





Illawarra Coal



Bulli Seam Operations Southern Brown Bandicoot Management Plan



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VERSION HISTORY

VERSION	DESCRIPTION OF CHANGES	DATE
1.0	New plan developed	2013
2.0	Incorporate comments from OEH and DSEWPaC	2014
3.0	<p>Updated to reflect South32 name and branding.</p> <p>Updates to management & mitigation measures to remove duplication with the Coal Wash Emplacement Area Management Plan.</p> <p>Updated section on Management of Captured bandicoots to preference being relocation.</p> <p>Updated section on Provision of Regional Funding - funding has been expended.</p>	2017

PERSONS INVOLVED IN THE REVIEW OF THIS PLAN INCLUDE:

NAME	TITLE	EXP (YRS)
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1 INTRODUCTION

1.1 Objectives

The objectives of this Management Plan are to meet the requirements of the:

- BSO Project EPBC Approval 2010/5350 and;
- BSO Project NSW EP&A Act (DoPI) Approval

The Conditions of these Approvals and the sections where these requirements are addressed are outlined in the following table.

Table 1: Approval conditions and where these requirements are met within the plan.

Development Consent instrument and Condition	Reference
BSO Project Approval - Schedule 4, Condition 17	
The Proponent shall prepare and implement a West Cliff Emplacement Area Management Plan for the project to the satisfaction of the Director-General. This plan must be prepared in consultation with OEH and be submitted to the Director -General for approval by the end of June 2013. This plan must include:	Separate MP
(d) management strategies for the protection and conservation of the Broad-headed Snake and the Southern Brown Bandicoot.	Page 9
BSO EPBC Project Approval (2010/5350) Condition 7	
Within 1 year of the date of this approval the person taking the action must provide for the Minister's approval a Southern Brown Bandicoot and Broad-headed Snake management plan or plans. The plan or plans must include:	This Management Plan
(a) measures to avoid, mitigate and manage impacts on the Southern Brown Bandicoot, Broad-headed Snake and their habitats occurring as result of the action;	Page 9
(b) provisions for the contribution of no less than \$250,000 (GST exclusive) in funding towards regional Southern Brown Bandicoot and Broad-headed Snake programs. This funding must not be expended on the measures referred to in condition 6a;	Page 13
(c) a description of actions to be funded and undertaken to inform and/or enhance the conservation of these species, including through survey or research, threat abatement with specific reference to predator controls and habitat restoration or rehabilitation, including public reporting or publication of information gained by these actions;	Page 13
(d) a demonstration that management actions to be undertaken will not adversely impact EPBC Act listed species;	Page 13
(e) a description of funding arrangements or agreements including work programs and responsible entities; and	Page 13

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Development Consent instrument and Condition	Reference
(f) measures for the provision of documentary evidence within 30 days of the funding having been expended and/or that funding commitments have been met.	Page 14

1.2 Scope

This Plan applies to potential impacts on the Southern Brown Bandicoot from Stages 3 and 4 of the West Cliff Emplacement construction and operations. The Plan addresses the requirements of:

- Bulli Seam Operations NSW EP&A Act - Project Approval Condition 17 (d) and
- Bulli Seam Operations - EPBC Approval Condition 2010/5350 Condition 7

A separate management plan has been prepared for the Broad Headed Snake.

2 ROLES AND RESPONSIBILITIES

The table below outlines the roles and responsibilities associated with this Management Plan.

Table 2: Summary of roles and responsibilities

Responsibilities	Role
Meeting the commitments (including auditing, investigation and reporting) of this Management Plan. Implementation and periodic review of this Management Plan.	Site Environmental Officer
Provision of suitable resources to manage the Emplacement in accordance with this Plan. Day to day operation and maintenance of Emplacement Area in accordance with this Management Plan.	Production Superintendent
Relocation (if required) of the Southern Brown Bandicoot.	Ecologist or wildlife specialist (with experience in relation to the Southern Brown Bandicoot)

2.1 Consultation

As required, the components relating to the Southern Brown Bandicoot from the West Cliff Coal Wash Emplacement Area Management Plan have been prepared in consultation with the then Department of the Environment (DoTE - Now Department of the Environment & Energy (DoTE&E)) and the NSW Office of Environment and Heritage (OEH).

DoTE and OEH were provided drafts of this Plan for comment with responses addressed within the previous version (Rev2) of the Plan where appropriate.

