Yilgarn Operations

Windarling Range W4 East Deposit

Environmental Protection Act 1986 (WA)
Environmental Impact Assessment
(Assessment on Proponent Information)

May 2012

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EXECUTIVE SUMMARY

Yilgarn Operations – Windarling Range W4 East Deposit

Cliffs Asia Pacific Iron Ore Pty Ltd's (Cliffs) Yilgarn Operations include the mining of iron ore deposits at the Koolyanobbing Range, Mt Jackson Range and the Windarling Range, processing of ore at Koolyanobbing, and road and rail transport between these operations and the Port of Esperance where the processed ore is exported to international customers.

Cliffs proposes to expand its Yilgarn Operations to include an additional mining operation at the Windarling Range W4 East Deposit, located at the Windarling Range approximately 130km north of the town of Southern Cross in the Shire of Yilgarn.

The Windarling Range W4 East Deposit contains an estimated 6.8 million tonnes of iron ore having an estimated gross economic value of approximately A$1.06billion. Development and operation of the Windarling Range W4 East Deposit proposal has been scheduled to commence from 2013, with an expected mining-life of approximately 5 years. The Windarling Range W4 East Deposit proposal includes the development, operation and mine closure of a mine pit being 27.5ha in area and a haul road being 0.5ha in area, which connect to Cliffs' existing mine operations at the Windarling Range.

The location of the Windarling Range W4 East Deposit proposal is identified in Figure E-1. The characteristics of the Windarling Range W4 East Deposit proposal are identified in Table E-1.

Implementation of the Windarling Range W4 East Deposit proposal will occur in accordance with Cliffs' Environmental Policy (Cliffs Natural Resources 2008; Appendix 1) and Cliffs' ISO:14001:2004-certified Environmental Management System (EMS) (NCSI 2011; Appendix 2). Cliffs' EMS contains a series of Environmental Management Plans (EMPs) used for the management of environmental aspects of mine operations.

Summary of Environmental Impact Assessment

This document has been prepared in accordance with the requirements of the Office of the Environmental Protection Authority's (OEPA) Scoping Guideline (EPA 2011a) for the purposes of an Environmental Impact Assessment (EIA) of the Windarling Range W4 East Deposit proposal at the level of Assessment on Proponent Information (API) under s40(2)(b) of the *Environmental Protection Act 1986* (WA) and in accordance with the *Environmental Impact Assessment Administrative Procedures 2010* (EPA 2010a). The key environmental factors relevant to the Windarling Range W4 East Deposit proposal have been identified by EPA (2011a) as:

- Flora;
- Fauna; and
- Mine Closure.

A summary of the assessment of the key environmental factors, potential for impact and proposed management is provided in Table E-2.

This EIA-API document identifies that, subject to implementation of Cliffs' environmental commitments, the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to the key environmental factors.

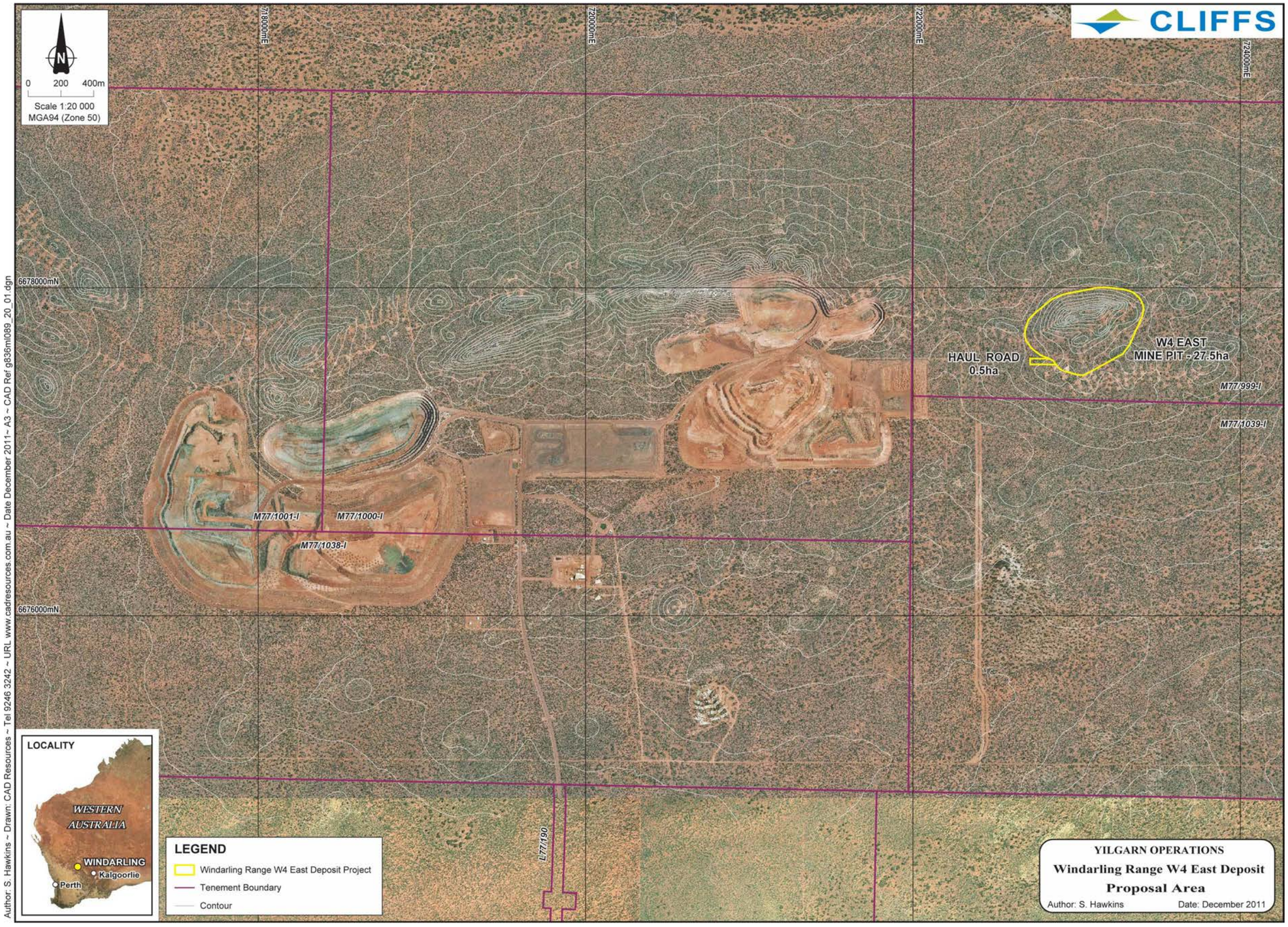

Figure E-1 Location of the Windarling Range W4 East Deposit Proposal.

ELEMENT	DESCRIPTION
GENERAL	
Location	Tenement M77/999 in the Shire of Yilgarn, Western Australia.
Mining Life	5 years (approximately)
Mining Method	Open cut
Area	28.0ha (as per the components listed below)
COMPONENTS	
Mine Pit	
Location	Tenement M77/999
Area	27.5ha
Depth	403mAHD (approximately)
Haul Road	
Location	Tenement M77/999
Area	0.5ha

Abbreviations:
ha = hectares
mAHD = metres in Australian Height Datum

All values stated are maximum values, unless otherwise specified.

Table E-1 Characteristics of the Windarling Range W4 East Deposit Proposal.

Table E-2 Summary of Key Environmental Factors, Potential for Impact, Management Proposed and Predicted Outcomes for the Windarling Range W4 East Deposit Proposal.

FACTOR	EPA OBJECTIVE and EPA GUIDANCE	NATURAL & HUMAN ENVIRONMENT	POTENTIAL IMPACT	MANAGEMENT	PREDICTED OUTCOME
Key Environmental Factors					
Flora	EPA Objective: Flora: To maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge (EPA 2010b). EPA Guidance: • EPA Guidance Statement #19: Environmental Offsets – Biodiversity (EPA 2008a). • EPA Guidance Statement #33: Environmental Guidance for Planning and Development (EPA 2008b). • EPA Guidance Statement #51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA 2004a). • EPA Guidance Statement #55: Implementing Best Practice in proposals submitted to the Environmental Impact Assessment Process (EPA 2003a). • EPA Position Statement #3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA 2002a). • EPA Position Statement #9: Environmental Offsets (EPA 2006a). • WA Environmental Offsets Policy (Government of Western Australia 2011).	The flora values of the Windarling Range include: • 2 Rare Flora species; • 5 DEC-classified 'Priority' flora species; • An array of other flora species not of conservation significance; and • 44 vegetation units. (Western Botanical 2010; Western Botanical 2011a)	The Windarling Range W4 East Deposit proposal is expected to impact: • 1 Rare Flora species; • 2 DEC-classified 'Priority' flora species; • An array of other flora species not of conservation significance; and • 10 vegetation units. The impact to 1,073 individuals of the Rare Flora species *Ricinocarpos brevis* may be considered significant. Following the application of direct environmental offsets (refer to Management column, right), the expected impact to 720 *Ricinocarpos brevis* individuals equates to an approximately 4% impact to *Ricinocarpos brevis* at the Windarling Range population scale (the cumulative impact increasing from 45% to 49%), and approximately 3% impact at a regional scale (the cumulative impact increasing from 34% to 37%). The impact to the other flora values are not expected to be significant.	As identified in Section 3.1, Cliffs will manage the impact to flora values for the Windarling Range W4 East Deposit proposal by implementation of: • Land Clearing Management Plan (Cliffs 2011a; Appendix 3); • Weed Management Plan (Cliffs 2011b; Appendix 4); • Fire Management Plan (Cliffs 2011c; Appendix 5); and • Dust Management Plan (Cliffs 2011d; Appendix 6). Implementation of the above management plans is expected to result in the Windarling Range W4 East Deposit proposal not having a significant impact to flora values. As also identified in Section 3.1, Cliffs will also implement environmental offsets for the impact to *Ricinocarpos brevis* which comprise of: • Direct environmental offsets incorporating avoidance of 353 individuals in approved mining impact areas and implementing a targeted rehabilitation program; and • Indirect environmental offsets incorporating a research program and plant translocations.	The Windarling Range W4 East Deposit proposal is generally not expected to result in a significant impact to flora values at species or ecosystem levels. Implementation of the Land Clearing Management Plan, Weed Management Plan, Fire Management Plan and the Dust Management Plan is expected to ensure the impact of the Windarling Range W4 East Deposit to flora values is managed to an acceptable standard. The impact to *Ricinocarpos brevis* will be offset through both direct environmental offsets and indirect environmental offsets. Accordingly, the potential impact of the Windarling Range W4 East Deposit proposal to flora can be managed to meet the EPA objective.
Fauna	EPA Objective: Fauna: To maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge (EPA	The fauna values of the Windarling Range include: • 6 Specially Protected Fauna species; • 4 DEC-classified	The Windarling Range W4 East Deposit proposal is expected to impact: • Nil Specially Protected Fauna species; • Nil DEC-classified 'Priority'	As identified in Section 3.2, Cliffs will manage the potential impact to fauna values for the Windarling Range W4 East Deposit proposal by implementation of: • Fauna Management Plan	The Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to fauna values at species or ecosystem levels.

FACTOR	EPA OBJECTIVE and EPA GUIDANCE	NATURAL & HUMAN ENVIRONMENT	POTENTIAL IMPACT	MANAGEMENT	PREDICTED OUTCOME
	2010b). EPA Guidance: • EPA Guidance Statement #20: Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia (EPA 2009). • EPA Guidance Statement #33: Environmental Guidance for Planning and Development (EPA 2008b). • EPA Guidance Statement #54: Sampling of Subterranean Fauna in Groundwater and Caves (EPA 2003b). • EPA Guidance Statement #54a: Sampling Methods and Survey Considerations for Subterranean Fauna in Western Australia (EPA 2007a). • EPA Guidance Statement #55: Implementing Best Practice in proposals submitted to the Environmental Impact Assessment Process (EPA 2003a). • EPA Guidance Statement #56: Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (EPA 2004b). • Technical Guide: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA & DEC 2010)	'Priority' fauna species; and • An array of other terrestrial vertebrate fauna, and terrestrial and subterranean invertebrate fauna, not of conservation significance. (BCE 2010)	fauna species; and • An array of other terrestrial vertebrate fauna, and terrestrial and subterranean invertebrate fauna, not of conservation significance. Impact to the above fauna values is not expected to be significant.	(Cliffs 2011e; Appendix 7); and • Land Clearing Management Plan (Cliffs 2011a; Appendix 3); Implementation of the above management plans is expected to result in the Windarling Range W4 East Deposit proposal not having a significant impact to fauna values.	Implementation of the Fauna Management Plan and the Land Clearing Management Plan is expected to ensure the impact of the Windarling Range W4 East Deposit to fauna values is managed to an acceptable standard. Accordingly, the potential impact of the Windarling Range W4 East Deposit proposal to fauna can be managed to meet the EPA objective.
Mine Closure	EPA Objectives: Decommissioning: To ensure, as far as practicable, that rehabilitation achieves a stable and functioning landform which is consistent with the surrounding landscape and other environmental values (EPA 2010b). EPA Guidance: • EPA Guidance Statement #6: Rehabilitation of Terrestrial Ecosystems (EPA 2006b). • Guidelines for Preparing Mine Closure Plans (DMP & EPA 2011).	N/A	Mine closure for the Windarling Range W4 East Deposit proposal will result in: • An abandonment bund being installed around the perimeter of the Windarling Range W4 East Deposit Mine Pit; and • Rehabilitation of the Windarling Range W4 East Deposit Haul Road with native vegetation.	As identified in Section 3.3, Cliffs will undertake mine closure for the Windarling Range W4 East Deposit proposal by implementation of: • Mine Closure Plan (Cliffs 2012a; Appendix 8). Implementation of the above management plan is expected to result in acceptable mine closure of the Windarling Range W4 East Deposit proposal.	Implementation of the Mine Closure Plan is expected to result in acceptable mine closure of the Windarling Range W4 East Deposit proposal. Accordingly, mine closure of the Windarling Range W4 East Deposit proposal can be managed to meet the EPA objective.

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Symbols and Acronyms

%	percent
^{o}	degree
>	greater than
≥	greater than or equal to
<	less than
≤	less than or equal to
^{o}C	temperature in degrees Celsius
A$	Australian dollars
AHD	Australian Height Datum
API	Assessment on Proponent Information
CRG	Community Reference Group
C'th	Commonwealth of Australia
DEC	Department of Environment and Conservation (WA)
DIA	Department of Indigenous Affairs (WA)
DMP	Department of Mines and Petroleum (WA)
DoW	Department of Water (WA)
DoSEWPC	Department of Sustainability, Environment, Water, Population and Communities (C'th)
DRDL	Department of Regional Development and Lands (WA)
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management System
EPA	Environmental Protection Authority (WA)
Fe	iron (chemical symbol)
ha	hectare
in prep.	in preparation
ISO	International Standards Organisation
IUCN	International Union for Conservation of Nature
km	kilometre
km^2	square kilometre
km/h	kilometres per hour
m	metre
M	million
Mt	million tonnes
M77/999	Mining Lease (example alpha-numeric code)
OEPA	Office of the Environmental Protection Authority (WA)
pers. com.	personal communication
sp.	species
ssp.	subspecies
WA	Western Australia

Terms

The terms used in this document have the following meanings:

Abandonment Bund means an earthen embankment placed around the crest of a mine pit for the purpose of preventing inadvertent human access to an abandoned mine pit and which is placed at a distance not being potentially susceptible to mine pit wall collapse.

Acid and Metaliferous Drainage (AMD) means a mobilised sulphuric acid leachate (a liquid) generated from the oxidation of sulphur present within waste rock material, which in turn, can cause the release of metals into the leachate.

Annual Recurrence Interval (ARI) means the average or expected value of the periods between exceedances of a given rainfall total accumulated over a given duration (as defined in BoM 2011a). A rainfall event of 1:10 ARI has a 9.5% chance of being equalled or exceeded within any one year (percentage expressed as an Annual Exceedance Probability (AEP)).

Assessment on Proponent Information means a level of environmental impact assessment as defined by the Environmental Protection Authority's Administrative Procedures 2010 (EPA 2010a).

Conservation Significance means, in relation to flora or fauna, a species or an association of species listed and protected under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th), *Wildlife Conservation Act 1950* (WA), Japan - Australia Migratory Birds Agreement 1981 (Government of Australia and Government of Japan 1981), China - Australia Migratory Birds Agreement 1988 (Government of Australia and Government of the People's Republic of China 1988), Republic of Korea – Australia Migratory Birds Agreement 2007 (Government of Australia and Government of the Republic of Korea (2007) or the Convention on the Conservation of Migratory Species of Wild Animals 1979 (Government of Australia 1979). Conservation significance may also relate to species considered to be under threat or otherwise in need of protection as indicated by published literature, scientific/expert opinion or other guidance.

Dewatering means the process of extracting groundwater to the surface that is undertaken to result in a temporary reduction in the elevation of the groundwater table.

Environmental Impact Assessment means the process of environmental assessment as defined under Part IV of the *Environmental Protection Act 1986* (WA).

Environmental Offset means an environmentally beneficial activity or activities undertaken to counterbalance an adverse environmental impact (as defined in EPA 2006a). Environmental offsets are considered after efforts to avoid or minimise impacts have been made and significant residual impacts still remain (as identified in EPA 2006a).

Fauna means animals, both indigenous and introduced.

Flora means plants, both indigenous and introduced.

Inert means not readily chemically reactive with other substances.

Mine Closure means the processes by which mine infrastructure is removed, actions are undertaken to ensure human safety, contaminated areas are remediated and impacted areas are rehabilitated to restore their environmental values.

Mine Pit means the open ground excavation for accessing an ore resource.

Mining, as defined by the *Mining Act 1978* (WA), means fossicking, prospecting and exploring for minerals, and mining operations.

Mining Operations, as defined by the *Mining Act 1978* (WA), means any mode or method of working whereby the earth or any rock structure stone fluid or mineral bearing substance may be disturbed removed washed sifted crushed leached roasted distilled evaporated smelted or refined or dealt with for the purpose of obtaining any mineral there from whether it has been previously disturbed or not and includes –

(a) the removal of overburden by mechanical or other means and the stacking, deposit, storage and treatment or any other substance considered to contain any mineral; and
(b) operations by means of which salt or other evaporates may be harvested; and
(c) operations by means of which mineral is recovered from the sea or a natural water supply; and
(d) the doing of all lawful acts incident or conducive to any such operation or purposes.

Migratory Species means fauna declared by the Commonwealth Minister for the Environment and protected under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) as a matter of national environmental significance for being a migratory species listed under the Convention on the Conservation of Migratory Species of Wild Animals 1979 (Bonn Convention), Japan-Australia Migratory Bird Agreement 1974, China-Australia Migratory Bird Agreement 1986 or the Republic of Korea-Australia Migratory Bird Agreement 2007.

Native Title means the recognition by Australian law that some Indigenous people have rights and interests to land that arise from their traditional laws and customs. Native Title rights may be exclusive (occupy to the exclusion of others) or non-exclusive.

Precautionary Principle means where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, decisions should be guided by (a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment, and (b) an assessment of the risk-weighted consequences of various options (as defined by s4A of the *Environmental Protection Act 1986* (WA)). Measures to prevent environmental degradation should also be cost effective, as defined by Principle 15 of the 1992 Rio Declaration (United Nations 1992).

Priority Ecological Community (PEC) means a naturally occurring vegetation assemblage that occurs in a particular type of habitat that is known from a few to many occurrences and which may or may not be managed for conservation and which may or may not be under threat. Classifications are made by DEC and categorised into five priority categories, with 'Priority 1' being of the highest conservation significance and/or a priority for surveying and determining the conservation significance based on current knowledge of perceived threat. PECs have no specific legal protection under the *Wildlife Conservation Act 1950* (WA) or the *Environmental Protection Act 1986* (WA), other than the general protection afforded to all native vegetation under such legislation.

Priority Fauna means fauna which are known from one, a few or several populations which may or may not be under threat, or may otherwise be rare. Classifications are made by DEC and categorised into 5 priority categories, with Priority 1 being of the highest conservation significance and/or a priority for surveying and determining the conservation significance based on current knowledge of perceived threat. Priority fauna have no specific legal protection under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th), *Wildlife Conservation Act 1950* (WA) or the *Environmental Protection Act 1986* (WA).

Priority Flora means flora which are known from one, a few or several populations which may or may not be under threat, or may otherwise be rare. Classifications are made by DEC and categorised into four priority categories, with 'Priority 1' being of the highest conservation significance and/or a priority for surveying and determining the conservation significance based on current knowledge of perceived threat. Priority flora have no specific legal protection under the *Wildlife Conservation Act 1950* (WA)

or the *Environmental Protection Act 1986* (WA), other than the general protection afforded to all native vegetation under such legislation.

Proponent means Cliffs Asia Pacific Iron Ore Pty Ltd (ACN 001 892 995) as the proponent for the Windarling Range W4 East Deposit proposal.

Proposal means a project, plan, program, policy, operation, undertaking or development or change in land use as defined under the *Environmental Protection Act 1986* (WA). Development of the Windarling Range W4 East Deposit is a proposal.

Putrescible Waste means a waste substance that is readily able to undergo decomposition when in contact with air or moisture (e.g. food).

Rare Flora means flora that is declared by the Western Australian Minister for Environment as protected under the *Wildlife Conservation Act 1950* (WA) due to it being considered likely to become extinct or rare and therefore in need of special protection, or flora that is presumed to be extinct in the wild and therefore in need of special protection.

Short-Range Endemic Invertebrate Fauna means invertebrate fauna that are geographically restricted in range due to life characteristics that may include (one or a combination of) poor powers of dispersal, confinement to discontinuous habitats, low levels of fecundity, and/or have seasonal activity (active during cool and wet periods).

Significant means having, or likely to have, a major effect or impact of consequence. Antonym: Non-significant.

Specially Protected Fauna means fauna that is declared by the Western Australian Minister for Environment as protected under the *Wildlife Conservation Act 1950* (WA) due to it being rare or likely to become extinct, presumed to be extinct, subject to an international agreement on migratory birds, or are otherwise in need of special protection.

Species means the fundamental category of biological classification for flora and fauna, composed of genetically related individuals that share common characteristics and are capable of inbreeding.

Subterranean Invertebrate Fauna means invertebrate fauna that have adapted to live underground. Subterranean fauna includes stygobitic subterranean fauna (aquatic subterranean fauna) and troglobitic subterranean fauna (non-aquatic subterranean fauna).

Threatened Species means a species of flora or fauna declared by the Commonwealth Minister for Environment and protected under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) as a matter of national environmental significance for being extinct, facing a risk of extinction, or in need of a conservation program to prevent the species from a risk of extinction. Threatened species are allocated a category of extinct, extinct in the wild, critically endangered, endangered, vulnerable or conservation dependent.

Threatened Ecological Community means a vegetation unit that occurs in a particular type of habitat that is facing a high, very high or extremely high risk of extinction in the wild in the medium-term, near or immediate future. Threatened Ecological Communities are declared and protected under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th), with subsequent protection also afforded under the *Environmental Protection Act 1986* (WA).

Unallocated Crown Land means Crown land in which no interest is known to exist (other than native title within the meaning of the *Native Title Act 1993* (C'th) and which is not reserved, declared or otherwise dedicated under the *Land Administration Act 1997* (WA).

Vegetation means an assemblage of flora species.

Waste Rock means the rock and soil material excavated from a mine pit that does not contain a concentration of iron at an economic grade (which may change subject to international market specifications and/or available technologies).

Waste Rock Landform means a designed, engineered and constructed structure made of waste rock.

Windarling Range W3/5 Deposit Waste Rock Landform means the landform constructed with part tenements M77/999, M77/1000 and M77/1038 used for the disposal of waste rock. The Windarling Range W3/5 Deposit Waste Rock Landform does not form part of the Windarling Range W4 East Deposit Proposal.

Windarling Range W4 East Deposit means the iron ore deposit of the Windarling Range W4 East Deposit proposal.

Windarling Range W4 East Deposit Haul Road means area of the haul road within part tenement M77/999 that connects the Windarling Range W4 East Deposit Mine Pit to the existing Windarling Range mine operations.

Windarling Range W4 East Deposit Mine Pit means the open ground excavation within part tenement M77/999 to access the ore of the Windarling Range W4 East Deposit.

Windarling Range W4 East Deposit Proposal means the proposal to undertake mining of the Windarling Range W4 East Deposit and includes the mine pit (27.5ha) and haul road (0.5ha) infrastructure located within part tenement M77/999, but does not include (a) the pre-existing components of Cliffs' Yilgarn Operations, (b) surveys and/or investigations of a geological or geotechnical or environmental or hydrological or planning or heritage nature (including any potential impacts associated with such surveys and/or investigations), (c) changes in asset ownership or land tenure, or (d) approval or consent or agreement associated with the existing components of Cliffs' Yilgarn Operations or surveys or investigations or ownership or tenure.

Windarling Range W4 West Deposit Mine Pit means the open ground excavation within part tenement M77/999 to access the ore of the Windarling Range W4 West Deposit. The Windarling Range W4 West Deposit Mine Pit does not form part of the Windarling Range W4 East Deposit Proposal.

Windarling Range W4 West Deposit Waste Rock Landform means the landform constructed with part tenement M77/999 within the area of the Windarling Range W4 West Deposit Mine Pit, used for the disposal of waste rock. The Windarling Range W4 West Deposit Waste Rock Landform does not form part of the Windarling Range W4 East Deposit Proposal.

Yilgarn Operations means the iron ore mining operations at the Koolyanobbing Range (Deposits A to K), Mt Jackson Range (Deposits J1 to J3), Windarling Range (Deposits W1 to W5), ore processing facility at Koolyanobbing, and road and rail facilities between these operations and the Port of Esperance where the ore is exported to international customers.

1 The Proposal

1.1 The Proponent

The Proponent for the Windarling Range W4 East Deposit proposal is:

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Cliffs is a supplier of Western Australian iron ore, with mine operations in the Yilgarn region and at Cockatoo Island. Approximately 80% of the mined ore is exported to China, with the remaining 20% exported to Japan.

Mine operations are undertaken in accordance with Cliffs' Environmental Policy (Cliffs Natural Resources 2008; Appendix 1). The Environmental Policy outlines Cliffs' overarching objectives of environmental protection and continual improvement in environmental performance. The Environmental Policy is implemented through Cliffs' Environmental Management System (EMS), which includes Environmental Management Plans (EMPs) for key environmental matters related to the mine operations. Cliffs' EMS for its Yilgarn Operations is certified and maintained to Australian and New Zealand Standard ISO 14001:2004 (NCSI 2011; Appendix 2).

1.2 Windarling Range W4 East Deposit Proposal

Cliffs' Yilgarn Operations include the mining of iron ore deposits at the Koolyanobbing Range, Mt Jackson Range and the Windarling Range, processing of ore at Koolyanobbing, and road and rail transport between these operations and the Port of Esperance where the processed ore is exported to international customers.

Cliffs proposes to expand its Yilgarn Operations to include an additional mining operation at the Windarling Range W4 East Deposit, located at the Windarling Range approximately 130km north of the town of Southern Cross in the Shire of Yilgarn.

The Windarling Range W4 East Deposit contains an estimated 6.8 million tonnes of iron ore having an estimated gross economic value of approximately A$1.06billion. Development and operation of the Windarling Range W4 East Deposit proposal has been scheduled to commence from 2013, with an expected mining-life of approximately 5 years. The Windarling Range W4 East Deposit proposal includes the development, operation and mine closure of a mine pit being 27.5ha in area and a haul road being 0.5ha in area, which connect to Cliffs' existing mine operations at the Windarling Range.

The regional location of Cliffs' Yilgarn Operations is depicted in Figure 1-1.

Figure 1-1 Regional Location of Cliffs' Yilgarn Operations. The Yilgarn Operations currently includes the mining of iron ore deposits on the Mt Jackson Range, Windarling Range and the Koolyanobbing Range, processing of ore at Koolyanobbing, and road and rail transport between these operations and the Port of Esperance where the processed ore is exported to international customers.

1.3 Proposal Characteristics

Table 1-1 identifies the characteristics of the Windarling Range W4 East Deposit proposal.

Figure 1-2 identifies the location of Cliffs' Yilgarn Operations and the Windarling Range W4 East Deposit proposal.

Figure 1-3 identifies the location of the Windarling Range W4 East Deposit proposal at the Windarling Range.

Figure 1-4 identifies the Windarling Range W4 East Deposit proposal infrastructure, in relation to other infrastructure at the Windarling Range. The other infrastructure depicted includes both existing developed infrastructure and infrastructure that has been approved but has yet to be developed.

Figure 1-5 identifies an indicative cross-section of the Windarling Range W4 East Deposit Mine Pit through its deepest section.

Figure 1-6 identifies an indicative cross section for the Windarling Range W4 East Deposit Haul Road.

ELEMENT	DESCRIPTION
GENERAL	
Location	Tenement M77/999 in the Shire of Yilgarn, Western Australia.
Mining Life	5 years (approximately)
Mining Method	Open cut
Area	28.0ha (as per the components listed below)
COMPONENTS	
Mine Pit	
Location	Tenement M77/999
Area	27.5ha
Depth	403mAHD (approximately)
Haul Road	
Location	Tenement M77/999
Area	0.5ha

Abbreviations:
ha = hectares
mAHD = metres in Australian Height Datum

All values stated are maximum values, unless otherwise specified.

Table 1-1 Characteristics of the Windarling Range W4 East Deposit Proposal.

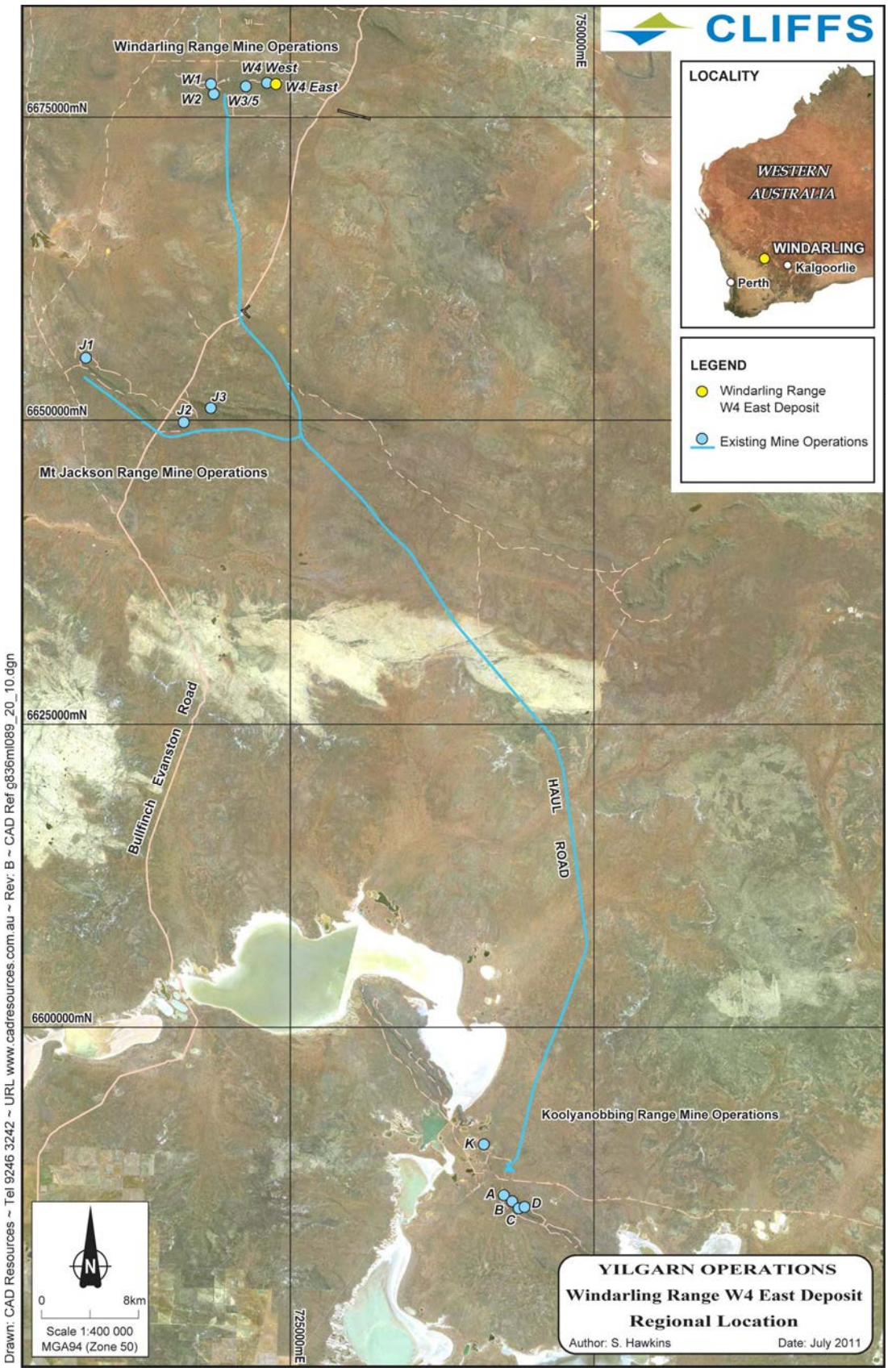

Figure 1-2 Location of Cliffs' Yilgarn Operations and the Windarling Range W4 East Deposit Proposal. The location of the Windarling Range W4 East Deposit proposal is identified in yellow. Cliffs' existing mine operations at the Windarling Range, Mt Jackson Range and the Koolyanobbing Range and the haul road network are identified in blue.

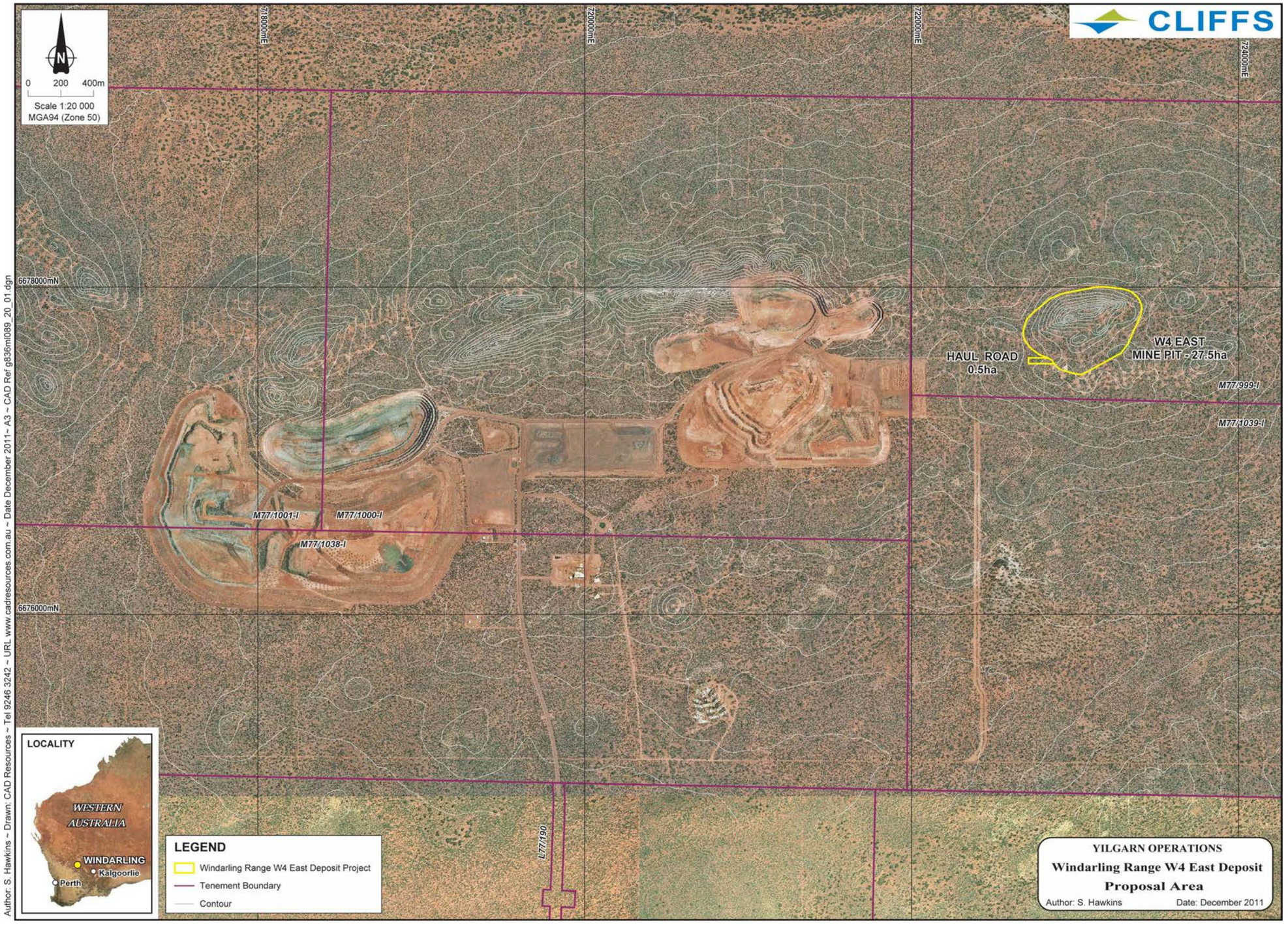

Figure 1-3 Location of the Windarling Range W4 East Deposit Proposal at the Windarling Range. The Windarling Range W4 East Deposit proposal area, indicated in yellow, is located at the eastern end of Cliffs' existing Windarling Range mine operations.

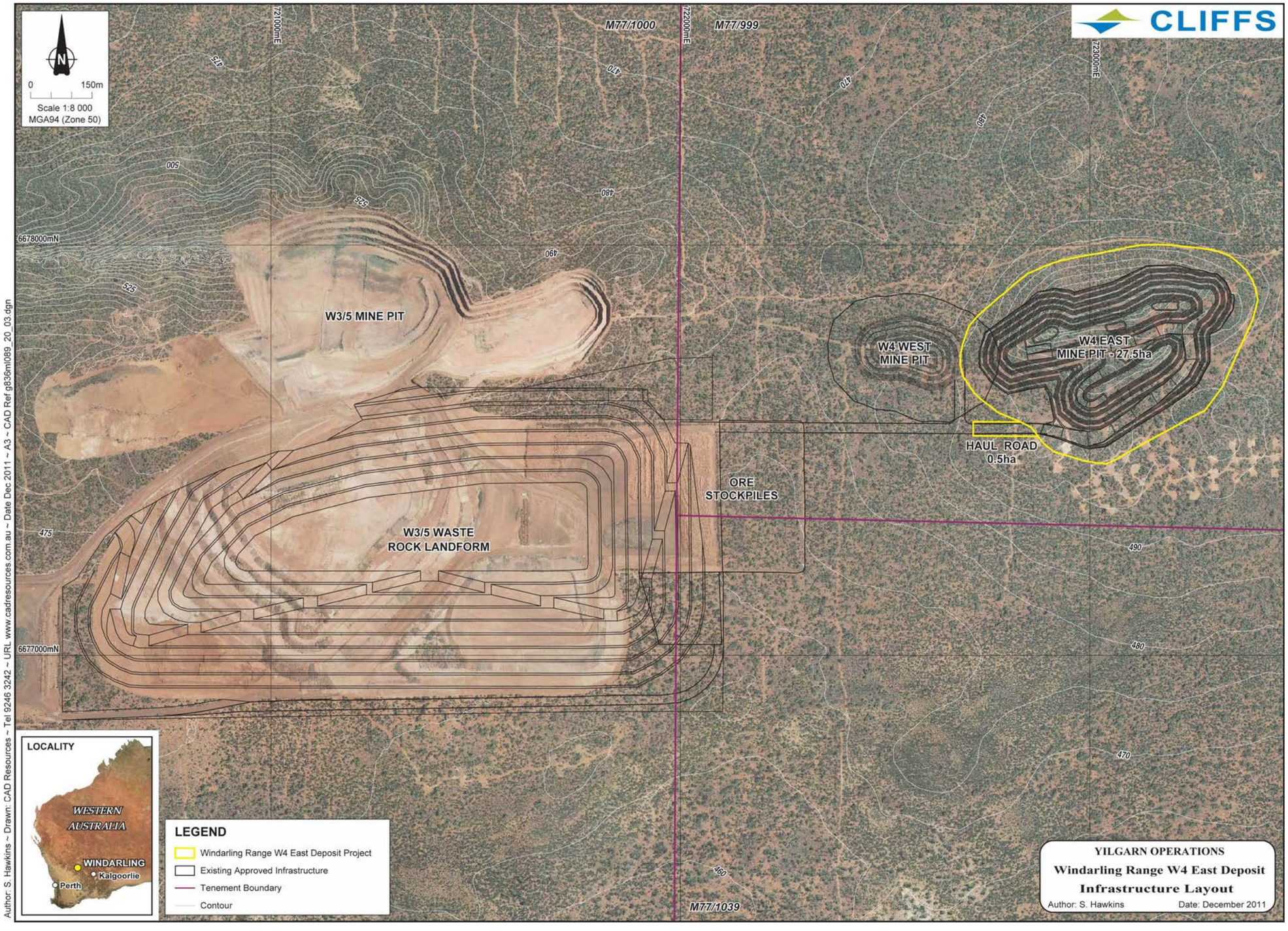

Figure 1-4 Windarling Range W4 East Deposit Proposal Infrastructure. The Windarling Range W4 East Deposit infrastructure, identified within the yellow polygon, includes one mine pit (27.5ha) and one haul road (0.5ha). To provide context, the design of Cliffs' other approved infrastructures at the Windarling Range that are related to the Windarling Range W4 East Deposit proposal are also identified.

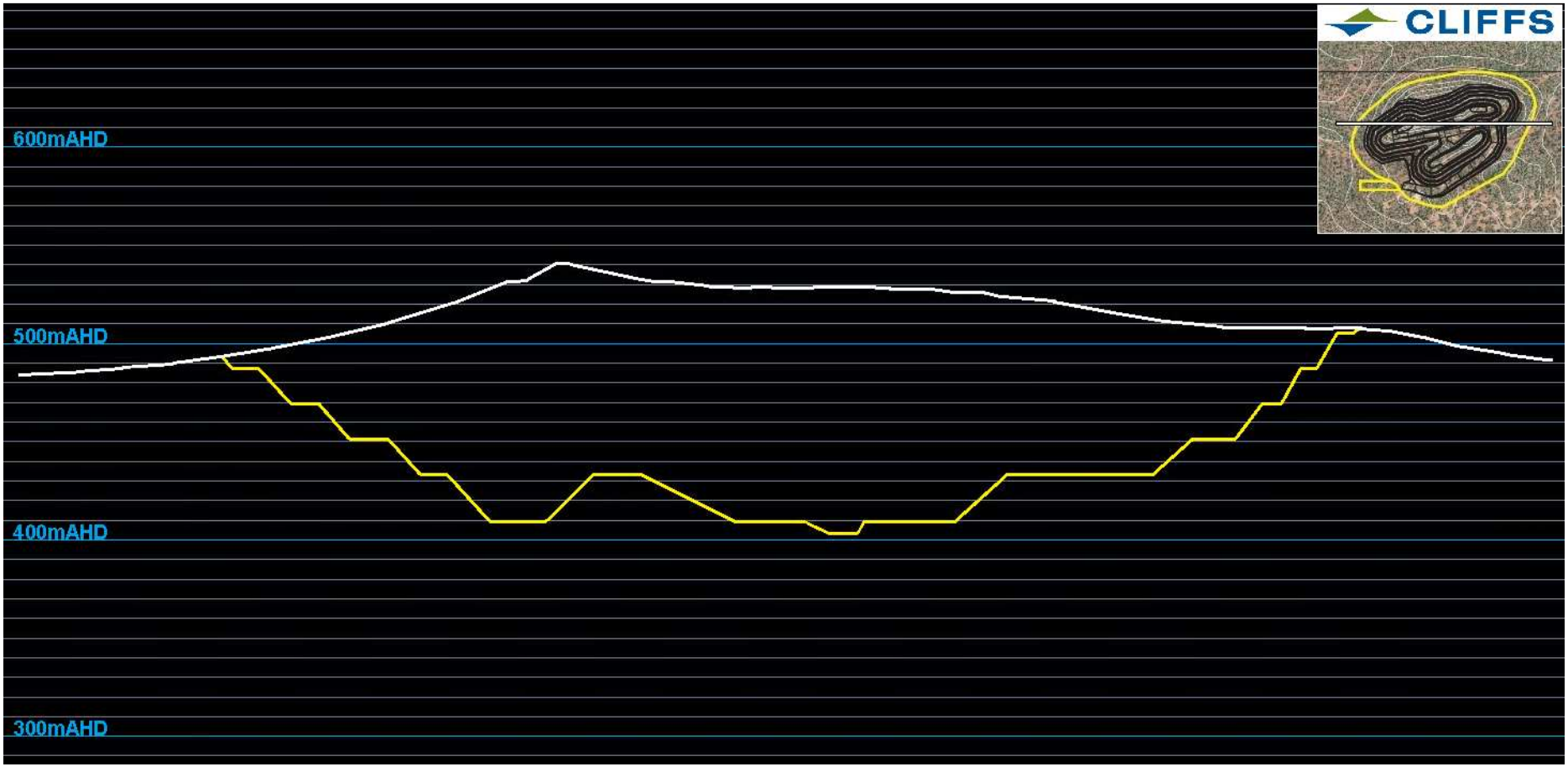

Figure 1-5 Windarling Range W4 East Deposit Mine Pit Cross-section. The cross-section for the Windarling Range W4 East Deposit Mine Pit is indicated in yellow. The existing land topography is indicated in white. The inset image identifies the location of the cross-section.

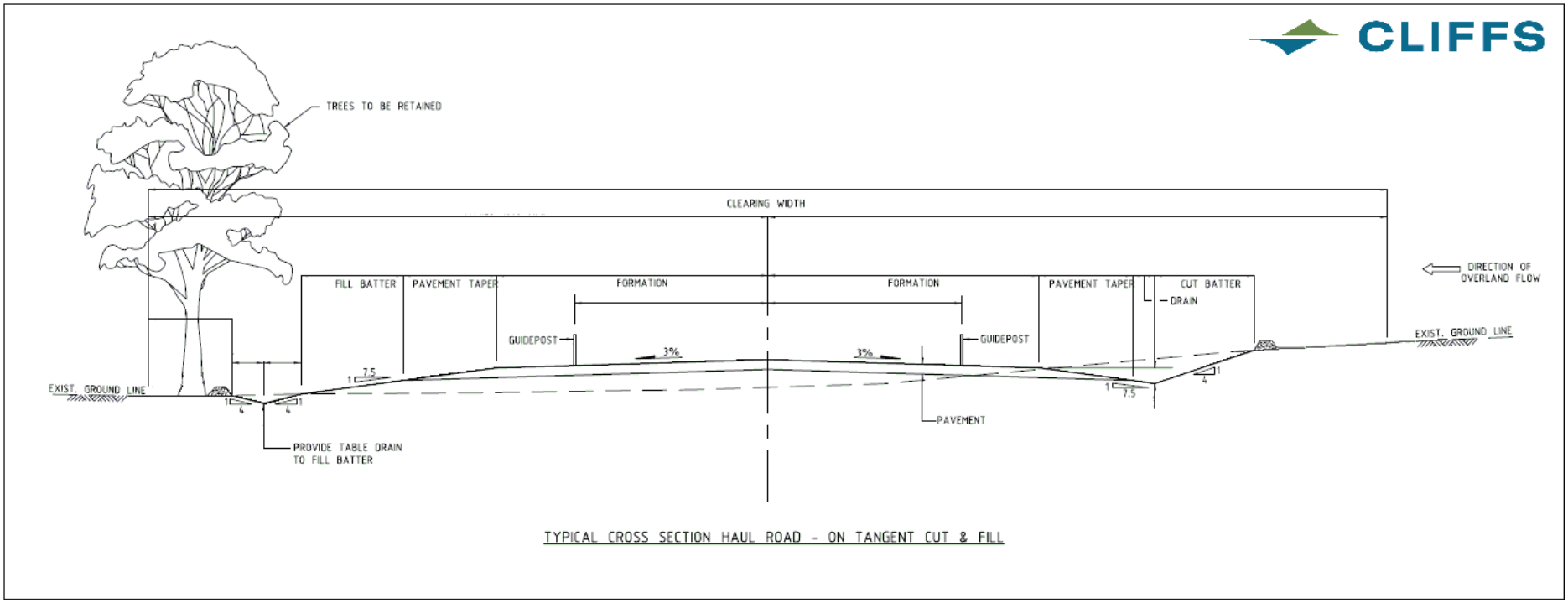

Figure 1-6 Windarling Range W4 East Deposit Haul Road Cross-section. The cross-section depicts a typical haul road design used by Cliffs at its mine operations. Source: adapted from RoadsWest Engineering Group WA Pty Ltd (2010 unpublished).

1.4 Proposal Description

A description of the components of the Windarling Range W4 East Deposit proposal is provided below.

1.4.1 Mine Pit

The Windarling Range W4 East Deposit Mine Pit will yield an estimated 6.8Mt of iron ore of a 60.5% Fe average grade. Mining will be undertaken by the standard open-cut mining methods of blasting and excavation to an elevation of approximately 403mAHD, creating a mine pit of approximately 100m depth below the surrounding ground surface.

The Windarling Range W4 East Deposit Mine Pit will require an area of 27.5ha. This area incorporates the area required for a post-mining abandonment bund installation in accordance with the requirements of the Department of Mines and Petroleum (DMP 1997), as outlined in Section 3.3 Mine Closure. This area also incorporates areas for the temporary stockpiling of vegetation and topsoil and subsoil cleared from the area of the mine pit.

Mine dewatering of the Windarling Range W4 East Deposit Mine Pit will not be required as mining will occur above the natural groundwater elevation of approximately 400mAHD.

The waste rock to be excavated from the Windarling Range W4 East Deposit Mine Pit has been characterised as non-saline, non-acid forming and having a low potential for metaliferous drainage (SWC 2010). Waste rock will be disposed of to a combination of the Windarling Range W3/5 Deposit Waste Rock Landform and by backfilling the Windarling Range W4 West Deposit Mine Pit following its mining (refer Figure 1-4).

At mine closure, the Windarling Range W4 East Deposit Mine Pit will be retained as an open mine void, as outlined in Section 3.3 Mine Closure. The Windarling Range W4 East Deposit Mine Pit will not be rehabilitated as the consolidated rock substrate and steep sides are not conducive to plant growth. Additionally, it is not safe for mine personnel to attempt rehabilitation on the steep sides of a mine pit.

1.4.2 Haul Road

A 0.5ha unsealed haul road will be constructed to connect the Windarling Range W4 East Deposit Mine Pit to Cliffs' existing Windarling Range mine operations. The Windarling Range W4 East Deposit Haul Road will connect to the (yet to be constructed) Windarling Range W4 West Deposit Haul Road which has previously been approved under the *Environmental Protection Act 1986* (WA) and the *Mining Act 1978* (WA) (refer Figure 1-4).

The haul road will be subject to an engineering design catering for a 1:10 year Annual Recurrence Interval (ARI) for rainfall, which is consistent with the engineering design of Cliffs' existing haul road network. Drainage will be controlled using a combination of table drains, sumps and earthen bunding (as required) to manage road drainage and allow for the drainage water to infiltrate and/or evaporate.

At mine closure, the Windarling Range W4 East Deposit Haul Road area will be rehabilitated with native vegetation, as outlined in Section 3.3 Mine Closure.

1.5 Proposal Exclusions

Cliffs' existing infrastructures and facilities at the Windarling Range mine operations includes mine pits, waste rock landforms, stockpiles, administration and workshop facilities, water and wastewater treatment facilities, water dams, power generation facilities, chemical and hydrocarbon and explosive storage facilities, waste management facilities, an airstrip and a mine camp. Cliffs' existing infrastructures and facilities do not form part of the Windarling Range W4 East Deposit proposal. These existing infrastructures and facilities have been assessed and approved under separate statutory processes, and these infrastructures and facilities will be used to the extent necessary under these existing approvals to support the development of the Windarling Range W4 East Deposit proposal. These infrastructures and facilities do not require re-assessment or re-approval for their continued use to support the Windarling Range W4 East Deposit proposal.

With regard to infrastructures and facilities directly connected to the Windarling Range W4 East Deposit proposal, the following are specifically not part of the Windarling Range W4 East Deposit proposal:

1.5.1 Windarling Range W3/5 Deposit Waste Rock Landform

Waste rock to be excavated from the Windarling Range W4 East Deposit Mine Pit will be disposed of to the Windarling Range W3/5 Deposit Waste Rock Landform (refer Figure 1-4). The Windarling Range W3/5 Deposit Waste Rock Landform has previously been assessed and approved under the provisions of both the *Environmental Protection Act 1986* (WA) and the *Mining Act 1978* (WA). Accordingly, the Windarling Range W3/5 Deposit Waste Rock Landform does not form part of the Windarling Range W4 East Deposit proposal, and the continued use of the Windarling Range W3/5 Deposit Waste Rock Landform to support the development of the Windarling Range W4 East Deposit proposal does not require reassessment or re-approval.

1.5.2 Windarling Range W4 West Deposit Mine Pit and Waste Rock Landform

Waste rock to be excavated from the Windarling Range W4 East Deposit Mine Pit will also be disposed of by backfilling the Windarling Range W4 West Deposit Mine Pit following its mining, to form a new Windarling Range W4 West Deposit Waste Rock Landform (refer Figure 1-4). The Windarling Range W4 West Deposit Mine Pit was previously assessed and approved under the provisions of both the *Environmental Protection Act 1986* (WA) and the *Mining Act 1978* (WA). As the Windarling Range W4 West Deposit Waste Rock Landform will result in a positive environmental outcome by replacement of an unrehabilitated mine void with a rehabilitated waste rock landform, the Windarling Range W4 West Deposit Waste Rock Landform will not result in a significant environmental impact that would require assessment and approval under Part IV of the *Environmental Protection Act 1986* (WA). Accordingly, the Windarling Range W4 West Deposit Waste Rock Landform does not form part of Windarling Range W4 East Deposit proposal. The construction of the Windarling Range W4 West Deposit Waste Rock Landform will be subject to the assessment and approvals processes under the provisions of the *Mining Act 1978* (WA).

1.6 Environmental Management

Cliffs' existing mine operations are undertaken in accordance with an EMS. Cliffs' EMS is certified and maintained to Australian and New Zealand Standard ISO:14001 (NCSI 2011; Appendix 2). Cliffs' EMS contains a series of EMPs that have previously been subject to review of the Commonwealth Department of Sustainability Environment Water Population and Communities (DoSEWPC), Environmental Protection Authority (EPA), Department of Environment and Conservation (DEC) and DMP for the management of key environmental matters related to mine operations.

The EMS and the series of EMPs are an integral management component of Cliffs' existing mine operations. Compliance with the EMS and EMPs is regularly audited both internally and by external consultants in order to ensure compliance, and to identify any changes necessary to achieve improved environmental outcomes. The regular auditing of the EMS and EMPs is consistent with Cliffs' Environmental Policy (Cliffs Natural Resources 2008; Appendix 1) for evaluation of performance against environmental targets.

To ensure consistency in mine operations and environmental protection, Cliffs proposes that the EMPs from Cliffs' EMS are also used for the Windarling Range W4 East Deposit proposal. These EMPs are considered to be appropriate for application to the Windarling Range W4 East Deposit proposal due to the environmental and operational similarities to Cliffs' existing mine operations. Accordingly, the following EMPs have been included and referred to in this Environmental Impact Assessment (EIA) Assessment on Proponent Information (API) document for the Windarling Range W4 East Deposit proposal:

- Land Clearing Management Plan (Cliffs 2011a; Appendix 3);
- Weed Management Plan (Cliffs 2011b; Appendix 4);
- Fire Management Plan (Cliffs 2011c; Appendix 5);
- Dust Management Plan (Cliffs 2011d; Appendix 6); and
- Fauna Management Plan (Cliffs 2011e; Appendix 7).

In addition to the above, Cliffs has also prepared the following EMP for the mine closure of the Windarling Range W4 East Deposit proposal, consistent with the DMP and EPA (2011) guideline for mine closure plans:

- Mine Closure Plan (Cliffs 2012a; Appendix 8).

The EMPs contained in Appendices 3 to 8 form part of the impact assessment for the Windarling Range W4 East Deposit proposal as they prescribe how the key environmental factors will be managed during mine development, mine operation and mine closure. Accordingly, consideration of the Windarling Range W4 East Deposit proposal should include consideration of the management and procedural actions contained within these EMPs.

As part of this EIA-API document, Cliffs makes a number of environmental commitments to implement the above EMPs for the management of key environmental factors relevant to the Windarling Range W4 East Deposit proposal. Cliffs supports these commitments to implement the EMPs to become legally binding in an approval from the WA Minister for Environment for the Windarling Range W4 East Deposit proposal under s45(5) the *Environmental Protection Act 1986* (WA).

1.7 Government Assessment and Approval Processes

The Windarling Range W4 East Deposit proposal will require assessment and approval under the *Environmental Protection Act 1986* (WA) and the *Mining Act 1978* (WA). The Windarling Range W4 East Deposit proposal has previously been considered under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th). A summary of these government assessment and approvals process is described below.

1.7.1 *Environmental Protection Act 1986* (WA)

The *Environmental Protection Act 1986* (WA) is the principal environmental protection legislation in Western Australia. The *Environmental Protection Act 1986* (WA) identifies that a proposal that is likely to have a significant impact on the environment may be referred to EPA for assessment. If EPA elects to assess a referred proposal, the Proponent for the proposal is to prepare an EIA document for consideration by EPA, with the EPA to report on the proposal to the Minister for the Environment. The Minister for the Environment subsequently determines if the proposal may be implemented and, if approved, imposes any environmental conditions or procedures considered necessary.

On 22nd October 2010, Cliffs referred the Windarling Range W4 East Deposit proposal to EPA in accordance with s38(1) of the *Environmental Protection Act 1986* (Cliffs 2010a). The EIA-API process is depicted by Figure 1-7.

On 23rd February 2011, EPA determined that the Windarling Range W4 East Deposit proposal should be subject to an EIA at an Assessment on Proponent Information (API) level (EPA 2011b), with Cliffs notified of the EPA decision by the Office of the EPA (OEPA) on 28th February 2011 (EPA 2011c).

On 6th April 2011, OEPA provided a Scoping Guideline (EPA 2011a) outlining the key environmental factors relevant to the Windarling Range W4 East Deposit proposal to be assessed in an EIA-API document prepared by Cliffs, being:

- Flora;
- Fauna; and
- Mine Closure.

This EIA-API document has been prepared by Cliffs in accordance with EPA (2011a & 2010a) for the purposes of an environmental impact assessment of the Windarling Range W4 East Deposit proposal under s40(2)(b) of the *Environmental Protection Act 1986* (WA).

