

Cowal Gold Operation

Flora and Fauna Management Plan



May 2015

**COWAL GOLD MINE
FLORA AND FAUNA MANAGEMENT PLAN**



Revision Status Register

Section/Page/ Annexure	Revision Number	Amendment/Addition	Distribution	DP&E Approval Date
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1 INTRODUCTION

The Cowal Gold Mine (the CGM) is located approximately 38 kilometres (km) north-east of West Wyalong in New South Wales (NSW) (Figure 1). Barrick (Cowal) Pty Ltd (Barrick) is the owner and operator of the CGM. Barrick is a wholly owned subsidiary of Barrick (Australia Pacific) Pty Ltd.

Development Consent for the CGM (including the Bland Creek Palaeochannel Borefield water supply pipeline) was granted by the NSW Minister for Urban Affairs and Planning under Part 4 of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act) on 26 February 1999 (DA 14/98). Development Consent (DA 2011/64) for the operation of the eastern saline borefield was granted by the Forbes Shire Council on 20 December 2010.

Barrick was granted approval by the NSW Minister for Planning to modify the Development Consent (DA 14/98) for the CGM Extension Modification under Section 75W of the EP&A Act on 22 July 2014. The CGM Extension Modification involves the continuation and extension of open pit mining and processing operations at the CGM for an additional operational life of approximately 5 years (i.e. to 2024). The general arrangement of the approved CGM is provided in Figure 2.

A copy of the Development Consent (DA 14/98) for the CGM (as modified on 22 July 2014) is available on the Barrick website (www.barrick.com).

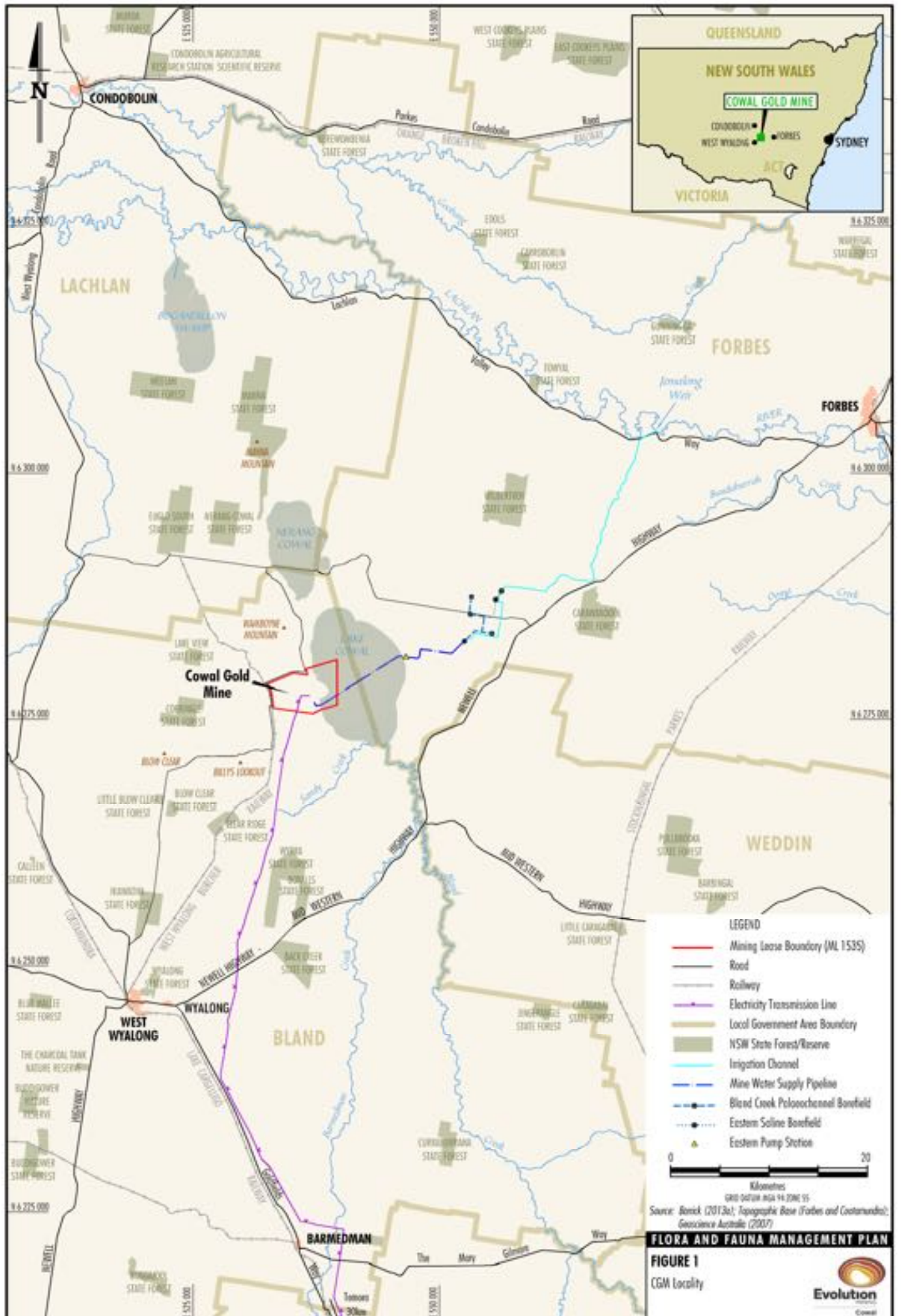
The original Flora and Fauna Management Plan (FFMP) was prepared in accordance with the requirements of the Development Consent in consultation with the National Parks and Wildlife Service (NPWS), Environment Protection Authority (EPA) and the former NSW Fisheries and approved by the former NSW Department of Planning, Infrastructure and Natural Resources (DIPNR) in October 2003. Two Addenda to the FFMP (dated June 2008 and May 2010) were approved by the former NSW Department of Planning (DoP) in November 2008 and May 2010.

This revised FFMP has been prepared to reflect the CGM Extension Modification and the modified Development Consent approved by the NSW Minister for Planning on 22 July 2014. This revised FFMP has been prepared in accordance with the requirements of Development Consent Condition 3.2(b) (and other relevant Development Consent Conditions) (as modified on 22 July 2014). This FFMP supersedes the former FFMP (including the June 2008 and May 2010 Addenda).

1.1 OBJECTIVES AND SCOPE

The objectives of this FFMP are to fulfil the relevant Development Consent conditions by providing:

- methods for monitoring daily and seasonal fauna usage of the tailings dams and whether deaths or other effects or incidents involving native fauna are occurring;
- a protocol for the reporting of any deaths or other incidents involving native fauna on the Mining Lease (ML);
- fauna autopsy facilities to enable the cause of any wildlife deaths to be quickly determined;
- contingency measures for reducing cyanide levels in the tailings dams in the event it is established that fauna deaths are occurring from cyanide in tailings dam water;
- mechanisms to keep fauna and avifauna away from the tailings storages;
- plans for the rescue and rehabilitation of wildlife that may become bogged/sick/trapped in the tailings dams or elsewhere within ML 1535;



- methods to conserve and enhance wildlife values around Lake Cowal and within ML 1535;
- fauna, flora, fish and aquatic invertebrate monitoring of the Lake Cowal region as documented in the *Cowal Gold Project Environmental Impact Statement* (North Limited, 1998a) (EIS);
- for the investigation of fauna deaths off site if requested by the Secretary of the Department of Planning and Environment (DP&E) (the Secretary);
- details to relocate any threatened species and/or its habitat away from disturbed areas that are created by mine operations;
- details of monitoring the mine's impacts particularly on birdlife in bird breeding areas, threatened fauna and flora, and fish and aquatic invertebrates around Lake Cowal, and contingency measures should impacts be identified; and
- a Threatened Species Management Protocol (TSMP), including provisions for targeted searches prior to construction and proposed mitigation measures where threatened flora or fauna species are found.

As required by Development Consent Condition 3.2(b), this FFMP covers the ML area and monitoring of Lake Cowal bird breeding areas (at locations previously identified by Barrick in consultation with the NSW Office of Environment and Heritage [OEH]). This FFMP also describes methods and measures that will be implemented in the wider locality to conserve and enhance wildlife values around Lake Cowal and within the ML, as required by Development Consent Condition 3.2(b)(vii) (Section 9).

1.2 STRUCTURE OF THIS FFMP

- Section 1: Outlines the objectives of the FFMP and details relevant consent conditions.
- Section 2: Identifies the statutory requirements relevant to flora and fauna at the CGM and the consultation conducted during the preparation of the FFMP.
- Section 3: Describes the mechanisms developed to keep fauna and avifauna away from the tailings storages.
- Section 4: Details the methods for monitoring the daily and seasonal fauna usage of the tailings dams.
- Section 5: Outlines plans for the rescue and rehabilitation of wildlife.
- Section 6: Provides a protocol for the monitoring and reporting of deaths or other incidents involving native fauna and describes the fauna autopsy facilities.
- Section 7: Provides the steps for the investigation of fauna deaths recorded off site.
- Section 8: Describes the contingency measures for reducing cyanide levels in the tailings dams.
- Section 9: Describes the methods to be implemented to conserve and enhance wildlife values within ML 1535 and around Lake Cowal.
- Section 10: Provides details of the relocation of threatened species and/or its habitat away from CGM disturbance areas.
- Section 11: Describes monitoring of fauna, flora, fish and aquatic invertebrates of the Lake Cowal region.
- Section 12: Outlines monitoring of the mine's impacts on birdlife in bird breeding areas, threatened flora and fauna, fish and aquatic invertebrates and provides contingency measures should impacts be identified.

- Section 13: Outlines mine closure and lease relinquishment requirements.
- Section 14: Details complaint recording and reporting procedures.
- Section 15: Presents the community consultation requirements.
- Section 16: Details the Independent Environmental Audit requirements and the Independent Monitoring Panel review procedures.
- Section 17: Outlines reporting requirements for issues related to flora and fauna management.
- Section 18: Lists the references cited in this FFMP.
- Section 19: Lists the abbreviations and acronyms used in this FFMP.

2 STATUTORY REQUIREMENTS

Details of the Development Consent conditions, Conditions of Authority for ML 1535 and the regulatory agency consultation requirements relevant to this FFMP are described in Sections 2.1 to 2.3. In addition, a number of regional, state and commonwealth policies, plans and strategies are relevant to this FFMP and are summarised in Section 2.4.

2.1 DEVELOPMENT CONSENT CONDITIONS

This FFMP has been prepared in accordance with the requirements of Condition 3.2(b) of the Development Consent. The requirements of Development Consent Condition 3.2 are outlined in Table 1, along with the relevant section of this FFMP in which the requirements are addressed. Other Development Consent Conditions relevant to flora and fauna management are also outlined in this section.

**Table 1
Development Consent Conditions Relevant to this FFMP**

Development Consent Condition		Section
3.2	Flora and Fauna Management	
	(a) The Applicant shall:	
	(i) minimise the removal of trees and other vegetation from the mine site and restrict any clearance to the areas occupied by the mine activity, buildings and paved surfaces, and those areas necessary for fire control in accordance with BSC's requirements, and have regard to the draft Mid-Lachlan Regional Vegetation Management Plan (or its final version);	Section 9.8
	(ii) not locate topsoil stockpiles within any area of Wilga Woodland in the DA area as identified in Figure 3-13 in the 1998 EIS (Appendix 3); and	Section 9.6.1
	(iii) not disturb any area of Belah Woodland in the DA area as identified in Figure 3-13 in the 1998 EIS.	Section 9.8.4
	(b) The Applicant shall prepare and implement a Flora and Fauna Management Plan for the development to the satisfaction of the Secretary. The shall be prepared in consultation with DPI (Fisheries) and OEH, and cover the mining lease area and monitoring of bird breeding areas as identified by the Applicant in consultation with OEH. The plan shall include, but not be limited to:	This FFMP
	(i) methods for monitoring daily and seasonal fauna usage of tailings dams (eg. species, number, location, habits), and whether deaths or other effects or incidents are occurring. Usage of the tailings dams shall be reported to the OEH on a six monthly basis, unless otherwise directed by the Secretary;	Section 4
	(ii) development of a protocol for the reporting of any native fauna deaths or other incidents involving native fauna on the mining lease to the OEH, DRE, CEMCC and in the case of fish, DPI (Fisheries). Native fauna deaths (except those attributable to physical trauma such as vehicle strike) must be reported as per this protocol within 24 hours (or next working day). The Applicant shall maintain a record of any native fauna deaths or other incidents and this record must be published annually on the Applicant's website for the development;	Section 6
(iii) provision for fauna autopsy facilities to enable the cause of any deaths to be quickly determined. The protocol required in sub clause (ii) above shall also detail collection and autopsy of fauna. This shall include but not be limited to collection and recording procedures, autopsy procedures and laboratory tests;	Section 6.3	
(iv) provision of contingency measures for reducing cyanide levels in the tailings dams in the event it is established that fauna deaths are occurring from cyanide in tailings dam water;	Section 8	

Table 1 (Continued)
Development Consent Conditions Relevant to this FFMP

Development Consent Condition		Section
3.2	Flora and Fauna Management (Cont.)	
	(v) development of effective mechanisms to keep fauna and avifauna away from the tailings storages, which shall include, but not be limited to: <ul style="list-style-type: none"> - minimising the area of open water in the tailings dams; - fencing to prevent both medium and large fauna, terrestrial and amphibians, from entering the area. Mesh will have holes no greater than 5 cm in diameter; - making the area non conducive to the establishment of wildlife habitats, as far as possible; - use of netting where practical; and - use of current best practice methods for avifauna deterrence; 	Section 3
	(vi) development of plans for the rescue and rehabilitation of wildlife that may become bogged/sick/trapped in the tailings dams or elsewhere within the mining lease area;	Section 5
	(vii) methods to conserve and enhance wildlife values around Lake Cowal, within the mine lease area, including: protection and enhancement of existing retained habitats;	Section 9
	(viii) provision to continue fauna and flora, fish, and aquatic invertebrate monitoring of the Lake Cowal region as documented in the EIS including investigation of fauna deaths off site if requested by the Secretary where it is considered the deaths are attributable to activities on the site;	Sections 7 and 11
	(ix) details to relocate any threatened species and/or its habitat away from disturbed areas that are created by mine operations. This will include placement and maintenance of suitable types and numbers of artificial roosting boxes for bats such as the Greater Long-eared Bat and other animals (eg. birds/possums) in undisturbed areas of the mine site; and	Section 10
	(x) details of monitoring the mine's impacts particularly on birdlife in bird breeding areas identified by the Applicant in consultation with OEH, threatened fauna and flora, and fish and aquatic invertebrates around Lake Cowal, and outline contingency measures should impacts be identified as occurring.	Section 12
	(c) The Applicant shall implement a Threatened Species Management Protocol for the development to the satisfaction of the Secretary, which will include provisions for targeted searches prior to construction and proposed mitigation measures where threatened flora or fauna species are found.	Section 9.7
(d) The Applicant shall monitor the effectiveness of measures outlined in the Flora and Fauna Management Plan and Threatened Species Protocol to the satisfaction of the Secretary. A summary of these monitoring results shall be published annually on the Applicant's website for the development.	Section 12	

In addition to the above, the following Development Consent Conditions are also relevant to this FFMP:

- Development Consent Condition 2.3 provides:

The Applicant shall secure the mine site as described in the EIS. The fence for the mining lease boundary shall be designed to minimise the impact on water birds and aquatic species.

This condition is addressed in Section 9.6.2.

- Development Consent Condition 4.6 provides:

The Applicant shall as a landowner have on-going regard for the provisions of the latest versions of the Jemalong Land and Water Management Plan, Lake Cowal Land and Water Management Plan, Mid-Lachlan Regional Vegetation Management Plan, and any future catchment/land and water management plans that may become relevant to the area.

This condition is addressed in Sections 9.3 and 9.8.

- Development Consent Condition 5.3(c) provides:

In the event of wildlife deaths occurring due to cyanide, review of cyanide levels shall occur by the OEH and EPA in consultation with the Applicant and DRE. Any decision to require cyanide reduction shall include, but not be limited to, consideration of the number of fauna deaths, the species involved, antecedent condition of species, methods employed at the time to prevent use of tailings dams by fauna, and antecedent climatic and surface water conditions of the Lake and surrounding area. The Applicant shall notify the CEMCC of any reductions in cyanide levels as soon as practicable.

This condition is addressed in Section 8.

- Development Consent Condition 9.4(a)(v) which outlines the requirements for a complaints register and is reproduced in full and discussed in Section 14.
- Development Consent Condition 9.1(d) which establishes the requirements for a Community Environmental Monitoring and Consultative Committee (CEMCC) and is reproduced in full and discussed in Section 15.
- Development Consent Conditions 9.2(a) and 9.2(b) which establish the requirements for an Independent Environmental Audit and an Independent Monitoring Panel and is reproduced in full and discussed in Section 16.
- Development Consent Conditions 9.1(b) and 9.1(c) which establish the reporting and review requirements for this FFMP and are reproduced in full and discussed in Section 17.

2.2 CONDITIONS OF AUTHORITY ML 1535

The Conditions of Authority for ML 1535 regulated by the Division of Resources and Energy (DRE) within the NSW Department of Trade and Investment, Regional Infrastructure and Services includes requirements that relate to rehabilitation and vegetation clearance. The relevant Conditions of Authority include:

Rehabilitation

12. (a) *Land disturbed must be rehabilitated to a stable and permanent form suitable for a subsequent land use acceptable to the Director-General and in accordance with the Mining Operations Plan so that:*
 - *there is no adverse environmental effect outside the disturbed area and that the land is properly drained and protected from soil erosion.*
 - *the state of the land is compatible with the surrounding land and land use requirements.*
 - *the landforms, soils, hydrology and flora require no greater maintenance than that in the surrounding land.*
 - *in cases where revegetation is required and native vegetation has been removed or damaged, the original species must be re-established with close reference to the flora survey included in the Mining Operations Plan. If the original vegetation was not native, any re-established vegetation must be appropriate to the area and at an acceptable density.*
 - *the land does not pose a threat to public safety.*
- (b) *Any topsoil that is removed must be stored and maintained in a manner acceptable to the Director-General.*

13. *The lease holder must comply with any direction given by the Director-General regarding the stabilisation and revegetation of any mine residues, tailings or overburden dumps situated on the lease area.*

These conditions are addressed in Section 9.5.

Prevention of Soil Erosion and Pollution

14. *Operations must be carried out in a manner that does not cause or aggravate air pollution, water pollution (including sedimentation) or soil contamination or erosion, unless otherwise authorised by a relevant approval, and in accordance with an accepted Mining Operations Plan. For the purpose of this condition, water shall be taken to include any watercourse, waterbody or groundwaters. The lease holder must observe and perform any instructions given by the Director-General in this regard.*

This condition is addressed in Section 9.5.

Trees and Timber

19. (a) *The lease holder must not fell trees, strip bark or cut timber on the lease without the consent of the landholder who is entitled to the use of the timber, or if such a landholder refuses consent or attaches unreasonable conditions to the consent, without the approval of a warden.*
- (b) *The lease holder must not cut, destroy, ringbark or remove any timber or other vegetative cover on the lease area except such as directly obstructs or prevents the carrying on of operations. Any clearing not authorised under the Mining Act 1992 must comply with the provisions of the Native Vegetation Conservation Act 1997.*
- (c) *The lease holder must have any necessary licence from the Forestry Commission of New South Wales before using timber from any Crown land within the lease area.*

This condition is addressed in Section 9.8.

Mining Operations Plan (MOP)

25. (1) *Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The Plan together with environmental conditions of development consent and other approvals will form the basis for-*
- (a) *ongoing mining operations and environmental management; and*
- (b) *ongoing monitoring of the project.*
- (4) *The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:-*
- (e) *flora and fauna management plan for the mine;*
- (f) *progressive landscape and rehabilitation management plan including schedules;*
- (g) *areas of particular environmental, ecological, archaeological and cultural sensitivity and measures to protect these areas; and*
- (l) *environmental monitoring program listing the location of monitoring points, frequency of monitoring and parameters to be monitored.*

This condition is addressed in Section 9.5.

The Conditions of Authority for ML 1535 also include environmental performance reporting requirements associated with the Annual Environmental Management Report (AEMR). Contemporary reporting requirements for the Annual Review (formerly the AEMR) are described in Section 17.

2.3 REGULATORY CONSULTATION

As described in Section 1, the original FFMP was prepared in accordance with the requirements of the Development Consent in consultation with the NPWS, EPA and the former NSW Fisheries and approved by the former DIPNR in October 2003. Two Addenda to the FFMP (dated June 2008 and May 2010) were approved by the former DoP in November 2008 and May 2010.

This FFMP supersedes the former FFMP (including the June 2008 and May 2010 Addenda), and in accordance with the requirements of Development Consent Condition 3.2(b), has been prepared in consultation with the NSW Department of Primary Industries (DPI) (Fisheries) and the OEH.

2.4 POLICIES, PLANS AND STRATEGIES

A number of regional, state and commonwealth policies and plans have been considered throughout the implementation of the FFMP since approval in 2003. A summary of key contemporary policies, plans and strategies relevant to this FFMP is provided below. Where practicable and appropriate, the principles and objectives of these policies, plans and strategies have been considered in this FFMP. A description of other CGM environmental management plans, referred to in this FFMP, relevant to vegetation management and biodiversity management both within the ML area and on Barrick-owned lands surrounding the CGM is also included in this section.

Policies

Wetlands Policy of the Commonwealth Government of Australia

The Wetlands Policy of the Commonwealth Government of Australia (Environment Australia, 1997) recognises the special role of wetlands in the well-being of present and future generations of Australians. Section 9.2 of this FFMP summarises the initiatives of the Compensatory Wetland Management Plan (CWMP), which includes measures to conserve and enhance wildlife values within ML 1535 and around Lake Cowal.

NSW Wetlands Policy, 2010

The NSW Wetlands Policy aims to provide for the protection, ecologically sustainable use and management of NSW wetlands (former NSW Department of Environment, Climate Change and Water [DECCW], 2010). The policy provides a set of guiding principles that all government agencies will adopt, and all stakeholders can refer to when making decisions on wetland management and conservation.

The principles relevant to this FFMP include that degraded wetlands and their habitats should be rehabilitated and their ecological processes improved as far as is practicable; and the conservation and management of wetlands are most appropriately considered at the catchment scale.

Section 9.5.2 of this FFMP summarises the rehabilitation concepts for the New Lake Foreshore. In particular, the objectives of the rehabilitation programme (Section 9.5.1) include the expansion of habitat opportunities for wetland and terrestrial fauna species. This includes the design and implementation of rehabilitation works at the New Lake Foreshore in a manner generally consistent with the NSW Wetlands Policy.

Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013)

The DPI's (2013) *Policy and Guidelines for Fish Habitat Conservation Management* outlines the policies and guidelines aimed at maintaining and enhancing fish habitat for the benefit of native fish species, including threatened species, in marine, estuarine and freshwater environments. In relation to this FFMP, the policy outlines key concepts for habitat rehabilitation. As described above, Section 9.5.2 of this FFMP summarises the rehabilitation concepts for the New Lake Foreshore and Section 9.5.1 identifies that a key objective of the CGM rehabilitation programme is the expansion of habitat opportunities for wetland (and terrestrial) fauna species.

Plans

Mid Lachlan Regional Vegetation Management Plan and Strategy

The Mid Lachlan Regional Vegetation Management Plan and Strategy (MLRVMP) was developed “to promote the sustainable management of native vegetation in the Mid Lachlan Region in a manner which is balanced, achievable and supported by the Region’s local communities” (former NSW Department of Land and Water Conservation [DLWC], 2001). The MLRVMP provided a framework for the enhancement and re-establishment of native vegetation in the Mid Lachlan Region. Development Consent Conditions 3.2(a)(i) and 4.6 require that regard must be had to the latest version of the MLRVMP. The MLRVMP, referred to in Conditions 3.2(a)(i) and 4.6, was repealed with effect from 1 December 2005. Notwithstanding, the original FFMP (dated October 2003) was prepared with regard to the MLRVMP.

Jemalong Land and Water Management Plan

The Jemalong Land and Water Management Plan (JLWMP) (Glasson and Duff, 2001) aims to guide the development of the Jemalong Irrigation District so that land and water resources are used in a way which is profitable and improves and sustains the environment for current and future generations.

The JLWMP provides strategies for on-farm options (such as landforming, farm planning, recycling systems, high volume outlets, soil fertility testing and improving pastures), as well as regional options (such as vegetation, floodway levees and rain reject storages).

This FFMP, and in particular the CGM’s Land Management Plan, have been developed in consideration of land management goals of the JLWMP.

Land and Water Management Plan for Lake Cowal and Associated Wetlands

The Land and Water Management Plan for Lake Cowal and Associated Wetlands (LWMPLC) (Australian Water Technologies, 1999) is a component of the JLWMP. The objectives and actions outlined in the plan are consistent with the vision to manage the lake in a way that sustains and enhances the economic, social and ecological well being of the Lake Cowal area for future generations.

Lachlan Catchment Action Plan

The Lachlan Catchment Action Plan provides a framework for the investment in works, projects, planning and research that are considered necessary to achieve sustainable and productive landscapes in the catchment during 2006 to 2016 (Lachlan Catchment Management Authority, 2006). Consistent with the Natural Resources Commission standards, the Lachlan Catchment Action Plan provides specific catchment and management targets, which reflect broader state-based targets (Lachlan Catchment Management Authority, 2006).

The themes underpinning Lachlan Catchment Action Plan management targets relevant to the FFMP include biodiversity and native vegetation, water and aquatic ecosystems and land management. The methods to conserve and enhance wildlife values around Lake Cowal outlined in Section 9 of this FFMP (combined with other CGM environmental management plans [described in this section and throughout this FFMP]) are considered to address these themes.

An updated Lachlan Catchment Action Plan was submitted to the Minister for Primary Industries on 1 February 2013.

The Riverina Local Land Services (LLS) is now responsible for developing natural resource management strategies in the region. Until the Riverina Local Strategic Plan is developed, the existing Lachlan Catchment Action Plan will continue to be applied.

Strategies

Draft New South Wales Biodiversity Strategy

A draft NSW Biodiversity Strategy 2010-2015 has been prepared by the former DECCW and former NSW Department of Industry and Investment NSW (DII). The Strategy aims to provide a framework to coordinate and guide investment in biodiversity conservation in NSW.

