4. THREATENED SPECIES

Conservation Planning Officers of the Regional Operations Group Office of Environment and Heritage provided a list of species requiring further consideration within the FBA for the project regarding the EIS for the Hera Mine Mod 3. Impacts on the following species require further consideration and provision of the information specified in s9.2 of the Framework for Biodiversity Assessment:

- Grey Falcon (*Falco hypoleucos*)
- Little Eagle (*Hieraaetus morphnoides*)
- Shy Heathwren (*Hylacola cautus*)
- Chestnut Quail-Thrush (*Cinclosoma castanotus*)
- Mallee Fowl (*Leipoa ocellata*)
- Turquoise Parrot (*Neophema pulchella*)
- Kultarr (*Antechinomys langier*)
- Cobar Greenhood Orchid (*Pterostylis cobarensis*)
- Curly Bark Wattle (*Acacia curranii*)
- *Commersonia procumbens*.

4.1 THE DEVELOPMENT SITE

A summary of threatened species at the Development Site has been provided below:

- A Biobanking credit report generated on 11/7/2015 (**Appendix 5**) did not identify additional species credit species
- No species able to withstand further loss have (to date) been identified in the Development Site
- The Tg values used in the calculations were not modified as they correctly assume any predicted species have potential to use habitat in the Development Site
- A targeted assessment on 6 July 2015 did not detect any listed species in the Development Site. OzArk 2011 to 2015 recorded eight listed ecosystem credit fauna species in 2010, six in 2013 and four in 2014 in 'The Peak' (but not in the Development Site). These were:
    - Major Mitchells Cockatoo (2010) – observed
    - Spotted Harrier (2010) – observed
    - Hooded Robin (2010, 2013, 2014) – observed
    - Turquoise Parrot (2010) – observed
    - Grey-crowned Babbler (eastern subspecies) (2010) – observed
    - Diamond Firetail (2010) – observed
    - Little Pied Bat (2010, 2013, 2014) – Ultrasonic detection
    - Yellow-bellied Sheathtail Bat (2010, 2013, 2014) - Ultrasonic detection
    - Eastern Bentwing Bat (2013) - Ultrasonic detection
    - Eastern Cave Bat (2013) - Ultrasonic detection
    - Large-eared Pied Bat (2013, 2014) - Ultrasonic detection.
- Turquoise Parrot was identified by OEH as requiring further consideration. Targeted assessment in the Development Site did not identify any suitable breeding sites. Further the Development Site is not near a creek (preferred breeding habitat). All listed ecosystem credit species fauna recorded in 'The Peak' were considered unlikely to have breeding habitat in the Development Site and the opportunities for feeding were compromised by low levels of biodiversity due to a thick Cypress Pine canopy (resulting in sparse ground cover)
- No ecosystem credit flora species or those requiring further assessment were identified in the 2010 to 2015 OzArk assessments in 'The Peak' or the Development Site. While the 2015 biobanking assessment was completed in winter, thus not suitable to detect Cobar Greenhood, rosettes for Veined Greenhood (*Pterostylis bisecta*) were observed as an incidental observation after the plots were completed. Targeted orchid assessments were completed in 2012 for the EA

/ project approvals in 'The Peak at Hill 1 (adjacent to the Development Site) after soaking rains in October 2011 and it was not recorded. It is considered highly unlikely Cobar Greenhood is within the Development Site but the unaltered Tg value recognises the Development Site has not been assessed for this species in its flowering period. The other flora species requiring additional assessment if present, would have been detected, the Tg values for these also remain unaltered recognising a viable (yet highly unlikely) seed bank may be present

- Transects walked and veg plots have been shown on **Figure 3-3**
- Vegetation recorded in each 20x20m plot has been provided as **Appendix 3**
- **Appendix 2** provides 20x50m BioBanking plot/transect data
- Credential of the assessor have been provided in **Section 1**
- Survey time matrix generated in the BioBanking calculator has been provided below:
    - Greenhood Orchid (Pterostylis cobarensis) September to November. Not consistent.
    - Koala (Phascolarctos cinereus) all year round. Consistent.
- Biobanking credit calculator predicted threatened species has been provided on **Table 4-1**
- Vegetation Zone 1 for Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion management scores has been provided as **Table 4-2**
- Vegetation Zone 1 for Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion management scores has been provided as **Table 4-3**.

Table 4-1: Development Site BioBanking credit calculator predicted threatened species

Common name	Scientific name *	TS offset multiplier	On site *
Australian Bustard	*Ardeotis australis*	2.6	Yes
Barking Owl	*Ninox connivens*	3.0	Yes
Bush Stone-curlew	*Burhinus grallarius*	2.6	Yes
Corben's Long-eared Bat	*Nyctophilus corbeni*	2.1	Yes
Diamond Firetail	*Stagonopleura guttata*	1.3	Yes
Gilbert's Whistler	*Pachycephala inornata*	1.3	Yes
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis subsp. temporalis*	1.3	Yes
Hooded Robin (south-eastern form)	*Melanodryas cucullata subsp. cucullata*	1.7	Yes
Kultarr	*Antechinomys laniger*	2.6	Yes
Little Pied Bat	*Chalinolobus picatus*	2.1	Yes
Major Mitchell's Cockatoo	*Lophochroa leadbeateri*	1.9	Yes
Painted Honeyeater	*Grantiella picta*	1.3	Yes
Pied Honeyeater	*Certhionyx variegatus*	1.3	Yes
Speckled Warbler	*Chthonicola sagittata*	2.6	Yes
Spotted Harrier	*Circus assimilis*	1.4	Yes
Stripe-faced Dunnart	*Sminthopsis macroura*	2.6	Yes
Varied Sittella	*Daphoenositta chrysoptera*	1.3	Yes
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	2.2	Yes

Table 4-2: Development Site BioBanking credit calculator vegetation zone score values (WE58)

Vegetation zone		WE58_Moderate/Good_Poor	
Plant community type		**Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion**	
Total veg zone area		**4.05**	
Management zone		**1**	
Management zone area		**4.05**	
Status		**Complete**	
	Current score (0-3)	Score with development (0-3)	[redacted]
Native plant species:	**1**	**0**	
Native over-storey cover:	**1**	**0**	
Native mid-storey cover:	**0**	**0**	
Native ground cover (grasses):	**3**	**0**	
Native ground cover (shrubs):	**3**	**0**	
Native ground cover (other):	**3**	**0**	
Exotic plant cover:	**3**	**0**	
Number of trees with hollows:	**0**	**0**	
Overstorey regeneration:	**0**	**0**	
Total length of fallen logs:	**1**	**0**	
	Current Site Value Score (out of 100)	Future Site Value Score (out of 100)	Decrease in Site Value Score
	26	0.00	26.00

Table 4-3: Development Site Biobanking credit calculator vegetation zone score values (WE92)

Vegetation zone		WE92_Moderate/Good_Poor	
Plant community type		**Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion**	
Total veg zone area		**2.55**	
Management zone		**2**	
Management zone area		**2.55**	
Status		**Complete**	
	Current score (0-3)	Score with development (0-3)	[redacted]
Native plant species:	**1**	**0**	
Native over-storey cover:	**3**	**0**	
Native mid-storey cover:	**3**	**0**	
Native ground cover (grasses):	**1**	**0**	
Native ground cover (shrubs):	**0**	**0**	

Native ground cover (other):	1	0	
Exotic plant cover:	3	0	
Number of trees with hollows:	0	0	
Overstorey regeneration:	0	0	
Total length of fallen logs:	0	0	
	Current Site Value Score (out of 100)	Future Site Value Score (out of 100)	Decrease in Site Value Score
	34.67	0.00	34.67

4.2 THE OFFSET SITE

A summary of threatened species at the Offset Site has been provided below:

- A BioBanking credit report generated on 11/7/2015 (**Appendix 6**)
- The Tg values used in the calculations were not modified as they correctly assume any predicted species have potential to use habitat in the Offset Site
- No species able to withstand further loss have (to date) been identified in the Offset Area
- There are no species credits available in the Offset Area
- A targeted assessment on 6 and 7 July 2015 recorded Grey-crowned Babbler (eastern sub-species) and Hooded Robin in the Offset Site (ecosystem credit species). OzArk (2013) and OzArk (2014) recorded two other listed ecosystem credit species in 'Chelsea' (in the existing Offset Site). These were:
    - Little Pied Bat (2013, 2014) – Ultrasonic detection
    - Large-eared Pied Bat (2013, 2014) - Ultrasonic detection.
- Anecdotal evidence from the past land owner suggests Kultarr and Superb Parrot is present in the Biodiversity Offset Area. In 2013, 150 trap nights and in 2014 three pit fall traps over three nights did not detect the species (personal experience states 1000 trap nights is required). 'Chelsea' remains under-surveyed as emphasis to date has been on establishing permanent vegetation plots and vegetation monitoring points. Now plots / points have largely been established the field assessment focus will shift from 'The Peak' to 'Chelsea' in 2015. Targeted assessment recorded trees with hollows suitable for breeding sites in the Offset Site, further the additional area proposed for offsetting the 2015 Development Site includes a creek in Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion with a number if Inland Grey Box as sub-canopy. All listed ecosystem credit species fauna recorded in Offset Site were considered likely to have breeding habitat form those which breed in the region
- No ecosystem credit flora species requiring further assessment were identified in OzArk (2013) and OzArk (2014) OzArk assessments in 'Chelsea' or the Offset Site. While the 2015 BioBanking assessment was completed in winter, thus not suitable to detect Cobar Greenhood, rosettes for Veined Greenhood (*Pterostylis bisecta*) were observed in 'Chelsea' Monitoring Point 1. Targeted orchid assessments have not been carried out at 'Chelsea' but are planned for 2015 (depending on suitable preceding rain). The other flora species requiring additional assessment if present, would have been detected, the Tg values for these also remain unaltered. It is considered likely any one of these species may be recorded in 'Chelsea' with targeted survey effort in an appropriate season
- Transects walked and vegetation plots have been shown on **Figure 3-4** and **3-5**
- Vegetation recorded in each 20x20m plot has been provided as **Appendix 4**
- **Appendix 2** provides 20x50m BioBank plot/transect data.

Table 4-4: Offset Site Biobanking credit calculator predicted threatened species

Common name	Scientific name	Managed at site?	Size of gain	Size of gain	Percent gain
Greenhood Orchid	*Pterostylis cobarensis*	No	0.00	indiv	71.00
Grey Falcon	*Falco hypoleucos*	No	0.00	ha	71.00
Koala	*Phascolarctos cinereus*	No	0.00	ha	71.00
Pine Donkey Orchid	*Diuris tricolor*	No	0.00	indiv	71.00
Rulingia procumbens	*Rulingia procumbens*	No	0.00	indiv	71.00

5. AVOID AND MINIMISE IMPACT

All information used in this section was collected in accordance with Chapters 3 to 6 of BBAM (2014). A written response from the Proponent regarding avoid minimise and has been provided as **Appendix 7**.

5.1 DEMONSTRATING AVOIDANCE AND MINIMISATION OF DIRECT IMPACTS ON BIODIVERSITY

If a proponent determines that a Major Project cannot proceed without impacting on biodiversity values despite seeking to avoid impacts in accordance with Paragraph 8.3.1.3, the proponent must identify reasonable measures and strategies to minimise the impact of development on biodiversity values (BBAM (2014)).

The proposed development associated with Hera Mine Modification 3 Project Approval (PA) 10_0191 cannot proceed without impacting on biodiversity values. Aurelia Metals Ltd will seek to avoid impacts in accordance with Paragraph 8.3.1.3. Reasonable measures and strategies have been identified to minimise the impact of the development on biodiversity impacts include:

- The proposed car park has been designed to fit in an existing area cleared area (under prior approval)
- The Development Site is adjacent to the approved Development Area and will not further fragment the ecosystem (See **Figures 1-1** to **1-4, 3-1** and **3-2**). There are no indirect impact areas
- The Development Site will not impact an endangered or a red flag community
- The Development Site has been identified as an unlikely breeding habitat for the region's threatened species (See **Section 4.1**)
- 'The Peak' has undergone targeted searches including animal trapping in three major events over the past five years. No listed flora or fauna have been recorded in the Development Site (See **Section 4.1**)
- The Development Site is not within critical habitat
- The Development Site is not adjacent or near a watercourse. The nearest waterway is Box Creek, this creek is ephemeral and located approximately two kilometres south of the proposed development (See **Figure 2-2** and **2-3**)
- The Development Site will be bunded to eliminate runoff of site waters. All site waters will be directed to sediment basins (See **Figures 1-1** to **1-4**)
- Clean water surrounding the Development Site will be redirected around the site to clean water storages to clean water storages (See **Figures 1-1** to **1-4**)
- The Development Site will not affect state significant biodiversity links.

