

96-166 Centre Road,
Narre Warren

Annual EPBC
Compliance Report 2020
– EPBC 2014/7380

Prepared for
Narre Warren Central Pty Ltd

March 2021
Report No. 14090 (16.2)



Nature
Advisory

(Formerly Brett Lane & Associates Pty Ltd)

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1. Introduction

This Compliance Report addresses the conditions of approval EPBC 2014/7380 under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) held by the approval holder Narre Warren Central Pty Ltd, ACN 600 509 064. This is for the approved action to undertake a residential estate development at 96-166 Centre Road, Narre Warren, Victoria.

The approval was dated 5th February 2016 and is effective until the 1st January 2031. This Compliance Report encompasses the dates from the commencement of approval (February 2016) to now (February 2021) as no prior compliance reports have been completed. Construction activities commenced on the 8th November 2016.

This report provides evidence of compliance with the thirteen (13) conditions of the approval, outlined in Section 3 and Table 1.

This report draws together information from the following sources:

- Onsite monitoring and reporting undertaken by Nature Advisory;
- Monitoring and reporting undertaken by Aquatica Environmental; and
- Correspondence from the approval holder.

This report was prepared by a team from Nature Advisory comprising Annette Cavanagh (Botanist) and Inga Kulik (Senior Ecologist and Project Manager).

The approval holder, Narre Warren Central Pty Ltd, accepts responsibility for this report.

Declaration of accuracy

In making this declaration, I am aware that sections 490 and 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) make it an offence in certain circumstances to knowingly provide false or misleading information or documents. The offence is punishable on conviction by imprisonment or a fine, or both. I declare that all the information and documentation supporting this compliance report is true and correct in every particular. I am authorised to bind the approval holder in this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed



Full name Inga Kulik

Position Senior Ecologist and Project Manager / Director

Organisation Nature Advisory Pty Ltd ABN 12 095 541 334

Date 5/03/2021

2. Compliance with approval conditions

The approval conditions (Appendix 1) relate to the controlling condition *Listed threatened species and communities*. Specifically, they relate to the EPBC Act listed vulnerable Dwarf Galaxias (*Galaxiella pusilla*). Dwarf Galaxias are located in suitable habitat in the drainage channels along Centre Road and internally (Figure 1).

All conditions of the EPBC approval have been considered and addressed.

In 2020, the approval holder applied for variations to the EPBC conditions. The revised conditions of the EPBC approval (changes marked in red), and whether compliance or non-compliance with each condition has been achieved, are listed below. The definitions from the approval that apply to the terms shown in bold throughout this document are listed in Appendix 1 of this report.

2.1. Conditions 1 to 4 – Mitigation

1. To avoid mortality of **dwarf galaxias**, prior to **construction activities** occurring within 30 metres of **dwarf galaxias habitat**, the **Approval Holder** must salvage and translocate **dwarf galaxias** in accordance with a **Salvage and Translocation Plan** approved by the **Victorian Government**.
2. To mitigate impacts on **dwarf galaxias** movement and dispersal in the local area, the **Approval Holder** must ensure flow connectivity is maintained between the **dwarf galaxias habitat retained**, Troups Creek East Branch, and Hallam Main Drain as indicated in Annex 2.
3. To mitigate impacts on **dwarf galaxias** due to stormwater runoff in **dwarf galaxias habitat retained**, there must be no **impact on water quality** between upstream and downstream water sampling points, **noting that background fluctuation may impact the overall water quality**, and no **impact on the water level**, during **construction activities** and 1 year after the completion of **construction activities**.

The Approval Holder must undertake the following monitoring to determine if these outcomes are being achieved:

- a) prior to the **commencement of construction** to gain baseline data;
 - b) once per fortnight throughout **construction activities**;
 - c) once every 3 months for the year following completion of **construction activities**;
- and
- d) after significant rainfall events of greater than 10mm, during both construction and the year following the completion of **construction activities**.
4. To mitigate impacts on **dwarf galaxias**, the **Approval Holder** must ensure that buffer areas identified in Annex 3 are revegetated within **5 years** of **commencement of construction** and that vegetation cover is retained until the expiry of the approval. This outcome must meet the following milestones:
 - a) less than **40%** weed cover **5 years** from the **commencement of construction**; and
 - b) less than **30%** weed cover and at least **70%** native vegetation cover **7 years** from the **commencement of construction**.

The **Approval Holder** must undertake the following monitoring to determine if these outcomes are being achieved:

- a) prior to the **commencement of construction** to gain baseline data;

- b) 6 months after the **commencement of construction**;
- c) 12 months after the **commencement of construction**;
- d) 2, 3, 5, 7 **and 10** years after the **commencement of construction**.

Condition 1 compliance

The approved dwarf galaxias Salvage and Translocation Plan was implemented on the 5th/6th October 2016 (prior to commencement of construction), with dwarf galaxias being salvaged from planned removed habitat and translocated to retained habitat.

Compliant

Condition 2 compliance

The dwarf galaxias retained habitat connection to the Centre Road drain has been maintained, as was the case prior to commencement of the project. The Centre Road drain also maintains all of its pre-construction connectivity with upstream inputs and downstream receiving waterways.

Note that the actual connectivity pathway is that the dwarf galaxias retained habitat connects to the Centre Road roadside drain, which then passes under Troupes Creek East Branch to the western side of Troupes Creek East Branch (via a syphon culvert), then passes via another culvert to the southern side of Centre Road and into the Hallam Main Drain floodplain.

There has been no loss or change to pre-existing connectivity due to the project.

Compliant

Condition 3 compliance

Water quality monitoring has been taking place throughout 2020 on a monthly basis up until June 2020 when fortnightly monitoring commenced.

Monitoring after >10mm rainfall events was achieved for rainfall events from June 2020.

Water quality data was collected monthly in the first half year of 2020 as construction was not occurring near dwarf galaxias habitat after March 2019. At this time, earthworks began at stages 6 and 7, which are located in the northern part of the site further away from dwarf galaxias habitat. Fortnightly water quality monitoring was resumed from 25th May 2020 (see Appendix 2). The proponent has worked with DAWE's compliance department on this and the matter has been resolved.

Water quality in the retained Dwarf Galaxias habitat and Centre Road roadside drain is highly variable due to natural seasonal variations and upstream impacts/inputs. Although water quality monitoring has not met the conditions, the overall data shows that the project has not resulted in an ecologically significant impact to water quality between upstream and downstream sites. There were some minor/short duration impacts to turbidity observed at times. These were generally to a lesser degree than the natural variations often observed in the dwarf galaxias retained habitat.

The more significant impacts observed in the data were associated with other sources of impact such as upstream water inputs and drain/culvert works undertaken by other parties (e.g. other nearby land developments).

Annual Dwarf Galaxias monitoring by Aquatica Environmental since the translocation event has shown that the retained habitat population is thriving (Appendix 2). In particular, the 2020 annual survey returned the highest number of individuals to date. This was due to a combination of higher winter/spring rains and improved hydrology due to the constructed swales providing improved habitat extent and quality.

Water quality and Dwarf Galaxias monitoring reports by Aquatica Environmental for 2020 are provided in Appendix 2.

Compliant from June 2020

Condition 4 compliance

This condition was varied to achieve 40% weed cover 5 years from the commencement of construction, which will be in 2021.

The Year 3 vegetation monitoring was undertaken by Nature Advisory in November 2020, four years after commencement of construction and weed cover varied between 0% and 50% across the buffer areas with an average weed cover between 30 and 40%. It is envisioned that an overall weed cover of 40% is achievable by the end of 2021 subject to continuing weed management.

Environmental Weed Management Australia Pty Ltd was appointed on 5th March 2018 to undertake weed management. The work included spraying of weeds throughout the construction site and the conservation area along the Centre Road roadside drain.

In 2020, the following weed management action were undertaken:

- Weed control works along roadside drain conservation area (19th Oct 2020)
- Weed control works along roadside drain conservation area (4th Dec 2020)
- Weed control works along roadside drain conservation area (7th Dec 2020)
- Weed control works along roadside drain conservation area (16th Dec 2020)

The vegetation monitoring report by Nature Advisory for November 2020 is provided in Appendix 3.

Compliant

2.2. Conditions 5 to 8 – Offsets

5. To compensate for the loss of **dwarf galaxias habitat** at the **project area**, prior to the **commencement of construction**, the **Approval Holder** must enter into an **Agreement** to ensure the long term security of the **offset site**. The **Approval Holder** must:
 - a) provide the **Department** with a signed copy of the **Agreement**, within 2 weeks of confirmation of the **Agreement**; and
 - b) provide the **Department** with the **offset attributes, shapefile** and map(s) clearly defining the location and boundaries of the **offset site**, within 2 weeks of confirmation of the **Agreement**.
6. Prior to **commencement of construction**, the **Approval Holder** must secure the **offset site** with an appropriate **legal conservation mechanism**. Any proposal for an alternative offset must be agreed to in writing with the **Department**.
7. After a period of 10 years from the **commencement of construction**, the **offset site** must contain at least 2 hectares of **Dwarf Galaxias habitat** which contains a self sustaining population of **Dwarf Galaxias** and is connected to known **Dwarf Galaxias habitat** in the local area. This outcome must meet the following milestones:
 - a) **Dwarf Galaxias habitat** in the **offset site** must be constructed within **5 years** of **commencement of construction**;

- b) **Dwarf Galaxias** must be identified as present in the **Dwarf Galaxias habitat** in the **offset site** within **6 years** of **commencement of construction**; and
 - c) **Dwarf Galaxias** presence and abundance must be consistent with that of **control sites** from after **7 years** of **commencement of construction** and for the life of the approval.
8. The **Approval Holder** must undertake a monitoring program, which includes the newly constructed **Dwarf Galaxias habitat** in the **offset site** and **control sites**. The monitoring program must ensure the data gathered is adequate to: inform adaptive management; and demonstrate whether the milestones and outcomes described in condition 7 have been met. Monitoring must be undertaken by a **suitably qualified person**.

