GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 10267/1
Permit Holder:	Chichester Metals Pty Ltd on behalf of Fortescue Ltd
Duration of Permit:	From 7 March 2024 to 7 March 2034

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 geotechnical and hydrogeological investigations.

2. Land on which clearing is to be done

Lot 151 on Deposited Plan 243201, Newman

Lot 1580 on Deposited Plan 72910, Newman

3. Clearing authorised

The permit holder must not clear more than 25.11 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

4. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 7 March 2029.

PART II – MANAGEMENT CONDITIONS

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

(a) 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:

(b) avoid the clearing of *native vegetation*;

(c) minimise the amount of *native vegetation* to be cleared; and

(d) reduce the impact of clearing on any environmental value.

6. Weed management

(a) 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*:

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

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

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

7. Vegetation management – watercourse and drainage line surface flow

The permit holder must:

(a) avoid clearing *riparian vegetation*,

(b) ensure that no clearing of *native vegetation* occurs within the major drainage line / river / creek habitat areas cross-hatched black in Figure 2 of Schedule 1,

(c) ensure that no clearing of *native vegetation* occurs:

(i) within or adjacent to a *watercourse* or *drainage line*, or

(ii) within the minor drainage line / river / creek habitat areas cross-hatched white in Figure 2 of Schedule 1,

(iii) except for the purpose of a crossing.

(d) Where a *watercourse* or *drainage line* is to be impacted by clearing for a crossing in accordance with condition 7(b), the permit holder shall ensure surface flow is maintained or is reinstated downstream into existing natural *drainage lines*.

(e) Where clearing is required for other purposes within the minor drainage line / river / creek habitat areas cross-hatched white in Figure 2 of Schedule 1, clearing is authorised up to 4.5 hectares.

8. Fauna management – clearing not allowed

The permit holder must ensure that no clearing of *native vegetation* occurs within the rocky escarpments / ridges / mesa and hills / ranges / plateaux habitat areas cross-hatched red in Figure 2 of Schedule 1.

9. Fauna management – pre-clearance survey

(a) Within seven (7) days of undertaking any clearing authorised under this permit within the area cross-hatched yellow in Figure 1 of Schedule 1, the permit holder shall engage a *fauna specialist* to undertake a pre-clearance survey of the areas to be cleared for the:

(i) western pebble-mound mouse (*Pseudomys chapmani*), including the identification and inspection of mounds,

(ii) greater bilby (*Macrotis lagotis*), including the identification and inspection of burrows, and

(iii) brush-tailed mulgara (*Dasycercus blythi*), including the identification and inspection of burrows.

(b) Where evidence of mounds and/or burrows is identified under condition 9(a) of this permit, the Permit holder shall:

(i) engage a *fauna specialist* to flag the location of the mounds and/or burrows; and

(ii) not clear within 50 metres of the flagged mounds and/or burrows.

(c) Where western pebble-mound mouse mounds or bilby or brush-tailed mulgara burrows are identified under condition 9(a) of this permit, the permit holder must include the following in a report submitted to the *CEO* within three months of undertaking any *clearing* authorised under this permit:

(i) the location of any western pebble-mound mouse mounds or bilby or brush-tailed mulgara burrows identified, using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees;

(ii) the name of the *fauna specialist* that undertook clearance surveys under condition 9(a) of this permit; and

(iii) the methodology used to survey the permit area.

10. Fauna management – fauna spotter

(a) The permit holder must:

(i) engage a fauna spotter to traverse the area cross-hatched yellow on Figure 1 of Schedule 1 ahead of clearing machinery immediately prior to, and for the duration of, clearing activities; and

(ii) conduct clearing activities in a slow, progressive manner in one direction, towards adjacent native vegetation, to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

(b) Clearing activities must cease in any area where native fauna are identified under condition 10(a) until native fauna individual(s) have moved on from that area to adjoining vegetation.

(c) Where *conservation significant fauna* individual(s) are identified under condition 10(a) of this permit, the permit holder must include the following in a report submitted to the *CEO* within three months of undertaking any *clearing* authorised under this permit:

(i) the species of each *conservation significant fauna* individual(s) identified;

(ii) the number of individuals identified;

(iii) the date each individual was identified;

(iv) the location where each individual was identified recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees;

(v) the relevant qualifications of the fauna spotter undertaking identification, under condition 10(b); and

(vi) details pertaining to the circumstances of any death of, or injury sustained by, a *conservation significant fauna* individual.

11. Fauna management – backfilling

(a) The permit holder must:

(i) backfill all test pits, bore holes and sumps on the day of drilling/excavating with excavated material; or

(ii) fence all test pits, bore holes and sumps on the day of drilling/excavating with fine mesh to prevent fauna access; or

(iii) cover all test pits, bore holes and sumps on the day of drilling/excavating with a cover which prevents entry to the pits by fauna species.

12. Fauna management – time of clearing

The permit holder must undertake all activities authorised under this permit during *daytime hours*.

13. Flora management – pre-clearance survey

(a) Prior to undertaking any clearing authorised under this permit within the area cross-hatched yellow on Figure 1 of Schedule 1, the permit holder must engage a *botanist* to conduct a *targeted flora survey* of the areas to be cleared for the presence of *threatened flora* and *priority flora*.

(b) Where *threatened flora* is identified under condition 13(a), the permit holder must not cause or allow:

(i) clearing within 50 metres of the identified *threatened flora*; and

(ii) clearing of the identified *threatened flora*.

(c) Where *priority flora* is identified under condition 13(a), the permit holder must not cause or allow:

(i) clearing within 20 metres of the identified *priority flora,* unless approved by the *CEO*; and

(ii) clearing of the identified *priority flora*, unless approved by the *CEO*.

(d) Where *threatened flora* or *priority flora* are identified under condition 13(a) of this permit, the permit holder must include the following in a report submitted to the *CEO* within three months of undertaking any *clearing* authorised under this permit:

(i) the species name of each *threatened flora* and *priority flora* individual(s) identified under condition 13(a);

(ii) the number of individuals identified;

(iii) the date each individual was identified;

(iv) the location of each *threatened flora* and *priority flora*, identified under condition 13(a), either as the location of individual plants, or where this is not practical, the areal extent of the population and an estimate of the number of plants, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees;

(v) the name of the *botanist* that undertook clearance surveys under condition 13(a) of this permit; and

(vi) the methodology used to survey the permit area.

14. Revegetation and rehabilitation – *temporary works*

The permit holder must:

(a) Retain the vegetative material and topsoil removed by clearing authorised under this permit and stockpile the vegetative material and topsoil in an area that has already been cleared.

(b) At an *optimal time* and no later than six (6) months following clearing authorised under this permit, *revegetate* and *rehabilitate* the area(s) that are no longer required for the purpose for which they were cleared under this permit (*temporary works*) by:

  (i) re-shaping the surface of the land so that it is consistent with the surrounding five (5) metres of uncleared land;

  (ii) ripping the ground on the contour to remove soil compaction; and

  (iii) laying the vegetative material and topsoil retained under condition 14(a) on the cleared area(s).

(c) Within 24 months of laying the vegetative material and topsoil on the cleared area in accordance with condition 14(a) of this permit:

  (i) engage an *environmental specialist* to determine the species composition, structure and density of the area *revegetated* and *rehabilitated*; and

  (ii) engage an *environmental specialist* to make a determination as to whether the composition, structure and density determined under condition 14(c)(i) of this permit will, without further revegetation, result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area.

(d) If the determination made by the *environmental specialist* under condition 14(c)(ii) is that the species composition, structure, and density determined under condition 14(c)(i) will not, without further revegetation, result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, the permit holder must *revegetate* the area by deliberately *planting local provenance* propagating material and/or *direct seeding* of *local provenance* seeds that will result in a similar species composition, structure, and density of *native vegetation* to pre-clearing vegetation types in that area.

(e) Where additional *planting* or *direct seeding* of *native vegetation* is undertaken in accordance with condition 14(d), the permit holder must repeat the activities required by condition 14(c) and 14(d) within 24 months of undertaking the additional *planting* or *direct seeding* of *local provenance native vegetation*.

(f) Where a determination is made by an *environmental specialist* under condition 14(c)(ii) that the composition, structure and density within areas *revegetated* and *rehabilitated* will result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, that determination shall be submitted to the *CEO* within three months of the determination being made by the *environmental specialist*.

(g) Where a notice is received from the *CEO:*

  (i) stating that the *CEO* disagrees with the determination submitted under condition 14(f); and

  (ii) specifying the required further *planting* of *local provenance* propagating material and/or *direct seeding* of *local provenance* seeds that in the *CEO*'s reasonable opinion are necessary to ensure that the *native vegetation* will result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area;

(iii) the permit holder must carry out the further *planting* and/or *direct seeding* specified in the notice, during the next *optimal time* occurring after receiving the notice from the *CEO*.

PART III - RECORD KEEPING AND REPORTING

15. 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 GDA2020, expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the time of day that the area was cleared; (e) the direction in which clearing was undertaken; (f) the size of the area cleared (in hectares); (g) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 5; (h) actions taken to minimise the risk of the introduction and spread of *weeds* in accordance with condition 6; and (i) actions taken in accordance with condition 8.
2.	In relation to vegetation management pursuant to condition 7	(a) the size of the area cleared (in hectares) in accordance with condition 7(c) and 7(e); (b) the location where clearing occurred in accordance with condition 7(c) and 7(e), recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings; (a) actions taken to maintain or reinstate surface flow of any *watercourse* or *drainage line* impacted by the clearing, in accordance with condition 7(d).
3.	In relation to fauna management pursuant to condition 9	(a) results of the pre-clearance surveys undertaken in accordance with condition 9 of this permit; and (b) a copy of the *fauna specialist's* report.

