GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9079/1
Permit Holder:	IB Operations Pty Ld
Duration of Permit:	From 15 January 2021 to 15 January 2026

The permit holder is authorised to clear native vegetation subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear native vegetation for the purpose of road maintenance, widening and upgrades.

2. Land on which clearing is to be done

Wodgina Road reserve (PIN 11734389), Marble Bar
Pippingarra Road reserve (PIN 12418059) Marble Bar
Pippingarra Road reserve (PIN 12418058), Marble Bar
Pippingarra Road reserve (PIN 12418060), Marble Bar

3. Clearing authorised

The permit holder must not clear more than 38 hectares of native vegetation within the area cross-hatched yellow in Figures 1 to 4 of Schedule 1.

PART II – MANAGEMENT CONDITIONS

4. Avoid, minimise, and reduce impacts and extent of clearing

In determining the native vegetation authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

(a) avoid the clearing of native vegetation;
(b) minimise the amount of native vegetation to be cleared; and
(c) reduce the impact of clearing on any environmental value.

5. Weed management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds*:

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;

(b) ensure that no known weed-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and

(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

PART III - RECORD KEEPING AND REPORTING

6. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 4; and (f) actions taken to minimise the risk of the introduction and spread of weeds and dieback in accordance with condition 5.

7. Reporting

The permit holder must provide to the *CEO* the records required under condition 6 of this permit when requested by the *CEO*.

DEFINITIONS

In this permit, the terms in Table have the meanings defined.

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
fill	means material used to increase the ground level, or to fill a depression.
dieback	means the effect of *Phytophthora* species on native vegetation.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	*Environmental Protection Act 1986* (WA)
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS

Meenu Vitarana
A/MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

22 December 2020

Schedule 1

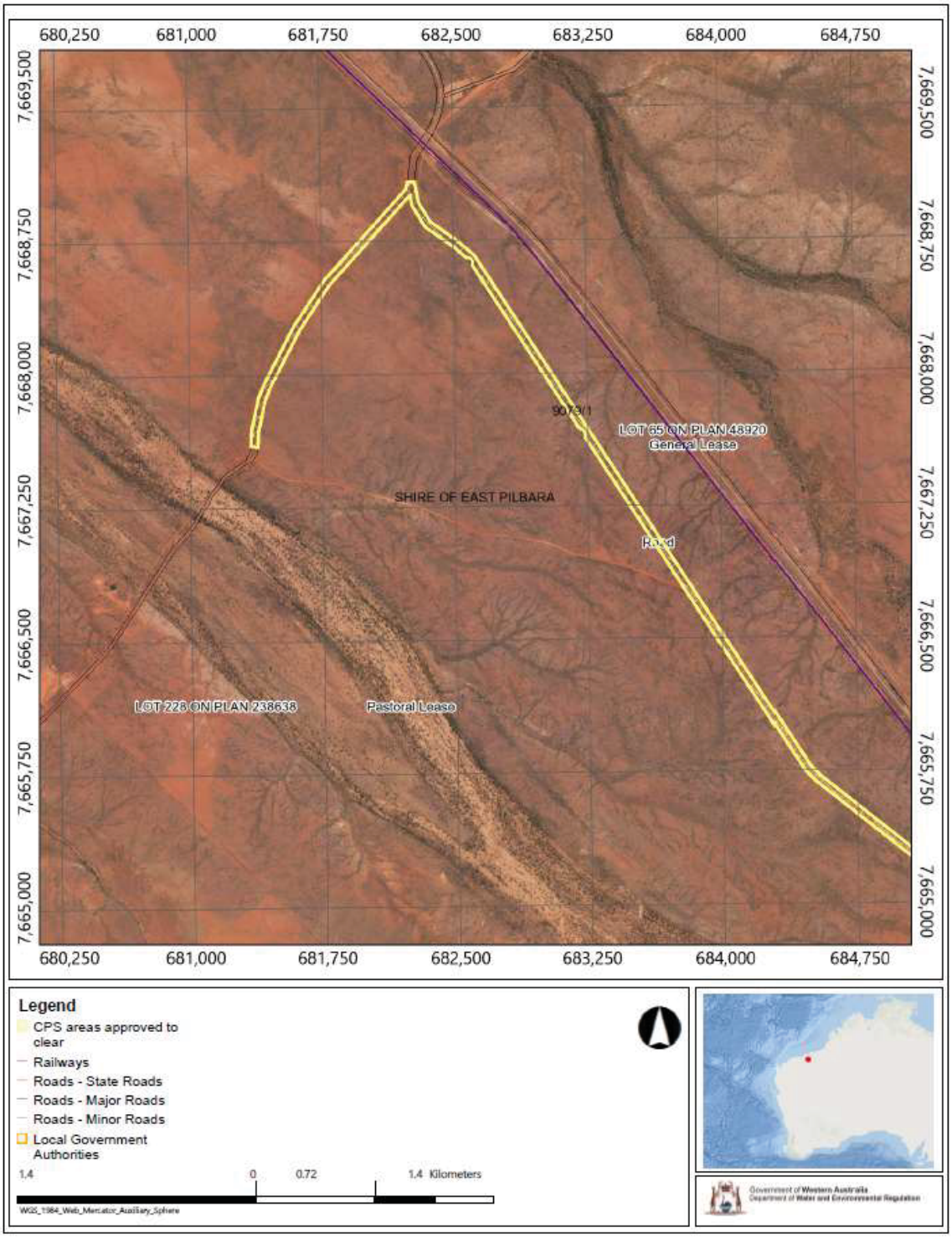

Figure 1: Map of the boundary of the area within which clearing may occur (1 of 4)

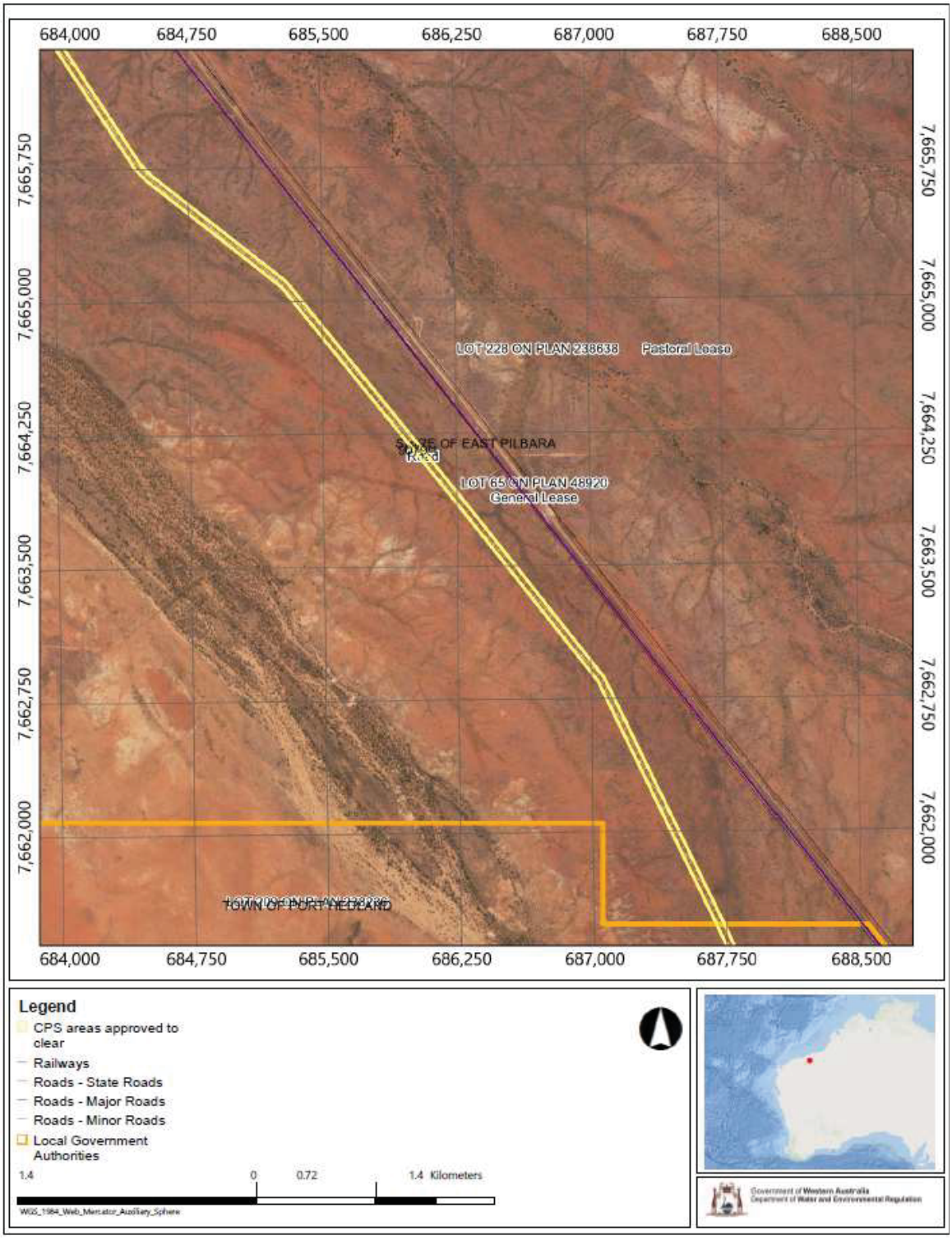

Figure 2: Map of the boundary of the area within which clearing may occur (2 of 4)

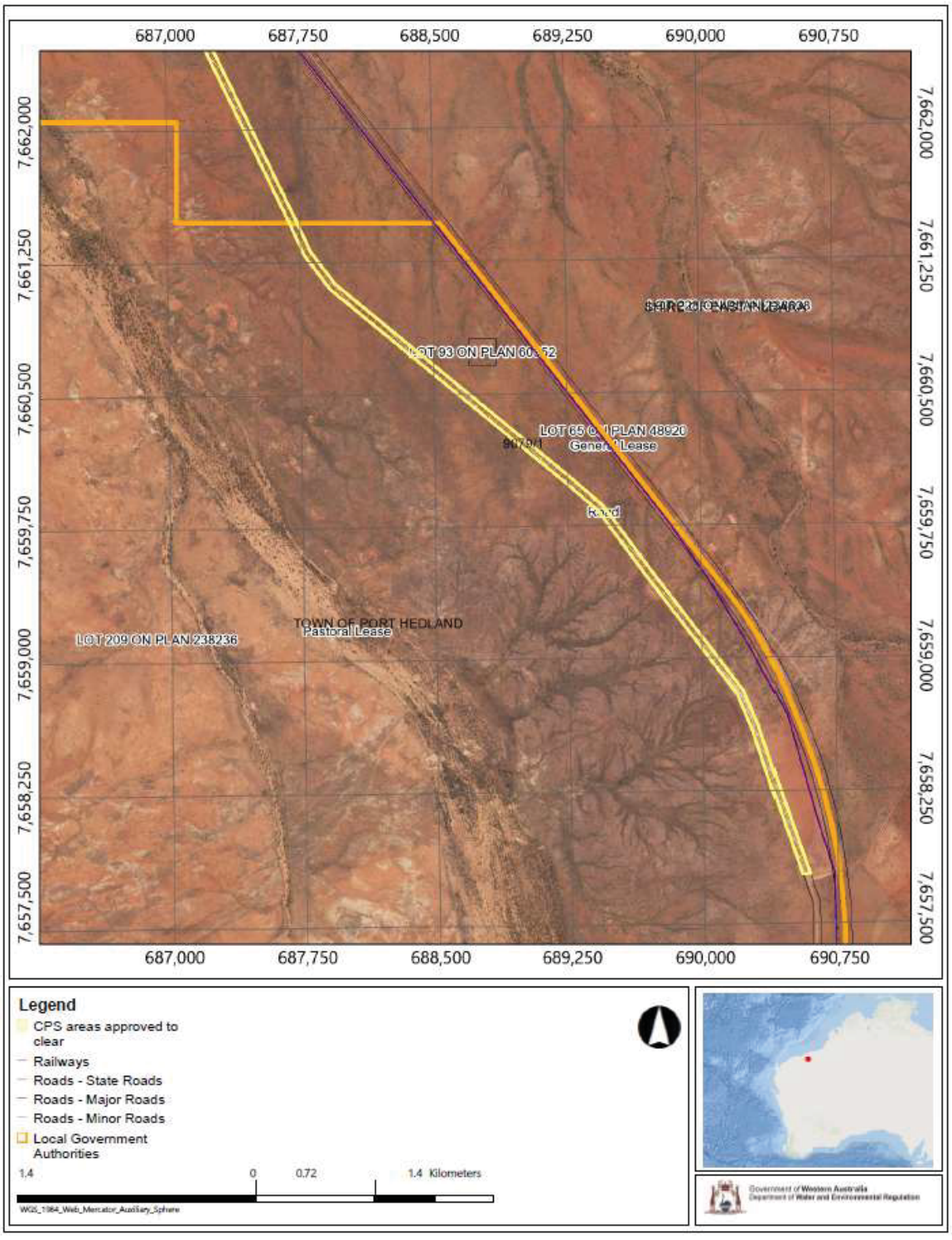

Figure 3: Map of the boundary of the area within which clearing may occur (3 of 4)

