



Title of Proposal - Geelong-Bacchus Marsh Road Upgrade Project

Section 1 - Summary of your proposed action

Provide a summary of your proposed action, including any consultations undertaken.

1.1 Project Industry Type

Transport - Land

1.2 Provide a detailed description of the proposed action, including all proposed activities.

VicRoads propose to upgrade Geelong-Bacchus Marsh Road between Heales Road, Lara and Fiskin Street, Bacchus Marsh.

The project area is divided into three sections: Section 1 extends from Heales Road to Little River-Ripley Road; Section 2 is located between Little River-Ripley Road and Ballan Road; and, Section 3 extends from Ballan Road to Fiskin Street.

Section 1 (Heales Road to Little River-Ripley Road) is excluded from the proposed action and is not being referred. This section of the project has been subject to a detailed ecological assessment and no Matters of National Environmental Significance (MNES) were recorded or are considered likely to be significantly impacted by future works within the road reserve. The location of the proposed action that is being referred comprises Section 2 (Little River-Ripley Road to Ballan Road) and Section 3 (Ballan Road to Fiskin Street) (referred to hereafter as the 'activity area') (Attachment 1 - Locality Plan).

The upgrade of Geelong-Bacchus Marsh Road has been identified in Victoria's new Road Safety Strategy and Action Plan, Towards Zero 2016-2020, as a section of road to be funded under the Safe System Road Infrastructure Program. The upgrade works within the activity area include construction of overtaking lanes, installation of safety barriers, intersection improvements, widening of traffic lanes and road shoulders, and addition of Safe System principles.

Geelong-Bacchus Marsh Road (C704) is a rural road which provides a key link between the cities of Geelong and Bacchus Marsh. Geelong-Bacchus Marsh Road is a two-lane two-way road, with an approximate traffic volume of 4,000 vehicles per day, of which 11 percent is commercial vehicles. The section of Geelong-Bacchus Marsh Road being treated consists of a number of sweeping bends, rolling terrain mixed with long straight sections of road. Traffic lane widths are approximately 3.5 metres, with 1.1 metre wide sealed shoulders along the route. There have been 10 lane departure crashes and four intersection crashes between July 2008 and June 2013. This includes three head-on collisions, four lane departure to the left and three lane departure to the right, resulting in four fatal crashes, six serious injury crashes and four other crashes. The key objective of the upgrade project is to deliver road safety improvements that embrace "Safe System" principles, focusing primarily on safe roads and roadsides to reduce crash risk and to lessen the severity of injuries. This objective directly aligns with the



focus of the Safe System Road Infrastructure Program, aspiring to eliminate death and serious injury from Victorian roads by embracing a 'Towards Zero' vision.

The upgrade project is largely a road widening exercise to accommodate the installation of centre median road safety treatments. This will involve carriageway and shoulder pavement widening, verge widening and table drain formation. It will also include the installation of new roundabouts and associated departure side overtaking lanes and turning lanes at a number of intersections. Works will be contained within the existing road reserve, with the exception of the south-east corner at Ballan Road, where some private land acquisition will be made to accommodate a new roundabout.

Note that the proposed action is based on the functional road design works within the activity area, which represents the full extent of works including implementation of 'No-Go Zones' (Attachment 2 - MNES Values). Specific details of the functional design works within the activity area are as follows:

Section 2 Project Scope:

- Centre line safety barrier is proposed for a 12-kilometre length of section two of the project (between Little River Ripley Road and Ballan Road.) Gaps in the safety barrier are proposed at all intersecting roads, most of the property access to dwellings and access gates. The barrier will be located centrally in a painted line-marked sealed median.
- The locations of left side barriers is not yet determined, however, the preliminary estimate extends for approximately five kilometres of lineal roadside distance. Any hazards such as power poles, trees, steep drains etc. that are not able to be removed, from a road design perspective are deemed a hazard if generally within nine metres (clear-zone) of the left edge of the running lane.
- Three overtaking lanes are proposed in Section 2. The following describes the approximate locations and total lengths including tapers:
 - o North bound from Chainage 27000-28400 (1400 metres).
 - o South bound from Chainage 29000-27600 (1400 metres).
 - o South bound from Chainage 36200-35000 (1200 metres).
- All of the made roads intersecting with Geelong-Bacchus Marsh Road will have the intersections upgraded. In most cases, this will included dedicated left and right turning lanes to reduce the risk of rear end type and turning crashes.
 - o Buftons Road - Little River Ripley Road Chainage 24240.
 - o Gilmores Road Chainage 25840.
 - o Matfins Road Chainage 26160.
 - o Birds Road - Sharkeys Road Chainage 29160.
 - o Davis Road - School Road Chainage 33660.
- Widening of 4 major Bridge and culvert structures is proposed to provide consistency of cross section form and enhance road safety:
 - o Little River Bridge - Chainage 26260
 - o Major Culvert Chainage 31500
 - o Balliang Creek Bridge Chainage 32700
 - o Major Culvert Chainage 33310
 - o Several minor culverts will also be extended as a part of the works.
- A local access service road is proposed to provide safer access and egress for a cluster of small rural properties with dwellings north of School Road, Balliang East. The location of the



service road is from Chainage 34020-34900. Access to this two-way service road is from Chainage 34020-34660. Installation of the service road also reduces the number of breaks in the centreline safety barrier.

Section 3 Project Scope:

- Existing driveways to be formalised where required, by installation of new pavement, drainage culverts and driveable endwalls where not protected by barrier (approx. Chainage 36380-45300).
- Safety barrier median treatment (approx. 1.4m wide) and associated carriageway and shoulder widening on both sides from approx. Chainage 36560-44500 with gaps for selected property accesses and intersecting roads.
- Painted median treatment (approx. 1.0 metre wide) and associated carriageway and shoulder widening on both sides from approx. Chainage 44680-45300 with gaps for selected property accesses and intersecting roads.
- New roundabouts will be constructed at the intersections of Ballan Road, Glenmore Road/Nerowie Road and School Lane/Parwan-Exford Road (approx. Chainage 36460, 39150 and 44630 respectively including formal underground drainage installation and service relocations as required).
- Northbound overtaking lanes and associated pavement widening from approx. Chainage 36540-36900, 39240 and 39840.
- Southbound overtaking lanes and associated pavement widening from approx. Chainage 38460-39060, Chainage 43940-44540.
- East Side Service Road and protected right turn lane installation Aerodrome Road from approx. Chainage 41220-41480.
- Pavement widening for installation of left and right turn lanes into Woolpack Road (approx. Chainage 45020-45260).
- Closure of East side Driveway access to Chainage 4300 Bacchus Marsh Road and installation of new access off the South side of Parwan-Exford Road.

1.3 What is the extent and location of your proposed action? Use the polygon tool on the map below to mark the location of your proposed action.

Area	Point	Latitude	Longitude
Geelong-Bacchus Marsh Road activity area	1	-37.873867150814	144.38173606954
Geelong-Bacchus Marsh Road activity area	2	-37.697841876609	144.45005729756
Geelong-Bacchus Marsh Road activity area	3	-37.699471776393	144.4512589272
Geelong-Bacchus Marsh Road activity area	4	-37.701237460721	144.45494964681



Area	Point	Latitude	Longitude
Marsh Road activity area			
Geelong-Bacchus Marsh Road activity area	5	-37.705583581431	144.45786789021
Geelong-Bacchus Marsh Road activity area	6	-37.706534261367	144.45769622884
Geelong-Bacchus Marsh Road activity area	7	-37.719163566111	144.45040062032
Geelong-Bacchus Marsh Road activity area	8	-37.724255418705	144.4497998055
Geelong-Bacchus Marsh Road activity area	9	-37.749437967732	144.44507911763
Geelong-Bacchus Marsh Road activity area	10	-37.753306225539	144.44293335042
Geelong-Bacchus Marsh Road activity area	11	-37.755409929975	144.44173172078
Geelong-Bacchus Marsh Road activity area	12	-37.766877460273	144.43975761495
Geelong-Bacchus Marsh Road activity area	13	-37.775086848377	144.43821266255
Geelong-Bacchus Marsh Road activity area	14	-37.794758531157	144.41409423909
Geelong-Bacchus Marsh Road activity area	15	-37.804592408899	144.40345123372
Geelong-Bacchus Marsh Road activity area	16	-37.830696696272	144.39272239766
Geelong-Bacchus Marsh Road activity area	17	-37.847371484805	144.38714340291
Geelong-Bacchus Marsh Road activity area	18	-37.857876021317	144.38774421773
Geelong-Bacchus Marsh Road activity area	19	-37.873867150814	144.38173606954



Area area	Point	Latitude	Longitude
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1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland).

The majority of the activity area comprises the Geelong-Bacchus Marsh Road reserve (fence line to fence line), between Little River-Ripley Road and Fiskin Street (approximately 22 kilometres). The activity area also extends for approximately 100 metres along the road reserves of all side roads, including: Little River-Ripley Road and Buftons Road, Gilmores Road, Birds Road and Sharkey Road, Davis Road and School Road, Ballan Road, Schultz Road, Glenmore Road and Nerowie Road, Aerodrome Road, Smiths Road, School Lane and Parwan-Exford Road, Woolpac Road, Cummings Road and Tilleys Road (Attachment 1 - Locality Plan).