A proponent may only use offsets to compensate for impacts on biodiversity values where those impacts have already been avoided and minimised as far as practicable in accordance with Paragraphs 8.3.1.3 and 8.3.1.4 (BBAM (2014)).

Through all stages of the planning process, as a priority, consideration was given to avoid impacts to native vegetation. Aurelia Metals Ltd has carefully considered all options and attempted to minimise impacts on biodiversity values associated with the proposed development. The current proposal minimises the impacts to the environment while also achieving the requirements of the project.

Measures that minimise the impact on biodiversity may be required for a particular threatened species, or apply to a particular phase of the project life cycle (BBAM (2014)).

A number of threatened species have been previously recorded on 'The Peak' (See **Section 4.1**). The Development Site has been identified by an ecologist as unlikely breeding habitat for the regions listed species and targeted flora assessments in the general area of the proposal over the past five years have not recorded any listed flora. As part of Aurelia Metals Ltd commitment to biodiversity values a yearly ecological monitoring program is conducted by suitably qualified consultants and this information has been used in the planning process.

Aurelia Metals Ltd is aware Hooded Robin and a number of listed microbats have been recorded on 'The Peak' property between 2011 and 2015. Annual ecological monitoring has identified suitable breeding areas on 'The Peak'. The Development Site is not in or immediately adjacent to these areas. The Development Site is dominated by thick stands of White Cypress Pine resulting in low biodiversity and thus fewer food resources makes it a sparse resource and a poor feeding ground for the regions listed species.

Annual ecological monitoring has also identified the Development Site does not provide suitable habitat for cave dependant listed microbats. There is a low density of trees with hollows in the Development Site (estimated at <1 tree with hollow per hectare) compared to other areas on the property (two to three per hectare).

The safeguards and mitigation measures for impacts to biodiversity are given in **Table 5-1**.

Table 5-1: Safeguards and management measures for potential impacts to biodiversity

Impact	Environmental safeguards	Responsibility	Timing
General	1. All personnel would be inducted such that they are aware that any stand of native vegetation outside the Development Site has legislative consequences if deliberately or accidentally impacted without approval under Part 5 of the EP&A Act. Evidence of all personnel receiving an induction would be kept on file (signed induction sheets etc.). Should an incident happen followed by an OEH investigation, this process is likely to reduce the severity of the repercussions to Proponent while encouraging the willingness to comply with the ground crews. 2. Do not park under trees. 3. Vehicle access will be identified on maps and in the field to avoid random meandering and unnecessary impact to native vegetation. 4. Any change in design will require assessment to determine if further ecological survey is required.	Proponent	Pre-construction Construction
Tree Clearing	5. Clearing shall be restricted to delineated Development Site shown on Figure 1–3 to 1-7. Clearing shall be limited to the minimum amount necessary to provide for the safety and security of the asset and people. 6. Clearing, where possible, would not be carried out in spring. 7. If a tree marked for removal can be retained apply judgement (following requisite protocols) and implement other management if possible i.e. lopping limbs rather than remove the tree. 8. Felled timber would be contained within the Subject Site (if possible) or would be re-located within adjacent vegetated areas to provide ground cover and habitat for fauna. 9. Before any tree clearing, care would be taken to identify nests and/or roosting sites and/or threatened species. 10. A pre-clearing check of any trees to be felled would be carried out to identify breeding sites of threatened species before impact. 11. Before lopping or clearing, inspect trees with bird nests before pushing or felling to ensure the nests are vacant (no nests were observed during the assessment). Inspection would occur immediately before pushing or felling. If a bird is in the nest, clear the trees around it first to see if the animal will disperse. If the bird is a nestling all measures would be taken to collect the bird and remove to a safe location.	Proponent	Pre-construction Construction

Impact	Environmental safeguards	Responsibility	Timing
Threatened Species	12. Clearing would, if possible, avoid in spring. 13. If vegetation in spring is not avoidable, then a suitably qualified person (ecologist / environmental scientist / Aurelia environmental officer) shall check trees for any potential breeding sites prior to clear clearing work. 14. If the tree is used for breeding then the nominated environmental representative will provide suitable management options i.e. supervise hollow destruction or other appropriate mitigation measures such as high visibility fencing and GPS marking of the site until the breeding event has completed.	Proponent	Pre-construction Construction
Invasive Flora and Fauna Management	15. Engage a weeds officer to inspect the Development Site and treat weeds before, during and post construction. 16. 'Best Practice' weed management practices would be in place to prevent transfer of weed seeds and vegetative materials, including wash-down of vehicles entering or leaving the Subject Site. To achieve this, weed control measures would need to be established before starting construction. 17. All vehicle movements would be restricted to existing cleared and defined surfaces to minimise disturbance to the surrounding vegetation. 18. All food scraps and rubbish are to be appropriately disposed of in sealed receptacles to prevent providing forage habitats for foxes, rats, dogs and cats.	Proponent	Pre-construction Construction

6. IMPACT SUMMARY

- Each vegetation zone assessed in the Development Site has a site score value greater than 17 (**Tables 4-2** and **4-3**) thus offsetting is compulsory for both vegetation zones shown on **Figure 3-2**
- No species credit species require offsetting (**Appendix 5**)
- Species identified by OEH as requiring further consideration will not be affected by the proposal (See **Section 4.1**)
- The future site value score for both vegetation zones in the Development Site for is zero (**Tables 4-2 and 4-3**):
    - WE58_Moderate/Good_Poor current site value 26.00 out of 100 will experience a decrease in site value score of 26
    - WE92_Moderate/Good_Poor current site value 34.67 out of 100 will experience a decrease in site value score of 34.67.
- The number of required ecosystem credits for impact of development on each vegetation zone at the Development Site have been provided on **Table 6-1**. Species credits are not required.

Table 6-1: Development Site offsetting requirements

PC type code	Vegetation Type	Red Flag	Area Impacted (ha)	Credits Required	Credits Required/ha	Est. Offset Area (ha) Required	
						Minimum Tier 3 Outcome (2:1)	Tier 1 Outcome Average Biobank Site 9.3 credits/ha
WE92	Benson 103 Poplar Box - Gum-barked Coolibah	No	2.55	74	29.0	5.1	8
WE 58	Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	No	4.05	81	20.0	8.1	9
	Total		**6.60**	**155**	**23.5**	**13.2**	**17**

STAGE 3: BIODIVERSITY OFFSET STRATEGY

7. OFFSET SITE IDENTIFICATION

The Biodiversity Offset Site ''Chelsea'' property is 1884.7 ha. The approved Biodiversity Offset Area within "Chelsea" is 537.71 ha and is shown in red on **Figure 2-2. Appendix 8** provides Biobanking credit report credit matching to demonstrate consistency with project approvals. The Biodiversity Offset Area currently protects:

- 512.30 hectares of Benson 103 (CW169/WE58)
- 24.29 hectares of Benson 174 (CW150)
- 1.15 hectares of Benson 180 (CW134/WE58).

Two vegetation zones possessing 175.47 hectares of native vegetation assessed for offsetting included:

- 80.17 hectares of CW134/WE58 'Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184). 8.13 hectares of in Zone 1 of this community type is required to achieve offsetting the Development Site.
- 95.30 hectares of CW169/WE91 'Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion (Benson 103). 9.88 hectares of in Zone 1 of this community type is required to achieve offsetting the Development Site.

The proposed offset areas are shown on **Figure 3-4** and **Figure 3-5.**

Approximately 295 ha of 'Chelsea' is on the same Catchment Management Authority (CMA) now Local Land Services (LLS) area as the Mine site i.e. Western (Nymagee-Rankins Springs), the remaining 1655 ha is in the Central West CMA (Nymagee-Rankins Springs) (see **Figures 1-1 and 1-2**). 'Chelsea' was historically used for forestry and light grazing (sheep and goats) and remains relatively undisturbed.

Project Approval 10_0191 granted on 31 July 2012 by the Director-General of the Department of Planning and Infrastructure in accordance with *the Environmental Planning and Assessment Act 1979* confirmed the ability to offset 'The Peak' Development Area 2012 within a different CMA. ''Chelsea'" is within both the Western and Central West CMA and adjoins the Nangerybone State Forest. While offsetting was achievable in the Western CMA portion, offsetting was preferred in the Central West CMA portion of the property so it could be adjacent to Nangerybone State Forest. This maximised the 'patch size 'of a contiguous remnant protected by a conservation covenant. This proposal seeks the same consideration for the same rationale used in 2012.

Further details for 'Chelsea' have been provided in **Section 2**, **Table 2-1.**

8. IMPROVEMENTS IN BIODIVERSITY VALUES THE THE OFFSETT SITE

8.1 FUTURE SITE VALUE SCORE LANDSCAPE VALUE SCORE AND AVERTED LOSS FOR EACH VEGETATION ZONE

Vegetation Zone 1 for Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion management scores has been provided as **Table 8-1**. The future score for this vegetation zone is 59.56 / 100. The change in landscape score is 22.89 and the averted loss is 4.17.

Table 8-1: Offset Site Biobanking credit calculator vegetation zone score values (WE58)

Vegetation zone		WE58_Moderate/Good_Medium				
Plant community type		Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion				
Total veg zone area		80.17				
Management zone		1				
Management zone area		80.17				
Status		Complete				
	Current score (0-3)	Averted loss (score (0-3)	Default Increased Score (0-3)	Score with management (0-3)	Reason for score changes	
Native plant species:	1	1	1.5	1.5	No change	
Native over-storey cover:	1	1	2	2	No change	
Native mid-storey cover:	0	0	1	1	No change	
Native ground cover (grasses):	0	0	1	1	No change	
Native ground cover (shrubs):	3	2	3	3	No change	
Native ground cover (other):	0	0	1	1	No change	
Exotic plant cover:	3	2	3	3	No change	
Number of trees with hollows:	0	0	0	0	No change	
Overstorey regeneration:	2	1.5	3	3	No change	
Total length of fallen logs:	3	2	3	3	No change	
	Current Site Value Score (out of 100)	Site value if unmanaged (out of 100)	Decrease in Site Value Score	Future Site Value (out of 100)	Increase in Site Value	Averted loss in Site Value
	36.67		59.56	59.56	22.89	4.17

Vegetation Zone 1 for Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion management scores has been provided as **Table 7-6**. The future score for this vegetation zone is 96.00 / 100. The change in landscape score is 9.33 and the averted loss is 7.84.

Table 8-2: Offset Site Biobanking credit calculator vegetation zone score values (WE92)

Vegetation zone	WE91_Moderate/Good_Medium					
Plant community type	Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion					
Total veg zone area	80.17					
Management zone	1					
Management zone area	80.17					
Status	Complete					
	Current score (0-3)	Averted loss (score (0-3)	Default Increased Score (0-3)	Score with management (0-3)	Reason for score changes	
Native plant species:	3	3	3	3	No change	
Native over-storey cover:	3	3	3	3	No change	
Native mid-storey cover:	3	3	3	3	No change	
Native ground cover (grasses):	3	2	3	3	No change	
Native ground cover (shrubs):	0	0	1	1	No change	
Native ground cover (other):	3	2	3	3	No change	
Exotic plant cover:	3	2	3	3	No change	
Number of trees with hollows:	0	0	0	0	No change	
Overstorey regeneration:	2	1.5	3	3	No change	
Total length of fallen logs:	3	2	3	3	No change	
	Current Site Value Score (out of 100)	Site value if unmanaged (out of 100)	Decrease in Site Value Score	Future Site Value (out of 100)	Increase in Site Value	Averted loss in Site Value
	86.67		96.00	96.00	9.33	7.84

8.2 ECOSYSTEM AND SPECIES CREDITS CREATED FOR THE IMPROVEMENT IN BIODIVERSITY VALUES FOR EACH VEGETATION ZONE

The number of ecosystem and species credits created for the improvement in biodiversity values for each vegetation zone has been provided as **Table 8-3**. Ecosystem credits were generated and species credits were not.

