



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 10329/1
Permit Holder:	Commonwealth Scientific, Industry and Research Organisation's (CSIRO)
Duration of Permit:	From 22 July 2024 to 22 July 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 the extension of pre-existing borrow pits and establish water bores related to SKA1-Low Project.

2. Land on which clearing is to be done

Lot 18 on Deposited Plan 220344, South Murchison.

Beringarra-Pindar Road reserve (PINs 11665424, 11665425, 11708250 and 11708252), South Murchison.

Boolarady-Kalli Road Reserve (PIN 11708251), South Murchison.

3. Clearing authorised

The permit holder must not clear more than 18.8 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1(a), 1(b), 1(c), 1(d) and 1(e) of Schedule 1.

4. Application

This permit allows the permit holder to authorise persons, including employees, contractors and agents of the permit holder, to clear *native vegetation* for the purposes of this permit subject to compliance with the conditions of this permit and approval from the permit holder.

5. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 22 July 2029.

PART II – MANAGEMENT CONDITIONS

6. 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.

7. Weed management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimize 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.

8. Wind erosion management

The permit holder must commence activities related to the purpose of the clearing, no later than three (3) months after undertaking the authorised clearing activities to reduce the potential for wind erosion.

9. Directional clearing

The permit holder must:

- (a) conduct clearing authorised under this permit from one direction to the other towards adjacent *native vegetation*; and
- (b) allow a reasonable time for fauna present within the areas being cleared to move into adjacent *native vegetation* ahead of the clearing activity.

10. Fauna management – Northern shield-backed trapdoor spider

- (a) The permit holder must demarcate and not clear *native vegetation* within 50 metres of the active/potentially active burrows of northern shield-backed trapdoor spider (*Idiosoma clypeatum*) identified in the Ecological assessment report - November 2022 - Square Kilometre Array (AECOM, 2023).
- (b) If the identified active/potentially active burrows cannot be avoided, the permit holder must:
 - (i) Engage a *fauna specialist* to undertake further generic analysis through specimen collection and assessment of the significance of impacts;
 - (ii) Submit the *fauna specialist*'s report on generic analysis and assessment to the *CEO* for approval prior to clearing any burrows.
- (c) The permit holder must not clear the areas identified as habitat types 'Hardpan plain with intermittent sandplain' and 'Granite boulders and heaps' in the

Ecological assessment report - November 2022 - Square Kilometre Array (AECOM, 2023) during the period of June to August annually.

11. Flora management – pre-clearance survey

- (a) Prior to undertaking any clearing authorised under this permit within the area cross-hatched yellow in Figures 1(a) to 1(e) of Schedule 1, the permit holder must engage a *botanist* to conduct a pre-clearance *targeted flora survey* of the areas to be cleared **in September** to identify possible occurrences of the following *priority flora* species:
 - *Calandrinia butcherensis* (Priority 1); and
 - *Calandrinia*. sp. Boolardy Station (P. Jayasekara 719-JHR-01) (Priority 1).
- (b) Where *priority flora* is identified in relation to condition 11(a) of this permit, the permit holder must ensure that no clearing occurs within 20 metres of identified *priority flora* species, unless approved by the *CEO* in writing.
- (c) The permit holder must provide the results of the *targeted flora survey* in a report to the *CEO* within three months of undertaking any clearing authorised under this permit.
- (d) If any of the abovementioned *priority flora* are identified within the area cross-hatched yellow in Figures 1(a) to 1(e) of Schedule 1, the *targeted flora survey* report must include the following:
 - (i) the location of each *priority flora*, identified under condition 11(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;
 - (ii) the species name of each *priority flora* species identified under condition 11(a); and
 - (iii) the methodology used to survey the permit area.

12. 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 within twelve (12) months following clearing authorised under this permit, *revegetate and rehabilitate* the area(s) that are no longer required for the authorised purpose under this permit by:
 - (i) re-shaping the surface of the land so that it is consistent with the surrounding five 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 12(a) on the cleared area(s).
 - (iv) undertake *weed* control activities on an ‘as needed’ basis to reduce *weed* cover within the cleared areas to no greater than the *weed* cover within the surrounding five (5) metres of uncleared land.

- (c) within 24 months of laying the vegetative material and topsoil on the cleared area in accordance with condition 12(b) of this permit, engage an *environmental specialist* to determine the species composition, structure and density of the area revegetated and rehabilitated.
- (d) if the determination made by the *environmental specialist* under condition 12(c) is that the species composition, structure, and density 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 and/or *direct seeding native vegetation* that will result in a similar species composition, structure and density of *native vegetation* of the surrounding five (5) metres in that area, ensuring only *local provenance* seeds and propagating material are used.
- (e) where additional *direct seeding* of *native vegetation* is undertaken in accordance with condition 12(d), the permit holder must repeat the activities required by condition 12(c) and 12(d) within two years of undertaking the additional *direct seeding* of *local provenance native vegetation*.
- (f) where a determination is made by an *environmental specialist* under condition 12(c) 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*.

PART III - RECORD KEEPING AND REPORTING

13. 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	<ul style="list-style-type: none"> (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 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 6; (f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> in accordance with condition 7; (g) actions taken in accordance with condition 8; and (h) actions taken in accordance with

No.	Relevant matter	Specifications
		condition 9.
2.	In relation to fauna management pursuant to condition 10	<ul style="list-style-type: none"> (a) locations of active/potentially active burrows of northern shield-backed trapdoor spider using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings; (b) actions taken to demarcate and avoid the clearing of these burrows; (c) a copy of the <i>fauna specialist's</i> report on generic analysis and assessment (if any).
3.	In relation to flora management pursuant to condition 11	<ul style="list-style-type: none"> (a) the name and location of each <i>priority flora</i> species, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings; (b) actions taken to demarcate <i>priority flora</i> species recorded and their relevant buffers; and (c) actions taken to avoid the clearing of <i>priority flora</i> species.
4.	In relation to the <i>revegetation</i> and <i>rehabilitation</i> of areas pursuant to condition 12	<ul style="list-style-type: none"> (a) the size of the area <i>revegetated</i> and <i>rehabilitated</i>; (b) the location of any <i>revegetated</i> and <i>rehabilitated</i> areas, 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; (c) a description of the <i>revegetation</i> and <i>rehabilitation</i> activities undertaken; (d) the date(s) on which the <i>revegetation</i> and <i>rehabilitation</i> was undertaken; (e) any remedial actions required to be undertaken; and (f) a copy of <i>environmental specialists</i> report and monitoring.

14. Reporting

The permit holder must provide to the *CEO* the records required under condition 13 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 <i>Biodiversity Conservation Act 2016</i> .
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
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.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
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	<i>Environmental Protection Act 1986</i> (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 <i>Biodiversity Conservation Act 2016</i> .
fill	means material used to increase the ground level, or to fill a depression.
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.
priority flora	means those fauna taxa describes as priority fauna, classes 1, 2, 3, or 4 in the <i>Department of Biodiversity, Conservation and Attractions Threatened and Priority Fauna List for Western Australia</i> (as amended);
rehabilitate/ed/ion	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
revegetate/ed/ion	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
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

Term	Definition
	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.
weeds	means any plant – (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i> ; 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


Mathew Gannaway
 MANAGER
 NATIVE VEGETATION REGULATION

*Officer delegated under Section 20
 of the Environmental Protection Act 1986*

28 June 2024

Schedule 1

The boundary of the areas authorised to be cleared is shown in the maps below (Figure 1(a) to 1(e)).

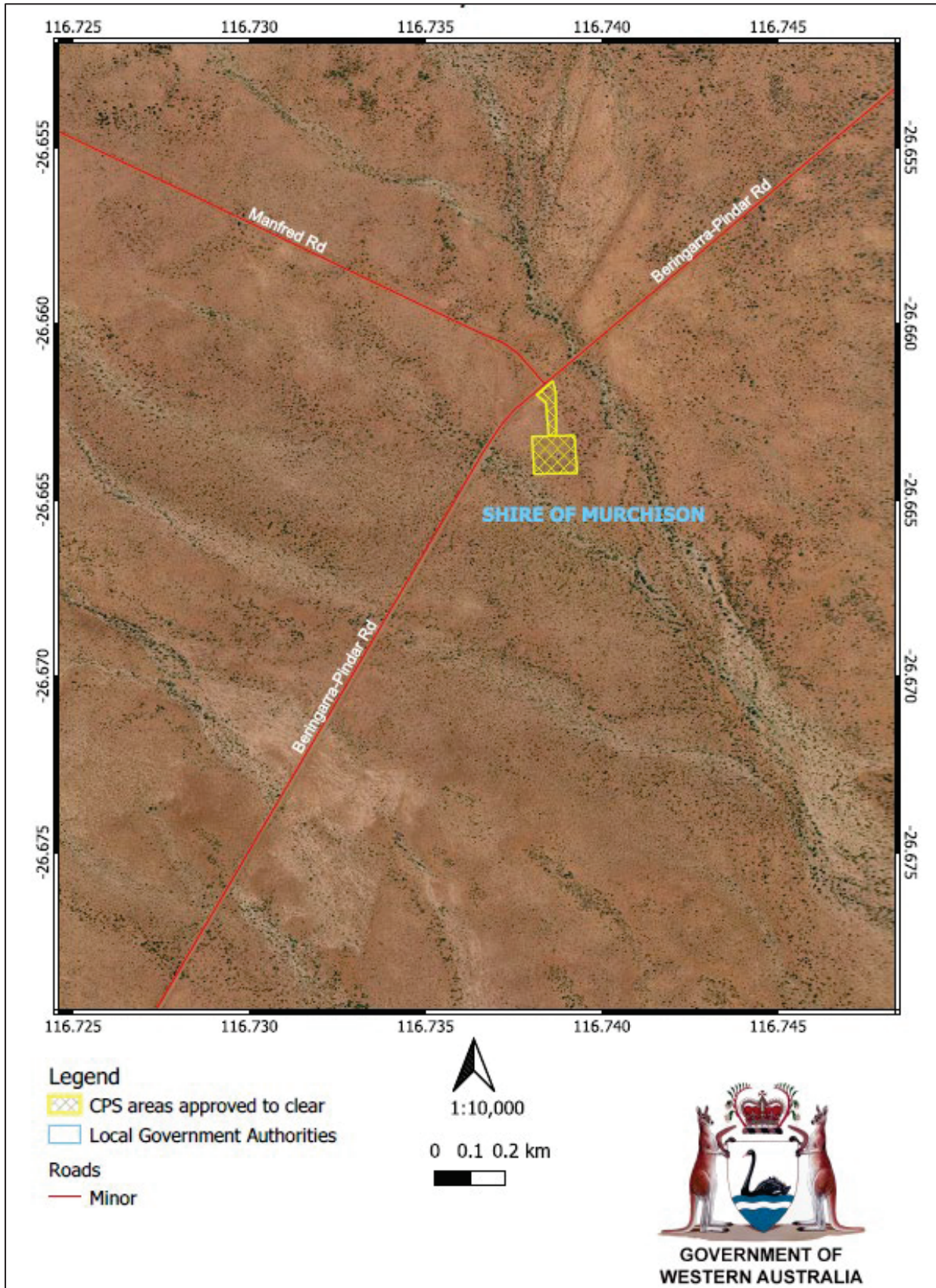


Figure 1(a). Map of the boundary of the area within which clearing may occur – Site A

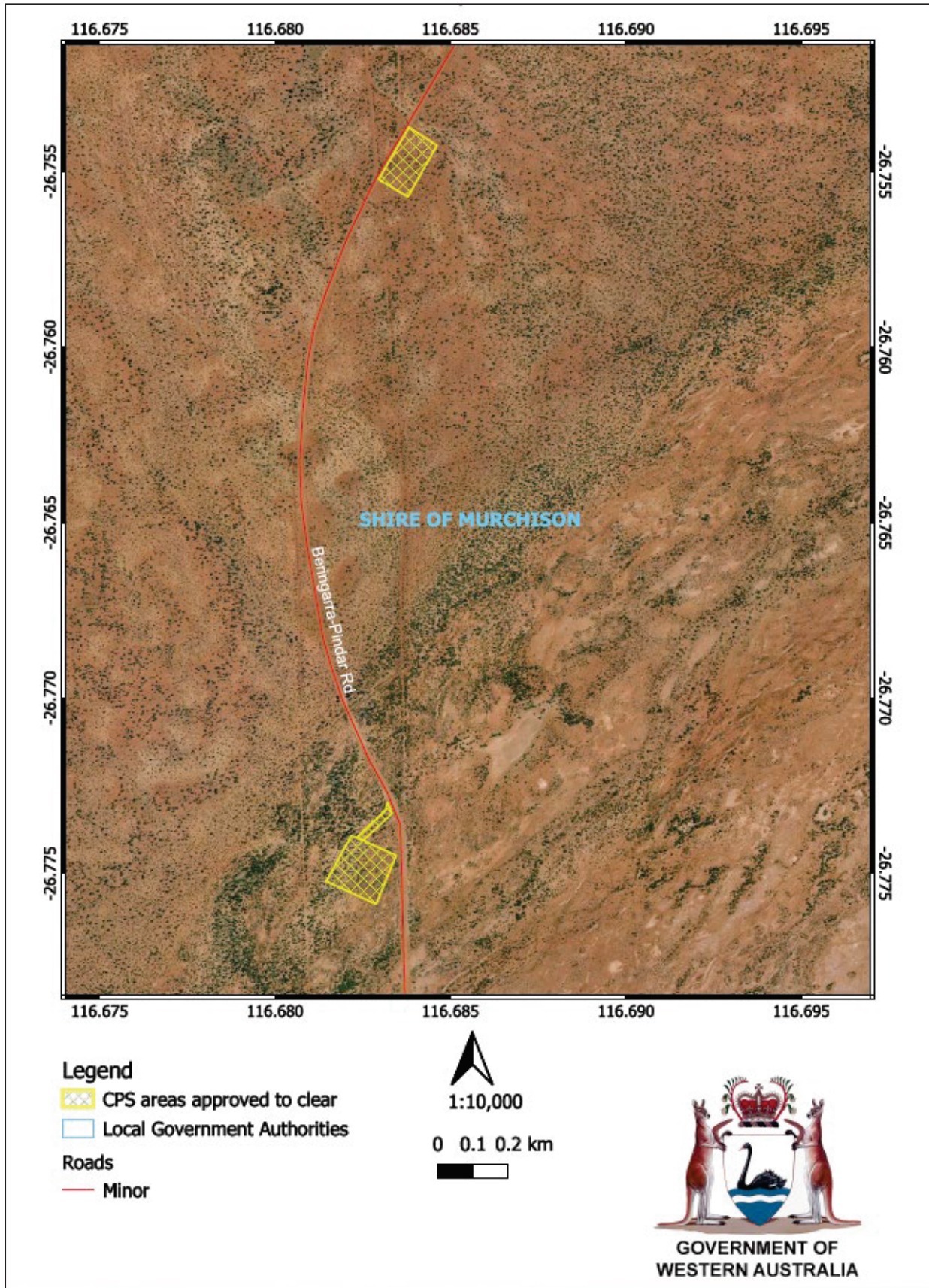


Figure 1(b). Map of the boundary of the area within which clearing may occur – Site B