Condition 5 compliance

The agreement securing Dwarf Galaxias Offset Site was entered into and was provided to the Department. Shapefiles of the offset site and an offset site assessment report (Nature Advisory Report 14090(10.2)) including a description of the attributes and maps were provided to the Department. – Not relevant for the 2020 compliance.

Condition 6 compliance

A S173 Agreement securing Dwarf Galaxias Offset Site was entered into before commencement of construction. This Agreement was provided to the Department in June and September 2016. – Not relevant for the 2020 compliance.

Compliant

Condition 7 compliance

Council issued a planning permit (PInA00545/16) on 22nd December 2016 for vegetation removal for the Dwarf Galaxias offset site. However, in March 2017, Council suggested that the offset site had the possibility of supporting the EPBC Act listed community *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains*.

Despite the advice given by Nature Advisory and confirmed by DoE that the offset site does not support the listed community, Melbourne Water asked to review the conceptual design to maximise the retention of vegetation that exist within *Seasonal Herbaceous Wetlands*. An application for conditions for Dwarf Galaxias works was submitted to Melbourne Water in May 2017. The extent of vegetation to be retained was finalised by Melbourne Water in September 2017 and a completed functional design was submitted to Melbourne Water in November 2017. This was accepted by Melbourne Water in May 2018.

The Council issued planning permit expired on the 22nd December 2017 and it was advised in May 2019 that a new permit for the Dwarf Galaxias offset site be applied for. A new permit application for vegetation removal was lodged with Council in July 2019 and a new permit (PInA00539/19) was issued on the 19th February 2020. Vegetation offsets were paid in May 2020.

Works commenced in summer 2020 when the area had sufficiently dried out. Preparatory works (slashing and vegetation removal) on the Dwarf Galaxias offset site officially commenced on 10/2/2020. It is expected that the Dwarf galaxias offset site construction will be finalised by the end of 2021, within 5 years of commencement of construction.

Compliant

Condition 8 compliance

Monitoring of the newly constructed habitat at the Dwarf Galaxias offset site will begin after construction of the site is completed by the end of 2021.

2.3. Conditions 9 to 13 – Administrative conditions

9. Within 7 calendar days after the **commencement of construction**, the **Approval Holder** must advise the **Department** in writing of the actual date of **commencement of construction**.
10. The **Approval Holder** must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement plans/programs and measures taken to achieve outcomes and milestones required by this approval and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be publicised through the general media.
11. Within 3 months of every 12 month anniversary of the **commencement of construction**, the **Approval Holder** must publish an annual report of compliance on their website addressing compliance with each of the conditions of this approval, including the implementation of any plans/programs specified in the conditions and whether outcomes and milestones required by these conditions have been or are on track to being met. The compliance report must consider the **Department's Annual Compliance Report Guidelines**. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the annual report of compliance is published.
12. Upon the direction of the **Minister**, the **Approval Holder** must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.
13. If, at any time after 5 years from the date of this approval, the **Approval Holder** has not **substantially commenced the action**, then the **Approval Holder** must not **substantially commence the action** without the written agreement of the **Minister**.

Condition 9 compliance

Not relevant to the year 2020 compliance.

Condition 10 compliance

Records regarding water quality, fish and vegetation monitoring are being kept and can be made available upon request to the department.

All monitoring reports providing details of the measurements and monitoring events are available on this website: <https://natureadvisory.com.au/notifications>

Compliant

Condition 11 compliance

This is the annual compliance report for 2020 that will be provided to the Department and published on this website: <https://natureadvisory.com.au/notifications>

Compliant

Condition 12 compliance

There has been no direction from the Minister to undertake an independent audit of compliance.

Not applicable

Condition 13 compliance

The action has been commenced.

Not applicable



Legend

- Property boundary
- Drain
- Buffer with retained native vegetation
- Buffer to be revegetated

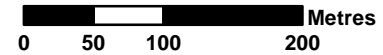
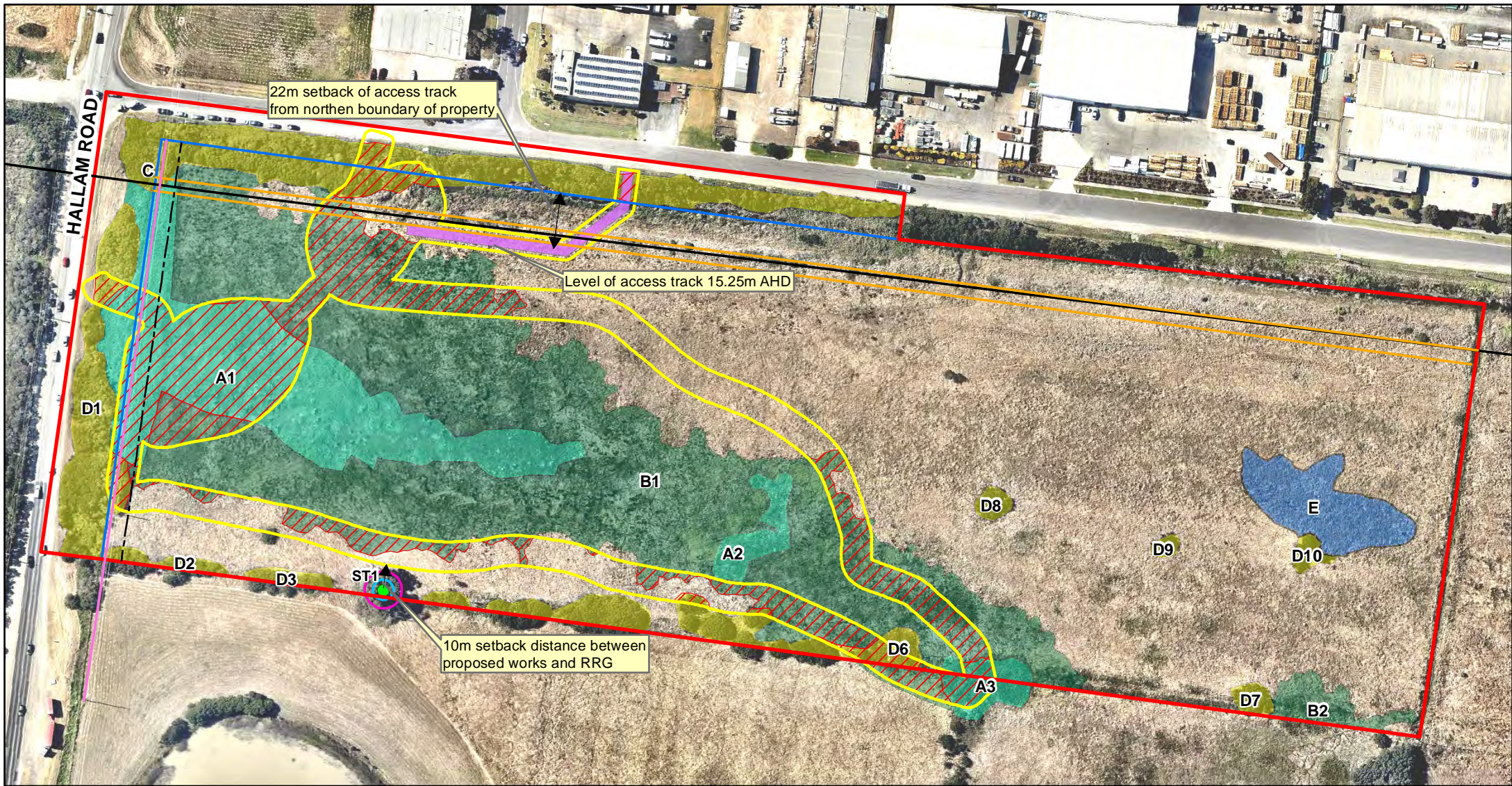


Figure 1: Dwarf Galaxias habitat buffer areas		
Project: 96-166 Centre Rd, Narre Warren		
Client: Narre Warren Central Pty Ltd		
Project No.:14090	Date: 14/01/2016	Created By: M. Ghasemi / D. Coppolino
Brett Lane & Associates Pty. Ltd. Ecological Research & Management		
Experience: Suite 5, 61 - 63 Camberwell Road Knowledge: Hawthorn East, VIC 3123 Solutions: PO Box 337, Camberwell, VIC 3124, Australia	Ph (03) 9815 2111 / Fax (03) 9815 2685 enquiries@ecologicalresearch.com.au www.ecologicalresearch.com.au	



Legend

- Study area
- Title boundary
- Development layout
- Electricity easement
- Overhead powerline
- Sewer pipe (1.5m pipe; approx. 7.4m below ground)
- Existing 5.5m wide sewerage easement
- Access track (4m wide)
- Structural Root Zone (SRZ) - 4.08m
- Tree Protection Zone (TPZ) - 7.44m
- Native vegetation removal
- Native vegetation**
- Plains Grassy Wetland - EVC 125
- Swampy Riparian Woodland - EVC 83
- Swamp Scrub - EVC 53
- Tall Marsh - EVC 821
- Scattered tree