Table 8-3: Offset Site Biobanking credit calculator ecosystem and species credits

The Offset Area			
Community ecosystem credit summary	**Available ha in Offset Area**	**Number of Credits Generated**	**No. Credits Generated/ ha (Offset Credits generated / ha in Offset)**
Benson 103 Poplar Box - Gum-barked Coolibah	95.3	714	7.49
Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	80.17	799	9.97
	175.47	1,513	N/A
Species credits summary	**Sci Name**	**Extent of individuals**	**Sp credits created**
N/A	N/A	N/A	N/A

8.3 MANAGEMENT ACTIONS PROPOSED FOR THE OFFSET SITE TO IMPROVE BIODIVERSITY

To date the following management actions have occurred in the Chelsea property and the Offset Area:

- Seven permanent flora plots (20 x 20 m), habitat plots (20 x 50 m) and three pit fall traps have been established. Three of the permanent plots are also Landscape Function Analysis points (see OzArk 2015)
- Annual flora and fauna monitoring was commenced in 2013, to date two reports have been delivered and a third (2015 spring assessment) has been scheduled. The proposed annual monitoring event in 2015 will focus on 'Chelsea'.
- The Proponent has obtained a National Vendor Declaration for removal of goats from the Chelsea Property. Aurelia is in consultation with neighbouring properties for an agreement to remove goats on a regular basis
- Planning is underway for the infilling of four of the five dams to restrict access to water to assist with control of goats/kangaroos. A 'goat trap' will be installed at the fifth dam
- Planning is underway for the thinning of Cypress Pine through mechanical means. Approval from regulators is required before works commence
- Consultation with the Rural Fire Service has been ongoing regarding managing fire risk and using fire as a control of White Cypress Pine.

Physical land management actions have not been scheduled in the Offset Area since the Proponent has purchased it as base line information is still being collected. Accordingly scores provided in **Tables 8-1** and **8-2** have not been altered from the credit calculator default score (no change).

8.4 VARIATION OF THE OFFSET RULES

No offset rule has been varied in this BAR.

8.5 CREDIT PROFILES FOR ECOSYSTEM CREDITS

The Biobanking calculator report can be reviewed in **Appendix 6**.

9. REHABILITATION AND SITE IDENTIFICATION

'Chelsea' was purchased in 2012 because it shares a common boundary with Nangerybone State Forest and was relatively undisturbed native vegetation. The property has never been used for ploughing agriculture and impacts to native vegetation were limited to forestry and light grazing. The benefit of protecting an area managed conservatively since pastoral selection in an agricultural setting are fewer resources are required to achieve and maintain a conservation outcome, hence 'do nothing' is not resulting in a significant negative impact to the sites local biodiversity.

Rehabilitation is not required at this property, land management is restricted to targeted erosion and feral animal control and thinning of White Cypress Pine.

Since 2012 no active land management has been implemented however the Rural Fire Service was contacted for advice in early 2015 regarding using fire to thin White Cypress Pine. The RFS stated controlled burns in this region are problematic unless the property is destocked and goats are controlled. While 'Chelsea' has only been used for light grazing and was destocked by the proponent upon purchase, feral goats still affect ground stratum biomass and even without commercial grazing the landscape is still unlikely to carry fire. The proponent is considering options to facilitate controlled burns i.e. replacement of the external boundary with a goat proof fence (there are no internal boundaries) or coordinating goat harvesting currently implemented by neighbouring landholders on site to be more frequent and effective.

A Biodiversity Management Plan (Biodiversity MP) has been prepared in accordance with Condition 3(29) of Project Approval 10_0191 (Project Approval) which was granted on 31 July 2012 by the Director-General of the Department of Planning and Infrastructure in accordance with EP&A Act. The Biodiversity MP describes the following:

- Approved activities
- Consultation undertaken during preparation of the Biodiversity MP
- Legal requirements, objectives and outcomes
- Competence and awareness training
- Biodiversity Strategy
- Existing environment and the impacts of the Mine
- Biodiversity management strategies including short, medium and long term measures
- Monitoring and evaluation of performance and completion criteria
- Trigger responses, corrective and preventative measures
- Reporting and review of the Biodiversity MP.

A Biodiversity Offset Strategy (BOS) has been prepared in accordance with Condition 3(29) of Project Approval 10_0191 (Project Approval) in accordance with the EP&A Act. The BOS describes the following:

- Consultation undertaken during preparation of this BOS
- Legal requirements, objectives and outcomes
- Competence and awareness training
- Biodiversity Strategy
- Identified risks
- Biodiversity management strategies including short, medium and long term measures
- Monitoring and evaluation of performance and completion criteria
- Trigger responses, corrective and preventative measures
- Reporting and review of the BOS.

During the 2011 *Environmental Assessment* two potential biodiversity offset areas were identified, namely part portion of "'The Peak'" property and the adjacent TSR8792 or part portion of the "'Chelsea'" property located 25kms south of "The Peak" (see **Figure 1-2**).

Permission to use Travelling Stock Reserve (TSR) TSR8792 located on ''The Peak'' as an offset was not granted. The "'Chelsea'" property was subsequently identified as a suitable Offset Area in consultation with OEH.

The MP and BOS covers both 'Chelsea' (as an entire property, not just the offset area) and areas with native vegetation on the Peak.

As the MP / BOS is a component of Condition 3(29) of Project Approval 10_0191 no additional credits for management actions were sought in the biobanking calculations.

10. SUPPLEMENTARY MEASURES

Supplementary measures (i.e. research / donations etc) are not a feature of this BAR.

11. SUMMARY

A summary of biodiversity offset measures detailed in the BOS and how these will match credit requirements created by the development site include:

- Clear objectives for the biodiversity offset area
- Short term measures
- Medium term measures
- Long term measures
- Vegetation management
- Soil erosion control
- Vertebrate pest management
- Grazing management
- Weed management
- Native fauna rescue
- Bushfire management
- Controlled access
- Securing the offset area into perpetuity
- Monitoring (and trigger response plan).

A summary of biodiversity offset measures detailed in the MP (and how these will match credit requirements created by the Development Site include have been outlined in **Section 9.**

11.1 LIKE FOR LIKE OR BETTER

The quantum of offsetting requirements has been substantiated by completing an assessment of the proposed Biodiversity Offset Area following the BioBanking Assessment Methodology (2014) and Credit Calculator Operation Manual v2.

Table 11-1 provide a summary of the BioBanking Credit reports generated for the Development Site at 'The Peak' and the Offset Site in 'Chelsea'. The information derived for this table are imbedded in a BioBanking report (**Appendix 5** and **6**).

If offsetting in the Central West CMA is permissible as per the last approvals then, a Tier 1 outcome on assessing and offsetting biodiversity impacts would be achieved (**Table 11-1**).

Table 11-1: Offset Site Biobanking credit calculator ecosystem and species credits

	The Development Area				The Offset Area						
	Vegetation Type	Area Impacted (ha)	Credits Required	Allowable Vegetation Types	Community ecosystem credit summary	Available ha in Offset Area	Number of Credits Generated	No. Credits Generated/ ha (Offset Credits generated / ha in Offset)	No. of hectares required to offset (Offset Credits generated / Development Credits required)	Surplus (black) deficit (red) credits to offset	Can offsetting be achieved?
WE91	Benson 103 Poplar Box - Gum-barked Coolibah	2.55	74	Benson 103	Benson 103 Poplar Box - Gum-barked Coolibah	95.3	714	7.49	9.88	640.00	YES
WE 58	Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	4.05	81	Benson 144	Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	80.17	799	9.97	8.13	718.00	YES
	Total	**6.60**	**155.00**			**175.47**	**1,513**	**N/A**	**18.00**	**N/A**	

Species credits summary	Sci Name	Extent of individuals	Sp credits created	Species credits summary	Sci Name	Extent of individuals	Sp credits created
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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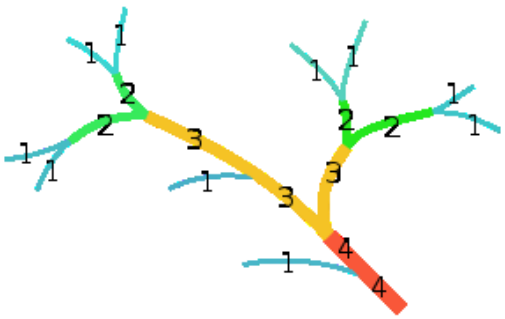
APPENDIX 1: TERMS AND ABBREVIATION

Definitions used in the report are shown below

Terminology	Abbreviation	Description
Activity		Has the same meaning as in the EP&A Act, i.e. the nature of the proposed activity is described in **Section 3**. The EP&A Act definition refers to physical 'activity' in relation to land that is specified by a regulation to be a work for the purposes of the Act
Australian Bureau of Meteorology	BOM	
Australian Height Datum	AHD	
BioBanking Assessment Methodology	BBAM	Method of assessing biodiversity under the TSC Act following BioBanking Assessment and Methodology and Credit Calculator Operation Manual (2009). Managed under Part 7A of the TSC Act. These assessments must be conducted by a person accredited under s.142B(1)(c) of the Act.
Biodiversity Certification Assessment Methodology	BCAM	The method is used to determine whether biodiversity certification will improve or maintain biodiversity values. The methodology assesses the loss of biodiversity values on land (proposed for biodiversity certification) and the impact, or likely impact, of proposed conservation measures. This is managed under Part 7AA of the TSC Act under s 126S.
Biodiversity Offset Area	BOA	Area (s) identified by the Proponent as suitable to offset impacts of the Proposal in accordance to the BioBanking Assessment Methodology or RMS Offsetting Policy.
Catchment Management Authority	CMA	Thirteen CMAs have been established, the specific functions of CMAs are described in the *Catchment Management Authorities Act 2003*. The CMAs are responsible for managing natural resources at the catchment scale. Key roles include preparing Catchment Action Plans (CAPs) and managing incentive programs to implement the plans. The Namoi CMA (Liverpool Plains Part B) is the relevant CMA.
Core Koala Habitat		State Environmental Planning Policy (SEPP) 44: core koala habitat means an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population.
	Council	Gunnedah Shire Council
Ecologically Sustainable Development.	ESD	The EPBC Act sets out the principles of ecologically sustainable development which apply to certain decisions made under the Act. These principles are: • The need to integrate economic, environmental, social and equitable considerations; • The precautionary principle; • The principle of inter-generational equity; • The conservation of biological diversity; and • Improved valuation, pricing and incentive mechanisms.
Endangered Ecological Community	EEC	An ecological community specified in Part 3 of Schedule 1 of the TSC Act or within the schedules of the EPBC Act.
Endangered population		Population specified in Part 2 of Schedule 1 of the TSC Act.

Terminology	Abbreviation	Description
Environmental Impact Statement	EIS	Describes the positive and negative environmental effects of a proposed action and provides potential management measures to ameliorate these impacts.
Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).	EPBC Act	Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
Environmental Planning and Assessment Act 1979 (NSW).	EP&A Act	Provides the legislative framework for land use planning and development assessment in NSW.
Fisheries Management Act 1994 (NSW).	FM Act	Administered by the Minister for Primary Industries, except Part 7 (Division 2), which is administered jointly by the Minister for Minister for the Environment and the Minister for Heritage and the Minister Assisting the Minister for Minister for the Environment and the Minister for Heritage.
Greenfield		An area of land that has not been developed.
Interim Biogeographic Regionalisation for Australia	IBRA	IBRA is a biogeographic regionalisation of Australia developed by the Australian Government's Department of Sustainability, Environment, Water, Population and Communities. It was developed for use as a planning tool, for example for the establishment of a National Reserve System.
Likely		Taken to be a real chance or possibility (NPWS 1996).
Local Environmental Plan	LEP	A type of planning instrument made under Part 3 of the EP&A Act.
Local Government Area	LGA	
Local population		The population that occurs within a given Study Area, unless the existence of contiguous or proximal occupied habitat and the movement of individuals or exchange of genetic material across the boundary can be demonstrated (NPWS 1996). In this instance a local population are those that occur within the Study Area.
Low condition / Moderate to Good Condition (as per BBAM 2008).	Low Condition Moderate to Good Condition	Native woody vegetation is in low condition if: The over-storey precent foliage cover is <25% of the lower value of the over-storey precent foliage cover benchmark for that vegetation type AND <50% of groundcover vegetation is indigenous species, or >90% of the area is ploughed or fallow, or 90% of the groundcover vegetation is regrowth but not protected regrowth. Remnant native vegetation and protected regrowth cannot be cleared if it is a vegetation type that is >70% cleared and NOT in low condition (i.e. Moderate to Good).
Locality		Area within a 50km radius of the Study Area.
Matters of national environmental significance.	MNES	Refers to the seven matters of national environmental significance as defined by the EPBC Act.
National Parks and Wildlife Act 1974 (NSW)	NPW Act	Under the National Parks and Wildlife Act, the Director-General of the NPWS is responsible for the care, control and management of all national parks, historic sites, nature reserves, reserves, Aboriginal areas and state game reserves. State conservation areas, karst conservation reserves and regional parks are also administered under the Act. The Director-General is also responsible under this legislation for the protection and care of native fauna and flora, and Aboriginal places and objects throughout NSW.