VicRoads propose to acquire a small portion (approximately 0.04 hectares) of the private property at 3358 Geelong-Bacchus Marsh Road for construction of the roundabout at Ballan Road. Material storage and stack sites have been identified within previously disturbed areas on Davis Lane, Nerowie Road and School Lane.

The activity area occurs within the Victorian Volcanic Plain bioregion and the Port Phillip and Westernport Catchment Management Authority boundary. The area south of Swamp Road and Balliang Creek falls within the City of Greater Geelong municipality, whereas areas to the north occur in the Moorabool Shire municipality. The activity area extends through the Township of Balliang East.

The topography varies from relatively flat land to low undulating slopes throughout the activity area, with moderate undulating slopes near Ballan Road and Woolpac Road. Several waterways and minor tributaries intersect Geelong-Bacchus Marsh Road; Little River runs east – west near Gilmores Road, Balliang Creek runs north – south near Blue Gum Track, Dry Creek runs east – west, south of School Road, and Parwan Creek runs east – west, north of Woolpac Road.

The surrounding land use is predominantly agricultural, with low-density residential development



in the Township of Balliang East and several rural dwellings located along Geelong-Bacchus Marsh Road. While the surrounding landscape has been modified from agricultural use, an extensive cover of native vegetation is present in several adjacent private properties, which is contiguous with native vegetation in the road reserve.

Various sections of the road reserve contain a modified landform and substrate from previous infrastructure works, and extensive areas have been planted with native trees and shrubs. The majority of the road reserve is subject to regular slashing for maintenance and fuel reduction purposes.

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

The proposed work area (including the existing pavement and No-Go Zones) covers 70.12 hectares

1.7 Is the proposed action a street address or lot?

Street Address

Geelong-Bacchus Marsh Road
Balliang East VIC 3340
Australia

1.8 Primary Jurisdiction.

Victoria

1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

No

1.10 Is the proposed action subject to local government planning approval?

No

1.11 Provide an estimated start and estimated end date for the proposed action.

Start date 10/2017



End date 06/2019

1.12 Provide details of the context, planning framework and State and/or Local government requirements.

Flora and Fauna Guarantee Act 1988

The *Flora and Fauna Guarantee Act 1988* (FFG Act) is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes.

A permit is required from the Department of Environment, Land, Water and Planning (DELWP) to 'take' (kill, injure, disturb or collect) listed flora species, flora species that are members of listed communities or protected flora from public land. Protected flora species includes all members of the following plant families Asteraceae (Daisies), Epacridaceae (Heaths) and Orchidaceae (Orchids), all clubmosses, ferns and fern allies (excluding *Pteridium esculentum*). All species of the following genera are also protected: *Acacia* (excluding *Acacia dealbata*, *Acacia decurrens*, *Acacia implexa*, *Acacia melanoxylon* and *Acacia paradoxa*), *Baeckea*, *Calytrix*, *Correa*, *Darwinia*, *Eremophila*, *Eriostemon*, *Gompholobium*, *Grevillea*, *Prostanthera*, *Sphagnum*, *Thryptomene*, *Thysanotus* and *Xanthorrhoea* (Grass-trees) (DELWP 2015).

VicRoads has a blanket permit to take protected flora for minor improvement and road safety treatments works in accordance with the principles of the Memorandum of Understanding (MoU) between the Department of Environment and Primary Industries (now DELWP) and the Department of Transport on the operation of the "Road Safety" exemption under Clause 52.17-6 of the Victoria Planning Provisions and the VicRoads Native Vegetation Removal Guidelines 2009, provided works adhere to the standard conditions under the permit (permit expiry 31/12/2017). The permit provisions do not include flora species or communities listed as Threatened under the FFG Act or listed on the *Advisory List of Rare or Threatened Plants in Victoria – 2014* (DEPI 2014).

The road reserve supports one FFG Act listed Threatened flora species (Buloke). Areas of Heavier-soils Plains Grassland mapped within the site meet the criteria for *Western (Basalt) Plains Grasslands Floristic Community 140*, and areas of Plains Grassy Woodland meet the criteria for the *Western Basalt Plains (River Red Gum) Grassy Woodland Floristic Community 55-04* (Okologie Consulting 2017a; 2017b).

The proposed works in the activity area will impact 7.9 hectares of *Western (Basalt) Plains Grasslands Floristic Community 140* and 0.58 hectares of *Western Basalt Plains (River Red Gum) Grassy Woodland Floristic Community 55-04*. An FFG Act permit is likely to be required from DELWP to remove a threatened community (Okologie Consulting 2017a; 2017b). The relevant permit requirements under the FFG Act will be addressed to the satisfaction of DELWP.

Planning and Environment Act 1987



The Public Roads Exemption under Clause 52.17-6 of the Victoria Planning Provisions provides that a planning permit is not required to remove, destroy or lop native vegetation to the minimum extent necessary in accordance with the Memorandum of Understanding (MoU) between the Department of Environment and Primary Industries (now DELWP) and the Department of Transport (VicRoads 2009).

The proposed action will take place within the City of Greater Geelong and Shire of Moorabool, and under their associated planning schemes. The Public Roads Exemption is likely to apply in this instance as VicRoads has determined the works fall under Combined Road Safety Treatments category (overtaking lanes, installation of safety barriers, shoulder sealing and road formation works) for activities associated with maintaining the safe and efficient function of existing public roads (VicRoads 2009).

The Public Roads Exemption only applies to native vegetation that is removed, destroyed or lopped to the minimum extent necessary, in accordance with the following key principles (VicRoads 2009):

Avoid vegetation removal where practical. Remove the minimum extent necessary.

Where native vegetation cannot be avoided the extent and impact of clearing must be minimised through the planning, design and undertaking of works (VicRoads 2009).

VicRoads has applied these principles through the functional design process. The draft functional design resulted in the removal of 10.4 hectares of native vegetation, however, the road width for Section 2 was reduced by adopting a centre median width of 1.4 metres rather than a centre median width of 2.2 metres previously used. This design change has reduced the overall removal of native vegetation down to 8.7 hectares (an overall reduction of 1.4 hectares). The impacts to native vegetation are based on the functional road design and includes implementation of No-Go Zones.

The Public Roads Exemption also contains Native Vegetation Removal Thresholds for works under the category of 'road safety treatments'. Plains Grassland, Plains Grassy Woodland and Riparian Woodland Ecological Vegetation Classes (EVC's) contain a Bioregional Conservation Status of Endangered with a removal threshold level of less than 0.5 hectares (VicRoads 2009). The proposed works for the activity area will impact 8.7 hectares of native vegetation, which exceeds the Native Vegetation Removal Thresholds for these three EVC's. As the proposed vegetation removal is over the specified Native Vegetation Removal Thresholds, offsets will be compliant with *Permitted clearing of native vegetation – Biodiversity assessment guidelines*.

Areas within the Greater Geelong municipality are subject to Environmental Significance Overlay – Schedule 1, Environmental Significance Overlay – Schedule 4 and Vegetation Protection Overlay – Schedule 1. Areas within the Moorabool municipality are subject to Environmental Significance Overlay – Schedule 2 and Environmental Significance Overlay –



Schedule 7. A permit for removal of native vegetation is unlikely to be required in this instance as the Public Roads Exemption applies to areas designated under Planning Scheme overlays (VicRoads 2009).

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders.

VicRoads has undertaken direct consultation with relevant stakeholders. For Section 2, three informal community engagements sessions were undertaken in May 2016 encouraging all road users and interested parties to attend and voice their road safety and other concerns about the project. One session was undertaken with all adjoining property owners in Section 2 conducted in April 2016 to discuss road safety and access requirements. Indigenous stakeholder consultation has been undertaken with the Wathaurung Aboriginal Corporation, trading as Wadawurrung. A Cultural Heritage Management Plan (Desktop, Standard and Complex Assessments) has been prepared for Section 2 (Benchmark Heritage Management 2016).

Public consultation for Section 3 has included a meeting with the prisons precinct on 30/05/2017. A key stakeholders workshop was undertaken on 02/06/2017, with Lara Country Fire Authority, Bacchus Marsh Police Highway Patrol, Lara Police, Parwan State Emergency Service, Lara Cyclists Group, DELWP and Representative from Geelong Port. A public consultation session was undertaken on 07/06/2017 at Lara Golf Club. Indigenous stakeholder consultation has been undertaken with the Wathaurung Aboriginal Corporation, trading as Wadawurrung. A Cultural Heritage Management Plan (Desktop Assessment) has been prepared for Section 3 (Benchmark Heritage Management 2017).

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project.

The project is not subject to an environmental impact assessment.

1.15 Is this action part of a staged development (or a component of a larger project)?

Yes



1.15.1 Provide information about the larger action and details of any interdependency between the stages/components and the larger action.