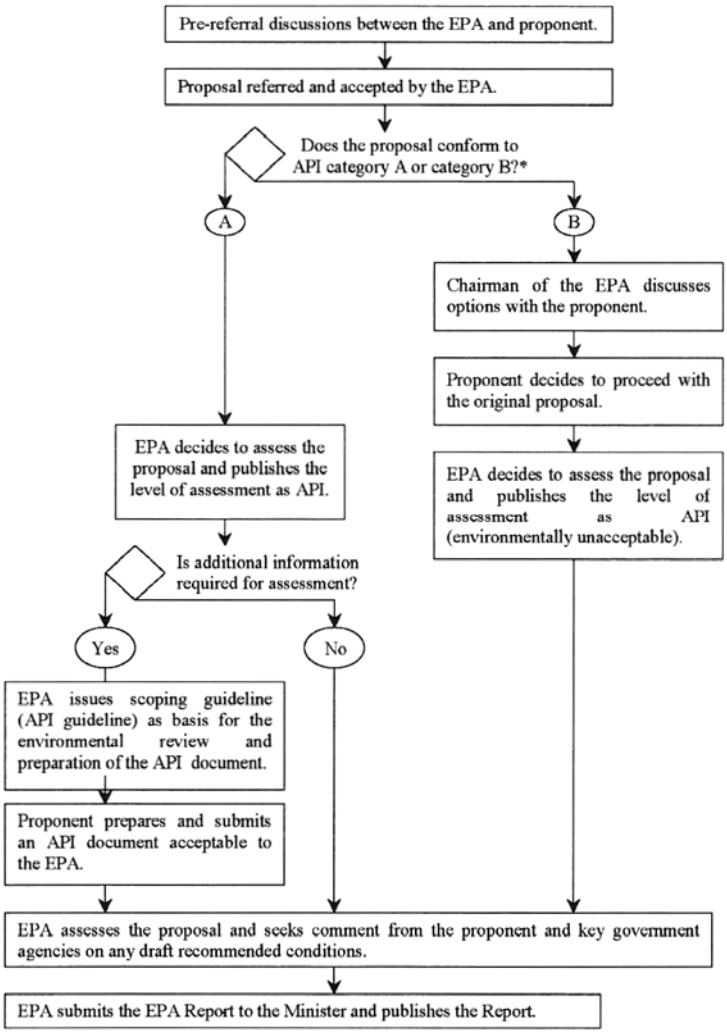

Figure 1-7 Environmental Impact Assessment (Assessment on Proponent Information) process under the *Environmental Protection Act 1986* (WA). This document has been prepared for the purposes of preparing an EIA-API document acceptable to EPA. Following the EPA Report to the Minister for Environment, the Minister will determine if the proposal can be implemented (not shown). Source: EPA (2010a).

1.7.2 *Mining Act 1978* (WA)

The *Mining Act 1978* (WA) is the principal mining legislation in Western Australia and is regulated by DMP. The purpose of the *Mining Act 1978* (WA) is to control mineral exploration and mine operations. Prior to undertaking mining operations, a Proponent is required to prepare a Mining Proposal in accordance with relevant guidelines for consideration by DMP, with DMP to subsequently determine on behalf of the Minister for Mines and Petroleum if the proposed mine operations may be implemented and, if approved, imposes any environmental and/or mining conditions considered necessary.

Cliffs will prepare and submit a Mining Proposal to DMP for the Windarling Range W4 East Deposit proposal in accordance with the *Mining Act 1978* (WA). This process is scheduled to commence from Q2 2012.

1.7.3 *Environment Protection and Biodiversity Conservation Act 1999* (C'th)

The *Environment Protection and Biodiversity Conservation Act 1999* (C'th) is the principal commonwealth environmental legislation and is regulated by DoSEWPC. The *Environment Protection and Biodiversity Conservation Act 1999* (C'th) identifies that a proposal that is likely to have a significant impact on a matter of national environmental significance, such as 'Threatened Species' of flora or fauna, is a controlled action requiring assessment. If DoSEWPC elects to assess a controlled action, the Proponent for the controlled action is to prepare an EIA document for consideration by DoSEWPC, with DoSEWPC to report on the controlled action to the Commonwealth Minister for Environment. The Commonwealth Minister for Environment (or DoSEWPC, under delegation) subsequently determines if the controlled action may be implemented and, if approved, imposes any environmental conditions or procedures considered necessary.

On 16th November 2009, Cliffs referred the Windarling Range W4 East Deposit proposal to DoSEWPC in accordance with s68(2) of the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) for potential impacts to threatened species (Cliffs 2009).

On 17th December 2009, DoSEWPC determined that the Windarling Range W4 East Deposit proposal was not a controlled action and therefore did not require assessment or approval under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) (DoSEWPC 2009).

1.8 Related Environmental Approvals

The Windarling Range W4 East Deposit proposal will be integrated into Cliffs' existing Yilgarn Operations. There are a number of related environmental approvals that are relevant for consideration as outlined below.

1.8.1 Implementation Statement 627 under Part IV of the *Environmental Protection Act 1986* (WA)

Implementation Statement 627 was issued to Cliffs by the WA Minister for the Environment in 2003 (WA Minister for the Environment 2003) for expansion of Cliffs' Yilgarn Operations, including development and operation of the Windarling Range and Mt Jackson Range mine operations, and a haul road connecting both to Cliffs' pre-existing Koolyanobbing Range mine operations. Cliffs' existing infrastructures and facilities constructed and operated under the Implementation Statement 627 approval include mine pits, waste rock landforms, stockpiles, administration and workshop facilities, water and wastewater treatment facilities, water dams, power generation facilities, waste management facilities, an airstrip, a mine camp and a haul road network.

Whilst these existing infrastructures and facilities approved under Implementation Statement 627 do not form part of the Windarling Range W4 East Deposit proposal, Implementation Statement 627 is considered a related environmental approval as these infrastructures and facilities will continue to be used to the extent necessary under the Implementation Statement 627 approval to support the development of the Windarling Range W4 East Deposit proposal.

1.8.2 Licence 5850 under Part V of the *Environmental Protection Act 1986* (WA)

Licence 5850 was issued to Cliffs by DEC for prescribed activities occurring at Cliffs' Koolyanobbing Range mine operations, including operation of the Koolyanobbing Ore Handling Plant for ore processing as a 'prescribed premises' under Category 12 of the *Environmental Protection Act 1986* (WA) (DEC 2010a).

Whilst the Koolyanobbing Ore Handling Plant does not form part of the Windarling Range W4 East Deposit proposal, Licence 5850 is considered a related environmental approval as ore from the Windarling Range W4 East Deposit proposal will be processed within the Koolyanobbing Ore Handling Plant operated under the Licence 5850 approval to support the development of the Windarling Range W4 East Deposit proposal.

1.8.3 Groundwater Licence GWL154459 under the *Rights in Water and Irrigation Act 1914* (WA)

Groundwater abstraction for Cliffs' Yilgarn Operations is undertaken in accordance with Groundwater Licence GWL154459 issued by DoW under the *Rights in Water and Irrigation Act 1914* (WA) (DoW 2011). Cliffs' Yilgarn Operations includes groundwater well infrastructures to enable groundwater abstraction for dust suppression. Whilst Cliffs' groundwater well infrastructures do not form part of the Windarling Range W4 East Deposit proposal, Groundwater Licence GWL154459 is considered a related environmental approval as abstracted groundwater will be used for dust suppression under the Groundwater Licence GWL154459 approval to support the development of the Windarling Range W4 East Deposit proposal.

1.9 Impacts, Management and Predicted Outcomes

1.9.1 Factors Assessed

This document has been prepared to meet the requirements of EPA for the purposes of an EIA-API under Part IV of the *Environmental Protection Act 1986* (WA) for the Windarling Range W4 East Deposit proposal. The key environmental factors relevant to the Windarling Range W4 East Deposit proposal have been identified by EPA (2011a) as being:

- Flora;
- Fauna; and
- Mine Closure.

A summary of the impact assessment for key environmental factors, potential impact, proposed management and predicted outcomes for the Windarling Range W4 East Deposit proposal is identified in Table 1-2.

The assessment of each key environmental factor is based on published literature and field surveys. The information from these sources is summarised in context with the Windarling Range W4 East Deposit proposal. Further detail from this published literature and the field surveys can be obtained directly from those sources.

For each key environmental factor assessed, consideration has been given to the relevant legislative frameworks, guidance documentation and the proposed management plans through which the potential impacts of the Windarling Range W4 East Deposit proposal can be managed. Where appropriate, Cliffs has made commitments to undertake actions to minimise or mitigate the potential impacts of the Windarling Range W4 East Deposit proposal.

Environmental Management Plans have been included in Appendices 3 to 8 of this document to provide the details as to how Cliffs will manage the potential impacts of the Windarling Range W4 East Deposit proposal. These management plans form an integral part of the environmental impact assessment of the Windarling Range W4 East Deposit proposal. Cliffs requests that consideration be

given to the content of these EMPs during assessment of the Windarling Range W4 East Deposit proposal.

Cliffs has also undertaken consultation with a range of government agencies and community groups in planning for the Windarling Range W4 East Deposit proposal. Details of this consultation are described in Section 4 Consultation.

1.9.2 Factors Not Assessed

Matters not considered by EPA (2011a) to be key environmental factors for the Windarling Range W4 East Deposit proposal are not assessed in this EIA-API document. Table 1-3 identifies these other matters, a summary of the potential for impact, and identification of how these matters are proposed to be managed.

Table 1-2 Summary of Key Environmental Factors, Potential for Impact, Management Proposed and Predicted Outcomes for the Windarling Range W4 East Deposit Proposal (in accordance with EPA 2010a and EPA 2011a).

FACTOR	EPA OBJECTIVE and EPA GUIDANCE	NATURAL & HUMAN ENVIRONMENT	POTENTIAL IMPACT	MANAGEMENT	PREDICTED OUTCOME
Key Environmental Factors					
Flora	EPA Objective: Flora: To maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge (EPA 2010b). EPA Guidance: • EPA Guidance Statement #19: Environmental Offsets – Biodiversity (EPA 2008a). • EPA Guidance Statement #33: Environmental Guidance for Planning and Development (EPA 2008b). • EPA Guidance Statement #51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA 2004a). • EPA Guidance Statement #55: Implementing Best Practice in proposals submitted to the Environmental Impact Assessment Process (EPA 2003a). • EPA Position Statement #3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA 2002a). • EPA Position Statement #9: Environmental Offsets (EPA 2006a). • WA Environmental Offsets Policy (Government of Western Australia 2011).	The flora values of the Windarling Range include: • 2 Rare Flora species; • 5 DEC-classified 'Priority' flora species; • An array of other flora species not of conservation significance; and • 44 vegetation units. (Western Botanical 2010; Western Botanical 2011a)	The Windarling Range W4 East Deposit proposal is expected to impact: • 1 Rare Flora species; • 2 DEC-classified 'Priority' flora species; • An array of other flora species not of conservation significance; and • 10 vegetation units. The impact to 1,073 individuals of the Rare Flora species *Ricinocarpos brevis* may be considered significant. Following the application of direct environmental offsets (refer to Management column, right), the expected impact to 720 *Ricinocarpos brevis* individuals equates to an approximately 4% impact to *Ricinocarpos brevis* at the Windarling Range population scale (the cumulative impact increasing from 45% to 49%), and approximately 3% impact at a regional scale (the cumulative impact increasing from 34% to 37%). The impact to the other flora values are not expected to be significant.	As identified in Section 3.1, Cliffs will manage the impact to flora values for the Windarling Range W4 East Deposit proposal by implementation of: • Land Clearing Management Plan (Cliffs 2011a; Appendix 3); • Weed Management Plan (Cliffs 2011b; Appendix 4); • Fire Management Plan (Cliffs 2011c; Appendix 5); and • Dust Management Plan (Cliffs 2011d; Appendix 6). Implementation of the above management plans is expected to result in the Windarling Range W4 East Deposit proposal not having a significant impact to flora values. As also identified in Section 3.1, Cliffs will also implement environmental offsets for the impact to *Ricinocarpos brevis* which comprise of: • Direct environmental offsets incorporating avoidance of 353 individuals in approved mining impact areas and implementing a targeted rehabilitation program; and • Indirect environmental offsets incorporating a research program and plant translocations.	The Windarling Range W4 East Deposit proposal is generally not expected to result in a significant impact to flora values at species or ecosystem levels. Implementation of the Land Clearing Management Plan, Weed Management Plan, Fire Management Plan and the Dust Management Plan is expected to ensure the impact of the Windarling Range W4 East Deposit to flora values is managed to an acceptable standard. The impact to *Ricinocarpos brevis* will be offset through both direct environmental offsets and indirect environmental offsets. Accordingly, the potential impact of the Windarling Range W4 East Deposit proposal to flora can be managed to meet the EPA objective.
Fauna	EPA Objective: Fauna: To maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse	The fauna values of the Windarling Range include: • 6 Specially Protected Fauna species;	The Windarling Range W4 East Deposit proposal is expected to impact: • Nil Specially Protected Fauna species;	As identified in Section 3.2, Cliffs will manage the potential impact to fauna values for the Windarling Range W4 East Deposit proposal by implementation of:	The Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to fauna values at species or ecosystem

FACTOR	EPA OBJECTIVE and EPA GUIDANCE	NATURAL & HUMAN ENVIRONMENT	POTENTIAL IMPACT	MANAGEMENT	PREDICTED OUTCOME
	impacts and improvement in knowledge (EPA 2010b). EPA Guidance: • EPA Guidance Statement #20: Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia (EPA 2009). • EPA Guidance Statement #33: Environmental Guidance for Planning and Development (EPA 2008b). • EPA Guidance Statement #54: Sampling of Subterranean Fauna in Groundwater and Caves (EPA 2003b). • EPA Guidance Statement #54a: Sampling Methods and Survey Considerations for Subterranean Fauna in Western Australia (EPA 2007a). • EPA Guidance Statement #55: Implementing Best Practice in proposals submitted to the Environmental Impact Assessment Process (EPA 2003a). • EPA Guidance Statement #56: Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (EPA 2004b). • Technical Guide: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA & DEC 2010)	• 4 DEC-classified 'Priority' fauna species; and • An array of other terrestrial vertebrate fauna, and terrestrial and subterranean invertebrate fauna, not of conservation significance. (BCE 2010)	• Nil DEC-classified 'Priority' fauna species; and • An array of other terrestrial vertebrate fauna, and terrestrial and subterranean invertebrate fauna, not of conservation significance. Impact to the above fauna values is not expected to be significant.	• Fauna Management Plan (Cliffs 2011e; Appendix 7); and • Land Clearing Management Plan (Cliffs 2011a; Appendix 3); Implementation of the above management plans is expected to result in the Windarling Range W4 East Deposit proposal not having a significant impact to fauna values.	levels. Implementation of the Fauna Management Plan and the Land Clearing Management Plan is expected to ensure the impact of the Windarling Range W4 East Deposit to fauna values is managed to an acceptable standard. Accordingly, the potential impact of the Windarling Range W4 East Deposit proposal to fauna can be managed to meet the EPA objective.
Mine Closure	EPA Objectives: Decommissioning: To ensure, as far as practicable, that rehabilitation achieves a stable and functioning landform which is consistent with the surrounding landscape and other environmental values (EPA 2010b). EPA Guidance: • EPA Guidance Statement #6: Rehabilitation of Terrestrial Ecosystems (EPA 2006b). • Guidelines for Preparing Mine Closure Plans (DMP & EPA 2011).	N/A	Mine closure for the Windarling Range W4 East Deposit proposal will result in: • An abandonment bund being installed around the perimeter of the Windarling Range W4 East Deposit Mine Pit; and • Rehabilitation of the Windarling Range W4 East Deposit Haul Road with native vegetation.	As identified in Section 3.3, Cliffs will undertake mine closure for the Windarling Range W4 East Deposit proposal by implementation of: • Mine Closure Plan (Cliffs 2012a; Appendix 8). Implementation of the above management plan is expected to result in acceptable mine closure of the Windarling Range W4 East Deposit proposal.	Implementation of the Mine Closure Plan is expected to result in acceptable mine closure of the Windarling Range W4 East Deposit proposal. Accordingly, mine closure of the Windarling Range W4 East Deposit proposal can be managed to meet the EPA objective.

Table 1-3 Summary of Other Factors, Potential for Impact, Management Proposed and Predicted Outcomes for the Windarling Range W4 East Deposit Proposal.

FACTOR	EPA OBJECTIVE and EPA GUIDANCE	NATURAL & HUMAN ENVIRONMENT	POTENTIAL IMPACT	MANAGEMENT	PREDICTED OUTCOME
Other Environmental Factors					
Conservation Areas	EPA Objective: Conservation areas: To protect the environmental values of areas identified as having significant environmental attributes (EPA 2010b). EPA Guidance: • EPA Guidance Statement #33: Environmental Guidance for Planning and Development (EPA 2008b).	The Windarling Range W4 East Deposit proposal is not located within a conservation area declared under the *Land Administration Act 1997* (WA). The Windarling Range W4 East Deposit proposal coincides with a proposed Conservation and Mining Reserve (WA Minister for Environment and WA Minister for Mines and Petroleum 2010). The proposed Conservation and Mining Reserve has yet to be proclaimed as formal land tenure under the *Land Administration Act 1997* (WA).	The Windarling Range W4 East Deposit proposal will not impact a conservation area declared under the *Land Administration Act 1997* (WA).	No management actions are proposed as the Windarling Range W4 East Deposit proposal is not located within a conservation area declared under the *Land Administration Act 1997* (WA). Further, no management actions are proposed as development of mine infrastructure is consistent with the accepted uses for the proposed Conservation and Mining Reserve.	The Windarling Range W4 East Deposit proposal will not impact a conservation area declared under the *Land Administration Act 1997* (WA). Development of mine infrastructure is consistent with the accepted uses for the proposed Conservation and Mining Reserve. Accordingly, the Windarling Range W4 East Deposit proposal can be managed to meet the EPA objective.
Water Quality	EPA Objectives: Water: To maintain the quantity of water so that existing and potential environmental values, including ecosystem maintenance, are protected (EPA 2010b). Water Quality: To ensure that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards (EPA 2010b). EPA Guidance: N/A.	Groundwater at the Windarling Range W4 East Deposit proposal area is located at an elevation of approximately 400mAHD, being approximately 3m below the proposed depth of mining for the Windarling Range W4 East Deposit proposal. The Windarling Range W4 East Deposit proposal will not require groundwater dewatering. Cliffs has been granted Groundwater Licence GWL154459 (DoW 2011) by DoW under the *Rights in Water and Irrigation Act 1914* (WA) for groundwater supplies.	Significant impacts to groundwater quality or quantity are not expected. General groundwater requirements for the Windarling Range W4 East Deposit proposal for dust suppression are not expected to be significant. The Windarling Range W4 East Deposit proposal will not require groundwater dewatering. Impacts from stormwater (drainage) are not expected when managed using a combination of table drains, sumps and earthen bunding (as required) to control stormwater and allow it to infiltrate and/or evaporate.	Cliffs will manage its groundwater requirements for the Windarling Range W4 East Deposit proposal by compliance with: • *Rights in Water and Irrigation Act 1914* (WA); and • Groundwater Licence GWL154459 (DoW 2011) as regulated by DoW. Compliance with the above legislation is expected to result in acceptable management of groundwater for the Windarling Range W4 East Deposit proposal. Drainage for mine infrastructure areas will be managed using a combination of table drains, sumps and earthen bunding (as required) to control stormwater and allow it to infiltrate and/or evaporate.	Significant impacts to groundwater quality or quantity are not expected. Compliance with the *Rights in Water and Irrigation Act 1914* (WA) and Groundwater Licence GWL154459 (DoW 2011) is expected to ensure the impact of the Windarling Range W4 East Deposit proposal to groundwater is managed to an acceptable standard. Accordingly, the Windarling Range W4 East Deposit proposal can be managed to meet the EPA objectives.

FACTOR	EPA OBJECTIVE and EPA GUIDANCE	NATURAL & HUMAN ENVIRONMENT	POTENTIAL IMPACT	MANAGEMENT	PREDICTED OUTCOME
Air Quality	EPA Objective: Air Quality: To ensure that emissions do not adversely affect environment values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards (EPA 2010b). EPA Guidance: • EPA Guidance Statement #18: Prevention of Air Quality Impacts from Land Development Sites (EPA 2000).	There are no existing land uses or residential dwellings in the vicinity of the Windarling Range W4 East Deposit proposal that could be affected by changes in air quality.	Air quality has the potential to be affected by dust generated during mine operations. Dust will be generated by the blasting, excavation, loading and transport of ore and waste rock. Dust has the potential to impact flora through shading, limiting gaseous transfer and/or increase leaf temperature.	Cliffs will manage the potential impact of dust for the Windarling Range W4 East Deposit proposal by implementation of • Dust Management Plan (Cliffs 2011d; Appendix 6). Implementation of the above management plan is expected to result in the Windarling Range W4 East Deposit proposal not having a significant dust impact.	Implementation of the Dust Management Plan is expected to result in the Windarling Range W4 East Deposit proposal not having a significant dust impact. Accordingly, the Windarling Range W4 East Deposit proposal can be managed to meet the EPA objective.
Greenhouse Gasses	EPA Objective: Greenhouse Gasses: To minimise emissions to levels as low as practicable on an ongoing basis and consider offsets to further reduce cumulative emissions (EPA 2010b). EPA Guidance: • EPA Guidance Statement #12: Guidance Statement for Minimising Greenhouse Gas Emissions (EPA 2002b).	N/A	Greenhouse gas emissions will occur from mine infrastructure powered by fuel-burning equipment (e.g. haulage trucks and light vehicles, mine offices). The Windarling Range W4 East Deposit proposal will emit an estimated 13,000 tonnes per year[1] of greenhouse gasses; being less than one fifth of the 100,000 tonnes per year emissions trigger used by EPA for determining significant emission levels (refer Cliffs 2010a).	Greenhouse gas emissions will be minimised through internal economic rationalisation to reduce costs associated with fuel burning equipment. No specific management actions or offsets are proposed as greenhouse gas emissions will not be significant.	The Windarling Range W4 East Deposit proposal is not expected to have a significant impact from greenhouse gas emissions. Accordingly, the Windarling Range W4 East Deposit proposal can be managed to meet the EPA objective.
Noise	EPA Objective: Noise: To protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring the noise levels meet statutory	The nearest residential dwelling is located approximately 40km to the north of the Windarling Range W4 East Deposit proposal.	Noise impacts are not expected to affect the nearest residential dwelling.	Noise is a standard mine operational matter and will be managed in accordance with the *Environmental Protection (Noise) Regulations 1997* (WA).	The Windarling Range W4 East Deposit proposal will be managed to meet the requirements of the *Environmental Protection (Noise) Regulations 1997* (WA) (as applicable). Accordingly, the Windarling Range

[1] Estimation based on greenhouse gas emissions calculated for Cliffs' existing Windarling Range mine operations, scaled to 6.8 million tonnes ore volume of the Windarling Range W4 East Deposit, over a mining period of 5 years mining for the Windarling Range W4 East Deposit proposal.

FACTOR	EPA OBJECTIVE and EPA GUIDANCE	NATURAL & HUMAN ENVIRONMENT	POTENTIAL IMPACT	MANAGEMENT	PREDICTED OUTCOME
	requirements and acceptable standards (EPA 2010b). EPA Guidance: • EPA Guidance Statement #8: Environmental Noise (EPA 2007b).				W4 East Deposit proposal can be managed to meet the EPA objective.
Social Factors					
Heritage and Native Title	EPA Objective: Heritage: To ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation (EPA 2010b). EPA Guidance: • EPA Guidance Statement #41: Assessment of Aboriginal Heritage (EPA 2004c).	The Windarling Range W4 East Deposit proposal does not coincide with any registered site of Aboriginal heritage on the Register of Aboriginal Heritage Sites maintained by the Department of Indigenous Affairs (DIA) under the *Aboriginal Heritage Act 1972* on (WA) (DIA 2011). Cliffs has obtained consent under s18 of the *Aboriginal Heritage Act 1972* (WA) from the Western Australian Minister for Indigenous Affairs for its mine operations at the Windarling Range, including the area of the Windarling Range W4 East Deposit Proposal (WA Minister for Indigenous Affairs 2003). The Windarling Range W4 East Deposit proposal does not coincide with any record of European heritage on the State Register of Heritage Places maintained by the Heritage Council of Western Australia (HCWA) under the *Heritage of Western Australia Act 1990* (WA) (HCWA 2011). The Windarling Range W4 East Deposit proposal does not coincide with any area of application or determination of Native Title recorded by the Federal Court of Australia under the *Native Title Act 1993* (C'th) (NNTT 2012).	The Windarling Range W4 East Deposit proposal will: • Not impact any registered site of Aboriginal heritage on the Register of Aboriginal Heritage Sites maintained under the *Aboriginal Heritage Act 1972* (WA) (DIA 2011); • Not impact any record of European heritage on the State Register of Heritage Places maintained under the *Heritage of Western Australia Act 1990* (WA) (HCWA 2011); and • Not impact any area of application or determination of Native Title recorded by the Federal Court of Australia under the *Native Title Act 1993* (C'th) (NNTT 2012).	No management actions are proposed as the Windarling Range W4 East Deposit proposal will not impact any registered site of Aboriginal heritage, any recorded site of European heritage or any area of Native Title application or determination under the relevant legislation. Ethnographic and archaeological surveys for Aboriginal heritage have been undertaken by Cliffs within the Windarling Range W4 East Deposit proposal area. No matters of Aboriginal heritage were identified by these surveys. If currently unknown matters of heritage or native title are identified during proposal implementation, these matters will be managed in accordance with: • *Aboriginal Heritage Act 1972* (WA) as regulated by DIA; • *Heritage of Western Australia Act 1990* (WA) as regulated by HCWA; and • *Native Title Act 1993* (C'th) as regulated by the National Native Title Tribunal and the Federal Court of Australia.	The Windarling Range W4 East Deposit proposal will not impact any registered site of Aboriginal heritage, any recorded site of European heritage or any area of Native Title application or determination under the relevant legislation. Accordingly, the Windarling Range W4 East Deposit proposal can be managed to meet the EPA objective.

FACTOR	EPA OBJECTIVE and EPA GUIDANCE	NATURAL & HUMAN ENVIRONMENT	POTENTIAL IMPACT	MANAGEMENT	PREDICTED OUTCOME
Visual Amenity and Recreation	EPA Objective: Visual Amenity: To ensure that aesthetic values are considered and measures are adopted to reduce visual impacts on the landscape as low as reasonably practicable (EPA 2010b). Recreation: To ensure that existing and planned recreational uses are not compromised. EPA Guidance: N/A.	The area of the Windarling Range W4 East Deposit proposal (543m peak elevation) does not have notable visual amenity value, having regard to other areas of the Windarling Range (575mAHD peak elevation) and nearby areas such as the Mt Jackson Range (615mAHD peak elevation), Die Hardy Range (645mAHD peak elevation) and Bungalbin Hill (680mAHD peak elevation). The Windarling Range W4 East Deposit proposal area does not have recorded recreational use.	The Windarling Range W4 East Deposit proposal will result in a localised and permanent change to the landscape through the development of a mine pit. The impacts to visual amenity from the landscape change will be localised. An impact to recreation is not expected.	No management actions are proposed as the Windarling Range W4 East Deposit proposal is not expected to have a significant impact to visual amenity. No management actions are proposed as the Windarling Range W4 East Deposit proposal is not expected to impact recreation.	The Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to visual amenity or recreation. Accordingly, the Windarling Range W4 East Deposit proposal can be managed to meet the EPA objectives.
Economic Factors					
Commonwealth, State and Regional Economies	EPA Objective: N/A. EPA Guidance: N/A.	Cliffs' Yilgarn Operations have direct and indirect benefits to the Commonwealth, State and regional economies through taxation, mineral royalties and investment.	The Windarling Range W4 East Deposit proposal will have a conservative direct gross economic value of approximately A$1.06billion, with an estimated direct economic value of more than A$370million in taxation and royalties for the Commonwealth and Western Australian governments. The Windarling Range W4 East Deposit proposal will also have a positive indirect economic impact for the regional economies of the Shire of Yilgarn and the Shire of Esperance through purchase of goods and services, which generates and maintains local employment and local economic activity.	No management actions are proposed as the Windarling Range W4 East Deposit proposal is expected to have a positive economic impact to Commonwealth, State and regional economies.	The Windarling Range W4 East Deposit proposal is expected to have a positive economic impact on Commonwealth, State and regional economies.

1.10 Principles of Environmental Protection

Section 4A of the *Environmental Protection Act 1986* (WA) identifies that the objective of the Act is to protect the environment having regard to five principles of environmental protection. The five principles of environmental protection are further expanded with supporting principles in EPA Position Statement No. 7 (EPA 2004d). In accordance with the intent outlined in EPA (2010a; 2010b), the manner in which the Windarling Range W4 East Deposit proposal addresses the principles of environmental protection are identified in Table 1-4.

Principles of Environmental Protection	Windarling Range W4 East Deposit proposal
The Precautionary Principle *Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.* *In the application of the precautionary principle, decisions should be guided by —* *a. careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and* *b. an assessment of the risk-weighted consequences of various options.*	Environmental surveys have been undertaken to provide certainty as to the environmental values and the potential for environmental impact of the Windarling Range W4 East Deposit proposal area. With regards to the Rare Flora species *Ricinocarpos brevis*, additional environmental investigations provide certainty as to the spatial distribution and genetic relationships within the Windarling Range and the other recorded populations at the Johnston Range and the Perrinvale Range.
The principle of intergenerational equity *The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.*	The Windarling Range W4 East Deposit proposal incorporates mine closure actions to restore the health, diversity and productivity of the environment for the post-mining benefit of future generations.
The principle of conservation of biological diversity and ecological integrity *Conservation of biological diversity and ecological integrity should be a fundamental consideration.*	Environmental surveys have been undertaken to provide certainty as to the environmental values and the potential for environmental impact of the Windarling Range W4 East Deposit proposal area. With regards to the Rare Flora species *Ricinocarpos brevis*, additional environmental investigations provide certainty as to the spatial distribution and genetic relationships within the Windarling Range and the other recorded populations at the Johnston Range and the Perrinvale Range.
Principles relating to improved valuation, pricing and incentive mechanisms *a. Environmental factors should be included in the valuation of assets and services.* *b. The polluter pays principle — those who generate pollution and waste should bear the cost of containment, avoidance or abatement.* *c. The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes.* *d. Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.*	Costs associated with the Windarling Range W4 East Deposit proposal (including provision of environmental staff and implementation of environmental management plans) will be borne exclusively by Cliffs. Funding for these costs will be obtained through the international customers purchasing the extracted ore product. The environmental impact of the Windarling Range W4 East Deposit proposal has been minimised to the lowest level practicable whilst still achieving Cliffs' resource development goals. Further reductions to the environmental impact of the proposal, if identified, will be implemented where practicable. Cliffs' commitment to continual improvement is reflected in Cliffs' Environmental Policy (Cliffs Natural Resources 2008; Appendix 1).
The principle of waste minimisation *All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.*	The mass of waste rock to be extracted from the Windarling Range W4 East Deposit Mine Pit has been minimised as part of mine pit design to minimise waste rock excavation, handling and disposal to the environment. All other wastes generated will be managed in accordance with the applicable regulatory standards at existing mine facilities.

Table 1-4 Windarling Range W4 East Deposit Proposal and the Principles of Environmental Protection. The Principles of Environmental Protection are contained in s4A of the *Environmental Protection Act 1986* (WA).

1.11 Consideration of Alternatives

In accordance with EPA (2008b), Cliffs has considered a number of alternatives in relation to the Windarling Range W4 East Deposit proposal. These considerations included waste rock management alternatives and no-development.

1.11.1 Waste Rock Management

Cliffs has considered a number of potential alternatives for the management of waste rock disposal for the Windarling Range W4 East Deposit proposal. The potential alternatives considered included waste rock disposal by:

- Transfer to the Windarling Range W3/5 Deposit Waste Rock Landform, located approximately 1km to the east of the Windarling Range W4 East Deposit Mine Pit (refer Figure 1-4);
- Backfilling of the adjacent Windarling Range W4 West Deposit Mine Pit (refer Figure 1-4);
- Construction of a new Windarling Range W4 West Deposit Waste Rock Landform within the area of the adjacent Windarling Range W4 West Deposit Mine Pit following backfilling; and
- Construction of a new waste rock landform in a new area (undisturbed) immediately adjacent to the Windarling Range W4 East Deposit Mine Pit.

The potential alternative of least environmental impact was identified as waste rock disposal to a combination of the Windarling Range W3/5 Deposit Waste Rock Landform and backfilling of the Windarling Range W4 West Deposit Mine Pit, with subsequently a new Windarling Range W4 West Deposit Waste Rock Landform constructed. This combination would have the lowest environmental impact due to waste rock disposal occurring within previously approved impact areas, as well as resulting in a positive environmental outcome through the conversion of the Windarling Range W4 West Deposit Mine Pit from an unrehabilitated open mine void to a rehabilitated Windarling Range W4 West Deposit Waste Rock Landform. Conversely, this option combination would have the highest financial cost due to the increased transport distances to the Windarling Range W3/5 Deposit Waste Rock Landform and in-pit disposal within the Windarling Range W4 West Deposit Mine Pit. Additional rehabilitation costs for the area of the new Windarling Range W4 West Deposit Waste Rock Landform also contributed to the increased financial cost of this combination alternative considered.

The potential alternative of greatest environmental impact was for the construction of a new waste rock landform in a new area in close proximity to the Windarling Range W4 East Deposit Mine Pit. This option would require an approximately 50ha of additional vegetation clearing; which would more than double the 28ha impact area of the Windarling Range W4 East Deposit proposal identified by this EIA-API document. This option had the lowest financial cost due to a reduced transport distance for waste rock disposal (which to note, was significantly lower even after the additional rehabilitation costs for this new landform were accounted for).

In consideration of the above, Cliffs proposes by this EIA-API document the option combination for waste rock disposal to the Windarling Range W3/5 Deposit Waste Rock Landform and backfilling of the Windarling Range W4 West Deposit Mine Pit, with subsequently a new Windarling Range W4 West Deposit Waste Rock Landform constructed. Whilst this option combination had a significantly higher financial cost than the other alternatives considered, this option combination was selected by Cliffs having regard to the reduced potential cumulative impact to flora from land clearing (refer

Section 3.1) and the potential to achieve a positive environmental outcome through the through the conversion of the Windarling Range W4 West Deposit Mine Pit from an unrehabilitated open mine void to a rehabilitated Windarling Range W4 West Deposit Waste Rock Landform.

1.11.2 No Development

Cliffs has considered a 'no development' alternative for the Windarling Range W4 East Deposit proposal. A no development alternative would have alternate environment, social and economic impacts, as identified below:

Environmental -
A no development option would retain the current flora values (refer Section 3.1) and fauna values (refer Section 3.2) of the Windarling Range W4 West Deposit proposal area.

Social -
A no development option would result in no localised impact to the visual amenity of the Windarling Range W4 East Deposit proposal area.

Economic -
A no development option would result in potential economic benefits forgone for the taxation and royalties payments to Commonwealth and State Governments, and employment and economic development in the Shire of Yilgarn and the Shire of Esperance.

This EIA-API document identifies that subject to implementation of Cliffs' EMS, EMPs and environmental commitments (refer to Section 5), the Windarling Range W4 East Deposit proposal is not expected to have a significant negative impact to environmental or social factors, and will have a positive impact to economic factors. Accordingly, Cliffs considers that the Windarling Range W4 East Deposit proposal can be implemented and managed to meet acceptable community objectives and standards. Accordingly, a 'no development' alternative is not proposed.

1.12 Future Proposal Changes

Cliffs may require additional infrastructure and/or areas for the Windarling Range W4 East Deposit proposal in the future that is not within the current proposal scope. Although Cliffs does not have an intention for such additional infrastructure or additional areas at this time, it is appropriate to identify that changes in Cliffs' operational requirements may occur in the future as a result of changes in matters such as geological knowledge, operational requirements and government requirements. If changes to the infrastructure or areas of the Windarling Range W4 East Deposit proposal area are required by Cliffs in the future, Cliffs will assess the potential impacts and seek the necessary statutory environmental and mining approvals for such changes at that time.

2 Natural and Human Environments

The natural and human environments of the Yilgarn region have been described extensively in various environmental and planning documents. Section 2 provides a summary on the existing natural and human environments relevant to the Windarling Range W4 East Deposit proposal.

2.1 Climate

The climate of the Yilgarn region is characterised by hot, dry summers and mild, wet winters. Maximum temperature peaks (>30^{o}C) occur between November and March. Rainfall occurs throughout the year with approximately 300mm of rainfall annually, occurring within approximately 45 rainfall days (BOM 2011b)[1].

2.2 Geology and Topography

The Windarling Range W4 East Deposit proposal is located within the Yilgarn Craton, which covers an area of approximately 62,000,000ha, being approximately 24% of the area of Western Australia (Gibson *et al.* 2007). A craton is a tectonically stable part of the Earth's crust which has not been deformed for a long period of time. Cliffs' Yilgarn Operations takes its name from being within the area of the Yilgarn Craton.

The Windarling Range W4 East Deposit is dominated by a geology of goethite-hematite and hematite mineralisation.

The majority of the region is gently undulating at approximately 400mAHD to 470mAHD, with low ironstone ridges rising above the surrounding plains to between approximately 500mAHD to 650mAHD. The Windarling Range W4 East Deposit proposal area has elevations ranging between approximately 490mAHD to 540mAHD. For comparison, the Windarling Range has a peak elevation of approximately 575mAHD, and nearby ranges such as the Mt Jackson Range (located approximately 25km south), Die Hardy Range (located approximately 10km north-north-west) and Bungalbin Hill (located approximately 50km south-east) have peak elevations of approximately 615mAHD, 645mAHD and 680mAHD, respectively.

2.3 Flora

The Windarling Range W4 East Deposit proposal is located in the Coolgardie Bioregion, near the southern boundary of the Murchison Bioregion. The Yilgarn Region contains over 1000 flora species, including flora species declared as 'Rare Flora' under the *Wildlife Conservation Act 1950* (WA) and flora species classified by DEC as 'Priority' (DEC 2008).

Flora surveys of the Windarling Range have identified the presence 217 native vascular flora species. Most notably, the Windarling Range contains 2 flora species declared as 'Rare Flora' under the *Wildlife Conservation*

[1] Climate statistics from the nearest monitoring station maintained by the Australian Bureau of Meteorology is at Southern Cross Airfield, approximately 130km south of the Windarling Range W4 East Deposit proposal.

Act 1950 (WA) and 5[1] flora species classified by DEC as 'Priority'. A total of 44 vegetation units were also identified across the Windarling Range. One DEC-classified 'Priority ecological community' (PEC) named the 'Windarling Ranges vegetation complex' has previously been identified by DEC (Western Botanical 2010; Western Botanical 2011a).

The Windarling Range W4 East Deposit proposal coincides with 1 flora species declared as 'Rare Flora' under the *Wildlife Conservation Act 1950* (WA), being *Ricinocarpos brevis*, and 2 flora species classified by DEC as 'Priority', being *Austrostipa blackii* (P3) and *Banksia arborea* (P4). The Windarling Range W4 East Deposit proposal coincides with 10 vegetation units and the DEC-classified 'Windarling Ranges vegetation complex' PEC.

A description of the flora values present in the area of the Windarling Range W4 East Deposit proposal, and an assessment of the potential impact of the Windarling Range W4 East Deposit proposal to flora values, is provided in Section 3.1.

2.4 Fauna

The Yilgarn Region is known to contain an array of vertebrate and invertebrate fauna species, supported by an array of fauna habitats within both plains and ridges. The fauna diversity of the Yilgarn Region is not well documented, with the areas surveyed predominantly being associated with fauna surveys for mineral exploration and mining operations.

Surveys for vertebrate fauna at the Windarling Range area have identified the potential presence of approximately 170 vertebrate fauna species comprising of birds, mammals, amphibians and reptiles (Bamford Consulting Ecologists 2010). Most notably, the survey results include 6 vertebrate fauna species classified as 'Specially Protected Fauna' under and the *Wildlife Conservation Act 1950* (WA) and 4 vertebrate fauna species classified by DEC as 'Priority'.

Surveys for short-range endemic invertebrate fauna within the area of the Windarling Range W4 East Deposit proposal has identified several short-range taxa including land snails, millipedes and mygalomorph spiders (Biota 2011a).

Surveys for troglofauna within the area of the Windarling Range W4 East Deposit proposal identified several troglofauna taxa (Bennelongia 2010).

A description of the fauna values present in the area of the Windarling Range W4 East Deposit proposal, and an assessment of the potential impact of the Windarling Range W4 East Deposit proposal to fauna values, is provided in Section 3.2.

[1] The difference between the number of DEC-classified priority flora species identified by Western Botanical (2010) and this EIA-API document arises from the subsequent removal of the flora species *Daviesia purpurascens* by DEC from its priority flora classifications.

2.5 Groundwater

Groundwater at the Windarling Range occurs at an elevation of approximately 400mAHD. Groundwater salinity at the Windarling Range is saline at approximately 30,000mg/L, with groundwater salinity in the area of the Windarling Range W4 East Deposit proposal being approximately 19,000mg/L (Rockwater 2003).

The Windarling Range W4 East Deposit proposal is located within the Goldfields Groundwater Management Area proclaimed under the *Rights in Water and Irrigation Act 1914* (WA), as regulated by DoW. The main use of this groundwater resource is in mineral exploration and mining operations.

2.6 Surface Water

There are no natural permanent natural surface water features in the immediate vicinity of the Windarling Range W4 East Deposit proposal. Cliffs maintains a number of surface water dams at its existing Windarling Range mine operations for the storage of saline groundwater for its use in mine operations. Permanent surface water in the region predominantly consists of dams excavated to provide saline groundwater to support pastoral and mining activities.

The Windarling Range W4 East Deposit proposal is located within the Internal Drainage Division of Western Australia. Surface drainage within the Internal Drainage Division flows to the numerous salt lakes including Lake Barlee and Lake Deborah, located approximately 40km north and 70km south of the Windarling Range W4 East Deposit proposal, respectively.

2.7 Land Tenure

The Windarling Range W4 East Deposit proposal is located on land tenure of Unallocated Crown Land under the *Land Administration Act 1997* (WA). Unallocated Crown Land comprises of approximately 38% of the area of Western Australia. The Department of Regional Development and Lands (DRDL) is responsible for the management of Unallocated Crown Land, with DRDL having an agreement with DEC for the management of flora, fauna and fire.

The Windarling Range W4 East Deposit proposal area was formerly part of the Diemals Pastoral Lease, which was cancelled in October 2011. Other pastoral leases in the region include the Mt Jackson Pastoral Lease (covering Cliffs' Mt Jackson Range mine operations) and the Brontie Pastoral Lease (covering Cliffs' Koolyanobbing Range mine operations). Low intensity grazing has occurred on these pastoral leases for more than 50 years, with mining and mineral exploration occurring within boundaries of these pastoral leases for more than 30 years.

Overlying the Unallocated Crown Land in the area of the Windarling Range W4 East Deposit proposal area is Mining Lease M77/999 granted to Cliffs under the *Mining Act 1978* (WA).

The Windarling Range W4 East Deposit proposal is not located within a conservation area declared under the *Land Administration Act 1997* (WA). The Windarling Range W4 East Deposit proposal coincides with a proposed Conservation and Mining Reserve (WA Minister for Environment & WA Minister for Mines and Petroleum 2010). This proposed Conservation and Mining Reserve has yet to be proclaimed as formal land tenure under the *Land Administration Act 1997* (WA). Mining for the Windarling Range W4 East Deposit proposal is consistent with the accepted land uses of this proposed land tenure.

The Helena and Aurora Range Conservation Park, classified as a 'Class C' reserve, is located approximately 6km to the east of the Windarling Range W4 East Deposit proposal. The Mt Manning Range Nature Reserve, also a 'Class C' reserve, abuts the eastern boundary of the Helena and Aurora Range Conservation Park; being approximately 19km to the east of the Windarling Range W4 East Deposit proposal.

2.8 Demography

The Shire of Yilgarn encompasses an area of approximately 3 million hectares and is centred on the town of Southern Cross, situated approximately 370km east of Perth and approximately 130km south of the Windarling Range W4 East Deposit proposal. The Shire of Yilgarn has a population of approximately 1,400 people (ABS 2007). Agriculture and mining are the key local industries within the Shire of Yilgarn (Shire of Yilgarn 2008; ABS 2007). The key areas of employment in the Shire of Yilgarn are agriculture and mining (ABS 2007).

2.9 Aboriginal Heritage

The Department of Indigenous Affairs maintains a Register of Aboriginal Heritage Sites in accordance with the *Aboriginal Heritage Act 1972* (WA). The Windarling Range W4 East Deposit proposal does not coincide with any registered site of Aboriginal heritage on the Register of Aboriginal Heritage Sites maintained by the Department of Indigenous Affairs (DIA) under the *Aboriginal Heritage Act 1972* on (WA) (DIA 2011).

Ethnographic and archaeological surveys for Aboriginal heritage have been undertaken by Cliffs within the Windarling Range W4 East Deposit proposal area. No matters of Aboriginal heritage were identified by these surveys.

Cliffs has obtained consent under s18 of the *Aboriginal Heritage Act 1972* (WA) from the Western Australian Minister for Indigenous Affairs for its mine operations at the Windarling Range, including the area of the Windarling Range W4 East Deposit Proposal (WA Minister for Indigenous Affairs 2003).

2.10 Native Title

A record of Native Title applications and Native Title determinations is maintained by the National Native Title Tribunal and the Federal Court of Australia in accordance with the *Native Title Act 1993* (C'th). The Windarling Range W4 East Deposit proposal does not coincide with any area of application or determination of Native Title recorded by the Federal Court of Australia under the *Native Title Act 1993* (C'th) (NNTT 2012).

2.11 European Heritage

The Heritage Council of Western Australia (HCWA) maintains a State Register of Heritage Places under the *Heritage of Western Australia Act 1990* (WA). The Windarling Range W4 East Deposit proposal does not coincide with any record of European heritage on the State Register of Heritage Places maintained by HCWA under the *Heritage of Western Australia Act 1990* (WA) (HCWA 2011).

3 Environmental Impact Assessment

Section 3 Environmental Impact Assessment provides an assessment of the potential impact of the Windarling Range W4 East Deposit proposal to key environmental factors identified by EPA (2011a), being:

- Flora;
- Fauna; and
- Mine Closure.

The assessment is based on a range of investigations that have been undertaken by appropriately qualified and reputable consultants for their study field, and provides an overview of the outcomes of those investigations in context with the Windarling Range W4 East Deposit proposal. Further detail from the surveys and investigations for the Windarling Range W4 East Deposit proposal can be sourced directly from the relevant survey and investigation reports, which are provided on the compact disc attached at the rear of this EIA-API document.

3.1 Flora

3.1.1 Aspect

Development of the Windarling Range W4 East Deposit proposal will require the clearing of 28ha of land containing flora. Section 3.1 provides an assessment of the potential impact of the Windarling Range W4 East Deposit proposal to flora values.

3.1.2 EPA Objective

The EPA's objective for flora is:

- To maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement of knowledge (EPA 2010b).

3.1.3 Legislation, Guidelines, Standards and Approvals

- Yilgarn Operations Land Clearing Management Plan (Cliffs 2011a; Appendix 3);
- Yilgarn Operations Weed Management Plan (Cliffs 2011b; Appendix 4);
- Yilgarn Operations Fire Management Plan (Cliffs 2011c; Appendix 5);
- Yilgarn Operations Dust Management Plan (Cliffs 2011d; Appendix 6);
- *Environmental Protection Act 1986* (WA);
- *Wildlife Conservation Act 1950* (WA);
- *Environment Protection and Biodiversity Conservation Act 1999* (C'th);
- EPA Guidance Statement 19: Environmental Offsets – Biodiversity (EPA 2008a);
- EPA Guidance Statement 51: Guidance for the Assessment of Environmental Factors – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA 2004a);
- EPA Guidance Statement 55: Guidance for the Assessment of Environmental Factors – Implementing Best Practice in Proposals submitted to the Environmental Impact Assessment Process (EPA 2003a);

- EPA Position Statement 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA 2002a);
- EPA Position Statement 9: Environmental Offsets (EPA 2006a); and
- WA Environmental Offsets Policy (Government of Western Australia 2011).

3.1.4 Environmental Impact Assessment

Legislative Framework for Flora Protection

All native flora in Western Australia is protected under the *Environmental Protection Act 1986* (WA) by virtue of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (WA). Specific flora species may be afforded special protection under the *Wildlife Conservation Act 1950* (WA) and the *Environment Protection and Biodiversity Conservation Act 1999* (C'th). The *Environment Protection and Biodiversity Conservation Act 1999* (C'th) may also afford special protection to vegetation units.

The following text provides a description[1] of the classifications used in flora protection:

Threatened Species (Flora)

Threatened Species includes flora species listed by the Commonwealth Minister for the Environment and protected under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) as a matter of national environmental significance for being extinct, facing a risk of extinction, or in need of a conservation program to prevent the species from a risk of extinction. Threatened species are allocated a category of extinct, extinct in the wild, critically endangered, endangered, vulnerable or conservation dependent.

Rare Flora

Rare Flora is flora declared by the Western Australian Minister for the Environment and is protected under the *Wildlife Conservation Act 1950* (WA) for being likely to become extinct, or rare, or otherwise in need of special protection.

Priority Flora

Priority flora is flora which are known from one, a few or several populations which may or may not be under threat, or may otherwise be rare. Classifications are made by DEC and categorised into 4 Priority categories, with 'Priority 1' being of the highest conservation significance and/or a priority for surveying and determining the conservation significance based on current knowledge of perceived threat. Priority flora have no specific legal protection under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th), *Wildlife Conservation Act 1950* (WA) or the *Environmental Protection Act 1986* (WA).

Threatened Ecological Community

A Threatened Ecological Community (TEC) is a naturally occurring vegetation unit that occurs in a particular type of habitat that is facing a high, very high or extremely high risk of extinction in the wild in the medium-term, near or immediate future. Threatened Ecological Communities are allocated a classification of vulnerable, endangered or critically endangered. Threatened Ecological Communities are listed by the Commonwealth Minister for the Environment and protected under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) as a matter of national environmental significance. Threatened Ecological Communities declared under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) are also protected under the *Environmental Protection Act*

[1] Descriptions are consolidated from the *Environment Protection and Biodiversity Conservation Act 1999* (C'th), *Wildlife Conservation Act 1950* (WA), and flora literature published by DEC and DoSEWPC.

1986 (WA). The DEC also has a process for identifying TECs, however, decisions through this process do not have a statutory basis.

Priority Ecological Community

A Priority Ecological Community (PEC) is a naturally occurring vegetation unit that occurs in a particular type of habitat that is known from a few to many occurrences, which may or may not be managed for conservation, and which may or may not be under threat. Classifications are made by DEC and categorised into 5 categories, with Priority 1 being of the highest conservation significance and/or a priority for surveying and determining the conservation significance based on current knowledge of perceived threat. Priority Ecological Communities have no specific legal protection under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th), *Wildlife Conservation Act 1950* (WA) or the *Environmental Protection Act 1986* (WA).

Flora of the Windarling Range

Surveys undertaken by botanical consultants Western Botanical of the Windarling Range W4 East Deposit proposal area and the greater Windarling Range were undertaken during 2009 and 2010 (Western Botanical 2010; Western Botanical 2011a; Western Botanical 2011b). The surveys identified the occurrence of 217 flora species and 44 vegetation units across the Windarling Range.

With regards to flora species identified, *Ricinocarpos brevis* was recorded across the Windarling Range and within the area of the Windarling Range W4 East Deposit proposal. *Ricinocarpos brevis* is declared as 'Rare Flora' under the *Wildlife Conservation Act 1950* (WA) and as a 'Threatened Species' of flora under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th). The Windarling Range W4 East Deposit proposal area also recorded 2 flora species classified by DEC as 'Priority'; being *Austrostipa blackii* (P3) and *Banksia arborea* (P4). The locations of flora species recorded at the Windarling Range and at the Windarling Range W4 East Deposit proposal are identified in Figures 3-1 and 3-2.

The Windarling Range W4 East Deposit proposal area coincides with 10 vegetation units and part of the DEC-classified 'Windarling Ranges vegetation complex' PEC. No TECs have been recorded at the Windarling Range. The locations of vegetation units recorded at the Windarling Range and at the Windarling Range W4 East Deposit proposal are identified in Figures 3-3 and 3-4, with the location of the DEC-classified 'Windarling Ranges vegetation complex' PEC identified in Figure 3-5.

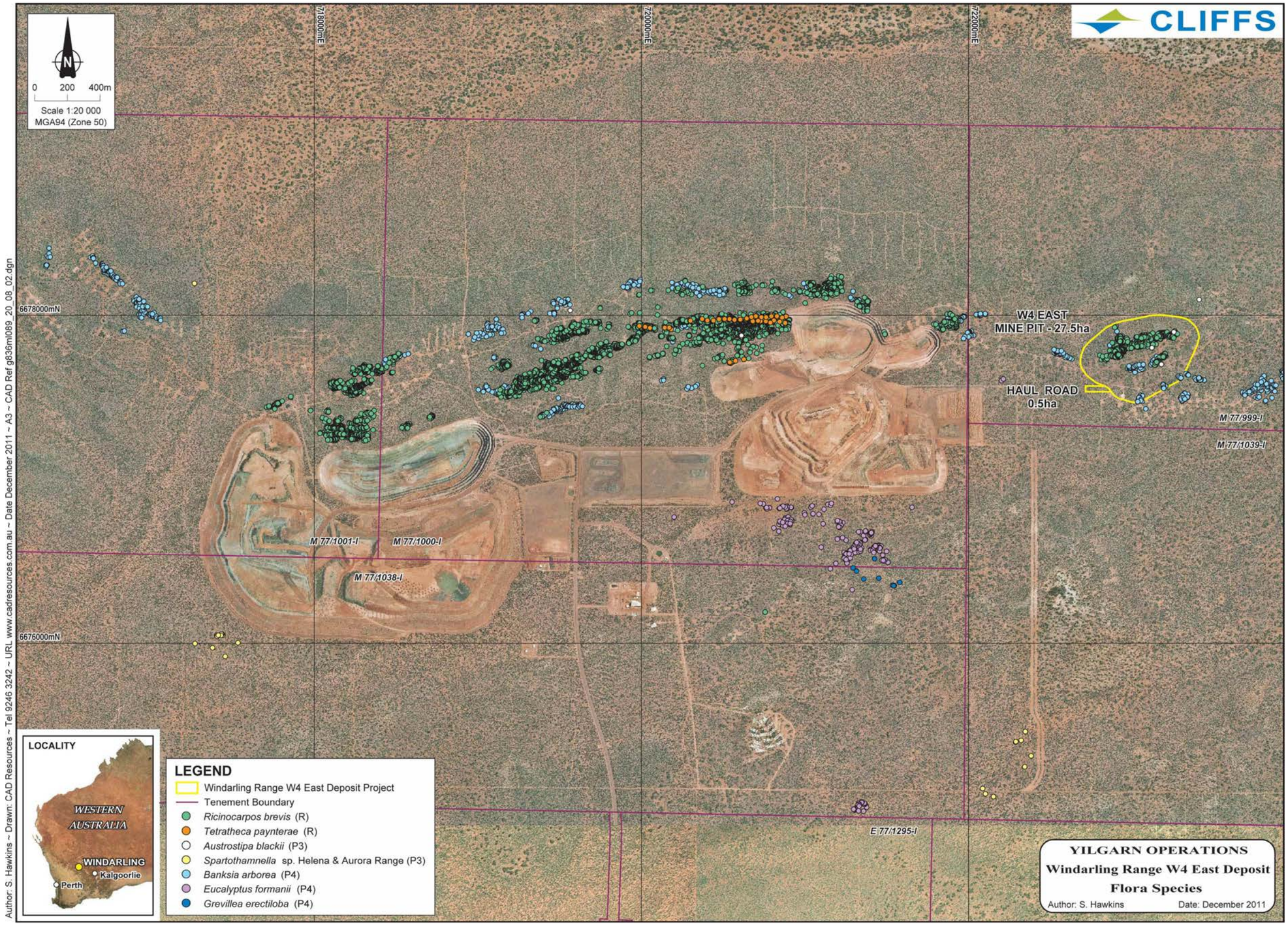

Figure 3-1 Flora Species recorded at the Windarling Range. The Windarling Range W4 East Deposit proposal infrastructure is identified in yellow. Source: Western Botanical (2010).

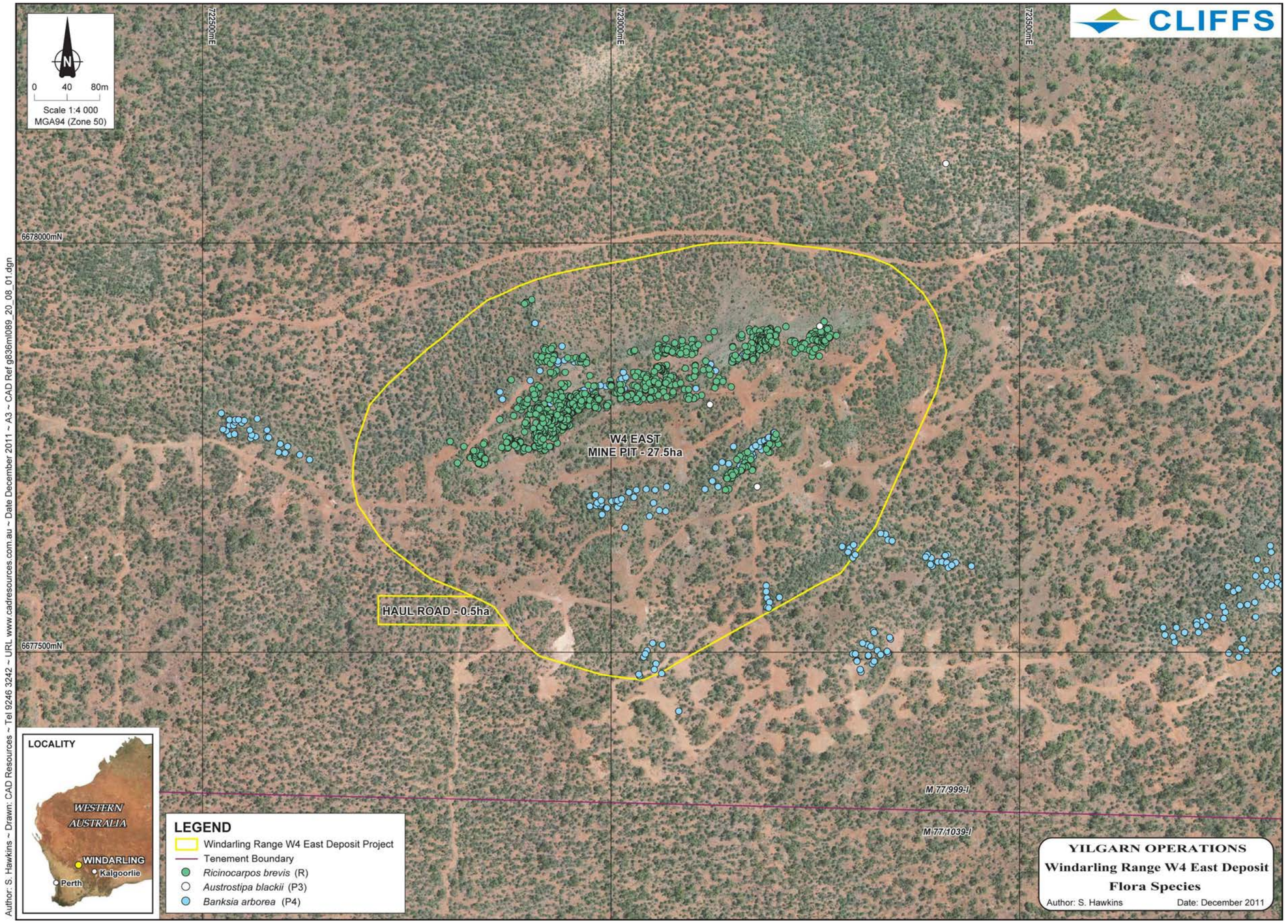

Figure 3-2 Flora Species recorded in the vicinity of the Windarling Range W4 East Deposit Proposal. The Windarling Range W4 East Deposit proposal, identified in yellow, coincides with the key flora species *Ricinocarpos brevis* (R), *Austrostipa blackii* (P3) and *Banksia arborea* (P4). Source: Western Botanical (2010).