Terminology	Abbreviation	Description
Native Vegetation Act 2003 (NSW)	NV Act	The native vegetation legislation was introduced in 2005. The Native Vegetation Act 2003 (NV Act) and Native Vegetation Regulation 2005 (NV Regulation) has delivered: • the Government's commitment to end broadscale clearing, to protect the health of our land, rivers and wildlife • investment security and increased flexibility for farmers • new powers to local catchment management authorities (CMAs) to make decisions in the best interests of the community.
Noxious Weeds Act 1993 (NSW)	Noxious Weeds Act	An Act to provide for the identification, classification and control of noxious weeds.
NSW Office of Water	NOW	
Office of Environment and Heritage.	OEH	Formally known as the Department of the Environment, Climate Change and Water (DECCW).
Potential Koala Habitat		SEPP 44: potential koala habitat means areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.
Regional Environmental Plan.	REP	A type of planning instrument made under Part 3 of the EP&A Act.
Regional Vegetation Community	RVC	Regionally, a vegetation map for the Namoi CMA has been produced (ELA 2009a). This mapping product is underpinned by a Regional Vegetation Community (RVC) classification which is linked to the vegetation type classification in the Biometric Vegetation Types Database.
Rural Fires Act 1997 (NSW)	RF Act	
Soil		The shallow organic layer of material used for plant growth (includes both topsoil and subsoil).
State Conservation Area.	SCA	
State Environmental Planning Policy (Infrastructure) 2007.	Infrastructure SEPP	The Infrastructure SEPP has specific planning and approval provisions for 25 types of infrastructure or facilities such as education, hospitals, roads, railways, emergency services, water supply and electricity generation and transmission. The SEPP assists the NSW Government agencies, local government, other private infrastructure providers and the communities they support by simplifying the planning process and by providing consistent planning provisions across all local government areas in NSW. The SEPP contains planning provisions including: • where the infrastructure facilities are permissible • what infrastructure development can be assessed and approved by a public authority under Part 5 of the Environmental Planning and Assessment (EP&A) Act 1979 • what infrastructure development requires consent under Part 4 of the EP&A Act • what infrastructure development is exempt or complying development.

Terminology	Abbreviation	Description
State Environmental Planning Policy No.14 – Coastal Wetlands	SEPP 14	State Environmental Planning Policy No14 - Coastal Wetlands (SEPP 14) was introduced in 1985 to protect coastal wetlands in the environmental and economic interested of the State. The Policy requires preparation of an EIS, the consent of local council and the concurrence of the Director of Planning for development in affected wetlands. Many developments do not proceed to the stage of development application because of the requirements of the Policy thus ensuring their protection.
State Environmental Planning Policy No.44 – Koala Habitat	SEPP 44	This Policy aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline: (a) by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and (b) by encouraging the identification of areas of core koala habitat, and (c) by encouraging the inclusion of areas of core koala habitat in environment protection zones. Applicable for projects determined under Part 4 and 5 of the EP&A Act.
State Environmental Planning Policy.	SEPP	A type of planning instrument made under Part 3 of the EP&A Act.
State Forest	SF	
study area		Encompasses all land shown in **Figure 2** and encompasses all aspects of the Proposal.
Strahler stream order		Strahler stream order and are used to define stream size based on a hierarchy of tributaries. 
Surrounding Residences		Gunnedah private and business residences within the Study Area.
The Proposal		The proposed activity to be carried out by the Proponent as detailed in **Section 3** of this report.
Threatened species		A species specified in Schedule 1 Part 1 (endangered species), Part 4 (presumed extinct) and Schedule 2 (vulnerable species) of the TSC Act, within the schedules of the FM Act or within the Schedules of the EPBC Act.

Terminology	Abbreviation	Description
Threatened Species Conservation Act 1995 (NSW)	TSC Act	The objects of this Act are as follows: (a) to conserve biological diversity and promote ecologically sustainable development, and (b) to prevent the extinction and promote the recovery of threatened species, populations and ecological communities, and (c) to protect the critical habitat of those threatened species, populations and ecological communities that are endangered, and (d) to eliminate or manage certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities, and (e) to ensure that the impact of any action affecting threatened species, populations and ecological communities is properly assessed, and (f) to encourage the conservation of threatened species, populations and ecological communities by the adoption of measures involving co-operative management.

APPENDIX 2: BIOBANKING PLOT DATA

Biobanking plots

Hera Development Site Transect number 1	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	10	30	0	20	0	20	5	0	0	0	8.5
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	0	3	1	3	1	1	0	0	0	0	0.9
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	1	1	1	1	1	0	0	0	0	0	0.5
Exotic plant cover (%)	0	0	0	0	0	0	0	0	0	0	0
Number of trees with hollows	1										
Total length of fallen logs (m)	0										
Regeneration	0										
Native plant species richness	6										
Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion [Benson 103]											

Hera Development Site Transect number 2	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	3	10	40	30	30	5	0	10	0	30	15.8
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	0	0	1	1	1	0	0	0	0	0	0.3
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	0	1	0	0	1	2	2	1	1	1	0.9
Exotic plant cover (%)	0	0	0	0	0	0	0	0	0	0	0
Number of trees with hollows	0										
Total length of fallen logs (m)	0										
Regeneration	0										
Native plant species richness	5										
Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion [Benson 103]											

Hera Development Site Transect number 3	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	20	10	30	20	0	10	20	30	10	10	16
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	0	2	1	0	1	0	0	0	0	0	0.4
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	0	0	2	2	0	2	1	0	1	1	0.9
Exotic plant cover (%)	0	0	0	0	0	0	0	0	0	0	0
Number of trees with hollows	1										
Total length of fallen logs (m)	5										
Regeneration	0										
Native plant species richness	5										
Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)											

Hera Development Site Transect number 4	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	20	10	20	20	0	10	15	30	15	10	15
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	0	2	1	0	1	0	0	0	0	0	0.4
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	0	0	1	1	0	2	1	0	1	1	0.7
Exotic plant cover (%)	0	0	0	0	0	0	0	0	0	0	0
Number of trees with hollows	0										
Total length of fallen logs (m)	2										
Regeneration	0										
Native plant species richness	5										
Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)											

Hera Development Site Transect number 5	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	30	10	30	20	10	10	20	30	10	15	18.5
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	0	2	1	0	1	0	0	0	0	0	0.4
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	0	2	0	2	0	0	1	0	1	2	0.8
Exotic plant cover (%)	0	0	0	0	0	0	0	0	0	0	0
Number of trees with hollows	0										
Total length of fallen logs (m)	1										
Regeneration	0										
Native plant species richness	5										
Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)											

'Chelsea' Offset Site Transect number A	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	50	0	10	0	0	10	40	0	15	20	14.5
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	30	30	15	10	15	5	5	5	15	10	14
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	30	5	5	5	10	5	5	5	5	5	8
Exotic plant cover (%)	15	15	10	10	10	5	5	5	3	3	8.1
Number of trees with hollows	4										
Total length of fallen logs (m)	13										
Regeneration	0.5										
Native plant species richness	10										
Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)											

'Chelsea' Offset Site Transect number B	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	10	5	30	20	20	15	30	30	30	30	22
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	10	15	5	5	5	5	5	5	5	5	6.5
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	2	10	10	10	15	15	5	5	5	5	8.2
Exotic plant cover (%)	2	5	5	5	5	5	2	2	2	0	3.3
Number of trees with hollows	4										
Total length of fallen logs (m)	45										
Regeneration	0.3										
Native plant species richness	9										
Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)											

'Chelsea' Offset Site Transect number C	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	20	0	0	20	0	0	0	0	20	0	6
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	10	15	10	15	15	10	5	5	10	10	10.5
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	10	5	10	10	10	5	5	5	5	5	7
Exotic plant cover (%)	5	2	2	2	5	2	2	2	2	2	2.6
Number of trees with hollows	4										
Total length of fallen logs (m)	55										
Regeneration	0.5										
Native plant species richness	12										
Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)											

'Chelsea' Offset Site Transect number D	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	20	0	0	0	0	5	0	0	10	20	5.5
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	5	15	10	10	15	15	15	15	10	15	12.5
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	10	2	5	5	0	5	5	5	15	5	5.7
Exotic plant cover (%)	5	0	5	0	0	0	2	2	2	0	1.6
Number of trees with hollows	4										
Total length of fallen logs (m)	30										
Regeneration	0.33										
Native plant species richness	16										
Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion [Benson 103]											

'Chelsea' Offset Site Transect number E	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	30	5	0	0	0	0	0	0	10	20	6.5
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	10	20	15	5	15	10	15	10	10	10	12
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	10	10	10	5	5	5	10	5	5	5	7
Exotic plant cover (%)	2	2	2	2	1	2	0	0	0	0	1.1
Number of trees with hollows	4										
Total length of fallen logs (m)	30										
Regeneration	0.5										
Native plant species richness	16										
Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion [Benson 103]											

'Chelsea' Offset Site Transect number F	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	0	0	0	40	0	0	0	0	10	0	5
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	5	5	10	10	10	10	15	10	10	15	10
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	0	0	2	2	5	5	2	5	5	2	2.8
Exotic plant cover (%)	0	0	0	0	2	2	0	2	2	0	0.8
Number of trees with hollows	1										
Total length of fallen logs (m)	35										
Regeneration	0.5										
Native plant species richness	18										
Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion [Benson 103]											

'Chelsea' Offset Site BioD Monitoring Point 1	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	10	40	10	20	5	0	0	10	10	10	11.5
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	5	5	5	2	5	2	2	0	2	5	3.3
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	1	2	5	2	5	5	5	0	2	5	3.2
Exotic plant cover (%)	0	0	2	0	2	2	2	0	0	2	1
Number of trees with hollows	4										
Total length of fallen logs (m)	14										
Regeneration	1										
Native plant species richness	17										
Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion [Benson 103]											

'Chelsea' Offset Site BioD Monitoring Point 2	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	0	15	20	25	40	5	30	0	0	0	13.5
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	5	10	10	5	10	10	5	5	5	10	7.5
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	10	5	5	5	5	5	2	15	5	5	6.2
Exotic plant cover (%)	5	2	2	2	2	2	2	10	2	2	3.1
Number of trees with hollows	2										
Total length of fallen logs (m)	9										
Regeneration	0.5										
Native plant species richness	17										
Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion [Benson 103]											

'Chelsea' Offset Site BioD Monitoring Point 3	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	20	30	50	0	5	0	0	10	50	0	16.5
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	5	10	5	5	5	10	5	5	5	15	7
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	10	20	15	10	10	5	5	1	2	2	8
Exotic plant cover (%)	2	5	5	2	5	2	2	1	1	0	2.5
Number of trees with hollows	1										
Total length of fallen logs (m)	10										
Regeneration	0.25										
Native plant species richness	17										
Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion [Benson 103]											

'Chelsea' Offset Site BioD Monitoring Point 4	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	0	0	0	0	0	0	0	0	20	0	2
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	15	5	5	5	10	10	5	5	2	5	6.7
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	5	15	10	5	10	10	10	10	15	10	10
Exotic plant cover (%)	5	5	2	0	5	2	2	2	5	2	3
Number of trees with hollows	2										
Total length of fallen logs (m)	15										
Regeneration	1										
Native plant species richness	13										
Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion [Benson 103]											

