



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 5376/1
Permit Holder:	Shire of Chapman Valley
Duration of Permit:	22 March 2013 – 22 March 2023

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 widening.

2. Land on which clearing is to be done

East Bowes Road reserve, NARALING (PIN 1326984, PIN 1326985 and PIN 11635020)

3. Area of Clearing

The Permit Holder must not clear more than 3.4 hectares of native vegetation within the areas shaded yellow on attached Plan 5376/1a and Plan 5376/1b.

4. Application

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

5. Period in which clearing is authorised

The Permit Holder shall not clear any native vegetation after 22 March 2018.

6. 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.

7. Compliance with Assessment Sequence and Management Procedures

Prior to clearing any native vegetation under conditions 1, 2 and 3 of this Permit, the Permit Holder must comply with the Assessment Sequence and the Management Procedures set out in Part II of this Permit.

PART II – ASSESSMENT SEQUENCE AND MANAGEMENT PROCEDURES

8. Avoid, minimise etc 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.

9. Land on which revegetation and rehabilitation is to be done

The Permit Holder must revegetate and rehabilitate within Lot 2 on Plan 232354, HOWATHARRA and Crown Reserve 15204, NARALING, in accordance with condition 10 of this permit.

10. Retain vegetative material and topsoil, revegetation and rehabilitation

The Permit Holder shall:

- (a) retain vegetative material and topsoil removed by clearing authorised under this Permit and stockpile this vegetative material and topsoil within the area cross-hatched red on attached Plan 5376/1c and Plan 5376/1d.
- (b) within 6 months following clearing authorised under this permit, *revegetate* and *rehabilitate* within the area cross-hatched red on attached Plan 5376/1c and Plan 5376/1d by:
 - (i) re-shaping the surface of the land so that it is consistent with the surrounding 5 metres of uncleared land; and
 - (ii) ripping the ground on the contour to remove soil compaction;
 - (iii) laying the vegetative material and topsoil retained under condition 10(a) on the red hatched area;
 - (iv) deliberately *planting* and/or *direct seeding* native vegetation that will result in a similar species composition, structure and density of native vegetation to pre-clearing vegetation types in that area; and
 - (v) ensuring only *local provenance* seeds and propagating material are used to *revegetate* and *rehabilitate* the area.
- (c) within 18 months of laying the vegetative material and topsoil on the cleared area in accordance with condition 10(b) of this Permit:
 - (i) engage an *environmental specialist* to determine the species composition, structure and density of the area *revegetated* and *rehabilitated*; and
 - (ii) where, in the opinion of an *environmental specialist*, the composition structure and density determined under condition 10(c)(i) of this Permit will not result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, *revegetate* the area by deliberately *planting* and/or *direct seeding* native vegetation that will result in a similar species composition, structure and density of native vegetation to pre-clearing vegetation types in that area and ensuring only *local provenance* seeds and propagating material are used.
- (d) Where additional *planting* or *direct seeding* of native vegetation is undertaken in accordance with condition 10(c)(ii) of this permit, the Permit Holder shall repeat condition 10(c)(i) and 10(c)(ii) within 24 months of undertaking the additional *planting* or *direct seeding* of native vegetation.

- (e) Where a determination by an *environmental specialist* that the composition, structure and density within areas *revegetated* and *rehabilitated* will result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, as determined in condition 10(c)(i) and (ii) of this permit, that determination shall be submitted for the CEO's consideration. If the CEO does not agree with the determination made under condition 10(c)(ii), the CEO may require the Permit Holder to undertake additional *planting* and *direct seeding* in accordance with the requirements under condition 10(c)(ii).

PART III - RECORD KEEPING AND REPORTING

11. Records must be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit:

- (a) In relation to the clearing of native vegetation authorised under this Permit:
- (i) the species composition, structure and density of the cleared area;
 - (ii) 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;
 - (iii) the date that the area was cleared; and
 - (iv) the size of the area cleared (in hectares).
- (b) In relation to the *revegetation* and *rehabilitation* of the area pursuant to condition 10 of this Permit:
- (i) a description of the *revegetation* and *rehabilitation* activities undertaken;
 - (ii) the size of the area *revegetated* and *rehabilitated* (in hectares); and
 - (iii) the species composition, structure and density of *revegetation* and *rehabilitation*.

12. Reporting

- (a) The Permit Holder must provide to the CEO on or before 30 June of each year, a written report:
- (i) of records required under condition 11 of this Permit; and
 - (ii) concerning activities done by the Permit Holder under this Permit between 1 January to 31 December of the preceding calendar year.
- (b) If no clearing authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar year, a written report confirming that no clearing under this permit has been carried out, must be provided to the CEO on or before 30 June of each year.
- (c) Prior to 22 December 2022, the Permit Holder must provide to the CEO a written report of records required under condition 12 of this Permit where these records have not already been provided under condition 12(a) of this Permit.

