ecology & heritage partners

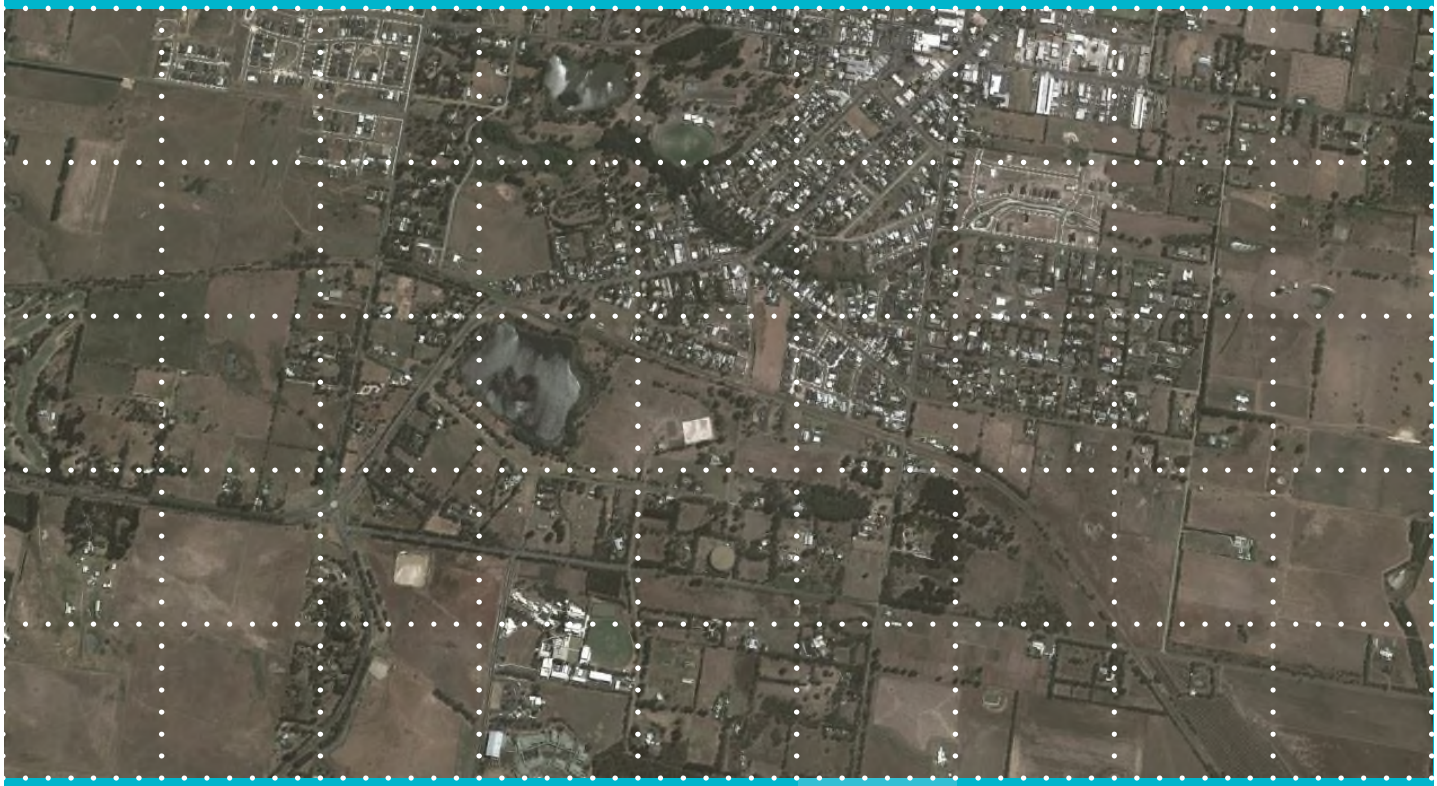
Final Report

Statement of Expert Evidence: Amendment C369 for the Greater Geelong Planning Scheme (Drysdale Bypass Project), Victoria

Prepared for

VicRoads (South Western Region)

July 2017



Ecology and Heritage Partners Pty Ltd

Andrew Hill

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We thank the following people for their contribution to the project:

- VicRoads' Drysdale Bypass staff for site and project information.
- Department of Environment, Land, Water and Planning (DELWP) for access to ecological databases.

DOCUMENT CONTROL

Assessment	Statement of Expert Evidence
Address	Drysdale Bypass Project, Drysdale, Victoria
Project number	9594
Project manager	Andrew Hill – Director / Principal Ecologist
Report author(s)	Andrew Hill – Director / Principal Ecologist
Report reviewer	Aaron Organ – Director / Principal Ecologist
Other EHP staff	Andrew Taylor – Consultant Zoologist, Andrew Warnock – Consultant Botanist and Robyn Giles – Senior Botanist
Mapping	Robyn Giles
File name	9594_DrysBypass_EWS_19072017_Final
Client	VicRoads (South Western Region)
Bioregion	Otway Plain
CMA	Corangamite
Council	City of Greater Geelong

1 AUTHOR'S EXPERTISE

This Statement of Expert Evidence has been prepared by Mr Andrew Hill, Director / Principal Ecologist of Ecology and Heritage Partners Pty Ltd, of 292 Mt Alexander Road, Ascot Vale, Victoria. It is based on the findings of an investigation by staff at Ecology and Heritage Partners Pty Ltd, and reports by two other consultancies, GHD and Biosis Research.

Andrew has over 23 years' experience in the environmental field, including 19 years in an environmental consultant capacity. Andrew has a broad working knowledge of flora and fauna throughout Victoria and has either managed or played an important role in providing environmental advice on a number of large infrastructure projects such as proposed pipelines, and road and rail developments, and numerous urban development projects (residential, industrial and commercial).

He has also been a lead author and/or co-author for over 500 projects and has provided expert advice to a range of private and government clients. Some of these projects include road projects, large infrastructure projects, long-term flora and fauna monitoring, and various large commercial and industrial projects as well as small residential projects throughout Victoria.

2 AUTHOR'S STATEMENT

I, Andrew Hill of Ecology and Heritage Partners Pty Ltd, have prepared this Statement of Expert Evidence pertaining to the proposed Drysdale Bypass, Drysdale, Victoria. The proceeding statement is based on the findings of ecological investigations undertaken by staff at Ecology and Heritage Partners Pty Ltd and reports by GHD and Biosis Research.

I have reviewed the majority of the work prepared by Ecology and Heritage Partners Pty Ltd for the Drysdale Bypass Project, and Andrew Taylor (Consultant Zoologist), Andrew Warnock (Consultant Botanist) and Robyn Giles (Senior Botanist) of Ecology and Heritage Partners Pty Ltd assisted with the background review, site assessments and reporting.

3 INTRODUCTION

3.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by VicRoads, in its capacity as the project proponent, to provide expert evidence relating to the ecological values within the proposed Drysdale Bypass (between Jetty Road and Whitcombes Road), Drysdale, Victoria. This evidence relates to potential ecological implications under the proposed Amendment C369 to the Greater Geelong Planning Scheme, *Victoria's Permitted clearing of Native Vegetation - Biodiversity assessment guidelines* (The Guidelines) (DEPI 2013), and other relevant Commonwealth and state environmental legislation and government policy.

Ecology and Heritage Partners conducted a preliminary ecological assessment in September 2014 to determine the existing terrestrial and aquatic flora and fauna values present within five Options for the Drysdale Bypass Project (Ecology and Heritage Partners 2014). VicRoads were investigating five Options to address traffic issues in Drysdale and this assessment was undertaken to identify the extent and type of remnant vegetation present within the options and to determine the likelihood of significant flora and fauna species and ecological communities occurring. This assessment identified remnant vegetation in poor to moderate condition sparsely scattered throughout the study area, as well as potential habitat for the State significant Bellarine Yellow-gum *Eucalyptus leucoxylon* subsp. *bellarinensis* and nationally significant Growling Grass Frog *Litoria raniformis*.

Potential habitat was identified for the nationally listed Growling Grass Frog *Litoria raniformis*, and therefore targeted terrestrial surveys were undertaken in late November and early December 2015. No frogs were recorded, and a referral to the Australian Government, under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is not required (Biosis Research 2016), and I agree with their conclusion.

In a further response to the findings of the preliminary ecological assessment, VicRoads commissioned GHD Pty Ltd to undertake a detailed ecological assessment of the chosen bypass alignment for the Drysdale Bypass Project, from Jetty Road to Whitcombes Road. This investigation included three assessments of the flora and vegetation within the study area, including;

- GHD 2017a. Drysdale Bypass: Habitat Hectare Assessment. Report prepared for VicRoads.
- GHD 2017b. Drysdale Bypass: Weed Assessment. Report prepared for VicRoads.
- GHD 2017c. Drysdale Bypass: Tree, Shrub and Significant Flora Assessment. Report prepared for VicRoads

VicRoads have also commissioned Ecology and Heritage Partners to prepare a summary of preliminary and detailed ecological assessments as part of the Drysdale Bypass Project (Ecology and Heritage Partners 2017).

