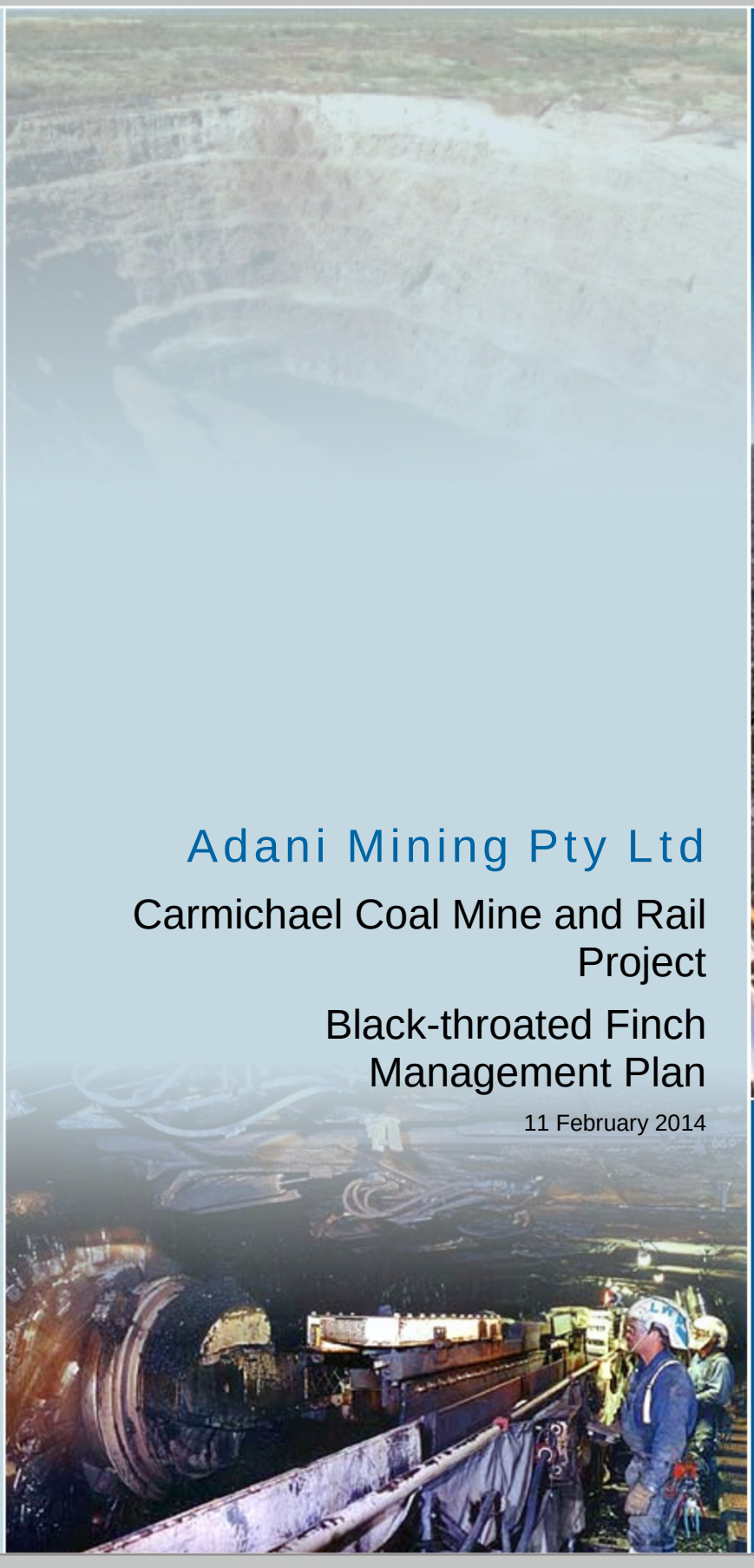
Adani Mining Pty Ltd



Adani Mining Pty Ltd

Carmichael Coal Mine and Rail Project

Black-throated Finch Management Plan

11 February 2014

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1. Introduction

1.1 Project description

Adani Mining Pty Ltd (Adani) is proposing to develop a 60 million tonne (product) per annum (Mtpa) thermal coal mine in the north Galilee Basin approximately 160 kilometres (km) northwest of the town of Clermont, Central Queensland. All coal will be railed via a privately owned rail line connecting to the existing Goonyella rail system south of Moranbah, and shipped through coal terminal facilities at the Port of Abbot Point and/or the Port of Hay Point. The Carmichael Coal Mine and Rail Project will have an operating life of approximately 60 years. Key components of the Project include:

- The Project (Mine): a greenfield coal Mine over EPC 1690 and the eastern portion of EPC 1080, which includes both open cut and underground mining, on Mine infrastructure and associated Mine processing facilities (the Mine), and the Mine (offsite) infrastructure including a workers accommodation village and associated facilities, an airport, an industrial area and water supply infrastructure.
- The Project (Rail): a greenfield rail line connecting the mine to the existing Goonyella and Newlands rail systems to provide for the export of coal via the Port of Hay Point (Dudgeon Point expansion) and the Port of Abbot Point, respectively including:
  - Rail (west): a 120 km dual gauge portion running from the Mine site (in the west) east to Diamond Creek
  - Rail (east): a 69 km narrow gauge portion running east from Diamond Creek connecting to the Goonyella rail system south of Moranbah
  - Quarries: five local quarries to extract quarry materials for construction and operational purposes.

1.2 Purpose

This black-throated finch management plan has been prepared to support an environmental impact assessment process for the Carmichael Coal Mine and Rail Project under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Queensland *State Development and Public Works Organisation Act 1974* (SDPWO Act). It provides a framework for the management of potential impacts and implementation of mitigation and management measures for the black-throated finch associate with the Project and offset properties.

The black-throated finch (southern) is listed as endangered under the *Nature Conservation Act 1992* (NC Act). It is also listed as endangered under the Australian Government EPBC Act, and therefore is a Matter for National Environmental Significance (MNES). Terrestrial ecological surveys of the Project (Mine) site and adjacent Moray Downs and Bygana properties (refer Section 3.7) identified a population of black-throated finch that have the potential to be impacted by the Project. This management plan reflects the findings and recommendations of these terrestrial ecological surveys that were undertaken for the Carmichael Coal Mine and Rail Project Environmental Impact Statement (EIS) and Supplementary EIS (SEIS).

A key component of this black-throated finch management plan is the long-term adaptive monitoring program that will inform management actions. Black-throated finch monitoring data

collected from the Project site and surrounding areas (e.g. Moray Downs property and offset sites) will help refine and improve the black-throated finch management actions overtime and therefore maximise the effectiveness of the management plan for conservation of the species. The current monitoring locations established within the Project area are shown in Figure 1-1. These locations will be revised prior to the commencement of each monitoring round. This approach of adaptive management and monitoring is discussed further in Section 9.

Key inputs into the development of this black-throated finch management plan include:

- The S*ignificant Impact Guidelines for the Endangered Black-throated Finch Poephila cincta cinta* (DEWHA, 2009a, b)
- *National Recovery Plan for the Black-throated Finch Southern Subspecies Poephila cincta cinta* (Black-throated Finch Recovery Team 2007)

The Plan will be further developed as detailed design of the Project continues and to achieve compliance with conditions of approvals obtained.

1.3 Objective

The objectives of this black-throated management plan are to:

- Detail actions and procedures to be followed during the pre-construction, construction, operations and post operations phases of the Project in order to mitigate adverse impacts on black-throated finch
- Facilitate compliance with relevant approval conditions specified by the Coordinator-General and the Commonwealth Department of the Environment (DotE)
- Facilitate compliance with commitments under the EIS and SEIS
- Contribute to regional management of the black-throated finch through contribution and participation in a bioregional species management plan
- Expand existing knowledge of the life history and ecology of the black-throated finch at the Project site and at a regional level, including:
  - Whether the black-throated finch is sedentary, locally migratory or regionally migratory
  - Whether the black-throated finch is using specific habitat, selective waters and a particular location at or near the Project site or if they are using a variety of habitats, variety of waters and general areas
  - Whether the black-throated finch is using a variety of habitats, waters and general locations across properties in the immediate environs and further afield in the Galilee Basin
  - Spatial and temporal occurrence probability mapping to identify worthy offset or good condition habitat and establish which habitat factors influence distribution i.e. - dietary requirements, home range, nesting requirements, response to grazing management, response to fire management, and spatial water arrangement.

Environmental management of the black-throated finch will operate within an Environmental Management System (EMS) framework, in accordance with the ISO 14001: 2004 EMS standard.

1.4 Structure of this management plan

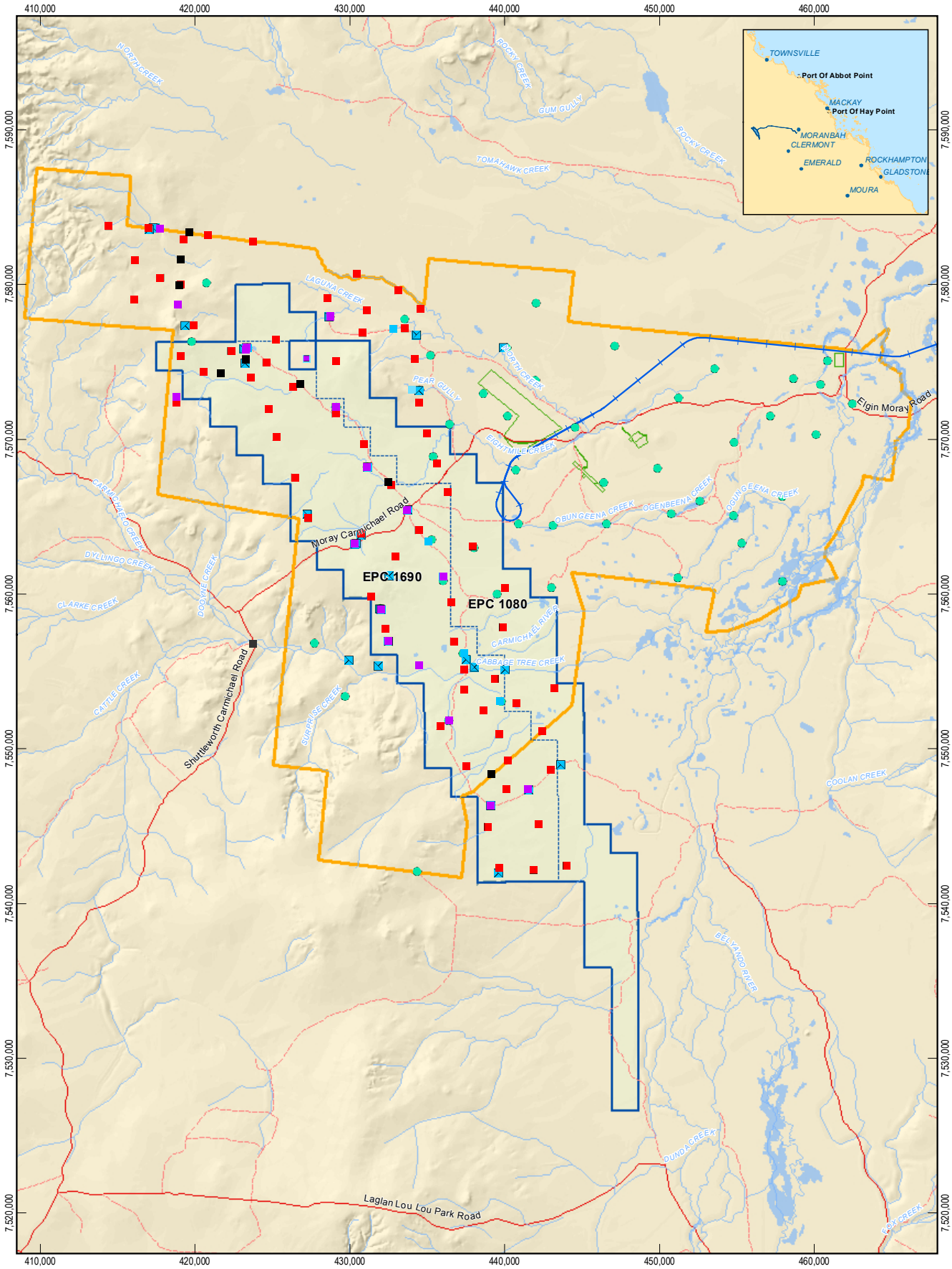
The structure of this management plan and an overview of the content contained within each section are outlined below:

- Section 1 Introduction – This section provides a brief overview of the Project and the purpose of the black-throated finch management plan
- Section 2 Legislative context – This section provides an over of the relevant legislation, guidelines, EIS commitments, approval conditions and offset requirements
- Section 3 Species overview – This section provides an overview of the black-throated finch including distribution, habitat and recognised threats
- Section 4 Performance indicators – This section identifies the performance targets relevant to the management and monitoring of the black-throated finch
- Section 5 Roles and responsibilities – This section outlines the roles and responsibilities of key personnel in implementing the actions identified in this management plan
- Section 5.2 Potential impacts – This section provides an overview of the potential impacts to black-throated finch as a result of the Project. The summary of impacts is based upon the impact assessments undertaken as part of the EIS and SEIS
- Section 7 Management and mitigation actions – This section identifies the actions and controls that will be implemented to minimise the potential impacts on black-throated finch
- Section 8 Monitoring – This section outlines the monitoring that will be undertaken to assess the success of the management and mitigation actions
- Section 9 Adaptive management framework – This section outlines the adaptive management framework and the relationship between monitoring, management actions and increased knowledge of black-throated finch in the Project site
- Section 10 Preventative and corrective actions – This section identifies the corrective action process that will be implemented should monitoring indicate management measures are not achieving their intended outcome in relation to the performance indicators
- Section 11 Communications, reporting and auditing – This section identifies the internal and external communication, reporting and auditing processes that will be implemented
- Section 12 Training – This section outlines the training that will be undertaken to ensure all contracts and staff have the knowledge and understanding to adequately implement the requirements of this management plan
- Section 13 Review and consultation – This section outlines and reviews and consultation that will be undertaken to inform the ongoing monitoring and management of the black-throated finch
- Section 14 References – Provides a summary of the key documents utilised during preparation of this management plan.

1.5 Links to other management plans

A number of other management plans developed or to be developed for the Project are also relevant to the management of black-throated finch and should be read in parallel to this plan, they include:

- Weed and pest management plan
- Water (surface and groundwater) management plan
- Fire management plan
- Closure and rehabilitation strategy
- Offset management plan.



LEGEND

BTF Survey sites May/October 2013
- Water
- Camera
- 2ha
- Incidental
- Past Surveys (Waterbodies)
- Indicative Dams
- Watercourse
- Waterbody
- Minor Road
- Track
- Moray Downs Property
- Project (Mine)
- Mine (Offsite)
- Project (Rail)

1:350,000 (at A4)
0 2 4 6 8 10
Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

N

Adani Mining Pty Ltd
Black-throated finch Management Plan

Carmichael Coal Mine Project area
and black-throated finch monitoring locations

Job Number 41-26422
Revision E
Date 21-01-2014

Figure 1-1

G:\41\26422\GIS\Maps\MXD\0600_Ecology\41_26422_0602_rev_e.mxd
Level 9, 145 Ann St Brisbane QLD 4000 T +61 7 3316 3000 F +61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data Source: GA: Road, Watercourse (2007); DME:EPC1690 (2010), EPC1080 (2011); DNRM: Waterbody (2010); GHD: Property, Survey Sites (2013) Adani: Offsite Infrastructure, Alignment(2013).

2. Legislative context

2.1 Commonwealth legislation

The EPBC Act is the Commonwealth's principal piece of environmental protection legislation. It provides a national framework for the protection of the Australian environment and its unique biodiversity. Specifically, the EPBC Act aims to protect the environment by reducing significant impacts to MNES.

The Federal Minister for the Environment determined the Project to be a 'controlled action' under the EPBC Act on 6 January 2011, due to the potential for the Project to impact upon MNES. Accordingly, the Project has been carefully assessed in terms of its potential impacts on the determined controlled provisions.

The black-throated finch (southern) is listed as endangered under the EPBC Act and is a MNES. The Project is required to avoid, manage and mitigate impacts on MNES as far as practical. However, if residual impacts are predicted, environmental offsets (direct or indirect) are a mechanism of last resort to compensate for adverse significant impacts of developments on MNES protected by the EPBC Act.

2.2 Queensland legislation

2.2.1 Nature Conservation Act 1992

The NC Act provides for the conservation of nature through protection of all native plants and animals in Queensland. Protection is provided under the NC Act through conservation of land as protected areas and wildlife protection outside of protected areas. Actions impacting on protected native flora and fauna are regulated under the NC Act. Permits for disturbance to native flora and fauna can be administered under the NC Act. The Queensland *Nature Conservation (Wildlife) Regulation 2006* (NC Regulation) is subordinate to the NC Act and lists flora and fauna species considered to be extinct in the wild, endangered, vulnerable, near threatened or special least concern in Queensland.

The black-throated finch (southern) is listed as endangered under the *Nature Conservation Act 1992* (NC Act) and therefore a permit to disturb native endangered fauna may be required under the NC Act. This permit will be required prior to construction of the Project (Mine).

2.2.2 Vegetation Management Act 1999

The *Vegetation Management Act 1999* (VM Act) provides a framework for the regulation of woody, terrestrial native vegetation located outside of protected areas. The Act provides for the establishment and mapping of regional ecosystems (REs) that encompass vegetation community descriptions within a geological and bioregional context. The black throated finch (southern) is dependent upon a number of REs as they represent high value habitat for feeding and nesting. Details on what clearing activities require assessment under the VM Act are provided by the *Sustainable Planning Regulation 2009* (SP Regulation).

2.2.3 Water Act 2000

The *Water Act 2000* (Water Act) and subordinate legislation (including the *Water Regulation 2002* and gazetted Water Resource Plans) provide for the sustainable management of water and other

resources (i.e. quarry material and riverine vegetation) in Queensland. The black throated finch (southern) is dependent upon access to reliable water sources which include the water resources protected under the Water Act.

2.3 National recovery plan

The National Recovery Plan for the black-throated finch southern subspecies (Black-throated Finch Recovery Team, 2007) was adopted under the EPBC Act on 8 January 2008. The aim of this plan is to manage and protect the black-throated finch and its habitat, and to promote the recovery of the southern subspecies (Recovery Team, 2007). Management and monitoring of impacts to the black-throated finch (southern) seek to contribute to the recovery of the subspecies, as per the objectives of the *National Recovery Plan for the Black-throated Finch Southern Subspecies* (black-throated finch Recovery Team, 2007).

Examples of recovery actions, documented in the *National Recovery Plan for the Black-throated Finch Southern Subspecies* (black-throated finch Recovery Team, 2007), that are incorporated into this black-throated finch management plan includes:

- Investigate breeding requirements and threats to key breeding areas (Action 1.1)
- Investigate feeding and other habitat requirements (Action 1.2)
- Undertake targeted surveys (to identify habitat) (Action 2.4)
- Secure selected sites for conservation (Action 3.1)
- Address threats on grazing lands (Action 3.2)
- Monitor management effectiveness (Action 3.3).

2.4 Significant impact guidelines

The *Significant impact guidelines for the endangered black-throated finch (southern) (Poephila cincta cincta)* (DEWHA, 2009) is an Australia Government policy statement designed to assist in determining whether a proposed action is likely to have a significant impact on the black-throated finch (southern).

The key management actions identified in the Significant Impact Guidelines (which are also derived from the Recovery Plan) that are relevant to this black-throated finch management plan include the need to:

- Identify and quantify threats (especially on grazing lands)
- Investigate breeding requirements and threats to key breeding areas
- Investigate feeding and other habitat requirements
- Quantify distribution and abundance, and therefore document sightings
- Develop standard survey guidelines
- Undertake mapping and habitat modelling
- Undertake targeted surveys
- Monitor management effectiveness.

Management actions, and the monitoring that provides information for the management, will be based largely on these main themes, but may be expanded according to existing and new local knowledge of black-throated finch at the Project Site.

2.5 Environmental impact statement

Adani Mining Pty Ltd (Adani, the Proponent), commenced an EIS process for the Carmichael Coal Mine and Rail Project (the Project) in 2010. On 26 November 2010, the Queensland Office of the Coordinator General declared the Project a 'significant project' and the Project was referred to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (referral No. 2010/5736). The Project was determined to be a controlled action on 6 January 2011 under section 75 and section 87 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The controlling provisions for the Project are:

- World Heritage properties (sections 12 & 15A)
- National Heritage places (sections 15B & 15C)
- Wetlands (Ramsar) (sections 16 & 17B)
- Listed threatened species and communities (sections 18 & 18A)
- Listed migratory species (sections 20 & 20A)
- Great Barrier Reef Marine Park (sections 24B & 24C)
- Protection of water resources (sections 24A & 24E).

The Queensland Government's EIS process has been accredited for assessment under Part 8 of the EPBC Act in accordance with the bilateral agreement between the Commonwealth of Australia and the State of Queensland. The Proponent prepared an EIS in accordance with the Terms of Reference (ToR) issued by the Coordinator-General in May 2011 (Queensland Government, 2011). The EIS process is managed under section 26(1) (a) of the *State Development and Public Works Act 1971* (SDPWO Act), which is administered by the Department of State Development, Infrastructure and Planning (DSDIP).

The EIS was submitted in December 2012 and placed on public exhibition during early 2013. Submissions received on the EIS during the public exhibition period were addressed through a SEIS which was submitted to the Coordinator General on 9 August 2013. The SEIS was publicly released from 25 November to 20 December 2013, following which a number of submissions were received relating to the management of black-throated finch. In particular, submissions from IESC, DotE, EHP and NRM were received that related specifically to the preparation and implementation of a black-throated finch management plan. This black-throated finch management plan takes into account these submissions.

2.6 Offset requirements

An Environmental Offset Package for the Project has been developed by Ecofund Queensland on behalf of Adani (Ecofund, 2013). The package outlines the environmental offset requirements for the Project under both Queensland and Australian Government offset policies. The extent of offsets was based on information contained in the EIS and SEIS. The offset package included options for offset delivery and examples of properties that may be suitable to meet the identified offset requirements.

All offsets must be secured by a legally binding mechanism. The appropriate mechanism for each offset will be determined through negotiation with regulators, Adani and the landholder.

This black-throated finch management plan will inform management of black-throated finch in areas secured to offset unavoidable impacts to the species across the Project (mine, rail and quarry areas).

2.7 Approvals and permits

Approvals and permits relevant to black-throated finch are listed in Table 2-1 and Table 2-2.

Table 2-1 Approvals register

Legislation	Approval or permit	Trigger
EPBC Act	Approval to undertake a controlled action	Potentially significant impacts on matters of national environmental significance
NC Act	Permit to take protected plants	Clearing of native vegetation

Table 2-2 Other obligations register

Legislation	Obligation
EP Act	Notification of notifiable activities
LP Act	Management of Class 1 and 2 declared weeds
EP Act	Authorised officers under the EP Act must be allowed entry to the mine on request and must be given all reasonable assistance.

2.8 Approval conditions

This section will be completed upon receipt of relevant approvals and will contain the conditions relevant to the black-throated finch.

2.9 Work permits

In accordance with CG-036 Work Permits, any non-routine activities that might adversely affect the environment must not be performed without a work permit. Non-routine works which have potential to cause environmental harm may include:

- Any ground disturbing activity
- Activities involving use of environmentally hazardous substances
- Activities in areas of native vegetation
- Activities in or immediately adjacent to streams and watercourses
- Activities within or adjacent to Category A or B environmentally sensitive areas

The following matters will be covered as part of the process of issue of a work permit:

- Any legislative approval requirements and whether these approvals are in place
- Conditions of approvals or permits that might apply to the activity
- Whether there are any cultural heritage, flora or fauna monitoring requirements
- Measures to prevent environmental impacts, including:

  - Impacts on environmentally sensitive areas
  - Accidental clearing of vegetation
  - Erosion and sediment release
  - Accidental release of hazardous substances to land, water or air
  - Measures to prevent noise or dust emissions exceeding the environmental authority or other legislated requirements
- Any requirements in relation to incident response, such as spill kits and personal protective equipment (PPE).

3. Species overview

3.1 Description of black-throated finch (southern)

The black-throated finch (southern) is a sleek but thickset grass-finch, which measures approximately 12 cm in length, and weighs approximately 15 g. It has a grey head and neck, with a short black loral stripe, and a conspicuous, large black 'bib' over the chin, throat and upper breast (see Plate 1). The bill is short, thick, conical and coloured black. The eye is a dark reddish-brown. The breast, back, and most of the belly, are brown. The wings are a darker shade of brown, and when folded have a narrow white stripe along the leading edge. The rump and the tail, which is short and rather rounded or square-tipped, are both black. The lower underbody is white, but with a black patch on the rear flanks. The legs and feet are a bright pinkish-red. Juveniles appear very similar to adults, but with duller colouring (Higgins et al. 2006).

