



# Clearing Permit Decision Report

## 1 Application details and outcome

### 1.1. Permit application details

<b>Permit number:</b>	CPS 9545/1
<b>Permit type:</b>	Purpose permit
<b>Applicant name:</b>	DevelopmentWA
<b>Application received:</b>	23 December 2021
<b>Application area:</b>	148.55 (revised) hectares of native vegetation
<b>Purpose of clearing:</b>	To provide engineering fill to facilitate general industrial development and the construction of an access road.
<b>Method of clearing:</b>	Mechanical
<b>Property:</b>	Lot 152 on Deposited Plan 220265 Lot 561 on Deposited Plan 71346 Lot 600 on Deposited Plan 400249 Lot 603 on Deposited Plan 407842
<b>Location (LGA area/s):</b>	Shire of Ashburton
<b>Localities (suburb/s):</b>	Talandji

### 1.2. Description of clearing activities

The vegetation proposed to be cleared comprises three areas within a single contiguous patch of native vegetation immediately north of Warrirda Road within the Ashburton North Strategic Industrial Area (ANSIA) (see Figure 1, Section 1.5). The objective of the proposal is to prepare Lot 603 on Deposited Plan 407842 for general industrial development by filling and levelling the site from 5mAHD to 6mAHD. Sand for engineering fill will be extracted from Lot 600 on Deposited Plan 400249 and Lot 561 on Deposited Plan 71346 and transported to Lot 603 on Deposited Plan 407842 along a newly constructed haul road.

The application was revised during the assessment process in response to a request for further information issued by the Department of Water and Environmental Regulation (DWER). The change included a reduction in the proposed clearing area from 233.15 hectares to 148.55 hectares to exclude an area of 84.6 hectares that is included under clearing permit applications CPS 9550/2 and CPS 9818/1 (see Figure 1) and to reduce impacts to clay pan communities (see Section 3.2.3). It is understood that general industrial development within part of Lot 600 on Deposited Plan 400249 will be undertaken by Hastings Technology Metals Ltd as an agent of Yangibana Pty Ltd following the extraction of engineering fill. Clearing Permit CPS 9550/2 was granted to Yangibana Pty Ltd on 6 September 2022. Clearing permit application CPS 9818/1 is currently under assessment by DWER.

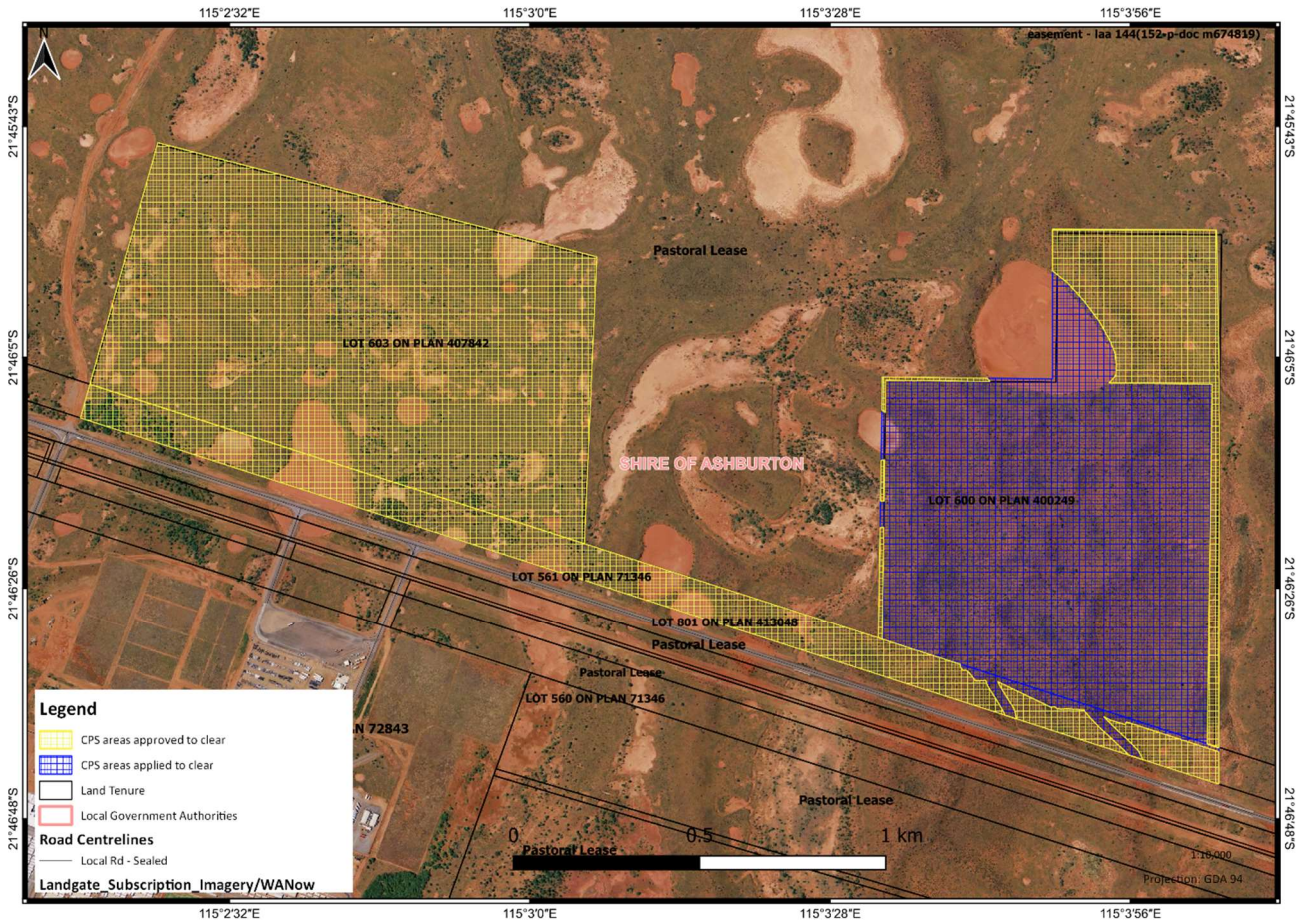


Figure 1. The area cross-hatched blue represents the original proposed clearing area of 233.15 hectares and the area cross-hatched yellow represents the revised clearing area of 148.55 hectares proposed to be cleared under CPS 9545/1.

### 1.3. Decision on application

<b>Decision:</b>	Granted
<b>Decision date:</b>	22 December 2022
<b>Decision area:</b>	148.55 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 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 biological surveys (see Appendix E),
- advice received from the Department of Biodiversity Conservation and Attractions (DBCA),
- 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:

- the loss of 164 individual *Eremophila forrestii* subsp. *viridis* (Priority 3) plants,
- the loss of native vegetation that is suitable habitat for migratory waterbirds, the Lakeland Downs mouse (*Leggadina lakedownensis*), and western pebble-mound mouse (*Pseudomys chapmani*), and potential direct impacts to these fauna if utilising the application area during the time of clearing,

- the loss of up to 12.19 hectares vegetation growing in, or in association with, an environment associated with a watercourse or wetland,
- land degradation if bare ground is left exposed to weathering for an extended period between the clearing of surface vegetation, the levelling of the site, and subsequent industrial development, 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 for conservation significant flora and fauna, and riparian communities.

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 have long-term adverse impacts on the persistence of priority flora at the regional and species level. The proposed clearing is also unlikely result in significant adverse impacts to significant habitat for fauna, the quality of surface or underground water, or the ecological values of the riparian communities associated with the watercourses and wetlands within the application area. The Delegated Officer determined that the proposed clearing can be minimised and managed to unlikely lead to an unacceptable risk to these environmental values or to cause appreciable land degradation.

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

- avoid, minimise, and 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,
- ensure earthworks and construction activities to commence no later than three months after undertaking the authorised clearing activities, where possible, or apply a suitable dust suppressant to bare areas to reduce the potential for wind erosion, and
- ensure the clearing of *Eremophila forrestii* subsp. *viridis* is limited to the individual plants recorded within the clearing boundary during the six local flora surveys.

## 1.5. Site map

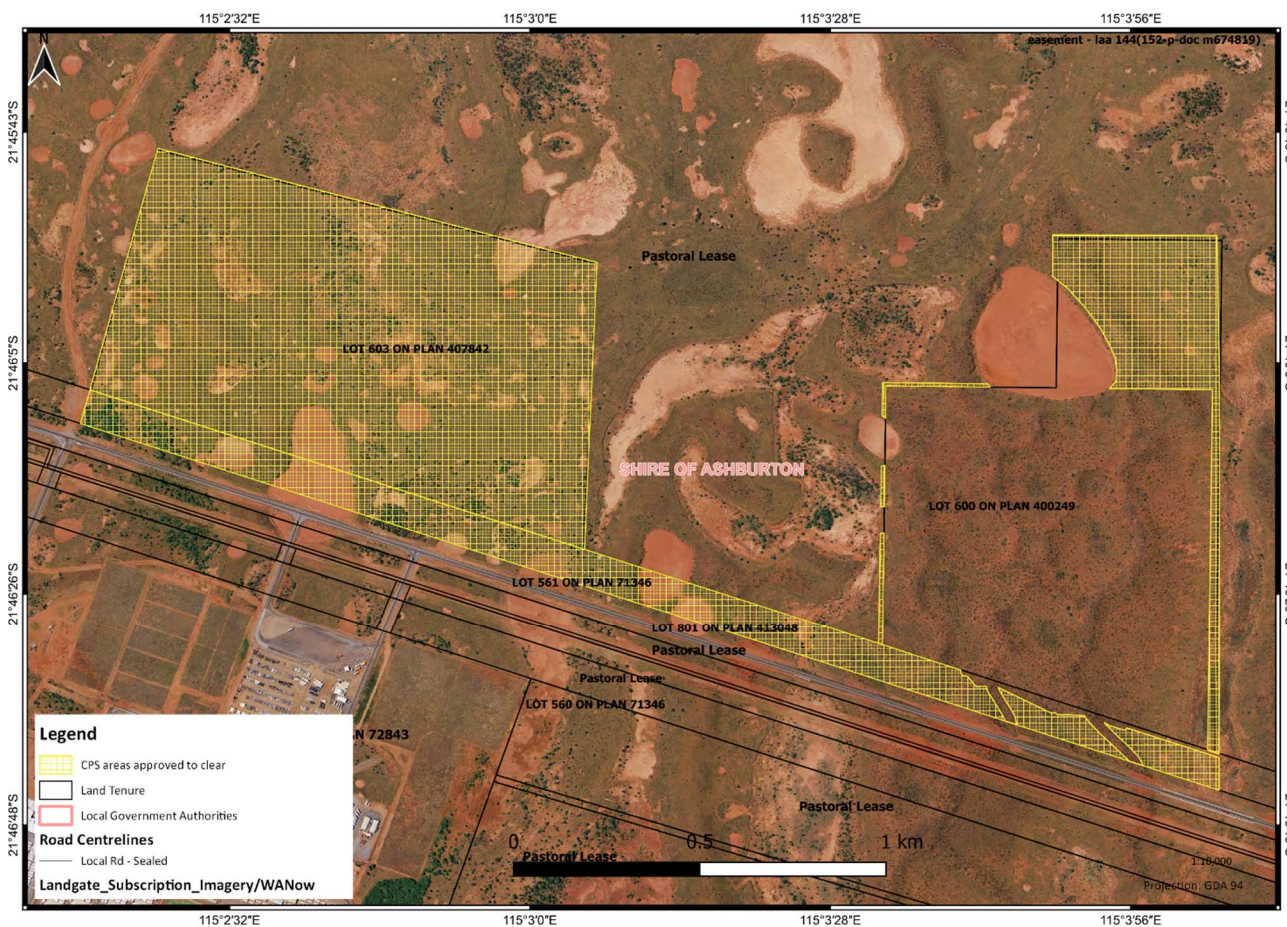


Figure 2 The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

## 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* (WA) (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)

## 3 Detailed assessment of application

### 3.1. Avoidance and mitigation measures

#### Background

The applicant is proposing to provide engineering fill to prepare Lot 603 on Deposited Plan 407842 for general industrial development and construct an access road in accordance with the approved ANSIA statutory planning framework (DevelopmentWA, 2021). The application area is situated within the General Industry Zone of the ANSIA, within which industrial development is regulated by the Western Australian Planning Commission under:

- Improvement Plan No. 41: Ashburton North Strategic Industrial Area, and
- Improvement Scheme No. 1: Ashburton North Strategic Industrial Area (DevelopmentWA, 2021).