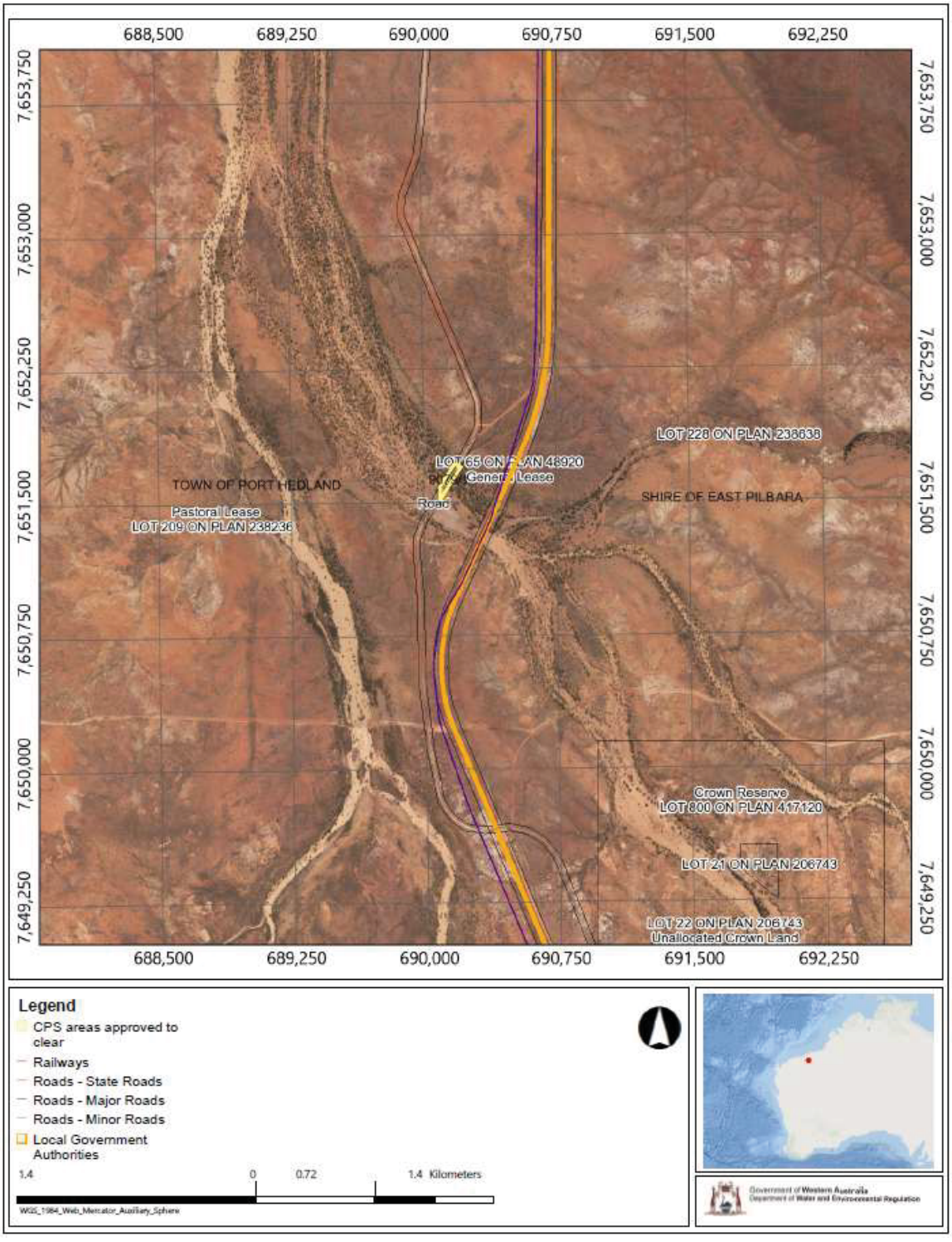

Figure 4: Map of the boundary of the area within which clearing may occur (4 of 4)

Clearing Permit Decision Report

1. Application details and outcome

1.1. Permit application details

Permit number:	CPS 9079/1
Permit type:	Purpose permit
Applicant name:	Fortescue Metals Group Ltd
Application received:	9 October 2020
Application area:	38 hectares (ha) of native vegetation
Purpose of clearing:	Maintenance, widening and upgrades of Pipingarra Road and Wodgina Road
Method of clearing:	Mechanical
Property:	Wodgina Road reserve (PIN 11734389) and Pippingarra Road reserve (PINs 12418059, 12418058 and 12418060), Marble Bar
Location (LGA area/s):	Town of Port Hedland and Shire of East Pilbara
Localities (suburb/s):	Marble Bar

1.2. Description of clearing activities

The footprint within which vegetation is applied to be cleared comprises of 64.83 hectares distributed across two separate areas. The northern area comprises an approximately 1.8 kilometre long, 40 metre wide length of Wodgina Road reserve containing an approximately 20 metre wide cleared area for the existing road, adjoining an approximately 14.3 kilometre long, 40 metre wide length of Pippingarra Road reserve containing an approximately 10 metre wide cleared area for the existing road (see Figures 1 to 3, Section 1.5). The southern portion comprises an approximately 200 metre long, 40 metre wide length of Pippingarra Road reserve containing an approximately 10 wide cleared area for the existing road (see Figure 4, Section 1.5). The applicant proposes to clear up to 38 hectares within this area for maintenance and widening and/or upgrades (where required) of these two roads to facilitate the transportation of steel fabricated modules between Port Headland and Iron Bridge mine site.

The application was revised during the assessment process following a request that the applicant avoid two Western pebble mound mouse mounds present within the application area, which resulted in an approximately 0.1 hectare reduction over two sections of the proposed Pipingarra Road clearing footprint where the mounds were located.

1.3. Decision on application and key considerations

Decision:	Granted
Decision date:	22 December 2020
Decision area:	38 hectares (ha) of native vegetation as depicted in Section 1.5 below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix E), the findings of a flora and fauna survey, the clearing principles set out in Schedule 5 of the EP Act (see **Error! Reference source not found.**), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The assessment identified that the proposed clearing will result in:

- The loss of up to 38 hectares of habitat for multiple threatened and priority fauna species; and
- The loss of one individual of priority 3 species *Heliotropium muticum.*

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 is unlikely to result in the loss of significant habitat for threatened and priority fauna or impact the conservation status of *Heliotropium muticum* and is therefore unlikely to lead to an unacceptable risk to environmental values and that the applicant has suitably demonstrated avoidance and minimisation measures.

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

- avoid, minimise to reduce the impacts and extent of clearing; and
- take hygiene steps to minimise the risk of the introduction and spread of weeds.

1.5. Site maps

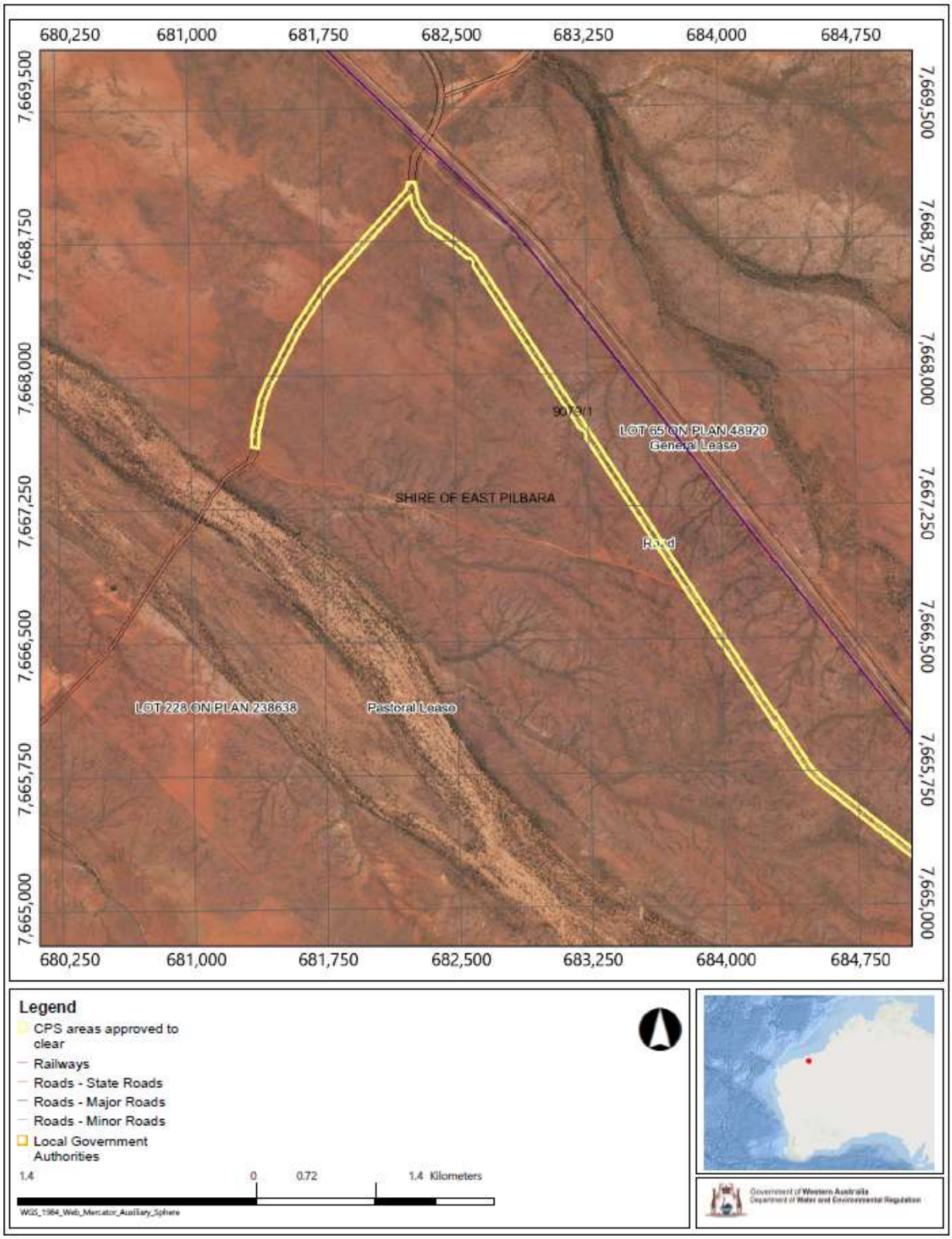

Figure 1. Map (1 of 4) of the application area. The area cross-hatched yellow indicates the areas authorised to be cleared under the granted clearing permit.

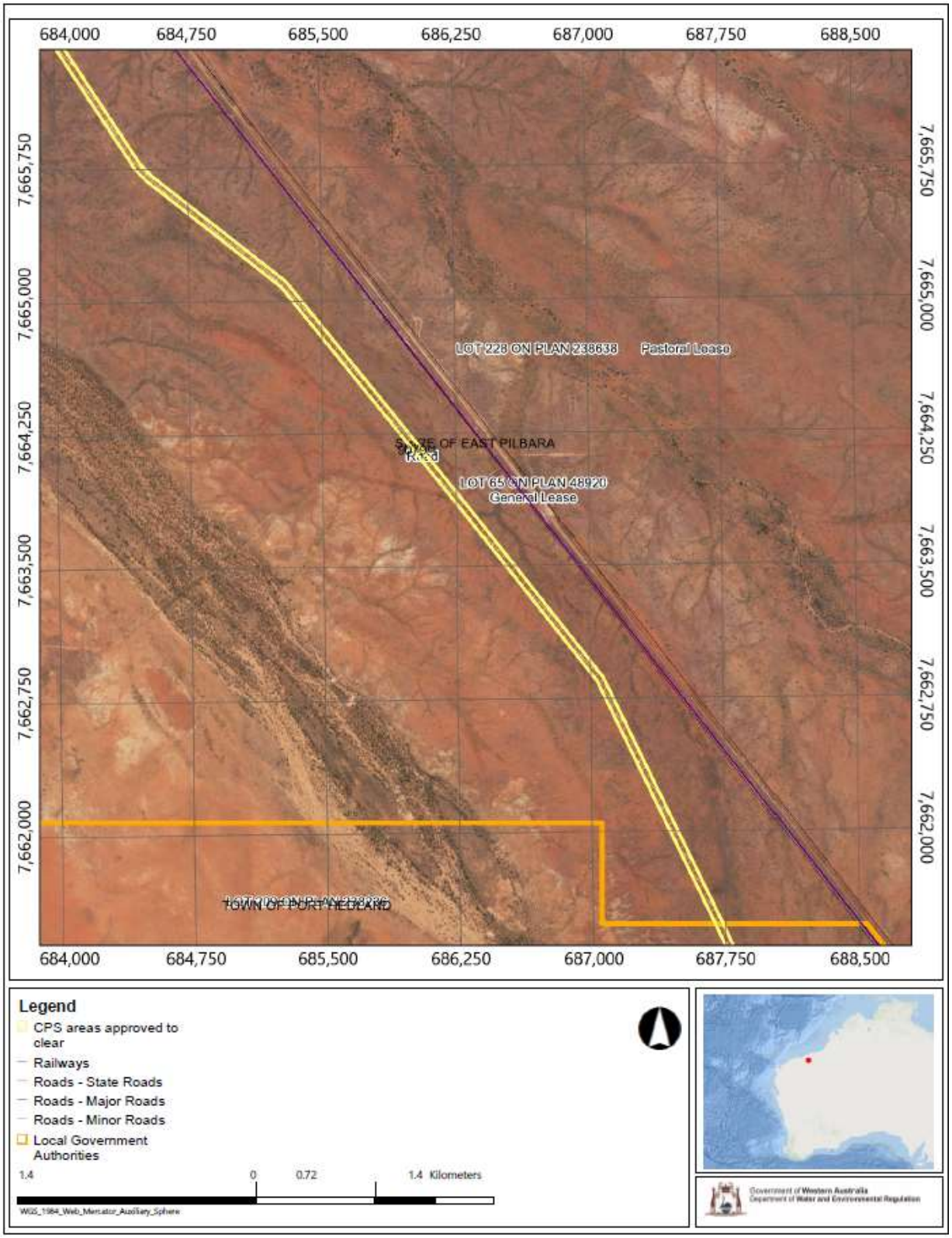

Figure 2. Map (2 of 4) of the application area. The area cross-hatched yellow indicates the areas authorised to be cleared under the granted clearing permit.