3.2 Scope of Assessment

I was engaged by VicRoads to:

- Prepare expert ecological evidence in regards to Amendment C369; and,
- Appear as an expert witness on behalf of Council at the hearing in regards to the Amendment.

I have visited parts of the study area several times in the past, but for this statement of expert evidence, I visited the study area on the 8th July 2017.

3.3 Study Area

The Drysdale Bypass Project is located between Jetty Road and Whitcombes Road, Drysdale, Victoria, to the south and east of Drysdale, and it is approximately six kilometres long and is between 20 m to 300 m wide (Figure 1). The study area is flat to gently undulating and includes several unnamed minor ephemeral streams and artificial farm dams.

Generally the land within the study area and the immediate surrounds has been subject to modification through agricultural use and residential development. Further, the majority of the native vegetation within the study area and surrounds has been cleared or modified as a result of previous land use activities and remnant vegetation is generally isolated and restricted to small remnants and/or scattered indigenous trees.

According to DEWLPs Biodiversity Interactive Map (DELWP 2017a) the study area occurs within the Otway Plain bioregion. The study area also falls within the Corangamite Catchment Management Authority and the City of Greater Geelong municipality. The proposed alignment is predominantly zoned Farming Zone (FZ), with small areas of Road Zone (RDZ1) and Public Use Zone Category 4 (PUZ4; Bellarine Rail Trail). The following overlays apply (DELWP 2017b, 2017c):

- Heritage Overlay (HO; Bellarine Rail Trail);
- Public Acquisition Overlay – Schedule 3 (PAO3); and,
- Vegetation Protection Overlay – Schedule 1 (VPO1; Portarlington Road).

The VPO1 largely relates to remnant vegetation along Portarlington Road and its protection.

4 REPORTS RELIED UPON

The following reports relating to the project were reviewed as part of the preparation of this statement of expert evidence, including;

- Biosis Research Pty Ltd 2016. Drysdale Bypass: Targeted Growling Grass Frog Survey. Unpublished report prepared for VicRoads.
- Ecology and Heritage Partners 2014. Preliminary Cultural Heritage Assessment for the proposed Drysdale Bypass. Unpublished report for VicRoads.
- Ecology and Heritage Partners 2017. Summary of Preliminary and Detailed Ecological Assessments for the Drysdale Bypass. Unpublished report for VicRoads.
- GHD 2017a. Drysdale Bypass: Habitat Hectare Assessment. Unpublished report prepared for VicRoads.
- GHD 2017b. Drysdale Bypass: Weed Assessment. Unpublished report prepared for VicRoads.
- GHD 2017c. Drysdale Bypass: Tree, Shrub and Significant Flora Assessment. Unpublished report prepared for VicRoads.

5 ECOLOGICAL RESULTS

Based upon the ecological reports listed above, and my recent site inspection, the following ecological values are known from the study area.

5.1 Summary of Ecological Values

Much of the vegetation within the study area consists of introduced grasses, planted trees or artificial/degraded drainage lines, however there were several small patches of native vegetation and scattered indigenous trees. The study area also supports seven broad vegetation and habitat types, including woodland, ephemeral wetland, scattered trees and farm dams, introduced grassland, planted trees and drainage lines (Ecology and Heritage Partners 2017).

According to GHD (2017a), remnant patches within the study area (Figure 2), consist of Heathy Woodland (Ecological Vegetation Class [EVC] 48), Grassy Woodland (EVC 175), and Tall Marsh (EVC 821), in poor to moderate condition. This is generally consistent with the extant DELWP vegetation mapping (DELWP 2017d). However, it is noted that some of the remnant vegetation south of Andersons Road is documented as Plains Sedgy Wetland in Ecology and Heritage Partners (2014), rather than Grassy Woodland in GHD (2017a), and based upon my recent inspection, the vegetation has a greater affinity to sedgy EVCs.

Based upon the Habitat Hectare Assessment (GHD 2017a), 8.473 hectares of remnant native vegetation are located within the study area, and are proposed to be cleared. This includes 5.309 hectares of remnant patches and 3.195 hectares attributable to 45 scattered remnant trees (45 trees x 0.071 hectares = 3.164 hectares) (GHD 2017a). It should be noted that based upon GHD (2017a, 2017c), Ecology and Heritage Partners (2017) and my recent inspection, the majority of the vegetation within the study area included in the vegetation loss calculations is not remnant. Once final road designs are completed, and only remnant native vegetation and remnant scattered trees are included within the vegetation loss calculations (as per the Guidelines [DEPI 2013]), it is likely that the hectares of remnant native vegetation proposed to be cleared will be significantly reduced.

As documented above, introduced flora species are prevalent within the study area, and a weed assessment by GHD (2017b), recorded noxious and Weeds of National Significance, scattered throughout the study area.

No threatened flora and fauna species, or listed ecological communities are present within the study area, and a referral to the Australian Government, under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is not required (Biosis Research 2016, Ecology and Heritage Partners 2017, GHD 2017c). However, three species listed as protected under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) (Black Wattle, Golden Wattle and Austral Grass-tree) were recorded within the study area. A permit to removed protected flora under the FFG Act will be required (GHD 2017c).

5.2 Permitted Clearing of Native Vegetation: Biodiversity Assessment Guidelines

5.2.1 Risk-pathway

Based on the combination of location risk as shown on the Native Vegetation Information Management tool and the extent risk thresholds (DEPI 2013), Amendment C369 falls under the Moderate Risk-pathway. Based upon a worst case scenario, a total of 1.226 habitat hectares (8.473 hectares) of remnant vegetation is proposed to be removed, which includes both remnant and non-indigenous vegetation losses (Table 1) (GHD 2017a).

Table 1. Permitted Clearing Assessment.

Location		A
Strategic Biodiversity Score (of vegetation to be removed)		0.194
Vegetation to be removed	Remnant Patch (ha)	5.309
	Scattered Trees (no)	45
	Total Hectares	**8.473**
	Total Habitat Hectares	**1.226**
Risk	Vegetation Risk	Moderate
	Scattered Trees Risk	Moderate
	Risk-pathway	**Moderate**

5.2.2 Offset Targets

The offset requirements for native vegetation removal, as prescribed by the Biodiversity Assessment Guidelines, have been calculated by DELWP, based on the habitat hectares scores as assessed by GHD (2017a). The resulting Biodiversity Impact and Offset Requirement (BIOR) report produced by DELWP is presented in GHD (2017a). These requirements are summarised below (Table 2).

Table 2. Offset requirements for the permitted clearance of vegetation.

Offset Type	General Offset
General Offset Amount (general biodiversity equivalence units)	0.452 general units
General Offset Attributes	
Vicinity	Corangamite Catchment Management Authority (CMA) or the City of Greater Geelong
Minimum Strategic Biodiversity Score	0.194*
Offset Type	**Specific Offsets**
Specific offset amount (specific biodiversity equivalence units) and attributes	N/A

Note. * Minimum strategic biodiversity score is 80% of the weighted average score across habitat zones where a general offset is required.

6 RESPONSE TO PANEL DIRECTIONS

6.1 Clarifications requested by the Panel at the Directions Hearing

- 'Fauna assessments - were the surveys conducted at the optimal time and if not how can this be addressed?'

Fauna assessments were undertaken at optimal times during the years. During the initial work undertaken by Ecology and Heritage Partners (2014), the fauna assessments were undertaken on 22 September 2014, and a review of significant fauna species records from ecological databases was also undertaken. Based upon the results of the initial work, targeted surveys for the nationally significant Growling Grass Frog were undertaken during late November 2015 and early December 2015, which is an optimal time of the year. Targeted surveys were undertaken according to the Significant Impact Guidelines for the Vulnerable Growling Grass Frog (DEWHA 2009) and the Survey Guidelines for Australia's Threatened Frogs (DEWHA 2010). Further, the Growling Grass Frog was recorded calling at a known site in Portarlington, indicating that the frog was active during the survey period.

- 'Flora assessment - what flora assessment has been conducted and what was done?'

Several flora assessments have been undertaken since 2014, including a preliminary inspection on the 22 September 2014 (Ecology and Heritage Partners 2014), a habitat hectare assessment on 4–5 August 2016, 16 November 2016 and 16 February 2017 of the Drysdale Bypass study area (GHD 2017a), a weed assessment on 4–5 August 2016 and 20 February 2017 of the Drysdale Bypass study area (GHD 2017b) and an assessment of trees, shrubs and significant flora species on 4–5 August 2016, 16 November 2016 and 16 February 2017 of the Drysdale Bypass study area. Generally the optimal time for flora assessments is spring to early summer, and the majority of these inspections were undertaken at an optimal time, and the weed assessment was undertaken just outside of the optimal period.

- 'How will the Basin reserve / road reserve that is within the Vegetation Protection Overlay be protected?'

