



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 8571/1
Permit Holder:	Shire of Ngaanyatjarraku
Duration of Permit:	2 January 2020 – 2 January 2025

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

PART I – CLEARING AUTHORISED

1. Purpose for which clearing may be done

Clearing for the purpose of road construction and upgrades

2. Land on which clearing is to be done

Lot 9 on Deposited Plan 91722, Ngaanyatjarra-Giles

3. Area of Clearing

The Permit Holder must not clear more than 2.55 hectares of native vegetation within the area hatched yellow on attached Plan 8571/1.

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. Type of clearing authorised

This Permit authorises the Permit Holder to clear native vegetation for the activities described in condition 1 of this Permit to the extent that the Permit Holder has the power to carry out works involving clearing for those activities under the *Local Government Act 1995* or any other written law.

PART II – MANAGEMENT CONDITIONS

6. Avoid, minimise and reduce the impacts and extent of clearing

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in 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 control

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds*:

- (a) clean any earth-moving machinery and other clearing equipment 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 area to be cleared.

PART III - RECORD KEEPING AND REPORTING

7. Records must be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit, in relation to the clearing of native vegetation authorised under this Permit:

- (a) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
- (b) the date that the area was cleared;
- (c) the size of the area cleared (in hectares);
- (d) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 6 of this Permit; and
- (e) actions taken to minimise the risk of the introduction and spread of *weeds* in accordance with condition 7 of this Permit.

8. Reporting

The Permit Holder must provide to the *CEO* the records required under condition 7 of this Permit, when requested by the *CEO*.

DEFINITIONS

The following meanings are given to terms used in this Permit:

CEO means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*;

fill means material used to increase the ground level, or fill a hollow;

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; and

weed/s means any plant -

- (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*;
or
- (b) published in a Department of Biodiversity, Conservation and Attractions Regional Weed Rankings Summary, regardless of ranking; or
- (c) not indigenous to the area concerned.