'Chelsea' Offset Site BioD Monitoring Point 6	1	2	3	4	5	6	7	8	9	10	Summary
Native over-storey cover (%)	30	20	10	0	10	20	20	40	40	30	22
Native mid-storey cover (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (grasses) (%)	2	5	2	10	5	10	5	5	5	5	5.4
Native ground cover (shrubs) (%)	0	0	0	0	0	0	0	0	0	0	0
Native ground cover (other) (%)	2	2	0	5	1	5	5	10	10	15	5.5
Exotic plant cover (%)	2	2	0	2	1	2	2	5	5	10	3.1
Number of trees with hollows	1										
Total length of fallen logs (m)	8										
Regeneration	1										
Native plant species richness	15										
Mallee - Smooth-barked Coolibah woodland on red earth flats of the eastern Cobar Peneplain Bioregion (Benson 174)											

APPENDIX 3: DEVELOPMENT SITE FLORA PLOT RESULTS

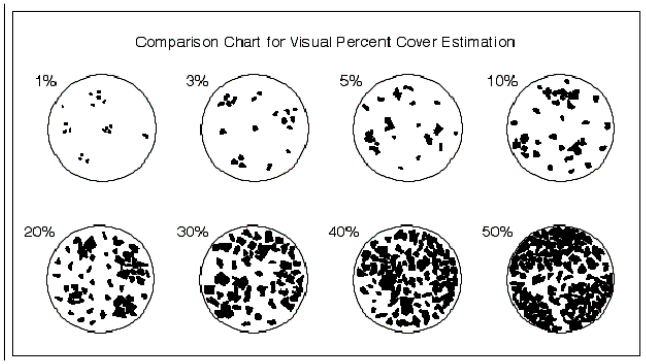
Key: to each flora species record:

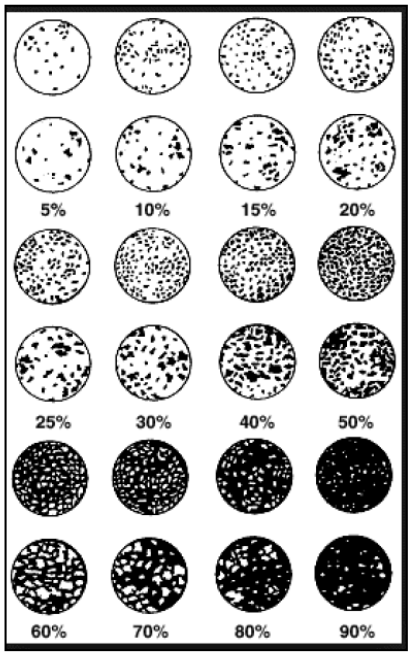
Ie **White Cypress (Pine Callitris glaucophylla) 3 (200)** = Braun banquet cover abundance (actual or estimated number of individuals).

White Cypress Pine is represented by many items is between 25 to 50% cover and about 200 were recorded in the 20x20m veg plot.

Note: The Flora species list provided in **Appendix 3** shows what flora species have been recorded during annual spring monitoring in 2013 and 2014, the reason why these have not been deleted for this assessment is to demonstrate to the determining authority the diversity of flora known to occur in 'The Peak'.

Score	Braun banquet cover of abundance
0	Absent from quadrant
0.1	Represented by a solitary item (<5% cover)
0.5	Represented by a few (<5) items (<5% cover)
1	Represented by >5 items (<5% cover)
2	Represented by many (>5) items (5-25% cover)
3	Represented by many items (25 - 50% cover)
4	Represented by many items (50-75% cover)
5	Represented by many items (75-100% cover)





Project Name: Hera Mine Site (2015) MOD 3					
20x20m Plot ID	**1**	**2**	**3**	**4**	**5**
GPS Zone	55	55	55	55	55
GDA N	6446575	6446697	6446988	6446932	6446944
GDA E	437138	437201	437106	437152	437131
Study Area	Hera	Hera	Hera	Hera	Hera
Details					
	1	**2**	**3**	**3**	**3**
Dominant Stratum	Upper	Upper	Upper	Upper	Upper
Dominant Stratum % Cover	30	40	30	30	30
Landscape Position and Mitchell Landscape	Flats	Flats	Flats	Flats	Flats
	Nymagee Downs	Nymagee Downs	Nymagee Downs	Nymagee Downs	Nymagee Downs
Health	Healthy	Healthy	Healthy	Healthy	Healthy
Condition (Biobanking)					
Biometric Veg Type ID	WE91	WE91	WE58	WE58	WE58
Biometric Vegetation Name	Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion [Benson 103]	Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion [Benson 103]	'Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)	'Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)	'Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)
EEC?	No	No	No	No	No
CMA (SubRegion)	Western (Nymagee-Rankins Springs)	Western (Nymagee-Rankins Springs)	Western (Nymagee-Rankins Springs)	Western (Nymagee-Rankins Springs)	Western (Nymagee-Rankins Springs)
Over Cleared Vegetation Type? >90% in CMA	No	No	No	No	No
Highly Cleared Vegetation Type? >70% in CMA	No	No	No	No	No
Upper Stratum % cover	25	25	20	20	20
Mid Stratum % Cover	0	0	0	0	0

Lower Stratum % Cover	1	1	1	1	1
Upper Stratum height (m)	5	5	4	4	4
Mid Stratum height (m)	0	0	0	0	0
Lower Stratum height (m)	0.05	0.05	0.05	0.05	0.05
% Bare Ground	99	99	99	99	99
% Rocks	0	0	3	3	3
Ground logs 20x50m >10cm diameter	0	0	1	1	1
Tree Hollows 20x50m area					
	1	**2**	**3**	**3**	**3**
No of tree with hollows	1	0	1	1	1
Stratum Details					
No of Upper Stratum sp	2	2	3	1	2
No of Mid Stratum sp	0	0	0	0	0
No of Lower Stratum sp	7	5	5	5	5
No of Native sp	6	5	5	5	5
No of exotic species	1	0	0	0	1
% Native sp	16	0	0	0	0
Biodiversity links ? (State, Regional, Local?)	local	local	local	local	local
Aquatic habitat					
	1	**2**	**3**	**3**	**3**
Dimensions of waterway	N/A	N/A	N/A	N/A	N/A
Depth of water	N/A	N/A	N/A	N/A	N/A
Flow characteristics of water, including changes to drainage and filtration	N/A	N/A	N/A	N/A	N/A
Bed substrate	N/A	N/A	N/A	N/A	N/A
Habitat features	N/A	N/A	N/A	N/A	N/A
Existing infrastructure and barriers to fish movement	N/A	N/A	N/A	N/A	N/A

Width and species composition of riparian vegetation	N/A	N/A	N/A	N/A	N/A
Water quality (i.e. a snapshot using basic water quality indicators at the time of sampling)	N/A	N/A	N/A	N/A	N/A
Aquatic flora species present	N/A	N/A	N/A	N/A	N/A
Aquatic fauna species present	N/A	N/A	N/A	N/A	N/A
Terrestrial habitat					
	1	**2**	**3**	**3**	**3**
Habitat features, including feeding, prey species, nesting, rocky habitat and refuge resources, including non-native hollow bearing trees	standing dead timber	NIL	standing dead timber, rocky habitat	standing dead timber, rocky habitat	standing dead timber, rocky habitat
Plot ID	**1**	**2**	**3**	**3**	**3**
Upper Stratum					
1 (Dominant species)	White Cypress Pine (Callitris glaucophylla)	White Cypress Pine (Callitris glaucophylla)	White Cypress Pine (Callitris glaucophylla)	White Cypress Pine (Callitris glaucophylla)	White Cypress Pine (Callitris glaucophylla)
2 (Sub dominant 1)	Gum-barked Coolibah (Eucalyptus intertexta)	Mugga Ironbark (E. sideroxylon)	Dwyer's Red Gum (Eucalyptus dwyeri)	Dwyer's Red Gum (Eucalyptus dwyeri)	Dwyer's Red Gum (Eucalyptus dwyeri)
3 (Sub dominant 2)			Mugga Ironbark (E. sideroxylon)	Mugga Ironbark (E. sideroxylon)	Mugga Ironbark (E. sideroxylon)
White Cypress (Pine Callitris glaucophylla)	3 (120)	3(400)	3(400)	3(350)	3(400)
Poplar Box (Eucalyptus populnea)					
Mugga Ironbark (E. sideroxylon)		0.1(1)	0.5(3)		
Gum-barked Coolibah (Eucalyptus intertexta)	0.1 (1)				
Green Mallee (Eucalyptus viridis)					
Red Mallee #1 (Eucalyptus socialis)					
Red Mallee #2 (oleosa subsp. Oleosa)					
Grey Mallee (Eucalyptus morrisii)					
White Mallee, (Eucalyptus dumosa)					
Dwyer's Red Gum (Eucalyptus dwyeri)			0.5(3)		0.5(4)

Wilga (Geijera parviflora)					
Kurrajong (Brachychiton populneus)					
Belah (Casuarina cristata)					
Whitewood (Atalaya hemiglauca)					
Beefwood (Grevillea striata)					
Box Mistletoe (Amyema miquelii)					
Yellow Box (Eucalyptus melliodora)					
Wonga Vine (Pandorea pandorana subsp. pandorana 'inland form')					
Pepper Tree (Schinus areira*)					
Mid Stratum spp					
	1	**2**	**3**	**3**	**3**
1 (Dominant species)	N/A	N/A	N/A	N/A	N/A
2 (Sub dominant 1)	N/A	N/A	N/A	N/A	N/A
3 (Sub dominant 2)	N/A	N/A	N/A	N/A	N/A
Wilga (Geijera parviflora)					
Western Rosewood (Alectryon oleifolius subsp. canescens)					
Wild Orange (Capparis mitchellii)					
Sticky Wallaby Bush (Beyeria viscosa)					
Wallaby Bush (Bertya cunninghamii)					
Western Golden Wattle (Acacia decora)					
Ironwood (Acacia excelsa subsp. Excels)					
Western Golden Wattle (Acacia decora)					
Deans Wattle (Acacia deanii)					
Box-leaf Wattle (Acacia buxifolia)					
Dead Finish (Acacia tetragonophylla)					
Sword-leaf Wattle (Acacia gladiifolis)					
Acacia colletioides					

Acacia havilandiorum					
Acacia burrowii					
Hooked Needlewood (Hakea tephrosperma)					
Punty Bush (Cassia eremophila)					
Emubush (Eremophila longifolia)					
Budda (Eremophila mitchellii)					
Turpentine bush (Eremophila stuartii)					
Turkey Bush (Eremophila deserti)					
Tarbush (Eremophila glabra)					
Wedge leaf hopbush (Dodonaea viscosa subsp. Cuneata)					
Dodonaea viscosa subsp. angustissima					
Dodonaea viscosa subsp. spatulata					
Dodonaea boroniifolia					
Bertya cunninghamii					
Bush Mallee Pea (Eutaxia microphylla)					
Silver Cassia (Senna form taxon 'artemisioides')					
Cassinia laevis					
Cactus Pea (Bossiaea walker)					
Prostanthera striatiflora					
Yarran (Acacia homophylla)					
White Cypress (Pine Callitris glaucophylla) juv.					
Poplar Box (Eucalyptus populnea) juv.					
Gum-barked Coolibah (Eucalyptus intertexta) juv.					
SALTBUSHES					
Thorny Saltbush (Rhagodia spinescens)					