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2.2 Review of the Management Plan

This management Plan will be reviewed, and if necessary revised, following the submission of an Independent Environmental Audit report; or any modification to relevant Project approval conditions (unless the conditions require otherwise); and if required by Condition 17 of the EPBC Act Approval.

Changes made to this Plan since first being approved are summarised in Table 1:

Table 3: Summary of changes made to this plan.

Summary of Changes	By Who	Date/Review No.
New draft plan developed for EPBC Act and NSW EP&A Act approvals	Niche Environment & Heritage	2013/Rev1
Plan updated to incorporate comments on draft from OEH and DSEWPaC	D. Gregory & Niche Environment & Heritage	2014/Rev 2
Updated to reflect South32 name and branding. Updates to management & mitigation measures to remove duplication with the Coal Wash Emplacement Area Management Plan. Updated section on <i>Management of Captured Southern Brown Bandicoots</i> to preference being relocation. Updated section on <i>Provision of Regional Funding</i> - funding has been expended.	D. Gregory	2017/Rev3

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3 SOUTHERN BROWN BANDICOOT INFORMATION

The Southern Brown Bandicoot, *Isodon obesulus obesulus* (Shaw and Nodder 1797), is a medium-sized (400-1600g) ground-dwelling marsupial. Like other members of the bandicoot family (Peramelidae) the species has a long tapering snout with a naked nose, a compact body and short tail with a pointed end. The head has small rounded ears and small eyes. The coarsely furred dorsal surface of the body is usually dark grey with golden-brown flecks, and the softer underbelly is creamy-white. While the forelegs are short with curved claws on the digits, the hind limbs are much longer resembling those of macropods. The hind feet are characterised by the presence of syndactylus toes, formed by fusion of the second and third digits. These are used for grooming. (DEC 2006).

The Southern Brown Bandicoot is a species of national conservation significance. It is listed as Endangered (Schedule 1, Part 1) on the NSW *Threatened Species Conservation Act 1995* (TSC Act) and Endangered on the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*. In NSW, the species has a patchy distribution along the eastern coastline and adjacent lower foothills in the southern part of the State, from the Hawkesbury River to the Victorian border. Records of the species are generally confined to heathlands or woodlands and forests with heath understorey, typically on friable sandy soil.

Bandicoots usually nest in a shallow depression in the ground covered by leaf litter, grass or other plant material (Rayment 1954; Ride 1970; Gordon 1974, in DEC 2006). The upper surface of this covering may be mixed with earth to waterproof the inside of the nest (Stodart 1983; Gordon 1983 in DEC 2006). Internally, the nest comprises a hollow chamber, often lined with grass and leaves with no distinct entrance or exit.



Figure 2: Southern Brown Bandicoot (DSEWPaC, 2011)

3.1 Significance of Southern Brown Bandicoot population within the Study Area

The Stage 3 Emplacement Species Impact Statement (SIS) prepared by Biosis (2007) found no records of Southern Brown Bandicoot during targeted surveys of the species in the West Cliff Emplacement Area. The SIS concluded that whilst habitat for the species existed within the emplacement area, it was unlikely that the species would be affected by the proposed Stage 3 emplacement area as the species had not been sighted since a recorded sighting in Dharawal National Park several decades prior.

During fauna survey for the Terrestrial Fauna Assessment prepared for the BSOP EA, Biosphere Consultants (2009) trapped one adult male Southern Brown Bandicoot in the proposed Stage 4 Emplacement Area. Further targeted trapping, use of hair tubes and use of infrared motion sensing cameras was conducted, however no further animals were captured, photographed or hair traces found.

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However, numerous Southern Brown Bandicoot diggings were located outside of the Stage 4 Coal Wash Emplacement Area (including within land to the north, in the Dharawal National Park to the east and in the Metropolitan Special Area to the south). In addition, some other bandicoot diggings were recorded; however, these could not be distinguished between the Long-nosed Bandicoot and the Southern Brown Bandicoot. A bandicoot skull was found within the Metropolitan Special Area and was subsequently identified as belonging to a Southern Brown Bandicoot by palaeontologist Henk Godthelp from the University of NSW (Biosphere 2009).

