WorleyParsons
resources & energy

Flinders MINES

FLINDERS MINES LIMITED

Blacksmith Pilbara Iron Ore Project (EPBC 2011/6152)

Response to DSEWPaC Request for Additional Information

201012-00322-000-EN-REP-0007

18-Jun-12

Infrastructure & Environment
Level 7, QV1 Building
250 St Georges Terrace
Perth WA 6000 Australia
Tel: +61 8 9278 8111
Fax: +61 8 9278 8110
www.worleyparsons.com
WorleyParsons Services Pty Ltd
ABN 61 001 279 812

PROJECT 201012-00322-000-EN-REP-0007 - BLACKSMITH PILBARA IRON ORE PROJECT (EPBC 2011/6152)

REV	DESCRIPTION	ORIG	REVIEW	WORLEY-PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
0	Issued for use	K Foster	C Kneen	P Knudsen	18 June 2012	N/A	

CONTENTS

1. INTRODUCTION 1
1.1 Context 1
1.2 Content, format and style 2
1.3 Public display of preliminary documentation 2
1.4 Report preparation 2
2. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE 4
2.1 Request 4
2.2 Response 5
2.2.1 Northern Quoll 5
2.2.2 Pilbara Olive Python 7
2.2.3 Pilbara Leaf-nosed Bat 8
2.2.4 All species 11
3. RELEVANT IMPACTS 19
3.1 Request 19
3.2 Response 20
4. PROPOSED SAFEGUARDS AND MITIGATION MEASURES 26
4.1 Request 26
4.2 Response 26
5. PROPOSED OFFSET MEASURES 29
5.1 Request 29
5.2 Response 29
6. ECOLOGICALLY SUSTAINABLE DEVELOPMENT 30
6.1 Request 30
6.2 Response 30
7. OTHER APPROVALS AND CONDITIONS 33
7.1 Request 33

7.2 Response 33
8. INFORMATION SOURCES 39
8.1 Request 39
8.2 Response 39
9. CONCLUSION 41
10. REFERENCES 42

Appendices

APPENDIX 1 DSEWPAC INFORMATION REQUEST
APPENDIX 2 RESPONSE TO DSEWPAC INFORMATION REQUEST INFORMATION SUMMARY
APPENDIX 3 MAPS
APPENDIX 4 PILBARA IRON ORE PROJECT – BLACKSMITH VERTEBRATE FAUNA AND SHORT RANGE ENDEMIC SURVEY
APPENDIX 5 FLINDERS MINES PILBARA IO PROJECT – TRANSPORT ROUTE CONSTRAINT ANALYSIS
APPENDIX 6 EPA GUIDANCE AND POSITION STATEMENTS
APPENDIX 7 SIGNIFICANT FAUNA MANAGEMENT PLAN
APPENDIX 8 DEC COMMUNICATION
APPENDIX 9 EPA ASSESSMENT DECISION NOTICE
APPENDIX 10 SURVEY TEAM SHORT CVS

ABBREVIATIONS

Abbreviation	Definition
API	Assessment on Proponent Information
DEC	Department of Environment and Conservation
DSEWPaC	Department of Sustainability, Environment, Water, Populations and Communities (Commonwealth)
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FMS	Flinders Mines Limited
Mtpa	Million tonne per annum
PIOP	Pilbara Iron Ore Project
SFMP	Significant Fauna Management Plan
SPRAT	Species Profile and Threats Database

1. INTRODUCTION

1.1 Context

Flinders Mines Limited (FMS) proposes to develop an iron ore mining project on the Blacksmith tenement in the Hamersley Range, West Pilbara Region of Western Australia (the PIOP). The proposed action includes development and operation of five deposits that would be mined separately, with some associated infrastructure within the tenement. Annual ore production would be 15 million tonne per annum (mtpa).

All areas within the Blacksmith tenement which are suitable to locate mining infrastructure are mineralised, meaning that the iron ore processing plant, administration buildings, ore stockpiles, accommodation village and all associated mining infrastructure must be located off-tenement.

In addition, the successful development of the PIOP will require FMS to negotiate a transport and export arrangement with a rail and port service provider. As FMS has not finalised an ore transport or port arrangement, the PIOP has been referred for environmental impact assessment in two stages, namely:

- Stage 1: Iron ore mining operations; and
- Stage 2: Iron ore processing, transport and associated mining infrastructure.

An EPBC Referral under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) regarding this Stage 1 was received by the Department of Sustainability, Environment, Water, Populations and Communities (DSEWPaC) on 20 October 2011. On 25 November 2011, DSEWPaC deemed the activity a Controlled Action (EPBC/6152) likely to have a significant impact on the following controlling provisions, which are protected under Part 3 of the EPBC Act:

- Sections 18 and 18A (listed threatened species and ecological communities).

DSEWPaC determined that the assessment is to be completed via preliminary documentation. In a letter dated 9 December 2011, DSEWPaC requested that FMS provide additional information to assist with the assessment process. A copy of the DSEWPaC information request is provided as Appendix 1.

FMS engaged WorleyParsons and Ecoscape to assist in responding to items detailed in the DSEWPaC information request. This Report provides FMS response to the information requested by DSEWPaC.

1.2 Content, format and style

This Report has been developed to align with the general content, format and style requirements as outlined within the DSEWPaC information request as far as practicable. Each specific information request is addressed in Sections 2 through 8 of this Report. Detailed technical information, studies or investigations necessary to support the response to the DSEWPaC information request are provided as appendices to this Report. A list of references used in the preparation of this Report is provided in Section 10.

In some instances information requested has been provided in the initial referral documentation. Appendix 2 provides a summary of information requested by DSEWPaC and its location within the initial EPBC Referral documentation and / or the supplementary information outlined within this Report.

1.3 Public display of preliminary documentation

In accordance with the requirements of the EPBC Act, this response will be publically displayed along with the referral documentation for the period as outlined within DSEWPaC's direction to publish. This will include hard copies available at pre-determined locations and electronic copies available on the internet.

1.4 Report preparation

As required by the DSEWPaC information request, a list of persons involved in the preparation of this response is provided in Table 1 1.

Table 1-1 Persons involved in Preparation of this Report

Organisation	Person	Position	Report Input
FMS	Mick Anstey	General Manager – HSEC & HR	Proposed offset measures General Report input and review
Ecoscape	Bruce Turner	Principal Environmental Scientist	Matters of national environmental significance Relevant impacts Proposed safeguards and mitigation measures General Report input and review Mapping
WorleyParsons	Cameron Kneen	Senior Approval Consultant	General Report input and review
WorleyParsons	Simon Hudson	Principal Scientist (Ecologist)	Primary Report review
WorleyParsons	Karen Foster	Senior Environmental Scientist	Ecologically sustainable development Report compilation General Report input and review
WorleyParsons	Kieran Kerr	Environmental Consultant	Ecologically sustainable development Other approvals and conditions Information sources Report compilation General Report input and review

2. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

2.1 Request

Identify EPBC Act listed threatened species potentially present on or off-site [1] that could be affected, directly or indirectly, as a consequence of the proposal. For each matter of national environmental significance, the following information must be provided:

i) Information on the distribution, ecology, and habitat preferences of the species (both on and off-site);

ii) Maps showing the location of known records (including those from databases and all surveys previously conducted for the proposal). A copy of the surveys should be included in the assessment information;

iii) Maps showing the potential habitat within and in the vicinity of the proposed site. These maps must highlight habitat components important for each relevant species, such as breeding habitat, wetlands, vine forests, rock outcrops, etc. Potential habitat occurring in areas that were previously burnt and therefore unsurveyed and areas adjacent to the mining tenement that may be used for additional mine processing infrastructure must be included.

iv) Maps showing the potential habitat for each species within the wider region, including habitat that is likely to be impacted by the potential rail transport corridors;

v) Information on the survey methodology used, including any limitation of the methodology and data collected for each species, as well as a justification for the survey methodology and survey sites employed;

vi) Information on the scientific reliability of survey investigation and conclusions, including the degree of certainty or statistical confidence where appropriate; and

[1] 'On-site' refers to not only the Blacksmith mining tenement area, but also includes the area for any potential off-tenement mine processing infrastructure, as outlined in the referral documentation. This includes areas identified for any off-tenement ore-processing facilities, tailings storage, mine buildings, conveyors, heavy and light vehicles mine access roads, pipelines, stockpiles and rail spur. 'On-site' does not include the potential transport infrastructure corridors. 'Off-site' refers to the wider geographical area surrounding the 'on-site' areas listed above. 'Off-site' includes areas of habitat that may be impacted by the potential transport infrastructure corridors, and habitat such as permanent watering holes that could potentially be impacted from actions such as mine dewatering.

vii) Provide a detailed analysis using the maps prepared, judgements of qualified fauna experts and recent and historical species records to determine the importance of the populations of listed threatened species and habitat at the proposed development site, including:

a) Current known threats and future predicted threats;

b) Risks to the viability of listed species populations locally, regionally and nationally;

c) Presence in conservation reserves;

d) Population trends in the Pilbara;

e) Conservation programs being undertaken in the Pilbara; and

f) Monitoring data that describes population responses to climate, disturbance or any other source or perturbation.

2.2 Response

EPBC Act listed threatened species potentially present on or off-site that could be affected, directly or indirectly, as a consequence of the proposal include:

1) Northern Quoll(Dasyurus hallucatus);

2) Pilbara Olive Python (Liasis olivaceus barroni); and

3) Pilbara Leaf-nosed Bat (Rhinonicteris aurantia).

Section 2.2.1 through 2.2.3 provide responses to items i) and vii) requested in Section 2.1 for each of these matters of national environmental significance. Items ii) though vi) are addressed in Section 2.2.4 as these responses are common to all species.

2.2.1 Northern Quoll

i) ***Distribution, ecology, and habitat preferences*** – The Northern Quoll is a medium-sized carnivorous marsupial that lives in the savannas of northern Australia. It occurs from south eastern Queensland to the northern Western Australian coast. Populations have declined across much of this range, particularly as a result of the spread of the Cane Toad (Chaunus (or Bufo) marinus). In the Pilbara, the distributional boundaries of Northern Quoll are defined in the north, east and south by the Great Sandy Desert, Gibson Desert and Little Sandy Deserts. Records from the Pilbara bioregion are scattered across the four subregions; namely the Hamersley, Fortescue Plains, Chichester and Roebourne Plains subregions with records extending as far west as the Little Sandy Desert (How et al. 2009) and as far south as Karijini National Park. The majority of recent records however have come from the Rocklea, Macroy and Robe land systems (Biota Environmental Sciences, 2008; Van Vreeswyk et al. 2004).

The Northern Quoll is known to occur on a number of Western Australia islands including Adolphus, Augustus, Berthier, Bigge, Boongaree, Caffarelli, Capstan, Carlia, Dolphin, Hidden, Koolan, Purrungku, Sir Fredrick, Uwins and Wollaston islands (Burbidge and McKenzie, 1978).

The status of the Northern Quoll has recently been upgraded to Endangered under the EPBC Act. This change in status is due to the negative impact of Cane Toads in more easterly parts of the Quoll's range, and the threat of Cane Toads in the north and west of the Quoll's range.

This species inhabits rock crevices, tree hollows and termite mounds. The Northern Quoll is often associated with rocky areas in the Pilbara but also occurs along watercourses. The Northern Quoll formerly occurred across much of northern Australia from the Pilbara to Brisbane, but now occurs in a number of fragmented populations across its former range (DEWHA, 2010). There are very few confirmed records of the species in the Hamersley Ranges south of the Fortescue Marshes. How et al. (1991) found this species at numerous locations on the Abydos Plains about 130km to the north-east.