Galvanised Burr (Sclerolaena birchii)					
Small-leaf Blue-bush (Maireana microphylla)					
Climbing Saltbush (Einadia nutans subsp. nutans)					
Black Cottonbush (Maireana declavens, Suaeda sp.)					
Eastern Cotton Bush (Maireana microphylla)					
Wingless Fissure-weed (Maireana enchylaenoides)					
Black Rolypoly (Sclerolaena muricata)					
	1	2	3	3	3
Lower Stratum spp					
1 (Dominant species)	Rough Speargrass (Stipa scabra complex)	Poison Rock Fern (Cheilanthes sieberi subsp. sieberi)	Poison Rock Fern (Cheilanthes sieberi subsp. sieberi)	Poison Rock Fern (Cheilanthes sieberi subsp. sieberi)	Poison Rock Fern (Cheilanthes sieberi subsp. sieberi)
2 (Sub dominant 1)	Aristida jerichoensis var. subspinulifera	Rough Speargrass (Stipa scabra complex)	Rough Speargrass (Stipa scabra complex)	Rough Speargrass (Stipa scabra complex)	Rough Speargrass (Stipa scabra complex)
3 (Sub dominant 2)		Aristida jerichoensis var. subspinulifera	Aristida jerichoensis var. subspinulifera	Aristida jerichoensis var. subspinulifera	Aristida jerichoensis var. subspinulifera
GRASS					
Aristida jerichoensis var. subspinulifera	0.5(9)	0.5(17)	0.5(12)	0.5(10)	0.5(11)
Bunch Wiregrass (Aristida behriana)					
No.9 wiregrass (Aristida jerichoensis)					
Purple wiregrass (Aristida ramosa)					
Bunched Kerosene Grass (Aristida contorta)					
Speargrass (Austrostipa scabra subsp. scabra),					
Foxtail Speargrass (Austrostipa densiflora)					
Wallaby Grass (Austrodanthonia bipartite)					

Wallaby Grass (Austrodanthonia setacea)					
Mulga Mitchell Grass (Thyridolepis mitchelliana)					
Bandicoot Grass (Monachather paradoxa)					
Short Windmill Grass (Chloris truncata)					
Tall Windmill Grass (Chloris verticillata)					
Purple Love Grass (Eragrostis lacunaria)					
Kangaroo Grass (Themeda australis)					
Mountain Wanderrie Grass (Eriachne mucronata)					
Long Grey-beard Grass (Amphipogon caricinus var. caricinus)					
Lobed Bluegrass (Bothriochloa biloba)					
Cotton Panic (Digitaria brownii)					
Tucker Speargrass (Austrostipa tuckerii)					
Delicate lovegrass (Eragrostis amabilis)					
Rough Speargrass (Stipa scabra complex)	0.5(32)	0.5(42)	0.5(46)	0.5(35)	0.5(41)
Curly windmill grass (Enteropogon acicularis)					
Pitted Bluegrass (Bothriochloa bladhii)					
Whorled pigeon grass (Setaria verticillata)					
Bottlewashers (Enneapogon avenaceus)					
Common wheatgrass (Elymus scaber)					
Hairy panic (Panicum effusum)					
SEDGES					
Knob Sedge (Carex inversa)					
Dirty Dora (Cyperus difformis)					
Forbes / Other					
Vittadinia cervicularis var. cervicularis (Asteraceae spp.)					

Yellow burr daisy (Calotis lappulacea)					
Purple Burr-daisy (Calotis cuneifolia)	0.5(28)				
Poison Rock Fern (Cheilanthes sieberi subsp. sieberi)		2(400)	2(400)	2(400)	2(400)
Matt Rush (Dianella longifolia var. longifolia)					
Iron Grass (Lomandra patens)					
Bathurst Burr (Xanthium spinosum)					
Australian cranesbill (Geranium solanderi)					
Native Geranium (Geranium solanderi var. Solanderi)					
Corrugated Sida (Sida corrugata)					
Paper foxtail (Ptilotus gaudichaudii)					
Crimson Foxtail (Ptilotus atriplicifolius)					
Silver Tails (Ptilotus obovatus var. Obovatus)					
Hill Goodenia (Goodenia havilandii)	0.5(34)	0.5(24)	0.5(18)	0.5(12)	0.5(22)
Spreading Daisy (Brachyscome smithwhitei)					
Sneeze Weed (Centipeda cunninghamii)					
Desert Sneeze Weed (Centipeda thespidiodes)					
Oxalis sp. (Oxalis perennans)	0.5(6)				
Kidney weed (Dichondra repens)					
Annual verbine (Cullen cinereum)					
Felted Nightshade (Solanum coactiliferum)					
Stinking pennywort (Hydrocotyle laxiflora)					
Swamp Dock (Rumex brownii)					
Yellow Rice-flower (Pimelea flava)					
Ground-heads (Chthonocephalus pseudevax steetz)					

Wild Sage (Salvia verbenaca)					
Bluebells (Hyacinthoides non-scripta)					
Apple of Sodom (Solanum sodomaeum)	0.5(4)				0.5(6)
Common White Sunray (Helipterum floribundum)					
Proliferous pink (Petrorhagia nanteuilii)					
Australian stonecrop (Crassula sieberiana)					
Fan flower (Scaevola aemula)					
Dainty everlasting (Schoenia ramosissima)					
Golden everlasting (Xerochrysum bracteatum)					
Hares Foot Clover (Trifolium arvense)					
Poplar Box (Eucalyptus populnea)					
White Cypress Pine (Callitris columellaris)					
Western Tarvine (Gilesia biniflora)					
Habanthus ...		0.1(1)			
Glycene clandesta					
Budda (Eremophila mitchellii)					
Yellow Buttons					
Pomax (Pomax umbellata)			1(5)	1(10)	1(15)
Grey Sunray (Helipterum corymbiflorum)					
SALTBUSHES					
Grey Copper Burr (Sclerolaena diacantha)	0.5(12)				
Pop Saltbush (Atriplex spongiosa)					
Ruby Saltbush (Enchylaena tomentosa)					
Climbing Saltbush (Einadia nutans)					
Berry Salt Bush (Einadia hastate)					

Black Crumbweed (Chenopodium melanocarpan)					
Small Crumbweed (Chenopodium pumilio)					
Small Leaf Goosefoot (Chenopodium pseudomicrophyllum)					
Mallee Goosefoot (Chenopodium desertorum subsp. Annidiophyllum)					
Crested Goosefoot (Chenopodium cristatum)					
Nitre Goosefoot (Chenopodium nitrariaceum)					
Short winged copperburr (Sclerolaena brachyptera)					
Cannon-ball (Sclerolaena paradoxa)					
Galvanised burr (Sclerolaena birchii)					
Weeds					
Sheppard's purse (Capsella bursa-pastoris*)					
Galvenized burr					
caustic weed					
Maltese cockspur					
Fat Hen (Chenopodium album*)					
White Horehound (Marrubium vulgare*)					
Blackberry Nightshade (Solanum nigrum*)					
Spotted Burr Medic (Medicago arabica*)					
Spear Thistle (Cirsium vulgare)					
bindy weed bidens					
Pattersons Curse (Echium plantagineum)					
St Barnaby's thistle (Centaurea solstitialis)					
Skeleton weed (Chondrilla juncea)					
Saffron thistle (Carthamus lanatus Linnaeus)					

Fuzzweed (Vittadinia cuneata)					
Burr medic (Medicago polymorpha)					
Eastern Cotton bush (Maireana microphylla)					
	7	**5**	**5**	**5**	**6**

APPENDIX 4: BIOBANK SITE FLORA PLOT RESULTS

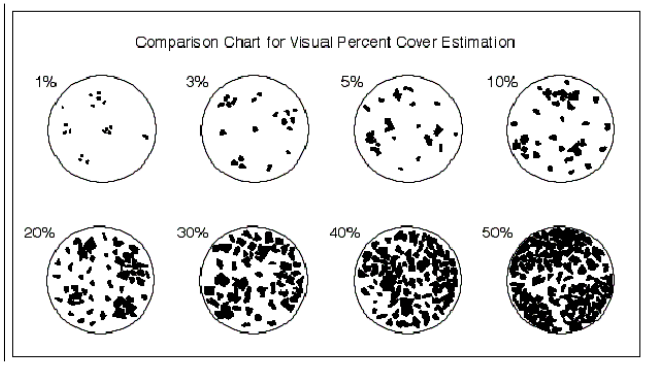
Key: to each flora species record

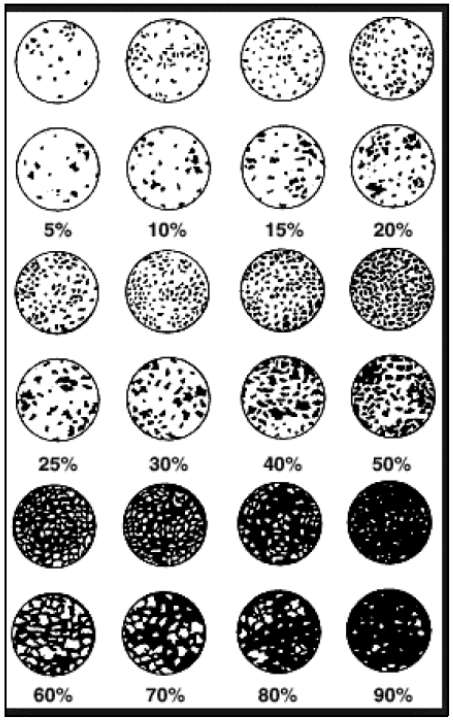
Ie **White Cypress (Pine Callitris glaucophylla) 3 (200)** = Braun banquet cover abundance (actual or estimated number of individuals)

White Cypress Pine is represented by many items is between 25 to 50% cover and about 200 were recorded in the 20x20m veg plot.

Note: The Flora species list provided in Appendix 4 shows what flora species have been recorded during annual spring monitoring in 2013 and 2014, the reason why these have not been deleted for this assessment is to demonstrate to the determining authority the diversity of flora known to occur in 'Chelsea' Monitoring Plots.

Score	Braun banquet cover of abundance
0	Absent from quadrant
0.1	Represented by a solitary item (<5% cover)
0.5	Represented by a few (<5) items (<5% cover)
1	Represented by >5 items (<5% cover)
2	Represented by many (>5) items (5-25% cover)
3	Represented by many items (25 - 50% cover)
4	Represented by many items (50-75% cover)
5	Represented by many items (75-100% cover)





Project Name: 'Chelsea' Biodiversity Offset Area (2015)											
	Monitoring point 1	Monitoring point 2	Monitoring point 3	Monitoring point 4	Monitoring point 6	Plot A	Plot B	Plot C	Plot D	Plot E	Plot F
20x20m Plot ID											
GPS Zone	55	55	55	55	55	55	55	55	55	55	55
GDA N	6424492	6424172	6423745	6423449	6425698	6424105	6424062	6423435	6423837	6424378	6424587
GDA E	451469	451055	453951	453623	453119	451301	451493	451450	451210	450806	450920
Study Area	Eroded Area Main Creek	Veg Plot 2	Confluence of Waterways	Tractor Shed	Creek Crossing Track	Base of outcrop	Base of outcrop	Flat Plain	Flat Plain	Flat Plain	Flat Plain
Details											
	1	2	3	4	6	A	B	C	D	E	F
Dominant Stratum	Upper	Mid	Upper	Lower	Upper	Upper	Upper	Upper	Upper	Upper	Upper
Dominant Stratum % Cover	50	55	45	30	15	14.5	22	6	5.5	6.5	5
Landscape Position and Mitchell Landscape	Nangerybone Hills - Creek Bank/Bed	Nangerybone Hills - Creek Bank	Nangerybone Hills - Confluence of several waterways	Nangerybone Hills - Gentle Slope	Nangerybone Hills - Creek Bank | Gentle Rise	Nangerybone Hills -Base of outcrop	Nangerybone Hills - Base of outcrop	Nangerybone Hills - Flat Plain	Nangerybone Hills	Nangerybone Hills	Nangerybone Hills
Health	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy	Healthy
Condition (Biobanking)	Moderate to Good	Moderate to Good	Moderate to Good	Moderate to Good	Moderate to Good	Moderate to Good	Moderate to Good	Moderate to Good	Moderate to Good	Moderate to Good	Moderate to Good
Biometric Veg Type ID	CW169 (WE91)	CW169 (WE91)	CW169 (WE91)	CW134 (WE58)	CW169 (WE91)	CW134 (WE58)	CW134 (WE58)	CW134 (WE58)	CW169 (WE91)	CW169 (WE91)	CW169 (WE91)