The Southern Brown Bandicoot is probably best described as present but rare. The proposed Stage 4 Coal Wash Emplacement area and surrounds provide habitat for the Southern Brown Bandicoot, resulting in part from the 2001 bushfires creating habitat mosaics in early to mid-succession phase at the time of the Project surveys. Conversely, the greater the time lapse since the last landscape-scale bushfire, the greater the possibility that some early successional habitats may become sub-optimal for the species. It is likely that well managed cool mosaic burnings between well-spaced landscape-wide bushfires may be required as part of a management mix to maintain optimal habitat outcomes for the Southern Brown Bandicoot. (Biosphere 2009).

3.2 Potential Impacts on Southern Brown Bandicoot

The Southern Brown Bandicoot Recovery Action Plan (DEC 2006) lists five key threatening processes (KTPs) from Schedule 3 of the TSC Act that are of direct relevance to the Southern Brown Bandicoot:

- (i) Predation by the European Red Fox *Vulpes vulpes*;
- (ii) Predation by the Feral Cat *Felis catus*;
- (iii) High frequency fire resulting in disruption of life cycle processes in plants and animals and loss of vegetation structure and composition;
- (iv) Clearing of native vegetation; and
- (v) Infection of native plants by *Phytophthora cinnamomi*.

The KTP of most direct relevance to the proposal is clearing of vegetation which would impact on actual and potential habitat for the Southern Brown Bandicoot.

The emplacement operations have the potential to negatively impact on the local population of Southern Brown Bandicoot either directly through mortality, habitat removal and increased susceptibility to predation by introduced carnivores, or indirectly by changes to habitat conditions, fragmentation of suitable habitats and loss or degradation of food resources.

A summary of potential impacts associated with the proposal is outlined in the following Sections.

Direct Impacts

Direct impacts that may result from the Stage 4 emplacement operations include:

- Death and/or injury of Southern Brown Bandicoots due to the removal of known and potential habitat for this species;
- Direct loss of habitat;
- Increased susceptibility to predation by introduced carnivores due to loss or degradation of habitat;
- Loss or injury to individuals during capture and translocation; and
- Creation of artificial barriers to movement.

Indirect Impacts

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Potential indirect impacts that may result from the active emplacement within the Stage 4 emplacement area include:

- Loss of habitat for prey items and hence loss of food resources leading to starvation;
- Reduction in genetic diversity within the regional population due to a reduction or loss of the West Cliff population, or to disrupted capacity for the species to move within and through the Stage 4 Emplacement Area; and
- Reduction in quality of the existing surrounding habitat due to noise and dust from the proposal.

4 MANAGEMENT AND MITIGATION

This Section addresses Condition 17(d) of the BSO Project Approval and Condition 7(a) of the EPBC Approval in relation to the Southern Brown Bandicoot as follows:

17 (d) management strategies for the protection and conservation of the Broad-headed Snake and the Southern Brown Bandicoot;

7 (a) measures to avoid, mitigate and manage impacts on the Southern Brown Bandicoot, Broad-headed Snake and their habitats occurring as result of the action.

4.1 Management Strategies

Clearing practices will incorporate appropriate controls to minimise mortality and injury to Southern Brown Bandicoots occupying the site. These are summarised in the following sections.

4.1.1 Pre-clearance Surveys

Prior to the first stage of clearing, the area to be cleared will be marked using flagging and surveyed by an ecologist or suitably trained site environmental representative to locate record and mark specific habitat features that are proposed for preservation and redistribution to the emplacement (e.g. rocks and boulders, stags and large hollows).

The pre-clearing surveys (relating to the Stage 3 coal wash emplacement operations) that have been undertaken to date are summarised in Table 4.

Table 4: Summary of pre-clearing surveys undertaken in Stage 3

Area in Ha	Purpose of Clearing	Report Reference
6.5	Coal wash emplacement	Niche, 2011
0.4	Coal wash emplacement	Niche 2012
0.25	Slurry pond	Illawarra Coal, 2013
2	Coal wash emplacement	Illawarra Coal, 2015
2	Coal wash emplacement	Illawarra Coal, 2016

4.1.2 Two-stage Clearing

The primary mitigating measure for protection of Southern Brown Bandicoots within the West Cliff Emplacement Area is two-stage clearing.

Where possible, (i.e. where access to trees by the excavator is safe and practical), clearing of hollow bearing trees will be performed in a two stage process where surrounding vegetation is cleared separately, before the removal of habitat trees to allow fauna an opportunity to move.

The process is detailed in the approved Coal Wash Emplacement Area Management Plan.