No.	Relevant matter	Specifications
4.	In relation to fauna management pursuant to condition 10	(a) actions taken to avoid impacts to fauna in accordance with condition 10; and (b) a copy of the fauna spotter's report in accordance with condition 10(c).
5.	In relation to fauna management pursuant to condition 11	(a) evidence of backfilling / fencing / covering all excavations in accordance with condition 11.
6.	In relation to flora management pursuant to condition 13	(a) actions taken to demarcate each *threatened flora* and/or *priority flora* species recorded and their relevant buffers; (b) actions taken to avoid the clearing of *threatened flora* and/or *priority flora* species; (c) a copy of the botanist's report in accordance with condition 13(d).
7.	In relation to *revegetation* and *rehabilitation* pursuant to condition 14	(a) actions taken in accordance with condition 14 to *revegetate* and *rehabilitate* temporarily cleared areas; (b) the size of the area(s) *revegetated* and *rehabilitated*; (c) the date(s) on which the *revegetation* and *rehabilitation* was undertaken; and (d) the boundaries of the area(s) *revegetated* and *rehabilitated*, recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings.

16. Reporting

The permit holder must provide to the *CEO* the records required under condition 15 of this permit when requested by the *CEO*.

DEFINITIONS

In this permit, the terms in Table 2 have the meanings defined.

Table 2: Definitions

Term	Definition
botanist	means a person who holds a tertiary qualification specialising in environmental science or equivalent and has a minimum of two (2) years' work experience in Western Australian flora identification and undertaking flora surveys native to the bioregion being inspected or surveyed, or who is approved by the *CEO* as a suitable environmental specialist for the bioregion, and who holds a valid flora licence issued under the *Biodiversity Conservation Act 2016*.

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.
conservation significant fauna	means those fauna taxa listed as threatened or specially protected species under the *Biodiversity Conservation Act 2016* (WA) or as priority fauna classes 1, 2, 3, or 4 in the Department of Biodiversity, Conservation and Attractions *Threatened and Priority Fauna List for Western Australia* (as amended from time to time) and/or listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999.*
daytime hours	Daytime hours means the duration starting half an hour before sunrise and ending half an hour after sunset.
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.
direct seeding	means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the desired plant species.
drainage lines	means a natural depression that carries surface water runoff.
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent and has a minimum of 2 years work experience relevant to the type of environmental advice that an environmental specialist is required to provide under this permit, or who is approved by the *CEO* as a suitable environmental specialist.
EP Act	*Environmental Protection Act 1986* (WA)
fauna specialist	means a person who holds a tertiary qualification specialising in environmental science or equivalent and has a minimum of 2 years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the *CEO* as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the *Biodiversity Conservation Act 2016*.
fill	means material used to increase the ground level, or to fill a depression.
local provenance	means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same IBRA subregion of the area cleared.
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.
optimal time	means the period from November to December for undertaking direct seeding and no planting without irrigation for undertaking planting.
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species
priority flora	means those plant taxa described as priority flora classes 1, 2, 3, or 4 in the Department of Biodiversity, Conservation and Attractions *Threatened and Priority Flora List for Western Australia* (as amended from time to time).
rehabilitate	means actively managing an area containing native vegetation in order to

Term	Definition
	improve the ecological function of that area.
revegetate	means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
riparian vegetation	has the meaning given to it in Regulation 3 of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.
targeted flora survey	means a field-based investigation, including a review of established literature, of the biodiversity of flora and vegetation of the permit area, focusing on habitat suitable for flora species that are being targeted and carried out during the optimal time to identify those species. Where target flora is identified in the permit area, the survey must also include a minimum of a 10 metre radius of the surrounding areas to place the permit area into local context.
temporary works	means access tracks, spoil areas, side tracks, site offices, storage areas, laydown areas, extraction sites, camps, project surveys, pre-construction activities, and similar works associated with a project activity that are temporary in nature.
threatened flora	means those plant taxa listed as threatened flora under the *Biodiversity Conservation Act 2016* (WA).
watercourse	has the meaning given under section 3 of the *Rights in Water and Irrigation Act 1914.*
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
MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

13 February 2024

Schedule 1

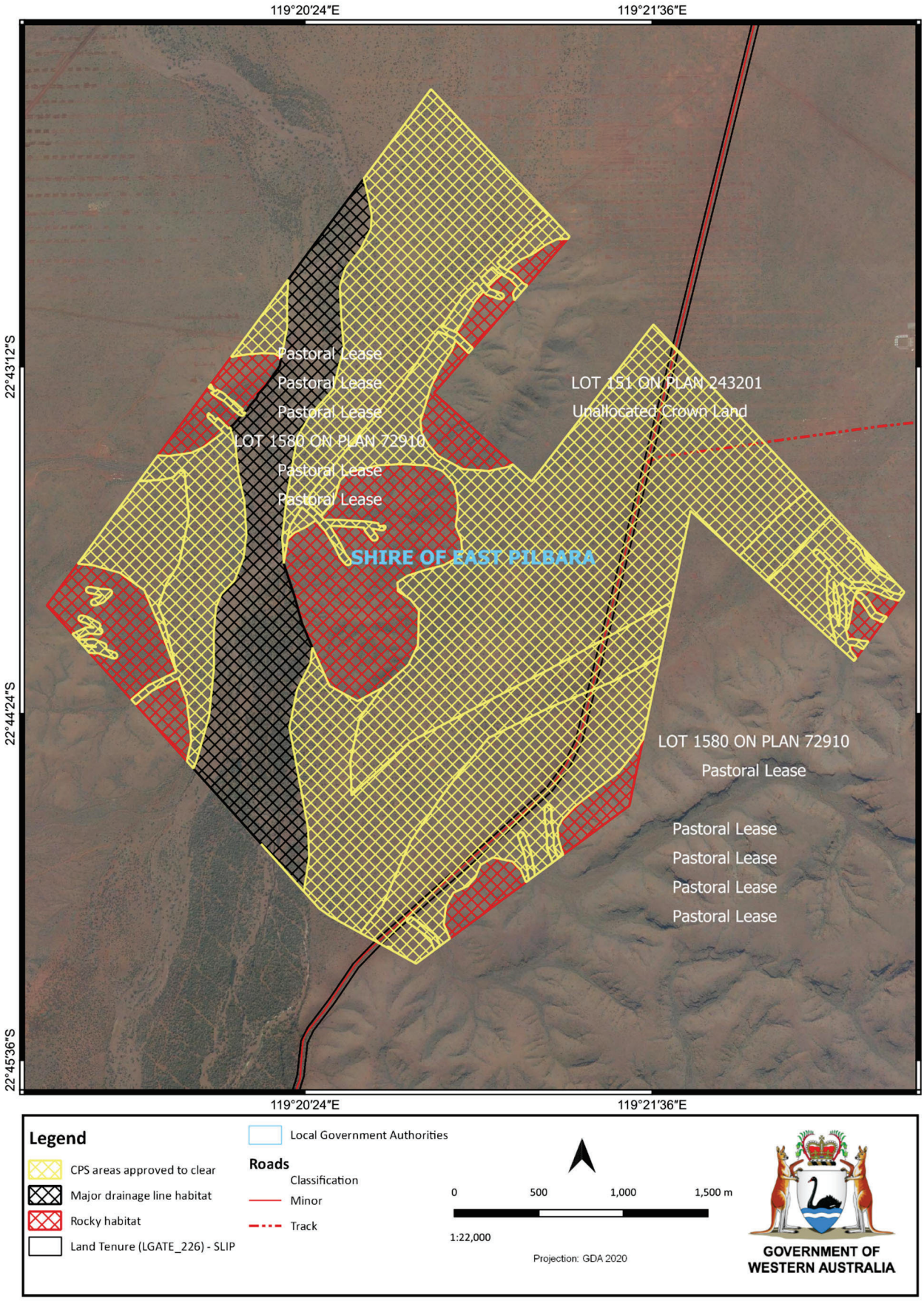

Figure 1: Map of the boundary of the area within which clearing may occur (cross-hatched yellow)

