, 118, 73, 70, 25, 120, 26, 143, 122, 168, 71	755435
2, 3, 4	776858
11	810747
2, 1	814633
1	835810
310, 311	850923
7008	1029652
132	1050074
102	1124638

### **3.4 VEGETATION TYPES AND IMPROVEMENT IN BIODIVERSITY VALUES AT ON-SITE OFFSET SITES**

**Table 6** outlines ground-truthed PCTs across the on-site offset sites and demonstrates expected improvement of vegetation condition within the sites as calculated within the BBAM calculator.

#### **3.4.1 Management actions proposed at the offset sites**

The minimum required management actions as per the FBA and BAM for Stewardship sites would be implemented at all offset sites. Additional management actions proposed are detailed in **Table 7**.

#### **3.4.2 Existing management obligations**

There are no known management obligations for conservation within the proposed on-site offsets.

### **3.5 COMPARISON OF PROJECT OFFSET REQUIREMENT WITH CREDITS CREATED AT ON-SITE OFFSET SITES**

Overall the 9,848 ecosystem credits created at the on-site offset sites (see **Table 8**) meet 41% of the Project's overall ecosystem credit offset requirement and 65% of the Stage 1 requirements. An additional 14,032 ecosystem credits are required from off-site offsets to meet the Project's overall offset requirement while an additional 5,320 credits are required to meet the Stage 1 offset credit requirement.

**Table 6**  
**On-site offset site biodiversity values and condition improvement scores**

Veg zone No	PCT no.	BVT code	Plant community type name	Condition	Area (ha)	Landscape Value Score	Current Site Value	Future Site Value	Gain in Site Value	Averted Loss in Site Value	Number of Ecosystem Credits Created
1	273	CW217	White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW	Moderate/ Good - Medium	12	21.2	79.17	100	20.83	12.5	164
2	277	CW112	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Moderate/ Good - Poor	158	21.2	65.33	91	25.67	10	2246
3	281	CW111	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Moderate/ Good - Medium	114	21.2	87.33	97.33	10	15	1317
4	281	CW111	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Moderate/ Good - Poor	91	21.2	59.33	91.00	31.67	7	1362
5	323	CW291	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/ Good - High	224	21.2	93.23	100	6.77	17.97	2573
6	323	CW291	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/ Good - Medium	18	21.2	71.35	88.54	17.19	15.1	241
7	323	CW291	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/ Good - Poor	47	21.2	35.24	63.02	27.78	5.55	641
8	324	CW263	Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes	Moderate/ Good - High	26	21.2	82.81	96.88	14.07	16.49	336
9	325	CW325	Blue-leaved Stringybark open forest of the Mudgee region NSW central western slopes	Moderate/ Good - High	70	21.2	82.81	100	17.19	16.92	968

**Table 7**  
**Additional Management Actions**

<b>Veg zone No</b>	<b>PCT no.</b>	<b>Condition</b>	<b>Area (ha)</b>	<b>Additional management actions</b>	<b>Additional increase in gain score</b>
1	273	Moderate/Good - Medium	12	None	-
2	277	Moderate/Good - Poor	158	Importation of logs from clearing activities Seeding for shrubs with native endemics Additional weed management for exotic species	0.5 0.5 0.5
3	281	Moderate/Good - Medium	114	Importation of logs from clearing activities	0.5
4	281	Moderate/Good - Poor	91	Importation of logs from clearing activities Seeding for shrubs with native endemics	0.5 0.5
5	323	Moderate/Good - High	224	None	-
6	323	Moderate/Good - Medium	18	Seeding for shrubs and/or native grasses	0.5
7	323	Moderate/Good - Poor	47	Seeding for shrubs and/or native grasses Import logs from clearing activities	0.5 0.5
8	324	Moderate/Good - High	26	None	-
9	325	Moderate/Good - High	70	None	-

Table 8

Comparison of the Project offset credit requirement and offsets created at the on-site offset sites

Name	PCT no.	TEC		Total BBAM Credits required	BBAM Credits required - Stage 1	BBAM Credits generated (on-site offset sites)	Other PCTs used to satisfy requirement – Stage 1	BBAM residual requirement – Stage 1
		BC Act	EPBC Act					
Rough-Barked Apple - red gum - Yellow Box woodland	281	Box Gum Woodland		10,118	7,053	2,679	PCT 277 (1,939)	2,435
Blakely's Red Gum - Yellow Box grassy tall woodland	277	Box Gum Woodland		1,250	307	2,246	-	0
White Box shrubby open forest on fine grained sediments on steep slopes	273	-	-	1,360	1,360	164	-	1,196
Blue-leaved Stringybark open forest of the Mudgee region	325	-	-	0	0	968	-	0
Inland Scribbly Gum grassy open forest on hills in the Mudgee Region	324	-	-	4,150	2,895	336	PCT 325 (968)	1,591
Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills	358	-	-	42	37	0	-	37
Red Stringybark - Inland Scribbly Gum open forest on steep hills	323	-		6,959	3,516	3,455	-	61
<b>Totals</b>				<b>23,880</b>	<b>15,168</b>	<b>9,848</b>	<b>-</b>	<b>5,320</b>



## **4. OFF-SITE OFFSET SITES**

As stated within Section 2.1, the objective of this offset strategy corresponds with the preferred approach listed within the FBA for offsetting (credit retirement from offset sites with like-for-like values secured and managed for conservation in-perpetuity). The process described below to identify suitable off-site offset areas demonstrates how the offset strategy will achieve its objectives.

### **4.1 APPROACH TO OFF-SITE OFFSETS**

To date the off-site offset sites have not been finalised, however significant work has been completed in order to inform the offset strategy. Various landholdings have been targeted based on the residual credits required after the contribution of on-site offset sites towards the overall offset package.

It is expected that a similar or slightly lower credit yield would be achieved within the off-site offset areas as compared with on-site offsets and an approximated yield of 10 BBAM credits per hectare (as opposed to an average of 13 credits per hectare at on-site offset sites) has been assumed for the purposes of providing an estimate of the land area required to meet the outstanding offset requirement.

Given the residual ecosystem credit requirement, it is predicted that between 1,000 and 1,300 hectares of off-site offset areas would be required.

The specific improvement of vegetation condition at the off-site offsets and consequent credit yield will be provided upon confirmation of the selected areas for offsetting and completion of required field survey.