#### Avoidance and mitigation

The applicant advised that, while the mitigation hierarchy has been applied to the proposed works, the avoidance of native vegetation clearing within the application area altogether is not practically achievable, as the clearing area is low lying at 5mAHD and requires fill to be provided to 6mAHD to create surface levels suitable for industrial development (DevelopmentWA, 2021). The applicant advised that offsite impacts to native vegetation adjacent to the application area will be avoided and mitigated through:

- Surveying and demarcating the authorised clearing area on-site prior to the commencement of vegetation clearing works to prevent accidental offsite disturbance,
- Clearly defining and demarcating on appropriate plans the extent of authorised clearing area,
- Briefing all site personnel responsible for clearing on the removal task during toolbox meeting/s,
- Mulching removed vegetation for reuse onsite (e.g., for dust suppression) or disposing of vegetative material off-site at an appropriate facility,
- Minimising the potential for dust to be generated from clearing and filling activities through the minimising the time between clearing and development and minimising fill stockpile heights, and
- Locating any stockpiles centrally within the authorised clearing area and as far away as possible from the adjacent vegetation limiting the potential for windblown dust and sediment containing overland flows to impact adjacent vegetation (RPS, 2022).

During the assessment of the application, the applicant reduced the area of proposed clearing to exclude approximately 4.4 hectares of clay pan communities in the north-western corner of Lot 600 on Deposited Plan 400249, as discussed further under Section 3.2.3. The applicant advised that measures would also be employed to mitigate potential offsite impacts to adjacent clay pan communities during clearing, construction, and development, including:

- Avoiding the storage of fuel and other hazardous materials within the authorised clearing area proximate to adjacent clay pan communities and without suitable controls (e.g., stored in bunded area),
- Implementing actions to avoid spills of liquids/chemicals and, if a spill occurs within the authorised clearing area, implementing emergency spill procedures, as appropriate,

- Reporting any uncontained spills to DWER,
- Locating spill kits within the authorised clearing area and training personnel in their use,
- Ensuring no refuelling of mobile plant machinery or vehicle maintenance is conducted within the authorised clearing area, and
- Ensuring no wash down of plant machinery and/or site vehicles is undertaken onsite within the authorised clearing area (RPS, 2022).

The applicant also advised that water management during the proposed clearing, construction, and development will be undertaken in accordance with the key water management documents endorsed by the previous Department of Water as part of the ANSIA Improvement Scheme, including the Hydrological and Planning Study Summary, and Local Water Management Strategy (RPS, 2022).

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

### 3.2. Assessment of 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 (flora and fauna) and land 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 (flora) - Clearing Principle (a)

##### Assessment

A review of the site characteristics and habitat preferences of the conservation significant flora species recorded in the local area (see Appendix B) identified that the application area may provide suitable and potentially significant habitat for the following species:

- *Eremophila forrestii* subsp. *viridis* (listed as Priority 3 by DBCA),
- *Eleocharis papillosa* (dwarf desert spike-rush) (listed as Vulnerable under the EPBC Act and as Priority 3 by DBCA), and
- *Triumfetta echinata* (listed as Priority 3 by DBCA).

##### ***Eremophila forrestii* subsp. *viridis***

*Eremophila forrestii* subsp. *viridis* is a multi-branched shrub with pink-cream flowers occurring in August and occurs in red to brown sandy soils, usually in *Acacia* shrubland over hummock grassland of *Triodia* spp. (Western Australian Herbarium, 1998-). *Eremophila forrestii* subsp. *viridis* is known from six locations in Western Australia over a range of 1000 kilometres east-west by 700 kilometres north-south from Talandji to Gibson Desert North and is also known from one record in the Northern Territory and one record in South Australia (DBCA, 2022). Advice received from DBCA indicates that, although the species occurs over a large range, the locations of records are disjunct and three known locations are based on records obtained pre-1980, where plants may no longer persist (DBCA, 2022). In addition, the number of individuals has not been recorded at most known locations and the total number of plants in Western Australia is unknown (DBCA, 2022).

The '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*', undertaken over eight days in October 2020, identified a total of 1102 individuals of *Eremophila forrestii* subsp. *viridis* within the greater survey area, of which 164 individuals occur within the revised application area of 148.55 hectares (RPS, 2021). From DWER's records, six flora surveys targeting *Eremophila forrestii* subsp. *viridis* have been undertaken in the vicinity of the proposed clearing area between 2021 and 2022. The extent of individuals recorded in these surveys is summarised in Table 1 and the extent of these surveys is captured in Figure 3 below. Based on the survey data available from the six local flora surveys outlined in Table 1, the proposed clearing will result in the loss of approximately 1.9 per cent of the recorded regional population.

Table 1. Summary of known flora and vegetation surveys conducted in the vicinity of the CPS 9545/1 application area.

Survey Reference	Survey Title	IBSA Reference	No. of <i>Eremophila forrestii</i> subsp. <i>viridis</i> identified
Spectrum Ecology (2021)	Warrirda Road Flora and Fauna Assessment	IBSA-2021-0480	1072
360 Environmental (2021)	Ashburton Infrastructure Project – Flora and vegetation Assessment	IBSA-2021-0460	1237
RPS (2021)	Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant	IBSA-2021-0097	1102
EcoLogical Australia (2021)	Targeted <i>Eremophila forrestii</i> subsp. <i>viridis</i> (P3) Survey at Onslow	IBSA-2021-0076	3559
Anders (2022a)	<i>Eremophila forrestii</i> subsp. <i>viridis</i> targeted flora survey August 2022	IBSA-2022-0303	281
Anders (2022b)	<i>Eremophila forrestii</i> subsp. <i>viridis</i> targeted flora survey September 2022	IBSA-2022-0337	1444
<b>TOTAL</b>			<b>8552*</b>

\*NOTE: Approximately 143 records of *Eremophila forrestii* subsp. *viridis* are considered to be duplicate records between surveys and have been removed from the total, based on the individual records overlapping by 2 metres or less.

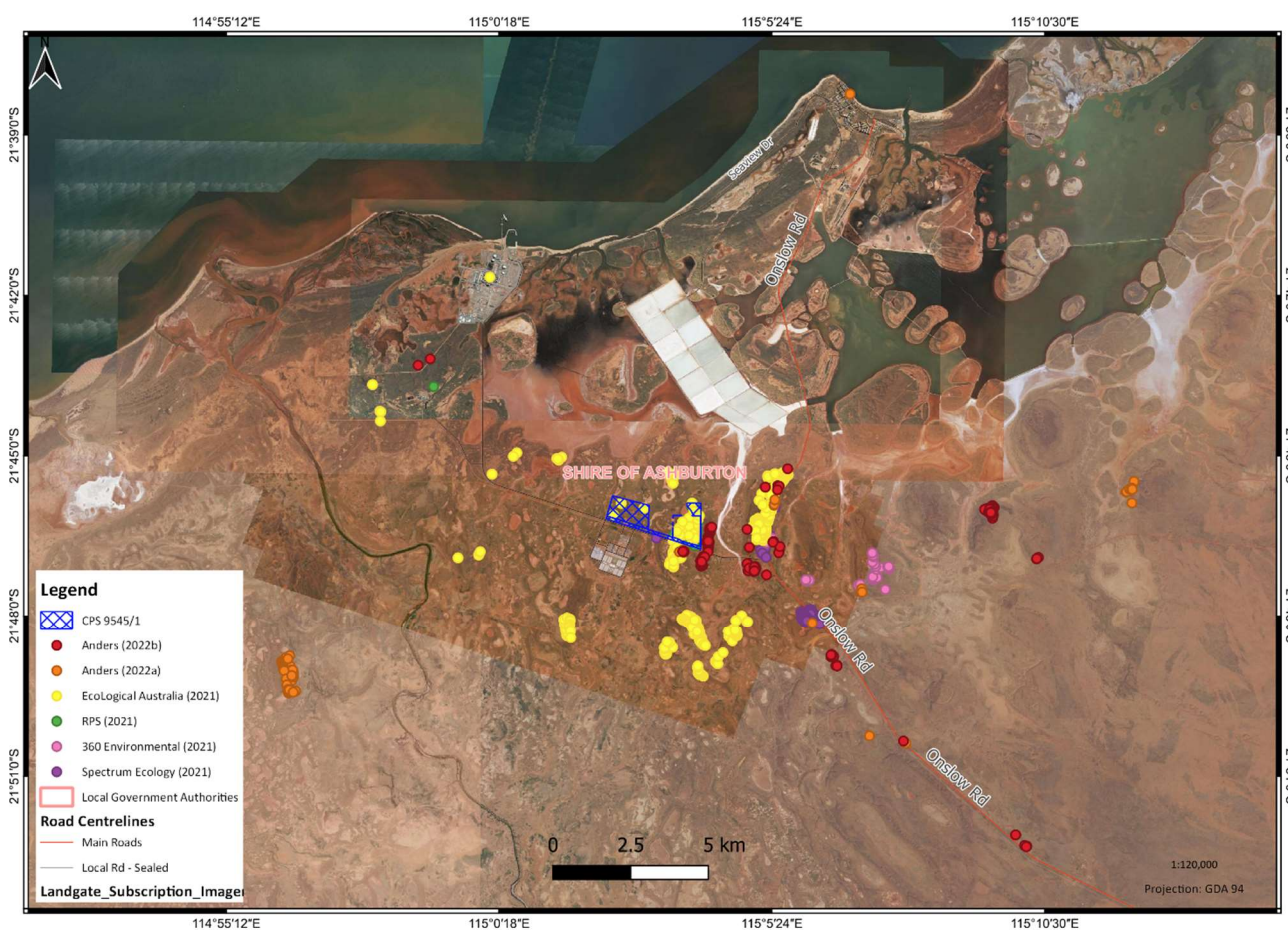


Figure 3. Records of *Eremophila forrestii* subsp. *viridis* from known flora and vegetation surveys conducted in the vicinity of the CPS 9545/1 application area.