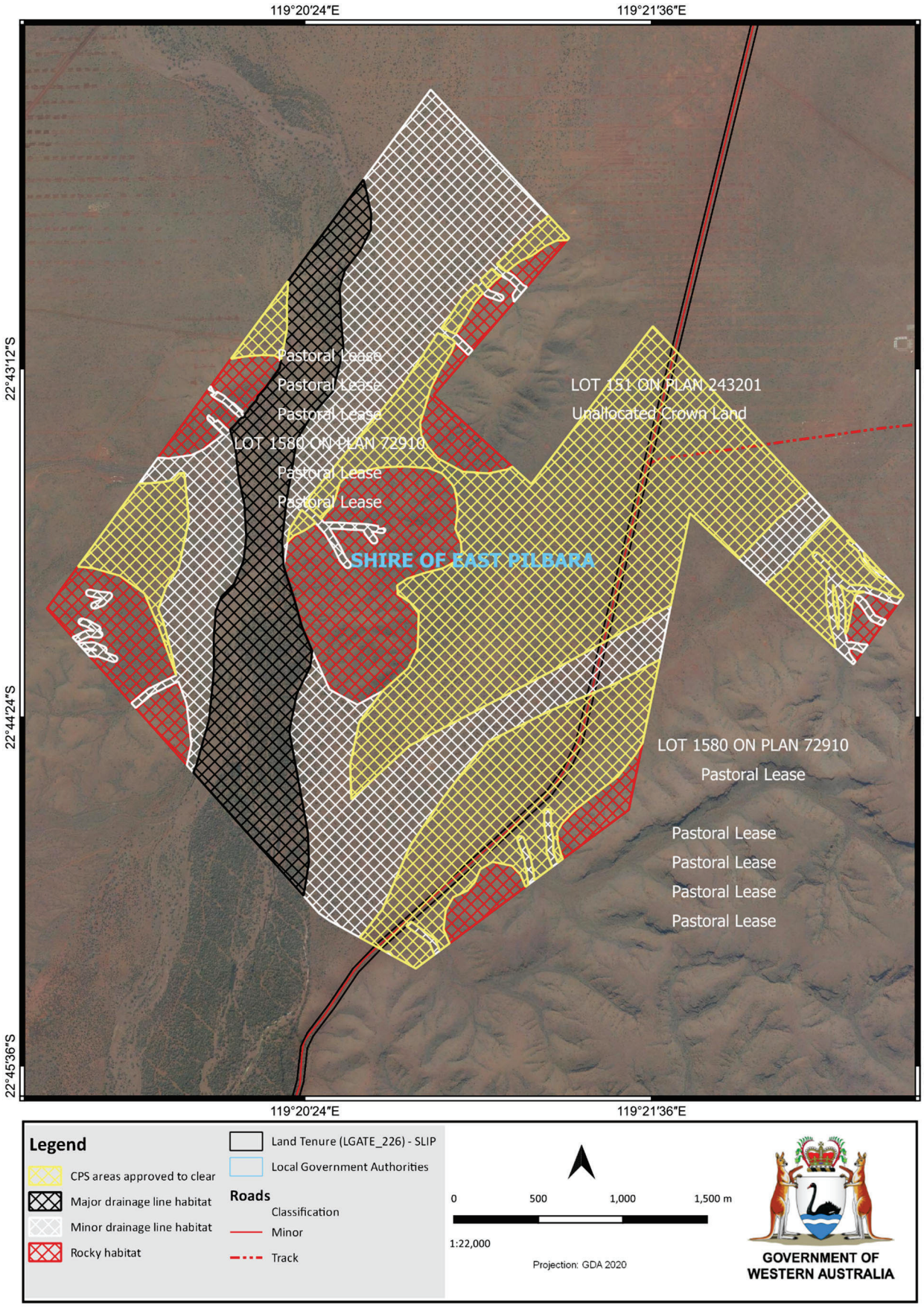

Figure 2: Map of the boundary of the minor drainage habitat areas (cross-hatched white) subject to condition 7, the major drainage habitat areas (cross-hatched black) within which clearing is not authorised (condition 7) and the rocky habitat areas (cross-hatched red) within which clearing is not authorised (condition 8)

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10267/1
Permit type:	Purpose permit
Applicant name:	Chichester Metals Pty Ltd on behalf of Fortescue Ltd
Application received:	7 July 2023
Application area:	25.11 hectares of native vegetation within an approximately 1,261-hectare footprint
Purpose of clearing:	Geotechnical and hydrogeological investigations
Method of clearing:	Mechanical
Property:	Lot 151 on Deposited Plan 243201 Lot 1580 on Deposited Plan 72910
Location (LGA area/s):	Shire of East Pilbara
Localities (suburb/s):	Newman

1.2. Description of clearing activities

The vegetation proposed to be cleared is 25.11 hectares of native vegetation within a 1,261-hectare footprint for the purpose of geotechnical and hydrogeological investigations (see Figure 1, Section 1.5). The application is to establish seven hydrological drill pads, nine geotechnical drill pads and multiple access tracks. The hydrological drill pads are 80 x 80 metres with one 80 x 30 metre sump on the edge of each pad. The sumps will be 1.5 metres deep. Each hydrological drill pad contains up to two 300-metre-deep bores. The geotechnical drill pads are 50 x 50 metres and contain multiple test pits. The test pits are up to 5 metres deep.

Once exploration is completed, the applicant intends to expand mining operations into this area should it be determined feasible. Clearing associated with the future mining activities is not covered by this application.

1.3. Decision on application

Decision:	Granted
Decision date:	13 February 2024
Decision area:	25.11 hectares of native vegetation within an approximately 1,261-hectare footprint, 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 F.1), the findings of biological surveys (see Appendix D and E), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered

relevant to the assessment (see Section 3.3). The Delegated Officer also took into consideration the purpose of the proposed clearing is for temporary works.

The assessment identified that the proposed clearing will result in:

- the loss of native vegetation that is suitable habitat for conservation significant fauna,
- the loss of native vegetation that may contain suitable habitat for conservation significant flora,
- potential temporary and short-term impacts to surface water hydrology, and
- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values.

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:

- avoidance and minimisation to reduce the impacts and extent of clearing
- avoid clearing of riparian vegetation
- avoid clearing of major drainage line, hills / ranges / plateaux and rocky escarpment habitat areas
- clearing within minor drainage line habitat areas restricted to not more than 4.5 hectares
- restricting clearing of watercourses or drainage lines to the purpose of a crossing only, ensuring surface flow is maintained or reinstated downstream
- avoid clearing at night to reduce impacts to nocturnal fauna
- take hygiene steps to minimise the risk of the introduction and spread of weeds to adjacent vegetation
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- engage a fauna spotter for the duration of clearing activities
- backfilling, fencing or covering all test pits, bore holes and sumps to prevent fauna access
- pre-clearance surveys to be undertaken to confirm presence / absence of conservation significant flora and a minimum buffer of 20 metres to be applied to any priority flora individuals identified
- pre-clearance surveys to be undertaken to confirm presence / absence of western pebble-mound mouse mounds and bilby and brush tailed mulgara burrows and a minimum buffer of 50 metres to be applied to any mounds or burrows identified
- revegetation and rehabilitation of areas cleared for temporary works

1.5. Site map

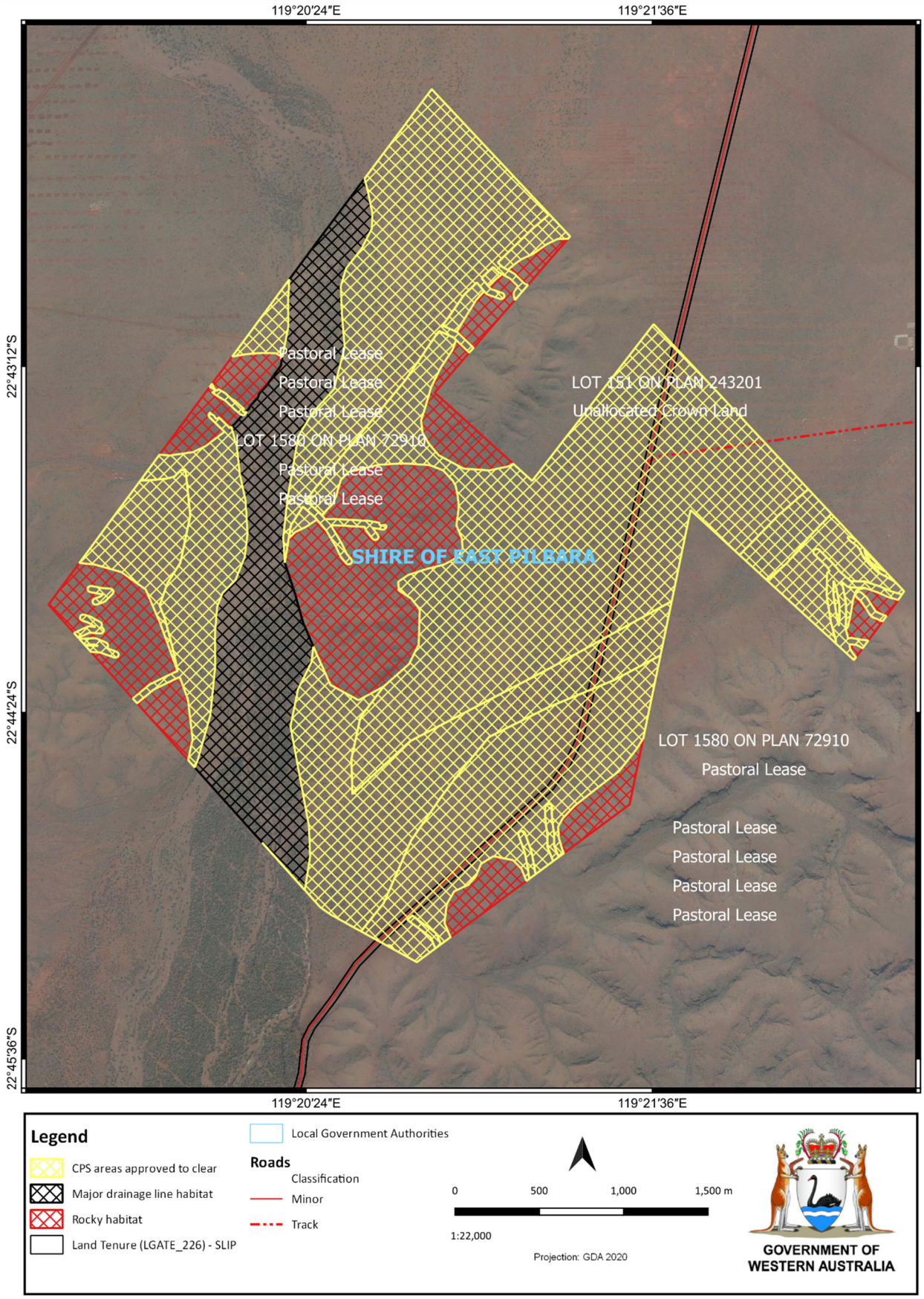

Figure 1 Map of the application area

The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit. The areas cross-hatched red and black indicate the areas within which clearing activities must not be undertaken.

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 polluter pays principle
- 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)
- *Land Administration Act 1997* (WA)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Native Title Act 1993* (Cth)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, 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

Supporting documentation was submitted by the applicant (Chichester Metals, 2023b), demonstrating that management measures will be implemented to avoid and mitigate environmental impacts, including but not limited to:

- using previously disturbed and existing cleared areas where practical,
- no clearing to be undertaken within 200 metres of Weeli Wolli Creek,
- protect natural drainage lines from construction to minimise impacts to water quality,
- implementing weed hygiene management in accordance with the applicant's *Weed Management Plan 100-PL-EN-1017*,
- implementing speed limit restrictions, right of way for fauna and the prohibition of off-road driving in accordance with the applicant's *Traffic Management Plan 100-PR-SA-0049* to minimise the potential for fauna injuries or deaths on haul and access roads,
- conduct progressive rehabilitation of disturbed areas in accordance with the applicant's *Exploration Environmental Management Plan E-PL-EN-0002*,
- drainage infrastructure location, design, construction, and operation will be designed to minimise interference and disruption of natural surface water flows and quality in accordance with the applicant's *Standard Engineering Specification for Drainage and Flood Protection 100-SP-CI-0004* and *Standard Engineering Specification for Road Design for Projects 100-SP-CL-0002*.