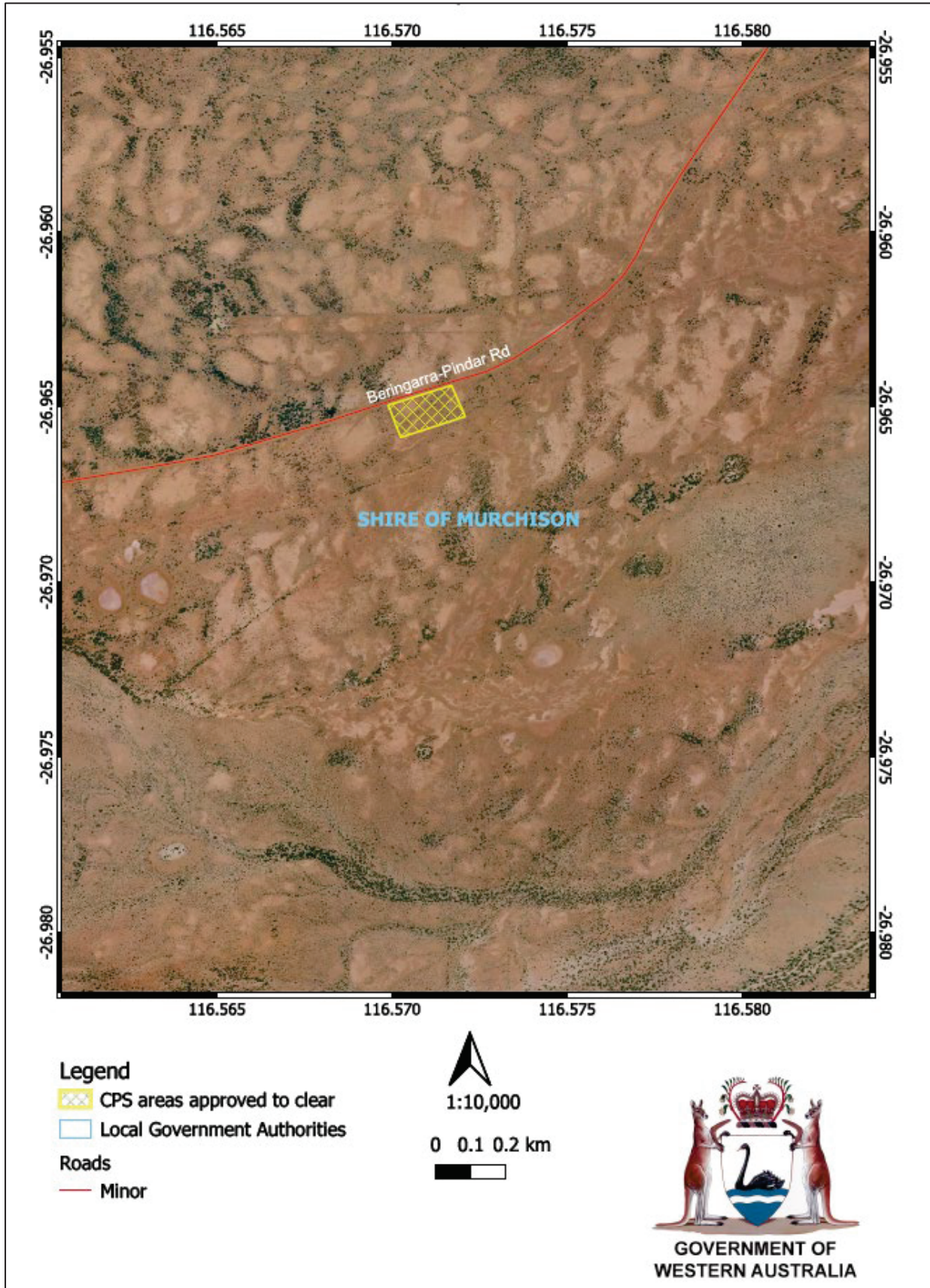


Figure 1(c). Map of the boundary of the area within which clearing may occur – Site C

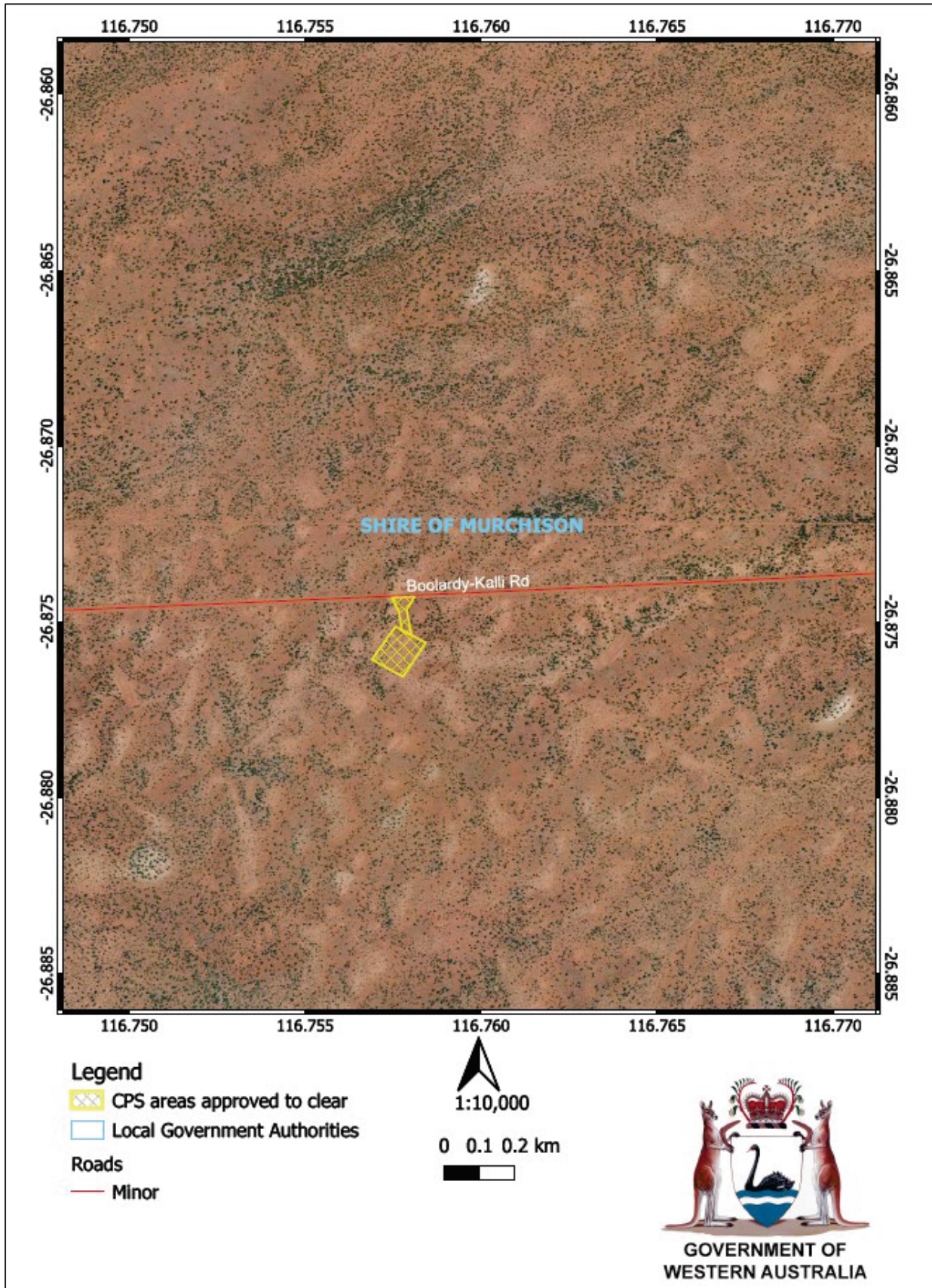


Figure 1(d). Map of the boundary of the area within which clearing may occur – Site D

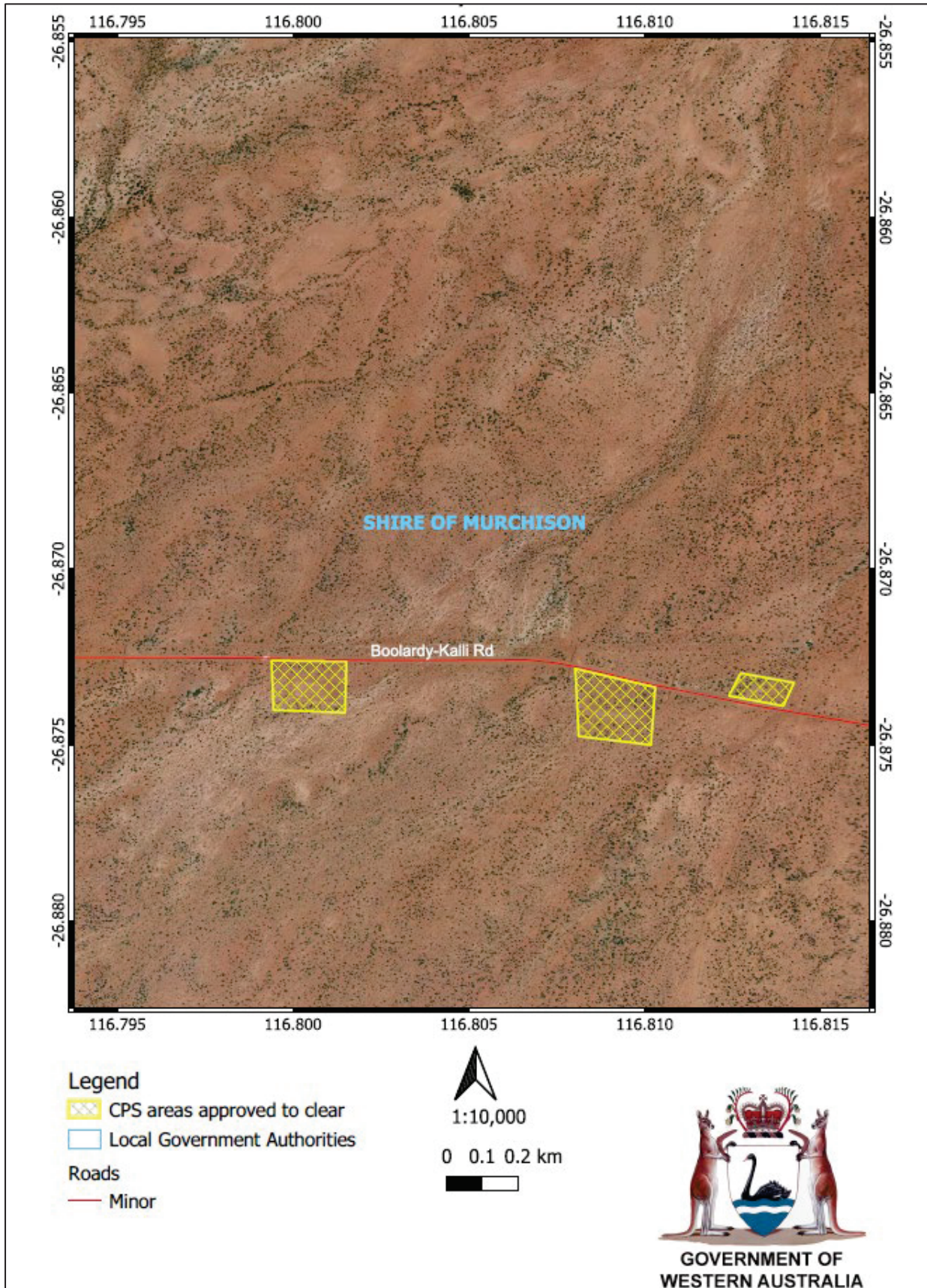


Figure 1(e). Map of the boundary of the area within which clearing may occur – Site E



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10329/1
Permit type:	Purpose permit
Applicant name:	Commonwealth Scientific, Industry and Research Organisation (CSIRO)
Application received:	6 September 2023
Application area:	18.8 hectares of native vegetation
Purpose of clearing:	Extension of pre-existing borrow pits and establish water bores related to SKA1-Low Project
Method of clearing:	Mechanical
Property:	Lot 18 on Deposited Plan 220344 Beringarra-Pindar Road reserve (PINs 11665424, 11708250, 11708252) Boolarady-Kalli Road reserve (PIN 11708250)
Location (LGA area/s):	Shire of Murchison
Localities (suburb/s):	South Murchison

1.2. Description of clearing activities

The vegetation proposed to be cleared is distributed across eight separate areas within the Shire of Murchison located in the Gascoyne Region (see Figure 1, Section 1.5).

The proposed clearing is to support the Square Kilometre Array (SKA) Project. SKA is a large international radio telescope project which aims to answer key cosmological questions using radio waves from across the universe to look back into the cosmic dark ages.

The proposal will involve the clearing of 18.8 hectares of native vegetation to extend the pre-existing borrow pits and establish water bores to serve the construction of the SKA1-Low Project. The applicant has advised that cleared locations will be rehabilitated as they become redundant (CSIRO, 2023).

1.3. Decision on application

Decision:	Granted
Decision date:	28 June 2024
Decision area:	18.8 hectares 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 B), relevant datasets (see Appendix F.1), the findings of a biological survey (see Appendix E), the clearing principles set out in

Schedule 5 of the EP Act (see Appendix C), 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:

- impacts on Priority 3 fauna species Northern shield-backed trapdoor spider (*Idiosoma clypeatum*) and potentially more restricted *Idiosoma* species;
- impacts on suitable habitats of *Calandrinia butcherensis* and *C. sp. Boolardy Station* (P. Jayasekara 719-JHR-01);
- the removal of 235 individuals of Priority 3 flora species *Gunniopsis divisa*;
- potential land degradation in the form of wind erosion.

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 lead to have significant/long-term adverse impacts on *Gunniopsis divisa* extent and land resource. The impacts on Northern shield-backed trapdoor spider and *Calandrinia* species can be minimised to unlikely lead to an unacceptable risk by management conditions imposed on the clearing permit.

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

- Avoid, minimise to reduce the impacts and extent of clearing.
- Take hygiene steps to minimise the risk of the introduction and spread of weeds.
- Undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity.
- Avoid identified active burrows of *I. clypeatum* with a buffer of 50 metres.
- Avoid clearing fauna habitat types (Hardpan plain with intermittent sandplain and Granite boulders and heaps) that are suitable habitat for *I. clypeatum* during winter.
- Pre-clearance survey targeting *C. butcherensis* and *C. sp. Boolardy Station* and avoidance of clearing the identified individuals with a buffer of 20 metres.
- Commence activities related to the purpose of the clearing no later than three months after undertaking the clearing to minimise wind erosion.
- Retain cleared vegetation and topsoil and respread on a cleared area of equivalent size within the adjacent existing gravel extraction area within 12 months of clearing to ensure native vegetation is not permanently lost.