In considering impacts to *Eremophila forrestii* subsp. *viridis* resulting from CPS 9545/1, the Delegated Officer also had regard to three additional clearing permit applications in the vicinity of the proposal that may impact the species (CPS 9534/1, CPS 9550/1, and CPS 9818/1). The extent of these applications is outlined in Figure 4 below. The cumulative impacts of these four proposals will result in the loss of approximately 1723 individuals of *Eremophila forrestii* subsp. *viridis*, with potential indirect impacts to an additional 269 individuals, and represents impacts to between 20.1 and 23.3 per cent of the regional population. However, it should be noted that CPS 9818/1 is still under assessment by DWER, and the extent of impacts are subject to change as a result of this assessment.

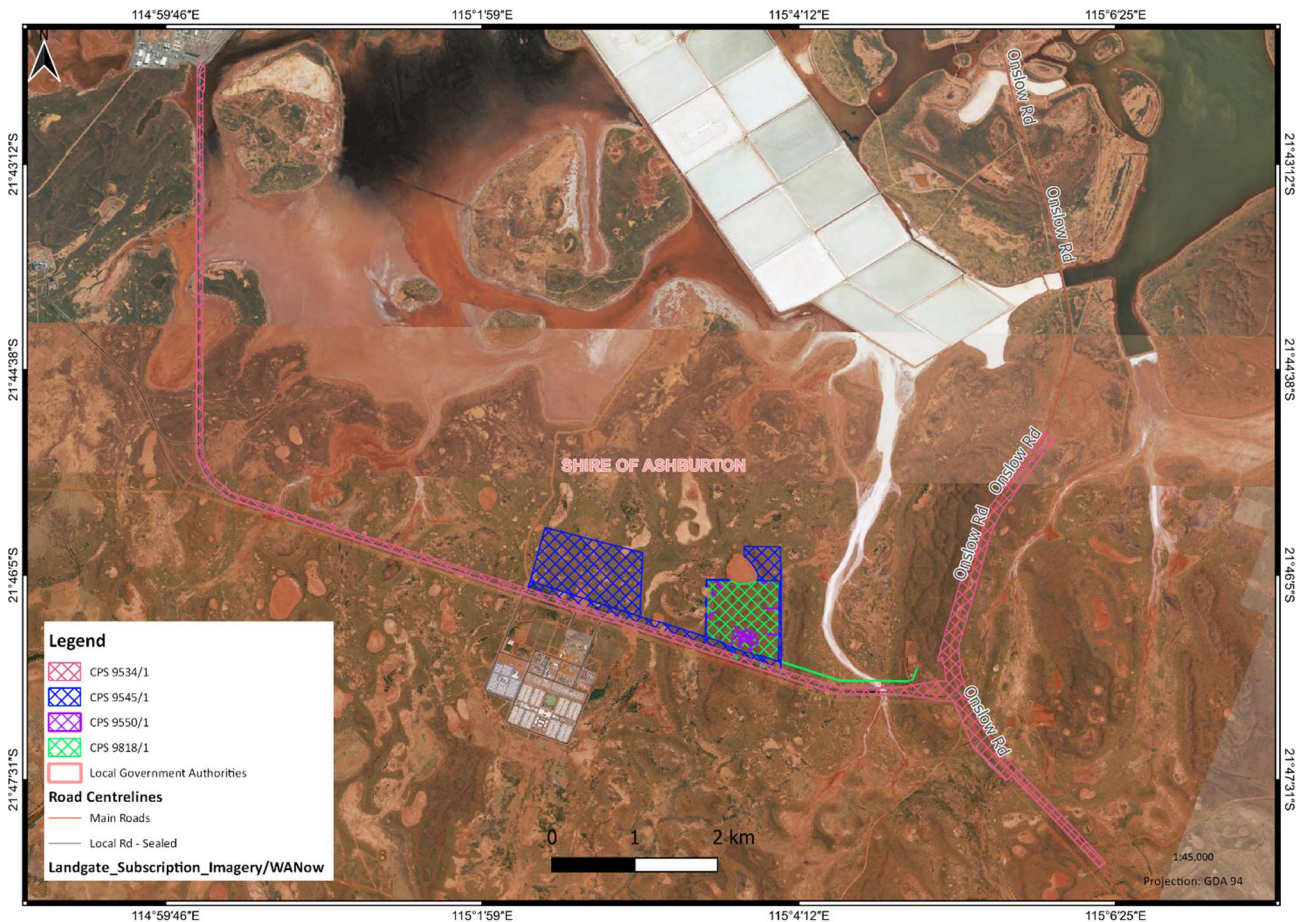


Figure 4. Clearing permit applications in the vicinity of the CPS 9545/1 application area.

Advice received from DBCA indicated that, as the combined clearing under CPS 9545/1 and CPS 9818/1 will result in the removal of a continuous area of approximately 227.95 hectares, there is the potential for the clearing to result in fragmentation of the subpopulations of *Eremophila forrestii* subsp. *viridis* present within these application areas and subsequent secondary impacts to the remaining plants (DBCA, 2022). However, it is acknowledged that the six flora surveys outlined in Table 1 are unlikely to have captured the full extent of the subpopulations within the vicinity of the CPS 9545/1 application area, given the surveys were predominantly linear in nature and focused on suitable habitat within and immediately adjacent to proposed disturbance areas. Although *Eremophila forrestii* subsp. *viridis* has not been well-surveyed over a large range, advice received from DBCA also indicates that there are large areas of unsurveyed suitable habitat and possible unconfirmed subpopulations in the region (DBCA, 2022). Therefore, the true impact to the regional population of *Eremophila forrestii* subsp. *viridis* may be less than the 20.1 to 23.3 per cent that has been assumed from the available survey data and is unlikely to represent a significant impact to the species' long-term persistence in the region (DBCA, 2022). Given the above, it is considered unlikely that the proposed clearing under CPS 9545/1 will result in significant impacts to *Eremophila forrestii* subsp. *viridis* at the regional or species level.

Advice received from DBCA indicated that, while impacts to up to 23.3 per cent of the population are unlikely to impact the long-term persistence of *Eremophila forrestii* subsp. *viridis*, the cumulative impacts of the four clearing permit applications are at the upper levels of acceptability and additional measures to avoid and minimise impacts to *Eremophila forrestii* subsp. *viridis* should be implemented on-ground, if practicable (DBCA, 2022). It is considered that the potential for additional or indirect impacts to *Eremophila forrestii* subsp. *viridis* can be adequately mitigated through permit conditioning and the applicant's avoidance and minimisation measures, including the demarcation of the clearing boundaries and dust management measures.

DBCA indicated that any additional impacts to *Eremophila forrestii* subsp. *viridis* in the region from future proposals may represent a significant impact to the conservation status of the species, unless additional survey data can be provided to demonstrate that the overall risk to the species has reduced (DBCA, 2022). It is considered that, if the clearing required for future proposals in the region does not meet the specifications of an exemption under the

Clearing Regulations, the cumulative impacts to *Eremophila forrestii* subsp. *viridis* in the region and the need for additional surveys would be considered by DWER during the assessment of such a proposal.

### ***Eleocharis papillosa***

*Eleocharis papillosa* is a small, erect perennial sedge associated with clay soils in temporary wetlands and grows in response to inundation, persisting as an underground tuber during dry periods (DEWHA, 2008). *Eleocharis papillosa* is known from 14 records in Western Australia from Onslow and Fortesque Marsh in the north to Menzies in the south and has also been recorded in the Northern Territory and South Australia (DEWHA, 2008; WA Herbarium, 1998-). The Bare clay pans with scattered annual grasses and forbs (claypan communities) and *Tecticornia* spp. Low Open Samphire Shrubland over *Lawrenzia viridigrisea* and *Eragrostis falcata* Sparse Forbland / Tussock Grassland (*Tecticornia* spp. samphire shrubland) vegetation units within the application area are likely to provide suitable habitat for this species.

The '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' did not record any individuals of *Eleocharis papillosa* within the application area or greater survey area (RPS, 2021). It is acknowledged that the flora and vegetation assessment was undertaken outside of the optimal time for the Carnarvon bioregion and during the dry season when the CP and TECSpp. vegetation units are not likely to be subject to inundation (RPS, 2021). Therefore, it is possible that *Eleocharis papillosa* could have been present within the application area as an underground tuber at the time of the flora and vegetation assessment and would not have been recorded.

However, *Eleocharis papillosa* was not recorded in the vicinity of the application area during the six flora surveys undertaken in the local area between 2021 and 2022, of which three occurred at an optimal time during the wet season (see Appendix F). Further, the application area occurs within an extensively vegetated local area and approximately 810.67 hectares of suitable habitat for *Eleocharis papillosa* persists within the broader ANSIA area according to the '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' (RPS, 2021). In considering the above, it is not expected that the proposed clearing of approximately 12.19 hectares of suitable habitat for *Eleocharis papillosa* will result in significant impacts at the species level.

### ***Triumfetta echinata***

*Triumfetta echinata* is a prostrate shrub that flowers in August and occurs in red to brown sandy soils, typically in dune systems of *Triodia* hummock grassland (Western Australian Herbarium, 1998-). *Triumfetta echinata* is known from three locations in Western Australia over a range of 40 kilometres east-west by 40 kilometres north-south from Peedamulla to Talandji (DBCA, 2022). An additional southernmost record of *Triumfetta echinata* in Yannarie was recorded in 1905, however, it is not considered to accurately represent the location of collection of the specimen, and it is unlikely that plants persist at this location (DBCA, 2022). Advice received from DBCA indicates that plant numbers have not been recorded at most locations and that the total number of plants cannot be estimated (DBCA, 2022). Previous flora and vegetation surveys undertaken in 2010 recorded *Triumfetta echinata* at two locations within the greater survey area of the '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' but east of the application area for CPS 9545/1 (RPS, 2021). The *Acacia* spp., *Grevillea* spp., and *Hakea* spp. shrubland over *Triodia* spp. hummock grassland within the application area is likely to provide suitable habitat for this species.

The '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' did not record any individuals of *Triumfetta echinata* within the application area or greater survey area during the October 2020 survey (RPS, 2021). However, the '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' noted that *Triumfetta echinata* may be reliant on fire events for germination and that it is possible that the species could be present within the application area following a fire event, given that the survey area is unlikely to have been exposed to a fire for over 10 years (RPS, 2021).