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4.1.3 Management of Captured Southern Brown Bandicoots

In the event that an individual is found during the two-stage clearing process, the animal will be relocated to pre-determined suitable habitat within the West Cliff surface mining lease area.

Sites for relocation will take into account the species home ranges and be evenly spaced to avoid social conflict. Where possible, captured bandicoots will be translocated from the initial capture point to the nearest site considered suitable for the long-term habitation by the species, but not more than 1 km from that point (where possible) to reduce the possibility for unfavorable genetic mixing.

Bandicoots will be released at sites as soon as practicable after capture.

4.1.4 Habitat Protection during Construction

In addition to the actions provided in the above sections, the following practices will be adopted during construction:

- Sediment control measures will be adopted during clearing, as outlined in the West Cliff Coal Wash Emplacement Area Management Plan;
- The emplacement area will be clearly demarcated and regularly surveyed to prevent unnecessary clearing or access by construction vehicles and plant to surrounding potential habitat;
- Construction materials and spoil must not be stored, dumped or stockpiled within surrounding habitat; and
- Induction of the Emplacement Area Supervisory personnel will include information about the Southern Brown Bandicoot and its habitat within Stage 4 of the Emplacement Area, along with protection measures that will be in place and enforced during the construction period;
- Inclusion of general information on threatened species (including key Site contacts for threatened species) for all West Cliff Emplacement personnel.

4.2 Summary of Impact Minimisation Strategies

Measures to minimise impacts of the Project (Stage 3 and 4 emplacement areas) on the local population of the Southern Brown Bandicoot are outlined in Table 5.

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**Table 5: Impact minimisation measures for the protection of the Southern Brown Bandicoot at West Cliff**

Performance Objective	Performance Target	Management/Mitigation Measures	Monitoring and Reporting Methods
Protection of <i>Isoodon obesulus obesulus</i> outside the approved emplacement and development footprints	- No loss of <i>Isoodon obesulus obesulus</i> individuals or its habitat outside the approved emplacement and development footprints	- Vegetation clearing to be within approved boundaries - Future development requiring land clearing to consider <i>Isoodon obesulus obesulus</i> individuals.	- Works as executed survey plans of any vegetation clearing
Protection of <i>Isoodon obesulus obesulus</i> within the approved emplacement and development footprints	Minimise loss of <i>Isoodon obesulus obesulus</i> individuals within the approved emplacement footprints due to construction and operations.	Conduct pre-clearance surveys in the Stage 3 and 4 emplacement areas and subsequent two-stage clearing, to give animals the opportunity to move away. Individuals found will be relocated to pre-determined suitable habitat within the West Cliff surface mining lease area.	Document by preparation of pre-clearing survey reports for every emplacement phase cleared including use of GIS coordinates for survey results. Document numbers of individuals trapped and released. Observation of animal condition. Record release location.
Re-establishment of suitable habitat on completed and rehabilitating emplacement areas	Establishment of suitable vegetation cover, habitat components and soil profiles to support <i>Isoodon obesulus obesulus</i> individuals within 5 years of commencement of rehabilitation.	Placement of topsoil, hollow logs and other structural elements of habitat for the Southern Brown Bandicoot in rehabilitated areas.	Annual Emplacement Rehabilitation Inspection program undertaken Reports from the annual Rehabilitation monitoring program to be attached to the Bulli Seam Annual Environmental Management Report (Annual Review).
Reduce dust impacts on bandicoot habitat from operations.	Dust controls as per West Cliff Coal Wash	Dust impacts from emplacement operations will be mitigated by the coal wash material being wet from coal	Annual environmental reporting of dust results in the Bulli Seam Annual

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Performance Objective	Performance Target	Management/Mitigation Measures	Monitoring and Reporting Methods
	Emplacement Area Management Plan	washing processes and being compacted once emplaced. Active emplacement areas will be capped and vegetated as soon as practicable.	Environmental Management Report (Annual Review).
Predator control to enhance population viability of the Southern Brown Bandicoot	Maintain or increase the population size of Southern Brown Bandicoots in overall project area.	Participation in regional vertebrate pest programs with National Parks & Wildlife Service and Sydney Catchment Authority. Note: The regional research program established under the EPBC Act project approval (condition 7b) will focus on population monitoring. A regional pest problem will be designed once a population of Southern Brown Bandicoots has been confirmed and defined.	Research reporting
Monitoring and Reporting undertaken and submitted as scheduled	Annual monitoring report submitted and Management Plan review as required.	Reporting of project to DoE and other stakeholders Adjustments made to systems and methods as required	Monitoring including pre-clearing surveys, capture and transfer of animals, implementation of two-stage clearing, success of translocation efforts, progress in rehabilitation of emplacement sites, success of captive breeding programs if applicable. Annual compliance report to DoTE&E.