Basin Road is outside of the study area and there are no proposed works located within the Basin Reserve or the Basin Road road reserve. According to the City of Greater Geelong website, the Basin Reserve is an important refuge for native plants and animal species (CoGG 2017). In order to prevent any potential issues, and to ensure the ecological values of these sites are retained, local access only should be maintained along Basin Road, and if required, speed limiting devices should be utilised if traffic patterns change significantly.

6.2 Addressing relevant submissions

Relevant objections and responses in regards to ecological matters are listed in the Appendix 2. DELWP and the CCMA have not objected to Planning Scheme Amendment C369. The City of Greater Geelong are generally supportive, and a response to one of their issues is discussed in Appendix 2.

7 CONCLUSION

Much of the vegetation within the study area consists of introduced grasses, planted trees or artificial/degraded drainage lines, however there were several small patches of native vegetation and scattered indigenous trees.

Based upon the Habitat Hectare Assessment, 8.473 hectares of remnant native vegetation are located within the study area, and are proposed to be cleared, and the application to remove native vegetation will be assessed under the Moderate risk-pathway. This includes 5.309 hectares of remnant patches and 3.195 hectares attributable to 45 scattered remnant trees (45 trees x 0.071 hectares = 3.164 hectares). The offset requirements for native vegetation removal, as prescribed by the Biodiversity Assessment Guidelines, have been calculated by DELWP to be 0.452 General Biodiversity Equivalence Units.

It should be noted that based upon GHD (2017a, 2017c), Ecology and Heritage Partners (2017) and my recent inspection, the majority of the vegetation within the study area included in the vegetation loss calculations is not remnant. In my opinion, once final road designs are completed, and only remnant native vegetation and remnant scattered trees are included within the vegetation loss calculations, it is likely that the hectares of remnant native vegetation proposed to be cleared, and therefore the offset requirement, will be significantly reduced.

No threatened flora and fauna species, or listed ecological communities are present within the study area, and a referral to the Australian Government, under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is not required (Biosis Research 2016, Ecology and Heritage Partners 2017, GHD 2017c). However, three species listed as protected under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) (Black Wattle, Golden Wattle and Austral Grass-tree) were recorded within the study area. A permit to removed protected flora under the FFG Act will be required.

Overall, given the ecological conditions within the study area and the proposed Drysdale Bypass, it is my view that the proposed development will not lead to any significant impacts to ecological values, provided appropriate mitigation measures are implemented during all phases of construction, such as maintaining hydrological conditions and ensuring pest control works are undertaken, and any landscaping/revegetation works use a variety of indigenous local species, which can provide opportunities to protect and augment retained native vegetation and fauna habitat for a range of locally common fauna species.

8 REFERENCES

Biosis Research Pty Ltd 2016. Drysdale Bypass: Targeted Growling Grass Frog Survey. Report prepared for VicRoads.

CoGG (2017). http://www.geelongaustralia.com.au/parks/item/basin.aspx City of Greater Geelong, Victoria.

DEPI 2013. Permitted clearing of native vegetation - Biodiversity assessment guidelines (the Guidelines). Victorian Department of Environment and Primary Industries.

DELWP 2017a. Biodiversity Interactive Map [www Document]. URL: <http://www.depi.vic.gov.au/environment-and-wildlife/biodiversity/biodiversity-interactive-map>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2017b. Planning Maps Online [www Document]. URL: <http://services.land.vic.gov.au/maps/pmo.jsp>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2017c. Planning Schemes Online [www Document]. URL: http://planningschemes.dpcd.vic.gov.au. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2017d. Ecological Vegetation Class (EVC) Benchmarks for each Bioregion [www Document]. URL: <http://www.depi.vic.gov.au/environment-and-wildlife/biodiversity/evc-benchmarks#bioregionname>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DEWHA 2009. Significant impact guidelines for the vulnerable Growling Grass Frog (*Litoria raniformis*). Nationally threatened species and ecological communities EPBC Act policy statement 3.14, Department of the Environment, Water, Heritage & the Arts, Australian Government, Canberra.

DEWHA 2010. Survey guidelines for Australia's threatened frogs. Guidelines for detecting frogs listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999, Department of the Environment, Water, Heritage & the Arts. Australian Government, Canberra

Ecology and Heritage Partners 2014. Preliminary Cultural Heritage Assessment for the proposed Drysdale Bypass. Unpublished report for VicRoads.

Ecology and Heritage Partners 2017. Summary of Preliminary and Detailed Ecological Assessments for the Drysdale Bypass. Unpublished report for VicRoads.

GHD 2017a. Drysdale Bypass: Habitat Hectare Assessment. Report prepared for VicRoads.

GHD 2017b. Drysdale Bypass: Weed Assessment. Report prepared for VicRoads.

GHD 2017c. Drysdale Bypass: Tree, Shrub and Significant Flora Assessment. Report prepared for VicRoads.

9 REQUIRED INFORMATION

Name and Address

This report has been prepared by Andrew Hill, Director of Ecology and Heritage Partners, 292 Mt Alexander Road, Ascot Vale, Ph: (03) 9377 0100, ahill@ehpartners.com.au

Area of Expertise

Andrew Hill is an expert ecologist, with skills in all the major ecological environments of south-eastern Australia (Appendix 1 for CV). He has particular expertise in the workings of ecological systems, both under natural conditions and when affected by unnatural disturbance regimes such as weed invasion and impacts of development projects. He has also considerable experience in the application and practical implementation of current Commonwealth and State environmental legislation and Government Policy. Andrew has appeared as an expert witness for a variety of small and large projects.

Expertise to make the Report

Andrew Hill has considerable knowledge of the native flora and fauna throughout south eastern Australia, including areas around Geelong. A selection of past VCAT and Panel appearances include:

- Statement of Expert Evidence for the Planning Scheme Amendment at Central Road, Nunawading;
- Statement of Expert Evidence for the Planning Scheme Amendment at Goldies Lane, Woodend;
- Statement of Expert Evidence for the Planning Scheme Amendment at High Street Road, Wantirna South;
- Statement of Expert Evidence for a proposed development at Hansens Lane, Balnarring Beach;
- Statement of Expert Evidence for a proposed development at Haydens Road, Beaumaris;
- Statement of Expert Evidence for a proposed development on the Hume Freeway, Wallan;
- Statement of Expert Evidence for the Planning Scheme Amendment for the Wonthaggi Golf Course, Wonthaggi;
- Statement of Expert Evidence for the proposed rezoning of the Bells Boulevard area, Jan Juc;
- Statement of Expert Evidence for the Planning Scheme Amendment at Cox Road, Sale;
- Statement of Expert Evidence for the Planning Scheme Amendment for the Mortlake Power Station, Mortlake;
- Statement of Expert Evidence for the Planning Scheme Amendment for the Shaw River Power Station, Portland;
- Statement of Expert Evidence for the Planning Scheme Amendment for the Ouyen Mineral Sands project, Ouyen; and,

- Statement of Expert Evidence for the Planning Scheme Amendment for the Phillip Island Tourist Road, Phillip Island.

Author's Declaration

I, Andrew Hill, have made all the inquiries that l believe are desirable and appropriate and that no matters of significance which l regard as relevant have to my knowledge been withheld from the tribunal.

---------- Date: 19/07/2017

APPENDIX 1 - CV

Andrew Hill

Position Director / Principal Ecologist

Qualifications Master of Environmental Science, Monash University, 1997 • Bachelor of Science (Honours), Monash University, 1992 • Certified Environmental Practitioner• Successful Competency Check for Vegetation Quality Assessments• Successful completion of the Development and Building in Bushfire Prone Areas course

Years' Experience 20

Skills and Experience

Andrew Hill has over 20 years' experience in the environmental field, with over half of these years as a consultant botanist/ecologist. Andrew has worked for State and Local Governments, and two large private environmental consultancies, and now is a Director of Ecology and Heritage Partners. From his experience he has developed an expert knowledge of flora and fauna issues throughout south eastern Australia. He is particularly competent in flora surveys, Environmental Impact Assessment, Biodiversity (formerly Net Gain) assessments, environmental audits, developing environmental management plans, consulting with all stakeholders and providing expert advice, including at VCAT and Panels. Andrew is also a Certified Environmental Practitioner, which is an initiative of the Environment Institute of Australia and New Zealand, to recognise practitioners that meet a high standard of ethical and professional conduct. He has also satisfactorily passed the Department of Environment, Land, Water and Planning (DELWP) competency check in the use of the Vegetation Quality Assessment Habitat Hectare approach, and has successfully passed the Development and Building in Bushfire Prone Areas course, which is run by the University of Western Sydney and is endorsed by the Country Fire Authority.

Andrew has also contributed to and managed over 500 projects and a selection of the projects managed includes proposed roads and pipelines, residential and industrial developments, environmental audits, biodiversity studies, bushfire management statements and environmental management plans.