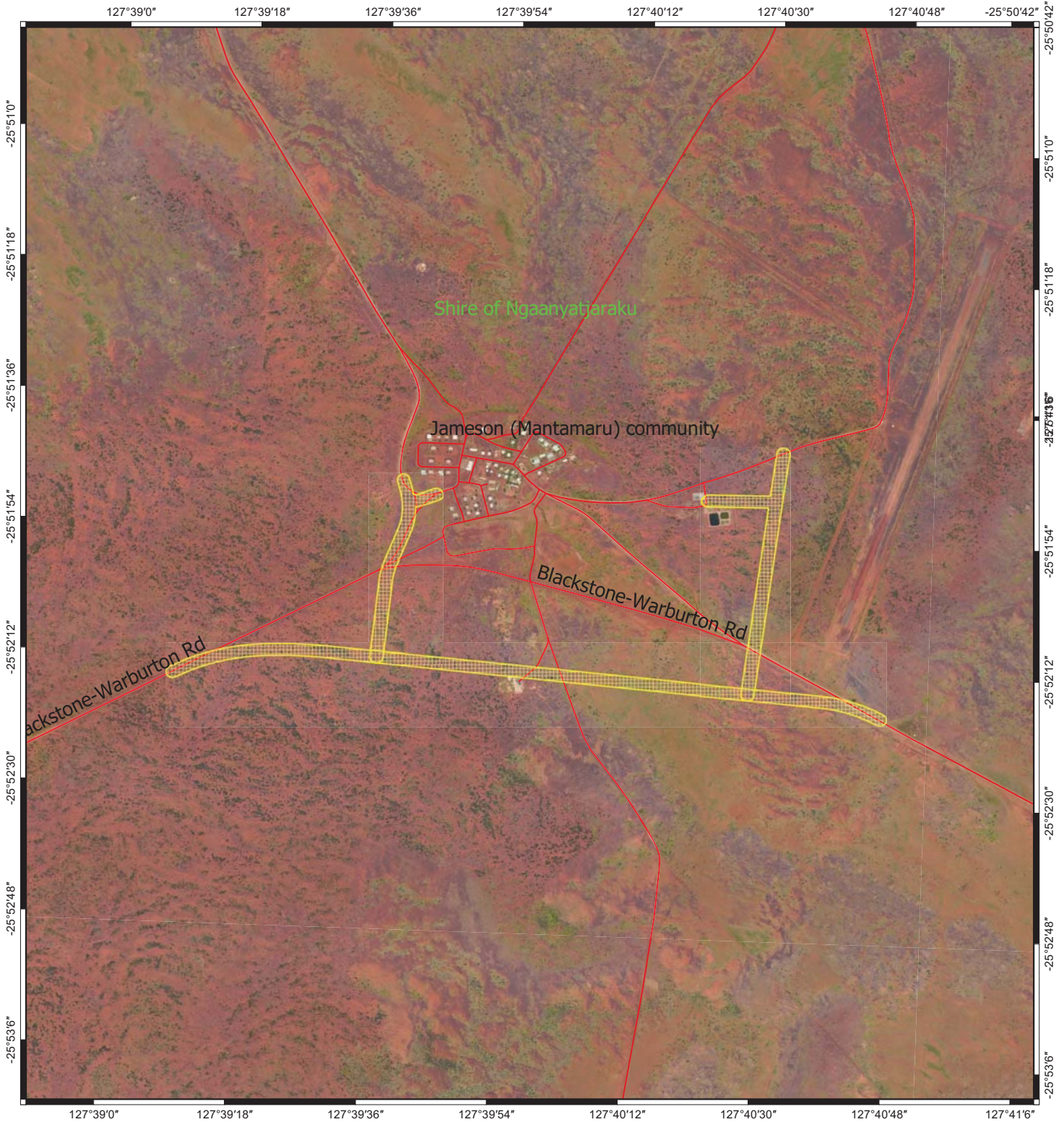


Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION





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

3 December 2019

Plan 8571/1



Legend

-  Areas approved to clear
-  Cadastre
-  Local Government Authorities
-  Roads
- Image



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Geocentric Datum of Australia 1994

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Officer with delegated authority under Section 20 of the
Environmental Protection Act 1986



GOVERNMENT OF
WESTERN AUSTRALIA



1. Application details

1.1. Permit application details

Permit application No.: 8571/1
Permit type: Purpose Permit

1.2. Proponent details

Applicant's name: Shire of Ngaanyatjarraku

1.3. Property details

Property: Lot 9 on Deposited Plan 91722
Local Government Authority: Ngaanyatjarraku, Shire of
Localities: Ngaanyatjarra-Giles

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
2.55		Mechanical Removal	Road construction and upgrades

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 3 December 2019
Reasons for Decision: The clearing permit application was received on 25 June 2019 and has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986*. It has been concluded that the proposed clearing may be at variance with Principle (a) and is not likely to be at variance with the remaining clearing principles.

It has been determined that the proposed clearing will result in the following impacts:

- Clearing of locally abundant Priority 3 flora species *Aristida jerichoensis* var. *subspinulifera* along an approximately 600 metre section of road; and
- Potential to spread a weed of national significance, Buffel grass (**Cenchrus ciliaris*), into the surrounding area.

The Delegated Officer considered that the implementation of a suitable weed management condition was appropriate to mitigate the impact of spreading weeds into adjacent vegetation.

The Delegated Officer determined that due to the extent and density of *A. jerichoensis* var. *subspinulifera* populations within the vicinity of the application area, the proposed clearing is not likely to significantly impact the species local occurrence or conservation status.

In determining to grant a clearing permit subject to conditions, the Delegated Officer found that the proposed clearing is unlikely to lead to an unacceptable risk to the environment.

2. Site Information

Clearing Description: The Shire of Ngaanyatjarraku has applied to clear 2.55 hectares within a 25 hectare footprint within Lot 9 on Deposited Plan 91722, Ngaanyatjarra-Giles, for the purpose of constructing a southern Bypass road to the community of Jameson (Mantamaru). The proposed Bypass works include three new sections of road close to the Jameson community:

- the proposed Bypass road connecting Warburton through to Blackstone;
- access from the Bypass to the western end of the community; and
- access from the Bypass to the community power generator site and airstrip (Ngaanyatjarra Council Land and Culture Unit, 2019a).

The current road corridor requires fuel and other truck transports to traverse through the community of the Jameson (Mantamaru) township, which will include B Triple Road Trains associated with nearby mining activities associated with Cassini/Oz Minerals Joint Venture for the West Musgrave Mine Development Project (Shire of Ngaanyatjarra, 2019; Ngaanyatjarra Council Land and Culture Unit, 2019a). The application area is shown in Figure 1.