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 (see Appendix B) identified that the impacts of the proposed clearing present a risk to biological values (fauna, flora and vegetation), and water resources. 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 (biodiversity – flora and vegetation) - Clearing Principle (a)

Assessment

The findings of a flora and vegetation survey (Ecoscape, 2021) indicates the application area consists of six vegetation types:

- *Acacia* low open woodland (AcCc),
- *Acacia* mid sparse shrubland (ApTp),
- *Acacia* mid open shrubland (AtTp),
- *Eucalyptus* low open woodland (EgAaTb2),
- *Eucalyptus* low open woodland (ElGwTv), and
- *Eucalyptus* mid open woodland (EvAcCc).

The flora and vegetation survey (Ecoscape, 2021) indicates the vegetation within the proposed clearing area is in Excellent to Degraded (Trudgen, 1991) condition. Excerpts of the survey descriptions, maps and representative photographs are available in Appendix D.

According to available databases, there are no conservation significant flora records within the application area. The closest known flora record is the Priority 1 *Calotis squamigera*, recorded approximately three kilometres from the application area. No threatened flora species have been recorded within the local area (50-kilometre radius from the application area).

A likelihood assessment was conducted based on habitat and soil preferences, vegetation within the application area, and known species distribution. The assessment identified 14 conservation significant flora species which may occur in the application area (see Appendix A.3.).

No priority or threatened flora were identified in the application area during the flora and vegetation survey (Ecoscape, 2021). The closest conservation significant flora species recorded in the flora and vegetation survey was *Lepidium catapycnon* (Priority 4). Eight *L. catapycnon* individuals were recorded approximately 250 metres from the application area (Ecoscape, 2021). Given the distance between these records and the application area, the proposed clearing is unlikely to significantly impact this population.

Given the extent of the application area, it is possible conservation significant flora species are present in the application area and were not identified during the flora survey. To avoid potential impacts to conservation significant flora species, a pre-clearing inspection will be undertaken to confirm the presence or absence of conservation significant flora in proposed clearing areas. If any priority flora species are identified during these surveys, clearing will not occur within 20 metres of these individuals.

Priority Ecological Communities (PEC)

The flora and vegetation survey (Ecoscape, 2021) did not identify any vegetation within the application area that is representative of a conservation significant ecological community. A portion of Weeli Wolli Creek, which is connected to the Priority 1 Weeli Wolli Spring Community PEC and Priority 1 Fortescue Marsh (Marsh Land System) PEC, is located within the application area. Given the proposed clearing is unlikely to significantly alter surface or groundwater hydrology of Weeli Wolli Creek or the quality of water resources in the area (see section 3.2.3. and 3.3), the proposed clearing is unlikely to impact these PECs.

Impacts to Weeli Wolli Creek and water resources are further discussed in section 3.2.3 below.

Conclusion

Based on the above assessment, the proposed clearing is unlikely to significantly impact local or regional flora and vegetation biodiversity. Given the size of the application area, it is possible conservation significant flora species are present in the application area and were not identified during the flora survey. To mitigate this risk, additional surveys will be required prior to clearing being undertaken and no clearing will occur within 50 metres of identified conservation significant flora individuals.

For the reasons set out above, it is considered that the impacts of the proposed clearing on flora and vegetation can be managed through the below conditions.

Conditions

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

- avoidance and minimisation to reduce the impacts and extent of clearing,
- take hygiene steps to minimise the risk of the introduction and spread of weeds to adjacent vegetation,
- pre-clearance surveys to be undertaken to confirm presence / absence of conservation significant flora and a minimum buffer of 20 metres applied to any priority flora individuals identified,
- avoid clearing of riparian vegetation,
- revegetation and rehabilitation of areas cleared for temporary works.

3.2.2. Biological values (biodiversity and fauna) - Clearing Principle (a and b)

Assessment

The findings of a fauna survey (360 Environmental, 2022) indicate the application area consists of five habitat types:

- Hills / Ranges / Plateaux
- Rocky Escarpments (Ridges / Mesa / Cliffs / Outcrops / Breakaways)
- Drainage Line / River / Creek (major)
- Drainage Line / River / Creek (minor)
- Hummock Grassland

The full habitat descriptions and maps are available in Appendix E. The flora and vegetation survey (Ecoscape, 2021) indicates the vegetation within the proposed clearing area is in Excellent to Degraded (Trudgen, 1991) condition (see Appendix D).

According to available databases, 26 conservation significant fauna species have been recorded within the local area. Of these, two species have been recorded in the application area: *Pandion cristatus* (eastern osprey; MI) and *Pseudomys chapmani* (western pebble-mound mouse; P4). Three conservation significant fauna species were recorded in the local area during the fauna survey: *Anilios ganei* (Gane's blind snake; P1), *Pseudomys chapmani* (western pebble-mound mouse; P4) and *Rhinonicteris aurantia* Pilbara (Pilbara leaf-nosed bat; VU) (360 Environmental, 2022). These species were recorded approximately two, six and 28 kilometres from the application area, respectively.

In forming a view on the likelihood of each species occurring within the application area, the following was considered:

- the preferred habitat and vegetation types of the species,
- their recorded proximity to the application area, and
- date of record (See Appendix A.4).

The likelihood analysis identified 20 conservation significant fauna species which may occur within the application area (See Appendix A.4).

The fauna survey (360 Environmental, 2022) recorded 127 non-conservation significant fauna individuals in the application area, comprising 51 species. Of these, 98 individuals were recorded in major drainage line habitat, 14 in the hummock grassland habitat, 11 in minor drainage line habitat and four in the hills / ranges / plateaux habitat (360 Environmental, 2022).

Hills / ranges / plateaux and rocky escarpment habitat

The hills / ranges / plateaux habitat consists of "rocky ironstone hills and slopes with rocky outcropping and thin soils over shallow bedrock… [with] open Acacia shrublands over Triodia hummock grasslands" (360 Environmental, 2022). This habitat type provides suitable denning, roosting, foraging, nesting, and dispersal features for conservation significant fauna species (360 Environmental, 2022; see Table A.4). The rocky escarpment habitat is a subset of the hills / ranges / plateaux habitat consisting of "abundant crevices, overhangs, cavities, and caves" (360 Environmental, 2022).

The microhabitats within the hills / ranges / plateaux and rocky escarpment habitat areas provide crucial refugia for many fauna species within the arid landscape (360 Environmental, 2022; see Table A.4). Given the flexible nature of the proposed clearing and the value of this habitat type for multiple conservation significant fauna species, clearing will not be undertaken within the hills / ranges / plateaux and rocky escarpment habitat areas. Given this, the proposed clearing is unlikely to significantly impact fauna reliant on these habitats.

Drainage line habitat

Both major and minor drainage line habitats consist of dense overstorey vegetation over grasslands, and the major drainage line habitat contains "permanent or semi-permanent pooling of water" (360 Environmental, 2022). The drainage line habitat areas provide suitable foraging, nesting, linkage and dispersal features and water sources for conservation significant fauna species (360 Environmental, 2022).

The drainage line habitat is considered to support high biodiversity value within the application area, especially the major drainage line habitat where surface water is seasonally available. Of the 127 fauna individuals recorded in the application area during the fauna survey, 98 were found in mapped drainage line habitat areas (360 Environmental, 2022).

Given the flexible nature of the proposed clearing and the value of drainage line habitat for fauna species in the arid landscape, clearing will not be undertaken within major drainage line habitat areas and will be restricted within minor drainage line habitat areas. Clearing of riparian vegetation will be avoided and impacts to surface water will be

mitigated (see section 3.2.3 for further consideration of water resource impacts). Given this, the proposed clearing is unlikely to significantly impact fauna reliant on these habitats.

Hummock grassland habitat

The hummock grassland habitat consists of mixed shrubs and scattered trees over Triodia hummock grassland (360 Environmental, 2022). Hummock grassland areas provide foraging, nesting, burrowing and dispersal features for conservation significant fauna and provides refugia for small fauna species (360 Environmental, 2022). This habitat type is considered to support high biodiversity compared to other habitat types within the survey area, especially for reptile species (360 Environmental, 2022).

The hummock grassland habitat in the application area is considered suitable habitat for conservation significant fauna species, including the bilby (*Macrotis lagotis*; VU), Gane's blind snake (*Anilios ganei*; P1), western pebble-mound mouse (*Pseudomys chapmani*; P4) and brush-tailed mulgara (*Dasycercus blythi*; P4). Impacts to these species are discussed further below.

Bilby (VU)

The bilby inhabits a range of habitats, including *Eucalyptus* and *Acacia* woodlands and *Acacia* shrubland over hummock and tussock grasslands (DCCEEW, 2023). The hummock grassland and drainage line habitats within the application area are considered to comprise suitable habitat for this species (360 Environmental, 2022). According to the bilby recovery plan (DCCEEW, 2023), bilbies have large foraging ranges, can disperse up to five kilometres between burrows on consecutive days and construct a new burrow every two and a half weeks on average.

According to available databases, the closest bilby record is approximately 25 kilometres east of the application area. While this species was not recorded during the fauna survey (360 Environmental, 2022), a targeted bilby search was not completed in the application area. Given the bilby's large home range and that the application area contains suitable habitat for this species, it is possible that bilbies are present within the application area. To mitigate potential impacts to this species, surveys will be undertaken prior to clearing to inspect for bilby burrows. If identified, clearing will not occur within 50 metres of a burrow. Given this, and the additional mitigation actions specified below, the proposed clearing is unlikely to significantly impact the bilby's conservation status.

Gane's blind snake (P1)

Gane's blind snake inhabits rocky ranges with nearby spinifex grasslands (Doughty et al. 2011). This species prefers moist microhabitats in crevices of steep rocks (Doughty et al. 2011; Aplin, 1998). The hummock grassland, drainage line and hills / ranges / plateaux habitats in the application area are considered to comprise suitable habitat for this species (360 Environmental, 2022). This is consistent with the Gane's blind snake individual recorded approximately two kilometres southeast of the application area during the fauna survey (360 Environmental, 2022). The individual was recorded within hummock grassland habitat near mapped hills / ranges / plateaux habitat.

As discussed above, clearing will not occur within mapped hills / ranges / plateaux habitat and will be avoided and restricted within the mapped drainage line habitats. Additionally, a fauna spotter will be present during clearing to prevent impacts to fauna individuals present at the time of clearing. Given this, the proposed clearing is considered unlikely to significantly impact the conservation status of this species.