*Triumfetta echinata* was recorded in the local area during one of the six flora surveys undertaken in the local area between 2021 and 2022 (Spectrum Ecology, 2021). However, the individuals were recorded approximately 1.6 kilometres east of the application area and no individuals were recorded in the vicinity of the application area for CPS 9545/1 (Spectrum Ecology, 2021). It is also acknowledged that approximately 2553.02 hectares of suitable habitat for *Triumfetta echinata* persists within the broader ANSIA area according to the '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' (RPS, 2021). Given the application area occurs within an extensively vegetated local area and that suitable dune systems of *Triodia* hummock grassland are likely to be abundant, it is not considered likely that the clearing of 136.36 hectares of suitable habitat will result in significant impacts to *Triumfetta echinata* at the regional or species level.



### Conclusion

Based on the above assessment, the proposed clearing will result in the loss of approximately 164 individuals of *Eremophila forrestii* subsp. *viridis* recorded within the clearing boundary during the six local flora surveys. For the reasons set out above, it is considered that the proposed clearing may impact *Eremophila forrestii* subsp. *viridis* at the subpopulation level by fragmenting and isolating plants but is unlikely to result in significant impacts at the regional or species level and does not constitute a significant residual impact to priority flora species.

Based on the avoidance and minimisation measures proposed by the applicant, it is considered that the impacts of the proposed clearing on priority flora species can be managed through permit conditioning and by implementing weed control measures.

### Conditions

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

- Flora management - Priority flora, which ensures that the clearing of *Eremophila forrestii* subsp. *viridis* is limited to the individual plants recorded within the clearing boundary during the six local flora surveys, and
- Weed control, which ensures protocols are put in place to limit the introduction and transportation of weed-affected materials.

### **3.2.2. Biological values (fauna) - Clearing Principles (a) and (b)**

#### Assessment

Noting the vegetation mapping from the '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' and the habitat preferences of the conservation significant fauna species recorded in the local area (see Appendix B), the application area was considered to contain suitable habitat for the following:

- Migratory waterbirds (37 species),
- *Falco peregrinus* (peregrine falcon) (listed as other specially protected fauna by DBCA),
- *Leggadina lakedownensis* (Lakeland Downs mouse or northern short-tailed mouse) (listed as Priority 4 by DBCA), and
- *Pseudomys chapmani* (Western pebble-mound mouse) (listed as Priority 4 by DBCA).

#### **Migratory waterbirds**

The following migratory waterbird species have the potential to occur within the application area based on habitat preferences:

- 28 species of migratory waterbird protected under International Agreements, which may inhabit the clay pan communities within the application area for foraging or roosting habitat, or as transient habitat during migration, when these areas are subject to inundation (Commonwealth of Australia, 2015).
- *Calidris canutus* (Red knot) (Endangered under EPBC Act and Vulnerable under BC Act) typically inhabit intertidal mudflats, sand flats and sandy beaches of sheltered coasts, estuaries, or terrestrial saline wetlands near the coast (TSSC, 2016a). The clay pan communities within the application area may provide suitable roosting and foraging habitat for this species when subject to inundation, as well as transient habitat during migration. The red knot is not known to breed in Australia, and the application area is not considered likely to provide suitable breeding habitat for this species (TSSC, 2016a).
- *Calidris ferruginea* (Curlew sandpiper) (Critically Endangered under EPBC Act and Vulnerable under BC Act) is found on intertidal mudflats of estuaries, lagoons, mangroves, as well as beaches, rocky shores and around lakes, dams and floodwaters (DoE, 2015a). The clay pan communities within the application area are unlikely to provide suitable breeding habitat, as the species does not breed in Australia, but may provide suitable roosting or foraging habitat for this species when subject to inundation, as well as transient habitat as it migrates between more suitable coastal habitats.
- *Calidris tenuirostris* (Great knot) (Critically Endangered under EPBC Act and BC Act) inhabits intertidal mudflats and sandflats in sheltered coasts, including bays and estuaries (TSSC, 2016b). They forage on the moist mud, and often roost on beaches or in nearby low vegetation, such as mangroves or dune vegetation (TSSC, 2016b). The clay pan communities within the application area are unlikely to provide suitable breeding habitat, as the species does not breed in Australia, but may provide suitable foraging habitat for this species when subject to inundation, as well as transient habitat as it migrates between more suitable coastal habitats for roosting.
- *Charadrius leschenaultii* (Greater sand plover) (Vulnerable under EPBC Act and BC Act) is known to occur in littoral and estuarine habitats, typically on sheltered sandy, shelly, or muddy beaches with large intertidal mudflats or sandbanks (TSSC, 2016c). The clay pan communities within the application area may provide suitable roosting and foraging habitat for this species when subject to inundation, as well as transient habitat during migration. The greater sand plover is not known to breed in Australia, and the application area is not considered likely to provide suitable breeding habitat for this species (TSSC, 2016c).

- *Charadrius mongolus* (Lesser sand plover) (Endangered under EPBC Act and BC Act) usually occurs in coastal littoral and mudflats in estuaries or beaches but has also been recorded at inland sites in muddy areas around lakes, soaks and bores (TSSC, 2016d). The clay pan communities within the application area may provide suitable roosting and foraging habitat for this species when subject to inundation, as well as transient habitat during migration. The lesser sand plover is not known to breed in Australia, and the application area is not considered likely to provide suitable breeding habitat for this species (TSSC, 2016d).
- *Limosa lapponica menzibieri* (Bar-tailed godwit, northern Siberian) (Critically Endangered under EPBC Act and BC Act) typically inhabit coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays (TSSC, 2016e). The clay pan communities within the application area are unlikely to provide suitable breeding habitat, as the species does not breed in Australia, but may provide suitable roosting or foraging habitat for this species when subject to inundation, as well as transient habitat during migration.
- *Numenius madagascariensis* (Eastern curlew) (Critically Endangered under EPBC Act and BC Act) is found on intertidal mudflats and sandflats, often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours and lagoons (DoE, 2015b). The clay pan communities within the application area are unlikely to provide suitable breeding habitat, as the species does not breed in Australia, but may provide suitable roosting or foraging habitat for this species when subject to inundation, as well as transient habitat as it migrates between more suitable coastal habitats.
- *Sternula nereis nereis* (Fairy tern) (Vulnerable under EPBC Act and BC Act) utilises a variety of habitats including offshore, estuarine, or lacustrine (lake) islands, wetlands, beaches and spits (DSEWPC, 2011). The claypan communities within the application area may provide suitable roosting and foraging habitat for this species when subject to inundation, as well as transient habitat during migration. Whilst it is acknowledged that the application area occurs within the breeding range of the fairy tern, it is noted that the species typically nests on sandy, shelly beaches, above the high-water mark and often in clear view of the water (DSEWPC, 2011). As the application area occurs approximately eight kilometres inland from the coast and the claypan communities do not comprise the preferred sandy, shelly substrate for nesting, it is not considered likely that the application area would be utilised as nesting habitat for the fairy tern.
- *Tringa brevipes* (Grey-tailed tattler) (Priority 4) is known to occur in sheltered coasts with reefs or rock platforms or with intertidal mudflats, including embayments, estuaries, and coastal lagoons, especially those fringed with mangroves (Higgins and Davies, 1996). The clay pan communities within the application area may provide suitable roosting and foraging habitat for this species when subject to inundation, as well as transient habitat during migration. The grey-tailed tattler is not known to breed in Australia, and the application area is not considered likely to provide suitable breeding habitat for this species (Higgins and Davies, 1996).

While the aforementioned waterbird species have the potential to occur within the application area, use of the claypan communities within the application area is likely to be seasonal and limited to times when the communities are inundated. It is also acknowledged that, while each community is likely to be locally unique, claypans are well-represented within the local area, with approximately 22,189 hectares of mapped claypans occurring within 50-kilometres of the application area, according to available databases. As none of the 37 waterbird species are expected to breed within the application area, the proposed clearing is also not considered likely to impact nest sites or significant breeding habitat for these species. Noting that disturbance activities within the claypan communities are limited to approximately 10.01 hectares and that abundant suitable habitat is available in the local area, the application area is not considered likely to represent significant breeding, foraging or roosting habitat for any conservation significant waterbird species. It is considered that the potential for direct impacts to individual waterbirds utilising the claypan communities within the application area for foraging or roosting at the time of the proposed clearing can be suitably mitigated through the application of slow, directional clearing.

### **Peregrine falcon**

The peregrine falcon typically nests on rocky ledges in tall, vertical cliff faces and gorges, or in tall trees associated with drainage lines, and can hunt in a range of habitat types including timbered watercourses, riverine environments, wetlands, plains, open woodlands, and pylons and spires of buildings (Australian Museum, 2021). Given the widespread nature of the species and the proximity of existing records, the application area may provide suitable foraging habitat for the peregrine falcon. However, the application area does not contain suitable nesting habitat for the species. Given the extent of similar, suitable habitat in the local area and that the peregrine falcon is a highly mobile species with a large range that does not rely on specialist niche habitats, it is not considered likely that the application area contains significant habitat for the species or that the proposed clearing will significantly reduce the extent of available foraging habitat for the peregrine falcon in the local area.

### **Ground-dwelling mammals**

The Lakeland Downs mouse occupies spinifex and tussock grasslands in *Acacia* shrublands on deep sandy soils (CALM, 2002). The species is nocturnal, residing in burrows during the day and foraging on invertebrates and plant material at night (CALM, 2002). The western pebble-mound mouse is known from across the Pilbara region and is

associated with *Triodia* hummock grasslands over eroding sands with exposed small stones (pebbles), often including an overstorey of *Cassia* spp., *Acacia* spp., and *Ptilotus* spp. (Kitchener, 1983). The western pebble-mound mouse utilises complex underground burrow systems characterised by a distinctive mound of pebbles at burrow entrances above-ground, with mounds hypothesised to insulate the burrows beneath from extreme desert temperatures (Kitchener, 1983). The *Acacia* spp., *Grevillea* spp., and *Hakea* spp. shrubland over *Triodia* spp. hummock grassland within the application area is likely to provide suitable habitat for both the Lakeland Downs mouse and western pebble-mound mouse.

The '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' did not include a fauna habitat assessment or targeted searches for conservation significant fauna species. However, it is acknowledged that no evidence of burrows or pebble-mounds were noted during the flora and vegetation assessment. Whilst it is acknowledged that the proposed clearing will result in the loss of up to 136.36 hectares of suitable habitat for the Lakeland Downs mouse and western pebble-mound mouse, it is noted that the similar suitable habitat is well-represented in the immediate vicinity of the application area, with approximately 2,553.02 hectares of sand dunes, plains and swale habitat recorded within the greater ANSIA area (RPS, 2021). Given suitable habitat is also likely to be well-represented in the extensively vegetated local area, it is not expected that the application area comprises significant habitat for the Lakeland Downs mouse or western pebble-mound mouse or is critical for the continuation of these species. Noting that suitable habitat for these species is located adjacent to the application area, it is expected that any individuals present at the time of clearing will be able to disperse into adjacent suitable habitat given the application of slow, directional clearing and are unlikely to be significantly impacted.

