#### COWAL GOLD OPERATIONS PROCESSING RATE MODIFICATION

# ADDENDUM TO THE BIODIVERSITY ASSESSMENT REPORT AND BIODIVERSITY OFFSET STRATEGY



PREPARED BY RESOURCE STRATEGIES

July 2018 Project No. HAL-16-41 Document No. 00925550

# COWAL GOLD OPERATIONS – ADDENDUM TO THE BIODIVERSITY ASSESSMENT REPORT AND BIODIVERSITY OFFSET STRATEGY

#### Background

Cowal Gold Operations Processing Rate Modification – Response to Submissions (Evolution, 2018a) was submitted to the Department of Planning and Environment (11 June 2018) to address comments received on the Cowal Gold Operations Processing Rate Modification Environmental Assessment (Evolution, 2018b).

The Cowal Gold Operations Processing Rate Modification – Response to Submissions (Evolution, 2018a) provides further information on the Cowal Gold Operations Processing Rate Modification Biodiversity Assessment Report and Biodiversity Offset Strategy (BARBOS) (Resource Strategies, 2018) in response to comments from the Office of Environment and Heritage (11 June 2018).

This addendum to the BARBOS incorporates additional information within the *Gold Operations Processing Rate Modification – Response to Submissions* (Evolution, 2018a) that was not included in the BARBOS.

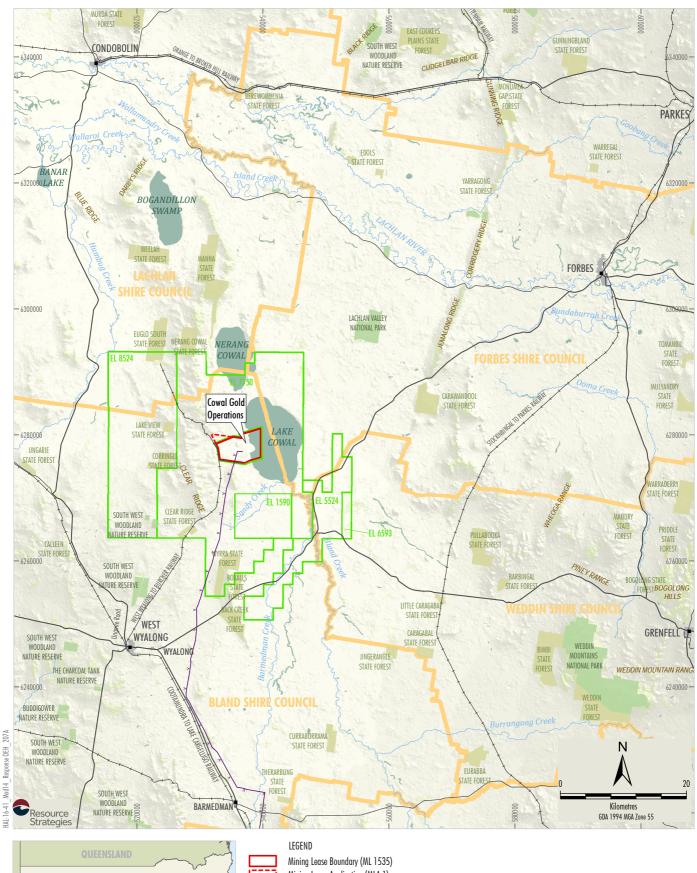
#### Additional Information

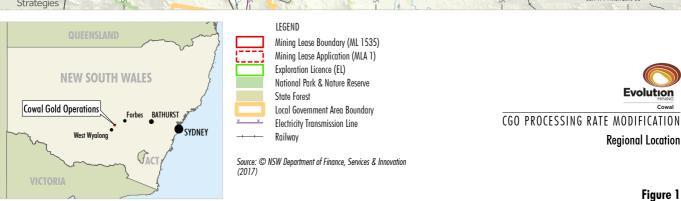
Eight additional figures were developed and included in the *Cowal Gold Operations Processing Rate Modification – Response to Submissions* (Evolution, 2018a), they are as follows:

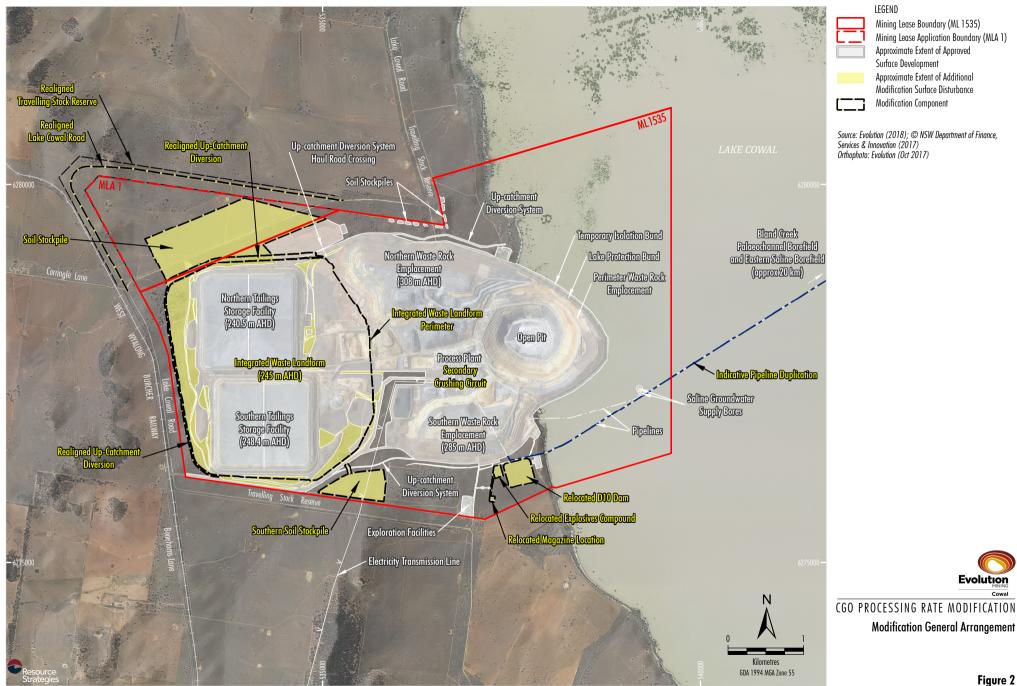
- Figure 1 shows the Cowal Gold Operation regional location;
- Figure 2 shows the modification general arrangement;
- Figure 3 shows areas not requiring assessment at the mine site;
- Figure 4 shows areas not requiring assessment at the pipeline;
- Figure 5 shows Biometric Vegetation Types (BVTs) not requiring offsetting;
- Figure 6 shows BVTs requiring offsetting at the mine site;
- Figure 7 shows BVTs requiring offsetting at the pipeline; and
- Figure 8 shows impacts requiring further consideration at the pipeline.

Table 1 (from the *Cowal Gold Operations Processing Rate Modification – Response to Submissions* [Evolution, 2018a]) provides the measures to avoid and minimise the impacts of the Modification, to be implemented, before, during and after construction, including action, outcome, timing and responsibility. Table 1 also includes the existing management plan that will be updated to include each action.

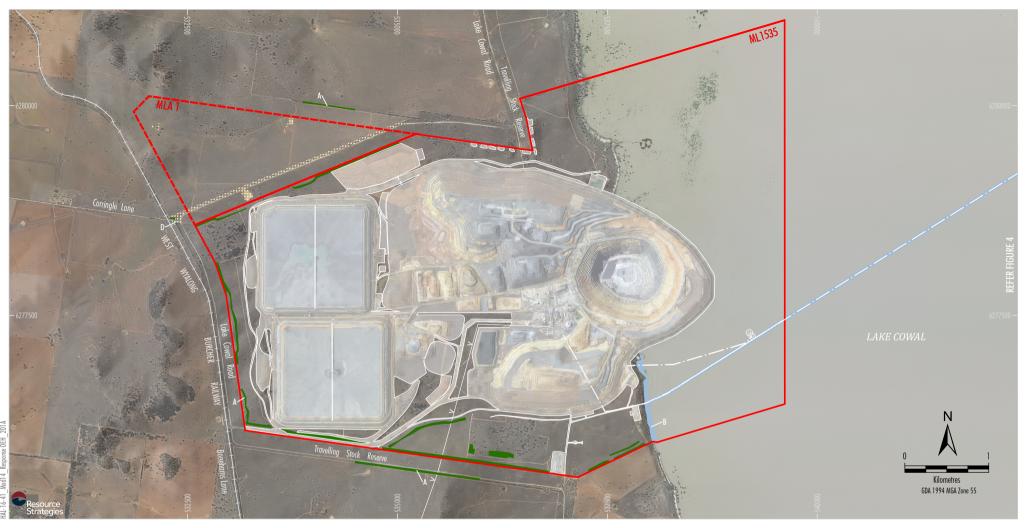
The BioBanking Credit Calculator reports for Offset Areas 3 - 6 are included in Attachment A1 - A4 of this BARBOS addendum.