1.5. Site maps

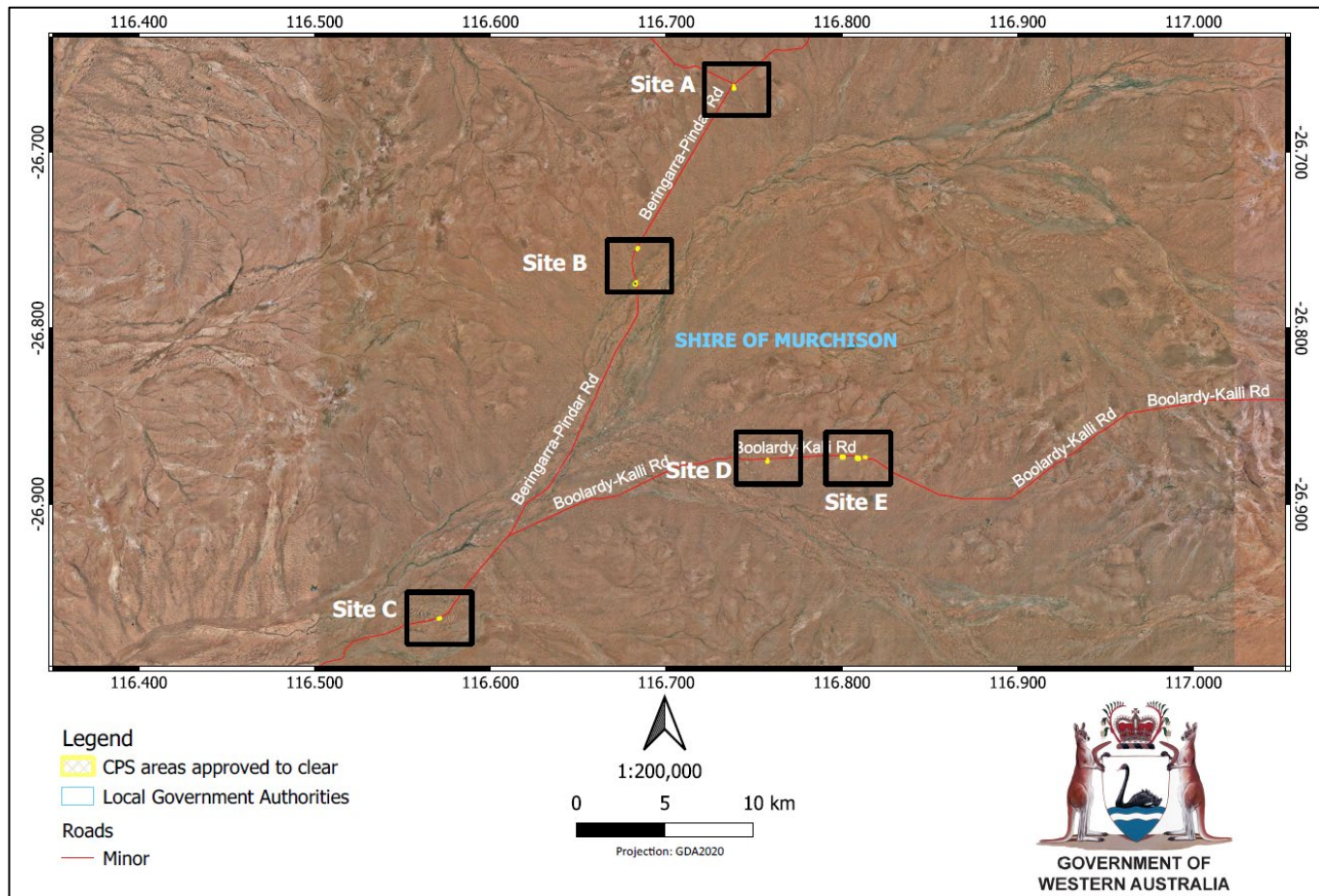


Figure 1. Context map of the application area

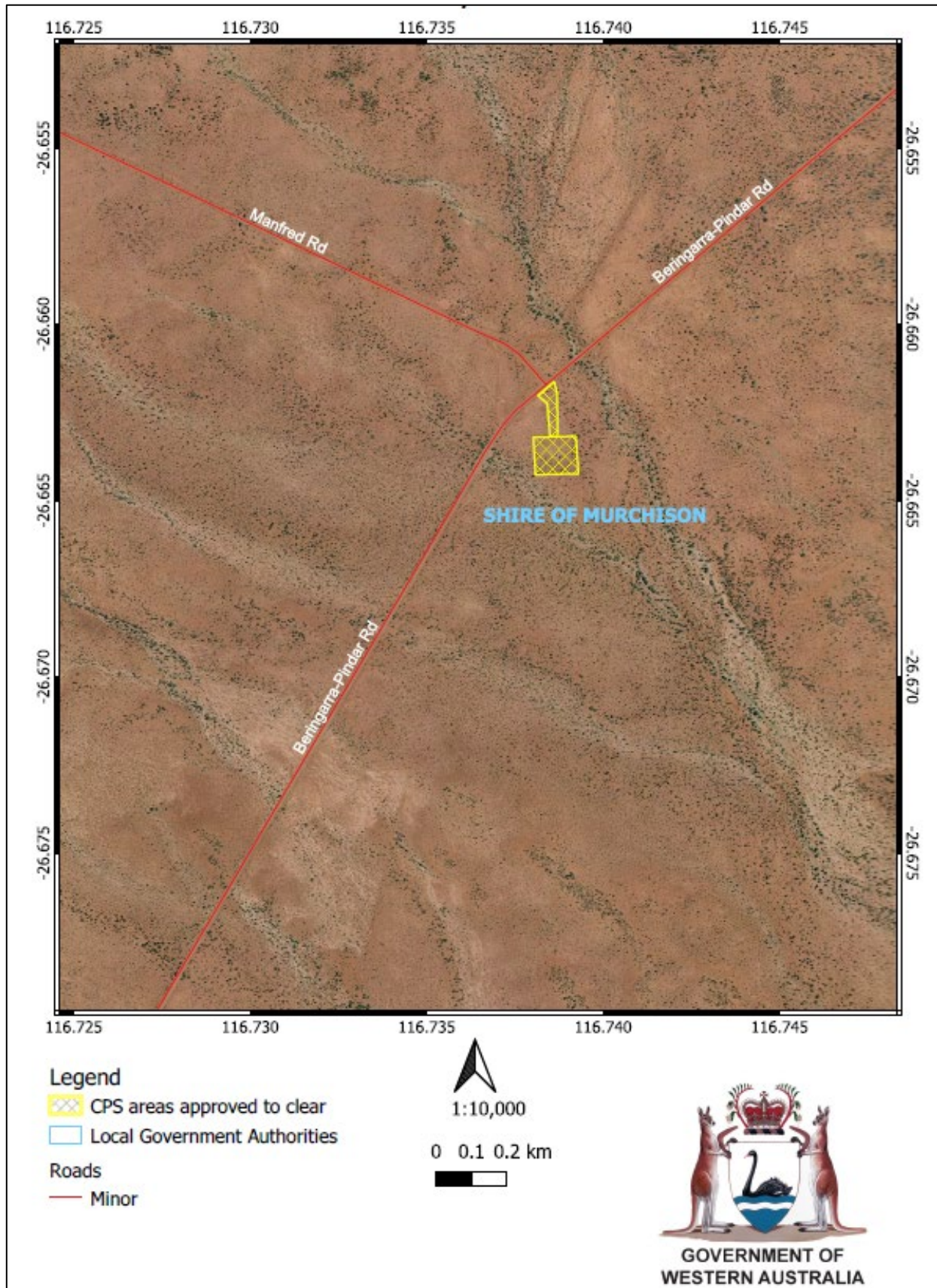


Figure 2-a. Map of the application area (Site A)

The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

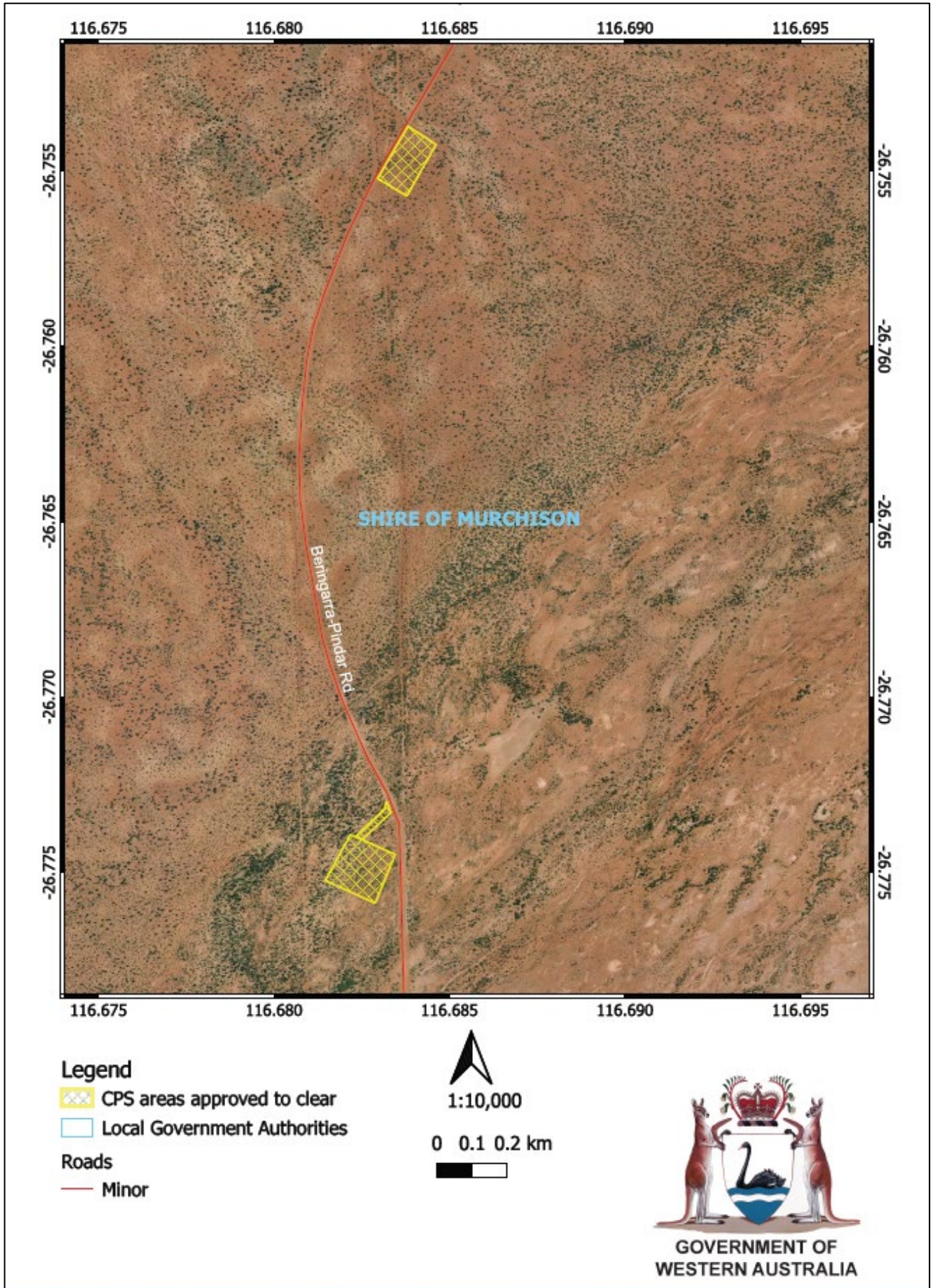


Figure 2-b. Map of the application area (Site B)

The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

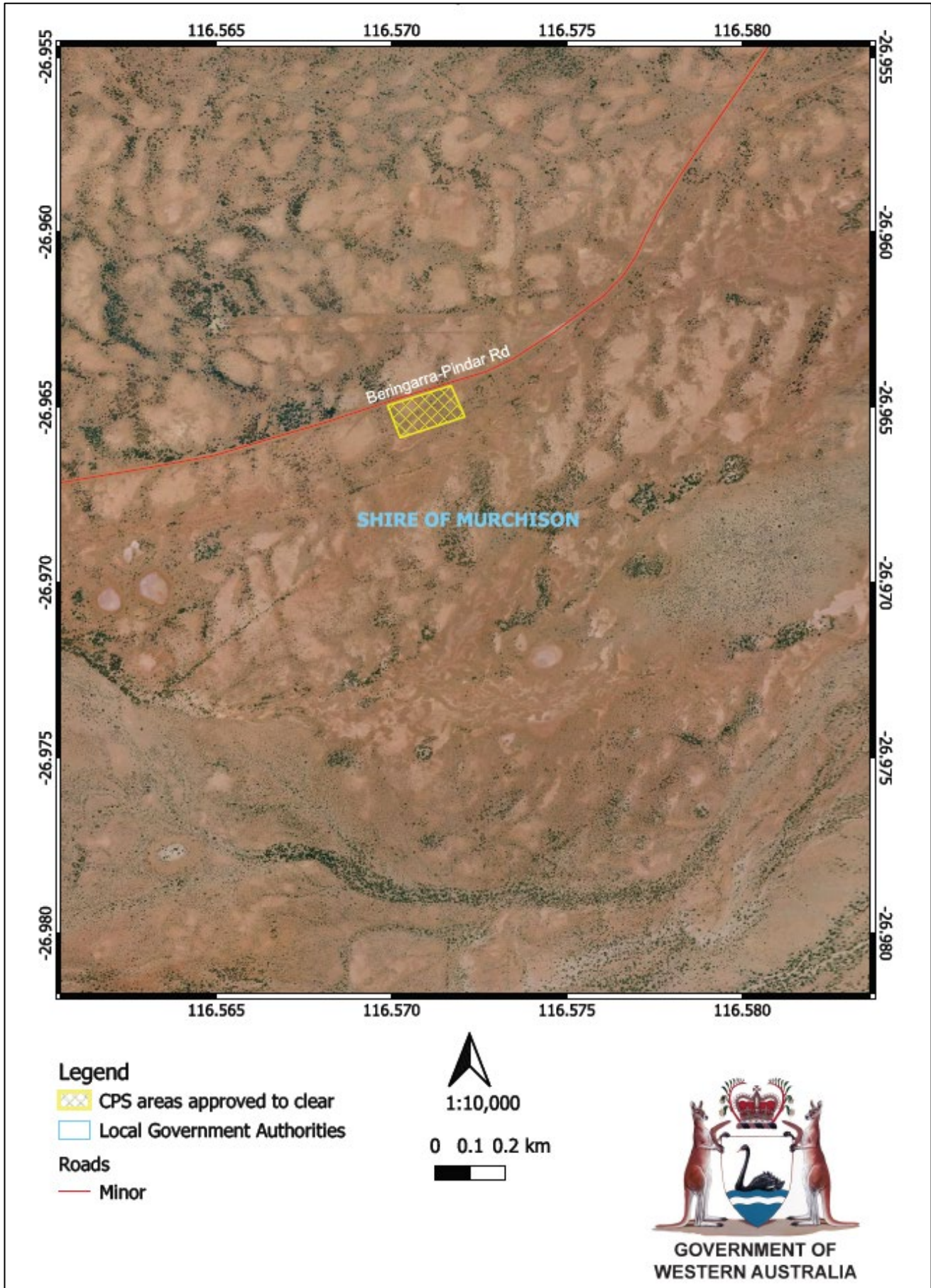


Figure 2-c. Map of the application area (Site C)