DEFINITIONS

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

direct seeding means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the desired plant species;

environmental specialist means a person who is engaged by the Permit Holder for the purpose of providing environmental advice, who holds a tertiary qualification in environmental science or equivalent, and has experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit;

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

local provenance means native vegetation seeds and propagating material from natural sources within 50 kilometres of the area cleared.

mulch means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation;

optimal time means the period from April to May for undertaking *direct seeding*, and the period from May to June for undertaking *planting*;

planting means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species;

regenerate/ed/ion means re-establishment of vegetation from in situ seed banks and propagating material (such as lignotubers, bulbs, rhizomes) contained either within the topsoil or seed-bearing *mulch*;

rehabilitate/ed/ion means actively managing an area containing native vegetation in order to improve the ecological function of that area; and

revegetate/ed/ion means the re-establishment of a cover of *local provenance* native vegetation in an area using methods such as natural *regeneration*, *direct seeding* and/or *planting*, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.

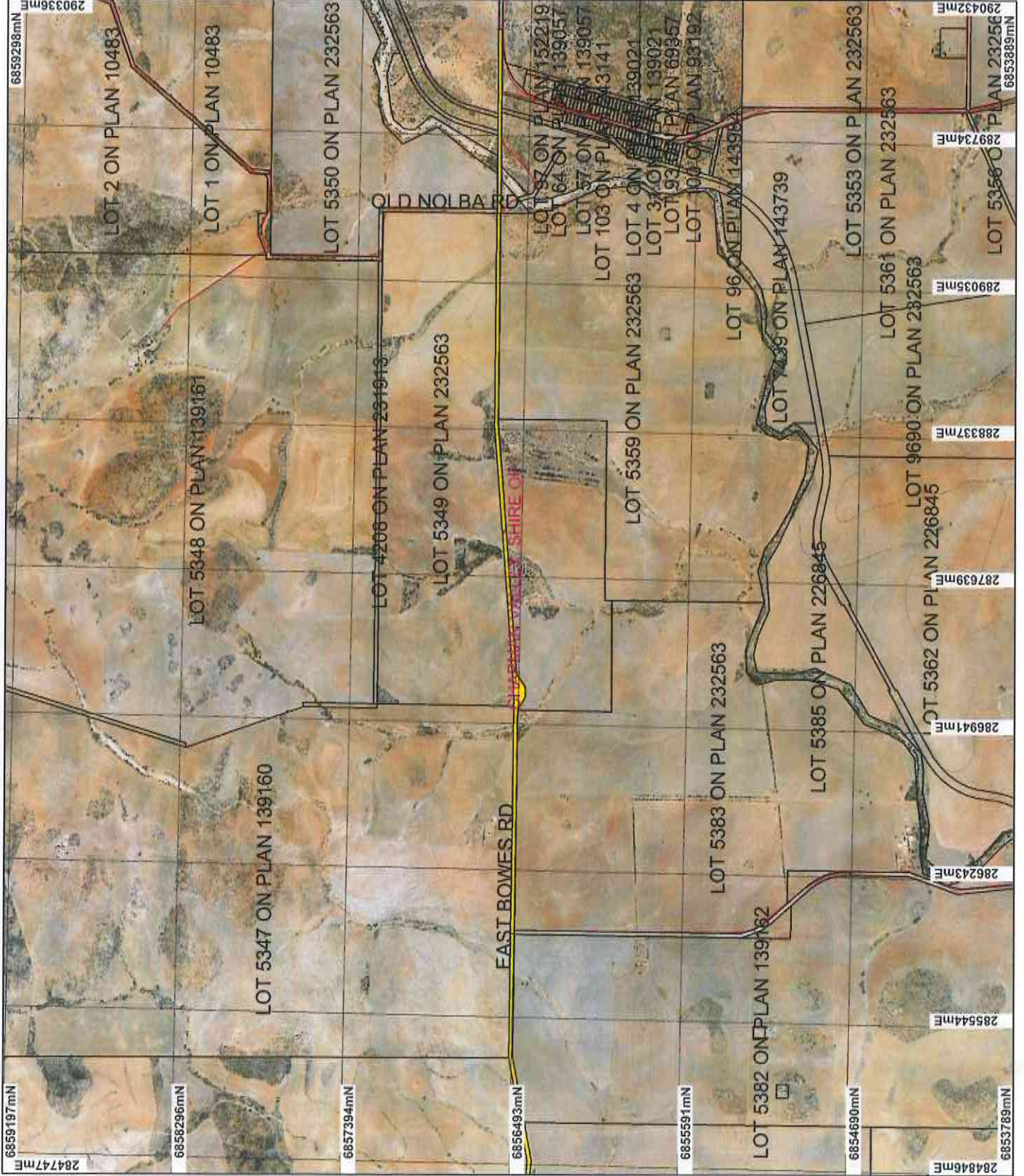


M Warnock
A/MANAGER
NATIVE VEGETATION CONSERVATION BRANCH

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

28 February 2013

Plan 5376/1a



LEGEND

- Road Centrelines
 - Cadastre 1
 - Clearing Instruments
 - Areas Approved to Clear
 - Local Government Authorities
- Northampton Shire Orthomosaic - Landgate 2006

* Project Data. This data has not been quality assured. Please contact map author for details.



0 750 m

Scale 1:26489

(Approximate when reproduced at A4)

Geocentric Datum Australia 1984

Note: this data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies.

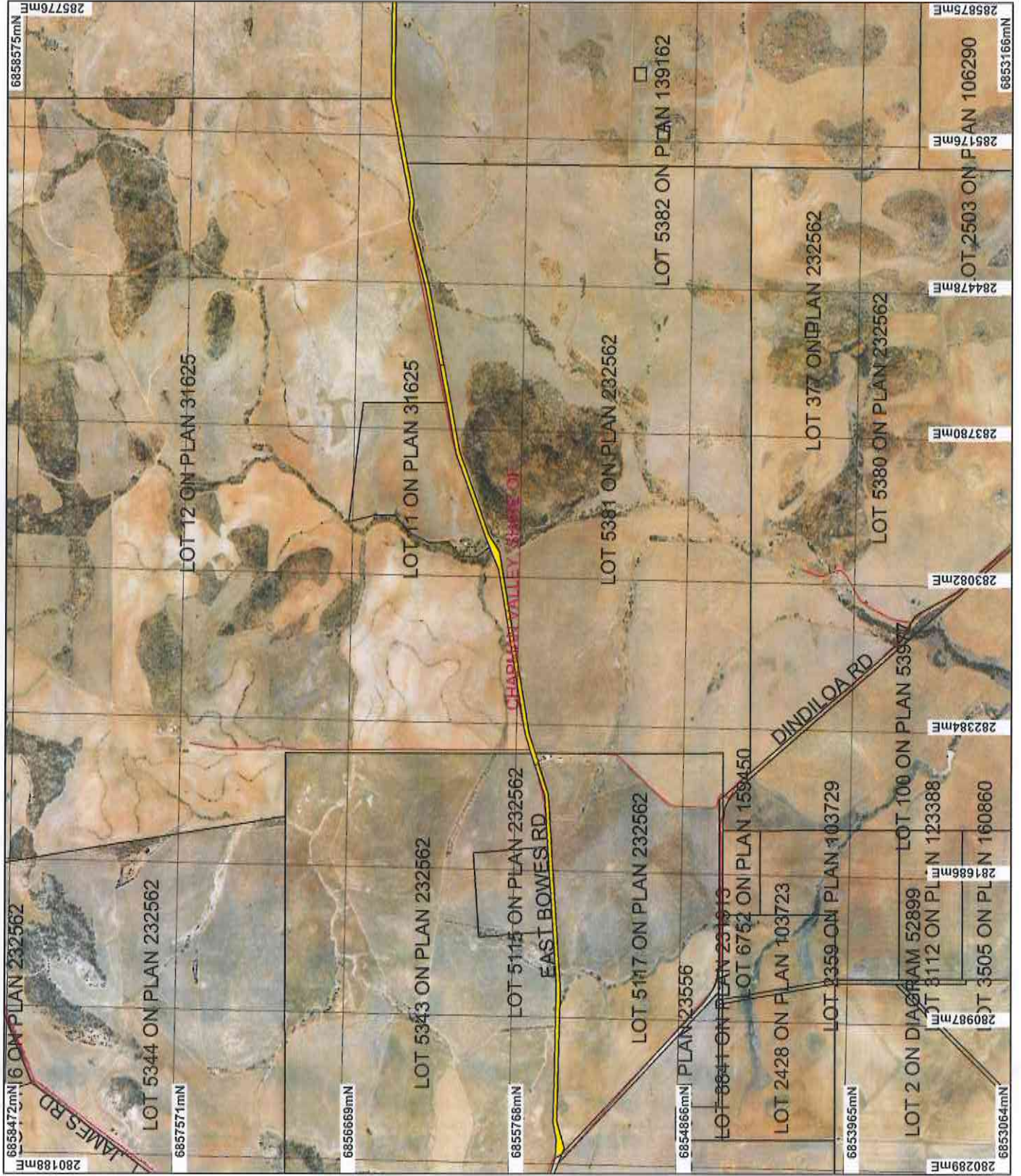
David Smith Date 28/2/13
M Warrack

Information derived from the map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.

