GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 7827/1
Permit Holder:	Shire of West Arthur
Duration of Permit:	19 July 2018 – 19 July 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**
   Bowelling-McAlinden Road Reserve (PINs 11518542 and 11518543), Bowelling
   Bowelling-Duranillin Road Reserve (PINs 11301192, 11301193, 11301189, 11301187, 11301188, 11301190, 11301206 and 11301196), Bowelling

3. **Area of Clearing**
   The Permit Holder must not clear more than 1.2 hectares of native vegetation and nine native trees within the combined areas cross-hatched yellow on attached Plan 7827/1a, Plan 7827/1b and Plan 7827/1c.

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. **Dieback and 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* and *dieback*:
(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
(b) ensure that no *dieback* or *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared; and
(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared;

8. **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* and *dieback* in accordance with condition 7 of this Permit.

9. **Reporting**
The Permit Holder must provide to the *CEO* the records required under condition 8 of this Permit, when requested by the *CEO*.

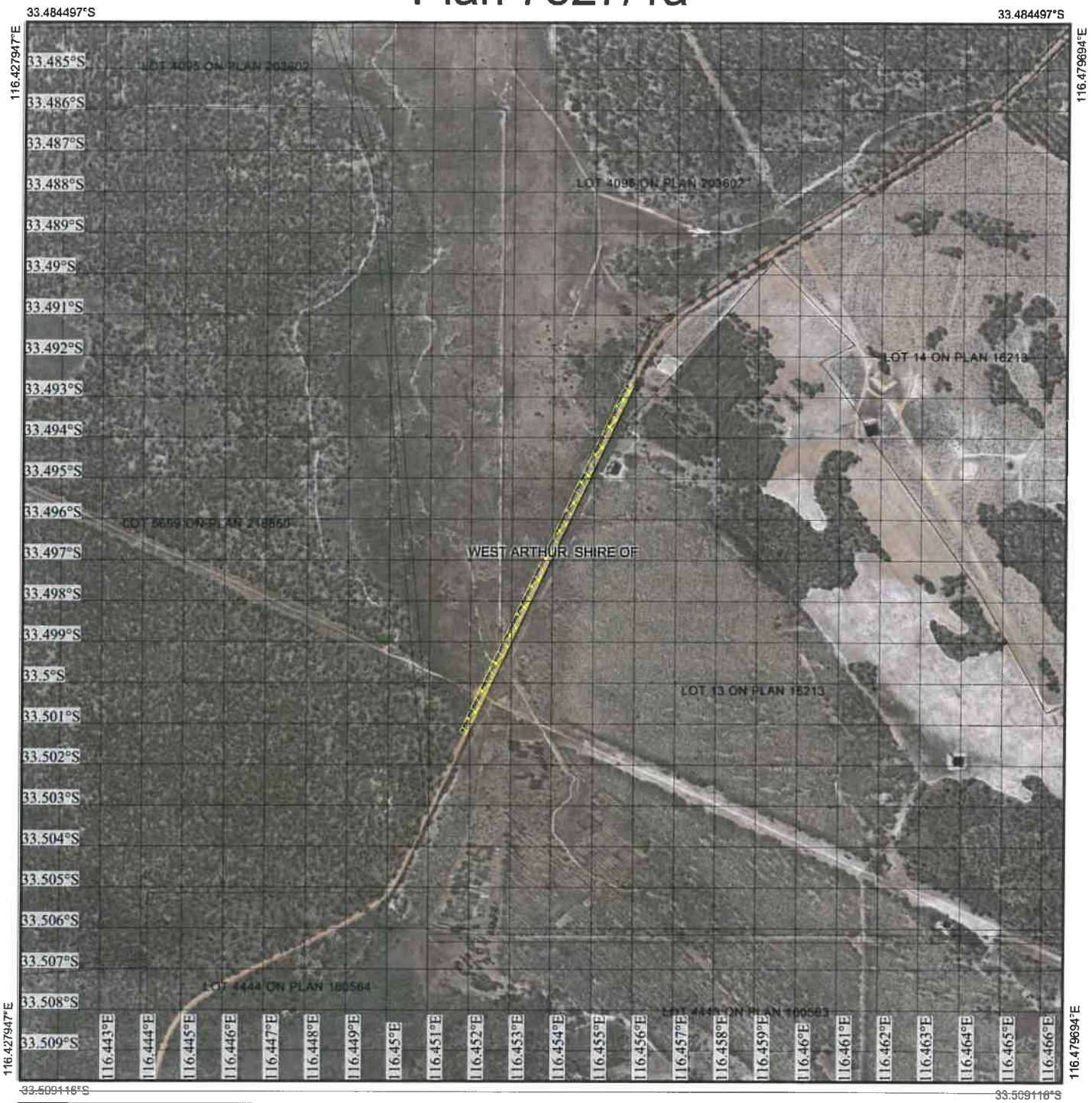
DEFINITIONS
The following meanings are given to terms used in this Permit:
CEO: means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*;
dieback means the effect of *Phytophthora* species on native vegetation;
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;
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 Parks and Wildlife Regional Weed Rankings Summary, regardless of ranking; or
(c) not indigenous to the area concerned.