Coffey Environments' recent surveys along the rail line corridor from Cloud Break to Port Hedland found evidence of Northern Quoll in the vicinity of rocky outcrops, escarpments and vegetated plains. Fresh scats and tracks and possible den sites were seen along the base of gorges and under rock overhangs. The Northern Quoll was not recorded by Biota (2005) at the Brockman Syncline 4 Project area but a skull was found in a cave at the Mesa A Project area. It was not recorded at Marandoo by Ninox Wildlife Consulting (1992). A single scat of unknown age was recorded within the Blacksmith tenement by Ecoscape (2011).

vii) ***Importance of populations*** – The presence of Northern Quoll populations and their persistence is problematical to determine as this species goes through an annual cycle of male die off after mating. Therefore a snap shot survey may provide little evidence of the species' presence. The survey established that there is suitable denning and foraging habitat within the Blacksmith tenement and a single scat of unknown age was recorded, but it has not been established that the site supports an existing population. (Ecoscape, 2011) Therefore, the importance of the population on the development site is considered low to negligible.

The DEC (Annette Cook pers. comm.) and the low number of NatureMap records of Northern Quoll presence from regional surveys, both indicate that the Hamersley Range in the vicinity of the proposal is not a critical area of Northern Quoll habitation. The DEC expressed the view that this area may be a dispersal area in times of favourable conditions (Keith Morris DEC pers. comm.) and the records seem to support this.

The proposal area therefore is not considered to provide a key population, is not necessary for maintaining genetic diversity as there is no resident long-term population and which appears to be an area devoid of recent Northern Quoll presence.

(a) ***Current known threats and future predicted threats*** – Lethal toxic ingestion caused by Cane Toads, removal, degradation and fragmentation of habitat, inappropriate fire regimes, weeds, feral predators and parasitism (DSEWPaC, 2010).

(b) ***Risks to the viability of listed species populations locally, regionally and nationally*** – The major threat to future survival of the species overall (O'Donnell et al. 2010) is the lethally toxic Cane Toad, which has already been implicated in rapid population declines in Queensland and the Northern Territory, is now expanding its range westwards into Western Australia, and is likely to become established in parts of the Pilbara within 15 years (Sutherst et al. 1996; TSSC, 2005).

(c) ***Presence in conservation reserves*** – Recorded from 15 conservation reserves in the Northern Territory (Kakadu, Litchfield, Garig Gunak Barlu, Mary River, Manton Dam, Nitmiluk, Umbrawara Gorge, Fogg Dam, Charles Darwin, Black Jungle, Tjuwaliyn (Douglas Hot Springs), Berry Springs, Limmen, Leaning Tree Lagoon and Howard Springs) (Woinarski et al. 2008).

(d) ***Population trends in the Pilbara*** – Populations of northern quoll in the Pilbara are considered to have been declining since the mid 1980s, although the degree of decline is unknown.

(e) ***Conservation programs being undertaken in the Pilbara*** – National Recovery Plan for the Northern Quoll Dasyurus hallucatus (Hill and Ward, 2010) lists management actions to be implemented on a national scale over 5 years.

(f) ***Monitoring data that describes population responses to climate, disturbance or any other source or perturbation*** – Historical analysis of sites in northern Queensland indicates that populations of Northern Quoll are more likely to persist in higher altitude sites and sites with higher and more seasonal rainfall. This has not been investigated for populations in the Pilbara. An ongoing decline in populations of northern quoll in response to the Cane Toad has been recorded in Queensland, although some populations have stabilised (Woinarski et al. 2008).

2.2.2 Pilbara Olive Python

i) ***Distribution, ecology, and habitat preferences*** – The species is restricted to ranges within the Pilbara region, north-western Western Australia, such as the Hamersley Range, and islands of the Dampier Archipelago. It is known to occur at 17 locations within the Pilbara (Pearson, 1993). Four populations occur at Pannawonica, Millstream, Tom Price and Burrup Peninsula (Pearson, 2003).

The Olive Python (Pilbara subspecies) is a dull olive-brown to pale fawn or rich brown python with a white / cream belly. The Pilbara Olive Python can grow to 4 m, but has an average size of 2.5 m (Cogger, 2000). Females are slightly longer than males (Shine and Slip, 1990).

They are most often seen at night and are generally found around rocky areas, rocky outcrops and cliffs, particularly in the vicinity of watercourses and water holes, but they also shelter in logs, flood debris, caves, tree hollows and thick vegetation. Limited habitat for this species is present within the Blacksmith study area in Ajax valley associated with a permanent waterhole and one individual was recorded during night searches.

vii) ***Importance of populations*** – Records show that Pilbara Olive Pythons have been recorded across much of the Pilbara bioregion and therefore the importance of the population in Ajax would appear to be low. The species appears to be stable and in sizeable numbers at known sites (Pearson, 2003).

(a) ***Current known threats and future predicted threats*** – Major fire events, foxes and cats, altered prey availability and deaths through road impacts (DSEWPaC, 2012).

(b) ***Risks to the viability of listed species populations locally, regionally and nationally*** – Cane Toad ingestion for juveniles, loss of habitat and altered water regimes.

(c) ***Presence in conservation reserves*** – A large portion of Pilbara Olive Python habitat is conserved in Karijini National Park (Pearson, 2003).

(d) ***Population trends in the Pilbara*** – Populations are considered stable and sizeable in number in some known sites of the Pilbara (Pearson, 2003).

(e) ***Conservation programs being undertaken in the Pilbara*** – The Commonwealth Conservation Advice on Liasis olivaceus barroni (Olive Python (Pilbara subspecies)) outlines research and actions required for the protection of the Pilbara Olive Python in the Pilbara (Threatened Species Scientific Committee, 2008).

(f) ***Monitoring data that describes population responses to climate, disturbance or any other source or perturbation*** – None known of or publically available.

2.2.3 Pilbara Leaf-nosed Bat

i) ***Distribution, ecology, and habitat preferences*** – The Pilbara Leaf-nosed Bat is restricted to the Pilbara region and field surveys suggest that it is divided into three discrete subpopulations (eastern Pilbara mines and granite, Hamersley Range, Upper Gascoyne), separated by relatively flat areas that impede gene flow such as the Fortescue and Ashburton valley (Armstrong, 2001 and 2003).

Colonies of the Pilbara Leaf-nosed Bat are found in three distinct areas: in the mines of the eastern Pilbara; scattered throughout the Hamersley Range in smaller colonies; and in sandstone formations south of the Hamersley Range in a small number of significant colonies (Armstrong, 2001). This includes the confirmed roosts of: Bamboo Creek mine, Copper Hills mine, Klondyke Queen mine, Lalla Rookh mine and one cave in Barlee Range; and 16 other likely permanent occurrences.

Locations are defined as sites that support a colony, such as a cave or mine. Determining the number of locations occupied by the Pilbara Leaf-nosed Bat is complicated by two factors: first, not all roosts may be used throughout the year; and second, many records of the species in the region are of bats in flight or road kills. Several observations within an area may derive from a single nearby roost, such as is probably the case at Cattle Gorge and Callawa Gorge (Ecologia Environment, 2005 & 2006a). The Pilbara Leaf-nosed Bat has been observed in the vicinity of workings such as the Trump, Bow Bells and Marble Bar copper mine but it is possible that all of these individuals may have roosted in the Klondyke Queen mine (Armstrong, 2001). Four major roosts in mines are currently known from the eastern Pilbara district (i.e. excluding the currently flooded Comet mine) and one from a cave in Barlee Range Nature Reserve.

The Pilbara Leaf-nosed Bat has very specific requirements for roosting caves, which need to provide a stable, hot (28 – 32 ºC) and very humid (96 – 100%) environment. There was no evidence of such caves within the Project area, but the species is likely to be a foraging visitor and transient animals may even roost overnight in crevices and tree hollows. A single call was identified by Songmeter echolocation recording in September 2011 (surveys for off-tenement infrastructure reporting incomplete) within the Blacksmith tenement (Appendix 3- Map 1 and 2).

Foraging habitat is diverse owing to the wide distribution of the Pilbara Leaf-nosed Bat (Churchill et al. 1988), however in the Pilbara it has been observed in the following habitats: Triodia hummock grasslands covering low rolling hills and shallow gullies, with scattered Eucalyptus camaldulensis along the creeks (e.g. near Marble Bar, Bamboo Creek, Lalla Rookh and Copper Hills; Armstrong, 2001; Churchill et al. 1988); over small watercourses amongst granite boulder terrain and around nearby koppies; over pools and low shrubs in ironstone gorges; and above low shrubs and around pools in gravelly watercourses with Melaleuca leucodendron, such as in Barlee Range Nature Reserve (Armstrong, 2001).

vii) ***Importance of populations*** – There is no suggestion that there has been a decline in extent of occurrence in the past 10 years (or three generations) but there has been no detailed study of population size in this period. No known major roosts have been lost (Armstrong, 2001). The colony at the Red Hill mine is now absent but the species is assumed to be still present in the general area as suggested by a record from Fortescue Roadhouse in 1990 Armstrong, 2001) and a more recent capture near Pannawonica (Biota Environmental Sciences, 2007).

There is currently no information that would suggest a future change in extent of occurrence. An unconfirmed record from a horizontal mine shaft near Jimblebar (north of Newman) might suggest a larger extent of occurrence in the south-eastern Pilbara (Ecologia Environment, 2006b).

(a) ***Current known threats and future predicted threats*** – Mine collapse, flooding, major fire events, foxes and cats, altered prey availability and deaths through road impacts (DSEWPaC, 2012).

(b) ***Risks to the viability of listed species populations locally, regionally and nationally*** – No threat data is currently available.

(c) ***Presence in conservation reserves*** – Barlee Range Nature Reserve.

(d) ***Population trends in the Pilbara*** – There is no data to suggest a recent past population decline. The population counts are based on data from observations in the three largest mines in the area - Klondyke Queen mine, Comet mine and Bamboo Creek mine.

(e) ***Conservation programs being undertaken in the Pilbara*** – Recovery objectives and management and research actions for the Pilbara Leaf-nosed Bat were outlined in the Action Plan for Australian Bats (McKenzie et al. 1999) with the primary recovery objectives being:

- Protect known Pilbara colonies and / or translocate them if necessary;
- Ascertain if colonies in natural roosts in the Barlee Range Nature Reserve are declining; and
- Locate and protect natural breeding roost sites in the Pilbara region.

Several new observations of bats in flight have been made in the region, mainly through environmental impact assessments and also through the Pilbara Biological Survey, but no roosts have yet been confirmed in natural caves other than at Barlee Range. It is very likely that several occur near Goldsworthy but also several other localities where they have been observed in flight. No efforts by environmental consultants have yet been successful in locating a roost site e.g. at the Eastern Ranges development near Paraburdoo (Armstrong, 2001) near Mesa K (Biota, 2007) several localities near Goldsworthy (Ecologia, 2005; Ecologia Environment 2006a).

(f) ***Monitoring data that describes population responses to climate, disturbance or any other source or perturbation*** – No known data to ascertain population responses.

2.2.4 All species

ii) ***Maps showing location of known records*** – Map 1 and 2 showing the location of conservation significant fauna species recorded by Ecoscape (2011) fauna surveys are provided in Appendix 3. A copy of the Pilbara Iron Ore Project – Blacksmith Vertebrate Fauna and Short Range Endemic Survey is included as Appendix 4.