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Plan 5376/1b



LEGEND

- Road Centrelines
 - Cadastre 1
 - Clearing Instruments
 - Areas Approved to Clear
 - Local Government Authorities
- Northampton Shire Orthomosaic - Landgate 2006

* Project Data. This data has not been quality assured. Please contact map author for details.



Scale 1:26488
(Approximate when reproduced at A4)

Geocentric Datum Australia 1994

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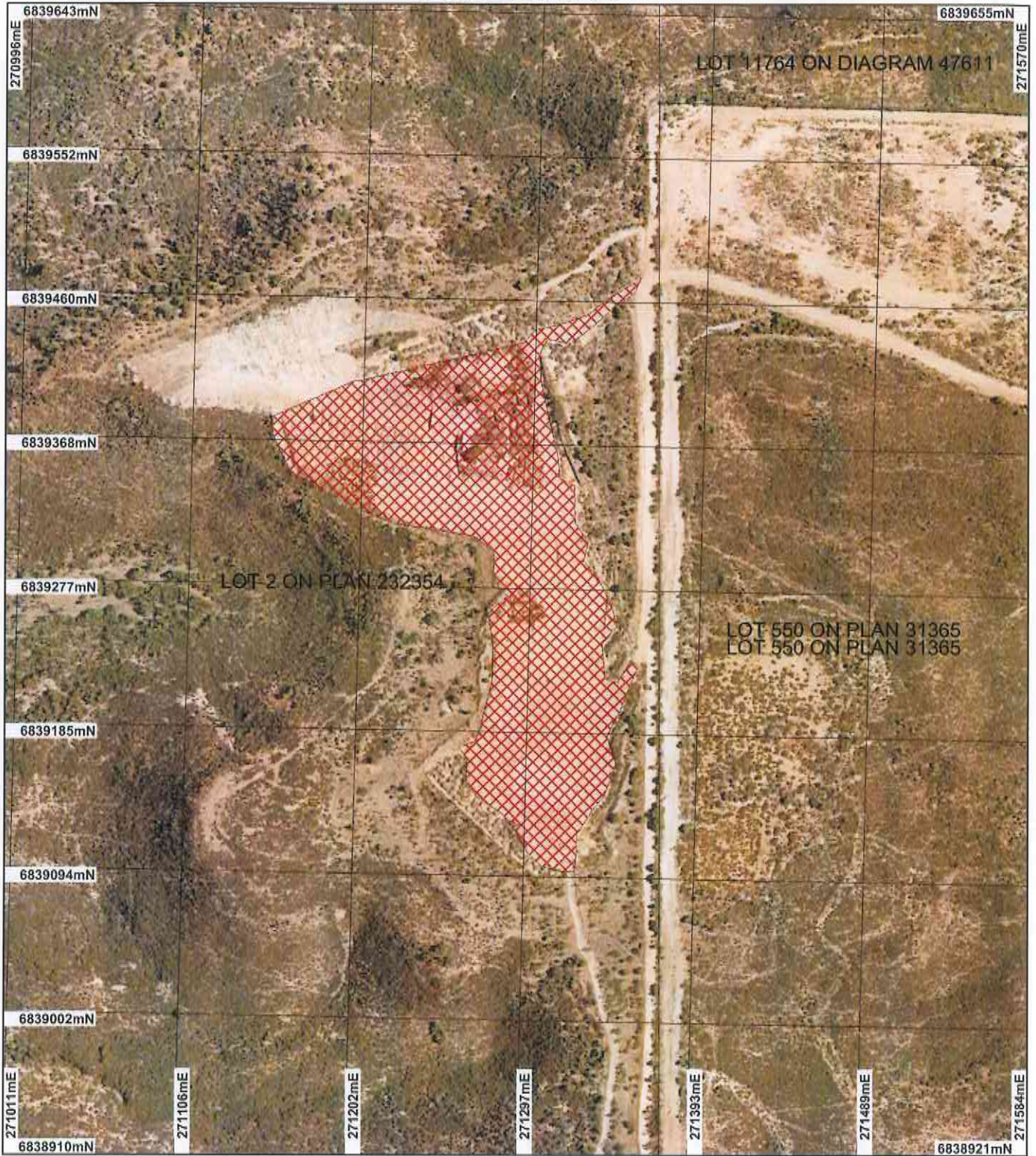
Amended Date 28/2/19
M Williams

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Plan 5376/1c



LEGEND

-  Instruments
-  Areas Subject to Conditions
- Geraldton 50cm Orthomosaic - Landgate 2006



Scale 1:3285
(Approximate when reproduced at A4)

Geocentric Datum Australia 1994

Note: the data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies.