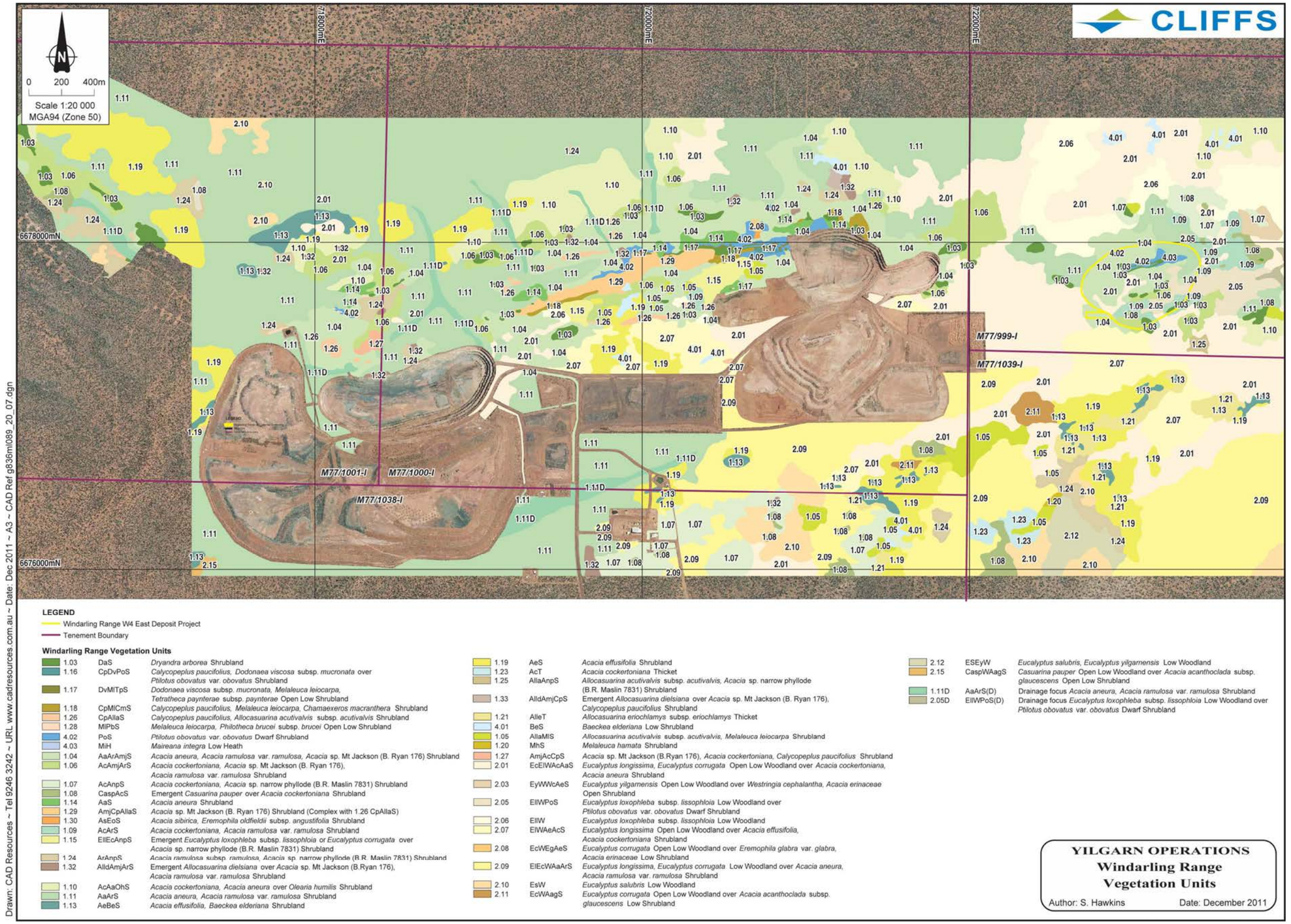

Figure 3-3 Vegetation Units recorded at the Windarling Range. The Windarling Range W4 East Deposit proposal infrastructure is identified in yellow. Source: Western Botanical (2010; 2011a).

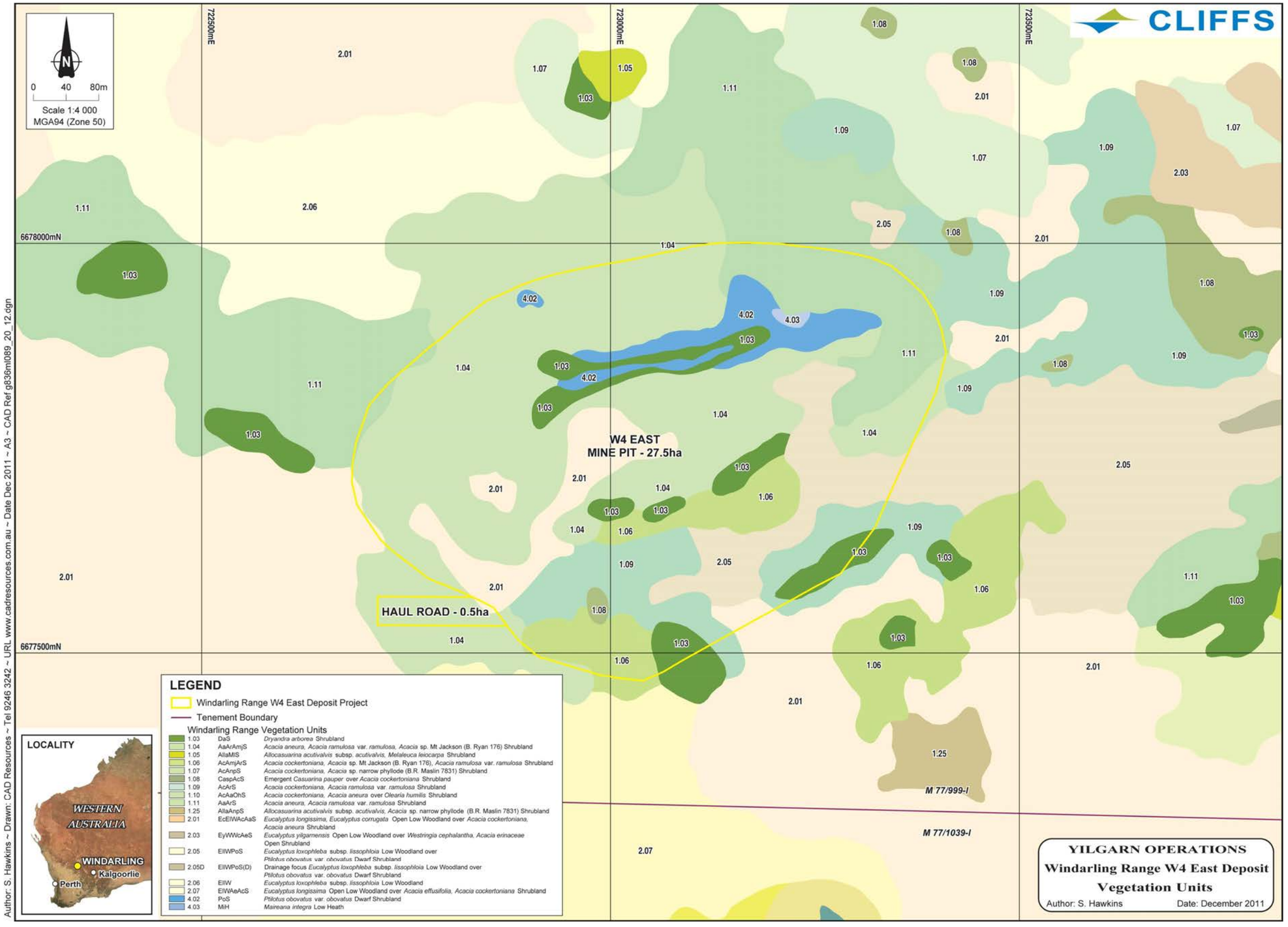

Figure 3-4 Vegetation Units recorded in the vicinity of the Windarling Range W4 East Deposit Proposal. The Windarling Range W4 East Deposit proposal infrastructure is identified in yellow. Source: Western Botanical (2010; 2011a).

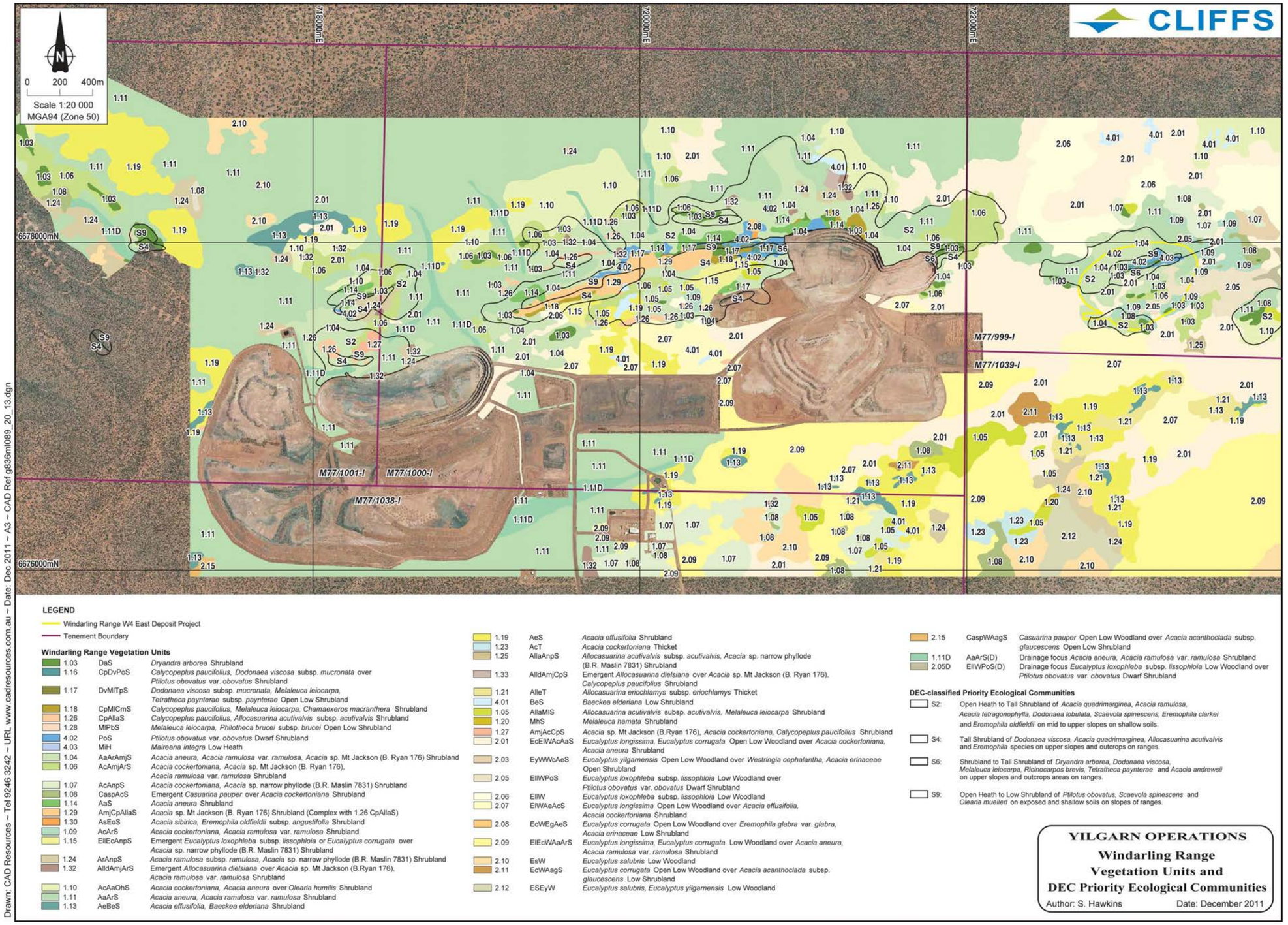

Figure 3-5 DEC-classified 'Windarling Ranges Vegetation Complex' Priority Ecological Community over Vegetation Units at the Windarling Range. The DEC-classified 'Priority Ecological Community Windarling Ranges Vegetation Complex' is identified in black, overlain on the Windarling Range vegetation units. The Windarling Range W4 East Deposit proposal infrastructure is identified in yellow. Source: Western Botanical (2010; 2011a).

Assessment of Potential Impact to Conservation Significant Flora Species

Within the area of the Windarling Range W4 East Deposit proposal, 3 flora species of conservation significance were identified, being:

- *Ricinocarpos brevis* (R);
- *Austrostipa blackii* (P3); and
- *Banksia arborea* (P4).

An assessment of the potential impact of the Windarling Range W4 East Deposit proposal to each flora species of conservation significance is provided below:

***Ricinocarpos brevis* (Rare Flora)**

Ricinocarpos brevis is a non-lignotuberous upright shrub which grows to approximately 1.8m in height and 1.5m in width. Populations of *R. brevis* have been recorded at the Windarling Range, Johnston Range and the Perrinvale Range. The Johnston Range is located approximately 30km north of the Windarling Range, with the Perrinvale Range located approximately 110km north-east of the Windarling Range. As most of the Yilgarn Region has yet to be subject to botanical survey, further botanical survey in the Yilgarn Region may yield additional populations of *R. brevis*.

The currently recorded regional distribution of *R. brevis* is identified in Figure 3-6. The distribution of *R. brevis* at the Windarling Range is identified in Figure 3-7. The distribution of *R. brevis* within the area of the Windarling Range W4 East Deposit proposal is identified in Figure 3-8.

Ricinocarpos brevis population estimates have been made through both census (counting of plants) and field estimate methods. The population records for *R. brevis* indicate a regional *R. brevis* population of approximately 24,000individuals, as identified by Table 3-1. The population census undertaken at the Windarling Range (Western Botanical 2011b) and the Perrinvale Range (Western Botanical 2008) indicate that approximately 70% of the individuals recorded could be classified as mature.

Location	***Ricinocarpos brevis* Population**
Windarling Range	18,112[1] individuals estimated, 12,271 individuals extant (Western Botanical 2011b)
Johnston Range	3,000 individuals estimated (DEC 2011a)
Perrinvale Range	2,982 individuals (Western Botanical 2008)
Total	**24,094 individuals estimated**
Total Extant	**18,253 individuals estimated**

Table 3-1 Regional Population Records for *Ricinocarpos brevis*.

[1] As identified by Western Botanical (2011b), based on assessment of 2003 and 2009 *R. brevis* census data there were at least 18,112 *R. brevis* individuals at the Windarling Range prior to development of Cliffs' existing Windarling Range mine operations. This figure is conservative, noting the census data for the areas of the Windarling Range W2 Deposit and the Windarling Range W3/5 Deposit, which were impacted in 2004, is based on the 2003 census data, which has been demonstrated to be in error by approximately 30% in comparison of areas surveyed in both the 2003 and 2009 census years. Extrapolation of this error to the areas of the Windarling Range W2 Deposit and the Windarling Range W3/5 Deposit indicate that the Windarling Range *R. brevis* population may have been in excess of 20,000 individuals. As agreed between Cliffs and DEC (pers. com. M Smith of DEC, August 2011), the conservative figure of 18,112 individuals has been used as the pre-impact Windarling Range *R. brevis* population estimate for the purpose of this EIA-API document.

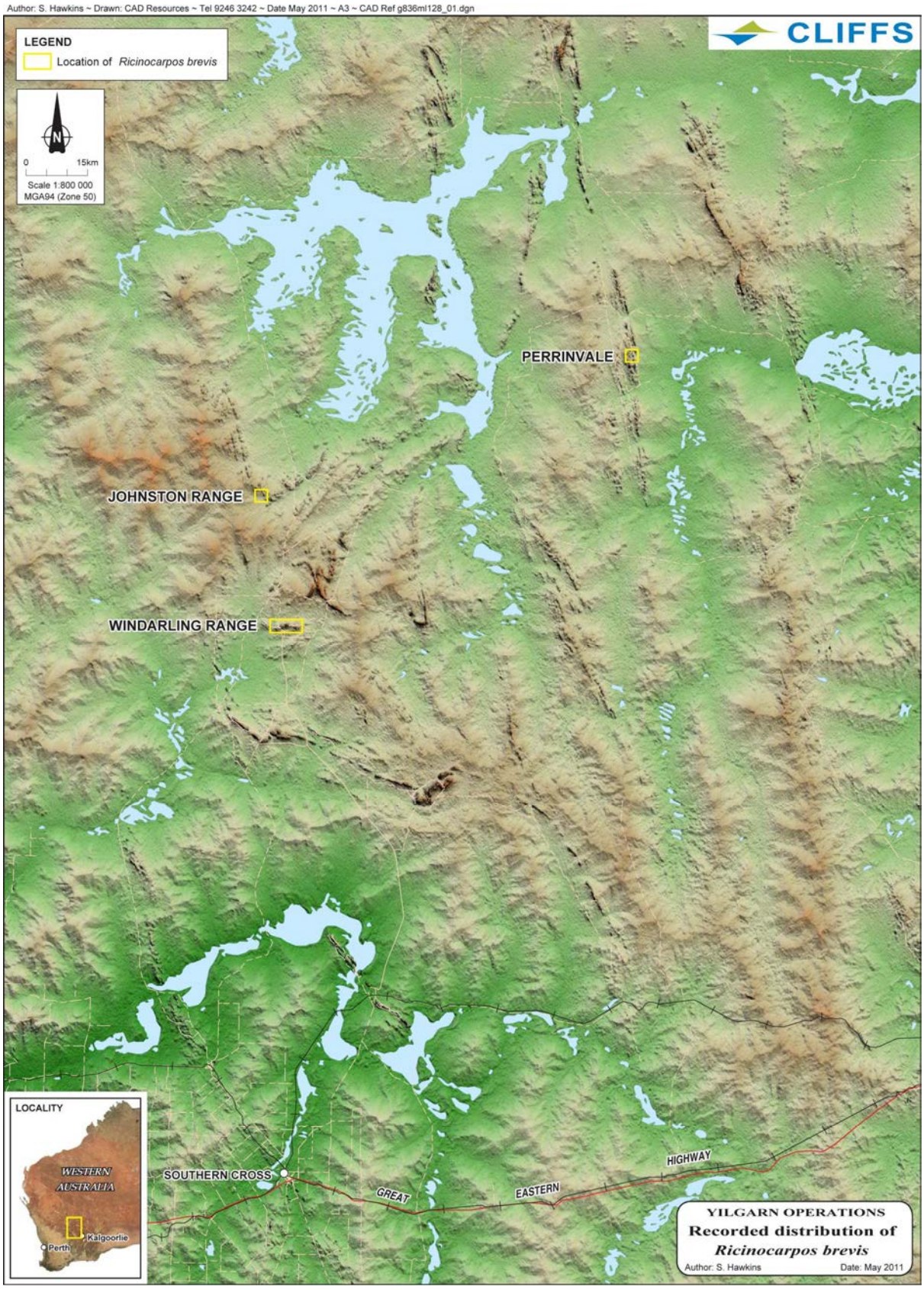

Figure 3-6 ***Ricinocarpos brevis*** **Regional Locations.** Populations of *R. brevis* have been recorded on the Windarling Range (18,112 individuals estimated, 12,271 individuals extant), Johnston Range (3,000 individuals estimated) and the Perrinvale Range (2,982 individuals).

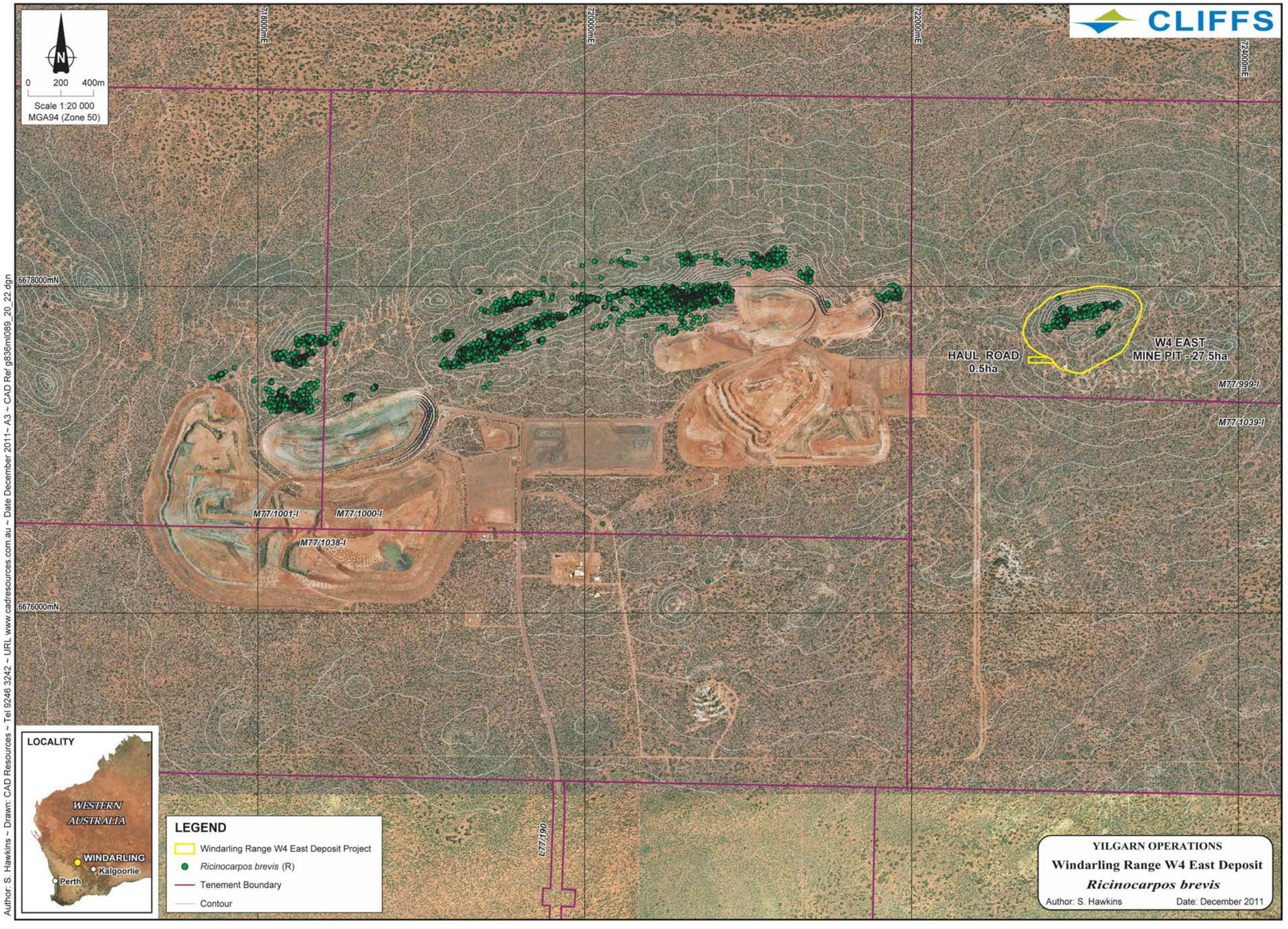

Figure 3-7 ***Ricinocarpos brevis*** **Records at the Windarling Range.** A total of 18,112 individuals of *R. brevis* are estimated to have occurred at the Windarling Range, with 12,271 individuals of *R. brevis* extant. Source: Western Botanical (2010; 2011b)

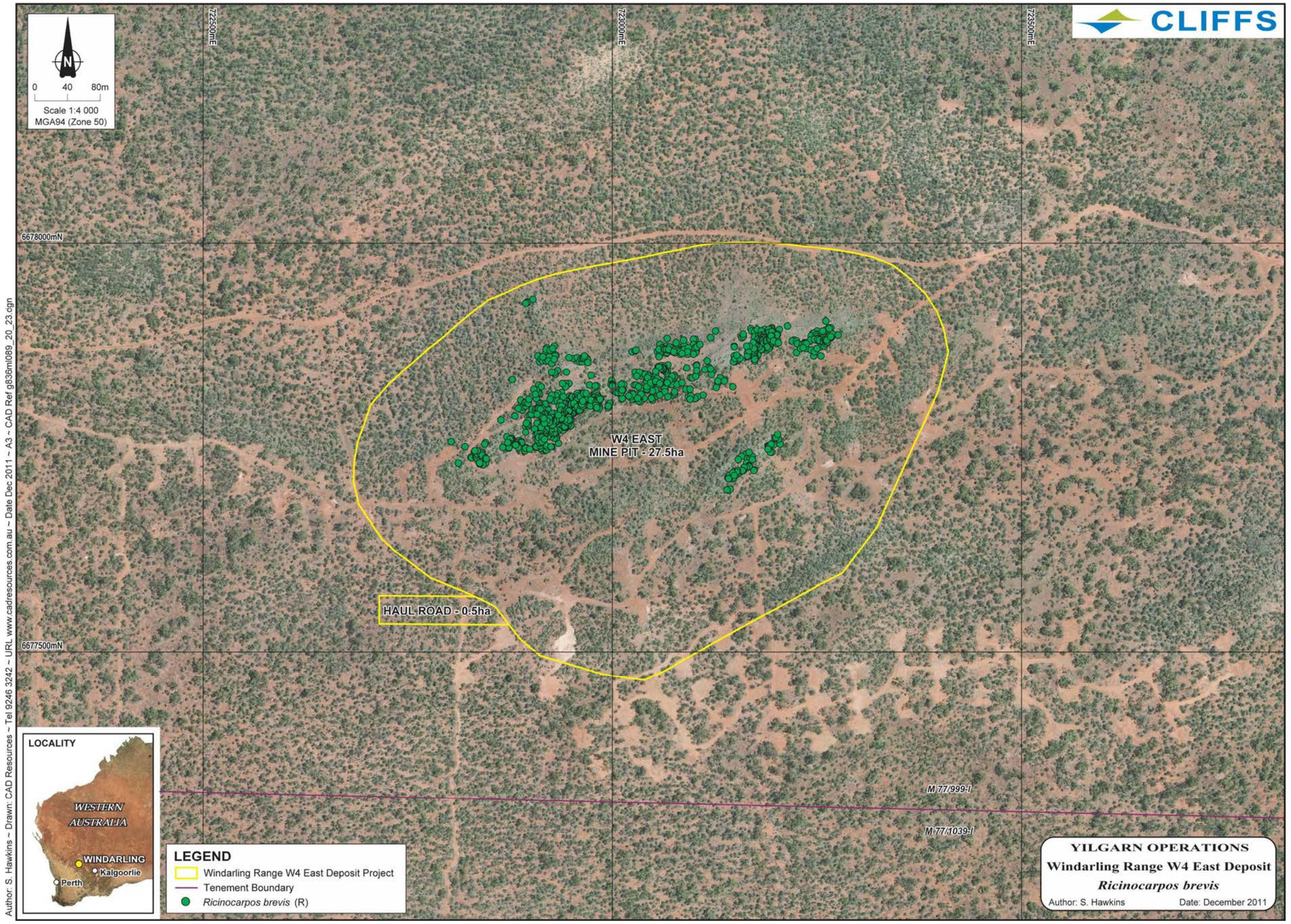

Figure 3-8 *Ricinocarpos brevis* Records at the Windarling Range W4 East Deposit Proposal. A total of 1,102 extant individuals of *R. brevis* have been recorded within the area of the Windarling Range W4 East Deposit proposal. Source: Western Botanical (2010; 2011b)

Cliffs' Windarling Range mine operations were initially approved by the WA Minister for Environment in 2003 under the *Environmental Protection Act 1986* (WA) through Implementation Statement 627 (WA Minister for Environment 2003). *Ricinocarpos brevis* occurred on each of the areas for Windarling Range Deposits W1, W2, W3/5 and W4 West that were approved for development under Implementation Statement 627. At that time, *Ricinocarpos brevis* had only been recorded at the Windarling Range, with the pre-mining *R. brevis* population estimate at the Windarling Range being 8,128 *R. brevis* individuals (Cliffs 2002).

A population census subsequently undertaken in 2003, being after approval was granted through Implementation Statement 627, revised the *R. brevis* population estimate at the Windarling Range to 14,994 individuals (Western Botanical 2011b); resulting in more than 6,800 additional *R. brevis* individuals being recorded at the Windarling Range than initially estimated.

In 2007, an additional population of *Ricinocarpos brevis* was identified by DEC at the Johnston Range, with approximately 3,000 *R. brevis* individuals estimated (DEC 2011a). In 2008, an additional population of *Ricinocarpos brevis* was identified by botanical consultants for Cliffs at the Perrinvale Range, with a population census identifying 2,982 *R. brevis* individuals (Western Botanical 2008). These additional populations of *R. brevis* resulted in a further increase of approximately 6,000 additional *R. brevis* individuals to the regional population record, to approximately 20,976 *R. brevis* individuals recorded regionally.

A subsequent population census undertaken in 2009, being after the commencement of mine operations, identified 12,271 extant *R. brevis* individuals at the Windarling Range (Western Botanical 2011b). Including the *R. brevis* individuals removed by mining operations for the Windarling Range Deposits W2 and W3/5 prior to the 2009 census, which based on the 2003 census data was 5,841 *R. brevis* individuals removed, the pre-mining *R. brevis* population at the Windarling Range would have been 18,112[1] *R. brevis* individuals; being an increase of 9,984 *R. brevis* individuals above the initial Windarling Range population estimate of 8,128 *R. brevis* individuals. The revised 18,112 *R. brevis* individuals for the Windarling Range further increased the recorded regional population estimate, to 24,094 *R. brevis* individuals (Table 3-1).

Ricinocarpos brevis was declared as 'Rare Flora' under the *Wildlife Conservation Act 1950* (WA) in 2005, being after mining was approved at the Windarling Range, but prior to identification of the *R. brevis* populations at the Johnston Range (in 2007) and the Perrinvale Range (in 2008). The declaration as Rare Flora was based upon an assessment by DEC (2004) using the International Union for Conservation of Nature (IUCN) criteria (IUCN 2001). The DEC (2004) assessment identified that *Ricinocarpos brevis* met the category of 'Critically Endangered'.

Ricinocarpos brevis was listed as a 'Threatened Species' of flora under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) in 2010. The listing as a Threatened Species is based upon criteria specified under Regulation 7.01 of the *Environment Protection and Biodiversity Conservation Regulations 2000* (C'th) with a listing category of 'Endangered' adopted (DoSEWPC 2010a; DoSEWPC 2010b).

As identified by Section 2.7, the Windarling Range *R. brevis* population is located on land tenure of Unallocated Crown Land under the *Land Administration Act 1997* (WA), which was formerly part of the Diemals Pastoral Lease, with this land managed by DRDL and DEC. Overlying the Unallocated

[1] Refer to footnote on Page 53.

Crown Land is Mining Leases granted to Cliffs under the *Mining Act 1978* (WA). As the Windarling Range area coincides with a proposed Conservation and Mining Reserve (WA Minister for Environment & WA Minister for Mines and Petroleum 2010), following its proclamation under the *Land Administration Act 1997* (WA), the Windarling Range area (including the *R. brevis*) will be managed by DEC for the purposes of conservation and mining as part of the Western Australian conservation estate.

The Johnston Range *R. brevis* population is located on land tenure of Unallocated Crown Land under the *Land Administration Act 1997* (WA), which was formerly part of the Diemals Pastoral Lease, with this land managed by DRDL and DEC. Overlying the Unallocated Crown Land is an Exploration Licence granted to Cliffs under the *Mining Act 1978* (WA). Cliffs is not aware of any proposals for this land that would result in an impact to the Johnston Range *R. brevis* population, and accordingly, the Johnston Range *R. brevis* population is not considered to be under threat.

The Perrinvale Range *R. brevis* population is located on land tenure of Unallocated Crown Land under the *Land Administration Act 1997* (WA) managed by DRDL and DEC. Overlying the Unallocated Crown Land is an Exploration Licence granted to Vale Australia EA Pty Ltd under the *Mining Act 1978* (WA). Cliffs is not aware of any proposals for this land that would result in an impact to the Perrinvale Range *R. brevis* population, and accordingly, the Perrinvale Range *R. brevis* population is not considered to be under threat.

Irrespective of the land tenures identified above, the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (C'th), *Environmental Protection Act 1986* (WA) and the *Wildlife Conservation Act 1950* (WA) will continue to provide legislative protection and impact assessment mechanisms for the *R. brevis* populations at the Windarling Range, Johnston Range and the Perrinvale Range.

Of the estimated 18,112 *R. brevis* individuals for the Windarling Range, approximately 45% (8,190 *R. brevis* individuals) occur within the area previously authorised for mine operations for the Windarling Range Deposits W1, W2, W3/5 and W4 West under Implementation Statement 627 (WA Minister for Environment 2003). As at 1st December 2011, 32% (5,841 *R.brevis* individuals) have been removed in development of the Windarling Range Deposits W2 and W3/5, and with further development of the Windarling Range Deposits W1, W3/5 and W4 West to remove the remaining 13% (2,349 *R. brevis* individuals) of the 45% of *R. brevis* previously approved to be impacted. Approximately 55% (9,922 *R.brevis* individuals) of the estimated 18,112 *R. brevis* individuals for the Windarling Range have not currently been approved to be impacted.

The condition of *R. brevis* at the Windarling Range has been monitored since 2003, being prior to mining commenced at the Windarling Range in 2004. The condition monitoring assessed the percentage of live material of individual plants for a representative subset of the *R. brevis* population at the Windarling Range. The results of the condition monitoring are identified in Figure 3-9. The condition monitoring results indicate that the condition of *R. brevis* at the Windarling Range has remained stable (within 10%) for each condition category in comparison of the 2003 pre-mining data and the 2010 current data. A decline in condition was recorded in 2007 for the highest condition category (with a resultant increase in the second highest condition category) as a result of extended drought during 2007, with this reduced condition being recorded for monitored individuals both near to and distant from Cliffs' mine operations. Between 2008 and 2010, the health condition of *R. brevis* has been recorded as having recovered to its condition prior to the 2007 drought.

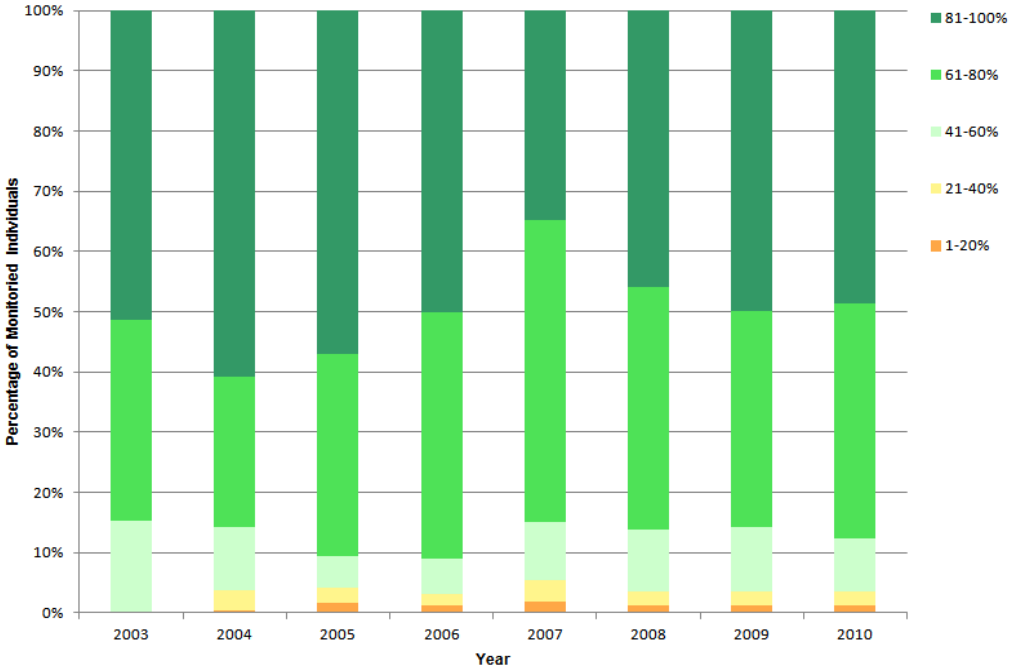

Figure 3-9 Condition Monitoring for *Ricinocarpos brevis* at the Windarling Range, 2003 to 2010. The coloured categories shown represent 'condition categories', being the proportion of live material on a representative subset of approximately 250 *R. brevis* individuals of the approximately 12,000 *R. brevis* individuals extant at the Windarling Range. The condition monitoring results indicate that the condition of *R. brevis* at the Windarling Range has remained stable (within 10%) for each condition category in comparison of the 2003 pre-mining data and the 2010 current data. Data Source: Western Botanical (unpublished). Graphic: Cliffs.

The Windarling Range W4 East Deposit proposal coincides with 1,073 *R. brevis* individuals that have not previously been approved for impact by mining[1]. The Windarling Range W4 East Deposit impact to 1,073 *R. brevis* individuals equates to approximately 6% of the estimated *R. brevis* population at the Windarling Range, which in addition to the previously approved 45%[2] impact to *R. brevis* at the Windarling Range, would result in an increase of the impact to the Windarling Range *R. brevis* population to approximately 51% (9,263 individuals). At a regional scale, the Windarling Range W4 East Deposit proposal would result in an increased impact to *R. brevis* from approximately 34%[3] to approximately 38%.

As the 1,073 *R. brevis* individuals coincide with the Windarling Range W4 East Deposit ore resource, Cliffs is unable to avoid these *R. brevis* individuals in implementation of the Windarling Range W4 East Deposit proposal. Cliffs acknowledges that impact to the 1,073 *R. brevis* individuals, which are

[1] A total of 1,102 *R.brevis* individuals occur within the area of the Windarling Range W4 East Deposit proposal (Western Botanical 2010). Of these 1,102 *R. brevis* individuals, 29 *R. brevis* individuals coincide with the area previously approved under the *Environmental Protection Act 1986* (WA) for the adjacent Windarling Range W4 West Deposit, and accordingly, the Windarling Range W4 East Deposit proposal will impact 1,073 *R. brevis* individuals.

[2] To note, DEC (2004) and DEC (2009, in DoSEWPC 2010b) identify approved impacts to *Ricinocarpos brevis* at 62% and 58%, respectively. The origin of these calculations by DEC is not known.

[3] The regional impact approved for mining in 2003 under Implementation Statement 627 was approximately 45%, noting *R. brevis* had only been recorded at the Windarling Range at that time. The subsequent identification of the Johnston Range and Perrinvale Range populations of *R. brevis* reduced the known regional impact to *R. brevis* for mining approved under Implementation Statement 627 from 45% to 34% of the regional *R.brevis* population.

declared as Rare Flora under the *Wildlife Conservation Act 1950* (WA), would be considered a significant environmental impact.

In order to offset the impact of the Windarling Range W4 East Deposit proposal to *R. brevis*, Cliffs has considered the application of both direct environmental offsets and indirect environmental offsets consistent with the EPA guidance on environmental offsets (EPA 2006a; EPA 2008a) and the Western Australia Government Offsets Policy (Government of Western Australia 2011). The EPA classifies Rare Flora, such as *Ricinocarpos brevis*, as a critical value biodiversity asset, and identifies that offsets may be applied to "*proposals or schemes referred to the EPA that have significant adverse impacts on biodiversity assets of 'high' or 'critical' value"* (EPA 2006a; EPA 2008a). Offsets are defined as *"activities undertaken to counter adverse environmental impacts arising from development"* (EPA 2008a) for the purpose "*to address significant residual environmental impacts of a development*" (Government of Western Australia 2011).

Cliffs proposes to implement the following direct environmental offsets and indirect environmental offsets in implementation of the Windarling Range W4 East Deposit proposal:

Direct Environmental Offsets for *Ricinocarpos brevis*

In seeking to identify opportunities for direct environmental offsets for the impact to *R. brevis* from development of the Windarling Range W4 East Deposit proposal, Cliffs has identified an opportunity for direct environmental offsets by avoiding *R. brevis* individuals previously approved to be impacted, and an opportunity to have targeted rehabilitation program for *R. brevis* in the area of the adjacent Windarling Range W4 West Deposit Waste Rock Landform.

Cliffs' proposed direct environmental offsets for *R. brevis* are:

- **Avoid Impact to *Ricinocarpos brevis* at Windarling Range W1 and W3/5 Deposits**

  Cliffs' mine operations at the Windarling Range, as initially approved in 2003, were authorised to impact areas containing approximately 45% (8,190 individuals) of the *R. brevis* population at the Windarling Range.

  In seeking to identify opportunities for direct environmental offsets for the impact to *R. brevis* from development of the Windarling Range W4 East Deposit proposal, Cliffs has identified an opportunity for direct environmental offset to 353 *R. brevis* individuals by modifying its approved mine operations to avoid impact to mine areas containing *R. brevis*, which comprise of:
  - 282 *R. brevis* individuals at the Windarling Range W1 Deposit; and
  - 71 *R. brevis* individuals at the Windarling Range W3/5 Deposit.

  The locations of the 353 direct environmental offset individuals of *R. brevis* within the areas of the Windarling Range W1 Deposit and the Windarling Range W3/5 Deposit are identified by Figures 3-10 and 3-11, respectively.

  These 353 direct environmental offset individuals of *R. brevis* have previously been approved for impact through Statement 627 issued by the WA Minister for Environment under the *Environmental Protection Act 1986* (WA) (WA Minister for Environment 2003). These 353 direct environmental offset individuals of *R. brevis* have also previously been

approved for impact through Permit 77-1112 issued by DEC under the *Wildlife Conservation Act 1950* (WA) (DEC 2011b).

The proposed direct environmental offset of 353 *R. brevis* individuals will reduce the impact of the Windarling Range W4 East Deposit proposal from 1,073 *R. brevis* individuals to 720 *R. brevis* individuals; equating to a 33% reduction in *R. brevis* individuals to be impacted by the Windarling Range W4 East Deposit proposal.

This proposed direct environmental offset of 353 individuals of *R. brevis* consequently reduces the increase in cumulative impact to *R. brevis* from approximately 6% to approximately 4% at the Windarling Range *R. brevis* population scale, and from approximately 4.5% to approximately 3% at a the regional *R. brevis* population scale.

The risk of indirect impact to the *R. brevis* individuals proposed to be used for the direct environmental offset is considered low as a result of the separation distance from mine infrastructure. Based on Cliffs' current mine engineering design, the *R. brevis* individuals are expected to have a minimum separation distance from the Windarling Range W1 Deposit Mine Pit of approximately 100m, and a minimum separation distance to associated support infrastructure (roads and topsoil stockpiles) of approximately 50m. Similarly, based on Cliffs' current mine engineering design, the *R. brevis* individuals are expected to have a minimum separation distance from the Windarling Range W3/5 Deposit Mine Pit of approximately 45m, and a minimum separation distance to associated support infrastructure (roads and topsoil stockpiles) of approximately 15m.

As identified in Section 2.7, the land tenure of the Windarling Range is currently a combination of Mining Leases granted to Cliffs under the *Mining Act 1978* (WA) overlying Unallocated Crown Land managed by DRDL under the *Land Administration Act 1997* (WA). As also identified by Section 2.7, the Windarling Range coincides with a proposed Conservation and Mining Reserve (WA Minister for Environment & WA Minister for Mines and Petroleum 2010), with this proposed Conservation and Mining Reserve yet to be proclaimed as formal land tenure under the *Land Administration Act 1997* (WA). Following the completion of Cliffs' mine operations, it is expected the area of the proposed *R. brevis* offset individuals will be managed by DRDL as Unallocated Crown land (for which DEC and DRDL have a memorandum of understanding for the management of flora) or managed directly by DEC under the Conservation and Mining Reserve when established as formal land tenure.

The value of this direct environmental offset to avoid impact to the 353 *R. brevis* individuals at the Windarling Range W1 Deposit and the Windarling Range W3/5 Deposit is estimated at approximately A$300million, which is based on the estimated 2Mt of iron ore that Cliffs would no longer be able to access due to the avoidance of the identified *R. brevis* individuals. Whilst the 2Mt of ore represents significant economic value, this direct environmental offset is considered acceptable by Cliffs in order to facilitate access to the greater 6.8Mt ore resource of the Windarling Range W4 East Deposit.

Cliffs acknowledges that an administrative amendment will be required to remove the 353 *R. brevis* individuals from the Statement 627 approval. Cliffs will support EPA in this administrative amendment process.

Cliffs further acknowledges that an administrative amendment will be required to remove the 353 *R. brevis* individuals from the Permit 77-1112 approval. Cliffs will support DEC in this administrative amendment process.

- **Rehabilitation Program for *R. brevis* at the Windarling Range**
  Using the information previously gained from the seeding trials for *R. brevis* (see additional investigations, below), Cliffs considers that it likely that a targeted Rehabilitation Program for *R. brevis* could successfully be undertaken within the area of the Windarling Range W4 West Deposit Waste Rock Landform, which will be located immediately to the west of the Windarling Range W4 East Deposit proposal in the area of the Windarling Range W4 West Deposit Mine Pit (refer Figure 1-4).

  The *R. brevis* Rehabilitation Program would require several years of *R. brevis* seed collection to provide adequate seed mass, physical and chemical soil analysis of the recipient site, seed application, and several years of monitoring and recording of seedling growth. Overall, the *R. brevis* Rehabilitation Program is anticipated to require an implementation period of approximately 5 years.

  Whilst Cliffs acknowledges that targeted rehabilitation programs may typically have elements of uncertainty as to their outcomes, the results of small-scale seeding trials for *R. brevis* previously undertaken at the Windarling Range (see additional investigations, below) indicate that a target of 1,000 *R. brevis* individuals germinating is likely to be achievable in context of a broader *R. brevis* Rehabilitation Program. The *R. brevis* Rehabilitation Program is also expected to benefit from the information to be gained from the *R. brevis* Research Program (see indirect environmental offsets, below).

  This proposed direct environmental offset for a *R. brevis* Rehabilitation Program is consistent with Recovery Action 6 of the *R. brevis* Interim Recovery Plan (DEC 2011a), which identifies investigation of translocations as a conservation strategy.

  The *R. brevis* Rehabilitation Program would be in addition to standard mine rehabilitation requirements, noting that standard mine rehabilitation requirements are not focussed on rehabilitation at a species-specific level. Additionally, the *R. brevis* Rehabilitation Program would be undertaken on land outside of the area for the Windarling Range W4 East Deposit proposal. Noting these characteristics, the *R. brevis* Rehabilitation Program is characterised as a direct environmental offset.

  The value of this direct environmental offset for a targeted rehabilitation program for *R.brevis* is estimated at approximately $300,000.

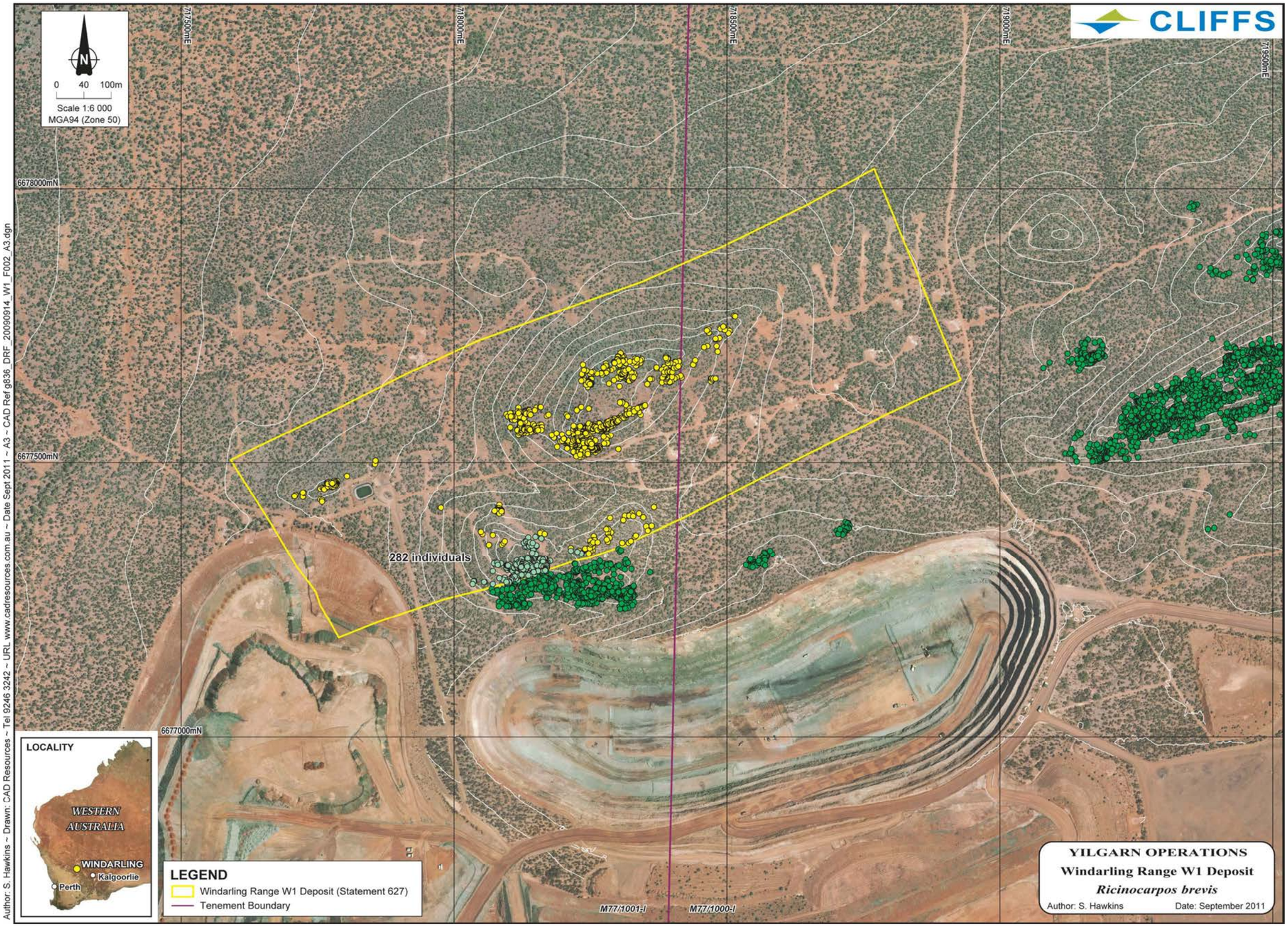

Figure 3-10 Direct Environmental Offset for *Ricinocarpos brevis* at the Windarling Range W1 Deposit. The previously approved impact area for the Windarling Range W1 Deposit mine pit is identified by the yellow polygon. Individuals of *R. brevis* are identified by circles. Cliffs proposes a direct environmental offset of 282 individuals of *R. brevis*, identified in light green, by avoiding impact to the identified individuals that occur within the previously approved impact area for the Windarling Range W1 Deposit.

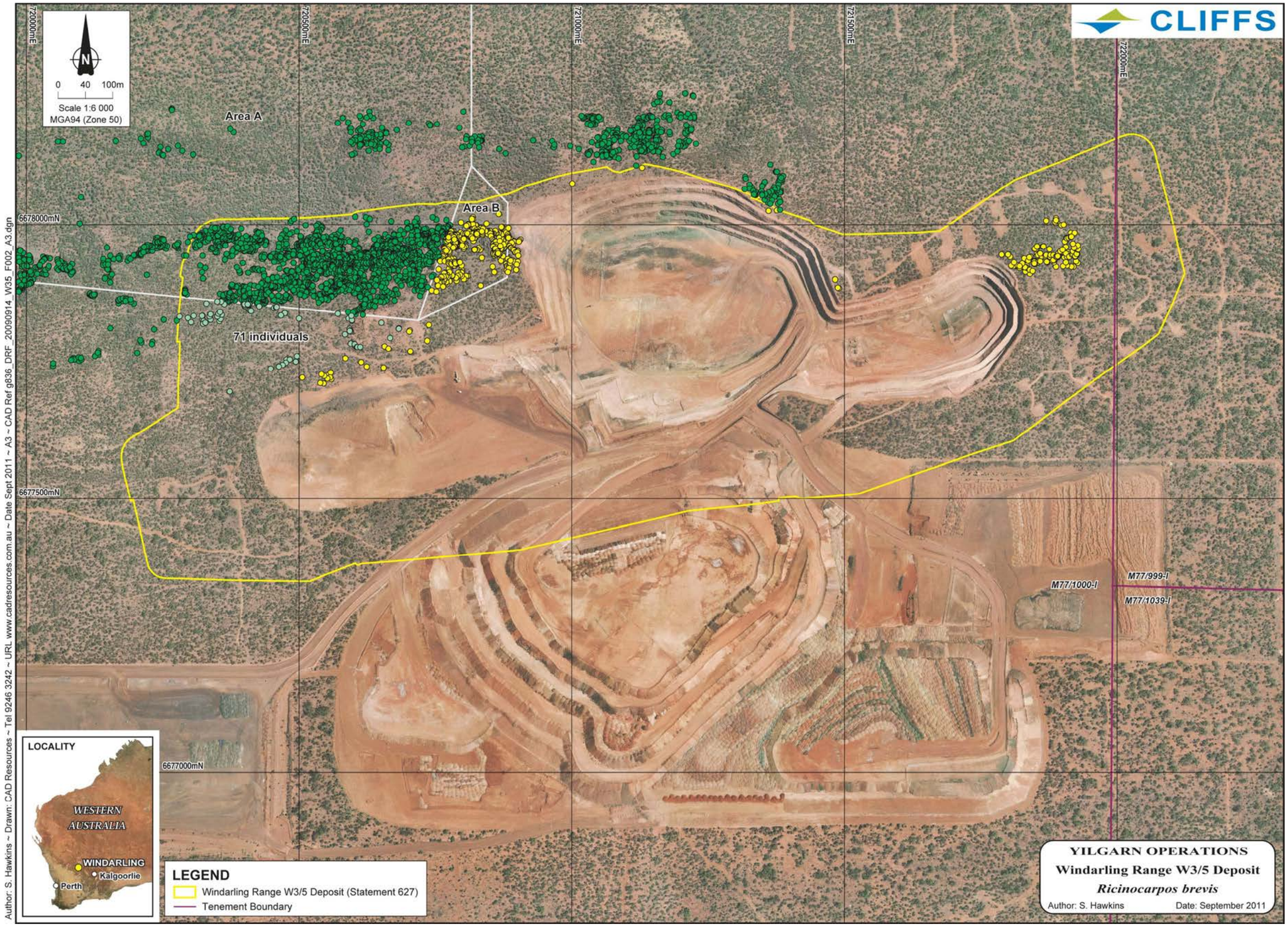

Figure 3-11 Direct Environmental Offset for *Ricinocarpos brevis* at the Windarling Range W3/5 Deposit. The previously approved impact area for the Windarling Range W3/5 Deposit mine pit is identified by the yellow polygon. Individuals of *R. brevis* are identified by circles. Cliffs proposes a direct environmental offset of 71 individuals of *R. brevis*, identified in light green, by avoiding impact to the identified individuals that occur within the previously approved impact area for the Windarling Range W3/5 Deposit.

Indirect Environmental Offsets for *Ricinocarpos brevis*

Cliffs has considered indirect environmental offsets in accordance with the EPA guidance on environmental offsets (EPA 2006a; EPA 2008a) and the Government of Western Australia's Offsets Policy (Government of Western Australia 2011), and in consideration of the additional investigations previously commenced or completed for *R. brevis* (see additional investigations, below).

Cliffs' proposed indirect environmental offsets for *R. brevis* are:

- ***Ricinocarpos brevis* Research Program**

  This indirect environmental offset (research category) is outlined in Botanic Gardens and Parks Authority (BGPA) (2011a) as a 5-year collaborative research agreement between Cliffs and BGPA. The BGPA Science Directorate has a strong track record in achieving practical outcomes in both *in-situ* and *ex-situ* conservation, restoration and translocation of native species and ecosystems in Western Australia.

  The purpose of this indirect environmental offset for a *R. brevis* Research Program is to:

  - develop an understanding, the technologies and the processes necessary for restoration of sustainable *R. brevis* populations at the Windarling Range, whose functional attributes resemble those of natural *R. brevis* populations (density, cover, genetic diversity, population processes and trend, and resilience to environmental variability).
  - develop measures, monitoring and analysis approaches to demonstrate that restoration of *R. brevis* populations and environmental attributes are, or are developing towards, those of a *R. brevis* sustainable population.

  The *R. brevis* Research Program will build upon the previous work undertaken by Cliffs in improving the scientific understanding of *R. brevis* (see additional investigations, below) and seeking to supplement existing populations and/or establish new populations of *R. brevis* in appropriate disturbed environments at the Windarling Range.

  The *R. brevis* Research Program will support the targeted *R. brevis* Rehabilitation Program (see *R. brevis* Rehabilitation Program, above) by developing an understanding of the behaviour and requirements of *R. brevis*, the environment which naturally supports it, and how these function together to enable *R. brevis* to persist. The *R. brevis* Research Program will also address the key factors in plant establishment, focusing on both germination and initial establishment. This knowledge will be used to inform the design of restoration sites, and associated topsoil handling strategies and seeding methods.

  Achieving this understanding will involve research on the root systems, water-use physiology, demography and reproductive biology (utilising information available from past and ongoing population monitoring completed by Cliffs as outlined in additional investigations, below), and biotic interactions of the species. Key attributes of the environment to be investigated include the chemical, physical and hydrological properties of the soils where *R. brevis* occur (and where it does not). The research will also consider how *R. brevis* responds to spatial and temporal variation in these

attributes. The key factors for *R. brevis* establishment will be examined in detail, including seed viability, dormancy, natural regeneration strategy and germination response in relation to restored substrates. Applying this understanding will involve designing and constructing restoration sites (surfaces and substrates) to mimic the identified key environmental parameters. Finally, the research program will develop appropriate functional and demographic indicators that can be utilised to monitor and assess the functional development of artificially established *R. brevis* populations and to compare these with the naturally occurring *R. brevis* populations.

This proposed indirect environmental offset for a *R. brevis* Research Program is consistent with Recovery Action 4 of the *R. brevis* Interim Recovery Plan (DEC 2011a), which identifies the need for a research program to improve the knowledge of the biology and ecology of *R. brevis*. This proposed indirect environmental offset for a *R. brevis* Research Program is also consistent with Recovery Action 6 of the *R. brevis* Interim Recovery Plan (DEC 2011a), which identifies investigation of translocation as a conservation strategy.

The estimated cost for this indirect environmental offset is approximately $640,000.

- ***Ricinocarpos brevis* Translocation at the Windarling Range W1 Deposit**
  This indirect environmental offset (research category) is scheduled to commence in 2012, with completion scheduled for 2013. The scope of the translocation is outlined in Cliffs (2011f), with the translocation proposal currently awaiting approval from DEC. The proposed translocation is a new initiative proposed by Cliffs, and not a requirement of any existing government approval or requirement.