Mathew Gannaway
MANAGER
CLEARING REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

19 June 2018

Plan 7827/1a



Legend

- Imagery
- Clearing Instruments Activities
- Local Government Authority

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(Approximate when reproduced at A4)

GDA 94 (Lat/Long)

Geocentric Datum of Australia 1994

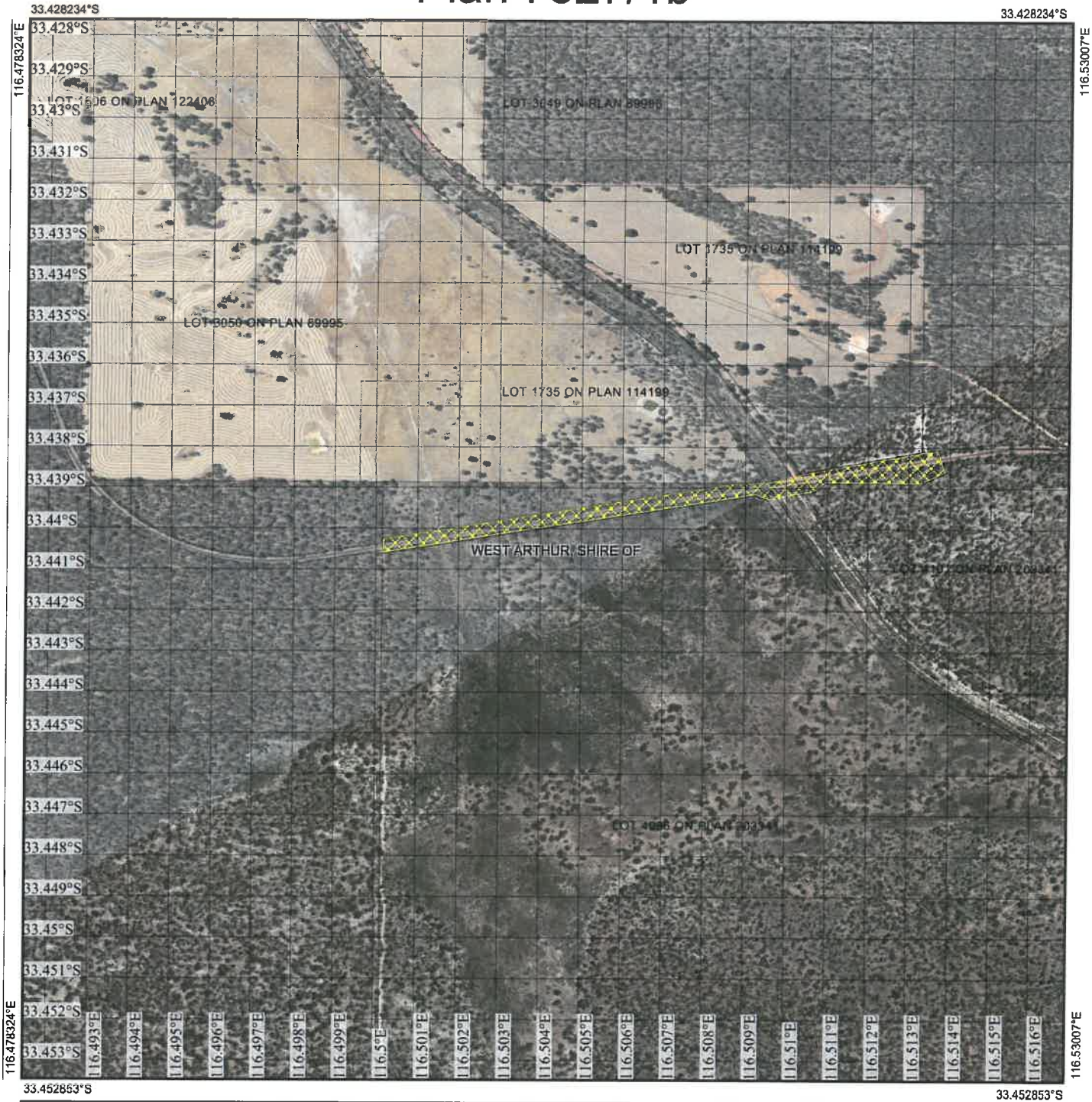
..... Date 19/06/2018.