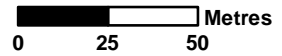


Figure 2: Offset site study area and native vegetation
Project: 1-39 Centre Road and 120-130 Hallam South Road HAMPTON PARK VIC 3976
Client: Narre Warren Central Pty Ltd

Project No.: 14090	Date: 14/08/2019	Created By: N. May / I. Kulik
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	Brett Lane & Associates Pty. Ltd. Ecological Research & Management	
	Experience: Suite 5, 61 - 63 Camberwell Road Knowledge: Hawthorn East, VIC 3123 Solutions: PO Box 337, Camberwell, VIC 3124, Australia	Ph (03) 9815 2111 / Fax (03) 9815 2685 enquiries@ecologicalresearch.com.au www.ecologicalresearch.com.au

3. EBPC approval conditions compliance table

Table 1: EPBC approval conditions compliance table

Condition Number	EPBC Approval condition	Is the project compliant with this condition?	Response
1	To avoid mortality of dwarf galaxias, prior to construction activities occurring within 30 metres of dwarf galaxias habitat, the Approval Holder must salvage and translocate dwarf galaxias in accordance with a Salvage and Translocation Plan approved by the Victorian Government.	Compliant	The approved dwarf galaxias Salvage and Translocation Plan was implemented on the 5th/6th October 2016 (prior to commencement of construction), with dwarf galaxias being salvaged from planned removed habitat and translocated to retained habitat. – Compliant.
2	To mitigate impacts on dwarf galaxias movement and dispersal in the local area, the Approval Holder must ensure flow connectivity is maintained between the dwarf galaxias habitat retained, Troups Creek East Branch, and Hallam Main Drain as indicated in Annex 2.	Compliant	The dwarf galaxias retained habitat connection to the Centre Road drain has been maintained, as was the case prior to commencement of the project. – Compliant.
3	To mitigate impacts on dwarf galaxias due to stormwater runoff in dwarf galaxias habitat retained, there must be no impact on water quality between upstream and downstream water sampling points and no impact on the water level, during construction activities and 1 year after the completion of construction	Compliant from June 2020 (see Infringement Notice ECB20-050 for non-compliance in first half year of 2020)	Approval compliance monitoring point b) has been met from June 2020 as there has been variation to the frequency of monitoring during the first half year of 2020. – Compliant from June 2020 Approval compliance monitoring point d) has been met from June 202 as monitoring after >10mm rainfall events was not achieved for all

Condition Number	EPBC Approval condition	Is the project compliant with this condition?	Response
	<p>activities.</p> <p>The Approval Holder must undertake the following monitoring to determine if these outcomes are being achieved:</p> <p>a) prior to the commencement of construction to gain baseline data;</p> <p>b) once per fortnight throughout construction activities;</p> <p>c) once every 3 months for the year following completion of construction activities; and</p> <p>d) after significant rainfall events of greater than 10mm, during both construction and the year following the completion of construction activities.</p>		<p>rainfall events in the first half year of 2020.</p> <p>– Compliant from June 2020</p> <p>Construction activities have not been completed so approval compliance monitoring point c) is not applicable.</p>
4	<p>To mitigate impacts on dwarf galaxias, the Approval Holder must ensure that buffer areas identified in Annex 3 are revegetated within 5 years of commencement of construction and that vegetation cover is retained until the expiry of the approval. This outcome must meet the following milestones:</p> <p>a) less than 40% weed cover 5 years from the commencement of construction; and</p> <p>b) less than 30% weed cover and at least 70% native vegetation cover 7 years from the commencement of construction.</p> <p>The Approval Holder must undertake the following monitoring to determine if these outcomes are being achieved:</p> <p>a) prior to the commencement of construction</p>	Not applicable	<p>This condition was varied to achieve 40% weed cover 5 years from the commencement of construction, which will be in 2021.</p> <p>The Year 3 vegetation monitoring was undertaken by Nature Advisory in November 2020, four years after commencement of construction and weed cover varied between 0% and 50% across the buffer areas with an average weed cover between 30 and 40%. It is envisioned that an overall weed cover of 40% is achievable by the end of 2021 subject to continuing weed management.</p> <p>Not applicable to year 4 after construction.</p>

Condition Number	EPBC Approval condition	Is the project compliant with this condition?	Response
	<p>to gain baseline data;</p> <p>b) 6 months after the commencement of construction;</p> <p>c) 12 months after the commencement of construction;</p> <p>d) 2, 3, 5, 7, 10 and 15 years after the commencement of construction.</p>		
5	<p>To compensate for the loss of dwarf galaxias habitat at the project area, prior to the commencement of construction, the Approval Holder must enter into an Agreement to ensure the long term security of the offset site. The Approval Holder must:</p> <p>a) provide the Department with a signed copy of the Agreement, within 2 weeks of confirmation of the Agreement; and</p> <p>b) provide the Department with the offset attributes, shapefile and map(s) clearly defining the location and boundaries of the offset site, within 2 weeks of confirmation of the Agreement.</p>	Not applicable	<p>The agreement securing Dwarf Galaxias Offset Site was entered into and was provided to the Department. Shapefiles of the offset site and an offset site assessment report (14090(10.2)) including a description of the attributes and maps were provided to the Department.</p> <p>Not applicable to the 2020 compliance.</p>
6	<p>Prior to commencement of construction, the Approval Holder must secure the offset site with an appropriate legal conservation mechanism. Any proposal for an alternative offset must be agreed to in writing with the Department.</p>	Compliant	<p>A S173 Agreement securing Dwarf Galaxias Offset Site was entered into before commencement of construction. This Agreement was provided to the Department in June and September 2016.</p>

Condition Number	EPBC Approval condition	Is the project compliant with this condition?	Response
7	<p>After a period of 10 years from the commencement of construction, the offset site must contain at least 2 hectares of Dwarf Galaxias habitat which contains a self sustaining population of Dwarf Galaxias and is connected to known Dwarf Galaxias habitat in the local area. This outcome must meet the following milestones:</p> <p>a) Dwarf Galaxias habitat in the offset site must be constructed within 1 year of commencement of construction;</p> <p>b) Dwarf Galaxias must be identified as present in the Dwarf Galaxias habitat in the offset site within 2 years of commencement of construction; and</p> <p>c) Dwarf Galaxias presence and abundance must be consistent with that of control sites from after 2 years of commencement of construction and for the life of the approval.</p>	Not applicable	It is expected that the Dwarf galaxias offset site construction will be finalised by the end of 2021, within 5 years of commencement of construction.
8	<p>The Approval Holder must undertake a monitoring program, which includes the newly constructed Dwarf Galaxias habitat in the offset site and control sites. The monitoring program must ensure the data gathered is adequate to: inform adaptive management; and demonstrate whether the milestones and outcomes described in condition 7 have been met. Monitoring must be undertaken by a suitably qualified person.</p>	Not applicable	Monitoring of the newly constructed habitat at the Dwarf Galaxias offset site will begin after construction of the site is completed by the end of 2021.

Condition Number	EPBC Approval condition	Is the project compliant with this condition?	Response
9	Within 7 calendar days after the commencement of construction, the Approval Holder must advise the Department in writing of the actual date of commencement of construction.	Not applicable	Not relevant to the year 2020 compliance.
10	The Approval Holder must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement plans/programs and measures taken to achieve outcomes and milestones required by this approval and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.	Compliant	Records regarding water quality, fish and vegetation monitoring are being kept and can be made available upon request to the department. – Compliant. All monitoring reports providing details of the measurements and monitoring events are available on this website: https://natureadvisory.com.au/notifications
11	Within 3 months of every 12 month anniversary of the commencement of construction, the Approval Holder must publish an annual report of compliance on their website addressing compliance with each of the conditions of this approval, including the implementation of any plans/programs specified in the conditions and whether outcomes and milestones required by	Compliant	This is the annual compliance report for 2020 that will be provided to the Department and published on this website: https://natureadvisory.com.au/notifications

Condition Number	EPBC Approval condition	Is the project compliant with this condition?	Response
	these conditions have been or are on track to being met. The compliance report must consider the Department's <i>Annual Compliance Report Guidelines</i> . Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the annual report of compliance is published.		
12	Upon the direction of the Minister, the Approval Holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.	Not applicable	There has been no direction from the Minister to undertake an independent audit of compliance.
13	If, at any time after 5 years from the date of this approval, the Approval Holder has not substantially commenced the action, then the Approval Holder must not substantially commence the action without the written agreement of the Minister.	Not applicable	The action has been commenced.

Appendix 1: Varied EPBC Approval 2014/7380



VARIATION OF CONDITIONS ATTACHED TO APPROVAL

Residential development, 96-166 Centre Road, Narre Warren, Victoria (EPBC 2014-7380)

This decision to vary conditions of approval is made under section 143 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Approved action

Person to whom the approval is granted Narre Warren Central Pty. Ltd.
ACN: 600 509 064

Approved action To undertake a residential estate development at 96-166 Centre Road, Narre Warren, Victoria (see EPBC Act referral 2014/7380).