#### Conclusion

Based on the above assessment, the application area is not considered likely to represent significant habitat for any conservation significant fauna species or to be critical for the continuation of these species. However, it is acknowledged that the proposed clearing has the potential to result in direct impacts to migratory waterbirds, the Lakeland Downs mouse and western pebble-mound mouse, if individuals are present at the time of the clearing. For the reasons set out above, it is considered that direct impacts to threatened and priority fauna species can be managed through the application of slow, directional clearing and that the proposed clearing does not constitute a significant residual impact.

#### Conditions

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

- Directional clearing, which ensures slow, progressive, directional clearing is undertaken to allow fauna to move into adjacent vegetation ahead of the clearing activity to minimise impact to individuals.

### **3.2.3. Land and water resources - Clearing Principles (f), (g) and (i)**

#### Assessment

##### **Water resources**

As the application area intersects several non-perennial waterbodies (claypans), some of the vegetation within the application area is considered to be growing in, or in association with, an environment associated with a watercourse or wetland. The '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' confirmed that the application area contains claypan communities and *Tecticornia* spp. samphire shrubland (RPS, 2021), which are indicative of wetland and riparian areas. Further, as the application area is mapped within the Pilbara Surface Water Area, any clearing within the vicinity of these waterbodies has the potential to impact surface water quality within a proclaimed water resource under the RIWI Act.

Based on vegetation mapping from the '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*', the original application area of 233.15 hectares comprised approximately 14.8 hectares of claypan communities and 3.9 hectares of *Tecticornia* spp. samphire shrubland (RPS, 2021). During the assessment of the application, the applicant modified the proposed clearing area to exclude 4.4 hectares of claypan vegetation in the north-western corner of Lot 600 on Deposited Plan 400249 in order to reduce the extent of impacts to claypan communities and ensure that the largest intact claypan community adjacent to the clearing area is retained (see Figure 5 below). Modifications to the clearing area to remove areas captured under clearing permit applications CPS 9550/2 and CPS 9818/1 also consequently reduced the extent of claypan vegetation and *Tecticornia* spp. samphire shrubland proposed to be cleared. The clearing of riparian vegetation within these areas will be considered during the assessment of these applications.

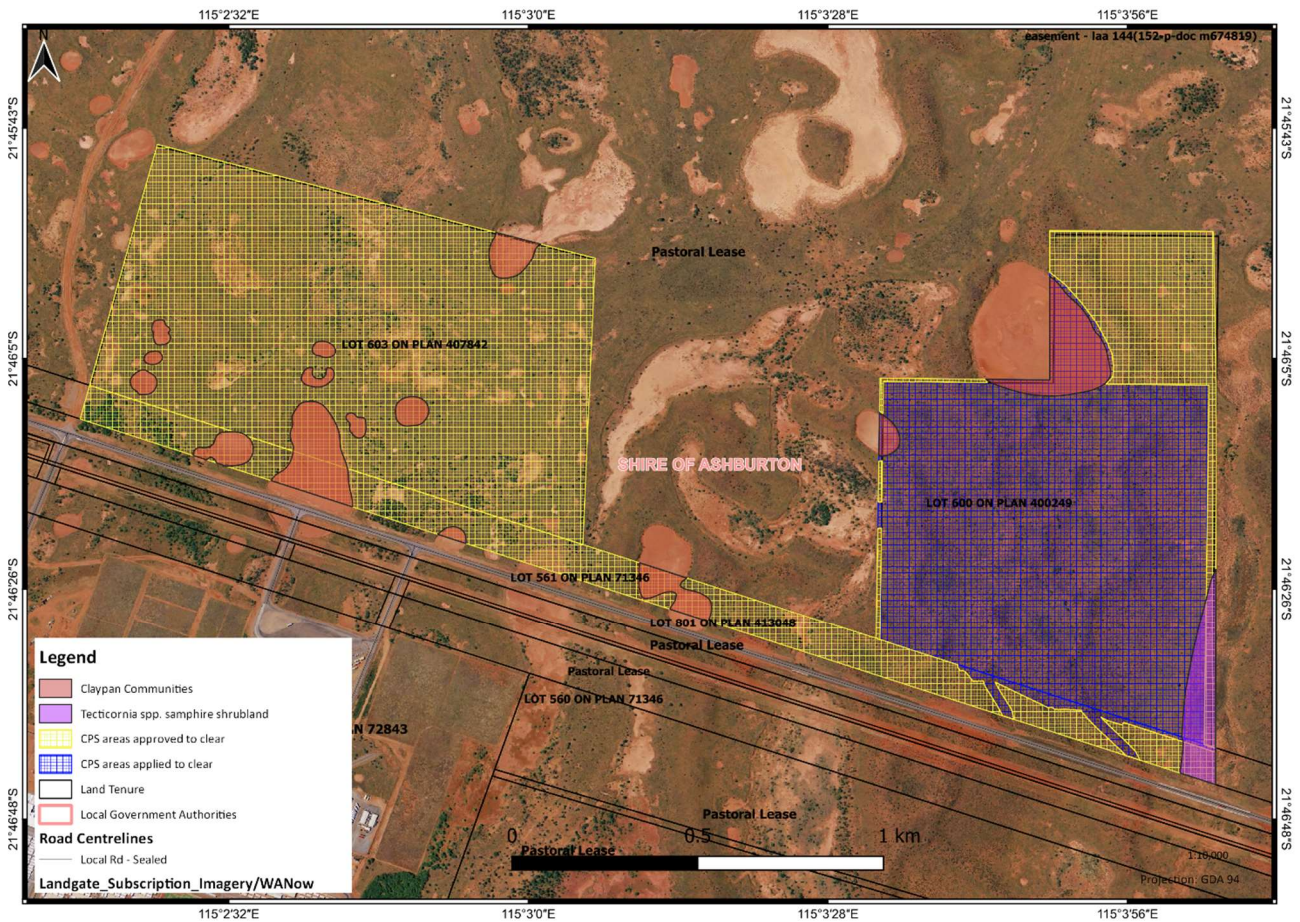


Figure 5. Riparian vegetation within the application area for CPS 9545/1, where the area shaded red represents clay pan communities and the area shaded purple represents *Tecticornia* spp. samphire shrubland. The area cross-hatched blue represents the original proposed clearing area of 233.15 hectares and the area cross-hatched yellow represents the revised clearing area of 148.55 hectares.

The revised application area of 148.55 hectares proposes to clear within 12 claypans with a total area 10.01 hectares, with each claypan varying in size from 3.8 hectares to 0.15 hectares, as well as 2.18 hectares of *Tecticornia* spp. samphire shrubland (RPS, 2021). Ten of the claypan communities are likely to be lost completely as a result of the proposed clearing, while two will be fragmented or reduced in size. Four of these claypans intersect or are adjacent to the existing Warrirda road and are likely to have been historically fragmented by the construction of this infrastructure and may be subject to ongoing disturbance through the use of the road.

While each claypan community may be locally unique, it is acknowledged that 24.2 hectares of claypan communities was recorded in the greater survey area during the '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' (RPS, 2021) and approximately 22,189 hectares of mapped claypans occur within a 50-kilometre radius of the application area, according to available databases. In addition, approximately 810.67 hectares of *Tecticornia* spp. samphire shrubland persists within the broader ANSIA area according to the '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' (RPS, 2021). The applicant has also advised that measures will be employed during the proposed clearing, construction, and development to ensure that indirect impacts to adjacent claypan communities and riparian vegetation are adequately mitigated (RPS, 2022). These measures are outlined in Section 3.1.

Advice received from DWER's North West Region indicates that water-related issues within the greater ANSIA have been assessed over a number of years in accordance with the *Better Urban Water Management Framework* (WAPC, 2008) and that the Hydrological and Planning Study Summary and Local Water Management Strategy for the ANSIA were endorsed by the previous Department of Water (DWER, 2022). The North West Region advised that, provided the clearing is undertaken in accordance with best practice management and the commitments of these documents, the proposed clearing is unlikely to significantly impact the quality of water resources (DWER, 2022). The applicant confirmed that water management during the proposed clearing, construction, and development will be undertaken in accordance with the endorsed plans and the mitigation measures outlined in Section 3.1 align with the water management objectives of the Local Water Management Strategy for the ANSIA (RPS, 2022).

Given the extent of the proposed clearing in the context of the local area, the non-perennial nature of the waterbodies present, and the applicant's avoidance and mitigation measures, it is not considered likely that the proposed clearing will result in any significant or long-term impacts to surface or underground water quality or to significantly impact the extent of riparian vegetation in the local area or the ecological values provided by local claypan communities.

### **Land degradation**

The application area is located within the Onslow and Dune soil systems which include sandy units and clay plains with tussock grasses that are susceptible to wind erosion where surface cover is lost (Van Vreeswyk et al., 2004). Given the purpose of the proposed clearing is to enable the site to be filled and levelled for industrial development and that 148.55 hectares of continuous vegetation is proposed to be clear-felled, there is the potential for the proposed clearing to result in appreciable land degradation if bare ground is left exposed to weathering for an extended period between the clearing of surface vegetation, the levelling of the site, and subsequent industrial development. Given the extensively vegetated local area, a wind erosion management condition, requiring development to commence within three months of clearing or the application of a suitable dust suppressant, is considered to mitigate the risk of appreciable land degradation.

Given the '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' (RPS, 2021) identified that parts of the application area contain invasive weeds, it is acknowledged that the proposed clearing may cause degradation of adjacent remnant native vegetation and riparian vegetation by facilitating the spread of weeds. It is considered that a weed management condition will adequately minimise this risk.

### **Conclusion**

Based on the above assessment, the proposed clearing may result in the loss of 12.19 hectares of vegetation growing in, or in association with, an environment associated with a watercourse or wetland, may result in land degradation through wind erosion, and may facilitate the spread of invasive weeds into adjacent vegetation in the local area. For the reasons set out above, the proposed clearing is unlikely to result in any significant or long-term impacts to the quality of surface or underground water or to significantly impact the extent or ecological values of riparian vegetation in the local area.

It is considered that the impacts of the proposed clearing can be managed through permit conditioning to taking steps to minimise the risk of the introduction and spread of weeds. In considering the above, the Delegated Officer determined that the impacts of the proposed clearing on land and water resources does not constitute a significant residual impact.

### **Conditions**

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

- Wind erosion management, which requires earthworks and construction activities to commence no later than three months after undertaking the authorised clearing activities, where possible, or a suitable dust suppressant to be applied where cleared areas will be exposed for more than three months, and
- Weed control, which ensures protocols are put in place to limit the introduction and transportation of weed-affected materials.

## **3.3. Relevant planning instruments and other matters**

The clearing permit application was advertised on DWER's website on 10 February 2022, inviting submissions from the public within a 21-day period. No submissions were received in relation to this application.

The Shire of Ashburton advised DWER that, pursuant to the Shire of Ashburton Local Planning Scheme No. 7 and the Deemed Provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015*, no Development Application is required (Shire of Ashburton, 2022). The Shire did not have any objections to the proposed clearing but noted that the proposed clearing will impact *Eremophila forrestii* subsp. *viridis* and recommended that any clearing approval include specific conditioning relating to the protection of priority flora species (Shire of Ashburton, 2022). The Delegated Officer notes that impacts to *Eremophila forrestii* subsp. *viridis* have been adequately assessed in the detailed assessment of impacts on environmental values (see Section 3.2.1) and considers that permit conditioning is sufficient to mitigate indirect impacts to *Eremophila forrestii* subsp. *viridis* outside of the authorised clearing area.