Matthew Gannaway

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

GOVERNMENT OF WESTERN AUSTRALIA

Plan 7827/1b



Legend

- Imagery
- Clearing Instruments Activities
- Local Government Authority

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Geocentric Datum of Australia 1994

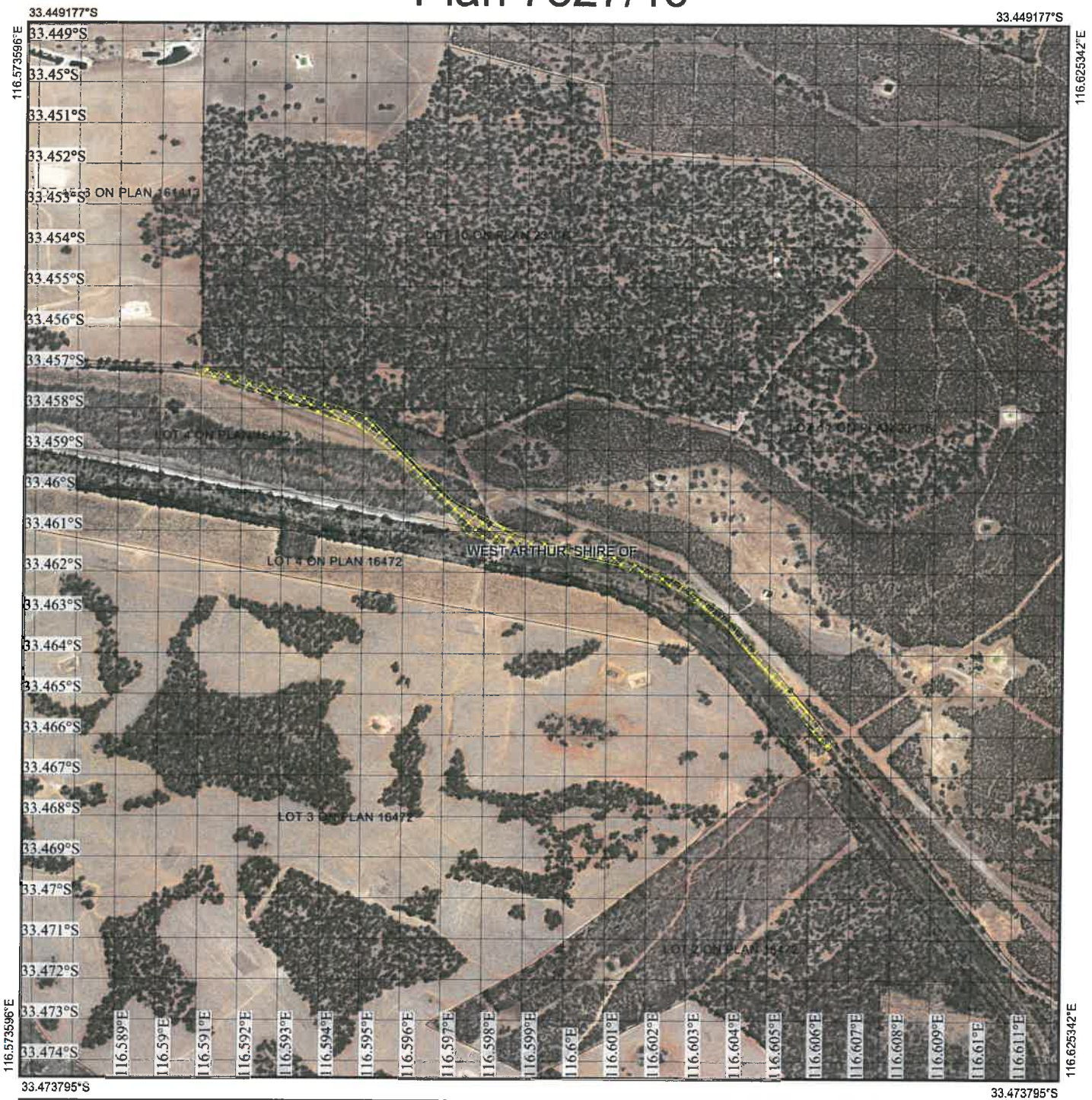
..... Date 19/06/2018...

Mathew Genneway

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

GOVERNMENT OF WESTERN AUSTRALIA

Plan 7827/1c



Legend

- Imagery
- Clearing Instruments Activities
- Local Government Authority

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GDA 94 (Lat/Long)

Geocentric Datum of Australia 1994

Mathew Gennewey ..... Date 19/06/2018

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

GOVERNMENT OF WESTERN AUSTRALIA

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 7827/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Shire of West Arthur
Application received date: 20 October 2017

1.3. Property details

Property: Bowelling-McAlinden Road Reserve (PINs 11518542 and 11518543), Bowelling
Bowelling-Duranillin Road Reserve (PINs 11301192, 11301193, 11301189, 11301187, 11301188, 11301190, 11301206 and 11301196), Bowelling
Local Government Authority: Shire of West Arthur
Localities: Bowelling

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
1.2		Mechanical Removal	Road construction or upgrades

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 19 June 2018
Reasons for Decision:

The clearing permit application was received on 20 October 2017 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 to principles (a), (c) and (f), is not at variance to principle (b) and (e) and is not likely to be at variance to the remaining principles.

The Delegated Officer noted that the proposed road seal widening activities and vegetation removal will occur from between the edge of the road seal to the outer edge of adjoining table drain (the road formation) which includes the 0.5 metre wide gravel shoulder. With the exception of three small trees within Locality B and a group of up to five young trees and one dead tree within Locality C, native vegetation clearing will only involve ground cover and shrubs where required.