Professional Affiliations

- Environment Institute of Australia and New Zealand (EIANZ) – Member and Certified Environmental Practitioner.
- Ecological Society of Australia - Member
- Victorian Field Naturalist Club – Member
- Australian Institute of Company Directors - Member

Relevant Projects

Audits

- Sugarloaf Pipeline Environmental Audit, Yarra Glen, Department of Sustainability and Environment, Victoria. Participated in the Audit Team as the Ecologist, and conducted quarterly audits for two years on this significant 120km pipeline project, reviewing and auditing during the pre-construction phase, during the construction phase and during the post-construction phase.

Forestry Audits

- Environmental audits of Timber Harvesting on Public Land in Victoria. Sub-consultant to GHD and URS for the Department of Sustainability and Environment, and Environment Protection Authority, Victoria. Completed the ecological components of the audit, which involved field work throughout Victoria, identification of ecological features and training of work crews, completion of work modules, and presentation of results.
- Environmental audits of Timber Harvesting on HVP land within the Strzelecki Ranges for Smartwood. Completed the ecological components of the audit, which involved field work, identification of ecological features and training of work crews, completion of work modules, and presentation of results.
- Environmental audits of Timber Harvesting on HVP land within the Strzelecki Ranges for the Latrobe Shire. Completed the entire audit, which involved field work, identification of ecological features, completion of work modules, and presentation of results.

Major Projects

- Gippsland Water Factory was an innovative wastewater treatment and recycling system servicing a population base of over 55,000, including a treatment plant at Maryvale, 78 kilometres of pipeline, three pump stations and five upgraded pump stations. Andrew lead Ecology and Heritage Partners' work for the Gippsland Water Factory Alliance (Parsons Brinckerhoff Australia Pty Ltd and Gippsland Water) complete a broad ecological assessment of the indicative project area. Detailed flora and fauna surveys were then undertaken once the pipeline alignment and development footprint of the plant site become available.

- Mortlake Power Station Project (Origin Energy Limited): Commissioned to undertake an ecological review of flora and fauna issues for the proposed water supply pipeline. This project included a review of the Departments biological databases and interactive maps. A site assessment was undertaken to review information on terrestrial flora and fauna values, record all vascular plants and fauna species and mapping any significant records found.

- Shaw River Gas Power Plant Project (Santos): Undertook a detailed flora, fauna and aquatic survey of the proposed Shaw River Power Station Project, located between Iona and Orford, Victoria. This project included a desktop analysis of the area as well as a detailed field survey to obtain information on terrestrial flora and fauna values within the study area and immediate surrounds.
- Victorian Desalination Project - Vegetation Survey, VIC, Thiess Degrémont Joint Venture - Ecology and Heritage Partners Pty Ltd worked in partnership with the Thiess Degrémont Joint Venture to undertake all of the detailed ecological investigations and monitoring requirements (along both the approved utilities alignment and at the plant site) during the commissioning stages of the State significant Victorian Desalination Plant Project.

- Vegetation mapping and floristic composition throughout western Victoria for the Department of Sustainability and Environment, Victoria. Managed and participated in a large project involving the collection of floristic data from more than 2,000 quadrats from western Victoria, over a 3 month period.

Roads and Rail

- Geelong Ring Road, Geelong, Victoria (VicRoads): Co-ordinated vegetation surveys and mapping to identify the ecological values present within, and surrounding Section 1 of the area proposed for the Geelong Ring Road. Provided an overview of ecological constraints and assisted the roads authority to identify an alignment with least ecological impacts. Prepared Offset Management Plans for the remainder of the Sections and identified and secured for VicRoads all relevant offsets.

- Regional Rail Link (Department of Transport): Commissioned to undertake a detailed flora and fauna assessment, aquatic survey, targeted flora and fauna surveys and a Net Gain analysis for the proposed

Regional Rail Link. The study area was within crown land and rail reserves and stretched from Southern Cross Station (Melbourne) to the Deer Park Bypass in Melbourne's west. The rail reserve included the entire twenty kilometre east-west route enabling land to be reserved for development of additional railway lines and upgrade of existing rail infrastructure.

- Cardinia Road railway station (Department of Transport): Undertook vegetation surveys and mapping to identify the ecological values present within, and surrounding the area proposed for the railway station. Provided a report identifying ecological constraints to assist the rail authority to identify an alignment with least ecological impacts.
- Caroline Springs railway station (Department of Transport): Co-ordinated vegetation and significant flora and fauna assessments for the railway station. Prepared a report which identified actions and mitigation measures required to address permit and approval requirements, as well as development of a significant species Conservation Management Plan.
- South Morang Rail Extension (Department of Transport): Coordinated an ecological assessment of the proposed rail alignment. Key roles included field surveys, reporting and consultation with regulatory agencies. Provided a report of ecological constraints to assist the rail authority to identify an alignment with least ecological impacts.

Bushfire

- Vegetation Condition and Fuel Load Assessment (DELWP), VIC 2011-2012: The project aimed to undertake a Vegetation Condition Assessment and Fuel Load Assessments across Victoria by assessing routine vegetation condition and fuel loads in regions of the State that had been selected based upon environmental typology related to vegetation type, vegetation condition and fire history on both privately owned and Crown lands. The data was used to inform fire hazard mapping and assist in the design and application of prescribed burning. Clio was responsible for collecting bushfire-related data for over 70 quadrat sites, including estimating fine fuel load cover in a variety of woodland and grassland ecosystems.
- Vegetation and Bushfire Assessment, Goldies Lane, Woodend, Victoria. Undertook a biodiversity assessment and provided a bushfire management plan, and attended VCAT, in regards to the proposed residential development at this site.

APPENDIX 2 – RESPONSE TO RELEVANT SUBMISSIONS

Appendix 2: Drysdale Bypass
Summary of Relevant Submissions – Planning Scheme Amendment C369

#	Submitter	Nature of Submission	Any specific changes sought to the PSA	Response / comment
9		▸ The submitter is not supportive of the proposed ultimate design of the Drysdale Bypass. ▸ The submitter believes the current design of the Bypass has the potential to negatively impact upon environmental values between Murradoc Road to Whitcombes Road. ▸ The submitter believes the current design has the potential to negatively impact upon environmental values, in particular the drainage line and areas of River Red Gum dominated native woodland vegetation that occurs on, and in the vicinity of, their property.	The following recommendations are made by the submitter including: ▸ To discontinue with the proposal to construct the Bypass beyond Murradoc Road. ▸ Ensure that adequate measures are put in place to protect the ecological values of the study area. ▸ Further investigate the Growling Grass Frog habitat in the study area.	▸ The ecological values between Murradoc Road and Whitcombes Road are highly modified, supporting common fauna species, and the vegetation consists of introduced pasture grasses and planted trees and shrubs. ▸ Native vegetation losses are minimal within the proposed alignment, and it is likely a final road design will reduce impacts further. Any native vegetation losses will be offset accordingly. ▸ A CEMP/EMP will be completed prior to works beginning. ▸ A targeted Growling Grass Frog survey was undertaken at the end of 2015, and no frogs were recorded within the study area and in nearby habitats. ▸ The existing hydrological regime is proposed to be maintained post construction, particularly in adjacent areas where remnant vegetation and/or remnant trees are present.
10		▸ The submitter is primarily concerned that the proposed elevation on Drakes Road of 4 – 6 metres will reduce the amenity by	▸ No specific changes are recommended in the submission.	▸ A targeted Growling Grass Frog survey was undertaken at the end of 2015, in wetlands nearby to Drakes Road, and no frogs were recorded within the study area and in nearby habitats.

#	Submitter	Nature of Submission	Any specific changes sought to the PSA	Response / comment
		allowing road users to look onto the submitter's property. ▸ The submitter is also concerned with the potential increased run off which may cause flooding, erosion, mud and bog. ▸ The submitter also raises concerns regarding a natural pond which is currently in his property believing he has a Growling Grass Frog population. ▸ The submitter disagrees with VicRoads noise modelling assessment.	A number of answers are sought regarding the treatment runoff such as: ▸ How will run off be slowed in both velocity and volume? ▸ Will water purity be maintained over the years? ▸ Who ensures water purity in the years to come?	
11		▸ The submitter is generally supportive of the Drysdale Bypass Project. The submitter raises a number of concerns in relation to the following: ▸ Indigenous vegetation ▸ Noxious plants, environmental weeds and pest animals. ▸ Increased usage of Gilles Road. ▸ The environmental value of Lake Lorne.	▸ Where possible, netting wire should be considered along roadsides to prevent noxious plants, environmental weeds and pest animals. ▸ The submitter would like an audit undertaken of all indigenous vegetation which may be removed. ▸ The submitter also requests specifications for landscaping of the bypass.	▸ Native vegetation losses are minimal within the proposed alignment, and it is likely a final road design will reduce impacts further. Any native vegetation losses will be offset accordingly. ▸ A weed assessment was undertaken within the study area and weeds were recorded scattered throughout the study area. Weed control measures, including pest animal controls, will be implemented as part of the CEMP/EMP. ▸ Lake Lorne is outside of the study area and there are no proposed works.
14		The submitter is not supportive of the proposed ultimate design of the	The submitter raises a number of questions in regards to the	▸ The ecological values between Murradoc Road and Whitcombes Road are highly