M Warnock Date 28/2/13

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

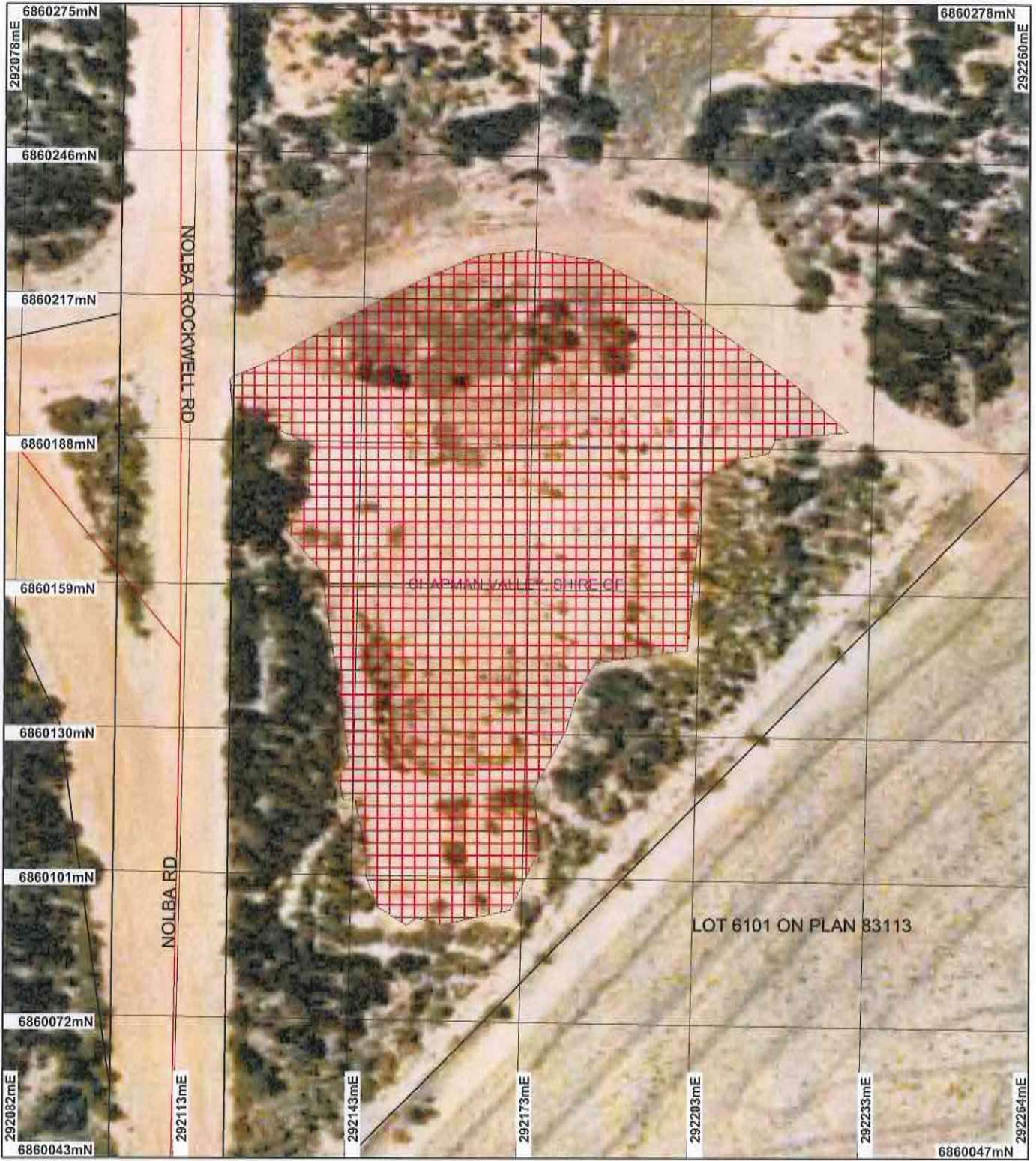
Information derived from this map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.



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Plan 5376/1d



LEGEND

- Road Centrelines
- Cadastre_1
- Clearing Instruments
- Areas Subject to Conditions
- Local Government Authorities

Northampton 50cm
Orthomosaic - Landgate
2006



Scale 1:1037

(Approximate when reproduced at A4)

Geocentric Datum Australia 1994

Note: the data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies.