It was also noted that a section of the proposed clearing within Locality B is adjacent to a population of a rare flora (orchid) species. The Delegated Officer noted the linear nature and small amount of proposed clearing, the proposed road works will be restricted to the existing road formation and is unlikely to impact the habitat of any flora of conservation significance. The Shire will adopt avoidance management measures, by demarcating areas of conservation significance, precluding machinery from entering these areas and thus minimising any potential impacts to flora habitat.

To minimise the risk of weeds and dieback spreading into the adjacent remnant vegetation at all three localities, a weed and dieback management condition will be included on the clearing permit.

In determining to grant a clearing permit subject to conditions, the Delegated Officer determined that potential impacts to the rare flora species can be adequately minimised and/or avoided and that the proposed clearing at all three localities is unlikely to lead to an unacceptable impact to the environment.

2. Site Information

Clearing Description

The proposed clearing of a combined 1.2 hectares of native vegetation within the road reserves detailed in Section 1.3 above is for widening of the existing road seal.

The three localities outlined throughout the duration of this report are defined below:

- Locality A - Bowelling-McAlinden Road Reserve – PINs 11518542 and 11518543, Bowelling (SLK 3.38-4.43) (0.42 hectares of proposed clearing);
- Locality B - Bowelling-Duranillin Road Reserve – PINs 11301192, 11301193, 11301187, 11301188, 11301190 and 11301196, Bowelling (SLK 2.97-4.27) (0.42 hectares of proposed clearing); and
- Locality C - Bowelling-Duranillin Road Reserve – PINs 11301189 and 11301206, Bowelling (SLK 12.02-13.84) (0.36 hectares of proposed clearing).

Vegetation Description

The vegetation within each application area is mapped as the following South West Vegetation Complexes (Mattiske and Havel, 1998):

Localities A and B:

- Swamp; Depressions and Swamps on Uplands; Mosaic of low open woodland of *Melaleuca preissiana-Banksia littoralis*, closed scrub of *Myrtaceae* spp., closed heath of *Myrtaceae* spp. and sedgelands of *Baumea* and *Leptocarpus* spp. on seasonally wet or moist sand, peat and clay soils on valley floors in all climatic zones.

Locality C:

- Pindalup; Darling Plateau; Open forest of *Eucalyptus marginata* subsp. *thalassica-Corymbia calophylla* on slopes and open woodland of *Eucalyptus wandoo* with some *Eucalyptus patens* on the lower slopes in semiarid and arid zones.

Vegetation Condition

Vegetation condition within the application area was determined from a Department of Water and Environmental Regulation (DWER) site inspection (DWER, 2018a). The application area was determined to be in the following condition (Keighery, 1994):

- Completely Degraded: the structure of the vegetation is no longer intact and the area is completely or almost completely without native species; to
- Degraded: Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management; to
- Good: Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate to it; to
- Very Good; Vegetation structure altered, obvious signs disturbance.

It was noted during the DWER site inspection that Locality A is in a Completely Degraded to Degraded (Keighery, 1994) condition. It is significantly disturbed, with long sections devoid of vegetation with, in some sections, a mono-culture of regenerating *Melaleuca* shrubs along the road verges' western drainage line. The road traverses a watercourse and adjoining areas which are also subject to winter inundation. This feature influences the type and condition of vegetation that grows here (DWER, 2018a).

Locality B is in a Good to Very Good (Keighery, 1994) condition, comprises a *Eucalyptus wandoo* open woodland over shrubland of *Melaleuca viminea*; occasional *Eucalyptus patens, E. marginata* and *Corymbia calophylla* with thickets of *Melaleuca* sp. shrubland. The road traverses several watercourses, with areas also subject to winter inundation.

Also noted during the DWER site inspection, some sections are devoid of vegetation and others exhibit a small degree of disturbance with a sparse mid-storey and a groundcover comprised of scattered native shrubs and weeds. Roadside markers delineate the approximate location of a rare flora population at the western end of Locality B (DWER, 2018a).

Locality C is predominately in a Completely Degraded to Degraded (Keighery, 1994) condition with just a small section in a Good (Keighery, 1994) condition. It also displays a vegetation structure and condition typical of many road verges with agricultural practices occurring in adjoining properties – areas devoid of vegetation, with either disturbed or weedy understories where often a mono-culture, as in this case, with an upper-storey of scattered and immature *Eucalyptus* sp. trees occur (DWER, 2018a) The road traverses several watercourses.

Soil type

The Department of Primary Industry and Regional Development (DPIRD) has mapped the soil types within the application area as:

Locality A and B
Harris subsystem – 2555DpHS; described as broad, poorly drained alluvial flats on the surface of the Darling Plateau; soils mapped as saline wet soils, wet soils and grey deep sandy duplex soils (DPIRD, 2017)

Locality C
Pindalup downstream valleys Phase - 255DpPNd; described as shallow minor valleys (5-10 m) dominated by broad (75-250 m) swampy floors; soils mapped as loamy gravels, deep sands, with saline and non-saline wet soils on the valley floors and saline wet soils, wet soils and semi-wet soils, loamy gravels and Duples sandy gravels (DPIRD, 2017)

Comment

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

3. Minimisation and mitigation measures

The proposed road seal widening activities will occur within the existing road formation and includes the gravel shoulders (which are 0.5 meters wide) and the adjacent table drains only. Road works will not need to extend beyond the existing drains and only that vegetation growing within these areas will require removal (DWER, 2018a).