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5 PROVISION OF REGIONAL FUNDING

5.1 Provision of Funding

This section addresses Condition 7(b) of the EPBC Approval as follows:

(b) provisions for the contribution of no less than \$250,000 (GST exclusive) in funding towards regional Southern Brown Bandicoot and Broad-headed Snake programs. This funding must not be expended on the measures referred to in condition 7a;

IC has funded \$250,000 towards the regional management of the Southern Brown Bandicoot and Broad Headed Snake programs as outlined in this Plan (Attachment B).

The project will take place over three years commencing July 2014 and finishing June 2017 with payments scheduled as follows:

- Year 1 \$85,000 July 2014
- Year 2 \$85,000 July 2015
- Year 3 \$80,000 July 2016.

5.2 Actions to be Funded

Illawarra Coal consulted with the Office of Environment and Heritage (local and threatened species unit) regarding EPBC Act Approval Conditions 7(b) to (e).

(c) a description of actions to be funded and undertaken to inform and/or enhance the conservation of these species, including through survey or research, threat abatement with specific reference to predator controls and habitat restoration or rehabilitation, including public reporting or publication of information gained by these actions;

The Office of Environment and Heritage (OEH) developed a Project Proposal to be funded by IC, which addresses points (c) to (f) of the EPBC Act Approval Condition 7.

The OEH letter and Project Proposal is included in this Plan as Attachment B.

5.3 Impacts on other EPBC Act Listed Species

This Section addresses Condition 7(d) of the EPBC Approval for works conducted by OEH as follows:

(d) a demonstration that management actions to be undertaken will not adversely impact EPBC Act listed species;

The OEH Proposal addressed the above requirement (see section titled *Consideration of Impacts of the Project*).

5.4 Funding Arrangements

This Section addresses Condition 7(e) of the EPBC Approval as follows:

(e) a description of funding arrangements or agreements including work programs and responsible entities.

OEH provided a Project Proposal for the Broad headed snake and Southern Brown bandicoot Recovery Actions (see Attachment B).

IC provided the funding through a Non-order Invoice (NOI). OEH issued three separate invoices, prior to the start of each financial year i.e. year 1, year 2 and year 3.



5.5 Documentary Evidence of Funding

This Section addresses Condition 7(f) of the EPBC Approval as follows

(f) measures for the provision of documentary evidence within 30 days of the funding having been expended and/or that funding commitments have been met.

IC provided documentary evidence to the DoTE&E in September 2016 to satisfy this condition.

Once the project is completed (June 2017), relevant results will be included in the FY17 BSO Annual Review.