Variation

Variation of conditions attached to approval The variation is:

Delete conditions 3, 4 and 7 attached to the approval and substitute with the conditions specified in the table below

Date of effect This variation has effect on the date the instrument is signed

Person authorised to make decision

Name and position Kim Farrant
Assistant Secretary
Assessments (Vic, Tas) and Post Approvals Branch

Signature

Date of decision

4 / 3 / 2021

Date of decision	Conditions attached to approval
Original dated 5/2/2016	<p><i>Mitigation</i></p> <p>1. To avoid mortality of dwarf galaxias, prior to construction activities occurring within 30 metres of dwarf galaxias habitat, the Approval Holder must salvage and translocate dwarf galaxias in accordance with a Salvage and Translocation Plan approved by the Victorian Government.</p>
Original dated 5/2/2016	<p>2. To mitigate impacts on dwarf galaxias movement and dispersal in the local area, the Approval Holder must ensure flow connectivity is maintained between the dwarf galaxias habitat retained, Troups Creek East Branch, and Hallam Main Drain as indicated in <u>Annex 2</u>.</p>
As varied on the date of signing this instrument	<p>3. To mitigate impacts on dwarf galaxias due to stormwater runoff in dwarf galaxias habitat retained, there must be no impact on water quality between upstream and downstream water sampling points, noting that background fluctuation may impact the overall water quality, and no impact on the water level, during construction activities and 1 year after the completion of construction activities.</p> <p>The Approval Holder must undertake the following monitoring to determine if these outcomes are being achieved:</p> <ul style="list-style-type: none"> a. prior to the commencement of construction to gain baseline data; b. once per fortnight throughout construction activities; c. once every 3 months for the year following completion of construction activities; and d. after significant rainfall events of greater than 10mm, during both construction and the year following the completion of construction activities.
As varied on the date of signing this instrument	<p>4. To mitigate impacts on dwarf galaxias, the Approval Holder must ensure that buffer areas identified in <u>Annex 3</u> are revegetated within 5 years of commencement of construction and that vegetation cover is retained until the expiry of the approval. This outcome must meet the following milestones:</p> <ul style="list-style-type: none"> a. less than 40% weed cover 5 years from the commencement of construction; and b. less than 30% weed cover and at least 70% native vegetation cover 7 years from the commencement of construction. <p>The Approval Holder must undertake the following monitoring to determine if these outcomes are being achieved:</p> <ul style="list-style-type: none"> a. prior to the commencement of construction to gain baseline data; b. 6 months after the commencement of construction; c. 12 months after the commencement of construction; and d. 2, 3, 5, 7 and 10 years after the commencement of construction.
Original dated 5/2/2016	<p><i>Offsets</i></p> <p>5. To compensate for the loss of dwarf galaxias habitat at the project area, prior to the commencement of construction, the Approval Holder must enter into an Agreement to ensure the long term security of the offset site. The Approval Holder must:</p> <ul style="list-style-type: none"> a. provide the Department with a signed copy of the Agreement, within 2 weeks of confirmation of the Agreement; and b. provide the Department with the offset attributes, shapefile and map(s) clearly defining the location and boundaries of the offset site, within 2 weeks of confirmation of the Agreement.
Original dated 5/2/2016	<p>6. Prior to commencement of construction, the Approval Holder must secure the offset site with an appropriate legal conservation mechanism. Any proposal for an alternative offset must be agreed to in writing with the Department.</p>

Date of decision	Conditions attached to approval
As varied on the date of signing this instrument	<p>7. After a period of 10 years from the commencement of construction, the offset site must contain at least 2 hectares of Dwarf Galaxias habitat which contains a self-sustaining population of Dwarf Galaxias and is connected to known Dwarf Galaxias habitat in the local area. This outcome must meet the following milestones:</p> <p>a. Dwarf Galaxias habitat in the offset site must be constructed within 5 years of commencement of construction;</p> <p>b. Dwarf Galaxias must be identified as present in the Dwarf Galaxias habitat in the offset site within 6 years of commencement of construction; and</p> <p>c. Dwarf Galaxias presence and abundance must be consistent with that of control sites from after 7 years of commencement of construction and for the life of the approval.</p>
Original dated 5/2/2016	8. The Approval Holder must undertake a monitoring program, which includes the newly constructed Dwarf Galaxias habitat in the offset site and control sites . The monitoring program must ensure the data gathered is adequate to: inform adaptive management; and demonstrate whether the milestones and outcomes described in condition 7 have been met. Monitoring must be undertaken by a suitably qualified person .
Original dated 5/2/2016	<p><i>Administrative conditions</i></p> <p>9. Within 7 calendar days after the commencement of construction, the Approval Holder must advise the Department in writing of the actual date of commencement of construction.</p>
Original dated 5/2/2016	10. The Approval Holder must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement plans/programs and measures taken to achieve outcomes and milestones required by this approval and make them available upon request to the Department . Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act , or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.
Original dated 5/2/2016	11. Within 3 months of every 12 month anniversary of the commencement of construction , the Approval Holder must publish an annual report of compliance on their website addressing compliance with each of the conditions of this approval, including the implementation of any plans/programs specified in the conditions and whether outcomes and milestones required by these conditions have been or are on track to being met. The compliance report must consider the Department's Annual Compliance Report Guidelines . Documentary evidence providing proof of the date of publication and non - compliance with any of the conditions of this approval must be provided to the Department at the same time as the annual report of compliance is published.
Original dated 5/2/2016	12. Upon the direction of the Minister , the Approval Holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister . The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister .
Original dated 5/2/2016	13. If, at any time after 5 years from the date of this approval, the Approval Holder has not substantially commenced the action , then the Approval Holder must not substantially commence the action without the written agreement of the Minister .

Date of decision	Definitions attached to approval
Original dated 5/2/2016	Agreement - the executed agreement between the Approval Holder and the relevant landowner or organisation, to legally secure the land for conservation for the long term.
Original dated 5/2/2016	Approval Holder - means the person to whom this approval is granted or the person as transferred under section 145B of the EPBC Act.

Date of decision	Definitions attached to approval
Original dated 5/2/2016	Commencement of construction - the date that preparatory works are first undertaken, including, but not limited to, the clearing of vegetation, the erection of any onsite temporary structures and the use of heavy duty equipment for the purpose of breaking the ground for fencing, buildings or infrastructure, including any works for the creation of vegetation buffers.
Original dated 5/2/2016	Construction activities - includes but is not limited to clearing of vegetation, the erection of any onsite temporary structures and the use of heavy duty equipment for the purpose of breaking the ground for infrastructure or earthworks. This does not include maintenance or use of existing access tracks, erection or construction of security fencing and signage, remediation/corrective actions or investigative activities such as accessing the site for surveying or planning purposes.
Original dated 5/2/2016	Control sites - existing known Dwarf Galaxias habitat sites in the local area to be monitored concurrently with the offset site , to provide evidence of the relative presence and abundance in the local area.
Original dated 5/2/2016	Department - the Australian Government Department administering the EPBC Act .
Original dated 5/2/2016	Dwarf Galaxias – means the EPBC Act listed vulnerable species <i>Galaxiella pusilla</i>
Original dated 5/2/2016	Dwarf Galaxias habitat – habitat identified as suitable for the persistence of Dwarf Galaxias , including: slow flowing and still, shallow, permanent and temporary freshwater habitats such as swamps, drains and the backwaters of streams and creeks and containing aquatic and terrestrial native vegetation.
Original dated 5/2/2016	Dwarf galaxias habitat removed – habitat to be removed as part of the proposed action, as identified in <u>Annex 1</u> .
Original dated 5/2/2016	Dwarf galaxias habitat retained – habitat to be retained as part of the proposed action, as identified in <u>Annex 1</u> .
Original dated 5/2/2016	EPBC Act - the <i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i> .
Original dated 5/2/2016	Impact on the water level - changes that result in unsuitable water levels for the persistence of the Dwarf Galaxias . Suitable water levels range between 0.5 m to 1.5 m or within 10% of the measured water level of control sites if less than 0.5 m.
Original dated 5/2/2016	Impact on water quality - compared to baseline data: a change of 1.0 pH unit, a 10% increase in total suspended solids, a 5% decrease in dissolved oxygen, a 20% change to electrical conductivity, any waste or visible hydrocarbons.
Original dated 5/2/2016	Landowner – the person(s) and/or company who legally owns the property that is secured as an offset site for the long-term management and protection of EPBC Act listed matters.
Original dated 5/2/2016	Legal conservation mechanism - A Trust for Nature covenant under the <i>Victorian Conservation Trust Act 1972</i> or a covenant under section 173 of the <i>Planning and Environment Act 1987</i> .
Original dated 5/2/2016	Minister - the Minister administering the EPBC Act and includes a delegate of the Minister.
Original dated 5/2/2016	Offset attributes - an '.xls' file capturing relevant attributes of the offset site, including the EPBC Act reference ID number, the physical address of the offset site, coordinates of the boundary points in decimal degrees, the EPBC Act protected matters that the offset compensates for, any additional EPBC Act protected matters that are benefiting from the offset, and the size of the offset in hectares.
Original dated 5/2/2016	Offset site – The 3.35 hectare site at 1-39 Centre Road, Hampton Park, Victoria as identified at <u>Annex 4</u> .
Original dated 5/2/2016	Salvage and Translocation Plan – A plan detailing specific actions and management measures of the proposed salvage and translocation of the Dwarf Galaxias present in Dwarf