The black-throated finch (southern) is a predominantly sedentary (Black-throated Finch Recovery Team, 2007; DEWHA, 2009b), gregarious bird that typically forages in groups of up to 30 individuals. During the breeding season (in the Townsville region breeding coincides with wet season (February to May)), only small daily movements between forage sites are made (DEWHA, 2009b). Movements of up to 3 km a day may occur during periods where forage resources are scarce. Larger movements are thought to be related to periods of drought and/or when water availability is reduced (DEWHA, 2009b). It often forms loose breeding colonies, where a number of nests are made in a single tree, or in neighbouring trees. The average clutch size is five, with chicks reaching sexual maturity at six months (DEWHA, 2009b).

Plate 1 Black-throated finch observed during field surveys

3.2 Distribution

3.2.1 Regional distribution

Black-throated finch has experienced a large decline in range in recent decades. Where it was once previously found throughout eastern and central Queensland north of the New South Wales border, it is now only known from the Townsville region and scattered sites in central Queensland. The extent of occurrence of black-throated finch has declined by approximately 80 per cent since the 1980s, with the majority of this decline in the range of the endangered southern subspecies (DEWHA, 2009a).

3.2.2 Local distribution

The black-throated finch (southern) is a predominantly sedentary bird, which typically occurs within a restricted local distribution. The species home range tends to vary between seasons. During the breeding season (the wet season), the species tends to remain close to the nest, making only small daily movements between foraging sites (Mitchell, 1996; Higgins et al., 2006; NRA, 2007). In the non-breeding season, birds can forage more widely, moving up to 3 km per day (Mitchell, 1996). Flock size also varies seasonally. While black-throated finches (southern) tend to forage in small groups of up to 30 individuals during the breeding season (Zann, 1976; Longmore, 1978; Higgins et al., 2006), larger flocks of up to 160 individuals have been recorded in non-breeding periods (Mitchell, 1996). The species forms loose nesting colonies, with multiple nests often found in a single tree (Higgins et al., 2006). The average clutch size is five, with chicks reaching sexual maturity at six months (DEWHA, 2009a).

3.3 General knowledge of the species habitat requirements

3.3.1 Overview

The subspecies inhabits grassy open woodland and open forest habitats characterised by trees belonging to the genera Eucalyptus, Corymbia, Acacia and Melaleuca. Generally it occurs in habitats near watercourses or water bodies; almost all recent records of the subspecies south of the tropics have been in riparian areas (DotE, 2013). Three critical habitat resources are required to support the subspecies (DEWHA 2009a):

- Water sources (natural and artificial)
- A mosaic of grass species that provide forage (grass seeds) throughout the year, particularly during the wet season
- Trees that provide suitable nesting habitat.

3.3.2 Critical resources – water

The lifecycle of the black-throated finch (southern) is dependent on the availability of both permanent and seasonal water bodies. Individuals need to drink at least daily and numerous times throughout the day during dry periods (DEWHA, 2009a). Black-throated finches (southern) use both natural and artificial water sources, including wetlands, creeks, dams, and stock troughs. Permanent water sources are the most critical limiting resource, as they provide refuge habitat during the dry season. Ephemeral water sources are also important to the lifecycle of the finch, allowing greater access to areas of foraging and nesting habitat during the wet season. With the onset of the wet season and proliferation of seasonal water bodies and seeding grasses, the finches move from their dry season refuge into habitat surrounding these water sources (DEWHA, 2009a). During the breeding season black-throated finches (southern) typically nest in trees located within 400 m of seasonal water sources (NRA, 2007a), therefore the presence of suitable trees close to seasonal water sources is critical for the black-throated finch (southern) (DEWHA, 2009a). Evidence from the local Carmichael population suggests that presence of permanent water is in itself, not a predictor of black-throated finch occurrence. Rather, their local distribution is determined by the coincidence of permanent water, suitable foraging and nesting habitat and access to ephemeral water sources in areas that have been lightly grazed.

3.3.3 Critical resources – nesting and foraging habitat

Black-throated finches (southern) predominantly feed on fallen grass seed, and require year-round access to a variety of grass species (DEWHA, 2009a). Grass species that are considered to be important forage species for black-throated finch (southern) include *Urochloa mosambicensis*, *Enteropogon acicularis*, *Panicum decompositum*, *Panicum effusum*, *Dichanthium sericeum*, *Alloteropsis semialata*, *Eragrostis sororia* and *Themeda triandra* (DEWHA, 2009a).Foraging habitat and dietary preferences are thought to vary seasonally with changing food availability (NRA 2007). During the breeding season, when seeding grasses are abundant, birds forage in close proximity to the nesting site (DEWHA, 2009a). As conditions dry out and grass seed abundance declines, individuals must forage more widely. In the Townsville region, there is believed to be a critical foraging resource bottleneck at the start of the wet season (November to December), when existing fallen seed germinates, but new seed has yet to be produced (NRA, 2007). The presence of grass species which produce seed early in the wet season (typically early flowering perennials) are likely to be essential for the survival of the black-throated finch (southern) (DEWHA, 2009a). This is likely to be the case for the local Carmichael population.

The black-throated finches (southern) nest site selection is more closely related to tree location than to tree structure itself (DEWHA, 2009a). Individuals are known to nest in a range of structures (that is, pendulous branches, hollow tree limbs, at the base of active raptor nests, bushy shrubs) however, it is the proximity and connectivity of the nesting site to water and foraging resources that is critical. In the Townsville region the subspecies typically nest within 400 m of a water source, and is rarely seen more than one km from permanent water during the breeding season (NRA, 2006). Nesting sites also need to be near foraging habitat as observations suggest that during the breeding season the subspecies travels smaller distances than it does during the dry season (Mitchell, 1996; NRA, 2006; NRA, 2007).

Existing knowledge of the species suggests the black-throated finch (southern) has some capacity to tolerate grazing (DEWHA, 2009a). This is supported by surveys of the Mine Area which indicate nesting occurs within areas subject to grazing pressure (where suitable foraging habitat and permanent water sources occur in close proximity).

3.4 Local knowledge of the species habitat requirements

3.4.1 Field surveys

Five bird surveys were undertaken during baseline surveys of terrestrial fauna for the Mine EIS:

- November 2010 (Mine Site) – 5 days x 6 ecologists
- April/May 2011 (Mine Site) – 15 days x 6 ecologists
- November 2011 (Mine Site) – 12 days x 6 ecologists
- May 2012 (Offsite Area) – 6 days x 6 ecologists
- June 2012 (Mine Site) – 1 day x 2 ecologists.

In each event, three survey methods were used: water body watches, two hectare counts and deployment of remote fauna cameras. These were based on the methods recommended in the Significant Impact Guidelines for the Black-throated Finch (southern) (*Poephila cincta cincta*) (hereafter, the 'Black-throated Finch (southern) Significant Impact Guidelines') (DEWHA 2009).

Water body watches were conducted at nine different water bodies for approximately 28 person hours during the EIS surveys and at eight water bodies during the SEIS surveys. The two hectare counts employed the methods recommended by Birds Australia (i.e. a timed 20 minute survey of a two hectare (2 ha) search area by one ecologist, recording the number of birds seen or heard calling, and the presence and composition of any mixed flocks). A total of 31 searches (21 person hours) were dedicated to bird surveys within the Study Area during the EIS surveys

Following the confirmed presence of the species on site during investigations for the EIS, consultation meetings were held with the Black-throated Finch Recovery Team (3 May 2013) and DotE (7 June 2013) and a draft monitoring program was developed. A key component of this was intensive local monitoring (observation) on the Mine Area. Three targeted surveys for the black-throated finch (southern) have been undertaken as part of preliminary surveys for the long-term black-throated finch monitoring program:

- May 2013 – 9 days x 4 ecologists
- August 2013 – 9 days x 2 ecologists
- October 2013 – 9 days x 4 ecologists.

Targeted surveys for the black-throated finch (southern) established 106 monitoring sites: 67 x 2 ha woodland sites, 19 x water body count sites and 20 camera trap sites. Detailed vegetation and habitat data was collected at the 2 ha sites. A more detailed description of the local monitoring methods to be implemented under this management plan are presented in Section 8.5.

3.4.2 Findings

The findings from the field surveys conducted between 2010 2013 for the EIS and SEIS are listed below:

- No black-throated finches (southern) were detected during any surveys of the Rail Study Area but are considered likely to occur within that environment given suitable habitat prevalence
- No black-throated finches (southern) were detected during the spring 2010 survey of the Mine Study Area
- A total of 345 black-throated finches (southern) were recorded on 34 separate occasions during subsequent autumn and spring 2011 surveys of the Mine Study Area and also on the Moray Downs property (this may include double counting of some individuals)
- A total of 95 black-throated finches (southern) were observed at 10 sites and in flocks of up to 30 individuals within the broader Moray Downs property during May 2012 surveys (this may include double counting of some individuals)
- A total of 155 black-throated finches (southern) were observed at 12 sites within the Mine Study Area and broader Moray Downs property during June/July 2012 surveys (by Ecology and Heritage Partners Pty Ltd (unpublished data, 2012) (this may include double counting of some individuals)
- One black-throated finch (southern) was recorded at a dam during April/May 2013 surveys of the Mine (Offsite) Area

- A total of 208 black-throated finches (southern) were observed at 26 locations, within the Mine Study Area and broader Moray Downs property during May 2013 (this may include double counting of some individuals)
- Two black-throated finches (southern) were observed at two locations within the Mine Study Area and broader Moray Downs property during August 2013
- A total of 84 black-throated finches (southern) were observed from 12 locations within the Mine Study Area and broader Moray Downs property during October 2013 (this may include double counting of some individuals).

3.5 Important habitat at the Project Area

3.5.1 Habitat mapping

Habitat mapping was undertaken after the completion of the field surveys for the EIS of the Mine Study Area to incorporate all records of black-throated finch (southern) from the initial EIS field surveys and to estimate the extent of important and potential habitat on Moray Downs in context of the Mine Area and the wider region. Habitat for the broader region was categorised into four different categories as outlined below:

Important: All RE polygons with a confirmed record of a black-throated finch (southern) that intersect with a 5 km buffer around the finch record, including non-remnant vegetation. A 5 km buffer is considered likely to cover habitat critical to the survival of the species necessary for activities such as foraging, breeding roosting or dispersal (DEWHA, 2009b).

Potential: All RE polygons that do not contain black-throated finch (southern) records, but which are the same RE that correspond to all finch records in the above important category, and all REs that are considered potentially suitable habitat for the subspecies (i.e. records in north Queensland since 1994) as presented in the National Recovery Plan for the Black-throated Finch Southern Subspecies (Black-throated Finch Recovery Team, 2007). These REs are 10.5.5, 10.3.6, 10.3.28, 10.7.7, (from this survey), and REs 10.3.9, 10.3.13, 10.4.8, 10.5.1, 10.7.11, 11.3.12, 11.3.25, 11.3.27, 11.3.30, 11.3.35 and 11.11.9 from the Black-throated Finch Recovery Plan (2007). All RE polygons containing these REs, even if they are part of a complex polygon, are included. For example, if a finch was recorded within RE 10.5.5, then all polygons of, or including, 10.5.5 are considered potential habitat. This includes all RE polygons sub-units (e.g. 10.5.5 a, b, c, etc.) alone or in a complex. Potential habitat includes REs within the Moray Downs/Carmichael Mine Study Area and REs beyond the Study Area in the presented map extent.

Other: All remnant vegetation not included in the above categories.

Non-remnant: all non-remnant vegetation excluding those within the 5 km buffer for the black-throated finch records in the important habitat category above.

3.5.2 Habitat classification

Further to the regional habitat categories identified in Section 3.5.1, a refined habitat assessment was undertaken based on availability of water sources within habitats of the Project site and adjacent properties. This refined habitat assessment subsequently informed predictions of direct

and indirect impacts in the SEIS and the Environmental Offset Package. The refined habitat classifications are illustrated in Figure 3-2 and summarised below:

High value habitat (permanent water): Is defined as REs that are listed in the Recovery Plan and Significant Impact Guidelines (Black-Throated Finch Recovery Team 2007; DEWHA 2009a; b) where black-throated finches have been recorded, and are REs where the primary surveys in the Study Area (GHD 2011; 2012) have consistently recorded the species, and noted them feeding and nesting. These REs are 10.3.6, 10.3.9, 10.3.28, 10.5.5 and 11.3.27. This potential habitat is further refined by distance to permanent water; being less than 3 km from artificial water sources (the 3 km zone as defined in the Significant Impact Guidelines for permanent water (i.e. wet and dry season use)). Any polygon that contains one of these RE types is included.

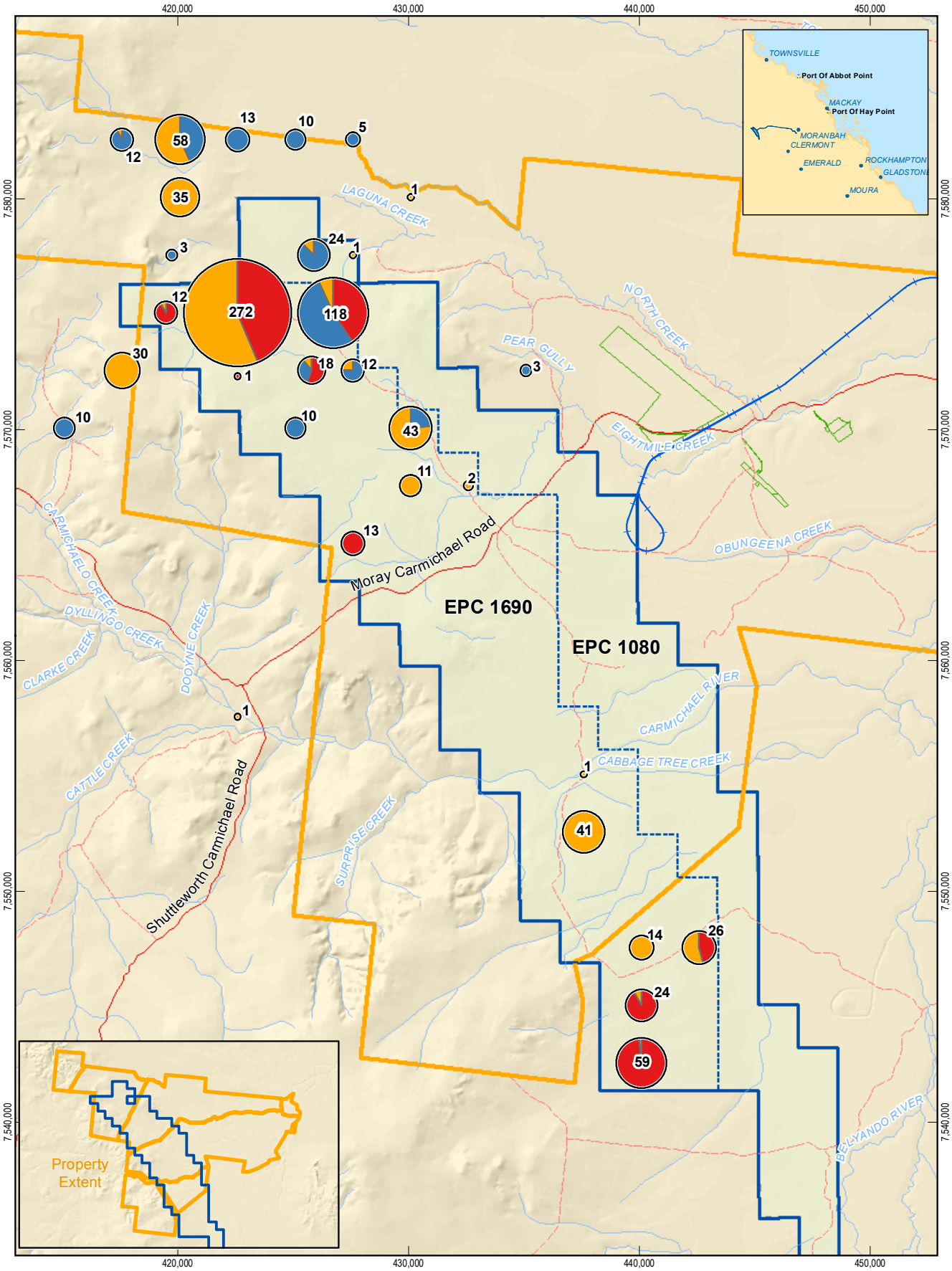
High value habitat: Is defined as regional ecosystems that are listed in the Recovery Plan and Significant Impact Guidelines (Black-Throated Finch Recovery Team 2007; DEWHA, 2009a; b) where black-throated finches have been recorded, and are REs where the primary surveys in the Project Area (GHD 2011; 2012) have consistently recorded the species, and noted them feeding and nesting. These REs are 10.3.6, 10.3.9, 10.3.28, 10.5.5 and 11.3.27. This potential habitat is further refined by distance to water; being more than 3 km from permanent water sources but within 1 km of drainage lines of the stream order 1, 2 and 3 (ephemeral water used during the wet season). Any polygon that contains one of these RE types is included.

Low value habitat value: Is defined as REs where black-throated finches have been recorded, and are listed in the Recovery Plan and Significant Impact Guidelines (Black- Throated Finch Recovery Team 2007; DEWHA, 2009a; b), but based on the primary surveys in the Project Area (GHD 2011) are not considered high value habitat (i.e. containing important feeding and nesting resources). These REs are 10.3.13, 10.4.8, 10.5.1, 10.7.11, 11.3.12, 11.3.25, 11.3.30, 11.3.35, 11.11.9. Only polygons where these are the dominant RE are included.

The division of the Mine Study Area into these high and low value habitat areas is based on the presence of known or potential habitat for the species with reference to RE mapping and location of water (i.e. artificial water points and drainage lines). These represent the key resources for the species; feeding and breeding (REs) and drinking (water sources). The definitions have been based upon field-verified data and observations within and adjacent to the Mine Area

3.5.3 Bird distribution

All black-throated finch sightings and abundance have been mapped to date to investigate the general pattern of finch location and abundance over time (Figure 3-1). This has incorporated known sightings from GHD baseline surveys (GHD, 2011) (GHD, 2012) (GHD, 2013a) (GHD, 20213b) and Ecology and Heritage Partners Pty Ltd (unpublished data, 2012). Locations are mapped as pie charts scaled to the total abundance over time (i.e. the larger the circle the higher the abundance) and split for each year where surveys have occurred. Although it is recognised that the survey effort is variable from 2011 to 2013 and ranged from general to targeted work, this data provides a general sense of the locations in the landscape where the black-throated finches are recorded consistently and in high numbers. The region to the north of the Mine site, Moray Downs (around 10 mile Bore) and the troughs in the south of the Mine site around Bygana (Carmichael Bore, Bygana Bores 1-3) consistently return a large number of records of the black-throated finch, compared to the central locations in the Mine site. This suggests that these are more important locations for the species, and require targeted management and mitigation actions during construction of the Project (Mine).



LEGEND

BTF Aggregated Locations

- BTF abundance 2011
- BTF abundance 2012
- BTF abundance 2013
- Watercourse
- Waterbody
- Minor Road
- Track
- Project (Mine)
- Mine (Offsite)
- Project (Rail)
- Moray Downs Property

1:235,000 (at A4)

0 2 4 6 8 10

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

N

Adani Mining Pty Ltd

Black-throated finch Management Plan

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Revision C
Date 14-01-2014

Distribution of black-throated finch (southern) sightings within the Mine Study Area Figure 3-1

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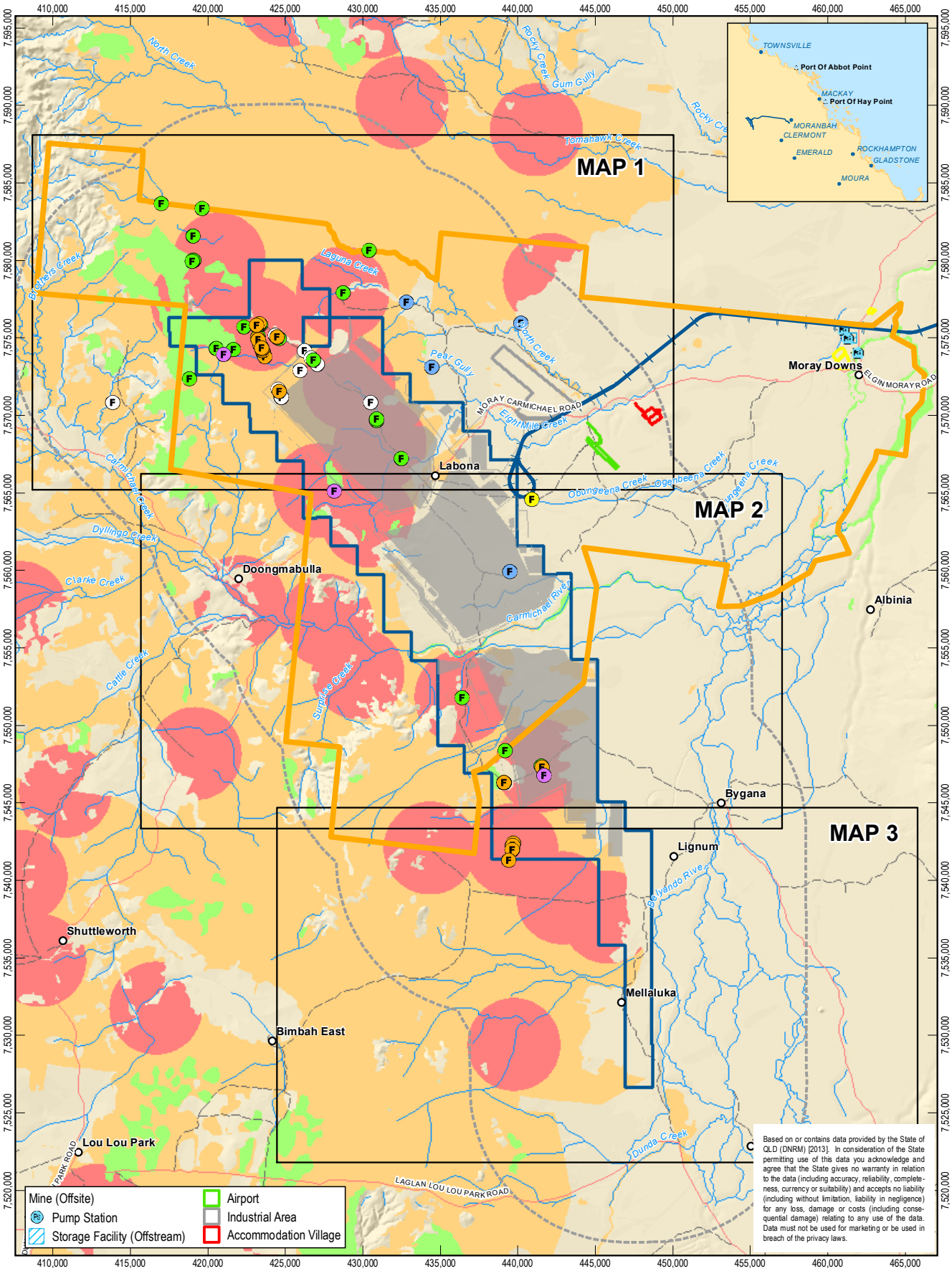
Level 9, 145 Ann St Brisbane QLD 4000 T +61 7 3316 3000 F +61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data Source: GA: Road, Watercourse (2007); DME:EPC1690 (2010), EPC1080 (2011); DNRM: Waterbody (2010); GHD: Property, BTF Abundance (2013) Adani: Offsite Infrastructure, Alignment(2013).