The Geelong-Bacchus Marsh Road upgrade project is located between between Heales Road, Lara and Fiskien Street, Bacchus Marsh. The location of the proposed action being referred comprises Section 2 (Little River-Ripley Road to Ballan Road) and Section 3 (Ballan Road to Fiskien Street) (Attachment 1 - Locality Plan).

Section 1 (Heales Road to Little River-Ripley Road) is excluded from the proposed action and is not being referred. This section of the project has been subject to a detailed ecological assessment and no Matters of National Environmental Significance (MNES) were recorded or are considered likely to be significantly impacted by future works within the road reserve.

1.16 Is the proposed action related to other actions or proposals in the region?

No



Section 2 - Matters of National Environmental Significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The [interactive map tool](#) can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest. Consideration of likely impacts should include both direct and indirect impacts.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The following resources can assist you in your assessment of likely impacts:

- [Profiles of relevant species/communities](#) (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;
- [Significant Impact Guidelines 1.1 – Matters of National Environmental Significance](#);
- [Significant Impact Guideline 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies](#).

2.1 Is the proposed action likely to have ANY direct or indirect impact on the values of any World Heritage properties?

No

2.2 Is the proposed action likely to have ANY direct or indirect impact on the values of any National Heritage places?

No

2.3 Is the proposed action likely to have ANY direct or indirect impact on the ecological character of a Ramsar wetland?

No

2.4 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

Yes

2.4.1 Impact table

Species	Impact
Natural Temperate Grassland of the Victorian	The activity area supports approximately 24



Species	Impact
Volcanic Plain (NTGVVP)	hectares of NTGVVP (Attachment 2 - MNES Values). However, NTGVVP within the activity area has been modified from disturbance (regular slashing, cultivation and weed invasion) and does not represent a high quality example of this ecological community (Okologie Consulting 2017a; 2017b) (Appendices 1 and 2). The works will result in the removal of 3.7 hectares of the NTGVVP within the activity area; however, the proposed activity is not considered to have a significant impact on NTGVVP as: The majority of the project works involves road widening, and the removal of NTGVVP is generally limited to very narrow, linear strips approximately 1-3 metres wide over the length of the project which, in context of impacts to the ecological community, is considered to result in a minor impact. The extent of impacts NTGVVP is shown in Attachment 2 - MNES Values. The works are unlikely to significantly reduce the overall extent of the community or fragment the community as 20.5 hectares of NTGVVP will be retained in the road reserve, which is contiguous with approximately 75 hectares of NTGVVP in adjacent private property in Section 2 (Attachment 2 - MNES Values). An assessment of the significant impact criteria for NTGVVP in the activity area is provided in Appendix 8.
Golden Sun Moth	Targeted Golden Sun Moth surveys were completed in the activity area by Okologie Consulting (2016a) (Appendix 3). The activity area supports a Golden Sun Moth population (twenty-nine males identified), and approximately 40 hectares of suitable Golden Sun Moth habitat, which comprises 19 hectares of higher quality habitat (NTGVVP in Section 2) and 21 hectares of lower quality habitat. The works will result in an overall loss of 7.9 hectares of Golden Sun Moth habitat within the activity area, which comprises of 2.4 hectares of higher quality habitat and 5.5 hectares of lower quality habitat. The significant impact threshold for Golden Sun Moth habitat is 0.5 hectares (in contiguous habitat of >10 hectares); however, the proposed activity is not



Species	Impact
	<p>considered to have a significant impact on Golden Sun Moth habitat as the works are unlikely to result in the significant loss, degradation or fragmentation of habitat. The majority of the project works involves road widening and the removal of habitat is generally limited to very narrow, linear strips approximately 1-3 metres wide over the length of the project which, in context of potential impacts to the species habitat, is considered a minor impact. The extent of impacts Golden Sun Moth habitat is shown in Attachment 2 - MNES Values. The Golden Sun Moth population recorded in the road reserve forms part of a larger local population from adjacent habitat on private property (5-95 Birds Road, Balliang), which comprises approximately 75 hectares of Golden Sun Moth habitat. Based on the results of the targeted survey the Golden Sun Moth population primarily occurs in the adjacent private property in Section 2 and is utilising habitat in the road reserve (Okologie Consulting 2016a; Appendix 3). While areas of Plains Grassland to the north and south of this area provide potential suitable habitat there is a low likelihood of occurrence for this species in these areas due to the modified condition of habitat from disturbance (i.e. regular slashing, soil disturbance). Approximately 32 hectares of Golden Sun Moth habitat will be retained in the road reserve, including areas of higher quality habitat that is contiguous with approximately 120 hectares of suitable Golden Sun Moth habitat in adjacent private property in Section 2 (Attachment 2 - MNES Values). An assessment of the significant impact criteria for Golden Sun Moth in the activity area is provided in Appendix 8.</p>
Striped Legless Lizard	<p>Targeted Striped Legless Lizard surveys were undertaken in Section 2 of the activity area by Ecology and Heritage Partners (2017a; Appendix 4) and a review of potential impacts to Striped Legless Lizard was prepared for Section 3 (Ecology and Heritage Partners 2017b; Appendix 5). The activity area supports a Striped Legless Lizard population (8</p>



Species	Impact
	<p>individuals) which is considered an ‘important population’ under the EPBC Act significance guidelines. Approximately 40 hectares of suitable Striped Legless Lizard habitat is present, which comprises of 19 hectares of higher quality habitat (NTGVVP in Section 2) and 21 hectares of lower quality habitat. The works will result in an overall loss of 7.9 hectares of Striped Legless Lizard habitat within the activity area, which comprises of 2.4 hectares of higher quality habitat and 5.5 hectares of lower quality habitat. However, the proposed activity is not considered to have a significant impact on Striped Legless Lizard habitat as: The majority of the project works involves road widening, and the removal of habitat is generally limited to very narrow, linear strips approximately 1-3 metres wide which, in context of potential impacts to the species habitat, is considered a minor impact. The works are unlikely to result in the significant loss or fragmentation of habitat, resulting in the population becoming non-viable or restricting breeding, dispersal or recruitment. The extent of impacts Striped Legless Lizard habitat is shown in Attachment 2 - MNES Values. The Striped Legless Lizard population was not recorded in the functional design area and approximately 32 hectares of Striped Legless Lizard habitat will be retained in the road reserve, including areas of higher quality habitat (where the population was recorded) that is contiguous with approximately 120 hectares of suitable Striped Legless Lizard habitat in adjacent private property in Section 2 (Attachment 2 - MNES Values). An assessment of the significant impact criteria for Striped Legless Lizard in the activity area is provided in Appendix 8.</p>
Growling Grass Frog	<p>Targeted Growling Grass Frog surveys were completed within five identified areas of potential habitat in the activity area (Little River, Balliang Creek and three drainage line culverts in Section 2) (Ecology and Heritage Partners 2017c; Appendix 6). The proposed activity is not considered to have a significant impact on</p>



Species	Impact
	Growling Grass Frog habitat as: Growling Grass Frog was not recorded during the targeted surveys. While it is considered to have a moderate likelihood of occurrence in Little River, no direct disturbance to the central waterway is proposed as part of the upgrade activities. The works will remove 0.1 hectares of terrestrial habitat within 200 metres of Little River, which may result in the temporary disturbance of potential over-wintering habitat for Growling Grass Frog on the banks of Little River, which is considered a minor impact. (Attachment 2 - MNES Values). An assessment of the significant impact criteria for Growling Grass Frog in the activity area is provided in Appendix 8.

2.4.2 Do you consider this impact to be significant?

No

2.5 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed migratory species, or their habitat?

No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

No

2.7 Is the proposed action to be taken on or near Commonwealth land?

No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

No

2.9 Is the proposed action likely to have ANY direct or indirect impact on a water resource related to coal/gas/mining?

No



2.10 Is the proposed action a nuclear action?

No

2.11 Is the proposed action to be taken by the Commonwealth agency?

No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage Place Overseas?

No

2.13 Is the proposed action likely to have ANY direct or indirect impact on a water resource related to coal/gas/mining?

No



Section 3 - Description of the project area

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed in Section 2).

3.1 Describe the flora and fauna relevant to the project area.

An ecological assessment was undertaken to determine the extent of native vegetation and ascertain the presence of any listed threatened flora or fauna species and associated habitats within the activity area (Okologie Consulting 2017a; 2017b) (Appendices 1 and 2). Review of the Protected Matter Search Tool (PMST) (DoEE 2017a) identified eight threatened flora species, 18 threatened fauna species or species habitats and five ecological communities as known or likely to occur within a five kilometre radius of the activity area (Appendix 7). Assessment of the likelihood of occurrence of MNES and their status within the activity area was based on the most recent available records and assessment of available habitat and site condition.

The NTGVVP ecological community, Golden Sun Moth, Striped Legless-lizard and Growling Grass Frog were recorded or considered likely to occur within the activity area. Potential suitable habitat was identified within the activity area for Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* and Matted Flax-lily *Dianella amoena*. However, these species were not recorded during targeted surveys and there is a low likelihood of occurrence for these species within the activity area due to disturbance from regular slashing, cultivation and weed invasion (Okologie Consulting 2016b; 2016c) (Appendices 9 and 10). Spiny Rice-flower, Matted Flax-lily and the remaining MNES identified in Appendix 7 are not addressed further in the referral.