  The purpose of this indirect environmental offset is to identify the potential for *R. brevis* individuals to be translocated to offset the impact of mine operations, with a view that the information obtained could assist to preserve the number of individuals and the security of the *R. brevis* population at the Windarling Range; an outcome consistent with the intent of the *R. brevis* Interim Recovery Plan (DEC 2011a). The *R. brevis* to be translocated have previously been approved by DEC under the *Wildlife Conservation Act 1950* (WA) through Permit 77/1112 (DEC 2011b) to be impacted by the previously approved mine operations at the Windarling Range.

  This proposed indirect environmental offset for translocation of *R. brevis* from the Windarling Range W1 Deposit is consistent with Recovery Action 6 of the *R. brevis* Interim Recovery Plan (DEC 2011a), which identifies investigation of translocation as a conservation strategy.

  The estimated cost for this indirect environmental offset is approximately $40,000.

- ***Ricinocarpos brevis* Translocation at the Windarling Range W4 East Deposit**
  Subject to approval of this proposal to develop the Windarling Range W4 East Deposit, this indirect environmental offset (research category) would be scheduled to commence from 2013. A translocation proposal will be submitted to DEC for this *R. brevis* translocation following approval of the Windarling Range W4 East Deposit proposal.

The scope of this proposed translocation is similar to that outlined in Cliffs (2011f), however, with the translocation source *R. brevis* individuals to be from within the area of the Windarling Range W4 East Deposit.

This proposed indirect environmental offset for translocation of *R. brevis* from the Windarling Range W4 East Deposit is consistent with Recovery Action 6 of the *R. brevis* Interim Recovery Plan (DEC 2011a), which identifies investigation of translocation as a conservation strategy.

The estimated cost for this indirect environmental offset is approximately $40,000.

Discussions on the above direct environmental offsets and indirect environmental offsets have been undertaken by Cliffs with both EPA and DEC during 2011 and 2012. The EPA, on advice of DEC, has advised that Cliffs' direct environmental offsets and indirect environmental offsets are aligned with EPA offset policy and guidance, and that from a preliminary assessment the combination of direct environmental offsets and indirect environmental offsets proposed appeared to form an adequate package to mitigate the impacts of the Windarling Range W4 East Deposit proposal to *R. brevis* (pers. com OEPA to S Hawkins of Globe Environments, January 2012).

Having regard to the 353 *R. brevis* individuals proposed for a direct environmental offset identified above, the residual impact of the Windarling Range W4 East Deposit proposal will be an impact to 720 *R. brevis* individuals. The remaining direct environmental offsets and indirect environmental offsets are expected to counterbalance the residual impact to the 720 *R. brevis* individuals.

The impact to 720 *R. brevis* individuals by the Windarling Range W4 East Deposit proposal equates to approximately 4% of the Windarling Range *R. brevis* population, which will increase the total impact to *R. brevis* from 45% to 49% of the Windarling Range *R. brevis* population. The impact to 720 *R. brevis* individuals by the Windarling Range W4 East Deposit proposal equates to approximately 3% of the regional *R. brevis* population, which will increase the total impact to *R. brevis* from 34% to 37% at the regional *R. brevis* population scale.

Cliffs has assessed the potential impact of the Windarling Range W4 East Deposit proposal to *Ricinocarpos brevis* using the IUCN (2001) threatened taxa criteria (Cliffs 2012b; Appendix 9). The assessment identified that implementation of the Windarling Range W4 East Deposit proposal, including previously approved impacts, would not be expected to increase the threatened taxa category under the IUCN (2001) criteria, and as such, implementation of the Windarling Range W4 East Deposit proposal would not affect the conservation status of *R. brevis*. By contrast, the assessment supports a revision of the threatened taxa category to adopt the lower threatened taxa category of 'Endangered' under the *Wildlife Conservation Act 1950* (WA).

In addition to the above, Cliffs has also undertaken a number of additional investigations in regard to *R. brevis* that are not listed in the environmental offsets identified above as they have either been substantially commenced or have been completed. These additional investigations have voluntarily been undertaken by Cliffs, in excess of its statutory obligations and not for the purpose of environmental assessment of the Windarling Range W4 East Deposit proposal. The EPA has advised Cliffs that whilst these additional investigations include actions that would under normal circumstances be accepted by EPA as indirect environmental offsets for *R. brevis*, these additional investigations would not be considered by EPA as indirect environmental offsets as they have been substantially commenced or completed (pers. com. OEPA of EPA to S Hawkins of Globe Environments,

December 2011). Cliffs notes and accepts this position. Having regard to this, it is appropriate that suitable credit be given to the value of these additional investigations voluntarily undertaken by Cliffs in the overall assessment of offsets for *R. brevis*, and that these additional investigations are acknowledged as being substantially commenced or completed within the environmental impact assessment process.

Cliffs' additional investigations undertaken for *R. brevis* are:

- **Population census of *Ricinocarpos brevis* at the Perrinvale Range**
  This additional investigation was completed in 2008, with the results outlined in Western Botanical (2008). The purpose of this additional investigation was to determine the number of individuals of *R. brevis* at the Perrinvale Range, with 2,982 newly recorded individuals confirmed. This survey followed the identification of this new population during botanical surveys by Cliffs. This additional investigation is consistent with Recovery Action 3 of the *R. brevis* Interim Recovery Plan (DEC 2011a), which identifies a need to map the habitat of *R. brevis*. The value of this additional investigation was approximately $20,000.

- **Genetic assessment of *Ricinocarpos brevis* at the Johnston Range and Perrinvale Range**
  This additional investigation was completed in 2011, with the results outlined in Botanic Gardens and Parks Authority (2011b). The purpose of this additional investigation was to determine and compare the genetic relationship of the *R. brevis* populations at the Perrinvale Range and the Johnston Range to the *R. brevis* population at the Windarling Range. This additional investigation is consistent with Recovery Action 4 of the *R. brevis* Interim Recovery Plan (DEC 2011a), which identifies investigation of the genetic structure and genetic diversity within and between populations. The estimated cost for this additional investigation was approximately $70,000[1].

- **Regional survey to locate new populations of *Ricinocarpos brevis* in the Yilgarn Region**
  This additional investigation was completed in 2009, with the results outlined in Western Botanical (2009). The purpose of this additional investigation was to search areas of potential *R. brevis* habitat by helicopter in order to identify new populations within the Yilgarn Region. This additional investigation is consistent with Recovery Action 3 of the *R. brevis* Interim Recovery Plan (DEC 2011a), which identifies a need to map the habitat of *R. brevis*. The estimated cost for this additional investigation was approximately $20,000.

- **Seeding Trials of *Ricinocarpos brevis* at the Windarling Range**
  This additional investigation commenced in 2010, and is expected to be completed in early 2012. The scope of the seeding trial is outlined in Cliffs (2010b), with the agreement of DEC outlined in DEC (2010b). The purpose of this additional investigation is to identify the potential for *R. brevis* to germinate from seed in field conditions, with a view that the information obtained could assist to inform future recovery of *R. brevis*; an outcome consistent with the intent of the *R. brevis* Interim Recovery Plan (DEC 2011a). The initial results of the seeding trial have recorded 72 successful germinants (Cliffs 2011g; pers. com. R Howard of Cliffs to S Hawkins of Globe Environments, November

[1] The genetic assessment of the Windarling Range *R. brevis* was undertaken for assessment of the Windarling Range W4 East Deposit proposal, and the cost for this genetic assessment is not included in the cost above. The cost identified is for the genetic assessment works for the Johnston Range and Perrinvale Range *R. brevis* populations only.

2011). This additional investigation is consistent with Recovery Action 6 of the *R. brevis* Interim Recovery Plan (DEC 2011a), which identifies investigation of translocation as a conservation strategy. The estimated cost for this additional investigation is approximately $30,000.

- **Seedling Trials of *Ricinocarpos brevis* at the Windarling Range**
  This additional investigation commenced in 2011, with completion scheduled for 2012. The scope of the seedling trial is outlined in Cliffs (2011h), with the agreement of DEC outlined in DEC (2011c). The purpose of this additional investigation is to identify the potential for *R. brevis* seedlings to be established in field conditions, with a view that the information obtained could assist to inform future recovery of *R. brevis*; an outcome consistent with the intent of the *R. brevis* Interim Recovery Plan (DEC 2011a). Initial results indicate approximately 60% of the translocated seedlings are surviving at 6 weeks after translocation (pers. com. K Greenacre of Cliffs to S Hawkins of Globe Environments, September 2011). This additional investigation is consistent with Recovery Action 6 of the *R. brevis* Interim Recovery Plan (DEC 2011a), which identifies investigation of translocation as a conservation strategy. The estimated cost for this additional investigation is approximately $30,000.

***Austrostipa blackii* (P3)**

Austrostipa blackii is a tufted facultative perennial grass to 1m height with distinctive hairs along its leaves (DEC 2011d). *Austrostipa blackii* was recorded at 6 locations across the Windarling Range, of which 3 locations occur within the area of the Windarling Range W4 East Deposit proposal. As outlined by Western Botanical (2010), the seasonal and inconspicuous nature of *A. blackii* makes it difficult to identify during field surveys, and consequently, *A. blackii* is likely to be more widespread than currently recorded, both within and outside of the Windarling Range W4 East Deposit proposal area.

Austrostipa blackii has also previously been recorded at the Mt Jackson Range, Hunt Range, Mt Finnerty Range and near Highclere Hills, along with more extensive populations further to the west and south-west (Western Botanical 2010). Regional population estimates for *A. blackii* are not available. DEC (2011d) identifies that *A. blackii* has a linear distribution of more than 600km.

Based on the recorded locations of *A. blackii* and the area of the Windarling Range W4 East Deposit proposal, it is estimated that 3 individuals of *A. blackii* will be impacted by the Windarling Range W4 East Deposit proposal.

Having regard to the currently recorded local and regional distribution of *A. blackii*, implementation of the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact that would reduce the regional distribution or regional population to an extent that the conservation status of *A. blackii* would be affected.

***Banksia arborea* (P4)**

Banksia arborea, previously referred to as *Dryandra arborea*, is a tree to 8m height with yellow flowers and spiked leaves (DEC 2011e). *Banksia arborea* was recorded by Western Botanical (2010) across the length of the Windarling Range, with more than 1,100 *B. arborea* individuals estimated to occur across the Windarling Range.

Banksia arborea is understood to occur on most ironstone ranges in the vicinity of the Windarling Range, with previous recordings at Mt Elvire, Mt Manning Range, Die Hardy Range, Mt Jackson Range, Bungalbin Hill, Koolyanobbing Range, Hunt Range, Pigeon Rocks, Yorkadine Hill, Mt Finnerty and the Perrinvale Range (Western Botanical 2010). DEC (2011e) indicates *B. arborea* has a linear distribution of approximately 200km. Western Botanical (2010) estimates that approximately 6,000 *B. arborea* individuals occur across the Yilgarn region.

Based on the recorded locations of *B. arborea* and the area of the Windarling Range W4 East Deposit proposal, it is estimated that 159 individuals of *B. arborea* will be impacted by the Windarling Range W4 East Deposit proposal.

Having regard to the local and regional population estimates and the local and regional distribution of *B. arborea*, implementation of the Windarling Range W4 East Deposit proposal is not expected to result in an impact that would reduce the regional distribution or regional population to an extent that the conservation status of *B. arborea* would be affected.

Table 3-2 summarises the estimated number of individuals of each flora species of conservation significance to be impacted by the Windarling Range W4 East Deposit proposal.

Flora Species	Estimated Impact (No.)	Windarling Range Population	Regional Population	Regional Distribution
Ricinocarpos brevis (R)	720 [(1)]	18,112 estimated (12,271 extant) [(2)]	24,094 estimated	Populations also recorded at Johnston Range and Perrinvale Range
Austrostipa blackii (P3)	3	6 recorded opportunistically [(3)]	Unknown	Populations also recorded at Mt Jackson Range, Hunt Range and Mt Finnerty Range, with a recorded regional distribution of approximately 600km [(3, 4)]
Banksia arborea (P4)	159	1,100 estimated [(3)]	6,000 estimated [(3)]	Populations also recorded at Mt Elvire, Mt Manning Range, Die Hardy Range, Mt Jackson Range, Bungalbin Hill, Koolyanobbing Range, Hunt Range, Pigeon Rocks, Yorkadine Hill, Mt Finnerty and Perrinvale Range, with a regional distribution of approximately 200km [(3, 5)]

Table 3-2 Flora Species Impact Table for the Windarling Range W4 East Deposit Proposal. The estimated number of individuals of each key flora species to be impacted by the Windarling Range W4 East Deposit proposal is identified. Notes: [(1)] Incorporates the reduced impact from 1,073 *R. brevis* individuals to 720 *R. brevis* individuals through the proposed direct environmental offset of 353 *R. brevis* individuals identified above; [(2)] Source: Western Botanical 2011b; [(3)] Source: Western Botanical 2010; [(4)] Source DEC 2011d; [(5)] Source DEC 2011e.

Assessment of Potential Impact to Other Flora Species

A total of 217 native vascular flora species have been recorded within the broader area of the Windarling Range W4 East Deposit (Western Botanical 2010). As these other flora species are generally considered to have wide distributions and are not threatened, implementation of the Windarling Range W4 East Deposit

proposal is not expected to result in an impact that would reduce the regional distribution or regional population of these other flora species to an extent that their conservation status would be affected. Accordingly, an assessment of each of these other flora species is not provided.

Assessment of Potential Impact to Vegetation Units

A total of 44 vegetation units were recorded at the Windarling Range (Western Botanical 2010; Western Botanical 2011a). Of these 44 vegetation units, 10 vegetation units coincide with the area of the Windarling Range W4 East Deposit proposal. Table 3-3 identifies the area of each vegetation unit to be impacted by the Windarling Range W4 East Deposit proposal.

With the exception of Vegetation Unit 4.03 *Maireana integra* low heath, all vegetation units recorded within the area of the Windarling Range W4 East Deposit proposal were also recorded outside of the impact areas.

Vegetation Unit 4.03 *Maireana integra* low heath is monotypic, in that it contains only the *Maireana integra* flora species (i.e. not a vegetation unit consisting of multiple species). *Maireana integra* is not listed as a 'Threatened Species' under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th), 'Rare Flora' under the *Wildlife Conservation Act 1950* (WA) or classified by DEC as a 'Priority' flora species. As outlined by Western Botanical (2010), species of the genus *Maireana* are common in rehabilitation works in the Yilgarn/Goldfields region, and as such, the impact of the Windarling Range W4 East Deposit to this flora species can readily be countered by rehabilitation works targeted at this species.

To note, the vegetation units recorded in the vicinity of the Windarling Range area may also have a broader distribution than the areas surveyed by Western Botanical (2010; 2011a). Vegetation survey for Cliffs' proposed Deception Deposit proposal (Biota 2011b), located approximately 20km north of the Windarling Range, recorded several of the vegetation units that were recorded at the Windarling Range.

Vegetation Unit		Estimated Impact (ha)
1.03	*Banksia arborea* Shrubland	1.9
1.04	*Acacia aneura, Acacia ramulosa* var. *ramulosa, Acacia* sp. Mt Jackson Shrubland	12.5
1.06	*Acacia cockertoniana, Acacia* sp. Mt Jackson, *Acacia ramulosa* var. *ramulosa* Shrubland	2.0
1.08	Emergent *Casuarina pauper* over *Acacia cockertoniana* Shrubland	0.1
1.09	*Acacia cockertoniana, Acacia ramulosa* var. *ramulosa* Shrubland	2.5
1.11	*Acacia aneura, Acacia ramulosa* var. *ramulosa* Shrubland	2.8
2.01	*Eucalyptus longissima, Eucalyptus corrugata* Open Low Woodland over *Acacia cockertoniana, Acacia aneura* Shrubland	2.3
2.05	*Eucalyptus loxophleba* subsp. *lissophloia* Low Woodland over *Ptilotus obovatus* var. *obovatus* Dwarf Shrubland	2.4
4.02	*Ptilotus obovatus* var. *obovatus* Dwarf Shrubland	1.4
4.03	*Maireana integra* Low Heath	0.1
	Total:	**28.0**

Table 3-3 Vegetation Unit Impact Table for the Windarling Range W4 East Deposit Proposal. The estimated area of each vegetation unit to be impacted by the Windarling Range W4 East Deposit proposal is identified.

With regards to the DEC-classified 'Windarling Range vegetation complex' PEC, and as identified by Western Botanical (2010), the boundaries for this PEC do not correlate with the vegetation unit boundaries, as depicted

in Figure 3-5, as a result of the mapping for the PEC boundaries being at a broader scale; identifying only 12 vegetation units across the Windarling Range compared to the 44 vegetation units identified by Western Botanical (2010).

The Windarling Range W4 East Deposit proposal coincides with 13.6ha of the currently mapped PEC. In order to meaningfully assess the potential impact of the Windarling Range W4 East Deposit proposal to the PEC, however, the boundaries would need to be reassessed by DEC based on the more detailed vegetation unit mapping of Western Botanical (2010). Western Botanical (2010) provides guidance as to the vegetation units that could be considered by DEC in reassessment of the PEC boundaries.

Assessment of Potential Cumulative Impact to Conservation Significant Flora Species

An assessment of the potential cumulative impact to conservation significant flora species is provided below:

***Ricinocarpos brevis* (Rare Flora)**

The Windarling Range W4 East Deposit proposal coincides with 1,073 *R. brevis* individuals that are not currently approved for impact by mining. Following the application of direct environmental offsets for *R. brevis* described above, the Windarling Range W4 East Deposit proposal will result in an impact to an additional 720 *R. brevis* individuals; an increase to the cumulative impact to *R. brevis* at the Windarling Range from 45% (8,190 individuals) to 49% (8,910 individuals). The land areas at the Windarling Range that would subsequently not be approved for impact by mining would support 9,202 *R. brevis* individuals, being 51% of the Windarling Range *R. brevis* population.

Whilst implementation of the Windarling Range W4 East Deposit proposal will result in an increase to the cumulative impact to *R. brevis*, based on comparison of the initial *R. brevis* population estimate and the 2009 census data, the number of *R. brevis* individuals to remain post-mining (9,202 *R. brevis* individuals) will be more than the initial Windarling Range *R. brevis* population estimate (8,128 *R. brevis* individuals). The number of *R. brevis* individuals to remain post-mining will also be more than double the previously expected post-mining *R. brevis* population based on the 2003 environmental approval for mining at the Windarling Range.

Following the identification of new populations of *R. brevis* at the Johnston Range (3,000 individuals estimated) and the Perrinvale Range (2,982 individuals), the expected impact to *R. brevis* at a regional scale has been reduced from approximately 45% (when the Windarling Range *R. brevis* population was the only known population) to approximately 34%. Implementation of the Windarling Range W4 East Deposit proposal will increase the cumulative impact to the regional *R. brevis* population from approximately 34% to approximately 37%; which is 8% lower than the approximately 45% cumulative impact to the *R. brevis* regional population that was previously approved in 2003. The additional 2 populations of *R. brevis* recorded at the Johnston Range and the Perrinvale Range should also provide improved confidence as to the long-term security for the *R. brevis* species.

As noted previously, Cliffs has assessed the potential impact of the Windarling Range W4 East Deposit proposal to *Ricinocarpos brevis* using the IUCN (2001) threatened taxa criteria (Cliffs 2012b; Appendix 9). This assessment concluded that implementation of the Windarling Range W4 East Deposit proposal, including previously approved impacts, would not be expected to increase the threatened taxa category under the IUCN (2001) criteria, and as such, implementation of the Windarling Range W4 East Deposit proposal would not affect the conservation status of *R. brevis*. By contrast, the assessment supports a revision of the threatened taxa category to adopt the lower threatened taxa category of 'Endangered' under the *Wildlife Conservation Act 1950* (WA). The lower category of "Endangered' identified by the assessment, compared to the higher 'Critically Endangered' category

adopted by DEC (2004), appears largely a result of the increased extent of occurrence at the Johnston Range and Perrinvale Range populations, and the increased recorded number of individuals for the Windarling Range, since the DEC (2004) assessment.

In context with the above, the impact to an additional 720 individuals of *R. brevis* from development of the Windarling Range W4 East Deposit proposal is not expected to result in a significant cumulative impact to *R. brevis*.

***Austrostipa blackii* (P3)**

Austrostipa blackii was recorded at 3 locations within the Windarling Range W4 East Deposit proposal area and 3 locations elsewhere at the Windarling Range. As identified by Western Botanical (2010), *A. blackii* is expected to be more widespread at the Windarling Range than currently recorded due to its inconspicuous nature. *Austrostipa blackii* has previously been recorded at the Mt Jackson Range, Hunt Range, Mt Finnerty Range and near Highclere Hills, along with more extensive populations further to the west and south-west (Western Botanical 2010), with DEC (2011d) identifying *A. blackii* as having a linear distribution of more than 600km.

Whilst local and regional population estimates for *A. blackii* are not available, having regard to the currently recorded local and regional distribution of *A. blackii*, implementation of the Windarling Range W4 East Deposit proposal is not expected to result in a cumulative impact that would reduce the regional distribution or regional population to an extent that the conservation status of *A. blackii* would be affected.

***Banksia arborea* (P4)**

Banksia arborea was recorded across the length of the Windarling Range, with more than 1,100 *B. arborea* individuals estimated to occur at the Windarling Range (Western Botanical 2010). *Banksia arborea* is understood to occur on most ironstone ranges in the vicinity of the Windarling Range, with previous recordings of *B. arborea* also at Mt Elvire, Mt Manning Range, Die Hardy Range, Mt Jackson Range, Bungalbin Hill, Koolyanobbing Range, Hunt Range, Pigeon Rocks, Yorkadine Hill, Mt Finnerty and Perrinvale Range, with more than 6,000 individuals estimated to occur regionally (Western Botanical 2010). The DEC (2011e) indicates *B. arborea* having a linear distribution of approximately 200km.

Having regard to the local and regional population estimates and the local and regional distribution of *B. arborea*, implementation of the Windarling Range W4 East Deposit proposal is not expected to result in a cumulative impact that would reduce the regional distribution or regional population to an extent that the conservation status of *B. arborea* would be affected.

Assessment of Potential Cumulative Impact to Vegetation Units

Assessment of cumulative impacts to vegetation units in environmental impact assessment is often difficult due to the inherent limitations of insufficient regional data. Accordingly, assessments of cumulative impacts are often broad in context.

As identified above, 44 vegetation units were recorded across the Windarling Range, of which 10 vegetation units will be impacted by the Windarling Range W4 East Deposit proposal. With the exception of Vegetation Unit 4.03 *Maireana integra* low heath, all vegetation units recorded within the Windarling Range W4 East Deposit proposal impact area were also recorded outside of the impact areas, and as such, in broad context the potential cumulative impact to these vegetation units is not expected to be significant.

The cumulative impact to the monotypic Vegetation Unit 4.03 *Maireana integra* low heath could be considered significant given it has not been recorded elsewhere at the Windarling Range. As identified by Western Botanical (2010), species of the genus *Maireana* are common in rehabilitation works in the Yilgarn/Goldfields region, and as such the potential cumulative impact can be readily counterbalanced by mine rehabilitation works targeted at this species. Accordingly, the potential cumulative impact to Vegetation Unit 4.03 *Maireana integra* low heath is not expected to be significant.

With regards to the potential cumulative impact to vegetation more generally, implementation of the Windarling Range W4 East Deposit proposal, being 28ha in area, will result in an approximately 5% increase to the 591ha area previously approved under Implementation Statement 627 for development of the Windarling Range mine operations. The cumulative impact to vegetation from implementation of the Windarling Range W4 East Deposit proposal, in addition to existing approved impacts in the region, is not expected to result in a significant impact to vegetation.

Assessment of Potential Indirect Impact to Flora – *Ricinocarpos brevis* Genetic Diversity

As the Windarling Range W4 East Deposit proposal will impact the most eastern grouping of *R. brevis* at the Windarling Range, with this *R. brevis* grouping separated from other *R. brevis* at the Windarling Range by approximately 900m, Cliffs commissioned BGPA to undertake a genetic assessment to determine the genetic relationship between this group of *R. brevis* individuals with other *R. brevis* at the Windarling Range.

As identified by BGPA (2011b), the genetic assessment confirmed that the *R. brevis* individuals at the Windarling Range W4 East Deposit were not unique, and as such, removal of the *R. brevis* individuals at the Windarling Range W4 East Deposit would not impact genetic diversity within *R. brevis* at the Windarling Range. Accordingly, the removal of *R. brevis* that occur within the area of the Windarling Range W4 East Deposit proposal is not expected to result in an indirect impact through a loss of genetic diversity within the *R. brevis* population at the Windarling Range.

Assessment of Potential Indirect Impact to Flora – *Ricinocarpos brevis* Retained at Windarling Range

As identified above and depicted in Figure 3-9, the condition of *R. brevis* at the Windarling Range has been monitored since 2003, being prior to mining commenced at the Windarling Range in 2004. The condition monitoring results indicate that the condition of *R. brevis* at the Windarling Range has remained stable (within 10%) for each condition category in comparison of the 2003 pre-mining data and the 2010 current data. The 8 years of condition monitoring indicate that the Windarling Range mine operations have not had a detectable impact to the retained *R. brevis* at the Windarling Range.

Accordingly, implementation of the existing approved mine operations and the proposed Windarling Range W4 East Deposit proposal are not expected to result in an indirect impact to the long-term condition of the retained *R. brevis* at the Windarling Range.

Assessment of Potential Indirect Impact to Flora - Introduced Flora (Weeds)

Introduced flora (weeds) can spread into disturbed land and compete for resources with native flora, with potential to subsequently affect the quality of the habitat for use by native fauna. Land disturbance by mining operations has the potential to introduce new weed species and increase the distribution of existing weed species.

Western Botanical (2010) recorded 6 weed species within the vicinity of the Windarling Range W4 East Deposit proposal, and a further 6 weed species elsewhere at the Windarling Range. Cliffs' flora records for the Windarling Range indicate a further 5 weed species as having previously been recorded at the Windarling Range (Cliffs 2011b; Appendix 4).

Management of weeds at Cliffs' existing Yilgarn Operations is undertaken in accordance with a Weed Management Plan (Cliffs 2011b; Appendix 4). The potential for both weed introduction and increases in weed distribution is an operational matter that can be managed through the implementation of standard weed hygiene practices and weed monitoring.

Cliffs will implement the Weed Management Plan (Cliffs 2011b; Appendix 4) for the prevention, identification and management of weeds for the Windarling Range W4 East Deposit proposal. As a result of the management actions proposed, the Windarling Range W4 East Deposit proposal is not expected to result in a significant introduction of new weed species or a significant increase in weed distribution.

Assessment of Potential Indirect Impact to Flora - Fire

Fire is an important natural process within the Australian environment, however, an increase in fire frequency has the potential to result in indirect impact to flora. The introduction of mine operations has the potential to introduce new ignition sources that could lead to an increase in fire frequency, and accordingly, fire management is necessary to prevent and manage unplanned fires.

Management of fire at Cliffs' existing Yilgarn Operations is undertaken in accordance with a Fire Management Plan (Cliffs 2011c; Appendix 5). The risk of fire is an operational matter that can be managed through standard fire prevention and fire response practices. Implementation of Cliffs' Fire Management Plan has resulted in no uncontrolled fires from Cliffs' existing mine operations to date. Furthermore, the presence of Cliffs' mine operations has improved fire management with the region, with Cliffs' having previously provided resources to both DEC and the Shire of Yilgarn to assist with fire management and fire response.

Cliffs will implement the Fire Management Plan (Cliffs 2011c; Appendix 5) for the prevention, identification and management of fire for the Windarling Range W4 East Deposit proposal. As a result of the management actions proposed, the risk of fire to flora from the Windarling Range W4 East Deposit proposal is not expected to be significant.

Assessment of Potential Indirect Impact to Flora - Dust

In previous environmental assessments of mine operations, dust has been identified as having a potential to indirectly impact flora. Dust on flora may have the potential to reduce the intensity of light required for plant photosynthesis, influence gaseous exchange required for plant respiration, increase leaf temperature and increase plant transpiration (Farmer 1993; Hirano *et al.* 1995).

Management of dust at Cliffs' existing Yilgarn Operations is undertaken in accordance with a Dust Management Plan (Cliffs 2011d; Appendix 6). The risk of dust is an operational matter that can be managed through standard dust prevention and dust minimisation practices.

The potential for dust generation for the Windarling Range W4 East Deposit proposal is expected to be greatest during the initial period of mine development as a result of a focus on land clearing. The potential for dust generation that may impact flora can be expected to reduce over the mining life as a result of reduced land clearing (mine operations occurring within cleared areas), increased mine pit wall height, and natural stabilisation of the surfaces of the mine pit walls.

Cliffs will implement the Dust Management Plan (Cliffs 2011d; Appendix 6) for the prevention, identification and management of dust for the Windarling Range W4 East Deposit proposal. As a result of the management actions proposed, the risk of dust to flora from the Windarling Range W4 East Deposit proposal is not expected to be significant.

3.1.5 Management Actions

Land Clearing Management

Land clearing at Cliffs' existing Yilgarn Operations is undertaken in accordance with a Land Clearing Management Plan (Cliffs 2011a; Appendix 3), which forms part of Cliffs' ISO 14001:2004-certified EMS. The Land Clearing Management Plan has been implemented at the Yilgarn Operations since 2004 and has been subject to previous review by EPA, DEC, DMP and DoSEWPC.

Cliffs' Land Clearing Management Plan outlines a range of management actions, which in relation to flora include:

1. Minimising vegetation clearing;
2. Site Disturbance Permit procedure to control land clearing;
3. Monitoring of land clearing;
4. Auditing of clearing areas against approved Site Disturbance Permits;
5. Rehabilitation of disturbed areas;
6. Reporting to government of land clearing areas; and
7. Education and training of mine personnel.

Cliffs will implement the Land Clearing Management Plan to ensure that the risk of land clearing to flora is appropriately managed during implementation of the Windarling Range W4 East Deposit proposal.

Weed Management

Weeds at Cliffs' existing Yilgarn Operations is undertaken in accordance with a Weed Clearing Management Plan (Cliffs 2011b; Appendix 4), which forms part of Cliffs' ISO 14001:2004-certified EMS. The Weed Management Plan has been implemented at the Yilgarn Operations since 2004 and has been subject to previous review by EPA, DEC, DMP and DoSEWPC.

Cliffs' Weed Management Plan outlines a range of management actions, which in relation to flora include:

1. Hygiene procedures for machinery and equipment;
2. Education and training of mine personnel;
3. Targeted surveys and opportunistic observations for weeds;
4. Chemical and/or mechanical control of high risk weed areas; and
5. Recording and maintenance of a weed database.

Cliffs will implement the Weed Management Plan to ensure that the risk of weeds to flora is appropriately managed during implementation of the Windarling Range W4 East Deposit proposal.

Fire Management

Fire at Cliffs' existing Yilgarn Operations is undertaken in accordance with a Fire Management Plan (Cliffs 2011c; Appendix 5), which forms part of Cliffs' ISO 14001:2004-certified EMS. The Fire Management Plan has been implemented at the Yilgarn Operations since 2004 and has been subject to previous review by EPA, DEC, DMP and DoSEWPC.

Cliffs' Fire Management Plan outlines a range of management actions, which in relation to flora include:

1. Risk assessment of fire as part of safety inspections;
2. Signage identifying prohibition of fires within mining tenements;
3. Establishing fire breaks;
4. Education and training of mine personnel;
5. Provision of fire fighting equipment;

6. Response to fires where they occur; and
7. Reporting to government of fires.

Cliffs will implement the Fire Management Plan to ensure that the potential risk of fire to flora is appropriately managed during implementation of the Windarling Range W4 East Deposit proposal.

Dust Management

Cliffs' existing Yilgarn Operations are undertaken in accordance with a Dust Management Plan (Cliffs 2011d; Appendix 6), which forms part of Cliffs' ISO 14001:2004-certified EMS. The Dust Management Plan has been implemented at the Yilgarn Operations since 2004 and has been subject to previous review by EPA, DEC, DMP and DoSEWPC.

Cliffs' Dust Management Plan outlines a range of management actions, which in relation to flora include:

1. Avoiding land clearing and handling of topsoil when winds are high;
2. Dampening of roads and open areas with water trucks to minimise dust generation;
3. Monitoring of flora adjacent to mine operations for dust impacts;
4. Undertaking progressive land rehabilitation works to minimise exposed areas; and
5. Education and training of mine personnel.

Cliffs will implement the Dust Clearing Management Plan to ensure that the risk of dust to flora is appropriately managed during implementation of the Windarling Range W4 East Deposit proposal.

Mine Closure

Mine closure actions in relation to restoration of flora values is addressed in Section 3.3 Mine Closure.

3.1.6 Commitments

Cliffs makes the following commitments for management of potential impact to flora during implementation of the Windarling Range W4 East Deposit proposal:

1. Land Clearing Management

1-1 Cliffs will undertake management of land clearing in accordance with the Land Clearing Management Plan (Cliffs 2011a; Appendix 3) during implementation of the Windarling Range W4 East Deposit proposal.

2. Weed Management

2-1 Cliffs will undertake management of weeds in accordance with the Weed Management Plan (Cliffs 2011b; Appendix 4) during implementation of the Windarling Range W4 East Deposit proposal.

3. Fire Management

3-1 Cliffs will undertake management of fire in accordance with the Fire Management Plan (Cliffs 2011c; Appendix 5) during implementation of the Windarling Range W4 East Deposit proposal.

4. Dust Management

4-1 Cliffs will undertake management of dust in accordance with the Dust Management Plan (Cliffs 2011d; Appendix 6) during implementation of the Windarling Range W4 East Deposit proposal.

5. *Ricinocarpos brevis* Environmental Offsets

5-1 Cliffs will offset the impact of the Windarling Range W4 East Deposit proposal to the Rare Flora species *Ricinocarpos brevis* by achieving the following outcomes:

(a) Direct environmental offsets of:

(i) Avoiding impact to 353 individuals of *Ricinocarpos brevis* within the previously approved area of impact for the Windarling Range W1 and W3/5 Deposits;

(ii) Implementation of a *Ricinocarpos brevis* Rehabilitation Program;

(b) Indirect environmental offset of:

(i) Implementation of a *Ricinocarpos brevis* Research Program;

(ii) Translocation of *Ricinocarpos brevis* whole individuals from the Windarling Range W1 and W4 East Deposits.

The scope of the environmental offsets are described in the document:

Cliffs Asia Pacific Iron Ore Pty Ltd (2012) *Yilgarn Operations Windarling Range W4 East Deposit Environmental Protection Act 1986 (WA) Environmental Impact Assessment (Assessment on Proponent Information)*. Report prepared for Cliffs Asia Pacific Iron Ore Pty Ltd by Globe Environments Australia Pty Ltd. Revision D, February 2012.

A consolidation of Cliffs' commitments for the Windarling Range W4 East Deposit proposal is contained in Section 5.

3.1.7 Conclusion

As identified by the above assessment, the potential impact of the Windarling Range W4 East Deposit proposal to flora is generally not expected to be significant. The potential impacts to flora can be managed through implementation of actions contained in the Land Clearing Management Plan, Weed Management Plan, Fire Management Plan and Dust Management Plan.

Specifically with regard to the 'Rare Flora' species *Ricinocarpos brevis*, Cliffs has proposed direct environmental offsets and indirect environmental offsets in order to offset the impact of the Windarling Range W4 East Deposit proposal to this species. Cliffs' direct environmental offsets and indirect environmental offsets are aligned with EPA offset policy and guidance, and the combination of environmental offsets form an adequate package to mitigate the impacts of the Windarling Range W4 East Deposit proposal to *R. brevis*.

Accordingly, EPA's objective for this factor can be met.

3.2 Fauna

3.2.1 Aspect

Development of the Windarling Range W4 East Deposit proposal will require the clearing of 28ha of land which provides habitat to an array of fauna species. Section 3.2 provides an assessment of the potential impact of the Windarling Range W4 East Deposit proposal to fauna values.

3.2.2 EPA Objective

The EPA's objective for fauna is:

- To maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge (EPA 2010b).

3.2.3 Legislation, Guidelines, Standards and Approvals

- Yilgarn Operations Fauna Management Plan (Cliffs 2011e; Appendix 7);
- Yilgarn Operations Land Clearing Management Plan (Cliffs 2011a; Appendix 3);
- *Environmental Protection Act 1986* (WA);
- *Wildlife Conservation Act 1950* (WA);
- *Environment Protection and Biodiversity Conservation Act 1999* (C'th);
- Japan-Australia Migratory Bird Agreement 1974 (Government of Australia and Government of Japan 1981);
- China-Australia Migratory Bird Agreement 1986 (Government of Australia and Government of the People's Republic of China 1988);
- Republic of Korea-Australia Migratory Bird Agreement 2007 (Government of Australia and Government of the Republic of Korea 2007);
- Convention on the Conservation of Migratory Species of Wild Animals 1979 (Government of Australia 1979);
- EPA Guidance Statement 20: Guidance for Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia (EPA 2009);
- EPA Guidance Statement 54: Guidance for Sampling Fauna in Groundwater and Caves for Environmental Impact Assessment (EPA 2003b);
- EPA Guidance Statement 54a: Guidance for the Assessment of Environmental Factors - Sampling methods and survey considerations for subterranean fauna in Western Australia (EPA 2007a);
- EPA Guidance Statement 55: Guidance for the Assessment of Environmental Factors – Implementing Best Practice in Proposals Submitted to the Environmental Impact Assessment Process (EPA 2003a);
- EPA Guidance Statement 56: Guidance for the Assessment of Environmental Factors – Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (EPA 2004b);
- EPA Position Statement 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA 2002a); and
- Technical Guide: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA & DEC 2010).

3.2.4 Environmental Impact Assessment

Legislative Framework for Fauna Protection

All native fauna in Western Australia is afforded general protection under the *Wildlife Conservation Act 1950* (WA). Specific fauna species may also be afforded special protection under the *Wildlife Conservation Act 1950* (WA) or the *Environment Protection and Biodiversity Conservation Act 1999* (C'th).

The following text provides a description[1] of the classifications used in fauna protection:

Threatened Species (Fauna)

Threatened Species includes fauna species listed by the Commonwealth Minister for the Environment and protected under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) as a matter of national environmental significance for being extinct, facing a risk of extinction, or in need of a conservation program to prevent the species from a risk of extinction. Threatened species are allocated a category of extinct, extinct in the wild, critically endangered, endangered, vulnerable or conservation dependent.

Migratory Species

Migratory Species includes fauna species listed by the Commonwealth Minister for the Environment and protected under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) as a matter of national environmental significance for being a migratory species listed under the Convention on the Conservation of Migratory Species of Wild Animals 1979 (Government of Australia 1979), Japan-Australia Migratory Bird Agreement 1974 (Government of Australia and Government of Japan 1981), China-Australia Migratory Bird Agreement 1986 (Government of Australia and Government of the People's Republic of China 1988) or the Republic of Korea-Australia Migratory Bird Agreement 2007 (Government of Australia and Government of the Republic of Korea 2007).

Specially Protected Fauna

Specially Protected Fauna is fauna declared by the Western Australian Minister for the Environment and protected under the *Wildlife Conservation Act 1950* (WA) as being rare, likely to become extinct, otherwise in need of special protection, or is an avifauna species protected by an international government agreement (refer to Migratory Species above for a list of international government agreements).

Priority Fauna

Priority Fauna are fauna which are known from one, a few or several populations which may or may not be under threat, or may otherwise be rare. Classifications are made by DEC and categorised into 5 Priority categories, with Priority 1 being of the highest conservation significance and/or a priority for surveying and determining the conservation significance based on current knowledge of perceived threat. Priority fauna have no specific legal protection under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th), *Wildlife Conservation Act 1950* (WA) or the *Environmental Protection Act 1986* (WA).

Fauna of the Windarling Range

Vertebrate fauna surveys undertaken during 2009 and 2010 by Bamford Consulting Ecologists (BCE 2010) of the Windarling Range W4 East Deposit proposal area identified 170 vertebrate fauna species which may potentially occur based on available habitats, comprising of 92 avifauna species, 54 reptile species, 21 mammal species and 3 amphibian species. A total of 76 vertebrate fauna species of the potential 170 vertebrate fauna species were recorded as present in the vicinity of the Windarling Range W4 East Deposit proposal. By

[1] Descriptions are consolidated from review of the *Environment Protection and Biodiversity Conservation Act 1999* (C'th), *Wildlife Conservation Act 1950* (WA), and flora literature published by DoSEWPC and DEC.

comparison, BCE (2010) identified 254 vertebrate fauna species that may potentially occur across the Windarling Range based on available habitats. Most notably, BCE (2010) identified that the potential vertebrate fauna assemblage in the vicinity of the Windarling Range W4 East Deposit proposal may potentially include 10 vertebrate fauna species of conservation significance, being:

- Malleefowl *Leipoa ocellata*, (Threatened Species, Specially Protected Fauna);
- Rainbow Bee-eater *Merops ornatus* (Migratory Species, Specially Protected Fauna);
- Fork-tailed Swift *Apus pacificus* (Migratory Species, Specially Protected Fauna);
- Peregrine Falcon *Falco peregrinus* (Specially Protected Fauna);
- South-western Carpet Python *Morelia spilota imbricata* (Specially Protected Fauna);
- Major Mitchell's Cockatoo *Cacatua leadbeateri* (Specially Protected Fauna);
- Crested Bellbird (Southern) *Oreoica gutturalis gutturalis* (Priority 4);
- White-browed Babbler (Wheatbelt) *Pomatostomus supercilious ashby* (Priority 4);
- Australian Bustard *Ardeotis australis* (Priority 4); and
- Inland Greater Long-eared Bat *Nyctophilus major tor* (Priority 4).

A targeted survey for the vertebrate fauna species *L. ocellata* was also undertaken by Aprasia Wildlife (2009) and identified 2 inactive *L. ocellata* nest mounds within the vicinity of the Windarling Range W4 East Deposit proposal.

Surveys for potential Short-Range Endemic (SRE) invertebrate fauna undertaken during 2009 by Biota (2011a) recorded 2 land snail taxa, 3 millipede taxa and 3 mygalomorph spider taxa within the vicinity of the Windarling Range W4 East Deposit proposal that may be considered potential SRE invertebrate fauna. Whilst not considered an SRE invertebrate fauna, Biota (2011a) also recorded the following invertebrate fauna species of conservation significance:

- Tree-stem Trapdoor Spider *Aganippe castellum* (Priority 4).

Surveys for troglobitic subterranean invertebrate fauna undertaken in 2009 by Bennelongia (2010) recorded 3 troglobitic subterranean fauna taxa within the vicinity of the Windarling Range W4 East Deposit proposal.

Previous surveys for stygobitic subterranean invertebrate fauna at the Windarling Range by Wetland Research and Management (2008; 2009) did not identify any stygobitic subterranean fauna.

The locations of fauna species recorded in the vicinity of the Windarling Range W4 East Deposit proposal is depicted in Figure 3-12. To note, Figure 3-12 notably focuses on invertebrate fauna arising from fixed sampling locations and the low mobility of invertebrate fauna. Whilst Figure 3-12 identifies the fixed locations of nest mounds for the vertebrate *L. ocellata*, the high mobility of vertebrate fauna prohibits specific location recordings for vertebrate fauna individuals.

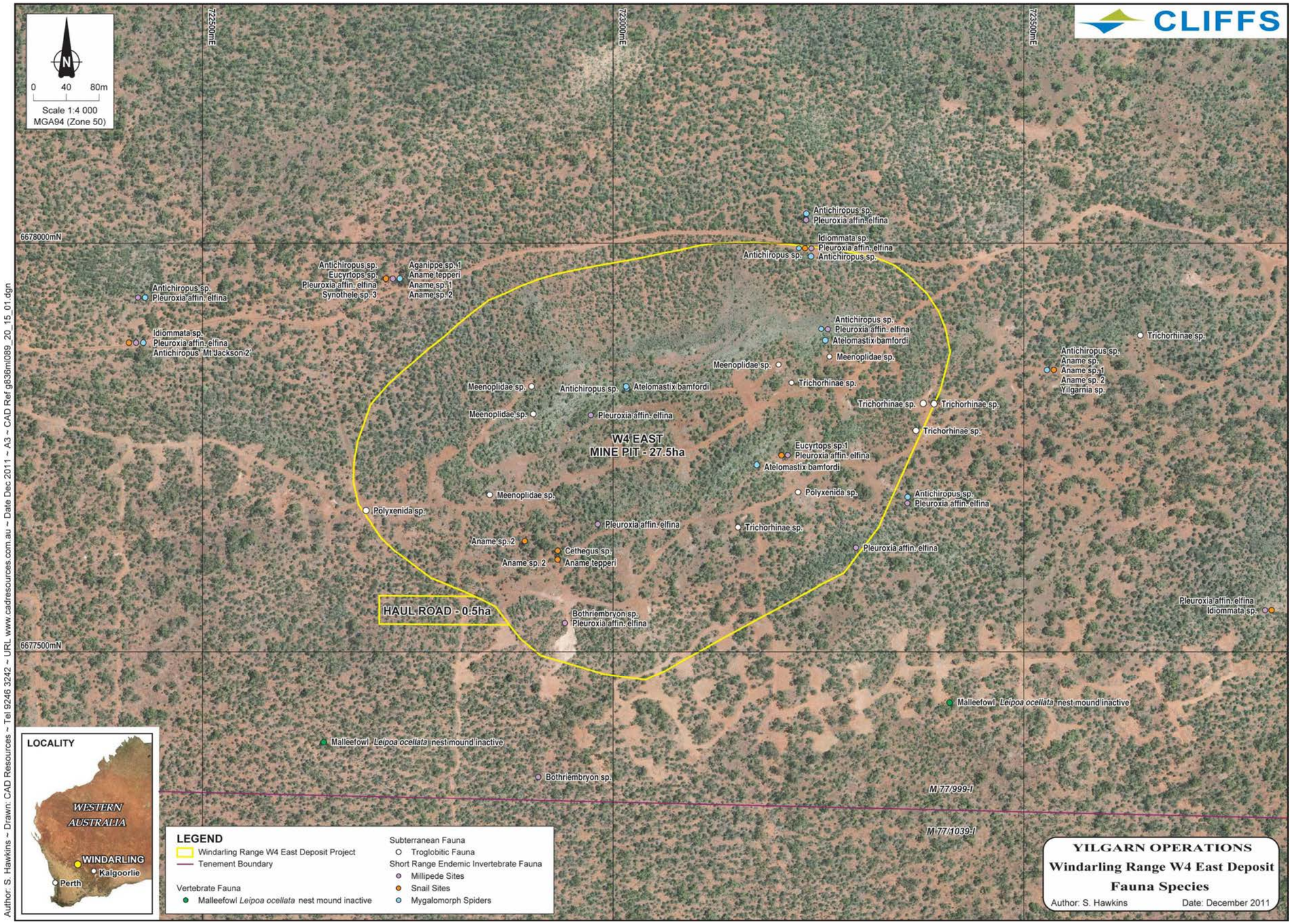

Figure 3-12 Fauna Species Records in the vicinity of the Windarling Range W4 East Deposit Proposal. Sources: Aprasia Wildlife (2009); Biota (2011a); Bennelongia (2010).

Assessment of Potential Impact to Conservation Significant Vertebrate Fauna Species

Vertebrate fauna surveys undertaken during 2009 and 2010 by BCE (2010) of the Windarling Range W4 East Deposit proposal area identified 170 vertebrate fauna species which may potentially occur, with 76 vertebrate fauna species recorded. A targeted survey for the vertebrate fauna species Malleefowl *Leipoa ocellata* was also undertaken by Aprasia Wildlife (2009) within the Windarling Range W4 East Deposit proposal area. An assessment of the potential impacts to conservation significant vertebrate fauna species is provided below:

Malleefowl *Leipoa ocellata* (Threatened Species, Specially Protected Fauna)

Leipoa ocellata is listed as a 'Threatened Species' under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) and as 'Specially Protected Fauna' under the *Wildlife Conservation Act 1950* (WA).

Leipoa ocellata is a large ground-dwelling omnivorous bird with mottled grey, brown, tan and black plumage that characteristically build a mounded nest on the ground (DoSEWPC & WWF c.2006). *L. ocellata* is widely distributed across Australia, with populations in Western Australia, South Australia, New South Wales and Victoria. Across Australia, *L. ocellata* has shown a historical decline in range, with the principal threats being habitat loss and habitat fragmentation/isolation from pastoral clearing (DEHSA 2007).

A targeted survey of the Windarling Range W4 East Deposit proposal area for *L. ocellata* by Aprasia Wildlife (2009) did not identify any active or inactive *L. ocellata* mounds in the area of the Windarling Range W4 East Deposit proposal. Aprasia Wildlife (2009) recorded 2 inactive *L. ocellata* nest mounds approximately 250m south-west and 250m south-east of the Windarling Range W4 East Deposit proposal area (refer Figure 3-12) with both mounds described as likely having last been used more than 10 years ago.

Cliffs' records from fauna studies at the Windarling Range undertaken since 2001 also indicate the presence of 4 other inactive *L. ocellata* nest mounds across the Windarling Range, and two recently active *L. ocellata* nest mounds at the Windarling Range located approximately 6 kilometres to the west of the Windarling Range W4 East Deposit proposal.

Based on the absence of both active and inactive *L. ocellata* nest mounds in the area of the Windarling Range W4 East Deposit proposal, the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to *L. ocellata.*

The low number of inactive *L ocellata* nest mounds recorded across the Windarling Range also indicates that the Windarling Range is not a key nesting habitat for *L. ocellata* within the region.

Rainbow Bee-eater *Merops ornatus* (Migratory Species, Specially Protected Fauna)

Merops ornatus is listed as a 'Migratory Species' under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) and as 'Specially Protected Fauna' under the *Wildlife Conservation Act 1950* (WA).

Merops ornatus is a medium-sized bird with distribution across most of mainland Australia in areas of open woodland or forest or shrubland, and usually in close proximity to permanent water. *Merops ornatus* is readily distinguishable by its blue, green and chestnut colourings. *Merops ornatus* feeds aerially for insects and nests in burrows on the ground (DoSEWPC 2011a).

Internationally, *M. ornatus* has been recorded in parts of Indonesia and Papua New Guinea, and as far north as Japan. *Merops ornatus* is not considered to be globally threatened, with its only recorded threat in Australia being the Cane Toad *Bufo marinus* (DoSEWPC 2011a).

As identified by BCE (2010), *M. ornatus* was recorded during the survey of the Windarling Range W4 East Deposit proposal area, as well as during previous surveys of the Windarling Range. *Merops ornatus* has also been recorded elsewhere in the region, including at the nearby Mt Jackson Range and Bungalbin Hill (Ecologia 2001).

As identified by BCE (2010), *M. ornatus* is a widespread species that is likely to be a spring to summer breeding visitor to the Windarling Range, and its preferred woodland habitat occurs outside of the area of the Windarling Range W4 East Deposit proposal.

Whilst *M. ornatus* was recorded within the during the survey of the Windarling Range W4 East Deposit proposal area, based on its broad habitat utilisation and high mobility, the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to *M. ornatus*.

Fork-tailed Swift *Apus pacificus* (Migratory Species, Specially Protected Fauna)
Apus pacificus is listed as a 'Migratory Species' under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) and as 'Specially Protected Fauna' under the *Wildlife Conservation Act 1950* (WA).

Apus pacificus is a medium sized swift that is predominantly blackish in colour with a white band across the rump, and is characterised by its deeply forked tail (DoSEWPC 2011b). *Apus pacificus* is a non-breeding visitor to Australia (Higgins 1999 in DoSEWPC 2011b).

Apus pacificus is an aerial species largely independent of terrestrial habitats. *Apus pacificus* was not recorded within the area of the Windarling Range W4 East Deposit proposal and has not been recorded in previous surveys of the Windarling Range, however, this species may be an irregular visitor (BCE 2010).

As *A. pacificus* is an aerial species largely independent of terrestrial habitats, the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to *A. pacificus*.

Peregrine Falcon *Falco peregrinus* (Specially Protected Fauna)
Falco peregrinus is listed as 'Specially Protected Fauna' under the *Wildlife Conservation Act 1950* (WA).

Falco peregrinus is a large raptor with a black hood, blue-black upperparts and creamy white chin, throat and underparts. The eye-ring is yellow, with the heavy bill also yellow and tipped black. *Falco peregrinus* is found across Australia, but is not common anywhere. *Falco peregrinus* pairs mate for life, laying eggs in recesses of cliff faces, tree hollows or in the large abandoned nests of other birds (Birds Australia 2011a).

As identified by BCE (2010), *Falco peregrinus* was recorded within the area of the Windarling Range W4 East Deposit proposal and, however is not expected to nest within the area of the Windarling Range W4 East Deposit proposal due to the absence of suitable habitat. *Falco peregrinus* has previously been recorded at the Windarling Range, and may nest along the main Windarling Range several kilometres to the west of the Windarling Range W4 East Deposit where suitable nesting

habitat exists. has been recorded in previous surveys of the Windarling Range. Bamford Consulting Ecologists (2010) identifies that the Windarling Range W4 East Deposit proposal may result in a minor loss of potential foraging habitat at the Windarling Range available to *F. peregrinus*.

Due to the absence of suitable nesting habitat, the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to *F. peregrinus*.

South-western Carpet Python *Morelia spilota imbricata* (Specially Protected Fauna)
Morelia spilota imbricata is listed as 'Specially Protected Fauna' under the *Wildlife Conservation Act 1950* (WA).

Morelia spilota imbricata is one of three subspecies of *M. spilota*, and occur in temperate climatic areas of south-western Western Australia that have good winter rains and dry summers. *Morelia spilota imbricata* vary from pale to dark brown in colour, with blotches or variegations which may form cross bands, and a white or cream or yellow belly (DEC undated).

Morelia spilota imbricata was not recorded during survey of the Windarling Range W4 East Deposit proposal area. *Morelia spilota imbricata* was previously recorded at the Windarling Range from a single opportunistic observation between 2000 and 2004 (pers. com. B Metcalf in BCE 2010), and is likely resident in the region in low abundance, particularly where rocks provide shelter (BCE 2010). As identified by BCE (2010), the Windarling Range W4 East Deposit proposal area may provide habitat for *M. spilota imbricata*, however this habitat is extensive across the Windarling Range.

As *M. spilota imbricata* was not recorded within the Windarling Range W4 East Deposit proposal area, and the potential available habitat for *M. spilota imbricata* across the Windarling Range is extensive, the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to *M. spilota imbricata*.

Major Mitchell's Cockatoo *Cacatua leadbeateri* (Specially Protected Fauna)
Cacatua leadbeateri is listed as 'Specially Protected Fauna' under the *Wildlife Conservation Act 1950* (WA).

Cacatua leadbeateri is a medium-sized bird with distinctive pink and white fathers and a red, yellow and white crest. *Cacatua leadbeateri* nest in hollows of large old trees, producing up to 2 eggs per year. *Cacatua leadbeateri* is long-lived, with records of breeding pairs older than 40 years (WNRMI undated).

As identified by BCE (2010), *C. leadbeateri* was recorded during of the Windarling Range W4 East Deposit proposal area, and has also been recorded in previous fauna surveys of the Windarling Range and the nearby Mt Jackson Range. *Cacatua leadbeateri* is expected to be an irregular visitor to the Windarling Range area. The preferred habitat of *C. leadbeateri* is Eucalypt woodlands, which are extensive in the Yilgarn Region. Bamford Consulting Ecologists (2010) identifies that there are few trees within the area of the Windarling Range W4 East Deposit proposal that have the potential for large hollows suitable for nesting by *C. leadbeateri*.

Based on *C. leadbeateri* being an irregular visitor to the Windarling Range and an absence of large trees with hollows suitable for nesting, the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to *C. leadbeateri*.

Crested Bellbird (Southern) *Oreoica gutturalis gutturalis* (Priority 4)

Oreoica gutturalis gutturalis is a DEC-classified 'Priority 4' fauna species largely due to the loss of habitat and declining populations in the wheatbelt region (BCE 2010). Priority 4 is a classification by DEC for species which have been adequately surveyed, for which sufficient knowledge is available, that are not currently threatened or in need of special protection but could become so if circumstances change, or which are declining significantly but are not yet threatened.

Oreoica gutturalis gutturalis is a medium-sized bird with a distribution of inland southern Western Australia, South Australia, Victoria, New South Wales and Queensland (Garnett and Crowley 2000 in 360 Environmental 2008). Adult males have grey heads with a raised black crest, a white forehead and throat, a prominent black breast, with the remainder of the body being grey or brown. Adult females and immature birds are less prominently coloured than the males, lack the black breast and have a smaller, unraised black crest (Simpson and Day 1998 in 360 Environmental 2008).

As identified by BCE (2010), *O. gutturalis gutturalis* was recorded during of the Windarling Range W4 East Deposit proposal area, and has also been recorded in previous fauna surveys of the Windarling Range and the nearby Mt Jackson Range. The preferred habitat of *O. gutturalis gutturalis* is woodland and shrublands, which are extensive at the Windarling Range and surrounds.

Based on the broad habitat utilisation of *O. gutturalis gutturalis*, the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to *O. gutturalis gutturalis*.

White-browed babbler (Wheatbelt) *Pomatostomus supercilious ashby* (Priority 4)

Pomatostomus supercilious ashby is a DEC-classified 'Priority 4' fauna species largely due to the loss of habitat and declining populations in the wheatbelt region (BCE 2010). Priority 4 is a classification by DEC for species which have been adequately surveyed, for which sufficient knowledge is available, that are not currently threatened or in need of special protection but could become so if circumstances change, or which are declining significantly but are not yet threatened.

Pomatostomus supercilious ashby is a small dark brown-grey bird with a white throat, a white tipped tail and a long, pointed curved bill, with its distinguishing features being a white brow and dark eye stripe. *Pomatostomus supercilious ashby* is endemic to mainland Australia (Birds Australia 2011b).

As identified by BCE (2010), *P. supercilious ashby* was recorded during of the Windarling Range W4 East Deposit proposal area, and has also been recorded in previous fauna surveys of the Windarling Range and the nearby Mt Jackson Range. The preferred habitat of *P. supercilious ashby* is woodland and shrublands, which are extensive at the Windarling Range and surrounds.

Based on the broad habitat utilisation of *P. supercilious ashby*, the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to *P. supercilious ashby*.

Australian Bustard *Ardeotis australis* (Priority 4)

Ardeotis australis is a DEC-classified 'Priority 4' fauna species largely due to the loss of habitat and declining populations in the wheatbelt region (BCE 2010). Priority 4 is a classification by DEC for species which have been adequately surveyed, for which sufficient knowledge is available, that are not currently threatened or in need of special protection but could become so if circumstances change, or which are declining significantly but are not yet threatened.

Ardeotis australis is one of Australia's largest birds and occurs on dry plains, grasslands and open woodlands of the Australian inland and tropical northern Australia. *Ardeotis australis* is mainly grey-brown, speckled with dark markings, a pale neck and black crown with a slight crest and a white eye-brow (Birds Australia 2011c).

As identified by BCE (2010), *A. australis* was recorded during the survey of the Windarling Range W4 East Deposit proposal area, and has also been recorded in previous fauna surveys of the Windarling Range and the nearby Mt Jackson Range. *Ardeotis australis* is expected to be an irregular visitor to the Windarling Range, noting its preferred habitat is open grassy shrublands, which are absent from the Windarling Range W4 East Deposit proposal area.

Based on the absence of suitable open grassy shrublands habitat preferred by *A. australis*, the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to *A. australis*.

