Government of Western Australia
Department of Mines, Industry Regulation and Safety

Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	10167/1
Permit type:	Purpose Permit
Applicant name:	Fortescue Metals Group Ltd
Application received:	27 April 2023
Application area:	4.75 hectares
Purpose of clearing:	Mineral exploration
Method of clearing:	Mechanical Removal
Tenure:	Mining Lease 45/1226
Location (LGA area/s):	Shire of East Pilbara
Colloquial name:	Shooting Star Prospect

1.2. Description of clearing activities

Fortescue Metals Group Ltd proposes to clear up to 4.75 hectares of native vegetation within a boundary of approximately 353 hectares, for the purpose of mineral exploration. The project is located approximately 73.5 kilometres west of Marble Bar, within the Shire of East Pilbara.

The application is to allow for mineral exploration, including associated pad and track construction at the Shooting Star Prospect.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	27 June 2023
Decision area:	4.75 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) on 27 April 2023. DMIRS advertised the application for a public comment for a period of 21 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix A), relevant datasets (Appendix E), supporting information provided by the applicant (Appendix D) including the results of a flora and vegetation survey, the clearing principles set out in Schedule 5 of the EP Act (Appendix C), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- potential impacts to conservation significant flora; and
- the loss of native vegetation that is suitable habitat for conservation significant fauna.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- flora management condition to ensure no clearing of identified *Quoya zonalis* plants are cleared and maintain a 50 metre buffer, however FMG are permitted to clear within the 50 metre buffer zone of 5% (212 individuals); and
- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat.

2. Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Mining Act 1978* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2014)
- *Procedure: Native vegetation clearing permits* (DWER, October 2021)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

In the supporting documentation for the Shooting Star drilling programme (FMG, 2023), the proponent advised that management actions will be implemented to mitigate the potential impacts from the proposed clearing. Some of these management actions are:

- Identified conservation significant flora will be recorded and appropriately flagged in the field;
- ensure staff and contractors area aware of the location of conservation significant flora and their responsibility to ensure they are protected;
- weed hygiene management will be implemented;
- vehicles will be confined to defined roads and access tracks;
- vehicles will adhere to appropriate speed limits on all roads;
- vehicle movement will be restricted to daylight hours only; and
- flood ways will be constructed at drainage line crossings.

For the full management measures FMG (2023) have committed to that will minimise impacts to threatened flora can be found in Appendix D.

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles identified that the impacts of the proposed clearing present a risk to biological values (fauna, flora, and vegetation). The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values - Clearing Principles (a, b, and c)

Assessment

FLORA

Two flora and vegetation surveys and two targeted flora surveys have been conducted over the application area and surrounds (FMG, 2023). One Threatened flora species was recorded during these surveys: *Quoya zonalis* (EN, previously named *Pityrodia* sp.) (FMG, 2023).

The area proposed to be cleared contains 4,240 individuals of Threatened flora species *Quoya zonalis* (FMG, 2023). FMG (2023) have committed to avoiding all recorded individuals of *Quoya zonalis*, however there may be inadvertent impacts to these plants as a result of the proposed works (DBCA, 2023). Less than 5% (212 individuals) of the proposed clearing falls within the 50 metre buffer zone of the recorded locations of *Quoya zonalis* (FMG, 2023). The proposed clearing within 50 metres of 212 individuals is unlikely significantly impact the conservation of this species if inadvertent impacts were to occur. In addition, FMG (2023) have an approved Threatened Flora Authorisation (TFL 2223-0114) under Section 40 of the *Biodiversity Conservation Act 2016*, for unintentional take as a result of indirect impacts from their exploration activities. The Authorisation outlines conditions that will need to be adhered to (DBCA, 2023):

- hygiene measures to reduce the introduction and spread of weeds and diseases;
- flagging all individuals of *Quoya zonalis* within the 50 metre buffer zone for avoidance; and
- a qualified botanist should be onsite to ensure works are undertaken appropriately to avoid all Threatened flora.

In addition, FMG (2023) have their own management measures they will implement in addition to their Section 40 Authorisation to minimise impacts on and protect conservation significant flora and vegetation (Table 1 in Appendix D).