The activity area is characterised by an extensive cover of exotic dominated grassland, interspersed with *Heavier-soils* Plains Grassland and planted trees, and shrubs. Highly modified patches of Plains Grassy Woodland were also present and the banks of Little River supports Riparian Woodland (Attachment 3 - Ecological Values).

Areas of exotic dominated vegetation were present throughout the activity area (72 hectares), particularly on modified landforms from previous infrastructure works, and along the 3-4 metre wide strip adjacent to the road shoulder that is regularly slashed. Exotic species typically



included Toowoomba Canary-grass *Phalaris aquatica*, Panic Veldt-grass *Ehrharta erecta*, Cocksfoot *Dactylis glomerata*, Perennial Ryegrass *Lolium perenne*, Serrated Tussock *Nassella trichotoma*, Chilean Needle-grass *Nassella neesiana*, Water Couch *Paspalum distichum*, Ribwort, Curled Dock *Rumex crispus*, Ox-tongue *Helminthotheca echioides* and Wild Radish *Raphanus raphanistrum*. A sparse cover (<5%) of indigenous grasses such as Common Wallaby-grass *Rytidosperma caespitosum* and Bristly Wallaby-grass *Rytidosperma setaceum* were often present in these areas.

The activity area supports approximately 40 hectares of *Heavier-soils* Plains Grassland that generally occurred in narrow, linear patches between the adjacent property boundary and the 3-4 wide metre strip of exotic dominated vegetation adjacent to the road shoulder. The majority of *Heavier-soils* Plains Grassland within the activity area has been modified from varying levels of disturbance from regular maintenance activities (slashing), soil disturbance (through cultivation) and weed invasion.

Modified areas of *Heavier-soils* Plains Grassland north of Balliang Creek to Parwan-Exford Road were generally slashed to 100mm and comprised a simplified cover of Common Wallaby-grass, Bristly Wallaby-grass, Striped Wallaby-grass *Rytidosperma racemosum* and Windmill Grass *Chloris truncata* (~30% cover), with exotic species such as Sweet Vernal-grass *Anthoxanthum odoratum*, Yorkshire Fog-grass, Paspalum, Onion Grass *Romulea rosea*, Cat's Ear *Hypochoeris radicata* and Ribwort *Plantago lanceolata* also present, particularly along the 3-4 wide metre strip adjacent to the road shoulder that is regularly slashed.

Approximately 24 hectares of *Heavier-soils* Plains Grassland met the key criteria and condition thresholds for the NTGVVP ecological community. The road reserve north of Little River to Balliang Creek comprised an extensive cover (~19 hectares) of *Heavier-soils* Plains Grassland over rocky basalt outcrops and cracking clay soils dominated by a simplified cover of native grasses (60-80% cover) such as Rough Spear-grass *Austrostipa scabra* subsp. *falcata*, Kneed Spear-grass *Austrostipa bigeniculata*, Common Wallaby-grass and Bristly Wallaby-grass, with Kangaroo Grass *Themeda triandra*, Brown-back Wallaby-grass *Rytidosperma duttonianum*, Common Wheat-grass *Anthosachne scabra*, Windmill Grass and Long-hair Plume-grass *Dichelachne crinita* occasionally present. Herbs present included a scattered cover (~1%) of Pink Bindweed *Convolvulus erubescens*, Lemon Beauty-heads *Calocephalus citreus* and Sheep's Burr *Acaena echinata*. Exotic species included Sweet Vernal-grass, Yorkshire Fog-grass, Onion Grass, Toowoomba Canary-grass, Panic Veldt-grass, Cocksfoot, Perennial Ryegrass and Serrated Tussock. Chilean Needle-grass was present at varying levels of cover (10-70%) throughout the road reserve, particularly along the 3-4 wide metre strip adjacent to the road shoulder that is regularly slashed. Areas of NTGVVP north of Schultz Road to Smith Road generally comprised a simplified cover (~60%) of Common Wallaby-grass, Bristly Wallaby-grass, Kneed Spear-grass and Rough Spear-grass, with few basalt outcrops present. These areas were also subject to regular slashing for maintenance. Exotic species included Paspalum,



Onion Grass, Yorkshire Fog-grass, Cocksfoot, Perennial Veldt-grass, Perennial Ryegrass, Chilean Needle-grass, Cat's Ear and Ribwort.

Plains Grassy Woodland was generally limited to fragmented patches south of Little River and north of Smith Road. Areas to the south comprised a canopy of Melbourne Yellow-gum *Eucalyptus leucoxylon* subsp. *connata*, with River Red-gum *Eucalyptus camaldulensis* occasionally present as scattered trees. The groundlayer was dominated by exotic species such as Perennial Veldt-grass, Onion Grass, Cocksfoot, Perennial Ryegrass, Sweet Vernal-grass, Toowoomba Canary-grass. Native grasses such as Kangaroo Grass, Rough Spear-grass, Bristly Wallaby-grass and Black-anther Flax-lily *Dianella admixta* were also present. Isolated patches dominated by Buloke *Allocasuarina luehmannii* and Blackwood *Acacia melanoxylon* were attributed to Plains Grassy Woodland.

Areas of Plains Grassy Woodland north of Smith Road were generally drier, with a canopy of Yellow Box *Eucalyptus melliodora*, with Swamp Gum *Eucalyptus ovata* and River Red-gum occasionally present. The shrub layer comprised a sparse cover of Golden Wattle *Acacia pycnantha*, Black Wattle *Acacia mearnsii* and Tree Violet *Melicytus dentatus*. The ground layer was highly modified and dominated by exotic Perennial Veldt-grass, Onion Grass, Cocksfoot, Perennial Ryegrass, Sweet Vernal-grass, Toowoomba Canary-grass, Buck's-horn Plantain, Cape Weed, Galenia and Soursob. Native species cover (~10%) included Weeping Grass *Microlaena stipoides*, Kangaroo Grass, Bristly Wallaby-grass and Black-anther Flax-lily.

Riparian Woodland along the banks of Little River were dominated by River Red-gum, with a sparse shrub layer of Black Wattle *Acacia mearnsii*. The ground layer was dominated by Common Tussock-grass *Poa labillardierei*, with Common Reed *Phragmites australis*, Common Spike-sedge *Eleocharis acuta*, Pale Rush *Juncus pallidus* and Tall Sedge *Carex appressa* present on the banks and waterway. Exotic species included a dense cover of Toowoomba Canary-grass, with Yorkshire Fog-grass, Paspalum, Cocksfoot, Water Couch, Ribwort, Curled Dock and Ox-tongue also present.

The road reserve contains an extensive cover of planted vegetation, which generally consisted of native (non-indigenous) trees and shrubs such as Sugar Gum *Eucalyptus cladocalyx*, Tuart *Eucalyptus gomphocephala*, River Sheoak *Casuarina cunninghamiana*, Sweet Hakea *Hakea drupacea*, Bottlebrush *Callistemon* spp., Giant Honey-myrtle *Melaleuca armillaris* and Moonah *Melaleuca lanceolata*. Planted vegetation also included indigenous species such as River Red-gum, Blackwood, Black Wattle and Golden Wattle (Okologie Consulting 2017a; 2017b).



Fauna

Woodland habitat and scattered indigenous trees (attributed to Plains Grassy Woodland and Riparian Woodland) are of moderate habitat value for fauna. Melbourne Yellow Gum, Yellow Box, Swamp Gum and River Red-gum trees provides perching, roosting and foraging habitat for a wide range of native bird species such as Grey Fantail *Rhipidura albiscapa*, New Holland Honeyeater *Phylidonyris novaehollandiae*, Welcome Swallow *Hirundo neoxena*, Willie Wagtail *Rhipidura leucophrys* and Brown Thornbill *Acanthiza pusilla*. Mature trees with hollows also provides habitat for mammals Brush-tailed Possum *Trichosurus vulpecular* and Common Ring-tailed Possum *Pseudocheirus peregrines*, and hollow dependent birds Crimson Rosella *Platycercus elegans*, Rainbow Lorikeet *Trichoglossus moluccanus* and Sulphur-crested Cockatoos *Cacatua galarita*.

Planted trees (i.e. Sugar Gum and Tuart) provide habitat for common birds associated with modified habitats, including Australian Raven *Corvus coronoides*, Brown Falcon *Falco berigora*, Magpie-lark *Grallina cyanoleuca*, Sulphur-crested Cockatoo *Cacatua galarita* and Grey Shrike-thrush *Colluricincla harmonica*. Planted shrubs provide habitat for smaller passerine birds such as Grey Fantail, Welcome Swallow, Willie Wagtail and Brown Thornbill.