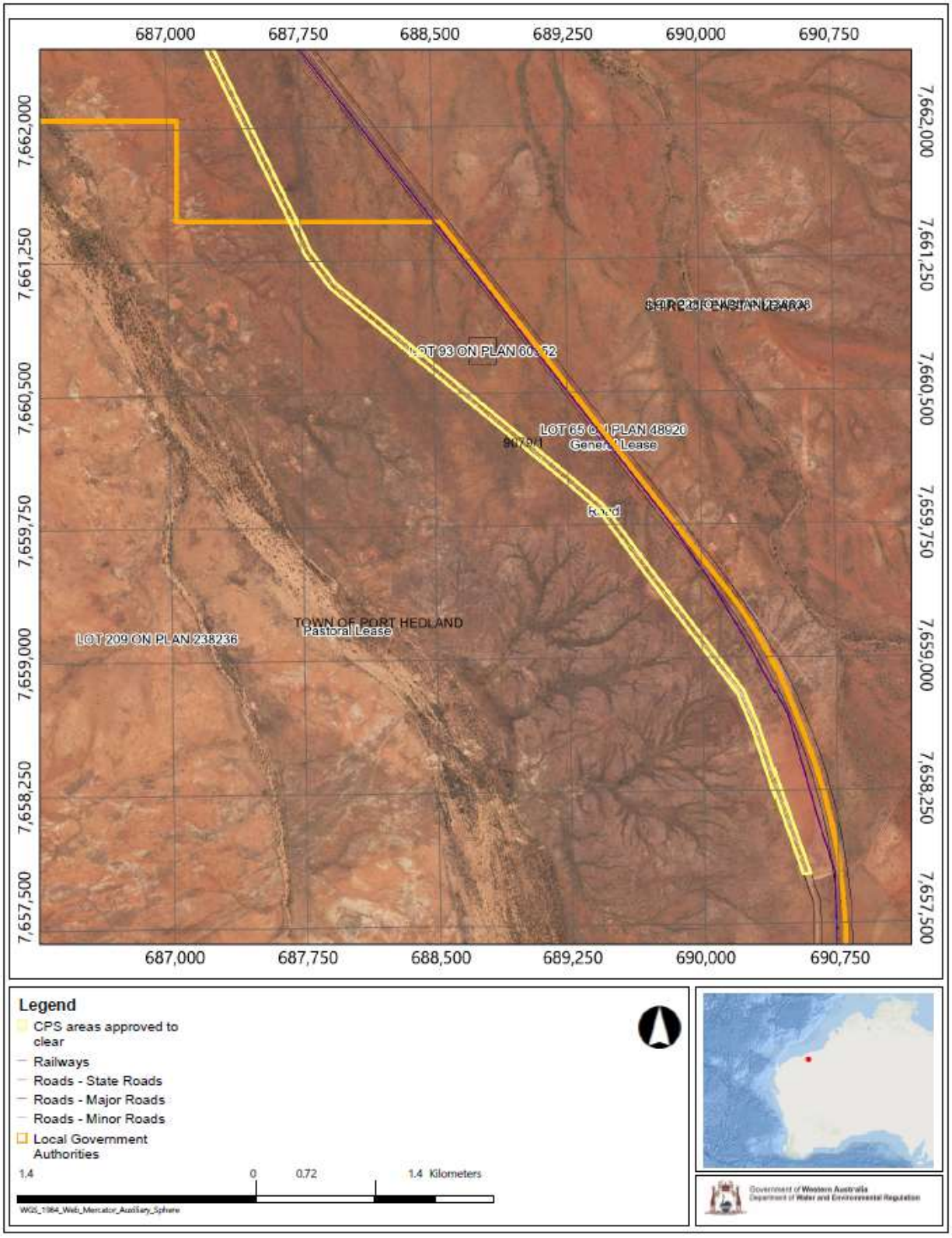

Figure 3. Map (3 of 4) of the application area. The area cross-hatched yellow indicates the areas authorised to be cleared under the granted clearing permit.

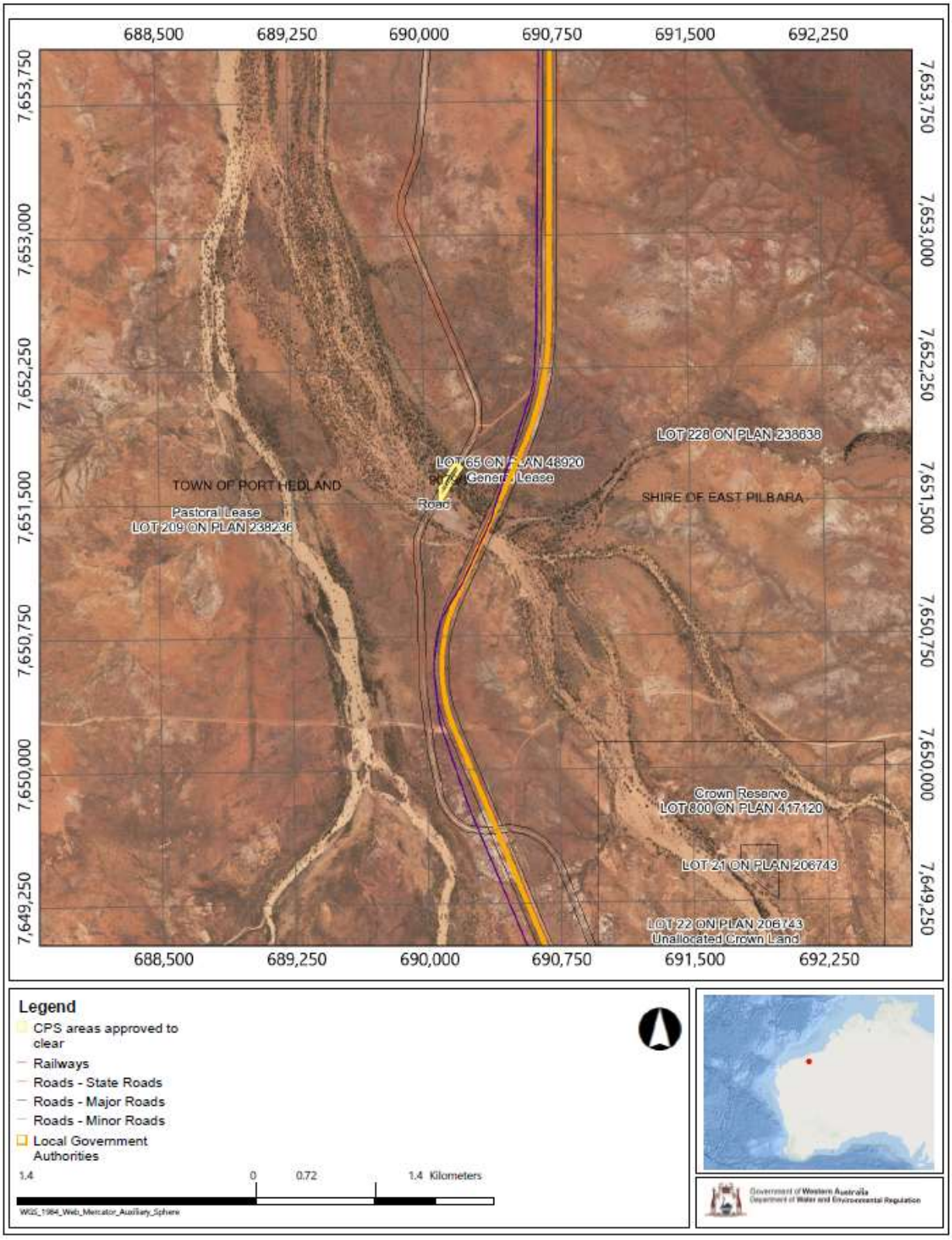

Figure 4. Map (4 of 4) of the application area. The area cross-hatched yellow indicates the areas authorised to be cleared under the granted clearing permit.

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 1.3), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

1. the precautionary principle;
2. the principle of intergenerational equity;
3. 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)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

In their clearing permit application, the applicant advised the following regarding avoidance and mitigation considerations:

- Requirements to widen the existing track areas were derived from an internal assessment based upon an external Restricted Access Vehicle assessment. This assessment identified minor adjustments to alignment, corner radius and width to ensure it remains safe and trafficable by heavy vehicles (IB Operations Pty Ltd, 2020a);
- The road will be nominally 11 m width with additional batter area either side creating a 15 m wide formation. Additional verge clearing may be undertaken to remove obstacles to wide modules that will be transported to site (IB Operations Pty Ltd, 2020a);
- Environmental management measures to mitigate the impacts of the clearing include (IB Operations Pty Ltd, 2020b);
    - Proposed project design will be reviewed against the vegetation survey data to avoid/minimise clearing of significant flora and vegetation;
    - All Threatened and Priority flora are to be identified on the ground by appropriate signage, fencing and/or flagging prior to clearing;
    - Clearing will be minimised to ensure significant flora and vegetation are protected;
    - Ensure staff and contractors are aware of the location of significant flora and vegetation to ensure they are protected;
    - Weed hygiene requirements will be implemented for plant and equipment in identified weed risk areas and/or in areas where weed populations have been identified and high-risk activities are proposed to be undertaken, in accordance with a Weed Management Plan;
    - Dust suppression to be carried out during construction;
    - Measures to manage chemical and hydrocarbon spills; and
    - Measures to manage altered surface hydrology.

Given the presence of priority flora (*Heliotropium muticum*), priority fauna (*Pseudomys chapmani* (Western pebble-mound mouse)) and watercourses within the original proposed clearing footprint, the Delegated Officer did not consider the above measures to adequately demonstrate that all reasonable efforts had been taken to avoid and minimise potential impacts of the proposed clearing on the environmental values, and the applicant was requested to demonstrate further consideration of avoidance and minimisation measures. The applicant provided the following further information in response to this request (Fortescue Metals Group, 2020a):

- There is one *Heliotropium muticum* record on the existing disturbed road / verge which would be subject to disturbance via road maintenance. The remaining records sit external to both the road reserve and permit areas and will not be subject to clearing. Where conservation significant flora cannot be avoided, disturbance will be minimised by undertaking management actions such as:
    - Construction corridors will be demarcated prior to disturbance;

    - Conservation significant flora adjacent to the construction corridors at risk of disturbance will be demarcated for preservation;
    - Minimising cleared areas to the smallest area practicable using the Land Use Certification (LUC) Procedure;
    - Implement dust management measures in accordance with a Mine and Rail Dust Management Plan; and
    - Implement weed management measures in accordance with a Weed Management Plan.
- The proposed clearing footprint was revised to exclude the Western Pebble Mouse mounds. Distances between the two mounds and the revised permit boundary are 2.2 metres and 2.1 metres. Larger buffers than these would require a new road alignment in proximity to the mounds and would also risk pushing the road outside the reserve boundary, which would prevent its construction. Where clearing occurs in close proximity to the mounds, best practice management actions will be implemented to minimise disturbance, including:
    - Implement the Land Use Certification (LUC) Procedure;
    - Implement dust management measures in accordance with a Mine and Rail Dust Management Plan;
    - Implement weed management measures in accordance with a Weed Management Plan;
- No upgrade or road widening works will be undertaken in proximity to the watercourses, and these areas will be limited to strictly maintenance works if/when required.