Inland Greater Long-eared Bat *Nyctophilus major tor* (Priority 4)

Nyctophilus major tor is a DEC-classified 'Priority 4' fauna species. Priority 4 is a classification by DEC for species which have been adequately surveyed, for which sufficient knowledge is available, that are not currently threatened or in need of special protection but could become so if circumstances change, or which are declining significantly but are not yet threatened.

Nyctophilus major tor occurs throughout Western Australia south of the Hamersley Range and across South Australia as far east as the Eyre Peninsula. Near recordings of *Nyctophilus major tor* (ssp. nov.) include Jaurdi Station (located approximately 75km south-east of the Windarling Range), Eagle Rock (located approximately 30km south of the Windarling Range) and Goongarrie Station (located approximately 180km east of the Windarling Range) (Parnaby 2009).

As identified by BCE (2010), *Nyctophilus major tor* was not recorded during survey of the Windarling Range W4 East Deposit proposal area, nor has it been recorded in previous surveys of the Windarling Range or the nearby Mt Jackson Range. *Nyctophilus major tor* was identified by BCE (2010) as potentially present based on available habitat at the Windarling Range. The preferred habitat of *N. major tor* is Eucalypt woodlands; which are extensive at the Windarling Range and surrounds.

Based on the absence of *N. major tor* from surveys at the Windarling Range, and the extensive area of potential habitat available to *N. major tor* at the Windarling Range and surrounds, the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to *N. major tor*.

Other Vertebrate Fauna Species

With regards to the other vertebrate fauna species identified by BCE (2010), these other vertebrate fauna species are not of conservation significance and are generally considered to have wide distributions. As such, implementation of the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to these other vertebrate fauna species. Accordingly, an assessment of the potential for impact to each of the other vertebrate fauna species identified by BCE (2010) is not provided.

Based on the recorded populations and distributions of the above species, both from surveys of the Windarling Range W4 East Deposit proposal area and from previous regional surveys, the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to vertebrate fauna species.

Assessment of Potential Impact to Short-Range Endemic Invertebrate Fauna Species

Short-range endemic invertebrate fauna taxa are generally described as fauna having a naturally small spatial distribution (<10,000km^2), and typically with characteristics that include poor powers of dispersal, confinement to discontinuous habitats, activity restricted to seasons (active during cooler and wetter months) and/or low levels of fecundity (resulting in low abundance) (Harvey 2002 in EPA 2009).

As identified by Biota (2011a), a total of 8 potential SRE invertebrate fauna taxa were recorded in the vicinity of the Windarling Range W4 East Deposit proposal, comprising of 2 land snail taxa, 3 millipede taxa and 3 mygalomorph spider taxa. None of the potential SRE invertebrate fauna taxa recorded are considered to be of conservation significance. As identified by Biota (2011a), all taxa recorded within the Windarling Range W4 East Deposit proposal area were also recorded at contextual sites elsewhere at the Windarling Range and/or recorded elsewhere in the region.

Based on the recorded broad distribution of the potential SRE invertebrate fauna taxa identified by Biota (2011a), and having regard to EPA (2009) guidance on assessment of impacts to potential SRE invertebrate fauna taxa, implementation of the Windarling Range W4 East Deposit proposal is not expected to result in a significant impact to potential SRE invertebrate fauna taxa.

Tree-stem Trapdoor Spider *Aganippe castellum* (Priority 4)

Whilst not considered an SRE invertebrate fauna taxa, Biota (2011a) recorded *Aganippe castellum*, a DEC-classified 'Priority 4' fauna species. Priority 4 is a classification by DEC for species which have been adequately surveyed, for which sufficient knowledge is available, that are not currently threatened or in need of special protection but could become so if circumstances change, or which are declining significantly but are not yet threatened.

Aganippe castellum has been recorded widely in the region, including across the Windarling Range, Mt Jackson Range, Koolyanobbing Range, Helena & Aurora Range, Die Hardy Range, and many wheatbelt areas between Wongan Hills and Southern Cross (Biota 2011a; Cliffs 2010c). Population estimates for *A. castellum* indicate approximately 44,000 *A. castellum* individuals occurring at the Koolyanobbing Range and approximately 200,000 *A. castellum* individuals occurring at the Mt Jackson Range (BCE 2009a and BCE 2009b, both in Cliffs 2010c).

Assessment of Potential Cumulative Impact to Fauna

Cumulative impacts in environmental impact assessment are often difficult to predict as a result of the inherent limitation of insufficient regional data. Accordingly, assessment of cumulative impacts are often broad in context, with a similar broad approach applied for this assessment of cumulative impacts for the Windarling Range W4 East Deposit proposal.

As identified by the assessment of potential impact to fauna species above, direct impacts to fauna from implementation of the Windarling Range W4 East Deposit proposal are not expected to be significant. The Windarling Range W4 East Deposit proposal is not expected to result in a reduction to the regional distribution or regional population of a fauna to an extent that would change the conservation status of any fauna species.

Whilst the Windarling Range has been subject to mineral exploration and mine operations for the past decade, for most species the area of the Windarling Range W4 East Deposit proposal is a small component of the potential fauna habitat available across the Windarling Range and the surrounding lands. Implementation of the Windarling Range W4 East Deposit proposal will result in a 28ha (5%) increase to the 591ha area for Windarling Range mine operations that have been approved under Implementation Statement 627. The cumulative impact to potential fauna habitat from implementation of the Windarling Range W4 East Deposit

proposal, in addition to existing approved impacts in the region, is not expected to result in a significant impact to fauna.

Assessment of Potential Indirect Impact to Fauna - Collision

The potential for indirect impact to fauna from collision with mine vehicles is a relevant consideration for fauna that low mobility and/or low population densities, such as *L. ocellata* or *M. spilota imbricata*. Fauna with low movement speed have a lower ability to avoid impact if a collision is likely. A collision resulting in mortality for a fauna species that has a naturally low population density may be considered significant.

The Windarling Range W4 East Deposit proposal will require one haul road being up to 0.5ha in area, which is considered a minor increase to Cliffs' existing road network at the Windarling Range mine operations. Accordingly, the potential risk of indirect impact to fauna from vehicle collision is not expected to be significant.

3.1.5 Management Actions

Fauna Management

Fauna management at Cliffs' existing Yilgarn Operations is undertaken in accordance with a Fauna Management Plan (Cliffs 2011e; Appendix 7), which forms part of Cliffs' ISO 14001:2004-certified EMS.

Cliffs' Fauna Management Plan outlines a range of management actions, which in relation to fauna include:

1. Restriction of vehicle speeds;
2. Prohibition of off-road vehicle use;
3. Prohibition of capturing or harm to native fauna;
4. Recording of feral fauna sightings;
5. Fencing of water supply dams to exclude fauna; and
6. Education and training of mine personnel.

Cliffs will implement the Fauna Management Plan to ensure that fauna are appropriately managed for the Windarling Range W4 East Deposit proposal.

Land Clearing Management

Land clearing at Cliffs' existing Yilgarn Operations is undertaken in accordance with a Land Clearing Management Plan (Cliffs 2011a; Appendix 3), which forms part of Cliffs' ISO 14001:2004-certified EMS. The Land Clearing Management Plan has been implemented at the Yilgarn Operations since 2004 and has been subject to previous review by EPA, DEC, DMP and DoSEWPC.

Cliffs' Land Clearing Management Plan outlines a range of management actions, which in relation to fauna include:

1. Minimising vegetation clearing;
2. Site Disturbance Permit procedure for the control and audit of land clearing;
3. Rehabilitation of disturbed areas; and
4. Education and training of mine personnel.

Cliffs will implement the Land Clearing Management Plan to ensure that the risk of land clearing to fauna is appropriately managed for the Windarling Range W4 East Deposit proposal.

Mine Closure

Mine closure actions in relation to restoration of flora values, which will subsequently also restore fauna habitat values, is addressed in Section 3.3 Mine Closure.

3.1.6 Commitments

Cliffs makes the following commitments for management of potential impacts to flora for the Windarling Range W4 East Deposit proposal:

1. **Fauna Management**
   - 1-1 Cliffs will undertake management of fauna in accordance with the Fauna Management Plan (Cliffs 2011e; Appendix 7) during implementation of the Windarling Range W4 East Deposit proposal.
2. **Land Clearing Management**
   - 2-1 Cliffs will undertake management of land clearing in accordance with the Land Clearing Management Plan (Cliffs 2011a; Appendix 3) during implementation of the Windarling Range W4 East Deposit proposal.

A consolidation of Cliffs' commitments for the Windarling Range W4 East Deposit proposal is contained in Section 5.

3.1.7 Conclusion

As identified by the above assessment, the potential impact of the Windarling Range W4 East Deposit proposal to fauna is not expected to be significant. The potential impact to fauna can be managed through implementation of actions contained in the Fauna Management Plan and the Land Clearing Management Plan.

Accordingly, EPA's objective for this factor can be met.

3.3 Mine Closure

3.3.1 Aspect

The Windarling Range W4 East Deposit proposal will require mine closure following the completion of mining. Section 3.3 assesses mine closure for the Windarling Range W4 East Deposit proposal.

3.3.2 EPA Objective

The EPA's objective for decommissioning is:

- To ensure, as far as practicable, that rehabilitation achieves a stable and functioning landform which is consistent with the surrounding landscape and other environmental values (EPA 2010b).

3.3.3 Legislation, Guidelines, Standards and Approvals

- Yilgarn Operations Windarling Range W4 Deposit Mine Closure Plan (Cliffs 2012a; Appendix 8)
- *Mining Act 1978* (WA);
- *Environmental Protection Act 1986* (WA);
- *Mines Safety and Inspection Regulations 1995* (WA);
- Guidelines for Preparing Mine Closure Plans (DMP & EPA 2011);
- Strategic Framework for Mine Closure (ANZMEC & MCA 2000);
- EPA Guidance Statement 6: Guidance for the Assessment of Environmental Factors – Rehabilitation of Terrestrial Ecosystems (EPA 2006b);
- Mine Closure and Completion: Leading Practice Sustainable Development Program for the Mining Industry (Department of Industry, Tourism and Resources 2006); and
- Safety Bund Walls Around Open Pit Mines (DMP 1997).

3.3.4 Environmental Impact Assessment

Legislative Framework for Mine Closure

Mine closure in Western Australia is principally regulated under the *Mining Act 1978* (WA) administered by DMP. The EPA also assesses mine closure for mine developments assessed under the *Environmental Protection Act 1986* (WA). In June 2011, DMP and EPA published *Guidelines for Preparing Mine Closure Plans* (DMP & EPA 2011) to outline the requirements for mine closure that will meet the expectations of DMP under the *Mining Act 1978* (WA) and EPA under the *Environmental Protection Act 1986* (WA).

Mine Closure of the Windarling Range W4 East Deposit Proposal

In accordance with the specifications outlined in DMP & EPA (2011), Cliffs has prepared a Mine Closure Plan (Cliffs 2012a; Appendix 8) to outline mine closure of the Windarling Range W4 East Deposit proposal. The Mine Closure Plan addresses mine closure for the components of the Windarling Range W4 East Deposit proposal outlined in this EIA-API document, being the Windarling Range W4 East Deposit Mine Pit (27.5ha) and the Windarling Range W4 East Deposit Haul Road (0.5ha).

The Mine Closure Plan also addresses mine closure for the Windarling Range W4 West Deposit Waste Rock Landform for the purposes of its assessment by DMP under the *Mining Act 1978* (WA). As identified in Section

1.5, the Windarling Range W4 West Deposit Waste Rock Landform does not form part of the Windarling Range W4 East Deposit proposal.

As outlined in the Mine Closure Plan, the key considerations addressed for mine closure of the Windarling Range W4 East Deposit proposal are:

- Mine Closure Aspects;
- Mine Closure Objectives;
- Completion Criteria;
- Financial Provision; and
- Monitoring.

These key considerations for mine closure of the Windarling Range W4 East Deposit proposal are summarised below.

Mine Closure Aspects

As outlined in the Mine Closure Plan (Cliffs 2012a; Appendix 8), the mine closure aspects relevant to the Windarling Range W4 East Deposit proposal are safety associated with the Windarling Range W4 East Deposit Mine Pit, and rehabilitation of the Windarling Range W4 East Deposit Haul Road.

With regards to safety, the Windarling Range W4 East Deposit Mine Pit will be left as an open void following the completion of mining. In accordance with DMP (1997), Cliffs will install an abandonment bund around the mine pit at mine closure. In consideration of the mine pit design and the unweathered geological rock structure of the Windarling Range W4 East Deposit, the abandonment bund will be located within the outer 10m of the Windarling Range W4 East Deposit Mine Pit area identified in Figure 1-4. The abandonment bund will be at least 2m in height with a 5m base width, as specified in DMP (1997).

With regards to rehabilitation, the Windarling Range W4 East Deposit Haul Road will require rehabilitation following the completion of mining. Consistent with rehabilitation practices employed at mines in Western Australia, the rehabilitation will sequentially involve respreading of stored topsoil and subsoil and retained vegetation (which were stockpiled during initial mine clearing), deep ripping for improved soil condition and drainage, and spreading of locally collected seed.

To note, the Windarling Range W4 East Deposit Mine Pit will not be rehabilitated as the steep sides and consolidated rock structure are not conducive to successful rehabilitation, nor is it considered safe to undertake rehabilitation in such areas.

Mine Closure Objectives

Consistent with the mine closure aspects above, Cliffs' broad mine closure objectives for the Windarling Range W4 East Deposit proposal, as outlined in the Mine Closure Plan (Cliffs 2012a; Appendix 8), are identified in Table 3-4.

Management Unit	Mine Closure Objective
Mine Pit	Abandonment bunding installed
Haul Road	Rehabilitated with native vegetation

Table 3-4 Mine Closure Objectives for the Windarling Range W4 East Deposit Proposal. The mine closure objectives for each mine closure management unit are identified. The mine closure objectives are based on the identified mine closure aspects.

Completion Criteria

Completion criteria are an agreed set of performance indicators, which upon being met, will demonstrate successful mine closure, and subsequently, allow for long-term responsibility of the land to be transferred from the miner to the landowner. As outlined in DMP & EPA (2011), development of interim completion criteria should commence in the project approval stage, with the interim completion criteria subsequently refined based on data obtained during mining.

Based on the mine closure objectives identified above, and knowledge gained from Cliffs' existing mine operations, Cliffs has developed interim completion criteria for the Windarling Range W4 East Deposit proposal. These interim completion criteria are expected to be refined during implementation of Cliffs' Windarling Range mine operations; consistent with the philosophy outlined in DMP & EPA (2011). Cliffs' interim completion criteria for the Windarling Range W4 East Deposit proposal, as outlined in the Mine Closure Plan (Cliffs 2012a; Appendix 8), are provided in Table 3-5.

Management Unit	Mine Closure Objective	Interim Completion Criteria
Mine Pit	Abandonment bunding installed	• Abandonment bunding installed to design criteria: o 2m height o 5m base width o Located beyond zone of potential instability
Haul Road	Rehabilitated with native vegetation	• Flora species diversity ≥70% of reference sites • Percentage foliar cover ≥70% of reference sites • Weeds ≤5% cover

Table 3-5 Interim Mine Closure Completion Criteria for the Windarling Range W4 East Deposit Proposal.

The interim completion criteria identified in Table 3-5 which relate to rehabilitation are based on the completion criteria recommended by EPA in previous mine developments approval, being for rehabilitated areas to achieve a flora species diversity (number of species per quadrat) of ≥70% of reference sites, foliar cover of ≥70% of reference sites, and ≤5% weed cover.

As outlined in DMP & EPA (2011), development of completion criteria should be refined during proposal implementation based on additional data obtained. This data to be obtained during implementation of the Windarling Range W4 East Deposit proposal, as outlined in the Mine Closure Plan (Cliffs 2012a; Appendix 8), is expected to include:

- Rehabilitation reference site selection and assessment; and
- Rehabilitation monitoring data from the haul road.

As outlined in the Mine Closure Plan (Cliffs 2012a; Appendix 8), appropriate rehabilitation reference sites will be selected during mine operations, and the rehabilitation works will be monitored (see below).

Financial Provision

Cliffs maintains financial provision for mine closure costs, with this financial provision maintained as a liability on corporate accounts. The financial provision is reviewed each six months to account for changes in the area of land disturbance.

The financial provision is based on established unit rate cost estimates provided by industry third parties providing service to Cliffs. The underlying rehabilitation cost assumptions and the resulting unit cost estimates are independently reviewed every three years to ensure the estimated unit costs are periodically refined to reflect true cost.

Cliffs' mine closure cost for the Windarling Range W4 East Deposit proposal has been estimated at approximately A$150,000[1].

As previously agreed with EPA, the breakdown of financial provisions has not been provided in this EIA-API document or the appended Mine Closure Plan as such detail is commercial-in-confidence and not necessary for EPA's assessment processes under the *Environmental Protection Act 1986* (WA) (pers. com. OEPA to S Hawkins of Globe Environments, July 2011). The breakdown of financial provision will be considered by DMP in assessment of a Mining Proposal under the *Mining Act 1978* (WA).

Monitoring

Monitoring of mine closure is necessary to assist in the development of final completion criteria, and in determining whether the final completion criteria have been met. Table 3-6 identifies the monitoring to be undertaken and the frequency of monitoring.

Management Unit	Interim Completion Criteria	Monitoring	Frequency
Mine Pit	• Abandonment bunding installed to design criteria: o 2m height o 5m base width o Located beyond zone of potential instability	Survey	Once, 2018
Haul Road	• Flora species diversity ≥70% of reference sites • Percentage foliar cover ≥70% of reference sites • Weeds ≤5% cover	Botanical assessment	Each 2 years, 2018 to 2024

Table 3-6 Mine Closure Monitoring for the Windarling Range W4 East Deposit Proposal.

Monitoring of mine closure associated with installation of the abandonment bund around the crest of the Windarling Range W4 East Deposit Mine Pit is scheduled to be undertaken by survey once in 2018, following the currently scheduled completion of mining in 2017. Monitoring of the abandonment bunding through survey will be undertaken by suitably qualified environmental and/or geological personnel from Cliffs, or consultants to Cliffs having equivalent qualification.

[1] The greater financial provision identified in the Mine Closure Plan (Cliffs 2012; Appendix 8) of approximately A$400,000 incorporates the mine closure cost for the Windarling Range W4 Deposit Waste Rock Landform, which does not form part of the Windarling Range W4 East Deposit proposal outlined in this EIA-API document.

Monitoring of mine closure associated with rehabilitation of the Windarling Range W4 East Deposit Haul Road is scheduled to be undertaken by botanical assessment each two years from 2018 to 2024, following the currently scheduled completion of mining in 2017. Monitoring of the rehabilitation through botanical assessment will be undertaken by suitably qualified environmental personnel from Cliffs, or consultants to Cliffs having equivalent qualification.

Where monitoring indicates that progress towards meeting the completion criteria is not progressing as necessary, contingency actions will be implemented, which may include additional earthworks and/or additional rehabilitation works, with subsequent additional monitoring to then also be implemented, as appropriate.

3.3.5 Management Actions

As identified above, Cliffs has prepared a Mine Closure Plan (Cliffs 2012a; Appendix 8) in accordance with the specifications outlined in DMP & EPA (2011) for mine closure of the Windarling Range W4 East Deposit proposal. The Mine Closure Plan addresses the following key considerations for mine closure:

- Mine Closure Aspects;
- Mine Closure Objectives;
- Completion Criteria;
- Financial Provision; and
- Monitoring.

Cliffs will implement the Mine Closure Plan for the Windarling Range W4 East Deposit proposal to ensure acceptable mine closure of the Windarling Range W4 East Deposit proposal.

3.3.6 Commitments

Cliffs makes the following commitment for mine closure of the Windarling Range W4 East Deposit proposal:

1 Mine Closure

1-1 Cliffs will undertake management of mine closure in accordance with the Windarling Range W4 Deposit Mine Closure Plan (Cliffs 2012a; Appendix 8) at the completion of mining for the Windarling Range W4 East Deposit proposal.

A consolidation of Cliffs' commitments for the Windarling Range W4 East Deposit proposal is contained in Section 5.

3.3.7 Conclusion

As identified by the above assessment, mine closure for the Windarling Range W4 East Deposit proposal will managed in accordance with a Mine Closure Plan (Cliffs 2012a; Appendix 8) that has been prepared in accordance with DMP & EPA (2011). Implementation of the Mine Closure Plan will ensure mine closure for the Windarling Range W4 East Deposit proposal will occur to an acceptable standard.

Accordingly, the EPA objective for this factor can be met.

4 Consultation

Consultation is a fundamental component of the environmental impact assessment process. Section 4 provides a summary of the consultation undertaken by Cliffs with the key stakeholders for the Windarling Range W4 East Deposit proposal.

4.1 Government Organisations Consulted

4.1.1 Environmental Protection Authority (including Office of the EPA)

On 11th October 2010, prior to referral of the Windarling Range W4 East Deposit proposal under the *Environmental Protection Act 1986* (WA), a meeting was held with OEPA to discuss the Windarling Range W4 East Deposit proposal. This consultation focussed on identification of the proposal location, potential for environmental impact, and proposed referral under the *Environmental Protection Act 1986* (WA).

On 22nd October 2010, Cliffs referred the Windarling Range W4 East Deposit proposal to EPA under s38(1) of the *Environmental Protection Act 1986* (WA) (Cliffs 2010a). The Windarling Range W4 East Deposit proposal referral document identified the scope of the Windarling Range W4 East Deposit proposal, included maps identifying the proposal infrastructure relevant to key environmental matters, identification of proposed environmental management actions and included key environmental reports to support assessment of the proposal. The OEPA subsequently made Cliffs' Windarling Range W4 East Deposit proposal referral document available for public comment between 10th December 2010 and 17th December 2010, during which no public comments were received.

On 23rd February 2011, EPA determined that the Windarling Range W4 East Deposit proposal should be subject to an EIA at an Assessment on Proponent Information (API) level (EPA 2011b), with Cliffs notified of the EPA decision by OEPA on 28th February 2011 (EPA 2011c).

On 15th March 2011, Cliffs met with OEPA to discuss the environmental assessment approach, key environmental factors requiring assessment and proposed assessment timelines for the Windarling Range W4 East Deposit proposal.

On 6th April 2011, OEPA provided its Scoping Guideline (EPA 2011a) for development of this EIA-API document, outlining the key environmental factors for assessment of the Windarling Range W4 East Deposit proposal as being:

- Flora;
- Fauna; and
- Mine Closure.

On 30th September 2011, Cliffs provided OEPA with a preliminary list of proposed *R. brevis* offsets, incorporating both the direct environmental offsets and indirect environmental offsets. On 8th November 2011, Cliffs met with OEPA to discuss the preliminary list of proposed *R. brevis* offsets. The OEPA advised that it would like to have a meeting with Cliffs and DEC to discuss the preliminary list of proposed *R. brevis* offsets, with OEPA noting that DEC was also reviewing the preliminary list of proposed *R. brevis* offsets and were responsible for the Interim Recovery Plan for *R. brevis.* On 5th December 2011, Cliffs met with OEPA and DEC (N Caporn, D Coffey, M Smith, S Thomas, A Jones) to discuss the preliminary list of proposed *R. brevis* offsets.

On 23rd December 2011, Cliffs submitted a revised list of proposed offsets for *R. brevis* to OEPA for consideration, commensurate with the environmental offsets identified in Section 3.1 of this EIA-API document. On 17th January 2012, OEPA, on advice of DEC, advised Cliffs that from a preliminary assessment the combination of direct environmental offsets and indirect environmental offsets proposed appeared to form an adequate package to mitigate the impacts of the Windarling Range W4 East Deposit proposal to *R. brevis*.

Submission of this EIA-API document to EPA, and subsequent assessment of this EIA-API document by EPA and OEPA, represent further consultations by Cliffs with EPA and OEPA on the Windarling Range W4 East Deposit proposal.

Consultation between EPA, OEPA and Cliffs on the Windarling Range W4 East Deposit proposal will be ongoing through the environmental assessment and approvals processes under the *Environmental Protection Act 1986* (WA). Cliffs anticipates that EPA and OEPA will also monitor the implementation of the Windarling Range W4 East Deposit proposal.

4.1.2 Department of Sustainability, Environment, Water, Population and Communities

On 16th November 2009, Cliffs referred the Windarling Range W4 East Deposit proposal to DoSEWPC in accordance with s68(2) of the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) for potential impacts to threatened species (Cliffs 2009).

Between 19th November 2009 to 3rd December 2009, DoSEWPC made Cliffs' Windarling Range W4 East Deposit proposal referral document publicly available for comment. No public comments were received.

On 17th December 2009, DoSEWPC determined that the Windarling Range W4 East Deposit proposal was not a controlled action, and therefore did not require assessment and approval under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) (DoSEWPC 2009).

Further consultation between DoSEWPC and Cliffs on the Windarling Range W4 East Deposit proposal is not considered necessary.

4.1.3 Department of Mines and Petroleum

On 1st August 2011, a meeting was held with DMP (R De Bari, D Dravnieks) to discuss key aspects and impacts of the Windarling Range W4 East Deposit proposal. The consultation focussed on the proposal location and design, the requirement for submission of a Mining Proposal to DMP in accordance with the *Mining Act 1978* (WA), and the requirement for preparation of a Mine Closure Plan consistent with DMP & EPA (2011).

Cliffs will prepare and submit a Mining Proposal to DMP for the Windarling Range W4 East Deposit proposal in accordance with the *Mining Act 1978* (WA). This process is scheduled to commence from Q2 2012.

Consultation between DMP and Cliffs on the Windarling Range W4 East Deposit proposal will be ongoing through the environmental and mining assessment and approvals processes under the *Mining Act 1978* (WA). Cliffs anticipates that DMP will also monitor the implementation of the Windarling Range W4 East Deposit proposal.

4.1.4 Department of Environment and Conservation

On 21st September 2010, prior to referral of the Windarling Range W4 East Deposit proposal to EPA under the *Environmental Protection Act 1986* (WA), informal preliminary consultation was held with DEC (D Coffey, S Thomas, D Pickles). This informal preliminary consultation discussed the general location of the Windarling Range W4 East Deposit proposal, environmental surveys being undertaken and the proposed referral to EPA.

On 22nd October 2010, Cliffs referred the Windarling Range W4 East Deposit proposal to EPA under s38(1) of the *Environmental Protection Act 1986* (WA) (Cliffs 2010a), with a copy provided to DEC (Perth) (D Coffey) for information. On 4th November 2010, an additional copy of the of the Windarling Range W4 East Deposit proposal referral document was provided to the DEC Kalgoorlie regional office (W Astill).

On 2nd February 2011, DEC provided advice to EPA on Windarling Range W4 East Deposit proposal (DEC 2011f). The key environmental aspect of concern identified by DEC was the potential for impact to *R. brevis*, and in particular, concern with regard to the potential for genetic impact if the *R. brevis* within the Windarling Range W4 East Deposit proposal area was genetically distinct.

On 18th March 2011, Cliffs met with DEC (D Coffey, S Thomas, M Smith, D Pickles, J Jackson) to discuss the Windarling Range W4 East Deposit proposal. This consultation outlined the general location of the Windarling Range W4 East Deposit proposal and the range of environmental surveys completed and in progress. The key environmental aspect of concern identified by DEC was the potential for impact to *R. brevis*, and specifically, matters of potential genetic impact. Cliffs identified its proposed direct environmental offsets for *R. brevis* at the Windarling Range W1 Deposit and the Windarling Range W3/5 Deposit (refer Section 3.1). The DEC requested Cliffs to consider additional indirect environmental offsets in order to offset the residual impact to *R. brevis*.

On 18th May 2011, Cliffs provided DEC (D Coffey) with a preliminary list of proposed *R. brevis* offsets, incorporating both the direct environmental offsets and indirect environmental offsets. On 14th July 2011, Cliffs met with DEC (D Coffey, M Smith) and had general discussions regarding the preliminary list of proposed *R. brevis* offsets. The DEC requested Cliffs to review its preliminary list of proposed *R. brevis* offsets to ensure that the proposed *R. brevis* offsets did not include works that were undertaken for the purpose of environmental impact assessment or include works that formed part of a management plan required under existing government approvals.

On 18th August 2011, Cliffs provided DEC with a copy of the genetic assessment of *R. brevis* (BGPA 2011b). As identified in Section 3.1, the genetic assessment confirmed that the *R. brevis* within the area of the Windarling Range W4 East Deposit proposal are not genetically distinct (BGPA 2011b); thereby addressing this key concern for the Windarling Range W4 East Deposit proposal identified previously by DEC on 2nd February and 18th March 2011.

On 30th September 2011, Cliffs provided DEC (D Coffey) with a preliminary list of proposed *R. brevis* offsets, incorporating both the direct environmental offsets and indirect environmental offsets. On 11th November 2011, DEC (S Thomas) provided Cliffs with its preliminary assessment of the preliminary list of proposed *R. brevis* offsets. On 5th December 2011, Cliffs met with DEC (N Caporn, D Coffey, M Smith, S Thomas, A Jones) and OEPA to discuss the preliminary list of proposed *R. brevis* offsets and the DEC response.

On 23rd December 2011, Cliffs submitted a revised list of proposed offsets for *R. brevis* to OEPA for consideration, commensurate with the environmental offsets identified in Section 3.1 of this EIA-API document, with this revised list of proposed environmental offsets forwarded to DEC for consideration and

advice to OEPA. On 17th January 2012 and on the advice of DEC, OEPA advised Cliffs that from a preliminary assessment the combination of direct environmental offsets and indirect environmental offsets proposed appeared to form an adequate package to mitigate the impacts of the Windarling Range W4 East Deposit proposal to *R. brevis*.

Consultation between DEC and Cliffs on the Windarling Range W4 East Deposit proposal will be ongoing through the environmental assessment and approvals processes under the *Environmental Protection Act 1986* (WA). Consultation between DEC and Cliffs on the Windarling Range W4 East Deposit proposal is also expected to be ongoing following proclamation of the proposed Conservation and Mining Reserve.

4.2 Non-Government Organisations Consulted

The Yilgarn Operations Community Reference Group (CRG) was formed in 2004 to provide review and comment on the environmental aspects of Cliffs' Yilgarn Operations. The CRG meets twice per year, in March and September. The CRG includes members of:

- Shire of Yilgarn;
- Malleefowl Preservation Group;
- Wildflower Society of Western Australia;
- Windarling Preservation Group;
- Yilgarn Land Conservation District Committee;
- Toodyay Naturalists Club;
- Pastoral representatives; and
- Community representatives.

On 16th September 2010, prior to referral of the Windarling Range W4 East Deposit proposal under the *Environmental Protection Act 1986* (WA), consultation was undertaken with the CRG on the Windarling Range W4 East Deposit proposal. A representative of DEC (D Pickles) was also in attendance at this meeting of the CRG. This consultation focussed on the aspects of the Windarling Range W4 East Deposit proposal, potential for environmental impact and the proposed referral under the *Environmental Protection Act 1986* (WA). No significant environmental concerns were identified by CRG representatives for the Windarling Range W4 East Deposit proposal during this consultation.

On 17th March 2011, additional consultation was undertaken with the CRG on the Windarling Range W4 East Deposit proposal. Representatives of DEC (J Jackson, B Lane) were also in attendance at this meeting of the CRG. This consultation focussed on the aspects of the Windarling Range W4 East Deposit proposal, potential for environmental impact and the assessment process under the *Environmental Protection Act 1986* (WA). No significant environmental concerns were identified by CRG representatives for the Windarling Range W4 East Deposit proposal during this consultation.

On 22nd September 2011, additional consultation was undertaken with the CRG on the Windarling Range W4 East Deposit proposal. A representative of DEC (J Jackson) was also in attendance at this meeting of the CRG. This consultation focussed on the aspects of the Windarling Range W4 East Deposit proposal, potential for environmental impact and the assessment process under the *Environmental Protection Act 1986* (WA). This consultation included a tour of Cliffs' Windarling Range mine operations including an inspection toward the southern side of the Windarling Range W4 East Deposit proposal area. Information was also provided to the CRG on the implementation progress for the *R. brevis* seeding and seedling offsets (refer Section 3.1) that were being undertaken at the Cliffs' Windarling Range mine operations. No significant environmental concerns

were identified by CRG representatives for the Windarling Range W4 East Deposit proposal during this consultation.

On 22nd July 2011, consistent with the request of OEPA (2011a) and in addition to the above consultation with CRG, specific consultation was also undertaken with the Wildflower Society of Western Australia (B Moyle). This consultation outlined the Windarling Range W4 East Deposit proposal and the potential for impact to the 'Rare Flora' species *Ricinocarpos brevis*. No significant environmental concerns were identified by the Wildflower Society of Western Australia for the Windarling Range W4 East Deposit proposal during this consultation.

Consultation between the CRG and Cliffs on the Windarling Range W4 East Deposit proposal will be ongoing through meetings of the CRG during proposal implementation.

4.3 Ongoing Consultation

Consultation with the key regulatory agencies for the Windarling Range W4 East Deposit proposal, being EPA and OEPA and DMP, will be ongoing during implementation of the Windarling Range W4 East Deposit proposal through the annual compliance reporting provisions under the statutory approvals issued or managed by these agencies under the *Environmental Protection Act 1986* (WA) and the *Mining Act 1978* (WA), respectively.

Consultation with DEC is expected to be ongoing during implementation of the Windarling Range W4 East Deposit proposal following proclamation of the proposed Conservation and Mining Reserve.

Consultation with the community through the CRG is expected to be ongoing during implementation of the Windarling Range W4 East Deposit proposal.

5 Environmental Commitments

As part of this environmental impact assessment, Cliffs has made a number of environmental commitments for the management of environmental factors relevant to the Windarling Range W4 East Deposit proposal. Cliffs supports these commitments to implement the EMPs and the environmental offsets to become legally binding in an approval from the WA Minister for Environment for the Windarling Range W4 East Deposit proposal under s45(5) the *Environmental Protection Act 1986* (WA). Cliffs' commitments to implement the EMPs include implementation of subsequent revisions of the EMPs.

The consolidation of Cliffs' environmental commitments for the Windarling Range W4 East Deposit proposal under the *Environmental Protection Act 1986* (WA) is below. For consistency, Cliffs has drafted these commitments in the same written text manner as conditions imposed by the WA Minister for Environment.

1. Land Clearing Management

1-1 Cliffs will undertake management of land clearing in accordance with the Land Clearing Management Plan (Cliffs 2011a; Appendix 3) during implementation of the Windarling Range W4 East Deposit proposal.

2. Weed Management

2-1 Cliffs will undertake management of weeds in accordance with the Weed Management Plan (Cliffs 2011b; Appendix 4) during implementation of the Windarling Range W4 East Deposit proposal.

3. Fire Management

3-1 Cliffs will undertake management of fire in accordance with the Fire Management Plan (Cliffs 2011c; Appendix 5) during implementation of the Windarling Range W4 East Deposit proposal.

4. Dust Management

4-1 Cliffs will undertake management of dust in accordance with the Dust Management Plan (Cliffs 2011d; Appendix 6) during implementation of the Windarling Range W4 East Deposit proposal.

5. *Ricinocarpos brevis* Environmental Offsets

5-1 Cliffs will offset the impact of the Windarling Range W4 East Deposit proposal to the Rare Flora species *Ricinocarpos brevis* by achieving the following outcomes:

(a) Direct environmental offsets of:

(i) Avoiding impact to 353 individuals of *Ricinocarpos brevis* within the previously approved area of impact for the Windarling Range W1 and W3/5 Deposits;

(ii) Implementation of a *Ricinocarpos brevis* Rehabilitation Program;

(b) Indirect environmental offset of:

(i) Implementation of a *Ricinocarpos brevis* Research Program;

(ii) Translocation of *Ricinocarpos brevis* whole individuals from the Windarling Range W1 and W4 East Deposits.

The scope of the environmental offsets are described in the document:

Cliffs Asia Pacific Iron Ore Pty Ltd (2012) *Yilgarn Operations Windarling Range W4 East Deposit Environmental Protection Act 1986 (WA) Environmental Impact Assessment (Assessment on Proponent Information)*. Report prepared by Globe Environments Australia Pty Ltd for Cliffs Asia Pacific Iron Ore Pty Ltd. Revision D, February 2012.

6. Fauna Management

6-1 Cliffs will undertake management of fauna in accordance with the Fauna Management Plan (Cliffs 2011e; Appendix 7) during implementation of the Windarling Range W4 East Deposit proposal.

7. Mine Closure

7-1 Cliffs will undertake management of mine closure in accordance with the Windarling Range W4 Deposit Mine Closure Plan (Cliffs 2012a; Appendix 8) at the completion of mining for the Windarling Range W4 East Deposit proposal.

6 Study Team

Development of this EIA-API document has involved a range of supporting consultants to Cliffs. The key consultants and their contributions are acknowledged and appreciated by Cliffs.

Globe Environments Australia Pty Ltd
www.GlobeEnvironments.com.au

- Project Management
- Environmental Impact Assessment
- Government Approvals

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- Malleefowl Survey

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- Vertebrate Fauna Survey

Bennelongia Pty Ltd
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- Troglobitic Fauna Survey

Biota Environmental Sciences Pty Ltd
www.Biota.net.au

- Invertebrate Fauna Survey

CAD Resources

www.CADResources.com.au

- Mapping and GIS Services

Soil Water Consultants Pty Ltd

www.SoilWaterGroup.com

- Soil Characterisation
- Geochemical Characterisation

Western Botanical

www.WesternBotanical.com.au

- Flora Survey

Woodman Environmental Consulting

www.WoodmanEnv.com.au

- Independent External Review (Section 3.1 Flora)

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8 Appendices

Appendix 1 Cliffs' Environmental Policy (Cliffs Natural Resources 2008)

Appendix 2 ISO 14001:2004 Environmental Management System Certification (NCSI 2011)

Appendix 3 Land Clearing Management Plan (Cliffs 2011a)

Appendix 4 Weed Management Plan (Cliffs 2011b)

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APPENDIX 1

Cliffs' Environmental Policy (Cliffs Natural Resources 2008)

CLIFFS

CLIFFS NATURAL RESOURCES INC.
& ASSOCIATED COMPANIES

ENVIRONMENTAL POLICY
OCTOBER 2008

Mining and mineral processing make a vital contribution to world development by providing the essential raw materials for products for modern society. Cliffs Natural Resources (the "Company") recognizes that extraction and processing of the earth's mineral resources must be accomplished in a responsible manner that minimizes impacts on the environment and the community. The Company believes that stewardship with proper concern for the environment is an essential element of a successful business strategy and subscribes to the tenets of sustainable development.

STATEMENT OF POLICY

It is the policy of the Company to conduct its affairs in accordance with appropriate best available practices. To accomplish this, the Company will:

A. Adopt standards that build from a foundation of compliance with applicable government laws and regulations, permits, and related agreements.

B. Establish management systems, standards, programs, and procedures within its corporate and operating units for implementation of this policy, and integrate environmental considerations into business planning.

C. Inform managers and employees of their responsibility to comply with this policy, and to be sensitive to the effects of the Company's operations on the environment.

D. Integrate pollution prevention into daily activities and business planning, and use formal environmental management systems to continually improve environmental performance.

E. Conduct periodic environmental audits of operating practices to verify compliance with this policy, and identify revisions or improvements required to minimize environmental effects.

F. Conduct environmental assessments for all new properties, activities, acquisitions, closures, divestitures, and proposed changes in operating procedures.

G. Ensure that contractors working on the Company's premises or on properties managed by the Company comply with relevant environmental standards.

H. Contribute to the development and administration of technically and economically sound environmental standards and compliance procedures through interaction with professional and trade groups, legislative bodies, regulatory agencies, and citizens' organizations.

I. Measure the environmental performance of its operations and share the results with stakeholders.

Joseph A. Carrabba
Chairman, President and
Chief Executive Officer
Cliffs Natural Resources Inc.

APPENDIX 2

ISO 14001:2004 Environmental Management System Certification (NCSI 2011)

NCS INTERNATIONAL
CERTIFIED
ENVIRONMENTAL
MANAGEMENT SYSTEM
ISO 14001

Cliffs Asia Pacific Iron Ore Pty Ltd
Koolyanobbing
WA 6426

Operates a management system
that complies with the requirements of:

AS/NZS ISO 14001:2004

The Scope of Certification is:

Management of the environmental aspects and impacts of mine operations at the Koolyanobbing Range, Windarling Range and Mt Jackson Range, including the connecting haul roads.

Date of Issue:	16 June 2011
Expiry Date:	31 May 2013
Certificate Number:	13881001-EMS-004
Certification Number:	13881
Certification Date:	02 December 2010

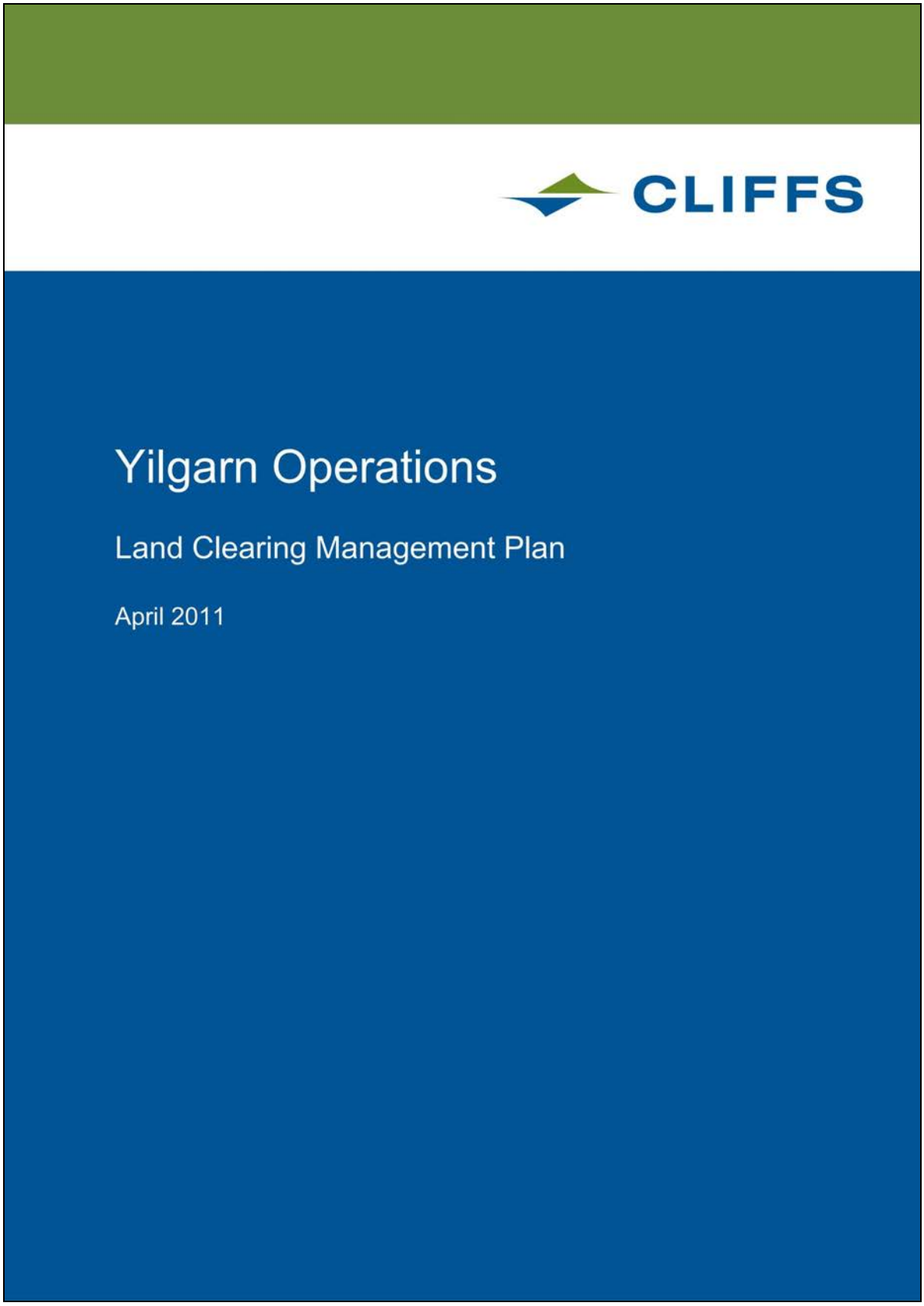
Greg Jewson
On behalf of the board members

NCS International
JAS-ANZ
IAF MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT

To confirm the currency of this certificate please email certification@ncsi.com.au
This Certificate remains the property of NCS International Pty Limited ACN 078 659 211
7 Leeds Street, Rhodes NSW 2138
A wholly owned subsidiary of The National Association of Testing Authorities, Australia ACN 004 379 748
Accreditation by the Joint Accreditation System of Australia and New Zealand (www.jas-anz.org/register)
Rev 09/10

APPENDIX 3

Land Clearing Management Plan (Cliffs 2011a)


CLIFFS
Yilgarn Operations
Land Clearing Management Plan
April 2011

Document History

Revision	Author	Status	Date	Distribution
P	Ecologia	Final	October 2003	Cliffs, DEC, DMP, DoSEWPC
A	G Barrett	Revised Draft	September 2008	Cliffs
B	G Barrett	Revised Draft	October 2008	Cliffs
C	G Barrett	Revised Draft	February 2009	Cliffs
D	G Barrett	Revised Draft	April 2009	DEC, EPA, DMP, DoSEWPC
E	G Barrett	Final	May 2009	Cliffs, EPA
F	S Hawkins	Final	April 2011	EPA, DMP, DoSEWPC

1. PURPOSE OF THIS PLAN

Cliffs Asia Pacific Iron Ore Pty Ltd's (Cliffs) Yilgarn Operations includes of mine operations at the Koolyanobbing Range, Mt Jackson Range, Windarling Range and the Johnston Range, ore processing at Koolyanobbing, and road and rail transport between these operations and the Port of Esperance where the processed ore is exported to international customers. The location of the mine operations is identified in Figure 1.

This management plan is one of a series of plans that outlines how Cliffs manages the environmental aspects of its mine operations. The purpose of this plan is to outline the management actions that Cliffs will implement with regards to the minimisation and control of land clearing required for mine operations.

2. POLICY AND STANDARDS

Cliffs' mine operations are undertaken in accordance with Cliffs' Environmental Policy. The Environmental Policy outlines Cliffs' overarching objectives for environmental protection and continual improvement in environmental performance.

Cliffs' Environmental Policy is implemented through Cliffs' Environmental Management System (EMS), which is certified and maintained to Australian and New Zealand Standard ISO 14001:2004. Cliffs' EMS includes a range of Environmental Management Plans (EMPs) for key environmental aspects and impacts related to mine operations, which are supported by various Environmental Operating Procedures (EOPs). This EMP forms part of Cliffs' EMS.

Cliffs has obtained various environmental and mining approvals to undertake its mine operations. These approvals have been obtained under various State and Commonwealth legislation, including the *Environmental Protection Act 1986*, *Mining Act 1978* (WA) and the *Environment Protection and Biodiversity Conservation Act 1999* (C'th). Where relevant, this EMP has been prepared to meet the requirements of these approvals.

3. POTENTIAL IMPACTS

Clearing can result in a loss of environmental values, namely the loss of flora species and fauna species, some which may be of conservation significance. Land clearing also has the potential to impact soil structure and facilitate erosion.

In order to minimise the loss of environmental values and soil structure, clearing should be minimised as far as practicable, be limited to within approved areas and not impact adjacent uncleared areas.

Figure 1. Location of mine operations. The mine operations at the Koolyanobbing Range, Mt Jackson Range, Windarling Range and the Johnston Range (Deception Deposit) are identified.

4. MANAGEMENT ACTIONS

Cliffs will ensure that the following actions are implemented:

Management Actions	Timing	Responsibilities
Land Clearing		
1. Land clearing shall only be undertaken in accordance with the Site Disturbance Permit procedure (EOP13) and have an approved Site Disturbance Permit (ENVF04).	Ongoing	General Manager Operations
2. Approved Site Disturbance Permits must have the necessary government approvals in place (e.g. *Environmental Protection Act 1986* (WA) and *Mining Act 1978* (WA)).	Ongoing	General Manager Operations Environmental Superintendent
3. Clearing is undertaken when necessary, not before, unless there is an environmental benefit (e.g. opportunity to directly replace topsoil to areas to be rehabilitated).	Ongoing	Environmental Superintendent
4. Clearing undertaken will be audited against approved Site Disturbance Permits.	Annually	Environmental Superintendent
Rare Flora		
5. Conditions will be applied to the Site Disturbance Permit to control the potential impacts to Rare Flora, where appropriate. Conditions could include actions such as fencing or monitoring dust generation.	Ongoing	Environmental Superintendent
Rehabilitation		
6. Rehabilitation of cleared land will occur in accordance with EOP12 Rehabilitation.	Ongoing	Environmental Superintendent
Education and Training		
7. Mine personnel involved in land clearing will be inducted in the use of Site Disturbance Permits. Refresher training will be provided should any non-conformances occur.	Ongoing	Environmental Superintendent

5. MONITORING

Monitoring will occur during land clearing to ensure compliance with the approved Site Disturbance Permit. The monitoring will be supported by an annual audit of approved Site Disturbance Permits.

6. PERFORMANCE INDICATORS

The following performance indicators are applicable to this EMP:

- Clearing is conducted in accordance with approved Site Disturbance Permits;
- An audit of Site Disturbance Permits is undertaken annually; and
- Mine personnel are trained in the Site Disturbance Permit system

7. RECORDS AND REPORTING

Approved Site Disturbance Permits will be retained. A GIS database will be used to identify the areas cleared under approved Site Disturbance Permits.

If clearing occurs otherwise than in accordance with an approved Site Disturbance Permit, the clearing will be investigated and recorded within the Incident Reporting System.

A summary of the areas cleared will be presented within Annual Environmental Report provided to government, where appropriate.

8. CONSULTATION

The management actions outlined in this EMP have previously been subject to review by the Environmental Protection Authority (WA), Department of Environment and Conservation (WA), Department of Mines and Petroleum (WA) and the Department of Sustainability, Environment, Water, Population and Communities (C'th).

9. REVIEW

Cliffs will review and update the management actions contained in this EMP from time to time for currency with legislation, standards, guidelines and/or operational requirements. Any changes to this EMP that results in a significant change to environmental outcome will be referred to the relevant regulatory authorities prior to implementation of such changes.

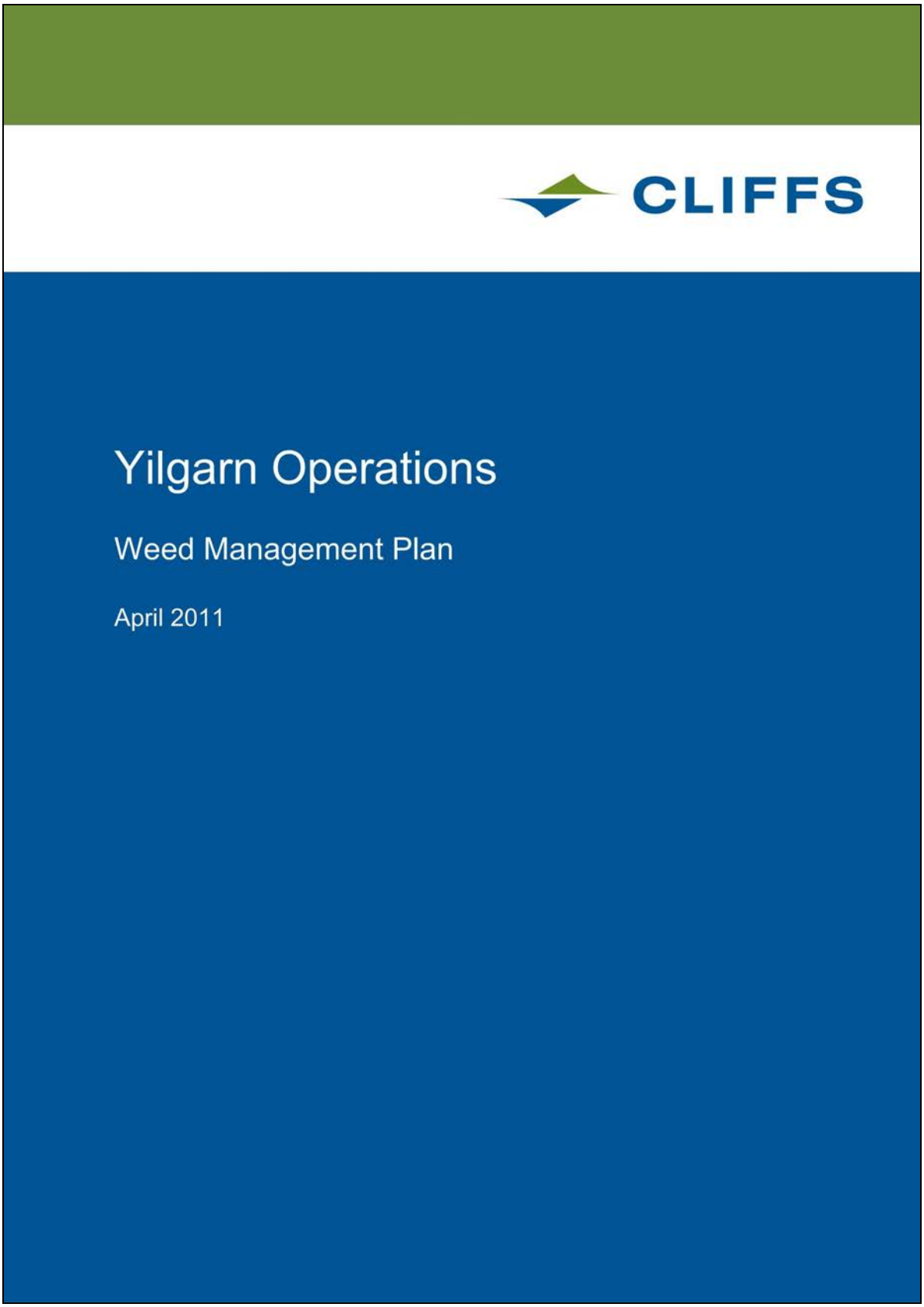
10. SUPPORTING DOCUMENTS

The following documents support this EMP:

- Environmental Operating Procedure EOP04 Land Clearing
- Environmental Operating Procedure EOP13 Site Disturbance Permits
- Environmental Form ENVF04 Site Disturbance Permit

APPENDIX 4

Weed Management Plan (Cliffs 2011b)


CLIFFS
Yilgarn Operations
Weed Management Plan
April 2011

Document History

Revision	Author	Status	Date	Distribution
P	Ecologia	Final	October 2003	Cliffs, DEC, DMP, DoSEWPC
A	G Barrett	Revised Draft	August 2008	Cliffs
B	G Barrett	Revised Draft	September 2008	Cliffs
C	G Barrett	Revised Draft	October 2008	Cliffs
D	G Barrett	Revised Draft	February 2009	Cliffs
E	G Barrett	Revised Draft	April 2009	DEC, EPA, DMP, DoSEWPC
F	G Barrett	Final	May 2009	Cliffs, EPA
G	**S Hawkins**	**Final**	**April 2011**	**EPA, DMP, DoSEWPC**

1. PURPOSE OF THIS PLAN

Cliffs Asia Pacific Iron Ore Pty Ltd's (Cliffs) Yilgarn Operations includes mine operations at the Koolyanobbing Range, Mt Jackson Range, Windarling Range and the Johnston Range, ore processing at Koolyanobbing, and road and rail transport between these operations and the Port of Esperance where the processed ore is exported to international customers. The location of the mine operations is identified in Figure 1.

This management plan is one of a series of plans that outlines how Cliffs manages the environmental aspects of its mine operations. The purpose of this plan is to outline the management actions that Cliffs will implement with regards to the prevention and control of weed species within the areas of Cliffs' mine operations.

2. POLICY AND STANDARDS

Cliffs' mine operations are undertaken in accordance with Cliffs' Environmental Policy. The Environmental Policy outlines Cliffs' overarching objectives for environmental protection and continual improvement in environmental performance.

Cliffs' Environmental Policy is implemented through Cliffs' Environmental Management System (EMS), which is certified and maintained to Australian and New Zealand Standard ISO 14001:2004. Cliffs' EMS includes a range of Environmental Management Plans (EMPs) for key environmental aspects and impacts related to mine operations, which are supported by various Environmental Operating Procedures (EOPs). This EMP forms part of Cliffs' EMS.

Cliffs has obtained various environmental and mining approvals to undertake its mine operations. These approvals have been obtained under various State and Commonwealth legislation, including the *Environmental Protection Act 1986*, *Mining Act 1978* (WA) and the *Environment Protection and Biodiversity Conservation Act 1999* (C'th). Where relevant, this EMP has been prepared to meet the requirements of these approvals.

3. POTENTIAL IMPACTS

Weeds are plants that establish in an environment where they do not naturally occur. Weeds are generally introduced (non-native species), however native species can also be regarded as weeds where they establish in areas beyond its natural distribution. Weeds have the potential to impact native flora through competition for resources (space, nutrients, etc), with subsequent potential impact to its value as fauna habitat.

Appendix A identifies each weed species recorded within the area of the mine operations and the surrounding lands.

Figure 1. Location of mine operations. The mine operations at the Koolyanobbing Range, Mt Jackson Range, Windarling Range and the Johnston Range (Deception Deposit) are identified.

4. MANAGEMENT ACTIONS

Cliffs will ensure that the following actions are implemented:

Management Actions	Timing	Responsibilities
Survey		
1. Assess the distribution, abundance and risk of weed species within mine areas through targeted surveys and opportunistic observations.	Ongoing	Environmental Superintendent
2. Incorporate weed species distribution data within the GIS database.	Ongoing	Environmental Superintendent
Control and Hygiene		
3. Implement chemical and/or mechanical weed control annually within high risk areas (e.g. known areas of significant weeds) and within areas having of high environmental value (e.g. vegetation supporting rare flora).	Ongoing	Environmental Superintendent
4. Implement weed hygiene in accordance with EOP16 Weed Management and ENVF07 Weed Hygiene Certificate.	Ongoing	Manager Environmental Services
5. Provide and maintain vehicle washdown facilities.	Ongoing	General Manager Operations
Management		
6. Incorporate weed control areas within the GIS database.	Ongoing	Environmental Superintendent
7. Include a contract clause requiring suppliers of native plant seed to certify the seed supplied is weed free.	Ongoing	Manager Environmental Services
8. Include a contract clause requiring major earthmoving and exploration contractors to adhere to Cliffs' weed hygiene procedures.	Ongoing	Manager Environmental Services
Training		
9. Provide general training of mine personnel on weed species and weed hygiene as part of site inductions.	Ongoing	Environmental Superintendent
10. Provide specialised training of selected mine personnel on weed identification and weed control methods.	Ongoing	Environmental Superintendent

5. MONITORING

Monitoring for the detection of weed populations will be undertaken through target surveys and opportunistic observations of mine areas. Monitoring to determine the success of weed control measures will occur following weed control.

6. PERFORMANCE INDICATORS

The following performance indicators are applicable to this EMP:

- appropriate mine personnel are trained on weed species and weed hygiene;
- no persistent new weed species introduced within mine areas; and
- the abundance and distribution of existing weed species within mine areas is controlled.

7. RECORDS AND REPORTING

Weed distribution, abundance and control will be recorded within the GIS database. Where appropriate, changes in the types of weed species present, their distribution and their abundance will be reported to the relevant government authorities.