Areas of native/exotic grassland provides habitat for birds adapted to modified habitats such as Australian Magpie *Cracticus tibicen*, Galah *Eolophus roseicapilla* and Australasian Pipit *Anthus novaeseelandiae*. Areas of Heavier-soils Plains Grassland/NTGVVP supports suitable habitat for the listed threatened Golden Sun Moth and Striped Legless Lizard.

Riparian vegetation within Little River supports suitable habitat for Growling Grass Frog, and common frog species, such as Eastern Banjo Frog *Limnodynastes dumerilii*, Spotted Marsh Frog *Limnodynastes tasmaniensis* and Common Froglet *Crinia signifera* (Okologie Consulting 2017a; 2017b).

3.2 Describe the hydrology relevant to the project area (including water flows).

Several ephemeral waterways and minor tributaries intersect Geelong-Bacchus Marsh Road; Little River runs east – west near Gilmores Road, Balliang Creek runs north – south near Blue Gum Track, Dry Creek runs east – west, south of School Road, and Parwan Creek runs east –



west, north of Woolpac Road (Okologie Consulting 2017a; 2017b).

3.3 Describe the soil and vegetation characteristics relevant to the project area.

The activity area occurs in the West Victorian Dissected Uplands – Midlands and the Undulating Plains - Western District geomorphic units, which is comprised of brown loams (Sedimentary) and red duplex soils (Basalt) respectively.

Vegetation within the road reserve is characterised by narrow, linear patches of *Heavier-soils* Plains Grassland that generally occurs between the adjacent property boundary and the 3-4 wide metre strip of exotic dominated vegetation adjacent to the road shoulder. Large sections of the road reserve are dominated by exotic grassland, interspersed with planted native and exotic trees and shrubs that are a common feature of the road reserve. Small, isolated remnant patches of Plains Grassy Woodland occurs within the northern and southern sections of the activity area. Riparian Woodland features along the waterway of Little River. The surrounding landscape is highly modified from agricultural use (cropping, grazing), and is generally cleared of native vegetation (Okologie Consulting 2017a; 2017b) (Attachment 3 - Ecological Values).

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area.

The activity area does not support any outstanding natural features.

3.5 Describe the status of native vegetation relevant to the project area.

Remnant vegetation within the site was attributed to *Heavier-soils* Plains Grassland (EVC 132_61), Plains Grassy Woodland (EVC 55) and Riparian Woodland (EVC 641) based on floristic, life form, ecological characteristics and soil type. Scattered indigenous trees were attributed to Plains Grassy Woodland (Okologie Consulting 2017a; 2017b).

The activity area supports a total of 44.6 hectares of remnant native vegetation, comprising 40 hectares of *Heavier-soils* Plains Grassland, 2.8 hectares of Plains Grassy Woodland and 1.8 hectares of Riparian Woodland (Attachment 3 - Ecological Values).



3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

The topography varies from relatively flat land to low undulating slopes throughout the activity area, with moderate undulating slopes near Ballan Road and Woolpac Road (Okologie Consulting 2017a; 2017b).

3.7 Describe the current condition of the environment relevant to the project area.

The majority of the activity area is comprised of exotic dominated vegetation (72 Hectares). Indigenous vegetation (Plains Grassland, Plains Grassy Woodland and Riparian Woodland) covers 44 hectares, with approximately 12 hectares of planted native and exotic trees and shrubs also present (Attachement 3 - Ecological Values). Various sections of the road reserve contain a modified landform and substrate from previous infrastructure works, which has contributed to the extensive cover of exotic vegetation. Seven weeds listed as noxious under the *Catchment and Land Protection Act 1994* were recorded in the activity area. No listed noxious pests (i.e. European Rabbit, Red Fox) were observed within the activity area, although they are considered likely to be present due to the surrounding agricultural land use. Some minor areas of erosion was observed in the road reserve to north near Woolpac Road (Okologie Consulting 2017a; 2017b).

3.8 Describe any Commonwealth Heritage Places or other places recognised as having heritage values relevant to the project area.

No Commonwealth Heritage Places or other places with heritage values are present within the activity area.

3.9 Describe any Indigenous heritage values relevant to the project area.

Section 2 of the activity area has been subject to a Cultural Heritage Management Plan (Benchmark Heritage Management 2016), in accordance with the *Aboriginal Heritage Act 2006*. The activity area falls within the boundaries of the Wathaurung Aboriginal Corporation. The results of field surveys and sub-surface testing found the highest density of Aboriginal cultural heritage is located in close proximity to the major waterways – Little River and Balliang Creek. The results of the complex assessment identified one previously recorded scarred tree, two previously unregistered Aboriginal scarred trees, one new artefact scatter, and one new low



density artefact distribution. Thirteen specific cultural heritage management recommendations were identified for the road upgrade project (Benchmark Heritage Management 2016).

A Cultural Heritage Management Plan (Desktop Assessment) has been prepared for Section 3, to inform a site prediction model and determine the most appropriate level of cultural heritage assessment in the activity area. The results of the desktop assessment found there are no previously registered Aboriginal Cultural Heritage Places located within the activity area. The site prediction model identified that stone artefacts scatters (including Low Density Artefact Distributions) are likely to occur in the activity area, Aboriginal archaeological sites are most likely to occur in close proximity to watercourses and/or swamps, and any surface or near surface archaeological sites may have been disturbed by the removal of native vegetation, pastoralism and/or agriculture (Benchmark Heritage Management 2017).

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area.

The existing road reservation is crown land. VicRoads also propose to acquire a small portion of freehold land at 3358 Geelong-Bacchus Marsh for construction of the roundabout at Ballan Road.

3.11 Describe any existing or any proposed uses relevant to the project area.

The existing use is road reserves. The land at 3358 Geelong-Bacchus Marsh is currently used for agricultural activities (cropping).

The proposed use of the activity area is for continued use as a main road and road reserves.



Section 4 - Measures to avoid or reduce impacts

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action.

General Mitigation Measures

VicRoads has an environmental specification (Section 177 - Environmental Management (Major), which forms the standard project contractual requirements for the avoidance and minimisation of impacts for each aspect of the environment (see Appendix 11). The contract specification will be adapted to address all site specific identified risks and proposed mitigation measures including any additional requirements detailed below.

Specific Mitigation Measures

Specific mitigation measures have been identified to ameliorate potential impacts on each MNES identified within the activity area, following an assessment of the activity against each significant impact guideline criteria. Note that 'No-Go Zones' described below are defined as the area of road reserve to be retained outside of the 'functional road design', as shown in Attachment 2 - MNES Values.

NTGVVP Mitigation Measures

Specific mitigation measures for NTGVVP include:



The existing biomass management regime will be maintained (slashing).

Weed control measures will be implemented to ensure there is no net increase in the cover of noxious or environmental weeds into areas of NTGVVP resulting from the works.

All native vegetation identified for retention, shall be identified as 'No-Go Zones' and protected by temporary fencing and signage.

Golden Sun Moth Mitigation Measures

Specific mitigation measures for Golden Sun Moth include:

The existing biomass management regime will be maintained (slashing); however, slashing of grassland/habitat will be undertaken outside of the local Golden Sun Moth flying season (late October to early January).

Weed control measures will avoid herbicide drift onto native vegetation and soil crust.

All habitat identified for retention, shall be identified as 'No-Go Zones' and protected by temporary fencing and signage.

Striped Legless Lizard Mitigation Measures

Specific mitigation measures for Striped Legless Lizard include:

Ensure that any surface and/or embedded rocks, or other refuge sites (e.g. logs) are retained wherever possible.

Where possible, reintroduce or increase the cover of surface refuges to augment existing habitat.

The existing biomass management regime will be maintained (slashing). Backfill any trenches overnight where possible.

In the event that trenches are left open overnight, checks for trapped fauna should be made in the morning, prior to any works commencing onsite.

Where required, relocation of Striped Legless Lizard must be undertaken by a qualified fauna handler under a current management authorisation.



All habitat identified for retention, shall be identified as 'No-Go Zones' and protected by temporary fencing and signage.

No Go Zones should include a fencing design that allows lizard movement (where appropriate).

Avoid placing any temporary barriers in areas of retained habitat to avoid restricting Striped Legless Lizard movement.

Growling Grass Frog Mitigation Measures

Specific mitigation measures for Growling Grass Frog include:

Pre-clearance surveys should be undertaken by a qualified ecologist immediately prior to initial disturbance within the riparian zone of Little River. Any salvaged frogs should be relocated to areas of suitable habitat within 100 metres of the point of capture.

Best practice sedimentation and erosion control measures will be implemented to minimise impacts to waterways and drainage lines.

All habitat identified for retention, shall be identified as 'No-Go Zones' and protected by temporary fencing and signage.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved.

On the basis that impacts to MNES within the activity area are unlikely to be significant, no direct environmental outcomes are proposed for this project. However, offsets will be required under the Victorian Native Vegetation Regulations for the loss of native vegetation associated with the activity, which is likely to result in a positive environmental outcome for the ecological community and species habitats.



Section 5 – Conclusion on the likelihood of significant impacts

A checkbox tick identifies each of the matters of National Environmental Significance you identified in section 2 of this application as likely to be a significant impact.