#	Submitter	Nature of Submission	Any specific changes sought to the PSA	Response / comment
		Drysdale Bypass. Primarily the submitter is not supportive of constructing the bypass beyond Murradoc Road for the following reasons: ▸ High cost and extent of earthworks. ▸ Increases in the amount and rate of water flow. ▸ Impact negatively on existing flora and fauna. ▸ Destroy the existing amenity of the property.	increase in water flow as follows: ▸ Who maintains these on an annual basis? ▸ What happens to the pollutants in a downpour event (as happened this year) and the hydrocarbons and tar are washed out of confinement and into our waterway populated by frogs , wading birds, ducks and bordered by the historically important remnant river red gums?	modified, supporting common fauna species, and the vegetation consists of introduced pasture grasses and planted trees and shrubs. ▸ Native vegetation losses are minimal within the proposed alignment, and it is likely a final road design will reduce impacts further. Any vegetation losses will be offset accordingly.
26		The submitter is generally supportive of the construction of the Drysdale Bypass. The submitter has however raised the following concerns: ▸ The submitter is concerned with the impact of noise and lights from the Bypass when the vegetation at their property is removed. ▸ That their property value will decrease. ▸ Impacts from construction such as dust and noise.	▸ No specific changes are sought however some concerns are raised.	▸ A CEMP/EMP will be completed prior to works beginning, which will reference landscape and/or revegetation plans, which may offset the losses of any planted trees and shrubs.

#	Submitter	Nature of Submission	Any specific changes sought to the PSA	Response / comment
		▸ The submitter is concerned that the area they live in will no longer be a green rural area.		
28		▸ The submitter is primarily concerned with the ultimate design of the Drysdale Bypass. Specifically the submitter believes the proposed intersection at Reserve/Portarlington Road will severely impact there amenity. ▸ The submitter believes that little consideration was given to their property in the design of the Drysdale Bypass. ▸ The submitter is concerned that the projected noise levels have not taken into consideration the removal of vegetation which acts as a natural buffer and increased traffic flow. ▸ The submitter believes VicRoads have provided little information as to how the consequences of the Bypass will be ameliorated to retain the properties rural living zone amenity.	▸ No specific changes are sought.	▸ A CEMP/EMP will be completed prior to works beginning, which will reference landscape and/or revegetation plans, which may offset the losses of any planted trees and shrubs. ▸
29		▸ DELWP recommends a number of principles be considered for inclusion in an environmental management plan.	DEWLP recommends the following principles be listed in Clause 5.2 of the incorporated document:	▸ All of the principles listed by DELWP are considered standard practice and can minimise impacts on ecological values within and adjacent to the study area.

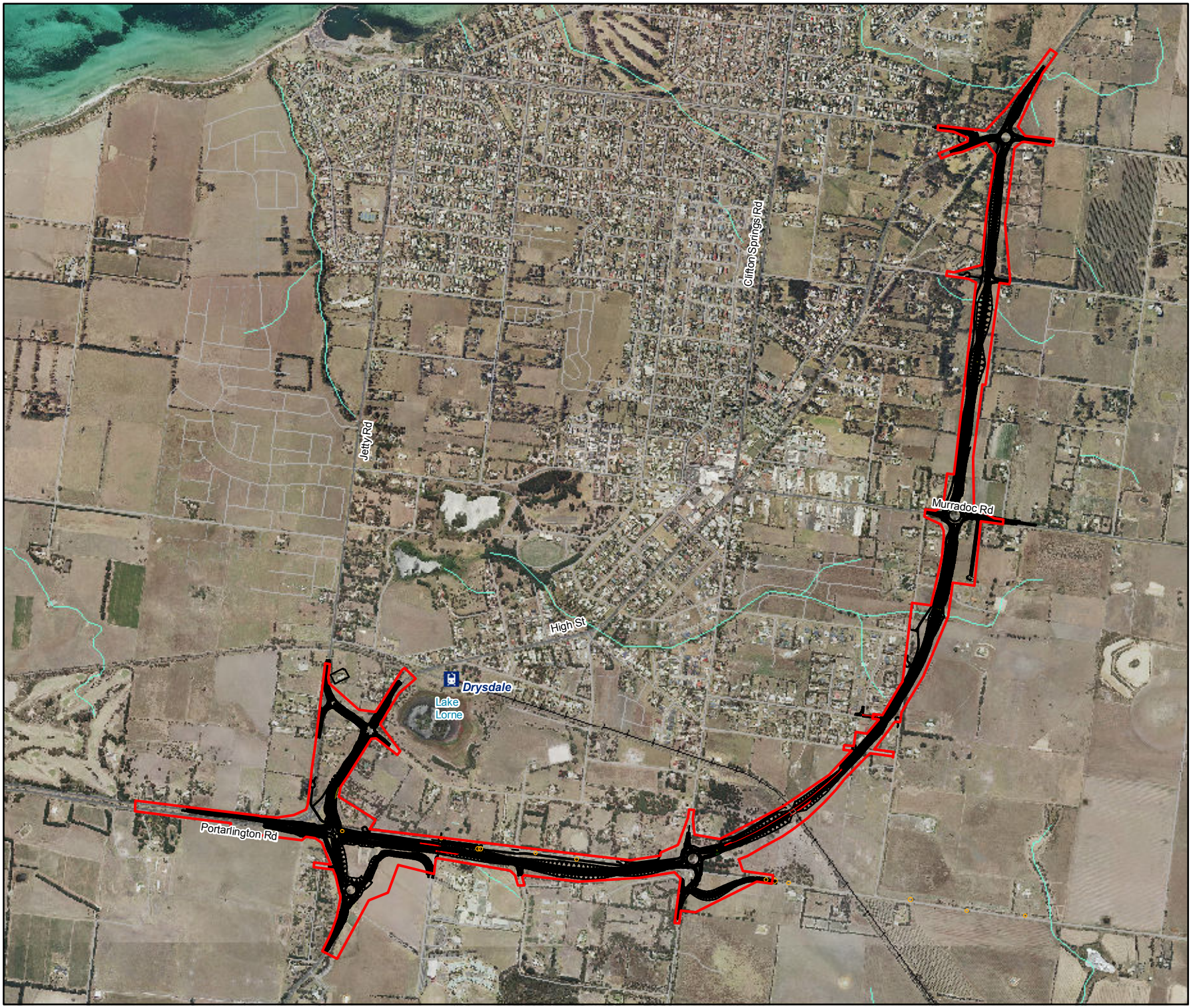
#	Submitter	Nature of Submission	Any specific changes sought to the PSA	Response / comment
			▸ Before work starts, the contractor must advise all persons undertaking the vegetation removal or works on the site of all relevant principals and associated statutory requirements or approvals. ▸ Before the vegetation removal starts, the boundaries of all native vegetation to be removed and retained must be clearly marked on the ground. ▸ Any pruning/lopping/trimming that is required to be done to the canopy of any tree to be retained must be done by a qualified arborist in accordance with Australian Standard 4373-2007 – Pruning of Amenity Trees. ▸ Tree protection zones (TPZs) need to be taken into consideration when planning works. TPZs prevent the indirect loss of vegetation due to encroaching construction/development	

#	Submitter	Nature of Submission	Any specific changes sought to the PSA	Response / comment
			in the area. Where impacts exceed 10% of the TPZ the tree should be considered lost and offset accordingly. ▸ Identification of site compound locations where native vegetation will not be impacted. There must be no temporary or permanent storage of any materials, vehicles, equipment or plant within areas of native vegetation identified to be retained. Such sites must not be located on or near erodible surfaces, surface water runoff areas or areas infested with weeds. ▸ Incorporating weed control measures to prevent the spread and introduction of new weeds into the site. This includes implementing wash down areas to avoid transporting plant material or soil, as well as post works weed monitoring and controls as required. Noxious weeds listed under the *Catchment and*	

#	Submitter	Nature of Submission	Any specific changes sought to the PSA	Response / comment
			Land Protection Act 1994 that were identified as part of the weed assessment for this project must be appropriately controlled throughout the study area to minimise their spread and impacts on ecological values. DELWP also recommends that the incorporated document be amended to require an Offset Management Plan to be prepared in consultation with DELWP.	
30		The COGG are generally supportive of the Amendment C369. COGG also makes reference to the strategic planning and the sports and school precinct. In its submission COGG indicates that a works in kind agreement could be negotiated to allow VicRoads to upgrade Belchers Road, COGG encourages the delivery of these works in the short term.	▸ The COGG has identified a number of areas where further design work and negotiation will be required. ▸ The COGG recommended a number of changes to the Incorporated Document.	▸ The existing hydrological regime is proposed to be maintained post construction, particularly in adjacent areas where remnant vegetation and/or remnant trees are present.