Date of decision	Definitions attached to approval
	Galaxias habitat to be removed as indicated in <u>Annex 1</u> , to be prepared by a qualified freshwater ecologist.
Original dated 5/2/2016	Shapefile - an ESRI Shapefile containing '.shp', '.shx' and '.dbf' files and other files capturing attributes including at least the EPBC Act reference ID number and EPBC Act protected matters present at the relevant site. Attributes should also be captured in '.xls' format.
Original dated 5/2/2016	Substantially commence(d) - commencement of construction of clearing the land including associated infrastructure (i.e. sewerage, power, water, stormwater) associated with development. This does not include preparatory works.
Original dated 5/2/2016	Suitably qualified person means a real person with relevant tertiary qualifications and/or a minimum of three years demonstrated experience relevant to the task in question.
Original dated 5/2/2016	Trust for Nature – The organisation established under the <i>Victorian Conservation Trust Act 1972</i> . ABN: 60 292 993 543
Original dated 5/2/2016	Victorian Government –the Victorian Government Department administering the <i>Flora and Fauna Guarantee Act 1988</i> and the <i>Fisheries Act 1995</i>

Date of decision	<u>Annexes</u>
Original dated 5/2/2016	Annex 1 - Figure 3: Dwarf Galaxias habitat areas
Original dated 5/2/2016	Annex 2 - Figure 1: Flow connectivity
Original dated 5/2/2016	Annex 3 - Figure 2: Dwarf Galaxias habitat buffer areas
Original dated 5/2/2016	Annex 4 - Figure 3: Offset site location

[Appendix 2: Water quality and Dwarf Galaxias monitoring report 2020 from Aquatica Environmental](#)

25 February 2021

Narre Warren Central Pty Ltd
Att Mr Paul Nio
52-54 Rathdowne Street
Carlton VIC 3053

Via email: pnio@osanrae.com.au
CC: cmistica@fidus.com.au; inga@natureadvisory.com.au

Dear Paul

Re: 2020 Annual Report of Water Quality and Dwarf Galaxias Monitoring for Casey Green

Aquatica Environmental was engaged by Narre Warren Central to undertake the 2020 annual monitoring of water quality and Dwarf Galaxias (*Galaxiella pusilla*) at the site of the Casey Green residential development at 96-166 Centre Road, Narre Warren, Victoria (the project).

The annual monitoring was undertaken to meet specific management actions outlined in the project's commonwealth, state and locally approved Dwarf Galaxias Management Plan (DGMP; BL&A 2015) and Dwarf Galaxias Salvage and Translocation Plan (DGSTP; Aquatica Environmental 2015). These actions were interpreted by the federal Department of Agriculture, Water and the Environmental (DAWE) to include the following monitoring requirements (DE 2016, including Aquatica Environmental 2015):

- **Dwarf Galaxias:** Survey Dwarf Galaxias and predatory fish populations at established/baseline and translocation release sites in November/December annually during construction and for least five years post completion of construction on the site.
- **Aquatic and riparian habitat condition:** Assess condition in conjunction with the Dwarf Galaxias survey.
- **Water quality:** Assess water quality at established sites once per fortnight and/or after rainfall events >10mm during construction, including during Dwarf Galaxias monitoring (Condition 3b and 3d).

This report has been produced to provide a summary record of the 2020 water quality and Dwarf Galaxias monitoring in accordance with the DGMP and DGSTP.

1 Methodologies

1.1 Sampling Sites

During initial baseline and salvage surveys in 2016-17 a number of water quality and Dwarf Galaxias survey sites were established (Aquatica Environmental 2017). However, in the time since these surveys were undertaken development of the site (and neighbouring sites) has progressed significantly and not all of the originally established sites still exist. Figure 1 shows the sites that were monitored during the 2020 year. The only variation to the 2019 monitoring locations was the addition of an additional water quality sampling site at the main entrance to the development ... (now referred to as Site WQ3)



Spatial Reference
 Name: GDA2020 MGA Zone 55
 PCS: GDA2020 MGA Zone 55
 GCS: GDA2020
 Datum: GDA2020
 Projection: Transverse Mercator



- | | |
|--------------------|--------------------------|
| Site | Retained Habitat |
| Wetland | Monitoring Points |
| Structure | Water Quality Site (WQ) |
| Connector or drain | Dwarf Galaxias Site (DG) |

Casey Green, 96-166 Centre Road, Narre Warren
Dwarf Galaxias and Water Quality monitoring sites
 Figure 1



Date Exported:
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1.2 Dwarf Galaxias and Predatory Fish Monitoring

Dwarf Galaxias and predatory fish monitoring was undertaken at the three locations identified in Figure 1. These align with previous years monitoring, with Sites 2 and 3 corresponding to where Dwarf Galaxia were released during the 2016 salvage and translocation program (Aquatica Environmental 2017).

Sampling for adult Dwarf Galaxias and predatory was undertaken using hand-held dip-nets, sampling in and around areas of suitable habitat, and bait traps set overnight with phosphorescent baits. Sampling for larval Dwarf Galaxias was also undertaken by collecting a sample of water (approximately 10 litres) and placing it in a shallow white tray, where any larva would have been visible.

Active searching using dip-nets and bait-trapping are standard methods for sampling Dwarf Galaxias and are the most effective methods outlined in the Survey Guidelines for Australia's Threatened Fish (DSEWPac 2004) and Biodiversity Precinct Structure Planning Kit (DSE 2010). They are also most appropriate method for sampling in the small and heavily vegetated water bodies, like those at the site.

Dwarf Galaxias sampling was undertaken by Aquatica Environmental at another nearby site, where Dwarf Galaxias also occur and as reference/baseline as to whether Dwarf Galaxias should have been detectable on the site.

1.3 Aquatic and Riparian Habitat Condition Monitoring

Aquatic and riparian habitat condition was visually and assessed at the Dwarf Galaxias survey sites. The assessment was primarily based on a comparison of the aquatic and riparian vegetation condition during this survey as compared to previous surveys (i.e. temporal comparison).

1.4 Water Quality Monitoring

Water quality monitoring was undertaken monthly between January and May, fortnightly and following rainfall events >10mm between late May and December and during the annual Dwarf Galaxias survey. In situ water quality data was collected by using a calibrated Hanna Instruments HI9829 multiparameter water quality metre. The parameters collected included temperature, electrical conductivity, pH, dissolved oxygen and turbidity.

2 Results

2.1 Sampling Frequency and Conditions

During the 2020 monitoring year a total of 22 sampling events had occurred in 2020, including 15 scheduled, 6 post >10mm rainfall and one during annual Dwarf Galaxias monitoring. The annual Dwarf Galaxias monitoring and associated water quality sampling occurred on the 9th and 10th of November. A single emergency site inspection was also undertaken on the 6th of August, however no water quality monitoring was undertaken at the time as it was deemed not necessarily following sampling the day prior.

A summary of the 2020 Dwarf Galaxias and water quality sampling schedule is provided in Table 1.

It should be noted that the 2020 monitoring year saw a change from what was initially understood to be a requirement for monthly water quality monitoring to fortnightly monitoring, as was stipulated in the DAWE approval (DE 2016). The change from monthly to fortnightly occurred in June.