The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

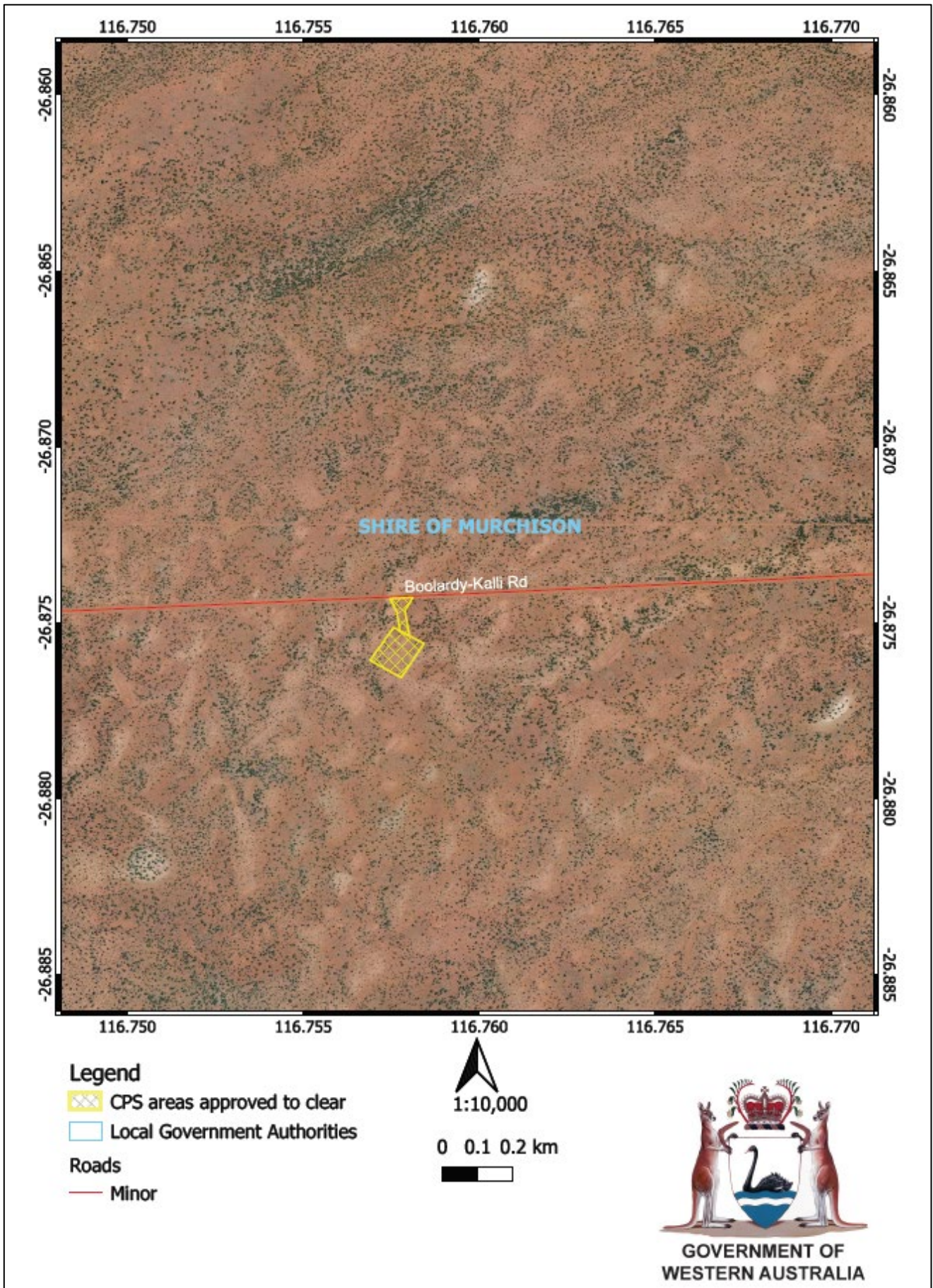


Figure 2-d. Map of the application area (Site D)

The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

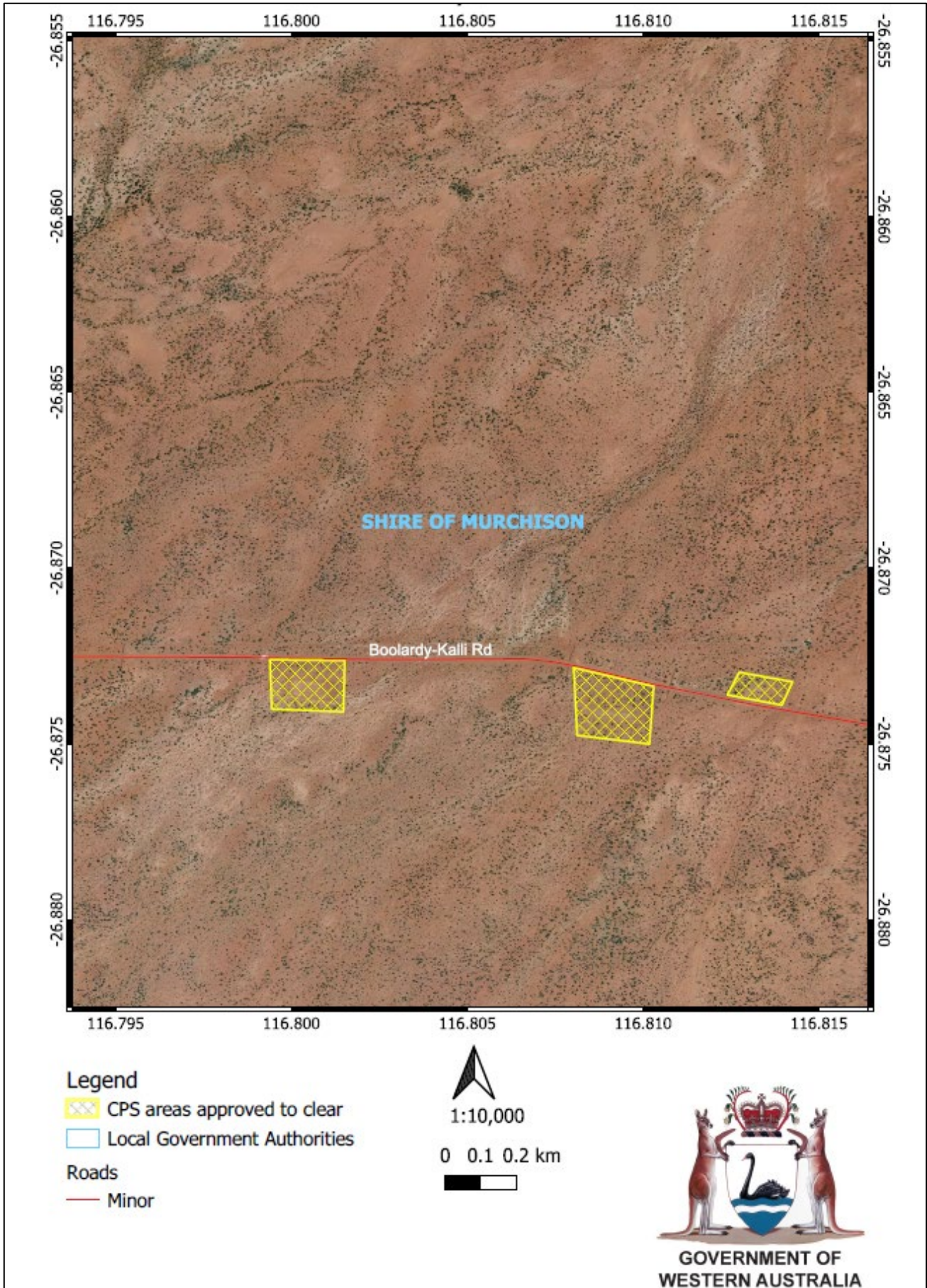


Figure 2-e. Map of the application area (Site E)

The areas crosshatched yellow indicate 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 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Rights in Water and Irrigation Act 1914* (RiWI Act)

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 document and further information (CSIRO, 2023) showed that the following measures have been applied/committed to be applied to avoid, minimise and mitigate the impacts of the proposed clearing:

Avoidance

In determining clearing location and amount, the applicant advised that:

- The locations were selected directly adjacent to existing roads and predominately leverage historical disturbances to minimise the need for further clearing.
- Clearing footprint was minimized to suit area needed for borrow material and groundwater abstraction well establishment. The proposals had already been prepared with an objective to minimise clearing but secure the volume of excavated material expected to be required.
- The pastoralists and Murchison Shire personnel had previously identified the locations as most suitable for gravel extraction due to access, and hence minimising impact on the land.
- The locations and design have been selected to avoid priority flora species *Gunniopsis divisa* (i.e. the TN BP road construction camp location – site C has been designed to avoid approximately 50 plants which are located within the area surveyed but have been excluded from the application area. The TN Kalli Road East survey area has been excluded from the current application to avoid approximately 20 plants).

Minimisation

During the clearing and excavation, the applicant committed:

- Limiting the degree or magnitude of the cleared footprint in the first instance (minimizing footprint, not disturbing soil while clearing bore hole locations).
- Careful planning and construction of roads to minimise capture and channelling overland flows, particularly on hardpan plains.
- In-field demarcation of clearing area using flagging/bunting, temporary fencing or other suitable method.
- The demarcated clearing boundary is to be checked, validated by Superintendent/Supervisor, photos taken prior to clearing being authorised to commence.
- Clearing will not commence more than three months prior to the intended use of the area to reduce the length of time that soil remains exposed and subject to wind erosion.
- Clearing will be conducted from existing cleared land towards adjacent vegetation to allow fauna present to move into nearby vegetation ahead of the directional clearing.
- Machinery to be clean prior to entering and leaving the area to be cleared to prevent introducing new weeds or spreading weeds.
- No weed affected soil, mulch, fill or other material is to be brought into the area to be cleared.
- Machinery movements will be contained to existing cleared areas or the area to be cleared.

- Cleared and exposed areas will be rehabilitated or otherwise stabilized as early as practicable to minimise the potential for wind erosion.
- To minimize the potential impacts on the Northern shield-backed trapdoor spider (*Idiosoma clypeatum*), the applicant committed (Aurora, 2024b):
 - Undertaking a pre-clearing inspection to assess the status of the previously active burrows.
 - If the burrows are found to be inactive, no further investigation will be undertaken.
 - If the burrows show signs of being active, or potentially active, a 50-metre buffer will be applied around the burrow where clearing will not occur unless further investigation is completed.
 - If the active burrow cannot be avoided, the applicant will liaise with DBCA about collecting and conducting genetic analysis to confirm which species the collected specimens belong to. The results of the analysis will inform the next course of action.

Mitigation

The applicant committed:

- Topsoil and vegetative material will be salvaged during clearing for stockpiling and re-use in a rehabilitation program. Topsoil and vegetative material will only be salvaged from areas with a vegetation condition rating of Good or better.
- Temporary vegetation clearing, such as for the purpose of borrow pits, will be rehabilitated using locally native species to reflect the surrounding vegetation and fauna habitat. The rehabilitation program will:
 - Ensure finished surfaces match the surrounding landform within five metres of the rehabilitation area, are stable and grades do not exceed 1 in 6.
 - Rip the area to be rehabilitated on the contour to remove compaction and encourage water penetration.
 - Spread salvaged topsoil and vegetative material across cleared areas.

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 B) 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 C) identified that the impacts of the proposed clearing present a risk to biological values (fauna and flora) and land resource. 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 and Fauna) - Clearing Principles (a) and (b)

The desktop assessment identified 17 conservation significant fauna species within the local area (50-kilometres from the application area), including 14 bird species, one mammal species, one invertebrate species and one reptile species. Of which, seven of these species are migratory bird species associated with coastal habitat not present within the application area.

Three fauna habitat types have been identified within the application area, including:

- hardpan plain with intermittent sandplain;
- granite boulders and heaps; and
- channels and creek line.

The detailed description of these habitat types can be found in the Appendix E.

In determining the likelihood of conservation significant fauna occurring within the application area, consideration was given to the results of the preferred habitat types, number of records within the local area, proximity of records to the application area, and the type and condition of the vegetation within the application area. Based on these factors, three conservation significant fauna species may possibly occur within the application area (See C.4 for fauna analysis table), including:

- Western spiny-tailed skink (*Egernia stokesii badia*)
- Northern shield-backed trapdoor spider (*Idiosoma clypeatum*)
- Peregrine falcon (*Falco peregrinus*)

No records of grey falcon (*Falco hypoleucos*) are mapped within the local area but this species was observed during the survey.

Western spiny-tailed skink (*Egernia stokesii badia*)

The western spiny-tailed skink (Vulnerable) is a moderately large, rock dwelling reptile. Two colour forms exist; the brown form and black form, the latter is delineated from the former by its black colouration, lack of patterning in adults and differing head and scale morphology. The black form occupies rock crevices in large, isolated rocky outcrops, typically granite (DEC, 2012).

Presence of the skink is determined by direct sightings or suitable habitat (i.e. rocky crevices). Crevices occupied by the black form of western spiny-tailed skink are usually identifiable by a “latrine” or scat pile, resulting from regular defecation of all family members, in close proximity to the entrance (DEC, 2012). The habitat type granite boulders and heaps occurring at site E contains crevices, however the crevices are shallow and not considered as suitable habitat for this skink species (AECOM, 2023). Noting the absence of suitable habitat and no records of the western spiny-tailed skink observed in the survey (AECOM, 2023), it is unlikely that this species would occur within the application area.

Northern shield-backed trapdoor spider (*Idiosoma clypeatum*)

The northern shield-backed trapdoor spider (Priority 3) has a widespread distribution in Western Australia’s inland arid zone, principally throughout the Yalgoo and Murchison bioregions (EOO >120,000 km²) (DBCA, 2024). The fauna habitat types Hardpan plain with intermittent sandplain and Granite boulders and heaps within the application are considered suitable habitat for this species (AECOM, 2023). The survey identified seven trapdoor burrows within the application areas, of which three burrows were considered to be active at the time of the survey (see Figure 2), with the remaining burrows been disturbed along with evidence of predation from goannas (AECOM, 2023).



Figure 3. Intact and potentially active Northern Shield-backed trapdoor spider burrows (AECOM, 2023).

DBCA advised that recent survey work and genetic analysis of *Idiosoma* species within the Yalgoo and Murchison bioregions by WA Museum and DBCA (conducted in 2023, post Rix *et al.* 2018 publication) has identified new species. Therefore, not all *Idiosoma* previously recorded as *I. clypeatum* are likely to be correctly identified and the taxa is likely to be more restricted than previously recorded (DBCA, 2024a). DBCA recommended to avoid the active burrows or to conduct further genetic analysis to provide an assessment of the significance of impacts, and to avoid the clearance during times of the year (peak in winter) when spider males are actively searching for females (DBCA, 2024a and 2024b).

The applicant committed to avoid active/potentially active burrows and to conduct genetic analysis and then liaise with DBCA for the following actions if the burrow cannot be avoided (See section 3.1). These commitments and DBCA’s recommendation on avoiding clearing during the species’ peak mating time have been converted to management conditions imposed on the clearing permit.

Grey falcon (*Falco hypoleucos*) and Peregrine falcon (*Falco peregrinus*)

The grey falcon (Vulnerable) occurs in arid and semi-arid inland Australia and is associated with timbered lowland plains such as tussock grassland, open woodland, and particularly *Acacia* shrublands that are crossed by tree-lined watercourses (TSSC, 2020). The grey falcon roosts and nests in the tallest trees along watercourses, particularly river red gum (*Eucalyptus camaldulensis*) and coolibah (*Eucalyptus coolabah*) (TSSC, 2020). There are no records of grey falcon mapped within a 50-kilometre radius from the application area (QGIS database), however the survey recorded one individual approximately more than 30 kilometres from the application area (AECOM, 2023). Considering the absence of tall trees and perennial watercourses within the application area footprint and the distance from the record observed from the survey, the proposed clearing area may not be a preferable foraging habitat for this species.