Given the above, 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 environmental impacts

In assessing the application in accordance with section 51O of the EP Act, the Delegated Officer has examined the application and site characteristics (Appendix B) and considered whether the clearing poses a risk to environmental values. The assessment against the Clearing Principles is contained in Appendix C.

This assessment identified that the impacts of the proposed clearing on fauna, flora and waterbodies/water quality required further consideration. The detailed consideration and assessment of the clearing impacts against the specific environmental values is provided below.

3.2.1. Environmental value: biological values (fauna) – Clearing Principles (a) and (b)

Assessment: The application area may provide suitable habitat for the following conservation significant fauna species:

- *Liasis olivaceus barroni* (Pilbara olive python) (T)
- *Macroderma gigas* (ghost bat) (T)
- *Macrotis lagotis* (bilby, dalgyte, ninu) (T)
- *Dasyurus hallucatus* (northern quoll) (T)
- *Falco hypoleucos* (grey falcon) (T)
- *Ctenotus nigrilineatus* (pin-striped finesnout ctenotus) (P1)
- *Dasycercus blythi* (brush-tailed mulgara) (P4)
- *Lagorchestes conspicillatus leichardti* (spectacled hare-wallaby (mainland)) (P4)
- *Leggadina lakedownensis* (northern short-tailed mouse, Lakeland Downs mouse, kerakenga) (P4)
- *Pseudomys chapmani* (western pebble-mound mouse, ngadji) (P4)
- *Rhinonicteris aurantia* (Pilbara leaf-nosed bat) (P4)
- *Falco peregrinus* (peregrine falcon) (OS)
- *Glareola maldivarum* (oriental pratincole) (IA)
- *Apus pacificus* (fork-tailed swift) (IA)
- *Calidris acuminata* (sharp-tailed sandpiper) (IA)
- *Charadrius veredus* (oriental plover) (IA)

The majority of the surveyed portions of the application area are considered to comprise of the habitat type “Hummock grasslands”, described as “hummock grasslands associated with either emergent shrubs or woodlands on stony clay or, to a lesser extent sandy and stony sandplain soils" (Ecoscape, 2020). This is likely to provide suitable habitat for the bilby (TSSC, 2016a), northern quoll (Hill and Ward, 2010), grey falcon (TSSC, 2020), pin-striped finesnout ctenotus (Wilson and Swan, 2013), brush-tailed mulgara (Masters et al, 2003), spectacled hare wallaby (Ingleby and Westoby, 1992), northern short-tailed mouse (Moro and Kutt, 2008), western pebble-mound mouse (Kitchener, 1983)

and peregrine falcon. The ghost bat and Pilbara leaf-nosed bat may forage within this habitat (TSSC, 2016a and 2016b). Although the hummock grasslands habitat may be suitable for the above species, as this habitat type is widespread throughout the surrounding area, the clearing of this habitat is not considered to have a significant impact on the above species on a regional scale.

Small portions of the application area intersecting are considered to provide habitat of the type "Creekline", described as "eucalypt woodlands over hummock grasses and shrubs on sandy soils" (Ecoscape, 2020). These areas are likely to provide suitable habitat for many of the above species, but most notably the northern quoll (Department of Sustainability, Environment, Water, Population and Communities, 2011), Pilbara olive python (Department of the Environment, Water, Heritage and the Arts, 2008), fork tailed swift (Department of the Environment and Heritage, 2006), oriental pratincole (Department of the Environment, 2020a), oriental plover (Department of the Environment, 2020b) and sharp-tailed sandpiper (Department of the Environment, 2020c). However, given that only maintenance of vegetation, and not clearing of large areas to facilitate road widening or upgrades, will be undertaken within this habitat type (Fortescue Metals Group, 2020a), clearing within this habitat type is not considered likely to have a significant impact on the above species on a regional scale.

It is noted that the applicant amended the application footprint during the assessment to exclude two western pebble mound mouse mounds recorded by Ecoscape (2020) from the application footprint, which will allow buffers of native vegetation of 2.2 metres and 2.1 metres surrounding these mounds to be retained. This is considered sufficient to minimise impacts on western pebble mound mice utilising these mounds. Any other fauna individuals utilising the application area will have sufficient native vegetation to move into in the areas surrounding the proposed clearing footprint. As such, the proposed clearing is considered to have minimal impacts on fauna individuals.

Conclusion: Based on the above assessment, the proposed clearing is unlikely to result in impacts to conservation significant fauna species.

Conditions: No fauna management conditions required.

3.2.2. Environmental value: biological values (flora) – Clearing Principles (a) and (c)

Assessment: One threatened flora species, *Quoya zonalis K.A.Sheph. & Hislop (Pilbara Foxglove)* (previously named *Pityrodia sp. Marble Bar*), has been recorded within the local area. However, a targeted survey undertaken by Ecoscape (2020) for this species did not record this species. Furthermore, the species tends to be associated with ironstone hillslopes (WA Herbarium, 1998-), which are not present within the application area. As such, it is considered unlikely that this species is present within the application area.

The following priority flora species present within the local area have been recorded within the same soil and vegetation types present within the application area:

- *Josephinia sp. Woodstock (A.A. Mitchell PRP 989)* (P1)
- *Eragrostis crateriformis* (P3)
- *Euphorbia clementii* (P3)
- *Fimbristylis sieberiana* (P3)
- *Gomphrena leptophylla* (P3)
- *Gymnanthera cunninghamii* (P3)
- *Heliotropium murinum* (P3)
- *Heliotropium muticum* (P3)
- *Nicotiana umbratica* (P3)
- *Phyllanthus hebecarpus* (P3)
- *Rothia indica subsp. australis* (P3)
- *Stylidium weeliwolli* (P3)
- *Terminalia supranitifolia* (P3)
- *Triodia chichesterensis* (P3)
- *Bulbostylis burbidgeae* (P4)
- *Goodenia nuda* (P4)
- *Ptilotus mollis* (P4)

Of these species, it is considered that *Bulbostylis burbidgeae*, *Fimbristylis sieberiana, Nicotiana umbratica* or *Phyllanthus hebecarpus* and *Ptilotus mollis* are unlikely to be present within the application area, given the lack of preferred habitat for these species (Western Australian Herbarium, 1998-). Furthermore, *Heliotropium murinum* and *Josephinia sp. Woodstock (A.A. Mitchell PRP 989)* are considered unlikely to occur within the application area, given that the closest records of these species are more than 40 kilometres from the application area. Although suitable habitat may be present within the application area for *Gomphrena leptophylla, Gymnanthera cunninghamii, Rothia*

indica subsp. australis, *Stylidium weeliwolli* and *Terminalia supranitifolia* (Western Australian Herbarium, 1998-), following a targeted search for conservation significant flora within the proposed clearing footprint, Ecoscape (2020) concluded that these species were unlikely to be present within the application area.

One individual of *Heliotropium muticum* was found within the application area by Ecoscape (2020). Fortescue Metals Group (2020a) advised that this individual may not be able to be retained. However, given that there are 78 records of this species in Western Australia (Western Australian Herbarium, 1998-), it is considered that the removal of one individual is unlikely to impact the conservation status of this species.

Ecoscape (2020) also considered that due to the presence of suitable habitat and low species detectability, *Eragrostis crateriformis*, *Euphorbia clementii* and *Goodenia nuda* may still possibly occur within the application area despite none being recorded during the survey. Furthermore, while no *Triodia chichesterensis* individuals were found within the proposed clearing footprint during the targeted search, it was recorded at six nearby locations, and it was considered by Ecoscape (2020) that additional locations may be present within the survey area in patches of recently burnt vegetation, as it was not always possible to identify species present to species level due to the lack of diagnostic material on small, regenerating hummocks. These four species also have relatively large numbers of records within Western Australia (49, 30, 107 and 20 respectively) and as such, if individuals of these species were present within the application are, it is considered that the removal of individuals of these species from the proposed clearing is unlikely to impact the conservation status of these species.

Conclusion: Based on the above assessment, the proposed clearing is unlikely to result in significant impacts to conservation significant flora species.

Conditions: No flora and/or vegetation management conditions required.

3.2.3. Environmental value – Waterbodies and water quality - Clearing Principles (f) and (i)

Assessment: The proposed clearing footprint intersects the Turner River and numerous minor, non-perennial watercourses. The proposed clearing will remove vegetation that is associated with the watercourses. However, given that only maintenance of vegetation, and not clearing of large areas to facilitate road widening or upgrades, will be undertaken within watercourse areas (Fortescue Metals Group, 2020a) and that the clearing is of a linear nature, potential impacts to surface water or groundwater quality are likely to be minimal.

Conclusion: Based on the above assessment, the proposed clearing is unlikely to result in impacts to waterbodies, surface water quality or groundwater quality.

Conditions: No management conditions required.

3.3. Relevant planning instruments and other matters

The Town of Port Hedland advised DWER that they did not have any objections to the proposed clearing (Town of Port Hedland, 2020). No comments were received from the Shire of East Pilbara.

It is noted that the proposed clearing area is within the Pilbara Surface Water Area proclaimed under the *Rights in Water and Irrigation Act 1914.* While the application area intersects a non-perennial portion of the Turner River and an adjacent inundation area, and ten mapped minor non-perennial watercourses associated with the Turner River catchment, the applicant has advised that no upgrade or road widening works will be undertaken in proximity to the watercourses, and these areas will be limited to strictly maintenance works if/when required (Fortescue Metals Group, 2020a). Advice received from DWER Licencing is that basic road maintenance activities do not require a Bed and Banks Permit (DWER, 2020a).

The southern portion of the proposed clearing footprint intersects an Aboriginal Heritage Site (Place ID 6653, Turner River (Tjirrlil)). It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

Appendix A – Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix C.

1. Site characteristics

Site characteristic	Details
Local context	The proposed clearing footprint areas are part of an expansive tract of native vegetation interspersed with roads, tracks and railways. Spatial data indicates the local area (50 km radius of the proposed clearing area) retains over 99% of the original native vegetation cover.
Ecological linkage	Given the highly vegetated state of the local area, the application area is not considered to comprise significant ecological linkage values.
Conservation areas	No conservation areas are within a 50 km radius of the application area.
Vegetation description	A vegetation survey (Ecoscape, 2020) conducted within the application area indicates the vegetation within the proposed clearing area consists of • *Acacia acradenia* and *Grevillea wickhamii* mid open shrubland over *Triodia wiseana* and *T. lanigera* low hummock grassland. (4.2 ha) • *Acacia ancistrocarpa* tall sparse shrubland over *Triodia lanigera* low hummock grassland.(24.9 ha) • *Acacia orthocarpa* and *A. inaequilatera* tall sparse shrubland over *Triodia wiseana* and *T. lanigera* low closed hummock grassland. (1.3 ha) • Cleared/Not Vegetated (27.2 ha) • *Corymbia hamersleyana* low open woodland over *Acacia bivenosa* and *Petalostylis labicheoides* mid sparse shrubland over *Triodia chichesterensis* low closed hummock grassland. (1.7 ha) • *Corymbia hamersleyana* low open woodland over *Acacia tumida var. pilbarensis* mid sparse shrubland over *Triodia epactia* and *T. wiseana* low hummock grassland. (0.8 ha) • *Corymbia zygophylla* low open woodland over *Acacia ancistrocarpa* mid sparse shrubland over *Triodia lanigera, Isotropis atropurpurea* and *Ptilotus astrolasius* low hummock grassland/shrubland. (2.3 ha) • *Eucalyptus camaldulensis subsp. refulgens* and *Eucalyptus victrix* mid woodland over *Acacia trachycarpa* and *Atalaya hemiglauca* tall open shrubland over *Cenchrus ciliaris* and *Triodia longiceps* mid tussock/hummock grassland. (0.6 ha) Vegetation unit mapping is available in Figures D-1 to D-6, Appendix D. This is largely consistent with the mapped vegetation types: • Northern portion - Beard Abydos Plain - Chichester_93, described as Hummock grasslands, shrub steppe; kanji over soft spinifex; and • Southern portion - Beard Abydos Plain - Chichester_619, described as Medium woodland; river gum (*Eucalyptus camaldulensis*) (Shepherd et al, 2001).
Vegetation condition	Ecoscape (2020) indicates the vegetation within the proposed clearing area is in Good to (largely) Excellent (Trudgen, 1991) condition. Areas cleared for roads are in Completely Degraded (Trudgen, 1991) condition. The full Trudgen condition rating scale is provided in Appendix D, below. The full survey descriptions and mapping are available in Figures D-7 to D-12, Appendix D.
Climate	Rainfall: 400 mm Evapotranspiration: 400 mm