### **4.2 METHODS TARGETING LANDHOLDINGS FOR OFF-SITE OFFSETS**

A desktop assessment was carried out to identify candidate properties for the establishment of offset sites. The desktop assessment involved the following:

- Analysis of vegetation mapping (DPIE, 2018) throughout the permissible offset areas comprising the IBRA subregions of Capertee Valley, Capertee Uplands, Wollemi and Inland Slopes
- Identification of land holdings with large areas of mapped native vegetation (c.1000 ha) including large areas of Box Gum Woodland PCTs.
- After consideration of the above, properties that were in close proximity to Regent Honeyeater, Koala and Squirrel Glider records according to the NSW Wildlife Atlas were prioritised.

The process described above resulted in a short-list of ten properties for which relevant landholders were contacted with an expression of interest. Of the ten properties identified, 7 landholders have so far expressed interest in the creation of a stewardship site which would be facilitated by the Applicant.

Given the extent of native vegetation within the identified properties it is likely that the residual offset obligation would be met through establishment of one or two of the ten candidate properties.

General locational information for candidate off-site offset sites are provided in **Table 9**.

**Table 9**  
**Off-site Offset Summary**

Potential offset site(s)	Property location	Location/values
Off-site offsets x 4	IBRA Region: South Western Slopes IBRA Subregion: Inland Slopes	South-west of the development site. Large areas of Box Gum Woodland. Squirrel Glider and Koala records in locality.
Off-site offsets x 2	IBRA Region: South Western Slopes IBRA Subregion: Capertee Valley	South-east of the development site. Areas of important habitat for Regent Honeyeater and other target species credit species.
Off-site offsets x 4	IBRA Region: South Western Slopes IBRA Subregion: Inland Slopes	South-west of the development site. Large areas of Box Gum Woodland. Squirrel Glider and Koala records in locality.

### 4.3 PURCHASE OF BIOBANKING CREDITS

During the course of investigating the offset strategy, credits required for the Project were added to the Biobanking credit register. Several parties expressed interest in supplying ecosystem and species credits. This indicates that suitable credits are available. These expressions of interest will be further pursued as required to address any possible shortfall regarding credits created via land purchase and stewardship site creation.

## **5. SPECIES CREDITS**

### **5.1 SPECIES CREDITS**

The presence of species credit species at the on-site and off-site offset sites, and the number of species credits generated, will be confirmed via targeted field survey in accordance with the BAM and relevant survey guidelines once the credit requirement is confirmed and after the necessary process for credit conversion takes place. Species credit surveys will be targeted to the most likely locations for each species based on the presence of NSW Wildlife records adjacent or upon on-site and off-site offset properties and after consideration of available habitat.

### **5.2 CREDIT CONVERSIONS AND APPROACH TO OFFSETTING**

#### **5.2.1 Regent Honeyeater**

The EnviroKey (2022) BAR for the Project has considered the majority of the development site as Regent Honeyeater habitat and the species has been considered significantly impacted under the EPBC Act. No Regent Honeyeater biobanking credits were found to be available after searches of relevant registers. Therefore, in order to satisfy the offset requirement for this species BAM credits must be created (since Biobanking credits can no longer be created) and retired. Conversion of the current Biobanking credit requirement for the Project will be necessary to calculate how many BAM credits are required.

Both the NSW BCD and (then) Commonwealth DoEE were consulted in regard to the process for credit conversion for the Regent Honeyeater. Under the new BAM the Regent Honeyeater only requires credits where important habitat is impacted by development. Within the disturbance footprint no areas coincide with mapped important habitat. Therefore, after the required conversion process the eventual BAM credit requirement for the species will be confined to associated ecosystem credits.

#### **5.2.2 Koala and Squirrel Glider credits**

Koala credits will be created after survey of on-site and off-site offset areas. Any shortfall in the number of credits required will be addressed through purchase of credits from the market (biobanking or BAM credits). These are readily available and Niche has received a number of EOs from credit holders for these species.

#### **5.2.3 Large-eared Pied Bat**

Large-eared Pied Bat credits will be created after survey of on-site and off-site offset areas. It is noted that the species was recorded at the proposed mine site and that on-site offset areas are located between the mine site and overhangs identified by EnviroKey so there is good potential for the species to occur within the on-site offset areas. Any shortfall in the number of credits required will be addressed through purchase of credits from the market (biobanking or BAM credits) or payment into the BCT fund.

#### **5.2.4      *Swainsona recta* (Small Purple-pea)**

Surveys completed for this plant around the proposed mine site and within the proposed on-site offset areas have identified the species to the extent that the full offset requirement is likely to be satisfied by the on-site offset area establishment.

In November 2021, AREA Environmental undertook field survey for this species, focussed on areas for a potential Biodiversity Stewardship Site. The survey identified the following in land to the east of the Mine Site.

- Two known occurrences of *Swainsona recta* were confirmed, one with eight plants, the other with two. The number of resident individuals were consistent with pre-drought populations.
- Previously unrecorded populations of *Swainsona recta* were recorded in the proposed biodiversity offset area, one comprising of one plant, another of three resident individuals and another of about 50 (an important population).

#### **5.2.5      *Swainsona sericea* (Silky Swainson-pea)**

As part of survey for the on-site offset area this species will be targeted. Additional credits will be sought from offsite offset areas or via the market as required.

## **6. FURTHER OFFSETTING CONSIDERATIONS**

### **6.1 REHABILITATION SITE IDENTIFICATION**

Rehabilitation is not proposed for offsetting at this stage, however, may be determined appropriate at the off-site offset areas when the available areas are confirmed and surveyed. Notwithstanding, it is important to note that mine disturbance would be rehabilitated in accordance with the development approval with a rehabilitation bond also required to be provided to the Resources Regulator in accordance with the mining lease(s) required for the Project.

### **6.2 SUPPLEMENTARY MEASURES**

Supplementary measures are not proposed at this stage, however, may be determined appropriate at both the on-site and off-site offset areas upon completion of targeted survey.

### **6.3 SUMMARY OF FURTHER WORK**

Upon confirmation of the available off-site offset areas, further field survey will be undertaken to determine the ecosystem and species credits that would be generated at these sites. Targeted field survey will also be undertaken at the on-site offset to determine whether species credits can be generated. This information will be included in a final BOS, with an accompanying management plan for the on-site and off-site offset areas.