Map 3 in Appendix 3 illustrates known records of Northern Quoll in the region (sourced from NatureMap).

iii) ***Maps showing potential habitat in vicinity of site*** – Maps 1 and 2 shows the potential habitat within and in the vicinity of the proposed site are provided as Appendix 3.

iv) ***Maps showing potential habitat in wider region*** – FMS commissioned WorleyParsons to conduct a desktop constraint assessment of off-tenement transport routes to provide evidence those route constraint assessments had been appropriately conducted from an environmental perspective. This assessment was also designed to satisfy the Environmental Protection Authority (EPA) that a suitable transport route is available with environmental referral and assessment of off-tenement infrastructure and mine transport route to be conducted as stage 2. A copy of the Flinders Mines Pilbara IO Project – Transport Route Constraint Analysis is provided as Appendix 5. This investigation identified that none of the potential infrastructure options has a fatal flaw or is highly constrained. Further flora and fauna surveys will be required once a preferred infrastructure solution has been selected. The results of subsequent surveys would be tabled in any future EPBC referral for off-tenement infrastructure.

v) ***Survey methodology and justification*** – The following provides an overview of survey methodology and justification. Full survey methodology and justification is outlined within Section 3 of the Pilbara Iron Ore Project – Blacksmith Vertebrate Fauna and Short Range Endemic Survey included as Appendix 4.

Risk-based Approach to Fauna Assessment:

The alternative to an intensive fauna trapping program is a risk-based approach developed in consultation with the DEC and EPA. This method involves targeted survey techniques, with little or no trapping, on the basis that trapping only confirms the presence of species expected. This process involved:

- Desktop assessment and literature review;
- Preliminary survey to:
    - Verify the applicability of desktop studies;

- Familiarise survey personnel with the study area and map major habitats, and
- Start the level 2 survey using specialists who had the experience to locate and record wildlife using non-invasive passive techniques and identify areas for targeted investigation; and

- Targeted trapping surveys focusing on habitat likely to contain conservation significant fauna species.

This approach requires more expertise, fewer people and less time than the traditional approach of intensive trapping programs. This process also required liaison and discussion with, and the approval of the DEC.

Timing:

Surveys were designed to take into account species expected, activity patterns of assemblages and animal welfare issues. The timing of surveys was deemed appropriate and the sites chosen adequate to sample assemblages likely to be impacted by mining activity. Timing of surveys is consistent with the guidelines as stated in EPA Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (September, 2010). Table 2 1 provides a summary of timing and duration.

Table 2-1 Summary of Survey Timing and Duration

Survey	Duration	Duration
Preliminary	31 May – 5 June 2010	18 (3 specialists) person days
Northern Quoll	13-18 July 2010	24 person days
Targeted Trapping	7-16 October 2010	40 person days
Bat Echolocation	14-17 September 2011	12 hours

Opportunistic Observations:

Opportunistic observations were made during both the preliminary survey and targeted survey. Observations were made when travelling to and from the study area as well as between sites. Approximately 34 diurnal survey hours and 25 nocturnal survey hours were completed searching and recording observations.

Searching for Significant Species:

Based on the results of the database searches, species habitats searched for included the Long-tailed Dunnart, Ghost Bat, Lakeland Downs Mouse, Western Pebble-mound Mouse, Pilbara Leaf-nosed Bat, Northern Quoll and the Pilbara Olive Python.

Micro-habitat Searching:

Micro-habitat searching was carried out in any areas of interest identified during the preliminary survey and targeted survey. Searching involved: raking through leaf-litter, breaking into dead trees, looking under bark, digging up burrows, turning over rocks, logs and dead vegetation and targeted spotlighting. Termite mounds were searched by spotlight opportunistically; no mounds were sectioned or destroyed.

Bird Census:

A bird census was undertaken on each morning and evening from October 7-16, 2010. An area search technique was used in which a series of 2 ha areas was searched, each for 15 minutes. The series of search areas included all habitat types from the creeks to the upper slopes and the isolated mid-slope valleys. Opportunistic observations were also made while travelling between sites and checking traps during the targeted survey.

Trail Cameras and Anabat:

Six trail cameras were located in different habitat types at sites chosen to maximise the likelihood of capturing fauna movement. Cameras were set at cave entrances, narrow active pathways in the creeks and road junctions. The cameras were setup to capture still images in colour and were operational for a total of five days during the preliminary survey and seven days during the targeted survey.

Targeted Trapping Survey:

This trapping survey was designed to focus on habitat likely to contain conservation significant fauna species, as identified through the preliminary survey. One team of four personnel completed the survey over a 12 day period.

Sampling techniques included trapping in identified significant habitat using:

- Elliott traps;
- Funnel traps with drift fences;

- Pitfall traps;
- Additional opportunistic bird observations;
- Searches for tracks, scats, bones and diggings;
- Active searching;
- Spotlighting / head torching; and
- Hand searching litter and rock outcrops.

The locations of Ecoscape targeted survey trap sites were selected to maximise sampling dense vegetation cover and all available microhabitats within each habitat type. Between each pitfall trap, one cage, two funnels and two Elliot traps were established to complete the trap site design. Pitfall traps were spaced approximately 50 m apart along a transect through each of the selected sites. Ecoscape's trapping surveys were conducted in seven trapping sites over seven nights. Survey effort is described in Table 2 2.

Table 2-2 Survey effort

Site	Trap Nights				Time (Minutes)			
	Pit Traps	Funnels	Elliot's	Cages	Bird Survey	Diurnal Search	Anabat (hrs)	Nocturnal Search
Blackjack Slope	0	20	10	0	120	120		
Blackjack Valley	10	10	10	5	120	120		
Champion Slope	10	10	9	5	202	240	24	240
Champion Valley	10	10	10	5	240	180		
Delta Slope	10	10	10	0	190	180	12 (09/11)	480
Delta Valley	9	9	8	0	130	120	36	120
Paragon	10	19	20	5	170	120	24	60
Ajax	-	-	-	-	240	480	36	480
Eagle	-	-	-	-	120	480	12	120
Total Traps	59	88	77	20				
Survey Total	**413**	**616**	**539**	**140**	**1172**	**2040**	**144**	**1500**
Off Tenement (09/11)	-	-	-	-	120	2400	12	

Data recorded were used to compile a comprehensive species list, locations of sampling sites, habitat descriptions and locations of any conservation significant fauna species encountered.

Limitations:

Possible limitations associated with the surveys are analysed in Table 2 3.

Table 2-3 Survey limitations

Possible Limitations	Constraint (Yes / No)	Significant, Moderate of Negligible	Comment
Competency / experience of the consultant conducting the survey	No Constraint		All field survey staff has relevant recent experience surveying in the Pilbara region. Senior staff has extensive experience with species identification over all fauna assemblages.
Scope	No Constraint		Scope was not constrained, sufficient time and effort undertaken for targeted trapping survey to be completed.
Proportion of fauna identified, recorded and / or collected	No Constraint		All observed and captured species identified. No vertebrate species collected, all vertebrate fauna observed identified.
Proportion of the task achieved and further work that may need to be undertaken	No Constraint		Study area surveyed adequately. Further targeted survey required for some conservation significant fauna species for proposal footprint.
Timing / weather / season / cycle	No Constraint		All surveys conducted in appropriate seasons under good weather conditions.
Intensity of survey (e.g. In retrospect was the intensity adequate?)	No Constraint		Survey intensity sufficient to assess fauna species present as indicated by number of species recorded, comparison with similar surveys and results from other surveys undertaken in the region.

Possible Limitations	Constraint (Yes / No)	Significant, Moderate of Negligible	Comment
Disturbances which affected results of the survey	Yes	Negligible	Much of the area had suffered from a wildfire event in February 2010, low level grazing for many years, which will have had a long-term effect on the fauna assemblage. More recently, exploration activity has degraded some of the habitat.
Sources of information	Yes	Moderate	Vertebrate fauna information was available using NatureMap, surveys conducted at other sites in the region and published and unpublished reports. These survey sites are <50 km away and allow for close comparison.
Completeness (e.g. was relevant area fully surveyed?)	No Constraint		Area fully covered with all habitats identified and adequately sampled.
Resources (e.g. Degree of expertise available for plant identification)	No Constraint		Adequate resources were available, highly experienced staff on hand for field identifications.
Remoteness and / or access problems	No Constraint		No restrictions other than access to caves at the top of steep slopes difficult to adequately survey.
Availability of contextual (e.g. bioregional) information for the survey area	Yes	Negligible	WA Museum fauna database, Department of Environment and Conservation's (DEC's) Threatened and Priority species database and published and unpublished reports of surveys conducted at other sites in the region were available. The DEC Pilbara regional survey data were not available for comparative purposes. The trapping effort and period of other surveys was limited.

vi) ***Scientific reliability*** – Fauna surveys undertaken by Ecoscape (2011) satisfy the requirements of the relevant EPA and DEC documents, including:

- Guidance Statement No. 20 Guidance for the Assessment of Environmental Factors - Sampling of Short Range Endemic Invertebrate fauna for Environmental Impact Assessment in Western Australia (May, 2009);
- Guidance Statement No. 56 Guidance for the Assessment of Environmental Factors – Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (June 2004);
- Position Statement No. 3 Terrestrial Biological Surveys as an Element of Biodiversity Protection (March, 2002); and
- Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (September, 2010).

Copies of these documents are provided as Appendix 6.

The surveys were undertaken by a highly experienced Vertebrate Fauna Assessment Team with relevant professional qualifications in order to adequately survey the Project area. As required specialist advice was obtained from appropriate organisations (e.g. the DEC for confirmation of North Quoll scats, Western Australia Museum and ScorpionID). Comparisons were made against surveys previously conducted in the immediate and wider region of the Project area with results comparable based on survey effort. Data analysis was undertaken using recognised software (e.g. AnalookW 3.7w and Species Diversity and Richness IV) and statistical methods (Shannon-Wiener (H), Simpson (D) and Smith and Wilson B).

The scientific reliability and degree of certainty of survey investigations and conclusions is considered to be acceptable.

3. RELEVANT IMPACTS

3.1 Request

Provide a description of the relevant impacts, including:

i) A description of the potential and likely short-term and long-term impacts of the action on matters of national environmental significance, including quantities of habitat likely to be impacted. This description must detail direct, indirect and cumulative impacts;

ii) Maps showing any areas of disturbance overlayed with the potential habitat for EPBC Act listed threatened species within and in the vicinity of the proposed site;

iii) Information on the likely impacts of the transport of material from the mine site by rail on matters of national environmental significance. This could include the Flinders Mines Pilbara IO Project Transport Route Constraint Analysis report or similar material;[2]

iv) A statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;

v) Analysis of the potential magnitude of the relevant impacts;

vi) Any technical data and other information used or needed to make a detailed assessment of the relevant impacts; and

vii) Information on the scientific reliability of investigations and conclusions drawn, including the degree of certainty or statistical confidence where appropriate. This must include any assumptions or limitation of any models used to make predictions.

Direct impact is an event or circumstance that is a direct consequence of the action.

Indirect impact refers to impacts which are a consequence or a secondary event or circumstance of which the action would be a substantial cause. This may include the actions of third parties that are facilitated by the proposed action, such as increase shipping or road traffic.

Cumulative impact refers to the incremental impacts of the action when combined with other past, present and reasonably foreseeable future actions (both related and unrelated).

[2] As the referral is limited to the on-tenement mining activity it has been agreed that information in relation to transport impacts will not be required at this stage.

3.2 Response

i) ***Potential and likely short-term and long-term impacts*** – Potential impacts to fauna resulting from the Project as assessed following the guidance of the EPA's Guidance Statement No. 56 Guidance for the Assessment of Environmental Factors – Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (June 20004) are identified in Table 3 1.