4. Assessment of application against clearing principles

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

Proposed clearing may be at variance to this Principle

The Shire's scope of works, to widen the existing road seal, and vegetation clearing are required to accommodate an increase in heavy haulage vehicles using these roads. The proposed works will only involve the existing road formation (gravel shoulder and adjoining table drains) on each side of the road. With the exception of three immature trees within Locality B and up to five immature eucalyptus trees within Locality C, vegetation proposed to be cleared comprises predominately ground cover species such as small shrubs and bushes (DWER, 2018a; SWA, 2017 and 2018).

Locality A

As outlined in Section 2 above, the vegetation under application is mapped as "Swamp; Depressions and Swamps on Uplands; Mosaic of low open woodland of *Melaleuca preissiana-Banksia littoralis*, closed scrub of *Myrtaceae* spp., closed heath of *Myrtaceae* spp. and sedgelands of *Baumea* and *Leptocarpus* spp. on seasonally wet or moist sand, peat and clay soils on valley floors in all climatic zones" (Mattiske and Havel, 1998).

It was noted during a DWER site inspection that the vegetation is in a Completely Degraded to Degraded (Keighery, 1994) condition. It is significantly disturbed, with long sections of the road reserve devoid of vegetation, with some sections comprising only a mono-culture of regenerating *Melaleuca* shrubs (DWER, 2018a).

According to available datasets one Priority Two and one Priority Three listed flora species are mapped within the local (10 kilometre) area within the same soil and/or vegetation type that occurs within Locality A (WA Herbarium, 1998-). Noting that the works will be restricted to the existing road formation and the completely degraded to degraded condition of the application area, it is unlikely these species would occur or persist within the road formation area. In addition, the small amount of proposed clearing is not likely impact the conservation status of these species should any individuals occur within the road formation.

No ecological communities (priority or threatened) are mapped within the application area or the local area. Given the small amount of vegetation within the application area and the areas completely degraded to degraded condition, the vegetation under application is unlikely to comprise or support a conservation significant ecological community.

As assessed under Principles (b), (c), (d) and (e), Locality A is not likely to contain rare flora, a threatened ecological community (TEC), or significant habitat for indigenous fauna and is not likely to be significant as a remnant of native vegetation.

Locality B

As outlined in Section 2, the vegetation under application is also mapped as that described for Locality A.

A DWER site inspection noted that Locality B is in a Good to Very Good (Keighery, 1994) condition, varies slightly from the mapped vegetation type comprising a *Eucalyptus wandoo* open woodland over shrubland of *Melaleuca viminea*; occasional *Eucalyptus patens, E. marginata* and *Corymbia calophylla* with thickets of *Melaleuca* sp. shrubland. The road traverses a watercourse towards the western end, and the associated area is subject to winter inundation.

Also noted during the DWER site inspection, some sections are devoid of vegetation and others exhibit a small degree of disturbance with a sparse mid-storey and a groundcover comprised of scattered native shrubs and weeds. Roadside markers delineate the approximate location of a rare flora species, an orchid, in the adjoining vegetation at the western end of Locality B It is unlikely to be impacted by the proposed road widening works (refer to Principle (c) below) (DWER, 2018a). Two small *Melaleuca* sp. (paperbark) trees and one *Eucalyptus* sp. tree nearby to the rare flora area will need to be removed as each occur within the table drain; neither are considered habitat trees (DWER, 2018a).

According to available datasets, one Priority 1, one Priority 3 and one Priority 4 listed flora species are mapped within the local area and within the same soil and/or vegetation type that occurs within Locality B (WA Herbarium, 1998-).

The general area surrounding Locality B currently represents the only known distribution of the Priority 1 flora species, *Synaphea trinacriformis*. This species grows in grey, loamy sands amongst *Eucalyptus marginata* woodlands (WA Herbarium, 1998-). As noted during an onsite inspection in May 2018 between the Department of Biodiversity, Conservation and Attractions (DBCA) and the Shire of West Arthur (Shire), the proposed road works will be restricted to the existing gravel formation and is unlikely to impact the habitat of (any) flora of conservation significance (DBCA, 2018a). The Shire will adopt avoidance management measures, by demarcating areas of conservation significance, precluding machinery from entering these areas and thus minimising any potential impacts to flora habitat (DBCA, 2018a).

Noting the small extent of clearing, and that the works will be restricted to the road's existing gravel formation, it is unlikely the priority flora species occur, or could be impacted, by road works within the road formation.

No ecological communities (priority or threatened) are mapped within the application area or the local area. Given the minimal amount of vegetation proposed to be cleared, and that some areas exhibit a small degree of disturbance, with a sparse mid-storey and a groundcover comprised of scattered native shrubs and weeds, the vegetation under application is unlikely to comprise or support a conservation significant ecological community.