LEGEND

- Homestead
- Local Road
- Track
- Watercourse
- Winter 2012 (Ecology and Heritage Partners)
- Autumn 2011 (EIS 1690 Surveys)
- Spring 2011 (EIS 1080 Surveys)
- Spring 2011 (EIS 1690 Surveys)
- Autumn 2012 (Targeted BTF Surveys)
- Autumn 2013 (Offsite Infrastructure Surveys)
- Autumn 2013 (Targeted BTF Surveys)
- Project (Mine) 10km Buffer
- Project (Rail)
- Project (Mine)
- Mine (Onsite)
- Quarry
- Moray Downs Property
- High Value Habitat (Permanent water)
- High Value Habitat
- Low Value Habitat

1:350,000 (at A4)
0 1 2 3 4 5
Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

N

GHD adani

Adani Mining Pty Ltd
Black-throated finch Management Plan

Black-throated finch (southern)
value habitat (high/low condition)

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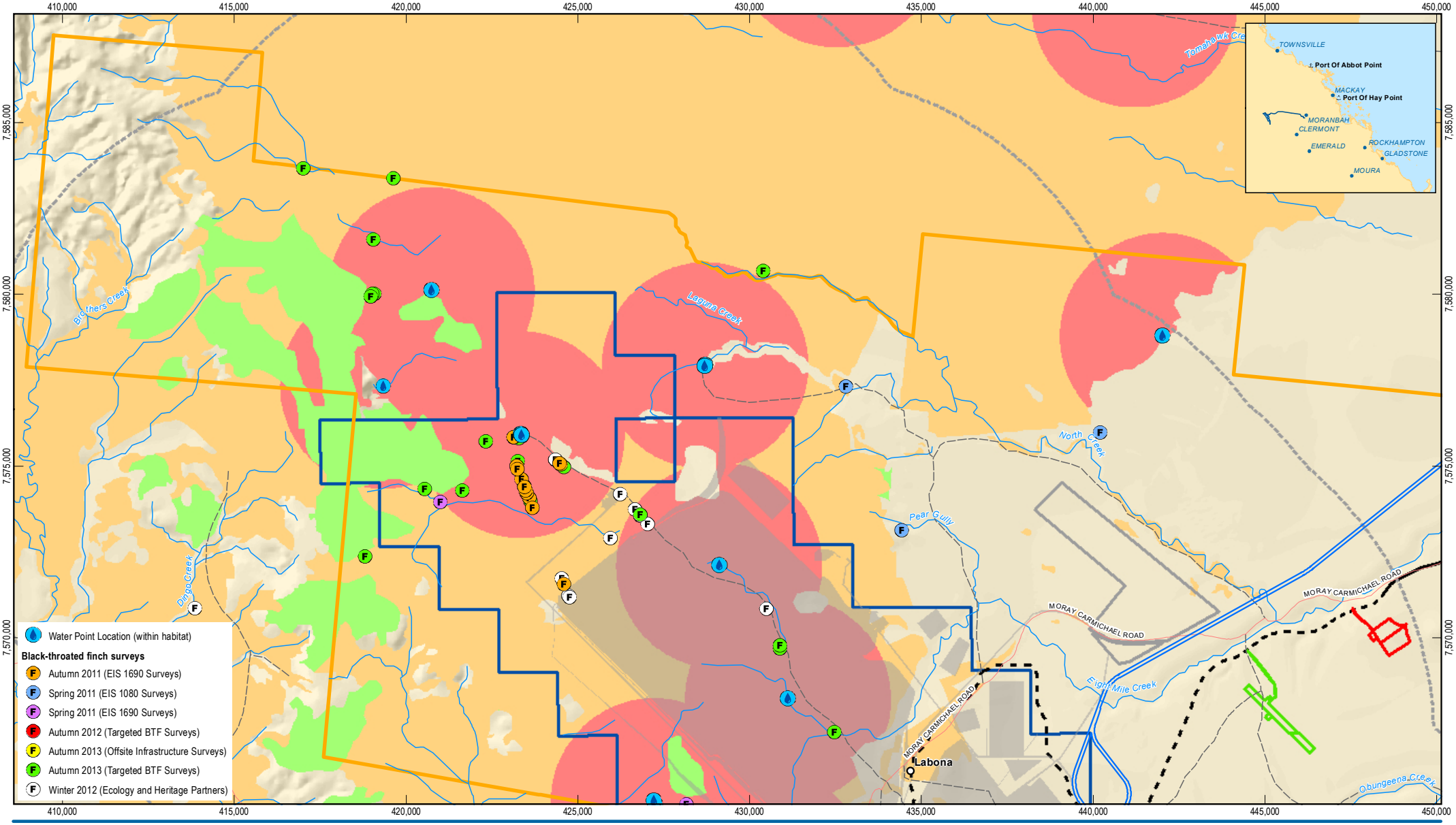
Index Map
Figure 3-2

G:\41\26422\GIS\Maps\MXD\0600_Ecology\41-26422_0662_rev_d.mxd
Level 9, 145 Ann St Brisbane QLD 4000 T +61 7 3316 3000 F +61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data Source: DME: EPC 1690 (2010), EPC 1080 (2011); DNRM: Regional Ecosystems v6.0 (2010); © Copyright Commonwealth of Australia - Geoscience Australia: Mainland, Homestead, Locality, Road, Watercourse (2007); Adani:Project Rail 1 (Opt11 Rev2) & 2 (Opt9 Rev3), Facilities, Offsite, Quarries, Mine (Onsite) (2013); GHD:Sightings, Potential Habitat (2011), Value Habitat, Confirmed Sightings, Moray Downs Property (2013). Created by: MS



1:150,000 (at A4)

0 2.5 5

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

N

LEGEND

- Homestead
- Local Road
- Track
- Watercourse
- Moray Downs Property
- Rail Corridor
- Project Area
- Road Corridor
- Road Corridor (proposed)
- Project (Mine) 10km Buffer
- High Value Habitat (Permanent water)
- High Value Habitat
- Low Value Habitat
- Mine (Onsite)
- Mine (Offsite)
- Airport
- Industrial Area
- Accommodation Village

Adani Mining Pty Ltd

Black-throated finch Management Plan

Black-throated finch (southern) value habitat (high/low condition)

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Figure 3-2

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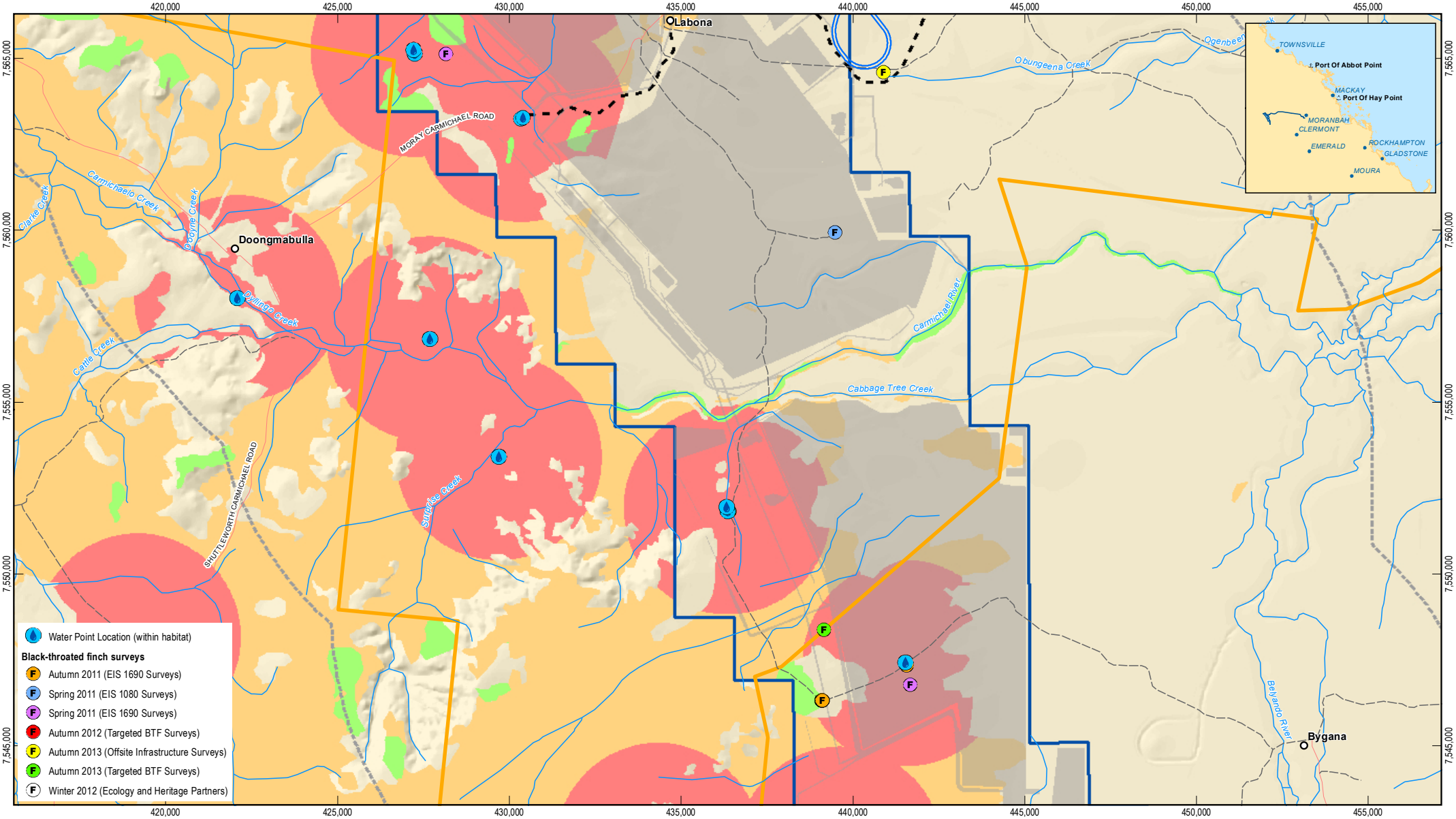
Level 9, 145 Ann St Brisbane QLD 4000 T +61 7 3316 3000 F +61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: DME: EPC1690 (2010)/EPC1080 (2011); © Commonwealth of Australia (Geoscience Australia): Watercourse, Tracks (2007); Adani: Alignment Opt11 Rev 2 (SP1 and 2)(2013), Offsite Infrastructure (2013); ESRI: Hillshade (2009); GHD: High/Low Value Habitat, Sightings, Moray Downs Property (2013). Created by: MS



1:150,000 (at A4)

0 2.5 5

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

N

LEGEND

- Homestead
- Local Road
- Track
- Watercourse
- Moray Downs Property
- Rail Corridor
- Project Area
- Road Corridor
- Road Corridor (proposed)
- Project (Mine) 10km Buffer
- High Value Habitat (Permanent water)
- High Value Habitat
- Low Value Habitat
- Mine (Onsite)
- Mine (Offsite)
- Airport
- Industrial Area
- Accommodation Village

Adani Mining Pty Ltd

Black-throated finch Management Plan

Black-throated finch (southern) value habitat (high/low condition)

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Figure 3-2

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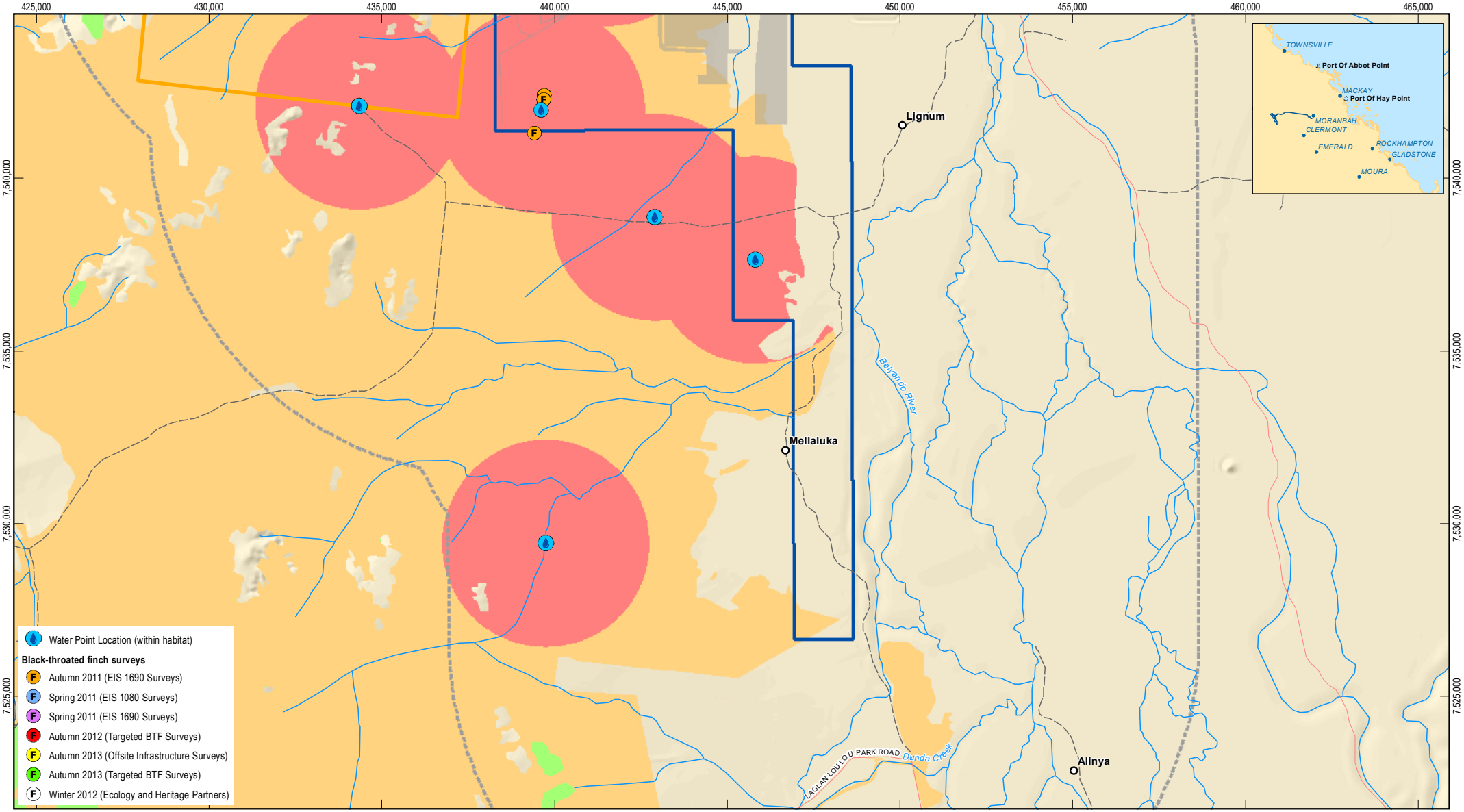
Level 9, 145 Ann St Brisbane QLD 4000 T +61 7 3316 3000 F +61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: DME: EPC1690 (2010)/EPC1080 (2011); © Commonwealth of Australia (Geoscience Australia): Watercourse, Tracks (2007); Adani: Alignment Opt11 Rev 2 (SP1 and 2)(2013), Offsite Infrastructure (2013); ESRI: Hillshade (2009); GHD: High/Low Value Habitat, Sightings, Moray Downs Property (2013). Created by: MS



1:150,000 (at A4)

0 2.5 5

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

N

LEGEND

- Homestead
- Local Road
- Track
- Watercourse
- Moray Downs Property
- Rail Corridor
- Project Area
- Road Corridor
- Road Corridor (proposed)
- Project (Mine) 10km Buffer
- High Value Habitat (Permanent water)
- High Value Habitat
- Low Value Habitat
- Mine (Onsite)
- Mine (Offsite)
- Airport
- Industrial Area
- Accommodation Village

Adani Mining Pty Ltd

Black-throated finch Management Plan

Black-throated finch (southern) value habitat (high/low condition)

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Figure 3-2

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Level 9, 145 Ann St Brisbane QLD 4000 T +61 7 3316 3000 F +61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: DME: EPC1690 (2010)/EPC1080 (2011); © Commonwealth of Australia (Geoscience Australia): Watercourse, Tracks (2007); Adani: Alignment Opt11 Rev 2 (SP1 and 2)(2013), Offsite Infrastructure (2013); ESRI: Hillshade (2009); GHD: High/Low Value Habitat, Sightings, Moray Downs Property (2013). Created by: MS

3.5.4 Drinking sites

Black-throated finches (southern) have been observed at a number of water bodies, predominantly within the northern and southern sections of the Mine site. Drinking sites have been a mixture of natural and artificial water bodies.

With respect to natural water sources, their significance to finches has been defined based on observations at the Mine site over a number of survey periods, and understanding of the landscape configuration in the Desert Uplands known to be important for the species. In this case, small, ephemeral watercourses are significant for the black-throated finch (southern) in the wet season, as these small pools allow the species to access a wide range of feeding sites. Streams of the order 1, 2 and 3 are considered most significant, whereas larger watercourses such as the Carmichael River are less important, especially due to the large array of other artificial and spring water sources available. Large running water sources are not suitable drinking sources for finches.

Artificial water sources (troughs, dams and springs) are considered important in both the wet season and dry season, and there are many observations and remote camera records of flocks of black-throated finches (southern) using these. Permanent water sources, including dams and troughs represent an important resource during the dry season. However only those that occur in close proximity to suitable foraging habitat and in areas that have been lightly grazed appear to be utilised. The distribution of REs considered suitable habitat for the species are extensive in the region and, though important, the landscape context, condition (i.e. historical management) and spatial arrangement is more important than simply the presence or absence of the RE type.

Black-throated finches in the Mine site consistently use the same water sources, and these water sources are more commonly both small dams that are fenced from cattle access, and unfenced troughs. These water sources are clean, and not pugged or degraded due to cattle access. This suggests that the provision of water sources, both to maintain persistence in the landscape in areas that will not be cleared and to encourage finches to access and utilise offset or adjacent properties that contain habitat but have less regular water sources (e.g. areas in Moray Downs directly north of the EPC), need to be smaller in size, include troughs and restrict cattle access. Troughs will be raised to prevent access by cattle and feral animals (based in models used in Newhaven and Gluepot Reserves) and small dams will be contained within both cattle and feral animal proof fences. The location of regular finch records and water sources are relatively well known, and planning will commence to identify and construct new water sources to facilitate regular black-throated finch use.

3.5.5 Nesting sites

Nesting sites were identified in the Study Area for the first time during the May 2013 survey. All were located near Ten Mile Bore, at the northern end of the Moray Downs Property. One nest location was identified from evidence of an adult bird carrying nesting material (*Panicum* stalks), and two others were actual nests being used by black-throated finch (southern). There was no evidence of breeding, and black-throated finch (southern) use nests on an annual basis to roost at night, as well as breed (DEWHA, 2009b). The size, shape and location of the nests were typical of other recorded instances of black-throated finch nests in northern Queensland (Black-throated Finch Recovery Team, 2007). While the Ten Mile Bore area is likely to be important for nesting, other nesting areas may occur. Further survey effort is required to document the distribution of nesting habitat.

3.5.6 Foraging habitat

Within surveys of the Mine Study Area, the highest numbers of black-throated finch (southern) are consistently recorded in the intact remnant vegetation dominated by *Eucalyptus melanophloia* woodlands (RE 10.5.5) and the associated *E. similis* (RE 10.5.1) and *E. populnea/brownii* woodlands (RE 10.3.6/10.3.28). This vegetation on the site, especially in the north-west, west and southwest, is in particularly good condition due to the low level of artificial watering points, low degree of exotic pasture invasion, the presence of poison bush (*Gastrolobium grandiflora*) which is toxic to cattle, and seemingly a history of low or light grazing. Many grass species that are considered “decreasers”, that is vulnerable to disappear due to cattle grazing, are diverse and of a high cover abundance (Kutt and Kemp, 2012; O'Reagain and Bushell, 2011). This includes a large number of grass species (e.g. *Alloteropsis*, *Triodia*, *Digitaria*, *Enteropogon*, *Eriachne*, *Panicum*) considered preferred food sources for the black-throated finch (southern) (Black-throated Finch Recovery Team, 2007). To further support the contention that good condition, lightly grazed sites seem to provide more suitable foraging habitat, *Eucalyptus melanophloia* woodlands (10.5.5) to the east of the EPC, have never recorded black-throated finches, despite ample water and the presence of the regional ecosystems considered finch “habitat”. These sites are grazed more heavily and are in poorer condition.

3.6 Recognised threats

The decline of the black-throated finch (southern) across its range is largely attributable to extensive agriculture and pastoralism, and the associated widespread clearing of habitat and conversion of the ground cover to predominantly exotic pastures (DEWHA, 2009a). Threats to the black-throated finch identified in the Species Profile and Threats Database (DotE, 2013) include:

- Clearance and fragmentation of woodlands, riparian habitats and wattle shrublands
- Degradation of habitat by domestic livestock and rabbits, including the alteration of fuel loads, vegetation structure and the availability of food during the wet season
- Alteration of habitat by changes in fire regimes
- Invasion of habitat by exotic weeds, including exotic grasses
- Illegal trapping
- Predation by introduced predators
- Hybridization with the northern subspecies.

The following threats are considered likely to be particularly relevant for the Carmichael Coal Mine and Rail Project:

- Clearing that fragments the available feeding, watering and nesting resources so that the remaining habitat is too small, or the distances between the resources too large to support a viable population.
- Increased exotic pasture and weed invasion of key habitat areas via poor grazing land management, machinery, soil disturbance, direct replacement (over-seeding) or other vectors that results in a homogenous unpalatable exotic pasture and weed composition.
- Large scale wildfire that can reduce, homogenise and change the ground cover from preferred food species, especially at key periods in the dry season and just after the wet

season (when grass curing is sufficient) where it can destroy significant seed sources on the ground.

- Loss or degradation of water sources via cattle and pig access, or changes in the groundwater and surface flows.
- Feral animal predation on adult birds, nests or eggs may also be a factor, however the magnitude of its effect is unknown.

3.7 Current studies and programs

Previous terrestrial ecological surveys conducted by GHD (GHD, 2011) (GHD, 2012) as part of the Project EIS and subsequently by Ecology and Heritage Partners Pty Ltd (unpublished data, 2012) identified large numbers of the black-throated finch on the proposed Mine site and opportunistically within the broader Moray Downs property adjacent to the Mine site.

In discussion with the DotE and the Black-throated Finch Recovery Team, Adani committed to the development and implementation of an additional monitoring program, to gain a better understanding of the population size, seasonal movements and key habitats and potential nesting areas used by the black-throated finch, both at the Mine site and adjacent Moray Downs and Bygana properties.

The first phase of the ongoing monitoring program was undertaken over the period 23 – 31 May 2013, coinciding with the recommended wet season survey period for the black-throated finch in areas north of latitude 23° (DEWHA, 2009a, b). The intent of this monitoring was to stratify and mark a series of permanent 2 ha plots across the Study Area, as well as identify and survey water bodies via observation and camera traps. Further local monitoring was undertaken on the Study Area in August and October 2013, This local monitoring program is a component of the larger adaptive monitoring and management program that is fundamental to this management plan (refer Section 9).

4. Performance indicators

4.1 Objective

The environmental objectives that have been developed for the black-throated finch management plan are specific to the environmental values that will be protected for the black-throated finch and the potential environmental impacts on these values. These objectives have been developed in accordance with HSE Management Standard HSE-ST-02 Planning, Objectives and Legal Obligations and include:

- The habitat values for the black-throated finch are maintained, and where possible enhanced, in the local landscape
- The management of areas for biodiversity onsite (Project areas such as the Mine) and offsite (other management areas such as mitigation and offset properties) contributes to the recovery actions set out in the black-throated finch recovery plan, including the following:
  - Investigate breeding requirements and threats to key breeding areas (Action 1.1)
  - Investigate feeding and other habitat requirements (Action 1.2)
  - Undertake targeted surveys (to identify habitat) (Action 2.4)
  - Secure selected sites for conservation (Action 3.1)
  - Address threats on grazing lands (Action 3.2)
  - Monitor management effectiveness (Action 3.3)
- The movement of black-throated finch into adjacent properties does not result in increased competition for resources in adjacent properties.

4.2 Indicators

The indicators that will be used to monitor the success of the management plan in achieving its objectives are as follows:

- Monthly audits demonstrating implementation of the mitigation and management measures
- No net decline in black-throated finch activity levels in rehabilitated habitat areas compared to black-throated finch activity levels in disturbed areas prior to construction
- Improvement in measurements of site-based vegetation attributes over-time against revegetation criteria developed for rehabilitation areas.
- Evidence of breeding and feeding in managed areas adjacent to the Project
- Evidence of continued use of water sources (artificial and ephemeral) adjacent the Project
- Evidence of use of areas where new water sources are relocated
- No uncontrolled fires, no increase in predator or feral animal numbers and no increase in exotic pasture distribution within existing high quality habitat areas.

5. Roles and responsibilities

5.1 Roles and responsibilities

Adani Compliance Guidelines set out requirements for assigning roles and responsibilities in relation to environmental management. The preliminary roles and responsibilities for pre-construction, construction and operation phases are listed in Table 5-1. These will be revised once organisational structures for each phase of the project and mining activity are confirmed.

In accordance with the guideline, position descriptions will contain responsibilities and accountabilities for environmental compliance and management. Performance against environmental compliance and management requirements will be part of the annual performance review and linked to remuneration and promotion of managers.