Vegetation and Site Description: The application area is mapped as Beard vegetation association 18, which is described as Low Woodland; mulga (*Acacia aneura*) (Shepherd et al., 2001).

A flora and vegetation survey was conducted over the area within 500 metres of the proposed roads by Ngaanyatjarra Council's Land and Culture Unit in April 2019. The survey identified seven

vegetation associations within the application area (Ngaanyatjarra Council Land and Culture Unit, 2019b):

- **Hardpan Mulga Woodland;** *Acacia aneura* (to 3.5m), *Hakea lorea* (wirtjinti; to 1.5m), *Corymbia opaca* (tjuta murrmurpa; to 0.5 m), *Eragrostis eriopoda* (tjanpi), *Euphorbia drummondii*, *Dissocarpus paradoxa* (tjilka tjilka), *Acacia tetragonophylla* (kultupuka; to 0.75 m), *Enchylaena tomentosa* var. *tomentosa*, *Atriplex vesicaria* and *Eremophila latrobei* subsp. *glabra* (narangkura) (Figure 2).
 - **Hardpan Mulga Woodland-Drainage;** comprising *Acacia aneura*, *Hakea lorea*, *Atriplex vesicaria*, *Eragrostis eriopoda*, *Dissocarpus paradoxa*, *Enchylaena tomentosa* var. *tomentosa*, *Acacia tetragonophylla*, *Rulingia loxophylla*, *Sclerolaena cornishiana* and *Alternanthera angustifolia* (Figure 3).
 - **Mulga Woodland;** comprising *Acacia aneura*, *Acacia pteraneura*, *Grevillea stenobotrya* (nyintilpa), *Hakea lorea*, *Acacia ligulata* (watarrka), *Senna artemisioides* (punti), *Eragrostis eriopoda* (tjanpi), *Eremophila latrobei* subsp. *glabra* (narangka), *Sclerolaena cornishiana* (tjilka tjilka) and *Rhagodia eremaea* (Figure 4).
 - **Mulga over *Maireana triptera* Shrubland;** Species included *Maireana triptera* (kunawiltu), *Eremophila longifolia*, *Acacia aneura*, *Eremophila serrulata*, (pirru pirru), *Rhyncharrhena linearis* (puya), **Cenchrus ciliaris* (buffel grass), *Solanum lasiophyllum* (rangki rangki), *Acacia ligulata* (watarrka), *Eremophila latrobei* subsp. *glabra* (narangka), *Dissocarpus paradoxus*, *Sclerolaena cornishiana* (tjilka tjilka), *Rhagodia eremaea* and *Grevillea stenobotrya* (nyintilpa) (Figure 5).
 - **Mulga Wandarrie over *Eremophila* spp./ *Senna* spp./ *Atriplex vesicaria* low shrubland;** Species include *Anthobolus leptomerioides*, *Acacia pteraneura* (pilytalypa), *Bonamia erecta*, **Cenchrus ciliaris* (buffel grass), *Rhagodia eremaea*, *Acacia pruinocarpa*, *Acacia aneura*, *Corymbia opaca*, *Anthobolus leptomerioides*, *Atriplex vesicaria*, *Bonamia erecta*, and *Aristida jerichoensis* var. *subspinulifera* (P3) (Figure 6).
 - **Claypan Grassland;** comprising graminoid species with frequent chenopods *Dissocarpus paradoxa* and *Sclerolaena cornishiana* as well as sparse shrubs of *Senna artemisioides*, *Acacia aneura*, *Maireana triptera* and *Eremophila* spp. Buffel grass (**Cenchrus ciliaris*) is present in varying densities in this vegetation type (Figure 7).
 - **Wandarrie Woodland;** no description included (Figure 8).
- * denotes a weed species

Vegetation Condition:

The survey indicated the vegetation within 500 meters of the proposed clearing area ranges from completely degraded to excellent (Keighery, 1994) condition (Ngaanyatjarra Council Land and Culture Unit, 2019b). In review, the majority of the vegetation proposed to be cleared appears to be in degraded to very good (Keighery, 1994) condition using the Keighery (1994) scale.