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7 APPENDICES

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ATTACHMENT A: PLANS

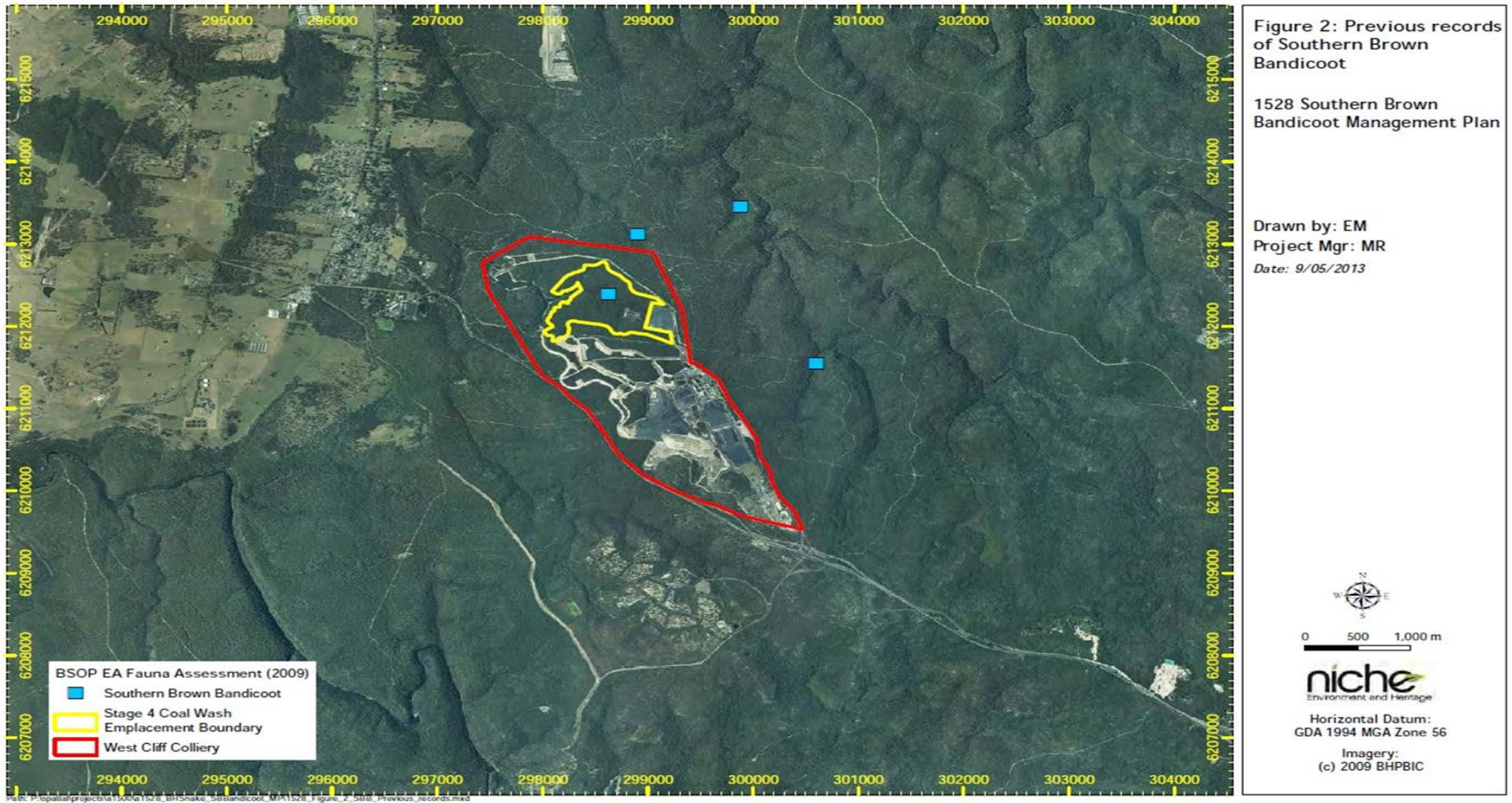


Figure 1: Previous records of Southern Brown Bandicoot

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ATTACHMENT B: OEH BROAD-HEADED SNAKE AND SOUTHERN BROWN BANDICOOT PROPOSAL


Our reference: DOC14/46528, SF14/2223
 Contact: Meagan Hinds 02 9585 6825

Joanne Page
 Manager Environment
 BHP Billiton Illawarra Coal
 PO Box 514
 Unanderra NSW 2526

Dear Ms Page

I am writing with regards to BHP Billiton Illawarra Coal (BHPBIC) request that the Office of Environment and Heritage (OEH) develop and implement a project proposal to fulfil the requirements of Condition 7 of the Federal Government Bulli Seam Operations Project Approval EPBC 2010/5350. This condition requires BHPBIC to contribute no less than \$250,000 to regional Broad-headed Snake and Southern Brown Bandicoot recovery programs in order to offset predicted impacts of the proposal.

I am pleased to advise you that this project proposal has now been finalised and a copy is attached for your endorsement. This project proposal has been prepared in consultation with the Commonwealth Department of Environment, species experts, relevant land managers and BHPBIC. It is proposed that the project be scheduled over three years, commencing 1 July 2014 and finishing 30 June 2017 with payments scheduled as follows:

Year 1 \$85,000 - July 2014
 Year 2 \$85,000 - July 2015
 Year 3 \$80,000 - July 2016

OEH now seeks your written endorsement of the project proposal to ensure that the necessary arrangements within OEH and BHPBIC are completed in time to allow for the commencement of the project and the first project payment in July 2014.

A copy of the final project proposal has also been provided to the Commonwealth Department of Environment. Should you require further information regarding this matter please contact Meagan Hinds, Senior Threatened Species Officer on 0295856825 or meagan.hinds@environment.nsw.gov.au.

Yours sincerely

David Trewin
 Regional Manager
 Greater Sydney Region

17/4/14

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