As assessed under Principles (b), (d) and (e), this location is not likely to contain a TEC, or significant habitat for indigenous fauna and is not likely to be significant as a remnant of native vegetation.

Locality C

As outlined in Section 2 above, the vegetation under application differs to that mapped at Localities A and B, being mapped as an "Open forest of *Eucalyptus marginata* subsp. *thalassica-Corymbia calophylla* on slopes and open woodland of *Eucalyptus wandoo* with some *Eucalyptus patens* on the lower slopes in semiarid and arid zones" (Mattiske and Havel,1998).

A DWER site inspection noted that Locality C is predominately in a Completely Degraded to Degraded (Keighery, 1994) condition with just a small section in a Good (Keighery, 1994) condition. It also displays a vegetation structure and condition typical of many road verges influenced by agricultural practices occurring in adjoining properties – areas devoid of vegetation, with either disturbed or weedy understories where often a mono-culture, as in this case, of an upper-storey of scattered and immature *Eucalyptus* sp. trees occur (DWER, 2018a).

Up to five immature eucalyptus trees in a small group and one dead tree at the eastern end, near a slight bend in the road, will require removal to improve road safety (DWER, 2018a; SWA, 2017and 2018).

According to available datasets, one Priority 1 listed flora species is mapped within the local area and within the same soil and/or vegetation type that occurs within Locality C (WA Herbarium, 1998-). Noting that the proposed road works will be restricted to the existing road formation, and given the completely degraded to degraded condition of the application area, it is unlikely this species would occur or persist within the road formation area. In addition, the proposed clearing would not likely impact the conservation status of this species should any individuals occur within the road formation (DBCA, 2018a).

No listed ecological communities (priority or threatened) are mapped within the application area or the local area. Given the minimal amount of vegetation to be cleared and its completely degraded to degraded condition, the vegetation under application is unlikely to comprise or support a conservation significant ecological community.

As assessed under Principles (b), (c), (d) and (e), this location is not likely to contain rare flora, a TEC, or significant habitat for indigenous fauna and is not likely to be significant as a remnant of native vegetation.

Given the above, Localities A and C are not likely to contain a high level of biological diversity and the proposed clearing is not likely to be at variance to this Principle. Locality B is not likely to contain a high level of biological diversity, however given the proximity of the rare and priority listed flora species, the proposed clearing may be at variance to this Principle.

Weed and dieback management practices will help minimise the risk of the proposed clearing impacting on the surrounding 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.

Proposed clearing is not at variance to this Principle

According to available databases, one threatened fauna (Baudin's Cockatoo), two Priority 4 fauna species (Quenda and Tammar Wallaby) and one fauna species protected under an international agreement (Rainbow Bee-eater), have been recorded within the local area (DBCA, 2007-).

As discussed in Principle (a), noting the small extent of the proposed clearing, and that the works will be restricted to the existing road formation (gravel shoulder and adjoining table drains) and associated groundcover vegetation, the proposed clearing will not impact on significant habitat for the above fauna species. The trees required to be removed do not contain any hollows suitable for breeding by Baudin's Cockatoo.

Given the above, all three application areas do not comprise the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia and the proposed clearing is not at variance to this Principle.

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

Proposed clearing may be at variance to this Principle

As outlined in Section 2 above, roadside markers delineate the approximate location of a rare orchid population in the adjoining vegetation within Locality B. The orchid's preferred habitat comprises sandy clay soils, in winter wet-swamps amongst dense native sedges and scattered shrubs and paperbarks (*Melaleuca* sp.) (CALM, 1998). It was noted during the DWER site inspection that some sections of the road reserve between the roadside markers and close to the road formation exhibit a small degree of disturbance (DWER, 2018a).

A follow-up site inspection in May 2018 conducted by DBCA and the Shire confirmed that the proposed road widening activities is unlikely to impact the orchid's habitat and that the scope of the proposed road works will be restricted to the existing road formation (DBCA, 2018). It was also confirmed that, as the road shoulder and associated table drains are comprised of gravel and are elevated above the surrounding landscape, it is unlikely that the orchid could grow or persist in the gravel environment. In some places where the road shoulder and drain are wider, the Shire advised that in those instances road works would not need to extend to the drains outer edge. Further, it was agreed that prior to any road works commencing, the extent of the rare flora's distribution and habitat will be delineated with flagging tape to ensure machinery and works would be excluded from the

rare flora's habitat. The Shire will give DBCA an opportunity to inspect the area before any works commence to ensure the rare flora's habitat is adequately excluded (DBCA, 2018).

DBCA also advised that the Shire would have to adhere to strict weed and dieback management practices to minimise the risk of weeds and dieback spreading into the rare flora's habitat. A weed and dieback management condition has been placed on the permit to mitigate this risk.

Given the potential for weeds and dieback to impact the rare flora population, the proposed clearing may be at variance to this Principle.

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

Proposed clearing is not variance to this Principle

As outlined in Section 2 and discussed in Principle (a) above, no listed TECs are mapped within the three application areas or the local area.