8. CONSULTATION

The management actions outlined in this EMP have previously been subject to review by the Environmental Protection Authority (WA), Department of Environment and Conservation (WA), Department of Mines and Petroleum (WA) and the Department of Sustainability, Environment, Water, Population and Communities (C'th).

9. REVIEW

Cliffs will review and update the management actions contained in this EMP from time to time for currency with legislation, standards, guidelines and/or operational requirements. Any changes to this EMP that results in a significant change to environmental outcome will be referred to the relevant regulatory authorities prior to implementation of such changes.

10. SUPPORTING DOCUMENTS

The following documents support this EMP:

- Environmental Operating Procedure EOP16 Weed Management
- Environmental Form ENVF07 Weed Hygiene Certificate

APPENDIX A

Weed species recorded in the area of Cliffs' mine operations and the surrounding lands.

Risk ranking follows DEC (1999) of High (H), Moderate (Mo), Mild (Mi) and Low (L). An asterisk (*) indicates a declared weed under the *Agricultural and Related Resources Protection Act 1976* (WA).

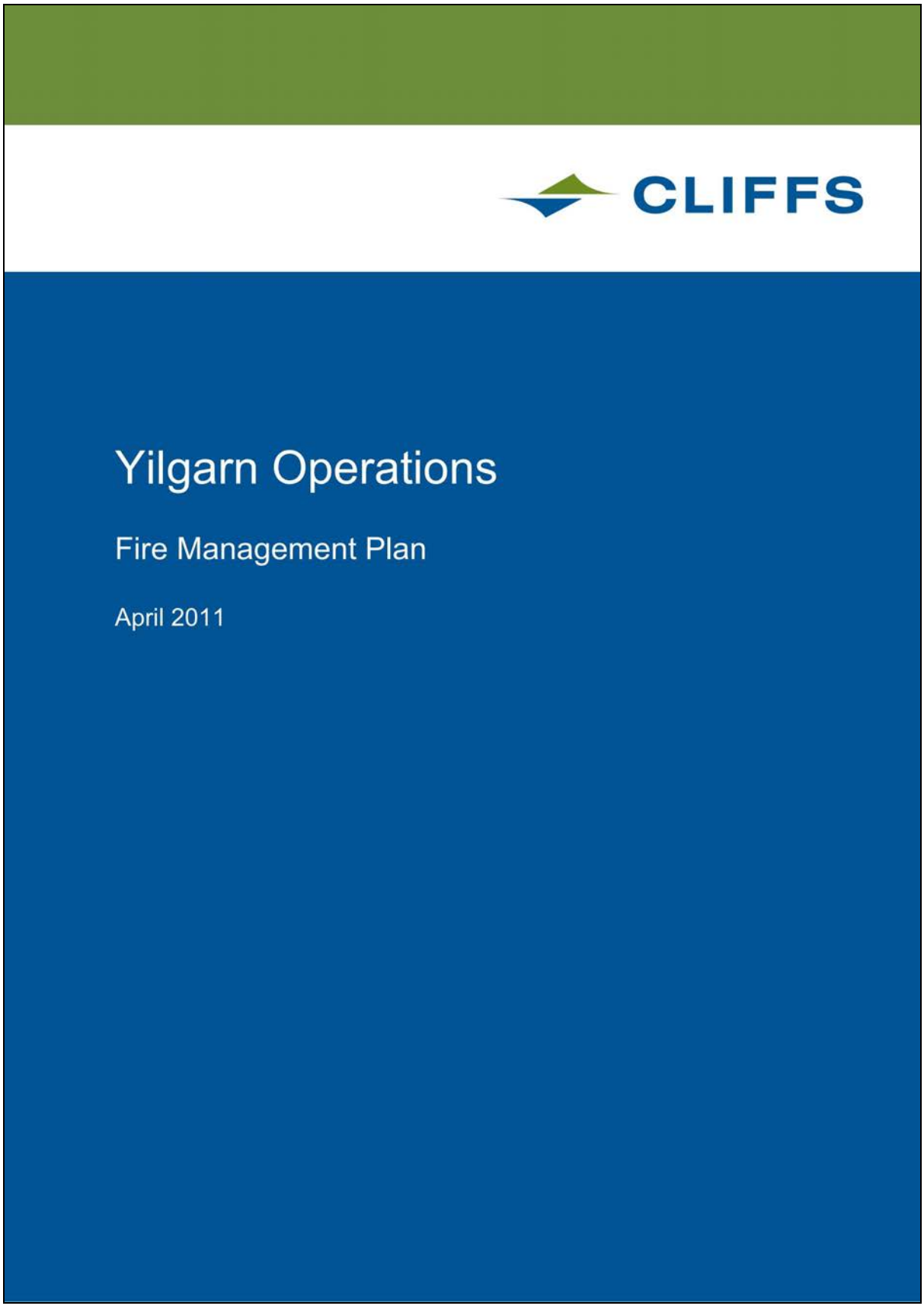
Species	Common Name	Koolyanobbing Range	Windarling Range	Mt Jackson Range	Deception Deposit	Haul Road	Bullfinch-Evanston Road	Southern Cross – Koolyanobbing Road	Mt Manning Range	Risk ranking
Acetosa vesicaria	Ruby Dock	✓								H
Aira caryophyllea	Silver Hairgrass		✓	✓		✓				Mo
Brassica tournefortii	Wild Turnip	✓				✓	✓	✓		H
Bromus diandrus	Great Brome	✓	✓	✓						H
Bromus madritensis	Brome Grass			✓						L
Bromus rubens	Red Brome		✓	✓						Mo
Carrichtera annua	Wards Weed	✓		✓		✓	✓	✓		H
*Carthamus lanatus**	Saffron Thistle	✓				✓	✓			L
Centaurea melitensis	Maltese Cockspur	✓		✓	✓	✓	✓	✓		Mo
Citrullus lanatus	Afghan Melon						✓	✓		L
Cleretum papulosum	-					✓				-
Cuscuta epithymum	Lesser Dodder					✓				Mo
Cuscuta planiflora	-					✓				-
Echium plantaginaeum	Patterson's Curse	✓					✓	✓		-
Eragrostis curvula	African Love Grass	✓					✓	✓		H
Erodium botrys	Big Herons Bill	✓		✓						L
Erodium cicutarium	Common Storksbill					✓				Mo
Hypochaeris glabra	Flat Weed		✓	✓		✓			✓	Mo
Hyptis suaveolens	Mint Weed	✓	✓	✓		✓	✓	✓		Mo
Medicago sp.	Medic			✓						-
Osteospermum calendulaceum	Stinking Roger	✓	✓	✓						Mi
Pentaschistis airoides	False Hairgrass	✓	✓	✓	✓	✓			✓	Mo
Rostraria pumila	Roughtail			✓		✓				Mo
Sisymbrium irio	London Rocket					✓				Mi
Sonchus asper	Prickly Sowthistle			✓						Mo
Sonchus oleraceus	Common Sowthistle		✓			✓			✓	Mo
Vulpia myuros var. myuros	Rats-tail Fescue		✓	✓		✓			✓	Mo

Data sources:

- Biota Environmental Sciences (2011) *Deception Deposit Vegetation and Flora Survey.*
- Department of Environment and Conservation (1999) *Draft Environmental Weed Strategy for Western Australia.*
- Gibson, N (2004) *Flora and Vegetation of the Eastern Goldfields Ranges: Part 6 Mt Manning Range.*
- Mattiske Consulting (2001) *Review of Flora on Portman Iron Ore Proposed Expansion Areas.*
- Western Botanical (2009) *Flora and Vegetation of the Western Jackson Range (Mt Jackson Range), Western Australia.*
- Western Botanical pers. com.

APPENDIX 5

Fire Management Plan (Cliffs 2011c)


CLIFFS
Yilgarn Operations
Fire Management Plan
April 2011

Document History

Revision	Author	Status	Date	Distribution
P	Ecologia	Final	October 2003	Cliffs, DEC, DMP, DoSEWPC
A	G Barrett	Revised Draft	December 2008	P West
B	G Barrett	Revised Draft	April 2009	EPA, DMP, DoSEWPC
C	G Barrett	Final	May 2009	Cliffs, EPA
D	S Hawkins	Final	April 2011	EPA, DMP, DoSEWPC

1. PURPOSE OF THIS PLAN

Cliffs Asia Pacific Iron Ore Pty Ltd's (Cliffs) Yilgarn Operations include mine operations at the Koolyanobbing Range, Mt Jackson Range, Windarling Range and the Johnston Range, ore processing at Koolyanobbing, and road and rail transport between these operations and the Port of Esperance where the processed ore is exported to international customers. The location of the mine operations is identified in Figure 1.

This management plan is one of a series of plans that outlines how Cliffs manages the environmental aspects of its mine operations. The purpose of this plan is to outline the management actions that Cliffs will implement with regards to the prevention, detection, equipment and training associated with the potential for fire within the areas of Cliffs' mine operations and the surrounding lands.

2. POLICY AND STANDARDS

Cliffs' mine operations are undertaken in accordance with Cliffs' Environmental Policy. The Environmental Policy outlines Cliffs' overarching objectives for environmental protection and continual improvement in environmental performance.

Cliffs' Environmental Policy is implemented through Cliffs' Environmental Management System (EMS), which is certified and maintained to Australian and New Zealand Standard ISO 14001:2004. Cliffs' EMS includes a range of Environmental Management Plans (EMPs) for key environmental aspects and impacts related to mine operations, which are supported by various Environmental Operating Procedures (EOPs). This EMP forms part of Cliffs' EMS.

Cliffs has obtained various environmental and mining approvals to undertake its mine operations. These approvals have been obtained under various State and Commonwealth legislation, including the *Environmental Protection Act 1986*, *Mining Act 1978* (WA) and the *Environment Protection and Biodiversity Conservation Act 1999* (C'th). Where relevant, this EMP has been prepared to meet the requirements of these approvals.

3. POTENTIAL IMPACTS

The location and frequency of fires is not constant, and as such the potential environmental impact is difficult to predict. Whilst many plant species in Western Australia are resilient in the presence of fire, any change to the frequency or intensity of fire has the potential to result in an adverse environmental impact. It is a responsibility of Cliffs to implement actions to minimise the risk of fire, and to respond to fire where it occurs from its mine operations. Cliffs may also be able to assist in response to fire that occurs outside of its mine operations.

The Department of Environment and Conservation (DEC) and the Fire and Emergency Services Authority (FESA) are responsible for the prevention, management and control of fire regionally. Cliffs has a Memorandum of Understanding with the DEC that defines the nature and geographical area of any assistance to DEC for fire management. Cliffs has also undertaken a wildfire threat analysis in consultation with DEC to identify areas within Cliffs' mine operations requiring special protection from fire.

Figure 1. Location of mine operations. The mine operations at the Koolyanobbing Range, Mt Jackson Range, Windarling Range and the Johnston Range (Deception Deposit) are identified.

4. MANAGEMENT ACTIONS

Cliffs will ensure that the following actions are implemented:

Management Actions	Timing	Responsibilities
Prevention		
1. Hot work permits shall be issued for any activities where there is a risk of fire.	Ongoing	Manager Operations
2. Site safety inspections shall include assessment of potential fire risks.	Ongoing	Manager Operations
3. Erect and maintain "No Fires" signage at various points throughout the mine tenements.	Ongoing	Environmental Superintendent
4. Restrict access and discourage camping within the mine tenements.	Ongoing	Manager Operations
Planning		
5. Establish fire breaks to protect areas of notable environmental value where existing access or haul roads do not provide sufficient protection, on advice of DEC.	Ongoing	General Manager Operations
Detection		
6. Report to DEC (Kalgoorlie) any fires in or near conservation reserves.	Ongoing	General Manager Operations
Response		
7. All light vehicles will carry a fire extinguisher for extinguishment of vehicle or small fires.	Ongoing	General Manager Operations
8. Maintain a dedicated emergency vehicle with fire fighting capability.	Ongoing	General Manager Operations
9. Extinguish all controllable fires within and adjacent to mine operations.	Ongoing	General Manager Operations
10. Investigate the cause and response to fire incidents.	Ongoing	General Manager Operations
Training		
11. Information on the potential impacts of fires on the environment will be included in the environmental induction delivered to all mine personnel.	Ongoing	Environmental Superintendent
12. Provide training for the emergency response team in fighting fires.	One every two years.	General Manager Operations

5. MONITORING

No monitoring is directly applicable to this EMP. In the event of a fire caused by Cliffs' mine operations, monitoring the recovery of vegetation may be considered on a case-by-case basis.

6. PERFORMANCE INDICATORS

The following performance indicators are applicable to this EMP:

- mine personnel are trained on fire prevention and fire response;
- no fires originate from mine operations; and
- where fires occur, fires are responded to appropriately.

7. RECORDS AND REPORTING

All fires will be investigated as an incident, recorded and, where appropriate, reported to the relevant government authorities as soon as practicable.

8. CONSULTATION

The management actions outlined in this EMP have previously been subject to review by the Environmental Protection Authority (WA), Department of Environment and Conservation (WA), Department of Mines and Petroleum (WA) and the Department of Sustainability, Environment, Water, Population and Communities (C'th).

9. REVIEW

Cliffs will review and update the management actions contained in this EMP from time to time for currency with legislation, standards, guidelines and/or operational requirements. Any changes to this EMP that results in a significant change to environmental outcome will be referred to the relevant regulatory authorities prior to implementation of such changes.

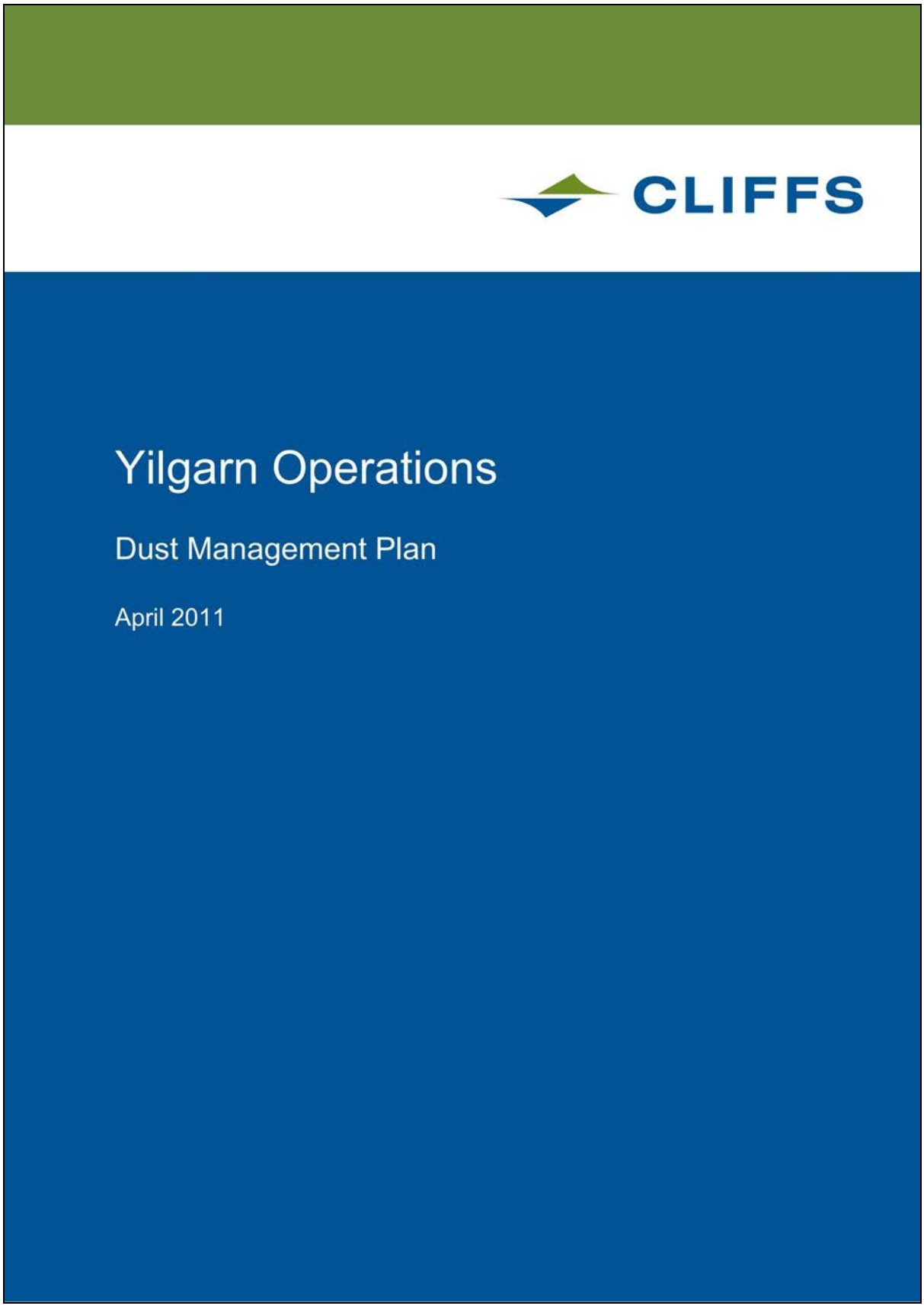
10. SUPPORTING DOCUMENTS

The following documents support this EMP:

- Environmental Operating Procedure EOP03 Fire Management
- Emergency Response Plan

APPENDIX 6

Dust Management Plan (Cliffs 2011d)


CLIFFS
Yilgarn Operations
Dust Management Plan
April 2011

Document History

Revision	Author	Status	Date	Distribution
P	Ecologia	Final	October 2003	Cliffs, DEC, DMP, DoSEWPC
A	G Barrett	Revised Draft	December 2008	Cliffs
B	G Barrett	Revised Draft	February 2009	Cliffs
C	G Barrett	Revised Draft	April 2009	EPA, DMP, DoSEWPC
D	G Barrett	Final	May 2009	Cliffs
E	**S Hawkins**	**Final**	**April 2011**	**EPA, DMP, DoSEWPC**

1. PURPOSE OF THIS PLAN

Cliffs Asia Pacific Iron Ore Pty Ltd's (Cliffs) Yilgarn Operations includes mine operations at the Koolyanobbing Range, Mt Jackson Range, Windarling Range and the Johnston Range, ore processing at Koolyanobbing, and road and rail transport between these operations and the Port of Esperance where the processed ore is exported to international customers. The location of the mine operations is identified in Figure 1.

This management plan is one of a series of plans that outlines how Cliffs manages the environmental aspects of its mine operations. The purpose of this plan is to outline the management actions that Cliffs will implement with regards to the prevention, minimisation and monitoring of dust emissions from Cliffs' mine operations.

2. POLICY AND STANDARDS

Cliffs' mine operations are undertaken in accordance with Cliffs' Environmental Policy. The Environmental Policy outlines Cliffs' overarching objectives for environmental protection and continual improvement in environmental performance.

Cliffs' Environmental Policy is implemented through Cliffs' Environmental Management System (EMS), which is certified and maintained to Australian and New Zealand Standard ISO 14001:2004. Cliffs' EMS includes a range of Environmental Management Plans (EMPs) for key environmental aspects and impacts related to mine operations, which are supported by various Environmental Operating Procedures (EOPs). This EMP forms part of Cliffs' EMS.

Cliffs has obtained various environmental and mining approvals to undertake its mine operations. These approvals have been obtained under various State and Commonwealth legislation, including the *Environmental Protection Act 1986*, *Mining Act 1978* (WA) and the *Environment Protection and Biodiversity Conservation Act 1999* (C'th). Where relevant, this EMP has been prepared to meet the requirements of these approvals.

3. POTENTIAL IMPACTS

Mining is an inherently dust generating activity due to the need for land clearing, blasting, excavation, loading and unloading ore and waste rock. Dust may also subsequently be generated through wind erosion from areas such as cleared land, materials stockpiles, waste rock landforms and mine pits. Dust may also be generated by the crushing and screening of ore.

A desktop study has identified that approximately 65% of dust generated from mine operations arises from the waste rock (loading, hauling, unloading and wind erosion of the waste rock landform). Monitoring of dust from Cliffs' mine pits has identified that dust deposition decreases with increasing distance, with the dust deposition in summer approximately more than double the dust deposition of the wetter months.

Flora has been identified by Cliffs as a sensitive dust receptor. Dust has the potential to settle on flora, which in turn, has the potential to reduce the intensity of light required for plant photosynthesis, influence gaseous exchange required for plant respiration, increase leaf temperature and increate plant transpiration. Accordingly, dust emissions from mine operations should be minimised in order to minimise the potential for impact to adjacent flora.

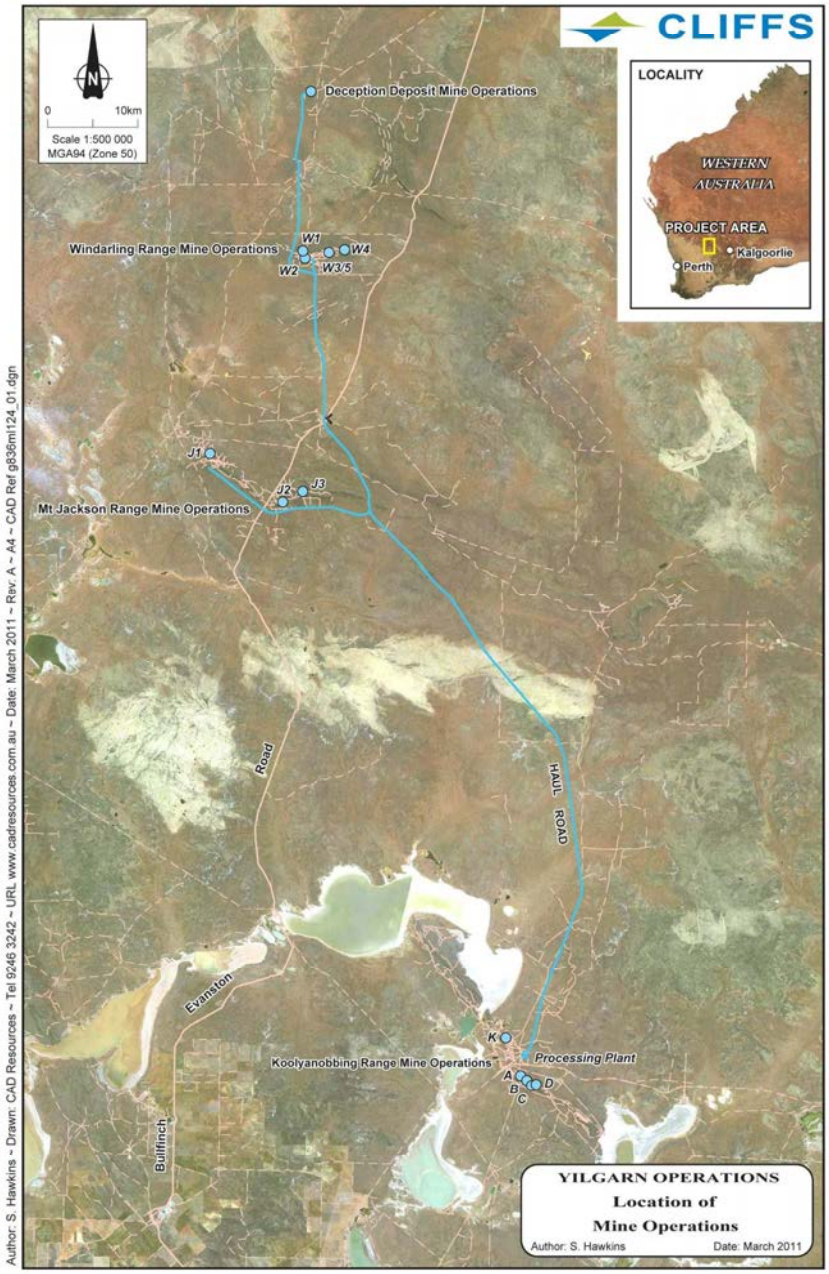


Figure 1. Location of mine operations. The mine operations at the Koolyanobbing Range, Mt Jackson Range, Windarling Range and the Johnston Range (Deception Deposit) are identified.

4. MANAGEMENT ACTIONS

Cliffs will ensure that the following actions are implemented:

Management Actions	Timing	Responsibilities
Minimisation		
1. Undertake land clearing only when necessary to minimise areas that may generate dust through wind erosion.	Ongoing	General Manager Operations
2. Avoid land clearing and handling of topsoil when winds >30km/h.	Ongoing	General Manager Operations
3. Dampen roads and other open areas using water trucks to minimise dust generation.	Ongoing	General Manager Operations
4. Ensure water sprays on the Koolyanobbing Ore Handling Plant are operational and effective.	Ongoing	General Manager Operations
5. Carry out progressive rehabilitation in accordance with EOP12 Rehabilitation to minimise areas that may generate dust through wind erosion.	Ongoing	General Manager Operations Environmental Superintendent
Windarling Range W3/5 Deposit Mine Pit Blasting		
6. Complete ENVF06 W3/5 Blast Planning Checklist prior to any blast at the Windarling Range W3/5 Deposit Mine Pit to assess wind direction and wind speed.	Ongoing	General Manager Operations Environmental Superintendent
7. Do not undertake any blast where the size of the blast, location of the blast (spatial and depth), wind direction and the wind speed are considered likely to result in significant dust deposition to the restricted rare flora species *Tetratheca paynterae* (Areas A and B).	Ongoing	General Manager Operations Environmental Superintendent
Monitoring		
8. Record dust deposition from the dust deposition gauges located adjacent to the Windarling Range W3/5 Deposit Mine Pit.	Monthly	Environmental Superintendent
9. Record data from the Osiris air quality meter located adjacent to the Windarling Range W3/5 Deposit Mine Pit.	Ongoing	Environmental Superintendent
10. Monitor the health condition of rare flora within 100m of active mine operations. Where a decline in condition is identified, compare the condition with Rare Flora distant from mine operations.	Annually	Environmental Superintendent
11. Monitor the health condition of vegetation adjacent to the haul road. Where a decline in condition is identified, compare the condition with vegetation distant from the haul road.	Annually.	Environmental Superintendent
Training		
12. Information on the potential impacts of dust and dust minimisation will be provided in the environmental induction delivered to all mine personnel.	Ongoing	Environmental Superintendent

5. MONITORING

The monitoring frequencies for the dust deposition gauges, Osiris air quality monitor, rare flora and vegetation monitoring are identified above. In the event of significant impacts to rare flora or vegetation being recorded, increased monitoring frequencies may be considered on a case-by-case basis.

6. PERFORMANCE INDICATORS

The following performance indicators are applicable to this EMP:

- mine personnel are trained on potential dust impacts and dust minimisation;
- relative condition of rare flora and vegetation is maintained;
- monitoring is undertaken; and
- blasting checklists are completed.

7. RECORDS AND REPORTING

All monitoring will be recorded and retained. Completed blasting checklists will be retained.

Where a decline in the condition of Rare Flora or vegetation is recorded, where appropriate, the decline will be reported to the relevant government authorities as soon as practicable.

8. CONSULTATION

The management actions outlined in this EMP have previously been subject to review by the Environmental Protection Authority (WA), Department of Environment and Conservation (WA), Department of Mines and Petroleum (WA) and the Department of Sustainability, Environment, Water, Population and Communities (C'th).

9. REVIEW

Cliffs will review and update the management actions contained in this EMP from time to time for currency with legislation, standards, guidelines and/or operational requirements. Any changes to this EMP that results in a significant change to environmental outcome will be referred to the relevant regulatory authorities prior to implementation of such changes.

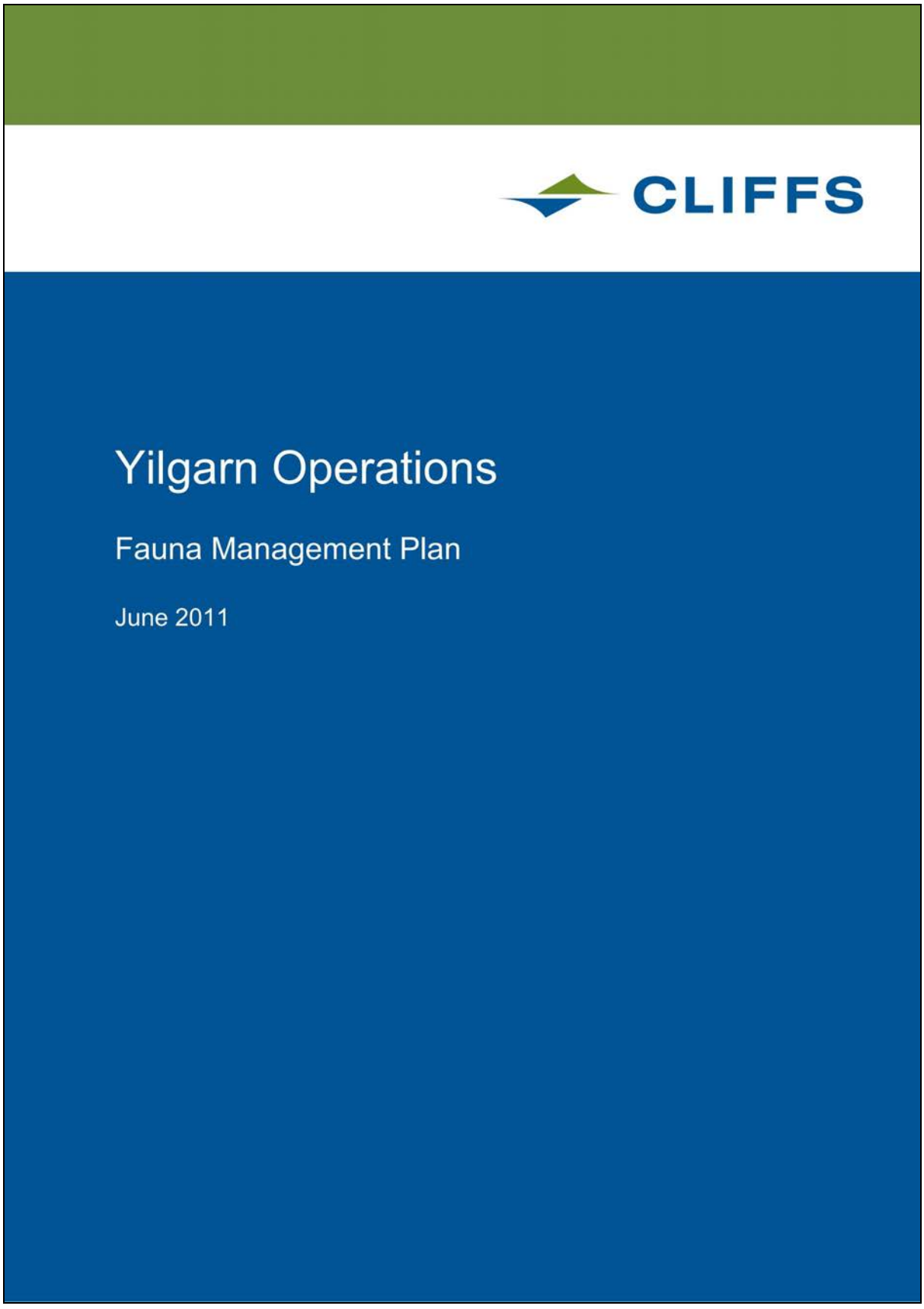
10. SUPPORTING DOCUMENTS

The following documents support this EMP:

- Environmental Operating Procedure EOP05 Dust Management
- Environmental Operating Procedure EOP12 Rehabilitation
- Environmental Form ENVF06 W3/5 Blast Planning Checklist
- Environmental Form ENVF16 W3/5 Water Cart Movement

APPENDIX 7

Fauna Management Plan (Cliffs 2011e)


CLIFFS
Yilgarn Operations
Fauna Management Plan
June 2011

Document History

Revision	Author	Status	Date	Distribution
A	B Huntley	Final	1st June 2011	Cliffs

1. PURPOSE OF THIS PLAN

Cliffs Asia Pacific Iron Ore Pty Ltd's (Cliffs') Yilgarn Operations includes mine operations at the Koolyanobbing Range, Mt Jackson Range, Windarling Range and the Johnston Range, ore processing at Koolyanobbing, and road and rail transport between these operations and the Port of Esperance where the processed ore is exported to international customers. The location of Cliffs' Yilgarn Operations is shown in Figure 1.

This Environmental Management Plan (EMP) is one of a series of plans that outlines how Cliffs manages the environmental aspects of its mine operations. The purpose of this EMP is to minimise the potential impact to native fauna and to assist in reducing the abundance of undesirable introduced fauna.

This EMP addresses vertebrate fauna that may be encountered at Cliffs' Yilgarn Operations. Invertebrate fauna are not addressed in this EMP.

2. POLICY AND STANDARDS

Cliffs' mine operations are undertaken in accordance with Cliffs' Environmental Policy. The Environmental Policy outlines Cliffs' overarching objectives for environmental protection and continual improvement in environmental performance.

Cliffs' Environmental Policy is implemented through Cliffs' Environmental Management System (EMS), which is certified and maintained to Australian and New Zealand Standard ISO 14001:2004. Cliffs' EMS includes a range of EMPs for key environmental aspects and impacts related to mine operations, which are supported by various Environmental Operating Procedures (EOPs). This EMP forms part of Cliffs' EMS.

Cliffs has obtained various environmental and mining approvals to undertake its mine operations. These approvals have been obtained under various State and Commonwealth legislation, including the *Environmental Protection Act 1986* (WA), *Mining Act 1978* (WA), *Wildlife Conservation Act 1950* (WA) and the *Environment Protection and Biodiversity Conservation Act 1999* (C'th). Where relevant, this EMP has been prepared to meet the requirements of these approvals.

3. POTENTIAL IMPACTS

Mining operations may impact fauna indirectly, through the clearing of habitat or directly, such as death or injury from vehicle collisions. Introduced fauna have the potential to be attracted to mine operations, and may subsequently impact native fauna through competition for resources and destruction of habitat. Fauna may also pose safety risks to mine personnel and mine infrastructure. This EMP identifies management actions to minimise the potential for impact to native fauna and to reduce the abundance of undesirable introduced fauna.

Appendix A provides specific additional guidance to safely and humanely manage both native and introduced fauna.

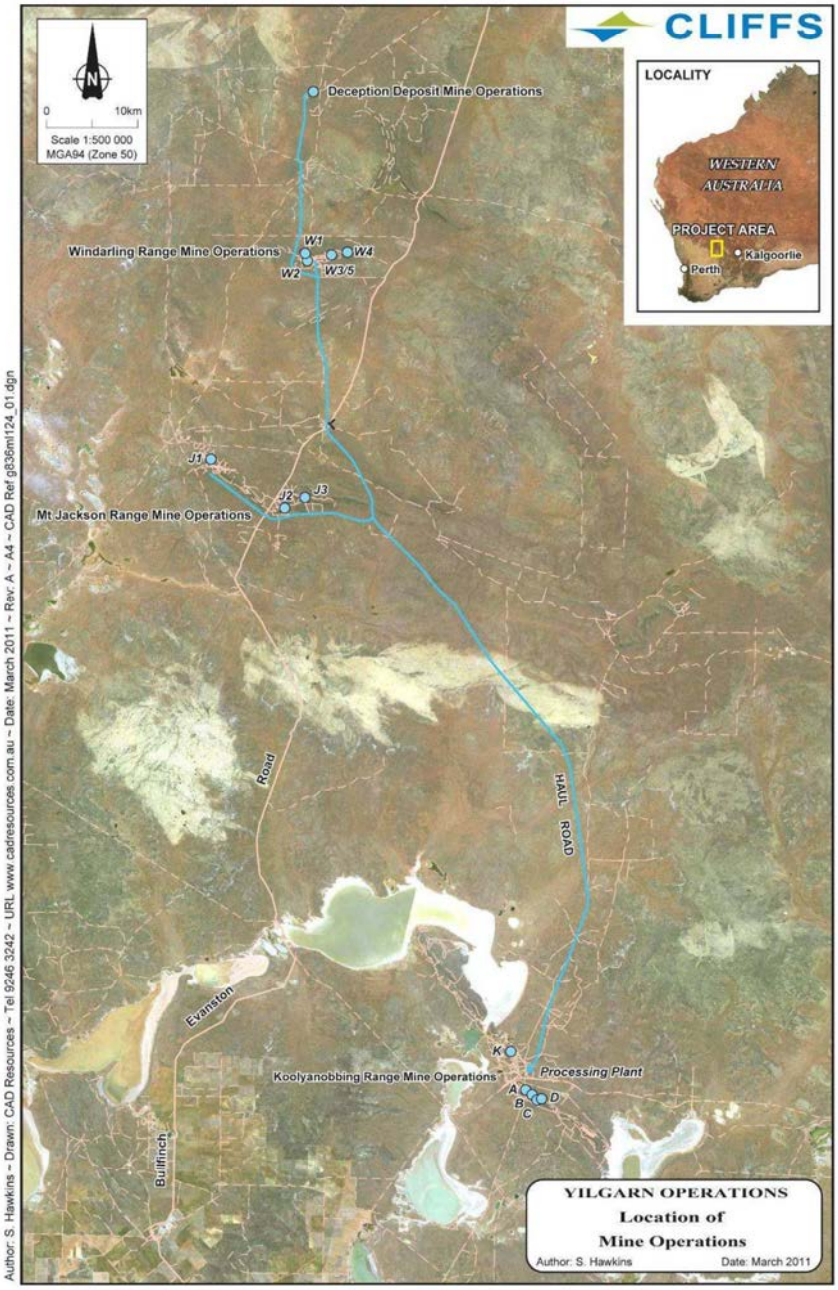


Figure 1. Location of Cliffs' Yilgarn Operations. The mine operations at the Koolyanobbing Range, Mt Jackson Range, Windarling Range and the Johnston Range (Deception Deposit) are identified.

4. MANAGEMENT ACTIONS

Cliffs will ensure that the following actions are implemented:

Management Actions	Timing	Responsibilities
Fauna Control		
1. Interaction with fauna will be discouraged and avoided, where practicable.	At all times	General Manager Operations
2. Housekeeping standards will be maintained to avoid attracting fauna.	At all times	General Manager Operations
3. Feeding of fauna by mine personnel will be prohibited.	At all times	Environmental Superintendent
4. Conduct trapping for introduced fauna should they be observed in the vicinity of the camp, waste disposal facility, or other areas managed by Cliffs.	At all times	Environmental Superintendent
5. Control programs for introduced fauna in the areas surrounding Cliffs' mine operations conducted by Dept of Environment and Conservation (DEC) and Dept of Agriculture and Food to be supported by Cliffs.	Ongoing	Environmental Superintendent
6. Pets and firearms are prohibited within mine operations.	At all times	General Manager Operations
Impact Minimisation		
7. In accordance with the land clearing management, land clearing will only be undertaken when necessary, to minimise impact to fauna habitat.	At all times	General Manager Operations
8. In accordance with EOP12 Rehabilitation, progressive rehabilitation will be undertaken to restore fauna habitat.	Ongoing	General Manager Operations
9. Off-road vehicle use will be prohibited, unless authorised.	At all times	General Manager Operations
10. Speed restrictions will be applied to mine operations to minimise the potential for vehicle collision.	At all times	General Manager Operations
11. Fauna have right of way, unless safety is compromised (e.g. do not serve to avoid a kangaroo whilst driving).	At all times	General Manager Operations
12. Water storage dams will be fenced and have fauna egress matting installed to enable fauna escape.	At all times	General Manager Operations
13. Exploration drill holes will be permanently capped in accordance with Dept of Mines and Petroleum (DMP) guidelines as soon as practicable.	During exploration rehabilitation	General Manager Exploration
14. Appropriate PPE and fauna handling techniques will be employed to avoid injury to mine site personnel, in accordance with Appendix A.	At all times	Environmental Superintendent
15. Only competent personnel to handle and euthanise fauna where applicable, in accordance with Appendix A.	At all times	Environmental Superintendent
Injured Fauna		
16. For injured native fauna, if likely to survive and transport and resources are available, take the injured animal to a care facility in accordance with Appendix A.	As required	Environmental Superintendent

Management Actions	Timing	Responsibilities
17. For injured native fauna, if unlikely to survive or transport and resources are not available, euthanise humanely in accordance with Appendix A.	As required	Environmental Superintendent
18. For injured or trapped introduced fauna (including large livestock), euthanise humanely in accordance with Appendix A.	As required	Environmental Superintendent
19. Dispose of all fauna carcasses appropriately in accordance with Appendix A.	As required	Environmental Superintendent
Training		
20. Provide training to mine personnel on fauna management as part of site induction.	Ongoing	Environmental Superintendent
21. Provide specialised training to select mine personnel on fauna identification, handling and control methods.	Ongoing	Environmental Superintendent
Monitoring		
22. In accordance with ENVF19 Animal Sightings Register, record notable native fauna (e.g. Malleefowl), unusual behaviour (e.g. fauna taking residence), dangerous or introduced fauna observed within mine operations.	Ongoing	Environmental Superintendent
Reporting		
23. Report all incidents involving fauna internally through Cliffs' incident reporting system.	As required	Environmental Superintendent
24. Report the results of introduced fauna control programs to the DEC in the Annual Environmental Report.	Annually	Environmental Superintendent
25. Sightings of conservation significant fauna will be reported to the DEC in the Annual Environmental Report. (refer to Malleefowl Conservation Plan for Malleefowl related reporting requirements)	Annually	Environmental Superintendent
26. Report deaths of conservation significant fauna to the relevant regulatory agency in accordance with Appendix A.	As required	Environmental Superintendent

5. MONITORING

The Animal Sightings Register (ENVF19) will be maintained and used to record any notable native fauna (e.g. conservation significant fauna) unusual behaviour (i.e. fauna taking residence), dangerous or introduced fauna observed at mine operations.

Refer to the Malleefowl Conservation Plan for Malleefowl monitoring requirements.

6. PERFORMANCE INDICATORS

The following performance indicators are applicable to this EMP. How the performance indicator is to be measured is stated in brackets:

- All mine personnel made aware of relevant fauna management actions via the site induction. (Induction records to show all mine personnel have been inducted).
- Relevant mine personnel are trained on fauna identification, handling and control methods (training records to show relevant mine personnel have completed training).

- No new introduced fauna species recorded within mine areas as a consequence of Cliffs' operations (no new species of introduced fauna recorded in Animal Sightings Registers).
- No increase in the abundance and distribution of introduced fauna within mine areas as a consequence of Cliffs' operations (numbers of introduced fauna recorded in Animal Sightings Registers does not increase).
- Control programs supported by Cliffs continue to produce positive results (reports produced by those undertaking the programs demonstrate positive results).

7. RECORDS AND REPORTING

Records will be kept of any notable native fauna (e.g. conservation significant fauna) unusual behaviour (i.e. fauna taking residence), dangerous or introduced fauna observed at mine operations in the ENVF19 Animal Sightings Register.

Incidents, hazards and near misses involving fauna will be reported internally through Cliffs' incident reporting system.

The results of introduced fauna control programs will be reported to the DEC in the Annual Environmental Report.

Fauna deaths of conservation significant fauna will be reported to the relevant regulatory agency in accordance with Appendix A. Refer to Malleefowl Conservation Plan for Malleefowl related reporting requirements.

8. CONSULTATION

The management actions outlined in this EMP and specific additional guidance on fauna management contained in Appendix A were developed in consultation with the specialist fauna consultants at Aprasia Wildlife Pty Ltd.

9. REVIEW

Cliffs will review and update the management actions contained in this EMP every two years in accordance with the EMS; or following changes legislation, standards, guidelines and/or operational requirements, whichever occurs first. Any changes to this EMP that results in a significant change to environmental outcomes will be referred to the relevant regulatory authorities prior to implementation of such changes.

10. SUPPORTING DOCUMENTS

The following documents support this EMP:

- Land Clearing Management Plan
- Malleefowl Conservation Plan
- EOP12 Rehabilitation
- EOP06 Fauna
- ENVF19 Animal Sightings Register

APPENDIX A

Guidance to safely and humanely manage native and introduced fauna within Cliffs Yilgarn Operations

Interaction with fauna by mine personnel is discouraged and should be avoided, where practicable. However, as mine operations are located immediately adjacent to known fauna habitat, encounters with fauna may occur.

Mine operations have the potential to impact fauna in a number of ways, with mine management generally focussing on minimising impacts. There may be occasions when fauna, both native and introduced, will require a more "hands on" approach to management, such as if the fauna is injured, sick, orphaned, trapped or captured.

This appendix has been developed for Cliffs' environmental staff as a guideline for the safe and humane management of both native and introduced fauna that may be encountered at its operations, and has been developed based on the following resource documents:

- Australian Government (2004) *Australian code of practice for the care and use of animals for scientific purposes;*
- Australian Government (2008) *National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes;*
- Department of Agriculture (2004) *Guidelines for the Safe Use of Firearms;*
- Department of Environment and Conservation (2008) *Minimising Disease Risk in Wildlife Management*. Standard operating procedures for fauna translocation, monitoring and euthanasia in the field; and
- New South Wales Department of Primary Industries (2005) *humane animal pest control*. Code of Practice and Standard Operating Procedures.

1 HEALTH AND SAFETY CONSIDERATIONS

1.1 Handling

Many animal species are capable of inflicting injury to humans when handled. Fauna should only be handled when absolutely necessary. Only competent people should attempt to capture/handle fauna to prevent injury to the animal or persons involved. It is imperative that personal safety is maintained when dealing with fauna. The following safety precautions are to be considered:

- Personal Protective Equipment (PPE) (e.g. gloves, safety glasses).
- Approach the animal quietly.
- If possible, work with a team member.
- If approaching large stunned animals (e.g. livestock), always approach the animals from the dorsal (spinal) side to prevent injury from involuntary movement of legs.
- Exercise appropriate manual handling techniques when moving or lifting fauna.

1.2 Disease

Care must be taken when handling live animals or carcasses as they may be carrying diseases (e.g. hydatidosis, sarcoptic mange, Q fever, sparganosis). Minimise the risk of disease by handling animals only when necessary, wearing appropriate PPE and by washing hands thoroughly after handling.

2 NATIVE FAUNA AND LIVESTOCK

2.1 Sick, Injured, Orphaned or Trapped Fauna

All native fauna are protected under the *Wildlife Conservation Act 1950* (WA) and cannot be handled without prior consultation with the appropriate regulatory authority. There may be, however, situations when native fauna are sick, injured, orphaned or trapped. In such cases, the animal's welfare is of highest priority and the following decisions are to be made:

- Native fauna that can be rehabilitated should be sent to a registered carer (see Section 2.5); or
- If the animal is unlikely to survive or adequate transport and resources are not available to care for it, euthanise the animal humanely (see Section 4).

As Cliffs' Yilgarn Operations occur within and/or adjacent to pastoral areas, there is potential to encounter sick, injured, orphaned or trapped livestock. If the livestock is likely to survive with adequate care, the Pastoral Leaseholder should be notified and assistance provided by Cliffs, as necessary. In the event that the livestock is unlikely to survive or adequate transport and resources are not available to care for it, the following actions are to be completed:

- the Environmental Superintendent (or delegate) will arrange for the euthanasia of the livestock (see Section 4);
- where the incident occurs on an active pastoral lease, the Pastoral Leaseholder will be notified by telephone or in person; and
- the livestock carcass will be relocated from the road or mine area (see Section 4.3).

2.2 Capture

Animal welfare, conservation status and personal safety are the key factors in determining if sick or injured fauna are to be captured, taken to a carer or released. Capture or handling should be undertaken:

- by competent people, to prevent injury to the animal or persons involved;
- using appropriate PPE, as stressed animals may cause personal injury by biting, scratching, kicking, etc;
- in a quiet location away from excessive noise and distraction; and
- with holding areas and containers that are safe, quiet and hygienic (see Section 2.3).

2.3 Containment

Care must be taken when containing fauna, as the animal may be distressed and difficult to handle. Capture and restraint must be conducted with minimal stress to the animal. In the event that the animals must be restrained for a period of time, the containment device must:

- allow animals to rest comfortably. It should be safe, quite, dark and hygienic;
- be covered with a hessian bag or blanket to reduce stress on the animal and exposure to the elements;
- small to medium sized animals, including birds, should be firmly wrapped in a towel, clean rag, jacket or similar
- be adequately ventilated;
- minimise the chance of escape;
- contain a secondary hide if appropriate for the species; and
- be placed in a quiet position where exposure to heat and cold is minimised.

If it is necessary to keep the injured animal for a period of time (i.e. for observation or longer transport distance) it should be placed in a box in a quiet location and not be exposed to extremes of temperature. A small shallow dish of water can be provided.

2.4 Transport

Undue stress may be caused to fauna requiring transport. To reduce stress, the following is to be considered:

- Use of suitable transportation containers.
- Limit the exposure of animals to extremes of temperature, noise, vibration and visual disturbance.
- Do not try to give the animal food or water while it is being transported.
- Separate fauna to avoid incompatibility of species, sex, size, age and reproductive status.

2.5 Wildlife Carers (Rehabilitation)

If an animal is to be transported to a wildlife carer, contact the wildlife carer prior to transportation. Details of available wildlife carers can be obtained by phoning the DEC Merredin Office (9041 2488) or Kalgoorlie Office (9080 5555).

In the event that conservation significant fauna require transportation, the Regional Wildlife Officer at DEC Merredin Office (9041 2488) or Kalgoorlie Office (9080 5555) should be contacted.

2.6 Release

Once an animal is deemed "fit to be released" by the wildlife carer, the following will need to be ensured:

- The time for which an animal is held must be kept to a minimum.
- Be aware that animals can be stressed and may be agitated when released. Animals must be held in a way that minimises stress.
- Animals must be released at point of capture, or as close as possible.
- Where practicable, the time of release must correspond to the usual active time of the species.
- Steps must be taken to minimise the chance of injury or predation at time of release.

2.7 Snakes and Goannas

Snakes and goannas may be occasional visitors to Cliffs' Yilgarn Operations. Low housekeeping standards may result in an increase in mice which is a common food source for snakes.

Steps taken to reduce mice numbers (and therefore reduce the occurrence of snakes) include:

- maintaining mine operations free of rubbish, particularly food scraps;
- prohibiting feeding of fauna;
- tidying up loose material, such as corrugated iron and flat boards that provide shelter for mice to breed; and
- trap mice in crib rooms and offices at the first signs of their appearance (see section 3.2.1).

In the event that a snake is encountered:

- leave it alone and monitor its movement. Most snakes will simply move through the area and will not pose any risk if not disturbed;
- if in a building, open the door and allow the snake to leave on its own accord and monitor carefully;
- report the snake sighting to Cliffs' environmental staff; and
- complete ENVF19 Animal Sightings Register. This will help establish if the animal has taken up residence.

If a snake represents a hazard, the hazard safety procedures are to be followed.

Most snake bites occur when people try to catch or kill snakes. With any snake encounter, the first step is to allow the animal to remove itself, with capture being the last option. Captured snakes can be stressed and may be agitated when released. If capture and relocation is required, the following steps must be taken:

- Snakes are only to be captured by qualified snake handlers as per the list displayed on the site notice boards.
- The correct tools must be used (e.g. jigger).
- The snake must not be free handled.
- The snake must be suitably contained for transport to a release site away from mine operations and mine accommodation.

Goannas also commonly found around sites. Although generally avoiding human contact, goannas may become people tolerant and reside within the mine areas when fed by employees and/or when housekeeping standards are low. Feeding of wildlife is strictly forbidden. Feeding may cause health related problems for the goanna and could also result in increasing the potential for attacks or bites.

3 INTRODUCED FAUNA

3.1 Sick, Injured, Orphaned or Trapped Fauna

If sick, injured, orphaned or trapped introduced fauna are encountered, they should be humanely euthanised by Cliffs' Environmental Superintendent or delegate, as outlined in Section 4.

3.2 Trapping

If fauna including mice, cats and foxes are encountered on site, consideration should be given to trapping in and around mine operations (specifically, accommodation and waste management areas) to reduce their numbers. The method for trapping of each species is outlined below.

3.2.1 House Mouse (*Mus musculus*)

Mice can reproduce rapidly and accumulate large numbers in a short period of time, particularly if housekeeping practices are poor. Mice can easily be controlled by trapping, the most common and simplest being the standard "break back trap". These traps are baited and rely on a spring trigger mechanism and will generally kill the mouse very quickly. The use of "break back traps" should involve:

- only using them when mice have been identified by Cliffs environmental staff (to ensure that it is not a native mouse);
- restricting their use to the inside of building such as dongas and crib rooms;
- be placed off the ground where possible;
- clearing the traps twice a day; and
- disposing of the carcasses correctly (Section 4.3).

Poisons are only to be used as a last resort as they may impact native species through direct ingestion or via secondary poisoning from eating animals that have consumed the poison. If poisons are to be used, the active ingredient must not accumulate up the food chain; and its use restricted to inside of buildings to avoid direct ingestion from native fauna. A common product that fits this category is Racumin® which contains the active ingredient Coumatetralyl.

3.2.2 Cats (*Felis catus*) and Foxes (*Vulpes vulpes*)

Cats and foxes are scavenging, predatory animals. Trapping using cage traps is the most appropriate control option for cats and foxes. Cage traps allow non-target species to be released unharmed and do not induce the injuries often associated with jaw-traps. Cats and foxes that are trapped must be euthanised in accordance with Section 4.

When trapping for cats and foxes, the following is to be considered:

- Traps set near where cat and foxes have been sighted, but out of view of minesite personnel.
- Reduce access to food scraps prior to setting traps, since it may be difficult to entice cats into a cage if other food sources are available.
- Cats/foxes are likely to be distressed once confined in a trap and they should be removed as soon as possible.
- In mild weather, check traps daily. In hot conditions, check traps early in the morning, then close during the day and re-open in the evening to reduce the chances of animals dying as a result of heat stress.
- Where practicable, set traps amongst vegetation and cover with a hessian bag to reduce exposure.
- Approach captured animals quietly to avoid stress.
- Captured cats/foxes must be euthanised as quickly and humanely as possible.
- If transporting trapped animals away from the site to euthanase, the cage is to be covered with a hessian bag or blanket to reduce stress on the animal and reduce exposure to the elements.
- If lactating females are captured, reasonable efforts are to be made near the trap site to find the kittens/pups (e.g. in hollow logs or amongst boulders) and euthanise them humanely.

Cage traps with dimensions of approximately 740 x 310 x 310mm for cats and 900 x 450 x 450mm for foxes (or similar) are recommended. Treadle operated traps are to be used if available, as hook mechanism traps may cause injury to trapped animals. Traps can be baited with a variety of products; cats are particularly attracted to fish meats and tuna oil.

3.2.3 Feral Goats (*Capra hircus*), Dogs/Dingoes (*Canis lupus*) and Rabbits (*Oryctolagus cuniculus*)

Prior to control of goats and dogs/dingoes, Cliffs' environmental staff will discuss management options with the DEC. Prior to control of rabbits, Cliffs' environmental staff will discuss management options with the Department of Agriculture and Food.

4 EUTHANASIA

The decision to euthanise native fauna and livestock must be based on the degree of suffering, severity of injury and chance of recovery (Section 2.1). All introduced fauna (either captured or injured) will be humanely euthanised as soon as possible. Suitable methods for euthanasia are presented in Table 4.1.

When euthanising an animal humane procedures should be followed. When conducting the act, it should be:

- reliable, avoiding pain or distress to the fauna;
- result in rapid loss of consciousness and death of the fauna;
- require minimum restraint of the fauna;
- avoid excitement of the fauna;
- cause minimal psychological stress to the fauna;
- where practicable, be undertaken in a quiet place away from other animals, as distress signals may cause undue stress to other fauna in close proximity;
- easily and safely conducted, causing minimal emotional stress to the person undertaking the euthanasia; and
- only carried out by Cliffs' Environmental Superintendent (or nominated delegate).

The fauna is to be confirmed dead before disposal, by confirming either:

- absence of breathing;
- absence of heartbeat; or
- no corneal reflex or response from the eyelid when stimulated.

Euthanising animals should only be attempted by the Environmental Superintendent or a nominated delegate; provided they are comfortable in carrying out the task. Various methods can be used and if performed correctly, it will result in a quick death; however if Cliffs personnel are performing the task, blunt trauma is the preferred option.

4.1 Blunt Trauma

Blunt trauma involves a hard, swift blow to the base of the skull with a blunt metal or heavy wooden bar. Blunt trauma is recommended for reptiles, amphibians and small to medium sized mammals (Table 4.1). The operator must be aware that blunt trauma may only result in the stunning of the animal if not performed effectively.

Table 4.1 Recommended technique for the humane euthanasia of animals, adapted from DEC (2008).

Blunt Trauma Recommended	Blunt Trauma Not Recommended
• Kangaroo • Wallabies • Small Mammals • Birds • Snakes • Lizards • Amphibians • Dingoes/Dogs • Rabbits • Foxes • Cats	• Cattle • Camel • Donkey • Goats

4.2 Shooting

Firearms are not permitted on Cliffs' Yilgarn Operations due to restrictions imposed on Cliffs by the Department of Mines and Petroleum (DMP) through its tenement conditions under the *Mining Act 1978* (WA). Shooting is the preferred method of euthanasia for large animals, such as livestock (Table 4.1). The Shire of Yilgarn Duty Ranger can be contacted via the Shire of Yilgarn office on 9049 1001 to undertake shooting.

4.3 Carcass Disposal

Fauna carcases may be disposed by relocation, burial or transfer to landfill. In particular, carcasses should be relocated away from haul roads to minimise the risk of fauna visiting the carcass and being susceptible to road collision. Cliffs' Environmental Superintendent will nominate an area for carcass disposal, with the site being located:

- away from working and residential areas;
- away from any major haulage routes (at least 1km where practicable, or as far as possible); and
- away from water courses.

In the event of a DEC-classified 'Schedule' or 'Priority' fauna species being killed, the carcass should be offered to the WA Museum, and if accepted, stored and supplied in the manner specified by the WA Museum.

In the event of Malleefowl *Leipoa ocellata* being killed, the university is to be contacted and the carcass is to be offered for scientific research to the University of Melbourne in the following manner:

- Information as to the date, location (preferably with GPS coordinates), collectors name and contact details, and approximate age of animal;
- a small amount (approx 2cm x 2cm) of muscle or other tissue stored in 70% Ethanol in a screw top container, obtained using a genetic sample collection pack (from either Windarling or Koolyanobbing) and examination gloves to avoid potential contamination;
- feathers (especially tail or wing) in paper envelope; and
- supplied to Ms Taneal Cope, Department of Zoology, University of Melbourne, Melbourne VICTORIA 3010 (Email: t.cope@student.unimelb.edu.au or Phone: 0402 838 480; Alternate contact: Assoc. Professor Raoul Mulder (03) 83446245).

The remainder of the Malleefowl *Leipoa ocellata* carcass should be offered to the WA Museum, and if accepted, stored and supplied in the manner specified by the WA Museum.

5 REPORTING

All incidents involving fauna will be reported internally through Cliffs' incident reporting system.