Table 5-1 Roles and responsibilities

Role	Pre-construction	Construction	Operation	Decommissioning
CEO	Approve and endorse Environment and Sustainability Policy. Ensure that adequate resources are available to comply with the Environment and Sustainability Policy.	Approve and endorse Environment and Sustainability Policy. Ensure that adequate resources are available to comply with the Environment and Sustainability Policy. Demonstrate a visible and pro-active commitment to HSE issues as per Adani Guideline CG-128 Management Commitment.	Approve and endorse Environment and Sustainability Policy. Ensure that adequate resources are available to comply with the Environment and Sustainability Policy. Assign authorities and responsibilities for environmental compliance and performance. Demonstrate a visible and pro-active commitment to HSE issues as per Adani Guideline CG-128 Management Commitment.	Approve and endorse Environment and Sustainability Policy. Ensure that adequate resources are available to comply with the Environment and Sustainability Policy. Assign authorities and responsibilities for environmental compliance and performance. Demonstrate a visible and pro-active commitment to HSE issues as per Adani Guideline CG-128 Management Commitment.
Adani Senior Management	Ensure compliance with all legal requirements including requirements of EPBC approval, environmental authority and other approvals. Ensure that requirements of this Plan are incorporated into engineering and procurement processes, and that these processes do not conflict with environmental performance requirements. Ensure that adequate resources are available to meet all compliance requirements and implement the requirements of this Plan. Demonstrate a visible and pro-active commitment to environmental issues as per Adani Guideline CG-128 Management Commitment.	Ensure compliance with all legal requirements including requirements of EPBC approval, environmental authority and other approvals. Ensure that adequate resources are available within Adani and contractors to meet all compliance requirements and implement the requirements of this Plan. Monitor close-out of corrective actions. Review outcomes of incident investigations. Demonstrate a visible and pro-active commitment to environmental issues as per Adani Guideline CG-128 Management Commitment.		

Role	Pre-construction	Construction	Operation	Decommissioning
Adani Contract Management and Procurement Team	Ensure that procurement and contracting strategies reflect environmental performance requirements and requirements of Adani Guidelines CG-022 Contractor's Management and CG-021. Procurement Ensure that specifications and contracts include performance requirements in relation to energy and water efficiency and other measures to reduce resource consumption and waste generation. Incorporate environmental performance requirements into contracts. Ensure that contractors hold necessary approvals and authorisations, particularly in relation to waste management services. Review environmental performance credentials of potential contractors. Demonstrate a visible and pro-active commitment to HSE issues as per Adani Guideline CG-128 Management Commitment.	Manage environmental performance requirements in contracts, including penalties in the event on non-compliance. Demonstrate a visible and pro-active commitment to HSE issues as per Adani Guideline CG-128 Management Commitment.	Ensure that specifications include performance requirements in relation to energy and water efficiency and other measures to reduce resource consumption and waste generation. Ensure that contractors hold necessary approvals and authorisations, particularly in relation to waste management services. Review environmental performance credentials of potential contractors. Demonstrate a visible and pro-active commitment to HSE issues as per Adani Guideline CG-128 Management Commitment. Meet requirements of Adani Guideline GE-021 Procurement in relation to purchasing.	Manage environmental performance requirements in contracts, including penalties in the event on non-compliance. Demonstrate a visible and pro-active commitment to HSE issues as per Adani Guideline CG-128 Management Commitment.
Environmental Manager and team	Provide advice to management, procurement and design teams in relation to the environmental requirements of this management plan. Conduct regular audits and checks of environmental performance. Manage technical studies and research activities relating to environmental management and monitoring for the black-throated finch.	Provide advice to Adani management teams and personnel in relation to environmental requirements. Integrate environmental management requirements into work procedures and practices. Conduct audits and checks of compliance and environmental performance of contractors. Monitor and report on compliance against all project approvals and	Provide advice to Adani managers and personnel in relation to the environmental requirements of this management plan. Assist and support managers, supervisors and workers in implementing this management plan and achieving environmental compliance. Conduct monitoring, auditing and reporting activities required in this	Provide advice to Adani managers and personnel in relation to the environmental requirements of this management plan. Assist and support managers, supervisors and workers in implementing this management plan and achieving environmental compliance. Conduct monitoring, auditing and reporting activities required in this

Role	Pre-construction	Construction	Operation	Decommissioning
	Maintain and further develop the black-throated finch management plan.	commitments. Communicate environmental obligations and requirements to construction staff. Manage technical studies and research activities relating to environmental assessment and management of the Project. Raise corrective actions for any non-compliance with this Plan or in response to results of incident investigations. Conduct incident investigations Report to Adani on environmental performance including compliance, non-compliance and incidents and near misses with potential or actual environmental harm. Further develop the Plan.	management plan. Monitor and report on compliance against all project approvals and commitments. Communicate environmental obligations and requirements to operational staff. Lead and assist with incident response and investigation where required to address environmental impacts or incidents. Compile monthly and quarterly environmental reports. Conduct audits and checks of compliance and environmental performance of contractors. Track changes in legislation, policy and other obligations and ensure these are incorporated into environmental compliance and management requirements and communicated to relevant managers and staff. Manage technical studies and research activities relating to environmental management and monitoring for the black-throated finch. Review, update and further develop the black-throated finch management plan.	management plan. Monitor and report on compliance against all project approvals and commitments. Communicate environmental obligations and requirements to operational staff. Lead and assist with incident response and investigation where required to address environmental impacts or incidents. Compile monthly and quarterly environmental reports. Conduct audits and checks of compliance and environmental performance of contractors. Track changes in legislation, policy and other obligations and ensure these are incorporated into environmental compliance and management requirements and communicated to relevant managers and staff.
Stakeholder Manager	Manage external relations with landholders and other stakeholders. Coordinate investigation and response to complaints and incidents involving members of the public.	Manage external relations with landholders and other stakeholders. Coordinate investigation and response to complaints and incidents involving members of the public.	Manage external relations with landholders and other stakeholder. Coordinate investigation and response to complaints and incidents involving members of the public.	Manage external relations with landholders and other stakeholder. Coordinate investigation and response to complaints and incidents involving members of the public.

Role	Pre-construction	Construction	Operation	Decommissioning
Employees and contractors	Comply with all requirements of this management plan.	Comply with all requirements of this Plan.	Comply with all requirements of this Plan.	Comply with all requirements of this Plan.
Design Manager	Ensure that design requirements set out in this management plan and any other design requirements needed to meet conditions of approval are incorporated into design.			
Design Leads	Ensure that design requirements set out in this Plan and any other design requirements needed to meet conditions of approval are incorporated into design. Consider safety in design and minimisation of environmental impacts in design. Demonstrate a visible and pro-active commitment to HSE issues as per Adani Guideline CG-128 Management Commitment.			
Construction Managers and supervisors		Implement all relevant requirements of this management plan. Integrate environmental management requirements into work procedures and practices. Provide initial responses to emergencies involving potential environmental impacts. Participate in incident investigations.		
Contractor Environmental Managers and Officers		Assist and support managers, supervisors and workers in implementing this management plan and achieving environmental compliance. Conduct monitoring, auditing and reporting activities required in this		

Role	Pre-construction	Construction	Operation	Decommissioning
		management plan. Assist with incident response and investigation where required to manage and address environmental impacts of incidents. Conduct induction training and tool box talks on environmental topics. Compile monthly and quarterly environmental reports.		
Mine General Manager			Implement Environment and Sustainability Policy. Ensure compliance with all legal requirements including requirements of EPBC approval, environmental authority and other approvals. Monitor actioning and close out of non-conformances. Ensure that adequate resources are available within Adani and contractors to meet all compliance requirements and implement the requirements of this Plan. Ensure that all personnel and contractors understand environmental authorities, responsibilities and requirements. Incorporate environmental performance and compliance requirements into job descriptions and performance reviews. Demonstrate a visible and pro-active commitment to HSE issues as per Adani Guideline CG-128 Management Commitment Reward outstanding performance in relation to environmental performance.	Implement Environment and Sustainability Policy. Ensure compliance with all legal requirements including requirements of EPBC approval, environmental authority and other approvals. Monitor actioning and close out of non-conformances. Ensure that adequate resources are available within Adani and contractors to meet all compliance requirements and implement the requirements of this Plan. Ensure that all personnel and contractors understand environmental authorities, responsibilities and requirements. Incorporate environmental performance and compliance requirements into job descriptions and performance reviews. Demonstrate a visible and pro-active commitment to HSE issues as per Adani Guideline CG-128 Management Commitment Reward outstanding performance in relation to environmental performance.

Role	Pre-construction	Construction	Operation	Decommissioning
Mine area managers			Ensure that requirements of this Plan are incorporated into all aspects of site operation and maintenance and are implemented. Integrate environmental management requirements with work procedures and practices. Raise corrective actions for any non-compliance with this Plan or in response to results of incident investigations Conduct incident investigations. Demonstrate a visible and pro-active commitment to HSE issues as per Adani Guideline CG-128 Management Commitment.	Ensure that requirements of this Plan are incorporated into all aspects of site operation and maintenance and are implemented. Integrate environmental management requirements with work procedures and practices. Raise corrective actions for any non-compliance with this Plan or in response to results of incident investigations Conduct incident investigations. Demonstrate a visible and pro-active commitment to HSE issues as per Adani Guideline CG-128 Management Commitment.
Mine supervisors			Comply and ensure compliance with all requirements of this management plan. Raise corrective actions for any non-compliance with this management plan or in response to results of incident investigations. Coordinate initial response to incidents with potential or actual environmental harm.	Comply and ensure compliance with all requirements of this management plan. Raise corrective actions for any non-compliance with this management plan or in response to results of incident investigations. Coordinate initial response to incidents with potential or actual environmental harm.

5.2 Expert Advisory Committee

An Expert Advisory Committee will be established to provide peer/technical expert input and reviews during implementation of this black-throated management plan. The Expert Advisory Committee will include representatives from the black-throated finch recovery team, DotE, DEHP, Adani's Environment Manager and the construction/operation contractor's environment manager.

The Expert Advisory Committee will be provided a copy of the draft black-throated finch management plan for review and comment on the proposed monitoring and management actions. They will also be provided a monitoring report every 6 months that will outline the results of the latest round of monitoring. Every six months the Expert Advisory Committee will meet to discuss these results and the implementation and objectives of future monitoring and management actions. Any non-compliance or corrective actions that have occurred will also be discussed at the six monthly meetings.

It will also be the responsibility of the Expert Advisory Committee to liaise with the bioregional species management plan Steering Committee regarding collaboration of the two monitoring and management programs in terms of sharing information and contributing to common goals. The bioregional species management plan is discussed further in Section 8.2.

In the event of an environmental incident involving black- throated finch or a non-compliance with the conditions of approval or this management plan, Adani's Environment Manager may engage the Expert Advisory Committee to assist in the development of appropriate preventative or corrective actions.

6. Potential impacts

6.1 Overview

The following section identifies the potential impacts to black-throated finch (southern) as a result of the construction and operation of the Project. The summary of impacts is based upon the impact assessments undertaken as part of the EIS and SEIS.

6.2 Habitat loss

The black-throated finch (southern) has been encountered in all targeted surveys undertaken within the proposed Mine site. The number of black-throated finch (southern) observations suggests that the subspecies occurs in large numbers in the area and that much of the habitat is in good condition. The sub-population of black-throated finch (southern) in the landscape that encompasses the Mine Area and adjacent properties to the north and west, is seemingly large and potentially significant in context of the existing known populations (i.e. Townsville).

Of the potential habitat for the black-throated finch (southern) identified at the Study Area, Figure 3-2 presents the 'important areas' for the black-throated finch (southern) at the Study Area, as defined in the black-throated finch (Southern) Significant Impact Guidelines (DEWHA, 2009b). These areas are defined as areas of identified potential habitat within 5 km of any post-1995 (i.e. Project field survey) sightings of the subspecies. A total of 9,730 ha of identified black-throated finch (southern) potential habitat are proposed to be impacted by vegetation clearing over the life of the Project (Mine and Rail). Approximately 84 percent of the habitat areas to be directly impacted are high condition habitat.

The area of direct impact has been minimised as far as possible throughout the design and development of the mine plan. The most significant area of changes was relocating out of pit stockpiles from the western portion of the mine site (over the underground mining area on EPC 1690) to the eastern edge (overlaying EPC 1080) resulting in the reduction of a direct impact of some 7,000 ha to the current indirect impact of 6,308 ha (low subsidence areas – high impact subsidence areas considered as direct impacts). This change to the mine plan resulted in an approximately 40 percent reduction in the potential area of direct impact. In addition, more recent changes to the mine plan between the EIS and SEIS included the removal of open cut pits in the northern extent of the mine and conversion of open cut pits to underground longwall panels; this has resulted in a further reduction of the potential area of direct impact.

Loss of habitat for the black-throated finch (southern) will be staged, in accordance with the staged development of the operational components of the Mine. Previously mined areas will be rehabilitated in parallel with development of previously unmined areas within the Study Area. Nonetheless, an overall reduction in the local availability of habitat for the subspecies will occur as a result of the operation phase of the Project. It is possible that the subspecies may disperse away from the developed parts of the Study Area, either to suitable, un-impacted habitat within other parts of the Study Area, or to potentially suitable habitat in the landscape to the north, west and south of the Study Area.

6.3 Habitat alteration through subsidence

The entire habitat to be indirectly impacted by subsidence is considered to be high condition habitat for the black-throated finch (southern). However, only a very small part of this habitat (approximately 2.6 percent) is considered to be subject to high subsidence impacts, with the rest low or no subsidence impact.

The black-throated finch (southern) has an affiliation to water, so may therefore be able to take advantage of the creation of additional ponded surface water areas as a result of subsidence, even where this resource is temporary, though the destructive impact on surface habitat might negate this effect. Black-throated finch (southern) requires an abundance of reliable water sources within its localised habitat ranges. Furthermore, they have been observed (during survey work) to drink from water sources in areas of cleared land or non-wooded vegetation and therefore any localised changes in habitat structure around existing or new water sources may not affect the subspecies' ability to use these water sources, so long as the requisite grassland and woodland habitats remain present within the nearby surrounds.

It is noted that the subsidence in the Mine Area will occur gradually and in a complex and partly unpredictable manner. Therefore the data being collected by the long-term monitoring in the Mine Area will provide information regarding the best strategies over time to mitigate any negative effects from subsidence on the black-throated finch (southern) habitat.

6.4 Changes to hydrology / surface water

Existing hydrology will be altered as a result of the mine operations through realignment of watercourses as well as removal of some existing farm dams and cattle troughs. Diversion drains around the perimeter of the mine site as well as areas of ponding and drainage management within the subsidence area provide water sources. The provision and security of surface water in those potential habitat areas may provide additional localised access to drinking water for the subspecies (or at least compensate for the loss of surface water resources in nearby parts of the Study Area).

6.5 Injury or mortality to species

Though probably a lesser impact, increased traffic, human and machine activity may cause direct mortality of black-throated finches (southern), especially as this species does feed in roadside vegetation. However the species is more likely to be indirectly affected by works reducing habitat availability and introducing weed and pest species within the local landscape.

6.6 Habitat degradation

Construction and operation of the Project has the potential to directly and indirectly degrade black-throated finch habitat. Vegetation clearing will provide an opportunity for weed species to establish in new areas and the transport of plant, equipment and materials has the potential to spread weed seeds. The most significant weeds that may affect black-throated finch habitat and feeding habitat condition are introduced pasture grass species, such as Buffel Grass *Pennisetum ciliare*, Indian Couch *Bothriochloa pertusa*, Grader Grass *Themeda quadrivalvis* and *Seca Stylosanthes* spp. These species are promoted by cattle grazing (directly and indirectly) and soil disturbance, and can become monocultures that exclude native grass species.

Feral animals such as pigs and cats can also degrade black-throated finch habitat. Though there is little evidence that black-throated finches are directly predated by feral animals, species such as pigs will degrade water sources and feeding areas via wallowing and rooting.

Cattle grazing are another key factor that can modify black-throated finch habitat by reducing native grass diversity and promoting weed incursions. Recent surveys at the Mine Area indicate the best habitat and most abundant populations of black-throated finch are located in areas that have not been cleared and have historically been very lightly grazed and, as a consequence, have a diverse ground cover and food resource.

Inappropriate fire regimes can have a significant impact on both the food sources and nest trees of the black-throated finch. Using appropriate fire regimes and management, especially during key resource dependent (bottleneck) periods, will be a critical management action.

Management actions to maintain and improve black-throated finch habitat are outlined in Section 7. This includes measures to minimise impacts from feral animals and weeds, promoting ecological burning regimes, enhance existing water sources and troughs, and creating new water sources to encourage dispersal and use of habitat adjacent to impacted areas.

7. Management and mitigation actions

The loss of habitat for the black-throated finch will occur in stages, in accordance with the staged development of the operational components of the Mine site. Management actions will seek to maintain and where possible enhance habitats and populations (e.g. through pest control, provision of water sources, appropriate grazing and fire management) in unmined parts of the Mine Area, as well as in adjacent areas. Management actions to encourage dispersal away from areas that will be cleared for staged Mine operations will also be developed. Adani will manage the adjacent Moray Downs property to preserve and enhance environmental values that will support the neighbouring black-throated finch (southern) population observed in the Mine Area. The Moray Downs property will be managed through the implementation of this black-throated finch management plan.

Key management actions that will be implemented to specifically mitigate impacts on the local population and habitats of the black-throated finch during construction and operation of the Project include:

- Procuring and managing suitable offset sites for the black-throated finch in accordance with the Environmental Offset Package (Ecofund, 2013)
- Implementing an adaptive monitoring program to further identify areas of high ecological value (i.e. drinking sites, nesting sites and key foraging habitat) within the Project area and offset areas and monitor changes in the distribution, behaviour and utilisation of habitats by the black-throated finch. The adaptive monitoring program is outlined in Section 8.
- Limiting the extent and duration of clearing of high-value habitat areas during black-throated finch nesting periods (the wet season)
- Providing additional raised drinking troughs in strategic locations that meet the following location criteria:
  - Within 400 m of suitable nesting habitat trees
  - The presence of grass species that provide forage (grass seeds) throughout the year, particularly in the wet season (typically early flowering perennials). Grass species that are considered important forage species for black-throated finch include *Urochloa mosambicensis*, *Enteropogon acicularis*, *Panicum decompositum*, *Panicum effusum*, *Dichanthium sericeum*, *Alloteropsis semialata*, *Eragrostis sororia* and *Themeda triandra* (DEWHA, 2009a).
- Maintaining existing fire regimes that promote generation of suitable foraging habitat for the black-throated finch (southern) and employing appropriate fire regimes in rehabilitated areas to enhance generation of suitable habitat. This will include:
  - Utilisation of mosaic burning regimes to stage and locate burning in order to avoid sudden and widespread loss of food resources
  - Timing of controlled burning to avoid breeding and nesting periods
  - Consideration of protected areas adjacent to known and utilised water resources
- Maintaining strategic areas of potential habitat that occur within the offset areas and in potential strategic habitat linkages within the landscape
- Managing pest populations that pose a predation threat or undermine habitat quality in areas of high ecological value (i.e. drinking sites, nesting sites and key foraging habitat)

- Managing weeds and exotic pasture plants within areas of high ecological value (i.e. drinking sites, nesting sites and key foraging habitat).

The other general mitigation and management measures that will be implemented to minimise potential impacts to black-throated finch during pre-construction, construction, operation and post operation are outlined in Table 7-1, Table 7-2, Table 7-3 and Table 7-4 respectively.

Table 7-1 Management and mitigation measures (pre-construction)

Issue	Control	Responsibility	Timeframe	Documentation
General	Establish local monitoring sites (as described in Section 8.3) to identify habitat and critical nesting, foraging and drinking resources within the Project Area.	Environmental Manager	Establish prior to construction. Undertake monitoring twice annually. Re-assess frequency of ongoing monitoring over time in consultation with the Recovery Team and government regulators.	Black-throated finch monitoring plan
	Provide information for inclusion in the site induction documentation that outlines the black-throated finch's critical resources and distribution within the Project area, the key threats to the species and the responsibilities outlined in this management plan for all workers undertaking work on site.	All staff	Prior to site entry	Worker induction information
	Identify and procure offset areas for the black-throated finch in accordance with Environmental Offset Strategy (Ecofund 2013).	Environmental Manager / Stakeholder Manager	Prior to construction	Offset Management Plan Black-throated finch monitoring plan
	Establish monitoring sites (as described in Section 8.2) to identify habitat and critical nesting, foraging and drinking resources within the proposed Offset Area.	Environmental Manager	Establish prior to construction. Undertake monitoring twice annually. Re-assess frequency of ongoing monitoring over time in consultation with the Recovery Team and government regulators.	Offset Management Plan Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
	Prepare and implement a Land Management Plan to manage grazing intensity on the Mine area, adjacent Moray Downs property and offset areas. This will include the preparation of a stock management map that will identify areas that require no net increase in stocking rates such as offset areas, areas subject to rehabilitation and critical resources (i.e. nesting sites, breeding sites and seasonally important foraging habitat).	Environmental Manager / Land Manager	Updated monthly as required, during pre-construction	Land Management Plan and Stock Management Map
Habitat loss	Maintain a current map of black-throated finch habitat and erect signage to prevent access to locations of critical nesting and drinking resources for the black-throated finch.	Environmental Manager	Updated after each monitoring event.	Map of habitat and critical resources for the black-throated finch
	Identify areas of high ecological value for the black-throated finch that will be subject to rehabilitation measures to encourage black-throated finch movement. Based on the nature of the site, undertake measures to improve the habitat quality (i.e. reduce the density of exotic pasture grasses, provide additional water resources, increase the density and diversity of native food grass species or implement a fire management regime).	Environmental Manager / Stakeholder Manager	Prior to construction	Black-throated finch monitoring plan
Habitat degradation	Undertake weed mapping prior to construction. Mapping will focus on sensitive areas including drinking and nesting sites and important foraging habitat for the black-throated finch. The weed mapping will also focus on the distribution and density of exotic pasture grasses.	Environmental Manager	Prior to construction	Weed mapping
	Minimise the extent of proposed new road network, particular in areas adjacent to feeding and nesting sites.	Construction Manager	Prior to construction	Site maps

Table 7-2 Management and mitigation measures (construction)

Issue	Control	Responsibility	Timeframe	Documentation
General	Continue implementing local monitoring as out lined in Section 8.3.	Environmental Manager	Ongoing. Twice annually. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	Black-throated finch monitoring plan
	Induct all construction staff and contractors prior to commencing work on site. The induction will include an overview of black-throated finch's critical resources and distribution within the Project area, the key threats to the species and the responsibilities outlined in this management plan for all workers undertaking work on site.	Environmental Manager	Prior to site entry	Training register
	Provide toolbox talks as required to communicate any non-compliances that have occurs in relation to the black-throated finch management plan and the corrective actions that are being implemented.	Environmental Manager	As required during construction.	Training log
	Continue ongoing monitoring as described in Section 8.2.	Environmental Manager	Ongoing. Twice annually. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	Offset Management Plan Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
	Continue to rehabilitate or protect areas of key ecological value for the black-throated finch (i.e. reducing grazing pressures, reduce the density of exotic pasture grasses, increase the density and diversity of native food grass species, protect drinking sites, provide artificial drinking sites and manage the fire regime).	Environmental Manager / Stakeholder Manager	During construction	Offset Management Plan Black-throated finch monitoring plan
Habitat loss	Maintain map of black-throated finch habitat and modify signage of critical resources if required.	Environmental Manager	Ongoing. Update map of habitat and signage of critical resources after each monitoring event.	Map of habitat and critical resources for the black-throated finch
	Locate temporary construction facilities (i.e. laydown areas, site offices) outside areas of mapped potential habitat for the black-throated finch.	Construction Manager	Throughout the construction period	Construction plans
	Minimise immediate loss of habitat by undertaking sequential clearing and limiting clearing to areas required for immediate construction activities.	Construction Manager	Throughout the construction period	Construction plans
	Limiting the extent and duration of clearing of high-value habitat areas during black-throated finch nesting periods (the wet season).	Construction Manager	Throughout the construction period	Construction plans
	Clearly identify the extent of vegetation clearing on construction plans and in the field. Areas that must not be cleared or damaged are to also be clearly identified on construction plans and in the field. Clearing extents will to be communicated to all necessary construction supervisors.	Construction Manager	Prior to construction commencing	Construction plans

Issue	Control	Responsibility	Timeframe	Documentation
	Provide new water sources (troughs) using a raised design to discourage access by macropods, cattle and feral animals, such as pigs and cats. The location of water sources will be within 400 m of suitable nesting habitat trees and have grass species that provide forage (grass seeds) throughout the year, particularly in the wet season (typically early flowering perennials). New water sources will be provided to replace existing drinking sites disrupted by construction activities as well as enhance the habitat of areas identified as high ecological value for the black-throated finch that will be rehabilitated to encourage black-throated finch movement.	Environmental Manager	Throughout the construction period	Black-throated finch monitoring plan
Direct injury or mortality	Undertake pre-clearance surveys for all clearing within areas of mapped potential habitat for the black-throated finch. Where suitable habitat is present, a qualified and experienced spotter-catcher will accompany clearing to avoid nests and other critical resources where possible.	Environmental Manager	Prior to clearing	Pre-clearance report
	Undertake vegetation clearing in a sequential manner to allow black-throated finches an opportunity to disperse away from construction areas.	Construction Manager	Throughout the construction period	Construction plans
	Vehicles will be required to stay on pre-determined routes.	All staff	Throughout the construction period	Site maps Signage Induction documents
	Erect warning signs along tracks that run adjacent to habitat and critical resources for the black-throated finch to inform workers of the presence of the species. All vehicles and plant will adhere to site rules relating to speed limits. Speed limits will be clearly signposted so as to minimise the potential for road kill.	All staff	Throughout the construction period	Signage