FAUNA

A fauna survey was conducted over the application area and surrounds by Ecologia Environment in March, April, July, October, and November 2011, for a total of 54 days (Ecologia Environment, 2012a). The survey identified two fauna habitats within the application area:

HABITAT TYPE	DESCRIPTION	Area (ha)	Area (%)
Hills, ranges, plateaus	Open vegetation structure with low sparse *Eucalyptus* and shrubland of *Acacia* species, *Senna* species, and *Solanum lasiophyllum* over tussock grassland of *Triodia* species	341.32	96.7
Rocky escarpments (ridges, mesa, cliffs, outcrops, breakaways)	Cliff faces along rocky ridges and breakaways with numerous vertical and horizontal crevices and rocky gorges with semi-permanent waterholes	11.67	3.3

The fauna assessment recorded a number of conservation significant fauna species in the broader survey area (Ecologia Environment, 2012a; FMG; 2023; Appendix A.3). Only northern quoll and Pilbara leaf-nosed bat were only recorded within the application area, and were only found in the rocky escarpment habitat (Ecologia Environment, 2012a; FMG, 2023).

The rocky escarpment habitat is considered critical habitat for northern quoll (*Dasyurus hallucatus*, EN), Pilbara leaf-nosed bat (*Rhinonicteris aurantia* (Pilbara form), VU), and Pilbara olive python (*Liasis olivaceus barroni*, VU) (Ecologia Environment, 2012a; FMG, 2023).

The rocky escarpment habitat may host potentially suitable denning habitat, and be utilised by northern quoll whilst foraging or moving through the area (FMG, 2023). There were no roosts or caves suitable for roosts for Pilbara leaf-nosed bat located within the application area (FMG, 2023).

Conclusion

Based on the management measures, commitments, and Section 40 Authorisation, it is not expected that the proposed clearing will have direct impacts to *Quoya zonalis*, however there may be indirect impacts from the proposed exploration (FMG, 2023; DBCA, 2023).

While the proposed clearing may have some impact on suitable habitat for northern quoll and Pilbara leaf-nosed bat, it is relatively low impact and temporary in nature (FMG, 2023). Ecologia Environment (2012a) identified suitable denning, roosting, dispersal, and foraging habitat for northern quoll and Pilbara leaf-nosed bat that extends well beyond the application area (Ecologia Environment, 2012a; FMG, 2023).

For the reasons set out above, it is considered that the impacts of the proposed clearing on can be managed by taking steps to minimise the risk of the introduction and spread of weeds, slow directional clearing to allow fauna to move into adjacent vegetation, and a flora management condition requiring FMG to avoid *Quoya zonalis* and maintain a 50 metre buffer, with the exception of being permitted to clear within the 50 metre buffer for 5% (212) of individuals.

The applicant may have notification responsibilities under the EPBC Act for impacts to a number of federally listed conservation significant species and their habitats, as set out in the EPBC Act referral guidelines for these species. The applicant has been advised to contact the federal Department of Climate Change, Energy, the Environment and Water (DCCEEW) to discuss EPBC Act referral requirements.

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- flora management condition to ensure no clearing of identified *Quoya zonalis* plants are cleared and maintain a 50 metre buffer, however FMG are permitted to clear within the 50 metre buffer zone of 5% (212 individuals); and
- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 9 May 2023 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim over the area under application (DPLH, 2023). This claim has been determined by the Federal Court on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (DPLH, 2023). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

Other relevant authorisations required for the proposed land use include:

- A Programme of Work approved under the *Mining Act 1978*.