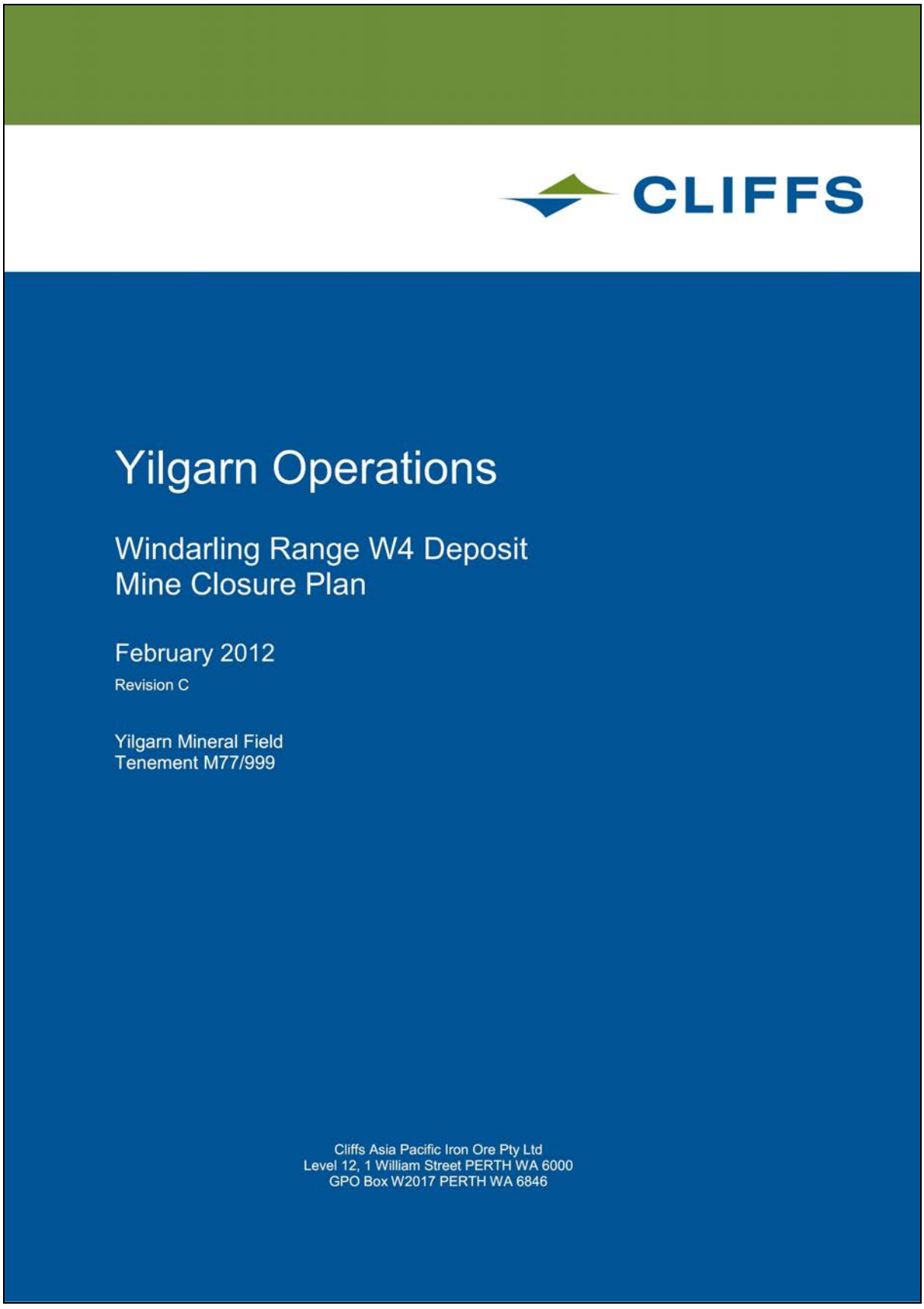
The results of introduced fauna control programs will be reported to the DMP in the Annual Environmental Report.

Deaths of Malleefowl *Leipoa* ocellata, which is classified as Specially Protected Fauna under the *Wildlife Conservation Act 1950* (WA) and Threatened Fauna under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) should be reported to the DEC and the Commonwealth Department of Sustainability, Environment, Water, Population and Communities annually.

Deaths of Specially Protected Fauna under the *Wildlife Conservation Act 1950* (WA) and DEC-classified 'priority' fauna should be reported to the Department of Environment and Conservation annually.

APPENDIX 8

Mine Closure Plan (Cliffs 2012a)


CLIFFS
Yilgarn Operations
Windarling Range W4 Deposit
Mine Closure Plan
February 2012
Revision C
Yilgarn Mineral Field
Tenement M77/999
Cliffs Asia Pacific Iron Ore Pty Ltd
Level 12, 1 William Street PERTH WA 6000
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Acknowledgement

This document has been prepared for Cliffs Asia Pacific Iron Ore Pty Ltd by Globe Environments Australia Pty Ltd. The assistance and contributions of staff from Cliffs Asia Pacific Iron Ore Pty Ltd is acknowledged and appreciated.

Globe Environments Australia Pty Ltd
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DMP MINE CLOSURE PLAN CHECKLIST

The following checklist has been provided in accordance with DMP and EPA (2011).

Table 1. Mine Closure Plan Checklist.

No	Mine Closure Plan Checklist	Yes, No, N/A	Page(s)	Comment
1	Has the Checklist been endorsed by a senior representative within the tenement holder/operating company?	Yes	5	-
2	How many copies were submitted to DMP?	Hard copies =	2	
		Electronic =	2 (compact disc with hard copies)	
Cover Page, Table of Contents				
3	Does the cover page include: a) Project Title b) Company Name c) Contact Details d) Document ID and version number e) Date of submission	Yes	1	-
4	Has a Table of Contents been provided?	Yes	6-8	-
Scope and Project Summary				
5	Why is the MCP submitted? (as part of a Mining Proposal or a reviewed MCP or to fulfil other legal requirements)	Yes	9-10	Section 1
6	Does the project summary include: a) Land ownership details; b) Location of the project; c) Comprehensive site plan(s); d) Background information on the history and status of the project.	Yes	11-20	Section 2
Legal Obligations and Commitments				
7	Has a consolidated summary or register of closure obligations and commitments been included?	Yes	21-22	Section 3
Data Collection and Analysis				
8	Has information relevant to mine closure been collected for each management unit or feature (including pre-mining baseline studies, environmental and other data)?	Yes	23-25	Section 4
9	Has a gap analysis been conducted to determine if further information is required in relation to closure of each management unit or feature?	Yes	23-25	Section 4
Stakeholder Consultation				
10	Have all stakeholders involved in closure been identified?	Yes	26-28	Section 5
11	Has a summary or register of stakeholder consultation been provided, with details as to who has been consulted and the outcomes?	N/A	26-28	Section 5
Final Land Use(s) and Closure Objectives				
12	Does the MCP include agreed post-mining land uses(s), closure objectives and conceptual landform design diagram?	Yes	11-20 29	Section 2 Section 6

No	Mine Closure Plan Checklist	Yes, No, N/A	Page(s)	Comment
13	Does the MCP identify all potential (or pre-existing) environmental legacies, which may restrict the post closure plan use (including contaminated sites)?	Yes	29	Section 6
Identification and Management of Closure Issues				
14	Does the MCP identify all potential issues impacting mine closure objectives and outcomes?	Yes	30-33	Section 7
15	Does the MCP include proposed management or mitigation options to deal with these issues?	Yes	30-33	Section 7
16	Have the process, methodology and rationale been provided to justify identification and management of the issues?	Yes	30-33	Section 7
Closure Criteria				
17	Does the MCP include a set of specific closure criteria and/or closure performance indicators?	Yes	34-36	Section 8
Closure Financial Provision				
18	Does the MCP include costing methodology, assumptions and financial provision to resource closure implementation and monitoring?	Yes	37	Section 9
19	Does the MCP include a process for regular review of the financial provision?	Yes	37	Section 9
Closure Implementation				
20	Does the reviewed MCP include a summary of closure implementation strategies and activities for the proposed operations or for the whole site?	Yes	38-42	Section 10
21	Does the MCP include a closure work program for each management unit or feature?	Yes	38-42	Section 10
22	Have site layout plans been provided to clearly show each type of disturbance?	Yes	11-20	Section 2
23	Does the MCP contain a schedule of research and trial activities?	Yes	38-42	Section 10 (initial rehabilitation works as research/trials)
24	Does the MCP contain a schedule of progressive rehabilitation activities?	Yes	38-42	Section 10
25	Does the MCP include details of how unexpected closure (including care and maintenance) will be handled?	Yes	38-42	Section 10
26	Does the MCP contain a schedule of decommissioning activities?	Yes	38-42	Section 10
27	Does the MCP contain a schedule of closure performance monitoring and maintenance activities?	Yes	43-44	Section 11
Closure Monitoring and Maintenance				
28	Does the MCP contain a framework, including methodology, quality control and remedial strategy for closure performance monitoring including post-closure monitoring and maintenance?	Yes	43-44	Section 11

No	Mine Closure Plan Checklist	Yes, No, N/A	Page(s)	Comment
Closure Information and Data Management				
29	Does the mine closure plan contain a description of management strategies, including systems and processes, for the retention of mine records?	Yes	45	Section 12
30	Confidentiality	Yes	37	Section 9

Corporate Endorsement

I hereby certify that, to the best of my knowledge and belief, the information within the Mine Closure Plan and checklist is true and correct, and addresses the requirements of the Guidelines for Preparing Mine Closure Plans approved by the Director General of the Department of Mines and Petroleum.

Signed: 

Name: Dr Rob Howard

Position: Principal Environmental Advisor
Cliffs Asia Pacific Iron Ore Pty Ltd

Date: 10th February 2012

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1. SCOPE AND PURPOSE

1.1 YILGARN OPERATIONS

Cliffs Asia Pacific Iron Ore Pty Ltd's (Cliffs) Yilgarn Operations includes mine operations and mineral exploration at the Koolyanobbing Range, Mt Jackson Range and Windarling Range, ore processing at Koolyanobbing, and road and rail transport between these operations and the Port of Esperance where the processed ore is exported to international customers.

This plan is one of a series of plans that outlines how Cliffs manages the environmental aspects of its Yilgarn Operations. The purpose of this plan is to outline the management actions that Cliffs will implement with regards to mine closure of the Windarling Range W4 Deposit infrastructure.

1.2 MINE CLOSURE PLAN

This Mine Closure Plan incorporates the following infrastructures for the Windarling Range W4 Deposit:

- Windarling Range W4 West Deposit Mine Pit;
- Windarling Range W4 East Deposit Mine Pit;
- Windarling Range W4 West Deposit Waste Rock Landform; and
- Windarling Range W4 Deposit Haul Road.

The above components are collectively described as the Windarling Range W4 Deposit infrastructure in this Mine Closure Plan.

The overarching purpose of this Mine Closure Plan is to outline the framework by which mine closure of the Windarling Range W4 East Deposit infrastructure will occur, in order to achieve rehabilitated post-mining landforms that are physically safe, geo-technically stable, geochemically non-polluting and consistent with the surrounding environment to enable a post-mining land use.

This Mine Closure Plan has been prepared consistent with the document *Guidelines for Preparing Mine Closure Plans* (DMP & EPA 2011) and the document *Strategic Framework for Mine Closure* (ANZMEC & MCA 2000). This Mine Closure Plan has been prepared for the purpose of supporting assessment and approval of the proposed Windarling Range W4 East Deposit proposal by the Department of Mines and Petroleum (DMP) under the *Mining Act 1978* (WA), and assessment by the Environmental Protection Authority (EPA) to support approval by the Minister for Environment under the *Environmental Protection Act 1986* (WA).

To note, Cliffs is currently preparing a Mine Closure Plan for its entire Windarling Range mine operations consistent with ANZMEC & MCA (2000) and DMP and EPA (2011). The Windarling Range Mine Closure Plan is scheduled to be completed by April 2012. The Windarling Range Mine Closure Plan will address mine closure for the components of Cliffs' Windarling Range mine operations that are not addressed in the Windarling Range W4 Deposit Mine Closure Plan (i.e. other waste rock landforms, other mine pits, stockpile areas, haul roads, camp, etc).

1.3 POLICY AND STANDARDS

Cliffs' Yilgarn Operations are undertaken in accordance with Cliffs' Environmental Policy (Cliffs Natural Resources 2008). The Environmental Policy outlines Cliffs' overarching objectives for environmental protection and continual improvement in environmental performance. Cliffs' Environmental Policy is implemented through Cliffs' Environmental Management System (EMS), which is certified and maintained to Australian and New Zealand Standard ISO 14001:2004 (NCSI 2011). Cliffs' EMS includes a

range of plans for key environmental aspects and impacts related to mine operations, which are supported by operational procedures. This Mine Closure Plan forms part of Cliffs' EMS.

1.4 REVIEW

This Mine Closure Plan is intended to be an adaptive framework that is subject to changes during mine operations and mine closure. Mine closure is a complex process that starts at initial mine planning stages and evolves with improved knowledge as mining and initial closure progress.

Cliffs will review and amend the contents of this Mine Closure Plan from time to time for currency with legislation, standards, guidelines, technical knowledge and/or operational requirements. Any amendment to the content of this Mine Closure Plan arising from such review that results in a significant change to the outcomes will be referred to the relevant regulatory agencies prior to implementation of such amendments.

In accordance with s84AA of the *Mining Act 1978* (WA), Cliffs will review and update the contents of this Mine Closure Plan not less than every 3 years, with the updated Mine Closure Plan submitted for subsequent review by DMP.

2. PROJECT OVERVIEW

2.1 CLIFFS ASIA PACIFIC IRON ORE PTY LTD

The operator of the Windarling Range W4 Deposit infrastructure is:

Cliffs Asia Pacific Iron Ore Pty Ltd (Cliffs) (ACN 001 892 995)
Level 12, The Quadrant
1 William Street
PERTH WA 6000

GPO Box W2017
PERTH WA 6846

Telephone: (08) 9426 3333
Fax: (08) 9426 3390
Website: www.CliffsNaturalResources.com

Cliffs' contacts for the Windarling Range W4 Deposit infrastructure are:

Project Enquiries -
Mr Stuart A. Hawkins
Director / Consulting Scientist
Globe Environments Australia Pty Ltd
Telephone: 0400 455 554
Email 1: Stuart.Hawkins@CliffsNR.com
Email 2: Stuart.Hawkins@GlobeEnvironments.com.au

Corporate Enquiries -
Dr Rob Howard
Principal Environmental Advisor
Cliffs Asia Pacific Iron Ore Pty Ltd
Telephone: 9426 3393
Email: Rob.Howard@CliffsNR.com

2.2 TENEMENTS

The Windarling Range W4 Deposit infrastructure is located within Tenement M77/999 granted to Cliffs under the *Mining Act 1978* (WA) (DMP 2011).

2.3 INFRASTRUCTURE

This Mine Closure Plan incorporates the following infrastructures for the Windarling Range W4 Deposit:

- Windarling Range W4 West Deposit Mine Pit;
- Windarling Range W4 East Deposit Mine Pit;
- Windarling Range W4 West Deposit Waste Rock Landform; and
- Windarling Range W4 Deposit Haul Road.

The above components are collectively described as the Windarling Range W4 Deposit infrastructure in this Mine Closure Plan. Consistent with DMP & EPA (2011), each infrastructure component is regarded as a separate Mine Closure Management Unit for the purpose of this Mine Closure Plan.

Following the completion of mining of the Windarling Range W4 West Deposit Mine Pit, the Windarling Range W4 West Deposit Waste Rock Landform is proposed to be constructed within this same area using waste rock excavated from the adjacent Windarling Range W4 East Deposit Mine Pit. As such, this Mine Closure Plan identifies mine closure objectives, aspects, completion criteria and monitoring only for the Windarling Range W4 West Deposit Waste Rock Landform as the final structure to remain at mine closure.

A description of the components of the Windarling Range W4 Deposit infrastructure is provided below.

2.3.1 Windarling Range W4 West Deposit Mine Pit

The Windarling Range W4 West Deposit Mine Pit occupies an area of 9.6ha and will yield an estimated 0.5Mt of iron ore. Development of the Windarling Range W4 West Deposit Mine Pit is currently scheduled to commence from 2012, and have a productive mining-life of 2 years, to 2013. Mining will be undertaken by the standard open-cut mining methods of blasting and excavation to an elevation of approximately 425mAHD. Waste rock excavated from the Windarling Range W4 West Deposit Mine Pit will be disposed of to the Windarling Range W3/5 Deposit Waste Rock Landform, located approximately 1km to the west of the Windarling Range W4 West Deposit Mine Pit.

The Windarling Range W4 West Deposit Mine Pit area incorporates the area required for the temporary stockpiling of vegetation and topsoil and subsoil cleared from the Windarling Range W4 East Deposit Mine Pit area, prior to its later use in land rehabilitation, as well as the area required for a post-mining abandonment bund installation around the crest of the Windarling Range W4 West Deposit Mine Pit in accordance with DMP (1997).

Subject to approval of the Windarling Range W4 East Deposit Mine Pit, the Windarling Range W4 West Deposit Mine Pit will be backfilled with waste rock from the Windarling Range W4 East Deposit Mine Pit to the extent that a new Windarling Range W4 West Deposit Waste Rock Landform will be formed over the area of the Windarling Range W4 West Deposit Mine Pit.

As the Windarling Range W4 West Deposit Mine Pit is proposed to be backfilled with waste rock from the Windarling Range W4 East Deposit Mine Pit to form the Windarling Range W4 West Deposit Waste Rock Landform, this Mine Closure Plan does not identify mine closure objectives, aspects, completion criteria or monitoring for the Windarling Range W4 West Deposit Mine Pit.

2.3.2 Windarling Range W4 East Deposit Mine Pit

The Windarling Range W4 East Deposit Mine Pit occupies an area of 25.9ha and will yield an estimated 6.5Mt of iron ore. Development of the Windarling Range W4 East Deposit Mine Pit is currently scheduled to commence from 2013, and have a productive mining-life of 5 years, to 2017. Mining will be undertaken by the standard open-cut mining methods of blasting and excavation to an elevation of approximately 415mAHD. Waste rock excavated from the Windarling Range W4 West Deposit Mine Pit will be disposed of to a combination of the Windarling Range W3/5 Deposit Waste Rock Landform, and by backfilling the Windarling Range W4 West Deposit Mine Pit from 2014 following the completion of its mining in 2013.

The Windarling Range W4 East Deposit Mine Pit area incorporates the area required for the temporary stockpiling of vegetation and topsoil and subsoil cleared from the Windarling Range W4 East Deposit Mine Pit area, prior to its later use in land rehabilitation, as well as the area required for a post-mining abandonment bund installation around the crest of the Windarling Range W4 East Deposit Mine Pit in accordance with DMP (1997).

At mine closure, the Windarling Range W4 East Deposit Mine Pit will be left as an unrehabilitated open void.

2.3.3 Windarling Range W4 West Deposit Waste Rock Landform

As identified above, the Windarling Range W4 West Deposit Mine Pit will be backfilled with waste rock excavated from the Windarling Range W4 East Deposit Mine Pit to form the Windarling Range W4 West Deposit Waste Rock Landform.

The Windarling Range W4 West Deposit Waste Rock Landform will be constructed within a 9.6ha area, being located within the footprint of the Windarling Range W4 West Deposit Mine Pit, but outside of the area of potential instability for the Windarling Range W4 East Deposit Mine Pit, as calculated in accordance with DMP (1997).

The Windarling Range W4 West Deposit Waste Rock Landform will be constructed to an elevation of nominally 500mAHD (approximately 20m above ground level). The size and elevation of the Windarling Range W4 West Deposit Waste Rock Landform is based on 10m lifts having a 15° slope, and 5m berms having a 5° backslope. This design for the Windarling Range W4 West Deposit Waste Rock Landform conceptually meets a 1:100 year Annual Recurrence Interval (ARI) for rainfall, noting that placement of suitable face rock material and revegetation will be necessary to achieve this.

Geochemical characterisation has identified that the waste rock from the Windarling Range W4 East Deposit Mine Pit, which will be used to construct the Windarling Range W4 West Deposit Waste Rock Landform, is non-acid-forming, non-saline and has a low risk of metaliferous drainage.

At mine closure, the Windarling Range W4 West Deposit Waste Rock Landform will be rehabilitated with native vegetation, and will include an outer cover of topsoil and subsoil to provide a suitable growth media for rehabilitation growth.

2.3.4 Windarling Range W4 Deposit Haul Road

The Windarling Range W4 Deposit Haul Road connects the Windarling Range W4 East Deposit Mine Pit and the Windarling Range W4 West Deposit Mine Pit/Windarling Range W4 West Deposit Waste Rock Landform to Cliffs' other Windarling Range mine infrastructure. The Windarling Range W4 Deposit Haul Road occupies an area of 2.0ha.

The Windarling Range W4 Deposit Haul Road meets an engineering design catering for a 1:10 year ARI for rainfall, which is consistent with the engineering design of Cliffs' existing haul road network. Drainage for the Windarling Range W4 Deposit Haul Road is controlled using a combination of table drains, sumps and earthen bunding (as required) to manage road drainage and allow for the drainage water to infiltrate and/or evaporate.

At mine closure, the Windarling Range W4 Deposit Haul Road will be removed, with this area rehabilitated with native vegetation.

2.3.5 Excluded Infrastructure

Cliffs' Windarling Range mine operations includes mine pits, waste rock landforms, stockpiles, administration and workshop facilities, water and wastewater treatment facilities, water dams, power generation facilities, waste management facilities, an airstrip and a mine camp. These other infrastructures do not form part of the Windarling Range W4 Deposit infrastructure (as defined above), and accordingly, are not addressed in this Mine Closure Plan for the Windarling Range W4 Deposit infrastructure. Mine closure for this other infrastructure will be addressed in a separate Mine Closure Plan for Cliffs' Windarling Range mine operations, which is scheduled to be completed by April 2012.

2.4 FIGURES

Figure 2-1 identifies the regional location of Cliffs' Yilgarn Operations. The regional location of the Windarling Range W4 Deposit infrastructure is identified in yellow. The regional location of Cliffs other mine infrastructures are identified in blue.

Figure 2-2 identifies the location of the Windarling Range W4 Deposit infrastructures at the Windarling Range mine operations. The Windarling Range W4 Deposit infrastructure is identified in yellow. Cliffs' other mine infrastructures at the Windarling Range are also visible.

Figure 2-3 identifies the location of the Windarling Range W4 Deposit infrastructures. For image clarity, the Windarling Range W4 West Deposit Mine Pit is not shown as it coincides with the same area of the Windarling Range W4 West Deposit Waste Rock Landform.

Figure 2-4 identifies a conceptual impression of the Windarling Range W4 Deposit infrastructure post-mining.

Figure 2-5 identifies a conceptual cross-section of the Windarling Range W4 West Deposit Waste Rock Landform.

Figure 2-6 identifies a conceptual flow-chart for development and mine closure of the Windarling Range W4 Deposit infrastructure. Figure 2-6 is provided to assist in understanding the mine development processes for the Windarling Range W4 Deposit infrastructure.

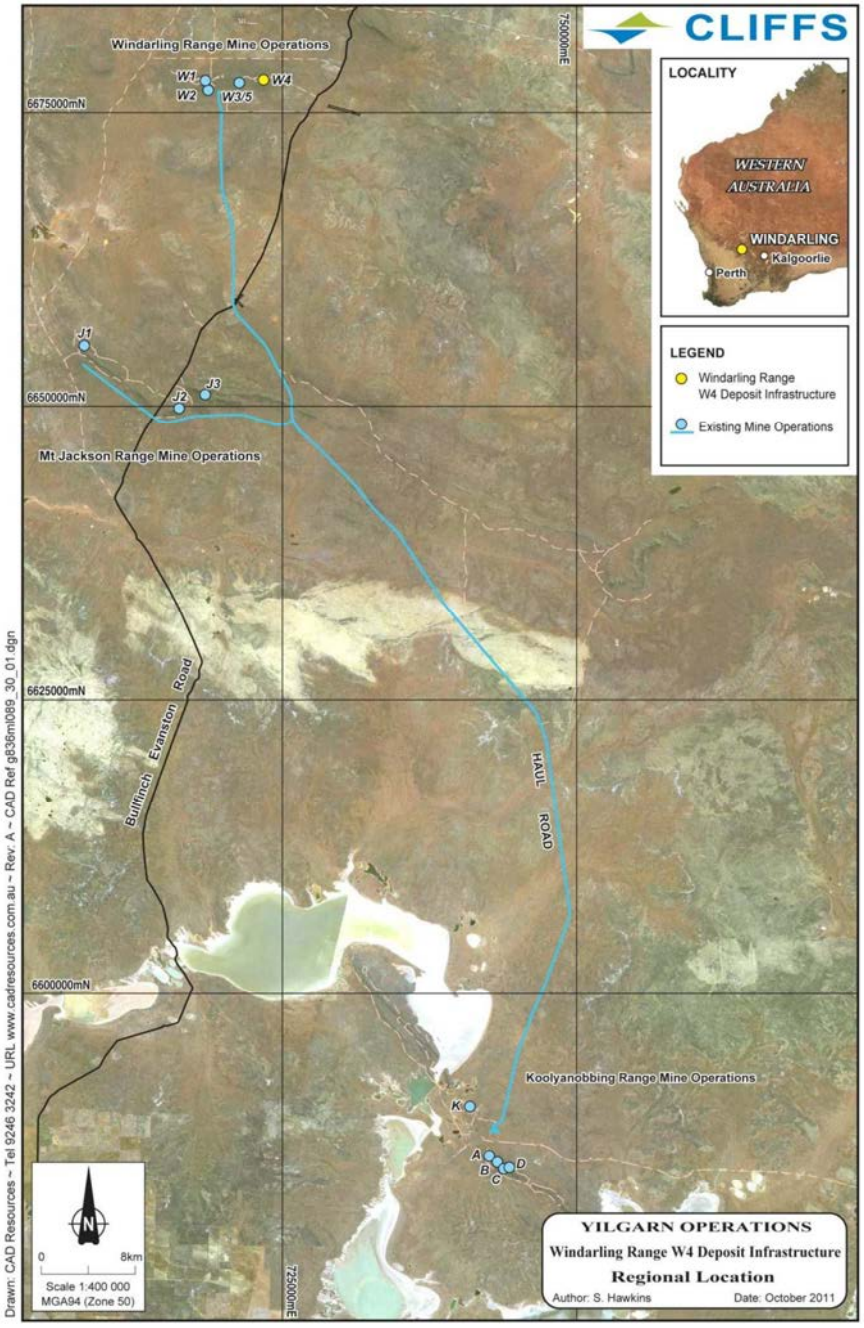

Figure 2-1 Location of the Yilgarn Operations. The location of the Windarling Range W4 Deposit infrastructure is identified in yellow. The location of Cliffs' other mine infrastructures at the Koolyanobbing Range, Mt Jackson Range, Windarling Range and the haul road network are identified in blue.

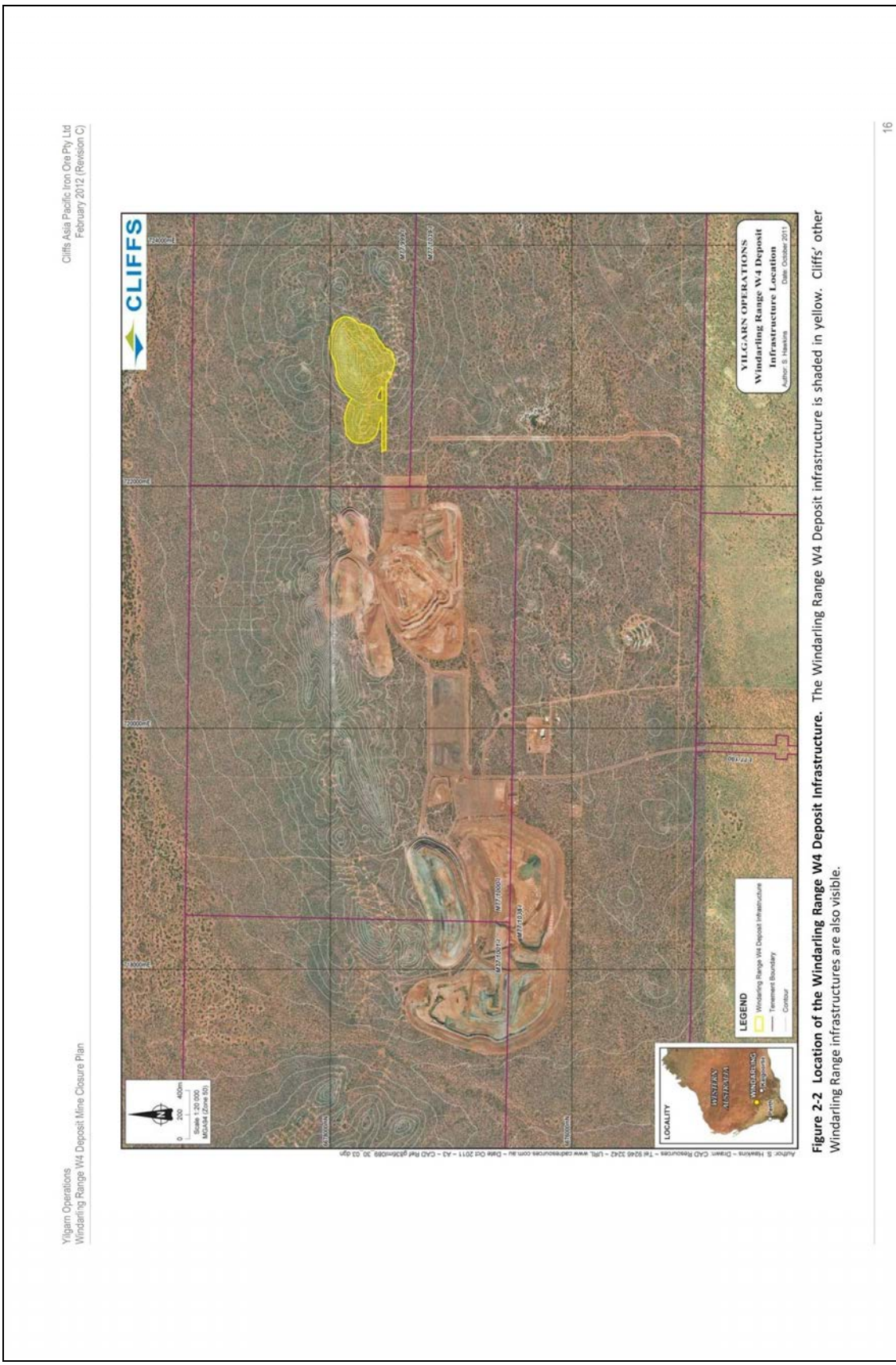

Figure 2-2 Location of the Windarling Range W4 Deposit Infrastructure. The Windarling Range W4 Deposit infrastructure is shaded in yellow. Cliffs' other Windarling Range infrastructures are also visible.

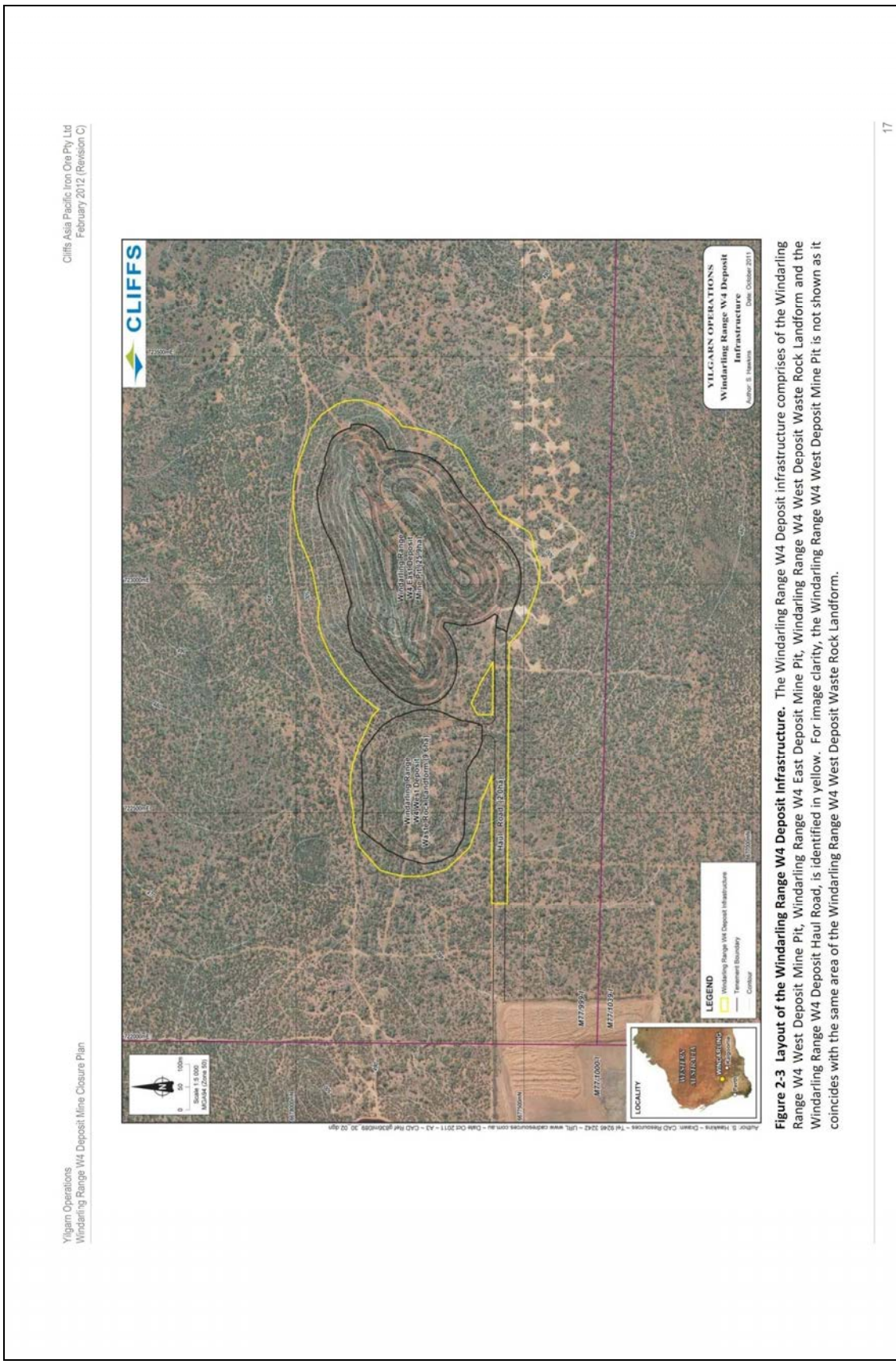

Figure 2-3 Layout of the Windarling Range W4 Deposit Infrastructure. The Windarling Range W4 Deposit infrastructure comprises of the Windarling Range W4 West Deposit Mine Pit, Windarling Range W4 East Deposit Mine Pit, Windarling Range W4 West Deposit Waste Rock Landform and the Windarling Range W4 Deposit Haul Road, is identified in yellow. For image clarity, the Windarling Range W4 West Deposit Mine Pit is not shown as it coincides with the same area of the Windarling Range W4 West Deposit Waste Rock Landform.

Figure 2-4 Conceptual Landforms Post-Mining. A three-dimensional conceptual impression of the Windarling Range W4 Deposit infrastructure post-mining is depicted. The conceptual impression depicts the Windarling Range W4 East Deposit Mine Pit at full development, the Windarling Range W4 West Deposit Mine Pit backfilled to form the Windarling Range W4 West Deposit Waste Rock Landform, with the Windarling Range W4 West Deposit Waste Rock Landform and the Windarling Range W4 Deposit Haul Road areas rehabilitated.

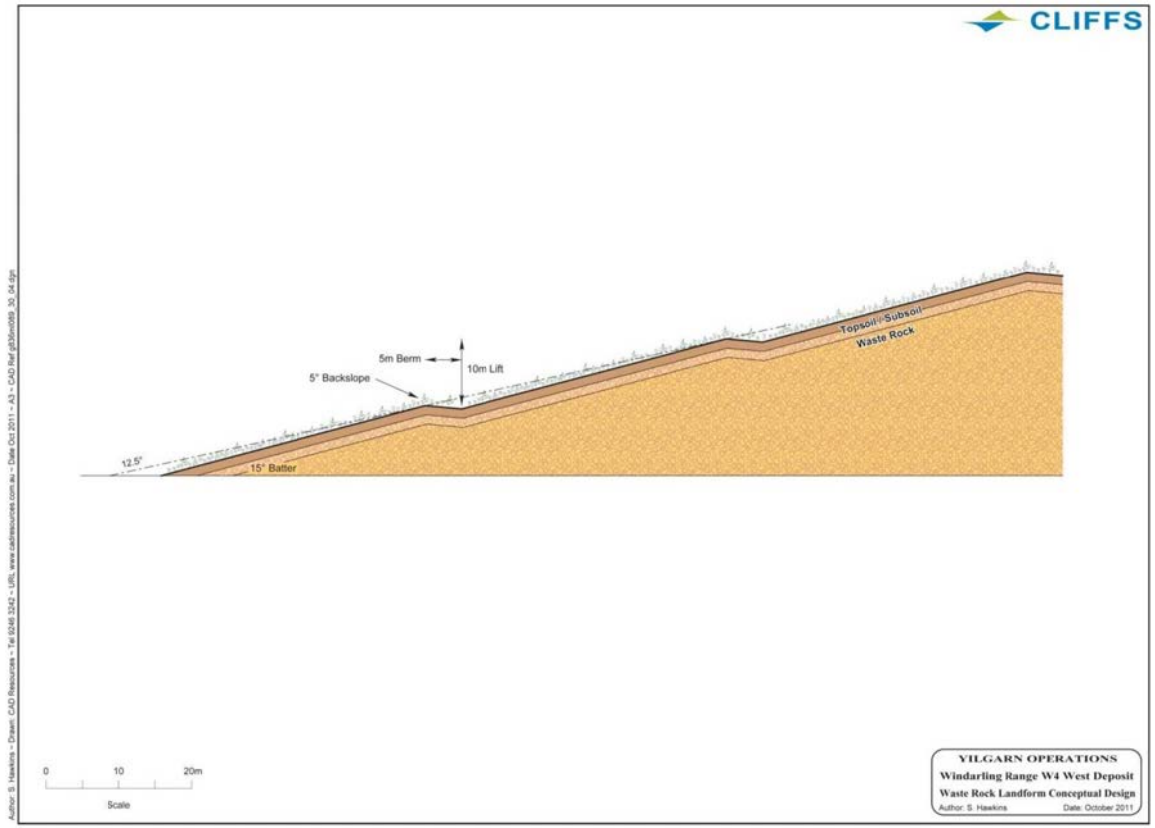

Figure 2-5 Conceptual Design Cross-section of the Windarling Range W4 West Deposit Waste Rock Landform. The conceptual design of the Windarling Range W4 West Deposit Waste Rock Landform is based on 10m lifts having a 15° batter, a 5m berm with a 5° backslope between lifts, and having an overall angle of approximately 12.5°. Topsoil and subsoil overlay the waste rock to provide a growth media for the rehabilitation works.

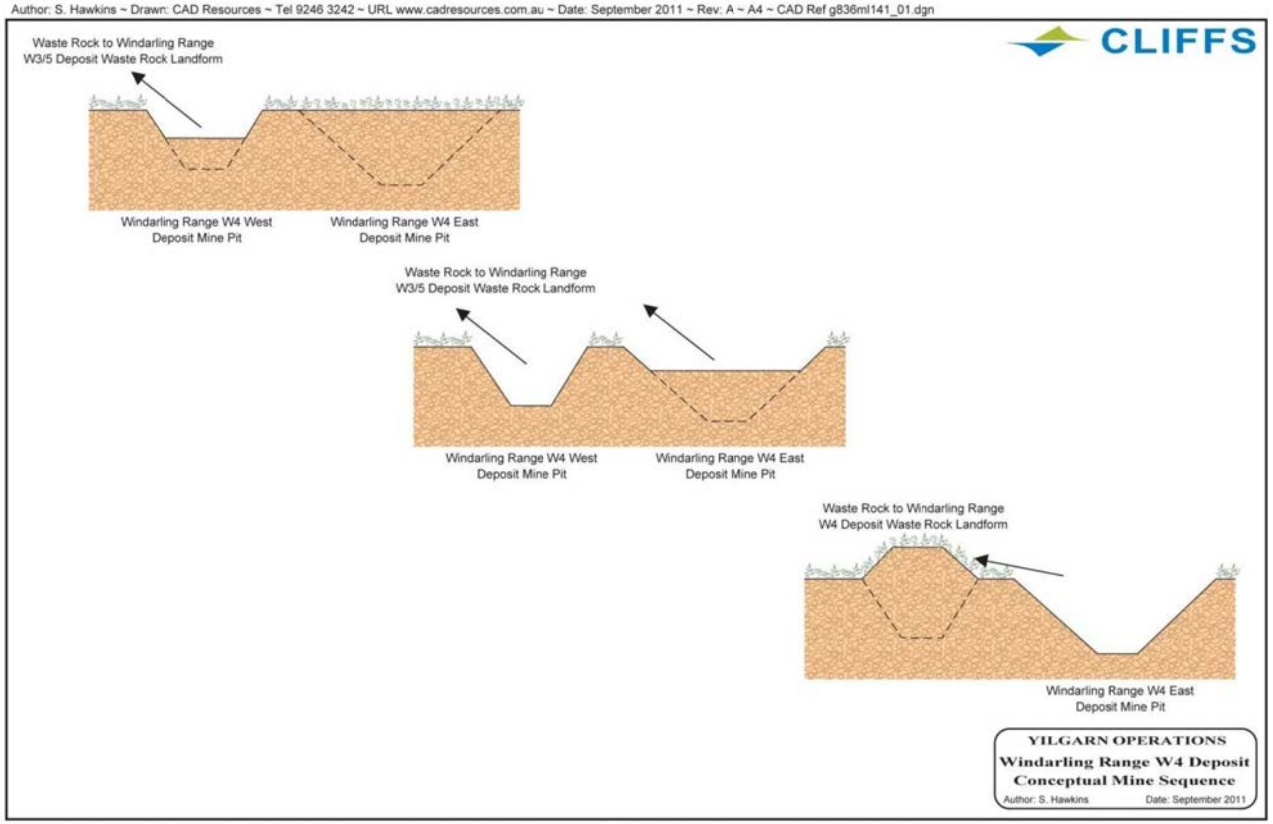

Figure 2-6 Conceptual Flow-Chart for Mine Development and Mine Closure of the Windarling Range W4 Deposit Infrastructure. The flow-chart identifies the sequence of mine development for the Windarling Range W4 Deposit infrastructure.

3. MINE CLOSURE OBLIGATIONS AND COMMITMENTS

The legal obligations specific to mine closure of the Windarling Range W4 Deposit under the *Mining Act 1978* (WA) and the *Environmental Protection Act 1986* (WA) are provided in Tables 3-1 and 3-2.

The list of legal obligations specific to mine closure of the Windarling Range W4 Deposit under the *Mining Act 1978* (WA) and the *Environmental Protection Act 1986* (WA) will be updated in periodic review of this Mine Closure Plan.

To note, Cliffs' commitments to implement this Mine Closure Plan under the *Mining Act 1978* (WA) and the *Environmental Protection Act 1986* (WA) includes implementation of subsequent revisions of this Mine Closure Plan.

Legislation: *Mining Act 1978* (WA) **Responsible Authority:** Department of Mines and Petroleum		
Conditions		
Tenement	**Condition**	**Status**
M77/999	*19: All topsoil being removed ahead of all mining operations from sites such as pit areas, waste disposal areas, ore stockpile areas, pipeline, haul roads and new access roads and being stockpiled for later respreading or immediately respread as rehabilitation progresses.*	As development of the Windarling Range W4 Deposit infrastructure has yet to commence, implementation of mine closure for the Windarling Range W4 Deposit infrastructure has also yet to commence.
	24: At the completion of operations, all buildings and structures being removed from site or demolished and buried to the satisfaction of an Environmental Officer, DMP.	As development of the Windarling Range W4 Deposit infrastructure has yet to commence, implementation of mine closure for the Windarling Range W4 Deposit infrastructure has also yet to commence.
	26: At the completion of operations, or progressively where possible, all access roads and other disturbed areas being covered with topsoil, deep ripped and revegetated with local native grasses, shrubs and trees to the satisfaction of the Environmental Officer, DMP.	As development of the Windarling Range W4 Deposit infrastructure has yet to commence, implementation of mine closure for the Windarling Range W4 Deposit infrastructure has also yet to commence.
Commitments		
Mining Proposal	**Commitment**	**Status**
Windarling Range W4 West Deposit (Cliffs 2010) (DMP Reg ID 28390)	*Cliffs will manage decommissioning and rehabilitation for the Windarling Range W4 West Deposit project by implementation of the decommissioning and rehabilitation actions contained in the approved Preliminary Closure Plan.*	As development of the Windarling Range W4 Deposit infrastructure has yet to commence, implementation of mine closure for the Windarling Range W4 Deposit infrastructure has also yet to commence.
Windarling Range W4 East Deposit Mining Proposal (Cliffs 2012a in prep.)	*Mine Closure: Cliffs will undertake management of mine closure in accordance with the Yilgarn Operations Windarling Range W4 Deposit Mine Closure Plan during implementation of the Windarling Range W4 East Deposit proposal.*	As development of the Windarling Range W4 Deposit infrastructure has yet to commence, implementation of mine closure for the Windarling Range W4 Deposit infrastructure has also yet to commence.

Table 3-1 Obligations for Mine Closure under the *Mining Act 1978* (WA).

Legislation: *Environmental Protection Act 1986* (WA) **Responsible Authority:** Environmental Protection Authority / Minister for Environment		
Conditions		
Assessment	**Condition**	**Status**
Windarling Range W4 West Deposit under Implementation Statement 627 (WA Minister for Environment 2003)	*19-1 Mine Closure: Prior to construction, the Proponent shall prepare a Preliminary Closure Plan, which provides the framework to ensure that the site is left in an environmentally acceptable condition, to the requirements of the Minister for Environment and Heritage on advice of the Environmental Protection Authority.*	The Preliminary Closure Plan has been prepared and approved. As development of the Windarling Range W4 Deposit infrastructure has yet to commence, implementation of the Preliminary Closure Plan for the Windarling Range W4 Deposit infrastructure has also yet to commence. The Preliminary Closure Plan will be replaced by the Windarling Range Mine Closure Plan currently in preparation, for completion by April 2012.
Windarling Range W4 West Deposit under Implementation Statement 627 (WA Minister for Environment 2003)	*19-3 Mine Closure: At least two years prior to the anticipated date of closure, or at a time agreed with the Environmental Protection Authority, the Proponent shall prepare a Final Closure Plan which is consistent with ANZMEC/MCA strategic framework for mine closure and is designed to ensure that the site is left in an environmentally acceptable condition, to the requirements of the Minister for Environment and Heritage on advice of the Environmental Protection Authority.*	The Final Closure Plan has yet to be prepared. The Final Closure Plan will be satisfied by the Windarling Range Mine Closure Plan currently in preparation, for completion by April 2012.
Commitments		
Assessment	**Commitment**	**Status**
Windarling Range W4 East Deposit Environmental Impact Assessment (Cliffs 2012b).	*Mine Closure: Cliffs will undertake management of mine closure in accordance with the Yilgarn Operations Windarling Range W4 Deposit Mine Closure Plan during implementation of the Windarling Range W4 East Deposit proposal.*	As development of the Windarling Range W4 Deposit infrastructure has yet to commence, implementation of mine closure for the Windarling Range W4 Deposit infrastructure has also yet to commence.

Table 3-2 Obligations for Mine Closure under the *Environmental Protection Act 1986* (WA). To note, Condition 19 of Implementation Statement 627 contains further detail which has not being included in the above table due to length (2 pages length in Implementation Statement 627).

4. MINE CLOSURE DATA

4.1 PRE-MINING DATA

A range of pre-mining data has been obtained by Cliffs for the Windarling Range W4 Deposit infrastructure, covering aspects including flora, fauna, groundwater, and soil and waste characterisation. Copies of this pre-mining data is maintained by Cliffs in both hardcopy and digital forms.

The key pre-mining data relevant to this Mine Closure Plan for the Windarling Range W4 Deposit infrastructure is identified in Table 4-1.

An analysis of the pre-mining data identified in Table 4-1 is contained in the documents identified in Table 4-2. The documents identified in Table 4-2 also address mine closure alternatives considered, but not adopted.

Table 4-3 provides a summary of the environmental and social characteristics of the Windarling Range W4 Deposit infrastructure areas, as adapted from Cliffs (2012a in prep.).

4.2 MINING DATA

A range of data will be collected during mine operations that will assist in informing mine closure (e.g. monitoring results from progressive land rehabilitation). Records of this mining data will be will be updated in periodic review of this Mine Closure Plan.

4.3 POST-MINING DATA

Data collected following the completion of mine operations will further inform mine closure (e.g. monitoring results from progressive land rehabilitation). Records of this post-mining data will be will be updated in periodic review of this Mine Closure Plan.

4.4 KNOWLEDGE GAPS

An analysis of data held by Cliffs has identified the current knowledge gaps in relation to this Mine Closure Plan. Table 4-4 identifies the current knowledge gaps in relation to this Mine Closure Plan, and the estimated schedule by which these knowledge gaps will be addressed. Identification of knowledge gaps will be updated in periodic review of this Mine Closure Plan.

Aspect	Reference
Flora	• Western Botanical (2010) *Flora and Vegetation Survey of the Windarling Range W4 Deposit*. Report prepared by Eckermann B and Cockerton G for Cliffs Asia Pacific Iron Ore Pty Ltd. October 2010.
Fauna	• Bamford Consulting Ecologists (2010) *Fauna Assessment of the Windarling Range W4 Deposit*. Report prepared by Bamford M and Everard C for Cliffs Asia Pacific Iron Ore Pty Ltd. September 2010. • Bennelongia Pty Ltd (2010) *Troglofauna Survey of the Windarling Range W4 East Deposit*. Report prepared by Trotter A and Halse S for Cliffs Asia Pacific Iron Ore Pty Ltd. April 2010. • Biota Environmental Sciences Pty Ltd (2011) *Short Range Endemic Invertebrate Fauna Survey Windarling Range W4 East Deposit*. Report prepared by Watson N and Hamilton Z for Cliffs Asia Pacific Iron Ore Pty Ltd. August 2011.
Groundwater	• Rockwater Pty Ltd (2003) *Groundwater Supplies for Koolyanobbing-Windarling Haul Road – Completion Report for Drilling, Bore Construction and Test-Pumping*. Report for Cliffs Asia Pacific Iron Ore Pty Ltd (formerly as Portman Iron Ore Limited), December 2003.
Soil and Waste Characterisation	• Soil Water Consultants (2010a) *Windarling Range W4 West Deposit Geochemical Characterisation*. Report prepared by Pratt A for Cliffs Asia Pacific Iron Ore Pty Ltd. September 2010. • Soil Water Consultants (2010b) *Windarling Range W4 East Deposit Geochemical Characterisation*. Report prepared by Pratt A for Cliffs Asia Pacific Iron Ore Pty Ltd. December 2010. • Soil Water Consultants (2010c) *Soil and Waste Characterisation for the Windarling Range W4 Deposit*. Report prepared by Pratt A for Cliffs Asia Pacific Iron Ore Pty Ltd. September 2010.

Table 4-1 Pre-mining Data Sources.

Aspect	Reference
Assessment under the *Mining Act 1978* (WA)	• Cliffs Asia Pacific Iron Ore Pty Ltd (2010) *Koolyanobbing Iron Ore Project Windarling Range W4 West Deposit Mining Proposal Addendum to Notice of Intent No 4450*. Report by Globe Environments Australia Pty Ltd for Cliffs Asia Pacific Iron Ore Pty Ltd. September 2010. • Cliffs Asia Pacific Iron Ore Pty Ltd (2012a in prep.) *Yilgarn Operations Windarling Range W4 East Deposit Mining Proposal Addendum to Notice of Intent No 4450*. Report by Globe Environments Australia Pty Ltd for Cliffs Asia Pacific Iron Ore Pty Ltd.
Assessment under the *Environmental Protection Act 1986* (WA)	• Cliffs Asia Pacific Iron Ore Pty Ltd (2002) *Koolyanobbing Iron Ore Expansion Project Public Environmental Review*. Report by Ecologia Environmental Consultants for Cliffs Asia Pacific Iron Ore Pty Ltd (formerly as Portman Iron Ore Ltd). March 2002. • Cliffs Asia Pacific Iron Ore Pty Ltd (2012b) *Yilgarn Operations – Windarling Range W4 East Deposit Environmental Impact Assessment (Assessment on Proponent Information)*. Report prepared by Globe Environments Australia Pty Ltd for Cliffs Asia Pacific Iron Ore Pty Ltd. February 2012.

Table 4-2 Pre-mining Data Analysis Sources.

Aspect	Description
Climate	• The climate of the Windarling Range region is characterised by hot, dry summers and mild, wet winters. Maximum temperature peaks (>30°C) occur between November and March. Rainfall occurs throughout the year with approximately 300mm annually, occurring within approximately 45 rainfall days (BOM 2011).
Geology	• The Windarling Range W4 Deposit is dominated by a geology of hematite and goethite-hematite mineralisation.
Topography	• The Windarling Range W4 Deposit infrastructure area has natural topographic elevations ranging between approximately 490mAHD to 540mAHD.
Flora	• The Windarling Range W4 Deposit infrastructure coincides with 1 flora species declared as a 'Rare Flora' under the *Wildlife Conservation Act 1950* (WA), being *Ricinocarpos brevis*, and 2 flora species classified by DEC as 'Priority', being *Austrostipa blackii* (P3) and *Banksia arborea* (P4) (Western Botanical 2010).
Fauna	• Surveys for vertebrate fauna in the vicinity of the Windarling Range W4 Deposit infrastructure have identified the potential presence of approximately 170 vertebrate fauna species comprising of birds, mammals, amphibians and reptiles, including 6 vertebrate fauna species protected under and the *Wildlife Conservation Act 1950* (WA) and 4 vertebrate fauna species listed by DEC as 'Priority' (BCE 2010). • Surveys for short-range endemic invertebrate fauna in the vicinity of the Windarling Range W4 Deposit infrastructure identified short-range taxa including land snails, millipedes and mygalomorph spiders (Biota 2011). • Surveys for troglofauna within the area of the Windarling Range W4 Deposit infrastructure identified several troglofauna taxa (Bennelongia 2010).
Groundwater	• Groundwater at the Windarling Range W4 Deposit infrastructure is saline and located at an elevation of approximately 400mAHD (Rockwater 2003).
Surface Water	• There are no natural permanent surface water features in the vicinity of the Windarling Range W4 Deposit infrastructure.
Land Tenure	• The Windarling Range W4 Deposit infrastructure is located within Unallocated Crown Land, formerly an area of the Diemals Pastoral Lease.
Demography	• The Shire of Yilgarn has a population of approximately 1,400 persons (ABS 2007). The Shire of Yilgarn is centred on the town of Southern Cross, situated approximately 130km south of the Windarling Range W4 Deposit infrastructure.
Aboriginal Heritage	• The Windarling Range W4 Deposit infrastructure does not coincide with any registered area of Aboriginal heritage on the Register of Aboriginal Heritage Sites maintained by the Department of Indigenous Affairs in accordance with the *Aboriginal Heritage Act 1972* (WA) (DIA 2011).
Native Title	• The Windarling Range W4 Deposit infrastructure does not coincide with any area of Native Title application or determination recorded by the Federal Court of Australia in accordance with the *Native Title Act 1993* (C'th) (NNTT 2012).
European Heritage	• The Windarling Range W4 Deposit infrastructure does not coincide with any record on the State Register of Heritage Places maintained by the Heritage Council of Western Australia in accordance with the *Heritage of Western Australia Act 1990* (WA) (HCWA 2011).

Table 4-3 Summary of Environmental and Social Characteristics.

Aspect	Description	Schedule
Reference sites	• Identification of reference sites for use in development and assessment of rehabilitation completion criteria.	• 2013+

Table 4-4 Knowledge Gaps.

5. STAKEHOLDER CONSULTATION

Stakeholder consultation is an integral component of mine closure planning. Cliffs seeks to consult with its key stakeholders on key aspects of mine development and mine closure. Cliffs also maintains active consultation with a range of government agencies regarding its mine operations. Reports are submitted annually to these government agencies on the implementation status of Cliffs' mine operations.

As a key component of Cliffs' stakeholder consultation strategy, in 2004, Cliffs established a Community Reference Group (CRG) for the Yilgarn Operations. The membership of the CRG is varied, with representatives from groups including local government, pastoral representatives and environmental interest groups. The CRG meets twice per year to discuss the environmental aspects of Cliffs' mine operations. Cliffs will continue to consult with CRG regarding mine closure of the Windarling Range W4 Deposit infrastructure.

A summary of key stakeholders for mine closure of the Windarling Range W4 Deposit infrastructure is identified in Table 5-1. To note, Table 5-1 is limited to key stakeholders specifically for mine closure of the Windarling Range W4 Deposit infrastructure, rather than key stakeholders for the Windarling Range W4 Deposit infrastructure more generally (for which the list of stakeholders is larger).

A record of stakeholder consultation for mine closure of the Windarling Range W4 Deposit infrastructure is identified in Table 5-2. To note, Table 5-2 is limited to consultation specifically for mine closure of the Windarling Range W4 Deposit infrastructure, rather than all consultation for the Windarling Range W4 Deposit infrastructure more generally (for which the list of consultations is larger). Table 5-2 also identifies consultation on mine closure undertaken with stakeholders other than those identified as key stakeholders for mine closure as identified in Table 5-1.

Consultation to date on mine closure for the Windarling Range W4 Deposit infrastructure has predominantly been associated with the Preliminary Closure Plan that applies to the Windarling Range W4 West Deposit Mine Pit and the Windarling Range W4 Deposit Haul Road. The Preliminary Closure Plan outlined that the Windarling Range W4 West Deposit Mine Pit would be left as an open mine void (which subject to approval of the Windarling Range W4 East Deposit Mine Pit, will now be backfilled) and the Windarling Range W4 Deposit Haul Road would be rehabilitated.

Additional consultation for mine closure will occur with key stakeholders as the assessment and approvals processes for the Windarling Range W4 East Deposit Mine Pit continue. Records of consultation on mine closure with key stakeholders will be maintained by Cliffs and provided in periodic review of this Mine Closure Plan.

Category	Stakeholder
State Government	• Department of Mines and Petroleum • Environmental Protection Authority[1]
Local Government	• Shire of Yilgarn
Community	• Community Reference Group

Table 5-1 Stakeholders for Mine Closure.

[1] Includes Office of the Environmental Protection Authority as a representative for the Environmental Protection Authority.

Table 5-2 Stakeholder Consultation Record.

Stakeholder	Date	Consultation Method	Mine Closure Aspects	Outcomes
Department of Mines and Petroleum (DMP)	September 2003	Preliminary Closure Plan (Draft) (Cliffs 2003a) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	
	November 2003	Preliminary Closure Plan (Final) (Cliffs 2003b) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	The Preliminary Closure Plan was approved by DMP.
	August 2010	Preliminary Closure Plan (Revised Final) (Cliffs 2010a) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	
	May 2011	Preliminary Closure Plan (Revised Final) (Cliffs 2011) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	
	August 2011	Meeting	Meeting to discuss the requirements for a Mine Closure Plan to be prepared for the Windarling Range W4 East Deposit.	DMP advised Cliffs to prepare a Mine Closure Plan for the Windarling Range W4 East Deposit.
Environmental Protection Authority (EPA)	September 2003	Preliminary Closure Plan (Draft) (Cliffs 2003a) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	
	November 2003	Preliminary Closure Plan (Final) (Cliffs 2003b) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	The Preliminary Closure Plan was approved by EPA (letter from DEC on behalf of EPA).
	August 2010	Preliminary Closure Plan (Revised Final) (Cliffs 2010a) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	
	May 2011	Preliminary Closure Plan (Revised Final) (Cliffs 2011) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	

Stakeholder	Date	Consultation Method	Mine Closure Aspects	Outcomes
Department of Environment and Conservation (DEC)	September 2003	Preliminary Closure Plan (Draft) (Cliffs 2003a) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	
	November 2003	Preliminary Closure Plan (Final) (Cliffs 2003b) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	The Preliminary Closure Plan was approved by DEC (on behalf of EPA).
	August 2010	Preliminary Closure Plan (Revised Final) (Cliffs 2010a) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	
	May 2011	Preliminary Closure Plan (Revised Final) (Cliffs 2011) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	
Department of Sustainability, Environment, Water Population and Communities (DoSEWPC)	September 2003	Preliminary Closure Plan (Draft) (Cliffs 2003a) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	
	November 2003	Preliminary Closure Plan (Final) (Cliffs 2003b) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	The Preliminary Closure Plan was approved by DoSEWPC.
	August 2010	Preliminary Closure Plan (Revised Final) (Cliffs 2010a) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	
	May 2011	Preliminary Closure Plan (Revised Final) (Cliffs 2011) submitted	The Preliminary Closure Plan outlined that mine pits were to be left as open mine voids with safety provisions installed, with other disturbance areas rehabilitated with native vegetation.	