Review the matters you have identified below. If a matter ticked below has been incorrectly identified you will need to return to Section 2 to edit.

5.1.1 World Heritage Properties

No

5.1.2 National Heritage Places

No

5.1.3 Wetlands of International Importance (declared Ramsar Wetlands)

No

5.1.4 Listed threatened species or any threatened ecological community

No

5.1.5 Listed migratory species

No

5.1.6 Commonwealth marine environment

No

5.1.7 Protection of the environment from actions involving Commonwealth land

No

5.1.8 Great Barrier Reef Marine Park

No

5.1.9 A water resource, in relation to coal/gas/mining

No



5.1.10 Protection of the environment from nuclear actions

No

5.1.11 Protection of the environment from Commonwealth actions

No

5.1.12 Commonwealth Heritage places overseas

No

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action.

The proposed activity is not considered to have a significant impact on MNES. This determination has been made following an assessment of the activity against each significant impact guideline criteria for MNES in the activity area, and includes application of specific mitigation measures (see Appendix 8). The impact to MNES in the activity area is based on the extent of works identified in the functional road design, and incorporates No-Go Zones (Attachment 2 - MNES Values).

An assessment of impacts to each MNES within the activity area is summarised below.

Natural Temperate Grassland of the Victorian Volcanic Plain

The proposed action is not considered a significant impact on NTGVVP ecological community due to:

The activity area supports approximately 24 hectares of NTGVVP, which has been modified from disturbance (regular slashing, cultivation and weed invasion) and does not represent a high quality example of this ecological community (Okologie Consulting 2017a; 2017b).

The works will result in the removal of 3.7 hectares of the NTGVVP within the activity area;



however, the majority of the project works involves road widening, and the removal of NTGVVP is generally limited to very narrow, linear strips approximately 1-3 metres wide over the length of the project which, in context of impacts to the ecological community, is considered to result in a minor impact. The extent of impacts NTGVVP is shown in Attachment 2 - MNES Values.

The works are unlikely to significantly reduce the overall extent of the community or fragment the community as 20.5 hectares of NTGVVP will be retained in the road reserve, which is contiguous with approximately 75 hectares of NTGVVP in adjacent private property in Section 2 (Attachment 2 - MNES Values).

VicRoads has undertaken steps to avoid and minimise impacts to NTGVVP through the functional design process, while still achieving the required design specifications to meet road safety objectives.

Potential impacts on NTGVVP during the construction phase of the project will be avoided and minimised through the implementation of specific mitigation measures.

An assessment of the significant impact criteria for NTGVVP in the activity area is provided in Appendix 8.

Golden Sun Moth Habitat

The proposed action is not considered a significant impact on Golden Sun Moth habitat due to:

The activity area supports a Golden Sun Moth population (twenty-nine males identified), and approximately 40 hectares of suitable Golden Sun Moth habitat, which comprises 19 hectares of higher quality habitat (NTGVVP in Section 2) and 21 hectares of lower quality habitat (Okologie Consulting 2016a).

The works will result in an overall loss of 7.9 hectares of Golden Sun Moth habitat within the activity area, which comprises of 2.4 hectares of higher quality habitat and 5.5 hectares of lower



quality habitat. The impact threshold for Golden Sun Moth habitat is 0.5 hectares (in contiguous habitat of >10 hectares); however, the works are unlikely to result in the significant loss, degradation or fragmentation of habitat. The majority of the project works involves road widening and the removal of habitat is generally limited to very narrow, linear strips approximately 1-3 metres wide over the length of the project which, in context of potential impacts to the species habitat, is considered a minor impact. The extent of impacts Golden Sun Moth habitat is shown in Attachment 2 - MNES Values.

The Golden Sun Moth population recorded in the road reserve forms part of a larger local population from adjacent habitat on private property (5-95 Birds Road, Balliang), which comprises approximately 75 hectares of Golden Sun Moth habitat. Based on the results of the targeted survey the Golden Sun Moth population primarily occurs in the adjacent private property in Section 2 and is utilising habitat in the road reserve (Okologie Consulting 2016a; Appendix 3). While areas of Plains Grassland to the north and south of this area provide potential suitable habitat there is a low likelihood of occurrence for this species in these areas due to the modified condition of habitat from disturbance (i.e. regular slashing, weed invasion).

VicRoads has undertaken steps to avoid and minimise impacts to higher quality Golden Sun Moth habitat through the functional design process, while still achieving the required design specifications to meet road safety objectives.

Approximately 32 hectares of Golden Sun Moth habitat will be retained in the road reserve, including areas of higher quality habitat that is contiguous with approximately 120 hectares of suitable Golden Sun Moth habitat in adjacent private property in Section 2 (Attachment 2 - MNES Values).

Potential impacts on Golden Sun Moth habitat during the construction phase of the project will be avoided and minimised through the implementation of specific mitigation measures.

Striped Legless Lizard Habitat

The proposed action is not considered a significant impact on Striped Legless Lizard habitat due to:



The activity area supports a Striped Legless Lizard population (8 individuals) which is considered an 'important population' under the EPBC Act significance guidelines. Approximately 40 hectares of suitable Striped Legless Lizard habitat is present, which comprises of 19 hectares of higher quality habitat (NTGVVP in Section 2) and 21 hectares of lower quality habitat (Ecology and Heritage Partners 2017a). Note that Striped Legless Lizard is assumed present within the 12.4 hectares of Plains Grassland in Stage 3; however, the precautionary approach has been applied in the absence of targeted surveys within this section and that the likelihood of Striped Legless Lizard being present is limited by the modified condition of the habitat (Ecology and Heritage Partners 2017b).

The works will result in an overall loss of 7.9 hectares of Striped Legless Lizard habitat within the activity area, which comprises of 2.4 hectares of higher quality habitat and 5.5 hectares of lower quality habitat. However, the majority of the project works involves road widening, and the removal of habitat is generally limited to very narrow, linear strips approximately 1-3 metres wide over the length of the project which, in context of potential impacts to the species habitat, is considered a minor impact. The works are unlikely to result in the significant loss or fragmentation of habitat, resulting in the population becoming non-viable or restricting breeding, dispersal or recruitment. The extent of impacts Striped Legless Lizard habitat is shown in Attachment 2 - MNES Values.

VicRoads has undertaken steps to avoid and minimise impacts to higher quality Striped Legless Lizard habitat through the functional design process, while still achieving the required design specifications to meet road safety objectives.

The Striped Legless Lizard population was not recorded in the functional design area and approximately 32 hectares of Striped Legless Lizard habitat will be retained in the road reserve, including areas of higher quality habitat (where the population was recorded) that is contiguous with approximately 120 hectares of suitable Striped Legless Lizard habitat in adjacent private property in Section 2 (Attachment 2 - MNES Values).

Potential impacts on Striped Legless Lizard habitat during the construction phase of the project will be avoided through the implementation of specific mitigation measures.

An assessment of the significant impact criteria for Striped Legless Lizard in the activity area is provided in Appendix 8.



Growling Grass Frog Habitat

The proposed action is not considered a significant impact on Growling Grass Frog habitat due to:

Growling Grass Frog was not recorded during the targeted surveys (Ecology and Heritage Partners 2017c). While it is considered to have a moderate likelihood of occurrence in Little River, no direct disturbance to the central waterway is proposed as part of the works.

The works will remove 0.1 hectares of terrestrial habitat within 200 metres of Little River, which may result in the temporary disturbance of potential over-wintering habitat for Growling Grass Frog on the banks of Little River, which is considered a minor impact (Attachment 2 - MNES Values).

VicRoads has undertaken steps to avoid and minimise impacts to Growling Grass Frog habitat through the functional design process, while still achieving the required design specifications to meet road safety objectives.

Specific mitigation measures will be implemented during the construction phase to avoid and minimise impacts to Growling Grass Frog habitat.

An assessment of the significant impact criteria for Growling Grass Frog in the activity area is provided in Appendix 8.



Section 6 – Environmental record of the person proposing to take the action

Provide details of any proceedings under Commonwealth, State or Territory law against the person proposing to take the action that pertain to the protection of the environment or the conservation and sustainable use of natural resources.

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Please explain in further detail.

The Victorian Roads Corporation (VicRoads) has initiated and completed a significant number of both major and minor road projects across the State, all of which have the potential for environmental impact. In any one year, it is estimated that approximately 200 projects are completed, of which, on average, five projects per year are referred for approval under the EPBC Act.

Although not established under the Corporation Act 2000, VicRoads publically reports its environmental performance in the Annual Report. In recent years, the environmental incident reporting system was upgraded to automatically track and escalate issues as appropriate. Since January 2010, there have only been three significant environmental incidents reported (significant is defined as Level 4 and Level 5 incidents) of which only one related to EPBC issues and resulted from contractor non-compliance with VicRoads specifications and requirements. Details are as follows:

The incident occurred on 6.12.2010:

VicRoads notified the Department of the Environment on 8.12.2010. The incident was investigated by VicRoads and corrective action taken.