Vegetation condition ratings are defined as follows:

- **Pristine:** Pristine or nearly so, no obvious signs of disturbance (Keighery, 1994).
- **Excellent:** Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species (Keighery, 1994).
- **Very Good:** Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).
- **Good:** Vegetation structure significantly altered by very obvious signs of multiple disturbance; retains basic structure or ability to regenerate (Keighery, 1994).
- **Degraded:** Basic vegetation structure severely impacted by disturbance; scope for regeneration but not to a state approaching Good condition without intensive management (Keighery, 1994).
- **Completely Degraded:** The structure of the vegetation is no longer intact and the area is completely or almost completely without native species (Keighery, 1994).

The survey area included cleared municipal areas including the community of Jameson, residences, public buildings, power generator and airfield. The majority of the remaining surveyed areas is subject to intensive periodic pressures associated with ephemeral campgrounds, such as firewood collection, compaction by off-road vehicles and incineration of rubbish (Ngaanyatjarra Council Land and Culture Unit, 2019b). Vehicle tracks of varying permanence, intensity and age were observed throughout the area almost without exception. Disturbance due to herbivore grazing was also noted and some areas within the surveyed footprint included areas of waste disposal, power generation and other infrastructure (Ngaanyatjarra Council Land and Culture Unit, 2019b).

Soil and Landform Type:

The application area is located within the Musgrave Range Zone (Department of Primary Industries and Regional Development, 2019), which is described as 'Sandplain and dunes with hills, ranges, plains and some wash plains on Musgrave Complex granite and gneiss (with some volcanic and sedimentary rocks). Red sandy earths with red deep sands, red loamy earths and some stony soils and self-mulching cracking clays' (Tille, 2006).

Comment:

The vegetation condition was derived from the flora and vegetation survey conducted by the Ngaanyatjarra Council Land and Culture Unit (2019b), and converted to the Keighery (1994) scale.

The local area referred to in the below assessment is defined as the area within a 40 kilometre radius of the application area.

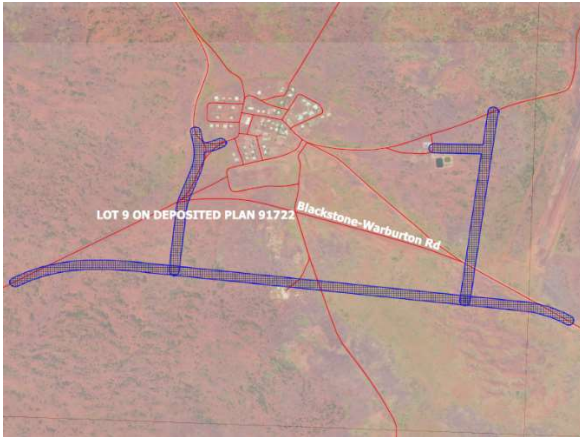


Figure 1. Application area (shaded blue)



Figure 2. Hardpan Mulga Woodland (Ngaanyatjarra Council Land and Culture Unit, 2019b)



Figure 3. Hardpan Mulga Woodlands - Drainage (Ngaanyatjarra Council Land and Culture Unit, 2019c)



Figure 4. Mulga Woodland (Ngaanyatjarra Council Land and Culture Unit, 2019b)



Figure 5. Mulga over *Maireana triptera* Shrubland (Ngaanyatjarra Council Land and Culture Unit, 2019b)



Figure 6. Mulga Wandarrie over *Eremophila spp./ Senna spp./ Atriplex vesicaria* low shrubland (Ngaanyatjarra Council Land and Culture Unit, 2019b)



Figure 7. Claypan grassland (Ngaanyatjarra Council Land and Culture Unit, 2019b)



Figure 8. Mulga Warranderie Woodland (Ngaanyatjarra Council Land and Culture Unit, 2019b)

3. Minimisation and mitigation measures

The Shire of Ngaanyatjarra (2019) advised that alternative by-pass routes were considered and that the proposed alignment was determined by a Heritage survey. The proposed alignment utilises areas that are subject to existing disturbance due to vehicle usage, litter and grazing stock and the proposed road formalisation is expected to reduce pressures on other areas from informal usage, including in areas of the locally uncommon vegetation type *Maireana triptera* Shrubland (Ngaanyatjarra Council Land and Culture Unit, 2019b).