Table 3-1 Potential Impacts on Fauna

Factor	Impact and Explanation
Degree of habitat degradation or clearing within the local area or region.	Low (Project lies within a region of continuous habitat with very little existing disturbance).
Size / scale of proposal / impact.	High (>50 ha of remnant native vegetation may be disturbed – Bioregion Group 2)
Rarity of vegetation and landforms.	Low (impacted vegetation and landforms are extensive in sub-region).
Refugia.	Low (vegetation types, soils and landforms are generally widespread).
Fauna protected under international agreements or treaties, specially protected or priority fauna.	Moderate (faunal assemblage includes species of high conservation significance but impacts on these species are expected to be low).
Size of remnant and condition / intactness of habitat and faunal assemblage.	Low (project area and surrounds comprises intact native vegetation)
Ecological linkage.	Low (vegetation types in project area are largely continuous)
Heterogeneity or complexity of the habitat and faunal assemblage.	Moderate (project area has a moderate habitat heterogeneity but lacks some vegetation and landform types that are important for biodiversity in the region).

A gap analysis between state and Commonwealth impact criteria has been undertaken. The Environmental Protection Authority has identified the scale and nature of impacts on biodiversity as shown in Table 3 from Guidance Statement No. 56 (attached) (Environmental Protection Authority 2004). DSEWPC has released Significant Impact Guidelines (Commonwealth of Australia 2009) for species identified as Matters of National Environmental Significance.

Both Guidelines are concerned with habitat disturbance to conservation significant fauna species, in that the area of disturbance determines the level of impact and therefore the level of survey required. Other alignments are concerned with the:

- level of status for listed species that set the level of impact i.e. listed species presence determines that the scale of impact is high
- the level of fragmentation and connectivity of habitat present
- the cumulative impacts of the proposal.

Therefore there is consistency between the Sate and Commonwealth impact criteria and these were addressed through desktop investigation and field survey. The guidelines diverge on the issues concerned with bioregion, the State guidelines assign differing levels of scale depending on the location of the proposal with a number of bioregions, whereas the Commonwealth guidelines do not and are purely concerned with the species that are EPBC listed that may occur within the proposal area.

The most significant direct impact resulting from the Project will be clearing of habitat and vegetation. The extent of habitat likely to be impacted is provided in Table 3 2.

Table 3-2 Habitat Disturbance

Impacts on Conservation Significant Fauna	Northern Quoll/Pilbara Leaf-nosed Bat		Pilbara Olive Python	Total
	Shelter	Foraging	Shelter/Foraging	
Area impacted by Pits (ha)	0.13	1700.19	18.18	1718.51
Area impacted by Haul Routes (ha)	3.08	200.38	5.762	209.22
Area impacted by Waste Dumps (ha)	2.37	220.21	0	222.58
Area impacted by Processing Plant (ha)	0	207.60	0	207.60
Total area impacted (ha)	5.58	2328.39	23.94	2357.91
Total area not impacted (ha)	242.25	9036.02	96.72	

The impacts of proposed developments are assessed by Ecoscape in accordance with Guidance Statement No. 56 (EPA 2004) and Position Statement No. 3 (EPA 2002) with respect to key environmental values and impacting processes. Impact assessment requires the interpretation of the ecological values of the project area and how they may be impacted by the proposed development.

Therefore, the impact assessment process can be examined under the following headings:

- the assessment of ecological values
- processes or threats that impact these values
- extent of impact on these values according to categories outlined in Table 3 3.

Table 3-3 Assessment criteria of impacts upon flora. Vegetation and fauna values

Impact Category	Observed Impact
None	No impact likely
Negligible	No population/community decline
Minor	Short-term population/community decline (recovery after end of project) within project area, no change in viability of conservation status of population/community
Moderate	Short to Mid-term population/community decline (recovery after end of project), no change in viability of conservation status of population/community
Major	Permanent population/community decline resulting in change in viability or conservation status of population/community
Critical	Taxon/community extinction

Table 3-3 was populated using these criteria.

As outlined in the Significant Fauna Management Plan (SFMP) (Appendix 7), other potential direct impacts may include:

- Noise, light and dust – disturbance of nearby resident fauna resulting in relocation or attraction of fauna to night lighting;
- Powerlines, fences and trenches – bird and bat strikes and entanglement or ground fauna entrapment;
- Drill holes – fauna entrapment; and
- Vehicle collision – fauna strikes.

Direct impacts are expected to be short term (i.e. life of mine (20 years)).

Indirect impacts associated with the Project include altered fire and water regimes and potential establishment of invasive species.

Cumulative impacts associated with the Project will include habitat loss. The impact of this is expected to be low to negligible considering the large extent of similar habitats in the region. Habitat rehabilitation at end of mine life will mean that this impact is short term.

Potential long term impacts on matters of national environmental significance may include:

- Establishment of invasive species to the detriment of recolonising native species.

Table 3 4 provides an assessment of direct and indirect threats for each species.

Table 3-4 Threat assessment

			Species		
			Northern Quoll (Endangered)	**Pilbara Olive Python (Vulnerable)**	**Pilbara Leaf-nosed Bat (Vulnerable)**
Threat Category	**Indirect**	**Invasive Species**	Moderate	Moderate	Negligible
		Altered Fire Regime	Negligible	Negligible	Negligible
		Altered Water Regime	None	Moderate	None
	Direct	**Noise**	Moderate	Moderate	Moderate
		Light	Negligible	Negligible	Negligible
		Dust	None	None	Negligible
		Powerlines &Fences	None	Negligible	Moderate
		Drill Holes &Trenches	Negligible	Negligible	None
		Road Deaths	Moderate	Moderate	None
		Vegetation Clearing	Negligible	Negligible	Negligible

ii) ***Maps showing areas of disturbance overlayed with potential habitat*** – Map 3 shows the areas of disturbance overlayed with the potential habitat for EPBC Act listed threatened species within and in the vicinity of the proposed site is provided as Appendix 3.

iii) ***Likely impacts of transport*** – As the referral is limited to the on-tenement mining activity it has been agreed that information in relation to transport impacts will not be required at this stage.

iv) ***Unknown, unpredictable or irreversible impacts*** – While the Project involves open pit iron ore mining and is similar to numerous actions undertaken in the Pilbara over the past 50 years, the relevant impacts on EPBC threatened species are not very predictable, given uncertainty about the status and extent of populations on site.

v) ***Potential magnitude of relevant impacts*** – The magnitude of the relevant potential impacts is considered to be low to negligible due to large amounts of similar habitat in the bioregion.

Furthermore, the SFMP (Appendix 7) proposes management and monitoring strategies to minimise the potential impacts on conservation significant fauna species and their habitats.

vi) ***Technical data and information for assessment of relevant impacts*** – Technical data utilised to make detailed assessments of the relevant impacts include NatureMap, EPBC Protected Matters Search Tool and relevant reports as listed in Ecoscape (2011).

vii) ***Scientific reliability of investigations and conclusions drawn*** – Information on relevant impacts is drawn from the DSEWPaC species profile and threats database (SPRAT) (DSEWPaC, 2012) and the Northern Quoll Referral Guidelines (DSEWPaC, 2011).

4. PROPOSED SAFEGUARDS AND MITIGATION MEASURES

4.1 Request

In addition to the information outlined in the SFMP provided in the referral documentation, provide further description of the proposed safeguards and mitigation measures, including:

i) An assessment of the expected or predicted effectiveness, of the proposed mitigation measures;

ii) Any statutory policy basis for the proposed mitigation measures;

iii) A description of any provisions for independent environmental auditing. This should be provided in the section of the SFMP where the framework for environmental management plans is outlined;

iv) Detail on how any management strategy or monitoring program would influence environmental practices on site, including not only the performance indicators outlined in the SFMP, but also trigger values and response measures where appropriate;

v) A consolidated list of proposed mitigation measures to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measure proposed to be taken not only by the proponent (as outlines in the SFMP), but also by State and local governments; and

vi) An assessment of impacts on matter of national environmental significance should contingency measure for the proposed action need to be undertaken (for example, the controlled release of surplus water to the environment).

4.2 Response

i) ***Assessment of effectiveness of mitigation measures*** – The proposed safeguards and mitigation measures as outlined in the SFMP (Appendix 7) have been discussed with DEC officers from the Environmental Protection Branch as per the attached communication (Appendix 8) with recommendations adopted into the SFMP. Noting the requirement for predisturbance surveys and subsequent amendment to the SFMP, the DEC has indicated that the scope and objectives of the SFMP are adequate. Once predisturbance surveys have been completed appropriate mitigation measures would then be included in the SFMP. It is therefore difficult to assess these measures without knowing fully what they might be. It is known that there is suitable habitat for the Northern Quoll, Pilbara Olive Python and Pilbara Leaf-nosed Bat so mitigation measures will include, but not be limited to:

- Avoidance, where possible, of habitat;
- Monitoring regimes to identify presence of conservation significant fauna species recolonising the project area; and
- Rehabilitation of disturbed areas.

ii) ***Statutory policy basis for mitigation measures*** – Statutory and policy basis for proposed mitigation measures includes:

- DSEWPaC Environment Protection and Biodiversity Conservation Act 1999 referral guidelines for the endangered northern quoll, Dasyurus hallucatus;
- DSEWPaC Matters of National Environmental Significance – Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999;
- DSEWPaC Survey guidelines for Australia's threatened mammals –Guidelines for detecting mammals listed as threatened under the Environment Protection and Biodiversity Act 1999;
- DSEWPaC Survey guidelines for Australia's threatened reptiles – Guidelines for detecting reptiles listed as threatened under the Environment Protection and Biodiversity Act 1999; and
- DSEWPaC Survey guidelines for Australia's threatened bats – Guidelines for detecting bats listed as threatened under the Environment Protection and Biodiversity Act 1999.

iii) ***Independent environmental auditing*** – FMS will undertake regular internal audits by an accredited auditor in accordance with FMS standard practice. Internal audit compliance reports would be submitted to DSEWPaC or other relevant regulatory authorities if required.

iv) ***How management and monitoring will influence practices on site*** – Trigger values and response measures are yet to be determined. These values and responses will be reliant on the information collected through detailed survey prior to disturbance. For example if no Northern Quoll are determined to be present (a likely scenario) through survey, the trigger value for monitoring would be a confirmed sighting of one individual with a response measure to capture and tag for tracking or recapture and if recommended by the DEC / DSEWPaC consultation to translocate as a last resort. The trigger values will therefore be set once it is determined that a significant fauna species is likely to be impacted by disturbance activity.

As stated in the SFMP (Appendix 7) surveys will be conducted prior to disturbance taking place and detailed records kept of survey effort and timing. Survey methodology will be non-invasive where possible and appropriate to reduce impacts from trapping; these methods include setting motion sensitive cameras and active searches for scats, tracks and other identifiable evidence.

v) ***Proposed mitigation measures*** – The SFMP (Appendix 7) details proposed mitigation measures to be undertaken by the proponent. As previously indicated, once predisturbance surveys have been completed any additional mitigation measures to those outlined in the SFMP will be documented.

vi) ***Impacts should contingency measures be implemented*** – Examples of potential contingency measures that may need to be undertaken as a result of the Project may include:

- Additional vegetation clearing for waste rock dumps where it is not possible to haul overburden into mined out pits;
- Alteration of mine plans; and
- Controlled release of surplus water to the environment.

Impacts from the first two potential contingency measures are predominantly concerned with additional clearing of native vegetation and therefore possibly significant fauna habitat. The impacts of clearing will apply (i.e. reduction in available habitat leading to reduction in carrying capacity and biodiversity, further fragmentation of habitats leading to a reduction in genetic transfer and an increase in the potential for invasive species to invade existing habitat, etc.). These impacts can be reduced by avoiding known significant fauna habitat, rehabilitation of disturbed habitat, and minimising the extent of vegetation clearing in advance of mining.

The release of water would likely involve discharge to established drainage lines. This would be managed to ensure that the flow velocities are lower than those occurring after a major storm event. Water quality would be measured prior to release to ensure no adverse impact due to water quality issues.