HAL-16-41 Mod14 Response OEH 208A





Mining Lease Boundary (ML 1535)
Mining Lease Application Boundary (MLA 1)
Approximate Extent of Approved
Surface Development
AREAS NOT REQUIRING ASSESSMENT - MINE SITE
Map Units



Source: © NSW Department of Finance, Services & Innovation (2017) Orthophoto: Evolution (Oct 2017)



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Areas Not Requiring Assessment
- Mine Site



Approximate Extent of Approved
Surface Development

AREAS NOT REQUIRING ASSESSMENT - PIPELINE

Map Units
Lake Bed

C Cropping



CGO PROCESSING RATE MODIFICATION

Areas Not Requiring Assessment
- Pipeline





Mining Lease Boundary (ML 1535) Mining Lease Application Boundary (MLA 1)
Approximate Extent of Approved Surface Development

BIOMETRIC VEGETATION TYPE NOT REQUIRING OFFSET

Grasslands - Western Slopes Grasslands
Highly Modified Derived Grasslands (Low Condition) (LA138)



CGO PROCESSING RATE MODIFICATION Biometric Vegetation Type Not Requiring Offset





Mining Lease Boundary (ML 1535)
Mining Lease Application Boundary (MLA 1)
Approximate Extent of Approved
Surface Development

FBA Plot

Source: © NSW Department of Finance, Services & Innovation (2017)
Orthophoto: Evolution (Oct 2017)

BIOMETRIC VEGETATION TYPE REQUIRING OFFET - MINE SITE

Semi-arid Woodlands (Grassy sub-formation) - Riverine Plain Woodlands

Weeping Myall Open Woodland (Semi Cleared in Moderate Condition) (LA212)

1b Weeping Myall Open Woodland (Semi Cleared in Low Condition) (LA212)
1c Weeping Myall Open Woodland (Derived Grassland in Low Condition) (LA212)

<u>Grassy Woodlands - Floodplain Transition Woodlands</u>

2a Inland Grey Box - White Cypress Pine Woodland (Semi Cleared in Moderate Condition) (LA152)
2b Inland Grey Box - White Cypress Pine Woodland (Derived Grassland in Low Condition) (LA152)

Forested Wetlands - Inland Riverine Forests

River Red Gum Forest (Moderate Condition) (LA191)

Semi-arid Woodlands (Grassy sub-formation) - Northwest Floodplain Woodlands

Belah Woodland (Low Condition) (LA105)

Semi Arid Woodland (Shrubby sub-formation) - Inland Rocky Hill Woodlands

Dwyer's Red Gum - White Cypress Pine - Currawang Woodland (Moderate Condition) (LA144) Grasslands - Western Slopes Grasslands

6a Highly Modified Derived Grasslands (Moderate Condition) (LA138)
Threatened Ecological Communities

Grey Box Woodland EEC (BC Act and EPBC Act)

Grey Box Woodland EEC (BC Act)

Weeping Myall Woodland EEC (BC Act and EPBC Act)

Weeping Myall Woodland EEC (BC Act)



CGO PROCESSING RATE MODIFICATION

Biometric Vegetation Type Requiring Offset
- Mine Site



Approximate Extent of Approved
Surface Development

FBA Plot

BIOMETRIC VEGETATION TYPE REQUIRING OFFET - PIPELINE

Semi-arid Woodlands (Grassy sub-formation) - Riverine Plain Woodlands

Weeping Myall Open Woodland (Semi Cleared in Moderate Condition) (LA212)

Weeping Myall Open Woodland (Semi Cleared in Low Condition) (LA212)

Weeping Myall Open Woodland (Derived Grassland in Low Condition) (LA212)

Forested Wetlands - Inland Riverine Forests

Piver Rad Gum Forest (Moderate Condition) (LA111)

River Red Gum Forest (Moderate Condition) (LA191)
Threatened Ecological Communities