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

End

Appendix A. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. It is surrounded by native vegetation and the landscape of the Pilbara region (GIS Database).
Ecological linkage	The application area does not form part of any formal or informal ecological linkages (GIS Database).
Conservation areas	The application areas is not located within any conservation areas. The closest conservation area is Mungaroona Range Nature Reserve which is located approximately 77 kilometres southwest of the application area (GIS Database).
Vegetation description	The vegetation of the application area is broadly mapped as the following Beard vegetation association: 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database). A flora and vegetation survey was conducted over the application area by Ecologia Environment during June to September, 2012. The following vegetation associations were recorded within the application area (Ecologia Environment, 2012b): **Acacia Open Shrubland (AtEm):** *Acacia tumida* and *Grevillea wickhamii* open tall shrubland over *Acacia orthocarpa* open mid shrubland *over Eriachne mucronata* isolated tussock grasses *over Dampiera candicans* isolated herbs. **Acacia Open Shrubland (AoTw):** *Acacia orthocarpa* open tall shrubland over *Triodia wiseana* open hummock grassland and *Eriachne pulchella* isolated tussock grasses. **Acacia Shrubland (At):** *Acacia tumida* and *Grevillea wickhamii* tall shrubland over *Indigofera monophylla* sparse low shrubland. **Triodia Hummock Grassland (GwTe):** *Grevillea wickhamii* sparse mid shrubland, over *Triodia epactia* or *Triodia schinzii* open hummock grassland and isolated *Eriachne ciliata* grasses and *Polycarpaea holtzei* herbs. **Triodia Hummock Grassland (Tl):** *Triodia lanigera* open hummock grassland, with Cyperus hesperius isolated sedges, *Eriachne ciliata* isolated grasses and *Cleome viscosa* isolated herbs. **Triodia Hummock Grassland (AiTb):** *Acacia inaequilatera* and *Grevillea wickhamii* sparse tall shrubland over *Acacia acradenia* sparse mid shrubland over *Triodia basedowii* and *Triodia wiseana* hummock grassland.
Vegetation condition	The vegetation survey (Ecologia Environment, 2012b) and aerial imagery indicate the vegetation within the proposed clearing area is in Excellent to Very Poor (Trudgen, 1991) condition. The full Trudgen (1991) condition rating scale is provided in Appendix C.
Climate	The application area is located is an arid zone with an annual average rainfall of 399.9 millimetres (BoM, 2023).
Soil description	The soil within the application area is mapped as soil unit Gf1 (GIS Database). This soil unit is described as steep ranges on basic lavas along with dolomites, tuff, banded iron formations, and dolerite dykes, with some narrow valley plains and high-level gently undulating areas of limited extent. The soils are generally shallow and stony and there are large areas without soil cover: chief soils are brown loams along with significant areas of earthy loam soils (Northcote et al., 1960-680).
Land degradation risk	The application area falls within the Capricorn land system (DPIRD, 2023). The Capricorn land system is described as rugged sandstone hills, ridges, stony footslopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs (DPIRD, 2023). The stoniness of the land system confers resistance to erosion (van Vreeswyk et al., 2004).
Waterbodies	The desktop assessment and aerial imagery indicated that several minor, non-perennial watercourses transect the area proposed to be cleared (GIS Database).
Hydrogeography	The application area is located within the Pilbara Groundwater Area, which is legislated by the *RIWI Act 1914* (GIS Database). The mapped groundwater salinity is 500-1,000 milligrams per litre total dissolved solids which is described as marginal (GIS Database).
Flora	There are several records of Threatened flora species *Quoya zonalis* within the application area (Spectrum, 2021). There are four Priority flora species that were identified within 10 kilometres of the application area (FMG, 2023; GIS Database).

Characteristic	Details
Ecological communities	The application area does not occur within or intersect any known or mapped Threatened or Priority Ecological Communities. The closest record is located approximately 96.5 kilometres south of the application area (GIS Database).
Fauna	Four conservation significant species have been identified in the application area and five other conservation significant species were identified within 25 kilometres of the application area (FMG, 2023; GIS Database).

A.2. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), and biological survey information, impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Euphorbia clementii	P3	Y	Y	Y	8.3 km	31	Y
Ptilotus mollis	P4	Y	Y	Y	8.7 km	43	Y
Quoya zonalis	EN	Y	Y	Y	0 km	24	Y
Themeda sp. *Panorama* (J. Nelson et al. NS 102)	P1	Y	Y	Y	0.23 km	7	Y
Triodia basitricha	P3	Y	Y	Y	8.2 km	34	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

(FMG, 2023; Western Australian Herbarium, 1998-; GIS Database)

A.3. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]	Recorded during surveys? [Y/N]
Gane's blind-snake	P1	Y	Y	0 km	40	Y	N
Northern quoll	EN	Y	Y	0 km	7925	Y	Y
Pilbara leaf-nosed bat	P4	Y	Y	0 km	2469	Y	Y
Pilbara olive python	VU	Y	Y	0 km	233	Y	Y
Ghost bat	VU	Y	Y	5.2 km	823	Y	Y
Greater bilby	VU	Y	Y	23 km	4233	Y	N
Grey falcon	VU	Y	Y	24 km	190	Y	Y
Long-tailed dunnart	P4	Y	Y	4.5 km	282	Y	Y
Western pebble-mound mouse	P4	Y	Y	4.8 km	1213	Y	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

(FMG, 2023; GIS Database)