#	Submitter	Nature of Submission	Any specific changes sought to the PSA	Response / comment
		COGG has also indicated that it intends to make further submissions in relation to drainage. COGG have asked for a further assessment of the hydrological impact of the project on the stand of red gums at Drakes Road,		
34		▸ The submitter is primarily concerned with the condition of Basin Road and believes the road is not suitable to carry increased traffic volumes. ▸ The submitter believes road side vegetation and the Basin Reserve will also be impacted through an increase in traffic.	▸ The construction of speed signs along Basin Road is sought. ▸ The construction of a shared path along Basin Road to allow people to ride/walk.	▸ Basin Reserve or the Basin Road road reserve is outside of the study area and there are no proposed works located within these sites. However, in order to prevent any potential issues, and to ensure the ecological values of these sites are retained, local access only should be maintained along Basin Road, and if required, speed limiting devices should be utilised if traffic patterns change significantly.

FIGURE 1



Legend

- Study Area Boundary
- Proposed Alignment

Figure 1

Location of the study area

Drysdale Bypass Option 5

N

0 260 520

Metres

ecology & heritage partners

8837_Fig01_Study_Area 11/04/2017 mneville

FIGURE 2

Based upon GHD (2017a) and Ecology and Heritage Partners (2017)

Legend

- Study Area Boundary

Habitat Hectare Assessment (GHD 2017)

- HZ1
- Planted Native Vegetation
- Scattered Trees

Figure 2a

Ecological features within the study area

Drysdale Bypass

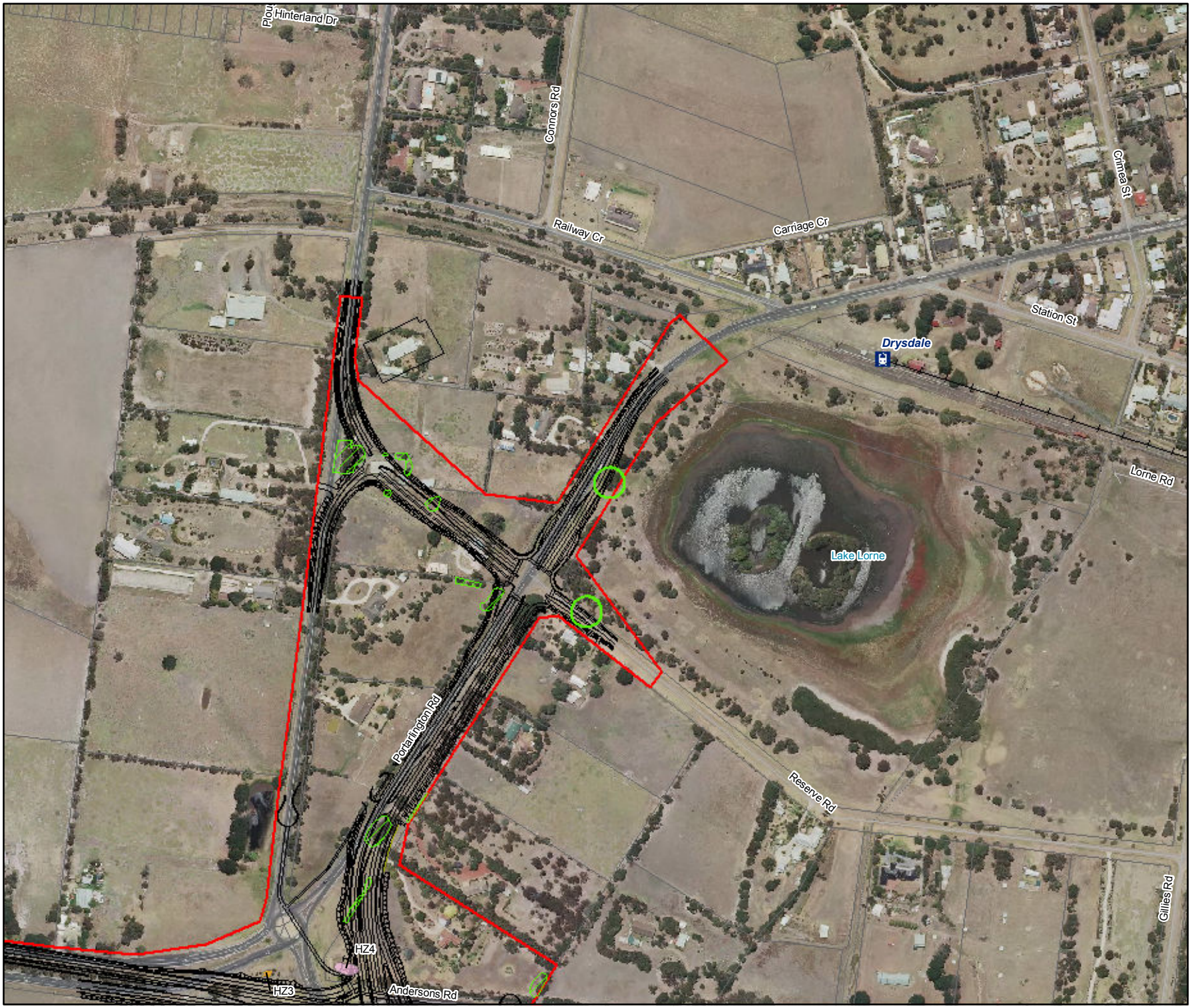
N

0 60 120

Metres

ecology & heritage partners

8837_Fig02_Eco_features 11/04/2017 mneville



Legend

- Study Area Boundary

Habitat Hectare Assessment (GHD 2017)

- HZ3
- HZ4
- Planted Native Vegetation
- Scattered Trees

Figure 2b

Ecological features within the study area

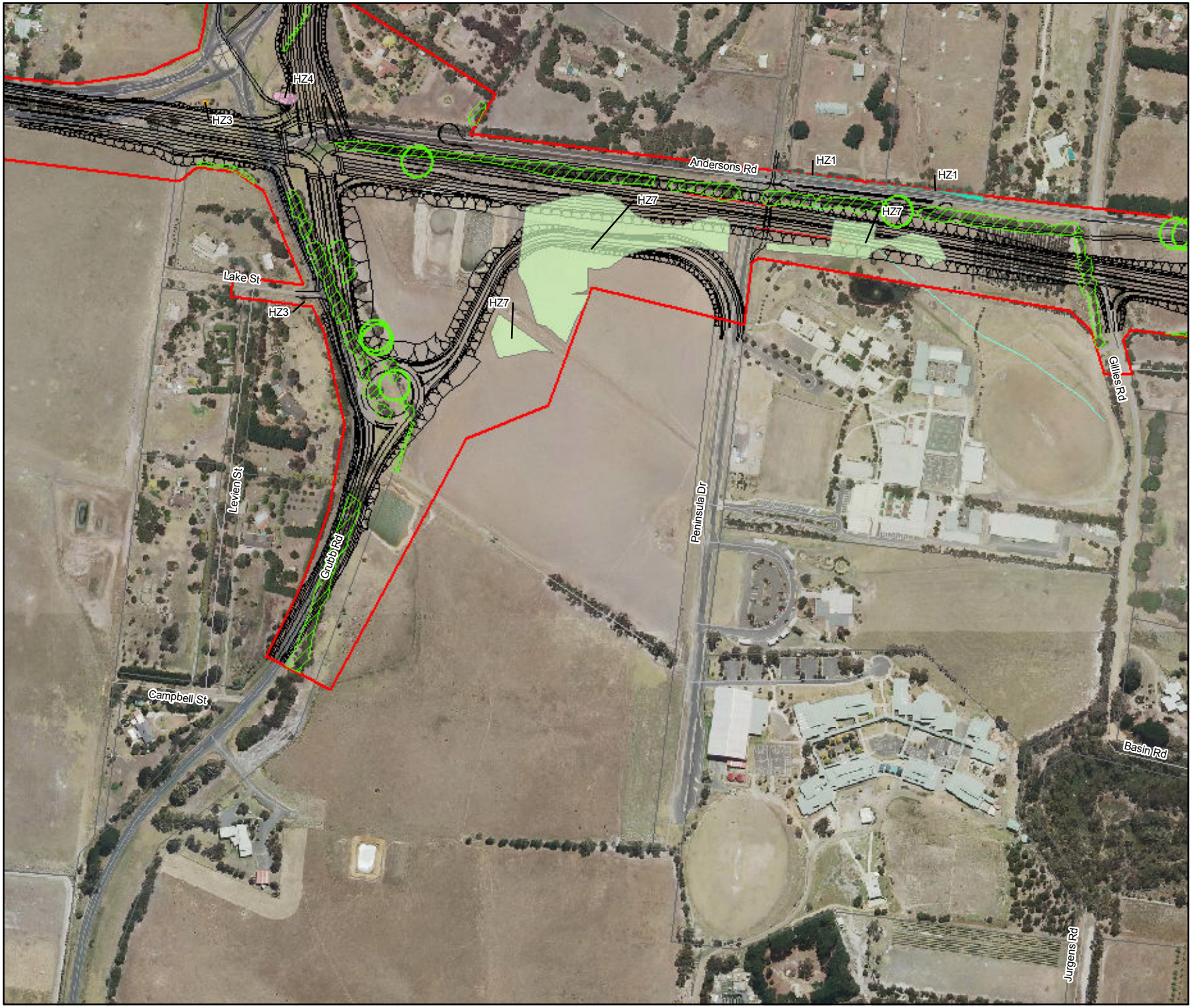
Drysdale Bypass

N

0 60 120

Metres

ecology & heritage partners



Legend

Study Area Boundary

Habitat Hectare Assessment (GHD 2017)