Western pebble-mound mouse (P4)

Preferred habitat for the western pebble-mound mouse (WPM) includes hummock grasslands with accessible stony soils suitable for building pebble mounds (Start et al. 2000; Start, 1996). These mounds may take years for WPM to construct (Start et al. 2000). The drainage line and hummock grassland habitats in the application area are considered to comprise suitable habitat for this species, especially where suitable stones are available for WPM mound construction (360 Environmental, 2022).

According to available databases, a WPM mound was recorded in the application area in March 2014. This mound was recorded in the mapped (360 Environmental, 2022) minor drainage line habitat, adjacent to hummock grassland and hills / ranges / plateaux habitats. Four WPM individuals were captured approximately 5.5 kilometres southeast of the application area during the fauna survey (360 Environmental, 2022). Given this, WPM are considered likely to be present within or near the application area.

As discussed above, clearing will not occur within hills / ranges / plateaux habitat and will be avoided and restricted within the drainage line habitats. To mitigate potential impacts to this species, surveys will be undertaken prior to clearing to inspect proposed clearing areas for WPM mounds. If identified, clearing will not occur within 50 metres of a WPM mound. Given this, and the additional mitigation actions specified below, the proposed clearing is unlikely to impact the conservation status of this species.

Brush-tailed mulgara (P4)

The brush-tailed mulgara is a nocturnal, burrowing marsupial (DBCA, n.d.) which has been found in low *Triodia* scrubland and "sparsely vegetated stony areas" (Thompson and Thompson, 2014). The hummock grassland and drainage line habitats within the application area are considered to comprise suitable habitat for this species (360 Environmental, 2022).

According to available databases, the brush-tailed mulgara has been recorded approximately three kilometres southwest of the application area. This species was not recorded during the fauna survey (360 Environmental, 2022). Given the distance to nearby records and that the application area contains suitable habitat for this species, the brush-tailed mulgara may be present within or near the application area. To mitigate potential impacts to this species, clearing will not be undertaken at night and surveys will be undertaken prior to clearing to inspect for brush-tailed mulgara burrows. If identified, clearing will not occur within 50 metres of a burrow. Given this, and the additional mitigation actions specified below, the proposed clearing is unlikely to impact the conservations status of this species.

Migratory birds

Multiple species of migratory birds may be transient visitors to the application area (see Appendix A.4), including the *Pandion haliaetus* (osprey; MI) which has previously been recorded in the application area. While migratory birds may utilise the drainage line and hummock grassland habitats as feeding habitat, the application area is not considered to provide suitable breeding habitat for these species. Given this, the proposed clearing is unlikely to impact significant habitat for these species.

Conclusion

Based on the above assessment, the proposed clearing will result in the loss of suitable habitat for conservation significant fauna. By avoiding clearing in the hills / ranges / plateaux and major drainage line habitat areas, the proposed clearing will reduce impacts to significant fauna refugia and areas of high biodiversity**.** Additional mitigation measures specified below, including undertaking pre-clearance surveys, engaging a fauna spotter, and revegetating temporarily cleared areas, will reduce impacts to fauna individuals present in the application area. Given this, the proposed clearing is considered unlikely to significantly impact habitat for conservation significant fauna species or areas comprising high fauna biodiversity.

For the reasons set out above, it is considered that the impacts of the proposed clearing on fauna biodiversity can be managed by the below conditions.

Conditions

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

- avoidance and minimisation to reduce the impacts and extent of clearing,
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity,
- engage a fauna spotter for the duration of clearing activities,
- avoid clearing of major drainage line, hills / ranges / plateaux and rocky escarpment habitat areas,
- clearing within minor drainage line habitat areas restricted to not more than 4.5 hectares,
- avoid clearing of riparian vegetation,
- avoid clearing at night to reduce impacts to nocturnal fauna,
- backfilling, fencing or covering all test pits, bore holes and sumps to prevent fauna access,
- pre-clearance surveys to be undertaken to confirm presence / absence of western pebble-mound mouse mounds and bilby and brush tailed mulgara burrows and a minimum buffer of 50 metres to be applied to any mounds or burrows identified,
- revegetation and rehabilitation of areas cleared for temporary works.

3.2.3. Water resources - Clearing Principles (f, i and j)

Assessment

The proposed clearing is within the southern zone of the Fortescue Marsh management area (Zone 2b – Poonda Plain) (EPA, 2013). The management objectives within this zone are:

- maintain the natural flow regime at the boundary between Northern Flank and Marsh zones,
- maintain the natural flow regime of tributaries entering the Marsh, and
- protect the hydrological and ecological integrity of major tributaries entering the Marsh (EPA, 2013).

In Zone 2b, the EPA recommends avoiding locating infrastructure on or near major Marsh tributaries and ensuring that groundwater drawdown does not lead to the loss of riparian vegetation along major tributaries (EPA, 2013).

The desktop assessment and aerial imagery indicate the application area intersects several major and minor water courses which are part of the Fortescue River system, including Weeli Wolli Creek (a major nonperennial river). Weeli Wolli Creek intersects the western portion of the application area and is located entirely within the mapped major drainage line habitat (360 Environmental, 2022; see section 3.2.2.). Weeli Wolli Creek is a major surface tributary to Fortescue Marsh (EPA, 2013).

The riparian vegetation associated with Weeli Wolli Creek provides "hydrological buffering and ecological connectivity between [Fortescue] Marsh and upstream aquatic systems" (EPA, 2013). The flora and vegetation survey (Ecoscape, 2021) observed dead or unhealthy trees along Weeli Wolli Creek, attributed to existing impacts to groundwater from mining operations upstream. Impacts to Weeli Wolli Spring Community PEC are discussed under section 3.2.1.

The application area falls within the Pilbara Surface Water Area and Pilbara Groundwater Area as proclaimed under the *Rights in Water and Irrigation Act 1914* (RiWI Act) (see section 3.3). Internal advice received under the RiWI Act indicates the proposed exploration activities are unlikely to significantly alter groundwater levels, given the proposed wells are non-artesian and the applicant is proposing minor taking of groundwater for the purpose of hydrological studies (DWER, 2023; DWER, 2024).

To maintain foreshore stability and protect riparian habitats in the application area, clearing of riparian vegetation will be avoided and revegetation of temporarily cleared areas will be required. Additionally, clearing within watercourses or drainage lines will only be undertaken for the purpose of a crossing and surface flow will be maintained or reinstated downstream. To mitigate impacts to Weeli Wolli Creek, clearing will not be undertaken in the mapped major drainage line habitat areas (see section 3.2.2.) and the applicant advised clearing will not be undertaken within 200 metres of the creek (see section 3.1 for further avoidance and minimisation measures). Given this, and that the proposed clearing is a small area within a large footprint, any impacts to surface or ground water are likely to be temporary and short term. Further conditions mitigating impacts to surface water are outlined below.

Given the proposed clearing is unlikely to significantly alter surface or groundwater hydrology, the proposed clearing is unlikely to exacerbate existing impacts to Weeli Wolli Creek or impact the management of Fortescue Marsh.

The flora and vegetation survey (Ecoscape, 2021) recorded a vegetation community in the application area considered potentially groundwater dependent:

- EvAcCc: *Eucalyptus victrix* mid open woodland over *Acacia citrinoviridis*, *Acacia pyrifolia var. pyrifolia* and *Grevillea wickhamii* tall sparse shrubland over *Corchorus crozophorifolius*, *Tephrosia rosea* var. Fortescue creeks (M.I.H. Brooker 2186) and **Cenchrus ciliaris* open low shrubland / tussock grassland.

This is due to the dominance of *Eucalyptus victrix*, which can be groundwater dependent depending on site characteristics (Ecoscape, 2021). The full survey descriptions and maps are available in Appendix D.

Most of the EvAcCc vegetation type is mapped within the major drainage line habitat areas, where clearing will not be undertaken (see section 3.2.2). Consequently, the proposed clearing is unlikely to directly impact this vegetation community. Additionally, given the proposed activities are unlikely to alter groundwater levels, the proposed clearing is unlikely to indirectly impact this vegetation community.

Conclusion

Based on the above assessment, the proposed clearing is unlikely to significantly impact the function or quality of surface or ground water resources. It is considered that the impacts of the proposed clearing on water resources can be managed through the below conditions.

Conditions

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

- avoidance and minimisation to reduce the impacts and extent of clearing,
- avoid clearing of riparian vegetation,
- avoid clearing of major drainage line habitat areas,
- clearing within minor drainage line habitat areas restricted to not more than 4.5 hectares,
- restricting clearing of watercourses or drainage lines to the purpose of a crossing only, ensuring surface flow is maintained or reinstated downstream,
- revegetation and rehabilitation of areas cleared for temporary works.

3.3. Relevant planning instruments and other matters

Other relevant authorisations required for the proposed land use include:

- Section 91 license to occupy Crown land under the *Land Administration Act 1997*
- Section 26D license to construct or alter a well under the RiWI Act

The applicant holds a valid section 91 license and an approved section 26D license to construct or alter a well under the RiWI Act (Chichester Metals, 2023c).

The department's North West Region advised that disturbance to riparian vegetation should be avoided and existing cleared areas used where possible (DWER, 2023). To mitigate potential impacts to Fortescue Marsh, the proposed clearing should align with the EPA's environmental objectives for resource management in Zone 2b of the Fortescue Marsh (EPA, 2013; see section 3.2.3.). Clearing and subsequent exploration activities should adhere to the departments' Water Quality Protection Guidelines and the Water Quality Protection Notes which provide recommendations on best practice measures to protect water resources:

- WQPN 6: Vegetation buffers to sensitive water resources
- WQPN 10: Containment spills – emergency response
- WQPN 56: Tanks for fuel and chemical storage near sensitive water resources
- WQPN 65: Toxic and hazardous substances – Storage and use

If clearing activities are undertaken in accordance with the above, the North West Region considers the proposed clearing is unlikely to impact on the water quality of water resources (DWER, 2023).

The department sought comment from the Shire of East Pilbara however no comment or advice was received.

The department sought comment from the Karlka Nyiyaparli Aboriginal Corporation RNTBC and Nyiyaparli People Claimant Group under the *Native Title Act 1993* (Cth) however no comment or advice was received.