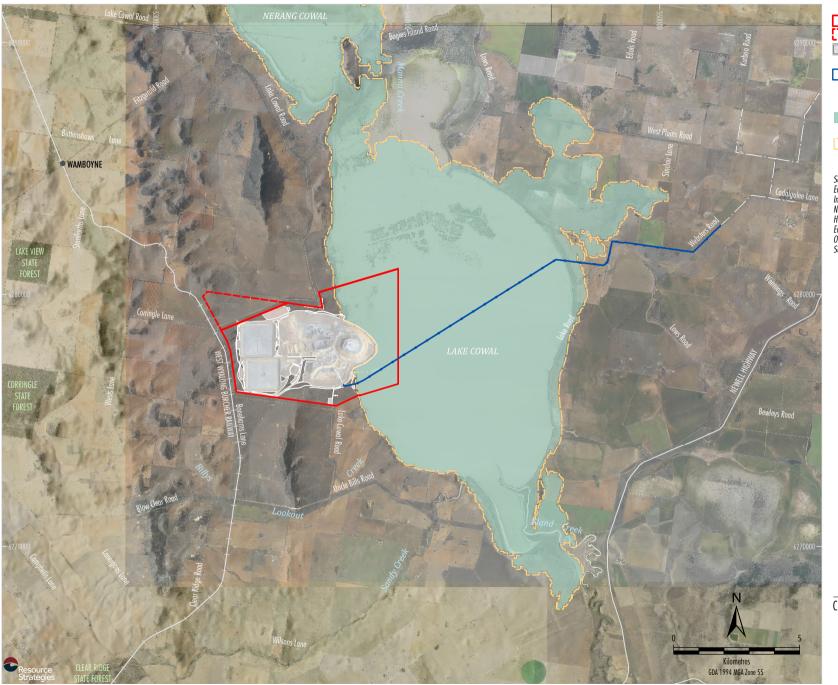
Weeping Myall Woodland EEC (BC Act and EPBC Act)
Weeping Myall Woodland EEC (BC Act)

Source: © NSW Department of Finance, Services & Innovation (2017) Orthophoto: Evolution (Oct 2017)



CGO PROCESSING RATE MODIFICATION

Biometric Vegetation Type Requiring Offset
- Pipeline





Source: Evolution (2018); © NSW Department of Planning and Environment (2017); Department of Finance, Services & Innovation (2017); Crown Lands and Water - a Division of the NSW Department of Industry (2013); Office of Environment and Heritage NSW; Australian Government Department of the Environment (2017)
Orthophoto: Evolution (Oct 2017); Department of Finance, Services & Innovation (2017)

Important Wetlands Australia



CGO PROCESSING RATE MODIFICATION Impacts Requiring Further Consideration - Pipeline

Figure 8

Table 1
Impact Avoidance and Mitigation Measures at the CGO

Action	Outcome	Timing	Responsibility	Management Plan
Revegetation of the post-mine landforms (including waste rock emplacements).	Stable rehabilitated landforms that increase the areas of endemic vegetation.	Ongoing during operations and post-closure.	Evolution	Rehabilitation Management Plan <sup>1</sup>
Rehabilitation of the final void.	Final void surrounds safe (for humans and stray stock).	Ongoing during operations and post-closure.	Evolution	Rehabilitation Management Plan <sup>1</sup>
Rehabilitation of the approved Tailings Storage Facilities (TSF)s.	Stable rehabilitated landforms that increase the areas of endemic vegetation.	Ongoing during operations and post-closure.	Evolution	Rehabilitation Management Plan <sup>1</sup>
Delineation of disturbance area.	Vegetation clearance is minimised.	Before and during construction and operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Pre-clearance surveys.	Minimise impact of land clearance on fauna.	Before and during construction and operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Fauna management strategies.	Minimise impact of land clearance on fauna.	Before and during construction and operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Vegetation clearance procedure.	Minimise impact of land clearance on fauna.	Before and during construction and operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Vehicle speed limits and road signage.	Reduce the danger of vehicles to wildlife.	Before and during construction and operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Threatened Species Management Protocol.	Minimise impact of land clearance on threatened species.	Before and during construction and operations.	Evolution	Implementation of the Threatened Species Management Protocol <sup>3</sup>
Mechanisms to keep fauna away from the TSFs.	Minimise fauna interaction with the TSFs.	Ongoing during operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Cyanide destruction process.	Minimise exposure of fauna to cyanide.	Ongoing during operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Monitoring of fauna usage of the final void.	Monitoring to detect fauna usage of the final void.	Post-closure.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Monitoring of fauna usage of the TSFs.	Monitoring to detect fauna usage of the TSFs.	Ongoing during operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Remnant Vegetation Enhancement.	Enhancement of habitat available to flora and fauna within four Remnant Vegetation Enhancement Areas.	Ongoing during operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Protection of Remnant Vegetation within Mining Lease (ML) 1535.	Areas of woodland (Myall Woodland Endangered Ecological Community [EEC]) located near the southern boundary of ML 1535 protected from disturbance during operations.	Ongoing during operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>