The Strategy outlines priorities for management of freshwater wetlands in NSW (including the Lachlan River wetlands of which Lake Cowal is a part). The Strategy's key objectives for fresh water wetlands are to protect and restore aquatic ecosystems; and manage and control threats through cooperative partnerships with key stakeholders (including integrated pest and weed management strategies, and managing total grazing pressure on lake beds when they are dry).

In accordance with the approved rehabilitation strategy for the CGM, rehabilitated final landforms (including the Compensatory Wetland) will be fenced and excluded from grazing in the long-term (Section 9.5.1). Section 9.5.2 of the FFMP summarises the rehabilitation concepts for the New Lake Foreshore within ML 1535.

The OEH is currently developing the new NSW Biodiversity Strategy. Upon finalisation, the NSW Biodiversity Strategy will be considered in subsequent revisions of this FFMP.

Australia's Biodiversity Conservation Strategy

Australia's Biodiversity Conservation Strategy 2010-2030 identifies initiatives that will target investment in terrestrial, aquatic and marine programs to conserve long-term national biodiversity (Natural Resource Management Ministerial Council, 2010). The Strategy addresses existing and emerging threats to biodiversity such as habitat loss, invasive species and the unsustainable use and management of natural resources.

The objectives of this FFMP and the CGM rehabilitation programme (Section 9.5.1) include the expansion of habitat opportunities for wetland and terrestrial fauna species. Section 9.5.2 of this FFMP outlines the rehabilitation concepts for the New Lake Foreshore.

As means of minimising invasive species at the CGM (and other Barrick-owned land) where practicable, Section 9.9 outlines the CGM's weed control practices.

Relevant CGM Environmental Management Plans

Other CGM environmental management plans (required under the Development Consent) are relevant to vegetation management and biodiversity management both within the ML area and on Barrick-owned lands surrounding the CGM. These plans include the CGM's Rehabilitation Management Plan, Biodiversity Offset Management Plan, Land Management Plan and Compensatory Wetland Management Plan. A summary of the scope of these plans is provided below.

Rehabilitation Management Plan (RMP)

The CGM's RMP is relevant to rehabilitation of the CGM within ML 1535 and associated infrastructure including the Bland Creek Palaeochannel Borefield and Eastern Saline Borefield and the associated pipeline to the CGM. The RMP has been prepared in accordance with the requirements of Development Consent Condition 2.4(c) and to reflect the approved rehabilitation strategy described in the *Cowal Gold Mine Extension Modification Environmental Assessment* (Barrick, 2013). A summary of the key rehabilitation principles, objectives and concepts for the CGM final landforms is provided in Section 9.5.

The rehabilitation monitoring methodology described in detail in the RMP is also used to assess revegetation and/or natural regeneration performance within the CGM's biodiversity offset areas (refer Section 9.4) and the CGM's Remnant Vegetation Enhancement Programme areas (refer Section 9.3).

Biodiversity Offset Management Plan (BOMP)

The CGM's BOMP is relevant to the CGM's Northern and Southern Offset Areas (refer Section 9.4). The BOMP has been prepared in accordance with the requirements of Development Consent Condition 3.4(c) and to reflect the approved biodiversity offset strategy described in the *Cowal Gold Mine Extension Modification Environmental Assessment* (Barrick, 2013).

The offset areas will contribute to the conservation and enhancement of wildlife values around Lake Cowal by conserving regional biodiversity and enhancing habitats available to flora and fauna. The CGM's BOMP provides a detailed description of the offset areas and the implementation of the CGM's biodiversity offset strategy.

Land Management Plan (LMP)

The CGM's LMP is relevant to all Barrick-owned land. The LMP has been prepared in accordance with the requirements of Development Consent Condition 3.7. The LMP also includes the Long-term Land Use Strategy which has been developed in accordance with Development Consent Condition 3.8.

The LMP in particular describes the pasture management, remnant vegetation management and weed and pest management measures that will be implemented on Barrick-owned lands.

Compensatory Wetland Management Plan (CWMP)

The CWMP is relevant to the CGM's Compensatory Wetland and has been prepared in accordance with the requirements of Development Consent Condition 3.3. A description of the CWMP initiatives is provided in Section 9.2.

3 MECHANISMS TO KEEP FAUNA AND AVIFAUNA AWAY FROM THE TAILINGS STORAGEES

In accordance with Development Consent Condition 3.2(b)(v) effective mechanisms have been developed to keep fauna and avifauna away from the tailings storages. The mechanisms have been developed in consultation with NPWS (NPWS, pers. comm., 21 May 2003) and include:

- minimising the area of open water in the tailings dams;
- fencing to prevent both medium and large fauna, terrestrial and amphibians, from entering the area;
- making the area non-conducive to the establishment of wildlife habitats, as far as possible;
- use of netting, where practicable; and
- use of current best practice methods for avifauna deterrence.

3.1 MINIMISING THE AREA OF OPEN WATER IN THE TAILINGS DAMS

The area of open water in the tailings dams will be minimised by maximising the dry density of tailings¹ (Section 3.1.1) and the re-use of water from the tailings dams (Section 3.1.2) (North Limited, 1998a).

3.1.1 Maximising Dry Densities

Tailings will be deposited peripherally via a spigotted ring main, allowing for the controlled development or “build-up” at any point around the surface of the tailings dams. The subaerial tailings depositional technique will promote the segregation of the coarse fraction on the perimeter and finer fraction towards the centre of the dam. The different particle settling rates will result in a tailings beach with maximum slopes toward the centre. As a result, water contained within the tailings will drain towards a pond area and decant towers located in the centre of the storage, thus maximising exposure of the tailings surface to air-drying and increasing in-storage tailings dry densities (North Limited, 1998a).

3.1.2 Maximising the Re-use of Water

Water re-use will be maximised using an under-drainage pipe network, decant towers, reclaim water dam and water return pipeline to the process water supply storage ponds. The tailings ponds will be maintained as small as possible through continual recycling of water through the processing plant (North Limited, 1998a).

3.2 FENCING TO PREVENT FAUNA FROM ENTERING THE TAILINGS STORAGE AREA

The perimeter of the tailings storages has been fenced to prevent medium to large terrestrial fauna (such as Echidnas, Emus and Kangaroos), as well as amphibians from entering the area (North Limited, 1998a, 1998b). Gates (of similar design) have been constructed within the fence to provide mine personnel access to the tailings storage area.

The fence is approximately 2 metre (m) high with holes no greater than 5 centimetres (cm) in diameter in accordance with Development Consent Condition 3.2(b)(v). The bottom metre of the fence includes mesh with holes of 2 cm in diameter.

¹ Dry density describes the relationship between the dry tailings mass and the total volume of tailings material.

The fence mesh has been skirted away from the tailings storage area to prevent fauna from burrowing under the fence (NPWS, pers. comm., 21 May 2003; North Limited, 1998b). The fence contains a half hat design which curves away from the tailings storage area.

The half hat design has been successful in excluding medium and large animals (Karori Wildlife Sanctuary, 2003), as well as amphibians (ACO Technologies, 1995), from entering fenced areas.

As recommended by the *Best Practise Guidelines for Reducing Impacts of Tailings Storage Facilities on Avian Wildlife in the Northern Territory of Australia* (Northern Territory Department of Mines and Energy, 1998), the area immediately adjacent to the fence will be kept clear of tall vegetation so that fauna cannot use it to gain access to the tailings storage area.

3.3 MAKING THE AREA NON-CONDUCTIVE TO THE ESTABLISHMENT OF WILDLIFE HABITATS

Rehabilitation of the tailings storage area during operations will be such that the tailings storage facility batters are stabilised whilst providing minimal habitat value for bird life (i.e. revegetated with pasture cover only) (Barrick, 2013). The batters will be maintained so that other vegetation (such as trees and shrubs) does not become established in the vicinity of the tailings storages until the facility has been de-commissioned and capped.

3.4 USE OF NETTING

Netting of tailings storages is a proven control measure on small areas, however over large expanses such as the storage areas at the CGM, inherent factors such as difficulty of structural maintenance and impediment to bird retrieval preclude the use of netting (North Limited, 1998a). Donato (1997) found that the netting of tailings storages was difficult to construct as well as maintain.

Exclusion nets are limited in the area which they can cover (Meredith, pers. comm., 1998 in North Limited, 1998b) and large tailings storage facilities, such as those at the CGM, have as far as can be ascertained, never been netted (North Limited, 1998b). In addition, problems can arise from the entanglement of birds seeking entry to the tailings storages (*ibid.*).

Notwithstanding, netting has been used to cover the leach thickener tanks in the CGM process plant area to restrict avifauna access.

3.5 CURRENT BEST PRACTICE METHODS FOR AVIFAUNA DETERRENCE

A number of mechanisms to deter birds from tailings storages have been employed at mining operations throughout the world (North Limited, 1998a). A review of relevant literature (e.g. Transport Canada, 2002; Baxter, 2000; Northern Territory Bird Usage of Tailings Storage Facilities Coordinating Group, 1999; Normandy Mining Limited, 1999; Northern Territory Department of Mines and Energy, 1998; Donato, 1997; Hagelstein, 1997 in Donato, 1997; Dodds-Smith and Filas, 1996; Wildlife Control Technology Inc., 1996; Nevada Mining Association *et al.*, 1990; Bomford and O'Brien, 1990) suggests that the use of physical deterrents alone as a control measure has limited long term value. Measures such as broadcast of audio and visual stimuli to scare/repel birds are widely accepted as having limited success in the short term and minimal success in the longer term. The literature recommends hazing techniques² be used in combination with other management mechanisms (such as minimising potential habitat opportunities for fauna, as discussed in Section 3.3).

² Hazing involves the use of frightening techniques to deter birds from landing or utilising an area or resource.

Hazing techniques employed at the CGM to deter different bird species may include:

- radar lobe systems that detect avifauna presence at the tailings facilities;
- bird deterrent stations, activated remotely by either the radar or timer mode which broadcast bird distress calls, barking dogs, gun shots etc;
- gas cannons linked to the radar or timer-mode control station/s;
- car horns;
- solar powered scattered laser light tripod station (held in safe storage to be used if required);
- bird scaring kite; and
- human presence.

Additional methods of avifauna deterrence will be considered as new technologies are developed.

4 METHODS FOR MONITORING THE DAILY AND SEASONAL FAUNA USAGE OF THE TAILINGS DAMS

In accordance with Development Consent Condition 3.2(b)(i), the tailings dams (also referred to in this FFMP as tailings storages) will be monitored for daily and seasonal fauna usage, and to determine whether deaths or other effects or incidents are occurring. For the purpose of this FFMP, 'Effects' and 'Incidents' are defined as follows:

- '*Effects*': where the observed occurrence or behaviour of fauna in the area of the tailings dams is considered to be due to the presence or operation of the facility. For example, an observed response by avifauna to the deterrence measures employed at the tailings dam may be considered to be an 'effect'.
- '*Incidents*': where the observed behaviour of fauna indicates that a negative impact on individual(s) is occurring as a result of the presence or operation of the facility. For example, a waterbird observed bogged in freshly deposited tailings would be considered to be an 'incident'.

Section 4.1 outlines the monitoring of daily and seasonal fauna usage of the tailings dams, while Section 4.2 describes the reporting of fauna usage. The monitoring methods described in Section 4.1 have been developed in consultation with NPWS (NPWS, pers. comm., 21 May 2003). The monitoring results will be used to determine the effectiveness of the mechanisms employed to keep fauna and avifauna away from the tailings storages (Section 3).

4.1 FAUNA USAGE MONITORING METHOD

The perimeter of the tailings dams will be patrolled twice a day to observe and record fauna usage of the tailings dams and whether deaths or other effects or incidents are occurring (North Limited, 1998a). One patrol will be conducted after dawn and the other in the late afternoon. A monthly patrol will be undertaken to inspect the tailings dam fence for evidence of fauna usage (e.g. tracks or breaks in the fence) and to determine the need for any maintenance measures (e.g. fence repair). Any maintenance measures will be undertaken, as soon as practicable. The monitoring results will be utilised to determine the requirement for modifications to the mechanisms being utilised to keep fauna and avifauna away from the tailings dams.

The following details and observations will be recorded:

- observer details (i.e. name and position);
- date and time of inspection;
- type of species;
- number of individuals of each species;
- location within the tailings dam (e.g. on tailings dam, beach or embankment, etc);
- behaviour and habits of individuals (e.g. flying over tailings dam, wading in the tailings dam, etc);
- fauna effects (as defined in Section 4 above);
- fauna incidents (as defined in Section 4 above); and
- fauna deaths.

In the event that fauna incidents or deaths are recorded, the Protocol for reporting any deaths or other incidents within ML 1535 will be initiated (refer Section 6). Further, in the event that any wildlife are found bogged, sick, and/or trapped in the tailings dams, wildlife rescue and rehabilitation procedures will also be initiated (refer Section 5).

In addition, opportunistic observations of fauna utilising the tailings dams will also be recorded. The register of records will be held by the Environmental Manager.

Usage of the tailings dams by bat fauna will also be monitored using an Anabat™ CF Zcain³ echolocation call detector system, controlled by a call-activated switching device. The Anabat detectors record from sunset to sunrise every night at the active tailings storage facility and at a control monitoring site (i.e. the farm homestead stock dam at the 'Hillgrove' [Barrick-owned] residence).

Data collected from the monitoring is stored in a database and used to assess the seasonal usage of the tailings storage facilities, the effectiveness of hazing/deterrent techniques and to record any effects that the tailings storage facilities may be having on native fauna. Analysis of echolocation call data will include assessment of the type of species and the number of calls of each species recorded.

Seasonal fauna usage of the tailings dams will be assessed by examining the fauna usage records for each season.

4.2 REPORTING OF FAUNA USAGE

Usage of the tailings dams by fauna will be reported to the OEH on a six monthly basis, unless otherwise directed by the Secretary, in accordance with Development Consent Condition 3.2(b)(i). The monitoring results will also be reported in the Annual Review (Section 17).

³ Anabat™ CF Storage Zero Crossing Analysis Interface Module.

5 PLANS FOR THE RESCUE AND REHABILITATION OF WILDLIFE

In accordance with Development Consent Condition 3.2(b)(vi), Sections 5.1 and 5.2 include plans for the rescue and rehabilitation of wildlife that may become bogged/sick/trapped in the tailings dams or elsewhere within ML 1535. The wildlife rescue and rehabilitation plans have been prepared in consultation with the NSW Wildlife Information, Rescue and Education Service Inc. (WIRES) (pers. comm., 6 March 2003) and NPWS (NPWS, pers. comm., 21 May 2003). CGM Environmental Department staff are trained WIRES volunteers.

5.1 WILDLIFE RESCUE

The following rescue procedures will be utilised in the event that any wildlife are found bogged, sick, and/or trapped in the tailings dams or elsewhere on the ML:

- Step 1: Where possible the animal will be moved away from danger. Table 2 presents potential rescue procedures which may be utilised for various fauna types (White, 1998). In the case of snakes no attempt will be made to handle them and due caution will be exercised.
- Step 2: The WIRES rescue unit located in Wagga Wagga will be contacted (phone 0407 600 755) and arrangements made for the animal to be collected. The WIRES rescue unit may provide advice on the temporary care of the animal until a trained WIRES rescuer arrives. The WIRES representative will be accompanied by mine site personnel at all times whilst on site.
- Step 3: While waiting for the WIRES representative to arrive, the following measures will be taken, where practicable:
 - stress to the rescued animal will be minimised by covering it with a towel or similar item;
 - the animal will be placed in a warm, dark and quiet place and only handled when necessary. While water may be offered, no attempt will be made to feed the sick or injured animal; and
 - advice provided by the WIRES rescue unit in relation to the temporary care of the animal will be implemented.

**Table 2
Potential Rescue Techniques for Differing Fauna Types¹**

Type of Fauna	Capture	Handling	Transport
Birds			
Small Birds	Throw net over bird or pick up with bare hands.	Hold gently in palm of hand with head and legs protruding.	Cardboard box.
Medium Birds	Throw towel over bird and wrap up.	Hold with both hands, encompassing the bird's body.	Cardboard box.
Large Birds	Best left to experts.	Best left to experts.	Best left to experts.
Waterbirds	Throw towel over bird and wrap up.	Hold head and body firmly. Large species may need beak secured, but do not cover nostrils.	Large cardboard box.
Mammals			
Possums and Gliders	Use pillowcase or similar as a glove and scoop inside.	Hold back of head and base of tail firmly.	Place pillowcase containing animal inside a box.
Kangaroos and Wallabies	Throw blanket over animal and wrap up.	Hold base of tail and support chest, lift and place headfirst inside bag.	Pillowcase for orphans, large hessian sack for adults.
Small Marsupials and Rodents	Use pillowcase or similar as a glove and scoop inside.	Hold back of head and support body.	Place pillowcase containing animal inside a box.
Insectivorous Bats	Throw net over bat or pick up with gloved hands.	Hold gently in palm of hand, head protruding.	Pillowcase or similar, tied securely.

Table 2 (Continued)
Potential Rescue Techniques for Differing Fauna Types¹

Type of Fauna	Capture	Handling	Transport
Reptiles			
Snakes	Best left to experts.	Best left to experts.	Best left to experts.
Lizards	Throw towel over lizard or coerce into box.	Hold back of head and support body. Large species need tail and legs secured.	Place pillowcase containing animal inside a box.
Freshwater Turtles	Throw towel over turtle or pick up with bare hands.	Hold edge of shell with both gloved hands.	Cardboard box.
Amphibians			
Frogs	Throw net over frog or pick up with wet hands.	Hold with wet hands cupped around frog. Beware of toxic skin secretions.	Wet pillowcase.

Source: After White (1998)

¹ Native wildlife will be approached and handled with caution and in consideration of safety hazards.

5.2 WILDLIFE REHABILITATION

On arrival, the WIRES rescuer will evaluate the situation and decide whether to (WIRES pers. comm., 2003):

- release the animal into a suitable environment;
- apply first aid and temporary care;
- transport the animal to a foster-carer for long-term rehabilitation; and/or
- transport the animal to a vet.

Once the animal has been rehabilitated it will be released back into suitable habitat outside of the ML area.

6 PROTOCOL FOR DEATHS OR OTHER INCIDENTS INVOLVING FAUNA RECORDED ON THE MINING LEASE

Sections 6.1 to 6.3 outline the Protocol for identifying and responding to any deaths or other incidents involving fauna on the ML. Section 6.1 describes the monitoring of deaths or other incidents involving fauna, Section 6.2 outlines the reporting of fauna deaths or other incidents and Section 6.3 provides an overview of the fauna autopsy facilities.

6.1 MONITORING OF DEATHS OR OTHER INCIDENTS INVOLVING FAUNA

In addition to the perimeter of the tailings dams being patrolled twice a day, a weekly inspection will be conducted of ML 1535 by Environmental personnel to identify any fauna incidents and/or deaths.

As described in Section 4, fauna 'Incidents' are considered to occur where the observed behaviour of fauna indicates that a negative impact on individual(s) is occurring as a result of the presence or operation of the mine (e.g. fauna is observed trapped within the ML fence). In the event that fauna incidents are observed, the following details and observations will be recorded:

- observer details (i.e. name and position);
- date and time of inspection;
- type of species;
- number of individuals of each species;
- location; and
- any other details of the fauna incident.

If the fauna incident involves native fauna, the reporting protocol outlined in Section 6.2 will be initiated, if necessary under the requirements of Development Consent Condition 3.2(b)(ii).

Any fauna found dead in the ML area will be reported to Environmental personnel who will arrange for collection. Dead fauna (except deaths attributable to physical trauma such as vehicle strike, and fence deaths) will be collected for autopsy to enable the cause of death to be quickly determined. The dead fauna to be autopsied will be handled by trained personnel as if they were harbouring potentially dangerous diseases and precautions for personal safety will be exercised. Protective clothing will be worn during collection and appropriate collection containers will be used. On collection, the details and observations listed above will be recorded, as well as the antecedent condition of the species and surface water conditions of the Lake and surrounding area.

Where practicable, photographs or video footage will be taken (e.g. of landscape, stance of clinically affected animal, place of death) to provide additional information for the investigation.

Following the collection of dead fauna, the reporting protocol outlined in Section 6.2 will be initiated if the incident relates to dead native fauna and the autopsy procedure undertaken as described in Section 6.3.1.

6.2 REPORTING OF DEATHS OR OTHER INCIDENTS INVOLVING NATIVE FAUNA

In accordance with Development Consent Condition 3.2(b)(ii), any native fauna deaths (except those attributable to physical trauma such as vehicle strike) will be reported to the OEH, DRE and CEMCC (Section 15) and, in the case of fish, DPI (Fisheries) within 24 hours (or the next working day).

Monitoring data obtained from procedures in Section 6.1 of wildlife deaths or other incidents will be recorded on a database. A record will be maintained of any wildlife deaths or other incidents and this record will be provided in the Annual Review (Section 17) in accordance with Development Consent Condition 3.2(b)(ii).

6.3 PROVISION OF FAUNA AUTOPSY FACILITIES

In accordance with Development Consent Condition 3.2(b)(iii), fauna autopsy facilities will be provided to enable the cause of any fauna death(s) to be quickly determined. Section 6.1 details the collection and recording procedures for any fauna found dead in the ML area, while Section 6.2 outlines the reporting of native fauna deaths. Sections 6.3.1 to 6.3.2 provide an overview of the procedures and laboratory tests to be conducted on dead fauna recorded in the ML area and the reporting of autopsy results.

6.3.1 Autopsy Procedures and Laboratory Tests

Where fauna is found dead and the cause of death (e.g. vehicle strike) cannot be determined by the Environmental Manager without dissection, the whole dead fauna or whole of the remaining body parts will be collected for autopsy. Where a number of dead fauna are found at the one time, a representative sample will be collected for autopsy.

A number of mine site personnel will be trained by a veterinarian in various collection and storage procedures. Dead fauna will be stored in a dedicated freezer, prior to transportation to a veterinarian laboratory.

The dead fauna will be transported to a veterinarian laboratory as soon as practicable. A gross autopsy⁴ will be conducted by a veterinarian to determine the cause of death.

Where the cause of death is determined without dissection by the Environmental Manager or by a gross autopsy, the results will be reported to the relevant regulatory authorities, as outlined in Section 6.3.2.

Where the cause of death cannot be determined by the gross autopsy, the tissue and whole blood samples collected will be transported to an appropriate laboratory. Thereafter, samples will be promptly processed for quantitative analyses (including cytochrome oxidase activity and cyanide bio-assays) and qualitative examinations (including bacteriology, gross pathology and histopathology). Reporting of the gross autopsy and laboratory results is outlined in Section 6.3.2.

6.3.2 Autopsy Results

The fauna autopsy results including gross autopsy and, where relevant, laboratory test results will be provided to the OEH, DRE and CEMCC and, in the case of fish, DPI (Fisheries) when they become available. All autopsy results will be held by the Environmental Manager and reported in the Annual Review (Section 17).

⁴ Autopsy is an examination of the dead fauna to determine the cause of death.

7 INVESTIGATION OF FAUNA DEATHS RECORDED OFF SITE

In accordance with Development Consent Condition 3.2(b)(viii), the Secretary may request fauna deaths recorded off site be investigated in the event it is considered that the deaths are attributable to activities on the site. The following procedure will be followed in this event:

- Step 1** – The following information will be obtained, where practicable, from the person(s) reporting the fauna death:
- name and contact details;
 - date of identification;
 - location where specimen(s) was found;
 - species and number of individuals; and
 - suspected cause of death.
- Step 2** – Barrick will submit a preliminary report to the Secretary with information relevant to the suspected cause of death.
- Step 3** – The Secretary will review the preliminary report and assess whether the fauna death can be attributed to activities on the site. If the Secretary considers that the death is unlikely to be attributable to activities on the site, no further action will be taken. If the Secretary considers that the fauna death may be attributable to activities on the site, the Secretary will provide instructions regarding further investigations required by Barrick.
- Step 4** – Barrick to provide the Secretary with results of the investigations.

8 CONTINGENCY MEASURES FOR REDUCING CYANIDE LEVELS IN THE TAILINGS DAMS

Development Consent Condition 3.2(b)(iv) requires the FFMP to provide contingency measures for reducing cyanide levels in the tailings dams in the event it is established that fauna deaths are occurring from cyanide in tailings dam water. The procedure outlined in Section 8.1 will be utilised to investigate any fauna deaths recorded from the tailings dam area or elsewhere on ML 1535.

8.1 PROCEDURE

The following procedure will be implemented to investigate whether the recorded fauna death(s) occurred as a result of cyanide in the tailings dams:

- Step 1** Report native fauna death(s) (except those attributable to physical trauma such as vehicle strike) to the OEH, DRE and CEMCC and, in the case of fish, DPI (Fisheries) within 24 hours (or the next working day) (in accordance with Development Consent Condition 3.2(b)(ii)).
- Step 2** Conduct autopsy of dead fauna (refer Section 6.3) and report findings to the OEH, DRE and CEMCC and, in the case of fish, DPI (Fisheries) when they become available.
- Step 3** In the event the autopsy concludes the fauna death(s) occurred as a result of cyanide in the tailings dam water, the OEH and EPA will review the cyanide levels in accordance with Development Consent Condition 5.3(c). The review will be conducted in consultation with Barrick and the DRE and will include consideration of the number of fauna deaths, the species involved, antecedent conditions of the species, methods employed at the time to prevent use of tailings dams by fauna, and antecedent climatic and surface water conditions of the Lake and surrounding area.
- Step 4** The OEH and EPA will make a decision as to whether cyanide levels are required to be reduced.
- Step 5** In the event the OEH and EPA determines cyanide levels are required to be reduced, contingency measures will be implemented (as described in Section 8.2).
- Step 6** Notify the CEMCC of any reductions in cyanide levels, as soon as practicable in accordance with Development Consent Condition 5.3(c).

8.2 CONTINGENCY MEASURES

In the event the OEH and EPA determines the cyanide levels within the tailings dams are required to be reduced (Step 4 above), one or more of the following contingency measures will be implemented:

- add cyanide destruction chemical(s) to tailings dam waters to reduce existing cyanide levels; or
- increase the dosage rate of cyanide destruction chemical(s) in the cyanide destruction circuit to achieve new cyanide level in tailings discharge to the dam.

The above contingency measures will continue to be implemented until the cyanide levels of the tailings dams have reached the reduced levels mandated by the Development Consent and in the CGM's Environment Protection Licence (EPL).