M Warnock Date *28/2/13*

M Warnock

Officer with delegated authority under Section 10 of the Environmental Protection Act 1986

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1. Application details

1.1. Permit application details

Permit application No.: 5376/1
 Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Shire of Chapman Valley

1.3. Property details

Property: ROAD RESERVE (NARALING 6532)
 Local Government Area: Shire of Chapman Valley
 Colloquial name: East Bowes Rd

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
3.4		Mechanical Removal	Road construction or maintenance

1.5. Decision on application

Decision on Permit Application: Grant
 Decision Date: 28 February 2013

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
The area under application has been mapped as Beard Vegetation Association 35, described as Shrublands; jam scrub with scattered York gum (Shepherd et.al, 2001).	The application is to clear 3.4 hectares of native vegetation along a ten kilometre stretch of East Bowes road for the purpose of road realignment. A flora survey of the application area undertaken in 2011 and updated in February 2013, revealed the following 4 vegetation communities (Siemon, 2013). Community 1: Tall open scrub of <i>Acacia saligna</i> , <i>Acacia rostellifera</i> , <i>Acacia tetragonophylla</i> and <i>Hakea</i> spp. over Low shrubland of <i>Grevillea pinaster</i> and agricultural weeds. Serious environmental weeds dominate portions of the understorey (Siemon, 2013). Community 2: <i>Grevillea pinaster</i> , <i>Scholtzia</i> and <i>Thyrtomene</i> open heath over low open heath. Annual grass weeds characterise the understorey (Siemon, 2013). Community 3: Chaotic weed assemblage (Siemon, 2013). Watercourse communities: <i>Casuarina obesa</i> over Couch (<i>Cynodon dactylon</i>) with some <i>Enchylaena tomentosa</i> (Siemon, 2013). Sixty percent of the application area was mapped in a degraded (Keighery, 1994) condition, 33 percent in a good condition and seven percent in a very good condition (Siemon, 2013).	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994) To Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994)	The clearing description and vegetation condition were determined through a flora survey of the application area undertaken in 2011 and updated in February 2013 (Siemon, 2013).

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments	<p>Proposal may be at variance to this Principle</p> <p>The vegetation under application is comprised of 3.4 hectares of native vegetation in a degraded to very good condition (Keighery, 1994) condition.</p> <p>A flora survey was also undertaken by the applicant in August 2011 and no rare or priority flora species were identified (Shire of Chapman Valley, 2013b).</p> <p>The areas in good to very good (Keighery 1994) condition are considered to represent a Beard vegetation association that is under represented within the Geraldton Sandplains Bioregion, with Beard vegetation association 35 having 17.02 per cent of pre-European extent remaining (Government of Western Australia 2011). In addition, less than 10 per cent of native vegetation remains within a 10 kilometre radius of the application area. The removal of 3.4 hectares of vegetation would reduce the percentage of Beard vegetation 35 remaining by roughly 0.004 per cent in the Geraldton Sand plains bioregion.</p> <p>As the application area contains portions of vegetation that are in a good to very good (Keighery 1994) condition and represents a highly cleared vegetation community, it is considered that the remaining vegetation under application is significant habitat for flora and fauna in the local area and therefore the proposed clearing may be at variance to this Principle.</p>
Methodology	<p>References:</p> <ul style="list-style-type: none">- Keighery (1994)- Shire of Chapman Valley (2013b) <p>GIS Data Sets</p> <ul style="list-style-type: none">- SAC Bio datasets (Accessed December 2012)- Pre-European vegetation

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments	<p>Proposal may be at variance to this Principle</p> <p>There are mapped records (DEC, 2007-) of 19 fauna species of conservation significance within the local area (20 kilometres radius), three of these species are listed as 'rare or likely to become extinct' on the Wildlife Conservation (Specially Protected Fauna) Notice 2012(2).</p> <p>Of the species listed as 'rare or likely to become extinct' the Southern Giant Petrel is an avian species preferring coastal environments and is not likely to occur within the application area. Images supplied by the applicant (Shire of Chapman Valley, 2012) depict vegetation devoid of large trees suitable as roosting and nesting sites for <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo) and, given its predominantly degraded (Keighery, 1994) condition, the application will not remove a substantial amount of foraging habitat. Therefore, it is not likely for the proposed clearing to contain significant habitat for this species.</p> <p>A record for <i>Idiosoma nigrum</i> (Shield-backed Trapdoor Spider) was recorded in 1982 from under a sheet of iron in the town of Northampton, 14 kilometres from the application area. This species preferred habitat consists of Open Eucalypt Woodland with a sparse <i>Acacia acuminata</i> understorey on clay soils. As the application area does not contain this habitat type, and is predominantly in a degraded (Keighery, 1994) condition, it is not likely that the application area forms habitat for this species.</p> <p>Of the species listed as priority and specially protected, the application may form habitat for <i>Lerista yuna</i> (Yuna Broad-blazed Slider) as well as foraging habitat for three predatory avian species.</p> <p>Given the extensively cleared and highly fragmented nature of native vegetation within the landscape (10 per cent of pre-European vegetation extent remaining), it is considered that any remaining remnant vegetation in the local area is important as wildlife habitat and as linkages between patches of remnant vegetation. The proposed clearing may therefore impact on significant habitat for local fauna.</p> <p>Given the above, the proposed clearing may be at variance to this Principle.</p>
Methodology	<p>References:</p> <ul style="list-style-type: none">- Wildlife Conservation (Specially Protected Fauna) Notice 2012(2)- DEC (2007-)- Shire of Chapman Valley (2012)- Keighery (1994) <p>GIS Data Sets</p> <ul style="list-style-type: none">-SAC Bio datasets (Accessed December 2012)