DWER's North West Region advised that the proposed activities occur within the Pilbara surface and groundwater areas that are subject to licensing requirements under the RIWI Act (DWER, 2022). However, as the claypan communities are ephemeral and are likely to fill from overland sheet flows and rainfall, the disturbance to bed or banks of these communities are unlikely to require a permit under the RIWI Act (DWER, 2022).

Several 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

Summary of comments	Consideration of comment
The applicant provided evidence of efforts to avoid and mitigate impacts to priority flora, surface water quality, and clay pan communities on 9 June 2022 in response to a formal Request for Further Information issued by DWER (RPS, 2022).	The information provided is summarised in <i>Avoidance and mitigation measures</i> (see Section 3.1).
<p>The applicant provided the following additional supporting information on 25 August 2022 in response to a formal Request for Further Information issued by DWER:</p> <ul style="list-style-type: none"> <li>A reduction in the proposed clearing area from 233.15 hectares to 148.55 hectares to exclude areas included under clearing permit applications CPS 9550/2 and CPS 9818/1 and to reduce impacts to clay pan communities, and</li> <li>Confirmation that the mitigation measures provided on 9 June 2022 are consistent with the key water management planning documents endorsed as part of the ANSIA Improvement Scheme (RPS, 2022).</li> </ul>	The additional information provided was considered in <i>Description of clearing activities</i> (see Section 1.2), <i>Avoidance and mitigation measures</i> (see Section 3.1), and the assessment of impacts to land and water resources (see Section 3.2.3).

## 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 immediately north of Warrirda Road within the Ashburton North Strategic Industrial Area (ANSIA). Spatial data indicates the local area (50-kilometre radius from the centre of the area proposed to be cleared) retains approximately 94.7 per cent of the original native vegetation cover (see Appendix B.2).
Ecological linkage	The application area does not intersect any formally mapped ecological linkages. Although the vegetation may be providing some connectivity along the existing road infrastructure, it is not considered likely to be contributing significantly to vegetation connectivity or linkage values in the local area, noting the extensively vegetated region and adjacent expansive tracts of connected vegetation.
Conservation areas	The closest conservation area is Locker Island Nature Reserve located approximately 28.5 kilometres west of the application area, off the coast of the Port of Ashburton. The closest mainland conservation area is Cane River Conservation Park, located approximately 47.7 kilometres south-east of the application area.
Vegetation description	A detailed flora and vegetation assessment undertaken by RPS in October 2020 identified nine vegetation units within the greater survey area, of which eight vegetation units occur within the revised clearing area, outlined in Table 2.

Characteristic	Details																																								
	<p>Table 2. Vegetation units within the clearing footprint for CPS 9545/1 (RPS, 2021).</p> <table border="1"> <thead> <tr> <th>Vegetation Unit</th> <th>Vegetation Type Description</th> <th>Extent within area to be cleared (ha)</th> <th>% of area to be cleared</th> </tr> </thead> <tbody> <tr> <td>AstTe</td> <td><i>Acacia stellaticeps</i> Mid Open Shrubland over <i>Triodia epactia</i> Hummock Grassland</td> <td>0.24</td> <td>0.16</td> </tr> <tr> <td>AstAteTe</td> <td><i>Acacia tetragonophylla</i> and <i>A. stellaticeps</i> Mid Isolated Shrubs over <i>Triodia epactia</i> Hummock Grassland</td> <td>18.68</td> <td>12.58</td> </tr> <tr> <td>AteTe.Sm/Ef/Eu</td> <td><i>Acacia tetragonophylla</i> Tall to Mid Isolated Shrubs over <i>Triodia epactia</i> Hummock Grassland and <i>Sporobolus mitchellii</i>, <i>Eragrostis falcata</i> and <i>Eulalia aurea</i> Tussock Grassland</td> <td>43.51</td> <td>29.29</td> </tr> <tr> <td>AteTe</td> <td><i>Acacia tetragonophylla</i> Tall to Mid Isolated Shrubs to Open Shrubland over <i>Triodia epactia</i> Hummock Grassland</td> <td>62.96</td> <td>42.39</td> </tr> <tr> <td>CP</td> <td>Bare clay pans with only scattered annual grasses and forbs</td> <td>10.01</td> <td>6.74</td> </tr> <tr> <td>GsTe</td> <td><i>Grevillea stenobotrya</i> Tall Sparse to Open Shrubland over <i>Triodia epactia</i> Open Hummock Grassland</td> <td>5.93</td> <td>3.99</td> </tr> <tr> <td>HsAstTe</td> <td><i>Hakea stenophylla</i> subsp. <i>stenophylla</i> Mid Sparse and <i>Acacia stellaticeps</i> Mid Sparse Shrubland over <i>Triodia epactia</i> Hummock Grassland</td> <td>5.04</td> <td>3.39</td> </tr> <tr> <td>TECSpp.</td> <td><i>Tecticornia</i> spp. Low Open Samphire Shrubland over <i>Lawrenca viridigrisea</i> and <i>Eragrostis falcata</i> Sparse Forbland / Tussock Grassland</td> <td>2.18</td> <td>1.46</td> </tr> <tr> <td>Total</td> <td></td> <td>148.55</td> <td>100</td> </tr> </tbody> </table> <p>The full survey mapping is available in Appendix E.</p> <p>This is broadly consistent with the mapped Beard vegetation association 670, which is described as hummock grasslands, shrub steppe and scattered shrubs over <i>Triodia basedowii</i> (Shepherd et al, 2001).</p>	Vegetation Unit	Vegetation Type Description	Extent within area to be cleared (ha)	% of area to be cleared	AstTe	<i>Acacia stellaticeps</i> Mid Open Shrubland over <i>Triodia epactia</i> Hummock Grassland	0.24	0.16	AstAteTe	<i>Acacia tetragonophylla</i> and <i>A. stellaticeps</i> Mid Isolated Shrubs over <i>Triodia epactia</i> Hummock Grassland	18.68	12.58	AteTe.Sm/Ef/Eu	<i>Acacia tetragonophylla</i> Tall to Mid Isolated Shrubs over <i>Triodia epactia</i> Hummock Grassland and <i>Sporobolus mitchellii</i> , <i>Eragrostis falcata</i> and <i>Eulalia aurea</i> Tussock Grassland	43.51	29.29	AteTe	<i>Acacia tetragonophylla</i> Tall to Mid Isolated Shrubs to Open Shrubland over <i>Triodia epactia</i> Hummock Grassland	62.96	42.39	CP	Bare clay pans with only scattered annual grasses and forbs	10.01	6.74	GsTe	<i>Grevillea stenobotrya</i> Tall Sparse to Open Shrubland over <i>Triodia epactia</i> Open Hummock Grassland	5.93	3.99	HsAstTe	<i>Hakea stenophylla</i> subsp. <i>stenophylla</i> Mid Sparse and <i>Acacia stellaticeps</i> Mid Sparse Shrubland over <i>Triodia epactia</i> Hummock Grassland	5.04	3.39	TECSpp.	<i>Tecticornia</i> spp. Low Open Samphire Shrubland over <i>Lawrenca viridigrisea</i> and <i>Eragrostis falcata</i> Sparse Forbland / Tussock Grassland	2.18	1.46	Total		148.55	100
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Vegetation condition	<p>The detailed flora and vegetation assessment undertaken by RPS in October 2020 identified that the vegetation within the proposed clearing area is in Very Good to Poor (Trudgen, 1991) condition, as outlined in Table 3.</p> <p>Table 3. Vegetation condition within the clearing footprint for CPS 9545/1 (RPS, 2021).</p> <table border="1"> <thead> <tr> <th>Condition Rating (Trudgen, 1991)</th> <th>Extent within area to be cleared (ha)</th> <th>% of area to be cleared</th> </tr> </thead> <tbody> <tr> <td>Very Good</td> <td>128.48</td> <td>86.5</td> </tr> <tr> <td>Good to Very Good</td> <td>9.78</td> <td>6.6</td> </tr> <tr> <td>Good</td> <td>9.39</td> <td>6.3</td> </tr> <tr> <td>Poor</td> <td>0.90</td> <td>0.6</td> </tr> <tr> <td>Total</td> <td>148.55</td> <td>100</td> </tr> </tbody> </table> <p>The full Trudgen (1991) condition rating scale is provided in Appendix D. The full survey mapping is available in Appendix E.</p>	Condition Rating (Trudgen, 1991)	Extent within area to be cleared (ha)	% of area to be cleared	Very Good	128.48	86.5	Good to Very Good	9.78	6.6	Good	9.39	6.3	Poor	0.90	0.6	Total	148.55	100																						
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Climate and landform	<p>The application area is located on flat topography within the Carnarvon bioregion, characterised by low plateaux, coastal plains and low folded ranges (RPS, 2021).</p> <p>The broader Carnarvon bioregion which has an arid-tropical bi-seasonal climate with a mean annual maximum temperature of 32.1°C and a mean annual minimum</p>																																								



Characteristic	Details
	temperature of 19.2°C. The mean annual rainfall and the annual evapotranspiration rate are both 400 millimetres.
Soil description and land degradation risk	<p>The soil within the application area is mapped as the following systems:</p> <ul style="list-style-type: none"> <li>• Onslow System (201On), described as undulating sandplains, dunes and level clay plains supporting soft spinifex grasslands and minor tussock grasslands, and</li> <li>• Dune System (201Du), described as dune fields supporting soft spinifex and minor hard spinifex grasslands (DPIRD, 2022).</li> </ul> <p>While the mapped soils generally are not prone to land degradation, sandy units of the Onslow System and Dune System are susceptible to wind erosion when bared by overgrazing or fire, but revegetate rapidly after rain (Van Vreeswyk et al., 2004). Clay plains with tussock grasses within the Onslow System are also sensitive to overgrazing and are susceptible to erosion (Van Vreeswyk et al., 2004).</p>
Waterbodies and hydrogeography	<p>The desktop assessment and aerial imagery indicate that the application area intersects several non-perennial waterbodies (clay pans). This was confirmed by the flora and vegetation assessment which identified 10.01 hectares of the application area comprises bare clay pans covered by scattered annual grasses and forbs (RPS, 2021).</p> <p>The application area is mapped within the Pilbara Surface Water Area and the Pilbara Groundwater Area proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act) but does not transect any water resources proclaimed under either the <i>Metropolitan Water Supply Sewerage and Drainage Act 1909</i> or <i>Country Areas Water Supply Act 1947</i> (CAWS Act).</p> <p>Groundwater salinity within the application area is mapped at 7000 to 14,000 milligrams per litre total dissolved solids.</p>
Flora	<p>The desktop assessment identified that a total of 8 rare flora species have been recorded within the local area, all of which are classified as Priority 3 (P3) flora (Western Australian Herbarium, 1998-). None of these existing records occur within the application area, with the closest records being occurrences of <i>Eremophila forrestii</i> subsp. <i>viridis</i> (P3) approximately 100 metres from the application area.</p> <p>No flora species listed as threatened under the BC Act or EPBC have been recorded in the local area.</p> <p>With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), the habitat preferences and conservation statuses of the aforementioned species, the distribution and extent of existing records, and biological survey information (RPS, 2021), the application area may provide suitable habitat for three priority flora species and impacts to these species required further consideration (see Appendix B.3).</p> <p>The '<i>Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant</i>', undertaken over eight days in October 2020, identified a total of 1102 individuals of <i>Eremophila forrestii</i> subsp. <i>viridis</i> within the greater survey area, of which 164 individuals occur within the revised application area of 148.55 hectares (RPS, 2021). No other priority flora were recorded within the revised application area.</p>
Ecological communities	<p>The desktop assessment identified that the closest state-listed threatened ecological community (TEC) is an occurrence of the Themeda grasslands on cracking clays (Hamersley Station, Pilbara) (Themeda grasslands) TEC, located approximately 230 kilometres south-east of the application area.</p>