Monitoring of the effectiveness of the contingency measures will be undertaken. In the event cyanide levels in the tailings dam waters are found to exceed the maximum criterion specified in Development Consent Condition 5.3(a) (i.e. 30 milligrams [mg] weak acid dissociable cyanide per litre [CN_{WAD}/L]), hazing techniques will be utilised to scare birds away from the tailings storages (Section 3.5).

9 METHODS TO CONSERVE AND ENHANCE WILDLIFE VALUES AROUND LAKE COWAL AND WITHIN ML 1535

9.1 LAND USE/VEGETATION OVERVIEW

Since European settlement, the extent, structure and management of native vegetation in the region has undergone extensive modification (North Limited, 1998a). Clearing is the most noticeable of these changes, however several other processes have changed the original characteristics of the CGM area including grazing of native vegetation and pastures, weed/pest incursion, possible alterations to fire regimes, modifications to waterways, and isolation of remnant vegetation (*ibid.*).

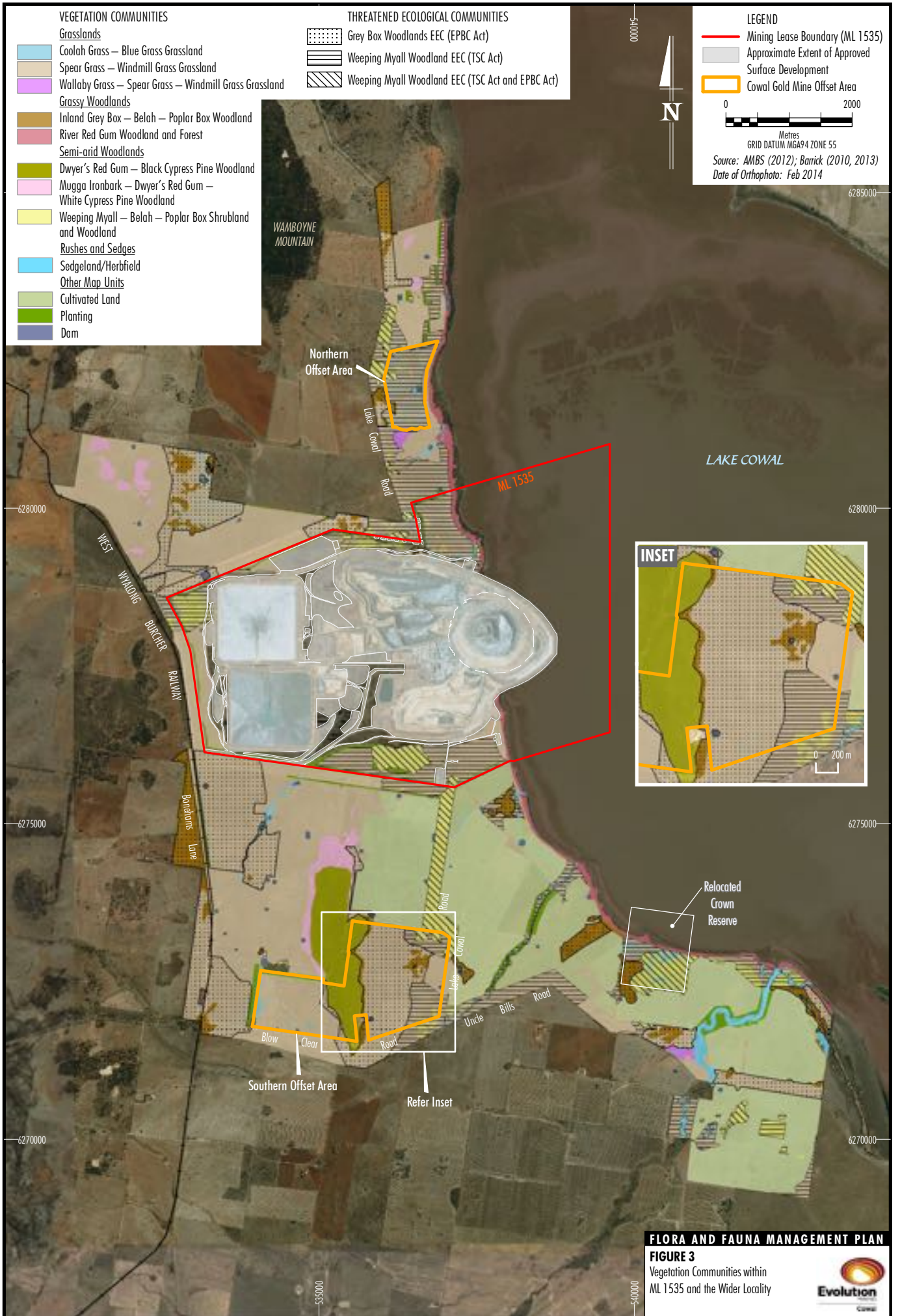
As a consequence, the vast majority of Barrick-owned lands comprise cleared, grazing and cropping lands, which are currently leased to local landholders engaged in primary production. Notwithstanding, patches of remnant vegetation occur on Barrick-owned lands and provide wildlife (to varying degrees) with opportunities for foraging, breeding, nesting, predator avoidance and movement between areas thus promoting genetic diversity and facilitating dispersal/migration.

Vegetation communities within ML 1535 and on Barrick-owned lands in the wider locality have been surveyed and mapped by Australian Museum Business Services (AMBS) (2012) and are shown on Figure 3. Vegetation communities that have been identified on Barrick-owned land include (Figure 3):

- Weeping Myall – Belah – Poplar Box Shrubland and Woodland;
- Spear Grass – Windmill Grass Grassland and Low Open Grassy Woodland;
- Inland Grey Box – Belah – Poplar Box Woodland;
- Mugga Ironbark – Dwyer’s Red Gum – White Cypress Pine Woodland;
- Wallaby Grass – Spear Grass – Windmill Grass Grassland;
- Coolah Grass – Blue Grass Grassland;
- Sedgeland/Herbfield;
- River Red Gum Woodland and Forest;
- Dwyer’s Red Gum – Black Cypress Pine –Woodland;
- Cropping; and
- Plantings.

The following threatened ecological communities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NSW *Threatened Species Conservation Act 1995* (TSC Act) have been recorded in areas on Barrick-owned land (Figure 3):

- *Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions endangered ecological community* (Weeping Myall Woodland EEC) listed under the NSW *Threatened Species Conservation Act, 1995* (TSC Act);
- *Weeping Myall Woodland EEC* listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act); and
- *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia* (Grey Box Woodlands EEC) listed under the EPBC Act.



The current extent of these vegetation communities on Barrick-owned land is shown on Figure 3. Historical land use practices have included grazing (and/or cropping in some areas such as the lake bed) of all of these vegetation communities.

In accordance with Development Consent Condition 3.2(b)(vii) a number of methods will be utilised to protect, conserve and enhance wildlife values within ML 1535 and around Lake Cowal, namely:

- Compensatory Wetland Management Plan initiatives (Section 9.2);
- Remnant Vegetation Enhancement Programme areas (Section 9.3);
- the CGM offset areas (Section 9.4);
- rehabilitation of ML 1535 disturbance areas (Section 9.5);
- CGM design (Section 9.6);
- Threatened Species Management Protocol (Section 9.7);
- Vegetation Clearance Protocol (Section 9.8);
- weed control (Section 9.9);
- pest control (Section 9.10); and
- other management measures (Section 9.11).

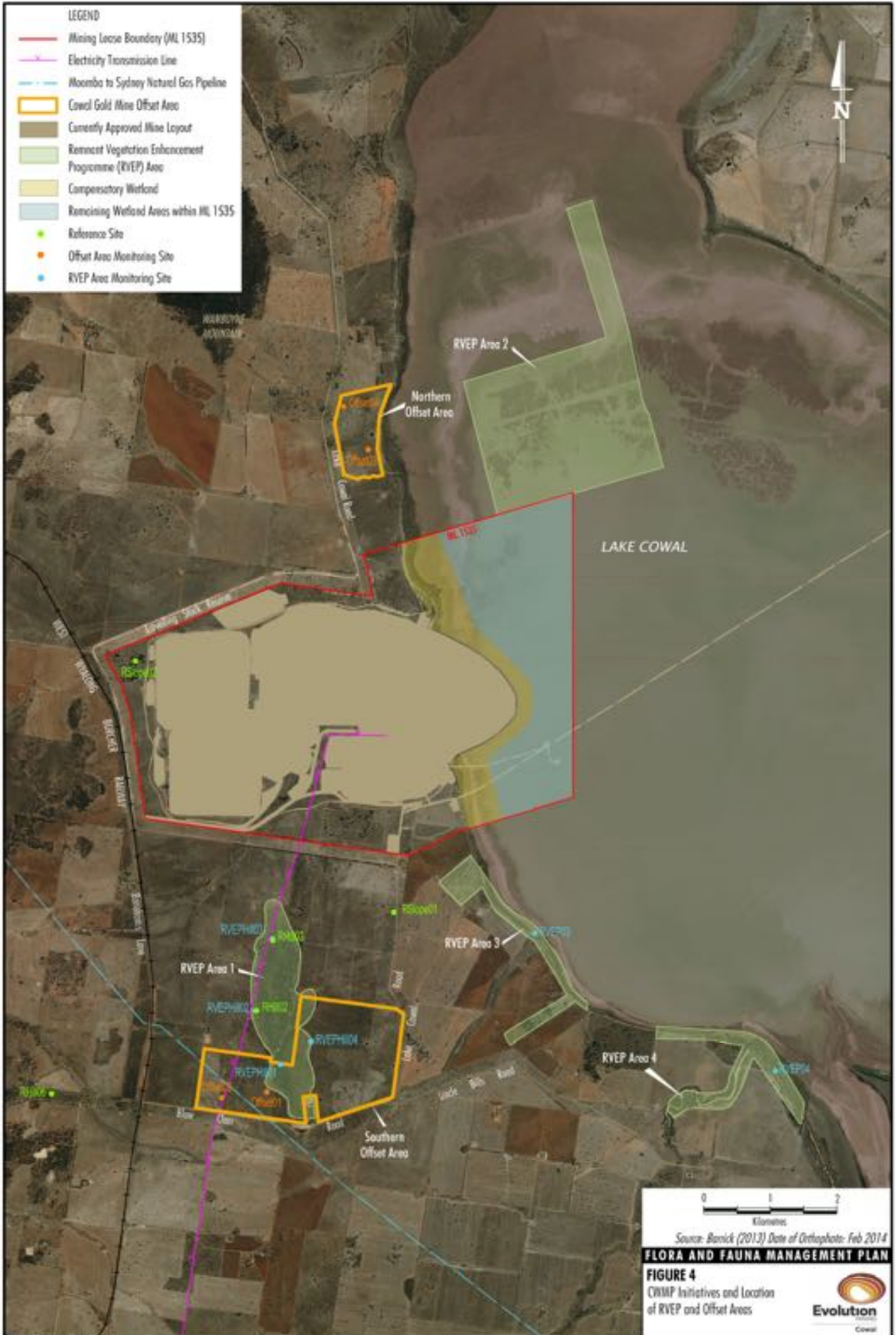
These methods are described in Sections 9.2 to 9.11 below.

9.2 COMPENSATORY WETLAND MANAGEMENT PLAN INITIATIVES

The CWMP prepared for the CGM includes measures to conserve and enhance wildlife values within ML 1535 and around Lake Cowal. These measures include the New Lake Foreshore, Compensatory Wetland, and enhancement of the remaining areas of wetland within ML 1535 (Figure 4). The Compensatory Wetland and remaining areas of wetland within ML 1535 include the conservation and enhancement of existing habitats and are discussed below. Rehabilitation of the New Lake Foreshore is discussed in Section 9.5.2. The CWMP measures will contribute to the conservation and enhancement of wildlife values within ML 1535 by improving existing wildlife habitats and rehabilitating disturbed habitats.

The Compensatory Wetland covers an area of approximately 140 hectares (ha) of existing wetland within ML 1535, including the fringing River Red Gum vegetation community (Figure 4). The remaining areas of wetland within ML 1535 (excluding the New Lake Foreshore) comprise approximately 620 ha of wetland (Figure 4). A number of management measures will be implemented within the Compensatory Wetland and remaining areas of wetland within ML 1535 including:

- preventing livestock from entering the enhancement areas to encourage the natural regeneration of native plants;
- measures to minimise the spread of weeds and competition with native flora;
- measures to minimise the occurrence of feral pests;
- provision of structural habitat for aquatic fauna in the Compensatory Wetland; and
- limiting vehicular access.



The planting of native wetland species may also be conducted to facilitate the regeneration of native vegetation. Further discussion of these management measures is provided in the CWMP.

Section 6.4 of the CWMP describes how the management measures outlined above are expected to improve habitats for wildlife, and thereby conserve and enhance wildlife values within ML 1535 and around Lake Cowal.

Monitoring will be conducted to assess the effectiveness of the CWMP management measures in improving habitats for wildlife as described in Sections 11.1.6, 11.2.2 and 11.3.1.

9.3 REMNANT VEGETATION ENHANCEMENT PROGRAMME

The Remnant Vegetation Enhancement Programme (RVEP) developed for the CGM includes management measures to conserve and enhance wildlife values around Lake Cowal, consistent with the requirements of Development Consent Condition 3.2(b)(vii). The RVEP will contribute to the conservation and enhancement of wildlife values around Lake Cowal by conserving regional biodiversity and enhancing habitats available to flora and fauna. During CGM operations, areas of remnant vegetation and areas of Lake Cowal wetland located within Barrick-owned land will be managed to maintain and enhance their inherent conservation values. Areas of remnant vegetation to be enhanced include Lignum/bird breeding areas in the north of Lake Cowal (RVEP Area 2), fringing River Red Gum (RVEP Areas 3 and 4), and a large area of remnant woodland located to the south of ML 1535 (RVEP Area 1) (Figure 4). RVEP Areas 1 to 4 were established in 2006. The RVEP is consistent with the LWMPLC, MLRVMP and JLWMP to conserve and enhance remnant vegetation (and as a result wildlife values) in the region.

It is anticipated that the RVEP will:

- improve the quality of habitat available to flora and fauna;
- expand the extent of remnant vegetation;
- increase the diversity and/or abundance of native flora and fauna within the enhancement areas; and
- significantly contribute to the conservation of regional biodiversity.

The management measures to be implemented within the enhancement areas are described in Section 9.3.1. Monitoring will be conducted to assess the effectiveness of the RVEP management measures as described in Section 9.3.2. Further detail regarding the RVEP is provided in the CGM LMP.

In addition to the RVEP areas, two offset areas located north and south of the CGM (Figure 4) have been established and conserved to offset the impacts associated with development of the CGM.

The offset areas supplement the remnant vegetation areas conserved under the RVEP. A detailed description of the offset areas and management of the offset areas is provided in the CGM's BOMP.

9.3.1 Management Measures

The management measures to be implemented within the enhancement areas are described below.

Stock Access Management and Natural Regeneration of Native Plants

The areas selected for enhancement at Lake Cowal have historically been cropped and/or grazed. Livestock can have direct and in-direct impacts on remnant vegetation and wetlands. The concept of preventing livestock from entering areas of remnant vegetation to encourage natural regeneration is a widely accepted practice and, in accordance with Development Consent Condition 4.6, is recommended by the LWMPLC, MLRVMP, JLWMP and the NSW Wetlands Policy. De-stocking or reducing stock access to remnant vegetation is also encouraged by the NPWS (NPWS, pers. comm., 21 May 2003).

In order to encourage the natural regeneration of native plant species, livestock will be controlled in the enhancement areas through fencing control and management, as outlined in the LMP.

Revegetation

It is anticipated that preventing livestock from entering the enhancement areas will naturally increase flora species diversity and abundance. Notwithstanding, selective planting of native vegetation may be conducted in the enhancement areas to increase the quantity of remnant vegetation and to link areas of existing remnant vegetation, where practicable. Livestock will be prevented from entering any portions of the enhancement areas which have been revegetated with native plant species. Native species that are potentially suitable for revegetation in the enhancement areas are provided in Table 3.

The location in which particular species will be planted will be determined in consideration of the existing occurrence of each vegetation community, as well as slope, elevation and soil. Native vegetation will be established in these areas through planting and/or direct seeding. Revegetation activities will be implemented by a suitably qualified person(s) and co-ordinated by the Environmental Manager.

Table 3
Potential Revegetation Species for Enhancement Areas

Scientific Name	Common Name	Scientific Name	Common Name
<i>Eucalyptus populnea</i> ssp. <i>bimbil</i>	Bimble Box	<i>Rumex brownii</i>	Slender Dock
<i>Eucalyptus microcarpa</i>	Grey Box	<i>Rumex tenax</i>	Shiny Dock
<i>Eucalyptus melliodora</i>	Yellow Box	<i>Chloris truncata</i>	Windmill Grass
<i>Eucalyptus sideroxylon</i>	Mugga Ironbark	<i>Bothriochloa macra</i>	Redleg Grass
<i>Eucalyptus camaldulensis</i>	River Red Gum	<i>Danthonia</i> sp.	Wallaby Grasses
<i>Casuarina cristata</i>	Belah	<i>Enteropogon acicularis</i>	Curly Windmill Grass
<i>Callitris endlicheri</i>	Black Cypress Pine	<i>Eragrostis parviflora</i>	Weeping Lovegrass
<i>Callitris glaucophylla</i>	White Cypress Pine	<i>Austrostipa scabra</i>	Speargrass
<i>Acacia pendula</i>	Myall	<i>Austrostipa densifolia</i>	Foxtail Speargrass
<i>Acacia doratoxylon</i>	Lancewood	<i>Sida intricata</i>	-
<i>Acacia stenophylla</i>	River Cooba	<i>Marsilea drummondii</i>	Common Nardoo
<i>Alectryon oleifolius</i>	Rosewood	<i>Eragrostis australasica</i>	Canegrass
<i>Geijera parviflora</i>	Wilga	<i>Muehlenbeckia florulenta</i>	Lignum

Source: After Anne Clements and Associates (1995), Charles Sturt University (1997)

Weed Control

Weed species are effective competitors for resources and have the potential to exclude native species from the landscape, resulting in changes in the composition and structure of plant communities. Weeds are one of the major causes of environmental degradation in the Mid Lachlan region (DLWC, 2001). Weed control within the enhancement areas will be conducted in accordance with the applicable procedures described for Barrick-owned land in Section 9.9.

Pest Control

Control of pest animals is an important component of habitat enhancement and land management. For example, the European Red Fox (*Vulpes vulpes*) has been confirmed as a significant threat to a range of listed endangered and vulnerable species (Environment Australia, 2001). The occurrence of rabbits (*Oryctolagus cuniculus*) has been found to influence fox abundance (Williams *et al.*, 1995). Where rabbit numbers are high, fox populations generally thrive, and conversely when rabbit numbers drop, fox populations often decline (*ibid.*). Rabbit control is important to improving habitats for wildlife. Management measures for the control of pests including rabbits, feral pigs, feral cats, wild dogs and foxes will be implemented in accordance with the procedures outlined in Section 9.10 and in accordance with the pest control measures set out in the LMP.

Limiting Vehicular Access

Damage by vehicles can result in the compaction of soil (which reduces infiltration of water into the soil and restricts root growth, and consequently natural regeneration), the spread of weeds and disturbance to vegetation. In order to reduce the degree of disturbance to the enhancement areas, vehicular access will be limited throughout mine construction and operation to authorised personnel only. Authorisation for vehicular entry into the enhancement areas will be determined by the Environmental Manager.

Surface Ripping

Surface ripping may be conducted to improve water infiltration and root establishment within the enhancement areas if soil compaction is identified as an inhibitor to regeneration. The progress of regeneration will be assessed as a component of the RVEP (Section 9.3.2).

Provision of Habitat for Herpetofauna

As a component of CGM vegetation clearance activities (refer Section 9.8), features identified for use in the CGM rehabilitation and habitat enhancement programmes will be salvaged/collected. Rocks and logs collected during CGM vegetation clearance activities will be dispersed within the RVEP enhancement areas to provide refuge and basking sites for herpetofauna.

Provision of Nest Boxes

Most eucalypts do not form hollows until they are about 100 years old (Gould League of Victoria Inc, 1997). Although nest boxes cannot replace tree hollows, they can be of great benefit where hollows are rare. A variety of nest boxes are available including those for Eastern Rosella, Red-rumped Parrot, Galah, Kookaburra, Cockatoos, Barn Owl, Nankeen Kestrel and Falcons, Treecreepers, Grey Shrike-thrush, Ducks, Common Brushtail Possum, and Sugar Gliders. In accordance with Development Consent Condition 3.2(b)(ix), nest boxes have been placed throughout the RVEP areas to provide roosting/nesting habitat for birds and arboreal mammals. Inspection and maintenance of the nest boxes is generally undertaken bi-annually.

Provision of Bat Roosts

Current designs of bat boxes have been refined to the extent that small species are attracted whilst predators and arboreal mammals are generally excluded (Greg Richards pers. comm., 2001). Species from the families *Chalinolobus*, *Vespadelus* and *Nyctophilus* have been recorded using bat boxes. A number of species from these families have been previously recorded at Lake Cowal. Bat boxes have been placed throughout the RVEP areas to provide roosting habitat for bat fauna. Inspection and maintenance of the bat boxes is generally undertaken bi-annually.

9.3.2 Remnant Vegetation Monitoring Programme

Remnant vegetation monitoring will be conducted annually within the enhancement areas to:

- assess the progress of natural regeneration;
- determine whether vegetation planted within the enhancement areas is establishing; and
- determine the need for any maintenance and/or contingency measures (such as the requirement for revegetation, supplementary plantings and weed control).

A number of survey plots (50 x 20 m) have been established within each enhancement area to obtain quantitative data on species diversity and abundance. Specifically:

- Each flora survey plot will be systematically searched to compile a list of vascular plant species observed within the plot.
- A count will be made of all individuals of each tree and shrub species occurring within the plot.
- The ground layer will be sampled using four permanent 5 x 1 m quadrats, with two quadrats placed at each end of the 50 x 20 m survey plot. Every ground layer species recorded within the 5 x 1 m quadrats will be rated for its percentage cover of the ground surface.

The survey plots will be monitored annually (when not inundated) after Year 2 of mine operations. Control plots may also be established at sites outside of the enhancement areas to provide a reference point against which the management measures can be assessed.

Further to the above, visual observations will be made on a regular basis of areas revegetated with native plants to assess the establishment success and the health of planted vegetation. This information will be utilised to determine the need for any supplementary plantings that may be required.

9.4 OFFSET AREAS

In accordance with Development Consent Condition 3.4, a biodiversity offset strategy has been developed for the CGM which involves the conservation and management of two designated offset areas located on land owned by Barrick (i.e. the Northern and the Southern Offset Areas) (Figure 4). The offset areas will contribute to the conservation and enhancement of wildlife values around Lake Cowal by conserving regional biodiversity and enhancing habitats available to flora and fauna. The CGM's BOMP provides a detailed description of the offset areas and the implementation of the CGM's biodiversity offset strategy.

9.5 REHABILITATION OF ML 1535 DISTURBANCE AREAS

In accordance with Development Consent Condition 2.4(b), rehabilitation of final landforms or disturbed areas will be undertaken progressively as soon as reasonably practicable following disturbance. Progressive rehabilitation will aim to minimise erosion and sedimentation potential and to minimise visual impacts of CGM landforms. Rehabilitation concepts and measures are described in detail in the CGM's RMP.

Details of progressive rehabilitation works are detailed in the CGM MOP in accordance with the requirements of DRE's MOP Guidelines and the Conditions of Authority for ML 1535 (Section 2.2). The status of progressive rehabilitation works will be reported annually within the CGM's Annual Review (Section 17).

The rehabilitation philosophy of the CGM is outlined in Section 9.5.1. The revegetation concepts for the CGM's major landforms, namely, the New Lake Foreshore, waste rock emplacements and tailings storage facilities are described in Sections 9.5.2 to 9.5.4, respectively.

9.5.1 Rehabilitation Philosophy

The CGM rehabilitation philosophy is to operate as a non-intrusive land user and to create stable rehabilitated landforms that increase the areas of endemic vegetation in the mine area and the status of land-lake habitats (Barrick, 2013).

The above philosophy has led to the rehabilitation principles and objectives described below.

Rehabilitation Principles

The CGM's rehabilitation programme includes the following general principles (Barrick, 2013):

- The rehabilitation of landforms is to be progressive and conducted in accordance with approved, verified plans.
- Final landforms are to be stable in the long-term and include native and/or endemic vegetation characteristic of remnant vegetation within the surrounding landscape.
- Endemic groundcover, understorey, tree seeds and seedlings are to be cultivated and used in the rehabilitation programme.
- Rehabilitation concepts are to be flexible to allow for adjustments, based on investigations, to improve the rehabilitation programme.
- The annual rehabilitation programme and budget is to be prepared by a site team incorporating senior management representatives.

Rehabilitation Objectives

The rehabilitation objectives for the CGM's rehabilitation programme include (Barrick, 2013):

- The water quality of Lake Cowal is not detrimentally affected by the new landforms.
- Revegetating the new landforms with selected native and/or endemic vegetation that is suited to the physiographic and hydrological features of each landform, and which expand on the areas of remnant endemic vegetation in the surrounding landscape.
- Designing final landforms so that they are stable and include revegetation growth materials that are suited to the landform and support self-sustaining vegetation.

- The placement (wherever possible) of soils on final landforms to enable the progressive establishment of vegetation.
- The expansion of habitat opportunities for wetland and terrestrial fauna species. This includes the design and implementation of rehabilitation works at the New Lake Foreshore in a manner consistent with the *NSW Wetlands Policy* (DECCW, 2010).
- The selection of revegetation species in accordance with accepted principles of long-term sustainability (e.g. genotypic variation, vegetation succession, water/drought tolerances).
- Grazing of land within ML 1535 to be excluded during operations and during rehabilitation of the site. At lease relinquishment, rehabilitated final landforms to be fenced with grazing excluded, with some areas suitable for grazing surrounding the rehabilitated final landforms.

Accordingly, the rehabilitation of ML 1535 disturbance areas will help conserve and enhance wildlife values within ML 1535 and around Lake Cowal.