- HZ1
- HZ3
- HZ4
- HZ7

Planted Native Vegetation

Scattered Trees

Figure 2c

Ecological features within the study area

Drysdale Bypass

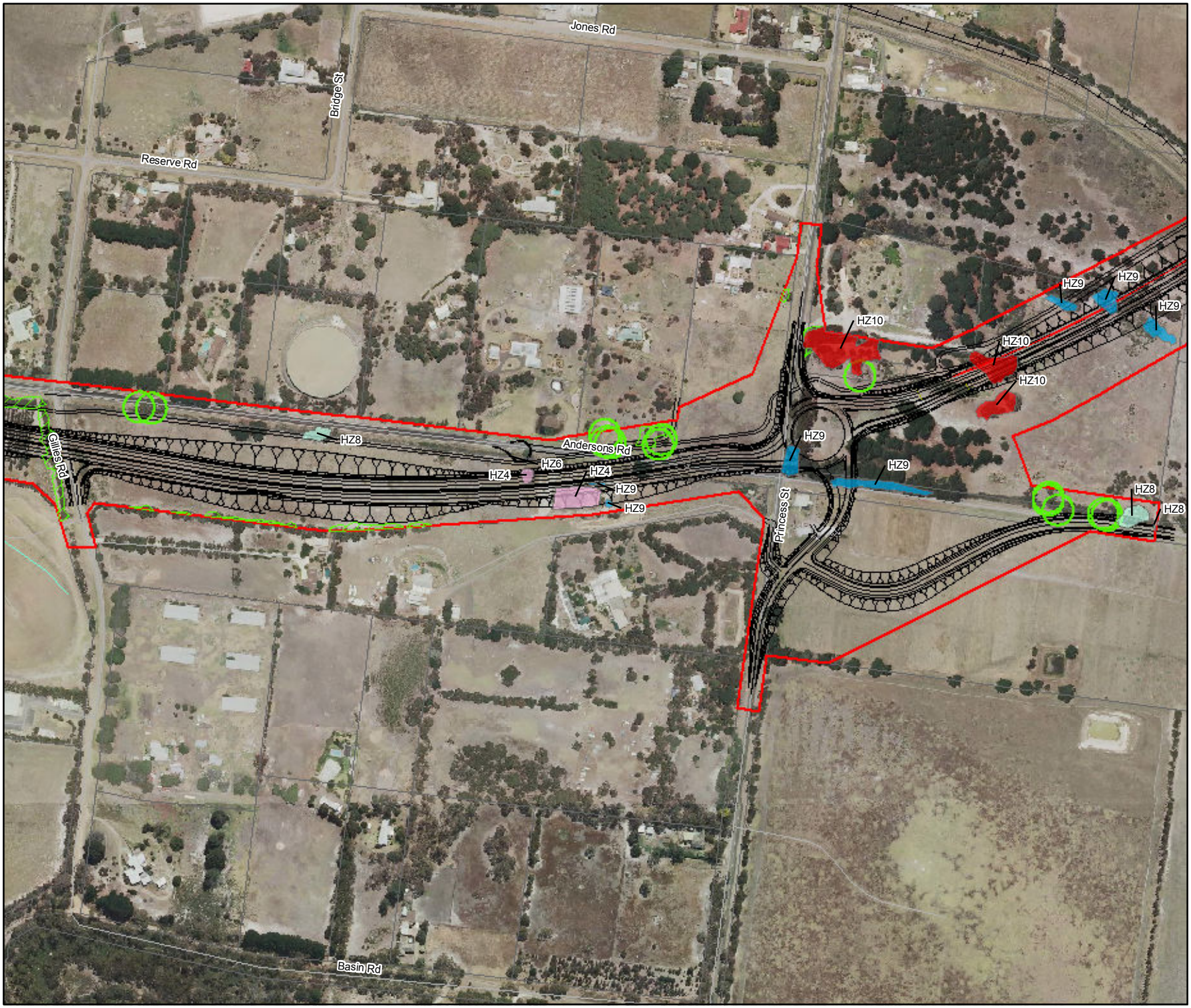
N

0 60 120

Metres

ecology & heritage partners

8837_Fig02_Eco_features 11/04/2017 mneville



Legend

- Study Area Boundary

Habitat Hectare Assessment (GHD 2017)

- HZ4
- HZ6
- HZ8
- HZ9
- HZ10
- Planted Native Vegetation
- Scattered Trees

Figure 2d

Ecological features within the study area

Drysdale Bypass

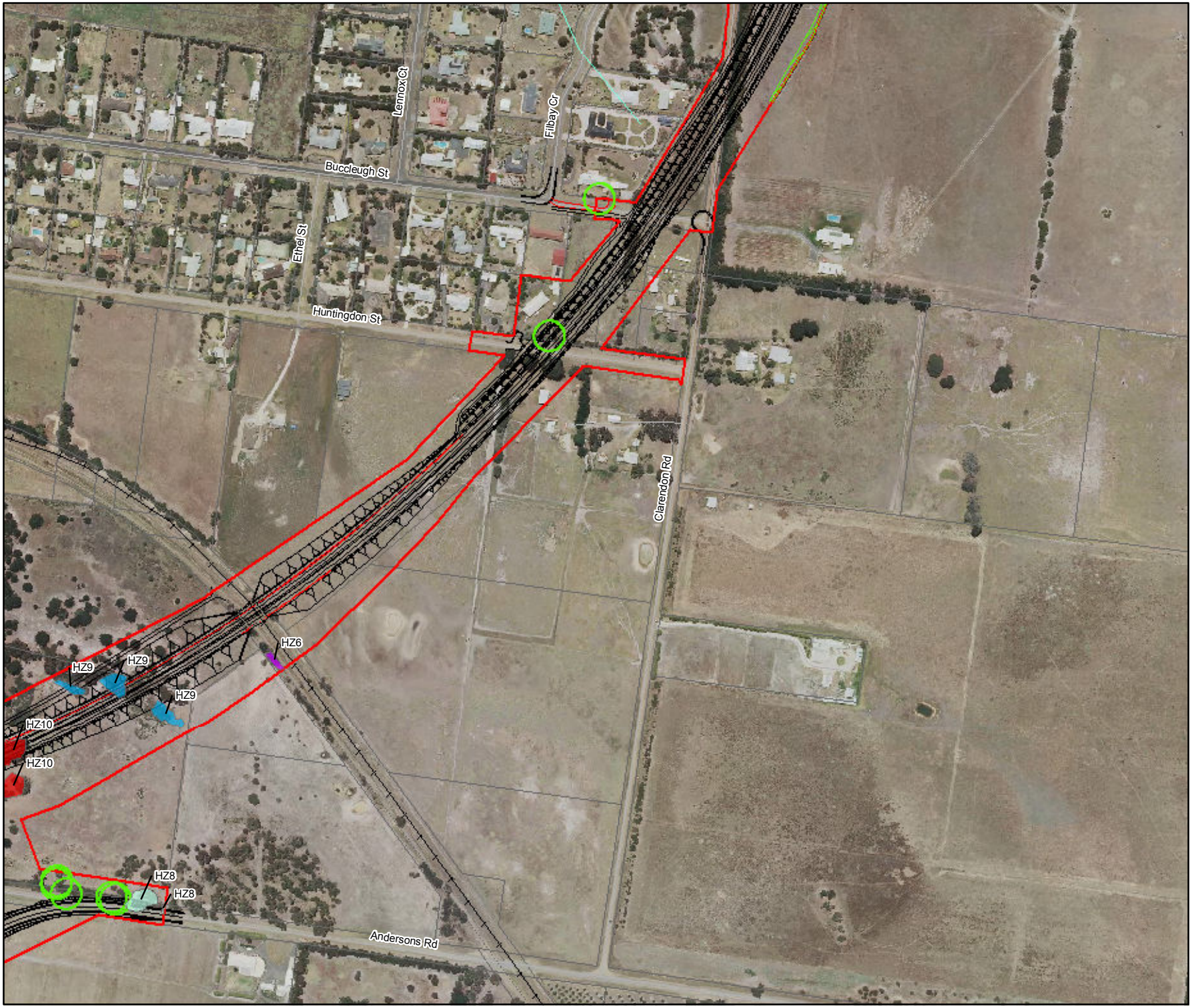
N

0 60 120

Metres

ecology & heritage partners

8837_Fig02_Eco_features 11/04/2017 mneville



Legend

- Study Area Boundary

Habitat Hectare Assessment (GHD 2017)