Should such contingency measures be required to be implemented, the SFMP would remain a valid management plan as it lists investigation (e.g. surveys) prior to disturbance as the main management practice. Such investigations would inform contingency planning to ensure that potential impacts are considered and minimised as far as practicable and any relevant approvals required are obtained.

Although considered unlikely, in some instances (e.g. emergency situations which pose risks to health and safety) contingency actions may be required to be implemented without prior environmental investigations. In this case subsequent investigations would be undertaken to identify potential impacts in relation to EPBC species and appropriate actions to minimise those impacts. The results of such investigations would be reported to DSEWPaC, if required.

5. PROPOSED OFFSET MEASURES

5.1 Request

Provide a description of proposed offset measures, including a proposed strategy to offset any impacts of the proposed action on matter of national environmental significance. The proposed strategy must:

i) Demonstrate how it will achieve long-term conservation outcomes; and

ii) Have regard to the scale and intensity of impact from the development on the site.

Further guidance may be found in the department's draft policy statement on the use of environmental offsets under the EPBC Act and associated discussion paper, both of which are available on the Department's website:

http://www.environment.gov.au/epbc/publications/pubs/draft-environmental-offsets.pdf

http://www.environment.gov.au/epbc/publications/pubs/draft-environmental-offsets-discussion.pdf

5.2 Response

The completed surveys and assessments indicate that the proposed action is not expected to have a significant or long-term impact on any matters of national environmental significance which would require the development of an offset package . Our scientific understanding of the sites environmental characteristics, which is supported by regional information, would indicate that the level of significance can be appropriately offset by indirect contributions to regional ecological research projects.

However, in consultation with DSEWPaC and DEC, FMS will fund a study into the Northern Quoll ecology, distribution and abundance in the Hamersley Ranges.

This study will assist the State and Commonwealth with a positive conservation gain by providing a better understanding of the conservation significant species.

6. ECOLOGICALLY SUSTAINABLE DEVELOPMENT

6.1 Request

Provide a description of the proposed action in relation to the principles of ecologically sustainable development, as defined in the EPBC Act:

i) The long-term and short-term economic, environmental, social and equitable considerations;

ii) The precautionary principle which states that a lack of full scientific certainty should not be used as a reason for postponing measure to prevent environmental degradation where there are threats of serious or irreversible environmental damage;

iii) The principle of inter-generational equity which states that the present generation should ensure the health, diversity and productivity of the environment is maintained or enhances for the benefit of future generations;

iv) The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making; and

v) Improved valuation, pricing and incentive mechanisms should be promoted.

6.2 Response

Throughout the planning and design of the Project, the principles of ecologically sustainable development, have played an integral role in the FMS decision making processes. FMS will continue to apply these principles throughout the construction, operational, decommissioning and rehabilitation stages of the Project. The following provides a description of the Project in relation to the principles of ecologically sustainable development, as defined in the EPBC Act:

i) ***Long-term and short-term economic environmental, social and equitable considerations*** –The assessment completed for the impact assessment has examined potential economic, environmental, social and cultural impacts resulting from the Project. The development of management plans has identified management actions to mitigate direct and cumulative impacts through each phase of the Project (e.g. Significant Fauna Management Plan). The Project planning includes early planning for decommissioning and rehabilitation, with the development of the conceptual Mine Closure Plan prior to the commencement of operation.

ii) ***Precautionary principle*** – To date FMS has adopted a proactive approach to prevent potential environmental degradation as a result of the Project and will continue to do so for

the lifespan of the Project. As outlined within the SFMP (Appendix 7), FMS will undertake additional fauna surveys prior to disturbance to complement existing data. FMS will seek to reduce scientific uncertainty regarding the potential for environmental impact through data acquisition and will further identify the potential direct and indirect impacts on conservation significant fauna and their habitats within the Project area. Based on the data, FMS will expedite the implementation of management and monitoring strategies to minimise these potential impacts and undertake continual improvement through monitoring and review of the effectiveness of management actions.

iii) ***Inter-generational equity*** – FMS is committed to implementing measures (e.g. environmental management plans, rehabilitation plans, etc.) to maintain and enhance the health, diversity and productivity of the environment for future generations. An example of this is the SFMP (Appendix 7) for which one of the primary objectives is to ensure better protection and long term conservation of EPBC listed threatened fauna species in the Pilbara region of Western Australia.

iv) ***Biological diversity and ecological integrity in decision making*** – The conservation of ecological integrity and biological diversity is one of the key objectives of the Commonwealth and state impact assessment process and weighs heavily in the decision-making process. FMS is required to meet the standards set by relevant legislation with regards to the conservation of ecological integrity and biological diversity. Furthermore, FMS has considered environmental aspects (e.g. significant vegetation, flora and fauna) in the planning and design of the Project. The Project is considered to present limited threats to the ecological integrity and biological diversity of the Hamersley subregion as a whole.

v) ***Promotion of improved valuation, pricing and incentive mechanisms*** – The Project will be consistent with the Western Australian and Commonwealth Government legislation promoting improved valuation, pricing and incentive mechanisms. This includes the inclusion of environmental factors in the valuation of assets and services, the polluter pays principle, product stewardship principle and cost effective pursuit of environmental goals. As outlined in the Company Environment Policy, FMS adopts and adheres to standards that are protective of the environment integrating environmental factors into planning and operational decisions and process. FMS will seek to achieve this by:

- Taking all reasonable actions to reduce environmental impacts from the Project through the implementation of environmental management plans (e.g. SFMP);
- Bearing the responsibility and cost for the development, implementation (e.g. survey and monitoring programs and contingency actions) and ongoing review of environmental management plans;
- Where feasible, give preference to more eco-friendly suppliers of goods and services; and

- Undertaking analysis of lifecycle environmental impact during the goods and services selection and production process (e.g. acknowledgement that costs associated with closure and decommissioning form part of the costs of production).

7. OTHER APPROVALS AND CONDITIONS

7.1 Request

If not already provided in the referral documentation, information given must include:

i) A description of any approval that has been obtained from a State Territory or Commonwealth agency or authority, including any conditions that apply to the action;

ii) A statement identifying any additional approval that is required;

iii) A description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action; and

iv) Provide detailed construction timeframes for all components of the proposed action.

7.2 Response

i) ***Approval previously obtained*** – As yet, no approvals have been received for the proposed action (excluding exploration activities).

FMS has referred the Project to the EPA for assessment. The EPA has provided advice that the Project has been given an assessment level of Assessment on Proponent Information (API) Category A. A copy of the EPA's decision notice is provided as Appendix 9. API is applied to proposals where the environmental acceptability (Category A) or unacceptability (Category B) of the proposal is apparent from the information provided in the referral information and the proponent has provided sufficient information on environmental impacts at the referral stage. In January 2012 the EPA provided FMS with a scoping guideline (see Appendix 9) setting out the requirements for submission of an Environmental Review document. The Environmental Review document was accepted for assessment in May 2012. The EPA will assess the proposal and provide an assessment report and recommendations to the Western Australia Minister for Environment who will make a final decision on the Project.

ii) ***Additional approvals*** – The approvals strategy for the Project is based upon a staged approach. Stage 1 (subject of this application) consists of iron ore mining operations on the Blacksmith exploration licence E47/882, with the initial mine pits to be located in the 'Delta', 'Champion' and 'Eagle' deposits. The infrastructure required to support the mining operation is likely to be located off the mining lease and will be Stage 2. The off-tenement infrastructure includes the ore processing facility, tailings storage, mine buildings, conveyors, heavy and light vehicle mine access roads, pipelines, stockpiles, a rail spur and the mine village. The

location for the off-tenement infrastructure will depend upon the nature of any ore off-take or transport arrangement. The Project assumes that FMS will reach an agreement with a third party, either as a joint venture, mine-gate sales or an ore transport and export arrangement for the transportation of the ore to port.

Key approvals required for the overall Project are outlined in Table 7 1. This is subject to change depending on the final off-tenement infrastructure configuration.

Table 7-1 Overall Project Approval Requirements

Legislation	Agency	Approval	Project component	Status
Commonwealth				
EPBC Act	DSEWPaC	Matters of national environmental significance – Sections 18 and 18A (listed threatened species and ecological communities)	On-tenement infrastructure – mine pits, waste dumps and haul roads	Subject of this application
		Matters of national environmental significance	Off-tenement infrastructure - ore processing facility, tailings storage, mine buildings, conveyors, heavy and light vehicle mine access roads, pipelines, stockpiles, a rail spur and the mine village	Definitive off-tenement rail / port infrastructure solution yet to be determined. On finalisation referral will be undertaken by FMS or other responsible party, if required.

Legislation	Agency	Approval	Project component	Status
Native Title Act 1993	National Native Title Tribunal	Native Title / Tenure	All	Native title negotiations have commenced and are substantially complete. Section 29 'right to negotiate' or section 24 ' infrastructure process'
State				
Environmental Protection Act 1986 and *Environmental Protection Regulations 1987*	Department of Environment and Conservation	Parts 5 Works approvals and licenses	All	Part V Works approvals and licences
Aboriginal Heritage Act 1972	Department of Indigenous Affairs	Section 18 – consent to certain uses	All	FMS has designed current exploration activities to avoid identified sites. Should FMS seek to disturb or impact on an Aboriginal site approval will be sought.
Dangerous Goods Safety Act 2004	Department of Mines and Petroleum	Various licenses and permits are required for the handling, transport, storage and disposal of dangerous goods	Off-tenement explosives storage and transport	Definitive off-tenement infrastructure solution yet to be determined. On finalisation relevant approvals will be obtained.

Legislation	Agency	Approval	Project component	Status
Environmental Protection (Clearing of Native Vegetation) Regulations 2004	Department of Mines and Petroleum	Vegetation clearing permit	All	Definitive off-tenement infrastructure solution yet to be determined. On finalisation relevant approvals will be obtained.
Mining Act 1978	Department of Mines and Petroleum	Mining title including environmental assessment	All	Progressing
Mines Safety and Inspection Act 1994	Department of Mines and Petroleum	Approval of Project Management Plan by State Mining Engineer	All	Required before mining operations commence.
Rights in Water and Irrigation Act 1914	Department of Water	Right to construct and alter water bores and wells (s26) Right to take water and manage its use (s5) Permit to interfere with beds and banks of watercourse (s17)	On-tenement aquifers or off-tenement aquifers	Location of supply bores to be confirmed through groundwater investigations. On completion of investigations relevant approvals will be obtained,
Main Roads Act 1930 *Road traffic Act 1974*	Main Roads	Main road access and egress Heavy vehicles and oversized loads	Access, haulage, etc.	Definitive off-tenement infrastructure solution yet to be determined. On finalisation relevant approvals will be obtained.
Electricity Industry Act 2004	Office of Energy / Economic Regulation Authority	Electricity licence	Off-tenement power generation plant	Definitive off-tenement infrastructure solution yet to be determined. On finalisation relevant approvals will be obtained.

Legislation	Agency	Approval	Project component	Status
Environmental Protection Act 1986	EPA	Part IV – Environmental impact assessment	All	The EPA has provided advice that the Project has been given an assessment level of API Category A.
Local				
Building Regulations 1989 *Local Government Act 1995* *Local Government (Miscellaneous Provisions) Act 1960*	Shire of Ashburton / Fire and Emergency Services Authority	Building licences	Off-tenement buildings	Definitive off-tenement infrastructure solution yet to be determined. On finalisation relevant approvals will be obtained. Ashburton has been kept up to date with respect to the intention to develop and operate the mine.
Shire of Ashburton Town Planning Scheme	Shire of Ashburton	Planning Approval	All	Definitive off-tenement infrastructure solution yet to be determined. On finalisation relevant approvals will be obtained. Ashburton has been kept up to date with respect to the intention to develop and operate the mine.