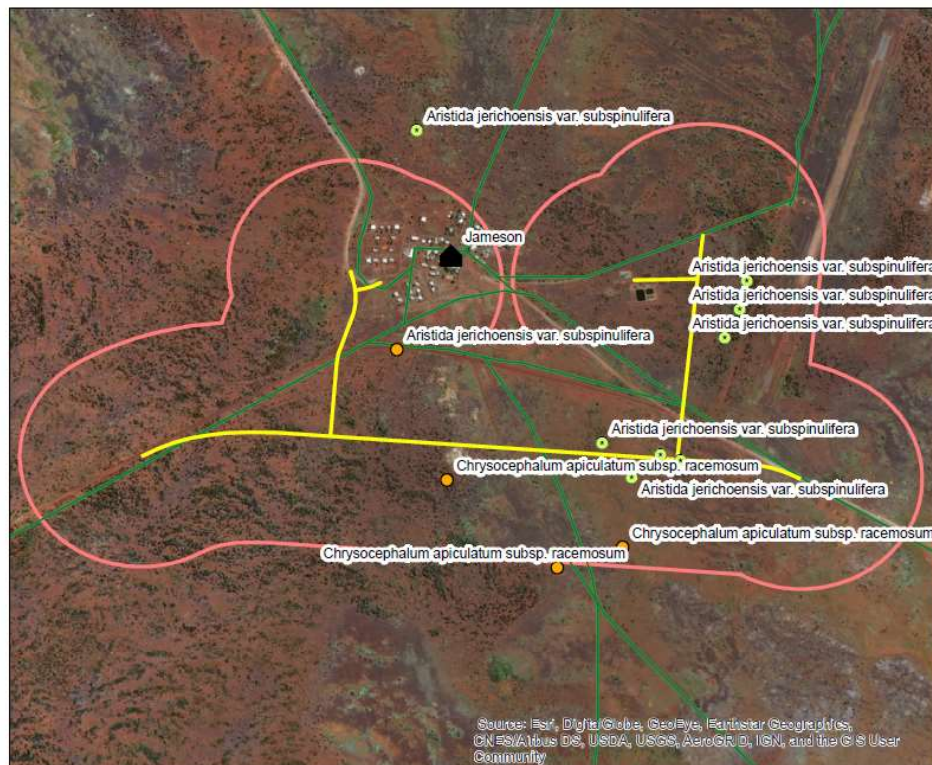
4. Assessment of application against clearing principles

The application area is located within the Interim Biogeographic Regionalisation for Australia (IBRA) Central Ranges Bioregion, which is described as high proportion of Proterozoic ranges and derived soil plains, interspersed with red Quaternary sandplains. The sandplains support low open woodlands of either desert oak or mulga over *Triodia basedowii* hummock grasslands. Low open woodlands of ironwood (*Acacia estrophiolata*) and corkwoods (*Hakea spp.*) over tussock and hummock grasses often fringe ranges. The ranges support mixed wattle scrub or *Callitris glaucophylla* woodlands over hummock and tussock grasslands (Thackway and Cresswell, 1995).

The closest mapped record of a conservation significant flora species is *Goodenia hirsuta* (listed as Priority 3 by the Department of Biodiversity, Conservation and Attractions), approximately 16.3 kilometres from the application area. The Ngaanyatjarra Council Land and Culture Unit's pre-survey review identified 21 flora species of conservation significance with the potential to occur within the survey area. *Indigofera warburtonensis* (Priority 1), *Tephrosia* sp. Central (P.K. Latz 17037) (Priority 3) and *Aristida jerichoensis* var. *subspinulifera* (Priority 3) were considered to have high likelihood of occurrence based on the availability of suitable habitat (Ngaanyatjarra Council Land and Culture Unit, 2019b). In addition, *Aristida jerichoensis* var. *subspinulifera* (Priority 3) and *Chrysocephalum apiculatum* subsp. *racemosum* (Priority 3) have been previously found within the survey area (Ngaanyatjarra Council Land and Culture Unit, 2019b).