6. POST-MINING LAND USE AND MINE CLOSURE OBJECTIVES

6.1 POST-MINING LAND USE

The Windarling Range W4 East Deposit proposal area is located within Unallocated Crown Land. The Windarling Range W4 East Deposit proposal area was formerly part of the Diemals Pastoral Lease, which was cancelled in October 2011.

In 2010, the Western Australian Government announced a proposal to create a 'Conservation and Mining Reserve' coinciding with the Windarling Range, however this reserve remains yet to be established under the *Land Administration Act 1997* (WA).

The post-mining land use for the land areas covered by the Windarling Range W4 Deposit infrastructure, whether a continuation of Unallocated Crown Land or a proposed reserve, is currently considered uncertain.

The post-mining land use for the land areas covered by the Windarling Range W4 Deposit infrastructure will be updated in periodic review of this Mine Closure Plan.

6.2 MINE CLOSURE OBJECTIVES

Irrespective of the current uncertainty as to the post mining land use (refer above), Cliffs' broad mine closure objective for the Windarling Range W4 Deposit infrastructure will be to rehabilitate the disturbed areas with native vegetation, and to ensure that the land and landforms are physically safe, geo-technically stable and geochemically non-polluting to enable a post-mining land use. This broad objective is considered achievable in the context of post-mining land capability and consistent with the surrounding environment.

Cliffs' mine closure objectives for the Windarling Range W4 Deposit infrastructure are identified in Table 6-1. The mine closure objectives incorporate assumptions that the abandonment bunding, safety and stability works, and infrastructure removal will be undertaken to accepted standards and guidelines, and the rehabilitation with native vegetation will be undertaken to achieve native vegetation that is likely to be of self-sustaining ecosystem function in the long-term following the completion of mine closure. There are no recorded aspects of the existing environment or the proposed mine operations that would have the potential to affect the mine closure objectives or post-mining land use.

Mine Closure Management Unit	Mine Closure Objective
Windarling Range W4 East Deposit Mine Pit	Abandonment bunding installed
Windarling Range W4 West Deposit Waste Rock Landform	Safe, stable and non-polluting
	Rehabilitated with native vegetation
Windarling Range W4 Deposit Haul Road	Rehabilitated with native vegetation

Table 6-1 Mine Closure Objectives.

7. IDENTIFICATION AND MANAGEMENT OF MINE CLOSURE ASPECTS

7.1 RISK ASSESSMENT

Mine closure aspects (or risks) relevant to the Windarling Range W4 Deposit infrastructure have been identified, assessed and evaluated through Cliffs' risk management framework. Table 7-1 identifies the risk rankings and management response for the mine closure aspects assessed. Appendices 1 to 3 identify Cliffs' risk management frameworks by which the mine closure aspects identified in Table 7-1 have been assessed.

The mine closure aspects relevant to mine closure of the Windarling Range W4 Deposit infrastructure will be reviewed and updated in periodic review of this Mine Closure Plan.

Additional contextual information on a number of the mine closure aspects identified in Table 7-1 is provided in Sections 7.2 to 7.7.

7.2 SAFETY

Following the completion of mining, Cliffs will install an abandonment bund around the crest of the Windarling Range W4 East Deposit Mine Pit, in accordance with the specifications outlined in DMP (1997) and for the purpose of preventing inadvertent post-mining human access to the mine pit. The abandonment bund may also assist to minimise inadvertent post-mining access by fauna.

Cliffs has considered the Windarling Range W4 East Deposit Mine Pit geology and design to determine the location of the abandonment bund, which will be placed within the outer 10m of the Windarling Range W4 East Deposit Mine Pit footprint identified by the yellow boundary in Figure 2-3. The abandonment bund will be at least 2m in height with a 5m base width. The abandonment bund will connect to the elevated sections of the Windarling Range W4 West Deposit Waste Rock Landform.

7.3 GEOTECHNICAL STABILITY

The design of the Windarling Range W4 West Deposit Waste Rock Landform has been undertaken by suitably qualified mine engineers to minimise the risk of geotechnical instability. The engineering design having 10m lifts and 15° slope (12.5° overall slope) is considered sufficient to minimise the risk of geotechnical instability.

7.4 WATER DRAINAGE

The design of the Windarling Range W4 West Deposit Waste Rock Landform has been undertaken by suitably qualified mine engineers to manage drainage. The engineering design of 5m berms with 5° backslope, and baffles on berms and the top lift, is expected to ensure the Windarling Range W4 West Deposit Waste Rock Landform is internally draining (not water shedding).

7.5 CHEMICAL DRAINAGE

Characterisation of waste rock from the Windarling Range W4 Deposit undertaken by Soil Water Consultants (SWC 2010a; SWC 2010b) identified the majority of waste rock was non-saline, non-acid forming and had a low risk of metaliferous drainage. Accordingly, chemical drainage from the Windarling Range W4 West Deposit Waste Rock Landform is not expected.

7.6 INFRASTRUCTURE

At mine closure, Cliffs will remove the Windarling Range W4 Deposit Haul Road. The area of the Windarling Range W4 Deposit Haul Road will be rehabilitated with native vegetation (refer below).

7.7 REHABILITATION

At mine closure, the areas of Windarling Range W4 Deposit Haul Road and the Windarling Range W4 West Deposit Waste Rock Landform will be rehabilitated with native vegetation. Rehabilitation will include the following general actions:

- Deep ripping for improved soil condition and drainage;
- Respreading of stockpiled topsoil, subsoil and retained vegetation to provide a plant growth medium, topsoil-stored seed and a microclimate for seed growth; and
- Spreading of seed collected during mine operations.

The above management actions are consistent with the general rehabilitation practices undertaken at mines in Western Australia.

Where possible, rehabilitation will be undertaken progressively during mine development. Progressive rehabilitation works will predominantly apply to the Waste Rock Landform; whereby constructed lifts can be rehabilitated during mine operations

Based on rehabilitation results at Cliffs' existing waste rock landforms, rehabilitation using a 15^{o} batter slope, as proposed for the Windarling Range W4 West Deposit Waste Rock Landform, can achieve acceptable rehabilitation outcomes with regards to landform stability and native vegetation growth. The Windarling Range W4 Deposit Haul Road is on relatively flat land topography, and as such, rehabilitation of this area is not expected to be problematical.

Table 7-1 Risk Assessment of Mine Closure Aspects. The consequence categories, likelihood, consequence and resulting risk rank for each mine closure aspect is identified. The risk rank is a product of the assessment of the likelihood and the consequence of each mine closure aspect.

Mine Closure Aspect	Risk Description	Management Proposed	Consequence Categories	Likelihood	Consequence	Risk Rank	Key Mine Closure Risk?
Windarling Range W4 East Deposit Mine Pit							
Safety	Inadvertent post-mining entry causing injury.	Managed by installation of abandonment bunding in accordance with the specifications of DMP (1997) to meet the requirements of s3.16(b) of the *Mines Safety and Inspection Regulations 1995* (WA).	S, F	E	5	H15	YES
Windarling Range W4 West Deposit Waste Rock Landform							
Geotechnical Stability	Potential for instability, which may result in partial failure.	Managed by engineering design having 10m lifts, 5m berms and 15° batter slope (12.5° overall slope) is sufficient to minimise the risk of instability.	F, E	D	2	L5	No
Water Drainage	Potential for drainage to result in erosion, with subsequent potential for off-site environmental impact.	Managed by engineering design including berms with 5° backslope, and baffles on berms and top lift, to ensure waste rock landform is internally draining (not water shedding).	F, E	C	2	M8	YES
Chemical Drainage (Acid, Metaliferous and/or Saline)	Potential for generation of acid and/or metaliferous drainage, with subsequent potential for off-site environmental impact.	Geochemical characterisation has identified the waste rock as non-saline, non-acid forming and having a low risk of metaliferous drainage.	E	E	3	L6	No
Rehabilitation	Potential for rehabilitation to not meet interim completion criteria for species diversity, percentage foliar cover and/or weeds. Potential for rehabilitation to be impacted by feral fauna or weeds. Potential for rehabilitation to be impacted by fire.	Managed by design incorporating outer cover of topsoil and subsoil as a suitable growth media, deep ripping, respreading of retained topsoil and subsoil and vegetation, and spreading of collected seed. Based on Cliffs' existing mine operations, the potential for rehabilitation to be impacted by feral fauna or weeds is considered low. Based on fire threat analysis conducted at Cliffs' Windarling Range mine operations, the potential risk of fire impacting rehabilitation is considered low.	F, E	C	2	M8	YES

Mine Closure Aspect	Risk Description	Management Proposed	Consequence Categories	Likelihood	Consequence	Risk Rank	Key Mine Closure Risk?
Windarling Range W4 Deposit Haul Road							
Infrastructure	Insufficient removal of infrastructure, affecting rehabilitation.	Removal of haul road infrastructure prior to preparation for rehabilitation works.	F, E	D	1	L2	No
Rehabilitation	Potential for rehabilitation to not meet interim completion criteria for species diversity, percentage foliar cover and/or weeds. Potential for rehabilitation to be impacted by feral fauna or weeds. Potential for rehabilitation to be impacted by fire.	Managed by deep ripping, respreading of retained topsoil and subsoil and vegetation, and spreading of collected seed. Based on Cliffs' existing mine operations, the potential for rehabilitation to be impacted by feral fauna or weeds is considered low. Based on fire threat analysis conducted at Cliffs' Windarling Range mine operations, the potential risk of fire impacting rehabilitation is considered low.	F, E	C	2	M8	YES

8. COMPLETION CRITERIA

8.1 DEVELOPMENT OF COMPLETION CRITERIA

Completion criteria are an agreed set of performance indicators, which upon being met, will demonstrate successful mine closure, and subsequently, allow for long-term responsibility of the land to be transferred from the miner to the landowner.

As outlined in DMP & EPA (2011), development of completion criteria should commence in the project approval stage, with these completion criteria refined during mine operations based on data obtained during mine operations. The process for development of completion criteria is illustrated in Figure 8-1.

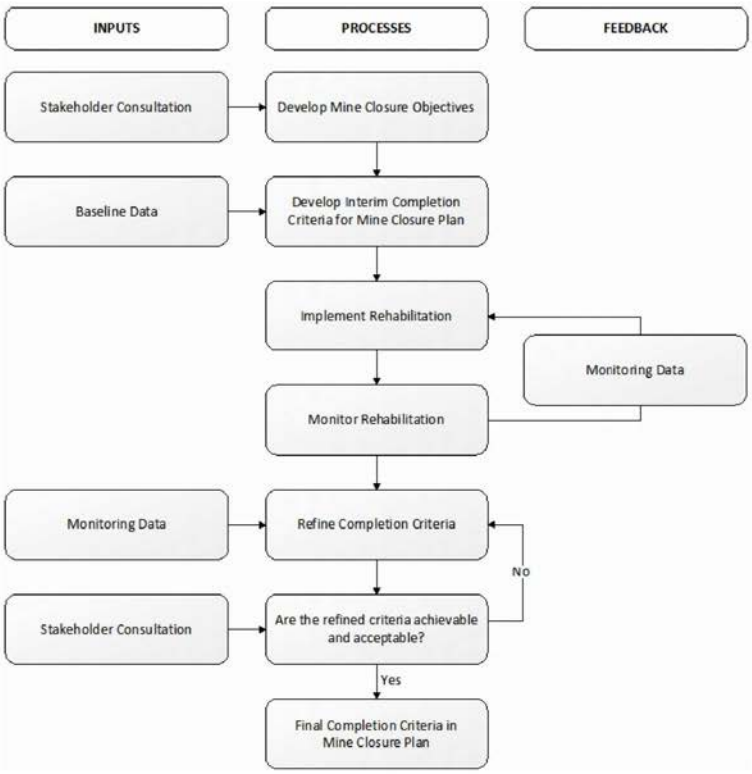

Figure 8-1 Process for Development of Mine Closure Completion Criteria. The development of completion criteria is an iterative process whereby the criteria is refined during mine operations through incorporating the monitoring data results from initial rehabilitation and ongoing stakeholder consultation. Adapted from Nichols (2010).

8.2 INTERIM COMPLETION CRITERIA

Based on the mine closure objectives identified in Section 6, and knowledge gained from Cliffs' existing mine operations, Cliffs has developed interim completion criteria for the Windarling Range W4 Deposit infrastructure. These interim completion criteria are expected to be refined over the life of mine operations; consistent with the philosophy outlined in DMP & EPA (2011). The interim completion criteria are identified in Table 8-1.

The interim completion criteria have been drafted in a manner such that they are directly measurable (e.g. percentages, angles, etc), or alternatively, can be determined by professional judgement of a competent professional for that field.

The completion criteria identified in Table 8-1 which relate to the safety, stability and waste containment for the Windarling Range W4 West Deposit Waste Rock Landform identify the design criteria depicted in Figure 2-5, with this design criteria based on accepted mine engineering design, the experience of Cliffs in waste rock landform construction at its existing operations, and the advice of external specialists in landform design and rehabilitation.

The completion criteria identified in Table 8-1 for rehabilitation are based on the ≥70% species diversity and ≥70% foliar cover completion criteria recommended by EPA in previous mine development approvals, with the ≤5% weed cover criterion being half of the ≤10% criterion previously recommended by EPA in previous mine development approvals.

The assessment of the interim completion criteria for rehabilitation will be undertaken at the scale of quadrats (not a landscape scale), whereby reference site quadrats will be assessed to determine species diversity (the number of flora species per quadrat), percentage foliar cover and weed cover, with these results used for comparison to the rehabilitation site quadrats. The assessment of the interim completion criteria for rehabilitation will be undertaken using comparable seasons (e.g. spring in reference sites compared to spring in rehabilitation sites).

8.3 FINAL COMPLETION CRITERIA

As outlined in DMP & EPA (2011) and illustrated in Figure 8-1, interim completion criteria should be refined during mine operations based on data obtained during mine operations. This data to be obtained during development of the Windarling Range W4 Deposit infrastructure is expected to include:

- Rehabilitation monitoring data from progressive rehabilitation; and
- Reference site selection and assessment.

Appropriate reference sites in non-impact areas will be selected to assist in defining the final completion criteria. Reference sites will be selected that best reflect the physical and structural properties (e.g. soil structure, elevation and aspect) of the rehabilitation areas.

Development of the final completion criteria will include consultation with DMP and EPA as the key government stakeholders, and noting the expertise of these government agencies in mine closure standards accepted in Western Australia, with Cliffs' other stakeholders informed of the final agreed completion criteria.

Similarly as identified for the interim completion criteria above, the final completion criteria should similarly be drafted with the objective of being directly measurable, or alternatively, can be determined by professional judgement of a competent professional for that field.

With specific regard to the completion criteria for rehabilitation, the final completion criteria will need to be met for a specified number of consecutive years to provide confidence to DMP and EPA that the rehabilitation works will achieve native vegetation that is likely to be of self-sustaining ecosystem function in the long-term following the completion of mine closure.

Mine Closure Management Unit	Mine Closure Objective	Interim Completion Criteria
Windarling Range W4 East Deposit Mine Pit	Abandonment bunding installed	• Abandonment bunding installed to design criteria: o 2m height o 5m base width o Located beyond zone of potential instability
Windarling Range W4 West Deposit Waste Rock Landform	Safe, stable and non-polluting	• Construction to design criteria: o 15° batters o 10m lifts o 5m berms with 5° backslope o Outer cover of topsoil and subsoil for rehabilitation • Surface water drainage controlled, comparable with drainage in surrounding areas
	Rehabilitated with native vegetation	• Flora species diversity ≥70% of reference sites • Percentage foliar cover ≥70% of reference sites • Weeds ≤5% cover
Windarling Range W4 Deposit Haul Road	Rehabilitated with native vegetation	• Flora species diversity ≥70% of reference sites • Percentage foliar cover ≥70% of reference sites • Weeds ≤5% cover

Table 8-1 Interim Mine Closure Completion Criteria.

9. FINANCIAL PROVISION

Cliffs maintains financial provision for mine closure costs in accordance with Cliffs' Policy FIN056 *Financial Processes Iron Ore Rehabilitation Provisions* (Cliffs 2010c). Financial provision is maintained as a liability on company accounts and include consideration of the following cost liabilities:

- Civil earthworks;
- Rehabilitation (ripping, replacement of subsoil and topsoil and vegetation);
- Removal and disposal of mine infrastructure;
- Investigation and remediation of potentially contaminated areas;
- Project management, administration and monitoring;
- Stakeholder consultation;
- Contingency; and
- Inflation.

Cliffs' mine closure cost for the Windarling Range W4 Deposit has been estimated at approximately A$400,000, based on the conservative unit cost estimates and the area of each mine closure management unit, as identified by Table 9-1. To note, the estimated unit costs for each mine closure management unit exceed the corresponding bond rates identified by the DMP Bond Policy (DMP 2010).

The underlying rehabilitation cost assumptions, and the resulting unit cost estimates, are independently reviewed every three years to ensure the estimated unit costs are periodically refined to reflect current cost. These estimates are based on established unit rate cost estimates provided by industry third parties providing service to Cliffs, and accordingly, are commercial in-confidence and not included in this publicly available Mine Closure Plan.

In accordance with Cliffs (2010c), the financial provisions for mine closure at Cliffs mine operations are reviewed each six months to account for changes in the area of land disturbance.

The financial provision for mine closure of the Windarling Range W4 Deposit will be assessed and provided for in accordance with Cliffs (2010c), and updated in this Mine Closure Plan when subject to periodic review.

Mine Closure Management Unit	Estimated Unit Cost ($/ha)	Management Unit Area (ha)	Estimated Total Cost ($)
Windarling Range W4 East Deposit Mine Pit	CONFIDENTIAL		
Windarling Range W4 West Deposit Waste Rock Landform			
Windarling Range W4 Deposit Haul Road			

Table 9-1 Estimated Mine Closure Costs.

10. MINE CLOSURE IMPLEMENTATION

10.1 SCHEDULED MINE CLOSURE

The Windarling Range W4 Deposit infrastructure is currently scheduled to commence development from 2012, with mining currently scheduled to occur until 2017.

Implementation of progressive mine closure actions for the Windarling Range W4 Deposit infrastructure is expected to commence from approximately 2016, with this implementation focussed on the design criteria and progressive rehabilitation of the Windarling Range W4 Deposit Waste Rock Landform.

Mining is currently schedule to cease in 2017, followed by the commencement of mine closure from 2018 for the Windarling Range W4 East Deposit Mine Pit and the Windarling Range W4 Deposit Haul Road. The mine closure actions (except for monitoring and maintenance – see Section 11) are expected to be completed during the 2018 year.

The implementation schedule for mine closure of the Windarling Range W4 Deposit infrastructure is identified in Table 10-1. The implementation schedule will be updated in periodic review of this Mine Closure Plan.

	Year						
	2012	2013	2014	2015	2016	2017	2018
Phase							
Mining	✓	✓	✓	✓	✓	✓	
Mine Closure					✓	✓	✓
Mine Closure Management Unit							
Windarling Range W4 East Deposit Mine Pit							✓
Windarling Range W4 West Deposit Waste Rock Landform					✓	✓	✓
Windarling Range W4 Deposit Haul Road							✓

Table 10-1 Mine Closure Implementation Schedule.

10.2 CARE AND MAINTENANCE

In the unlikely event of mine operations needing to enter a care and maintenance phase, the extent of implementing the mine closure actions will be dependent on the then extent of mine operations and the predicted duration of the care and maintenance phase. The overall objective of a care and maintenance phase is to minimise safety and environmental risks until such time as mine operations recommence, or a decision is made for mine closure. To achieve this, a care and maintenance phase will include installation of precautions to discourage inadvertent access by third parties to the Windarling Range W4 Deposit infrastructure (e.g. signage and/or bunding across established access points), and engage a caretaker to monitor and discourage inadvertent access.

10.3 MINE CLOSURE WORK PROGRAMS

As recommended by ICMM (2008) and DMP & EPA (2011), Mine Closure Work Programs for each Mine Closure Management Unit are provided in Tables 10-2 to 10-6. The Mine Closure Work Programs will be updated in periodic review of this Mine Closure Plan.

Mine Closure Work Program Mine Closure Management Unit: Windarling Range W4 East Deposit Mine Pit	
Description	• Open void to access the Windarling Range W4 East Deposit ore resource
Area	• 25.9ha
Location	• M77/999
Location Map	• Refer Section 2
Implementation Schedule	• 2013-2017
Implementation Status	• Inactive
Closure Schedule	• 2018
Mine Closure Cost Estimate	• Refer Section 9
Key Reference Documentation	• Refer Section 4
Legal Obligations	• Refer Section 3
Mine Closure Objective	• Abandonment bunding installed
Interim Completion Criteria	• Abandonment bunding installed to design criteria: o 2m height o 5m base width o Located beyond zone of potential instability
Closure Assumptions	• Mine pit will be left as an open mine void • Prior to development, vegetation and topsoil and subsoil will be cleared from the area of development and stockpiled at the outer edges for use in progressive rehabilitation works of other mine areas • The location of the abandonment bunding has been calculated in accordance with DMP (1997) as being the outer 10m of the mine pit area, and connecting to the Windarling Range W4 West Deposit Waste Rock Landform.
Management Actions	• Install abandonment bund using waste rock of 2m height and 5m base width around the crest of the mine pit within the outer 10m of the mine pit area yellow boundary, connecting to the Windarling Range W4 West Deposit Waste Rock Landform, to meet the requirements of DMP (1997)
Monitoring	• Survey
Responsibility	• General Manager Operations
Further Investigation	• Further investigations are not currently considered necessary
Implementation Description	• Not currently applicable
Bond Reduction	• Not currently applicable
Relinquishment	• Not currently applicable

Table 10-2 Work Program for the Windarling Range W4 East Deposit Mine Pit Mine Closure Management Unit.

Mine Closure Work Program Mine Closure Management Unit: Windarling Range W4 West Deposit Waste Rock Landform	
Description	• Engineered structure of waste rock
Area	• 9.6ha
Location	• M77/999
Location Map	• Refer Section 2
Implementation Schedule	• 2014-2017
Implementation Status	• Inactive
Closure Schedule	• 2016+ (Progressive rehabilitation)
Mine Closure Cost Estimate	• Refer Section 9
Key Reference Documentation	• Refer Section 4
Legal Obligations	• Refer Section 3
Mine Closure Objective	• Safe, stable and non-polluting • Rehabilitated with native vegetation
Interim Completion Criteria	• Construction to design criteria: o 15° batters o 10m lifts o 5m berms with 5° backslope o Outer cover of topsoil and subsoil for rehabilitation • Surface water drainage controlled, comparable with drainage in surrounding areas • Flora species diversity ≥70% of reference sites • Percentage foliar cover ≥70% of reference sites • Weeds ≤5% cover
Closure Assumptions	• Prior to development, vegetation and topsoil and subsoil will be cleared from the area of development and stockpiled at the outer edges for use in progressive rehabilitation works • The waste rock landform design will be appropriate for vegetative growth and drainage control • Rehabilitation works will be undertaken progressively as sections of the waste rock landform are completed • Successful rehabilitation will allow for the recolonisation of fauna species over time
Management Actions	• Civil earthworks to construct as per design • Surfaces ripped along contour • Topsoil, subsoil and vegetation respread
Monitoring	• Survey • Visual Inspection • Botanical Assessment
Responsibility	• General Manager Operations (Civil Earthworks, Survey and Inspections) • Manager Environmental Services (Botanical Assessment)
Further Investigation	• Further investigations are not currently considered necessary
Implementation Description	• Not currently applicable
Bond Reduction	• Not currently applicable
Relinquishment	• Not currently applicable

Table 10-3 Work Program for Windarling Range W4 West Deposit Waste Rock Landform Mine Closure Management Unit.

Mine Closure Work Program Mine Closure Management Unit: Windarling Range W4 Deposit Haul Road	
Description	• Road for transport of ore
Area	• 2.0ha
Location	• M77/999
Location Map	• Refer Section 2
Implementation Schedule	• 2012-2017
Implementation Status	• Inactive
Closure Schedule	• 2018+
Mine Closure Cost Estimate	• Refer Section 9
Key Reference Documentation	• Refer Section 4
Legal Obligations	• Refer Section 3
Mine Closure Objective	• Rehabilitated with native vegetation
Interim Completion Criteria	• Flora species diversity ≥70% of reference sites • Percentage foliar cover ≥70% of reference sites • Weeds ≤5% cover
Closure Assumptions	• Prior to development, vegetation and topsoil and subsoil will be cleared from the area of development and stockpiled at the outer edges for use in progressive rehabilitation works • Successful rehabilitation will allow for the recolonisation of fauna species over time
Management Actions	• Civil earthworks to landform the haul road area (including removal of drainage structures) so as to be comparable with surrounding land • Surfaces ripped along contour • Topsoil, subsoil and vegetation respread
Monitoring	• Botanical assessment
Responsibility	• General Manager Operations (Civil Earthworks) • Manager Environmental Services (Botanical Assessment)
Further Investigation	• Further investigations are not currently considered necessary
Implementation Description	• Not currently applicable
Bond Reduction	• Not currently applicable
Relinquishment	• Not currently applicable

Table 10-3 Work Program for Windarling Range W4 Deposit Haul Road Mine Closure Management Unit.

11. MINE CLOSURE MONITORING AND MAINTENANCE

11.1 MONITORING

Monitoring of mine closure is necessary to assist in the development of final completion criteria, and in determining whether the final completion criteria have been met (refer Section 8). Table 11-1 identifies the proposed monitoring schedule for mine closure of the Windarling Range W4 Deposit infrastructure. Table 11-2 identifies the monitoring to be undertaken to monitor against each completion criteria and the frequency of monitoring.

Monitoring of mine closure for the Windarling Range W4 Deposit infrastructure is expected to commence from 2016 as part of progressive mine closure actions (refer Section 10) and continue to 2024 when Cliffs anticipates the final completion criteria for the Windarling Range W4 Deposit infrastructure could be met. Formal monitoring has generally been scheduled by Cliffs to occur each 2 years. Specifically with regard to monitoring the rehabilitation works for the Windarling Range W4 West Deposit Waste Rock Landform, formal monitoring has been scheduled by Cliffs to occur each 1 year for the first 3 years, 2016 to 2018, in order to apply specific focus on the success of initial rehabilitation methodology and outcomes, noting the slopes of the Windarling Range W4 West Deposit Waste Rock Landform likely being the most challenging of the areas to rehabilitate. All monitoring will be undertaken by suitably qualified personnel.

The schedule of formal monitoring will be in addition to the informal monitoring (observations) by Cliffs' on-site mining and environmental personnel during implementation of mine operations and mine closure actions. The mine closure monitoring identified in Table 11-2 is in addition to the internal auditing undertaken as part of standard mine operations (such as ensuring land clearing includes removal and segregation of topsoil and subsoil for later use in rehabilitation, appropriate segregation and placement of waste rock, etc).

11.2 MAINTENANCE

Where monitoring indicates that progress towards meeting the completion criteria for the Windarling Range W4 Deposit infrastructure is not progressing as necessary, maintenance (or contingency) actions will be implemented. Such actions may include additional:

- Civil earthworks;
- Removal of infrastructure;
- Investigation and remediation of contamination; and/or
- Seeding, or planting of seedlings.

11.3 FINANCIAL SECURITY

In accordance with s126 of the *Mining Act 1978* (WA), Cliffs is required to lodge with DMP a financial security (bond) to for compliance with the *Mining Act 1978* (WA) and compliance with the tenement conditions. During progressive mine closure, Cliffs will apply to have the financial securities progressively reduced for the Windarling Range W4 Deposit infrastructure in accordance with the DMP Bond Policy (DMP 2010), which identifies the following bond reduction targets and rates:

- Primary earthworks – 50% reduction of financial security;
- Finishing earthworks – 30% reduction of financial security; and
- Revegetation – 20% reduction of financial security.

11.4 RELINQUISHMENT

Where monitoring identifies that the agreed completion criteria for the Windarling Range W4 Deposit infrastructure have been met, Cliffs will apply to DMP and EPA to have agreement that the process of mine closure has been completed. Agreement will relinquish Cliffs of further responsibility for land management under both the *Mining Act 1978* (WA) and the *Environmental Protection Act 1986* (WA), and allow for long-term responsibility of the land to be transferred from Cliffs to the landowner.

	Year								
	2016	2017	2018	2019	2020	2021	2022	2023	2024
Mine Closure Management Unit									
Windarling Range W4 East Deposit Mine Pit			✓						
Windarling Range W4 West Deposit Waste Rock Landform	✓	✓	✓		✓		✓		✓
Windarling Range W4 Deposit Haul Road			✓		✓		✓		✓

Table 11-1 Mine Closure Monitoring Schedule Summary.

Mine Closure Management Unit	Interim Completion Criteria	Monitoring	Frequency
Windarling Range W4 East Deposit Mine Pit	• Abandonment bunding installed to design criteria: o 2m height o 5m base width o Located beyond zone of potential instability	Survey	Once, 2018
Windarling Range W4 West Deposit Waste Rock Landform	• Construction to design criteria: o 15° batters o 10m lifts o 5m berms with 5° backslope o Outer cover of topsoil and subsoil for rehabilitation	Survey	Each 2 years, 2016-2024
	• Surface water drainage controlled, comparable with drainage in surrounding areas	Visual inspection	Each 2 years, 2016-2024
	• Flora species diversity ≥70% of reference sites • Percentage foliar cover ≥70% of reference sites • Weeds ≤5% cover	Botanical assessment	Each 1 year, 2016-2018 Each 2 years, 2020-2024
Windarling Range W4 Deposit Haul Road	• Flora species diversity ≥70% of reference sites • Percentage foliar cover ≥70% of reference sites • Weeds ≤5% cover	Botanical assessment	Each 2 years, 2018-2024

Table 11-2 Mine Closure Monitoring.

12. INFORMATION AND DATA

Information and data related to mine closure are maintained by Cliffs to enable retrieval when required to inform mine closure. This information and data is maintained in both hardcopy and digital formats, and is accessible to relevant personnel involved in mine closure. Section 13 References identifies the key information and data sources relevant to mine closure of the Windarling Range W4 Deposit infrastructure.

Additional information and data will be obtained during development of the Windarling Range W4 Deposit infrastructure that will additionally assist in mine closure. This additional information will be similarly maintained to ensure access to relevant personnel involved in mine closure.

Cliffs' management of compliance information (such as implementation of this Mine Closure Plan) is undertaken with the assistance of the Intelex document management system.

The list of relevant information and data identified in Section 13 References will be updated in this Mine Closure Plan when subject to periodic review.

13. REFERENCES

The following references have been cited in this Mine Closure Plan.

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14. APPENDICES

Appendix 1 Risk Rating and Management Response

Appendix 2 Risk Rank from Likelihood Criteria and Consequence Criteria

Appendix 3 Consequence Criteria

APPENDIX 1

Risk Rating and Management Response.
The risks ratings are categorised by the management response required to address the risk.

Risk Rating	Management Response
Critical	Critical Risk: Risk requires changes to project design or operating procedures.
High	High Risk: Risk requires research and/or planning to develop specific management actions.
Medium	Moderate Risk: Risk manageable by implementing management actions based on existing information.
Low	Low Risk: Risk manageable by implementing standard management actions.

APPENDIX 2

Risk Rank from Likelihood Criteria and Consequence Criteria.

The likelihood scale ratings (A to E) are based on the likelihood of events occurring. The consequence scale ratings (1 to 5) are based on the consequence of the event. The consequence scale ratings are assessed using the consequence criteria identified in Appendix 3. Assessment of the likelihood and consequence of a mine closure aspect produce a risk rank (L1 to C25).

Likelihood Scale			Consequence Scale				
	For ongoing activities	For defined time activities	1	2	3	4	5
A	Many times each year	99% chance	M11	H16	C20	C23	C25
B	Once each year	50% chance	M7	H12	H17	C21	C24
C	Once each 5 years	10% chance	L4	M8	H13	C18	C22
D	Once each 15 years	1% chance	L2	L5	M9	H14	C19
E	Unlikely in life of mine	0.1% chance	L1	L3	L6	M10	H15

APPENDIX 3

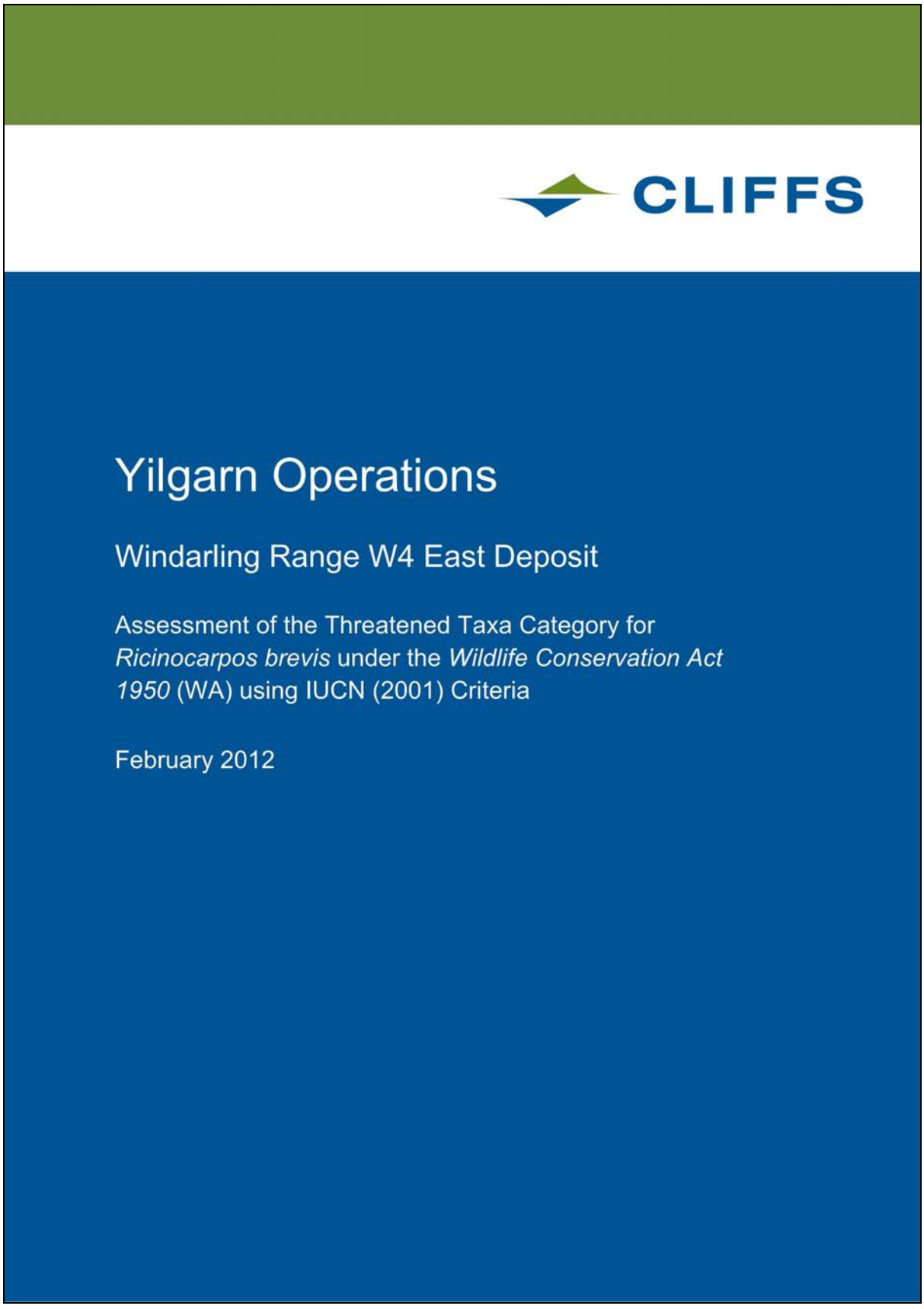
Consequence Criteria.

The consequence scale rating (1 to 5) for a risk is based on consideration of one or a number of defined factors (F to OE).

Consequence Scale	Business Impact (F)	Health (H)	Safety (S)	Environment (E)	Reputation, Community and Public Relations (R)	Compliance (C)	Employee Development / Organizational Effectiveness (OE)
5	> $20million.	Long term chronic health effects to workers or public with potential for death	Fatality (Including multiple fatalities, permanent disability)	Large scale long-term environmental damage offsite and/or a compliance breach that threatens continued operation.	International adverse media coverage. Severe, prolonged local community resistance.	Operations suspended or severely reduced by authorities.	Prolonged strike. Unavailability or loss of multiple key skills or personnel.
4	$5million to $20million	Long term chronic health effects to workers or public with major impact on body function or lifestyle	Serious injury. (Serious injury and hospitalization, temporary disability.)	Large scale short-term environmental damage offsite and/or a compliance breach sanction.	National adverse media coverage; reduction in credibility with major stakeholders; persistent community problems.	Major breach of regulation. Potential for severe fines and/or litigation.	Strike. Unavailability or loss of a few key skills or personnel.
3	$1million to $5million	Chronic health effects causing partial impact on body function(s).	Moderate injury. (Minor or short-term loss of body function. Loss time incident.)	Small scale environmental damage offsite and/or a reportable compliance breach; major environmental damage onsite.	Local adverse media coverage; repeated community complaints.	Serious breach of internal policy; breach of regulation; potential for fines and/or litigation.	Arbitration; occasional shortage of key skills or personnel.
2	$100,000 to $1million	Health treatment requiring medical treatment or intervention; but not permanent.	Medical treatment. (Treatment that must be given by a doctor.)	Significant environmental damage onsite; minor offsite impact; and/or technical compliance breach.	Low level community dissatisfaction.	Internal non-compliance; minor breach of regulation; no fines or litigation.	Grievance activity by group.
1	Less than $100,000	Transitory health impact.	Minor impact. (First Aid Treatment)	Minor environmental impact and/or technical compliance breach.	Isolated local community incident.	Insignificant internal non-compliance.	Isolated employee dissatisfaction.

APPENDIX 9

Assessment of the Threatened Taxa category for *Ricinocarpos brevis* using IUCN (2001) Criteria (Cliffs 2012b)


CLIFFS
Yilgarn Operations
Windarling Range W4 East Deposit
Assessment of the Threatened Taxa Category for *Ricinocarpos brevis* under the *Wildlife Conservation Act 1950* (WA) using IUCN (2001) Criteria
February 2012

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Summary

Cliffs Asia Pacific Iron Ore Pty Ltd's (Cliffs) Yilgarn Operations include the mining of iron ore deposits at the Koolyanobbing Range, Mt Jackson Range and the Windarling Range, processing of ore at Koolyanobbing, and road and rail transport between these operations and the Port of Esperance where the processed ore is exported to international customers.

Cliffs proposes to expand its Yilgarn Operations to include an additional mining operation at the Windarling Range W4 East Deposit, located at the Windarling Range approximately 130km north of the town of Southern Cross in the Shire of Yilgarn. Development of the Windarling Range W4 East Deposit proposal will impact the flora species *Ricinocarpos brevis*, which has been declared as 'Rare Flora' under the *Wildlife Conservation Act 1950* (WA) and as a 'Threatened Species' of flora under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th).

Ricinocarpos brevis was declared as Rare Flora under the *Wildlife Conservation Act 1950* (WA) in 2005. The declaration as Rare Flora was based upon an assessment by DEC (2004) using the International Union for Conservation of Nature (IUCN) criteria (IUCN 2001). The DEC (2004) assessment identified that *Ricinocarpos brevis* met the category of 'Critically Endangered'.

This report has been prepared to assess the potential for a change to the threatened taxa category for *Ricinocarpos brevis* as a result of implementation of the Windarling Range W4 East Deposit proposal. The assessment uses the criteria of IUCN (2001) as used by the Department of Environment and Conservation (DEC) in assessment under the *Wildlife Conservation Act 1950* (WA). For context, this report should be read in conjunction with the Environmental Impact Assessment (EIA) document for the Windarling Range W4 East Deposit proposal (Cliffs 2012).

The assessment contained within this report identifies that implementation of the Windarling Range W4 East Deposit proposal is not expected to result in an increase to the threatened taxa category under the IUCN (2001) criteria.

Assessment

Background

Ricinocarpos brevis was declared as 'Rare Flora' under the *Wildlife Conservation Act 1950* (WA) in 2005. The declaration as Rare Flora was based upon an assessment by DEC (2004) using the International Union for Conservation of Nature (IUCN) criteria (IUCN 2001), with *Ricinocarpos brevis* considered by DEC to meet the category of 'Critically Endangered'. The IUCN criteria are summarised in Appendix 1 (IUCN 2011).

Populations of *Ricinocarpos brevis* have been recorded at the Windarling Range, Johnston Range and the Perrinvale Range. *Ricinocarpos brevis* population estimates have been made through both census (counting of plants) and field estimate methods, with a total population estimated at approximately 24,100 individuals (Cliffs 2012).

The term 'population' used in IUCN (2001) is defined as the total number of mature individuals of the taxon (IUCN 2011). This approach differs from the common biological usage of defining populations as geographically or genetically distant groupings of the same taxon. This approach also excludes non-reproductive individuals of the taxon.

Population census undertaken at the Windarling Range (Western Botanical 2011) and the Perrinvale Range (Western Botanical 2008) indicate that approximately 70% of the individuals recorded were classified as mature. Accordingly, a total mature population of approximately 16,900 *Ricinocarpos brevis* individuals (i.e. 70% of the total 24,100 individuals), of which approximately 12,800 *Ricinocarpos brevis* individuals are extant, is applicable for assessment using the IUCN (2011) criteria, as identified by Table 1.

Location	***Ricinocarpos brevis* Population**
Windarling Range	12,700 individuals (8,600 individuals extant)
Johnston Range	2,100 individuals
Perrinvale Range	2,100 individuals
Total	**16,900 individuals**
Total Extant	**12,800 individuals**

Table 1 Population Estimate for *Ricinocarpos brevis*. Non-mature individuals have been excluded in accordance with IUCN (2011). Data sources: Cliffs (2012); DEC (2011a); Western Botanical (2008); Western Botanical (2011).

Of the estimated population of 16,900 mature *Ricinocarpos brevis* individuals, approximately 5,700 mature individuals (34%) occur within areas at the Windarling Range that have previously been authorised for the mine operations for the Windarling Range Deposits W1, W2, W3/5 and W4 West. As at 1st December 2011, approximately 24% (4,100 mature *Ricinocarpos brevis* individuals) had been removed in development of the Windarling Range Deposits W2 and W3/5, and with further development of the Windarling Range Deposits W1, W3/5 and W4 West to remove the remaining approved 10% (1,600 mature *Ricinocarpos brevis* individuals) of the total 34% of mature *Ricinocarpos brevis* individuals currently approved to be impacted.

Cliffs proposes to expand its Windarling range mine operations to include development of the Windarling Range W4 East Deposit proposal. The Windarling Range W4 East Deposit proposal is expected to impact an additional approximately 720 total *Ricinocarpos brevis* individuals after direct environmental offsets are taken into consideration (refer to Cliffs 2012), of which an estimated 500 *Ricinocarpos brevis* individuals (70%) are estimated to be mature. The additional approximately 500 mature *Ricinocarpos brevis* individuals to be impacted by the Windarling Range W4 East Deposit proposal equates to an additional 3% impact to the *Ricinocarpos brevis* population; being from the currently approved population impact of approximately 34% to an increased population impact of approximately 37%.

Assessment

Table 2 provides an assessment of the IUCN (2001) criteria for *Ricinocarpos brevis*, which incorporates the cumulative impact to *Ricinocarpos brevis* from both the previously approved Windarling Range mine operations and the proposed Windarling Range W4 East Deposit proposal. Table 2 is formatted as per the IUCN (2011) summary format; being the same format used by DEC for assessment (as per DEC 2011b).

Cliffs' assessment of *Ricinocarpos brevis* against the IUCN (2001) criteria was undertaken consistent with the relevant guidance contained within IUCN (2001) and IUCN (2011). The relevant threatened taxa criteria considered applicable are highlighted in yellow.

Results

As identified by Table 2, Cliffs' assessment concludes that the threatened taxa category of 'Endangered' is applicable based on IUCN (2001) Criteria B1, being that *Ricinocarpos brevis* has a geographic extent of occurrence of approximately 1,700km^2; thereby meeting the <5,000km^2 criteria for the category of 'Endangered'.

The IUCN (2001) Criteria A4 was also met for the threatened taxa category of 'Vulnerable', being that the past and projected population reduction is estimated at approximately 37%; thereby meeting the >30% criteria for the category of 'Vulnerable.

The IUCN (2001) Criteria D was also met for the threatened taxa category of 'Vulnerable'. Whilst the number of mature *Ricinocarpos brevis* individuals post-impact exceed 1,000 individuals and the area of occupancy exceeds 20km^2 under Criteria D, *Ricinocarpos brevis* has been recorded at 3 locations; thereby meeting the ≤ 5 locations criteria for the category of 'Vulnerable'.

No other criteria were met.

Whilst noting that the 'Vulnerable' categories were met for both IUCN (2001) Criterion A4 and D, the higher category of 'Endangered' that was met for IUCN (2001) Criteria B1 should be taken as the applicable threatened taxa category for *Ricinocarpos brevis*.

Effect of implementation of the Windarling Range W4 East Deposit proposal

Based on this assessment, implementation of the Windarling Range W4 East Deposit proposal is not expected to result in an increase to the threatened taxa category of 'Critically Endangered' currently adopted by DEC under the *Wildlife Conservation Act 1950* (WA) using the IUCN (2001) criteria. By contrast, the assessment supports a revision of the threatened taxa category to adopt the lower threatened taxa category of 'Endangered' under the *Wildlife Conservation Act 1950* (WA).

Current Threatened Taxa Status under State and Commonwealth Legislation

The threatened taxa category of 'Endangered' identified by this assessment is lower than the previous 'Critically Endangered' category adopted by DEC (2004). The lower category of "Endangered' identified by this assessment appears largely a result of the increased extent of occurrence through the subsequent identification of *Ricinocarpos brevis* at the Johnston Range and Perrinvale Range, and the subsequent increased total number of mature individuals recorded at the Windarling Range, Johnston Range and Perrinvale Range locations.

To adopt the lower threatened taxa category of 'Endangered' under the *Wildlife Conservation Act 1950* (WA), as suggested by this assessment, would be consistent with the more recent classification adopted under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th). In 2010, *Ricinocarpos* brevis was listed as a 'Threatened Species' of flora under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th), with the threatened taxa category of 'Endangered' adopted (DoSEWPC 2010a; DoSEWPC 2010b). This listing followed an assessment using the criteria in Regulation 7.01 of the *Environment Protection and Biodiversity Conservation Regulations 2000* (C'th), which is considered similar to the IUCN (2001) criteria.

Table 2 Assessment of Threatened Taxa Categories for *Ricinocarpos brevis* using IUCN (2001) Criteria.

This assessment includes consideration of the impact of both currently approved impacts and the impact of the Windarling Range W4 East Deposit proposal, and was undertaken consistent with the relevant guidance contained within IUCN (2001) and IUCN (2011). The highlighted criteria are those that are considered to be applicable.

Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable	Cliffs' Assessment
A. Population reduction Declines measured over the longer of 10 years or 3 generations				
A1	> 90%	> 70%	> 50%	
A2, A3 & A4	> 80%	> 50%	> 30%	
A1. Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction are clearly reversible AND understood AND have ceased, based on and specifying any of the following: (a) direct observation (b) an index of abundance appropriate to the taxon (c) a decline in area of occupancy (AOO), extent of occurrence (EOO) and/or habitat quality (d) actual or potential levels of exploitation (e) effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.				Not applicable: This criteria regards past population reduction that is understood and has ceased. The past population reduction for *Ricinocarpos brevis* does not meet the minimum >50% criteria. The past population reduction is estimated at approximately 24% to date, based on a recorded impact to approximately 4,100 mature *Ricinocarpos brevis* individuals of the estimated approximately 16,900 mature individuals of the population (Cliffs 2012).
A2. Population reduction observed, estimated, inferred, or suspected in the past where the causes of reduction may not have ceased OR may not be understood OR may not be reversible, based on any of (a) to (e) under A1.				Not applicable: This criteria regards past population reduction that may not have ceased, may not be understood or may not be reversible. The past population reduction for *Ricinocarpos brevis* does not meet the minimum >30% criteria. The past population reduction is estimated at approximately 24% to date, based on a recorded impact to approximately 4,100 mature *Ricinocarpos brevis* individuals of the estimated approximately 16,900 mature individuals of the population (Cliffs 2012).
A3. Population reduction projected or suspected to be met in the future (up to a maximum of 100 years) based on any of (b) to (e) under A1.				Not applicable: This criteria regards future population reduction. The projected population reduction does not meet the minimum >30% criteria. The projected population reduction is estimated at approximately 13%, based on projected impact to a further 2,100 individuals of the estimated approximately 16,900 mature individuals of the population (Cliffs 2012).

Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable	Cliffs' Assessment
A4. An observed, estimated, inferred, projected or suspected population reduction (up to a maximum of 100 years) where the time period must include both the past and the future, and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible, based on any of (a) to (e) under A1.				**CRITERIA A4 IS APPLICABLE FOR THE 'VULNERABLE' CATEGORY:** This criteria regards past and future population reductions that may not have ceased, may not be understood or may not be reversible. The past and projected population reduction is estimated at approximately 37%, based on the estimated approximately 16,900 mature individuals of the population of which approximately 4,100 mature *Ricinocarpos brevis* individuals have been impacted to date (24%), a projected impact to a further 1,600 mature *Ricinocarpos brevis* individuals by currently approved mine operations (10%), and impact to a further 500 mature *Ricinocarpos brevis* individuals to be impacted by the Windarling Range W4 East Deposit proposal (3%); thereby meeting the >30% criteria for the 'Vulnerable' category under IUCN (2001) Criteria A4. The Windarling Range W4 East Deposit proposal will not result in a change to the threatened taxa Category for *Ricinocarpos brevis* under IUCN (2001) Criteria A4. The currently approved impact to *Ricinocarpos brevis* at 34% and the proposed increased impact to 37% from implementation of the Windarling Range W4 East Deposit proposal both meet the >30% criteria for the 'Vulnerable' category under IUCN (2001) Criteria A4.
B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)				
B1. Extent of occurrence	< 100 km²	< 5,000 km²	< 20,000 km²	**CRITERIA B1 IS APPLICABLE FOR THE 'ENDANGERED' CATEGORY:** The extent of occurrence for *Ricinocarpos brevis* is approximately 1,700km^2 (DEC 2009 in DoSEWPC 2010b); thereby meeting the <5,000km^2 criteria for the 'Endangered' category under IUCN (2001) Criteria B1. The Windarling Range W4 East Deposit proposal will not result in a change to the threatened taxa Category for *Ricinocarpos brevis* under IUCN (2001) Criteria B1. The proposed Windarling Range W4 East Deposit proposal will not reduce the area of occurrence for *Ricinocarpos* brevis, and accordingly, the <5,000km^2 criteria for the 'Endangered' category under IUCN (2001) Criteria B1 will not be affected.

Use any of the criteria A-E		Critically Endangered	Endangered	Vulnerable	Cliffs' Assessment
B2.	Area of occupancy	< 10 km²	< 500 km²	< 2,000 km²	Not applicable: Whilst *Ricinocarpos brevis* has ≤5 recorded locations covering an area <500km² (which would meet the 'Endangered' category under IUCN (2001) Criteria B2), the *Ricinocarpos brevis* population is not severely fragmented such that fragmentation is expected to result in an increased risk of extinction under criteria B2(a) (refer to IUCN 2001, Section 3, for further information on the interpretation of 'severely fragmented'), and a continuing decline is not expected under criteria B2(b) (refer to IUCN 2001, Section 3, for further information on the interpretation of 'continuing decline').
	and 2 of the following 3:				
	(a) severely fragmented or # locations	= 1	≤ 5	≤ 10	
	(b) continuing decline in (i) extent of occurrence (ii) area of occupancy, (iii) area, extent and/or quality of habitat, (iv) number of locations or subpopulations and (v) number of mature individuals.				
	(c) extreme fluctuations in any of (i) extent of occurrence, (ii) area of occupancy, (iii) number of locations or subpopulations and (iv) number of mature individuals.				
C.	**Small population size and decline**				Not applicable: The number of mature *Ricinocarpos brevis* individuals post-impact is estimated at approximately 10,200 individuals. Whilst a decline in the *Ricinocarpos brevis* population has been observed and projected, the number of mature *Ricinocarpos brevis* individuals post-impact does not meet the minimum <10,000 individuals criteria. Assessment against criteria C1 and C2 is therefore not necessary.
	Number of mature individuals and either **C1** or **C2**:	< 250	< 2,500	< 10,000	
C1.	An estimated continuing decline of at least of up to a maximum of 100 years	25% in 3 years or 1 generation	20% in 5 years or 2 generations	10% in 10 years or 3 generations	
C2.	A continuing decline and (a) and/or (b):				
	(a i) # mature individuals in largest subpopulation:	< 50	< 250	< 1,000	
	(a ii) or % individuals in one subpopulation =	90-100%	95-100%	100%	
	(b) extreme fluctuations in the number of mature individuals				

Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable	Cliffs' Assessment
D. Very small or restricted population				
Either (1) number of mature individuals or (2) restricted area of occupancy	< 50 na	< 250 na	< 1,000 typically: AOO < 20 km² or # locations ≤ 5	**CRITERIA D IS APPLICABLE FOR THE 'VULNERABLE' CATEGORY:** Whilst the number of mature *Ricinocarpos brevis* individuals post-impact greatly exceed 1,000 individuals and the area of occupancy greatly exceeds 20km^2, *Ricinocarpos brevis* has been recorded at 3 locations; thereby meeting the ≤ 5 locations criteria for the 'Vulnerable' category under IUCN (2001) Criteria D.
E. Quantitative Analysis				
Indicating the probability of extinction in the wild to be at least:	50% in 10 years or 3 generations (100 years max)	20% in 20 years or 5 generations (100 years max)	10% in 100 years	Not applicable: *Ricinocarpos brevis* is not expected to become an extinct taxa. Extinction is not expected as a result of separate locations of the population (Windarling Range, Johnston Range and Perrinvale Range) and impacts being limited to only 1 location (Windarling Range).

References

Cliffs Asia Pacific Iron Ore Pty Ltd (2012) *Yilgarn Operations Windarling Range W4 East Deposit Environmental Protection Act 1986 (WA) Environmental Impact Assessment (Assessment on Proponent Information)*. Report prepared by Globe Environments Australia Pty Ltd for Cliffs Asia Pacific Iron Ore Pty Ltd. Revision D, February 2012.

Department of Environment and Conservation (2004) *Flora Nomination Form: Ricinocarpos brevis ms*. Form for consideration at the 2004 Threatened Species Scientific Committee meeting for assessment of *Ricinocarpos brevis* as Rare Flora under the *Wildlife Conservation Act 1950* (WA). Prepared by the former Department of Conservation and Land Management.

Department of Environment and Conservation (2011a) *Ricinocarpos brevis Interim Recovery Plan 2011 - 2016*. Interim Recovery Plan No. 312. August 2011.

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International Union for Conservation of Nature (2001). *IUCN Red List Categories and Criteria*. Version 3.1. IUCN Species Survival Commission, Switzerland and United Kingdom.

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Western Botanical (2011) *Ricinocarpos brevis 2009 Census at Windarling Range*. Report prepared by McNee S for Cliffs Asia Pacific Iron Ore Pty Ltd. October 2011.

Western Australian legislation cited can be obtained from the State Law Publisher at http://www.slp.wa.gov.au. Commonwealth legislation and International Treaties cited can be obtained from the Australian Legal Information Institute at http://www.austlii.edu.au.

Appendix 1
IUCN criteria

Source: IUCN (2011).

Use any of the criteria A-E		Critically Endangered	Endangered	Vulnerable
A.	**Population reduction** Declines measured over the longer of 10 years or 3 generations			
	A1	> 90%	> 70%	> 50%
	A2, A3 & A4	> 80%	> 50%	> 30%
A1.	Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction are clearly reversible AND understood AND have ceased, based on and specifying any of the following: (a) direct observation (b) an index of abundance appropriate to the taxon (c) a decline in area of occupancy (AOO), extent of occurrence (EOO) and/or habitat quality (d) actual or potential levels of exploitation (e) effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.			
A2.	Population reduction observed, estimated, inferred, or suspected in the past where the causes of reduction may not have ceased OR may not be understood OR may not be reversible, based on any of (a) to (e) under A1.			
A3.	Population reduction projected or suspected to be met in the future (up to a maximum of 100 years) based on any of (b) to (e) under A1.			
A4.	An observed, estimated, inferred, projected or suspected population reduction (up to a maximum of 100 years) where the time period must include both the past and the future, and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible, based on any of (a) to (e) under A1.			
B.	**Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)**			
B1.	Extent of occurrence	< 100 km²	< 5,000 km²	< 20,000 km²
B2.	Area of occupancy	< 10 km²	< 500 km²	< 2,000 km²
	and 2 of the following 3:			
	(a) severely fragmented or # locations	= 1	≤ 5	≤ 10
	(b) continuing decline in (i) extent of occurrence (ii) area of occupancy, (iii) area, extent and/or quality of habitat, (iv) number of locations or subpopulations and (v) number of mature individuals.			
	(c) extreme fluctuations in any of (i) extent of occurrence, (ii) area of occupancy, (iii) number of locations or subpopulations and (iv) number of mature individuals.			
C.	**Small population size and decline**			
	Number of mature individuals	< 250	< 2,500	< 10,000
	and either **C1** or **C2**:			
C1.	An estimated continuing decline of at least of up to a maximum of 100 years	25% in 3 years or 1 generation	20% in 5 years or 2 generations	10% in 10 years or 3 generations
C2.	A continuing decline and (a) and/or (b):			
	(a i) # mature individuals in largest subpopulation:	< 50	< 250	< 1,000
	(a ii) or % individuals in one subpopulation =	90-100%	95-100%	100%
	(b) extreme fluctuations in the number of mature individuals			
D.	**Very small or restricted population**			
	Either (1) number of mature individuals	< 50	< 250	< 1,000
	or (2) restricted area of occupancy	na	na	typically: AOO < 20 km² or # locations ≤ 5
E.	**Quantitative Analysis**			
	Indicating the probability of extinction in the wild to be at least:	50% in 10 years or 3 generations (100 years max)	20% in 20 years or 5 generations (100 years max)	10% in 100 years

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