The vegetation condition within all three locations ranges from being in a Completely Degraded to Very Good (Keighery, 1994) condition with the majority within the completely degraded to degraded category.

The proposed road works and vegetation to be cleared will occur only within the road's existing gravel shoulder and adjoining table drain where minimal native vegetation occurs.

Therefore it is considered that the vegetation under application at all three locations does not comprise the whole or a part of, or is necessary for the maintenance of a TEC.

Given the above, the proposed clearing for each location is not at variance to this Principle.

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

Proposed clearing is not at variance to this Principle

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). The application area is located within the Jarrah Forest Interim Biogeographic Regionalisation of Australia (IBRA) bioregion, which retains approximately 69 per cent of the pre-European vegetation extent, and the mapped South West vegetation complex "Swamp' retains approximately 76 per cent, and 'Pindalup' retains approximately 77 per cent of their pre-European vegetation extent within the Jarrah Forest IBRA bioregion (Government of Western Australia, 2018). On this basis, and noting the small extent of the proposed clearing at each location, the vegetation within each location is unlikely to be significant as a remnant in an area that has been extensively cleared.

Given the above, the proposed clearing for each location is not at variance to this Principle.

Table 1: vegetation extents

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Current Extent in DBCA Managed Lands (%)
IBRA Bioregion*				
Jarrah Forest	4,506,660	2,406,938	**53**	69
SW Vegetation complexes				
Swamp	53,658	40,663	**76**	64
Pindalup	167,151	128,369	**77**	60

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

Proposed clearing may be at variance to this Principle

According to available databases, the Camballan Creek, a minor river linked to the Collie River East Branch watercourse, crosses the road within Locality A, whilst a minor watercourse runs parallel to the road formation. A large stream and several minor watercourses which are also linked to the Collie River East Branch watercourse cross the road within Localities B and C. Therefore the proposed clearing areas may include vegetation growing in, or in association with, an environment associated with a watercourse or wetland.

The proposed clearing will occur only within the existing road formation where minimal native vegetation occurs. Should the proposed roads works occur during excessive wet periods, any impacts to water quality will be short term, minimal and manageable via existing drains and culverts.

Given the above, the proposed clearing may be at variance to this Principle.

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

Proposed clearing is not likely to be at variance to this Principle
As discussed in Section 2, the soils within Localities A and B are broadly mapped as drained alluvial flats, saline wet soils, wet soils and grey deep sandy duplex soils. Those within Locality C are mapped as loamy gravels, deep sands, with saline and non-saline wet soils on the valley floors and saline wet soils, wet soils and semi-wet soils, loamy gravels and Duples sandy gravels (DPIRD, 2017).

A DWER site inspection noted that each location is relatively broad, flat and lack any large elevations (DWER, 2018a). There are sections within Localities A and B which naturally flood and /or retain surface water particularly as a result of winter rains, but not within Locality C given its loamy and/or sandy gravels.

The proposed clearing will be limited to the road's long and linear gravel shoulder and adjoining table drain where minimal native vegetation exists. The nature and location of the road works is not likely to cause any land degradation in the form of water or wind erosion, or cause an increase in flooding or waterlogging or changes to salinity or eutrophication levels.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

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

Proposed clearing is not likely to be at variance to this Principle
According to available databases, the nearest conservation area within Locality A is the adjacent Muja Conservation Park and for Locality B is the adjacent Muja State Forest. Locality C has no nearby conservation areas that will be impacted by the proposed road works.

As discussed in Principle (a), noting the small extent of the proposed clearing, and that the works will be restricted to the existing road formation (gravel shoulder and adjoining table drains), the proposed clearing is not likely to directly or in-directly impact these nearby conservation areas.

As note in Principle (c), the applicant (Shire) will have to adhere to strict weed and dieback management practices at Locality B to minimise the risk of weeds and dieback spreading into the rare flora's habitat.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

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

Proposed clearing is not likely to be at variance to this Principle
As discussed in Section 2 above, the soils within Localities A and B are broadly mapped as drained alluvial flats, saline wet soils, wet soils and grey deep sandy duplex soils. Those within Locality C are mapped as loamy gravels, deep sands, with saline and non-saline wet soils on the valley floors and saline wet soils, wet soils and semi-wet soils, loamy gravels and Duples sandy gravels (DPIRD, 2017).

There are sections within Localities A and B which naturally flood and /or retain surface water particularly as a result of winter rains. Ground water salinity is measured at 3,000 – 7,000 MGL/total dissolved solids and is considered low. No change to salinity levels are considered likely as a result of the proposed clearing.

Locality C comprises loamy and/or sandy gravels. Ground water salinity here is measured at 7,000-14,000 MGL/total dissolved solids and is considered low to medium. No change to salinity levels are considered likely as a result of the proposed clearing.

The proposed clearing will be limited to the existing gravel shoulder and adjoining table drain where minimal native vegetation occurs.