Several Aboriginal sites of significance have been mapped within the application area. The applicant has advised the department that, in accordance with the Nyiyaparli Land Access Agreement, comprehensive cultural heritage surveys will be conducted with Nyiyaparli traditional owners and their professional heritage consultants to ensure no heritage sites are disturbed by the proposed clearing and exploration activities. 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.

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 located approximately 77 kilometres northwest of Newman in the Shire of East Pilbara. Spatial data indicates the local area (50-kilometre radius from the centre of the area proposed to be cleared) retains approximately 99.5 per cent of the original native vegetation cover.
Ecological linkage	The application area is not within a formally mapped ecological linkage.
Conservation areas	The application area does not intersect a mapped conservation area. The closest mapped conservation area is Karijini National Park (R 30082) approximately 70 kilometres east of the application area.
Vegetation description	The flora and vegetation survey (Ecoscape, 2021) indicates the vegetation within the proposed clearing area consists of six vegetation types: • *Acacia* low open woodland (AcCc), • *Acacia* mid sparse shrubland (ApTp), • *Acacia* mid open shrubland (AtTp), • *Eucalyptus* low open woodland (EgAaTb2), • *Eucalyptus* low open woodland (ElGwTv), and • *Eucalyptus* mid open woodland (EvAcCc) Excerpts of the survey descriptions and maps are available in Appendix D. This is consistent with the mapped vegetation type(s): • Beard Vegetation Association 29, described as Mulga *Acacia aneura* and associated species. Low woodland, open low woodland or sparse woodland, and • Beard Vegetation Association 82, described as Hummock grassland with scattered bloodwoods & snappy gum Triodia spp., *Corymbia dichromophloia*, *Eucalyptus leucophloia*. Low tree-steppe (Shepherd et al, 2001). *The mapped vegetation types retain approximately 99.5 per cent of the original extent (Government of Western Australia, 2019).*
Vegetation condition	The flora and vegetation survey (Ecoscape, 2021) indicates the vegetation within the proposed clearing area is in Excellent to Degraded (Trudgen, 1991) condition, described as: • Excellent: Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement. • Degraded: 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. The full Trudgen (1991) condition rating scale is provided in Appendix C. Excerpts of the survey descriptions and maps are available in Appendix D.
Climate and landform	The average annual rainfall received over the application area from 1991 to 2020 is 400 to 600 millimetres (Commonwealth of Australia, 2021). The application area is at an altitude of 470 to 480 metres above sea level, occasionally peaking to 530 metres above sea level.
Soil description	The soil is mapped as: • Newman System (284Ne; 285Ne) described as rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands, • River System (284Ri; 285Ri) 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,

Characteristic	Details
	• Urandy System (284Ur) described as stony plains, alluvial plains and drainage lines supporting shrubby soft spinifex grasslands, and • Boolgeeda System (285Bg) described as stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands (DPIRD, 2019).
Land degradation risk	Land degradation risks are summarised in Table A.5.
Waterbodies	The desktop assessment and aerial imagery indicate that multiple nonperennial watercourses occur within the application area, including a major river (Weeli Wolli Creek) and multiple minor rivers of the Fortescue River system.
Hydrogeography	The application area is located within the Pilbara Surface Water Area and Pilbara Groundwater Area as proclaimed under the *Rights in Water and Irrigation Act 1914* (RiWI Act). The groundwater salinity level is mapped as 500-1000 milligrams per litre.
Flora	The desktop assessment identified 56 priority flora species within the local area. There are no threatened flora species recorded within the local area. The nearest record is the Priority 1 *Calotis squamigera*, recorded approximately three kilometres from the application area.
Ecological communities	No conservation significant ecological communities or buffers are mapped over the application area. There are no Threatened Ecological Communities (TEC) within the local area. Seven Priority Ecological Communities (PEC) are recorded within the local area.
Fauna	The desktop assessment identified 26 conservation significant fauna in the local area. The closest records are the *Pandion cristatus (*eastern osprey) and *Pseudomys chapmani (*Western pebble-mound mouse), both recorded within the application area.

A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Pilbara	17,808,657.04	17,731,764.88	99.57	1,801,714.98	10.12
Vegetation complex					
Fortescue Valley vegetation association 82*	2,565,901.28	2,553,206.19	99.51	295,377.96	11.51
Fortescue Valley vegetation association 29*	7,903,991.45	7,898,973.24	99.94	496,367.56	6.28
Local area					
50km radius	862,822.59	858,477.29	99.50	-	-

*Government of Western Australia (2019)

A.3. Flora analysis table

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)
Calotis squamigera	P1	Y	Y	Y	3.14
Synostemon hamersleyensis	P1	Y	Y	Y	5.09

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)
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	P3	Y	Y	Y	8.78
Lepidium catapycnon	P4	Y	Y	Y	10.00
Isotropis parviflora	P3	Y	Y	Y	18.10
Eremophila youngii subsp. lepidota	P4	Y	Y	Y	22.91
Streptoglossa sp. Cracking clays (S. van Leeuwen et al. PBS 7353)	P3	Y	Y	Y	26.32
Rhynchosia bungarensis	P4	Y	Y	Y	27.36
Eragrostis sp. Mt Robinson (S. van Leeuwen 4109)	P2	Y	Y	Y	30.09
Stackhousia clementii	P3	Y	Y	Y	33.82
Oxalis sp. Pilbara (M.E. Trudgen 12725)	P2	Y	Y	Y	39.56
Ptilotus mollis	P4	Y	Y	Y	43.23
Dolichocarpa sp. Hamersley Station (A.A. Mitchell PRP 1479)	P3	Y	Y	Y	44.73
Triodia basitricha	P3	Y	Y	Y	47.35

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

A.4. 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)	Suitable habitat type(s)
Pandion haliaetus (osprey)	MI	Y	Y	0.00	D
Pseudomys chapmani (western pebble-mound mouse)	P4	Y	Y	0.00	D, H/R, HU
Dasycercus blythi (brush-tailed mulgara)	P4	Y	Y	3.29	D, HU
Falco peregrinus (peregrine falcon)	OS	Y	Y	4.06	D, H/R
Apus pacificus (fork-tailed swift)	MI	Y	Y	6.43	D
Macroderma gigas (ghost bat)	VU	Y	Y	8.88	D, H/R
Liasis olivaceus barroni (Pilbara olive python)	VU	Y	Y	9.19	D, H/R
Dasyurus hallucatus (northern quoll)	EN	Y	Y	17.85	D, H/R
Macrotis lagotis (bilby)	VU	Y	Y	25.22	D, HU
Anilios ganei (Gane's blind snake (Pilbara))	P1	Y	Y	25.57	D, H/R, HU
Underwoodisaurus Seorsus (Pilbara barking gecko)	P2	Y	Y	26.52	H/R
Rostratula australis (Australian painted snipe)	EN	Y	Y	28.23	D
Rhinonicteris aurantia (Pilbara) (Pilbara leaf-nosed bat)	VU	Y	Y	29.63	D, H/R
Falco hypoleucos (grey falcon)	VU	Y	Y	31.98	D
Tringa nebularia (common greenshank)	MI	Y	Y	33.82	D
Gelochelidon nilotica (gull-billed tern)	MI	Y	Y	34.34	D

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Suitable habitat type(s)
Plegadis falcinellus (glossy ibis)	MI	Y	Y	34.34	D
Charadrius veredus (oriental plover)	MI	Y	Y	44.80	D
Tringa stagnatilis (marsh sandpiper)	MI	Y	Y	44.81	D
Calidris acuminata (sharp-tailed sandpiper)	MI	Y	Y	46.20	D

D: drainage line habitat, H/R: hills / ranges / plateaux and rocky escarpment habitat, HU: hummock grassland habitat

A.5. Land degradation risk table

Risk categories	*Land Unit 1*
Wind erosion	L1: <3% of the map unit has a high to extreme hazard
Water erosion	L1: <3% of the map unit has a very high to extreme hazard
Salinity	L1: <3% of the map unit has a moderate hazard
Subsurface Acidification	L1: <3% of the map unit has a high susceptibility
Flood risk	L1: <3% of the map unit has a moderate to high hazard
Water logging	L1: <3% of the map unit has a moderate to very high to risk
Phosphorus export risk	L1: <3% of the map unit has a high to extreme hazard

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: Suitable habitats for conservation significant flora and fauna are present within the application area and a watercourse within the application area is connected to the nearby Weeli Wolli Spring Community and Fortescue Marsh (Marsh Land System) priority ecological communities. The application area is considered to contain high biodiversity value. Any potential impacts can be managed via permit conditions.	At variance	Yes *Refer to Section 3.2.1 and 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 area proposed to be cleared contains suitable habitat for conservation significant fauna. Any potential impacts can be managed via permit conditions.	At variance	Yes *Refer to Section 3.2.2, 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 is unlikely to contain habitat for threatened flora species listed under the BC Act. According to available databases, no	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
threatened flora species have been recorded within the local area and the flora and vegetation survey (Ecoscape, 2021) did not identify threatened flora in the application area.		
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: According to available databases, there are no TECs recorded within the local area and the flora and vegetation survey (Ecoscape, 2021) did not identify species indicating a TEC in the application area.	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 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. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage.	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 impact the environmental values of nearby 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: Multiple watercourses are mapped within the application area. Any potential impacts to watercourses can be managed via permit conditions.	At variance	Yes *Refer to Section 3.2.3, above.*
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are not susceptible to land degradation risks. Noting the extent of native vegetation cover within the application area and the temporary nature of the disturbance, the proposed clearing is not likely to have an appreciable impact on land degradation. Potential impacts will be further mitigated by a rehabilitation and revegetation condition imposed on the permit.	Not likely to be at variance	Yes
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 multiple watercourses are mapped within the application area, the proposed clearing may impact surface or ground water quality. Any potential impacts can be managed via permit conditions and best practice measures.	May be at variance	Yes *Refer to Section 3.2.3, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
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: The mapped soils and topographic contours in the surrounding area indicate the proposed clearing is unlikely to contribute to increased incidence or intensity of flooding or waterlogging.	Not likely to be at variance	Yes *Refer to Section 3.2.3, 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.