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment:	At variance	Yes *Refer to Section 3.2.1, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
The application area contains Threatened flora and conservation significant fauna species (FMG, 2023). There are no know or mapped Priority Ecological Communities within the application area (FMG, 2023; GIS Database).		
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The area proposed to be cleared contains potential breeding and/or foraging habitat for conservation significant fauna. The vegetation associations present are common and widespread across the region (FMG, 2023).	May be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared contains 4,240 individuals of Threatened flora species *Quoya zonalis* (FMG, 2023).	At variance	Yes *Refer to Section 3.2.1, above.*
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: The area proposed to be cleared does not contain any known or mapped Threatened Ecological Communities (FMG, 2023; GIS Database).	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The application area falls within the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (GIS Database). Over 99 per cent of the pre-European vegetation still exists in the Pilbara Bioregion (Government of Western Australia, 2019). The application area is mapped as Beard vegetation association 82 (GIS Database). This vegetation association has not been extensively cleared as over 99 per cent of the pre-European extent of this vegetation association remain uncleared at both the state and bioregional level (Government of Western Australia, 2019).	Not at variance	No
Principle (h): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."* Assessment: Given the distance (77 kilometres) to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of any known or mapped conservation areas.	Not likely to be at variance	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: There are several drainage lines intersecting the application area (GIS Database). Impacts to vegetation growing in association with a watercourse can be managed by a vegetation management condition to avoid clearing of riparian vegetation where possible and maintaining water flows.	Not likely to be at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The land system mapped within the application area are not susceptible to erosion (van Vreeswyk et al., 2004). Noting the location of the application area, the proposed clearing is not likely to have an appreciable impact on land degradation.	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: Given permanent water courses, wetlands or Public Drinking Water Source Areas are recorded within the application area (GIS Database), the proposed clearing is unlikely to impact surface or ground water quality.	Not likely to be at variance	No
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: Given no permanent water courses or wetlands are recorded within the application area, and that the average annual evaporation (3,200 millimetres) is larger than the average annual rainfall (399.9 millimetres) (BoM, 2023), the proposed clearing is unlikely to cause, or exacerbate, the incidence or intensity of flooding.	Not likely to be at variance	No

Appendix C. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix D. Supporting documentation excerpts

Table 1: Management measures FMG (2023) will instate in order minimise any impact on flora and vegetation.

RISK PATHWAY AND IMPACTS	MANAGEMENT ACTIONS

• Unauthorised or over clearing resulting in unwanted direct loss of flora and vegetation
• Unauthorised or over clearing resulting in direct loss of conservation significant flora
	• Where significant flora and vegetation have been identified, ensure they are recorded in the Corporate GIS and Document Management System and appropriately flagged in the field.
	• Review the proposed ground disturbance and clearing against flora and vegetation data to avoid/minimise clearing of significant flora and vegetation.
	• Ensure staff and contractors are aware of the location of significant flora and vegetation on site and their responsibility to ensure they are protected.
	• Conduct vegetation clearing in accordance with a permit issued under the Land Use Certificate Procedure. Internal Land Use Certificates (LUC) will be required prior to commencement of activities, which may include:
	  ○ pre-clearance checks for conservation significant flora and/or vegetation undertaken by suitably experienced personnel prior to ground disturbance,
	  ○ areas to be cleared clearly delineated both on maps and on the ground,
	  ○ post-clearing audits undertaken to assess compliance with internal permits.
	• Any plants that may be impacted will be flagged prior to clearing works, as per the requirements of the S40 permit.

• Unauthorised vehicle movement resulting in direct loss of flora and vegetation • Unauthorised vehicle movement resulting direct loss of conservation significant flora	• Vehicles will be confined to defined roads and access tracks. • All Threatened and Priority Flora are to be identified on the ground by appropriate flagging prior to clearing. • Ensure staff and contractors are aware of the location of significant flora and vegetation on site and their responsibility to ensure they are protected.
• Introduction of weed species via increased vehicle movement resulting in degradation of vegetation	• Vehicles will be confined to defined roads and access tracks. • Weed Hygiene Management will be implemented as per Weed Management Plan.
• Vehicle movements, ground disturbance and clearing activities leading to increased dust emissions/deposition resulting in degradation of vegetation	• Vehicles will be confined to defined roads and access tracks. • Vehicles will adhere to appropriate speed limits on all roads.

Appendix E. Sources of information

E.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- Aboriginal Heritage Places (DPLH-001)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Pre-European Vegetation Statistics
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna

- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

E.2.References

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4. Glossary

Acronyms:

BC Act	*Biodiversity Conservation Act 2016,* Western Australia
BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DCCEEW	Department of Climate Change, Energy, the Environment and Water, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DoEE	Department of the Environment and Energy (now DCCEEW)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)

DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	*Environmental Protection Act 1986*, Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	*Rights in Water and Irrigation Act 1914*, Western Australia
TEC	Threatened Ecological Community

Definitions:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-

T **Threatened species:**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**
Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**
Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU **Vulnerable species**
Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX **Extinct species**
Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW **Extinct in the wild species**
Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its*

life cycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI **Migratory species**
Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD **Species of special conservation interest (conservation dependent fauna)**
Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS **Other specially protected species**
Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P **Priority species:**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

P1 **Priority One - Poorly-known species**
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

P2 **Priority Two - Poorly-known species**
Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature

reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

P3 **Priority Three - Poorly-known species**
Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

P4 **Priority Four - Rare, Near Threatened and other species in need of monitoring**
(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Principles for clearing native vegetation:

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

(j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.