9.5.2 Rehabilitation Concepts for the New Lake Foreshore

Rehabilitation of the New Lake Foreshore will be an iterative process and revegetation species will continue to be selected in consideration of (Barrick, 2013):

- Lake Cowal's hydrological regime (wetting and drying cycles);
- species occurring in relevant reference sites (including lake and slope woodland communities);
- species performance during revegetation trials; and
- suitability to substrate conditions.

Subject to these parameters, species may be selected from the following vegetative suites:

- fringing lake vegetation on the foreshore batters (i.e. Eucalypt dominated woodland including River Red Gum, River Cooba (*Acacia stenophylla*), Wilga (*Geijera parviflora*), Kurrajong (*Brachychiton populneus*), Green Wattle and Grey Box); and
- freshwater habitats (i.e. Foxtail [*Austrostipa densiflora*], Rush, Cane Grass [*Eragrostis australasica*] and Lignum).

Revegetation concepts and methods for the New Lake Foreshore are described in detail in the CWMP and are shown on Figures 5 and 6.

9.5.3 Rehabilitation Concepts for the Waste Rock Emplacements

The rehabilitation objectives for the waste rock emplacements are to:

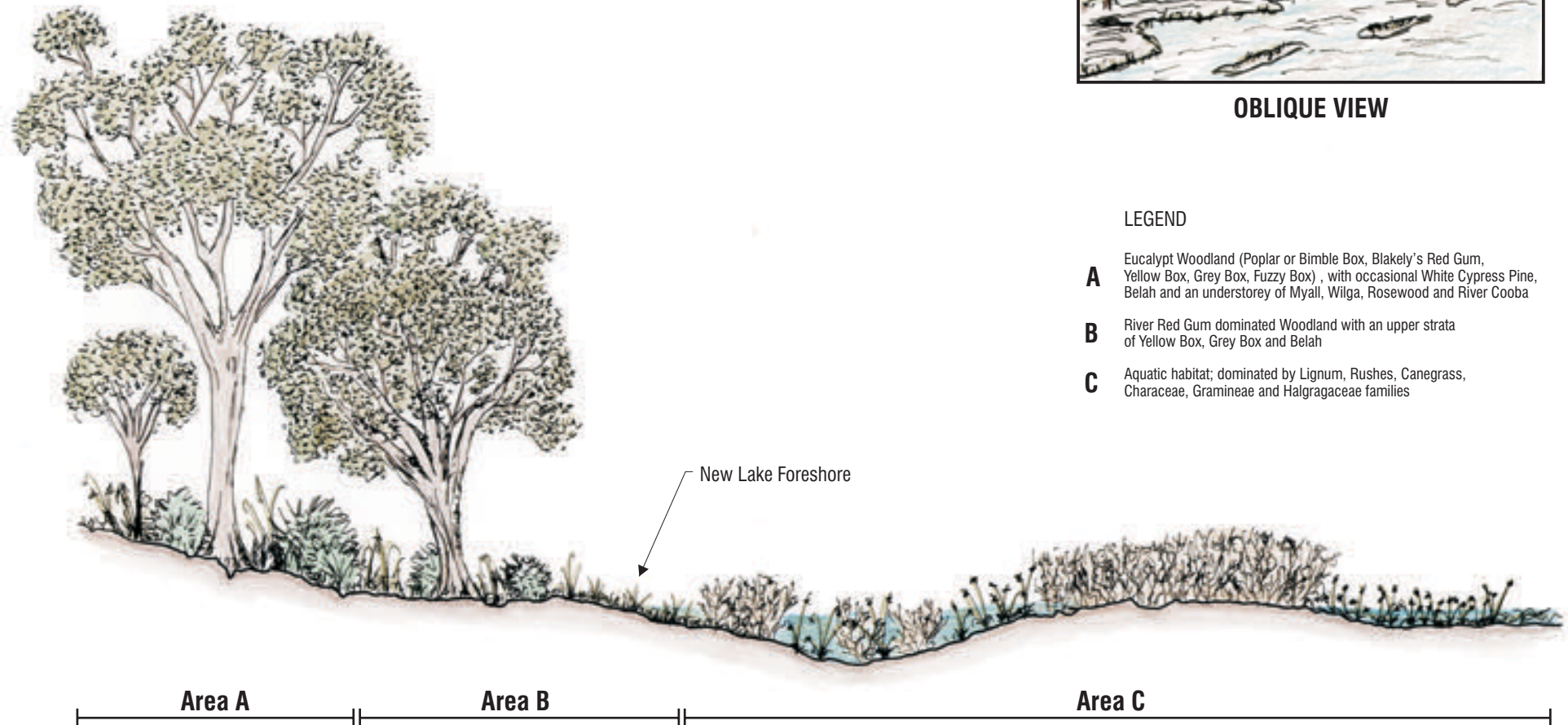
- stabilise batter slopes with rock armour (primary waste rock mulch) to control surface water runoff downslope and reduce erosion potential in the long-term;
- provide a stable plant growth medium able to support long-term vegetation growth including native and/or endemic Eucalypt woodland, shrubland and grassland species suited to slope and elevated positions similar to those remnants in the surrounding landscape; and
- conserve the rehabilitated area post-mining and exclude grazing and agricultural production.



OBLIQUE VIEW

LEGEND

- A** Eucalypt Woodland (Poplar or Bimble Box, Blakely's Red Gum, Yellow Box, Grey Box, Fuzzy Box) , with occasional White Cypress Pine, Belah and an understorey of Myall, Wilga, Rosewood and River Cooba
- B** River Red Gum dominated Woodland with an upper strata of Yellow Box, Grey Box and Belah
- C** Aquatic habitat; dominated by Lignum, Rushes, Canegrass, Characeae, Gramineae and Halragraceae families



TYPICAL SECTION

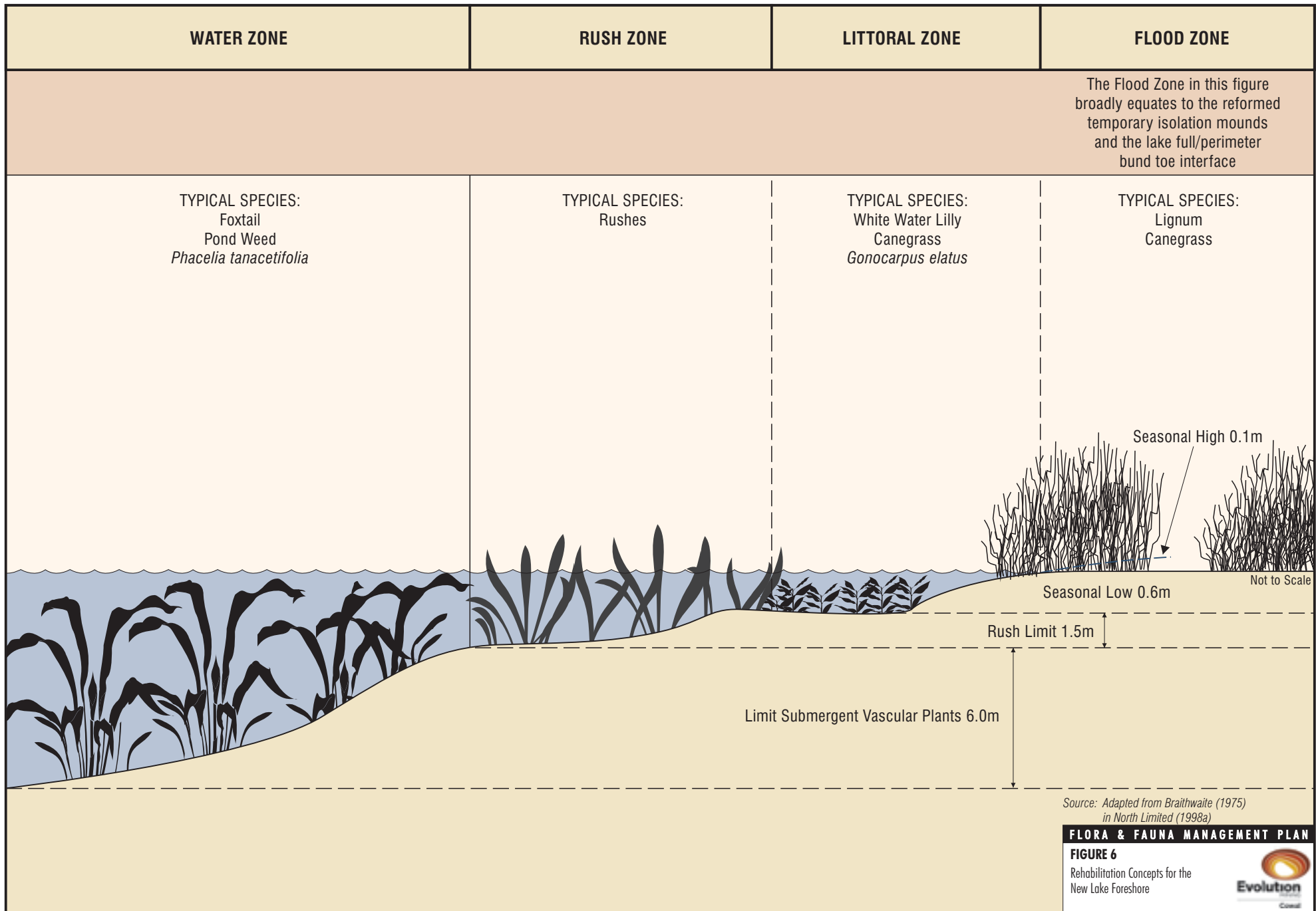
Source: North Limited (1998a)

FLORA & FAUNA MANAGEMENT PLAN

FIGURE 5

Final Landform Revegetation Concepts





Revegetation of the waste rock emplacements will aim to re-establish endemic woodland, shrub and grassland communities similar to those remnants in the regional landscape that are suitable to the physiographic and hydrological features of the landform and surface rehabilitation materials (Barrick, 2013).

In consideration of the final land use for the waste rock emplacements, DnA Environmental (2013) identified that an intergrade of woodland communities will be suited to the waste rock emplacements, with major species characteristic of the following woodland communities to be used in rehabilitation trials:

- woodland on slopes dominated by Bimble Box or Poplar Box, Grey Box (*Eucalyptus microcarpa*) woodland, White Cypress Pine (*Callitris glaucophylla*) and Western Rosewood (*Alectryon oleifolius*); and
- woodland on low ridges and hills dominated by Dwyer's Red Gum (*Eucalyptus dwyeri*), Spearwood (*A. doratoxylon*), Black Cypress Pine (*C. endlicheri*) and Mugga Ironbark (*E. sideroxylon*).

Based on the results of rehabilitation trials and research conducted to date, the rehabilitation cover system for the outer batters of the waste rock emplacements will include benign primary waste rock mulch to provide long-term stability, control surface water runoff downslope and reduce erosion potential.

9.5.4 Rehabilitation Concepts for the Tailings Storage Facilities

The rehabilitation objectives for the tailings storage facilities are to (Barrick, 2013):

- establish permanently stable landforms;
- during operations, stabilise batters so that they provide minimal habitat value for bird life (i.e. pasture cover);
- post-operations, to establish vegetative communities (including Eucalypt and Riverine woodland species and understorey species such as Rush species and pasture species) which are endemic to the region and which enhance remnant habitat extension opportunities; and
- exclude grazing and agricultural production.

Revegetation of the tailings storage facilities will use a combination of native and/or endemic plant species and pasture species to rapidly stabilise landforms in the initial period following construction (Barrick, 2013). Post-operations, the tailings storage facilities will be revegetated with plant species that may include (Barrick, 2013):

- In the central, occasionally wet area, species such as River Red Gum (*Eucalyptus camaldulensis*) and understorey species such as Rush.
- On the remainder of the covered storage surface, Eucalypt and Riverine woodland species (including salt tolerant species) which typically occur in the surrounding landscape.
- On the outer batters, native and/or endemic pasture species and/or select shallow-rooted species to minimise the potential for plant root systems to compromise the integrity of the tailings storage facility outer batters.

Consistent with the rehabilitation concepts for the outer batters of the waste rock emplacements, benign primary waste rock mulch will be incorporated into the rehabilitation cover system for the outer batters of the tailings storage facilities to provide long-term stability, control surface water runoff downslope and reduce erosion potential.

9.6 CGM DESIGN

A number of CGM design components will help conserve wildlife values within ML 1535 and around Lake Cowal including the positioning of topsoil stockpiles (Section 9.6.1), design of the ML fence (Section 9.6.2), construction of the mine water supply pipeline (Section 9.6.3) and night lighting (Section 9.6.4), as discussed below.

9.6.1 Topsoil Stockpiles

In accordance with Development Consent Condition 3.2(a)(ii), topsoil stockpiles within ML 1535 will not be located within any area of remnant Wilga woodland as identified on Figure 3-13 of the EIS (shown as Weeping Myall – Belah – Poplar Box Shrubland and Woodland located near the north western corner and near the northern boundary of ML 1535 on Figure 3). The topsoil stockpiles will be managed in accordance with the Soil Stripping Management Plan.

9.6.2 ML Fence Design

Fences will be constructed within ML 1535 and around the ML boundary.

In accordance with Development Consent Condition 2.3 (which requires the mine site to be secured), a fence has been constructed around the boundary of ML 1535 (Figure 2).

In accordance with Development Consent Condition 2.3, the fence has been designed to minimise the impact on waterbirds and aquatic species. The fence comprises a standard four strand farm fence. However to minimise the impact on waterbirds and aquatic species, the spacing between the top three wires has been increased by 75 millimetres (mm) in comparison to a standard farm fence and the fence contains no barb wire. A farm gate has been built on the northern and southern fence boundary and two have been built in the eastern fence boundary.

The fences will continue to be subject to weekly inspection and maintenance. If animals are found trapped inside the wetland area, the appropriate access gate(s) will be opened or maintained to facilitate movement.

9.6.3 Pipeline Construction

A borefield of four production bores has been developed within the Bland Creek Palaeochannel located approximately 20 km to the east-northeast of the CGM site (Figure 1). The borefield reticulation system includes a break pressure/balancing storage after the final bore, a buried 600 mm diameter pipeline to the CGM site and power supply along existing road reserves (North Limited, 1998a).

The pipeline was laid in such a way so as not to impede the passage of fish or other animals or interfere with flood behaviour or the passage of boats and vehicles, as required by Development Consent Condition 4.2(a)(ii).

In accordance with Development Consent Condition 4.2(a)(iii), an automatic shut down device has been installed such that water pumping will cease immediately in the event of a pipe rupture. Such a system will negate the risk of significant impact on lake surface water quality (former NSW Department of Urban Affairs and Planning, 1998).

Further details are provided in the Water Management Plan (WMP).

9.6.4 Night Lighting

Consistent with the requirements of Development Consent Condition 6.5(b), Barrick will use the following lighting strategies/control measures to minimise visual impacts associated with the CGM:

- scheduling of mining operations, where practicable, so that evening and night-time operations on the Northern and Southern Waste Rock Emplacements would be located to reduce the potential for direct lighting impacts to locations outside of ML 1535;
- restriction of night-lighting to the minimum required for operations and safety requirements, where appropriate;
- plan lighting layout to avoid potential for direct views of lights from the public road (i.e. direct lights inward towards the centre of the ML where practicable);
- direct fixed outdoor lights to shine below horizontal and below the building or structure line;
- use light shields to limit the spill of lighting;
- direct in-pit mobile lighting to shine below the pit wall and below the horizontal (where practicable); and
- installation of external lighting at the CGM is generally in accordance with Australian Standard (AS) 4282-1997 *Control of Obtrusive Effects of Outdoor Lighting*.

9.7 THREATENED SPECIES MANAGEMENT PROTOCOL

The CGM's TSMP (Appendix A) was developed to minimise potential impacts of the CGM on threatened flora and fauna species known and/or considered possible occurrences in the CGM disturbance areas and/or immediate surrounds, and to threatened ecological communities.

The TSMP will be implemented in accordance with Development Consent Condition 3.2(c) and will include provisions for targeted searches prior to relevant development/construction activities (e.g. prior to vegetation clearance activities) and proposed mitigation measures where threatened flora or fauna species are found.

The key components of the Protocol include:

- Database Interrogation;
- Preliminary Assessment;
- Secondary Assessment;
- Threatened Species Management Strategy; and
- Regulatory Review.

9.7.1 Database Interrogation

The Database Interrogation provides a mechanism for determining whether there are any records of threatened species in the proposed disturbance area or immediate surrounds. The determination is carried out by examining/interrogating a variety of threatened species databases.

In accordance with the TSMP, the assessment for threatened species with records less than 10 years old proceeds to the Secondary Assessment stage (refer Section 9.7.3). Where no such records exist, a Preliminary Assessment is undertaken (Section 9.7.2).

9.7.2 Preliminary Assessment

In recognition of the inherent limitations of database records a Preliminary Assessment is undertaken to take into account the potential for threatened species to occur at a particular site. This is achieved by examining the presence/absence of habitat resources typically associated with the essential lifecycle components of threatened species (i.e. breeding, foraging, nesting/roosting and migration/dispersal).

The Preliminary Assessment will adopt a two-fold approach:

- (1) attempt to categorise (quantify and qualify) the habitat resources of the proposed disturbance area and immediate surrounds; and
- (2) attempt to determine the presence of habitat resources particular to those threatened species known or considered likely to occur in the CGM area.

Where the Preliminary Assessment determines that no habitat resources critical to the lifecycle components of a threatened species exist in the CGM disturbance area and/or immediate surrounds, development works can proceed. Where the Preliminary Assessment determines that habitat resources critical to the lifecycle components of a threatened species exist, then a Secondary Assessment for these species will be initiated.

9.7.3 Secondary Assessment

The Secondary Assessment is conducted following the:

- identification of a valid threatened species record from CGM disturbance areas and/or immediate surrounds; or
- identification of habitat resource(s) typically associated with the essential lifecycle components of a threatened species known or considered likely to occur in the area.

This stage of assessment attempts to determine the presence of any threatened species from within the CGM disturbance areas and/or immediate surrounds.

This is achieved by undertaking target surveys for the threatened species. Where a threatened species is recorded in the course of targeted surveys or habitat resources typically associated with the lifecycle components of a threatened species are identified, a Threatened Species Management Strategy will be prepared.

9.7.4 Threatened Species Management Strategy

The principal aim of the Threatened Species Management Strategy is to develop management options and measures that provide a means for ensuring the viability of a local population of a threatened species is not placed at risk by the CGM. Management options and measures that may be implemented include development design modifications and alterations, consideration of alternative technologies, comprehensive rehabilitation planning, as well as iterative procedures such as relocation and re-establishment programmes.

Threatened Species Management Strategies have been prepared for relevant threatened flora, amphibians, reptiles, birds, mammals and fish in consultation with the former NPWS, DIPNR and NSW Fisheries.

Additionally, Threatened Species Management Strategies have been prepared for the following EECs in consultation with the former NSW Department of Environment and Conservation and Department of Primary Industries – Mineral Resources:

- Aquatic Ecological Community in the Natural Drainage System of the Lowland Catchment of the Lachlan River EEC (*Fisheries Management Act, 1994*);
- Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes Bioregions EEC (TSC Act); and
- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions EEC (TSC Act) (it should be noted that the areas of vegetation within ML 1535 previously mapped and classified by Bower (2003) as the Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions EEC listed under the TSC Act, have since been covered by development of the northern waste rock emplacement and processing plant area).

9.8 VEGETATION CLEARANCE PROTOCOL

In accordance with Development Consent Condition 3.2(b)(vii) which requires the protection of retained habitats within the ML area and Development Consent Condition 3.2(a)(i) which requires the minimisation of the removal of trees and other vegetation from the mine site, a Vegetation Clearance Protocol (VCP) has been developed for the CGM (Figure 7). All vegetation clearance activities required by the CGM will be conducted in accordance with the VCP. The VCP will be implemented by suitably qualified person(s) and coordinated by the Environmental Manager.

In accordance with Development Consent Condition 3.2(a)(i) and the FFMP, clearance activities within the ML area will be restricted to the areas occupied by mine activities, buildings and paved surfaces, and those necessary for fire control. The VCP is consistent with the JLWMP and LWMP/PLC to minimise vegetation clearance in the region. The key components of the VCP are (Figure 7):

- delineation of disturbance areas (Section 9.8.1);
- pre-clearance surveys (Section 9.8.2);
- fauna management strategies (Section 9.8.3);
- vegetation clearance procedure (Section 9.8.4); and
- a link to the TSMP (Section 9.7).

Information obtained throughout each phase of the VCP will contribute to the CGM's rehabilitation and enhancement programmes.

VEGETATION CLEARANCE PROTOCOL

DELINEATION OF DISTURBANCE AREAS

Delineation of areas to be cleared of native remnant vegetation. Remnant native vegetation immediately adjoining proposed clearance areas to be clearly marked or fenced to prevent accidental damage during vegetation clearance activities or construction works.

PRE-CLEARANCE SURVEYS

Stage 1 - Preliminary Habitat Assessment

Inspection of individual trees located within the proposed disturbance area for features with the potential to provide roosting and/or nesting resources for birds, bats and arboreal mammals (defined as 'habitat trees'). Each habitat tree identified is to be clearly marked. Information recorded may include (but not necessarily be limited to) habitat tree characteristics and fauna observations.

Stage 2 Secondary Habitat Assessment

Utilising information recorded by the preliminary habitat assessment, habitat trees may be surveyed further to assess their usage by birds, bats and/or arboreal mammals. This stage may include (but not necessarily be limited to) spotlighting for arboreal mammals, observations of hollows and nests for nesting bird species or bat surveys using Anabat electronic detectors. This stage to be conducted with consideration of seasonal and temporal factors.

Habitat tree utilised by non- threatened fauna as a roosting and/or nesting resource.

Threatened flora or fauna species identified during pre-clearance surveys

THREATENED SPECIES MANAGEMENT PROTOCOL (TSMP)
Threatened Species Management Strategy Phase of the TSMP to be initiated.

Threatened flora or fauna species identified during pre-clearance surveys

YES

NO

FAUNA MANAGEMENT STRATEGIES

Identification of management strategies to minimise the impact of clearing activities on resident fauna in the short-term and minimise the loss of habitat in the long-term (initiatives to be incorporated into the rehabilitation and enhancement programmes).

Short-term management strategies may include:

- observations of hollows;
- capture and release of fauna;
- bat roost relocation;
- timing of vegetation clearance;
- alternative felling methods;
- modification of the disturbance area; and/or
- a combination of management measures.

Long-term management strategies may include:

- the placement of nesting boxes in suitable habitat for birds and arboreal mammals;
- the placement of roosting boxes in suitable habitat for bats; and
- inclusion of hollow-developing tree species in the rehabilitation programme.

VEGETATION CLEARANCE

Vegetation clearance activities undertaken with consideration of seasonal factors (wherever practicable, vegetation clearance to be undertaken during late summer/early autumn).

Inspection of trees felled for the presence of fauna. Injured fauna to be collected and temporarily cared for in accordance with the plans for the rescue and rehabilitation of wildlife, detailed in the FFMP. Uninjured fauna to be released into nearby suitable habitat at an appropriate time of day.

Where practicable, habitat features (eg. hollows) to be salvaged for utilisation in the rehabilitation or habitat enhancement programmes.

Maximise the harvesting of valuable timber resources and to effectively recycle or dispose of other vegetative parts.

9.8.1 Delineation of Disturbance Areas

This phase of the VCP involves the delineation of areas to be cleared of native remnant vegetation. In accordance with Development Consent Condition 3.2(a)(i), clearance activities will be restricted to the areas occupied by the mine activities, buildings and paved surfaces, and those necessary for fire control. The boundary of the disturbance area will be clearly marked or fenced to prevent accidental damage to adjoining remnant native vegetation during vegetation clearance activities or construction works. Protection, where practicable, will extend to all strata and life forms including trees, shrubs, grasses, other herbs and forbs, ground litter, fungi and logs.

9.8.2 Pre-Clearance Surveys

Preliminary Habitat Assessment

The preliminary habitat assessment phase of the pre-clearance surveys involves the inspection of all trees by a suitably qualified person(s) located within proposed disturbance areas for features with the potential to provide roosting and/or nesting resources for birds, bats and arboreal mammals (e.g. hollows, openings, cracks and/or loose bark). Trees containing such features are referred to in this FFMP as potential 'habitat trees'. The purpose of the preliminary habitat assessment is to identify roosting/nesting habitat resources that may be impacted by the vegetation clearance activities.

The results of the preliminary habitat assessment will be utilised to determine appropriate secondary habitat assessment activities (described below).

Parameters recorded by the preliminary habitat assessment may include:

- habitat features (e.g. hollow, opening, crack, loose bark, bird nest);
- the position of the habitat feature (e.g. located on a branch or trunk);
- the size of the feature (e.g. small, medium or large);
- living status of the tree (e.g. alive or stag);
- the potential for the habitat features to be salvaged and used in the rehabilitation or habitat enhancement programmes;
- fauna observed in the area and surrounds, particularly bird activity at hollows and nests; and
- evidence of fauna in the area and surrounds (e.g. scats, tracks and scratches).

During the preliminary habitat assessment phase, trees may also be examined for their provision of seed to be utilised in the rehabilitation programme. Where available, seed will be collected at the time of vegetation clearance activities.

In the event that any threatened species are observed during the preliminary habitat assessment, the TSMP will be initiated.

Secondary Habitat Assessment

The secondary habitat assessment involves further surveys of habitat trees by a suitably qualified person(s) to determine their usage by birds, bats and/or arboreal mammals. This may include:

- observations of hollows and nests for nesting birds;
- spotlighting for arboreal mammals; and
- bat surveys using Anabat electronic detectors.

The secondary habitat assessment phase will be conducted with consideration of seasonal and temporal factors. For example, where practicable, bat fauna surveys will be conducted to avoid the hibernation period (May to August). The secondary habitat assessment will be conducted within two weeks prior to vegetation clearance, where practicable.

Where the secondary habitat assessment determines that a habitat tree is being utilised as a roosting and/or nesting resource by non-threatened fauna, the fauna management strategies phase of the VCP will be initiated (Section 9.8.3). Where the secondary habitat assessment determines that a habitat tree is being utilised as a roosting and/or nesting resource by threatened fauna, the Threatened Species Management Strategy stage of the TSMP will be initiated (Section 9.7.4).

Where the secondary habitat assessment determines that a habitat tree is not being utilised by fauna as a roosting and/or nesting resource, vegetation clearance can proceed using the vegetation clearance procedure (Figure 7).