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.
Degraded	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. Flora and vegetation survey excerpts (Ecoscape, 2021)

The flora and vegetation survey (Ecoscape, 2021) indicates the application area consists of six vegetation types, described as:

- **AcCc:** *Acacia citrinoviridis* and *A. pruinocarpa* low open woodland over **Cenchrus ciliaris* and **C. setiger* low tussock grassland. Other characteristic species: *Abutilon lepidum, Atalaya hemiglauca, Boerhavia coccinea, Hakea lorea* subsp. *lorea, Ptilotus obovatus, Senna notabilis, Solanum lasiophyllum, Triodia epactia*
- **ApTp:** *Acacia pachyacra, A. ancistrocarpa* and *A. inaequilatera* mid sparse shrubland over *Triodia pungens, *Cenchrus ciliaris* and *Eragrostis eriopoda* low hummock grassland/ tussock grassland. Other characteristic species: *Acacia pruinocarpa, Boerhavia coccinea, Eriachne aristidea, Euphorbia coghlanii, Gossypium australe, Hakea lorea* subsp. *lorea, Hibiscus sturtii* var. *platychlamys, Senna artemisioides* subsp. *helmsii, Senna artemisioides* subsp. *oligophylla*
- **AtTp:** *Acacia tumida* var. *pilbarensis, A. pyrifolia* var. *pyrifolia* and *G. wickhamii* mid open shrubland over *Triodia pungens* and **Cenchrus ciliaris* low hummock/tussock grassland. Other characteristic species: *Arivela viscosa, Corchorus lasiocarpus, Corymbia hamersleyana, Cucumis variabilis, Cymbopogon ambiguus, Cymbopogon obtectus, Goodenia microptera, Gossypium robinsonii, Indigofera monophylla, Polycarpaea longiflora, Polymeria ambigua, Pterocaulon sphaeranthoides, Ptilotus obovatus, Senna artemisioides* subsp. *oligophylla, Senna glutinosa* subsp. *glutinosa, Senna notabilis Tephrosia rosea* var. Fortescue creeks (M.I.H. Brooker 2186), *Themeda triandra, Trigastrotheca molluginea.*
- **EgAaTb2:** *Eucalyptus gamophylla* and *Corymbia hamersleyana* low open woodland over *Acacia ancistrocarpa, A. sclerosperma* subsp. *sclerosperma* and *A. inaequilatera* mid sparse shrubland over *Triodia basedowii* low hummock grassland. Other characteristic species: *Acacia pachyacra, Aristida holathera* var. *holathera, Aristida inaequiglumis, Bonamia erecta, *Cenchrus ciliaris, Corchorus sidoides* subsp. *sidoides, Dicrastylis cordifolia, Eragrostis eriopoda, Hakea lorea* subsp. *lorea, Hibiscus sturtii* var. *platychlamys, Indigofera monophylla, Ptilotus astrolasius, Ptilotus exaltatus, Senna artemisioides* subsp. *oligophylla, Solanum lasiophyllum.*
- **ElGwTv:** *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Grevillea wickhamii, Acacia inaequilatera* and *Senna glutinosa* subsp. *glutinosa* mid sparse shrubland over *Triodia vanleeuwenii* low hummock grassland. Other characteristic species: *Acacia hilliana, Acacia pruinocarpa, Corchorus lasiocarpus, Eriachne pulchella* subsp. *dominii, Fimbristylis simulans, Polycarpaea holtzei, Ptilotus calostachyus, Senna glutinosa* subsp. *pruinose.*
- **EvAcCc:** *Eucalyptus victrix* mid open woodland over *Acacia citrinoviridis, A. pyrifolia* var. *pyrifolia* and *G. wickhamii* tall sparse shrubland over *Corchorus crozophorifolius, Tephrosia rosea* var. Fortescue creeks (M.I.H. Brooker 2186) and **Cenchrus ciliaris* open low shrubland/tussock grassland. Other characteristic species: *Arivela viscosa, Atalaya hemiglauca, Boerhavia coccinea, *Cenchrus setiger, Phyllanthus maderaspatensis, Ptilotus exaltatus, Waltheria indica.*

Figure 2.1. Vegetation type AcCc

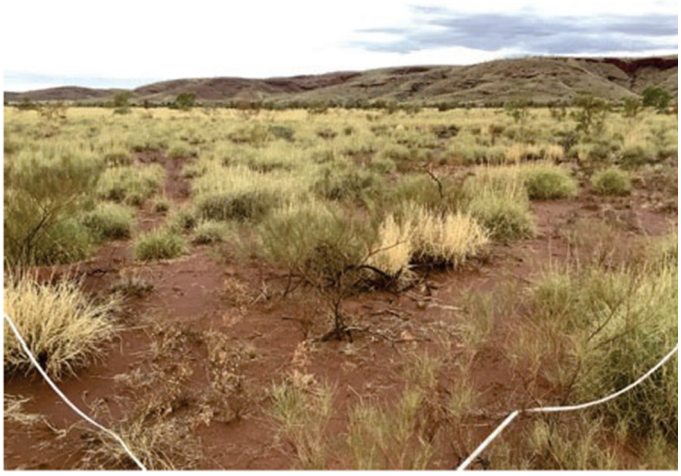

Figure 2.2. Vegetation type ApTp

Figure 2.3. Vegetation type AtTp

Figure 2.4. Vegetation type EgAaTb2

Figure 2.5. Vegetation type ElGwTv

Figure 2.6. Vegetation type EvAcCc

Figure 2. Representative photographs of vegetation types identified in the application area (Ecoscape, 2021).

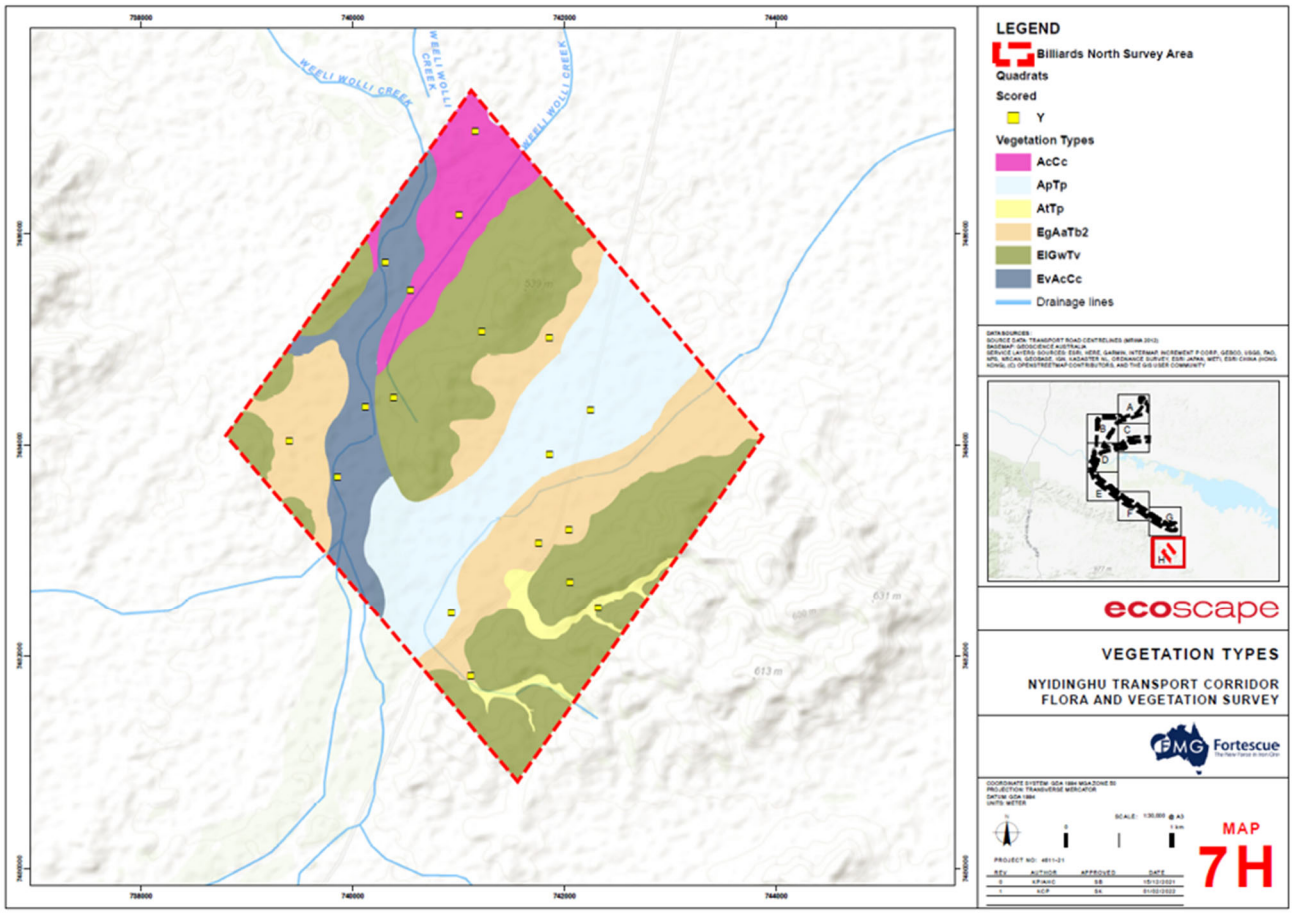

Figure 3. Vegetation types identified in the application area by Ecoscape (2021).