The April 2019 survey recorded *Aristida jerichoensis* var. *subspinulifera* (Priority 3) in eight locations within and around the surveyed area and an additional population 300 metres north of the Jameson Community (Figure 9; Ngaanyatjarra Council Land and Culture Unit, 2019b). This species was recorded in the Claypan Grassland vegetation type, which covers an approximately 600 metre stretch of the east-west bypass road, where it is the dominant grass species in some areas south of the proposed road (Ngaanyatjarra Council Land and Culture Unit, 2019b). The remaining conservation significant flora species identified pre-survey review were not identified within the surveyed area (Ngaanyatjarra Council Land and Culture Unit, 2019b). The proposed clearing within the Claypan Grassland vegetation type is likely to include a number of *Aristida jerichoensis* var. *subspinulifera* individuals. However, given the extent and density of *Aristida jerichoensis* var. *subspinulifera* populations within the vicinity of the application area, the proposed clearing is not likely to impact the species local occurrence or conservation status. Noting the presence of priority flora within the application area, and the potential for the proposed clearing introduce weeds in the surrounding environment, the proposed clearing may be at variance with Principle (a).

According to available databases, 51 terrestrial fauna species have been recorded within a 40 kilometre radius of the application area, including four species of conservation significance; brush-tailed mulgara (*Dasyercus blythi*, Priority 4), greater stick-nest rat (*Leporillus conditor*, Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Vulnerable under the *Biodiversity Conservation Act 2019* (BC Act)), black-flanked rock-wallaby (*Petrogale lateralis* subsp. *lateralis*, Endangered under the EPBC Act and BC Act), and malleefowl (*Leipoa ocellata*, Vulnerable under the EPBC Act and BC Act). Whilst the application area contains suitable habitat for the greater stick-nest rat and malleefowl, given the small extent of the proposed clearing within a local area that contains approximately 95 per cent remnant native vegetation, the proposed clearing is not likely to be necessary for the maintenance of significant fauna habitat.



Legend

- Jameson (Mantamaru) Community
- Existing Roads
- 500 m buffer around proposed road realignment
- Proposed Road Realignment
- Aristida jerichoensis* var. *subspinulifera* (P3) recorded during survey
- Western Botanical Priority Flora Records August 2018

Figure 9. Priority flora species recorded within the survey area (Ngaanyatjarra Council Land and Culture Unit, 2019b).

Clearing activities have the potential to facilitate the spread of weeds into adjacent native vegetation. Buffel grass (*Cenchrus ciliaris*) is a weed of national significance and was identified throughout the surveyed area, in varying densities (Ngaanyatjarra Council Land and Culture Unit, 2019b). Weed species can decrease the biodiversity value of an area, as they out-compete native vegetation for available resources, contribute to land degradation and increase the frequency and intensity of fires. Potential impacts to biodiversity within and nearby the application area as a result of the proposed clearing may be minimised by the implementation of weed management practices.

No threatened ecological communities (TEC) or priority ecological communities (PEC) occur within the Central Ranges IBRA bioregion. The closest PEC is located over 500 kilometres from the application area. The application area is not likely to comprise, or be necessary for the maintenance of any TEC or PEC.

The closest conservation area is the Gibson Desert National Reserve located approximately 140 kilometres northwest from the application area. Given the distance between the application area and the nearest conservation area, the application area is not likely to have an impact on the environmental values of any adjacent or nearby conservation areas.

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). Both the IBRA Central Ranges Bioregion and the mapped Beard vegetation association retains approximately 99 per cent of their pre-European extent (Government of Western Australia, 2018). Aerial imagery indicates the local area retains approximately 95 per cent remnant native vegetation. Although the Mulga over *Maireana triptera* shrubland vegetation community is reported to not be widespread in the local context (Western Botanical 2018), it was found to occur on raised landforms within the surveyed area and is not within the area proposed to be cleared (Ngaanyatjarra Council Land and Culture Unit, 2019b). Given the above, the vegetation proposed to be cleared is not considered to be significant as a remnant of native vegetation that has been extensively cleared.

There are no watercourses and wetlands mapped within the area proposed to be cleared. No wetland or watercourses were identified within the application area during the 2019 survey (Ngaanyatjarra Council Land and Culture Unit, 2019b). The proposed clearing will not impact on vegetation growing in, or in association with, an environment associated with a watercourse or wetland.