Legislation	Agency	Approval	Project component	Status
Health Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974	Shire of Ashburton / Department of Health	Approval for onsite wastewater system	Off-tenement wastewater treatment system	Definitive off-tenement infrastructure solution yet to be determined. On finalisation relevant approvals will be obtained.

iii) ***Applicable monitoring, enforcement and review procedures*** –Detailed environmental management plans, to accompany the SFMP (Appendix 7) will be developed post approval to ensure compliance with all conditions of approval. Generally, annual reports outlining compliance with conditions of approval (e.g. water quality criteria, annual extraction limits, etc.) are required to be submitted to the relevant regulatory authorities. Auditing and review of environmental documentation will occur periodically to reflect knowledge gained during the course of operations and any legislative changes

iv) ***Construction schedule*** – Construction is expected to be completed in 2014 and commissioning in late 2014. First ore is expected in Q1 2015. A detailed schedule will not be available until completion of the Definitive Feasibility Study for the Project.

8. INFORMATION SOURCES

8.1 Request

For information given state, state:

i) The source of the information;

ii) How recent the information is;

iii) How the reliability of the information was tested;

iv) What uncertainties (if any) are in the information; and

v) The qualification and experience of the study team and any specialist consultants.

8.2 Response

i) ***Source of information*** – Information has been obtained from a wide range of sources including:

- Desktop assessments of the DSEWPaC and DEC databases;
- Review of available literature including previous studies in the area; and
- Field surveys.

All sources of information have been referenced in this document and documents attached to this Report.

ii) ***How recent information is*** – The most recent sources of information have been utilised in assessments. Surveys were undertaken between May and October, 2010 and September 2011.

iii) ***Testing reliability of information*** – Surveys were undertaken by a specialist consultant and survey team in accordance with the relevant guidance documents (Appendix 6). This has ensured consistency with accepted survey methods to provide reliable data. Results of surveys were compared to similar sized surveys in the region. It was determined that survey results were comparable in terms of number of captures based on sampling effort.

iv) ***Uncertainties in information*** – There is some uncertainty regarding the presence of the Northern Quoll (scats only) and the Pilbara Leaf-nosed Bat (one call). Survey suggests these

species are both present, but it is not known how many, where or how often (Pilbara Leaf-nosed Bat). The effects of the February 2010 fire may also mean that these are now transient visitors and not likely resident. This may be the result of the reduction in available prey species due to vegetation loss from the fire.

v) ***Qualifications and experience of survey team*** – Survey team qualifications are provided in Appendix 10. Table 1 1 of this Report provides a list of persons and agencies consulted and the names of, and work done by, the persons involved in preparing this Report.

9. CONCLUSION

It is considered that the information provided in this Report sufficiently addresses the DSEWPaC Request for Additional Information. In accordance with the requirements of the EPBC Act, FMS requests that DSEWPaC provide a direction to publish the EPBC referral and this Response to The DSEWPaC Information Request for public comment.

FMS will then publish the information in accordance with the requirements of the EPBC Act and the DSEWPaC direction to publish.

10. REFERENCES

Abbott, I., R. Black & N. Gueho (1978). Notes on Rainbow Birds and Fairy Terns on Rottnest Island. *Western Australian Naturalist*. 14:64-65.

Armstrong, KN (2001), 'The roost habitat and distribution of the orange leaf-nosed bat, Rhinonicteris aurantius, in the Pilbara region of Western Australia', *Wildlife Research*, vol. 28, pp. 95-104.

Armstrong, KN (2003), The bats that time forgot: the Orange Leaf-nosed Bat Rhinonicteris aurantius (Gray, 1845) (*Microchiroptera: Hipposideridae*) in the Pilbara region of Western Australia. Ph.D. Thesis, The University of Western Australia.

Barrett, G, Silcocks, A, Barry, S, Cunningham, R, Poulter, R. (2003), The New Atlas of Australian Birds. Royal Australasian Ornithologists Union, Victoria.

Biota Environmental Sciences (2005), Fauna habitats and fauna assemblage of the Brockman Syncline 4 project, near Tom Price, Unpublished Report for Hamersley Iron Pty Ltd, Perth.

Biota Environmental Sciences (2007), Mesa K Targeted Fauna Survey, Unpublished report for Pilbara Iron.

Biota Environmental Sciences (2008), Hope Downs Northern Quoll Position Paper. Prepared for Rio Tinto Iron Ore on behalf of Hamersley HMS, unpublished Report for HMS.

Blakers, M., Davies, S.J.J.F. and Reilly P.N. 1984. The Atlas of Australian Birds. RAOU/Melbourne, University Press, Melbourne.

Burbidge, AA and McKenzie, NL (1978), 'The islands of the North-west Kimberley, Western Australia', Wildlife Research Bulletin, vol. 7.

Churchill, S.K., P.M. Helman & L.S. Hall (1988). Distribution, populations and status of the Orange Horseshoe Bat, *Rhinonicteris aurantius* (Chiroptera: Hipposideridae). *Australian Mammalogy*. 11(1):27-33.

Cogger, HG (2000), Reptiles and Amphibians of Australia - 6th edition, Reed New Holland, Sydney, NSW.

Department of Sustainability Environment Water Population and Communities (DSEWPaC) (2010), Northern Quoll - Dasyurus hallucatus, Australian Government, from http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=331

Department of Sustainability Environment Water Population and Communities (DSEWPaC) (2011), *Environment Protection and Biodiversity Conservation Act 1999* referral guidelines for the endangered northern quoll, Dasyurus hallucatus , from http://www.environment.gov.au/epbc/publications/pubs/northern-quoll.pdf

Department of Sustainability Environment Water Population and Communities (DSEWPaC) (2012), Liasis olivaceus barroni in Species Profile and Threats Database, Department of Sustainability Environment Water Population and Communities (DSEWPaC), from http://www.environment.gov.au/sprat

Department of the Environment, W, Heritage and the Arts (DEWHA), (2010), Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by Cane Toads (DRAFT), Commonwealth of Australia, Canberra, ACT

Ecologia Environment (2005), 'Pilbara Leaf-nosed Bat, (*Rhinonicteris aurantius*) and Ghost Bat, (*Macroderma gigas*) monitoring survey at Nimingarra and Cattle Gorge 2005', Unpublished report prepared by Ecologia Environment Pty Ltd for BHP Billiton Iron Ore Pty Ltd, August 2005.

Ecologia Environment (2006a), 'Goldsworthy bat monitoring, February 2006', Unpublished report prepared for BHP Billiton Iron Ore Pty Ltd.

Ecologia Environment (2006b), 'Hashimoto terrestrial fauna survey', Unpublished report prepared for BHP Billiton Iron Ore Pty Ltd.

Ecoscape (2011), Pilbara Iron Ore Project – Blacksmith Vertebrate Fauna and Short Range Endemic Survey, Flinders Mines Limited, Adelaide, unpublished report.

Environmental Protection Authority (2010), Technical Guide - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment, Environmental Protection Authority, Perth, Western Australia.

EPA (2002), Position Statement No. 3 - Terrestrial Biological Surveys as an Element of Biodiversity Protection, Environmental Protection Authority, Perth.

EPA (2009), Guidance for the Assessment of Environmental Factors: Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia No. 20.

Higgins, PJ (1999), Handbook of Australian, New Zealand and Antarctic Birds: Parrots to Dollarbird, Oxford University Press, Melbourne.

Hill, BM and Ward, SJ (2010), National Recovery Plan for the Northern Quoll Dasyurus hallucatus, Department of Natural Resources, Environment, The Arts & Sport, Darwin.

How, R. A., Dell, J. and Cooper, N. K. (1991). Vertebrate Fauna. In: Ecological survey of Abydos-Woodstock Reserve, Western Australia. Records of the Western Australian Museum, 0Suppl. 37: 78-123.

How, R.A., P.B.S. Spencer & L.H. Schmitt (2009). Island populations have high conservation value for northern Australia's top marsupial predator ahead of a threatening process. 1-12. *Journal of Zoology*. Page(s) 1-12.

McKenzie, N., K. Armstrong & P. Kendrick (1999). Pilbara Leaf-nosed Bat. In: Duncan, A, G.B. Baker and N. Montgomery, eds. *The Action Plan for Australian Bats*. Page(s) 36-38. Environment Australia, Canberra.

Ninox Wildlife Consulting (1992), Vertebrate Fauna Assessments (1975 – 1991) Marandoo Project Area, Perth, Unpublished report for Enviroscan.

O'Donnell, S., J. K. Webb & R. Shine (2010). Conditioned taste aversion enhances the survival of an endangered predator imperilled by a toxic invader. *Journal of Applied Ecology*. 47, 3:558-565. [Online]. Online: British Ecological Society. Available from: http://www3.interscience.wiley.com/journal/123350230/abstract?CRETRY=1&SRETRY=0

Pearson, D (1993), 'Distribution, status and conservation of pythons in Western Australia. ' in D Lunney and D Ayers (eds), Herpetology in Australia: a Diverse Discipline, Royal Zoological Society of NSW, Sydney, pp. 383-95.

Pearson, D (2003), 'Giant Pythons of the Pilbara', Landscope, vol. 19, no. 1.

Shine, R and Slip, D (1990), 'Biological aspects of the adaptive radiation of Australasian pythons (*Serpentes: Boidae*)', Herpetologica, vol. 46, no. 3, pp. 283-90.

Storr, GM and Johnstone, RE (1988), 'Birds of the Swan Coastal Plain and adjacent seas and islands', Records of the Western Australian Museum Supplement, vol. Suppl. 28, pp. 1-76.

Sutherst, R.W., Floyd, R.B., and Maywald, G.F. (1995). The potential distribution of the cane toad, Bufo marinus L. in Australia. *Conservation Biology* 10, 294-299.

Threatened Species Scientific Committee (2005), Commonwealth Conservation Advice on Northern Quoll (*Dasyurus hallucatus*). Retrieved 2011, from http://www.environment.gov.au/biodiversity/threatened/species/dasyurus-hallucatus.html#conservation

Threatened Species Scientific Committee (2008), Commonwealth Conservation Advice on Liasis olivaceus barroni (Olive Python (Pilbara subspecies)), Department of the Environment, Water, Heritage and the Arts, from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/66699-conservation-advice.pdf

van Vreeswyk, A.M.E., A.L. Payne, K.A. Leighton & P. Hennig (2004). An inventory and condition survey of the Pilbara region, Western Australia. *Department of Agriculture Technical Bulletin* No. 92.

Woinarski, J.C.Z., M. Oakwood, J. Winter, S. Burnett, D. Milne, P. Foster, H. Myles & B. Holmes (2008). Surviving the toads: patterns of persistence of the northern quoll *Dasyurus hallucatus* in Queensland. Report submitted to the Natural Heritage Trust Strategic Reserve Program.