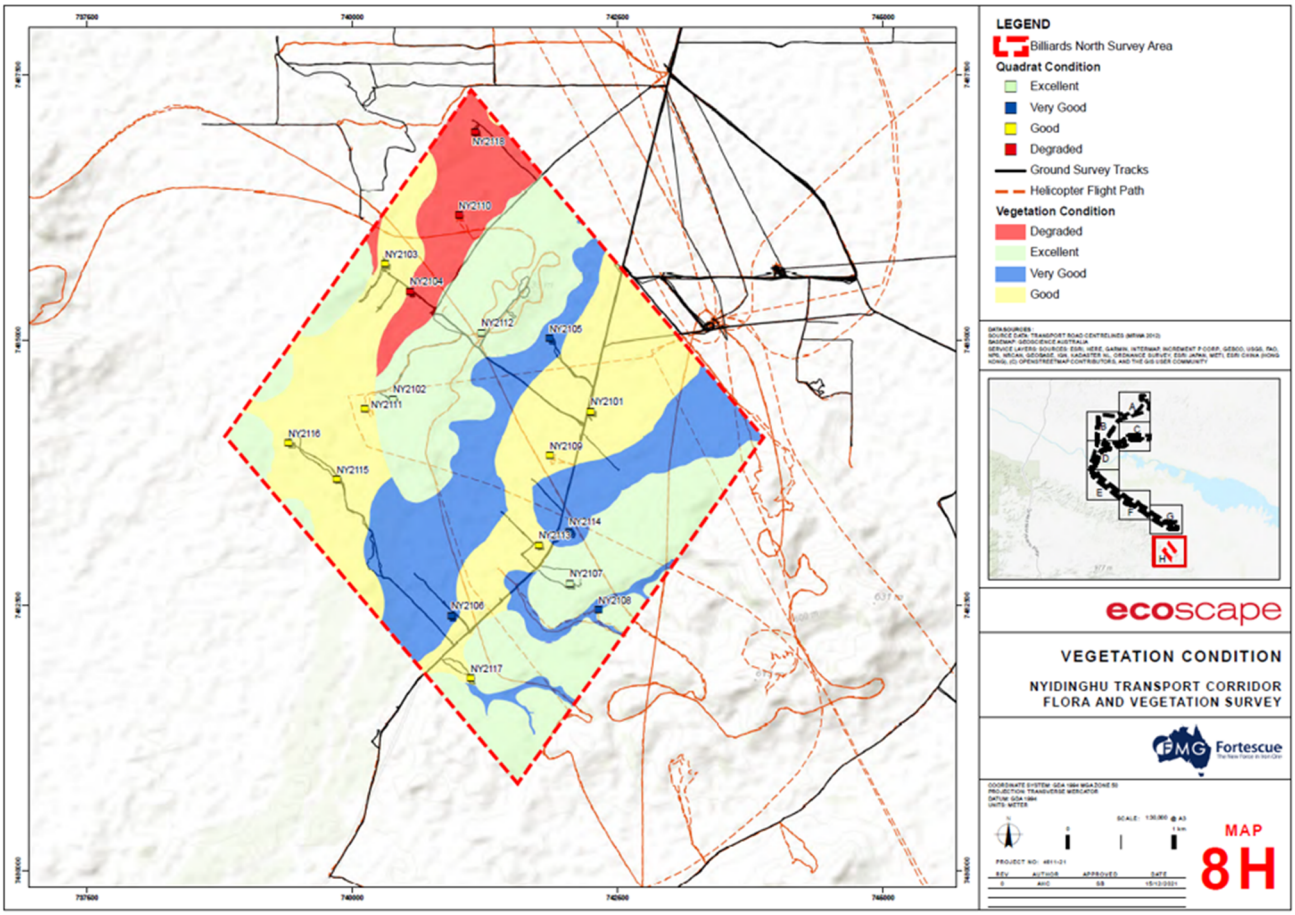

Figure 4. Vegetation condition in the application area (Ecoscape, 2021).

Appendix E. Fauna survey excerpts (360 Environmental, 2022)

The fauna survey (360 Environmental, 2022) indicates the application area consists of five habitat types, described as:

- **Hills / Ranges / Plateaux:** Rocky ironstone hills and slopes with rocky outcropping and thin soils over shallow bedrock. Vegetation consists primarily of open Acacia shrublands over Triodia hummock grasslands. Microhabitats include Triodia hummocks which provide shelter for a variety of species and rocky outcrops which provide abundant crevices for small fauna species. Hummocks were generally small possibly due to a combination of burning or shallow soils.
- **Rocky Escarpments (Ridges / Mesa / Cliffs / Outcrops / Breakaways):** This habitat forms part of the broader Hills/Ranges/Plateaux habitat, however, has been mapped separately as it comprises escarpments and breakaways with abundant crevices, overhangs, cavities and caves. This habitat is in excellent condition as it is inaccessible to most forms of disturbance.
- **Drainage Line/River/Creek (major):** Areas of drainage often consisting of multiple braided channels or broad individual channels. Dense overstorey vegetation made up primarily of Eucalyptus sp. and Corymbia sp., and occasionally Melaleuca sp. Ground cover is typically Triodia hummock grassland or tussock grassland on substrates ranging from sand to sandy clay, with an assortment of river stones. Often contains permanent or semi-permanent pooling of water. Large, hollow-bearing Eucalypts were relatively abundant within this habitat. The overstorey vegetation provides valuable nesting and foraging habitat for birds. Key microhabitats include woody debris, leaf litter, peeling bark, hollow trees and logs, and hummocks grasslands provide refuge, shelter, and foraging opportunities for a wide variety for fauna taxa.
- **Drainage Line / River / Creek (minor):** Areas of drainage consisting of narrow individual channels or, in some cases, lacking surface channelling altogether. Dense overstorey vegetation made up primarily of tall Acacia spp., with Eucalyptus sp. and Corymbia sp. Ground cover is typically Triodia hummock grassland or tussock grassland on substrates ranging from sand to sandy clay, with an assortment of river stones. Most minor drainage lines lack permanent or semi-permanent pooling of water. Large, hollow-bearing Eucalypts were occasionally observed within this habitat. The overstorey vegetation provides valuable nesting and foraging habitat for birds. Key microhabitats include woody debris, leaf litter, peeling bark, hollow trees and logs, and hummock grasslands provide refuge, shelter, and foraging opportunities for a wide variety of fauna taxa.
- **Hummock Grassland:** Triodia hummock grassland on primarily red sand and sandy loam plain with a sparse overstorey of mixed shrubs dominated by Acacia spp. and scattered Corymbia sp. Abundant Triodia hummocks found within this habitat type provide an important source of shelter, refuge and nesting opportunities for small fauna taxa including birds, mammals, and reptiles. The sandy substrate is suitable for digging and burrowing.

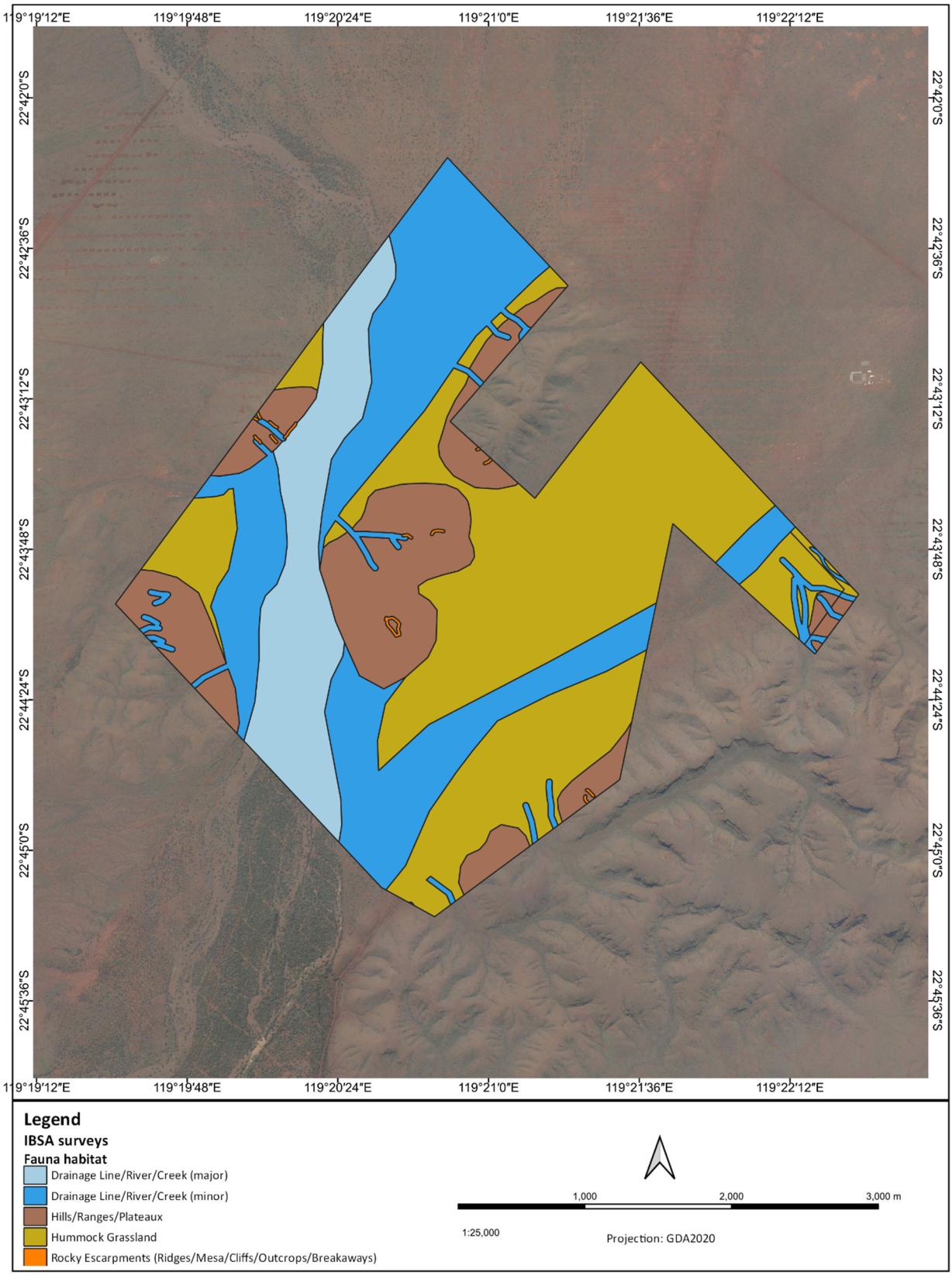

Figure 5. Fauna habitat types identified in the application area (360 Environmental, 2022).

Appendix F. Sources of information

F.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- 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
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- 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 – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems
- Wheatbelt Wetlands Stage 1 (DBCA-021)

Restricted GIS Databases used:

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

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