9.8.3 Fauna Management Strategies

The principal aims of the fauna management strategies stage of the VCP are to minimise the impact of clearing activities on resident fauna in the short-term and minimise the loss of habitat in the long-term. The management strategies identified are to be incorporated into the CGM rehabilitation and enhancement programmes, where appropriate.

Short-term Management Strategies

Short-term management strategies may include:

- inspection and/or observations to confirm the use of the hollow and/or nest as a nesting resource;
- observations to determine the completion of nesting activities (i.e. young have left the nest and the hollow and/or nest is no longer used for nesting);
- capture and removal of animal(s) to alternative suitable habitat;
- in the event roosting bats are identified, the following options may be considered:
 - fell surrounding non-habitat trees to encourage the colony/individuals in the habitat tree to move to an alternative roost;
 - cause sufficient physical disturbance to the roost (without damage) to encourage roost members to move to an alternative roost site;
 - as close as possible to dusk, fell the tree as slowly as possible using an excavator and inspect on felling (pers. comm., David Donato, 17 March 2015). Capture exiting bats for release that night; or
 - relocate the roost to adjacent suitable vegetation;
- modification of the disturbance area; and/or
- a combination of the above measures.

The practicality of implementing each management strategy will be dependent on the characteristics of the tree in question.

Long-term Management Strategies

Long-term management strategies identified to minimise the loss of potential habitat resources may include:

- the placement of nesting boxes in suitable habitat for birds and arboreal mammals;
- the placement of bat boxes in suitable habitat for bats;
- the relocation of habitat features salvaged from felled trees (e.g. branches with hollows) in suitable habitat;
- inclusion of hollow-developing tree species in the rehabilitation and habitat enhancement programmes; and
- inclusion of forage resources in the rehabilitation and habitat enhancement programmes.

Following implementation of the appropriate short-term fauna management strategies and identification of appropriate long-term management strategies, vegetation clearance can proceed in accordance with the vegetation clearance procedure described below. Development of the long-term fauna management strategies will have regard to the MLRVMP.

9.8.4 Vegetation Clearance Procedure

Where the removal of vegetation is necessary for the development and operation of the CGM, specific procedures have been developed to ensure efficient clearing operations, to maximise the harvesting of valuable timber resources and to effectively recycle or dispose of other vegetative parts.

Specifically, the following vegetation clearance procedures will be employed:

- Where practicable, the removal of native vegetation identified as containing potential roosting/nesting resources for birds, bats and/or arboreal mammals to be conducted outside of peak breeding/hibernating periods (e.g. for a large number of species late summer/early autumn is the most appropriate).
- In consideration of the behaviour of many bat fauna species to utilise a number of roosts, trees containing potential bat habitat are to be felled, as soon as practicable after a negative Anabat survey result.
- Where practicable, vegetation clearance to be conducted within two weeks following the secondary habitat assessment to reduce the potential for species to occupy surveyed habitat.
- Habitat trees identified by the preliminary habitat assessment will be inspected upon felling for fauna. The following management options are available for fauna captured during felling:
 - Any injured fauna will be collected and/or temporarily cared for in accordance with the plans for the rescue and rehabilitation of wildlife (Section 5).
 - Depending on the animal, uninjured fauna will either be released into surrounding suitable habitat at the time of capture or a more suitable time (e.g. at night for arboreal mammals and bats).
- Features identified for use in the rehabilitation and habitat enhancement programmes will be salvaged (e.g. hollow branches), collected (e.g. seed stock) or processed (e.g. for woodchips).
- Harvestable timber not required for the rehabilitation and habitat enhancement programmes will be extracted and used where practicable (e.g. as fence posts).

In accordance with Development Consent Condition 3.2(a)(iii) no area of Belah Woodland within the Development Application (DA) area (as identified in Figure 3-13 of the EIS) will be disturbed by development of the CGM (note, Belah Woodland is shown as Weeping Myall – Belah – Poplar Box Shrubland and Woodland located near the southern boundary of ML 1535 on Figure 3). The management of habitat trees throughout the different stages of the Protocol will be documented. Vegetation clearance activities will be reported in the Annual Review (Section 17).

9.9 WEED CONTROL

Weeds will be managed at the CGM in accordance with measures described in Section 6 of the LMP. The weed management programme is aimed at minimising the possibility of new weed incursion and controlling the spread of any existing noxious weeds on Barrick-owned land.

The weed management programme (as described in the LMP) includes the following measures:

- identification of weeds by annual site inspections;
- communication with other landholders/leaseholders and regulatory authorities to keep weed management practices in line with regional weed control activities;
- mechanical removal of identified noxious weeds and/or the application of approved herbicides in authorised areas (herbicide use in wetland areas will be strictly controlled);
- implementing follow-up site inspections to determine the effectiveness of the weed control measures;
- where practicable, prevention of the establishment of new weeds on Barrick-owned land by minimising seed transport of weed species through the use of a vehicle wash bay; and
- pest control activities.

The CGM's rehabilitation monitoring programme includes monitoring and recording weed presence within the rehabilitation areas. Rehabilitation monitoring results will be detailed in an annual rehabilitation monitoring report, and any weed control measures conducted will be reported in the Annual Review (Section 17). Contingency measures or remedial works such as supplementary seeding or planting will be implemented where rehabilitation monitoring indicates significant revegetation damage or failure due to weed infestation.

In addition, an annual weed survey is also conducted across ML 1535 and all Barrick-owned lands which includes a detailed description of any weeds present, its location (including a photographic record) and recommended management/control measures. The weed survey includes inspections of the CGM's soil stockpiles. Should any significant weed infestations of soil stockpiles be identified, appropriate maintenance/control measures will be undertaken (e.g. spraying or manual removal). Any maintenance measures conducted will be recorded in the CGM soil stockpile register.

As described in Section 7.2 of the CWMP, the use of herbicides in the Compensatory Wetland will be strictly controlled. Within these areas, physical removal methods will be employed, where practicable. Where physical control methods are not suitable, a herbicide registered for use in aquatic situations by the Australian Pesticides and Veterinary Medicines Authority will be utilised.

9.10 PEST CONTROL

Barrick will undertake pest control activities at the CGM in accordance with the procedures detailed in Section 7 of the LMP. Pest control activities (as described in the LMP) will include the following measures:

- regular inspections to assess the status of pest populations within ML 1535 and on all Barrick-owned land;
- mandatory pest control for declared pests (i.e. rabbits, feral pigs, wild dogs and foxes) in accordance with Pest Control Orders under the *Local Land Services Act, 2013*, and management of plague locust species including the Australian Plague Locust, Migratory Locust and the Spur-throated Locust; and
- inspections to assess the effectiveness of control measures implemented and review these if necessary.

Where inspections identify damage or failure of revegetation due to pests, contingency measures would be implemented to remediate the area.

Barrick will undertake pest control activities in conjunction with adjacent landholders for more effective pest control. This process will be facilitated via consultation with local landholders and landholder groups through the CEMCC process (Section 15).

The NSW DPI (2014) *Vertebrate Pest Control Manual* will be used as a guide for pest control activities in consultation with the Riverina LLS and NSW DPI (Agriculture) when necessary. The *Threat Abatement Plan for Predation by Feral Cats* (Commonwealth Department of the Environment, Water, Heritage and the Arts [DEWHA], 2008a) and the *Model Code of Practice for the Humane Control of Feral Cats* (Sharp and Saunders, 2004) will be used as a guide for the humane control of feral cats within ML 1535. The *Threat Abatement Plan for Predation by the European Red Fox* (DEWHA, 2008b) will be used to guide fox control within ML 1535.

As described in Section 7.3 of the CWMP to minimise the risks to the wetland, poisoning of vertebrate pests will not be employed in the Compensatory Wetland area unless Barrick is specifically directed to do so by the Riverina LLS in accordance with relevant permits and requirements of the *Local Land Services Act, 2013*, *NSW Pesticides Act, 1999* and *Commonwealth Agricultural and Veterinary Chemicals Code Act, 1994* and the subsequent *Agricultural and Veterinary Chemicals Code Amendment Bill, 2010*.

Pest control activities implemented within ML 1535 will be reported in the Annual Review (Section 17).

9.11 OTHER MANAGEMENT MEASURES

Further to the above, a number of additional methods will be employed to conserve wildlife values and protect existing wildlife habitats, namely:

- A clean, rubbish-free environment will be maintained within ML 1535 particularly around administration and contractor areas in order to discourage scavenging and reduce the potential for colonisation of these areas by non-endemic fauna.
- The introduction of animals on to the ML area will be prohibited. Domestic pets will not be allowed on ML 1535 and employees and contractors will not be permitted to keep native fauna or to encourage fauna through feeding.

- The movement of vehicles associated with the CGM has the potential to increase the incidence of fauna mortality via vehicular strike. To reduce this potential, speed limits will be imposed on vehicles using ML 1535 roads and tracks. Signposting will be installed to remind personnel of the danger of vehicles to wildlife.
- To minimise the potential for native fauna to become trapped in holes in the ground (e.g. open bore holes used for groundwater monitoring and excavations for the pipeline), the holes will be capped and/or temporarily covered when appropriate whilst under construction.
- Provision of information relevant to the management of native fauna during employee and contractor inductions.

10 DETAILS TO RELOCATE ANY THREATENED SPECIES AND/OR ITS HABITAT AWAY FROM CGM DISTURBANCE AREAS

In the event that a threatened species is identified within a CGM disturbance area, the Threatened Species Management Strategy phase of the TSMP will be initiated (as described in Section 9.7).

The Threatened Species Management Strategy phase of the TSMP involves the identification of mitigation measures to ameliorate any potentially significant impacts on the threatened species. Management measures and options for the species will be developed in consideration of a number of factors including the:

- threatened species identified and its ecological characteristics (such as home range and important lifecycle components such as breeding, roosting/nesting or foraging);
- likely usage of the disturbance area by the species (e.g. breeding, roosting/nesting or foraging);
- location in which the threatened species was recorded within the disturbance area (e.g. pipeline, access road or ML 1535 disturbance areas); and
- potential to relocate the species and/or its habitat away from the disturbance area.

Species specific requirements exclude the possibility of developing a general management strategy to incorporate all threatened species that may potentially be identified within the CGM disturbance area. In accordance with Development Consent Condition 3.2(b)(ix), potential management strategies that could be utilised to relocate a threatened species and/or its habitat away from CGM disturbance areas include:

- *Capture and Release of Fauna into Surrounding Suitable Habitat* – For example, in the event a Southern Bell Frog was identified in CGM disturbance areas it could potentially be relocated to alternative suitable habitat. Any threatened species relocation programme would be undertaken in consultation with the NPWS.
- *Modification of Area to be Disturbed* – Opportunities may be available to modify the area proposed to be disturbed by the CGM. For example, in the event a tree hollow is identified as a known nesting/breeding resource for a threatened bird species, the required disturbance area may be able to be modified to avoid disturbance to the threatened species habitat.
- *Bat Roost Relocation and Placement of Bat Boxes in Suitable Habitat* – Known roosting habitat (e.g. hollows) for bat fauna such as the Greater Long-eared Bat and Yellow-bellied Sheathtail Bat salvaged during vegetation clearance activities has the potential to be relocated to suitable habitat. In addition, as described in Section 9.3.1, bat boxes have been established in the RVEP areas to provide roosting habitat for bat fauna. Additional bat boxes may be installed within suitable areas of the CGM offset areas if required.
- *The Placement of Nesting Boxes in Suitable Habitat for Birds and Arboreal Mammals* – As described in Section 9.3.1, nest boxes have been established in the RVEP areas to provide nesting habitat for threatened fauna (e.g. woodland birds and arboreal mammals). Additional nest boxes may be installed within suitable areas of the CGM offset areas if required.
- *Inclusion of Hollow-Developing Tree Species in the Rehabilitation and/or Enhancement Programmes* – Consideration can be given to planting flora species that will, in the long-term, provide nesting/breeding resources for the threatened species identified. For example, the revegetation of River Red Gum and other eucalypt species will, in the long-term, provide hollows for threatened species such as the Barking Owl, Glossy Black-Cockatoo and Major Mitchell's Cockatoo.

- *Trialling of the Establishment of Threatened Flora Species in the Rehabilitation Programme* – In the event threatened flora species are identified within CGM disturbance areas, consideration will be given to trialling the establishment of the species in the rehabilitation programme.
- *Provision of Forage Resources in the Rehabilitation and Habitat Enhancement Programmes* – Consideration can be given to planting flora species that will provide potential foraging resources for the threatened species identified in the disturbance areas. For example, were the Swift Parrot to be identified in the CGM disturbance areas, winter-flowering eucalypts could be planted to provide foraging habitat for this species.

In accordance with the TSMP, the management strategies developed would be subject to review and approval by the OEH, prior to implementation.

11 MONITORING OF FAUNA, FLORA, FISH AND AQUATIC INVERTEBRATES

In accordance with Development Consent Condition 3.2(b)(viii), fauna, flora, fish and aquatic invertebrates will be monitored during the operations phase at the CGM. The monitoring components are summarised in Table 4.

**Table 4
Fauna, Flora, Fish and Aquatic Invertebrate Monitoring Components**

Monitoring Component	Section
<i>Fauna</i>	11.1
Bird numbers and species diversity at bird breeding sites	11.1.1
Fauna usage of the tailings storages	11.1.2
Fauna usage of the final void	11.1.3
Noise and blasting and bird behaviour in bird breeding areas and at the New Lake Foreshore	11.1.4
Fauna usage of the rehabilitated New Lake Foreshore, waste emplacements and tailings storages	11.1.5
Fauna Usage of the Compensatory Wetland	11.1.6
<i>Flora</i>	11.2
Revegetation of rehabilitated landforms, including the New Lake Foreshore	11.2.1
Flora within the Compensatory Wetland and remaining wetland areas within ML 1535	11.2.2
Monitoring of flora within the RVEP enhancement areas and offset areas	11.2.3
<i>Fish and Aquatic Invertebrates</i>	11.3
New Lake Foreshore, Compensatory Wetland and remaining areas of wetland within ML 1535	11.3.1

The monitoring programme will be coordinated by the Environmental Manager and conducted by suitably qualified person(s). The results of the monitoring programme will be reported in the Annual Review (Section 17).

11.1 FAUNA

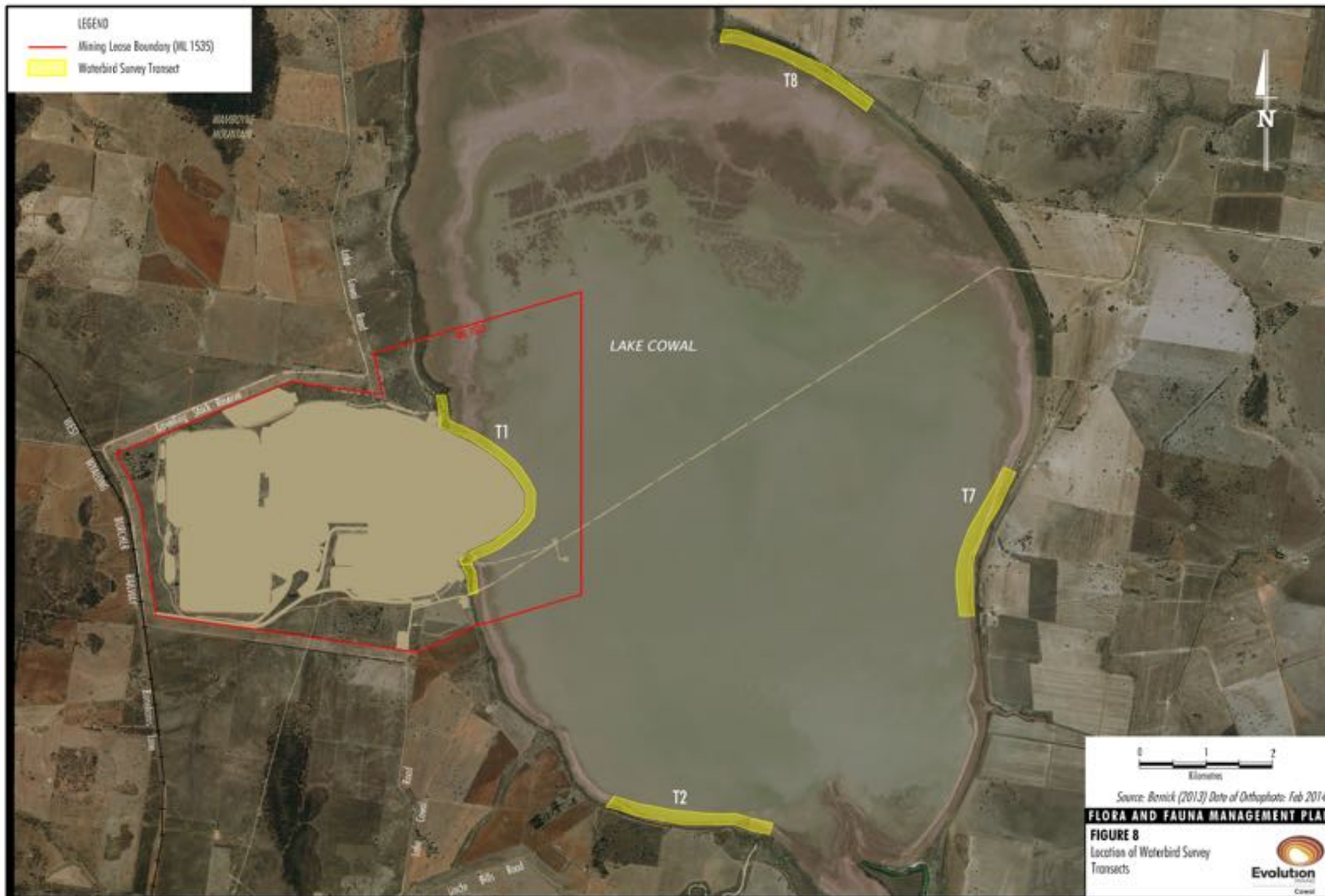
Incidental observations of fauna activity within ML 1535 will be documented during weekly inspections of ML 1535. Surveys will also be conducted to monitor fauna in ML 1535 and around Lake Cowal, as described in Sections 11.1.1 to 11.1.6.

11.1.1 Bird Numbers and Species Diversity at Bird Breeding Sites

Bird breeding monitoring has been conducted at Lake Cowal since 1989. Survey records (Crome, 1995; Lane, 1989, 1990, 1991abc; EES, 1992-2000; Gell and Peake, 2001; Gell, 2002-2003) indicate that the main bird breeding areas occur in wooded and vegetated parts in northern sections of the lake (Figure 8). The main bird breeding periods at the Lake Cowal bird breeding areas occur in the months of January, August and October, dependant on suitable climatic conditions and lake water levels (EES, 1999).

The monitoring programme has included examination of bird breeding activity and the assemblage of bird species for the following periods:

- over a whole filling and drying cycle of the lake from August 1989 to the end of 1997 (EES, 1999);
- when the lake was dry between January and August 1998;
- when it then partially refilled before drying out in January 2002 (Gell, 2002-2003);



- during the recent filling and drying cycle from October 2010 to December 2014; and
- when the lake was dry between January 2015 to the present.

During the dry periods, little bird breeding activity was observed (Gell, 2002, 2003 and 2004 to 2010).

The long-term monitoring of bird breeding will continue. The monitoring methodology includes (EES, 1995; EES, 1999; Resource Strategies *et al.*, 1997):

1. Waterbird breeding surveys.
2. Collection of environmental data including lake depth, changes in depth, Southern Oscillation Index (SOI), season, and rainfall.
3. Statistical analysis to examine variation in the abundance of breeding birds, and the number and survival of fledglings and the mean number of breeding bird species between years, seasons, lake water cycle and climatic conditions.

11.1.2 Fauna Usage of the Tailings Storages

Section 4 describes the methods that will be utilised to monitor fauna usage of the tailings storages. In summary, the perimeter of the tailings storages will be patrolled twice a day to observe and record fauna usage of the storages and whether deaths or other effects or incidents are occurring. One patrol will be conducted after dawn and the other in the late afternoon. Usage of the tailings storages by bat fauna will also be monitored as described in Section 4.1. Opportunistic observations of fauna usage of the tailings storages will also be recorded (Section 4.1).

11.1.3 Fauna Usage of the Final Void

In accordance with Development Consent Condition 3.8, Barrick has developed a strategy for the long-term land use of its landholdings, which includes long-term management and monitoring of the CGM area including the final void. The strategy has been developed in consultation with NSW Office of Water (NOW), OEH, Bland Shire Council (BSC), CEMCC, and to the satisfaction of the Secretary.

In addition to the long-term land use strategy, a fauna usage monitoring programme of the final void post-mine closure, will be developed in consideration of the fauna monitoring results obtained during construction and operation, relevant scientific literature and research.

11.1.4 Noise and Blasting and Bird Behaviour

The “*Cowal Gold Project 2005 Annual Environmental Management Report*” (Barrick, 2006) includes a summary of bird observation results during the first 10 blasts at the CGM (undertaken in accordance with former requirements of the CGM’s Development Consent). The blast observations included four fauna specialists and were overseen by Dr Peter Gell of the University of Adelaide. Dr Peter Gell has been involved in monitoring and reporting on waterbird populations and breeding activities at Lake Cowal since 1992. The four fauna specialists found that there was no abrupt change in the behaviour of any bird species to any blast and no evidence that any bird perceived any blast (Gell, 2005). Further observations by Dr Gell in 2011 during a blast event identified no discernible reaction to the noise (or other effects) associated with the blast (Gell and Peake, 2011).

Bird breeding/behaviour monitoring will continue to be conducted by a suitably qualified person during the main bird breeding periods each year at the main bird breeding areas of Lake Cowal, as detailed below.

Bird Behaviour Monitoring

In 2013, AMBS (2013) conducted a review of the bird breeding monitoring programme against contemporary fauna survey guidelines. Subsequent to the AMBS review, the monitoring programme was refined for consistency with these contemporary fauna survey guidelines. A summary of the monitoring programme is provided below.

A suitably qualified person will monitor the main bird breeding areas (Figure 8) during the main bird breeding periods from a bird hide or a boat. Parameters that will be monitored include:

- meteorological conditions present at the time of monitoring;
- lake characteristics (e.g. lake depth, percent water coverage of lake and filling phase status);
- vegetation survey data of the transects;
- abrupt changes of bird behaviour as a result of noise (e.g. bird taking flight as a result of a noise stimulus);
- differences in behaviour between different species of birds;
- the number and proportion of birds that take flight if considered to be in response to noise (relative to the total resident population at the time of monitoring);
- the proportion of birds that return if they take flight in response to noise;
- the length of time birds are away if they take flight and the likely impact this would have to hatching and fledging of offspring;
- the degree to which birds develop tolerance to noise levels over time; and
- changes in foraging and breeding patterns in terms of the extent and/or location of foraging and breeding areas.

Possible contingency measures are outlined in Sections 12.4.1.3 and 12.4.1.4 for noise and blasting emissions respectively.

New Lake Foreshore

In accordance with Section 6.5.5 of the EIS (North Limited, 1998a), noise monitoring (and blast overpressure and vibration monitoring) will be undertaken at the New Lake Foreshore to assess any impacts on bird behaviour at variance to EIS predictions. This monitoring will continue to be undertaken once the New Lake Foreshore rehabilitation is well established, post-mining.

11.1.5 Fauna Usage of Rehabilitated Areas

New Lake Foreshore

Waterbird surveys of the New Lake Foreshore will be conducted annually during the main bird breeding periods. The monitoring programme will utilise the existing waterbird survey transect within ML 1535 (Figure 8). Additional survey transects have also been established within the New Lake Foreshore area. The location of transects have been selected in consideration of the vegetative suites that are aimed to be established by the revegetation programme. The monitoring programme will survey waterbird diversity and abundance.

Visual/opportunistic observations of terrestrial fauna (i.e. birds, mammals, amphibians and reptiles) will be conducted by CGM Environmental department personnel of the New Lake Foreshore. Following establishment of the New Lake Foreshore (i.e. breaching of the Temporary Isolation Bund at the completion of mining), survey methodology may include visual and opportunistic observations, active searches, spotlighting, identification of bird calls, identification of amphibian calls, Elliott trapping and electronic call detection. The frequency of monitoring thereafter will be determined in consultation with relevant regulatory agencies. The monitoring programme will be detailed in the CWMP.

Waste Emplacements and Tailings Storage Facilities

A survey of terrestrial fauna (i.e. birds, mammals, amphibians and reptiles) will be conducted of the waste emplacements and tailings storage facilities subsequent to mine closure once revegetation has established. Survey methodology may include visual and opportunistic observations, active searches, spotlighting, identification of bird calls, identification of amphibian calls, Elliott trapping and electronic call detection. The monitoring programme will be developed in consultation with relevant regulatory agencies.

11.1.6 Fauna Usage of the Compensatory Wetland

Waterbird surveys within the Compensatory Wetland will be conducted annually during the main bird breeding periods. A survey transect has been established within the Compensatory Wetland (Figure 8) to survey waterbird diversity and abundance. The location of this transect was selected in consideration of the establishment and progress of any revegetation and natural regeneration.

11.2 FLORA

11.2.1 Revegetation of Rehabilitated Landforms

Waste Emplacements and Tailings Storage Facilities

A comprehensive rehabilitation monitoring programme has been developed for the CGM and is described in detail in the RMP. The annual rehabilitation monitoring programme includes using Ecosystem Function Analysis (EFA) to monitor rehabilitation development and quality.

An overview of the EFA method is provided below as a general guide to the proposed approach to monitoring. EFA is a Commonwealth Scientific and Industrial Research Organisation (CSIRO) developed method used to provide indicators of rehabilitation success and allows the assessment of ecosystem sustainability through the plotting of development trajectories. EFA aims to measure the progression of rehabilitation towards a self-sustaining ecosystem through the assessment of landscape function, vegetation dynamics and habitat complexity.

The Landscape Function Analysis (LFA) component of EFA provides an effective quantitative tool for management and monitoring. Data recorded as part of LFA monitoring is based on landscape processes and focuses on the dynamics of resource mobilisation, transport, deposition, utilisation and loss of soil condition. Parameters assessed as part of LFA monitoring typically include:

- soil cover;
- perennial grass basal cover and canopy cover;
- litter cover, origin and incorporation;

- cryptogam⁵ cover;
- crust condition;
- erosion type and severity;
- amount of deposited material;
- microtopography (surface roughness);
- surface resistance to disturbance; and
- soil type (slake and texture tests).