Topography	Northern portion: Ranges from 150 metres AHD at the northern end to 170 metres AHD at the southern end. Southern portion: approximately 170 metres AHD.
Soil description	The soil is mapped as: • Majority of northern portion - 283Mc (Macroy System), described as stony plains and occasional tor fields based on granite supporting hard and soft spinifex shrubby grasslands; • Southern 700m section of northern portion - 280Mc (Macroy System), described as stony plains and occasional tor fields based on granite supporting hard and soft spinifex shrubby grasslands. • Southern portion - 283Ri (River System), described as narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex (DPIRD, 2017).
Land degradation risk	• 283Mc and 280Mc: o Subsurface Acidification Susceptibility - 45% of map unit has a high susceptibility (Schoknecht et al., 2004); o Subsurface Compaction Susceptibility - 45% of the map unit has a high susceptibility (Schoknecht et al., 2004); o Low or very low erosion hazard (van Vreeswyk et al, 2004); • 283Ri: o Subsurface Acidification Susceptibility - 60% of map unit has a high susceptibility (Schoknecht et al., 2004); o Subsurface Compaction Susceptibility - 60% of the map unit has a high susceptibility (Schoknecht et al., 2004); o Susceptibility to erosion is high or very high if vegetative cover is removed (van Vreeswyk et al, 2004).
Waterbodies	The desktop assessment indicated that the southern portion of the application area intersects a non-perennial portion of the Turner River and an adjacent inundation area. A perennial pool associated with the Turner River is also mapped approximately 35 metres from the southern portion of the application area. The northern potion of the application area intersects ten mapped minor non-perennial watercourses associated with the Turner River catchment, and the western corner of this portion is located approximately 250 m from a non-perennial portion of the Turner River.
Hydrogeography	Hydrogeology: Rocks of Low Permeability, Fractured and Weathered Rocks - Local Aquifers, granitoid lithology The application lies within the Pilbara Groundwater Area and Pilbara Surface Water Area proclaimed under the *Rights in Water and Irrigation Act 1914 (WA).*
Flora	A search of relevant datasets found that one threatened flora species and 22 priority flora species have been recorded within the local area (50km), with the closest recorded species One priority flora species *Heliotropium muticum* (Priority 3) was mapped within the application area by Ecoscape (2020) (refer to Figure D-2 Appendix D).
Ecological communities	A search of relevant datasets found that no threatened or priority ecological communities are present within the local area.
Fauna	A search of relevant datasets found that six threatened flora species, nine priority flora species, 16 fauna species under international agreement and one other specially protected fauna species have been recorded within the local area (50km). Two mounds and one individual of the priority fauna species *Pseudomys chapmani* (Western pebble-mound mouse, ngadji) (Priority 4) were recorded within the application area by Ecoscape (2020) (refer to Figure D-13 Appendix D) and one *Apus*

	pacificus (Fork-tailed swift) individual was previously recorded within the application area by Ecologia (2012).

2. Flora, fauna and ecosystem analysis

With consideration for the site characteristics set out above, relevant datasets (see Appendix G), and biological survey information, the following conservation significant flora and fauna species may be impacted by the clearing.

Flora Species	Listing	Distance of closest record to application area (kilometres)	Number of records within local area	Suitable soil type?	Suitable vegetation type?	Suitable habitat?	Are surveys adequate to identify? (Y, N, N/A)
Bulbostylis burbidgeae	P4	5.2	20	Y	Y	N	Y
Eragrostis crateriformis	P3	9.3	10	Y	Y	Y	N (still considered possibly occurring after survey)
Euphorbia clementii	P3	0.4	23	Y	Y	Y	N (still considered possibly occurring after survey)
Fimbristylis sieberiana	P3	0.2	2	Y	Y	N	Y
Gomphrena leptophylla	P3	6.7	2	Y	Y	Y	Y
Goodenia nuda	P4	5.0	1	Y	Y	Y	N (still considered possibly occurring after survey)
Gymnanthera cunninghamii	P3	4.0	11	Y	Y	Y	Y
Heliotropium murinum	P3	43	3	Y	Y	Y	N (not identified in survey desktop assessment)
Heliotropium muticum	P3	0 (recorded within application area (Ecoscape, 2020)	31	Y	Y	Y	Y
Josephinia sp. Woodstock (A.A. Mitchell PRP 989)	P1	41.2	3	Y	Y	N	N (not identified in survey desktop assessment)
Nicotiana umbratica	P3	5.2	9	Y	Y	N	Y
Phyllanthus hebecarpus	P3	4.2	5	Y	Y	N	Y

Flora Species	Listing	Distance of closest record to application area (kilometres)	Number of records within local area	Suitable soil type?	Suitable vegetation type?	Suitable habitat?	Are surveys adequate to identify? (Y, N, N/A)
Quoya zonalis K.A.Sheph. & Hislop (Pilbara Foxglove)	T	12.6	72	N	Y	N	Y
Ptilotus mollis	P4	24.8	5	N	Y	N	Y
Rothia indica subsp. australis	P3	20.4	6	Y	Y	Y	Y
Stylidium weeliwolli	P3	6.8	2	N	Y	Y	Y
Terminalia supranitifolia	P3	1.3	5	Y	Y	Y	Y
Triodia chichesterensis	P3	0.6	17	Y	Y	Y	Y

T: threatened, P: priority

* previously named *Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)*

Fauna Species	Listing	Distance of closest record to application area (kilometres)	Number of records within local area	Most recent record	Suitable habitat?	Are surveys adequate to identify? (Y, N, N/A)
Apus pacificus (Fork-tailed swift)	IA	0 (Ecologia, 2012)	12	2014	Y	Y
Calidris acuminata (Sharp-tailed sandpiper)	IA	39.7	1	1979	possible (southern portion)	Y
Charadrius veredus (oriental plover)	IA	13.8	1	1999	possible (southern portion)	Y
Ctenotus nigrilineatus (Pin-striped finesnout Ctenotus)	P1	26.2	7	2012	Y	Y
Dasycercus blythi (Brush-tailed mulgara)	P4	0.8	120	2019	Y	Y
Dasyurus hallucatus (Northern quoll)	T	0.5	1377	2019	Y	Y
Falco hypoleucos (Grey falcon)	T	0.2	14	2017	Y	Y
Falco peregrinus (Peregrine falcon)	OS	10.1	4	2013	Y	Y
Glareola maldivarum (Oriental pratincole)	IA	40.4	4	2012	possible (southern portion)	Y

Fauna Species	Listing	Distance of closest record to application area (kilometres)	Number of records within local area	Most recent record	Suitable habitat?	Are surveys adequate to identify? (Y, N, N/A)
Lagorchestes conspicillatus leichardti (Spectacled hare-wallaby (mainland))	P4	0.9	155	2018	Y	Y
Leggadina lakedownensis (Northern short-tailed mouse, Lakeland Downs mouse, kerakenga)	P4	26.2	2	2001	Y	Y
Liasis olivaceus barroni (Pilbara olive python)	T	9.3	62	2017	Y	Y
Macroderma gigas (Ghost bat)	T	4.5	119	2018	possible	Y
Macrotis lagotis (Bilby, dalgyte, ninu)	T	0.1	500	2018	Y	Y
Pseudomys chapmani (Western pebble-mound mouse, ngadji)	P4	0 (Ecoscape, 2020)	140	2019	Y	Y
Rhinonicteris aurantia (Pilbara leaf-nosed bat)	T	5.9	386*	2019	possible	Y

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

* Also includes records for *Rhinonicteris aurantia* (Orange leaf-nosed bat) as because record for this taxon are within the Pilbara region, they would be considered part of the Pilbara leaf nosed bat population (Armstrong, 2006)

3. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	% remaining	Current extent in all DBCA managed land (ha)	% current extent in all DBCA managed land (proportion of pre-European extent)
IBRA bioregion					
Pilbara	17,808,657.04	17,731,764.88	99.57	1,801,714.98	10.12
Vegetation complex					
93	3,042,114.27	3,038,471.67	99.88	59,536.96	1.96
619	118,920.31	118,116.78	99.32	236.34	0.20

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: The proposed clearing area contains locally and regionally significant flora and fauna species.	May be at variance	Yes: Refer to Section 3.2.1 and Section 3.2.2 above.
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 proposed clearing area contains habitat for conservation significant fauna.	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 proposed clearing area is unlikely to contain flora species listed under the BC Act.	Not likely to be at variance	No
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 proposed clearing area does not species indicative of a state listed threatened ecological community.	Not likely to be at variance	No
Environmental values: 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 extent of the mapped vegetation type and native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia. Vegetation in the proposed clearing area is not considered to be part of a significant ecological linkage in the local area.	Not likely to be 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 to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values on any conservation areas.	Not likely to be at variance	No
Environmental values: 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: The application area intersects a river and several non-perennial watercourses. However, noting that the applicant will only be undertaking maintenance clearing of vegetation within watercourse areas and	Is at variance	Yes: Refer to Section 3.2.3 above.

Assessment against the Clearing Principles	Variance level	Is further consideration required?
no substantial clearing will be undertaken, impacts of the proposed clearing to the watercourses are expected to be minimal.		
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: Noting the extent of the proposed clearing being narrow and linear along an existing access track, the management measures proposed to mitigate land degradation and the clearing is for instatement of hardstands, the proposed clearing is unlikely to cause appreciable land degradation.	Not likely to be at variance	No
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 the linear nature of the clearing and that only maintenance clearing activities will be undertaken within watercourse areas, potential impacts to surface water or groundwater quality are likely to be short term and minimal.	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 the linear nature of the clearing, the nature of the vegetation to be cleared, the topographic contours over the clearing area and that only maintenance clearing activities will be undertaken within watercourse areas, the proposed clearing is not likely to contribute to increased incidence or intensity of flooding or waterlogging.	Not likely to be at variance	Yes: Refer to Section 3.2.1 above.

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.

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 – Biological survey information excerpts

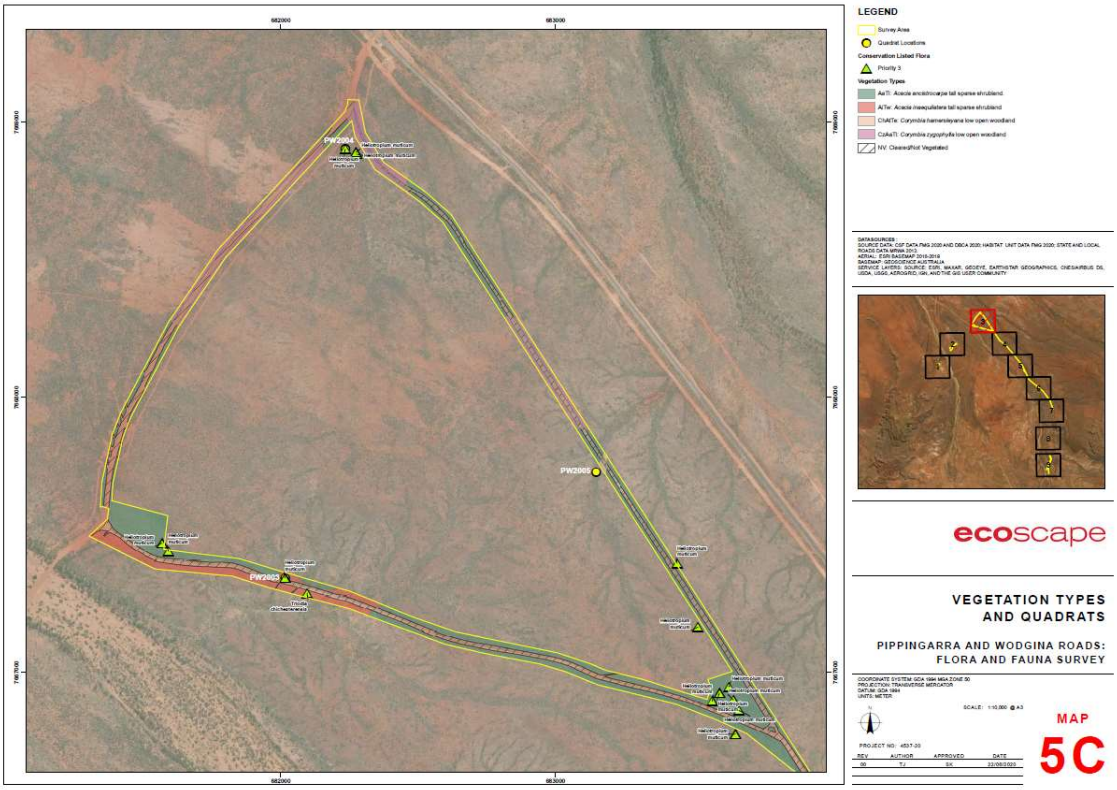

Figure D-1 – Vegetation units and conservation significant flora within proposed clearing footprint (1 of 6) (Ecoscape, 2020)