Issue	Control	Responsibility	Timeframe	Documentation
	Report any incidence of fauna mortality to the Environmental Manager and log in a fauna incident register.	All staff, Environmental Manager	Report immediately in response to incidents during construction	Fauna incident register
Habitat degradation	Areas of potential habitat that are not impacted by construction and have the potential to link areas of black-throated finch habitat within the Project Area with habitat in offset areas will be protected from degradation or rehabilitated. This will include no net increase in grazing intensity, introducing water troughs, implementing measures to reduce the density of exotic pasture grasses and increasing the density and diversity of native food grass species. Suitable areas for rehabilitation will be determined based on the habitat mapping provided in Figure 3-2. High value habitat areas without water sources will be identified and artificial water sources installed.	Environmental Manager	Throughout the construction period	Rehabilitation Plan
	Manage erosion and sedimentation in accordance with erosion and sediment controls set out in Volume 4, Appendix Q1 Environmental Management Plan (Mine) and Volume 4, Appendix Q2 Environmental Management Plan (Offsite).	Environmental Manager	Throughout the construction period	Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Undertake dust suppression activities where construction occurs adjacent to foraging habitat and drinking or nesting sites for the black-throated finch. This will be in accordance with the mitigation measures outlined in Volume 4 Appendix K3 Water Quality Report.	Environmental Manager	Throughout the construction period	Water Quality Report Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Manage ephemeral water sources such as springs by preventing access by stock and feral animals in the wet season.	Environmental Manager	Throughout the construction period	Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
	Store fuels, chemicals, wastes and other potentially environmentally hazardous substances in bunded or otherwise contained areas away from watercourses, waterbodies and other known or potential drinking sites for the black-throated finch.	All staff	Throughout the construction period	Waste and Hazardous Materials Storage Register Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Maintain all vehicles and plant to regular maintenance and inspection schedules to reduce the potential for oil leaks and spills.	All staff	Throughout the construction period	Vehicle maintenance schedules and inspection
	Immediately report and manage all oil and pollutant spills.	All staff	Throughout the construction period	Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Monitor water quality at all potential and confirmed drinking sites for the black-throated finch, in accordance with the methods outlined in Volume 4 Appendix K3 Water Quality report.	Environmental Manager	Monthly, throughout the construction period	Monthly Water Quality Reporting
	Monitor weeds levels in and adjacent to all sensitive areas for the black-throated finch (i.e. drinking sites, nesting sites and important foraging habitat). If required, undertake weed control in areas that are infested with exotic pasture grasses.	Environmental Manager	Throughout the construction period	Weed Management Plan Weed Monitoring Reporting
	Inspect and certify all vehicles, equipment and materials brought onto site as free of weeds and weed seeds and carry a weed hygiene declaration. Records are to be kept of compliance with this requirement. A weed wash down facility will be constructed onsite.	All staff	Throughout the construction period	Weed Hygiene Certification

Issue	Control	Responsibility	Timeframe	Documentation
	Store soil stripped and stockpiled from areas containing known weed infestations in areas separate from areas free of weeds and away from all mapped potential habitat and drinking sites and nesting sites for the black-throated finch.	Construction Manager	Throughout the construction period	Weed Management Plan
	Use habitat rehabilitation methods that exclude the use of exotic pasture species, and instead use local native grass species known to be black-throated finch food species.	Environmental Manager	During and after construction	Rehabilitation Plan
	Monitor pest animal occurrence during construction and implement humane pest control measures to reduce the number of wild pigs and cats.	Environmental Manager	Annually, throughout the construction period	Pest animal monitoring report
	Reduce or eliminate baiting of dingoes. These animals are the top order predators in Australia and are known to exclude feral cats from their territories (i.e. the species most likely to prey on black-throated finch (southern)) and reduce feral pigs and kangaroos, both species that can degrade resources for the finch.	Environmental Manager	Throughout the construction period	Pest animal monitoring report
	Incorporate ecological burning regimes for the black-throated finch in the broader Fire Management Plan for the Mine.	Environmental Manager / Land Manager	Throughout the construction period	Fire Management Plan Black-throated finch monitoring plan
	Undertake late wet season/early dry season mosaic burns, to break up the country and prevent extensive late dry season wildlife.	Environmental Manager / Land Manager	Throughout the construction period	Fire Management Plan Black-throated finch monitoring plan
	Undertake some wet season storm burning, when appropriate.	Environmental Manager / Land Manager	Throughout the construction period	Fire Management Plan Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
	Document and map the distribution, frequency and timing of fire events and maintain a range of fire ages in the black-throated finch habitat areas.	Environmental Manager / Land Manager	Annually, throughout the construction period	Fire incidence report and map
	Clear networks of fire breaks that help promote a range of fire ages across remaining finch habitat and offset areas.	Environmental Manager / Land Manager	Throughout the construction period	Fire Management Plan

Table 7-3 Management and mitigation measures (operation)

Issue	Control	Responsibility	Timeframe	Documentation
General	Continue implementing local monitoring as out lined in Section 8.4.	Environmental Manager	Ongoing. Twice annually. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	Black-throated finch monitoring plan
	Induct all operation staff and contractors prior to commencing work on site. The induction will include an overview of black-throated finch's critical resources and distribution within the Project area, the key threats to the species and the responsibilities outlined in this management plan for all workers undertaking work on site.	Environmental Manager	Prior to site entry	Training register
	Provide toolbox talks as required to communicate any non-compliances that have occurs in relation to the black-throated finch management plan and the corrective actions that are being implemented.	Environmental Manager	As required during operation.	Training log
	Continue ongoing monitoring as described in Section 8.3.	Environmental Manager	Ongoing. Twice annually. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	Offset Management Plan Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
	Continue to rehabilitate or protect areas of key ecological value for the black-throated finch (i.e. reducing grazing pressures, reduce the density of exotic pasture grasses, increase the density and diversity of native food grass species, protect drinking sites, provide artificial drinking sites and manage the fire regime).	Environmental Manager / Stakeholder Manager	During operation	Offset Management Plan Black-throated finch monitoring plan
Habitat loss	Maintain map of black-throated finch habitat and modify signage of critical resources if required.	Environmental Manager	Ongoing. Update map of habitat and signage of critical resources after each monitoring event.	Map of habitat and critical resources for the black-throated finch
	Minimise immediate loss of habitat by undertaking sequential clearing and limiting clearing to areas required for immediate operation activities.	Operation Manager	During operation	Operation plans
	Limiting the extent and duration of clearing of high-value habitat areas during black-throated finch nesting periods (the wet season).	Operation Manager	During operation	Operation plans
	Clearly identify the extent of vegetation clearing on operation plans and in the field. Areas that must not be cleared or damaged are to also be clearly identified on operation plans and in the field. Clearing extents will to be communicated to all necessary operation supervisors.	Operation Manager	Prior to operation commencing	Operation plans

Issue	Control	Responsibility	Timeframe	Documentation
	Provide new water sources (troughs) using a raised design to discourage access by macropods, cattle and feral animals, such as pigs and cats. The location of water sources will be within 400 m of suitable nesting habitat trees and have grass species that provide forage (grass seeds) throughout the year, particularly in the wet season (typically early flowering perennials). New water sources will be provided to replace existing drinking sites disrupted by operation activities as well as enhance the habitat of areas identified as high ecological value for the black-throated finch that will be rehabilitated to encourage black-throated finch movement.	Environmental Manager	During operation	Black-throated finch monitoring plan
Direct injury or mortality	Undertake pre-clearance surveys for all clearing within areas of mapped potential habitat for the black-throated finch. Where suitable habitat is present, a qualified and experienced spotter-catcher will accompany clearing to avoid nests and other critical resources where possible.	Environmental Manager	Prior to clearing	Pre-clearance report
	Undertake vegetation clearing in a sequential manner to allow black-throated finches an opportunity to disperse away from operation areas.	Operation Manager	During operation	Operation plans
	Vehicles will be required to stay on pre-determined routes.	All staff	During operation	Site maps Signage Induction documents
	Minimise the extent of proposed new road network, particular in areas adjacent to feeding and nesting sites.	Operation Manager	During operation	Site maps

Issue	Control	Responsibility	Timeframe	Documentation
	Erect warning signs along tracks that run adjacent to habitat and critical resources for the black-throated finch to inform workers of the presence of the species. All vehicles and plant will adhere to site rules relating to speed limits. Speed limits will be clearly signposted so as to minimise the potential for road kill.	All staff	During operation	Signage Induction documents
	Report any incidence of fauna mortality to the Environmental Manager and log in a fauna incident register.	All staff, Environmental Manager	Report immediately in response to incidents during operation	Fauna incident register
Habitat degradation	Areas of potential habitat that are not impacted by operation and have the potential to link areas of black-throated finch habitat within the Project Area with habitat in offset areas will be protected from degradation or rehabilitated. This will include no net increase in grazing intensity, introducing water troughs, implementing measures to reduce the density of exotic pasture grasses and increasing the density and diversity of native food grass species. Suitable areas for rehabilitation will be determined based on the habitat mapping provided in Figure 3-2. High value habitat areas without water sources will be identified and artificial water sources installed.	Environmental Manager	During operation	Rehabilitation Plan
	Manage erosion and sedimentation in accordance with erosion and sediment controls set out in Volume 4, Appendix Q1 Environmental Management Plan (Mine) and Volume 4, Appendix Q2 Environmental Management Plan (Offsite).	Environmental Manager	During operation	Environmental Management Plan (Mine) Environmental Management Plan (Offsite)

Issue	Control	Responsibility	Timeframe	Documentation
	Undertake dust suppression activities where operation works occurs adjacent to foraging habitat and drinking or nesting sites for the black-throated finch. This will be in accordance with the mitigation measures outlined in Volume 4 Appendix K3 Water Quality Report.	Environmental Manager	During operation	Water Quality Report Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Manage ephemeral water sources such as springs will be managed to prevent access by stock and feral animals in the wet season.	Environmental Manager	During operation	Black-throated finch monitoring plan
	Store fuels, chemicals, wastes and other potentially environmentally hazardous substances in bunded or otherwise contained areas away from watercourses, waterbodies and other known or potential drinking sites for the black-throated finch.	All staff	During operation	Waste and Hazardous Materials Storage Register Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Maintain all vehicles and plant to regular maintenance and inspection schedules to reduce the potential for oil leaks and spills.	All staff	During operation	Vehicle maintenance schedules and inspection
	Immediately report and manage all oil and pollutant spills.	All staff	During operation	Environmental Management Plan (Mine) Environmental Management Plan (Offsite)

Issue	Control	Responsibility	Timeframe	Documentation
	Monitor weeds levels in and adjacent to all sensitive areas for the black-throated finch (i.e. drinking sites, nesting sites and important foraging habitat). If required, undertake weed control in areas that are infested with exotic pasture grasses.	Environmental Manager	During operation	Weed Management Plan Weed Monitoring Reporting
	Inspect and certify all vehicles, equipment and materials brought onto site as free of weeds and weed seeds and carry a weed hygiene declaration. Records are to be kept of compliance with this requirement. A weed wash down facility will be constructed onsite.	All staff	During operation	Weed Hygiene Certification
	Store soil stripped and stockpiled from areas containing known weed infestations in areas separate from areas free of weeds and away from all mapped potential habitat and drinking sites and nesting sites for the black-throated finch.	Operation Manager	During operation	Weed Management Plan
	Use habitat rehabilitation methods that exclude the use of exotic pasture species, and instead use local native grass species known to be black-throated finch food species.	Environmental Manager	During operation	Rehabilitation Plan
	Monitor pest animal occurrence during operation and implement humane pest control measures to reduce the number of wild pigs and cats.	Environmental Manager	Annually during operation	Pest animal monitoring report
	Reduce or eliminate baiting of dingoes. These animals are the top order predators in Australia and are known to exclude feral cats from their territories (i.e. the species most likely to prey on black-throated finch (southern)) and reduce feral pigs and kangaroos, both species that can degrade resources for the finch.	Environmental Manager	During operation	Pest animal monitoring report
	Incorporate ecological burning regimes for the black-throated finch in the broader Fire Management Plan for the Mine.	Environmental Manager / Land Manager	During operation	Fire Management Plan Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
	Undertake late wet season/early dry season mosaic burns, to break up the country and prevent extensive late dry season wildlife.	Environmental Manager / Land Manager	During operation	Fire Management Plan Black-throated finch monitoring plan
	Undertake some wet season storm burning, when appropriate.	Environmental Manager / Land Manager	During operation	Fire Management Plan Black-throated finch monitoring plan
	Document and map the distribution, frequency and timing of fire events and maintain a range of fire ages in the black-throated finch habitat areas.	Environmental Manager / Land Manager	Annually during operation	Fire incidence report and map
	Clear networks of fire breaks that help promote a range of fire ages across remaining finch habitat and offset areas.	Environmental Manager / Land Manager	During operation	Fire Management Plan

Table 7-4 Management and mitigation measures (decommissioning)

Issue	Control	Responsibility	Timeframe	Documentation
General	Continue implementing local monitoring as out lined in Section 8.4.	Environmental Manager	Ongoing. Twice annually. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	Black-throated finch monitoring plan
	Induct all staff and contractors prior to commencing work on site. The induction will include an overview of black-throated finch's critical resources and distribution within the Project area, the key threats to the species and the responsibilities outlined in this management plan for all workers undertaking work on site.	Environmental Manager	Prior to site entry	Training register
	Provide toolbox talks as required to communicate any non-compliances that have occurs in relation to the black-throated finch management plan and the corrective actions that are being implemented.	Environmental Manager	As required during decommissioning.	Training log
	Continue ongoing monitoring as described in Section 8.3.	Environmental Manager	Ongoing. Twice annually. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	Offset Management Plan Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
	Continue to rehabilitate or protect areas of key ecological value for the black-throated finch (i.e. reducing grazing pressures, reduce the density of exotic pasture grasses, increase the density and diversity of native food grass species, protect drinking sites, provide artificial drinking sites and manage the fire regime).	Environmental Manager / Stakeholder Manager	During decommissioning	Offset Management Plan Black-throated finch monitoring plan
Habitat loss	Maintain map of black-throated finch habitat and modify signage of critical resources if required.	Environmental Manager	Ongoing. Update map of habitat and signage of critical resources after each monitoring event.	Map of habitat and critical resources for the black-throated finch
	Clearly identify the extent of rehabilitated areas on decommissioning plans and in the field.	Decommissioning Manager	Prior to decommissioning commencing	Rehabilitation Plan
	Continue to provide new water sources (troughs) where required in rehabilitated areas.	Environmental Manager	During decommissioning	Black-throated finch monitoring plan
Direct injury or mortality	Vehicles will be required to stay on pre-determined routes.	All staff	During decommissioning	Site maps Signage Induction documents
	Erect warning signs along tracks that run adjacent to rehabilitated areas and critical resources for the black-throated finch to inform workers of the presence of the species. All vehicles and plant will adhere to site rules relating to speed limits. Speed limits will be clearly signposted so as to minimise the potential for road kill.	All staff	During decommissioning	Signage Induction documents
	Report any incidence of fauna mortality to the Environmental Manager and log in a fauna incident register.	All staff, Environmental Manager	Report immediately in response to incidents during decommissioning	Fauna incident register

Issue	Control	Responsibility	Timeframe	Documentation
Habitat degradation	Manage ephemeral water sources such as springs to prevent access by stock and feral animals in the wet season.	Environmental Manager	During decommissioning	Black-throated finch monitoring plan
	Store fuels, chemicals, wastes and other potentially environmentally hazardous substances in bunded or otherwise contained areas away from watercourses, waterbodies and other known or potential drinking sites for the black-throated finch.	All staff	During decommissioning	Waste and Hazardous Materials Storage Register Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Maintain all vehicles and plant to regular maintenance and inspection schedules to reduce the potential for oil leaks and spills.	All staff	During decommissioning	Vehicle maintenance schedules and inspection
	Immediately report and manage all oil and pollutant spills.	All staff	During decommissioning	Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Monitor weeds levels in and adjacent to all sensitive areas for the black-throated finch (i.e. drinking sites, nesting sites and important foraging habitat). If required, undertake weed control in areas that are infested with exotic pasture grasses.	Environmental Manager	During decommissioning	Weed Management Plan Weed Monitoring Reporting
	Inspect and certify all vehicles, equipment and materials brought onto site as free of weeds and weed seeds and carry a weed hygiene declaration. Records are to be kept of compliance with this requirement. A weed wash down facility will be constructed onsite.	All staff	During decommissioning	Weed Hygiene Certification

Issue	Control	Responsibility	Timeframe	Documentation
	Use habitat rehabilitation methods that exclude the use of exotic pasture species, and instead use local native grass species known to be black-throated finch food species.	Environmental Manager	During decommissioning	Rehabilitation Plan
	Monitor pest animal occurrence and implement humane pest control measures to reduce the number of wild pigs and cats.	Environmental Manager	Annually during decommissioning	Pest animal monitoring report
	Reduce or eliminate baiting of dingoes. These animals are the top order predators in Australia and are known to exclude feral cats from their territories (i.e. the species most likely to prey on black-throated finch (southern)) and reduce feral pigs and kangaroos, both species that can degrade resources for the finch.	Environmental Manager	During decommissioning	Pest animal monitoring report
	Incorporate ecological burning regimes for the black-throated finch in the broader Fire Management Plan for the Mine.	Environmental Manager / Land Manager	During decommissioning	Fire Management Plan Black-throated finch monitoring plan
	Undertake late wet season/early dry season mosaic burns, to break up the country and prevent extensive late dry season wildlife.	Environmental Manager / Land Manager	During decommissioning	Fire Management Plan Black-throated finch monitoring plan
	Undertake some wet season storm burning, when appropriate.	Environmental Manager / Land Manager	During decommissioning	Fire Management Plan Black-throated finch monitoring plan
	Document and map the distribution, frequency and timing of fire events and maintain a range of fire ages in the black-throated finch habitat areas.	Environmental Manager / Land Manager	Annually during decommissioning	Fire incidence report and map
	Clear networks of fire breaks that help promote a range of fire ages across remaining finch habitat and offset areas.	Environmental Manager / Land Manager	During decommissioning	Fire Management Plan

8. Monitoring

8.1 Overview

The following monitoring program was developed in consultation with the black-throated finch Recovery Team (meeting on 3 April 2013, James Cook University, Townsville), and DotE (meeting on 7 June 2013, Canberra). It also incorporates information and advice provided by DEHP via their submission on the Project's SEIS (November 2013). The DEHP submission included recommended conditions for managing cumulative impacts on black-throated finch in the Galilee Basin, bioregional monitoring and management, management of populations and habitats at a project level and proponent contributions to a bioregional species management plan.

Apart from gaining further knowledge regarding black-throated finch life history and ecology at the Project site, there are three key questions of spatial scale that are important in designing effective management and mitigating actions, namely:

- Are black-throated finch sedentary in this area, utilising the same habitat/vegetation associations, water bodies and general locations annually on the Carmichael Coal Mine and Moray Downs
- Are black-throated finch locally migratory in this area, utilising a variety of habitat/vegetation associations, water bodies and general locations annually on the Carmichael Coal Mine and Moray Downs
- Are black-throated finch regionally migratory in this area, utilising a variety of habitat/vegetation associations, water bodies and general locations annually on a variety of properties and locations in the wider area.

As such there are four components of the monitoring program that address these questions as well as providing contextual life history and ecology information that can be used to provide management and mitigation actions:

1. Regional distribution (species distribution modelling)
2. Regional distribution (surveys)
3. Local monitoring (observational) on the Project Site
4. Local monitoring (detailed) on the Project Site.

The framework for these four monitoring components is provided in Section 8.3 to Section 8.6.

8.2 Bioregional management plan input

In conjunction with DEHP and other mining proponents in the Galilee Basin, Adani will participate and contribute to the development of a bioregional species management plan for the black-throated finch. This bioregional management plan will include a regional habitat assessment and monitoring program to address potential cumulative impacts on the black-throated finch and its habitat within the Galilee Basins. Adani will make available project species and habitat monitoring results needed to inform the bioregional management plan, assessment and monitoring programs.

The Expert Advisory Committee, as outlined in Section 5.2, will provide technical support and resources to the bioregional management plan Steering Committee.

The bioregional management plan will include:

- The establishment of a steering committee made up of relevant representatives of EHP, mining proponents, Birds Australia, the black-throated finch recovery team and ecologist with knowledge of species in this bioregion that directs the activities of the management plan and reviews information arising from activities carried out at the basin-wide and project specific levels to advise and develop ongoing adaptive management of the species.
- A schedule of bioregion wide survey for black-throated finch.
- Research priorities for establishing black-throated finch dietary, nesting requirements and home range in the Galilee Basin and Desert Uplands bioregion.
- Location of suitable habitat and offset areas within Desert Uplands bioregion.
- Development of best management practises for mining activities in Galilee Basin – with particular focus on artificial watering points, fire management, exotic plant management, predator management, disturbance management.
- Development of best management practises for management of offset areas within Desert Uplands bioregion with particular focus on exotic pasture management, fire management, grazing tolerance, watering point, predator management.
- A schedule for annual monitoring program for species and habitat condition.
- Community engagement.

8.3 Regional distribution (species distribution modelling)

8.3.1 Purpose

The intent of this component of the monitoring program is to review all records in the region (Einasleigh Uplands and Desert Uplands) and refine the habitat and distribution model using a combination of expert opinion, and temporal and spatial species distribution models. This component is a desk top exercise.

8.3.2 Data

Species distribution models initially require black-throated finch survey data that might include; presence-only data, presence-absence data (sites where surveys occur and the species is detected and not detected), and abundance data. All three types of data are available, but at different landscape scales. In addition, spatially referenced environmental data layers are required in the construction of species distribution models to predict the probability or relative likelihood of occurrence of a species throughout the landscape (Wintle, 2013). The quality and relevance of the environmental data determines the quality of species distribution models outputs and the data should reflect the key habitat requirements of the species (Wintle, 2013). In this case, the data to be used will be vegetation, topographic, geological and hydrological spatial layers, though fine scale information that reflect black-throated finch life history and ecology, such as plant species composition (i.e. diet), will also be used where available.

8.3.3 Methods

There is a substantial body of work and publications regarding the appropriate methods for species distribution models, a good summary of which can be found in Wintle (2013). In general species

distribution models combine observations of species occurrence or abundance with information about environmental variables to gain ecological insights and to predict species' distributions across landscapes (Wintle, 2013). The central species distribution model output in this exercise will be a map of the probability of a species' occurrence over the wider region, and statistical information about the strength of the prediction, and what environmental layers are most significant.

8.3.4 Outcomes

The species distribution models generated here will provide:

- Maps of probability of occurrence, both spatially and temporally
- Maps that can be used in conservation planning, such as the identification of potential offset sites or critical habitat
- The relative influence of different landscape and environmental factors such as vegetation type, climate, and management (e.g. fire history).

As further black-throated finch presence and abundance data is collected, along with site specific habitat information, these species distribution models will be refined.

All black-throated finch, species, habitat and environmental data would be stored in a project database (Microsoft Access) to inform local monitoring (observational) on the Project site (refer Section 8.5).

The species distribution models and associated database will also be made available for use/consideration in regional management of the black-throated finch through a bioregional management plan (refer 8.2).

8.3.5 Timing

Species distribution modelling will be completed prior to the commencement of any further local or regional monitoring and then updated regularly as new black-throated finch data is compiled through monitoring activities.

8.3.6 Links to black-throated finch management plan

This component of the monitoring has a broad link to black-throated finch management actions, and most importantly to understanding broad landscape context to distribution over time, and key areas that might be suitable as offset areas. In addition it would provide a significant planning tool for regional distribution surveys (refer Section 8.4).

8.4 Regional distribution (surveys)

8.4.1 Purpose

The aim of this component of the monitoring program is to undertake systematic surveys in the adjacent Desert Uplands, Einasleigh Uplands and perhaps Northern Brigalow Belt regions in order to understand the regional distribution of the black-throated finch. This component of the Project's monitoring program will also form part of Adani's contribution and participation in a regional black-throated finch monitoring and assessment program which will be implemented through a bioregional management plan (refer Section 8.2).

8.4.2 Data

The stratification and planning for the survey will be reliant on existing black-throated finch locations, spatial data layers regarding regional ecosystem distribution (and preferred habitat distribution) and where available the location of natural and artificial water bodies. The species distribution modelling outlined in Section 8.3 will be important in stratifying areas to target in the regional distribution surveys.