# Table 1 (Continued) Impact Avoidance and Mitigation Measures at the CGO

Action	Outcome	Timing	Responsibility	Management Plan
Limiting vehicular access during construction of the pipeline in the CGO Compensatory Wetland.	Potential impacts from vehicles are minimised.	During construction.	Evolution	Compensatory Wetland Management Plan <sup>4</sup>
Weed management during construction of the pipeline in the CGO Compensatory Wetland.	Weed impacts are minimised.	During construction.	Evolution	Compensatory Wetland Management Plan <sup>4</sup>
Vehicle hygiene weed measures during construction of the pipeline in the CGO Compensatory Wetland.	Weed impacts are minimised.	During construction.	Evolution	Compensatory Wetland Management Plan <sup>4</sup>
Monthly monitoring for 12 months following construction of the pipeline in the CGO Compensatory Wetland the following: erosion, sedimentation, slumping and weed establishment.	Impacts on the native vegetation in the CGO Compensatory Wetland are minimised.	During construction.	Evolution	Compensatory Wetland Management Plan <sup>4</sup>
Dust control.	Dust impacts are minimised.	Ongoing during operations.	Evolution	Air Quality Management Plan <sup>5</sup>
Noise management.	Noise impacts are minimised.	Ongoing during operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Blasting management.	Blasting impacts are minimised.	Ongoing during operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Pest (animal and vermin) control.	Animal pest impacts are minimised.	Ongoing during operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Weed management.	Weed impacts are minimised.	Ongoing during operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Site water management.	Surface water impacts are minimised.	Ongoing during operations.	Evolution	Water Management Plan <sup>6</sup>
Design – Impact Avoidance.	Vegetation clearance is minimised.	Before construction.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Revegetation of the post-mine landforms.	Mine rehabilitation would include species characteristic of the Grey Box EEC and Weeping Myall Woodlands EEC listed under the EPBC Act.	Ongoing during operations and post-closure.	Evolution	Rehabilitation Management Plan <sup>1</sup>
Vegetation Clearance Protocol - Delineation of disturbance area.	Vegetation clearance is minimised.	Before construction.	Evolution	Flora and Fauna Management Plan <sup>2</sup>

# Table 1 (Continued) Impact Avoidance and Mitigation Measures at the CGO

Action	Outcome	Timing	Responsibility	Management Plan
Fencing.	Fencing along the travelling stock reserve (TSR) would exclude livestock from the land between the re-aligned TSR and the proposed stockpile.	Before construction.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Seed Collection.	Seed from species characteristic of the Grey Box EEC and Weeping Myall Woodlands EEC listed under the EPBC Act would be collected.	Before and during construction and operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>
Mechanisms to keep fauna away from the TSFs.	The Integrated Waste Landform would be less conducive to the establishment of wildlife habitats.	During construction and operations.	Evolution	Flora and Fauna Management Plan <sup>2</sup>

Source: After Resource Strategies (2018).

<sup>&</sup>lt;sup>1</sup> Evolution (2017a).

<sup>&</sup>lt;sup>2</sup> Evolution (2016).

<sup>&</sup>lt;sup>3</sup> Barrick (2003a).

<sup>&</sup>lt;sup>4</sup> Barrick (2003b).

<sup>&</sup>lt;sup>5</sup> Evolution (2015).

<sup>&</sup>lt;sup>6</sup> Evolution (2017b).

#### References

Barrick (Cowal) Limited (2003a) Cowal Gold Project Implementation of the Threatened Species Management Protocol.

Barrick (Cowal) Limited (2003b) Cowal Gold Project Compensatory Wetland Management Plan.

Evolution (2015) Cowal Gold Project Air Quality Management Plan.

Evolution (2016) Cowal Gold Operations Flora and Fauna Management Plan.

Evolution (2017a) Cowal Gold Operations Rehabilitation Management Plan.