The peregrine falcon (Other Specially Protected Fauna) is found Australia-wide and occurs in a range of habitats including woodlands, grasslands and coastal cliffs, usually near watercourses (DAWE, 2020). Preferred roosting and breeding habitat for the peregrine falcon includes granite outcrops and coastal cliffs, but in the absence of these habitats, the species has been known to utilise the nests of other bird species or tree hollows for breeding (Marchant & Higgins, 1993). It is considered that the habitat present within the application area may also provide suitable transient foraging habitat for this species as individuals migrate through the landscape. However, noting that the peregrine falcon is a highly mobile species with a large home range that does not rely on special niche habitats, the peregrine falcon is likely to be transient in the application area and it is unlikely that the application area represents significant habitat for the species, noting the availability of extensive suitable foraging habitat within the surrounding local area.

Ecological linkage

Noting that there are extensive areas of native vegetation within the local area (which retains more than 99 per cent native vegetation cover) and the extent of clearing is small and distributed in discrete locations, the proposed clearing is unlikely to have a significant impact to ecological linkage and dispersal values of the local area.

Conclusion

Based on the above assessment, the proposed clearing may result in impacts on the northern shield-backed trapdoor spider (*Idiosoma clypeatum*) and potentially more restricted *Idiosoma* species. Management conditions imposed on the permit to avoid active burrows and restrict clearing timeframes will minimise impacts to this species.

Other fauna may be present at the time of clearing. Undertaking slow, progressive clearing towards adjacent native vegetation will minimise impacts to individuals present at the time of clearing.

Conditions

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

- Avoid clearing the identified active burrows of *I. clypeatum* with a buffer of 50 metres.
- Avoid clearing fauna habitat types that are suitable habitat for *I. clypeatum* during winter.
- Undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity.

3.2.2. Biological values (Biodiversity and Flora) - Clearing Principles (a) and (c)

Assessment

No threatened flora species are mapped within the local area (GIS database) and were identified in the biological survey (AECOM, 2023).

The application area is located within the Boolardy Station which is noted to be very dry and has been disturbed from extensive historical grazing, despite being destocked more than four years ago. This has led to reduced biomass, significant erosion, and compacted soil profile (AECOM, 2023). Forty-one (41) native flora species from 20 genera and 12 families and no weed species were recorded during the survey (AECOM, 2023).

The desktop assessment identified 30 conservation significant flora records within the local area. Based on a review of current environmental information, site characteristics, habitat preferences, and the distribution and extent of existing records, five conservation significant flora species recorded in the local area have the potential to occur within the application area (refer to Appendix C.3). Among them, *Gunniopsis divisa* was observed within the application area (AECOM, 2023).

Flora species confirmed to occur***Gunniopsis divisa***

Gunniopsis divisa (Priority 3) is an annual herb that grows between 0.05-0.1 metre high. The species produces white flowers during August. The habitat for this species consists of loam, quartz, roadsides (Western Australian Herbarium, 1998). This species is commonly found on colluvial outwash associated with banded ironstone formations. The survey recorded 305 individuals *Gunniopsis divisa* within the survey area, with 235 plants occurring within the application area (AECOM, 2023). This species is considered locally common and is expected to be more widespread within the local area if further targeted surveys were conducted (Aurora, 2024a). Several surveys in the local area supporting the SKA project have recorded a total of 1,086 individuals of this species, as in the following table:

Table 1. Records of *Gunniopsis divisa* from SKA survey areas (Aurora, 2024a)

Survey	Survey area	Number of records
Detailed flora and vegetation survey by AECOM in 2014	6,195 ha (SKA1-Survey) 4,538 ha (SKA1-Low)	149 plants (9 locations)
Pre-clearance survey for CPS 9547/1 by AECOM in 2022	99 ha	448 plants (51 locations)
Reconnaissance flora, vegetation and fauna survey by AECOM in 2023 – supporting this application	Numerous small areas covering 56.44 ha	305 plants (21 locations)
Reconnaissance flora, vegetation and fauna survey by AECOM in 2023	Numerous linear corridors covering 185.37 ha	181 plants (4 locations)
Reconnaissance flora, vegetation and fauna survey by UMWELT in 2024	62 ha area for potential airstrip upgrade	3 plants (3 locations)
Total		1,086 plants

DBCA advised that *Gunniopsis divisa* is known from 26 locations in DBCA database, from Jack Hills near Meekatharra to the Mount Gibson area, and the proposed clearing is not likely to impact the species' regional extent. Therefore, impact of clearing on this priority flora is not considered significant at the regional or species level (DBCA, 2024a). Noting the abundance of *Gunniopsis divisa* recorded in surveys within the proposed clearing surrounding areas, the removal of 235 plants within the application area is unlikely to significantly impact the species extent at local level.

Flora species likely to occur***Calandrinia butcherensis* and *Calandrinia* sp. Boolardy Station (P. Jayasekara 719-JHR-01)**

Calandrinia butcherensis (Priority 1) is distributed within the Carnarvon, Gascoyne, Murchison and Yalgoo IBRA Regions, while *C. sp. Boolardy Station* (Priority 1) is located in the Murchison IBRA Region (Western Australian Herbarium, 1998). The application area is within the known range and contains suitable habitat for these *Calandrinia* species (DBCA, 2024a and AECOM, 2023). DBCA advised that the *C. butcherensis* has previously been collected from late August to early/mid-October; while *C. sp. Boolardy* is an annual herb known from a single herbarium specimen collected on 18 October 2006, but was unable to be relocated in a follow up survey completed in November that year. The survey supporting this application was carried out from 10-13 November 2022, which is likely to have been too late to identify these priority species as they would dry up and not be recognised after a period of hot weather (DBCA, 2024a). AECOM (2023) also indicated that these species might not be in flower during the time of the survey and consequently overlooked.

Noting the above, it is unclear about the presence/absence of these *Calandrinia* species within the application area. Clearing of these species may result in a significant impact on their local and regional extents due to the small known distribution of the species. Therefore, to mitigate the potential impact on these species, a pre-clearance survey at the optimal time (September) and avoidance of identified individuals are required.

Eremophila muelleriana

Eremophila muelleriana (Priority 3) is known to be distributed in the Gascoyne, and Murchison IBRA regions. This species is described as a shrub or tree that grows between 0.3 – 4 metres tall, the flowers are purple/red/black which bloom between August to October (Western Australian Herbarium, 1998). This species was recorded in the biological survey conducted by AECOM (2023) within the survey area with 17 individuals, however these records were outside of the clearing footprint.

Eremophila simulans* subsp. *megacalyx

Eremophila simulans subsp. *megacalyx* (Priority 3) is distributed in the Murchison IBRA region. The survey area was identified to contain suitable habitat for this species, however no individuals were recorded (AECOM, 2023). *E.* subsp. *megacalyx* is a perennial species, it is therefore considered unlikely that this species occurs within the clearing footprint as it was not detected in the survey and would not have been overlooked (AECOM, 2023).

Conclusion

Based on the above assessment, the proposed clearing will result in the removal of 235 individuals of *G. divisa* which is considered unlikely to significantly impact the extent of this species in local, regional and species level. The clearing may also impact *C. butcherensis* and *C. sp.* Boolardy Station (P. Jayasekara 719-JHR-01) should they be present within the application area. This potential impact can be managed by undertaking a pre-clearance survey and avoidance of identified *Calandrinia* species.

Conditions

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

- Pre-clearance survey targeting *C. butcherensis* and *C. sp.* Boolardy Station at the optimal time (September) and avoidance of clearing vegetation within 20 metres from the identified individuals.

3.2.3. Land resource - Clearing Principle (g)

Assessment

The mapped soils across the application area indicate moderate to high risk of susceptibility to acidification (See Appendix B.5). Considering the small extent of clearing at five separate sites and that the end land use is not for agricultural purposes, the proposed clearing is not likely to have an appreciable impact on land degradation due to acidification.

The mapped soils at site B, D and E are susceptible to accelerated erosion when severely degraded. The cumulative impacts by grazing animals and pastoral management, in particular, the loss of perennial vegetation has led to accelerated soil erosion in the local area (Curry et al., 1994). Given rainfall is limited and evaporation is high, the risk from water erosion is considered to be restricted to high rainfall events. Due to the lack of ground cover, the loose soils are prone to wind erosion. Increased wind erosion can lead to dust build up on plants, which may affect the plant health and subsequent quality of adjacent vegetation (Matsuki et al., 2016). To mitigate this, the applicant committed to not commence the clearing more than three months prior to the intended use of the area and to rehabilitate/stabilize as early as applicable to minimize the wind erosion risk (See section 3.1). Noting the applicant's commitments and the relatively small extent of clearing, it is considered that although clearing may lead to some land degradation in the form of soil erosion and dust deposition, these impacts are likely to be minor, localised and temporary. Conditions on limiting the exposure time of cleared areas to wind and rehabilitation can mitigate these potential impacts.

Conclusion

Based on the above assessment, the proposed clearing is considered unlikely to lead to appreciable or long-term land degradation.

Conditions

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

- Commence activities related to the purpose of the clearing no later than three months after clearing.
- Revegetation of the cleared area after completion of the intended use.

3.3. Relevant planning instruments and other matters

The proposed clearing area is located in the Boolardy Station, a 346,748-hectare pastoral property. A lease was granted by the Minister for Lands under the *Land Acquisition Act 1969* to CSIRO, with permitted uses that includes developing, operating, undertaking and decommissioning the SKA-1 Low project (AECOM, 2023).

The SKA project was referred to the EPA under Part IV of the EP Act, and the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the EPBC Act in 2017. The EPA determined not to assess the project and DCCEEW determined that it was 'not a Controlled Action' (CSIRO, 2024).

The Shire of Murchison were invited to provide comments on the application, but no comments have been received.

The proposed clearing area is located within the Gascoyne Groundwater Area proclaimed under the RiWI Act. The application area is located in the Murchison River surface water area, however this is not a proclaimed surface water resource (DWER, 2023). The applicant currently holds a licence to take groundwater (GWL208982) for 160 000kL which is expired in 2033, and a licence to construct or alter wells CAW208983 which is expired in August 2024 (DWER, 2023).

No Aboriginal sites of significance have been mapped within the application area. 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. Additional information provided by applicant

During the assessment, the applicant responded to requests for information on the following (see below).

Summary of additional information	Consideration of provided additional information
Information on records of <i>Gunniopsis divisa</i> within surrounding areas from biological surveys supporting SKA project.	This information has been used to justify the significance level of clearing on this priority flora species as presented in Section 3.2.2.
Further information on applicant's commitments to avoid, minimize and mitigate the impacts of the proposed clearing.	The information is presented in Section 3.1 and has been considered in assessing the impacts on environmental values in Section 3.2.
Commitments regarding the Northern shield-backed trapdoor spider (<i>Idiosoma clypeatum</i>).	This information has been considered in Section 3.2.1 and converted into permit conditions.
Information on the depth of excavation and groundwater level in the area.	This information has been used to assess the impacts on groundwater and is presented in Appendix C.

Appendix B. Site characteristics

B.1. 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.

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 in the Murchison Bioregion, in the locality of South Murchison. Spatial data indicates the local area (50-kilometre radius from the centre of the application area) retains approximately 99.99 per cent of its original native vegetation cover.
Ecological linkage	There are no mapped ecological linkages within the application area and the combined local area (50-kilometre radius from the application area). The application area is unlikely to provide any specific linkage values, noting the extent of surrounding native vegetation.
Conservation areas	There are no mapped conservation areas within the application area. The only conservation area within the local area is a conservation covenant under the Remnant Vegetation Protection Scheme, located from 16 to 40 kilometres from the application sites.
Vegetation description	Ecological assessment (AECOM, 2023) indicates the vegetation within the proposed clearing area consists of three vegetation communities: <ul style="list-style-type: none"> AiAtEf – Acacia Woodland: <i>Acacia incurvaneura</i>, <i>Acacia craspedocarpa</i> and <i>Acacia fuscaneura</i> low open woodland over <i>Acacia tetragonophylla</i>, <i>Acacia kempeana</i> and <i>Acacia oswaldii</i> sparse tall shrubland over <i>Eremophila fraseri</i> subsp. <i>parva</i>, <i>Senna artemisioides</i> subsp. <i>helmsii</i> and <i>Eremophila macmillaniana</i> sparse mid shrubland. AvEp – Acacia Woodland: <i>Acacia victoriae</i> subsp. <i>victoriae</i>, <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and <i>Acacia tetragonophylla</i> tall shrubland over <i>Eremophila pterocarpa</i> subsp. <i>pterocarpa</i>, <i>Senna</i> sp. Meekatharra (E. Bailey 1-26) and <i>Atriplex amnicola</i> mixed chenopod shrubland. ApAgEf – Acacia Woodland: <i>Acacia pteraneura</i> low woodland to open woodland over <i>Acacia grasbyi</i> and <i>Acacia tetragonophylla</i> tall sparse shrubland over <i>Eremophila forrestii</i> subsp. <i>forrestii</i>, <i>Senna artemisioides</i> subsp. <i>helmsii</i> and <i>Eremophila fraseri</i> subsp. <i>parva</i> mid shrubland. <p>Representative photos, description and map of these vegetation communities are available in Appendix E.</p>

Characteristic	Details
	<p>This is consistent with the mapped vegetation type(s):</p> <ul style="list-style-type: none"> • Upper Murchison 29, which is described as low woodland, open low woodland, or sparse woodland • Upper Murchison 204, which is described as Mulga, other wattle <i>Atriplex</i> spp., Maireana spp. with <i>Acacia aneura</i> and other <i>Acacia</i> spp. <p>The mapped vegetation types retain over 99 per cent of their original extent (Government of Western Australia, 2019).</p>
Vegetation condition	<p>Ecological assessment (AECOM, 2023) indicates that the vegetation within the proposed clearing area is in very good or completely degraded (Trudgen, 1991) condition.</p> <p>The full Trudgen (1991) condition rating scale is provided in Appendix D. The vegetation condition mappings are available in Appendix E.</p>
Climate	<p>Climate</p> <p>Mean maximum temperature: 30.4 °C</p> <p>Mean maximum temperature: 14.6 °C</p> <p>The annual average rainfall is 228.3 millimetres (taken from Murchison station) (BOM, 2024).</p>
Soil and landform description	<p>The soils are mapped as:</p> <ul style="list-style-type: none"> • 272Yg - almost flat hardpan wash plains, with or without small wanderrie banks and weak groving; supporting mulga shrublands and wanderrie grasses on banks (A section of site B and entire sites D and E). • 272Bg - Riverine plains with floodplains and channels, supporting halophytic shrublands, mixed <i>Acacia</i> shrublands and low woodlands with minor perennial grasses (A section of site B). • 272Er - Tributary floodplains with shallow, erodible duplex soils on red-brown hardpan, more or less saline and supporting <i>Acacia</i> shrublands with halophytic and non-halophytic undershrubs (Site C). • 272Sh - Breakaways, kaolinised footslopes and extensive gently sloping plains on granite supporting mulga shrublands and minor halophytic shrublands (A section of site A). • 272Ko - Quartz-strewn stony plains and low rises with outcropping granite, gneiss and schist, supporting scattered mulga shrublands and other mainly non-saline shrubs (A section of site A).
Land degradation risk	<p>The soils in the application area are mapped as being susceptible to erosion and acidification (See Table B.5)</p>
Waterbodies	<p>The desktop assessment and aerial imagery indicated that site C is located within an inundation area of the Roderick River. Distances from application sites to the closest mapped waterbodies (non-perennial minor rives) range from approximately 150 to 2,200 metres.</p>
Hydrogeography	<p>The application area falls within the Gascoyne Groundwater Area as proclaimed under the RiWI Act. Site B is mapped with groundwater salinity of 3000-7000 milligrams per litre total dissolved solids, while the remaining sites are mapped with groundwater salinity of 1000-3000 milligrams per litre total dissolved solids.</p>
Flora	<p>A total of 30 conservation significant flora records occur in the combined local area, which are all priority flora species. There are seven priority flora species that occur on the same soil type and vegetation type as found within the application area. The biological survey identified the priority flora <i>Gunniopsis divisa</i> within the application area (AECOM, 2023).</p>
Ecological communities	<p>There are no mapped threatened or priority ecological communities within the application area. The closest mapped priority ecological community (PEC) is recorded as the</p>

Characteristic	Details
	'Priority 1 Meka calcrete groundwater assemblage type on Murchison palaeodrainage on Meka Station' located approximately 13 kilometres South-East of the application area.
Fauna	According to available databases, 17 species of conservation significant fauna species have been recorded within the combined local area, including five threatened fauna species, two priority fauna species, and ten specially protected fauna species, including nine migratory species. Records of grey falcon (<i>Falco hypoleucos</i> - Vulnerable) and Northern shield-backed trapdoor spider (<i>Idiosoma clypeatum</i> - Priority 3) were observed during the fauna survey (AECOM, 2023).