The vegetation dynamics component provides a quantitative assessment of species composition, density and cover. The habitat complexity component provides an index of the development of available habitats for fauna and includes measurements of vegetation cover, ground habitat (litter, logs, rocks) and the availability of water. The monitoring of habitat complexity is based on the assumption that more environmental niches for fauna develop as the diversity of vegetation and ground cover (e.g. litter) increases.

A number of permanent transects have been established within areas of rehabilitation. Corresponding transects have also been established in adjacent unmined (reference) communities. The reference site information obtained will be used to track rehabilitation progress, predict self-sustainable values and compare the rehabilitation and performance. The location of CGM rehabilitation and reference sites is provided and described in the RMP.

Visual assessments will also be incorporated into the revegetation monitoring programme to allow for the rapid application of remedial actions where necessary.

New Lake Foreshore

As described in the RMP (and CWMP), monitoring will be conducted to determine whether vegetation planted within the New Lake Foreshore is establishing and to determine the need for any maintenance and/or contingency measures (such as the requirement for supplementary plantings, erosion control or weed and pest control).

As described above, EFA will be used to obtain quantitative data on species diversity and abundance at a number of survey plots (50 x 20 m) in the New Lake Foreshore area. Specifically:

- Each flora survey plot will be systematically searched to compile a list of vascular plant species observed within the plot.
- A count will be made of all individuals of each tree and shrub species occurring within the plot.
- The ground layer will be sampled using four permanent 5 x 1 m quadrats, with two quadrats placed at each end of the 50 x 20 m quadrat. Every ground layer species recorded within the 5 x 1 m quadrats will be rated for its percentage cover of the ground.

Visual observations will be made on a regular basis to assess whether plants are growing and to assess the health of planted vegetation.

⁵ Cryptogam is a generic term which includes algae, fungi, lichens, mosses and liverworts. These are plants which can exist on stable surfaces, with access to light, which stabilise and help to protect the soil surface (Tongway and Hindley, 1995).

11.2.2 Monitoring of Flora within the Compensatory Wetland and Remaining Wetland Areas within ML 1535

Monitoring will be conducted to assess the success of the Compensatory Wetland and enhancement of the remaining wetland areas within ML 1535 in improving habitats for wildlife (and thereby enhancing wildlife values). The monitoring methodology will be consistent with the CGM's rehabilitation monitoring programme methodology to provide quantitative data on flora species diversity and abundance using permanent survey plots. Visual observations will also be made on a regular basis to assess whether plants are growing and to assess the health of planted vegetation. The monitoring of flora within the Compensatory Wetland and the remaining wetland areas within ML 1535 is detailed in the CWMP and RMP.

11.2.3 Monitoring of Flora within the RVEP Enhancement and Offset Areas

As described in Section 9.3, four areas containing remnant vegetation and/or Lake Cowal wetland have been selected for enhancement as a component of the RVEP and two offset areas have been selected to offset CGM development impacts (Figure 4). Remnant vegetation monitoring will be conducted within the RVEP enhancement areas and offset areas to assess the progress of natural regeneration and to determine whether vegetation planted within the enhancement areas or offset areas is establishing. A description of the monitoring methods that will be used is provided in Sections 9.3.2 and 11.2.1.

A detailed description of the RVEP is provided in the LMP, and a detailed description of the offset areas and the CGM's Biodiversity Offset Strategy is provided in the BOMP.

11.3 FISH AND AQUATIC INVERTEBRATES

Biological monitoring, including monitoring the CGM's potential impacts on fish and aquatic invertebrates, will be undertaken in accordance with Development Consent Condition 3.2(b)(viii). In accordance with Development Consent Condition 4.5(b), a biological monitoring programme has been developed that will be implemented during the operations phase of the mine. The biological monitoring programme has been developed in consultation with the DPI (Fisheries), NOW and OEH and is detailed in the Surface Water, Groundwater, Meteorological and Biological Monitoring Programme (SWGMBMP). The biological monitoring programme includes monitoring of:

- changes in lake water quality;
- removal/modification of habitat;
- movement of dust away from active areas to lake environs; and
- lake sediment quality.

11.3.1 New Lake Foreshore, Compensatory Wetland and Remaining Wetland Areas within ML 1535

In accordance with the CGM's CWMP, fish fauna and aquatic habitat surveys will be conducted within the New Lake Foreshore, Compensatory Wetland and remaining wetland areas within ML 1535, no more than annually, when the lake is full (i.e. at full storage level). Survey methods may include seine netting; fyke netting; small bait traps; and opera traps.

12 MONITORING OF THE MINE'S IMPACTS ON BIRDLIFE IN BIRD BREEDING AREAS, THREATENED FLORA AND FAUNA, AND FISH AND AQUATIC INVERTEBRATES

Development Consent Condition 3.2(b)(x) requires the FFMP to provide details of monitoring of the mine's impacts on birdlife in bird breeding areas, threatened flora, threatened fauna, fish and aquatic invertebrates around Lake Cowal, and outline contingency measures should impacts be identified as occurring. Accordingly, Section 12.1 outlines potential impacts of the CGM relevant to birdlife in bird breeding areas, threatened flora, threatened fauna, fish and aquatic invertebrates. The programmes developed to monitor the mine's impacts on birdlife in bird breeding areas, threatened flora, threatened fauna, fish and aquatic invertebrates are described in Section 12.2. Section 12.3 describes the assessment of the mine's impacts and Section 12.4 outlines the contingency measures that will be implemented should impacts be identified as occurring.

12.1 POTENTIAL IMPACTS RELEVANT TO BIRDLIFE IN BIRD BREEDING AREAS, THREATENED FLORA AND FAUNA, FISH AND AQUATIC INVERTEBRATES

A list of the potential impacts considered relevant to birdlife in bird breeding areas, threatened flora, threatened fauna, fish and aquatic invertebrates is provided in Table 5. The potential impacts identified in Table 5 will be monitored (Section 12.2), assessed (Section 12.3) and contingency measures proposed in the event impacts are identified as occurring (Section 12.4).

**Table 5
Relevant Potential Impacts**

Category	Relevant Potential Impacts
Birdlife in Bird Breeding Areas	<ul style="list-style-type: none"> • Change in lake water quality • Movement of dust away from active areas to lake environs • Noise and blasting
Threatened Flora	<ul style="list-style-type: none"> • Removal/modification of habitat • Movement of dust away from active areas to lake environs
Threatened Fauna	<ul style="list-style-type: none"> • Change in lake water quality • Removal/modification of habitat • Impacts associated with the tailings storages • Movement of dust away from active areas to lake environs • Noise and blasting • Bird strike and electricity transmission lines • Salinity of the final void
Fish and Aquatic Invertebrates	<ul style="list-style-type: none"> • Change in lake water quality • Removal/modification of habitat • Movement of dust away from active areas to lake environs

Source: North Limited (1998a)

12.2 MONITORING OF THE MINE'S POTENTIAL IMPACTS

Sections 12.2.1 to 12.2.4 describe the monitoring that will be undertaken to assess the mine's impact on birdlife in bird breeding areas, threatened flora, threatened fauna, fish and aquatic invertebrates. In the event that impacts are identified as occurring, appropriate contingency measures will be implemented, as outlined in Section 12.4.

12.2.1 Birdlife in Bird Breeding Areas

As described in Section 11.1.1, baseline survey records (Crome, 1995; Lane, 1989, 1990, 1991abc; EES, 1992-2000; Gell and Peake, 2001; Gell, 2002-2003) indicate that the main bird breeding areas occur in wooded and vegetated parts in northern sections of the lake. Sections 12.2.1.1 to 12.2.1.3 describe the monitoring that will be undertaken to assess potential impacts on birdlife in bird breeding areas, specifically:

- change in lake water quality;
- movement of dust away from active areas to lake environs; and
- noise and blasting.

12.2.1.1 Change in Lake Water Quality

As described in the WMP, a review of available surface water quality monitoring data for the recent Lake Cowal fill event (between 2010 and 2013) was undertaken by Gilbert & Associates (2013) and compared to the (pre-mining) baseline data. The monitoring data review indicated that there is no evidence that the existing CGM has resulted in changes to water quality in Lake Cowal (Gilberts & Associates, 2013).

Notwithstanding, in accordance with Development Consent Condition 4.5(b) water quality of Lake Cowal will continue to be monitored for a number of parameters along the Lake Cowal monitoring transects and at lake inflow sites. Table 6 outlines the monitoring locations, frequency of monitoring and surface water parameters relevant to Lake Cowal that will be monitored in accordance with the surface water monitoring programme described in Section 4.3 of the SWGMBMP.

**Table 6
Lake Cowal Surface Water Monitoring Programme**

CGM Component	Site *	Monitoring Frequency	Parameter/Analyte
Lake Cowal Water Level	Lake Cowal gauge board	Monthly (when lake water is present)	Lake water level.
Lake Cowal Chemical Monitoring	P1, P3, L1, C1	Weekly and following rainfall events of 20 mm or greater in a 24 hour period (when lake water is present and the lake water level is at or above 204.5 m AHD)	Suspended Solids, EC, pH.
	Lake Cowal transect sampling sites: Lachlan Floodway transect – L1, L2, L5, L8, L9, L11 and L13 Irrigation Channel transect – I1, I3 and I4 East Shore transect – E1, E3 and E5 Bland Creek transect – B1, B2, B4 and B6 Project transect – P1 to P3 Control sites transect – C1 to C3	Monthly (when lake water is present and the lake water level is at or above 204.5 m AHD) Quarterly (when lake water is present and the lake water level is at or above 204.5 m AHD)	EC, pH, turbidity, dissolved oxygen, temperature, lake water level. Suspended Solids, Alkalinity, cations and anions. Total Fe, Ca, Mg, K, sodium, chloride, sulphate, total phosphate, ortho phosphate, ammonium, nitrogen as nitrate and nitrite. Total As, Cd, Cu, Mo, Ni, Pb, Sb, Se and Zn. Dissolved As, Cd, Cu, Mo, Ni, Pb, Sb, Se and Zn.

Table 6 (Continued)
Lake Cowal Surface Water Monitoring Programme

CGM Component	Site *	Monitoring Frequency	Parameter/Analyte
Lake Cowal Inflow Sites	Lake inflow sites: Lachlan Floodway, Irrigation Channel, Bland Creek and Sandy Creek inflow sites	Monthly (when lake water is present and the lake water level is at or above 204.5 m AHD)	EC, pH, turbidity, dissolved oxygen, temperature.
		Quarterly (when lake water is present and the lake water level is at or above 204.5 m AHD)	Suspended Solids, Alkalinity, cations, anions. Total Fe, Ca, Mg, K, sodium, chloride, sulphate, total phosphate, ortho-phosphate, ammonium, nitrogen as nitrate and nitrite. Total As, Cd, Cu, Mo, Ni, Pb, Sb, Se and Zn. Dissolved As, Cd, Cu, Mo, Ni, Pb, Sb, Se and Zn.

Source: SWGMBMP

* Refer to Figure 6 in the SWGMBMP for locations.

AHD Australian Height Datum

12.2.1.2 Movement of Dust Away From Active Areas to Lake Environs

Dust deposition levels surrounding the CGM and Lake Cowal will continue to be monitored in accordance with the Air Quality Management Plan (AQMP). The air quality monitoring sites are located both proximal to and distant from the CGM on the lake's eastern shore near bird breeding areas.

12.2.1.3 Noise and Blasting

As described in Section 11.1.4, results of waterbird behaviour monitoring conducted by Professor Gell (and other fauna specialists) found that there was no abrupt change in the behaviour of any bird species to any noise (or other effects) of the first 10 blasts conducted at the CGM and there was no evidence that any bird perceived any blasts (Gell, 2005). Further observations by Professor Gell in 2011 during a blast event identified no discernible reaction by the waterbirds to the noise (or other effects) associated with the blast (Gell and Peake, 2011).

Notwithstanding, bird breeding/behaviour monitoring will continue to be conducted by a suitably qualified person during the main bird breeding periods each year at the main bird breeding areas of Lake Cowal (as detailed in Section 11.1.4) and will continue to include observations of bird behaviour during blast events.

Monitoring results from the CGM's noise and blasting monitoring programmes (as detailed in the Noise Management Plan and Blast Management Plan [BLMP] respectively) will also be used to monitor noise and blasting impacts.

12.2.2 Threatened Flora

Sections 12.2.2.1 and 12.2.2.2 describe monitoring of the mine's potential impacts on threatened flora, specifically, the removal/modification of habitat and the movement of dust away from active areas to lake environs.

12.2.2.1 Removal/Modification of Habitat

Pilularia novae-hollandiae (Austral Pillwort) is a widespread but uncommon, small semi-aquatic perennial fern that grows in seasonally dry depressions, margins of marshes and gilgai country when wet (Bower, 1997). The growth cycle is completed before the depression dries out in Summer (Bower, 1998).

Austral Pillwort consist of long, slender creeping rhizomes just below the surface from which arises the filiform bright green fronds in groups of two or three at intervals of about 1 cm (Harden, 1990; Bower, 1998). This species has been recorded from the Central Coast, Southern Tablelands, and South Western Slopes of NSW (Harden, 1990), and is also known to occur in northern and western Victoria, South Australia and Tasmania (North Limited, 1998a).

The Austral Pillwort was recorded during surveys of the Lake Cowal region by Anne Clements and Associates (1995) from gilgai along the western edge of Lake Cowal within the ML area and along the riparian zone of Bland Creek, 12 km south-east of the CGM area (North Limited, 1998a). At the time of the survey, these findings represented an extension of the known range of *P. novae-hollandiae* in the Central Western Slopes of NSW (Bower, 1997).

It was considered that the collections for *P. novae-hollandiae* in NSW at this time may not have reflected the true abundance of *P. novae-hollandiae* given its relatively short lifecycle (in response to the ephemeral nature of its habitat) and inconspicuous presence (Bower, 1997). A targeted survey for the Austral Pillwort was conducted in November 1998. The survey focused on gilgai depressions in areas proposed to be disturbed by the CGM in the ML. *P. novae-hollandiae* was found to be widespread and relatively abundant in gilgai depressions in the ML (Bower, 1998).

The survey also indicated that *P. novae-hollandiae* is a relatively common inhabitant of gilgai depressions not only in the CGM area but also in much of the gilgai habitat that is found around the Lake Cowal region both to the north and south of the CGM area (Bower, 1998). Similar gilgai habitat occurs widely beyond Lake Cowal and it is therefore likely that *P. novae-hollandiae* is widespread in Central Western NSW. This was supported by survey findings of *P. novae-hollandiae* abundant in a gilgai located 12 km south of Condobolin (*ibid.*).

Bower's 2003 surveys for the Austral Pillwort within the CGM area and surrounds indicate that the species primarily occurs in gilgai areas around the edges of Lake Cowal and on the crest of the ridge situated immediately to the west of Lake Cowal (Bower, 2003).

During 2012-2013, DnA Environmental and AMBS undertook monitoring and targeted surveys for the Austral Pillwort, but did not locate the species within the CGM Extension Modification area (Resource Strategies, 2013).

The CGM will impact on the species through the loss of areas of gilgai habitat. The removal of this habitat in the disturbance areas will result in a small reduction in the local population of *P. Novae-hollandiae*.

Some potential habitat for the Austral Pillwort would be cleared for the CGM Extension Modification, however the potential habitat is in poor condition due to past disturbance, which could be one of many reasons for the species' absence within the CGM Extension Modification area (Resource Strategies, 2013).

The occurrence of the Austral Pillwort within ML 1535 and immediate surrounds not disturbed by the CGM will be monitored annually.

An estimate of the abundance of the Austral Pillwort will be recorded. The location of the Austral Pillwort will also be recorded using a Global Positioning System. Observations of the health of the specimens will also be recorded (e.g. leaf yellowing etc.).

In the event that additional threatened flora are identified within the CGM disturbance areas and/or immediate surrounds during implementation of the VCP, TSMP, flora monitoring surveys and/or general observations, the Threatened Species Management Strategy phase of the TSMP (Appendix A) will be initiated.

A Threatened Species Management Strategy has been developed for the Austral Pillwort and involves the identification of mitigation measures to ameliorate any potential impacts on the threatened species. This phase of the TSMP also involves the provision of a means of measuring and monitoring the relative success of the management strategies employed. Monitoring of any additional threatened flora will be conducted in accordance with the TSMP.

12.2.2.2 Movement of Dust Away from Active Areas to Lake Environs

Dust deposition levels surrounding the CGM and Lake Cowal will continue to be monitored in accordance with the AQMP. The AQMP monitoring programme includes sites located within ML 1535 and near the foreshore of Lake Cowal (i.e. proximal to potential habitat for the Austral Pillwort).

As described in Section 12.2.2.1, annual monitoring for the Austral Pillwort in known/potential habitat areas will continue to be conducted.

12.2.3 Threatened Fauna

Sections 12.2.3.1 to 12.2.3.7 describe the monitoring of the mine's potential impacts on threatened fauna, specifically:

- change in lake water quality;
- removal/modification of habitat;
- impacts associated with the tailings storages;
- movement of dust away from active areas to lake environs;
- noise and blasting;
- bird strike and electricity transmission lines; and
- salinity of the final void.

12.2.3.1 Change in Lake Water Quality

Water quality of Lake Cowal will be monitored for a number of parameters along the Lake Cowal monitoring transects and at lake inflow sites in accordance with the SWGMBMP. Table 6 outlines the monitoring locations, frequency of monitoring and surface water parameters that will be monitored.

12.2.3.2 Removal/Modification of Habitat

In the event that threatened fauna species are identified within the CGM disturbance areas and/or immediate surrounds during implementation of the VCP, TSMP, fauna surveys and/or general observations, the Threatened Species Management Strategy phase of the TSMP will be initiated (refer Section 9.7).

The Threatened Species Management Strategy phase of the TSMP involves the identification of mitigation measures to ameliorate any potential impacts on the threatened fauna species. This phase of the TSMP also involves provision of a means of measuring and monitoring the relative success of the management strategies employed. Monitoring of any threatened fauna species will be conducted in accordance with the TSMP.

12.2.3.3 Impacts Associated with the Tailings Storages

Section 4 describes the methods that will be utilised to monitor fauna usage of the tailings storages. In summary, the perimeter of the tailings storages will be patrolled twice a day to observe and record fauna usage of the storages and whether deaths or other effects or incidents are occurring. One patrol will be conducted after dawn and the other in the late afternoon. Usage of the tailings storages by bat fauna will also be monitored as described in Section 4.1. Opportunistic observations of fauna usage of the tailings storages will also be recorded (Section 4.1).

12.2.3.4 Movement of Dust Away from Active Areas to Lake Environs

Dust deposition levels surrounding the CGM and Lake Cowal will continue to be monitored in accordance with the AQMP.

12.2.3.5 Noise and Blasting

Bird breeding/behaviour monitoring will continue to be conducted by a suitably qualified person during the main bird breeding periods each year at the main bird breeding areas of Lake Cowal (as detailed in Section 11.1.4) and will continue to include observations of bird behaviour (including threatened fauna) during blast events.

In addition to bird breeding/behaviour monitoring, visual and opportunistic monitoring will be conducted within the CGM including the New Lake Foreshore, Compensatory Wetland and remaining wetland areas within ML 1535 as described in Section 11.1.5 and the CWMP.

12.2.3.6 Bird Strike and Electricity Transmission Lines

Incidental observations of fauna activity within ML 1535 will be documented during weekly inspections of ML 1535. The monitoring programme will record any deaths or other incidents involving native fauna.

12.2.3.7 Salinity of the Final Void

As described in Section 11.1.3, a monitoring programme will be developed to monitor fauna usage (including threatened fauna) of the final void. The fauna usage monitoring programme of the final void post-mine closure, will be developed in consideration of the fauna monitoring results obtained during construction and operation, relevant scientific literature and research.

12.2.4 Fish and Aquatic Invertebrates

Sections 12.2.4.1 to 12.2.4.4 describe the monitoring of the mine's potential impacts on fish fauna and aquatic invertebrates, specifically, changes in water quality, the removal/modification of habitat and the movement of dust away from active areas to lake environs and monitoring of sediment taken from lake monitoring points.

12.2.4.1 *Change in Lake Water Quality*

Water quality of Lake Cowal will be monitored for a number of parameters along the Lake Cowal monitoring transects and at lake inflow sites in accordance with the SWGMBMP. Table 6 outlines the monitoring locations, frequency of monitoring and surface water parameters that will be monitored.

The default high conservation/ecological value protection level triggers (including the 99% protection level for toxicants) provided in ANZECC and ARMCANZ (2000) will be used to trigger surface water investigations, as described in Section 8 of the SWGMBMP.

Water quality monitoring will also be undertaken during the fish fauna and aquatic habitat surveys of the Compensatory Wetland, New Lake Foreshore and the remaining wetland areas within ML 1535.

12.2.4.2 *Removal/Modification of Habitat*

The impact of removal/modification of habitat on fish fauna and aquatic invertebrates will be monitored in accordance with the CWMP, as described below (and via surface water monitoring programme outlined in Table 6 and described in Section 4.3 of the SWGMBMP).

Compensatory Wetland Management Plan

Revegetation concepts for the New Lake Foreshore have been designed to improve habitats for wildlife including fish fauna and aquatic invertebrates (refer Section 6.4.2 of the CWMP). Further to the rehabilitation of the New Lake Foreshore, the CWMP also includes wetland enhancement initiatives to improve existing habitats for fish fauna and aquatic invertebrates, namely the Compensatory Wetland and enhancement of wetland areas in the remaining areas of ML 1535 (refer Section 6.2 of the CWMP for detail).

A monitoring programme will be implemented to assess the success of the wetland rehabilitation (i.e. New Lake Foreshore) and enhancement measures (i.e. Compensatory Wetland and remaining areas of wetland in ML 1535) in improving wetland habitats for fish fauna and aquatic invertebrates.

Fish fauna and aquatic habitat surveys will be conducted within the Compensatory Wetland, New Lake Foreshore and remaining wetland areas within ML 1535, no more than annually, when the lake is full (i.e. when the lake water level is at or above 204.5 m AHD) to assess fish fauna usage of these areas. Monitoring will also be conducted to assess natural regeneration and the progress of revegetation in the wetland areas (Section 11.2.2).

12.2.4.3 *Movement of Dust Away from Active Areas to Lake Environs*

Dust deposition levels surrounding the CGM and Lake Cowal will continue to be monitored in accordance with the AQMP. Results from the AQMP air quality monitoring programme will be reviewed in conjunction with the surface water monitoring programme results and lake sediment monitoring programme results (Section 12.2.4.4).

12.2.4.4 *Lake Sediments*

Analyses of sediment taken from lake monitoring points will be undertaken to assess the bio-availability of metals within the bed of Lake Cowal. The water quality monitoring programme and sediment monitoring programme will combine to provide data relevant to the bio-availability of metals.

The sediment monitoring will be relevant to potential surface water quality and dust deposition impacts, and will be undertaken during lake “dry” and “wet” periods (when the lake water level is at or above 204.5 m AHD), where practicable⁶.

A detailed description of the sediment monitoring programme is provided in the biological monitoring programme component of the SWGMBMP.

Biological monitoring results will be interpreted and reported in the Annual Review (Section 17) which will be made available on Barrick’s website in accordance with Development Consent Condition 9.4(a)(vii).

12.3 ASSESSMENT OF MONITORING RESULTS

Sections 12.3.1 to 12.3.4 describe how the mine’s impact on birdlife in bird breeding areas, threatened flora, threatened fauna, fish and aquatic invertebrates will be assessed.

12.3.1 Birdlife in Bird Breeding Areas

12.3.1.1 Change in Lake Water Quality

As described in Section 12.2.1.1, a detailed surface water quality monitoring programme has been developed for the CGM. Monitoring results from the surface water quality monitoring programme will be reviewed and analysed in the manner presented in the SWGMBMP. The results will be utilised to assess the occurrence of water quality changes in the lake.

Monitoring results will be reviewed in accordance with the procedure set out in Section 8.4 of the SWGMBMP. The review procedure will involve validation of data, management of data, analysis and investigation, and where necessary development of ameliorative measures.

The investigation will involve the consideration of the monitoring results in conjunction with site activities being undertaken at the time, water quality results in nearby locations, the prevailing and preceding meteorological conditions and changes to the land use/activities being undertaken in the contributing catchment. The scope and timeframe of the investigation will be developed in consultation with the relevant authorities. The results of the investigations will be presented to the relevant regulator and the CGM’s Independent Monitoring Panel (IMP) and CEMCC within the agreed timeframe.

In the event that the CGM is found to be impacting on water quality, contingency measures will be implemented, as described in Section 12.4.1.1.

12.3.1.2 Movement of Dust Away From Active Areas to Lake Environs

As described in Section 12.2.1.2, a detailed air quality monitoring programme has been developed for the CGM. The air quality monitoring results will be reviewed in accordance with the Compliance Assessment Protocol described in Section 9 of the AQMP.

⁶ Given the ephemeral nature of Lake Cowal, sediment monitoring will not be possible at all times. For example, sediment monitoring will not be possible when the water level within the lake does not permit access or sediment cores to be taken safely.

The protocol includes assessment of the dust deposition monitoring programme results against EPA and Development Consent air quality impact assessment criteria (as detailed in the AQMP).

In the event the impact assessment criteria for dust deposition is exceeded at monitoring sites located in the immediate Lake Cowal surrounds, an assessment will be conducted to determine possible reasons for the exceedance (e.g. can the exceedance be attributed directly to the CGM). This will include consideration of (but not be limited to):

- meteorological factors;
- exclusion of the combustible fractions of the dust samples;
- CGM mining activities at the approximate time of the exceedance; and
- other potential factors (including agricultural activities that may have occurred at the approximate time of the exceedance).

If the assessment determines the impact assessment criteria for dust deposition is exceeded as a result of CGM activities, contingency measures will be implemented to minimise dust emissions (Section 12.4.1.2).

12.3.1.3 Noise and Blasting

As described in Section 12.2.1.3, bird breeding/behaviour monitoring will continue to be conducted by a suitably qualified person during the main bird breeding periods each year at the main bird breeding areas of Lake Cowal and will continue to include observations of bird behaviour (including threatened fauna) during blast events.