Table 1 2020 Water quality sampling schedule

DAY	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	KEY
Wednesday	1/1/20			1/4/20			1/7/20						Standard WQ Monitoring Event
Thursday	2/1/20			2/4/20			2/7/20			1/10/20			Post >10mm rainfall event
Friday	3/1/20			3/4/20	1/5/20		3/7/20			2/10/20			Incident
Saturday	4/1/20	1/2/20		4/4/20	2/5/20		4/7/20	1/8/20		3/10/20			Next scheduled
Sunday	5/1/20	2/2/20		5/4/20	3/5/20		5/7/20	2/8/20		4/10/20	1/11/20		Annual DG Survey
Monday	6/1/20	3/2/20	2/3/20	6/4/20	4/5/20	1/6/20	6/7/20	3/8/20		5/10/20	2/11/20		
Tuesday	7/1/20	4/2/20	3/3/20	7/4/20	5/5/20	2/6/20	7/7/20	4/8/20	1/9/20	6/10/20	3/11/20	1/12/20	
Wednesday	8/1/20	5/2/20	4/3/20	8/4/20	6/5/20	3/6/20	8/7/20	5/8/20	2/9/20	7/10/20	4/11/20	2/12/20	
Thursday	9/1/20	6/2/20	5/3/20	9/4/20	7/5/20	4/6/20	9/7/20	6/8/20	3/9/20	8/10/20	5/11/20	3/12/20	
Friday	10/1/20	7/2/20	6/3/20	10/4/20	8/5/20	5/6/20	10/7/20	7/8/20	4/9/20	9/10/20	6/11/20	4/12/20	
Saturday	11/1/20	8/2/20	7/3/20	11/4/20	9/5/20	6/6/20	11/7/20	8/8/20	5/9/20	10/10/20	7/11/20	5/12/20	
Sunday	12/1/20	9/2/20	8/3/20	12/4/20	10/5/20	7/6/20	12/7/20	9/8/20	6/9/20	11/10/20	8/11/20	6/12/20	
Monday	13/1/20	10/2/20	9/3/20	13/4/20	11/5/20	8/6/20	13/7/20	10/8/20	7/9/20	12/10/20	9/11/20	7/12/20	
Tuesday	14/1/20	11/2/20	10/3/20	14/4/20	12/5/20	9/6/20	14/7/20	11/8/20	8/9/20	13/10/20	10/11/20	8/12/20	
Wednesday	15/1/20	12/2/20	11/3/20	15/4/20	13/5/20	10/6/20	15/7/20	12/8/20	9/9/20	14/10/20	11/11/20	9/12/20	
Thursday	16/1/20	13/2/20	12/3/20	16/4/20	14/5/20	11/6/20	16/7/20	13/8/20	10/9/20	15/10/20	12/11/20	10/12/20	
Friday	17/1/20	14/2/20	13/3/20	17/4/20	15/5/20	12/6/20	17/7/20	14/8/20	11/9/20	16/10/20	13/11/20	11/12/20	
Saturday	18/1/20	15/2/20	14/3/20	18/4/20	16/5/20	13/6/20	18/7/20	15/8/20	12/9/20	17/10/20	14/11/20	12/12/20	
Sunday	19/1/20	16/2/20	15/3/20	19/4/20	17/5/20	14/6/20	19/7/20	16/8/20	13/9/20	18/10/20	15/11/20	13/12/20	
Monday	20/1/20	17/2/20	16/3/20	20/4/20	18/5/20	15/6/20	20/7/20	17/8/20	14/9/20	19/10/20	16/11/20	14/12/20	
Tuesday	21/1/20	18/2/20	17/3/20	21/4/20	19/5/20	16/6/20	21/7/20	18/8/20	15/9/20	20/10/20	17/11/20	15/12/20	
Wednesday	22/1/20	19/2/20	18/3/20	22/4/20	20/5/20	17/6/20	22/7/20	19/8/20	16/9/20	21/10/20	18/11/20	16/12/20	
Thursday	23/1/20	20/2/20	19/3/20	23/4/20	21/5/20	18/6/20	23/7/20	20/8/20	17/9/20	22/10/20	19/11/20	17/12/20	
Friday	24/1/20	21/2/20	20/3/20	24/4/20	22/5/20	19/6/20	24/7/20	21/8/20	18/9/20	23/10/20	20/11/20	18/12/20	
Saturday	25/1/20	22/2/20	21/3/20	25/4/20	23/5/20	20/6/20	25/7/20	22/8/20	19/9/20	24/10/20	21/11/20	19/12/20	
Sunday	26/1/20	23/2/20	22/3/20	26/4/20	24/5/20	21/6/20	26/7/20	23/8/20	20/9/20	25/10/20	22/11/20	20/12/20	
Monday	27/1/20	24/2/20	23/3/20	27/4/20	25/5/20	22/6/20	27/7/20	24/8/20	21/9/20	26/10/20	23/11/20	21/12/20	
Tuesday	28/1/20	25/2/20	24/3/20	28/4/20	26/5/20	23/6/20	28/7/20	25/8/20	22/9/20	27/10/20	24/11/20	22/12/20	
Wednesday	29/1/20	26/2/20	25/3/20	29/4/20	27/5/20	24/6/20	29/7/20	26/8/20	23/9/20	28/10/20	25/11/20	23/12/20	
Thursday	30/1/20	27/2/20	26/3/20	30/4/20	28/5/20	25/6/20	30/7/20	27/8/20	24/9/20	29/10/20	26/11/20	24/12/20	
Friday	31/1/20	28/2/20	27/3/20		29/5/20	26/6/20	31/7/20	28/8/20	25/9/20	30/10/20	27/11/20	25/12/20	
Saturday		29/2/20	28/3/20		30/5/20	27/6/20		29/8/20	26/9/20	31/10/20	28/11/20	26/12/20	
Sunday		1/3/20	29/3/20		31/5/20	28/6/20		30/8/20	27/9/20		29/11/20	27/12/20	
Monday			30/3/20			29/6/20		31/8/20	28/9/20		30/11/20	28/12/20	
Tuesday			31/3/20			30/6/20			29/9/20			29/12/20	
Wednesday									30/9/20			30/12/20	
Thursday												31/12/20	

2.2 Dwarf Galaxias and Predatory Fish

The survey was undertaken on 9th to 10th November 2020 (approximately 5-6 weeks earlier than 2018 and 2 weeks earlier than 2019). The weather during the survey was mild to warm with temperatures ranging between 20°C (day time maximum) and 8.1°C (night time minimum). No rain fell during the survey. The seasonal timing for the survey (late spring) was ideal and young of year and adults would be expected to be found following the usual late autumn to spring breeding season.

It's worth noting that larvae Dwarf Galaxias were also observed at Site WQ6 during water sampling on 28 September 2020, indicating breeding was/had occurred (Plate 1a).

A total of 25 Dwarf Galaxias were recorded during the November survey, including 20 young adults of year (i.e. from this most recent breeding season) and 5 previous year surviving adults (Plate 1b). All were recorded at Site DG2, with none at DG3 and DG1 which were too dry/low water to survey. All were recorded near Site DG2/WQ6 with Site DG1 being mostly dry/drying and unable to be sampled and limited access for sampling to Site DG3 (Due to dense vegetation).

Unlike the 2019 survey, no breeding adults were recorded during the early November survey, suggesting breeding had ended. This finding was further supported by a general lack of breeding adults at a nearby reference site and by juveniles being incidentally recorded while collecting water samples on 28 September 2020.

Based on the number and condition of the individuals recorded during this survey, it appears there has been another good year for the species on the site (i.e. 2019 and 2020). This has also been our experience at other sites in the region, mostly due to above average winter/spring rains and mild temperatures.

The results also confirm that the constructed swales are continuing to function well and as intended, by supplying consistent water levels to the retained habitat, but limiting pest fish ingress to the retained habitat drain.

The results of the November 2020 survey are provided in Table 2 and compared to previous rounds of monitoring.

Similarly to the 2018 and 2019 surveys, Mosquitofish (*Gambusia holbrooki*) (Plate 2a) were recorded in small numbers in the retained habitat at Site DG2. This is very low abundance compared to the unvegetated reaches of the main Centre Road drain and new swales, where Mosquitofish are observed in the many thousands and large adult Goldfish

(and other pest species) are known to reside. It is likely the dense emergent vegetation and Melaleuca overstorey, which is favoured by Dwarf Galaxias, it not preferential for the pest species.

A single Oriental Weatherloach (*Misgurnus anguillicaudatus*) was also recorded for the first time at Site DG2 (Plate 2b).

Table 2 Number of individuals recorded

Common Name	Scientific Name	Sampling Event			
		2020	2019	2018	2017
Dwarf Galaxias	<i>Galaxiella pusilla</i>	25	12	3	2
Mosquitofish	<i>Gambusia holbrooki</i>	12	6	3	-
Goldfish	<i>Carassius auratus</i>	-	2	4	-
Freshwater Burrowing Crayfish	<i>Engeus spp.</i>	-	1	1	-
Oriental Weatherloach	<i>Misgurnus anguillicaudatus</i>	1			



Plate 1 Larval (a) and adult (b) Dwarf Galaxias

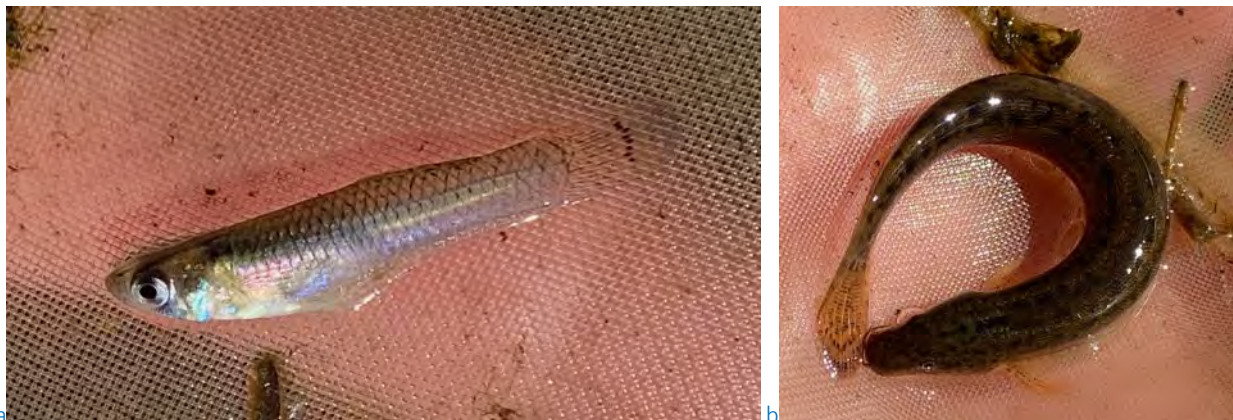


Plate 2 Mosquitofish (a) and Oriental Weatherloach (b)

2.3 Aquatic and Riparian Habitat Condition

Aquatic and riparian habitat condition was assessed during the Dwarf Galaxias survey at sites DG1, 2 and 3.

Aquatic and riparian habitat at site DG 2 appeared to have further improved upon that observed during the 2019 survey. As previously reported the swales either side of this habitat maintain a relatively consistent water level yet still allowing some drying and filling on an ephemeral basis. This provides excellent conditions through the retained habitat for aquatic, emergent and overstorey vegetation. Compared to the 2019 survey there appeared to be a continued increase in the area, density and abundance in particular of emergent vegetation such as *Persicaria* and *Juncus*, and further recruitment of *Melaleuca* (Plate 3a and b).