B.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*					
Murchison	28,120,586.77	28,044,823.42	99.73	2,185,987.96	7.77
Vegetation complex					
Upper Murchison 29	1,823,089.89	1,822,612.98	99.97	83,653.65	10.77
Upper Murchison 204	115,310.14	115,306.30	100.00	4,857.92	4.21

*Government of Western Australia (2019)

B.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), and biological survey information (AECOM, 2023), impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features ? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records within the combined local area	Are surveys adequate to identify? [Y, N, N/A]
<i>Calandrinia butcherensis</i>	P1	Y	Y	Y	20.2	1	N
<i>Calandrinia</i> sp. Boolardy Station (P. Jayasekara 719-JHR-01)	P1	Y	Y	Y	13.8	1	N
<i>Eremophia muelleriana</i>	P3	Y	Y	Y	1.5	6	Y
<i>Eremophila simulans</i> subsp. <i>megacalyx</i>	P3	N	Y	Y	4.9	7	Y
<i>Gunniopsis divisa</i>	P3	Y	Y	Y	36.1	5	Y

P: priority

B.4. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), and biological survey information (AECOM, 2023), impacts to the following conservation significant fauna required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records within the combined application area	Are surveys adequate to identify? [Y, N, N/A]
Western spiny-tailed skink (<i>Eremia stokesii badia</i>)	VU	Y	Y	3.7	12	Y
Northern shield-backed trapdoor spider (<i>Idiosoma clypeatum</i>)	P3	Y	Y	16.31	4	Y
Peregrine falcon (<i>Falco peregrinus</i>)	OS	Y	Y	16.3	3	Y
Grey falcon (<i>Falco hypoleucos</i>)	EN	Y	Y	> 50	0	Y

VU: Vulnerable; P: priority; EN: Endangered; OS: Other Specially Protected

B.5. Land degradation risk table

Risk categories	272Yg (Site B, D, E)	272Bg (Site B)	272Er (Site C)	272Sh (Site A)	272Ko (Site A)
Erosion	susceptible to accelerated erosion when severely degraded	37% of the system area traversed showed moderate to severe erosion	26% of the system area traversed showed moderate or severe erosion	Major units are not generally susceptible to accelerated erosion	not normally susceptible to accelerated erosion, even where severely degraded
Salinity	100% of map unit has slight to nil risk				
Acidification risk	20% of map unit has high risk, 80% has moderate risk	high: 25% moderate: 45% low: 30%	high: 50% moderate: 30% low: 20%	high: 50% moderate: 45% low: 5%	moderate: 100%

(DPIRD, 2022)

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The proposed clearing area contains priority flora species and habitat of conservation significant fauna species was observed within the application area.</p>	At variance	Yes <i>Refer to Section 3.2.1 and 3.2.2, above.</i>
<p><u>Principle (b):</u> "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."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains suitable habitat for conservation significant fauna, northern shield-backed trapdoor spider (<i>Idiosoma clypeatum</i> - Priority 3) (AECOM, 2023).</p>	At variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (c):</u> "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p> <p><u>Assessment:</u></p> <p>No threatened flora species were mapped within the local area, and no threatened flora were recorded during the ecological surveys (AECOM, 2023)</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not contain species that can indicate a threatened ecological community.</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The extent of the mapped vegetation type 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 in the local area.</p>	Not at variance	No
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>The Roderick River is mapped within 150 metres of several locations of proposed clearing areas. Sites B, C, D and E contain waterbodies that are likely the results of historical disturbance in the area. Given the extent of the proposed clearing, the ephemeral nature of waterbodies within the application area and that none of the listed vegetation communities within the application area are riparian, the proposed clearing is unlikely to impact environment associated with a watercourse or wetland.</p>	May be at variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils may be susceptible to erosion and acidification when vegetation cover is removed. Impacts are considered to be localised and temporary. Noting the small extent of clearing in discrete locations, the proposed clearing is not likely to have an appreciable impact on land degradation.</p>	May be at variance	Yes <i>Refer to Section 3.2.3, above.</i>
<p><u>Principle (i):</u> <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.”</i></p> <p><u>Assessment:</u></p> <p>Given no significant water courses, wetlands or Public Drinking Water Sources Areas are recorded within the application area and noting the small area of</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p>clearing in discrete locations, the proposed clearing is unlikely to impact surface or ground water quality (DWER, 2023).</p> <p>The estimated depth of excavation is approximately three meters below ground level, while the ground water levels are generally 10 to 15 meters below ground level (Aurora, 2024b). Noting this, the subsequent activities after clearing are also unlikely to impact the underground water.</p>		
<p>Principle (j): <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding or waterlogging.</p> <p>However, the excavation of borrow pits is likely to expand the ephemeral waterbodies within the application area, especially after rainfall events.</p>	Not likely to be at variance	No

Appendix D. Vegetation condition rating scale

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




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

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

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

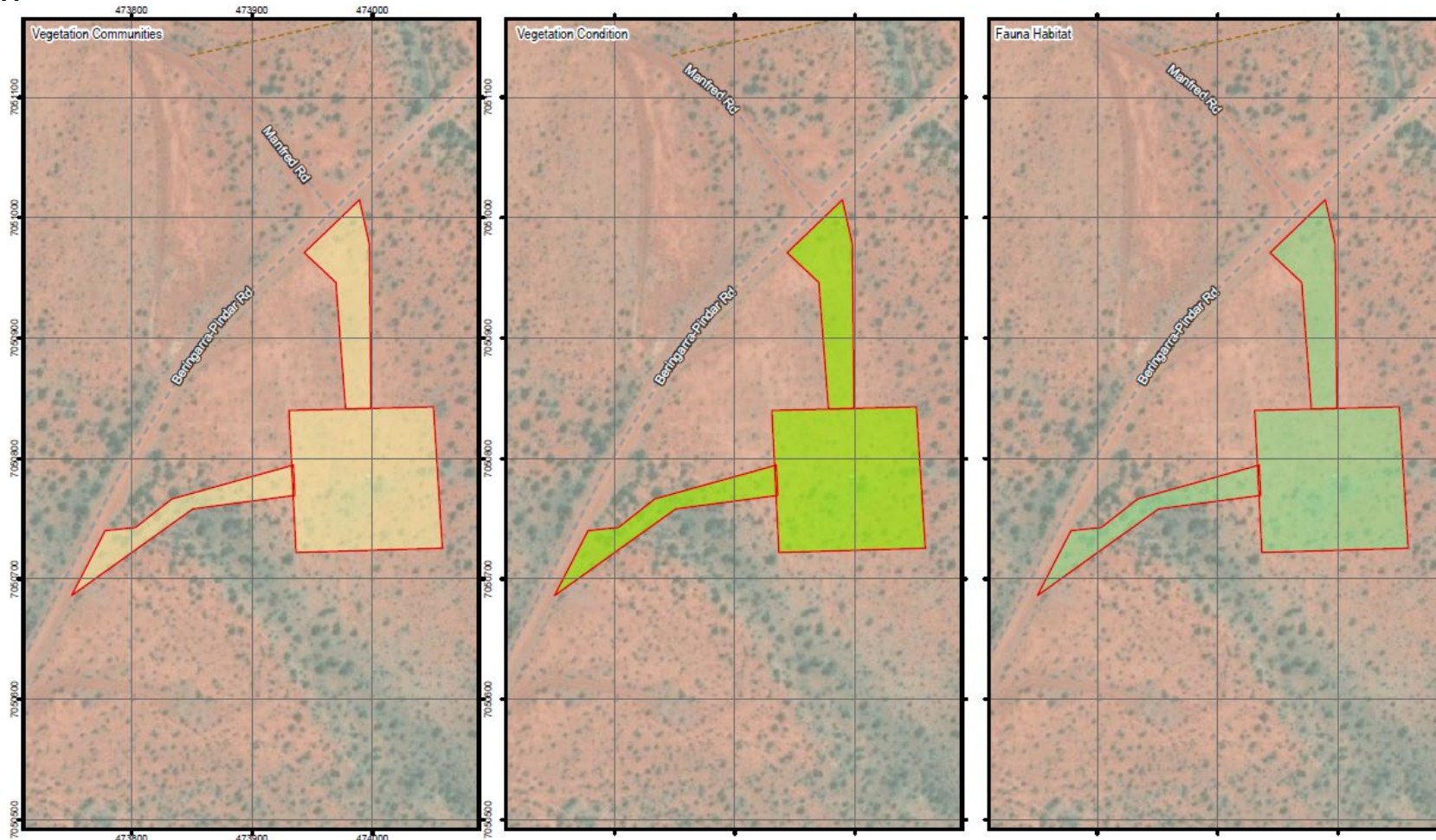
Appendix E. Biological survey information excerpts

Table 15 Vegetation Communities Recorded in the Survey Area

Description	Site details	Photo
<p>AiAtEf Acacia Woodland</p> <p><i>Acacia incurvaneura</i>, <i>Acacia craspedocarpa</i> and <i>Acacia fuscaneura</i> low open woodland over <i>Acacia tetragonophylla</i>, <i>Acacia kempeana</i> and <i>Acacia oswaldii</i> sparse tall shrubland over <i>Eremophila fraseri</i> subsp. <i>parva</i>, <i>Senna artemisioides</i> subsp. <i>helmsii</i> and <i>Eremophila macmillaniana</i> sparse mid shrubland.</p>	<p>Flat terrain with red clay with a variable soil profile reflecting erosion. Alluvial sands found close to drainage channels transition to clay loams on flats.</p> <p>Extent (ha): 47.58</p> <p>Species richness:</p> <ul style="list-style-type: none"> • 32 native species 	
<p>AvEp Acacia Woodland</p> <p><i>Acacia victoriae</i> subsp. <i>victoriae</i>, <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and <i>Acacia tetragonophylla</i> tall shrubland over <i>Eremophila pterocarpa</i> subsp. <i>pterocarpa</i>, <i>Senna</i> sp. <i>Meekatharra</i> (E. Bailey 1-26) and <i>Atriplex amnicola</i> mixed chenopod shrubland</p>	<p>Hardwash plains with red-brown sandy loam clay soils.</p> <p>Extent (ha): 1.68</p> <p>Species richness:</p> <ul style="list-style-type: none"> • 16 native species 	
<p>ApAgEf Acacia Woodland</p> <p><i>Acacia pteraneura</i> low woodland to open woodland over <i>Acacia grasbyi</i> and <i>Acacia tetragonophylla</i> tall sparse shrubland over <i>Eremophila forrestii</i> subsp. <i>forrestii</i>, <i>Senna artemisioides</i> subsp. <i>helmsii</i> and <i>Eremophila fraseri</i> subsp. <i>parva</i> mid shrubland.</p>	<p>Undulating flat terrain with red-brown sandy loam soils.</p> <p>Extent (ha): 3.24</p> <p>Species richness:</p> <ul style="list-style-type: none"> • 11 native species 	

Vegetation communities, vegetation conditions and fauna habitat recorded within the application area (AECOM, 2023).

Site A



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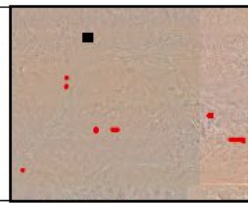
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LEGEND
 Survey Area
 Vegetation Communities
 AIAIEF

Vegetation Condition
 Very Good

Fauna Habitat
 Hardpan plain with intermittent sandplain

Scale: 1:4,300 (when printed at A4)
 Datum: GDA2020 MGA Zone 50
 0 25 50 75 100 metres



Vegetation Communities, Condition and Fauna Habitat - Dorothea

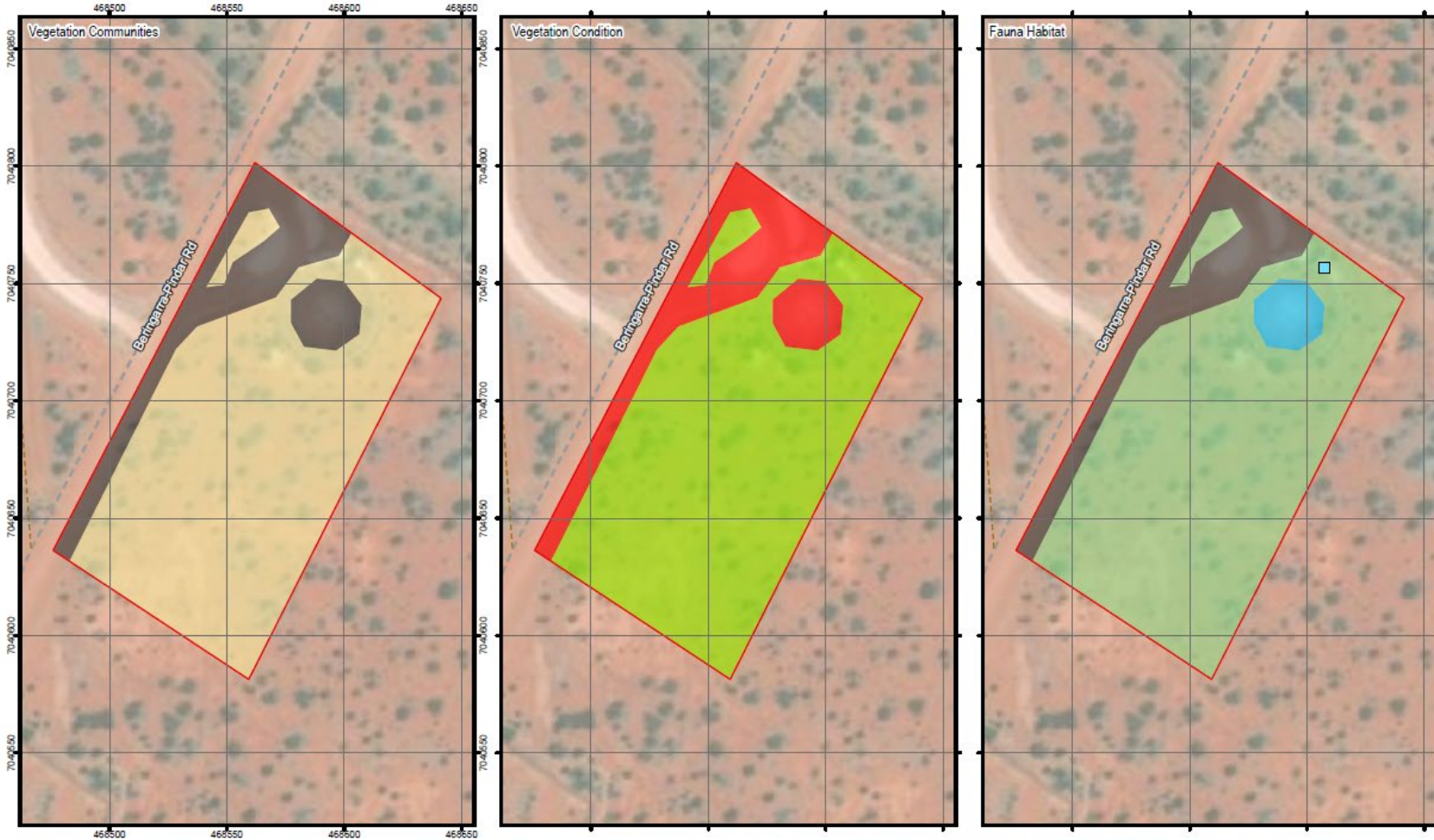
DEPARTMENT OF INDUSTRY, SCIENCE, ENERGY AND RESOURCES
 ECOLOGICAL ASSESSMENT - NOVEMBER 2022 - SQUARE KILOMETRE ARRAY