In addition, to the best of our knowledge, neither VicRoads or its directors have been refused a licence, permit or authority under any environment protection legislation or had any such licence, permit or authority suspended, revoked or withdrawn in Australia or elsewhere been prosecuted for an offence under any environment protection legislation either in Australia or elsewhere been found guilty of an indictable environmental offence either in Australia or elsewhere



A search of EPA Victoria's prosecutions database as at 5 June 2015, [<http://www.epa.vic.gov.au/our-work/compliance-and-enforcement/epa-sanctions/prosecutions>] in relation to enforcement of the Environment Protection Act 1970 and the Pollution of Waters by Oil and Noxious Substances Act 1986, has indicated no prosecutions involving VicRoads.

VicRoads has been involved in EPBC compliance audits as noted below.

EPBC 2005/1990 – Construction of Bayles Bridge

Approval conditions attached to a project by VicRoads to replace the Bayles Bridge in Victoria were audited on 25 to 26 October 2006. The conditions related to the protection of Growling Grass Frog (*Litoria raniformis*), Southern Brown Bandicoot (*Isodon obesulus*) and Dwarf Galaxias (*Galaxiella pusilla*).

The audit identified compliance with eight of the 12 conditions of approval. Two instances of noncompliance were found, these related to the implementation of an offset strategy and bridge construction material. Five elements of the conditions were found to be partially compliant. These related to construction methods and materials, water quality testing, and reporting to the Department. A formal warning was issued to VicRoads and recommendations for rectification of the compliance issues made. The non-compliances have been addressed to the satisfaction of the Department in accordance with the Department's Compliance and Enforcement Policy

EPBC 2008/4486 – Geelong Ring Road – Section 4A, Victoria

A compliance audit of the Geelong Ring Road – Section 4A, Victoria, was conducted by the Department on 21 August 2012.

There are seven particular manner requirements set out in the decision notification. VicRoads demonstrated compliance with requirements 2, 5, 6 and 7 relating to best practice erosion, siltation and sediment controls being implemented; controls to manage a one in two Year Average Recurrence Interval event being implemented and maintained; construction activities that could potentially impact on the breeding of the Yarra Pygmy Perch and the Growling Grass Frog not being undertaken during September and October in associated habitat; and the construction area being fenced off to ensure that areas outside of the construction area are not impacted.

Non-compliance was found with elements of requirements 1, 3 and 4 relating to the



implementation of the Project Environment Protection Strategy and water quality monitoring requirements for the project. The non-compliances have been addressed to the satisfaction of the Department in accordance with the Department's Compliance and Enforcement Policy.

EPBC 2010/5741 – Western Highway Project Section 2: Beaufort to Ararat, Victoria

VicRoads self-reported an alleged breach of conditions attached to EPBC 2010/5741 to the Department the day following the potential impact to an area less than 0.1 hectare of Grassy Eucalypt Woodland of the Victorian Volcanic Plain (GEWVVP).

Condition 5 of the approval required VicRoads to implement the Threatened Species Management Plan approved by the Department. The Plan required no-go zones to be installed at the section of the site where unapproved works were undertaken. Vegetation, located outside the no-go zone, that had been marked and agreed to be cleared by VicRoads and its Contractor was fallen and stored in the no-go zone by a subcontractor.

An audit by the Department determined that although condition 5 of EPBC 2010/5741 had been contravened, no matters of national environmental significance were impacted in this instance.

No further action was taken by the Department at that time.

6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application.

Not applicable.



6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

Yes

6.3.1 If the person taking the action is a corporation, please provide details of the corporation's environmental policy and planning framework.

VicRoads has a comprehensive environmental management system designed to identify and minimise environmental impact from its construction and maintenance activities. VicRoads approach to environmental management is modelled on ISO 14001- Environmental Management Systems. The VicRoads Environmental Risk Management Guidelines are attached as Appendix 12.

The main elements of VicRoads environmental management system are:

VicRoads Sustainability and Climate Change Policy (2014), VicRoads Sustainability and Climate Change Strategy (2015-2020), VicRoads Environmental Risk Management Guidelines (2012); Environmental procedures for management of projects; Project Environment Protection Strategies. Where appropriate, specific guidance documents e.g. integrated water management, fauna sensitive design, etc. Contract specifications with specific environmental clauses. Surveillance audits of contractor activities based on a risk based approach. Independent environmental audits of contractor environmental management systems prior to commencement of major works. Independent environmental audits throughout the life of major construction projects. Training modules including e-learning modules for environmental aspects of project construction.

When managing projects, VicRoads exercises high standards of environmental diligence both in the contract preparation and administration. The VicRoads Environmental Risk Management Guidelines provide more detail about VicRoads systems which are utilised to manage risk and protect the environment and how these systems and tools are implemented throughout the life cycle of a project.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

Yes



6.4.1 EPBC Act No and/or Name of Proposal.

Since, January 2010, 29 projects have been referred by VicRoads to the Commonwealth Minister for decision under the EPBC Act (see below)

- 2016/7809. VICROADS/Transport - Land/chainage 10.90 and 15.00 Pyrenees Hwy/Victoria/Road safety works, Pyrenees Hwy, Green Gully, Vic.
- 2014/7252 Roads Corporation T/A VicRoads/Natural resources management/Mortlake Ararat Road, Lake Bolac/VIC/Construction of the Mortlake Ararat Road firebreak 26 Jun 2014
- 2014/7203 Roads Corporation T/A VicRoads/Transport - land/Main Road, St Albans/VIC/Level Crossing Removal 09 May 2014
- 2013/7077 Roads Corporation Trading As VicRoads/Transport - land/Great Ocean Road, Wye River, Victoria/VIC/Proposed replacement of existing culvert 03 Dec 2013
- 2013/6970 Roads Corporation trading as VicRoads/Transport - land/Dartmoor-Hamilton Road, Yulecart/VIC/Muddy Creek Culvert Rehabilitation 20 Aug 2013
- 2013/6850 Roads Corporation (trading as VicRoads)/Transport - land/between Warren St in Echuca Vic & Perricoota Rd in Moama NSW/VIC/Construction of a second Murray River crossing Echuca-Moama, Vic 01 May 2013
- 2013/6792 Roads Corporation (trading as VicRoads)/Transport - land/Kilmore within the Shire of Mitchell/VIC/Construction of the Kilmore - Wallan bypass road 18 Mar 2013
- 2012/6642 Roads Corporation T/A VicRoads/Transport - land/western fringe of Kaniva in far west Victoria/VIC/Upgrade of Western Highway rail overpass at Kaniva 26 Nov 2012
- 012/6640 VicRoads, Western Region/Transport - land/Between Nurcoung and Minimay in West Wimmera Shire/VIC/Road Safety Improvement Works - Natimuk Frances Road 23 Nov 2012
- 2012/6568 Roads Corporation (trading as VicRoads)/Transport - land/From Winchelsea to Colac/VIC/Princes Highway Duplication - Winchelsea to Colac, VIC 03 Oct 2012
- 2012/6417 VicRoads/Transport - land/Winchelsea/VIC/Barwon River Bridge & Hesse Street Intersection, Winchelsea, VIC 05 Jun 2012
- 2012/6291 VicRoads (South Western Region - Geelong)/Transport - land/Grovedale, approximately 85km south west of Melbourne /VIC/Pioneer Road and bridge Duplication 24 Feb 2012
- 2012/6264 Roads Corporation t/a VicRoads /Transport - land/Between Mitta Mitta and



Omeo /VIC/Upgrade and seal existing unsealed sections of the Omeo Highway 23 Jan 2012

- 2012/6238 VicRoads- Geelong/Transport - land/Foxhow Road approx 140km west of Melbourne/VIC/Foxhow Road Realignment 06 Jan 2012
- 2011/6180 VicRoads, Wesrern Region /Transport - land/Between Stawell and Halls Gap/VIC/Grampians Road Safety Improvement Project 07 Nov 2011
- 2011/6054 Roads Corporation t/a VicRoads (Western Victoria)/Transport - land/Within Grampians National Park (GNP)/VIC/Flood Recovery Works 28 Jul 2011
- 2011/5805 VicRoads/Transport - land/Between Willow drive and Livingstone Rise, Hampton Park VIC/VIC/Hallam Road Duplication between Pound Rd & Ormond Rd 11 Jan 2011
- 2010/5784 VicRoads/Transport - land/Healesville - Koo Wee Rup Road/VIC/Pakenham Bypass to South Gippsland Highway 20 Dec 2010
- 2010/5744 VicRoads/Transport - land/Between Ararat and Stawell/VIC/Duplication of the Western Highway 24 Nov 2010
- 2010/5741 VicRoads/Transport - land/Between Old Shirley Road Beaufort & Heath Street Ararat/VIC/Western Highway Project: Beaufort to Ararat 19 Nov 2010
- 2010/5738 VicRoads/Department of Transport/Transport - land/Williams Landing/VIC/Palmers Road Rail Overpass and Bridge Works 18 Nov 2010
- 2010/5705 VicRoads/Transport - land/Between Burrumbeet and Beaufort/VIC/Upgrade of the Western Highway 25 Oct 2010
- 2010/5640 VicRoads/Transport - land/Stammers Road, Traralgon East to Templetons Road, Fulham /VIC/Princes Highway Duplication - Traralgon East to Fulham 10 Sep 2010
- 2010/5604 Roads Corporation trading as VicRoads/Transport - land/Henty HWY, approx 6.5km southwest of Hamilton /VIC/Construction of road deviation to side of existing carriageway and new bridge 04 Aug 2010
- 2010/5509 VicRoads /Transport - land/Between Princes Freeway, Laverton North & Greensborough /VIC/M80 Ring Road Upgrade, Part 2 25 May 2010
- 2010/5375 VicRoads/Transport - land/Nhill /VIC/Proposed Heavy Vechicle Trailer Exchange 26 Feb 2010
- 2010/5369 VicRoads/Transport - land/Taylors Lakes /VIC/Calder Freeway/Kings Road Interchange & Kings Road Duplication Project 23 Feb
- 2010 2010/5332 VicRoads/Transport - land/Fulham to Sale/VIC/East Princes Highway Duplication 25 Jan 2010