Characteristic	Details
	<p>The closest state-listed priority ecological community (PEC) is an occurrence of the Tanpool Land System PEC, located approximately 55 kilometres east of the application area.</p> <p>No TECs or PECs were recorded within the application area (RPS, 2021).</p>
Fauna	<p>The desktop assessment identified that a total of 70 threatened or priority fauna species have been recorded within the local area, including 20 threatened fauna species, 11 priority fauna species, 34 fauna species protected under international agreement, and five other specially protected fauna species (DBCA, 2007-). None of these records occur within the application area, with the closest being a record of <i>Leggadina lakedownensis</i> (Lakeland Downs mouse) (P4) approximately 1.6 kilometres from the application area.</p> <p>With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), the habitat preferences and conservation statuses of the aforementioned species, and the distribution and extent of existing records, the application area may provide suitable habitat for 40 conservation significant fauna species and impacts to these species required further consideration (see Appendix B.4).</p>

## 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*					
Carnarvon	8,382,890.35	8,360,801.46	99.74	1,020,434.08	12.17
Vegetation complex*					
Beard vegetation association 670	147,810.16	147,793.61	99.99	17242.88	11.67
Vegetation complex within IBRA bioregion*					
Beard vegetation association 670 (Carnarvon)	147,808.61	147,792.06	99.99	17242.88	11.67
Local area					
50-kilometre radius	526,885.35	498,893.03	94.69	-	-

\*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), the distribution and extent of existing records, and biological survey information (RPS, 2021), 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 in local area (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Eleocharis papillosa</i>	P3	Y	Y	Y	5.1	2	Y
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Y	Y	Y	0.01	3	Y
<i>Triumfetta echinata</i>	P3	Y	Y	Y	1.8	6	Y

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

#### B.4. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1) and the distribution and extent of existing records, 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 in local area (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Calidris canutus</i> (Red knot)	EN	Y	Y	12.6	3	N/A
<i>Calidris ferruginea</i> (Curlew sandpiper)	CR	Y	Y	11.2	5	N/A
<i>Calidris tenuirostris</i> (Great knot)	CR	Y	Y	6.2	11	N/A
<i>Charadrius leschenaultii</i> (Greater sand plover)	VU	Y	Y	6.2	106	N/A
<i>Charadrius mongolus</i> (Lesser sand plover)	EN	Y	Y	6.2	33	N/A
<i>Falco peregrinus</i> (Peregrine falcon)	OS	Y	Y	2.5	5	N/A
<i>Leggadina lakedownensis</i> (Lakeland Downs mouse)	P4	Y	Y	1.6	348	N/A
<i>Limosa lapponica menzbieri</i> (Bar-tailed godwit)	CR	Y	Y	15.1	4	N/A
Migratory waterbirds (28 species)	MI	Y	Y	<10.0	-	N/A
<i>Numenius madagascariensis</i> (Eastern curlew)	CR	Y	Y	6.9	29	N/A
<i>Pseudomys chapmani</i> (Western pebble-mound mouse)	P4	Y	Y	2.2	5	N/A
<i>Sternula nereis nereis</i> (Fairy tern)	VU	Y	Y	15.0	51	N/A
<i>Tringa brevipes</i> (Grey-tailed tattler)	P4	Y	Y	6.2	96	N/A

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

### Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
<b>Environmental value: biological values</b>		
<p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u> The area proposed to be cleared contains 148.55 hectares of <i>Acacia</i> spp., <i>Grevillea</i> spp., and <i>Hakea</i> spp. shrubland over <i>Triodia</i> spp. grassland, <i>Tecticornia</i> spp. samphire shrubland, and bare claypan communities that are well-represented in the local area and region but contains suitable habitat for priority flora and conservation significant fauna species.</p>	At variance	<p>Yes</p> <p>Refer to Sections 3.2.1 and 3.2.2, above.</p>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (b):</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 significant habitat for fauna.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared contains suitable habitat for conservation significant fauna.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u> No threatened flora species listed under the BC Act are known to occur within a 50-kilometre radius of the application area. Therefore, the area proposed to be cleared is unlikely to contain suitable or significant habitat necessary for the continued existence of threatened flora species.</p>	Not likely to be at variance	No
<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> The area proposed to be cleared is unlikely to be representative of any TEC listed under the BC Act or EPBC Act. Given the separation from the nearest TEC through road infrastructure, the proposed clearing is not likely to impact or be necessary for the maintenance of any TEC.</p>	Not likely to be at variance	No
<b>Environmental value: significant remnant vegetation and conservation areas</b>		
<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> The extent of the mapped vegetation types 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 in the local area.</p>	Not likely to be 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> Given the distance and separation from the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of any nearby conservation areas.</p>	Not likely to be at variance	No
<b>Environmental value: land and water resources</b>		
<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> Given the application area transects claypan communities, the vegetation is considered to be growing in, or in association with, an environment associated with a watercourse or wetland and the proposed clearing has the potential to impact on- or off-site hydrology.</p>	At variance	Yes <i>Refer to Section 3.2.3, above.</i>
<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> The mapped soils are susceptible to wind erosion where surface cover is lost. As the purpose of the proposed clearing is to enable the site to be filled and levelled, there is the potential for the proposed clearing to result in land degradation if bare ground is left exposed to weathering for an extended period between the levelling of the site and industrial development.</p>	May be at variance	Yes <i>Refer to Section 3.2.3, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (i)</u>: “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.”</p> <p><u>Assessment</u>: Given claypan communities are recorded within the application area, the proposed clearing has the potential to impact surface or ground water quality.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.3, above.</i>
<p><u>Principle (j)</u>: “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</p> <p><u>Assessment</u>: Given claypan communities are recorded within the application area, portions of the application area may be seasonally inundated. However, 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. Further, noting the extent of the proposed clearing in the context of the extensively vegetated local area, the proposed clearing is not considered likely to cause, or exacerbate, the incidence or intensity of flooding.</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

### Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant (RPS, 2021)

The applicant commissioned the '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' to complement the results of previous flora and vegetation surveys within the ANSIA and to fill any knowledge gaps to ensure that the survey area data meets Environmental Protection Authority's (EPA) Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016) standards (RPS, 2021). The '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' comprised a desktop assessment and field surveys, including a reconnaissance level flora and vegetation survey and a detailed flora and vegetation survey (RPS, 2021).

#### Desktop Assessment

The desktop assessment for the '*Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant*' was undertaken by experienced botanists and involved the following:

- A review of all relevant and available environmental literature and reports relevant to the survey area, and collation and summary of the historical knowledge of the flora and vegetation values,
- A review of previous flora and fauna surveys assessments conducted in the vicinity of the survey area against the technical guidance (EPA, 2016),
- A summary of the vegetation communities and flora present within the survey area,
- Assessment of the conservation significance of the flora and vegetation,
- Assessment of the adequacy of the available data in satisfactorily describing the flora and vegetation values of the survey area, and
- Identification of knowledge gaps, if any, in the biological information available for the survey area (RPS, 2021).

#### Field Surveys

The methods of the flora and vegetation assessment were in accordance with the EPA's Technical Guidance *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016). The flora and vegetation assessment was undertaken by experienced botanists and involved the following:

- Field surveys over eight days between 16 and 23 October 2020, including a reconnaissance survey over the service and access road corridors through selective sampling and a detailed survey through the collection of floristic data at 22 quadrats (50 m x 50 m),
- Compilation of a comprehensive vascular flora inventory of all flora species recorded within the survey area, including weed species, using data collected from selective sampling and quadrats,
- Vegetation type mapping for the survey area, using data collected from selective sampling and quadrats,
- Vegetation condition mapping for the survey area, using data collected from selective sampling and quadrats, and
- Targeted searches for significant flora, involving systematic traverses through potential habitat for conservation significant flora identified in the desktop assessment (RPS, 2021).

### Additional Regional Flora and Vegetation Surveys

DWER's assessment of CPS 9545/1 also considered additional data of flora records from recent flora and vegetation surveys in the region that were not commissioned by the applicant, including:

- '*Ashburton Infrastructure Project – Flora and Vegetation Assessment*' which comprised a desktop assessment and targeted flora surveys over 22 days between 17 March and 24 May 2021 (360 Environmental, 2021),
- '*Warrirda Road Detailed and Targeted Flora and Basic Fauna Assessment*' which comprised a desktop assessment, flora and vegetation assessment, and terrestrial fauna assessment over three days between 4 and 7 May 2021 (Spectrum Ecology, 2021),
- '*Targeted Eremophila forrestii subsp. viridis (P3) Survey at Onslow*' which comprised a desktop assessment and targeted flora survey over four days from 13 December to 16 December 2020 (EcoLogical Australia, 2021),
- '*Eremophila forrestii subsp. viridis targeted flora survey August 2022*' which comprised a desktop assessment and targeted searches for *Eremophila forrestii* subsp. *viridis* over three days from 27 to 29 July 2022 (Anders, 2022a), and
- '*Eremophila forrestii subsp. viridis targeted flora survey September 2022*' which comprised a desktop assessment and targeted searches for *Eremophila forrestii* subsp. *viridis* over five days from 31 August to 4 September 2022 (Anders, 2022b).