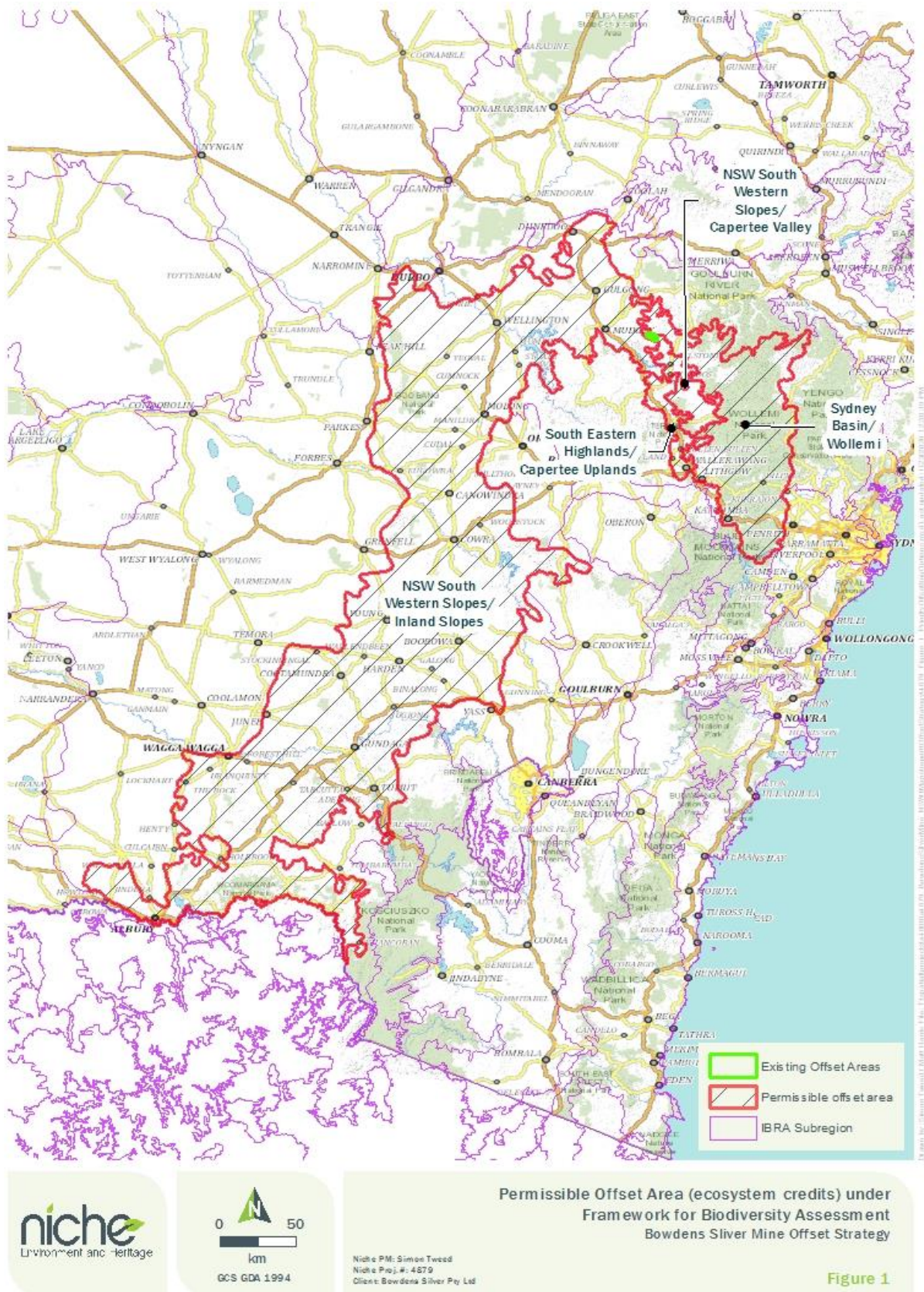
## **7. REFERENCES**

**DPIE (2018)** *State Vegetation Type Map: Central Tablelands Region* Version 1.0. VIS\_ID 4778. NSW Department of Planning Industry and Environment. Available online: [https://data.nsw.gov.au/data/dataset/state-vegetation-type-map-central-tablelands-region-version-0-1-vis\\_id-4778](https://data.nsw.gov.au/data/dataset/state-vegetation-type-map-central-tablelands-region-version-0-1-vis_id-4778)

**EnviroKey (2022)** *Updated Biodiversity Assessment Report*, Presented as Appendix 5 of the Amendment Report – Water Supply. Prepared for Bowdens Silver Pty Limited.