If a suitably qualified person observes an adverse reaction as a result of noise or blasting operations at the CGM, a review of contingency measures outlined in Sections 12.4.1.3 and 12.4.1.4 for noise and blasting respectively, will be undertaken and implemented as appropriate.

12.3.2 Threatened Flora

12.3.2.1 Removal/Modification of Habitat

A suitably qualified person will, on the basis of the results of the monitoring outlined in Section 12.2.2.1, experience and literature research, come to an opinion as to whether the removal/modification of habitat is impacting on threatened flora (e.g. during VCP works). If, at any time, a suitably qualified person determines that impacts are occurring, contingency measures will be implemented. Possible contingency measures are outlined in Section 12.4.2.1.

12.3.2.2 Movement of Dust Away From Active Areas to Lake Environs

As described in Section 12.2.2.2, a detailed air quality monitoring programme has been developed for the CGM. The air quality monitoring results will be reviewed in accordance with the Compliance Assessment Protocol described in Section 9 of the AQMP. The Compliance Assessment Protocol is described in Section 12.3.1.2.

If, at any time during the monitoring programme described in Section 12.2.2.2, a suitably qualified person determines that adverse impacts are occurring to threatened flora due to dust deposition from CGM operations, a review of contingency measures outlined in 12.4.2.2 will be undertaken and implemented as appropriate.

12.3.3 Threatened Fauna

12.3.3.1 Change in Lake Water Quality

Surface water quality monitoring results will be reviewed in accordance with the procedure set out in Section 8.4 of the SWGMBMP. The review procedure will involve validation of data, management of data, analysis and investigation, and where necessary development of ameliorative measures.

The investigation will involve the consideration of the monitoring results in conjunction with site activities being undertaken at the time, water quality results in nearby locations, the prevailing and preceding meteorological conditions and changes to the land use/activities being undertaken in the contributing catchment. The scope and timeframe of the investigation will be developed in consultation with the relevant authorities. The results of the investigations will be presented to the relevant regulator and the IMP and CEMCC within the agreed timeframe.

In the event that the CGM is found to be impacting on water quality, contingency measures will be implemented, as described in Section 12.4.3.1.

12.3.3.2 Removal/Modification of Habitat

A suitably qualified person will, on the basis of the results of the monitoring outlined in Section 12.2.3.2, experience and literature research, come to an opinion as to whether the removal/modification of habitat is impacting on threatened fauna. If, at any time during the monitoring programme, a suitably qualified person determines that impacts are occurring, contingency measures will be implemented. Possible contingency measures are outlined in Section 12.4.3.2.

12.3.3.3 Impacts Associated with the Tailings Storage Facilities

In the event that fauna incidents or deaths are recorded during monitoring of the tailings storages, the Protocol for identifying and responding to any deaths or other incidents involving fauna on the ML will be initiated (as detailed in Section 6). This procedure will be utilised to assess whether the tailings storages are impacting on threatened fauna. In the event impacts are identified as occurring, contingency measures will be implemented (Section 12.4.3.3).

12.3.3.4 Movement of Dust Away From Active Areas to Lake Environs

As described in Section 12.2.3.4, a detailed air quality monitoring programme has been developed for the CGM. The air quality monitoring results will be reviewed in accordance with the Compliance Assessment Protocol described in Section 9 of the AQMP and as summarised in Section 12.3.1.2.

If the assessment determines the impact assessment criteria for dust deposition are exceeded as a result of CGM activities, contingency measures will be implemented to minimise dust emissions (Section 12.4.3.4).

In addition, if, at any time during the fauna monitoring programmes described in Section 11.1, a suitably qualified person determines that adverse impacts are occurring to threatened fauna due to dust deposition from CGM operations, a review of contingency measures outlined in 12.4.3.4 will be undertaken and implemented as appropriate.

12.3.3.5 Noise and Blasting

As described in Section 12.2.3.5, bird breeding/behaviour monitoring will be conducted by a suitably qualified person during the main bird breeding periods each year at the main bird breeding areas of Lake Cowal and will continue to include observations of bird behaviour (including threatened fauna) during blast events.

If a suitably qualified person observes an adverse reaction as a result of noise or blasting operations at the CGM, a review of contingency measures outlined in Sections 12.4.3.5 and 12.4.3.6 for noise and blasting, respectively, will be undertaken and implemented as appropriate.

12.3.3.6 Bird Strike and Electricity Transmission Lines within ML 1535

In the event that fauna incidents or deaths are recorded during the weekly inspections of the ML, the Protocol for identifying and responding to any deaths or other incidents involving fauna on the ML will be initiated (as described in Section 6). This procedure will be utilised to assess whether the electricity transmission lines are impacting on threatened fauna. In the event impacts are identified as occurring, contingency measures will be implemented (Section 12.4.3.7).

12.3.3.7 Salinity of the Final Void

A suitably qualified person will, on the basis of the results of the post-mine closure monitoring programme outlined in Section 12.2.3.7, experience and literature research, come to an opinion as to whether the salinity of the final void is impacting on threatened fauna.

If, at any time during the monitoring programme, a suitably qualified person determines that impacts are occurring, contingency measures will be implemented. Possible contingency measures are outlined in Section 12.4.3.8.

12.3.4 Fish and Aquatic Invertebrates

12.3.4.1 Change in Lake Water Quality

Surface water quality monitoring results will be reviewed in accordance with the procedure set out in Section 8.4 of the SWGMBMP.

The investigation will involve the consideration of the monitoring results in conjunction with site activities being undertaken at the time, water quality results in nearby locations, the prevailing and preceding meteorological conditions and changes to the land use/activities being undertaken in the contributing catchment. The scope and timeframe of the investigation will be developed in consultation with the relevant authorities. The results of the investigations will be presented to the relevant regulator and the IMP and CEMCC within the agreed timeframe.

In the event that the CGM is found to be impacting on water quality, ameliorative/contingency measures will be implemented, as described in Section 12.4.4.1.

12.3.4.2 *Removal/Modification of Habitat*

A suitably qualified person will, on the basis of the results of the monitoring outlined in Section 12.2.4.2, experience and literature research, come to an opinion as to whether the removal/modification of habitat is impacting on fish fauna and aquatic invertebrates. If, at any time during the monitoring programme, a suitably qualified person determines that adverse impacts are likely occurring, contingency measures will be implemented. Possible ameliorative/contingency measures are outlined in Section 12.4.4.2.

12.3.4.3 *Movement of Dust Away From Active Areas to Lake Environs*

As described in Section 12.2.4.3, a detailed air quality monitoring programme has been developed for the CGM. The air quality monitoring results will be reviewed in accordance with the Compliance Assessment Protocol described in Section 9 of the AQMP and as summarised in Section 12.3.1.2.

The protocol includes assessment of the dust deposition monitoring programme results against EPA and Development Consent air quality criteria (as detailed in the AQMP). The assessment results will be considered with results of the surface water monitoring programme and lake sediment monitoring programme.

If the assessment determines the impact assessment criteria for dust deposition are exceeded as a result of CGM activities, contingency measures will be implemented to minimise dust emissions (Section 12.4.4.3).

12.3.4.4 *Lake Sediments*

The concentration of metals in sediment taken from lake monitoring points will be assessed against the recommended sediment quality guidelines defined in ANZECC and ARMCANZ (2000) and presented in Section 8.3.1.4 of the SWGMBMP.

If the trigger values defined in the SWGMBMP are exceeded, a preliminary assessment will be conducted and will include consideration of previous monitoring results collected during baseline and mine operations phase monitoring programmes, site activities being undertaken at the time, surface water quality monitoring results from Lake Cowal transect sampling sites and lake inflow sites and contained water storages D1 and D4, monitoring results from dust deposition gauges in and around the lake, the prevailing and preceding meteorological conditions and changes to the land use/activities being undertaken in the contributing catchment.

If the preliminary assessment shows that impacts may be potentially associated with the CGM, further investigation will be conducted in accordance with the methodology described in Section 3.5.5 of ANZECC and ARMCANZ (2000) to assess the need and type of ameliorative/contingency measures. The scope and timeframe of the investigation will be developed in consultation with the relevant authorities (e.g. requirement for toxicity testing).

12.4 **CONTINGENCY MEASURES**

In the event that assessment of the monitoring results (Section 12.3) indicates that impacts are occurring on birdlife in bird breeding areas, threatened flora, threatened fauna, fish or aquatic invertebrates, contingency measures will be implemented as appropriate. Possible contingency measures are described below.

12.4.1 Impacts on Birds in Bird Breeding Areas

12.4.1.1 *Change in Lake Water Quality*

Contingency measures will be developed in consultation with the relevant authorities based on the results of the investigative process outlined in Section 8.4 of the SWGMBMP.

12.4.1.2 *Movement of Dust Away from Active Areas to Lake Environs*

Based on the results of the dust deposition criteria assessment described in Section 12.3.1.2, contingency measures will be implemented to minimise dust emissions from the CGM. Dust control, management and modification measures to be adopted will be selected with consideration of:

- mine activities scheduled for the next phase of operation;
- possible reasons for previous elevated dust levels;
- additional modifications in the form of control methods or operational changes which could be adopted;
- control equipment that will be utilised; and
- the location of current and future dust generating activities.

As described in the AQMP, potential dust control/management measures include:

- increased watering of exposed surfaces via water trucks or other methods as required;
- exposed active work areas on waste emplacement surfaces will be watered to suppress dust where practicable; and
- the temporary cessation of ancillary or non essential on-site dust generating activities (e.g. soil stripping).

12.4.1.3 *Noise*

In the event that a suitably qualified person observes an adverse reaction as a result of noise emissions from the CGM during monitoring of bird breeding/behaviour (Section 12.3.1.3), a review of suitable contingency measures will be undertaken and implemented as appropriate.

Contingency measures may include:

- restricting movement of trucks on ridgelines and exposed haul routes where their noise can propagate over a wide area, especially at night;
- scheduling the use of noisy equipment during the daytime;
- siting noisy equipment behind structures that act as barriers, or at the greatest distance from the noise sensitive area;
- orienting equipment so that noise emissions are directed away from any sensitive areas, to achieve maximum attenuation of noise;
- scheduling operations so that noisy equipment items are used separately rather than concurrently;
- keeping equipment well maintained;

- employing ‘quiet’ practices when operating equipment (e.g. positioning idling trucks in appropriate areas);
- adjusting reversing alarms on heavy equipment to make them ‘smarter’, limiting acoustic range to the immediate danger area;
- using equipment with efficient mufflers and using quieter engines (such as electric instead of internal combustion);
- using high-pressure hydraulic systems to split rock instead of hydraulic or pneumatic hammers; and/or
- damping or lining metal trays.

12.4.1.4 *Blasting*

In the event that a suitably qualified person observes an adverse reaction as a result of blasting emissions from the CGM during monitoring of bird behaviour and breeding (12.3.1.3), a review of relevant contingency measures will be undertaken and implemented as appropriate. Possible contingency measures that could be adopted are outlined in Table 7 (as described in the BLMP).

**Table 7
Airblast Overpressure Contingency Measures**

Contingency Measure	Summary Description of Effect
Reduce the MIC or charge mass per delay, to the lowest possible level.	The level of airblast is inversely proportional to the MIC, the lower the MIC the lower the airblast.
Keep face heights to a practical minimum.	As the face height determines the blast hole depth and therefore in turn the MIC, reducing the bench height consequently reduces the MIC.
Ensure stemming type and length is adequate.	Use a stemming length of no less than the burden dimension and use aggregate of an appropriate size which “locks” in the blast hole to prevent the escape of the gases from the explosives.
Eliminate exposed detonating cord. Investigate alternative initiation methods.	Detonating cord has a very high velocity of detonation generating high airblast levels. NONEL initiation “burns internally” and does not contribute to the airblast level from blasting.
Eliminate secondary blasting (instead of popping, use rock breaker or drop hammer).	Secondary blasting of oversize rock should be minimised as the explosives are less confined which may result in high airblast levels.
Reduce the need for toe shots (e.g. better control of drill patterns).	Drill the blast holes below the level of the bench floor (subdrill) so that no rock is left at the base of the blast bench (toe).
Orientate faces where possible so that they do not face directly towards residences.	The forward movement of the blast face generates the major component of airblast so orientate the face away from receivers where possible.
Ensure that all delays are designed to eliminate wave front reinforcement.	Design the detonator delay sequence to provide at least 8 ms between the blast holes on a given delay time to avoid overlap.
Vary the direction of initiation.	Airblast levels are reinforced in the direction of initiation of the detonators. Orientate initiation direction away from receivers.
Exercise strict control over the burden, spacing and orientation of all blast drill holes.	Less than design burden and spacing (i.e. reduced rock cover) facilitates “blow outs” resulting in high airblast levels.
Take particular care where the face is already broken or where it is strongly jointed, sheared, or faulted.	This requires either “lighter” charging or “decking” with an inert material across the respective zones in order to avoid blowouts resulting in high airblast levels.
Consider deck loading where appropriate to avoid broken ground or cavities in the face (e.g. from back break).	Decking refers to separating explosives within a blast hole using an inert material, usually stemming (see above).

After: AS 2187.2; EPA (pers. comm., 5 May, 2003) and Richard Heggie Associates (pers. comm., 25 July 2003)

12.4.2 Impacts on Threatened Flora

12.4.2.1 Removal/Modification of Habitat

In the event the assessment of monitoring results indicates the removal/modification of habitat is impacting on threatened flora (Section 12.3.2.1), contingency measures will be implemented. Possible contingency measures include:

- trialling the establishment of the species in the rehabilitation and/or enhancement programmes;
- relocation of individuals away from the disturbance area to suitable habitat (if considered feasible); and
- modification of the area to be disturbed.

The contingency measures would be developed in consultation with the OEHL, prior to implementation.

12.4.2.2 Movement of Dust Away from Active Areas to Lake Environs

In the event that a suitably qualified person, on the basis of the monitoring outlined in Section 12.2.2.2, comes to an opinion that dust deposition emissions from the CGM are adversely impacting known or potential habitat of threatened flora, a review of relevant contingency measures will be undertaken and implemented as appropriate. Dust control, management and modification measures to be adopted will be selected with consideration of:

- mine activities scheduled for the next phase of operation;
- possible reasons for previous elevated dust levels;
- additional modifications in the form of control methods or operational changes which could be adopted;
- control equipment that will be utilised; and
- the location of current and future dust generating activities.

Potential measures include:

- increased watering of exposed surfaces via water trucks or other methods as required;
- exposed active work areas on waste emplacement surfaces will be watered to suppress dust where practicable; and
- the temporary cessation of ancillary or non essential on-site dust generating activities (e.g. soil stripping).

12.4.3 Impacts on Threatened Fauna

12.4.3.1 Change in Lake Water Quality

Contingency measures will be developed in consultation with the relevant authorities based on the results of the investigative process outlined in Section 8.4 of the SWGMBMP.

12.4.3.2 *Removal/Modification of Habitat*

In the event the assessment of monitoring results indicates the removal/modification of habitat is impacting on threatened fauna (Section 12.3.3.2), contingency measures will be implemented. Possible contingency measures primarily relate to the establishment and/or provision of additional habitat resources for the species in suitable areas, such as the:

- placement of nesting boxes in suitable habitat for birds and arboreal mammals;
- placement of roosting boxes in suitable habitat for bats;
- planting of additional foraging resources, which may include native trees, shrubs and grasses; and
- planting of hollow-developing tree species.

Contingency measures will be developed in consultation with the OEH, prior to implementation.

12.4.3.3 *Impacts Associated with the Tailings Storages*

In the event it is determined that the tailings storages are impacting on threatened fauna, the mechanisms employed to keep fauna and avifauna away from the tailings storages (Section 3) will be reviewed and improved where practicable.

If it is determined that the mechanisms cannot be improved or revised in a reasonable timeframe, a number of additional deterrence mechanisms will be considered, namely (North Limited, 1998a,b):

- Electronic Bird Deterrents – the use of constantly changing (to reduce habituation) audible and ultrasonic sounds at distress call frequencies to create a zone that birds dislike and avoid.
- Electronic Bat Deterrents - the strategic placement of sensor-activated units to emit bursts of ultrasound to “jam” echolocation signals of microchiropteran bats.
- Visual deterrents – such as scarecrows that move in the breeze, large hawk eyes mounted on poles of varying heights that move in the breeze, large balls to cover the tailings storage surface, and flash tape tied to various structures that flap in the breeze.

12.4.3.4 *Movement of Dust Away from Active Areas to Lake Environs*

In the event that a suitably qualified person, on the basis of the monitoring outlined in Section 12.2.3.4, comes to an opinion that dust deposition emissions from the CGM are adversely impacting threatened fauna, a review of relevant contingency measures will be undertaken and implemented as appropriate.

Dust control, management and modification measures to be adopted will be selected with consideration of:

- mine activities scheduled for the next phase of operation;
- possible reasons for previous elevated dust levels;
- additional modifications in the form of control methods or operational changes which could be adopted;
- control equipment that will be utilised; and
- the location of current and future dust generating activities.

Potential measures include:

- increased watering of exposed surfaces via water trucks or other methods as required;
- exposed active work areas on waste emplacement surfaces will be watered to suppress dust where practicable; and
- the temporary cessation of ancillary or non essential on-site dust generating activities (e.g. soil stripping).

12.4.3.5 *Noise*

In the event that a suitably qualified person observes an adverse reaction as a result of noise emissions from the CGM during monitoring of threatened fauna (Section 12.3.3.5), a review of relevant contingency measures will be undertaken and implemented as appropriate. Contingency measures may include:

- restricting movement of trucks on ridgelines and exposed haul routes where their noise can propagate over a wide area, especially at night;
- scheduling the use of noisy equipment during the daytime;
- siting noisy equipment behind structures that act as barriers, or at the greatest distance from the noise sensitive area;
- orienting equipment so that noise emissions are directed away from any sensitive areas, to achieve maximum attenuation of noise;
- scheduling operations so that noisy equipment items are used separately rather than concurrently;
- keeping equipment well maintained;
- employing 'quiet' practices when operating equipment (e.g. positioning idling trucks in appropriate areas);
- adjusting reversing alarms on heavy equipment to make them 'smarter', limiting acoustic range to the immediate danger area;
- using equipment with efficient mufflers and using quieter engines (such as electric instead of internal combustion);
- using high-pressure hydraulic systems to split rock instead of hydraulic or pneumatic hammers; and/or
- damping or lining metal trays.

12.4.3.6 *Blasting*

In the event that a suitably qualified person observes an adverse reaction as a result of noise emissions from the CGM during monitoring of threatened fauna (Section 12.3.3.5), a review of relevant contingency measures will be undertaken and implemented as appropriate. Possible contingency measures are provided in Section 12.4.1.4 (Table 7).

12.4.3.7 *Bird Strike and Electricity Transmission Lines within ML 1535*

In the event it is determined that the electricity transmission lines located within ML 1535 are impacting on threatened fauna, contingency measures will be implemented. Possible contingency measures include:

- The use of bird diverters (such as orange PVC balls), mechanical devices which work by visually breaking the horizon line and thereby alerting birds to the position of the electricity transmission line conductors and earth cables.
- The use of fast-growing trees along the electricity transmission line to create a visual screen and barrier to bird flight.

12.4.3.8 *Salinity of the Final Void*

If it is determined that the salinity of the final void is impacting on threatened fauna (Section 12.3.3.7), contingency measures will be implemented. Possible contingency measures include:

- Wildlife exclusion fence - to exclude small, medium or large terrestrial or amphibian fauna from entering the final void area.
- Electronic bat deterrents - the strategic placement of sensor-activated units to emit bursts of ultrasound to “jam” echolocation signals of microchiropteran bats.

Additional methods to reduce the impact of the final void salinity on threatened fauna species will be considered as new technologies are developed.

12.4.4 Impacts on Fish and Aquatic Invertebrates

12.4.4.1 *Change in Lake Water Quality*

Contingency measures will be developed in consultation with the relevant authorities based on the results of the investigative process outlined in Section 8.4 of the SWGMBMP.

12.4.4.2 *Removal/Modification of Habitat*

In the event the assessment of monitoring results indicates the removal/modification of habitat is impacting on fish fauna and/or aquatic invertebrates (Section 12.3.4.2), contingency measures will be implemented. Possible contingency measures primarily relate to the establishment and/or provision of additional habitat resources for fish and aquatic invertebrates, such as the:

- provision of structural habitat (such as root balls, logs and tree limbs) onto the bed of the lake to provide shelter, feeding and breeding sites for fish; and
- planting of additional forage resources (such as aquatic macrophytes) in wetland areas.

Contingency measures will be developed in consultation with the relevant authorities.

12.4.4.3 *Movement of Dust Away from Active Areas to Lake Environs*

Based on the results of the dust deposition criteria assessment described in Section 12.3.4.3, contingency measures will be implemented to minimise dust emissions from the CGM. Dust control, management and modification measures to be adopted will be selected with consideration of:

- mine activities scheduled for the next phase of operation;
- possible reasons for previous elevated dust levels;
- additional modifications in the form of control methods or operational changes which could be adopted;
- control equipment that will be utilised; and
- the location of current and future dust generating activities.

Potential measures include:

- increased watering of exposed surfaces via water trucks or other methods as required;
- exposed active work areas on waste emplacement surfaces will be watered to suppress dust where practicable; and
- the temporary cessation of ancillary or non essential on-site dust generating activities (e.g. soil stripping).

13 MINE CLOSURE AND LEASE RELINQUISHMENT

Upon the cessation of mining operations, tenure of ML 1535 would be maintained by Barrick until such a time when lease relinquishment criteria have been met and rehabilitation is to the satisfaction of relevant regulatory authorities including the DRE and the DP&E. It is anticipated that lease relinquishment criteria would include:

- Rehabilitated landforms are stable and consistent with the nominated post-mining land use which has been developed in consultation with relevant regulatory agencies and key stakeholders.
- The water quality of Lake Cowal has not been detrimentally affected by the final landforms.
- Rehabilitated final landforms are indicative of a landscape on a trajectory towards a self-sustaining ecosystem and comprise self-sustaining native and/or endemic species characteristic of remnant vegetation communities in the surrounding landscape.
- All Mining Lease conditions (including public safety considerations) have been satisfied.
- Hard-stand areas and infrastructure have been removed (unless otherwise agreed with the ultimate landholder).

In accordance with Development Consent Condition 3.8, a long-term land use strategy has been developed for the CGM and is relevant to land within ML 1535, the Bland Creek Palaeochannel water supply pipeline and borefield, the Eastern Saline Borefield and Barrick-owned land outside ML 1535.

The long-term land use strategy provides a description of:

- the proposed long-term land uses;
- the potential environmental impacts associated with the proposed long-term land uses; and
- the long-term management measures (to mitigate potential environmental impacts).

The long-term land use strategy has been developed in consultation with NOW, OEH, BSC, CEMCC, and to the satisfaction of the Secretary and is described in detail in the RMP.

14 COMPLAINTS REGISTER

A complaints register will be maintained by the Community Relations Manager in accordance with Environment Protection Licence Condition M5.1.

Information recorded in the complaints register with respect to each complaint will include:

- date of complaint;
- the method by which the complaint was made;
- nature of complaint; and
- response action taken to date (if no action was taken, the reasons why no action was taken).

An initial response will be provided to the complainant within 24 hours. Preliminary investigations into the complaint will commence within 48 hours of complaint receipt.

A summary of the complaints register will be displayed on the Barrick website in accordance with Development Consent Condition 9.4(a)(v) and will be updated on a monthly basis.

Dispute Resolution

In the event that dispute resolution is necessary, the resolution process will be one of informed discussion involving the complainant and Barrick. Barrick may also refer the dispute (with the complainant's agreement) to the CGM's CEMCC for mediation. In the event that the complainant is still dissatisfied, the matter may be referred to the DP&E for consideration of further measures. Every effort will be made to ensure that concerns are addressed in a manner that results in a mutually acceptable outcome.

15 COMMUNITY CONSULTATION

Community Environmental Monitoring and Consultative Committee (CEMCC)

A CEMCC has been established for the CGM in accordance with Development Consent Condition 9.1(d). Development Consent Condition 9.1(d) is reproduced below:

9.1 Environmental Management

(d) *Community Environmental Monitoring and Consultative Committee*

(i) *The Applicant shall establish and operate a Community Environmental Monitoring and Consultative Committee (CEMCC) for the development to the satisfaction of the Secretary. This CEMCC must:*

- *be comprised of an independent chair and at least 2 representatives of the Applicant, 1 representative of BSC, 1 representative of the Lake Cowal Environmental Trust (but not a Trust representative of the Applicant), 4 community representatives (including one member of the Lake Cowal Landholders Association);*
- *be operated in general accordance with the Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects (Department of Planning, 2007, or its latest version).*
- *monitor compliance with conditions of this consent and other matters relevant to the operation of the mine during the term of the consent.*

Note: The CEMCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Applicant complies with this consent.

(ii) *The Applicant shall establish a trust fund to be managed by the Chair of the CEMCC to facilitate the functioning of the CEMCC, and pay \$2000 per annum to the fund for the duration of gold processing operations. The annual payment shall be indexed according to the Consumer Price Index (CPI) at the time of payment. The first payment shall be made by the date of the first Committee meeting. The Applicant shall also contribute to the Trust Fund reasonable funds for payment of the independent Chairperson, to the satisfaction of the Secretary*

As required, the CEMCC is comprised of:

- four community representatives (including one member of the Lake Cowal Landholders Association);
- one representative of the Lake Cowal Foundation;
- one representative of the Wiradjuri Condobolin Corporation;
- one representative of the BSC;
- an independent chairperson; and
- two representatives of Barrick.

The CEMCC will continue to provide opportunities for members of the community to attend CEMCC meetings to discuss specific issues relevant to them, including flora and fauna related issues. This will be achieved by landholders making a request to the CEMCC regarding a particular issue, or by the landowner registering a complaint in the complaints register. Landowners who register complaints may be invited to join in discussion of the issue at the next CEMCC meeting.