Appendix 1 DSEWPaC information request

Appendix 2 Response to DSEWPaC information request information summary

DSEWPaC Additional Information Request	Initial EPBC Act Referral Document Reference	Response to DSEWPaC Request for Additional Information Document Reference
General Content, Format and Style		
The preliminary documentation, which includes the referral information and the additional information described below, should be contained as one document with attachments, and include sufficient information to avoid the need to search for supplementary reports.	Referral layout as per DSEWPaC template. Additional information provided as attachments.	Layout as per DSEWPaC General Content, Format and Style Requirements outlined in Request for Additional Information. Additional information provided as attachments.
The documentation must enable interested stakeholders and the Minister to understand the environmental consequences of the proposed development on matters of national environmental significance. The information provided should be objective, clear, succinct and, where appropriate, supported by maps, plans, diagrams or other descriptive detail.	Referral layout as per DSEWPaC template.	Layout as per DSEWPaC General Content, Format and Style Requirements outlined in Request for Additional Information. Section 1.2
Detailed technical information, studies or investigation necessary to support the main text should be included. It is recommended that any supporting documentation and studies, reports or literature, from which information has been extracted and which are not normally available to the public, be attached as appendices to the main document and made available at appropriate locations during the period of public displays of the preliminary documentation.	Attachment 5 Attachment 6 Attachment 7	Section 1.3 Appendix 3 Appendix 4 Appendix 5 Appendix 7
The proponent should also make the documentation and supporting information available on the internet.	Referral located on DSEWPaC website.	Section 1.3 Section 1.3
If it is necessary to make use of material that is considered to be of a confidential nature, the proponent should consult with the DSEWPaC on the preferred presentation of that material, before submitting the documents to the Minister for approval for publication.	-	Section 1.3
The level of analysis and detail in the documentation should reflect the level of expected impacts on the environment. Any variables or assumptions made in the assessment must be clearly stated and discussed. The extent to which the limitations, if any, of available information may influence the conclusions of the environmental assessment should be discussed.	Section 7.2 – Reliability and date of information (page 24 of 25) Attachment 5, Section 3.7 – Survey limitations (page 24) Attachment 7, Section 3.1 – Botanical limitations (page 53) Attachment 7, Appendix 9, Section 3 – Limitations (page 8)	Section 1.3 Section 8.2
The documentation should be written so that any conclusions reached can be independently assessed. To this end, all sources must be appropriately referenced using the Harvard standard. The reference list should include the address of any internet “web” pages used as data sources.	Section 7.1 – References (page 23 of 25) Attachment 5 – References (page 49) Attachment 6 – References (page 50) Attachment 6, Appendix 5 – SRE Technical Report 1 – References (page 5) Attachment 6, Appendix 5 – SRE Technical Report 2 – References (page 3 of 3) Attachment 7 – References (page 64) Attachment 7, Appendix One, Section 6 – References (page 27)	Section 1.3
The additional information should include a list of persons and agencies consulted and the names of, and work done by, the persons involved in preparing the documentation.	Attachment 5, Section 3.3.3 Survey Team (page 16)	**Table 1-1**

DSEWPaC Additional Information Request	Initial EPBC Act Referral Document Reference	Response to DSEWPaC Request for Additional Information Document Reference
Maps, diagrams and other illustrative material should be included, where appropriate. The additional information should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size and in colour where possible. The proponent should consider the format and style of the document appropriate for publication on the internet. The capacity of the website to store data and display the material may have some bearing on how the document is constructed.	Attachment 1 Attachment 2 Attachment 5, Appendix 1 – Maps (page 54) Attachment 6, Appendix 1 – Maps (page 31)	Appendix 3
The additional information must include a copy of the guidelines and a table indicating where the information fulfilling the guidelines is included in the preliminary documentation.	-	Appendix 2
Specific Content of the Additional Information		
1) Matters of National Environmental Significance		
Identify EPBC Act listed threatened species potentially present on or off-site[3] that could be affected, directly or indirectly, as a consequence of the proposal. For each matter of national environmental significance the following information must be provided:		
i) Information on the distribution, ecology and habitat preferences of the species (both on and off-site);	Section 3.1(d) – Listed threatened species and ecological communities (page 10 of 25) Attachment 5, Section 4.6 – Conservation significance (page 38) Attachment 6, Appendix 2 – Conservation Significant Fauna Species (page 34)	Section 2.2.1 Section 2.2.2 Section 2.2.3
ii) Maps showing the location of known records (including those from databases and all surveys previously conducted for the proposal). A copy of the surveys should be included in the assessment information.	Attachment 5, Appendix 1, Map 1 – Vertebrate trap site locations, trail camera and Anabat locations (page 55) Attachment 6, Appendix 2 – Conservation Significant Fauna Species (page 34) Attachment 7, Map 4 – Conservation significant flora locations (page 133) Attachment 8, Map 8 – Locations of conservation significant flora and fauna records and project design	Section 2.2.4
iii) Maps showing the potential habitat within and in the vicinity of the proposed site. These maps must highlight habitat components important for each relevant species, such as breeding habitat, wetlands, vine forests, rock outcrops, etc. Potential habitat occurring in areas that were previously burnt and therefore unsurveyed and areas adjacent to the mining tenement that may be used for additional mine processing infrastructure must be included.	Attachment 5, Appendix 1, Map 2 – Vertebrate fauna Habitat Types (page 56) Attachment 6, Appendix 1, Map 2 – Vertebrate fauna Habitat Types (page 56)	Section 2.2.4
iv) Maps showing the potential habitat for each species within the wider region, including habitat that is likely to be impacted by the potential rail transport corridors;	-	Section 2.2.4

[3] 'On-site' refers to not only the Blacksmith mining tenement area, but also includes the area for any potentail off-tenement mine processing infrastrcutre, as outlined in the referral documentation. This includes areas identified for any-off tenentment ore-processing facilities, tailings storage, mine buildings, conveyors, heavy and light vehicle mine access roads, pipelines, stockpiles and rail spur. 'On-site' does not include the potentail transport infrastucture corridors. 'Offsite' refers to the wider geographical area surrounding the 'on-site' areas listed above. 'Off-site' includes areas of habitat that may be impacted by the potential transport infrastructure corridors, and habitat such as permanent watering holes that could potentailly be impacted from actions such as mine dewatering.

DSEWPaC Additional Information Request	Initial EPBC Act Referral Document Reference	Response to DSEWPaC Request for Additional Information Document Reference
v) Information on the survey methodology used, including any limitations of the methodology and data collected for each species, as well as a justification for the survey methodology and survey sites employed;	Attachment 5, Section 3 – Survey methods (page 13) Attachment 5, Section 3.7 – Survey limitations (page 24) Attachment 7, Section 2 – Method (page 9) Attachment 7, Section 3.1 – Botanical limitations (page 53) Attachment 7, Appendix 9, Section 3 – Limitations (page 8)	Section 2.2.4
vi) Information on the scientific reliability of survey investigations and conclusions, including the degree of certainty or statistical confidence where appropriate; and	Attachment 5, Section 3.7 – Survey limitations (page 24) Attachment 7, Section 3.1 – Botanical limitations (page 53) Attachment 7, Appendix 9, Section 3 – Limitations (page 8)	Section 2.2.4
vii) Provide a detailed analysis using the maps prepared, judgements of qualified fauna experts and recent and historical species records to determine the importance of the populations of listed threatened species and habitat at the proposed development site, including:	-	-
(a) Current known threats and future predicted threats;	Section 3.1(d) – Listed threatened species and ecological communities (page 10 of 25) Attachment 6, Appendix 2 – Conservation Significant Fauna Species (page 34)	Section 2.2.1 Section 2.2.2 Section 2.2.3
(b) Risks to the viability of listed species populations locally, regionally and nationally;	-	
(c) Presence in conservation reserves;	-	
(d) Population trends in the Pilbara;	-	
(e) Conservation programs being undertaken in the Pilbara;	-	
(f) Monitoring data that describes population response to climate, disturbance or any other source of perturbation.	-	
2) Relevant Impacts		
Provide a description of the relevant impacts, including:		
i) A description of the potential and likely short-term and long-term impacts of the action on matters of national environmental significant, including quantities of habitat likely to be impacted. This description must detail direct, indirect, and cumulative impacts;	Section 3.1(d) – Listed threatened species and ecological communities (page 10 of 25) Attachment 5, Section 5.4 – Ecological processes and impact assessment (page 45) Attachment 5, Section 5.5 – Impacts on fauna habitat (page 47) Attachment 6, Section 4 – Potential impacts (page 13) Attachment 7, Section 4 – Impact assessment (page 54)	Section 3.2
ii) Maps showing any areas of disturbance overlayed with the potential habitat for EPBC Act listed threatened species within and in the vicinity of the proposed site;	Attachment 8, Map 8 – Locations of conservation significant flora and fauna records and project design	Section 3.2
iii) Information on the likely impacts of the transport of material from the mine site by rail on matters of national environmental significance. This could include the Flinders Mines Pilbara IO Project Transport Route Constraints Analysis report or similar material;	-	Section 3.2
iv) A statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible	-	Section 3.2

DSEWPaC Additional Information Request	Initial EPBC Act Referral Document Reference	Response to DSEWPaC Request for Additional Information Document Reference
v) Analysis of the potential magnitude of the relevant impacts;	Section 3.1(d) – Listed threatened species and ecological communities (page 10 of 25) Attachment 5, Section 5.4 – Ecological processes and impact assessment (page 45) Attachment 5, Section 5.5 – Impacts on fauna habitat (page 47) Attachment 6, Section 4 – Potential impacts (page 13) Attachment 7, Section 4 – Impact assessment (page 54)	Section 3.2
vi) Any technical data and other information used or needed to make a detailed assessment of the relevant impacts; and	Attachment 5 Attachment 7	Section 3.2
vii) Information on the scientific reliability of investigations and conclusions drawn, including the degree of certainty or statistical confidence where appropriate. This must include any assumptions or limitations of any models used to make predictions.	Section 7.2 – Reliability and date of information (page 24 of 25) Attachment 5, Section 3.7 – Survey limitations (page 24) Attachment 7, Section 3.1 – Botanical limitations (page 53) Attachment 7, Appendix 9, Section 3 – Limitations (page 8)	Section 3.2
3) Proposed Safeguards and Mitigation Measures		
In addition to the information outlined in the Significant Fauna Management Plan (SFMP) provided in the referral documentation, provide further description of the proposed safeguards and mitigation measures, including:		
i) An assessment of the expected or predicted effectiveness, of the proposed mitigation measures;	-	Section 4.2 Appendix 7 Appendix 8
ii) Any statutory or policy basis for the proposed mitigation measures;	-	Section 4.2
iii) A description of any provisions for independent environmental auditing. This should be provided in the section of the SFMP where the framework for the environmental management plans is outlined;	Attachment 6, Section 5.0 – Objective 1 (page 15)	Section 4.2
iv) Detail on how any management strategy or monitoring program would influence environmental practices on site, including not only the performance indicators outlines in the SFMP, but also trigger values and response measures where appropriate;	-	Section 4.2
v) A consolidated list of proposed mitigation measures to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measures proposed to be taken not only by the proponent (as outlined in the SFMP) but also by the State and local governments; and	-	Section 4.2 Appendix 7
vi) An assessment of impacts on matters of national environmental significance should contingency measures for the proposed action need to be undertaken (for example, the controlled release of surplus water to the environment).	-	Section 4.2 Appendix 7
4) Proposed Offset Measures		
Provide a description of proposed offset measures, including a proposed strategy to offset any impacts of the proposed action on matters of national environmental significance. The proposed strategy must:		
i) Demonstrate how it will achieve long-term conservation outcomes; and	Attachment 6, Section 5.0 – Objective 32 (page 20) Attachment 6, Section 5.0 – Objective 33 (page 20)	Section 5.2