During the survey sites DG1 and DG3 had mostly dried, with negligible surface water present at the time. habitat conditions at these sites were similar to previous years of monitoring with some sparse patches of aquatic and emergent vegetation and an overstory of Melaleuca, in much the same condition as during previous years of monitoring.



Plate 3 Habitat edge vegetation at Site DG2 showing Melaleuca recruitment (a) and existing retained habitat (b)

2.4 Water Quality

The raw water quality data is provided in Appendix B. Table 1 provides a summary of the relevant statistical analysis and/or relevant State Environmental Protection Policy (Waters)(SEPP; EPA 2018) objectives for the Urban, Lowlands of Dandenong Creek segment.

Overall the data showed the following patterns:

- Temperature was on average very consistent across the year, with the highest combined site average occurring during the 29th January sampling event (mean = 24.42°) and lowest in during the 17th July event (mean = 8.53°). Comparing sites, the lowest average temperatures were observed at those with more vegetation (i.e. shading at Sites 6 and 7) and highest at those with the least shading (i.e. Sites 1 and 5).
- pH was on average consistent across all sites and did not exceed the SEPP Waters objectives.
- Electrical conductivity was consistently and significantly higher at Sites 6 (mean=1346 $\mu\text{S}/\text{cm}$ compared to 640-911 $\mu\text{S}/\text{cm}$ at Sites 1-5 and 7), most likely reflective of the lack of direct flows and the concentration of salts due to evaporation. The SEPP Waters objective of ≤ 500 $\mu\text{S}/\text{cm}$ was exceeded at all sites. However, the levels observed were not attributable to the development of the site, rather occurred naturally and/or other influences, and were clearly of no concern for Dwarf Galaxias due to their ongoing presence and increased abundance at the site.
- Percent dissolved oxygen was consistently low across all sites. The SEPP Waters objective of $\geq 75\%$ was not met at any site. Similarly to electrical conductivity, the levels observed were not attributable to the development of the site, rather occurred naturally and/or other influences, and were clearly of no concern for the resident Dwarf Galaxias population.
- Turbidity was on average highest at Site 1, indicating a high turbidity input from unknown upstream sources and which was visually observed during sampling events on 5th August, 17th July and 25th May. The data showed that turbidity generally reduced through the downstream flowing sites (i.e. Site 1 to 5) with no strong indication of inputs from the development of the site. The SEPP Waters objective of ≤ 25 NTU was not met at any site. Again, the overall levels observed were not attributable to the development of the site, rather occurred naturally and/or other influences, and were clearly of no concern for the resident Dwarf Galaxias population.

Table 3 Water quality sampling summary

Parameter		SEPP (Waters) Objective	Centre Road Drain Sites					Habitat Sites	
			Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
Temperature (°C)	Min.	NA	8.24	8.36	8.49	8.55	8.53	7.22	8.23
	Max.		22.75	26.20	18.30	25.90	24.73	22.50	19.89
	Mean		14.60	14.09	14.32	14.41	14.87	14.03	13.14
pH	25 th %tile	≥6.4	6.48	6.52	6.72	6.65	6.59	6.67	6.59
	75 th %tile	≤7.9	7.05	6.91	7.06	7.12	7.17	7.02	6.99
	Mean	NA	6.77	6.75	6.94	6.84	6.82	6.88	6.74
Electrical Conductivity (µS/cm)	75 th %	≤500	812	730	911	689	640	1346	852
	Mean	NA	640	610	803	554	518	988	727
Dissolved Oxygen (%)	25 th %tile	≥75	28.93	24.00	32.60	30.73	42.83	45.00	31.65
	Max.	130	81.40	62.80	46.90	60.30	60.10	87.40	68.90
	Mean	NA	42.93	37.42	38.26	39.41	48.72	52.11	44.92
Turbidity (NTU)	75 th %tile	≤25	101.5	90.2	49.9	83.5	83.3	55.7	72.5
	Mean	NA	113.2	61.4	36.2	64.4	53.1	41.4	60.5

3 Summary and Recommendations

The 2020 annual Dwarf Galaxias monitoring event detected 25 individual Dwarf Galaxias in the retained habitat drain (compared to 12 in 2019 and 3 in 2018). This was the highest never recovered at any stage of the program and indicates that conditions for the species have improved over recent years. The primary reason for this is the constructed swales retained water level in the retained habitat drain in a manner that is clearly suited to the resident Dwarf Galaxias population (i.e. Still maintaining ephemerality but not allowing over drying).

Considering this and previous rounds of sampling for the project and historical records (Aquatica Environmental 2017, 2019 and 2020), it is considered likely the abundance and distribution of the Dwarf Galaxias population in the habitat areas is somewhat dynamic, varying between years and due to seasonal influenced on water availability and therefore habitat. However, with the continued improvement of the retained habitat and expansion of suitable habitat into the constructed swales it is safe to say there has been an overall increase in the quality and area of available habitat for Dwarf Galaxias. This appears to have also correlated with a slight increase in the number of predatory fish species (i.e. Mosquitofish and Oriental Weatherloach), however their presence doesn't appear to have impacted the successful breeding and increasing numbers of Dwarf Galaxias. This is probably due to the habitat being more suitable to Dwarf Galaxias than the pest/predatory species.

Based on the results of the 2020 survey and the 2020 data, it is our option that development of the Casey Green site to date has been undertaken in accordance the DGSTP and associated approvals. No ecologically significant impacts have been observed to the retained habitat, with the constructed swales having improved overall conditions for Dwarf Galaxias.

The 2021 monitoring year commenced in January 2021. In accordant with approved DGSTP (and the project Dwarf Galaxias Management Plan; BL&A 2015) the following monitoring should occur during the year:

- Water quality monitoring: Fortnightly and/or after rainfall events > 10 millimetres until all construction is completed (i.e. all works on site completed) and then monthly following completion.
- Dwarf Galaxias monitoring: Annually in November/December for at least five years post construction.

Please note, we interoperate the “completion of construction” to be the point at all major works including site clean-up, landscaping, etc. Have been completed and there is not further risk to the Dwarf Galaxias and their habitat (i.e. all possible sources of sediment/contaminant runoff have been mitigated).

If you have any questions or would like to discuss this assessment, report or any other matter further, please do not hesitate to call me on 0413 935 497.

Kind Regards,



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Appendix a: Water Quality Results

Temperature (°C)

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
23/12/20	18.60	18.60	18.30	18.50	18.70	19.56	19.77
14/12/20	18.42	18.19	17.99	19.75	20.80	20.09	19.89
25/11/20	17.75	17.73	17.85	18.79	20.61	20.22	19.63
9/11/20	15.88	14.25	15.83	13.31	16.52	13.75	13.86
26/10/20	15.77	14.23		14.28	15.85	16.29	15.51
19/10/20	15.85	13.90		14.62	15.52	16.62	15.18
8/10/20	15.58	14.55		14.92	15.51	18.49	17.50
28/9/20	12.47	11.54		11.67	14.43	13.68	12.95
25/9/20	13.88	11.57		12.40	11.38	10.72	10.66
11/9/20	12.06	10.60		10.90	10.45	10.01	10.24
24/8/20	10.16	9.82		9.44	9.43	9.19	9.68
19/8/20	12.37	11.24		11.66	11.20	10.96	11.06
5/8/20	9.32	9.21		8.92	8.99	7.22	8.23
28/7/20	10.90	10.23		9.98	10.38	9.88	9.99
17/7/20	8.24	8.36	8.49	8.55	8.53	8.59	8.63
26/6/20	12.10	11.14	11.49	11.87	10.62	10.63	10.90
12/6/20	11.60	10.50	10.32	12.63	12.19	9.55	9.68
25/5/20	10.14	8.83		10.26	11.61	9.17	
14/4/20	18.60	19.60		18.50	18.70	17.30	
18/3/20	19.30	17.06		17.26	17.46	16.18	
24/2/20	19.40	22.70		22.80	23.60	18.10	
29/1/20	22.75	26.20		25.90	24.73	22.50	

pH

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
23/12/20	6.86	6.91	6.98	6.87	6.81	6.86	6.99
14/12/20	6.85	6.90	7.04	6.77	6.75	7.00	7.08
25/11/20	6.57	6.57	6.73	6.64	6.71	7.07	6.95
9/11/20	6.55	7.21	7.07	7.27	6.95	6.59	6.91
26/10/20	6.45	6.77		6.76	6.61	6.68	6.73
19/10/20	6.45	6.78		6.76	6.63	6.66	6.73
8/10/20	6.32	6.35		6.22	6.28	6.75	6.53
28/9/20	7.06	6.55		6.45	6.32	7.11	6.89
25/9/20	6.72	6.92		7.21	6.89	7.45	7.01
11/9/20	6.77	6.50		6.78	7.34	6.87	6.59
24/8/20	6.34	6.03		6.29	6.18	6.64	6.21
19/8/20	6.26	6.43		6.62	6.58	6.79	6.60
5/8/20	6.99	6.67		6.56	6.81	7.57	7.03
28/7/20	6.77	6.69		6.68	6.69	6.53	6.71
17/7/20	7.27	7.83	7.36	7.38	7.41	7.04	7.02
26/6/20	6.08	6.34	6.68	6.71	6.38	6.38	6.21
12/6/20	7.03	6.69	6.71	6.89	6.12	6.51	6.39
25/5/20	7.28	6.97		7.48	7.51	7.00	
14/4/20	7.12	6.64		7.23	7.33	7.03	