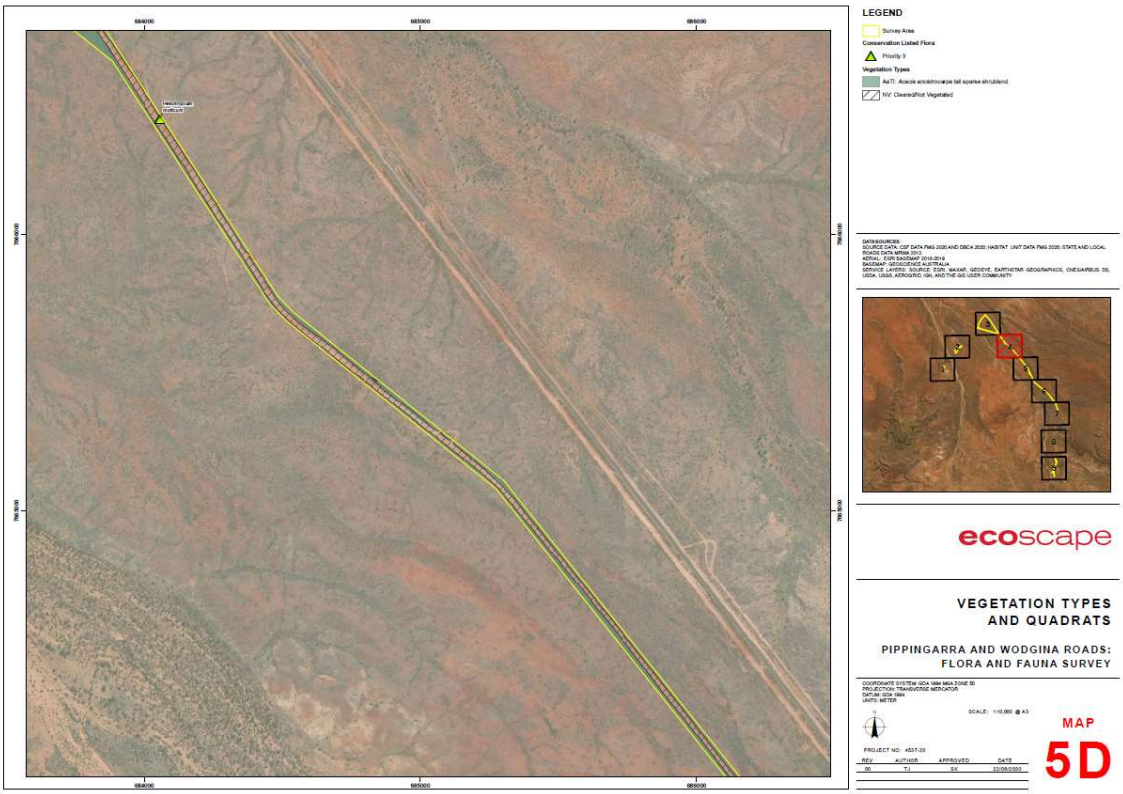

Figure D-2 – Vegetation units and conservation significant flora within proposed clearing footprint (2 of 6) (Ecoscape, 2020)

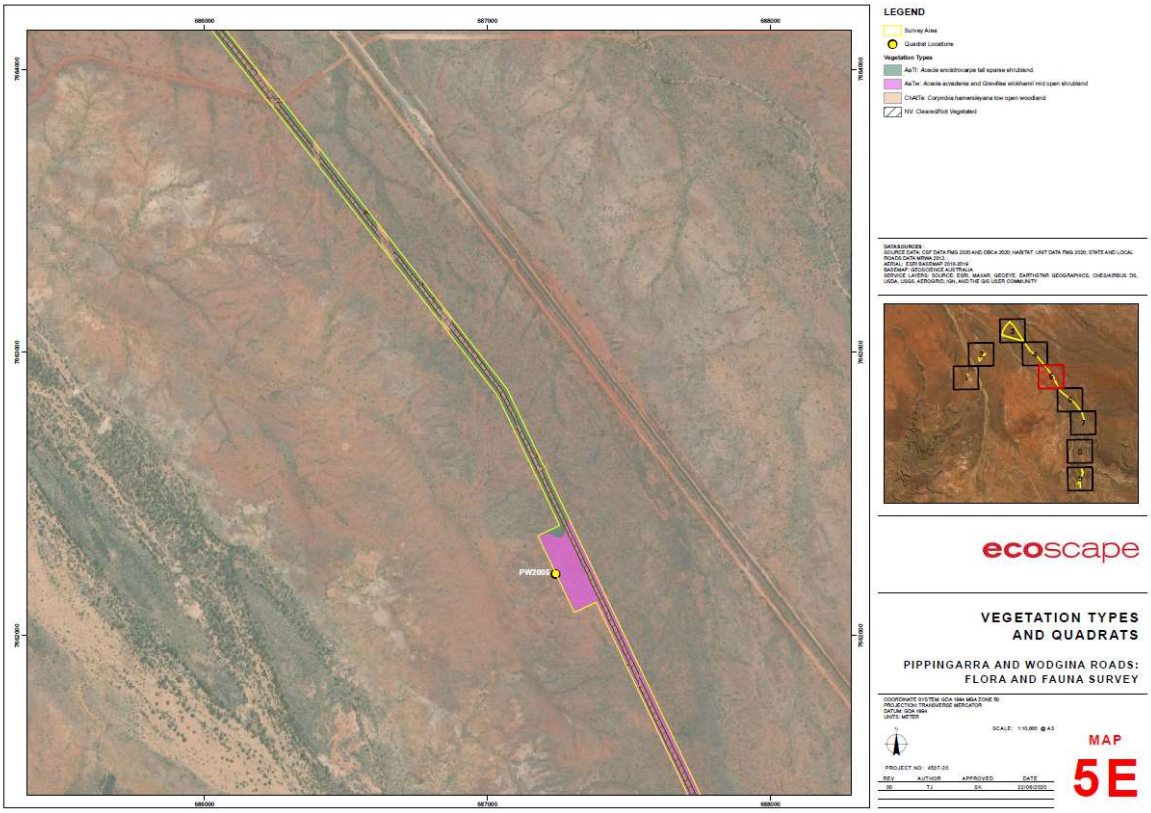

Figure D-3 – Vegetation units and conservation significant flora within proposed clearing footprint (3 of 6) (Ecoscape, 2020)

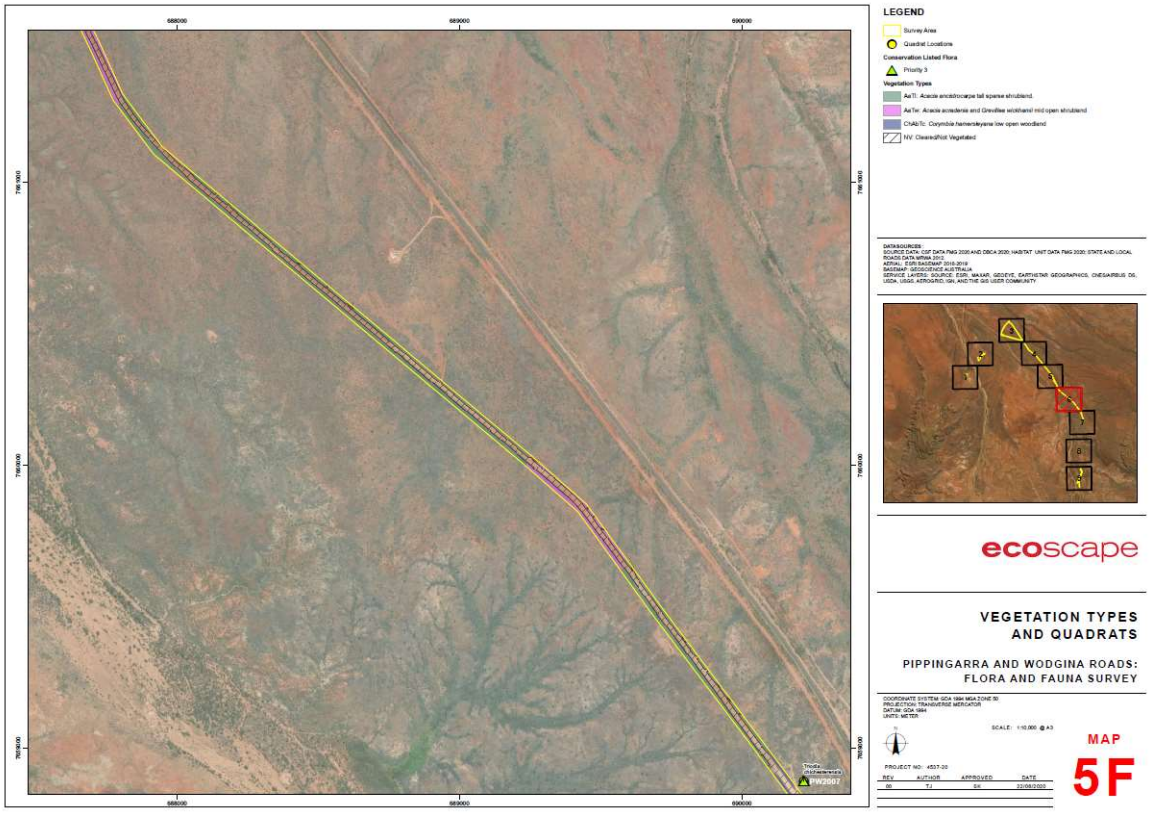

Figure D-4 – Vegetation units and conservation significant flora within proposed clearing footprint (4 of 6) (Ecoscape, 2020)

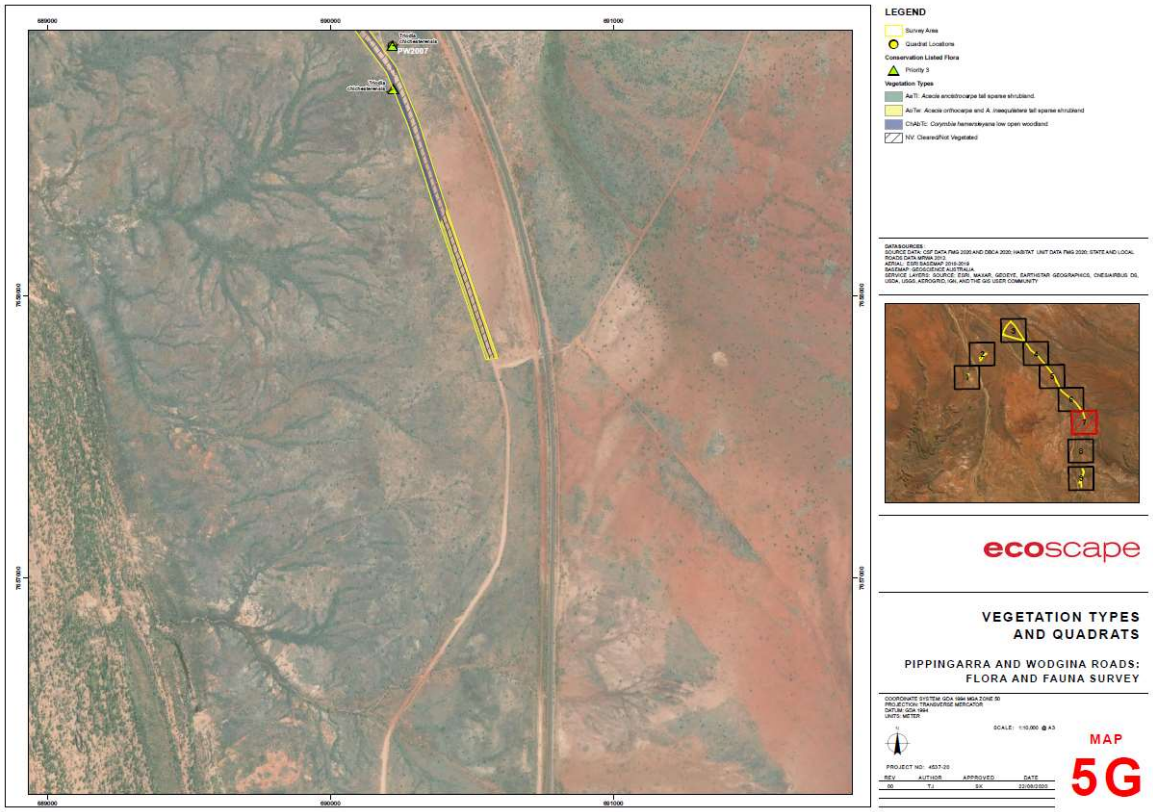

Figure D-5 – Vegetation units and conservation significant flora within proposed clearing footprint (5 of 6) (Ecoscape, 2020)