## FIGURES

Figure 1 Regional location of offset sites





**Figure 2 Proposed stages of clearing**

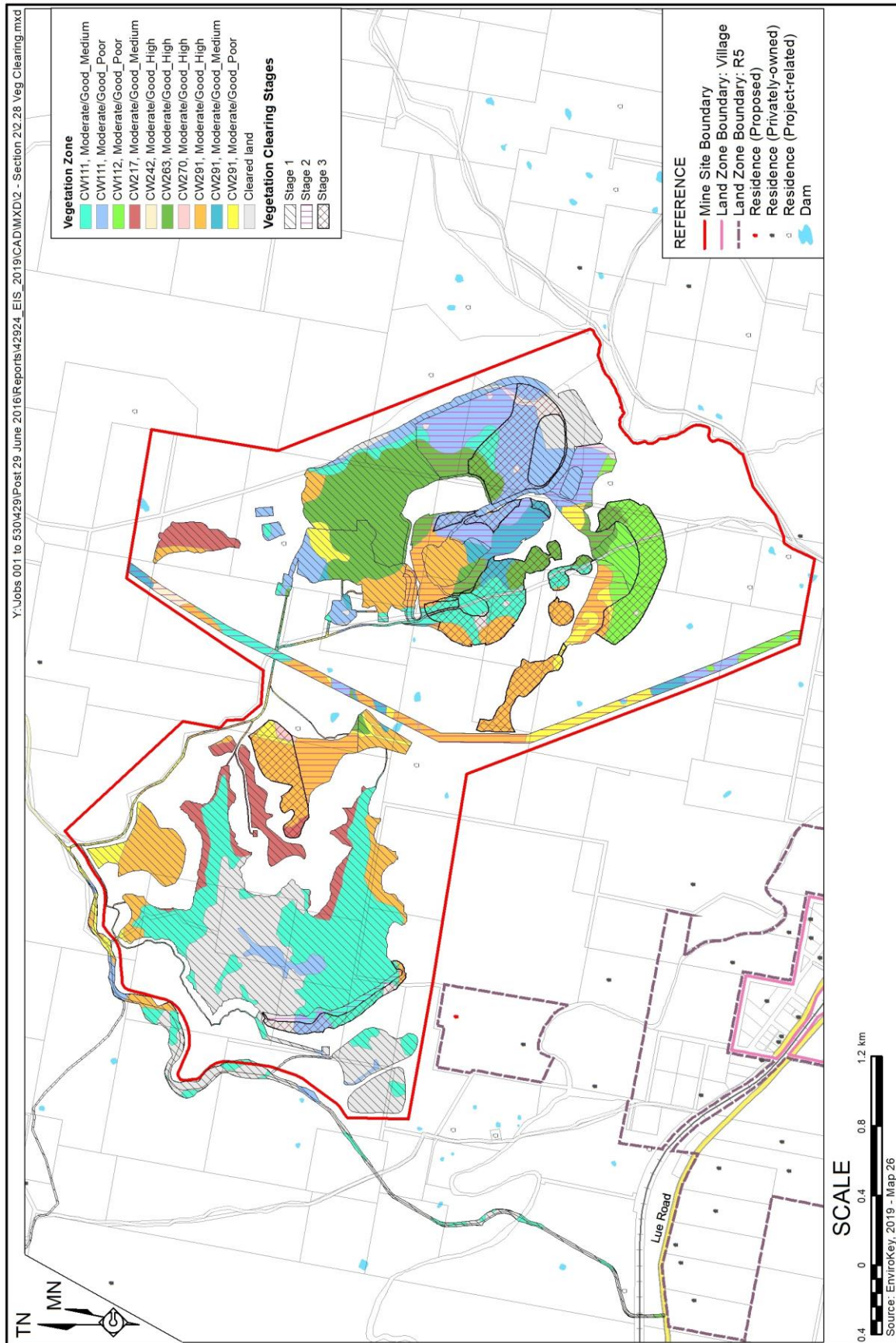
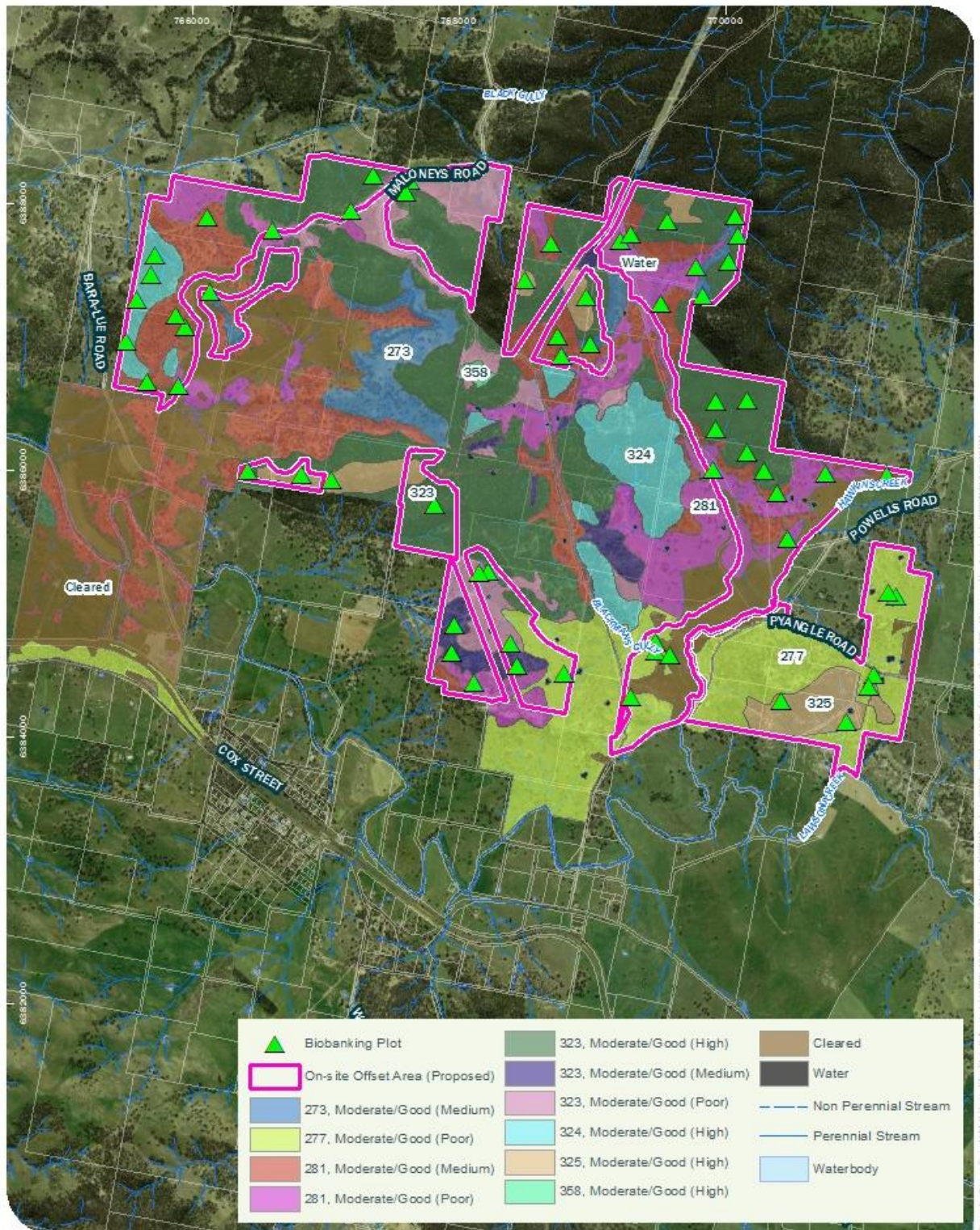




Figure 3 Details of on-site offset sites



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# Annexures

(Total No. of pages including blank pages = 34)

- Annexure 1    Staged Credit Requirement (4 pages)
- Annexure 2    Biobanking Credit Calculator Output  
(Development Site) (6 pages)
- Annexure 3\*   Credit Profiles (Development Site) (16 pages)
- Annexure 4    Biodiversity Credit Report from the  
Biobanking Credit Calculator (Offset Sites)  
(6 pages)

\* This Annexure is only available on the digital version of this document

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# **Annexure 1**

## **Staged Credit Requirements**

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

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Table A1-1 Staged Ecosystem Credit Requirement