16 INDEPENDENT ENVIRONMENTAL AUDIT AND INDEPENDENT MONITORING PANEL

Independent Environmental Audit

An Independent Environmental Audit (IEA) will be conducted in accordance with Development Consent Condition 9.2(a). Development Consent Condition 9.2(a) is reproduced below:

9.2 Independent Auditing and Review

(a) Independent Environmental Audit

- (i) *By the end of July 2016, and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:*
- *Be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;*
 - *Include consultation with relevant regulatory agencies, BSC and CEMCC;*
 - *Assess the environmental performance of the development and assess whether it is complying with the requirements in this consent and any other relevant approvals (such as environment protection licences and/or mining lease (including any assessment, plan or program required under this consent));*
 - *Review the adequacy of any approved strategy, plan or program required under this consent or the abovementioned approvals; and*
 - *Recommend measures or actions to improve the environmental performance of the development, and/or strategy, plan or program required under this consent.*
- Note: This audit team must be led by a suitably qualified auditor, and include ecology and rehabilitation experts, and any other fields specified by the Secretary.*
- (ii) *Within 3 months of commissioning this audit, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of these recommendations as required. The applicant must implement these recommendations, to the satisfaction of the Secretary.*

In accordance with the recommendations from the IMP's *Third Annual Report of the Independent Monitoring Panel for the Cowal Gold Project (October 2007)*, Barrick will continue to conduct IEAs annually, instead of triennially as defined in Condition 9.2(a)(i).

Independent Monitoring Panel

An IMP has been established in accordance with Development Consent Condition 9.2(b) to review the IEAs, Annual Reviews and all CGM environmental monitoring procedures including the monitoring programmes required by this FFMP.

Development Consent Condition 9.2(b) provides:

9.2 Independent Auditing and Review

(b) Independent Monitoring Panel

- (i) *The Applicant shall at its own cost establish an Independent Monitoring Panel prior to commencement of construction. The Applicant shall contribute \$30,000 per annum for the functioning of the Panel, unless otherwise agreed by the Secretary. The annual payment shall be indexed according to the Consumer Price Index (CPI) at the time of payment. The first payment shall be paid by the date of commencement of construction and annually thereafter. Selection of the Panel representatives shall be agreed by the Secretary in consultation with relevant government agencies and the CEMCC. The Panel shall at least comprise two duly qualified independent environmental scientists and a representative of the Secretary.*
- (ii) *The panel shall:*
- *provide an overview of the annual reviews and independent audits required by conditions 9.1(b) and 9.2(a) above;*
 - *regularly review all environmental monitoring procedures undertaken by the Applicant, and monitoring results; and*
 - *provide an Annual State of the Environment Report for Lake Cowal with particular reference to the on-going interaction between the mine and the Lake and any requirements of the Secretary. The first report shall be prepared one year after commencement of construction. The report shall be prepared annually thereafter unless otherwise directed by the Secretary and made publicly available on the Applicant's website for the development within two weeks of the report's completion.*

17 ANNUAL REVIEW AND REVIEW OF THIS FFMP

Annual Review

An Annual Review will be prepared in accordance with the requirements of Development Consent Condition 9.1(b) and will be submitted to the Secretary by the end of July each year, or as otherwise agreed with the Secretary. Development Consent Condition 9.1(b) is reproduced below:

9.1 Environmental Management

b) Annual Review

By the end of July each year, or as otherwise agreed with the Secretary, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary. This review must:

- (i) describe the development that was carried out in the previous calendar year, and the development that is proposed to be carried out over the next year;*
- (ii) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against the:

 - the relevant statutory requirements, limits or performance measures/criteria;*
 - the monitoring results of previous years; and*
 - the relevant predictions in the EIS;**
- (iii) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;*
- (iv) identify any trends in the monitoring data over the life of the development,*
- (v) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and*
- (vi) describe what measures will be implemented over the next year to improve the environmental performance of the development.*

Condition 26 of the Conditions of Authority for ML 1535 also has requirements for Annual Review (formerly the AEMR) reporting which are generally consistent with the requirements of Development Consent Condition 9.1(b). The requirements of Condition 26 are detailed below.

Annual Environmental Management Report (AEMR)

- 26. (1) Within 12 months of the commencement of mining operations and thereafter annually or, at such other times as may be allowed by the Director-General, the lease holder must lodge an Annual Environmental Management Report (AEMR) with the Director-General.*
- (2) The AEMR must be prepared in accordance with the Director-General's guidelines current at the time of reporting and contain a review and forecast of performance for the preceding and ensuing twelve months in terms of:

 - (a) the accepted Mining Operations Plan;*
 - (b) development consent requirements and conditions;*
 - (c) Environment Protection Authority and Department of Land and Water Conservation licences and approvals;*
 - (d) any other statutory environmental requirements;*
 - (e) details of any variations to environmental approvals applicable to the lease area; and*
 - (f) where relevant, progress towards final rehabilitation objectives.**

- (3) *After considering an AEMR the Director-General may, by notice in writing, direct the lease holder to undertake operations, remedial actions or supplementary studies in the manner and within the period specified in the notice to ensure that operations on the lease area are conducted in accordance with sound mining and environmental practice.*
- (4) *The lease holder shall, as and when directed by the Minister, cooperate with the Director-General to conduct and facilitate review of the AEMR involving other government agencies and the local council.*

The Annual Review will report on flora and fauna related issues including:

- a summary of deaths or other incidents involving fauna;
- fauna usage of the tailings storages;
- results of any native fauna autopsies;
- vegetation clearance activities;
- the status of progressive rehabilitation works;
- weed and pest management;
- Lake Cowal biological monitoring results;
- results of the flora and fauna monitoring programmes; and
- the progress of remnant vegetation and wetland enhancement programmes.

Review of this FFMP

In accordance with Condition 9.1(c) of the Development Consent, this FFMP will be reviewed, within three months of the submission of:

- an Annual Review under Condition 9.1(b);
- an incident report under Condition 9.3(a);
- an audit under Condition 9.2(a);
- an Annual State of the Environment Report under Condition 9.2(b);
- the approval of any modification to the conditions of the Development Consent; or
- any direction of the Secretary under Condition 1.1(c).

Where this review leads to revisions of this FFMP, then within four weeks of the review, the revised FFMP will be submitted for the approval of the Secretary (unless otherwise agreed with the Secretary). The revision status of this FFMP is indicated on the title page of each copy.

This FFMP will be made publicly available on Barrick's website (www.barrick.com), in accordance with Condition 9.4(a)(iii) of the Development Consent. A hard copy of the FFMP will also be kept at the CGM.

18 REFERENCES

- ACO Technologies (1995) *ACO Wildlife Road Tunnels and Fencing Systems to Protect Wildlife*.
- Anne Clements and Associates (1995) *Terrestrial Flora Report: Lake Cowal District* in NSR Environmental Consultants Pty Ltd (1995) *Lake Cowal Gold Project Environmental Impact Statement. Appendix F*.
- Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand (2000) *National Water Quality Management Strategy No. 4: Australian Guidelines for Water Fresh and Marine Water Quality Monitoring and Reporting Vol1 & 2*.
- Australian Museum Business Services (2012) *Cowal Gold Mine and Surrounds Flora Survey*.
- Australian Museum Business Services (2013) *Lake Cowal Waterbird Monitoring Programme*.
- Australian Water Technologies Pty Ltd (1999) *Land and Water Management Plan for Lake Cowal and Associated Wetlands*. Prepared for the Jemalong Land and Water Management Plan Steering Committee.
- Baxter, A. (2000) *Use of Distress Calls to Deter Birds from Landfill Sites Near Airports*. Central Science Laboratory. Sand Hutton, York.
- Barrick Australia Limited (2006) *Cowal Gold Project 2005 Annual Environmental Management Report*.
- Barrick (Cowal) Limited (2013) *Cowal Gold Mine Extension Modification Environmental Assessment*.
- Bomford, M. and O'Brien, P. H. (1990) Sonic deterrents in animal damage control: a review of device tests and effectiveness. *Wildl. Soc. Bull.* 18:411-422.
- Bower, C. (1997) *Cowal Gold Project: Flora – Threatened Species Assessment*. Report Prepared for North Limited.
- Bower, C. (1998) *Survey of the Cowal Gold Project Area and Surrounds for the Austral Pillwort (*Pilularia novae-hollandiae*)*. Orchid Research.
- Bower, C. (2003) *Vegetation Community Mapping on Barrick-owned Land*. Unpublished Report.
- Charles Sturt University (1997) *Cowal Gold Project Area Botanical Survey*. Report prepared for North Limited.
- Crome, F. (1995) *Waterbird Monitoring on Lake Cowal* in NSR Environmental Consultants Pty Ltd (1995) *Lake Cowal Gold Environmental Impact Statement. Appendix C*.
- Department of Environment, Climate Change and Water (2010) *New South Wales Wetlands Policy*.
- Department of Environment, Climate Change and Water, Department of Industry and Investment (2010) *Draft New South Wales Biodiversity Strategy 2010–2015*.
- Department of the Environment, Water, Heritage and the Arts (2008a) *Threat Abatement Plan for Predation by Feral Cats*.
- Department of the Environment, Water, Heritage and the Arts (2008b) *Threat Abatement Plan for Predation by the European Red Fox*. Commonwealth of Australia, Canberra.

- Department of Land and Water Conservation (DLWC) (2001) *Mid Lachlan Regional Vegetation Management Plan and Strategy*. NSW Government.
- Department of Primary Industries (2013) *Policy and Guidelines for Fish Habitat Conservation Management*.
- Department of Primary Industries (2014) *Vertebrate Pest Control Manual*.
- Department of Urban Affairs and Planning (1998) *Primary Submission to the Commission of Inquiry into the Cowal Gold Project*.
- DnA Environmental (2013) *Northern Waste Emplacement Trials: Experimental Design*.
- Dodds-Smith, M. and Filas, B. (1996) Preventing Bird Deaths. *Mining Environmental Management December 1996*. pp 10-11.
- Donato, D. (1997) *Bird Usage Patterns on Northern Territory Mining Tailings and Their Management to Reduce Mortalities Interim report September 1997*. Report to Bird Usage of Tailings Storage Facilities Co-ordinating group.
- Environment Australia (1997) *The Wetlands Policy of the Commonwealth Government of Australia*. Environment Australia, Canberra.
- Environment Australia (2001) *Threat Abatement Plan for Predation by the European Red Fox*. Commonwealth of Australia, Canberra.
- Environmental & Educational Services (EES) (1992-2000) *Lake Cowal Waterbird Monitoring Survey Progress Report*. Unpublished Data.
- Environmental & Educational Services (EES) (1999) *Lake Cowal Waterbird Monitoring Survey Progress Report*. Unpublished Data.
- Gell, P.A. (2002-2003). *Lake Cowal Waterbird Monitoring Survey Progress Reports January 2002, August 2002, October 2002, January 2003, August 2003, October 2003*, Unpublished Data.
- Gell, P.A. and Peake, P. (2001). *Lake Cowal Waterbird Monitoring Survey Progress Report*. Unpublished Data.
- Gell, P.A. (2004-2010) *Lake Cowal Waterbird Monitoring Survey: Progress Reports from 2004 to 2010*.
- Gell, P.A. (2005) *Lake Cowal Waterbird Monitoring Survey: Progress Report – October 2005*.
- Gell, P.A. and Peake, P. (2011) *Lake Cowal Waterbird Monitoring Survey: Progress Report January 2011*.
- Gilbert & Associates Pty Ltd (2013) *Cowal Gold Mine Extension Modification Hydrological Assessment*.
- Glasson, A. and Duff, S. (2001) *The Jemalong Land and Water Management Plan, Project Overview and Negotiated Outcomes, Final Report*.
- Gould League of Victoria Inc. (1997) *The Nestbox Book*. Gould League of Victoria, Victoria.

- Hagelstein, K. (1997) *Strategies and Standards for Control of Bird Mortality at Mining Operations* in Short Course Notes on Management of Cyanide Mining, 14-16 April 1997 Perth, ACMRR, Kenmore, Qld. in Donato, D. (1997) *Bird Usage Patterns on Northern Territory Mining Water Tailings and Their Management to Reduce Mortalities*. Interim Report September 1997. Report to Bird Usage of Tailings Storage Facilities Co-ordinating Group.
- Harden, G.J. (Ed) (1990) *Flora of New South Wales, Volume 1*. University of New South Wales Press, Sydney.
- Karori Wildlife Sanctuary (2003) <http://www.sanctuary.org.nz/story/fence>.
- Lachlan Catchment Management Authority (2006) *Lachlan Catchment Action Plan*.
- Lane, B.A. (1989) *West Wyalong Prospect Waterbird Investigation: Breeding Survey Report, October 1989*. Report prepared for North Limited.
- Lane, B.A. (1990) *West Wyalong Prospect: Waterbird Investigation Data Report*. Report prepared for North Limited.
- Lane, B.A. (1991a) *Report on Lake Cowal Waterbird Breeding Activity, January 1991*. Report prepared for North Limited.
- Lane, B.A. (1991b) *Lake Cowal Waterbird Monitoring Survey: Progress Report, August 1991*. Report prepared for North Limited.
- Lane, B.A. (1991c) *Lake Cowal Waterbird Monitoring Survey: Progress Report, October 1991*. Report prepared for North Limited.
- Natural Resource Management Ministerial Council (2010) *Australia's Biodiversity Conservation Strategy 2010–2030*.
- Nevada Mining Association, Nevada Department of Minerals, Nevada Department of Wildlife (1990) *Proceedings of the Nevada Wildlife/Mining Workshop 27-29 March 1990*, Nevada.
- Normandy Mining Limited (1999) *Normandy Mining Limited 1999 Environmental Report*.
- North Limited (1998a) *Cowal Gold Project – Environmental Impact Statement*. Report prepared by Resource Strategies Pty Ltd.
- North Limited (1998b) *Cowal Gold Project – Commission of Inquiry Primary Submission*. Prepared by North Limited.
- Northern Territory Bird Usage of Tailings Storage Facilities Coordinating Group (1999) *Bird Usage Patterns on Northern Territory Mining Water Tailings and their Management to Reduce Mortalities*. Prepared by David Donato
- Northern Territory Department of Mines and Energy (1998) *Best Practise Guidelines – Reducing Impacts of Tailings Storage Facilities on Avian Wildlife in the Northern Territory of Australia*.
- Resource Strategies, CSIRO Wildlife and Ecology, Goldney, D. and Greg Richards and Associates (1997) *Cowal Gold Project Species Impact Statement*. Report prepared for North Limited.
- Resource Strategies (2013) *Cowal Gold Mine Extension Modification Threatened Species Assessment*.

- Sharp, T. and Saunders, G. (2004) *Model Code of Practice for the Humane Control of Feral Cats*. NSW Department of Primary Industries.
- Tongway, D and Hindley, N. (1995) *Manual for Soil Condition Assessment of Tropical Grasslands*. CSIRO Australia Division of Wildlife and Ecology. Canberra.
- Transport Canada (2002) *Wildlife Control Procedures Manual*. Transport Canada. Canada.
- White, S., (1998) *Caring for Australian Wildlife*. Australian Geographic Pty Ltd. Terry Hills.
- Wildlife Control Technology Inc. (1996) Bird Balls. *Mining Environmental Management* June 1996, p 23.
- Williams, K.I., Parer, I.B., Coman, B.J., Burley, J. and Brayster, M. (1995) *Managing Vertebrate Pests: Rabbits*. Australian Government Publishing Service, Canberra.
- WIRES (the NSW Wildlife Information, Rescue and Education Service Inc.) (2003) <http://www.wires.org.au>.

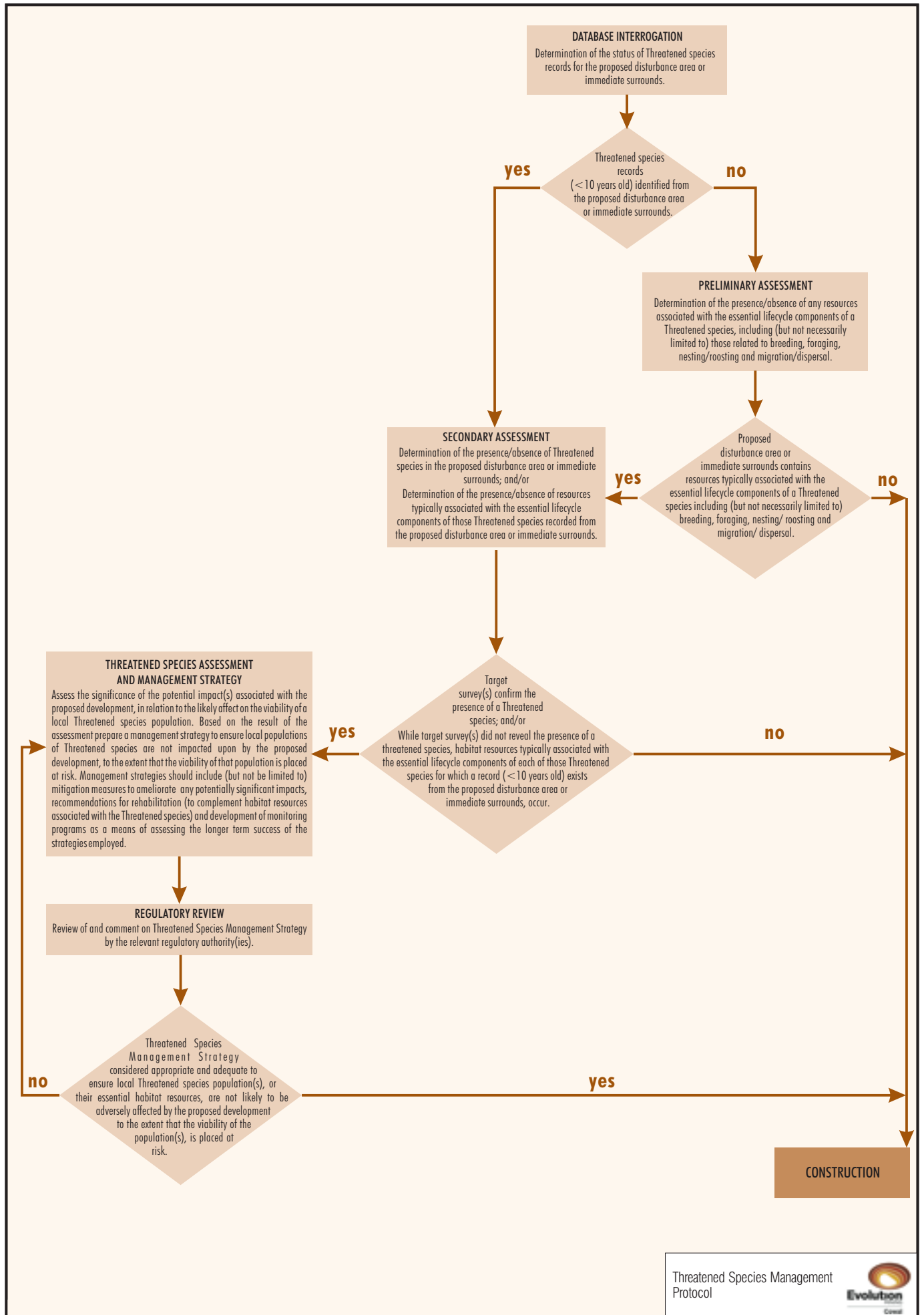
19 LIST OF ABBREVIATIONS AND ACRONYMS

AEMR	Annual Environmental Management Report
AHD	Australian Height Datum
AMBS	Australian Museum Business Services
As	Arsenic
AS	Australian Standard
AQMP	Air Quality Management Plan
Barrick	Barrick (Cowal) Pty Ltd
BLMP	Blast Management Plan
BOMP	Biodiversity Offset Management Plan
BSC	Bland Shire Council
Ca	Calcium
Cd	Cadmium
CEMCC	Community Environmental Monitoring and Consultative Committee
CGM	Cowal Gold Mine
CN _{WAD} /L	weak acid dissociable cyanide per litre
cm	centimetre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Cu	Copper
CWMP	Compensatory Wetland Management Plan
DA	Development Application
DECCW	NSW Department of Environment, Climate Change and Water (former)
DEWHA	Commonwealth Department of the Environment, Water, Heritage and the Arts
DII	NSW Department of Industry and Investment (former)
DIPNR	NSW Department of Planning, Infrastructure and Natural Resources (former)
DLWC	NSW Department of Land and Water Conservation (former)
DoP	NSW Department of Planning (former)
DP&E	NSW Department of Planning and Environment

DPI	NSW Department of Primary Industries
DRE	Division of Resources and Energy within the NSW Department of Trade and Investment, Regional Infrastructure and Services
EC	Electrical Conductivity
EEC	Endangered Ecological Community
EFA	Ecosystem Function Analysis
EP&A Act	NSW <i>Environment Planning & Assessment Act, 1979</i>
EPA	Environment Protection Authority
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environment Protection Licence
EIS	<i>Cowal Gold Project Environmental Impact Statement</i> (North Limited, 1998)
Fe	Iron
FFMP	Flora and Fauna Management Plan
ha	hectare
IEA	Independent Environmental Audit
IMP	Independent Monitoring Panel
K	Potassium
km	kilometre
JLWMP	Jemalong Land and Water Management Plan
LFA	Landscape Function Analysis
LLS	Riverina Local Land Services
LMP	Land Management Plan
LWMPLC	Land and Water Management Plan for Lake Cowal and Associated Wetlands
m	metre
mg	milligrams
Mg	Magnesium
MIC	Maximum Instantaneous Charge
mm	millimetre

ML	Mining Lease
MLRVMP	Mid Lachlan Regional Vegetation Management Plan and Strategy
Mo	Molybdenum
MOP	Mining Operations Plan
Ni	Nickel
NONEL	Non-electric
NOW	NSW Office of Water
NPWS	National Parks and Wildlife Service
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
Pb	Lead
RMP	Rehabilitation Management Plan
RVEP	Remnant Vegetation Enhancement Programme
Sb	Antimony
Se	Selenium
SWGMBMP	Surface Water, Groundwater, Meteorological and Biological Monitoring Programme
Secretary	Secretary of the NSW Department of Planning and Environment
TSC Act	NSW <i>Threatened Species Conservation Act 1995</i>
TSMP	Threatened Species Management Protocol
TSMS	Threatened Species Management Strategy
VCP	Vegetation Clearance Protocol
WIRES	NSW Wildlife Information, Rescue and Education Service Inc.
WMP	Water Management Plan
Zn	Zinc

APPENDIX A
THREATENED SPECIES MANAGEMENT PROTOCOL



This Threatened Species Management Protocol has been prepared as a means of assisting in the ecological assessment process for development that has the potential to impact on the status and dynamics of a threatened species population and/or, habitat(s) associated with the essential lifecycle components of the species.

DATABASE INTERROGATION

As a means of strengthening and streamlining the protocol assessment process, it is considered pertinent to introduce an initial step which provides a mechanism for determining whether there are any records of Threatened species in the proposed disturbance area or immediate surrounds.

This determination should be carried out by examining/interrogating a variety of Threatened species databases including, (but not necessarily limited to):

- those held by National Parks and Wildlife Service/OEH and other reliant government authorities;
- any local tertiary institute likely to collect and collate such records;
- local branches of recognised ecological-based groups such as Birdlife Australia and the like; and
- other published reports.

The validity of any record should be scrutinised and in order to account for previous land use practices and likely disturbance scenarios (e.g. fire events, clearing etc.), all records should be less than 10 years old. In the event that such records are uncovered, the assessment process should then proceed directly to the Secondary Assessment level. Where no such records exist, a Preliminary Assessment should be undertaken.

PRELIMINARY ASSESSMENT

In recognition of the inherent limitations of database records a preliminary assessment is undertaken to take into account the potential for Threatened species to occur at a particular site. This is achieved by examining the presence/absence of habitat resources typically associated with the essential lifecycle components of Threatened species. These components include breeding, foraging, nesting/roosting and migration/dispersal. Ultimately suitable habitat resources would include any factor that is known or considered likely to assist in the exchange of genetic material between individual species and the provision of means to sustain the offspring to a point of self-reliance.

The Preliminary Assessment should adopt a two-fold approach: (1) attempt to categorize (quantify and qualify) the habitat resources of the proposed disturbance area and immediate surrounds; and (2) attempt to determine the presence of habitat resources particular to those Threatened species known or considered likely to occur in Project area.

Where the Preliminary Assessment determines that no habitat resources critical to the lifecycle components of a Threatened species exist in the proposed disturbance area and/or immediate surrounds, development works can proceed. However when such resources are identified, the next level of assessment should be enacted, i.e. the Secondary Assessment stage.

SECONDARY ASSESSMENT

The Secondary Assessment is conducted following the identification of a valid Threatened species record from the proposed disturbance area and/or immediate surrounds or, identification of habitat resource(s) typically associated with the essential lifecycle components of a Threatened species known or considered likely to occur in the area.

This stage of assessment attempts to determine the presence of any Threatened species from within the proposed disturbance area and/or immediate surrounds. This is achieved by undertaking target surveys designed to give the greatest possible chance of recording a particular species (subject to temporal factors and conditions). Where a Threatened species is recorded a Threatened Species Management Strategy should be prepared. Similarly, where habitat resources typically associated with the lifecycle components of each of those Threatened species for which a valid record exists from the proposed disturbance area or immediate surrounds, are identified in the course of the target surveys, a Threatened Species Management Strategy should be prepared.

THREATENED SPECIES MANAGEMENT STRATEGY

This level of assessment is required in the event that a Threatened species is recorded from the proposed disturbance area or immediate surrounds or, where habitat resources typically associated with the essential lifecycle components of each of those Threatened species know or considered likely to occur in the region, exist in the proposed disturbance area and/or immediate surrounds.

The principle aim of the Threatened Species Management Strategy (TSMS) is to provide a means for ensuring the viability of a local population of Threatened species is not placed at risk by the proposed development. The TSMS should take a holistic approach and present options and measures specific to each particular species, which enable an ecologically sustainable ethos to be incorporated into a development at the 'grass roots' level. Measures and options that could be implemented include (but should not be limited to) development design modifications and alterations, consideration of alternative technologies, comprehensive rehabilitation planning, as well as iterative procedures such as relocation and re-establishment programmes.

An important component of this strategy is the provision of a means of measuring and monitoring the relative success of each option/measure employed. Consultation with relevant regulatory authorities/bodies throughout the development of a TSMS is paramount to the overall success of the strategy.

REGULATORY REVIEW

Consultation with the appropriate regulatory or determining authority underpins the Threatened species management protocol. This is an on-going process that should be initiated from the onset however formal and direct consultation is required regarding the TSMS. The main purpose of this step is to obtain approval from the appropriate authorities for the construction to proceed in accordance with the measures contained in the TSMS.

ATTACHMENT 1
CGM ENVIRONMENTAL MANAGEMENT SYSTEM