8.4.3 Methods

The level of effort will be dependent on the number of survey personnel available and the extent of the area to be surveyed. The methods will be as per the Significant Impacts Guidelines and include a combination of:

- Water body counts
- Standardised bird surveys (Bird Life recommended 2 ha counts and 500 m radius searches)
- Rapid habitat assessments (modified Queensland Herbarium and BioCondition methods).

8.4.4 Outcomes

These surveys would provide information to:

- Update the black-throated finch species distribution models and the regional black-throated finch database
- Provide contextual information on black-throated finch population in the Project site, and the potential size and spatial and temporal distribution and variation in black-throated finch numbers in the region
- Additional habitat preference data, including information on habitat thresholds and tolerances
- The location and condition of potential offset areas within the region
- Incidental data on diet, nesting requirements and home range in the Galilee Basin and Desert Uplands, mixed flocks, land management effects.

8.4.5 Timing

Regional distribution surveys will commence prior to construction and be undertaken bi-annually. The surveys will be undertaken under an adaptive monitoring framework and therefore as monitoring data becomes available, management and monitoring priorities will be adapted over time and the frequency of monitoring revised in consultation with the Expert Advisory Committee. The regional distribution surveys will also form a component of the regional black-throated management plan and therefore any changes to survey frequency or monitoring locations will be undertaken in consultation with the bioregional management plan Steering Committee.

8.4.6 Links to the black-throated finch management plan

This component of the monitoring will provide information on:

- Regional context for habitat connectivity and seasonal changes in habitat use
- Regional context for land management effects (i.e. grazing, fire, weeds) over time, and how these effect or enhance black-throated finch persistence

- The variation in the types of water sources preferentially used over changing seasons, and how these can be managed and manipulated over the life of the mine to enhance black-throated finch protection
- Regional context for the potential effect of feral animals (e.g. via camera trap data).

8.5 Local monitoring (observational) on Project site

8.5.1 Purpose

The aim of this component of the monitoring is to undertake repeated and systematic surveys of black-throated finch distribution and habitat at the Project site. The monitoring will use the existing permanent 2 hectare (ha) plots (refer Figure 1-1), as well as identify and survey water bodies via observation and camera traps. This phase will collect site specific data for the black-throated finch management plan from within mine affected areas, subsidence areas, adjacent properties and offset areas.

8.5.2 Data

Prior to the selection of the monitoring sites, the Project site will be stratified by landscape factors considered important determinants of black-throated finch distribution, namely:

- Areas < 1 km and > 1 km from water (artificial and natural)
- Elevation >250 m and < 250 m
- Remnant and non-remnant vegetation
- Suitable and not suitable black-throated finch habitat (based on known regional ecosystem distribution at the site).

The intent is not just to target known suitable habitat for the black-throated finch but to monitor a range of sites to understand the spatial variation of habitat use over time, and whether there are areas that are used more consistently than others, and therefore need targeted management.

8.5.3 Methods

A combination of three survey methods will be employed based on the recommended methods within the Significant Impact Guidelines for the black-throated finch (southern) *Poephila cincta cincta* (DEWHA, 2009a) (DEWHA, 2009b); water body watches; area counts; and remote fauna cameras. Where black-throated finch are encountered the following data will be collected (DEWHA, 2009a) (DEWHA, 2009b):

- The number observed
- The number of adults and juveniles
- Observations on feeding, drinking, perching, preening, begging by young, flighting, nesting and mating.

Water body watches will be conducted by at least two people and include at least one person watching for the full duration of the watch and one person surveying the surrounding habitat (600 m radius of water source). The effort will try and meet those recommended by the significant impact survey guidelines (DEWHA, 2009a).

A number of 2 ha woodland habitat survey sites will be identified via the stratification, and permanently marked. At each of these sites, 2 x 20-30 minute two bird counts will be undertaken by two people, recording all bird species encountered (seen or heard), abundance and whether they were within in a mixed flock (Vanderduys et al., 2012). These standardised bird counts follow the method recommended by Bird Life Australia (Barrett et al., 2003). The two bird surveys at each site will be undertaken at different times of the day and at least once in the premium survey period between dawn and 3 hours after dawn.

Camera traps (ScoutGard SG560Z-8M) will be installed at a range of different water bodies, including large dams, troughs, puddles near leaking tanks, road scrapes and ephemeral drainage lines. The traps will remain *in situ* for at least 4 weeks.

Where black-throated finches are encountered incidentally (outside of the standardised survey methods identified above), the accurate location of the sighting will be recorded via GPS, including other bird species present and black-throated finch specific data outlined above.

At each 2 ha survey site, a habitat assessment will be undertaken based on the recommendations of the Significant Impacts Guidelines and the Queensland BioCondition framework (Eyre et al., 2011b)and the Queensland Herbarium flora survey methods (Neldner et al., 2005). At each site a 100 m transect will be set centrally in the sample unit (on a cardinal bearing) and marked at the 0 – 100 m points by a star picket. Four habitat components will be recorded.

- **Broad management effects**. For the entire transect the following will be estimated:
  - Wildfire (0 = <1 yr, 1 = 1 – 5 yr, 2 = >5 yr)
  - Grazing (0 = none to 3 = severe)
  - Weeds (0 = none to 3 = severe), Grazing definition: 0 = none, 1 = small amount from few plants, 2 = small to moderate amount from many plants, 3 = moderate to large amount from many plants
  - Erosion (0 = none to 3 = severe), Erosion definition: 0 = stable, 1 = slight disturbance (i.e. cattle tracks), 2 = moderate (pedestalling, sheet, rill), 3 = severe (pedestals, scalds, sand blown, exposure)
- **Ground cover**. Within 5 x 1 m^2 plots located at the 0, 25, 50, 75, 100 m marks, the following components will be estimated and then averaged to give a mean score for the site:
  - Native perennial tussock grass, Native perennial hummock grass, Native perennial herbs/forbs (non-grass), Native annual grass, herbs and forbs, Native shrubs (< 1 m height)
  - Non-native grass, Non-native herbs and shrubs
  - Litter (woodies < 10 cm diameter, dead annual grasses, herbs and forbs), Litter (logs > 10 cm diameter)
  - Rock, Bare ground
- **Ground composition**. Within 5 x 1 m^2 plots located at the 0, 25, 50, 75, 100 m mark the ground cover species will be recorded and their cover estimated. These scores will be averaged to give a mean score for the site.
- **Tree and shrub canopy cover (estimate and 100 m line intercept)**. For the 100 m transect the following will be recorded:

- An estimate of the average height of each woody / tree strata (E = emergent, T1 = upper canopy, T2 = mid canopy, T3 = lower canopy, S = shrub)
- An estimate of the crown cover of each woody / tree strata (E, T1, T2, T3, S) and species in a 10 x 100 m area
- The line intercept total of the crown cover of each woody / tree strata (E, T1, T2, T3, S) and species
- The average crown cover of each strata and species, as an average of the above two scores

All data collected will be stored in a project database (Microsoft Access) for efficient manipulation and interrogation, so that subsequent survey data can be included and extracted efficiently. This database will also include all existing black-throated finch observations from the Project site from previous surveys (GHD, 2011) (GHD, 2012) and will be made available for use/consideration in regional management of the black-throated finch through a bioregional management plan (refer Section 8.2).

8.5.4 Outcomes

These surveys will provide important information on:

- Coarse population estimates and any spatial and temporal variation in numbers in the Project site
- Habitat condition and preferences, local habitat use (i.e. hotspots), preferred habitat structure and vegetation composition, diet, nesting sites and reliance on mixed species flocks
- Land management effects (i.e. grazing, fire, clearing, weeds, feral animals) on distribution over time
- The most appropriate methods for survey over different seasons (i.e. water counts in dry season versus 2 ha searches in wet season)
- Temporal variation in habitat use.

The data collected will be important to monitor the effectiveness of mitigation management measures during construction and operation of the Project as well as aiding in the development or modification of management measures overtime.

8.5.5 Timing

Monitoring will commence prior to construction and be undertaken bi-annually. The monitoring will be undertaken under an adaptive monitoring framework and therefore as monitoring data becomes available, management and monitoring priorities will be adapted over time and the frequency of monitoring revised in consultation with the Expert Advisory Panel. The location of the monitoring sites may also change, as offset properties are identified and included in the monitoring program.

8.5.6 Links to the black-throated finch management plan

This component of the monitoring will provide information on:

- Habitat connectivity and seasonal changes in habitat use

- Land management effects (i.e. grazing, fire, weeds) over time, and how these could be managed to enhance black-throated finch persistence
- Types of water sources preferentially used over changing seasons, and how these can be managed and manipulated over the life of the mine to enhance black-throated finch protection
- The number and potential effect of feral animals (e.g. via camera trap data).

8.6 Local monitoring (detailed) on project site

8.6.1 Purpose

The aim of this component of the monitoring is to undertake detailed surveys of black-throated finch habitat use, home range sizes, fine scale distribution changes over seasons, the genetic status of the local population and physiological health of the black-throated finch populations over time (especially in times of resource bottlenecks).

8.6.2 Data

This component is reliant on the capture of black-throated finch. Information from monitoring in Section 8.5 will be important for targeting known hotspots or regular watering sites.

8.6.3 Methods

This component of the monitoring will involve physical capture of birds via mist netting, and then the banding or attachment of radio transmitters. Surveys will then involve intensive observations and searching for banded birds and radio tracking. Continued camera trapping around water sources will help locate and identify banded birds.

8.6.4 Outcomes

These surveys will provide important information on:

- Fine-scale spatial and temporal habitat use (i.e. daily and weekly patterns)
- Fine-scale spatial and temporal diet shifts
- Home range and distances travelled between nesting, feeding locations, and watering sites over time and season
- Accurate population estimates
- Information on temporal variation on bird health.

8.6.5 Timing

This component of the monitoring is not a current priority. The development and implementation of an intensive monitoring program would be finalised with input from the Expert Advisory Committee. This program of monitoring would be intensive over 1-3 years and involve extensive on-site work banding, tagging, tracking and observing black-throated finch over many months in multiple years.

8.6.6 Links to the black-throated finch management plan

This component of the monitoring will provide fine scale information that would complement the black-throated finch management actions and data collected in the local monitoring (observational) on the Project site outlined in Section 8.5.

9. Adaptive management framework

Adaptive management is a process that deals with uncertainty and incomplete knowledge by using systematic monitoring to reduce uncertainty and improve management actions overtime. The monitoring program that will provide data to inform and improve the management actions in this black-throated finch management plan are outlined in Section 8. In general, the monitoring framework will:

- Address key questions regarding black-throated finch ecology and distribution. The new knowledge will be systematically reviewed and used to refine the monitoring and management of black-throated finch at the Project site. Improved knowledge about the black-throated finch ecology and distribution will also allow us to refine our understanding of the potential impacts on black-throated finch during construction, operation and decommissioning
- Employ appropriate regular review and analysis of the monitoring data to refine the monitoring program and refine the management actions.

Adaptive management emphasises the iterative feedback between the implementation of management actions and the assessment of their effectiveness via continuous improvement of knowledge via monitoring and evaluation of the monitoring data (Walsh et al., 2012).

The key management actions identified in the Significant Impact Guidelines (which are also derived from the Recovery Plan, (DEWHA, 2009a) that are relevant to the this management are summarised in Section 2.4. Management actions, and the monitoring that provides information for the management, will be based largely on these main themes, but may be expanded as new knowledge of black-throated finch at the Project site becomes available. For example the need to trap and relocate black-throated finch during mine development, or the timing of clearing due to nesting and breeding activity, is unknown at this stage. On-going monitoring of black-throated finch at the Project site will provide this information which will then be included in this management plan.

The framework for adaptive management in this management plan is outlined in Figure 9-1. The Significant Impact Guidelines, existing knowledge of black-throated finch life history and ecology as well as expert advice have provided information for the monitoring program (refer Section 8) and management actions (refer Section 7). The ongoing monitoring program will inform the management actions over time which will in turn will help develop more effective monitoring programs. All of these steps will allow ongoing revision and improvement of the black-throated finch management plan.

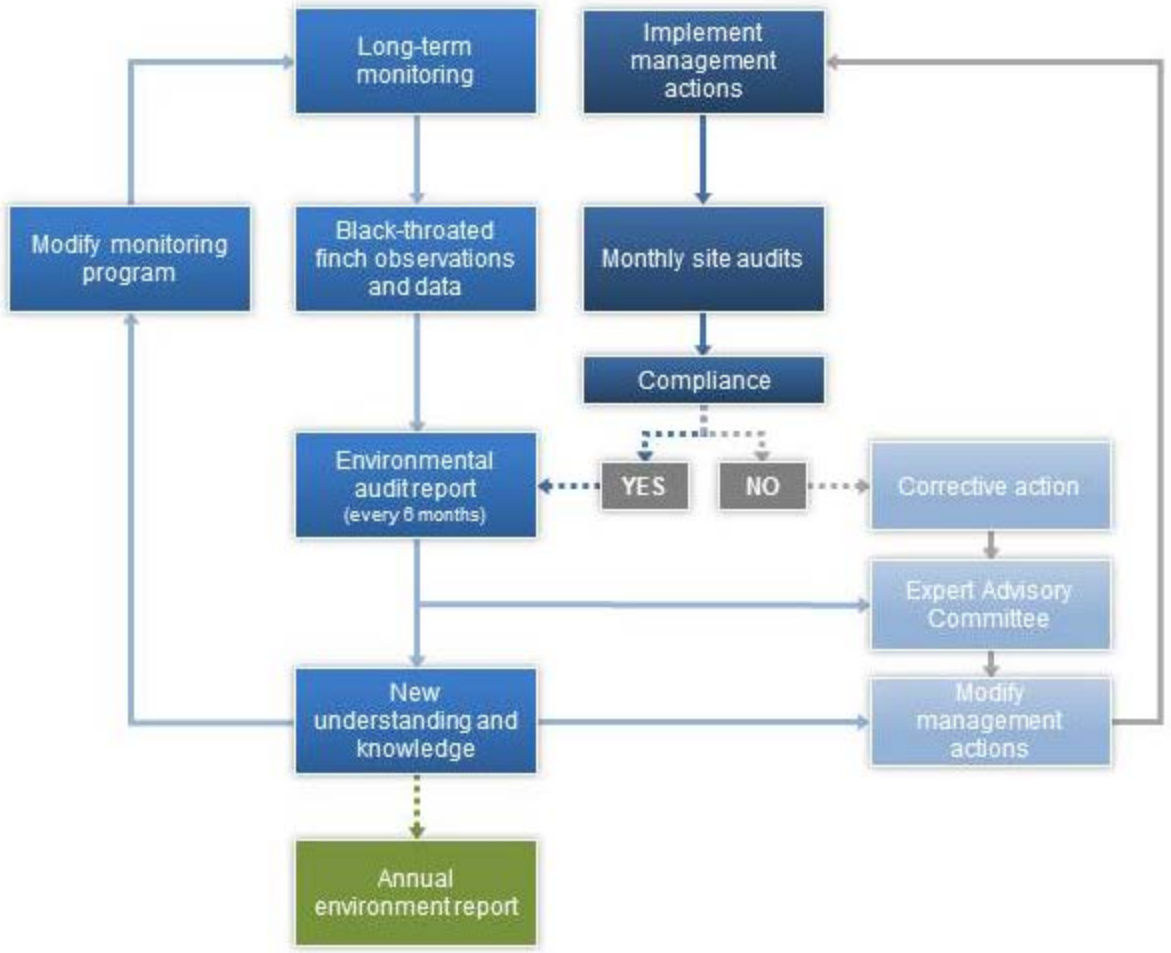

Figure 9-1 Adaptive managmentframwork

10. Preventative and corrective actions

10.1 Action management

In the event of a non-compliance with the environmental management controls set out in this management plan or an environmental incident relating to black-throated finch, the non-compliance/environmental incident will be managed as follows:

- The incident/non-compliance will be recorded in the environmental incident register
- The nature of the incident/non-compliance will be investigated by the environmental manager. Advice may be sought from a specialist where the extent of the issue is beyond the expertise of the in-house resources
- Additional monitoring may be undertaken where required
- The effectiveness or need for new/additional controls will be reviewed
- An appropriate preventative and corrective action will be implemented and entered into the environmental incident register
- The incident/non-compliance will be monitored to ensure the success of the preventative or corrective action
- The environmental incident/non-conformance will be closed out.

Future audits will check for compliance with this management plan and that the necessary preventative or corrective action is still in place.

10.2 Triggers

An environmental incident or non-compliance will be detected through verification processes such as staff and contractors reporting the issue, monitoring, inspections, audits and receipt of complaints from external parties. Triggers for a non-conformance will include:

- Not procuring suitable offset sites for the black-throated finch in accordance with the approved Environmental Offset Package
- Not implementing conditions of approval in regard to black-throated finch management and monitoring (refer Section 2)
- Clearing of high-value habitat areas during black-throated finch nesting periods (the wet season)
- No black-throated finch observed annually at installed drinking troughs
- A wildfire event or limited generation of suitable foraging habitat after a controlled burn.
- A net increase in pest populations that pose a predation threat or undermine habitat quality in areas of high ecological value (i.e. drinking sites, nesting sites and key foraging habitat)
- A net increase in weeds or exotic pasture plants within areas of high ecological value (i.e. drinking sites, nesting sites and key foraging habitat).

In the event of a failure to comply with this management plan or the Project's conditions of approval, investigations will be undertaken to identify the cause of the non-compliance.

10.3 Responsibilities

It is the responsibility of all contractors and staff working on site to be aware of the requirements of this management plan. This includes the responsibilities to report any environmental incidents or non-conformances to the environment manager as soon as possible. It is then the responsibility of the environment manager to investigate the incident/non-compliance and notify the appropriate stakeholders if required. It is also the responsibility of the environment manager and team to ensure appropriate preventative or corrective actions are implemented and monitored for effectiveness.

In the event of an environmental incident or non-compliance, the Environment Manager may engage the Expert Advisory Committee to provide expert technical input into the development of appropriate preventative or corrective actions. The Expert Advisory Committee will also discuss the implementation and progress of corrective actions at their six monthly meetings.

In the event of a non-compliance with the conditions of approval, the environment manager must notify, in writing, the non-compliance with any condition of the approval as soon as practical and no later than two business days of becoming aware of the non-compliance.

11. Communication, reporting and auditing

11.1 Communication

The requirements of this black-throated finch management plan will be communicated to all construction and operational personnel via a number of channels. The construction and operations contractors as well as Adani's environmental manager will ensure that the general intent, scope and relevance of this document are understood. The channels for communication will include:

- Environmental induction program and training
- Daily toolbox meetings
- Risk workshops
- Management meetings
- Noticeboards
- Environmental reports.

The effectiveness of the communication will be assessed in third party environmental audits as measured through awareness of staff and subcontractors and compliance with day-to-day site environmental management requirements.

11.2 Internal reporting

During construction and operation of the Carmichael Coal Mine, the internal reporting that will be undertaken which is relevant to implementation of this black-throated finch management plan will include:

- Annual environmental report
- Environmental audit report (every 6 months)
- Environmental incident reports and corrective action register
- Training register
- Complaints register
- Monthly site audit report
- Monitoring reports (every 6 months)
- Management meetings minutes. Environmental compliance, incidents, initiatives and corrective actions will be agenda items at every meeting.

11.3 External reporting

External reporting to government agencies and relevant stakeholders will be required in accordance with relevant environmental legislation. A summary of the external reporting requirements is provided in Table 11-1. This table will be updated upon receipt of the Project's conditions of approval. In accordance with the *Corporations Act 2001*, Adani's annual report will also include information relating to compliance with environmental requirements.

Table 11-1 External environmental reporting requirements

Reporting trigger	Report content	Report recipient	Adani responsibility
Annual return under environmental authority	Compliance with environmental authority requirements	DEHP	General Manager Environment
Incidents causing actual or potential environmental harm	Incident investigation and corrective actions	DEHP	Environmental Manager

External reporting will also include the provision of monitoring data to appropriate stakeholders for consideration and inclusion in the bioregional species management plan. The reporting of monitoring data to external stakeholders is summarised in Table 11-2.

Table 11-2 Monitoring data reporting

Reporting trigger	Report content	Report recipient	Adani responsibility
Completion of a monitoring round	Monitoring data/results and initial interpretation	Expert Advisory Committee Bioregional management plan Steering Committee	Environmental Manager
Completion of Annual Environment Report	An overview of black-throated finch management and monitoring that has occurred throughout the year and an overview of future proposed activities	Black-throated finch recovery team, DotE and DEHP	Environmental Manager

11.4 Audits

11.4.1 Overview

Audits of Adani's environmental performance will be undertaken in accordance with the *Adani Compliance Guideline CG-004 Audits and Assessment*. The following standards will also be considered when undertaking audits:

- AS/NZS ISO 14012-1996 Guidelines for Environmental –Qualification Criteria for Environmental Auditors
- AS/NZS ISO 14015-2003 Environmental Management – Environmental Assessment of Sites and Organizations
- AS/NZS ISO/IEC 17021:2011 Conformity assessment –Requirements for bodies providing audit and certification of management systems
- AS/NZS ISO 19011-2003 Guidelines for Quality and/or Environmental Management Systems Auditing
- ISO 19011:2011 Guidelines for auditing management systems.

Finalised audit reports will be circulated to the mine manager and area managers, and any recommendations will be entered into the corrective action register. Findings will be discussed at

management meetings and where relevant, presented as tool box talks. Any non-compliance that is required to be reported under legislation or conditions of approval will be reported.

11.4.2 Construction

Auditing during construction will depend on the contracting strategy selected and whether contractors and subcontractors operate under Adani's management systems or the contractor's own environmental management system.

If contractors/subcontractors are utilising their own environmental management systems, Adani will conduct audits on a six monthly basis, or for shorter duration contracts, at least once during the contract duration. These audits will cover:

- Contractor's compliance with legal and other obligations
- Whether contractor's management plans have appropriately identified environmental impacts and risks
- Whether roles, responsibilities and training and competency requirements have been identified and followed
- Whether adequate management and control strategies are in place to achieve compliance with legal requirements and performance requirements documented in this black-throated management plan
- Whether management and control strategies are being implemented
- Monitoring approaches and outcomes, and identification and implementation of corrective actions
- Adequacy of record keeping and reporting.

It would also be expected that contractors will have internal and external audit programs. If contractors and subcontractors are utilising Adani's management system, system compliance audits will be conducted based on agreed and approved audit requirements.

11.4.3 Operation

Environmental audits during operation will be undertaken in accordance with Adani's Management Standard ST-18 Reviews, Audits and Inspections. A preliminary audit schedule for the Carmichael Coal Mine is shown in Table 11-3. Where audit outcomes and recommendations require corrective actions, these will be entered into the corrective action register.

Compliance with approval conditions issued under State and Commonwealth legislation, including conditions under the NC Act, EP Act, EPBC Act and Environmental Authority will be audited. Where non-compliance occurs with regard to the conditions of approval, a report will be submitted to relevant authority. The report will outline the type of non-compliance and the remedial actions taken to ensure that the matter is resolved within a reasonable time frame. The time frame will be specified in writing by the relevant approval agency.

Table 11-3 Preliminary audit schedule

Audit Type	Scope	Frequency
Environmental monitoring review	Review results of environmental monitoring activities. Identify whether environmental performance requirements are achieved, and whether degradation of values or resources has occurred that may be attributable to the Project. Identify further investigations and/or corrective actions.	Annual
General environmental audit	Environmental impacts and risks have been correctly identified. Management controls are effective in managing the impacts and risks identified EMP is consistent with environmental authority conditions. Environmental management requirements are being implemented and evidence is available.	Every six months

11.5 Documentation, document control and records

Document control in relation to environmental management will be through the Adani's Management System as set out in CG-008 Documentation and Document Control. This black-throated finch management plan and all associated registers will be controlled documents subject to unique document identifiers and version control. The corrective action register will be managed through a database to ensure that updates on the status of corrective actions are available to managers and supervisors. Other documentation and records to be retained will include:

- Incident investigation reports
- Completed site checklists
- Records of training and induction
- Audit reports
- All monitoring records.

Monitoring records in relation to the environmental authority must be retained for five years and must be available for provision to the administering authority within 10 business days of any request.

The document control and records management system will meet the requirements of Adani's Management Standard ST-04 Documentation, Document Control and Records.

12. Training

12.1 Site inductions

Site induction training will be provided to ensure all contractors and staff working onsite is aware of their environmental obligations including the requirements of this black-throated finch management plan. Staff, contractors and visitors will be suitably inducted to ensure that they incorporate environmentally appropriate work practices on a day-to-day basis. This will enable staff to identify emerging environmental issues and respond proactively to avoid incidents of this nature.