# Survey Descriptions and Mapping

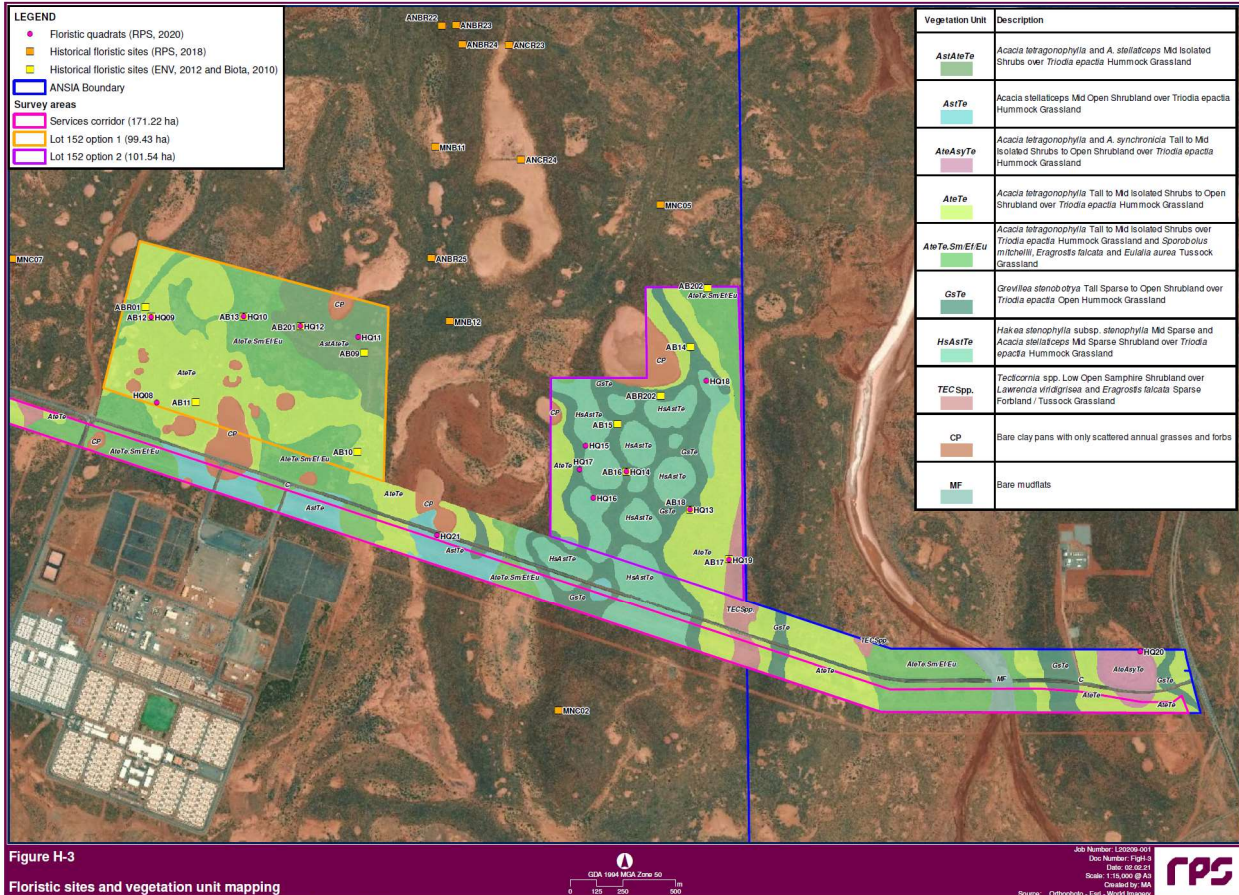


Figure 6. Floristic sites and vegetation type mapping overview for the clearing footprint for CPS 9545/1 (RPS, 2021).

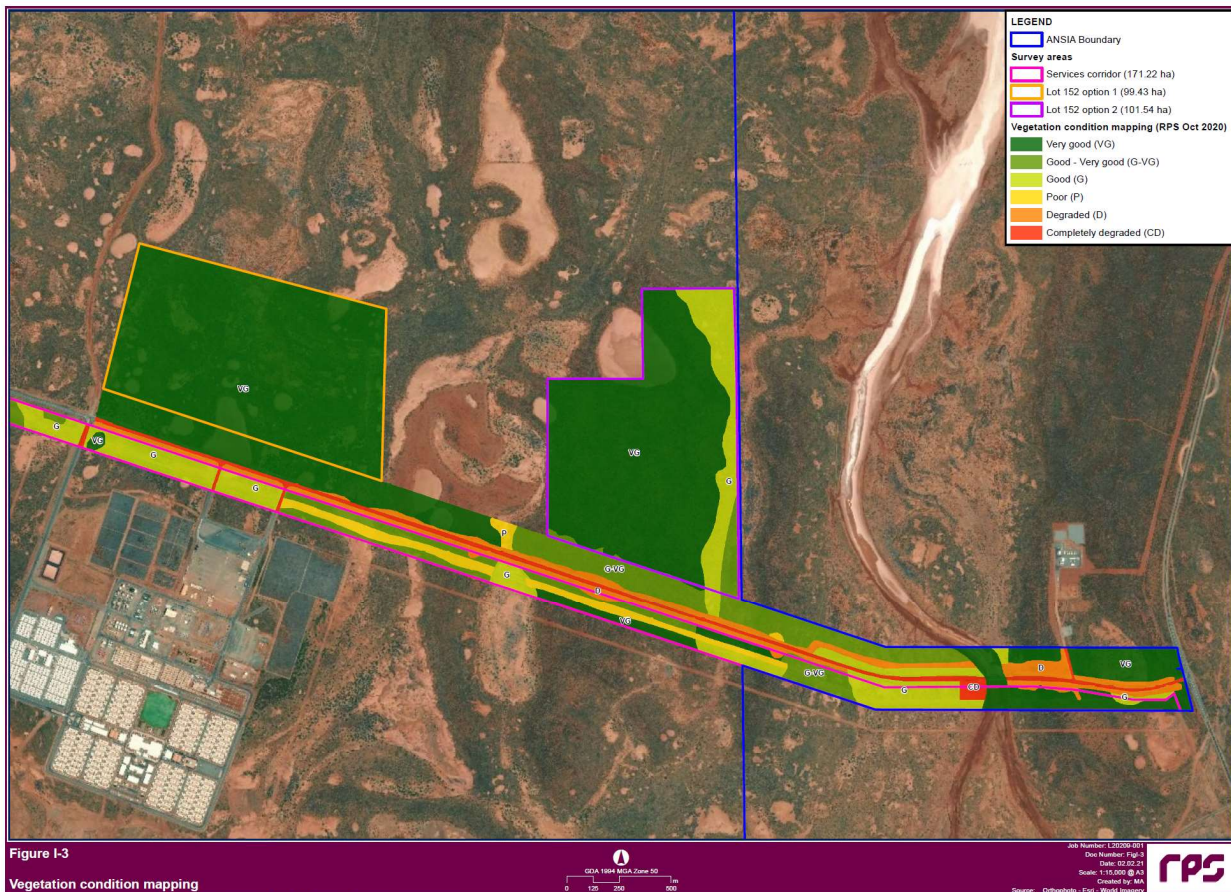


Figure 7. Vegetation condition mapping overview for the clearing footprint for CPS 9545/1 (RPS, 2021).

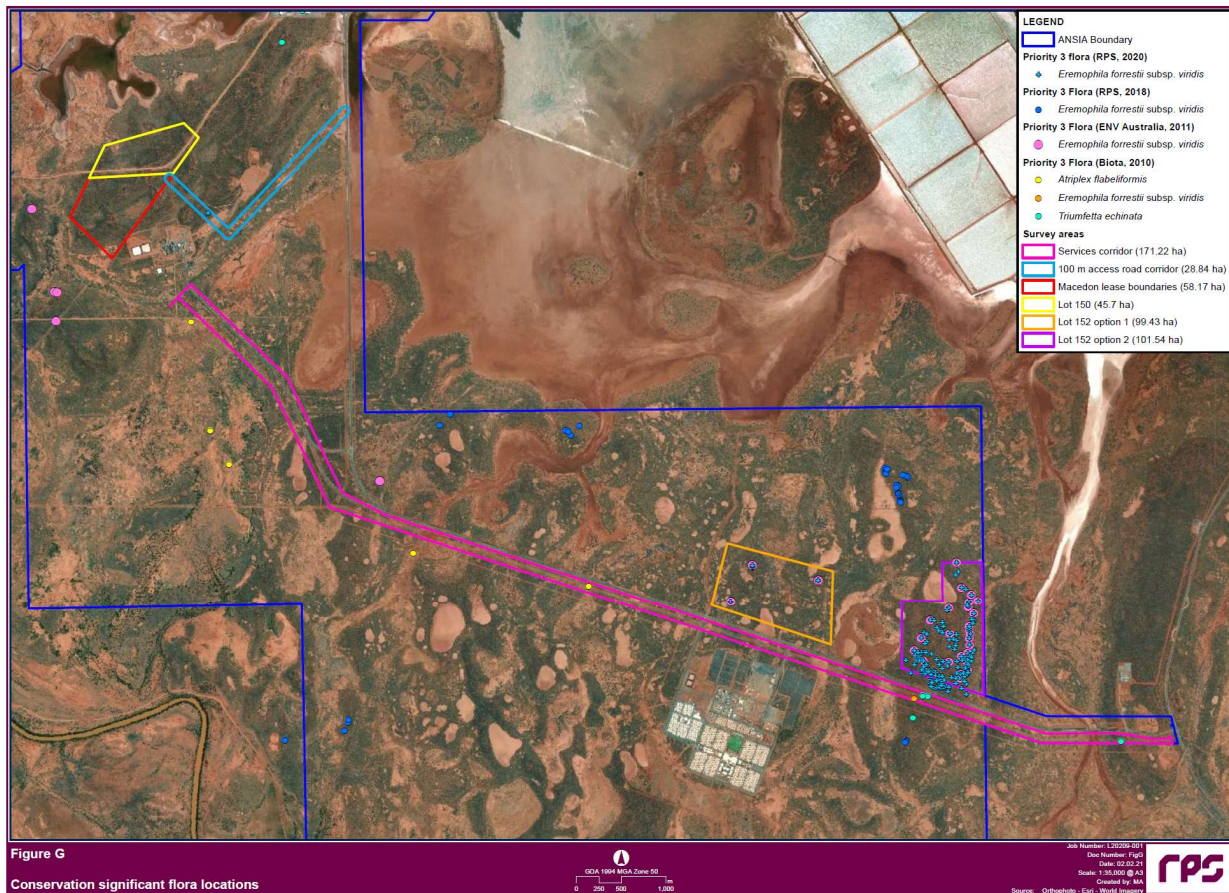


Figure 8. Conservation significant flora locations identified in the ‘Detailed Flora and Vegetation Assessment – Onslow Rare Earths Plant’ survey area (RPS, 2021).

## Appendix F. Sources of information

### F.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Bush Forever Areas 2000 (DPLH-019)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- CAWSA Part 2A Clearing Control Catchments (DWER-004)
- Consanguineous Wetlands Suites (DBCA-020)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- DBCA Statewide Vegetation Statistics
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments - Catchments (DWER-028)
- Hydrographic Catchments - Divisions (DWER-029)
- Hydrography, Linear (Hierarchy) (DWER-031)
- 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 (DPIRD-006)
- 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 (DPIRD-027)
- Soil Landscape Mapping – Systems (DPIRD-064)

Restricted GIS Databases used:

- Conservation Covenants Western Australia (DPIRD-023)
- Contaminated Sites Database - Restricted (DWER-073)
- 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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