Evolution (2017b) Cowal Gold Operations Water Management Plan.

Evolution (2018a) Cowal Gold Operations Processing Rate Modification - Response to Submissions.

Evolution (2018b) Cowal Gold Operations Processing Rate Modification Environmental Assessment.

Resource Strategies (2018) Cowal Gold Operations Processing Rate Modification Biodiversity Assessment Report and Biodiversity Offset Strategy. Prepared for Evolution.

(	Cowal Gold Operations Processing Rate Modification
Addendum to t	he Biodiversity Assessment Report and Biodiversity Offset Strategy

ATTACHMENT A1 TO A4
CREDIT REPORT FOR THE PROPOSED OFFSET AREAS

## BioBanking credit report

Expert report...

Request for additional gain in site value



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

Date of report: 14/05/2018 Time: 2:07:09PM Calculator version: v4.0 **Biobank details** 0056/2018/4789B Proposal ID: Cowal Gold Mod 14 - Offset 3 Proposal name: Proposal address: 2283 Lake Road Lake Cowal NSW 2671 Proponent name: **Evolution Mining (Cowal)** Cowal Gold Operations Lake Cowal Road Lake Cowal NSW 2671 Proponent address: 0269754749 Proponent phone: James Gleeson Assessor name: PO Box 1842 BRISBANE NSW 4064 Assessor address: 07 3871 3144 Assessor phone: Assessor accreditation: 0056 Additional information required for approval: Use of local benchmark

#### **Ecosystem credits summary**

Plant Community type	Area (ha)	Credits created
Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions.	47.30	714.00
River Red Gum swampy woodland wetland on cowals (lakes) and associated flood channels in central NSW	19.50	292.00
Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	20.00	305.00
Total	86.80	1,311

#### **Credit profiles**

# 1. Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion, (LA212)

Number of ecosystem credits created 305

IBRA sub-region Lower Slopes - Lachlan

# 2. Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions., (LA105)

Number of ecosystem credits created 714

IBRA sub-region Lower Slopes - Lachlan

# 3. River Red Gum swampy woodland wetland on cowals (lakes) and associated flood channels in central NSW, (LA191)

Number of ecosystem credits created 292

IBRA sub-region Lower Slopes - Lachlan

### **Species credits summary**

Common name	Scientific name	Extent of impact Ha or individuals	Number of species credits created
Superb Parrot	Polytelis swainsonii	13.50	96

## Additional management actions

Additional management actions are required for:

Management action details
Exclude commercial apiaries
Exclude miscellaneous feral species
Feral and/or over-abundant native herbivore control
Fox control
Control of feral pigs
Exclude commercial apiaries
Exclude miscellaneous feral species
Feral and/or over-abundant native herbivore control
Fox control
Maintain or re-introduce natural flow regimes
Slashing
Feral and/or over-abundant native herbivore control
Exclude commercial apiaries
Feral and/or over-abundant native herbivore control
Fox control

# BioBanking credit report

Request for additional gain in site value



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

Date of report: 14/05/2018	Time: 2:08:50PM	Calculator version:	v4.0
Biobank details			
Proposal ID:	0056/2018/4741B		
Proposal name:	Cowal Gold Mod 14 - Offset 4		
Proposal address:	2283 Lake Road Lake Cowal NSW 2671		
Proponent name:	Evolution Mining (Cowal)		
Proponent address:	Cowal Gold Operations Lake Cowal Road Lake Co	owal NSW 2671	
Proponent phone:	0269754749		
Assessor name:	James Gleeson		
Assessor address:	PO Box 1842 BRISBANE NSW 4064		
Assessor phone:	07 3871 3144		
Assessor accreditation:	0056		
Additional information required for	or approval:		
Use of local benchmark			
Expert report			

### **Ecosystem credits summary**

Plant Community type	Area (ha)	Credits created
Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	157.00	1,694.00
Total	157.00	1,694

### **Credit profiles**

1. Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW, (LA175)

Number of ecosystem credits created 1,694

IBRA sub-region Upper Slopes - Lachlan

## **Species credits summary**

### Additional management actions

Additional management actions are required for:

Vegetation type or threatened species	Management action details
Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	Exclude commercial apiaries
Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	Exclude miscellaneous feral species
Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	Feral and/or over-abundant native herbivore control
Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	Fox control

## BioBanking credit report

Expert report...