The provision of training will be in accordance with the Adani's HSE Management Standard HSE-ST-03 -Training and Competence. The induction program will include:

- Overview of relevant policies
- Duty of care and duty to notify
- Incident response and reporting procedures
- Roles and responsibilities
- Environmental awareness
- Identification of black-throated finch and potential nesting sites
- Relevant mitigation and management measures to be implemented
- Safe driving with respect to fauna
- Weed hygiene procedure and importance of weed control
- For selected members - fire suppression and control.

12.2 Toolbox talks

At the commencement of each work shift, tool-box talks will be undertaken with contractors and staff to communicate relevant environmental considerations for the shift. Of particular importance, will be when works commence in a new location or new activities will be undertaken. In regard to the black-throated finch management plan, information that will be communicated through tool box talks will include:

- Sensitive environmental areas in proximity to where works are being undertaken
- Any mitigation and management measures that are relevant to works
- Recent environmental incidents and the corrective actions that are being undertaken.

13. Review and consultation

13.1 Black-throated finch management plan review

Management reviews of the black-throated finch management plan will be carried out at least twice per year (CG-011 Management Review). The management review will examine:

- Adequacy and effectiveness of the EMP
- Compliance with Adani management system
- Opportunities for improvement
- Opportunities for waste minimisation.

Inputs to the management review will include:

- Results of monitoring and audits
- Status of achievement of performance requirements and indicators
- Summary of environmental incidents, non-compliances and complaints
- Status of corrective actions
- Communications and complaints
- Follow up of actions from previous management review
- Significant changes affecting environmental management, including legislation and policy changes.

Decisions and actions arising from the management review will be documented and actions will be entered into the corrective action register.

13.2 Expert Advisory Committee review

A draft copy of this black-throated management plan will be provided to the Expert Advisory Committee for review and comment prior to submission to government agencies. Any comments or feedback received from the expert panel will be reviewed and incorporated into this management plan where appropriate.

In the event an environmental incident/non-conformance during construction or operation of the Project, the Expert Advisory Committee will be notified of incident as well as the proposed corrective action. Any changes that may be required to management actions as a result of the corrective action will also be communicated. As results from monitoring the corrective actions success become available, the Expert Advisory Committee will also be notified where requested.

A copy of the annual environmental report will also be provided to the Expert Advisory Committee and will provide information of the following:

- Monitoring progress throughout the year including results
- Environmental incidents/non compliances and the corrective actions implemented
- Proposed monitoring program for the coming year

- Application of adaptive monitoring and management principles and how they are influencing management of the black-throated finch.

13.3 Consultation

13.3.1 Black-throated finch specialists and regulatory agencies

Black-throated finch specialists and the relevant regulatory agencies will provide input into the development and implementation of the black-throated finch management plan through participation on the Expert Advisory Committee. The roles, responsibility and involvement of the Expert Panel are outlined in Section 5.2. Meetings with black-throated finch specialist on the Exert Panel will be held after each monitoring event to discuss the results and any potential implications it may have on our understanding of the species in the Project site, potential improvement of management actions and future monitoring.

Six monthly progress reports will also be provided to black-throated finch specialists and the relevant regulatory agencies through the Expert Advisory Committee. The involvement of the Expert Advisory Committee and black-throated finch specialists may become less frequent as the project progresses.

13.3.2 Landholder engagement (if required)

Adani will notify, in writing, the occupiers or registered owners of affected land and any other potentially impacted stakeholder as soon as reasonably practicable after becoming aware of any emergency or incident that has the potential to impact on environmental values or breaches any condition of this EA concerning releases of contaminants to the environment. The notification will include the following:

- Location of the emergency or incident
- Date and time of the emergency or incident
- Estimated quantity and type of any substances involved in the emergency or incident
- Potential impacts to environmental values caused by the emergency or incident
- Where there is potential impact on livestock or human health, precautionary measures that will be taken.

All internal and external complaints related to environmental aspects of the Project will be recorded, acknowledged, considered and responded to as soon as is practicable. Complaints and concerns will be treated as incidents and investigated accordingly.

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Appendices

Appendix A - Black-throated finch management, monitoring and corrective measures summary

1. Management

1.1 Pre-construction

Table 1 Management and mitigation measures (pre-construction)

Issue	Control	Responsibility	Timeframe	Documentation
General	Establish local monitoring sites (as described in Section 8.3) to identify habitat and critical nesting, foraging and drinking resources within the Project Area	Environmental Manager	Establish prior to construction. Undertake monitoring twice annually. Re-assess frequency of ongoing monitoring over time in consultation with the Recovery Team and government regulators.	Black-throated finch monitoring plan
	Provide information for inclusion in the site induction documentation that outlines the black-throated finch's critical resources and distribution within the Project area, the key threats to the species and the responsibilities outlined in this management plan for all workers undertaking work on site.	All staff	Prior to site entry	Worker induction information
	Identify and procure offset areas for the black-throated finch in accordance with Environmental Offset Strategy (Ecofund 2013)	Environmental Manager / Stakeholder Manager	Prior to construction	Offset Management Plan Black-throated finch monitoring plan
	Establish monitoring sites (as described in Section 8.2) to identify habitat and critical nesting, foraging and drinking resources within the proposed Offset Area	Environmental Manager	Establish prior to construction. Undertake monitoring twice annually. Re-assess frequency of ongoing monitoring over time in consultation with the	Offset Management Plan Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
			Recovery Team and government regulators.	
	Prepare and implement a Land Management Plan to manage grazing intensity on the Mine area, adjacent Moray Downs property and offset areas. This will include the preparation of a stock management map that will identify areas that require no net increase in stocking rates such as offset areas, areas subject to rehabilitation and critical resources (i.e. nesting sites, breeding sites and seasonally important foraging habitat).	Environmental Manager / Land Manager	Updated monthly as required, during pre-construction	Land Management Plan and Stock Management Map
Habitat loss	Maintain a current map of black-throated finch habitat and erect signage to prevent access to locations of critical nesting and drinking resources for the black-throated finch	Environmental Manager	Updated after each monitoring event.	Map of habitat and critical resources for the black-throated finch
	Identify areas of high ecological value for the black-throated finch that will be subject to rehabilitation measures to encourage black-throated finch movement. Based on the nature of the site, undertake measures to improve the habitat quality (i.e. reduce the density of exotic pasture grasses, provide additional water resources, increase the density and diversity of native food grass species or implement a fire management regime).	Environmental Manager / Stakeholder Manager	Prior to construction	Black-throated finch monitoring plan
Habitat degradation	Undertake weed mapping prior to construction. Mapping will focus on sensitive areas including drinking and nesting sites and important foraging habitat for the black-throated finch. The weed mapping will also focus on the distribution and density of exotic pasture grasses.	Environmental Manager	Prior to construction	Weed mapping
	Minimise the extent of proposed new road network, particular in areas adjacent to feeding and nesting sites.	Construction Manager	Prior to construction	Site maps

1.2 Construction

Table 2 Management and mitigation measures (construction)

Issue	Control	Responsibility	Timeframe	Documentation
General	Continue implementing local monitoring as out lined in Section 8.3	Environmental Manager	Ongoing. Twice annually. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	Black-throated finch monitoring plan
	Induct all construction staff and contractors prior to commencing work on site. The induction will include an overview of black-throated finch's critical resources and distribution within the Project area, the key threats to the species and the responsibilities outlined in this management plan for all workers undertaking work on site	Environmental Manager	Prior to site entry	Training register
	Provide toolbox talks as required to communicate any non-compliances that have occurs in relation to the black-throated finch management plan and the corrective actions that are being implemented.	Environmental Manager	As required during construction.	Training log
	Continue ongoing monitoring as described in Section 8.2	Environmental Manager	Ongoing. Twice annually. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	Offset Management Plan Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
	Continue to rehabilitate or protect areas of key ecological value for the black-throated finch (i.e. reducing grazing pressures, reduce the density of exotic pasture grasses, increase the density and diversity of native food grass species, protect drinking sites, provide artificial drinking sites and manage the fire regime).	Environmental Manager / Stakeholder Manager	During construction	Offset Management Plan Black-throated finch monitoring plan
Habitat loss	Maintain map of black-throated finch habitat and modify signage of critical resources if required.	Environmental Manager	Ongoing. Update map of habitat and signage of critical resources after each monitoring event.	Map of habitat and critical resources for the black-throated finch
	Locate temporary construction facilities (i.e. laydown areas, site offices) outside areas of mapped potential habitat for the black-throated finch	Construction Manager	Throughout the construction period	Construction plans
	Minimise immediate loss of habitat by undertaking sequential clearing and limiting clearing to areas required for immediate construction activities.	Construction Manager	Throughout the construction period	Construction plans
	Limiting the extent and duration of clearing of high-value habitat areas during black-throated finch nesting periods (the wet season)	Construction Manager	Throughout the construction period	Construction plans
	Clearly identify the extent of vegetation clearing on construction plans and in the field. Areas that must not be cleared or damaged are to also be clearly identified on construction plans and in the field. Clearing extents will to be communicated to all necessary construction supervisors.	Construction Manager	Prior to construction commencing	Construction plans

Issue	Control	Responsibility	Timeframe	Documentation
	Provide new water sources (troughs) using a raised design to discourage access by macropods, cattle and feral animals, such as pigs and cats. The location of water sources will be within 400 m of suitable nesting habitat trees and have grass species that provide forage (grass seeds) throughout the year, particularly in the wet season (typically early flowering perennials). New water sources will be provided to replace existing drinking sites disrupted by construction activities as well as enhance the habitat of areas identified as high ecological value for the black-throated finch that will be rehabilitated to encourage black-throated finch movement.	Environmental Manager	Throughout the construction period	Black-throated finch monitoring plan
Direct injury or mortality	Undertake pre-clearance surveys for all clearing within areas of mapped potential habitat for the black-throated finch. Where suitable habitat is present, a qualified and experienced spotter-catcher will accompany clearing to avoid nests and other critical resources where possible.	Environmental Manager	Prior to clearing	Pre-clearance report
	Undertake vegetation clearing in a sequential manner to allow black-throated finches an opportunity to disperse away from construction areas.	Construction Manager	Throughout the construction period	Construction plans
	Vehicles will be required to stay on pre-determined routes.	All staff	Throughout the construction period	Site maps Signage Induction documents
	Erect warning signs along tracks that run adjacent to habitat and critical resources for the black-throated finch to inform workers of the presence of the species. All vehicles and plant will adhere to site rules relating to speed limits. Speed limits will be clearly signposted so as to minimise the potential for road kill.	All staff	Throughout the construction period	Signage
	Report any incidence of fauna mortality to the Environmental Manager and log in a fauna incident register	All staff, Environmental Manager	Report immediately in response to incidents during construction	Fauna incident register

Issue	Control	Responsibility	Timeframe	Documentation
Habitat degradation	Areas of potential habitat that are not impacted by construction and have the potential to link areas of black-throated finch habitat within the Project Area with habitat in offset areas will be protected from degradation or rehabilitated. This will include no net increase in grazing intensity, introducing water troughs, implementing measures to reduce the density of exotic pasture grasses and increasing the density and diversity of native food grass species. Suitable areas for rehabilitation will be determined based on the habitat mapping provided in Figure 3-2. High value habitat areas without water sources will be identified and artificial water sources installed.	Environmental Manager	Throughout the construction period	Rehabilitation Plan
	Manage erosion and sedimentation in accordance with erosion and sediment controls set out in Volume 4, Appendix Q1 Environmental Management Plan (Mine) and Volume 4, Appendix Q2 Environmental Management Plan (Offsite).	Environmental Manager	Throughout the construction period	Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Undertake dust suppression activities where construction occurs adjacent to foraging habitat and drinking or nesting sites for the black-throated finch. This will be in accordance with the mitigation measures outlined in Volume 4 Appendix K3 Water Quality Report.	Environmental Manager	Throughout the construction period	Water Quality Report Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Manage ephemeral water sources such as springs by preventing access by stock and feral animals in the wet season.	Environmental Manager	Throughout the construction period	Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
	Store fuels, chemicals, wastes and other potentially environmentally hazardous substances in bunded or otherwise contained areas away from watercourses, waterbodies and other known or potential drinking sites for the black-throated finch	All staff	Throughout the construction period	Waste and Hazardous Materials Storage Register Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Maintain all vehicles and plant to regular maintenance and inspection schedules to reduce the potential for oil leaks and spills	All staff	Throughout the construction period	Vehicle maintenance schedules and inspection
	Immediately report and manage all oil and pollutant spills	All staff	Throughout the construction period	Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Monitor water quality at all potential and confirmed drinking sites for the black-throated finch, in accordance with the methods outlined in Volume 4 Appendix K3 Water Quality report.	Environmental Manager	Monthly, throughout the construction period	Monthly Water Quality Reporting
	Monitor weeds levels in and adjacent to all sensitive areas for the black-throated finch (i.e. drinking sites, nesting sites and important foraging habitat). If required, undertake weed control in areas that are infested with exotic pasture grasses.	Environmental Manager	Throughout the construction period	Weed Management Plan Weed Monitoring Reporting
	Inspect and certify all vehicles, equipment and materials brought onto site as free of weeds and weed seeds and carry a weed hygiene declaration. Records are to be kept of compliance with this requirement. A weed wash down facility will be constructed onsite.	All staff	Throughout the construction period	Weed Hygiene Certification

Issue	Control	Responsibility	Timeframe	Documentation
	Store soil stripped and stockpiled from areas containing known weed infestations in areas separate from areas free of weeds and away from all mapped potential habitat and drinking sites and nesting sites for the black-throated finch	Construction Manager	Throughout the construction period	Weed Management Plan
	Use habitat rehabilitation methods that exclude the use of exotic pasture species, and instead use local native grass species known to be black-throated finch food species.	Environmental Manager	During and after construction	Rehabilitation Plan
	Monitor pest animal occurrence during construction and implement humane pest control measures to reduce the number of wild pigs and cats.	Environmental Manager	Annually, throughout the construction period	Pest animal monitoring report
	Reduce or eliminate baiting of dingoes. These animals are the top order predators in Australia and are known to exclude feral cats from their territories (i.e. the species most likely to prey on black-throated finch (southern)) and reduce feral pigs and kangaroos, both species that can degrade resources for the finch.	Environmental Manager	Throughout the construction period	Pest animal monitoring report
	Incorporate ecological burning regimes for the black-throated finch in the broader Fire Management Plan for the Mine.	Environmental Manager / Land Manager	Throughout the construction period	Fire Management Plan Black-throated finch monitoring plan
	Undertake late wet season/early dry season mosaic burns, to break up the country and prevent extensive late dry season wildlife	Environmental Manager / Land Manager	Throughout the construction period	Fire Management Plan Black-throated finch monitoring plan
	Undertake some wet season storm burning, when appropriate	Environmental Manager / Land Manager	Throughout the construction period	Fire Management Plan Black-throated finch monitoring plan
	Document and map the distribution, frequency and timing of fire events and maintain a range of fire ages in the black-throated finch habitat areas	Environmental Manager / Land Manager	Annually, throughout the construction period	Fire incidence report and map
	Clear networks of fire breaks that help promote a range of fire ages across remaining finch habitat and offset areas.	Environmental Manager / Land Manager	Throughout the construction period	Fire Management Plan

1.3 Operation

Table 3 Management and mitigation measures (operation)

Issue	Control	Responsibility	Timeframe	Documentation
General	Continue implementing local monitoring as out lined in Section 8.3	Environmental Manager	Ongoing. Twice annually. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	Black-throated finch monitoring plan
	Induct all operation staff and contractors prior to commencing work on site. The induction will include an overview of black-throated finch's critical resources and distribution within the Project area, the key threats to the species and the responsibilities outlined in this management plan for all workers undertaking work on site	Environmental Manager	Prior to site entry	Training register
	Provide toolbox talks as required to communicate any non-compliances that have occurs in relation to the black-throated finch management plan and the corrective actions that are being implemented.	Environmental Manager	As required during operation.	Training log
	Continue ongoing monitoring as described in Section 8.2	Environmental Manager	Ongoing. Twice annually. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	Offset Management Plan Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
	Continue to rehabilitate or protect areas of key ecological value for the black-throated finch (i.e. reducing grazing pressures, reduce the density of exotic pasture grasses, increase the density and diversity of native food grass species, protect drinking sites, provide artificial drinking sites and manage the fire regime).	Environmental Manager / Stakeholder Manager	During operation	Offset Management Plan Black-throated finch monitoring plan
Habitat loss	Maintain map of black-throated finch habitat and modify signage of critical resources if required.	Environmental Manager	Ongoing. Update map of habitat and signage of critical resources after each monitoring event.	Map of habitat and critical resources for the black-throated finch
	Minimise immediate loss of habitat by undertaking sequential clearing and limiting clearing to areas required for immediate operation activities.	Operation Manager	During operation	Operation plans
	Limiting the extent and duration of clearing of high-value habitat areas during black-throated finch nesting periods (the wet season)	Operation Manager	During operation	Operation plans
	Clearly identify the extent of vegetation clearing on operation plans and in the field. Areas that must not be cleared or damaged are to also be clearly identified on operation plans and in the field. Clearing extents will to be communicated to all necessary operation supervisors.	Operation Manager	Prior to operation commencing	Operation plans
	Provide new water sources (troughs) using a raised design to discourage access by macropods, cattle and feral animals, such as pigs and cats. The location of water sources will be within 400 m of suitable nesting habitat trees and have grass species that provide forage (grass seeds) throughout the year, particularly in the wet season (typically early flowering perennials). New water sources will be provided to replace existing drinking sites disrupted by operation activities as well as enhance the habitat of areas identified as high ecological value for the black-throated finch that will be rehabilitated to encourage black-throated finch movement.	Environmental Manager	During operation	Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
Direct injury or mortality	Undertake pre-clearance surveys for all clearing within areas of mapped potential habitat for the black-throated finch. Where suitable habitat is present, a qualified and experienced spotter-catcher will accompany clearing to avoid nests and other critical resources where possible.	Environmental Manager	Prior to clearing	Pre-clearance report
	Undertake vegetation clearing in a sequential manner to allow black-throated finches an opportunity to disperse away from operation areas.	Operation Manager	During operation	Operation plans
	Vehicles will be required to stay on pre-determined routes.	All staff	During operation	Site maps Signage Induction documents
	Minimise the extent of proposed new road network, particular in areas adjacent to feeding and nesting sites.	Operation Manager	During operation	Site maps
	Erect warning signs along tracks that run adjacent to habitat and critical resources for the black-throated finch to inform workers of the presence of the species. All vehicles and plant will adhere to site rules relating to speed limits. Speed limits will be clearly signposted so as to minimise the potential for road kill.	All staff	During operation	Signage Induction documents
	Report any incidence of fauna mortality to the Environmental Manager and log in a fauna incident register	All staff, Environmental Manager	Report immediately in response to incidents during operation	Fauna incident register
Habitat degradation	Areas of potential habitat that are not impacted by operation and have the potential to link areas of black-throated finch habitat within the Project Area with habitat in offset areas will be protected from degradation or rehabilitated. This will include no net increase in grazing intensity, introducing water troughs, implementing measures to reduce the density of exotic pasture grasses and increasing the density and diversity of native food grass species. Suitable areas for rehabilitation will be determined based on the habitat mapping provided in Figure 3-2. High value habitat areas without water sources will be identified and artificial water sources installed.	Environmental Manager	During operation	Rehabilitation Plan

Issue	Control	Responsibility	Timeframe	Documentation
	Manage erosion and sedimentation in accordance with erosion and sediment controls set out in Volume 4, Appendix Q1 Environmental Management Plan (Mine) and Volume 4, Appendix Q2 Environmental Management Plan (Offsite).	Environmental Manager	During operation	Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Undertake dust suppression activities where operation works occurs adjacent to foraging habitat and drinking or nesting sites for the black-throated finch. This will be in accordance with the mitigation measures outlined in Volume 4 Appendix K3 Water Quality Report.	Environmental Manager	During operation	Water Quality Report Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Manage ephemeral water sources such as springs will be managed to prevent access by stock and feral animals in the wet season.	Environmental Manager	During operation	Black-throated finch monitoring plan
	Store fuels, chemicals, wastes and other potentially environmentally hazardous substances in bunded or otherwise contained areas away from watercourses, waterbodies and other known or potential drinking sites for the black-throated finch	All staff	During operation	Waste and Hazardous Materials Storage Register Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Maintain all vehicles and plant to regular maintenance and inspection schedules to reduce the potential for oil leaks and spills	All staff	During operation	Vehicle maintenance schedules and inspection
	Immediately report and manage all oil and pollutant spills	All staff	During operation	Environmental Management Plan (Mine) Environmental Management Plan (Offsite)

Issue	Control	Responsibility	Timeframe	Documentation
	Monitor weeds levels in and adjacent to all sensitive areas for the black-throated finch (i.e. drinking sites, nesting sites and important foraging habitat). If required, undertake weed control in areas that are infested with exotic pasture grasses.	Environmental Manager	During operation	Weed Management Plan Weed Monitoring Reporting
	Inspect and certify all vehicles, equipment and materials brought onto site as free of weeds and weed seeds and carry a weed hygiene declaration. Records are to be kept of compliance with this requirement. A weed wash down facility will be constructed onsite.	All staff	During operation	Weed Hygiene Certification
	Store soil stripped and stockpiled from areas containing known weed infestations in areas separate from areas free of weeds and away from all mapped potential habitat and drinking sites and nesting sites for the black-throated finch	Operation Manager	During operation	Weed Management Plan
	Use habitat rehabilitation methods that exclude the use of exotic pasture species, and instead use local native grass species known to be black-throated finch food species.	Environmental Manager	During operation	Rehabilitation Plan
	Monitor pest animal occurrence during operation and implement humane pest control measures to reduce the number of wild pigs and cats.	Environmental Manager	Annually during operation	Pest animal monitoring report
	Reduce or eliminate baiting of dingoes. These animals are the top order predators in Australia and are known to exclude feral cats from their territories (i.e. the species most likely to prey on black-throated finch (southern)) and reduce feral pigs and kangaroos, both species that can degrade resources for the finch.	Environmental Manager	During operation	Pest animal monitoring report
	Incorporate ecological burning regimes for the black-throated finch in the broader Fire Management Plan for the Mine.	Environmental Manager / Land Manager	During operation	Fire Management Plan Black-throated finch monitoring plan
	Undertake late wet season/early dry season mosaic burns, to break up the country and prevent extensive late dry season wildlife	Environmental Manager / Land Manager	During operation	Fire Management Plan Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
	Undertake some wet season storm burning, when appropriate	Environmental Manager / Land Manager	During operation	Fire Management Plan Black-throated finch monitoring plan
	Document and map the distribution, frequency and timing of fire events and maintain a range of fire ages in the black-throated finch habitat areas	Environmental Manager / Land Manager	Annually during operation	Fire incidence report and map
	Clear networks of fire breaks that help promote a range of fire ages across remaining finch habitat and offset areas.	Environmental Manager / Land Manager	During operation	Fire Management Plan

1.4 Decommissioning

Table 4 Management and mitigation measures (decommissioning)

Issue	Control	Responsibility	Timeframe	Documentation
General	Continue implementing local monitoring as out lined in Section 8.3	Environmental Manager	Ongoing. Twice annually. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	Black-throated finch monitoring plan
	Induct all staff and contractors prior to commencing work on site. The induction will include an overview of black-throated finch's critical resources and distribution within the Project area, the key threats to the species and the responsibilities outlined in this management plan for all workers undertaking work on site	Environmental Manager	Prior to site entry	Training register
	Provide toolbox talks as required to communicate any non-compliances that have occurs in relation to the black-throated finch management plan and the corrective actions that are being implemented.	Environmental Manager	As required during decommissioning.	Training log
	Continue ongoing monitoring as described in Section 8.2	Environmental Manager	Ongoing. Twice annually. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	Offset Management Plan Black-throated finch monitoring plan

Issue	Control	Responsibility	Timeframe	Documentation
	Continue to rehabilitate or protect areas of key ecological value for the black-throated finch (i.e. reducing grazing pressures, reduce the density of exotic pasture grasses, increase the density and diversity of native food grass species, protect drinking sites, provide artificial drinking sites and manage the fire regime).	Environmental Manager / Stakeholder Manager	During decommissioning	Offset Management Plan Black-throated finch monitoring plan
Habitat loss	Maintain map of black-throated finch habitat and modify signage of critical resources if required.	Environmental Manager	Ongoing. Update map of habitat and signage of critical resources after each monitoring event.	Map of habitat and critical resources for the black-throated finch
	Clearly identify the extent of rehabilitated areas on decommissioning plans and in the field.	Decommissioning Manager	Prior to decommissioning commencing	Rehabilitation Plan
	Continue to provide new water sources (troughs) where required in rehabilitated areas.	Environmental Manager	During decommissioning	Black-throated finch monitoring plan
Direct injury or mortality	Vehicles will be required to stay on pre-determined routes.	All staff	During decommissioning	Site maps Signage Induction documents
	Erect warning signs along tracks that run adjacent to rehabilitated areas and critical resources for the black-throated finch to inform workers of the presence of the species. All vehicles and plant will adhere to site rules relating to speed limits. Speed limits will be clearly signposted so as to minimise the potential for road kill.	All staff	During decommissioning	Signage Induction documents
	Report any incidence of fauna mortality to the Environmental Manager and log in a fauna incident register	All staff, Environmental Manager	Report immediately in response to incidents during decommissioning	Fauna incident register