Figure 7.5

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Site B-1



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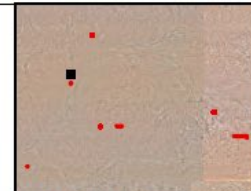
Datum: GOA2020 MGA Zone 50
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 (When printed at A4)

Scale bar: 0 10 20 30 40 metres

Data source:
 Base Data: (1) Based on information provided by and with the permission of the Western Australian Land Information Authority (trading as Landgate (2010), Geoscience Australia, Swireps)

LEGEND

- Survey Area
- Vegetation Communities
 - Cleared
 - AIATef
- Vegetation Condition
 - Very Good
 - Completely Degraded
- Fauna Habitat
 - Potential Conservation Significant Fauna Species
 - Channels and creek line
 - Cleared
 - Hardpan plain with intermittent sandplain



Vegetation Communities, Condition and Fauna Habitat - TN BP Road ASKAP Turnoff

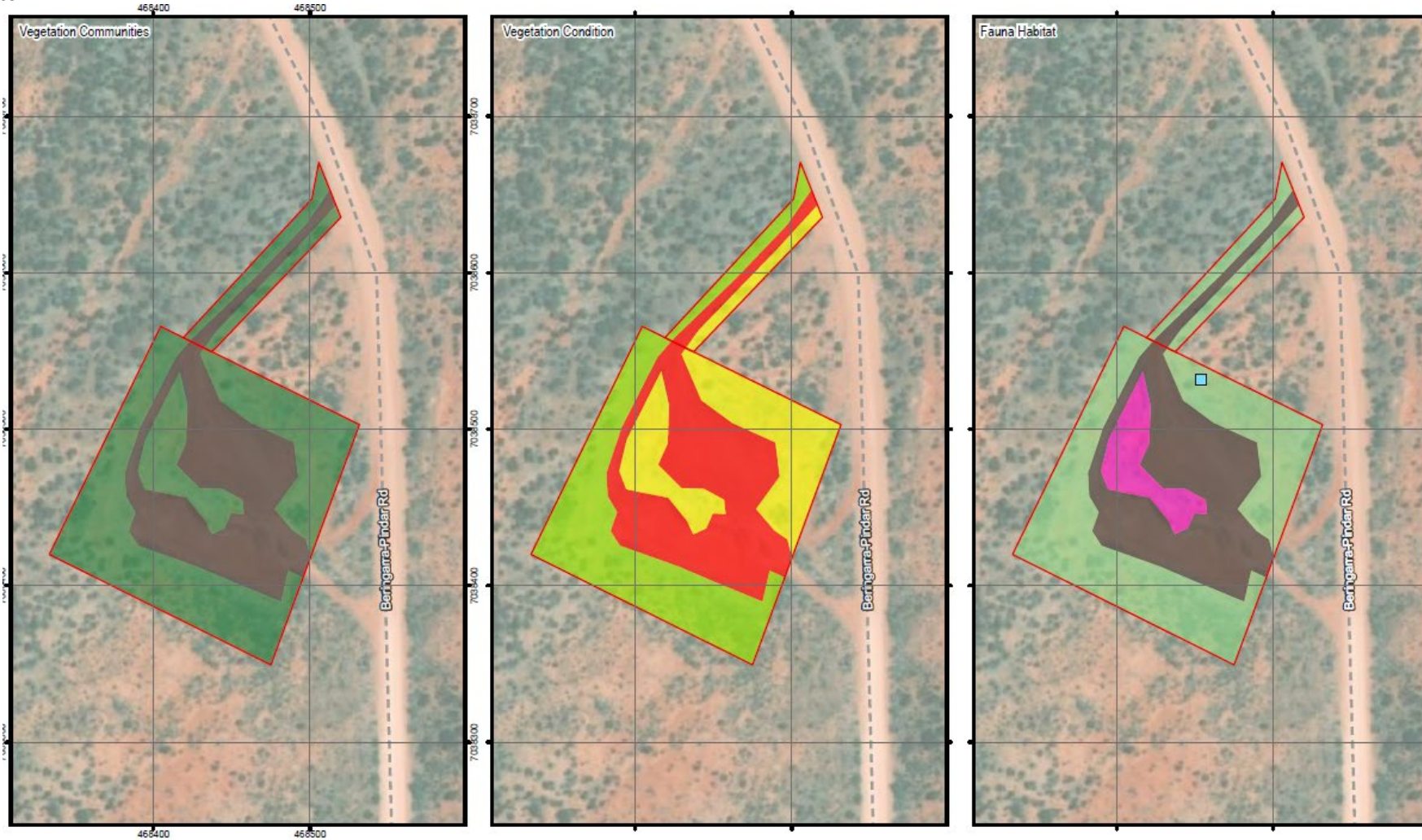
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Figure 7.8

A4 size

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Site B-2



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Scale source:

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LEGEND

Survey Area

Vegetation Communities

- Cleared
- AvEp

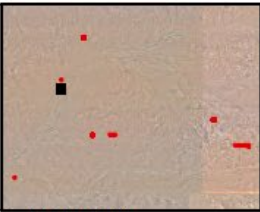
Vegetation Condition

- Very Good
- Good
- Completely Degraded

Potential Conservation Significant Fauna Species

Fauna Habitat

- Cleared
- Hardpan plain with intermittent sandplain
- Granite boulders and heaps



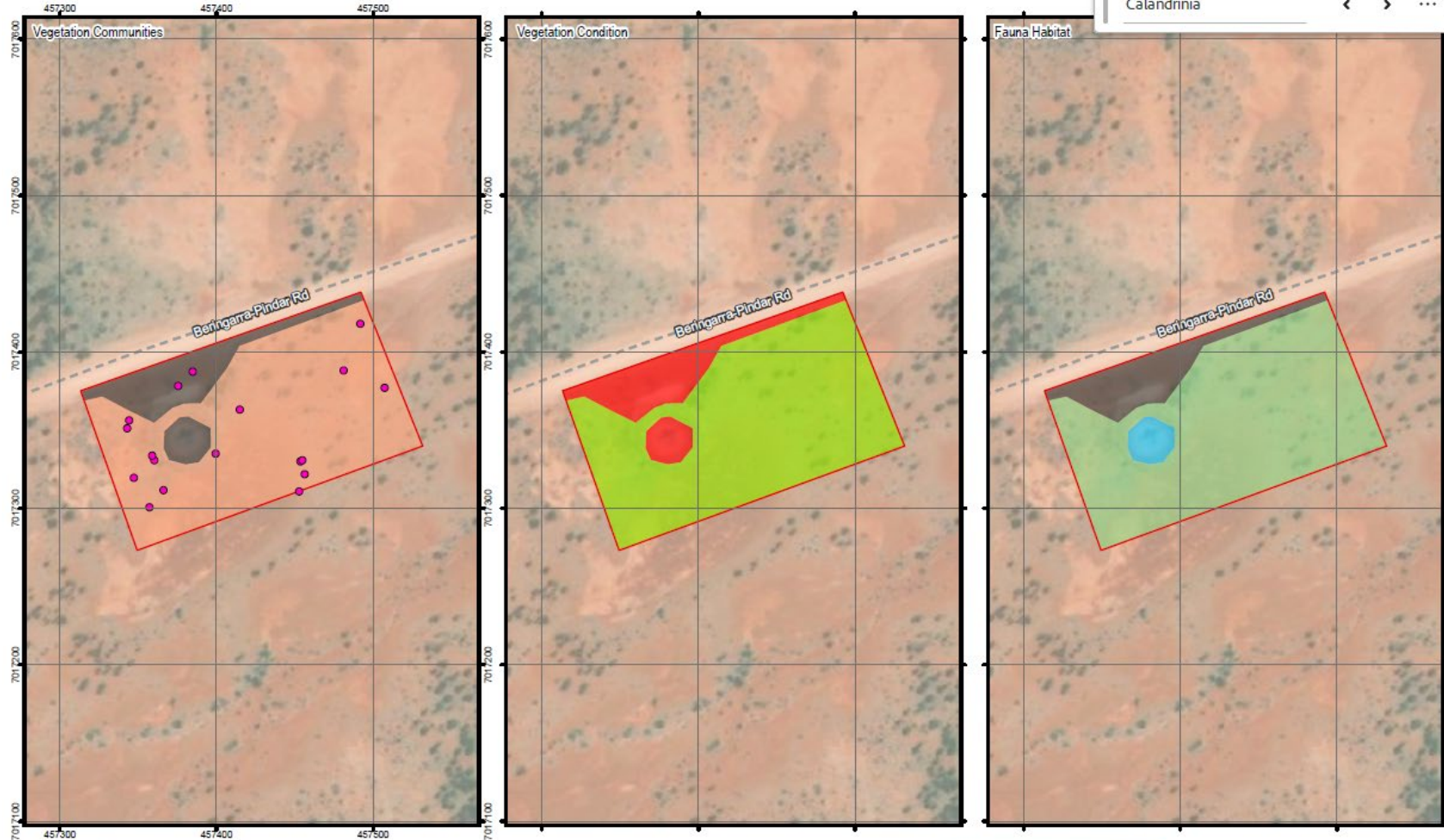
Vegetation Communities, Condition and Fauna Habitat - BP01

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Figure 7.1

Site C



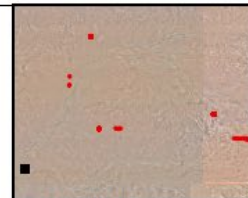
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Datum: GDA2020 MGA Zone 50
 1:3,300
 (when printed at A4)

Scale source:
 Base Data: (S) Based on information provided by and with the permission of the Western Australian Land Information Authority (reading as Landgate (2013) Geoscience Australia, OpenStreetMap)

- LEGEND**
- Survey Area
 - Priority Flora
 - *Gunnopsis divisa*
 - ApAgEf
 - Cleared
- Vegetation Condition**
- Very Good
 - Completely Degraded
- Fauna Habitat**
- Channels and creek line
 - Cleared
 - Hardpan plain with intermittent sandplain



Vegetation Communities, Condition and Fauna Habitat - TN BP Road Constuction Camp

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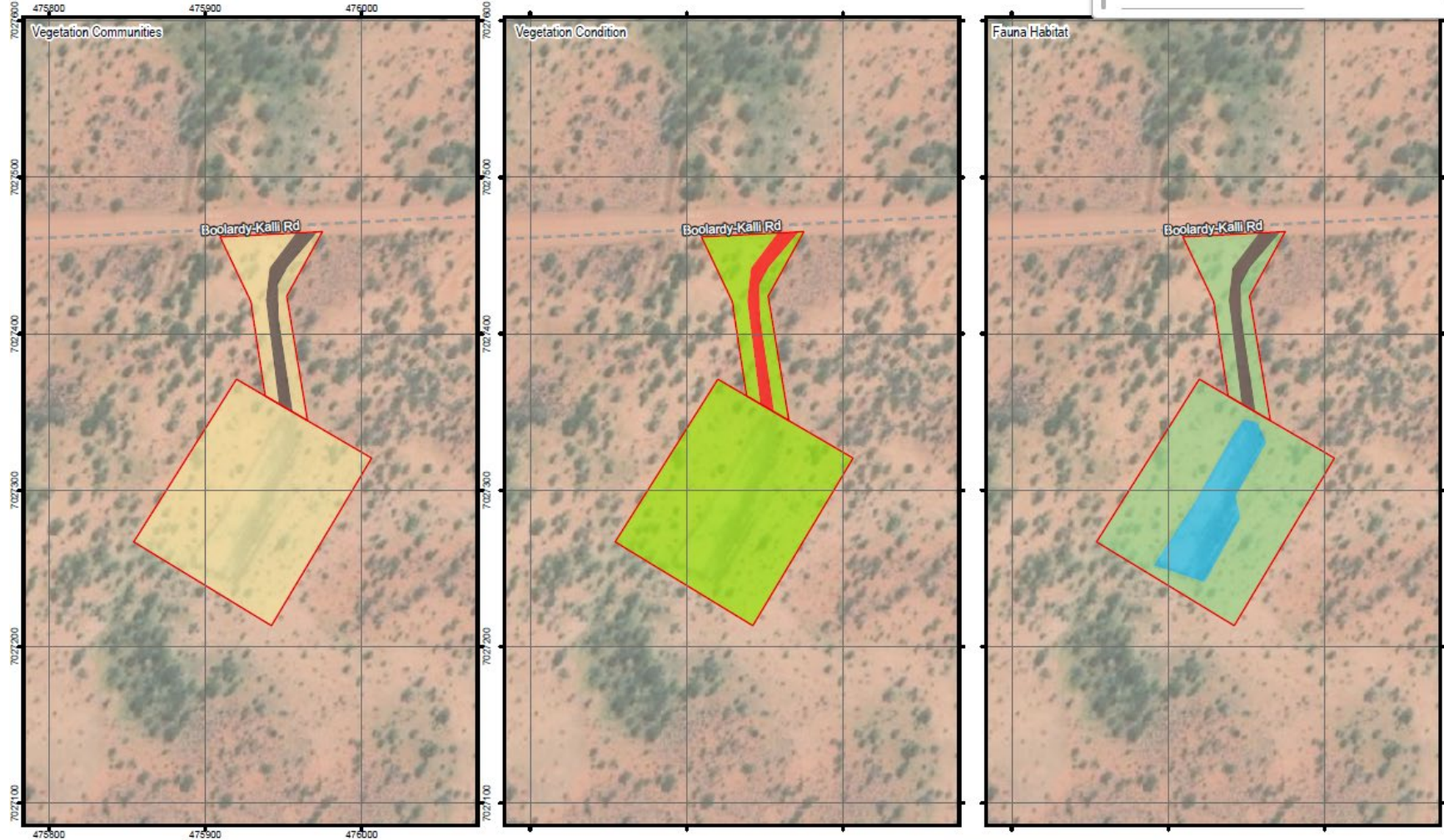
ECOLOGICAL ASSESSMENT - NOVEMBER 2022 - SQUARE KILOMETRE ARRAY