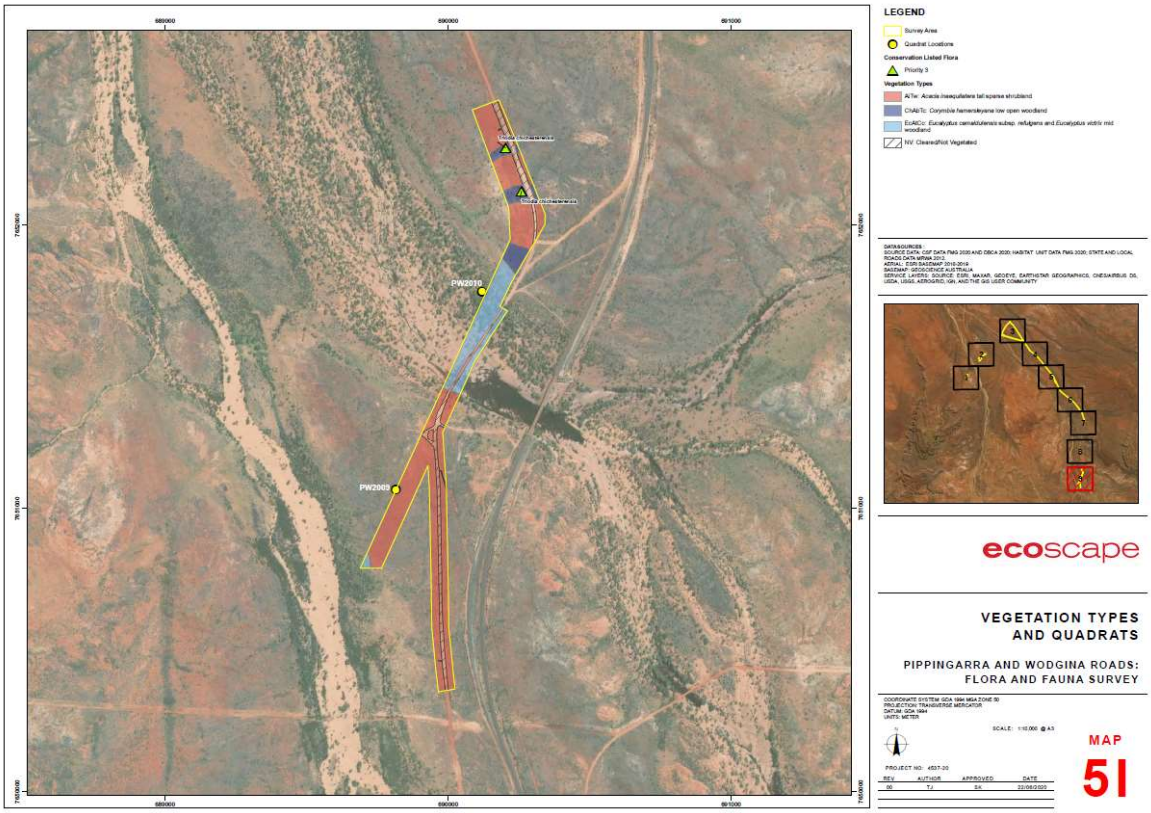

Figure D-6 – Vegetation units and conservation significant flora within proposed clearing footprint (6 of 6) (Ecoscape, 2020)

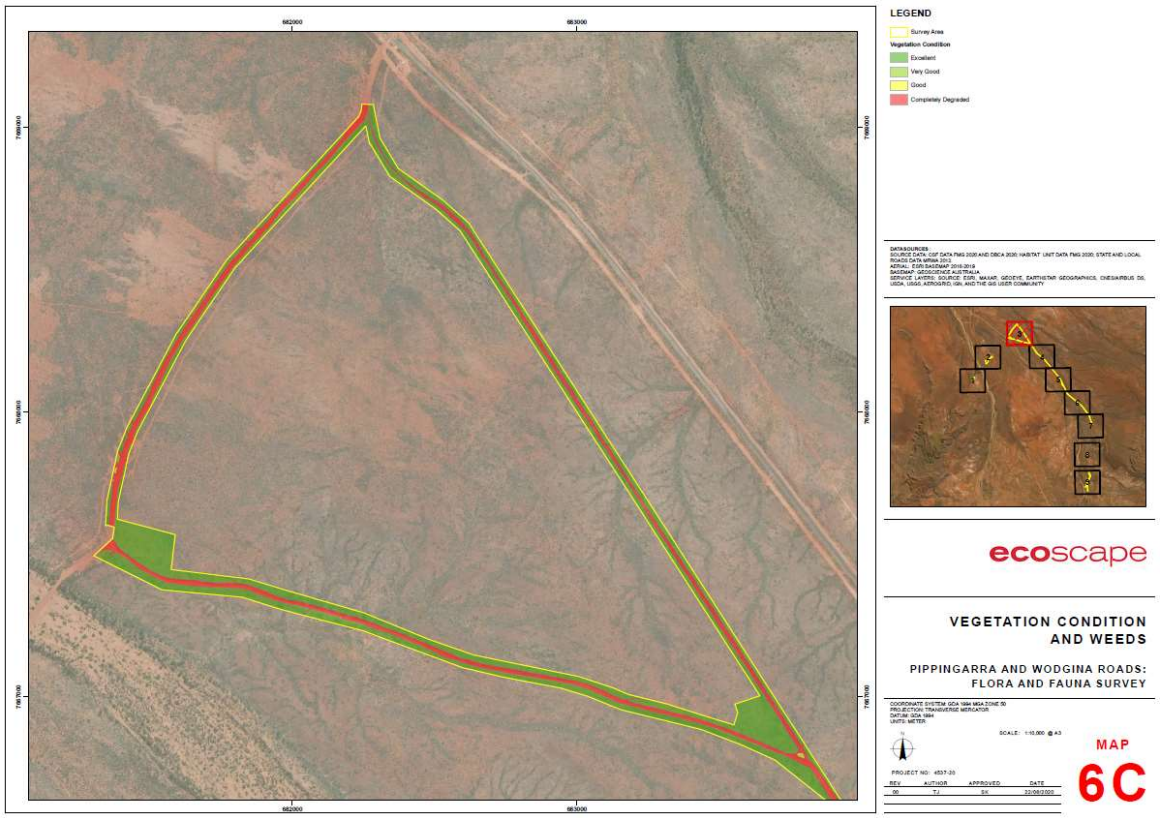

Figure D-7 – Vegetation condition mapping within proposed application area (1 of 6) (Ecoscape, 2020)

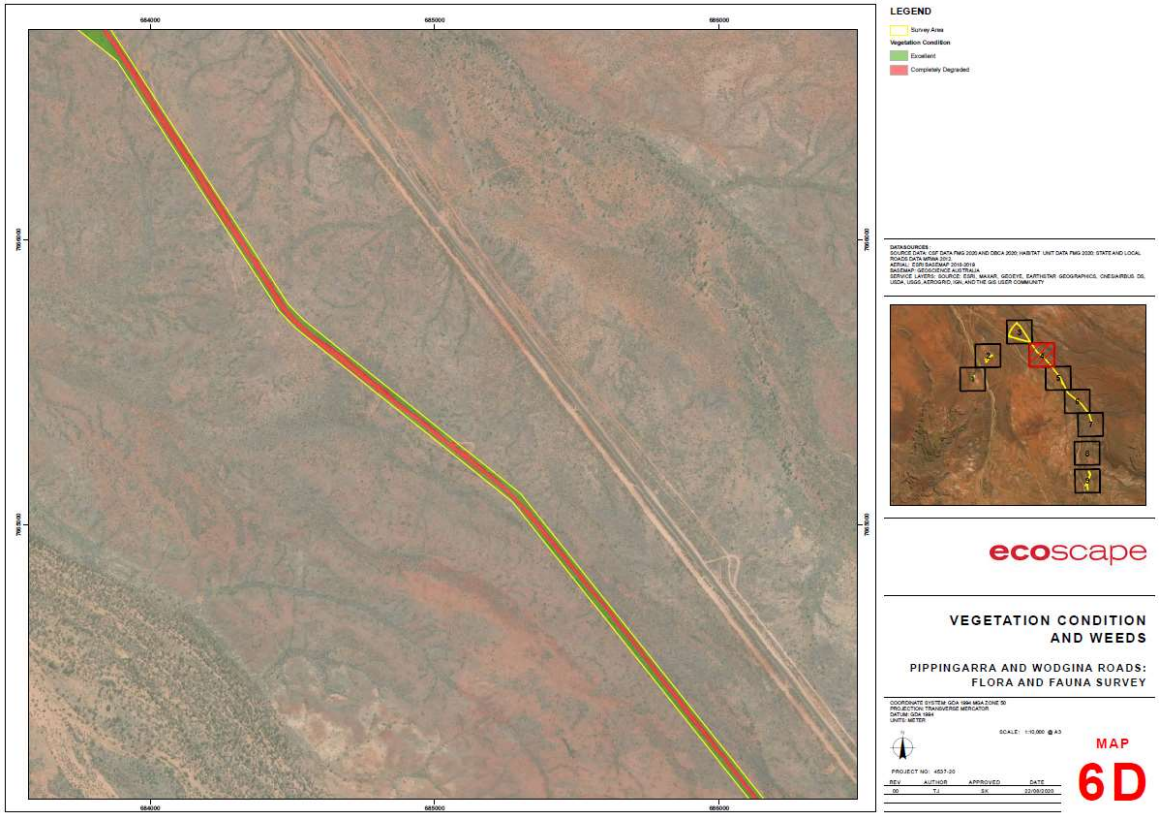

Figure D-8 – Vegetation condition mapping within proposed application area (2 of 6) (Ecoscape, 2020)

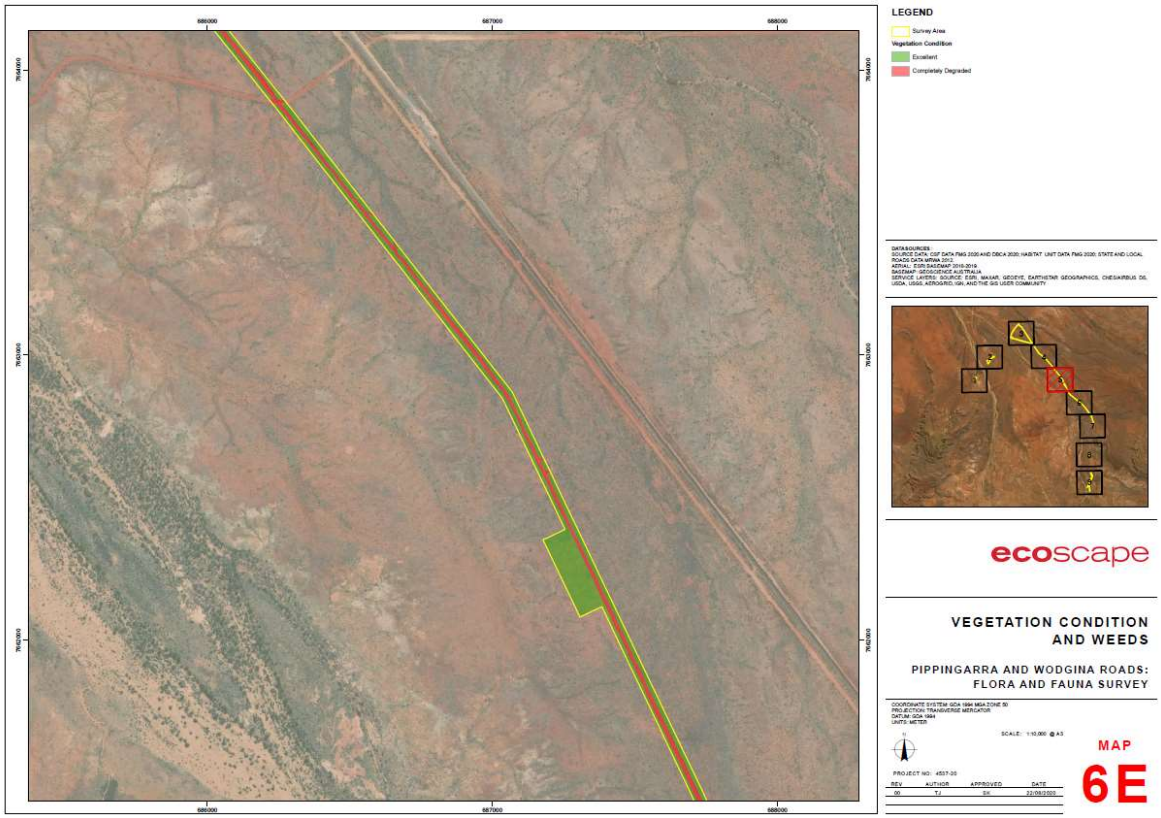

Figure D-9 – Vegetation condition mapping within proposed application area (3 of 6) (Ecoscape, 2020)