Any potential surface water quality issues in the form sedimentation will be short term, minimal and manageable given the nature and location of the proposed clearing and existing drains and culverts.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

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

Proposed clearing is not likely to be at variance to this Principle
There are sections within Localities A and B which naturally flood and /or retain surface water particularly as a result of winter rains. The loamy gravels and deep sands within Locality C are more likely to be free draining and not susceptible to water retention.

The proposed clearing will only occur within the existing gravel shoulder and adjoining table drain where minimal native vegetation occurs and where road infrastructure such as culverts and diversion drains already exist.

The proposed clearing is not likely to cause, or exacerbate, the incidence or intensity of flooding and therefore is not likely to be at variance to this Principle.

Planning instruments and other relevant matters.

During a DWER site inspection (DWER, 2018a), the Shire advised that a 1.2 kilometre section of Bowelling-Duranillin Road between SLK 12.02 to 15.0 originally applied for should be removed from the application as it was included in error. As a result, this excluded several flora species of conservation significance needing to be assessed in this clearing assessment. The Shire also advised the scope of works and extent of vegetation clearing is required to accommodate an increase in heavy haulage vehicles using these roads. Widening of the existing road seal by 0.5 meters on each road side utilising only the existing gravel shoulder and reforming the adjoining table drains is required. As a result, this reduced the amount of clearing originally applied for from1.86 hectares to 1.2 hectares.

Localities A, B and C fall within the Wellington Dam Catchment Surface Water Area and Collie River Irrigation District Surface Water Area *Country Areas Water Supply Act 1947* (CAWS Act) and *Rights in Water and Irrigation Act 1914* (RIWI Act) respectively (DWER, 2018b).

The area is located within an unassigned priority Public Drinking Water Source Area; no priority source protection area is proposed. The catchment has however been subject to CAWS Act native vegetation clearing controls since November 1976 to prevent salinisation of water resources. This is mapped within Zone A, a very high salinity risk part of the catchment, where DWER Policy and Guidelines for the "Granting of Licences to Clear Indigenous Vegetation" provide for the grant of a licence for government works subject to an equivalent area being reforested within the same or higher salinity risk zone (DWER, 2018b).

Since the proposed clearing area is small (subsequently further reduced to 1.2 hectares) the amalgamation of similar offset area requirements over time to create sustainable revegetation areas is acceptable. The Shire's CAWS Act offset obligations from past clearing is currently only 1 ha and as such no action is required with regards to the establishment of the offset at this time. Consequently, there is no objection to the proposal under the CAWS Act (DWER, 2018b).

As Localities A, B and C are within the boundaries of the RIWI Act proclaimed Upper Collie River Surface Water Area, the taking and use of water is subject to assessment and licencing. The proposed clearing crosses over five tributaries and the East Branch of the Collie River. Any interference with the bed or banks including the replacement of culverts will require a bed and banks permit (DWER, 2018b).

No Aboriginal sites of significance have been mapped within the application area.

The clearing permit application was advertised on DWER's website on 9 November 2017 with a 21 day submission period. Two public submissions were received in relation to this application (Submissions, 2017). The submissions raised similar concerns in relation to the proposed clearing, including the lack of supporting documentation, justification for the proposed clearing from a safety perspective, demonstration of how the proposed clearing has been avoided and/or minimised, potential impacts to 25 species of rare or priority listed flora and six species of threatened or priority listed fauna, potential impacts to adjacent conservation areas and the road realignment design. These matters have been considered through the assessment and addressed in this report. The submission also made comment concerning matters including alternative road configuration designs, installation of road safety barriers, signage, and reducing speed limits. These matters are beyond the scope of the assessment of clearing impacts and have not been addressed.

5. References

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

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Department of Primary Industry and Regional Development (DPIRD) (2017). NRInfo Digital Mapping. Department of Primary Industry and Regional Development. Government of Western Australia. URL: https://maps.agric.wa.gov.au/nrm-info/ (accessed May 2018).

Department of Water and Environmental Regulation (DWER) (2018a) Site inspection report for clearing permit application CPS 7827/1 (DWER Ref: A1638169, A1638557, A1638559, A1635466)

Department of Water and Environmental Regulation (DWER) (2018b) Land Use Planning. Requirement for water licence for clearing permit application CPS 7827/1 (DWER Ref: A1683248)

Government of Western Australia. (2018). 2017 South West Vegetation Complex Statistics. Current as of October 2017.

Mattiske, E.M. and Havel, J.J. (1998) Vegetation Complexes of the South-west Forest Region of Western Australia. Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.

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Submissions (2017) Public submissions received in relation to clearing permit application CPS 7827/1 (DWER Ref. A1572071 and A1571285)

Western Australian Herbarium (1998-) FloraBase - The Western Australian Flora. Department of Biodiversity, Conservation and Attractions. http://florabase.dpaw.wa.gov.au/ (accessed May 2018).

GIS Databases:

- Aboriginal Sites of Significance
- Aerial imagery (accessed December 2017)
- Department of Biodiversity, Conservation and Attractions Managed Estate
- Groundwater salinity
- Hydrography, linear
- SAC bio datasets (accessed December 2017 and May 2018)
- Soils
- Wetlands