Biometric Vegetation Name	Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion (Benson 103)	Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion (Benson 103)	Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion (Benson 103)	Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)	Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion (Benson 103)	Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)	Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)	Dwyer's Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion (Benson 184)	Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion (Benson 103)	Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion (Benson 103)	Poplar Box - Gum-barked Coolibah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion (Benson 103)
EEC?	no	no	no	no	no	no	no	no	no	no	no
Over Cleared Vegetation Type? >90% in CMA	no	no	no	no	no	no	no	no	no	no	no
Highly Cleared Vegetation Type? >70% in CMA	no	no	no	no	no	no	no	no	no	no	no
Upper Stratum % cover	50	50	45	10	15	30	22	6	5.5	6.5	5
Mid Stratum % Cover	30	55	20	5	60	0	0	0	0	0	0
Lower Stratum % Cover	5	5	90	70	80	20	10	15	12	12	10
Upper Stratum height (m)	20	25	25	15	20	5	5	5	15	15	15
Mid Stratum height (m)	4	4	4	3	5	0	0	0	0	0	0
Lower Stratum height (m)	0.1	0.3	0.3	0.3	0.4	0.1	0.1	0.1	0.2	0.2	0.1
% Bare Ground	50	70	10	70	20	75	60	30	30	30	30
% Rocks	0	0	0	0	0	10	20	0	0	0	0
Ground logs 20x50m >10cm diameter	14	9	10	15	8	13	45	55	30	30	35
Tree Hollows 20x50m area											
	1	2	3	4	6	A	B	C	D	E	F

Trees w hollows	4	2	1	2	1	4	4	4	4	4	1
Stratum Details											
No of Upper Stratum sp	3	3	4	2	2	2	2	2	2	2	2
No of Mid Stratum sp	0	0	0	0	0	0	0	0	0	0	0
No of Lower Stratum sp	13	16	12	15	13	8	7	14	14	14	16
Native plant species richness	17	17	17	13	15	10	9	12	16	16	18
No of exotic species	1	2	0	2	1	1	1	1	0	0	0
% Weeds	5.88	11.76	0.00	15.38	6.67	10.00	11.11	8.33	0.00	0.00	0.00
Biodiversity links ? (State, Regional, Local?)	No	No	No	No	No	No	No	No	No	No	No
Terrestrial habitat											
	1	**2**	**3**	**4**	**6**	**A**	**B**	**C**	**D**	**E**	**F**
Habitat features, including feeding, prey species, nesting, rocky habitat and refuge resources, including non-native hollow bearing trees	Creek line, mixture of three ecotones, alluvial and rocky area	Near ephemeral creek, decorating bark, forms hollows	Healthy native grassy understory, open habitat	Grassy Layer	Logs, hollows, native grassy layer, riparian	Logs, hollows, rocky area	Logs, hollows, rocky area	Logs, hollows	Logs, hollows	Logs, hollows	Logs, hollows
	1	**2**	**3**	**4**	**6**	**A**	**B**	**C**	**D**	**E**	**F**
Upper Stratum spp											
1 (Dominant species)	White Cypress Pine	White Cypress Pine	White Cypress Pine	Dwyer's Red Gum	White Cypress Pine	White Cypress Pine	White Cypress Pine	White Cypress Pine	White Cypress Pine	White Cypress Pine	White Cypress Pine
2 (Sub dominant 1)	Dwyer's Red Gum (Eucalyptus dealbata)	Dwyer's Red Gum (Eucalyptus dealbata)	Inland Grey Box (Eucalyptus microcarpa)	White Cypress Pine	Poplar Box (Eucalyptus populnea)	Dwyer's Red Gum	Dwyer's Red Gum	Dwyer's Red Gum	Poplar Box (Eucalyptus populnea)	Poplar Box (Eucalyptus populnea)	Poplar Box (Eucalyptus populnea)

3 (Sub dominant 2)	Inland Grey Box (Eucalyptus microcarpa)	Kurrajong (Brachychiton populneus)	Poplar Box								
White Cypress (Pine Callitris glaucophylla)	3(45)	2(30)	2(20)	0.5 (12)	2(100)	3(45)	3(45)	3(30)	1(14)	1(20)	1(10)
Dwyer's Red Gum (Eucalyptus dwyeri)	0.5 (4)	0.5 (3)	0.1 (1)	1 (2)		3(15)	3(5)	3(9)			
Bimble Box (Eucalyptus populnea subsp. Bimbil)			0.1 (1)		0.5 (2)				2(5)	2 (3)	0.1 (1)
Gum-barked Coolibah (Eucalyptus intertexta)											
Blakely's Red Gum											
Inland Grey Box (Eucalyptus microcarpa)	0.5 (1)		0.1 (1)								
Kurrajong (Brachychiton populneus)		0.1 (1)									
Mid Stratum spp	**1**	**2**	**3**	**4**	**6**	**A**	**B**	**C**	**D**	**E**	**F**
1 (Dominant species)											
2 (Sub dominant 1)											
3 (Sub dominant 2)											
White Cypress Pine											
Poplar Box											
Dwyer's Red Gum											

Western Golden Wattle (Acacia decora)											
Needle Hakea											
Lower Stratum spp	**1**	**2**	**3**	**4**	**6**	**A**	**B**	**C**	**D**	**E**	**F**
1 (Dominant species)	Rough Speargrass (Austrostipa scabra subsp. scabra)	Rough Speargrass (Austrostipa scabra subsp. scabra)	Rough Speargrass (Austrostipa scabra subsp. scabra)	Rough Speargrass (Austrostipa scabra subsp. scabra)	Rough Speargrass (Austrostipa scabra subsp. scabra)	Rough Speargrass (Austrostipa scabra subsp. scabra)	Rough Speargrass (Austrostipa scabra subsp. scabra)	Poison Rock Fern (Cheilanthes sieberi subsp. sieberi)	Rough Speargrass (Austrostipa scabra subsp. scabra)	Rough Speargrass (Austrostipa scabra subsp. scabra)	Rough Speargrass (Austrostipa scabra subsp. scabra)
2 (Sub dominant 1)	Austrostipa scabra	Earth cress (Geococcus pusillus)	Austrostipa scabra	Earth cress (Geococcus pusillus)	Earth cress (Geococcus pusillus)	Poison Rock Fern (Cheilanthes sieberi subsp. sieberi)	Earth cress (Geococcus pusillus)	Rough Speargrass (Austrostipa scabra subsp. scabra)	Pale everlasting (Helichrysum rutidolepis)	Earth cress (Geococcus pusillus)	New Zealand Spinach (Tetragonia tetragonioides)
3 (Sub dominant 2)	Curly Windmill Grass (Enteropogo n)	Dirty Dora (Cyperus difformis)	Common Cranesbill (Geranium retrorsum)	Austrostipa scabra	Poison Rock Fern (Cheilanthes sieberi subsp. sieberi)	Common Cranesbill (Geranium retrorsum)	Woolly Cloak Fern (Cheilanthes distans)	Earth cress (Geococcus pusillus)	Slender violet (Hybanthus monopetalus)	New Zealand Spinach (Tetragonia tetragonioides)	Earth cress (Geococcus pusillus)
GRASS	**1**	**2**	**3**	**4**	**6**	**A**	**B**	**C**	**D**	**E**	**F**
No.9 wiregrass (Aristida jerichoensis)											
Speargrass (Austrostipa scabra subsp. scabra),	1 (80)		1 (90)	2 (100)	2 (150)	2(80)	1 (55)	1 (30)	0.5 (2)	0.5 (5)	1 (30)
Purple wiregrass (Aristida ramosa)											
Bunched Kerosene Grass (Aristida contorta)											
Rough Speargrass (Austrostipa	2 (150)	2 (200)	2 (300)	2 (200)		2(200)	2(180)	1 (50)	3 (250)	3 (300)	3(180)

scabra subsp. scabra)											
Wallaby Grass (Austrodanthonia bipartite)								0.5 (2)		0.5 (4)	
Wallaby Grass (Austrodanthonia setacea)	0.5 (4)			0.5 (4)							
Short Windmill Grass (Chloris truncata)										0.5 (3)	
Stipa bigeniculata											
Curly Windmill Grass (Enteropogon)	1 (80)									0.5 (5)	
Shivery Grass (Briza minor)											
Foxtail Speargrass (Austrostipa densiflora)											
SEDGES	**1**	**2**	**3**	**4**	**6**	**A**	**B**	**C**	**D**	**E**	**F**
Eleocharis XYZ											
Dirty Dora (Cyperus difformis)	0.5 (4)	1(90)									
Juncas sp.											
Forbes / Other	**1**	**2**	**3**	**4**	**6**	**A**	**B**	**C**	**D**	**E**	**F**
Broad-leaf Parakeelya (Calandrinia balonesis)					0.5 (5)		0.5 (4)				
Common Cranesbill (Geranium retrorsum)				1 (75)	0.5 (5)			1 (10)		0.5 (3)	

Corrugated Sida (Sida corrugata)											
Dense Stonecrop (Crassula colorata)											
Early Nancy (Anguillaria dioica)										1 (45)	2 (60)
Earth cress (Geococcus pusillus)	1 (60)	2 (160)	1 (60)	1 (50)	2 (100)	1 (45)		1 (55)	1 (25)		2 (200)
Ground-heads (Chthonocephalus pseudevax)		0.5 (5)	0.5 (5)	0.5 (5)							
Hoary Guinea-flower (Hibbertia obtusifolia)				0.5 (4)							
Iron Grass (Lomandra patens)						2 (120)	1 (50)	0.5 (4)			
Long Tails (Ptilotus polystachys)						0.5 (3)					
New Zealand Spinach (Tetragonia tetragonioides)		0.5 (5)	0.5 (5)	0.5 (5)	0.5 (5)	0.5 (4)		0.5 (4)	2 (40)	1(15)	1(25)
Pale everlasting (Helichrysum rutidolepis)					0.5 (5)		1 (25)				0.5 (2)
Pale sundew (Drosera peltata)	1 (50)	2 (150)									
Poison Rock Fern (Cheilanthes sieberi subsp. sieberi)	1 (20)	0.5 (4)	0.5 (5)	0.5 (5)	1 (40)				2(100)		0.5 (4)
Pomax umbellata	1 (30)	0.5 (4)									
Poverty Bush (Sclerolaena intricata)				1 (20)							

Purple Burr-daisy (Calotis cuneifolia)											
Riged Sida (Sida cunninghamii)											
Showy violet (Viola betonicifolia)										1(5)	
Slender violet (Hybanthus monopetalus)		0.5 (3)	0.5 (5)	0.5 (5)	0.5 (5)						
Smooth Goodenia (Goodenia glabra)				1 (20)	1 (25)	0.5(4)	1(14)	1(10)	1(5)		
Stinging nettle (Urtica incisa)			1 (20)		0.5 (5)		2 (120)		0.5 (4)		1(5)
Tall Fuzzweed (Vittadinia)									1(25)		
Tiny star (Hypoxis pusila)									1(35)		1(45)
Variable Desmodium (Desmodium varians)											
Veined greenhood (Pterostylis bisecta)	0.5 (4)										
Vittadinia cervicularis var. cervicularis (Asteraceae spp.)						1(25)	2(85)	1(35)			2(100)
Wahlenbergia sp.									1(50)		0.5 (4)
White Sunray (Leucochrysum albicans var tricolor)											

Winter Apple / ammula (Eremophila debilis)									1(15)		
Wonga Vine (Pandorea pandorana subsp. pandorana 'inland form')										1 (15)	1 (10)
Wooly Cloak Fern (Cheilanthes distans)										0.5 (4)	0.5 (2)
Yellow Burr-daisy (Calotis lappulacea)											
Yellow Buttons (Chrysocephalum apiculatum)		0.5 (3)	1 (15)	1 (25)							
Yellow Rush Lily (Tricoryne elatior)								0.5 (2)			
Yellow wooded sorrel (Oxalis corniculata)	1 (15)	0.5 (3)	0.5 (5)	0.5 (5)		1(10)					
	13	14	13	17	13	12	11	13	14	14	16
Exotic Species	1	2	3	4	6	A	B	C	D	E	F
Common fumitory (Fumaria officinalis)	1 (35)	0.5(5)									
Flatweed (Hypochaeris radicata)											
Hares Foot Clover (Trifolium arvense)											
Maltase Cockspur (Centaurea melitensis)											