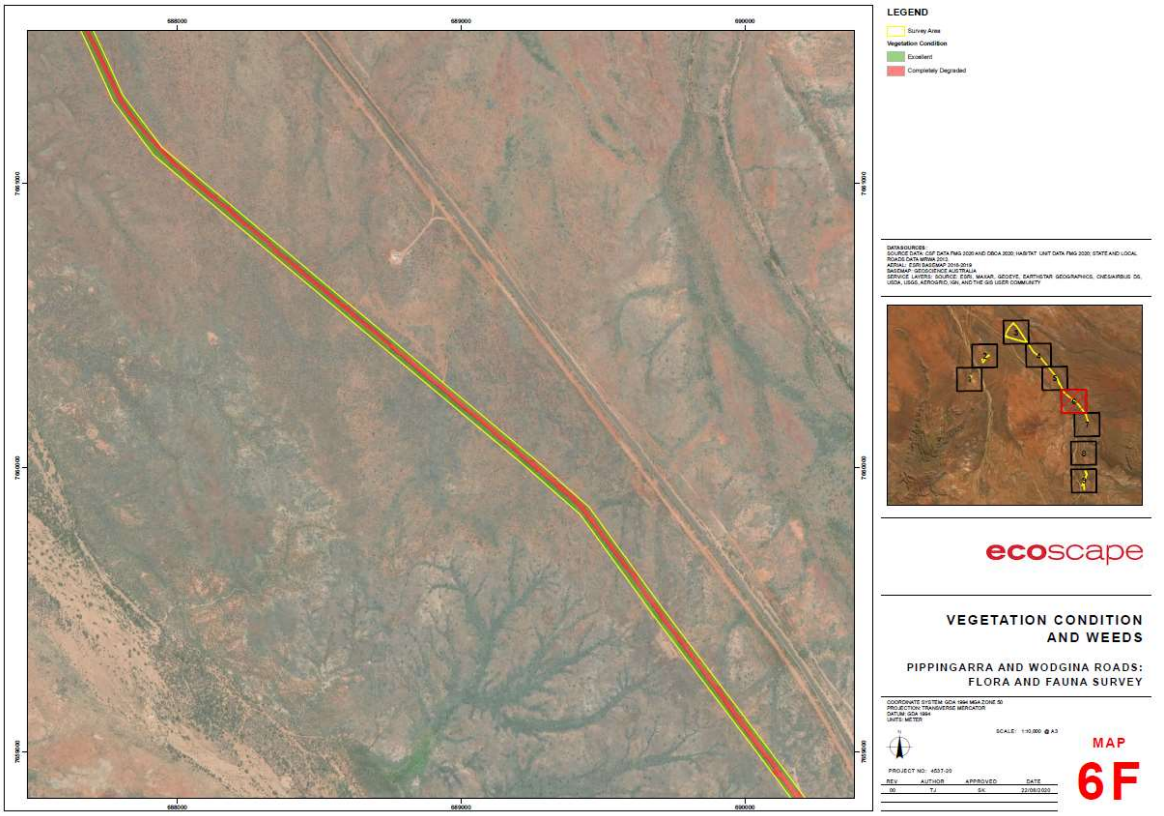

Figure D-10 – Vegetation condition mapping within proposed application area (4 of 6) (Ecoscape, 2020)

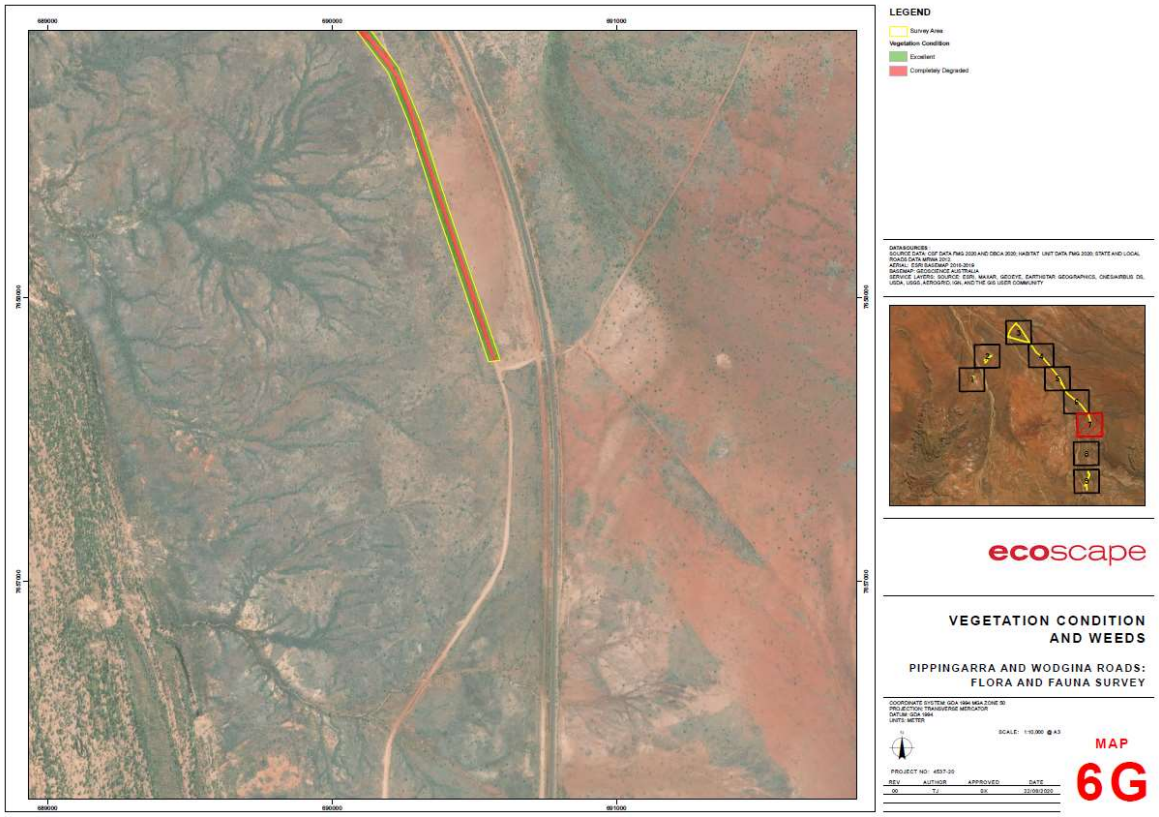

Figure D-11 – Vegetation condition mapping within proposed application area (5 of 6) (Ecoscape, 2020)

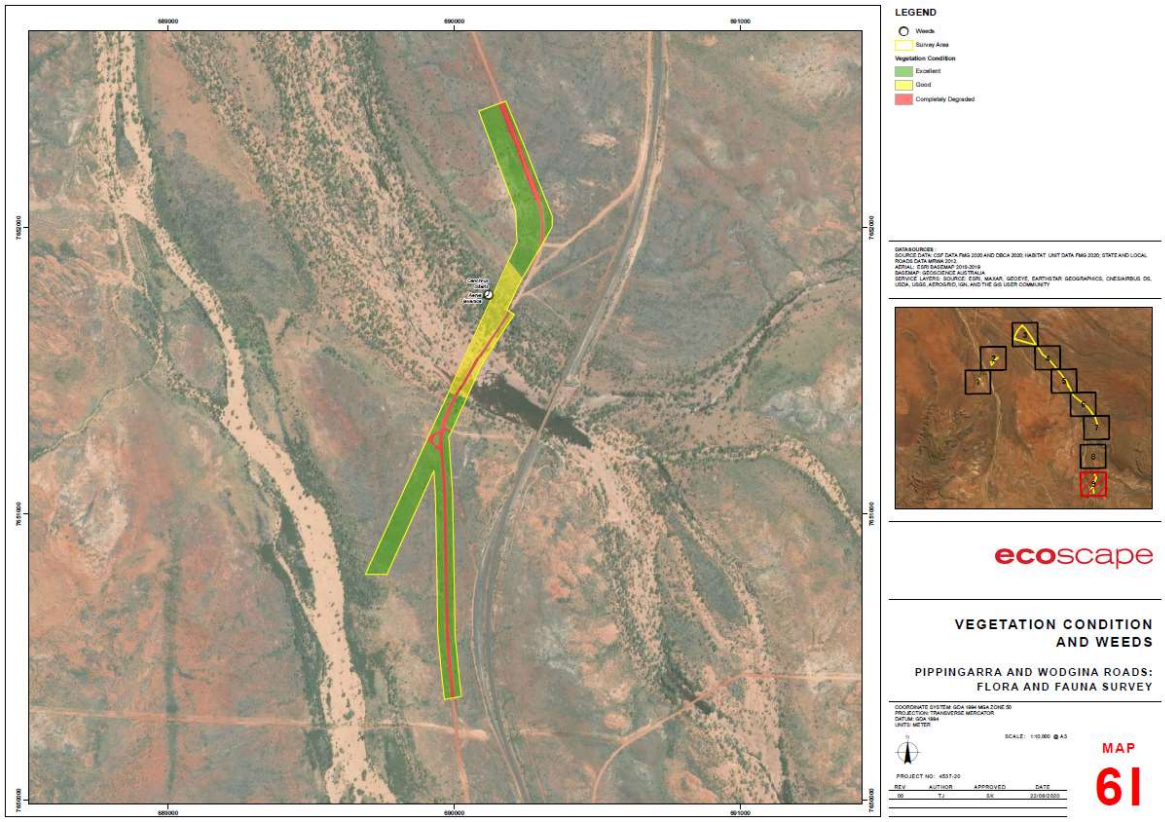

Figure D-12 – Vegetation condition mapping within proposed application area (6 of 6) (Ecoscape, 2020)

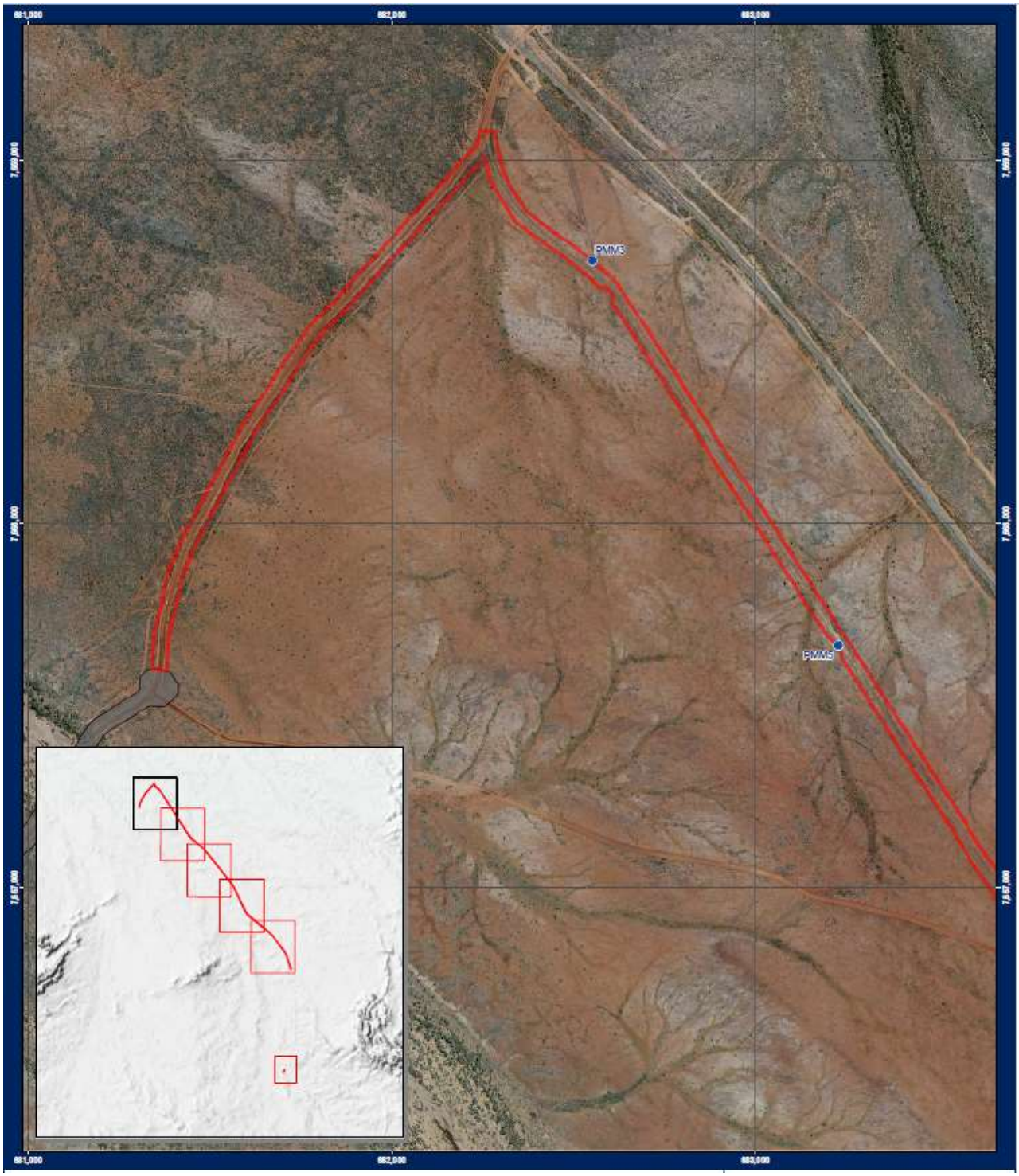

Figure D-13 – Location of Western pebble mound mouse mounds in proximity to application area (Fortescue Metals Group, 2020b).

Appendix E – References and databases

1. GIS datasets

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

- 10 Metre Contours (DPIRD-073)

- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- IBRA Vegetation Statistics
- Imagery
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Subsurface Compaction Risk (DPIRD-012)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL) (DBCA-036)
- Threatened Flora (WAHerb)
- Threatened and Priority Fauna (DBCA-037)
- Threatened Ecological Communities and Priority Ecological Communities (DBCA-038)
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

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