Figure 7.9

A4 size

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Site D



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Datum: GDA2020 MGA Zone 50
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 (when printed at A4)
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Scale source:
 Base Data: (1) Based on information provided by and with the permission of the Western Australian Land Information Authority (holding an Landgate 2013) Geospatial Australia, Geotitles

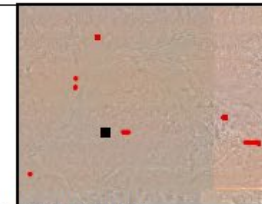
LEGEND

Survey Area (Red outline)

Vegetation Communities
 Cleared (Grey)
 AiAIEF (Yellow)

Vegetation Condition
 Very Good (Light Green)
 Completely Degraded (Red)

Fauna Habitat
 Channels and creek line (Blue)
 Cleared (Grey)
 Hardpan plain with intermittent sandplain (Light Green)



Vegetation Communities, Condition and Fauna Habitat - BP05

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Figure 7.2

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Site E-1



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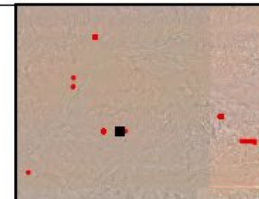
AECOM
 www.aecom.com

Datum: GDA2020 MGA Zone 50
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 (When printed at A4)
 metres

Scale source:
 Data source:
 Base Data: (S) Based on information provided by and with the permission of the Western Australian Land Information Authority (relying on Landgate 2013) Geoscience Australia, Streets

LEGEND

- Survey Area
- Vegetation Communities
- AiAeF
- Vegetation Condition
- Very Good
- Potential Conservation Significant Fauna Species
- Fauna Habitat
- Channels and creek line
- Hardpan plain with intermittent sandplain



Vegetation Communities, Condition and Fauna Habitat - BP06

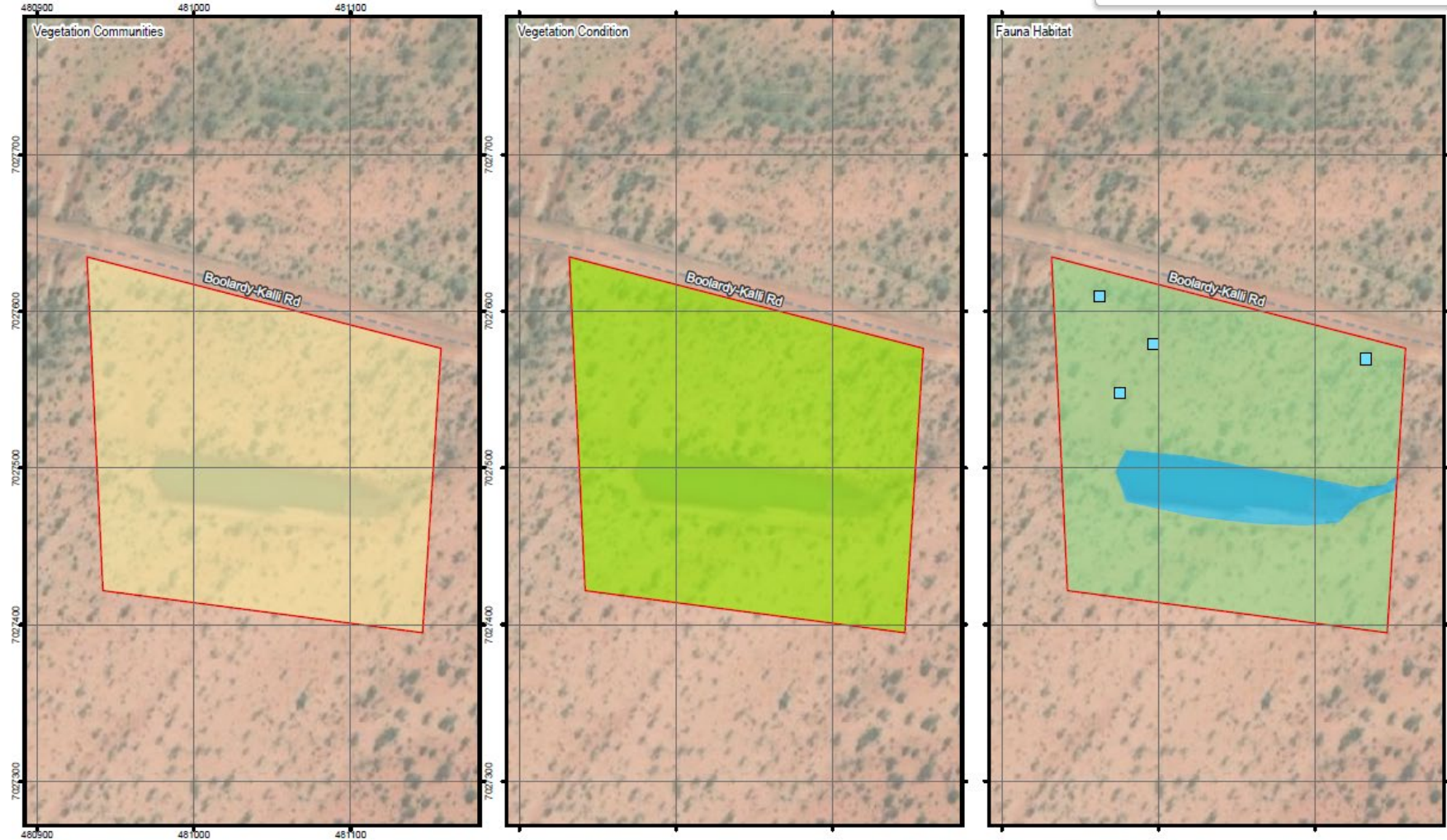
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Figure 7.3

A4 size

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Site E-2



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Scale: 0 10 20 30 40 metres

Date source:
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LEGEND

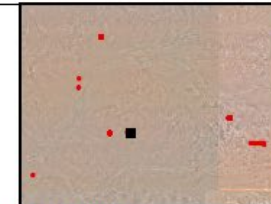
- Survey Area
- Vegetation Communities
- AiAIEf

Vegetation Condition

- Very Good

Potential Conservation Significant Fauna Species

- Fauna Habitat
- Channels and creek line
- Hardpan plain with intermittent sandplain



Vegetation Communities, Condition and Fauna Habitat - BP07

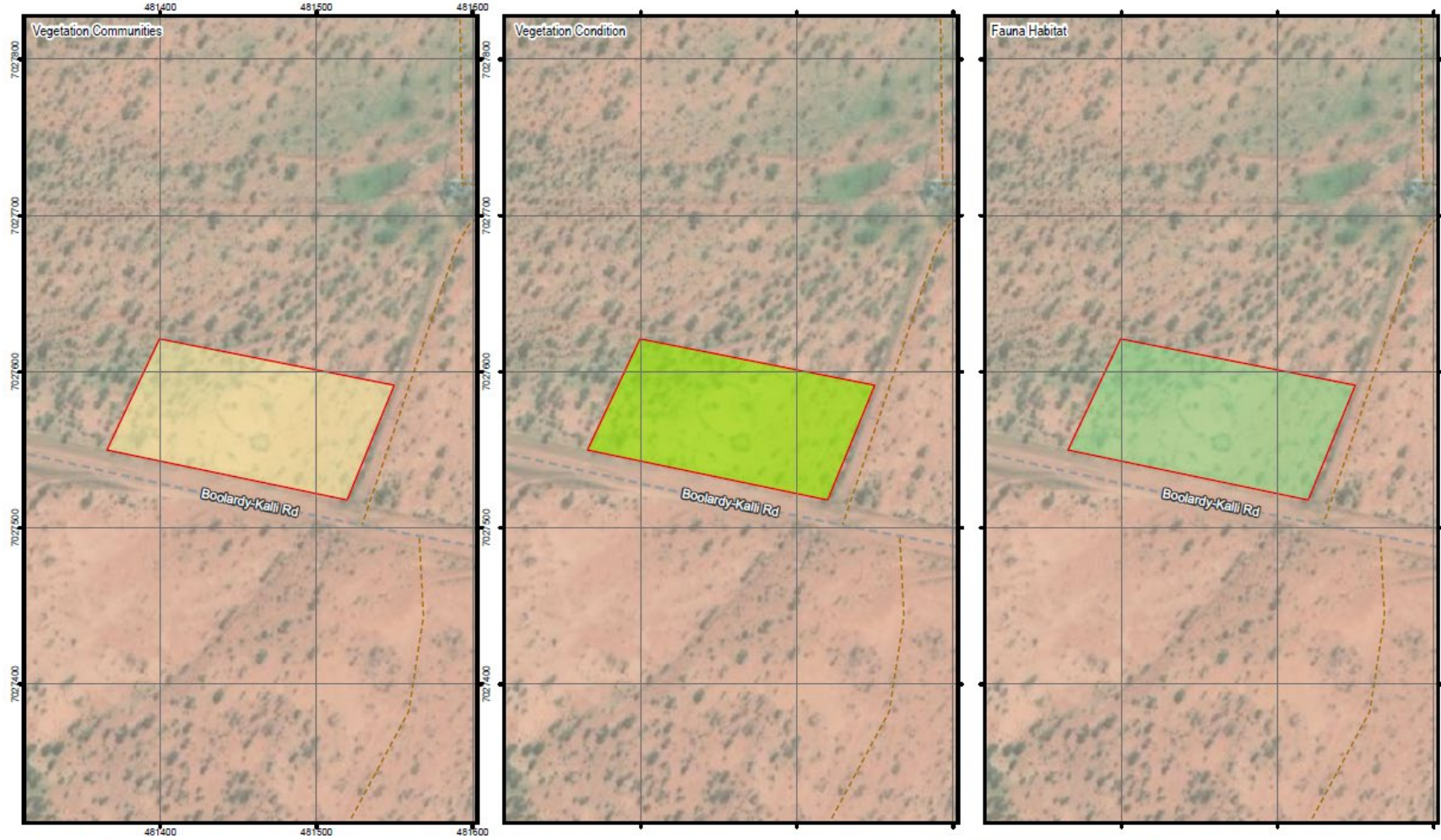
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Figure 7.4

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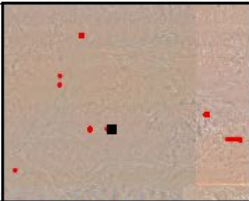
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 (When printed at A4)

Scale: 0 10 20 30 40 metres

Base Data: (S) Based on information provided by and with the permission of the Western Australian Land Information Authority (trading as Landgate 2013), Geoscience Australia, Geowise

LEGEND

- Survey Area
- Vegetation Communities
- AIAIEf
- Vegetation Condition
- Very Good
- Fauna Habitat
- Hardpan plain with intermittent sandplain



Vegetation Communities, Condition and Fauna Habitat - Pia Bubba

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Figure 7.7

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Appendix F. Sources of information

F.1. GIS databases

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

- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Contours (DPIRD-073)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- 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)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- 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

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

F.2. References

AECOM Australia Pty Ltd (AECOM) (2023) *Ecological assessment November 2022 – Square Kilometre Array*. IBSA number: IBSA-2023-0436.

Aurora Environmental (Aurora) (2024a) *Response to the 1st request for further information CPS 10329/1*. Received 19 February 2024. (DWER Ref: DWERDT908945).

Aurora Environmental (Aurora) (2024b) *Response to the 2nd request for further information CPS 10329/1*. Received 16 May 2024. (DWER Ref: DWERDT956360).

Bureau of Meteorology (BOM) (2024). *Climate statistics for Australian locations – Murchison*. Available from: http://www.bom.gov.au/climate/averages/tables/cw_006099.shtml (Accessed in April 2024)

Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.

Commonwealth Scientific and Industrial Research Organisation (CSIRO) (2023) *Native vegetation permit application CPS 10329/1 and supporting documents*, received 6 September 2023 (DWER Ref: DWERDT857437).

- Curry, P.J., Payne, A.L., Leighton, K.A., Hennig, P. and Blood, D.A. (1994) *An inventory and condition survey of the Murchison River catchment, Western Australia*. Department of Agriculture, Western Australia, Australia. Available from: <https://library.dbca.wa.gov.au/static/Journals/082156/082156-84.pdf>
- Department of Agriculture, Water and the Environment (DAWE) (2020) *The Peregrine Falcon (Falco peregrinus)*. Canberra, Australia. Available from: <https://www.environment.gov.au/resource/peregrinefalconfalcopepergrinus>
- Department of Biodiversity, Conservation and Attractions (DBCA) (2024a) *Species and Communities Branch advice for clearing permit application CPS 10329/1*, received 6 February 2024. Department of Biodiversity, Conservation and Attractions, Western Australia (DWER Ref: DWERDT904360).
- Department of Biodiversity, Conservation and Attractions (DBCA) (2024b) *Species and Communities Branch further advice for clearing permit application CPS 10329/1*, received 30 May 2024. Department of Biodiversity, Conservation and Attractions, Western Australia (DWER Ref: DWERDT958440).
- Department of Environment and Conservation (DEC) (2012). *Western Spiny-tailed Skink (Egernia stokesii) Recovery Plan*. Bentley. Available from: <https://www.dcceew.gov.au/sites/default/files/documents/e-stokesii.pdf>
- Department of Environment Regulation (DER) (2013). *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf.
- Department of Primary Industries and Regional Development (DPIRD) (2022). *NRInfo Digital Mapping. Department of Primary Industries and Regional Development*. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/> (accessed June 2024).
- Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.
- Department of Water and Environmental Regulation (DWER) (Mid West Gascoyne Region) (2023) *Rights in Water and Irrigation Act 1914 advice for clearing permit application CPS 10329/1*, received 6 November 2023 (DWER Ref: DWERDT861711).
- Environmental Protection Authority (EPA) (2016). *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.
- Environmental Protection Authority (EPA) (2016). *Technical Guidance – Terrestrial Fauna Surveys*. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf.
- Government of Western Australia. (2019) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report)*. Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Marchant, S. & Higgins, P.J. (1993) *Handbook of Australian, New Zealand & Antarctic birds. Volume 2: Raptors to Lapwings*. Oxford University Press, USA.
- Matsuki, M., M.R. Gardener, A. Smith, R.K. Howard and A. Gove. (2016). *Impacts of dust on plant health, survivorship, and plant communities in semi-arid environments*. Austral Ecology. February 2016. DOI: 10.1111/aec.12328
- Threatened Species Scientific Committee (TSSC) (2020) *Conservation Advice Falco hypoleucos Grey Falcon*. Department of the Environment, Canberra, ACT. Available from: <https://www.environment.gov.au/biodiversity/threatened/species/pubs/929-conservation-advice-09072020.pdf>.

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.

Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed May 2024)