- HZ6
- HZ8
- HZ9
- HZ10
- Planted Native Vegetation
- Scattered Trees

Figure 2e

Ecological features within the study area

Drysdale Bypass

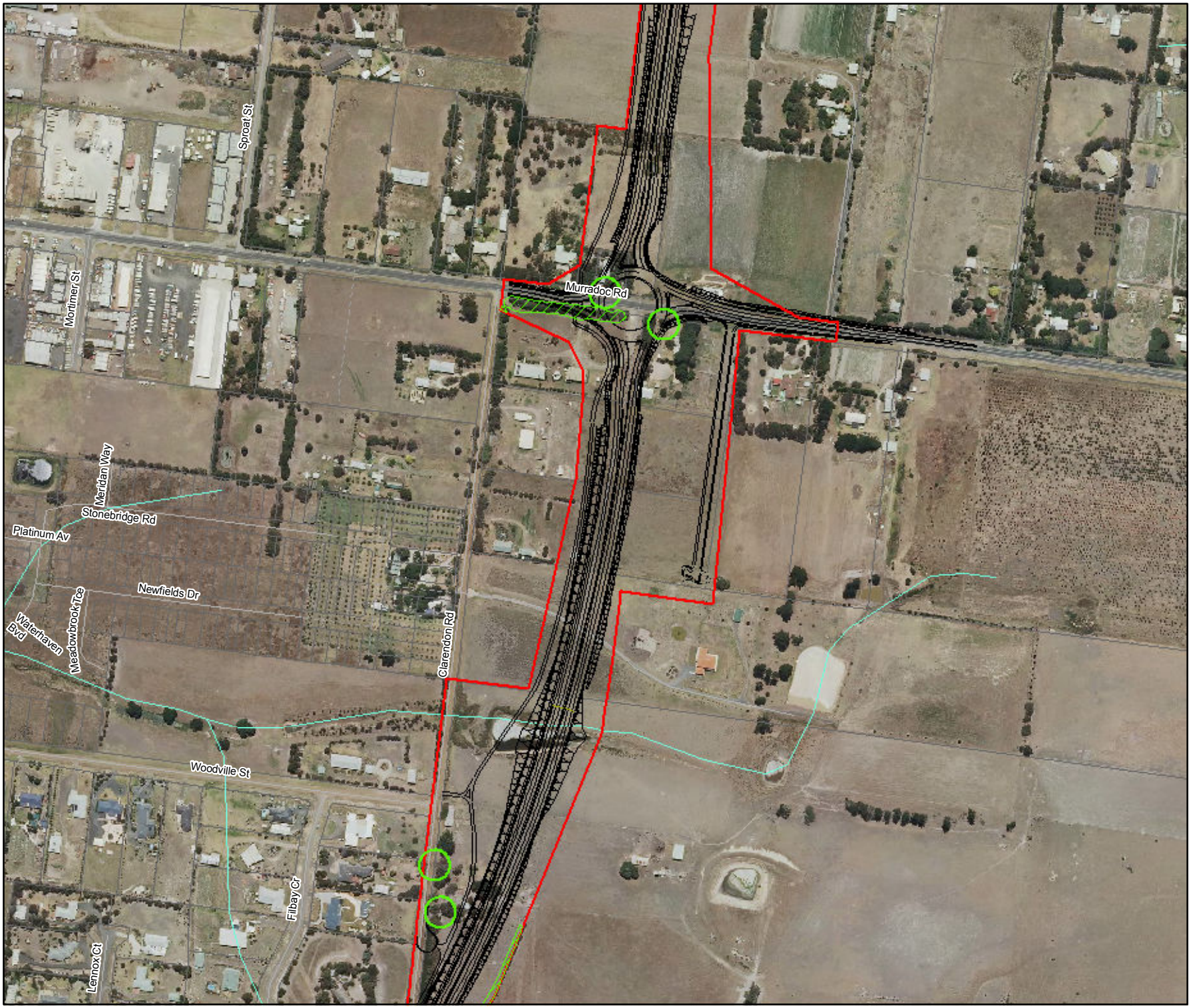
N

0 60 120

Metres

ecology & heritage partners

8837_Fig02_Eco_features 11/04/2017 rneville



Legend

- Study Area Boundary
- Planted Native Vegetation
- Scattered Trees

Figure 2f

Ecological features within the study area

Drysdale Bypass

N

0 60 120

Metres

ecology & heritage partners

Legend

- Study Area Boundary
- Planted Native Vegetation

Figure 2g

Ecological features within the study area

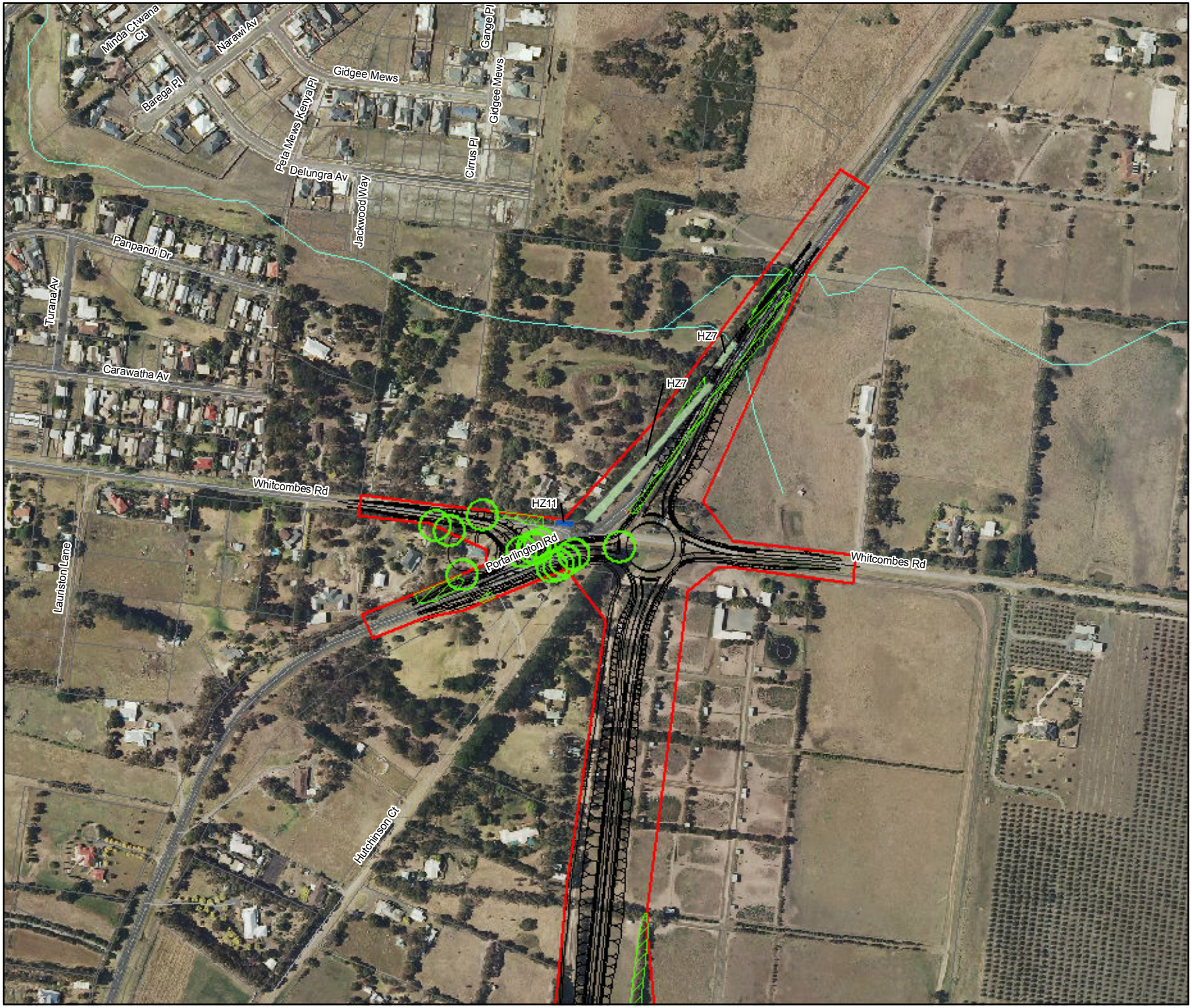
Drysdale Bypass

N

0 60 120

Metres

ecology & heritage partners



Legend

- Study Area Boundary

Habitat Hectare Assessment (GHD 2017)

- HZ7
- HZ11
- Planted Native Vegetation
- Scattered Trees

Figure 2h

Ecological features within the study area

Drysdale Bypass

N

0 60 120

Metres

ecology & heritage partners