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- 2010/5328 VicRoads/Natural resources management/Norbank Road to Morris Road, Lake Bolac/VIC/Ararat-Mortlake Road Grassland Restoration Project 21 Jan 2010
 - 2010/5314 VicRoads/Transport - land/Western Highway Chainages 119515 to 127662/VIC/Western Highway Duplication - Ballarat to Burrumbeet 14 Jan 2010



Section 7 – Information sources

You are required to provide the references used in preparing the referral including the reliability of the source.

7.1 List references used in preparing the referral (please provide the reference source reliability and any uncertainties of source).

Reference Source	Reliability	Uncertainties
Okologie Consulting 2017a. Ecological Assessment for Geelong Bacchus Marsh Road Upgrade Project. Section 2 (Little River-Ripley Road to Ballan Road). Report prepared for VicRoads South Western Region.	Okologie Consulting	No uncertainties
Okologie Consulting 2017b. Ecological Assessment for Geelong Bacchus Marsh Road Upgrade Project. Section 3 (Ballan Road to Fiskin Street). Report prepared for VicRoads Safe System Road Infrastructure Program.	Okologie Consulting	No uncertainties
Okologie Consulting 2016a. Targeted Golden Sun Moth Survey for Geelong Bacchus Marsh Road Upgrade Project. Section 2 and 3 (Little River Ripley Road to Fiskin Street). Report prepared for VicRoads South Western Region.	Okologie Consulting	No uncertainties
EHP 2017a. Targeted Survey for Striped Legless Lizard, Geelong-Bacchus Marsh Road (Little River Ripley Road to Ballan Road). Report prepared by Ecology and Heritage Partners for VicRoads South Western Region.	Ecology and Heritage Partners	No uncertainties
EHP 2017b. Addendum-Targeted Survey for Striped Legless Lizard, Geelong-	Ecology and Heritage Partners	No uncertainties



Reference Source	Reliability	Uncertainties
BacchusMarsh Road (Little River-Ripley Road to Ballan Road). Report prepared by Ecology and Heritage Partners for VicRoads South Western Region		
EHP 2017c. Targeted Survey for Growling Grass Frog, Geelong-Bacchus Marsh Road (Little River-Ripley Road to Ballan Road). Prepared by Ecology and Heritage Partners for VicRoads - South Western Region	Ecology and Heritage Partners	No uncertainties
Benchmark Heritage Management 2016. 'Geelong – Bacchus Marsh Road Safety Upgrade Cultural Heritage Management Plan: Desktop, Standard and Complex Assessments: Section 2'. Report prepared for VicRoads	Benchmark Heritage Management	No uncertainties
Benchmark Heritage Management 2017. 'Geelong – Bacchus Marsh Road Safety Upgrade Cultural Heritage Management Plan: Desktop, Standard and Complex Assessments: Section 3' (Draft). Report prepared for VicRoads	Benchmark Heritage Management	No uncertainties
DoEE 2017. Protected Matters Search Tool. Department of Environment and Energy: http://www.environment.gov.au/epbc/pmst/	Department of Environment and Energy	No uncertainties
Okologie Consulting 2016b. Targeted Spiny Rice-flower Survey for Geelong Bacchus Marsh Road Upgrade Project. Section 2. Report prepared for VicRoads South Western Region	Okologie Consulting	No uncertainties
Okologie Consulting 2016c. Targeted Matted Flax-lily Survey for Geelong Bacchus	Okologie Consulting	No uncertainties



Reference Source	Reliability	Uncertainties
Marsh Road Upgrade Project. Section 2. Report prepared for VicRoads South Western Region		



Section 8 – Proposed alternatives

You are required to complete this section if you have any feasible alternatives to taking the proposed action (including not taking the action) that were considered but not proposed.

8.0 Provide a description of the feasible alternative?

Due to the required road safety outcomes no alternative locations, time frames or activities were considered appropriate.

8.1 Select the relevant alternatives related to your proposed action.

8.27 Do you have another alternative?

No



Section 9 – Contacts, signatures and declarations

Where applicable, you must provide the contact details of each of the following entities: Person Proposing the Action; Proposed Designated Proponent and; Person Preparing the Referral. You will also be required to provide signed declarations from each of the identified entities.

9.0 Is the person proposing to take the action an Organisation or an Individual?

Organisation

9.2 Organisation

9.2.1 Job Title

Director

9.2.2 First Name

Bryan

9.2.3 Last Name

Sherritt

9.2.4 E-mail

bryan.sherritt@roads.vic.gov.au

9.2.5 Postal Address

1 McNab Avenue
Footscray VIC 3011
Australia

9.2.6 ABN/ACN

ABN

61760960480 - ROADS CORPORATION

9.2.7 Organisation Telephone

0407 599 164



9.2.8 Organisation E-mail

bryan.sherritt@roads.vic.gov.au

9.2.9 I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

Not applicable

Small Business Declaration

I have read the Department of the Environment and Energy's guidance in the online form concerning the definition of a small a business entity and confirm that I qualify for a small business exemption.

Signature:..... Date:

9.2.9.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations

No

9.2.9.3 Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made

Person proposing the action - Declaration

I, BRYAN SHERRITT, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature:.......... Date: 22/08/2017.....

I, BRYAN SHERRITT, the person proposing the action, consent to the designation of _____ as the proponent of the purposes of the action describe in this EPBC Act Referral.

Signature:.......... Date: 22/08/2017.....

9.3 Is the Proposed Designated Proponent an Organisation or Individual?



Organisation

9.5 Organisation

9.5.1 Job Title

Director

9.5.2 First Name

Bryan

9.5.3 Last Name

Sherritt

9.5.4 E-mail

bryan.sherritt@roads.vic.gov.au

9.5.5 Postal Address

1 McNab Avenue
Footscray VIC 3011
Australia

9.5.6 ABN/ACN

ABN

61760960480 - ROADS CORPORATION

9.5.7 Organisation Telephone

0407599164

9.5.8 Organisation E-mail

bryan.sherritt@roads.vic.gov.au

Proposed designated proponent - Declaration

I, _____, the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.



Signature:..... Date:

9.6 Is the Referring Party an Organisation or Individual?

Organisation

9.8 Organisation

9.8.1 Job Title

Director

9.8.2 First Name

Bryan

9.8.3 Last Name

Sherritt

9.8.4 E-mail

bryan.sherritt@roads.vic.gov.au

9.8.5 Postal Address

1 McNab Avenue
Footscray VIC 3011
Australia

9.8.6 ABN/ACN

ABN

61760960480 - ROADS CORPORATION

9.8.7 Organisation Telephone

0470599164

9.8.8 Organisation E-mail

bryan.sherritt@roads.vic.gov.au

Referring Party - Declaration



I, _____, I declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.

Signature:..... Date:



Appendix A - Attachments

The following attachments have been supplied with this EPBC Act Referral:

1. appendix1_bacchusmarshroad_section2_vicroads_08082017_v5.pdf
2. appendix2_bacchusmarshroad_section3_vicroads_08082017_v2.pdf
3. appendix3_gsm_survey_bacchusmarshroad_report_07032017_v1.pdf
4. appendix4_ehp_balliang_sll_070617_cb.pdf
5. appendix5_ehp_balliang_sll_addendum_070817_cb.pdf
6. appendix6_ehp_balliang_ggf_120417.pdf
7. appendix7_pmst.pdf
8. appendix7_targeted_srf_vicroads_report_30112016_v1.pdf
9. appendix8_impact_assessment.pdf
10. appendix8_mfltargetedsurvey_bacchusmarshroad_report_20122016_v1.pdf
11. appendix11_section_177.pdf
12. appendix12_environmental_risk_management_guidelines_2012.pdf
13. attachment1_fig01_localityplan.pdf
14. attachment2_mnes_values.pdf
15. attachment3_ecologicalvalues.pdf
16. attachment4_fig04_flora.pdf
17. attachment5_fig05_fauna.pdf
18. submission_area.zip