- Pre-European vegetation
- Northampton 50cm Orthomosaic.
- NWLRA, extent of vegetation

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments **Proposal is not likely to be at variance to this Principle**
 The application area has been mapped as soil type Pb29 which is described as generally rolling but sometimes undulating or hilly terrain on granulite; some rock outcrops; some mesas and buttes of unit Uc2: chief soils are hard acidic red soils and neutral red soils (Northcote et al 1960 - 1968). Photos supplied by the applicant (Shire of Chapman Valley, 2012) confirm the presence of red soils on a predominantly flat landscape with no rocky outcrops. Numerous minor watercourses and the Chapman River also cross the application area.

Two rare flora species have been mapped within a 10 kilometre radius of the application area. Given the mapped soil type and details of the preferred habitat for each recorded rare flora (Brown et al. (1998), the application may contain suitable habitat for one of these (DEC, 2012). A flora survey was also undertaken by the applicant in August 2011 and no rare or priority flora species were identified (Shire of Chapman Valley, 2013b).

Given the above the application is not likely to be at variance to this Principle.

Methodology **References:**

- Northcote et al (1960 - 1968)
- Brown et al. (1998)
- Shire of Chapman Valley (2012b)

GIS Data Sets

- SAC Bio datasets (Accessed December 2012)
- Pre-European vegetation
- Soils, statewide

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments **Proposal is not likely to be at variance to this Principle**
 The closest recorded Threatened Ecological Community is over 100km from the application area. Given this, the application is not likely to be at variance to this clearing principle.

Methodology **GIS Data Sets**

- SAC Bio datasets (Accessed January 2013)
- Pre-European vegetation

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments **Proposal is at variance to this Principle**
 The local area (10 kilometre radius) is approximately 10 per cent vegetated with a majority of this vegetation occurring within small isolated remnants of native vegetation.

The application area is in a degraded to very good (Keighery, 1994) condition and has been mapped as Beard vegetation 35, of which there is approximately 17 per cent of its pre-European extent remaining in the Geraldton Sand plains bioregion (Government of Western Australia, 2011). The removal of 3.4 hectares of vegetation would reduce the percentage of Beard vegetation 35 remaining by roughly 0.004 per cent in the Geraldton Sand plains bioregion.

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).

Given that portions of the application represent this highly cleared vegetation community, that the vegetation may be considered likely to represent significant fauna habitat and that it occurs within an extensively cleared landscape, the proposed clearing is at variance to this Principle.

	Pre-European (ha)	Current Extent Remaining (ha)	Remaining (%)	Extent in DEC Managed Lands (%)
IBRA Bioregion*				
Geraldton Sand Plains	3,136,026	1,408,070	45	40

Shire*					
Shire of Chapman Valley	398,022	135,291	34	42	
Beard Vegetation Association in Bioregion*					
35	184,502	31,397	17	2	

* Government of Western Australia (2011)

Methodology

References

- Government of Western Australia (2011)
- Commonwealth of Australia (2001)
- Keigehry (1994)

GIS Databases

- Geraldton 50cm Orthomosaic - Landgate 2006
- SAC Biodatasets (accessed December 2012)
- Pre European Vegetation (DA 2001)
- Current Extent of Native Vegetation (NLWRA 2001)
- Interim Biogeographic Regionalisation of Australia (EA 10/00)

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments

Proposal is at variance to this Principle

The Chapman River (classified as a major river) and nine minor non-perennial watercourses have been mapped within the application area. Vegetation condition maps supplied by the applicant (Shire of Chapman Valley, 2013a) depict the riparian vegetation along the Chapman River to be in a good (Keighery, 1994) condition.