PCT Code	BVT Code	Management zone	Clearing area – total disturbance	Clearing area – Stage 1 (hectares)	Clearing area – Stage 2 (hectares)	Clearing area – Stage 3 (hectares)	Total BBAM Credits required	BBAM Credits required – Stage 1	BBAM Credits required – Stage 2	BBAM Credits required – Stage 3
273	CW217	Moderate/Good_Medium	22.04	22.04	0.00	0.00	1360	1360	0	0
277	CW112	Moderate/Good_Poor	22.97	5.64	4.29	13.05	1250	307	233	710
281	CW111	Moderate/Good_Medium	90.80	74.23	6.80	9.76	6803	5562	510	731
281	CW111	Moderate/Good_Poor	66.40	29.87	20.47	16.06	3315	1491	1022	802
323	CW291	Moderate/Good_High	84.37	45.35	24.85	14.18	5603	3012	1650	941
323	CW291	Moderate/Good_Medium	13.93	2.24	6.44	5.26	653	105	302	247
323	CW291	Moderate/Good_Poor	21.26	12.10	6.91	2.25	703	400	229	74
324	CW263	Moderate/Good_High	58.69	40.95	7.70	10.05	4150	2895	544	711
358	CW270	Moderate/Good_High	0.71	0.62	0.08	0.00	42	37	5	0
<b>Totals</b>			<b>381.17</b>	<b>233.04</b>	<b>77.54</b>	<b>70.61</b>	<b>23879</b>	<b>15169</b>	<b>4495</b>	<b>4217</b>

Table A1-2 Staged Species Credit Retirement

Species	BBAM Credits required	Stage 1 Credits required	Stage 2 Credits required	Stage 3 Credits required
Regent Honeyeater	29350	17943	5970	5437
Squirrel Glider	8386	5127	1706	1553
Koala	9910	6059	2016	1835
Large-eared Pied Bat	4391	2860	835	696
<i>Swainsona recta</i>	104	0	104	0
<i>Swainsona sericea</i>	972	954	0	18



# **Annexure 2**

## **Biobanking Credit Calculator Output (Development Site)**

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## BioBanking Credit Calculator

### Ecosystem credits

Proposal ID : 0143/2020/5088MP  
Proposal name : Bowdens MineSiteOnly Nov2021 MajPr  
Assessor name : Steve Sass  
Assessor accreditation number : 0143  
Tool version : v4.0  
Report created : 04/03/2022 10:44

Assessment circle name	Landscapes score	Vegetation zone name	Vegetation type name	Condition	Red flag status	Management zone name	Management zone area	Current site value	Future site value	Loss in site value	Credit required for bio diversity	Credit required for TS	TS with highest credit requirement	Average species loss	Species TG Value	Final credit requirement for management zone
BowdMineSite Sep2020	29.70	CW111_Moderate/Good_Medium	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Moderate/Good_Medium	Yes	1	90.80	90.00	0.00	90.00	6,803	6,803	Powerful Owl	100.00	3.00	6,803
BowdMineSite Sep2020	29.70	CW111_Moderate/Good_Poor	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Moderate/Good_Poor	Yes	2	66.40	56.67	0.00	56.67	3,315	3,315	Powerful Owl	33.33	3.00	3,315
BowdMineSite Sep2020	29.70	CW112_Moderate/Good_Poor	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Moderate/Good_Poor	Yes	3	22.97	62.67	0.00	62.67	1,250	1,250	Masked Owl	66.67	3.00	1,250
BowdMineSite Sep2020	29.70	CW217_Moderate/Good_Medium	White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW	Moderate/Good_Medium	Yes	4	22.04	72.40	0.00	72.40	0	1,360	Masked Owl	94.44	3.00	1,360
BowdMineSite Sep2020	29.70	CW263_Moderate/Good_High	Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes	Moderate/Good_High	Yes	6	58.69	84.38	0.00	84.38	0	4,150	Powerful Owl	93.33	3.00	4,150
BowdMineSite Sep2020	29.70	CW270_Moderate/Good_High	Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion	Moderate/Good_High	Yes	7	0.71	69.27	0.00	69.27	0	42	Powerful Owl	93.33	3.00	42
BowdMineSite Sep2020	29.70	CW291_Moderate/Good_High	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/Good_High	Yes	8	84.37	78.65	0.00	78.65	0	5,603	Powerful Owl	100.00	3.00	5,603
BowdMineSite Sep2020	29.70	CW291_Moderate/Good_Medium	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/Good_Medium	Yes	9	13.93	52.60	0.00	52.60	0	653	Powerful Owl	53.33	3.00	653

As on 4/03/2022

Page 1 of 3

Assessment circle name	Landsc ape score	Vegetation zone name	Vegetation type name	Condition	Red flag status	Management zone name	Manage ment zone area	Current site value	Future site value	Loss in site value	Credit required for bio diversity	Credit required for TS	TS with highest credit requirement	Average species loss	Species TG Value	Final credit requirement for management zone
BowdMineSite Sep2020	29.70	CW291_Mo derate/Good _Poor	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/Good _Poor	Yes	10	21.26	34.20	0.00	34.20	0	703	Powerful Owl	53.33	3.00	703



## BioBanking Credit Calculator

### Species credits

Proposal ID : 0143/2020/5088MP  
Proposal name : Bowdens MineSiteOnly Nov2021 MajPr  
Assessor name : Steve Sass  
Assessor accreditation number : 0143  
Tool version : v4.0  
Report created : 04/03/2022 10:44

Scientific name	Common name	Species TG value	Identified population?	Can Id. popn. be offset?	Area / number of loss	Negligible loss	Red flag status	Number of credits
Swainsona recta	Small Purple-pea	2.60	No		4.00	0.00	Yes	104
Swainsona sericea	Silky Swainson-pea	1.80	No		54.00	0.00	Yes	972
Chalinolobus dwyeri	Large-eared Pied Bat	1.30	No		337.80	0.00	No	4,391
Petaurus norfolcensis	Squirrel Glider	2.20	No		381.17	0.00	No	8,386
Phascogale cinerea	Koala	2.60	No		381.17	0.00	No	9,910
Anthochaera phrygia	Regent Honeyeater	7.70	No		381.17	0.00	No	29,350

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# **Annexure 3**

## **Credit Profiles (Development Site)**

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

Note: This Annexure is only available on the digital version of this document

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## ***Biodiversity credit report***



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

Date of report: 18/01/2022

Time: 1:48:17PM

Calculator version: v4.0

### **Major Project details**

<b>Proposal ID:</b>	0143/2020/5088MP
<b>Proposal name:</b>	Bowdens MineSiteOnly Nov2021 MajPr
<b>Proposal address:</b>	Envirokey P/L PO Box 7231 Tathra NSW 2550
<b>Proponent name:</b>	Bowdens Silver Limited
<b>Proponent address:</b>	68 Maloneys Road Lue NSW 2850
<b>Proponent phone:</b>	0263736420
<b>Assessor name:</b>	Steve Sass
<b>Assessor address:</b>	PO Box 7231 Tathra NSW 2550
<b>Assessor phone:</b>	02 6494 5422
<b>Assessor accreditation:</b>	0143