DSEWPaC Additional Information Request	Initial EPBC Act Referral Document Reference	Response to DSEWPaC Request for Additional Information Document Reference
ii) Have regard to the scale and intensity of impact from the development on the site.	Attachment 6, Section 5.0 – Objective 32 (page 20) Attachment 6, Section 5.0 – Objective 33 (page 20)	Section 5.2
5) Ecologically Sustainable Development		
Provide a description of the proposed action in relation to the principles of ecologically sustainable development, as defined in the EPBC Act:		
i) The long-term and short-term economic, environmental, social and equitable considerations;	-	Section 6.2
ii) The precautionary principle which state that a lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation where there area threats of serious or irreversible environmental damage;	-	Section 6.2
iii) The principle of inter-generational equity which states that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;	-	Section 6.2
iv) The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making; and	-	Section 6.2
v) Improved valuation, pricing and incentive mechanisms should be promoted.	-	Section 6.2
6) Other Approvals and Conditions		
If not already provided in the referral documentation, information given must include:		
i) A description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority, including any conditions that apply to the action;	Section 2.4 – Context, planning framework and state / local government requirements (page 5 of 25)	Section 7.2
ii) A Statement identifying any additional approval that is required;	Section 2.4 – Context, planning framework and state / local government requirements (page 5 of 25)	Section 7.2
iii) A description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action; and	-	Section 7.2
iv) Provide detailed construction timeframes for all components of the proposed action.	Section 1.8 – Time frame	Section 7.2
7) Information Sources		
For information given, state:		
i) The source of the information;	Section 7.1 – Information sources and attachments	Section 8.2
ii) How recent the information is;	Section 7.2 – reliability and date of information	Section 8.2
iii) How the reliability of the information was tested;	Attachment 5, 3.0 Survey Methodology (page 13)	Section 8.2
iv) What uncertainties (if any) are in the information; and	Section 7.2 – reliability and date of information Attachment 5, 3.0 Survey Methodology (page 13)	Section 8.2
v) The qualifications and experiences of the study team and any specialist consultants.	Attachment 5, Section 3.3.3 Survey Team (page 16)	Section 8.2

Appendix 3 Maps

536000 538000 540000 542000 544000 546000 548000 550000 552000

7556000 7554000 7552000 7550000 7548000

Olive Python

Northern Quoll

Pilbara Leaf-nosed Bat

Ghost Bat

Ramphotyphlops ganei

Flinders Mine Camp

GDA 1994 MGA Zone 50

0 1 2 Km

Scale 1:45,000 @ A3

ecoscape
9 Stirling Hwy.
North Fremantle WA 6159
ph: (08) 9430 8955
web: www.ecoscape.com.au

Legend

- Conservation Significant Fauna
- Anabat/Songmeter
- Blacksmith Tenement

Vertebrate Fauna Habitat Types

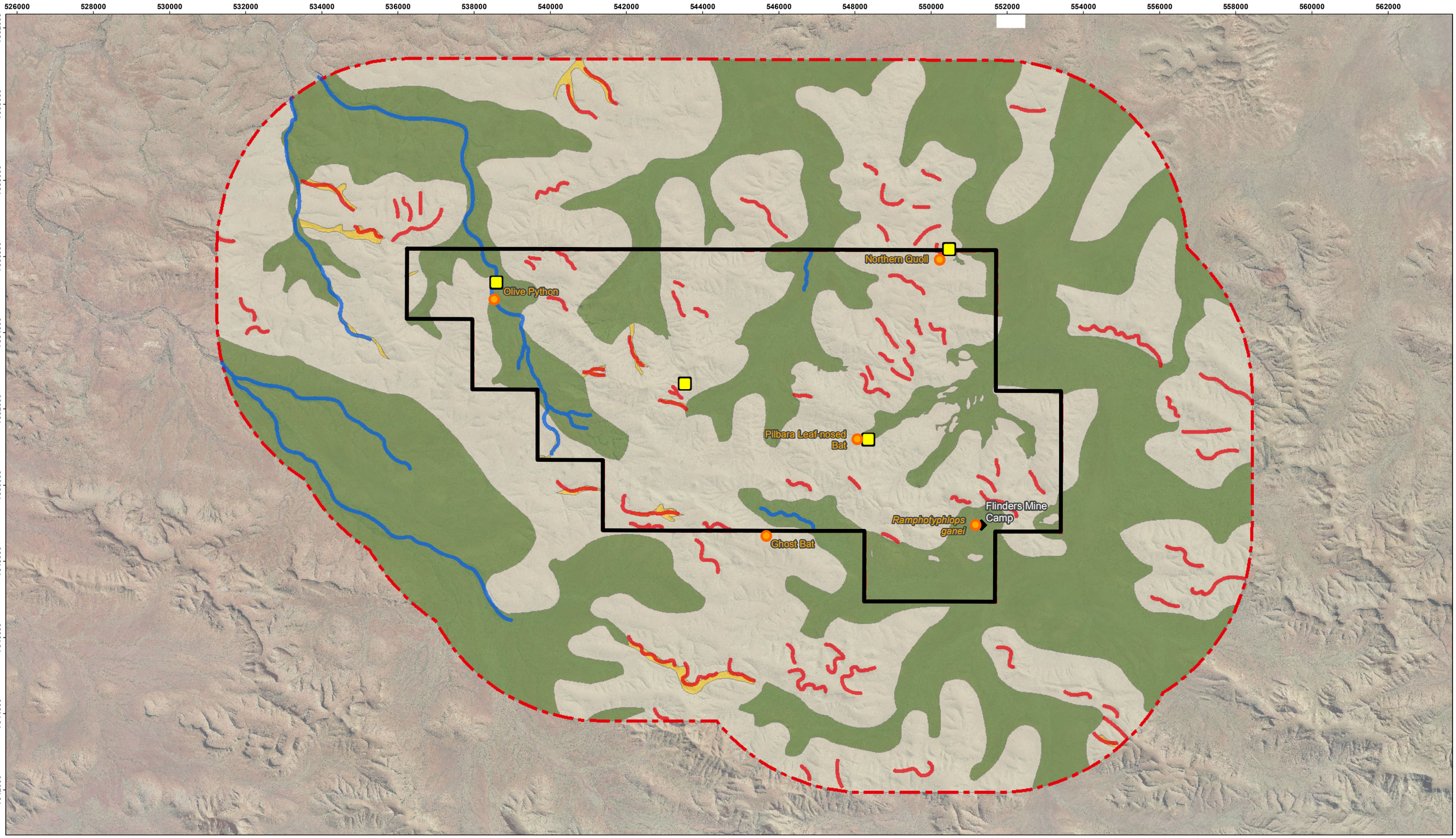
- H1 - Valley floors, including secondary drainage lines
- H2 - Slopes surrounding valleys
- H3 - Gorges

Map Author: CM
Approved: JN
Revision: 0
Project No: 2463-11

Pilbara Iron Ore Project - Blacksmith
Flinders Mines Ltd

MAP 1

Vertebrate Fauna Habitat Types



0 2 4 Km

Scale 1:95,000 @ A3

ecoscape
9 Stirling Hwy.
North Fremantle WA 6159
ph: (08) 9430 8955
web: www.ecoscape.com.au

Legend

- Conservation Significant Fauna
- Anabat/Songmeter
- Blacksmith Tenement
- Flinders Tenement 5km Buffer
- Northern Quoll Critical Habitat
- Pilbara Olive Python Critical Habitat

Vertebrate Fauna Habitat Types

- H1:Valley floors, including secondary drainage lines
- H2:Slopes surrounding valleys
- H3:Gorges

Map Author: CM
Approved: BT
Revision: 0
Project No: 2463-11

Pilbara Iron Ore Project - Blacksmith
Flinders Mines Ltd

MAP 2

Vertebrate Fauna Habitat Types
5 km Buffer

536000 538000 540000 542000 544000 546000 548000 550000 552000 554000

7556000 7554000 7552000 7550000 7548000 7546000

GDA 1994 MGA Zone 50

0 1 2 km

Scale 1:50,000 @ A3

Legend

- Blacksmith Tenement
- Haul Routes
- Pit Outlines
- Waste Dumps

Vertebrate Fauna Habitat Types

- H1 - Valley floors, including secondary drainage lines
- H2 - Slopes surrounding valleys
- H3 - Gorges

ecoscape
9 Stirling Hwy.
North Fremantle WA 6159
ph: (08) 9430 8955
web: www.ecoscape.com.au

Map Author: CM
Approved: JN
Revision: 0
Project No: 2463-11

Pilbara Iron Ore Project - Blacksmith
Flinders Mines Ltd

MAP 3

Vertebrate Fauna Habitat Types and Mine Infrastructure

Appendix 4 Pilbara Iron Ore Project – Blacksmith Vertebrate Fauna and Short Range Endemic Survey

Appendix 5 Flinders Mines Pilbara IO Project – Transport Route Constraint Analysis

Appendix 6 EPA Guidance and Position Statements

Guidance Statement No. 20 Guidance for the Assessment of Environmental Factors - Sampling of Short range Endemic Invertebrate fauna for Environmental Impact Assessment in Western Australia (May, 2009)

Guidance Statement No. 56 Guidance for the Assessment of Environmental Factors – Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (June 20004)

Position Statement No. 3 Terrestrial Biological Surveys as an Element of Biodiversity Protection (March, 2002)

Technical Guide – Terrestrial Vertebrate fauna Surveys for Environmental Impact Assessment (September, 2010)

Appendix 7 Significant Fauna Management Plan

Appendix 8 DEC Communication

FLINDERS MINES LIMITED
BLACKSMITH PILBARA IRON ORE PROJECT (EPBC 2011/6152)
RESPONSE TO DSEWPAC REQUEST FOR ADDITIONAL INFORMATION

Your Ref: 17 Dick Perry Drive, Technology Park, Western Precinct, KENSINGTON WA 6151

Our Ref: Postal Address: Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983

Enquiries: Murray Baker Tel: (08) 9334 0365 Fax: (08) 9334 0140

Email: murray.baker@dec.wa.gov.au

To: Principal Environmental Scientist, Ecoscape (Att: Bruce Turner)

From: Environmental Officer, Environmental Management Branch – DEC (Att: Murray Baker)

Date: 1 July 2011

Subject: Significant Fauna Species Management Plan – Flinders Mines Limited

Thank you for the opportunity to review and comment on the aforementioned management plan in relation to its completeness and suitability.

The attached document contains comments with respect to matters related to potential impacts on biodiversity conservation values.

DEC acknowledges that the management plan will require updating as surveys are undertaken and information regarding the composition of conservation significant fauna (and other conservation values) in the project area becomes available, however, DEC has briefly reviewed the document and in general, DEC is of the view that the scope and objectives of the management plan appear adequate, noting the attached recommendations.

Please don't hesitate to contact the Murray Baker if you have any queries in relation to this advice.

Murray Baker

Environmental Officer

Environmental Management Branch

for Keiran McNamara

Director General

Appendix 9 EPA Assessment Decision Notice

ENVIRONMENTAL PROTECTION AUTHORITY

Weekly record of determinations for development proposals

Title:	Flinders Pilbara Iron Ore Project, 70km northwest of Tom Price, Shire of Ashburton				**Determination:** Assess: Assessment on Proponent Information
Referral ID:	A416555	**Date Received:**	26/07/2011	**Date Final Info:**	08/08/2011
Referror:	Flinders Mines Ltd				Assessment No: 1903
Proponent:	Flinders Mines Ltd				
Contact:	Mr M Anstey				
Telephone:	81327976				**Procedure:** Category A: EPA-prepared scoping guideline
LGA:	Shire of Ashburton				
Environmental Factors:	Flora and vegetation, fauna, groundwater.				
Potential Significant Impacts:	Impact to troglofauna species known only from mine area. Potential impact to Conservation Significant Flora Species. Impacts to Priority 2 area of Millstream Water Reserve.				
Public comments on referral information:	Not Assess 0 Assess (no public review) 0 Assess (with public review) 0 TOTAL COMMENTS 0				**Deputy Chairman's Initials:**
Explanation of Decision:	Formal assessment of these environmental factors will enable the EPA to determine the significance of the potential environmental impacts of the proposal.				**Date Signed:** 1/9/11
Officer:	Ben Miles				

Appendix 10 Survey Team Short CVs