There are no public drinking water source areas located within the application area. The application area is located within the East Murchison Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1947*. A review of available databases determined the groundwater resources in the vicinity of the application area has been mapped at a total dissolved solids content of 1,000 - 3,000 milligrams per litre, which is considered to be brackish. Considering the small extent of clearing

proposed (2.55 hectares) within a 25 hectare footprint, no adverse impacts to the quality of groundwater is anticipated to result from the proposed clearing.

Inundation may occur following significant rainfall events within the application area and surrounding environment. However, given the relatively low annual average rainfall of 293 millimetres and high annual average pan evaporation rates of 3,400 millimetres, the proposed clearing is not likely to cause or exacerbate the incidence or intensity of flooding.

As described within Section 2 of this report, the application area is located within the Musgrave Range Zone (Department of Primary Industries and Regional Development, 2019). Based on the images provided by the applicant (Ngaanyatjarra Council Land and Culture Unit, 2019b), the soil within the application area is consistent with the described red sandy earths and stony soils. Considering the extent of native vegetation remaining in the local area and the condition and composition of the vegetation proposed to be cleared, no appreciable land degradation impacts are expected to result from the proposed clearing activities.

Given the above, the proposed clearing may be at variance with Principle (a) and is not likely to be at variance with the remaining clearing principles.

Planning instruments and other relevant matters.

The area proposed to be cleared is within the Shire of Ngaanyatjarraku and in the Indigenous Protected Area managed by Ngaanyatjarra Council Aboriginal Corporation (Ngaanyatjarra Council Land and Culture Unit, 2019b). The Ngaanyatjarra Council Aboriginal Corporation is the lessee of Lot 9 on Deposited Plan 91722, Ngaanyatjarra-Giles, and has provided a letter of support for the Shire of Ngaanyatjarraku to construct the southern Bypass road for the Jameson Community (Ngaanyatjarra Council Aboriginal Corporation, 2019).

There are no registered Aboriginal Sites of Significance mapped within the area proposed to be cleared. It is the applicant's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

A heritage survey was conducted over the application area by the Ngaanyatjarra Council Land and Culture Unit on 27 and 28 November 2018 and 29 March 2019. The area proposed to be cleared for the Jameson bypass road was confirmed acceptable by the heritage survey team (Ngaanyatjarra Council Land and Culture Unit, 2019a).

The clearing permit application was advertised on 27 August 2019 with a 21 day submission period. No submissions were received in relation to this application.

5. References

- Commonwealth of Australia (2001). National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- Department of Primary Industries and Regional Development (2019). NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/> (Accessed March 2019).
- Government of Western Australia (2018). 2017 State-wide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of February 2018. WA Department of Parks and Wildlife, Perth.
- Keighery, B.J. (1994). Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Ngaanyatjarra Council Aboriginal Corporation (2019). Letter of Support for Jameson Southern Bypass. 17 June 2019. (DWER Ref: A1801692)
- Ngaanyatjarra Council Land and Culture Unit (2019a). Report to Ngaanyatjarraku Shire on Consultations and Heritage Survey in Relation to Proposed Construction of a Bypass Road on the western side of Jameson Community, Ngaanyatjarra-Giles, Western Australia. 26 May 2019. (DWER Ref: A1801691).
- Ngaanyatjarra Council Land and Culture Unit (2019b). Terrestrial Flora and Vegetation Impact Assessment, Ngaanyatjarra-Giles, Western Australia, 10 June 2019, (DWER Ref: A1801686).
- Ngaanyatjarra Council Land and Culture Unit (2019c). Terrestrial Flora and Vegetation Impact Assessment, Ngaanyatjarra-Giles, Western Australia. (DWER Ref: A1775076).
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Shire of Ngaanyatjarra (2019). Application for Clearing Permit CPS 8571/1. Received 25 June 2019. (DWER Ref: DWERDT171943)
- Thackway, R., and Cresswell, I.D. (1995) (Eds). An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves, Version 4.0. Australian Nature Conservation Agency, Canberra.
- Tille, P.J. (2006). Soil-landscapes of Western Australia's rangelands and arid interior. Department of Agriculture and Food, Western Australia.

GIS Databases:

- Aboriginal Sites of Significance
- Hydrography, linear
- Hydrography, hierarchy
- SAC bio datasets accessed October 2019