**Summary of ecosystem credits required**

Plant Community type	Area (ha)	Credits created
Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	22.97	1,250.20
Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes	58.69	4,150.00
Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion	0.71	42.00
Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	119.56	6,959.00
Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	157.20	10,118.38
White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW	22.04	1,360.00
<b>Total</b>	<b>381.17</b>	<b>23,880</b>

**Credit profiles**

**1. Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, (CW111)**

Number of ecosystem credits created	10,118
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, (CW111)</p> <p>Apple Box - Blakely's Red Gum moist valley and footslopes grass-forb open forest of the NSW South Western Slopes Bioregion, (CW103)</p> <p>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (CW112)</p> <p>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (CW138)</p> <p>Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion, (CW139)</p> <p>Blakely's Red Gum - White Box - Yellow Box - Black Cypress Pine box grass/shrub woodland on clay loam soils on undulating hills of central NSW South Western Slopes Bioregion, (CW209)</p> <p>White Box - Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region, (CW211)</p> <p>White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, (CW213)</p> <p>White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (CW215)</p> <p>White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (CW216)</p> <p>Yellow Box - Blakely's Red Gum grassy woodland of the Nandewar Bioregion, (CW225)</p> <p>Yellow Box grassy tall woodland on alluvium or pama loams and clays on flats in NSW South Western Slopes Bioregion, (CW226)</p> <p>Apple Box - Rough-barked Apple terrace flats woodland of the southern Brigalow Belt South Bioregion, (CW231)</p> <p>White Box - Blakely's Red Gum - Long-leaved Box - Nortons Box - Red Stringybark grass-shrub woodland on shallow soils on hills in the NSW South Western Slopes Bioregion, (CW320)</p> <p>Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion, (CW295)</p> <p>Red Stringybark - Blakely's Red Gum +/- Long-leaved Box shrub/grass hill woodland of the NSW South Western Slopes Bioregion, (CW285)</p> <p>Red Box - White Box +/- Red Stringybark hill woodland in the NSW South Western Slopes Bioregion, (CW280)</p> <p>Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion, (CW330)</p>	<p>Capertee</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

**2. Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (CW112)**

Number of ecosystem credits created	1,250
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (CW112)</p> <p>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (CW138)</p> <p>White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (CW215)</p> <p>White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (CW216)</p> <p>Red Box - White Box +/- Red Stringybark hill woodland in the NSW South Western Slopes Bioregion, (CW280)</p>	<p>Capertee</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

**3. White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW, (CW217)**

Number of ecosystem credits created	1,360
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW, (CW217)</p> <p>Blue-leaved Ironbark heathy woodland of the southern part of the Brigalow Belt South Bioregion, (CW114)</p> <p>Buloke - White Cypress Pine woodland in the NSW South Western Slopes Bioregion, (CW121)</p> <p>Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, (CW149)</p> <p>Mugga Ironbark - Western Grey Box - cypress pine tall woodland on footslopes of low hills in the NSW South Western Slopes Bioregion, (CW155)</p> <p>Mugga Ironbark - Buloke - Pillga Box - White Cypress Pine shrubby woodland on sandstone in the Dubbo region, south-western Brigalow Belt South Bioregion, (CW157)</p> <p>Tumbledown Red Gum - Black Cypress Pine - Red Box low woodland of hills of the NSW South Western Slopes Bioregion, (CW202)</p> <p>Mugga Ironbark - Black Cypress Pine - Red Stringybark - Blakely's Red Gum - Red Ironbark woodland on hillslopes and in valleys on ranges in the NSW central western slopes, (CW268)</p> <p>Bottlebrush riparian shrubland wetland of the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, (CW243)</p> <p>Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)</p> <p>Thyme Honey-myrtle - red gum - Mugga Ironbark shrubland / woodland in impeded drainage flats or depressions in the southern Brigalow Belt South Bioregion, (CW308)</p>	<p>Capertee</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

**4. Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion, (CW291)**

Number of ecosystem credits created

6,959

IBRA sub-region

Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions

Bottlebrush riparian shrubland wetland of the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, (CW243)

Red Stringybark - Long-leaved Box - Black Cypress Pine - grassy/shrubby low woodland on ranges, central NSW South Western Slopes Bioregion, (CW287)

Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)

Narrow-leaved Ironbark - White Cypress Pine - Buloke tall open forest on lower slopes and flats in the Pilliga Scrub and surrounding forests in the central north Brigalow Belt South Bioregion, (CW273)

Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region, (CW299)

Dapper Mugga Ironbark - Western Grey Box - Blakely's Red Gum - Black Cypress Pine grass shrub hill woodland (southern Brigalow Belt South Bioregion), (CW271)

White Mallee - Dwyer's Red Gum mallee heath on sands in the Goonoo - Pilliga region, Brigalow Belt South Bioregion, (CW327)

Red Stringybark - Rough-barked Apple +/- Nortons Box open forest on hillslopes in the Warrumbungle NP - Coolah regions, (CW290)

Red Stringybark - Narrow-leaved Ironbark - Black Cypress Pine - hill red gum sandstone woodland of southern NSW Brigalow Belt South Bioregion, (CW289)

Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo), (CW272)

White Cypress Pine - Narrow-leaved Ironbark - Buloke grassy open forest of the Dubbo region, southern Brigalow Belt South Bioregion, (CW326)

Mugga Ironbark - Narrow-leaved Ironbark - Buloke - Black Cypress Pine shrub grass open forest in the Goonoo forests and surrounding region, southern Brigalow Belt South Bioregion, (CW269)

Dwyer's Red Gum - Black Cypress Pine - ironbark low woodland on sandstone hillcrests in the Dubbo - Gilgandra region, south-western Brigalow Belt South Bioregion, (CW255)

Thyme Honey-myrtle - red gum - Mugga Ironbark shrubland / woodland in impeded drainage flats or depressions in the southern Brigalow Belt South Bioregion, (CW308)

Red gum - Rough-barked Apple - Narrow-leaved Ironbark - cypress pine grassy open forest on flats and drainage lines in the Goonoo and surrounding forests, southern Brigalow Belt South Bioregion, (CW281)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion, (CW260)

Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion, (CW282)

Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bio, (CW275)

Capertee

and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion, (CW291)

Black Cypress Pine - Narrow-leaved Stringybark heathy woodland of the southern Brigalow Belt South Bioregion, (CW107)

Black Cypress Pine shrubby woodland of the Brigalow Belt South Bioregion, (CW108)

Blue-leaved Ironbark heathy woodland of the southern part of the Brigalow Belt South Bioregion, (CW114)

Blue-leaved Ironbark woodland on sandy uplands and slopes of the Darling Riverine Plains Bioregion, (CW115)

Brown Bloodwood - cypress - ironbark heathy woodland in the Pilliga region of the Brigalow Belt South Bioregion, (CW120)

Buloke - White Cypress Pine woodland in the NSW South Western Slopes Bioregion, (CW121)

Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, (CW149)

Motherumbah (*Acacia cheelii*) woodlands on sandstones of the Brigalow Belt South Bioregion, (CW153)

Mugga Ironbark - Western Grey Box - cypress pine tall woodland on footslopes of low hills in the NSW South Western Slopes Bioregion, (CW155)

Mugga Ironbark - Inland Grey Box shrubby woodland of the Brigalow Belt South Bioregion, (CW156)

Mugga Ironbark - Buloke - Pilliga Box - White Cypress Pine shrubby woodland on sandstone in the Dubbo region, south-western Brigalow Belt South Bioregion, (CW157)

Narrow-leaved Ironbark shrubby woodland of the Brigalow Belt South bioregion, (CW160)

Scribbly Gum - Brown Bloodwood woodland on volcanic slopes of the southern Brigalow Belt South Bioregion, (CW186)

Tumbledown Red Gum - Black Cypress Pine - Currawang woodland of ridges and rocky hills mainly of the Cobar Peneplain Bioregion, (CW201)

Tumbledown Red Gum - Black Cypress Pine - Red Box low woodland of hills of the NSW South Western Slopes Bioregion, (CW202)

White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes, (CW212)

White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW, (CW217)

Red Stringybark - Long-leaved Box - Black Cypress Pine shrub/grass woodland on siliceous sedimentary ranges in the upper NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion, (CW288)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine hillslope shrub-tussock grass open forest on mainly sandstone ranges in the NSW



central western slopes, (CW261)

Inland Scribbly Gum - Black Cypress Pine - Red Ironbark open forest of the NSW central western slopes, (CW259)

Mugga Ironbark - Black Cypress Pine - Red Stringybark - Blakely's Red Gum - Red Ironbark woodland on hillslopes and in valleys on ranges in the NSW central western slopes, (CW268)

Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion, (CW292)

**5. Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes, (CW263)**

Number of ecosystem credits created	4,150
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions

Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes, (CW263)

Black Cypress Pine - Narrow-leaved Stringybark heathy woodland of the southern Brigalow Belt South Bioregion, (CW107)

Black Cypress Pine shrubby woodland of the Brigalow Belt South Bioregion, (CW108)

Blue-leaved Ironbark heathy woodland of the southern part of the Brigalow Belt South Bioregion, (CW114)

Blue-leaved Ironbark woodland on sandy uplands and slopes of the Darling Riverine Plains Bioregion, (CW115)

Brown Bloodwood - cypress - ironbark heathy woodland in the Pilliga region of the Brigalow Belt South Bioregion, (CW120)

Buloke - White Cypress Pine woodland in the NSW South Western Slopes Bioregion, (CW121)

Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, (CW149)

Motherumbah (*Acacia cheelii*) woodlands on sandstones of the Brigalow Belt South Bioregion, (CW153)

Mugga Ironbark - Western Grey Box - cypress pine tall woodland on footslopes of low hills in the NSW South Western Slopes Bioregion, (CW155)

Mugga Ironbark - Inland Grey Box shrubby woodland of the Brigalow Belt South Bioregion, (CW156)

Mugga Ironbark - Buloke - Pilliga Box - White Cypress Pine shrubby woodland on sandstone in the Dubbo region, south-western Brigalow Belt South Bioregion, (CW157)

Narrow-leaved Ironbark shrubby woodland of the Brigalow Belt South bioregion, (CW160)

Scribbly Gum - Brown Bloodwood woodland on volcanic slopes of the southern Brigalow Belt South Bioregion, (CW186)

Tumbledown Red Gum - Black Cypress Pine - Currawang woodland of ridges and rocky hills mainly of the Cobar Penepain Bioregion, (CW201)

Tumbledown Red Gum - Black Cypress Pine - Red Box low woodland of hills of the NSW South Western Slopes Bioregion, (CW202)

White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes, (CW212)

White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW, (CW217)

Red Stringybark - Long-leaved Box - Black Cypress Pine shrub/grass woodland on siliceous sedimentary ranges in the upper NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion, (CW288)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine hillslope shrub-tussock grass open forest on mainly sandstone ranges in the NSW central western slopes, (CW261)

Capertee

and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion, (CW291)

Blue-leaved Stringybark open forest of the Mudgee region NSW central western slopes, (CW242)

Inland Scribbly Gum - Black Cypress Pine - Red Ironbark open forest of the NSW central western slopes, (CW259)

Mugga Ironbark - Black Cypress Pine - Red Stringybark - Blakely's Red Gum - Red Ironbark woodland on hillslopes and in valleys on ranges in the NSW central western slopes, (CW268)

Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion, (CW292)

Bottlebrush riparian shrubland wetland of the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, (CW243)

Red Stringybark - Long-leaved Box - Black Cypress Pine - grassy/shrubby low woodland on ranges, central NSW South Western Slopes Bioregion, (CW287)

Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)

Inland Scribbly Gum - White Bloodwood - Red Stringybark - Black Cypress Pine shrubby sandstone woodland mainly of the Warrumbungle NP - Pilliga region in the Brigalow Belt South Bioregion, (CW262)

Narrow-leaved Ironbark - White Cypress Pine - Buloke tall open forest on lower slopes and flats in the Pilliga Scrub and surrounding forests in the central north Brigalow Belt South Bioregion, (CW273)

Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland) in the Pilliga - Goonoo sandstone forests, Brigalow Belt South Bioregion, (CW238)

Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region, (CW299)

Dapper Mugga Ironbark - Western Grey Box - Blakely's Red Gum - Black Cypress Pine grass shrub hill woodland (southern Brigalow Belt South Bioregion), (CW271)

White Bloodwood - Red Ironbark - Black Cypress Pine shrubby sandstone woodland of the Pilliga Scrub and surrounding regions, (CW318)