Issue	Control	Responsibility	Timeframe	Documentation
Habitat degradation	Manage ephemeral water sources such as springs to prevent access by stock and feral animals in the wet season.	Environmental Manager	During decommissioning	Black-throated finch monitoring plan
	Store fuels, chemicals, wastes and other potentially environmentally hazardous substances in bunded or otherwise contained areas away from watercourses, waterbodies and other known or potential drinking sites for the black-throated finch	All staff	During decommissioning	Waste and Hazardous Materials Storage Register Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Maintain all vehicles and plant to regular maintenance and inspection schedules to reduce the potential for oil leaks and spills	All staff	During decommissioning	Vehicle maintenance schedules and inspection
	Immediately report and manage all oil and pollutant spills	All staff	During decommissioning	Environmental Management Plan (Mine) Environmental Management Plan (Offsite)
	Monitor weeds levels in and adjacent to all sensitive areas for the black-throated finch (i.e. drinking sites, nesting sites and important foraging habitat). If required, undertake weed control in areas that are infested with exotic pasture grasses.	Environmental Manager	During decommissioning	Weed Management Plan Weed Monitoring Reporting
	Inspect and certify all vehicles, equipment and materials brought onto site as free of weeds and weed seeds and carry a weed hygiene declaration. Records are to be kept of compliance with this requirement. A weed wash down facility will be constructed onsite.	All staff	During decommissioning	Weed Hygiene Certification

Issue	Control	Responsibility	Timeframe	Documentation
	Use habitat rehabilitation methods that exclude the use of exotic pasture species, and instead use local native grass species known to be black-throated finch food species.	Environmental Manager	During decommissioning	Rehabilitation Plan
	Monitor pest animal occurrence and implement humane pest control measures to reduce the number of wild pigs and cats.	Environmental Manager	Annually during decommissioning	Pest animal monitoring report
	Reduce or eliminate baiting of dingoes. These animals are the top order predators in Australia and are known to exclude feral cats from their territories (i.e. the species most likely to prey on black-throated finch (southern)) and reduce feral pigs and kangaroos, both species that can degrade resources for the finch.	Environmental Manager	During decommissioning	Pest animal monitoring report
	Incorporate ecological burning regimes for the black-throated finch in the broader Fire Management Plan for the Mine.	Environmental Manager / Land Manager	During decommissioning	Fire Management Plan Black-throated finch monitoring plan
	Undertake late wet season/early dry season mosaic burns, to break up the country and prevent extensive late dry season wildlife	Environmental Manager / Land Manager	During decommissioning	Fire Management Plan Black-throated finch monitoring plan
	Undertake some wet season storm burning, when appropriate	Environmental Manager / Land Manager	During decommissioning	Fire Management Plan Black-throated finch monitoring plan
	Document and map the distribution, frequency and timing of fire events and maintain a range of fire ages in the black-throated finch habitat areas	Environmental Manager / Land Manager	Annually during decommissioning	Fire incidence report and map
	Clear networks of fire breaks that help promote a range of fire ages across remaining finch habitat and offset areas.	Environmental Manager / Land Manager	During decommissioning	Fire Management Plan

2. Monitoring

2.1 Monitoring sites

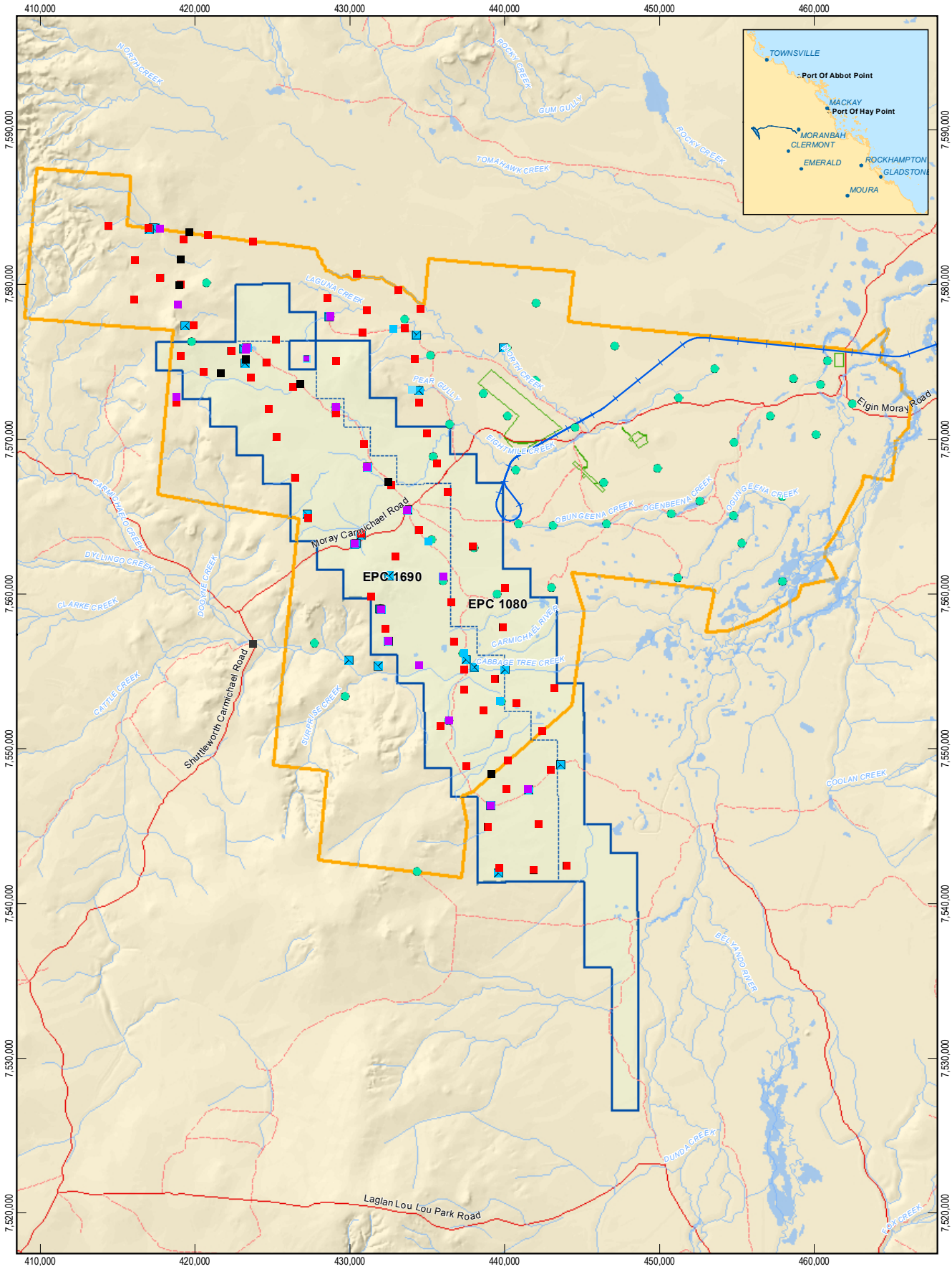
Monitoring for the black-throated finch will include onsite, offsite and regional monitoring locations. A key component of this black-throated finch management plan is that monitoring data collected from the Project site and surrounding areas (e.g. Moray Downs property and offset sites) will help refine and improve monitoring locations overtime. The current black-throated finch onsite and offsite monitoring locations are summarised in Table 5 and shown in Figure 1. These locations are the same as those used in the previous BTF monitoring programs for the EIS and SEIS however; they will be reviewed and refined in consultation with the expert panel, prior to each new round of monitoring commencing. The regional monitoring locations are yet to be determined however they will also be developed in consultation with the expert panel prior to each round of monitoring

Table 5 Monitoring locations

Monitoring location	Name	Type	East	North
CWAT01	10 Mile Bore	Large Dam	423382	7575879
CWAT02	16 Mile Tank	Large Dam	432833	7577157
CWAT03	10 Mile Tank	Large Dam	428716	7577948
CWAT04	Swamp Tank	Large Dam	437386	7556168
CWAT05	Bushy's Dam	Large Dam	439715	7553076
CWAT06	Matheson's Dam	Large Dam	435107	7563409
CWAT07	10 Mile Dam (#1 Dam)	Large Dam	431186	7568219
CWAT08	Four Mile Dam	Large Dam	436019	7561136
CHAB01	EPC E	2 ha	427319.5	7564911.5
CHAB02	EPC S	2 ha	426469.6	7567541.3
CHAB03	EPC E	2 ha	425249.2	7570166.2
CHAB04	EPC S	2 ha	424738.1	7571955.4
CHAB05	EPC W	2 ha	423618.1	7573979.8
CHAB06	EPC S	2 ha	422324.8	7575722.9
CHAB07	Moray N	2 ha	419923.4	7577402.6
CHAB08	Moray W	2 ha	418803.7	7572371.1
CHAB09	EPC W	2 ha	420566.8	7574366.6
CHAB10	EPC E	2 ha	419077.5	7575395.6
CHAB11	Moray S	2 ha	419079.0	7580025.9
CHAB12	Moray S	2 ha	417749.8	7580444.7
CHAB13	Moray W	2 ha	416092.8	7579010.5
CHAB14	Moray E	2 ha	416121.0	7581590.0
CHAB15	Moray W	2 ha	414414.1	7583803.6
CHAB16	Moray S	2 ha	417001.8	7583684.4
CHAB17	Moray W	2 ha	419267.0	7582921.0
CHAB18	Moray S	2 ha	420810.0	7583191.0
CHAB19	Moray S	2 ha	423758.0	7582809.0
CHAB20	EPC N	2 ha	425217.5	7576417.7
CHAB21	EPC S	2 ha	424594.1	7574981.7
CHAB22	EPC E	2 ha	426312.4	7573408.2
CHAB23	EPC S	2 ha	429102.9	7571664.6

CHAB24	EPC S	2 ha	430891.3	7569686.7
CHAB25	EPC S	2 ha	432665.1	7567048.8
CHAB26	EPC E	2 ha	435623.8	7568478.6
CHAB27	EPC E	2 ha	434980.3	7570378.9
CHAB28	Moray E	2 ha	434480.7	7572373.1
CHAB29	Moray E	2 ha	434206.2	7575210.8
CHAB30	Moray W	2 ha	434549.0	7578457.5
CHAB31	Moray S	2 ha	433133.8	7579619.0
CHAB32	Moray S	2 ha	430444.3	7580697.7
CHAB33	Moray W	2 ha	428551.6	7579130.3
CHAB34	Moray N	2 ha	431071.0	7578350.0
CHAB35	Moray S	2 ha	430826.2	7576903.9
CHAB36	Moray S	2 ha	433547.2	7577171.3
CHAB37	EPC S	2 ha	429110.6	7575027.2
CHAB38	EPC W	2 ha	434440.2	7564126.5
CHAB39	EPC N	2 ha	436050.0	7561144.2
CHAB40	EPC E	2 ha	436538.8	7559460.8
CHAB41	EPC N	2 ha	436730.3	7556963.4
CHAB42	EPC W	2 ha	437362.0	7555139.3
CHAB43	EPC E	2 ha	437384.6	7553812.0
CHAB44	EPC E	2 ha	435846.2	7551470.6
CHAB45	EPC S	2 ha	438652.2	7552498.1
CHAB46	EPC W	2 ha	437540.4	7548868.6
CHAB47	EPC N	2 ha	439645.3	7550939.8
CHAB48	EPC N	2 ha	440214.6	7549287.8
CHAB49	EPC W	2 ha	432315.8	7557767.3
CHAB50	EPC E	2 ha	431362.9	7559818.5
CHAB51	EPC W	2 ha	432916.5	7562441.5
CHAB52	EPC W	2 ha	430734.3	7563922.1
CCAM01	10 Mile Bore	Small Dam	423338	7575930
CCAM02	10 Mile Bore	Ephemeral	423288	7575822
CCAM03	10 Mile Dam (#1 Dam)	Large Dam	431097	7568215
CCAM04	Dam #2	Large Dam	429082	7572104
CCAM05	No name	Ephemeral	417715	7583613
CCAM06	Tank near Langlands Bore	Ephemeral	418881	7578727
CCAM07	Drainage line	Ephemeral	418787	7572769
CCAM08	Labona Bore	Trough	433685	7565430
CCAM09	10 Mile Tank	Large Dam	428713	7577946
CCAM10	10 Mile Tank	Large Dam	428718	7577918
CCAM11	Bygana	Ephemeral	439096	7546324
CCAM12	Bygana	Trough	441533	7547414
CCAM13	Four Mile Dam	Trough	436047	7561138
CCAM14	Carmichael Bore	Trough	436402	7551819
CCAM15	Humes Bore 1	Trough	432492	7556974
CCAM16	Humes Bore 2	Trough	432012	7559007
CCAM17	Drainage line	Ephemeral	430343	7563292

CCAM18	Drainage line	Ephemeral	432472	7567250
CCAM19	Bygana	Trough	434458	7555399
CCAM20	Bygana	Trough	439097	7546321



LEGEND

BTF Survey sites May/October 2013
- Water
- Camera
- 2ha
- Incidental
- Past Surveys (Waterbodies)
- Indicative Dams
- Watercourse
- Waterbody
- Minor Road
- Track
- Moray Downs Property
- Project (Mine)
- Mine (Offsite)
- Project (Rail)

1:350,000 (at A4)
0 2 4 6 8 10
Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

N

Adani Mining Pty Ltd
Black-throated finch Management Plan

Carmichael Coal Mine Project area
and black-throated finch monitoring locations

Job Number 41-26422
Revision E
Date 21-01-2014

Figure 1-1

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Level 9, 145 Ann St Brisbane QLD 4000 T +61 7 3316 3000 F +61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data Source: GA: Road, Watercourse (2007); DME:EPC1690 (2010), EPC1080 (2011); DNRM: Waterbody (2010); GHD: Property, Survey Sites (2013) Adani: Offsite Infrastructure, Alignment(2013).

2.2 Black throated finch monitoring

Table 6 Pre-construction monitoring black throated finch

Issue	Monitoring action	Responsibility	Frequency	Performance requirement
General	Establish local monitoring sites and conduct local monitoring as outlined in the BTF Monitoring Plan	Environmental Manager	Ongoing. Every two months for the first three years and then twice annually after that	No net decline in black-throated finch activity levels in rehabilitated habitat areas compared to black-throated finch activity levels in disturbed areas prior to construction No net decline in regional population numbers Evidence of breeding and feeding in managed areas adjacent to the Project Evidence of continued use of water sources (artificial and ephemeral) adjacent the Project Evidence of use of areas where new water sources are relocated
	Establish ongoing monitoring sites and conduct ongoing monitoring as outlined in the BTF Monitoring Plan	Environmental Manager	Prior to construction, every two months for the first three years and then twice annually for the next ten years. Re-assess frequency of ongoing monitoring over time in consultation with the Recovery Team and government regulators	As above
Habitat loss	Establish monitoring sites at new (troughs) and existing water sources as outlined in the BTF Monitoring Plan	Environmental Manager	Prior to construction	Improvement in measurements of site-based vegetation attributes over-time against revegetation criteria developed for rehabilitation areas. Evidence of breeding and feeding in managed areas adjacent to the Project Evidence of continued use of water sources (artificial and ephemeral)

Issue	Monitoring action	Responsibility	Frequency	Performance requirement
				adjacent the Project Evidence of use of areas where new water sources are relocated
Habitat degradation	Establish weed and pest monitoring in accordance with the Weed Monitoring Plan and the Pest Animal Monitoring Plan	Environmental Manager	Prior to construction	No wildfires, no increase in predator or feral animal numbers and no increase in exotic pasture distribution within existing high quality habitat areas

Table 7 Construction monitoring black throated finch

Issue	Monitoring action	Responsibility	Frequency	Performance requirement
General	Conduct local monitoring as outlined in the BTF Monitoring Plan	Environmental Manager	Ongoing. Every two months for the first three years and then twice annually after that.	No net decline in black-throated finch activity levels in rehabilitated habitat areas compared to black-throated finch activity levels in disturbed areas prior to construction No net decline in regional population numbers Evidence of breeding and feeding in managed areas adjacent to the Project Evidence of continued use of water sources (artificial and ephemeral) adjacent the Project Evidence of use of areas where new water sources are relocated
	Conduct ongoing monitoring as outlined in the BTF Monitoring Plan	Environmental Manager	Every two months for the first three years and then twice annually after that. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	As above
Habitat loss	Conduct monition at new (troughs)and existing water sources as outlined in the BTF Monitoring Plan	Environmental Manager	Throughout the construction period	Improvement in measurements of site-based vegetation attributes over-time against revegetation criteria

Issue	Monitoring action	Responsibility	Frequency	Performance requirement
				developed for rehabilitation areas. Evidence of breeding and feeding in managed areas adjacent to the Project Evidence of continued use of water sources (artificial and ephemeral) adjacent the Project Evidence of use of areas where new water sources are relocated
Direct injury or mortality	Undertake pre-clearing surveys as outlined in the BTF Monitoring Plan	Environmental Manager	Prior to clearing	
Habitat degradation	Conduct weed and pest monitoring in accordance with the Weed Monitoring Plan and the Pest Animal Monitoring Plan	Environmental Manager	Throughout the construction period	No wildfires, no increase in predator or feral animal numbers and no increase in exotic pasture distribution within existing high quality habitat areas

Table 8 Operation monitoring black throated finch

Issue	Monitoring action	Responsibility	Frequency	Performance requirement
General	Continue implementing local monitoring as outlined in the BTF Monitoring Plan	Environmental Manager	Ongoing. Every two months for the first three years and then twice annually after that.	No net decline in black-throated finch activity levels in rehabilitated habitat areas compared to black-throated finch activity levels in disturbed areas prior to construction No net decline in regional population numbers Evidence of breeding and feeding in managed areas adjacent to the Project Evidence of continued use of water sources (artificial and ephemeral) adjacent the Project Evidence of use of areas where new water sources are relocated
	Continue implementing ongoing monitoring as outlined in the BTF		Every two months for the first three years and then twice	As above

Issue	Monitoring action	Responsibility	Frequency	Performance requirement
	Monitoring Plan		annually after that. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	
Habitat loss	Continue monition at new (troughs)and existing water sources as outlined in the BTF Monitoring Plan	Environmental Manager	During operation	Improvement in measurements of site-based vegetation attributes over-time against revegetation criteria developed for rehabilitation areas. Evidence of breeding and feeding in managed areas adjacent to the Project Evidence of continued use of water sources (artificial and ephemeral) adjacent the Project Evidence of use of areas where new water sources are relocated
Direct injury or mortality	Undertake pre-clearing surveys as outlined in the BTF Monitoring Plan	Environmental Manager	Prior to clearing	As above
Habitat degradation	Conduct weed and pest monitoring in accordance with the Weed Monitoring Plan and the Pest Animal Monitoring Plan	Environmental Manager	During operation	No wildfires, no increase in predator or feral animal numbers and no increase in exotic pasture distribution within existing high quality habitat areas

Table 9 Decommissioning monitoring black throated finch

Issue	Monitoring action	Responsibility	Frequency	Performance requirement
General	Continue implementing local monitoring as outlined in the BTF Monitoring Plan	Environmental Manager	Ongoing. Every two months for the first three years and then twice annually after that.	No net decline in black-throated finch activity levels in rehabilitated habitat areas compared to black-throated finch activity levels in disturbed areas prior to construction No net decline in regional population numbers Evidence of breeding and feeding in

Issue	Monitoring action	Responsibility	Frequency	Performance requirement
				managed areas adjacent to the Project Evidence of continued use of water sources (artificial and ephemeral) adjacent the Project Evidence of use of areas where new water sources are relocated
	Continue implementing ongoing monitoring as outlined in the BTF Monitoring Plan		Every two months for the first three years and then twice annually after that. Reassess frequency of monitoring over time in consultation with the Recovery Team and government regulators.	As above
Habitat loss	Continue monition at new (troughs)and existing water sources as outlined in the BTF Monitoring Plan	Environmental Manager	During decommissioning	Improvement in measurements of site-based vegetation attributes over-time against revegetation criteria developed for rehabilitation areas. Evidence of breeding and feeding in managed areas adjacent to the Project Evidence of continued use of water sources (artificial and ephemeral) adjacent the Project Evidence of use of areas where new water sources are relocated
Habitat degradation	Conduct weed and pest monitoring in accordance with the Weed Monitoring Plan and the Pest Animal Monitoring Plan	Environmental Manager	During decommissioning	No wildfires, no increase in predator or feral animal numbers and no increase in exotic pasture distribution within existing high quality habitat areas

3. Corrective measures

Table 10 Corrective measures

Trigger	Responsibility	Corrective action
Not procuring suitable offset sites for the black-throated finch in accordance with the approved Environmental Offset Package	Environmental Manager	The nature of the incident/non-compliance will be investigated by the environmental manager. Advice may be sought from a specialist where the extent of the issue is beyond the expertise of the in-house resources The incident/non-compliance will be monitored to ensure the success of the preventative or corrective action The environmental incident/non-conformance will be closed out
Not implementing conditions of approval in regard to black-throated finch management and monitoring	Environmental Manager	The incident/non-compliance will be recorded in the environmental incident register The nature of the incident/non-compliance will be investigated by the environmental manager. Advice may be sought from a specialist where the extent of the issue is beyond the expertise of the in-house resources Additional monitoring may be undertaken where required An appropriate preventative and corrective action will be implemented and entered into the environmental incident register The incident/non-compliance will be monitored to ensure the success of the preventative or corrective action The environmental incident/non-conformance will be closed out
Clearing of high-value habitat areas during black-throated finch nesting periods (the wet season)	Environmental Manager	The incident/non-compliance will be recorded in the environmental incident register The nature of the incident/non-compliance will be investigated by the environmental manager. Advice may be sought from a specialist where the extent of the issue is beyond the expertise of the in-house resources The effectiveness or need for new/additional controls will be reviewed An appropriate preventative and corrective action will be implemented and entered into the environmental incident register

Trigger	Responsibility	Corrective action
		The incident/non-compliance will be monitored to ensure the success of the preventative or corrective action The environmental incident/non-conformance will be closed out
No black-throated finch observed annually at installed drinking troughs	Environmental Manager	The incident/non-compliance will be recorded in the environmental incident register The nature of the incident/non-compliance will be investigated by the environmental manager. Advice may be sought from a specialist where the extent of the issue is beyond the expertise of the in-house resources The effectiveness or need for new/additional controls will be reviewed An appropriate preventative and corrective action will be implemented and entered into the environmental incident register The incident/non-compliance will be monitored to ensure the success of the preventative or corrective action The environmental incident/non-conformance will be closed out
A wildfire event or limited generation of suitable foraging habitat after a controlled burn.	Environmental Manager	The incident/non-compliance will be recorded in the environmental incident register The nature of the incident/non-compliance will be investigated by the environmental manager. Advice may be sought from a specialist where the extent of the issue is beyond the expertise of the in-house resources The effectiveness or need for new/additional controls will be reviewed An appropriate preventative and corrective action will be implemented and entered into the environmental incident register
A net increase in pest populations that pose a predation threat or undermine habitat quality in areas of high ecological value (i.e. drinking sites, nesting sites and key foraging habitat)	Environmental Manager	The incident/non-compliance will be recorded in the environmental incident register The nature of the incident/non-compliance will be investigated by the environmental manager. Advice may be sought from a specialist where the extent of the issue is beyond the expertise of the in-house resources The effectiveness or need for new/additional controls will be reviewed

Trigger	Responsibility	Corrective action
		An appropriate preventative and corrective action will be implemented and entered into the environmental incident register The incident/non-compliance will be monitored to ensure the success of the preventative or corrective action The environmental incident/non-conformance will be closed out
A net increase in weeds or exotic pasture plants within areas of high ecological value (i.e. drinking sites, nesting sites and key foraging habitat)	Environmental Manager	The incident/non-compliance will be recorded in the environmental incident register The nature of the incident/non-compliance will be investigated by the environmental manager. Advice may be sought from a specialist where the extent of the issue is beyond the expertise of the in-house resources The effectiveness or need for new/additional controls will be reviewed An appropriate preventative and corrective action will be implemented and entered into the environmental incident register The incident/non-compliance will be monitored to ensure the success of the preventative or corrective action The environmental incident/non-conformance will be closed out

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B	M Trebitsch	J Keane	On file	J Keane	On file	21/01/2014
C	M Trebitsch	J Keane	On file	J Keane	On file	23/01/2014
0	Nil	J Keane		J Keane		11/02/2014

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