Mayne's pest (Glandularia aristigera)				0.5(4)							
Paterson's Curse (Echium plantagineum)							0.5(4)	0.5 (2)			
Proliferous Pink (Petrorhagia nanteuilii)											
Purple Love Grass (Eragrostis lacunaria)											
Scarlet pimpernel (Anagallis arvensis)		0.5(4)		0.5(5)	0.5(5)						

APPENDIX 5: DEVELOPMENT SITE BIOBANKING CREDIT REPORT

BioBanking credit report

NSW GOVERNMENT Office of Environment & Heritage

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

Date of report: 24/07/2015 Time: 4:55:50PM Calculator version: v4.0

Development details

Proposal ID:	0117/2015/2038D
Proposal name:	Hera Gold Mine MOD 3 July 2015
Proposal address:	'Hera' via Burthong Road Nymagee NSW 2831
Proponent name:	Aurelia Metals Ltd
Proponent address:	2 Corporation Place Orange NSW 2800
Proponent phone:	0263635200
Assessor name:	Phillip Cameron
Assessor address:	6 Belmore Street DUBBO NSW 2830
Assessor phone:	02 6882 0118
Assessor accreditation:	0117

Improving or maintaining biodiversity

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

Red flag	Reason
Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	Vegetation type being > 70% cleared; or it contains an endangered ecological community;
Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion	Vegetation type being > 70% cleared; or it contains an endangered ecological community;

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

Additional information required for approval:

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

Ecosystem credits summary

Plant Community type	Area (ha)	Credits required	Red flag
Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	4.05	81.00	No
Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion	2.55	74.00	Yes
Total	6.60	155	

Credit profiles

1. Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion, (WE58)

Number of ecosystem credits created	81
IBRA sub-region	Nymagee-Rankins Springs - Western

Offset options - vegetation types	Offset options - CMA sub-regions
Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion, (WE58) Green Mallee tall mallee woodland on rises in the Pilliga - Goonoo regions, southern Brigalow Belt South Bioregion, (WE133) Gum Coolabah - Mugga Ironbark - White Cypress Pine woodland on granite low hills in the eastern Cobar Peneplain Bioregion and central NSW South Western Slopes Bioregion, (WE145) Dwyer's Red Gum - Currawang grassy low woodland of the central western plains of NSW, (WE57) Green Mallee - White Cypress Pine very tall mallee woodland on gravel rises mainly in the Cobar Peneplain Bioregion, (WE59) Grey Mallee - Mulga shrubland of the north-western Cobar Peneplain Bioregion, (WE60) Grey Mallee - White Cypress Pine woodland on rocky hills of the eastern Cobar Peneplain Bioregion, (WE61) Ridge mallee woodland on hills of meta-sediments and volcanics, eastern Cobar Peneplain Bioregion, (WE62) Gum Coolabah woodland on slopes of sandstone ranges in the Paroo - Darling region, mainly Mulga Lands Bioregion, (WE63) Gum Coolabah woodland on sedimentary substrates mainly in the Cobar Peneplain Bioregion, (WE64) White Cypress Pine - Mulga low woodland on siliceous rocky ranges mainly of the Cobar Peneplain Bioregion, (WE65)	Nymagee-Rankins Springs - Western and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

2. Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion, (WE92)

Number of ecosystem credits created	74
IBRA sub-region	Nymagee-Rankins Springs - Western

Offset options - vegetation types	Offset options - CMA sub-regions
Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion, (WE92) Western Rosewood - Wilga - Wild Orange - Belah low woodland of the Brigalow Belt South Bioregion and eastern Darling Riverine Plains Bioregion, (WE150)	Nymagee-Rankins Springs - Western and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Species credits summary

APPENDIX 6: OFFSET SITE BIOBANKING CREDIT REPORT

BioBanking credit report

NSW GOVERNMENT | Office of Environment & Heritage

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

Date of report: 24/07/2015 Time: 4:54:19PM Calculator version: v4.0

Biobank details

Proposal ID:	0117/2015/2043B
Proposal name:	Hera Gold Mine Offsetting (Chelsea)
Proposal address:	Chelsea Nymagee NSW 2831
Proponent name:	Aurelia Metals Ltd
Proponent address:	2 Corporation Place Orange NSW 2800
Proponent phone:	0263635200
Assessor name:	Phillip Cameron
Assessor address:	6 Belmore Street DUBBO NSW 2830
Assessor phone:	02 6882 0118
Assessor accreditation:	0117

Additional information required for approval:

- ☐ Use of local benchmark
- ☐ Expert report...
- ☐ Request for additional gain in site value

Ecosystem credits summary

Plant Community type	Area (ha)	Credits created
Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	80.17	799.00
Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	95.30	714.00
Total	175.47	1,513

Credit profiles

1. Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion, (WE58)

Number of ecosystem credits created	799
IBRA sub-region	Nymagee-Rankins Springs - Western

2. Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion, (WE91)

Number of ecosystem credits created	714
IBRA sub-region	Nymagee-Rankins Springs - Western

Species credits summary

Additional management actions

Additional management actions are required for:

Vegetation type or threatened species	Management action details
Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	Exclude commercial apiaries
Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	Exclude miscellaneous feral species
Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	Feral and/or over-abundant native herbivore control
Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	Fox control
Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	Exclude commercial apiaries
Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	Exclude miscellaneous feral species
Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	Feral and/or over-abundant native herbivore control
Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	Fox control

APPENDIX 7: AURELIA METALS LETTER

Offsetting and Biodiversity Assessment for the Hera Mine Modification 3 Project Approval 10_0191

Paragraph 8.3.1.4 - If a proponent determines that a Major Project cannot proceed without impacting on biodiversity values despite seeking to avoid impacts in accordance with Paragraph 8.3.1.3, the proponent must identify reasonable measures and strategies to minimise the impact of development on biodiversity values.

It has been determined that the proposed development associated with Hera Mine Modification 3 Project Approval (PA) 10_0191 cannot proceed without impacting on biodiversity values. Aurelia Metals Ltd (AMI) will seek to avoid impacts in accordance with Paragraph 8.3.1.3. Reasonable measures and strategies have been identified to minimise the impact of the development on biodiversity impacts include:

- The proposed development is immediately adjacent to the current project area and will not further fragment the ecosystem;
- The proposed development will not impact an endangered community;
- The proposed development has been identified as an unlikely breeding habitat for the regions threatened species;
- The site has undergone targeted searches including animal trapping over the past five years. No listed flora or fauna have been recorded in the area;
- The proposed development is not adjacent or near a watercourse. The nearest waterway to the development is Box Creek. This creek is ephemeral and located approximately two kilometres south of the proposed development;
- The proposed development will be bunded to eliminate runoff of site waters. All site waters will be directed to sediment basins and;
- Clean water surrounding the proposed development will be redirected around the site to clean water storages.

8.3.1.5 - A proponent may only use offsets to compensate for impacts on biodiversity values where those impacts have already been avoided and minimised as far as practicable in accordance with Paragraphs 8.3.1.3 and 8.3.1.4.

Through all stages of the planning process, as a priority, consideration was given to avoid impacts to native vegetation. AMI has carefully considered all options and attempted to minimise impacts on biodiversity values associated with the proposed development. The current proposal minimises the impacts to the environment while also achieving the requirements of the project.

8.3.1.6 Measures that minimise the impact on biodiversity may be required for a particular threatened species, or apply to a particular phase of the project life cycle. These measures must be set out in the BAR.

There are a number of threatened species in the area surrounding the proposal. The development site has been identified by an ecologist as unlikely breeding habitat for the regions listed species and targeted flora assessments in the general area of the proposal over the past five years have not recorded any listed flora. As part of AMI commitment to biodiversity values a yearly ecological monitoring program is conducted by suitably qualified consultants and this information is used in the planning process.

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AMI is aware Hooded Robin and a number of listed microbats have been recorded on the Hera property. Annual ecological monitoring has identified areas on Hera suitable for Hooded Robins to breed. The area of the proposed development is not in or immediately adjacent to these areas. The proposed development is dominated by thick stands of white cypress pine resulting in low biodiversity and thus fewer food resources making it a sparse resource poor feeding ground for the regions listed species.

The monitoring has also identified that the proposed development site does not provide suitable habitat for cave dependant listed microbats. There is a low density of trees with hollows in the proposed development area (estimated at <1 tree with hollow per hectare) compared to other areas on the property.

Yours Sincerely

Bruce Anderson.

Bruce Anderson
General Manager – Hera Project

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APPENDIX 8: DEVELOPMENT SITE AND OFFSET SITE CREDIT MATCHING

2015 DEVELOPMENT SITE AND OFFSET AREA CREDIT MATCHING

Impact Offset Requirements

PC type code	Vegetation Type	Red Flag	Area Impacted (ha)	Credits Required	Credits Required/ha	Est. Offset Area (ha) Required	
						Minimum Tier 3 Outcome (2:1)	Tier 1 Outcome Average Biobank Site 9.3 credits/ha
WE92	Benson 103 Poplar Box - Gum-barked Coolibah	No	2.55	74	29.0	5.1	8
WE 58	Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	No	4.05	81	20.0	8.1	9
	Total		**6.60**	**155**	**23.5**	**13.2**	**17**

Vegetation Offset Matching

	The Development Area				The Offset Area						
	Vegetation Type	**Area Impacted (ha)**	**Credits Required**	**Allowable Vegetation Types**	**Community ecosystem credit summary**	**Available ha in Offset Area**	**Number of Credits Generated**	**No. Credits Generated/ ha (Offset Credits generated / ha in Offset)**	**No. of hectares required to offset (Offset Credits generated / Development Credits required)**	**Surplus (black) deficit (red) credits to offset**	**Can offsetting be achived?**
WE91	Benson 103 Poplar Box - Gum-barked Coolibah	Impact and Offset Credit Matching	74	Benson 103	Benson 103 Poplar Box - Gum-barked Coolibah	95.3	714	7.49	9.88	640.00	**YES**
WE 58	Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	4.05	81	Benson 144	Dwyer's Red Gum - White Cypress Pine - Currawang low shrub-grass woodland of the Cobar Peneplain Bioregion	80.17	799	9.97	8.13	718.00	**YES**
	Total	**4.05**	**155.00**			**175.47**	**1,513**	**N/A**	**18.00**	**N/A**	

Species credits summary	**Sci Name**	**Extent of individuals**	**Sp credits created**	**Species credits summary**	**Sci Name**	**Extent of individuals**	**Sp credits created**

2012 DEVELOPMENT SITE AND OFFSET AREA CREDIT MATCHING

Impact Offset Requirements

Vegetation Type	Red Flag	Area Impacted (ha)	Credits Required	Credits Required/ha	Est. Offset Area (ha) Required	
					Minimum Tier 3 Outcome (2:1)	Tier 1 Outcome Average Biobank Site 9.3 credits/ha
Benson 103 Poplar Box - Gum-barked Coolibah	No	73.70	3,928	53.3	147.4	422
Benson 174 Mallee - Smooth-barked Coolibah Woodland	No	3.20	205	64.1	6.4	22
Benson 180 Grey Mallee - White Cypress Pine	No	0.10	9	90.0	0.2	1
Total		**77.00**	**4,142**	**53.8**	**154.0**	**445**

Vegetation Offset Matching

Impact Site (The Peak)					Chelsea (Western CMA)			Chelsea (Central West CMA)				
Vegetation Type	**Area Impacted (ha)**	**Target Offset Area (Tier 1 or full loM)**	**Credits Required**	**Allowable Vegetation Types (BBAM)**	**Available Offset Area**	**Number of Credits Generated**	**No. Credits Generated/ ha**	**Available Offset Area**	**Number of Credits Generated**	**No. Credits Generated/ ha**	**Area (ha) required to meet Tier 1 Offset**	**Credit Surplus / Deficit**
Benson 103 Poplar Box - Gum-barked Coolibah	73.7	422	3,928	Benson 103	310	2,377	7.67	830	5516	6.65	512.28	3,965
Benson 174 Mallee - Smooth-barked Coolibah Woodland	3.2	22	205	Benson 174				238	2009	8.44	24.29	1,804
Benson 180 Grey Mallee - White Cypress Pine	0.1	1	9	Benson 180								
				Benson 184				570	4456	7.82	1.15	4,447
Total	**77.00**	**445.00**	**4,142.00**		**310.00**	**2,377**	**7.67**	**1,638**	**11,981**	**7.31**	**537.71**	**10,216.00**

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