Request for additional gain in site value



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

Date of report: 14/05/2018 Time: 2:08:02PM Calculator version: v4.0 **Biobank details** 0056/2018/4742B Proposal ID: Cowal Gold Mod 14 - Offset 5 Proposal name: Proposal address: 935 Buttenshaws Lane Lake Cowal NSW 2671 Proponent name: **Evolution Mining (Cowal)** Proponent address: Cowal Gold Operations Lake Cowal Road Lake Cowal NSW 2671 0269754749 Proponent phone: James Gleeson Assessor name: PO Box 1842 BRISBANE NSW 4064 Assessor address: 07 3871 3144 Assessor phone: Assessor accreditation: 0056 Additional information required for approval: Use of local benchmark

■ Derived tussock grassland of the central western plains and lower slopes of NSW

#### **Ecosystem credits summary**

Plant Community type	Area (ha)	Credits created
Derived tussock grassland of the central western plains and lower slopes of NSW	9.00	50.00
Green Mallee - White Cypress Pine very tall mallee woodland on gravel rises mainly in the Cobar Peneplain Bioregion	30.50	300.00
Total	39.50	350

### **Credit profiles**

1. Green Mallee - White Cypress Pine very tall mallee woodland on gravel rises mainly in the Cobar Peneplain Bioregion, (LA148)

Number of ecosystem credits created 300

IBRA sub-region Upper Slopes - Lachlan

2. Derived tussock grassland of the central western plains and lower slopes of NSW, (LA138)

Number of ecosystem credits created 50

IBRA sub-region Upper Slopes - Lachlan

## **Species credits summary**

### Additional management actions

Additional management actions are required for:

Vegetation type or threatened species	Management action details
Green Mallee - White Cypress Pine very tall mallee woodland on gravel rises mainly in the Cobar Peneplain Bioregion	Exclude commercial apiaries
Green Mallee - White Cypress Pine very tall mallee woodland on gravel rises mainly in the Cobar Peneplain Bioregion	Feral and/or over-abundant native herbivore control
Green Mallee - White Cypress Pine very tall mallee woodland on gravel rises mainly in the Cobar Peneplain Bioregion	Fox control

# BioBanking credit report

Request for additional gain in site value



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

Date of report: 14/05/2018	Time: 2:07:36PM	Calculator version: v4.0		
Biobank details				
Proposal ID:	0056/2018/4743B			
Proposal name:	Cowal Gold Mod 14 - Offset 6			
Proposal address:	419 Uncle Bills Road Lake Cowal NSW 2671			
Proponent name:	Evolution Mining (Cowal)			
Proponent address:	Cowal Gold Operations Lake Cowal Road Lake Cowal NSW 2671			
Proponent phone:	0269754749			
Assessor name:	James Gleeson	James Gleeson		
Assessor address:	PO Box 1842 BRISBANE NSW 4064	PO Box 1842 BRISBANE NSW 4064		
Assessor phone:	07 3871 3144	07 3871 3144		
Assessor accreditation:	0056			
Additional information requi	red for approval:			
Use of local benchmark				
■ Derived tussock grasslan	nd of the central western plains and lower slopes of	NSW		
Expert report				

#### **Ecosystem credits summary**

Plant Community type	Area (ha)	Credits created
Derived tussock grassland of the central western plains and lower slopes of NSW	29.00	241.00
Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluivial plains and floodplains	6.80	76.00
Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion	165.50	2,084.00
Total	201.30	2,401

#### **Credit profiles**

1. Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion, (LA152)

Number of ecosystem credits created 2,084

IBRA sub-region Upper Slopes - Lachlan

2. Derived tussock grassland of the central western plains and lower slopes of NSW, (LA138)

Number of ecosystem credits created 241

IBRA sub-region Upper Slopes - Lachlan

3. Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluivial plains and floodplains, (LA198)

Number of ecosystem credits created 76

IBRA sub-region Upper Slopes - Lachlan

## **Species credits summary**

### Additional management actions

Additional management actions are required for:

Vegetation type or threatened species	Management action details	
Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluivial plains and floodplains	Control exotic pest fish species (within dams)	
Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluivial plains and floodplains	Control of feral pigs	
Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluivial plains and floodplains	Exclude miscellaneous feral species	
Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluivial plains and floodplains	Feral and/or over-abundant native herbivore control	
Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluivial plains and floodplains	Fox control	
Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluivial plains and floodplains	Maintain or re-introduce natural flow regimes	