White Mallee - Dwyer's Red Gum mallee heath on sands in the Goonoo - Pilliga region, Brigalow Belt South Bioregion, (CW327)

Black Cypress Pine - Narrow-leaved Ironbark - red gum +/- White Bloodwood shrubby open forest on hills of the southern Pilliga, Coonabarabran and Garawilla regions, Brigalow Belt South Bioregion, (CW235)

Red Stringybark - Rough-barked Apple +/- Nortons Box open forest on hillslopes in the Warrumbungle NP - Coolah regions, (CW290)

Spur-wing Wattle heath on sandstone substrates in the Goonoo - Pilliga forests, Brigalow Belt South Bioregion, (CW307)

Red Stringybark - Narrow-leaved Ironbark - Black Cypress Pine - hill red gum sandstone woodland of southern NSW Brigalow Belt South Bioregion,

<p>(CW289)</p> <p>Blue-leaved Ironbark - Black Cypress Pine shrubby sandstone open forest in the southern Brigalow Belt South Bioregion (including Goonoo), (CW241)</p> <p>Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo), (CW272)</p> <p>White Cypress Pine - Narrow-leaved Ironbark - Buloke grassy open forest of the Dubbo region, southern Brigalow Belt South Bioregion, (CW326)</p> <p>Mugga Ironbark - Narrow-leaved Ironbark - Buloke - Black Cypress Pine shrub grass open forest in the Goonoo forests and surrounding region, southern Brigalow Belt South Bioregion, (CW269)</p> <p>Dwyer's Red Gum - Black Cypress Pine - ironbark low woodland on sandstone hillcrests in the Dubbo - Gilgandra region, south-western Brigalow Belt South Bioregion, (CW255)</p> <p>Thyme Honey-myrtle - red gum - Mugga Ironbark shrubland / woodland in impeded drainage flats or depressions in the southern Brigalow Belt South Bioregion, (CW308)</p> <p>Red gum - Rough-barked Apple - Narrow-leaved Ironbark - cypress pine grassy open forest on flats and drainage lines in the Goonoo and surrounding forests, southern Brigalow Belt South Bioregion, (CW281)</p> <p>Narrow-leaved Wattle low open forest / very tall shrubland on ridges in northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, (CW276)</p> <p>Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion, (CW260)</p> <p>Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion, (CW282)</p> <p>Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bio, (CW275)</p>	
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**6. Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)**

Number of ecosystem credits created	42
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)</p> <p>Buloke - White Cypress Pine woodland in the NSW South Western Slopes Bioregion, (CW121)</p>	<p>Capertee</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

**Summary of species credits required**

Common name	Scientific name	Extent of impact Ha or individuals	Number of species credits created
Koala	<i>Phascolarctos cinereus</i>	381.17	9,910
Regent Honeyeater	<i>Anthochaera phrygia</i>	381.17	29,350
Squirrel Glider	<i>Petaurus norfolcensis</i>	381.17	8,386
Small Purple-pea	<i>Swainsona recta</i>	4.00	104
Silky Swainson-pea	<i>Swainsona sericea</i>	64.00	1,152
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	337.80	4,391

# **Annexure 4**

## **Biodiversity Credit Report from the Biobanking Credit Calculator (Offset Sites)**

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## BioBanking Credit Calculator

### Ecosystem credits



Proposal ID : 171/2019/4990B  
Proposal name : Bowdens Silver Project  
Assessor name : Simon Tweed  
Assessor accreditation number : 171  
Tool version : v4.0  
Report created : 04/02/2020 14:29

Assessment circle name	Landsc ape score	TS subzone number	Vegetation zone name	Vegetation type name	Condition	Management zone name	Management zone area	Current site value	Future site value	Gain in site value	Total credit created for management zone
XXX	21.20	CW217_Moderate/Good_Medium_1	CW217_Moderate/Good_Medium	White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW	Moderate/Good_Medium	mz1off	12.00	79.17	100.00	20.83	164
XXX	21.20	CW112_Moderate/Good_Poor_1	CW112_Moderate/Good_Poor	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Moderate/Good_Poor	mz2off	158.00	65.33	91.00	25.67	2,246
XXX	21.20	CW111_Moderate/Good_Medium_1	CW111_Moderate/Good_Medium	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Moderate/Good_Medium	mz3off	114.00	87.33	97.33	10.00	1,317
XXX	21.20	CW111_Moderate/Good_Poor_1	CW111_Moderate/Good_Poor	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Moderate/Good_Poor	mz4off	91.00	59.33	91.00	31.67	1,362
XXX	21.20	CW291_Moderate/Good_High_1	CW291_Moderate/Good_High	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/Good_High	mz5off	224.00	93.23	100.00	6.77	2,573
XXX	21.20	CW291_Moderate/Good_Medium_1	CW291_Moderate/Good_Medium	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/Good_Medium	mz6off	18.00	71.35	88.54	17.19	241
XXX	21.20	CW291_Moderate/Good_Poor_1	CW291_Moderate/Good_Poor	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/Good_Poor	mz7off	47.00	35.24	63.02	27.78	641
XXX	21.20	CW263_Moderate/Good_High_1	CW263_Moderate/Good_High	Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes	Moderate/Good_High	mz8off	26.00	82.81	96.88	14.07	336

Assessment circle name	Landsc ape score	TS subzone number	Vegetation zone name	Vegetation type name	Condition	Management zone name	Management zone area	Current site value	Future site value	Gain in site value	Total credit created for management zone
XXX	21.20	CW242_Moderate/Good_High_1	CW242_Moderate/Good_High	Blue-leaved Stringybark open forest of the Mudgee region NSW central western slopes	Moderate/Good_High	mz9off	70.00	82.81	100.00	17.19	968

## BioBanking Credit Calculator

### Species credits



Proposal ID : 171/2019/4990B  
Proposal name : Bowdens Silver Project  
Assessor name : Simon Tweed  
Assessor accreditation number : 171  
Tool version : v4.0  
Report created : 04/02/2020 14:29

Scientific name	Common name	Species TG value	Biobank on identified population?	Number Units found?	Number of credits
Petaurus norfolcensis	Squirrel Glider	2.20	No	363.00 ha	2,577
Phascolarctos cinereus	Koala	2.60	No	363.00 ha	2,577
Anthochaera phrygia	Regent Honeyeater	7.70	No	760.00 ha	5,396
Acacia ausfeldii	Ausfeld's Wattle	7.70	No	363.00 indiv	2,577

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