The application is for the purpose of road widening; given the length of road (10 kilometres) and application area (3.4 hectares), this would allow for 1.5 metres of clearing on each side of the road. As the banks of the identified watercourses are already altered by the passage of the road corridor, the proposed widening will not have significant additional impacts on the movement of water through the environment.

As the application impacts on vegetation associated with watercourses it is at variance to this Principle. The clearing of riparian vegetation should be avoided and minimised where possible to limit environmental impacts on these areas.

Methodology

References:

- Shire of Chapman Valley (2013a)
- Keighery (1994)

GIS Data Sets

- Hydrography linear
- Hydrography linear (Hierarchical)

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments

Proposal is not likely to be at variance to this Principle

Due to the limited size, linear nature of the application area and as the land will be compacted and maintained as a road. The application is not likely to be at variance to this clearing principle.

Methodology

GIS Databases

- Geraldton 50cm Orthomosaic - Landgate 2006

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments

Proposal is not likely to be at variance to this Principle

The application area is 10 kilometres from the nearest conservation area and does not form a direct ecological linkage between areas of conservation.

The application is not likely to be at variance to this Principle.

Methodology

GIS Data Sets

- DEC Tenure
- Town Planning Scheme (Regional)

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments Proposal is not likely to be at variance to this Principle

Ground water salinity levels in the local area have been mapped as moderate at between 1000 - 3000 total dissolved solids milligrams per litre. The limited clearing (3.4 hectares) is not considered likely to increase the risk of salinity and is not likely to affect the quality of groundwater.

Although the application area crosses nine minor watercourses and the Chapman River, the application is not likely to cause further deterioration in the quality of surface water as the banks of the identified watercourses are already altered by the passage of the road corridor. The application is not likely to have further detrimental impact on the quality of surface water.

The application is not likely to be at variance to this clearing Principle.

Methodology GIS Data Sets
- Salinity Statewide
- Hydrography linear (Hierarchical)

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments Proposal is not likely to be at variance to this Principle

The applied clearing area lies within an area with an evaporation rate of approximately 1,500 millimetres and a mean annual rainfall of 500 millimetres.

Although the application crosses watercourses, it is not likely that the application will cause or exacerbate the incidence or intensity of flooding as the movement of water through the landscape will not be altered. The application is not likely to be at variance to this clearing Principle.

Methodology GIS Data Sets
- Evaporation Isoleths
- Rainfall, Mean Annual

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments

The application is to clear 3.4 hectares of native vegetation for the purpose of road widening.

The applicant was sent a letter on the 17 January 2013 asking as to how identified environmental impacts will be managed. In response the applicant has proposed the revegetation of a 3 hectare gravel pit to offset these impacts (Shire of Chapman Valley, 2013c).

An Aboriginal Site of Significance has been mapped within the application area. The proponent is advised to contact the Department of Indigenous Affairs to seek advice on their responsibilities under the Aboriginal Heritage Act 1972.

Methodology References:
- Shire of Chapman Valley (2013c)

GIS Data Sets
- Aboriginal Sites of Significance

4. References

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

DEC (2007 -) NatureMap: Mapping Western Australia's Biodiversity. Department of Environment and Conservation. URL: <http://naturemap.dec.wa.gov.au/>. Accessed 28/11/2012.

EPA (2000) Environmental protection of native vegetation in Western Australia. Clearing of native vegetation, with particular reference to the agricultural area. Position Statement No. 2. December 2000. Environmental Protection Authority, Western Australia.

Government of Western Australia (2011); 2011 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). WA Department of Environment and Conservation, 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.

Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68): 'Atlas of Australian Soils, Sheets 1 to 10, with explanatory data'. CSIRO and Melbourne University Press: Melbourne.

Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.

Shire of Chapman Valley (2012) Information submitted in support of Clearing Permit Application CPS 5376/1, East Bowes Road reserve. Shire of Chapman Valley, Western Australia (DEC Ref. A569341).

Shire of Chapman Valley (2013a) Vegetation condition maps submitted in support of Clearing Permit Application CPS 5376/1, East Bowes Road reserve. Shire of Chapman Valley, Western Australia (DEC Ref. A597059).

Shire of Chapman Valley (2013b) Offset information submitted in support of Clearing Permit Application CPS 5376/1, East Bowes Road reserve. Shire of Chapman Valley, Western Australia (DEC Ref. A596518).

Siemon, N (2013) East Bowes Road, Shire of Chapman Valley, Flora and Vegetation Survey. Nicole Siemon and Associates PL, Western Australia (DEC Ref. A601010).

Western Australian Herbarium (1998-) FloraBase - The Western Australian Flora. Department of Environment and Conservation. <http://florabase.dec.wa.gov.au/> (Accessed December 2012).