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
18/3/20	6.76	6.51		6.77	7.35	6.86	
24/2/20	7.09	6.85		7.01	7.19	6.96	
29/1/20	7.31	7.29		7.15	7.12	6.95	

Electrical Conductivity ($\mu\text{S}/\text{cm}$)

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
23/12/20	1002	956	902	812	723	644	685
14/12/20	986	963	899	796	629	726	713
25/11/20	398	399	325	320	281	695	526
9/11/20	1006	995	920	692	584	369	469
26/10/20	634	710		536	475	532	579
19/10/20	631	707		540	472	536	576
8/10/20	264	428		377	370	692	692
28/9/20	284	355		375	399	1646	1153
25/9/20	768	900		620	644	1830	975
11/9/20	483	450		370	344	821	526
24/8/20	499	620		580	541	1426	852
19/8/20	412	653		755	786	804	806
5/8/20	395	685		901	898	1105	965
28/7/20	986	854		680	668	925	823
17/7/20	637	737	1424	824	853	755	865
26/6/20	492	439	529	505	506	506	487
12/6/20	758	408	623	533	469	1869	669
25/5/20	1052	392		486	387	2802	
14/4/20	826	431		418	368	1639	
18/3/20	600	469		350	348	476	
24/2/20	526	456		361	336	481	
29/1/20	432	409		349	315	465	

Dissolved Oxygen (%)


Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
23/12/20	21.1	23.5	35.5	40.2	55.9	58.7	28.6
14/12/20	19.4	21.3	28.6	26.3	52.9	19.6	19.2
25/11/20	22.0	21.5	37.5	38.2	45.9	48.7	38.6
9/11/20	17.4	19.0	29.7	26.1	50.3	24.2	31.5
26/10/20	48.3	38.1		44.9	43.8	55.6	50.0
19/10/20	48.0	38.7		34.5	54.2	55.2	50.8
8/10/20	79.8	57.1		44.0	56.8	87.4	68.9
28/9/20	60.6	46.1		45.0	52.4	77.5	59.0
25/9/20	28.2	30.8		52.6	40.6	52.6	49.5
11/9/20	58.4	47.7		52.1	60.1	69.4	51.6
24/8/20	61.1	61.0		54.5	57.0	47.9	51.3
19/8/20	55.3	38.2		39.0	48.4	56.6	58.7
5/8/20	81.4	57.4		50.1	42.5	66.2	51.3
28/7/20	34.9	23.2		22.8	55.2	56.8	51.2
17/7/20	39.2	55.4	46.8	32.3	36.5	36.3	
26/6/20	36.2	25.5	46.9	60.3	37.4	37.4	26.8

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
12/6/20	31.1	33.6	42.8	58.6	42.3	45.6	31.7
25/5/20	53.9	62.8		37.9	33.0	44.8	
14/4/20	36.4	38.5		21.1	46.7	48.0	
18/3/20	24.9	10.1		14.3	58.3	43.2	
24/2/20	38.6	26.0		30.2	51.4	50.7	
29/1/20	48.3	47.8		42.0	50.2	64.1	

Turbidity (NTU)

Sample Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
23/12/20	25.90	24.6	23.9	19.3	21.6	15.0	19.5
14/12/20	12.6	13.5	16.0	9.6	12.6	19.6	12.3
25/11/20	17.75	16.8	18.7	18.7	19.1	16.3	17.0
9/11/20	18.8	3.1	16.8	5.6	9.3	13.0	12.9
26/10/20	78.9	48.0		47.7	29.1	21.5	22.7
19/10/20	102.0	78.0		228.0	89.0	55.0	73.0
8/10/20	146.0	93.0		215.0	118.0	56.6	72.3
28/9/20	100.0	118.0		86.7	67.5	18.7	22.9
25/9/20	44.6	23.5		26.8	24.9	27.0	21.8
11/9/20	50.5	47.8		72.9	75.0	59.4	67.4
24/8/20	96.4	151.0		159.0	165.0	132.0	153.0
19/8/20	104.0	81.7		73.9	95.1	40.5	55.0
5/8/20	790.0	203.0		98.9	61.6	47.7	52.3
28/7/20	88.3	56.7		20.4	23.1	21.6	22.9
17/7/20	46.6	130.0	17.7	57.5	49.3	18.4	
26/6/20	94.1	107.0	84.5	127.0	95.7	95.7	77.5
12/6/20	253.0	69.0	75.9	66.0	85.9	55.9	265.0
25/5/20	301.0	21.6		25.4	75.3	26.8	
14/4/20	55.3	16.0		14.9	12.3	42.6	
18/3/20	13.1	5.9		4.7	6.3	59.7	
24/2/20	22.0	15.5		15.4	12.3	35.7	
29/1/20	28.9	27.1		24.0	20.6	32.1	

[Appendix 3: Vegetation monitoring report 2020 from Nature Advisory](#)



96-166 Centre Road,
Narre Warren –
Dwarf Galaxias
habitat buffer

Year 3
Vegetation Monitoring

Prepared for
Narre Warren Central Pty Ltd
c/- The Fidus Group

December 2020
Report No. 14090 (15.0)



**Nature
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1. Introduction

Nature Advisory (formerly Brett Lane & Associates) were engaged by Fidus Group, on behalf of Narre Warren Central Pty Ltd, to conduct vegetation monitoring within Dwarf Galaxias habitat buffer areas at 96-166 Centre Road, Narre Warren, approximately 37 kilometres south-east of Melbourne's CBD. The buffers of native vegetation have been retained for the purpose of protecting drainage channels known to support a population of Dwarf Galaxias from neighbouring construction. Dwarf Galaxias is listed as critically endangered under the commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The vast majority of the property has been approved for a residential subdivision, with construction having commenced in November 2016. Condition 4 of the EPBC Act approval for the project (EPBC 2014-7380) requires that buffer areas around Dwarf Galaxias habitat (Figure 1) are revegetated within 2 years of the commencement of construction and that vegetation cover is retained until the expiry of the approval.

The following targets were set to achieve this objective:

- Less than 10% weed cover 6 months from the commencement of construction; and
- Less than 5% weed cover and at least 90% native vegetation cover 2 years from the commencement of construction.

The following monitoring timeline was set in order to determine if these targets are being met:

- Prior to the commencement of construction to gain baseline data;
- Six months after the commencement of construction;
- Twelve months after the commencement of construction; and
- Two, three, five, seven, 10 and 15 years after the commencement of construction.

A baseline study was conducted in October 2016, before construction started in November 2016, during which 15 x 1m² quadrats were established within representative areas of the habitat buffers for future monitoring. The quadrats were surveyed again in September 2017 to collect monitoring data at six months post the commencement of construction, but it was actually undertaken 10 months after construction commenced. The twelve months survey (November 2017) was missed and the two-year survey (scheduled for November 2019) was delayed by six months (May 2020). This report presents the year three monitoring data which was collected in November 2020.

This report is divided into the following sections:

Section 2 describes the methods used for the field survey.

Section 3 describes the limitations of the assessment.

Section 3 describes the results of the field survey.

Section 4 provides a review of the monitoring program and makes alternative recommendations for the management of the habitat buffers.

This investigation was undertaken by a team at Nature Advisory comprising Annette Cavanagh (Botanist), Verity Fyfe (Senior Ecologist) and Inga Kulik (Senior Ecologist and Project Manager).

2. Methods

The field assessment was conducted on the 24th November 2020. During this assessment, the study area was surveyed on foot and the 16 of the 20 previously established quadrats/quadrat locations within the Dwarf Galaxias habitat buffer areas (Figure 1) were assessed.

During the baseline survey, quadrats were established in the following vegetation types:

- Swamp Scrub (EVC 53) – nine quadrats (1, 3, 4, 6, 7, 9, 10, 16, 19 & 20)
- Swampy Riparian Woodland (EVC 83) vegetation – two quadrats (11 & 15)
- Non-native vegetation – four quadrats (2, 5, 13 & 17)
- Quadrats 12, 14 and 18 are not to be surveyed anymore as it was decided during the 6-month assessment that they were too close to other monitoring quadrats and would not add any additional information. Quadrat 8 was removed after the area was disturbed and the marking stake lost.

Under Condition 4 of the EPBC Act, areas of non-native vegetation were required to be revegetated with indigenous species.

At the time of establishment, each quadrat was marked with a single wooden stake in the north-west corner and positioned along a north-south to east-west axis.

A photograph was taken at the north-west corner of the accessible quadrats at a height of approximately 1.3 metres, looking south-east over the quadrat, and the following data was collected:

- Total vegetation cover;
- Native vegetation cover;
- Weed cover;
- Cover of bryophytes, bare ground and litter; and
- Each flora species recorded.

This methodology was repeated during the current survey, however as is explained in the following section, there were significant limitations which prevented the quadrats from being accessed and assessed.

3. Limitations

Of the 16 quadrats, none were able to be accessed and surveyed directly during the current survey, due to being surrounded by water and/or because of impenetrable vegetation.

The habitat buffer which ran alongside Centre Road to the west of Billy Button Drive was unable to be accessed due to being surrounded by water, as both the drainage channel to the south of the habitat buffer and the swale that was present immediately north of the buffer, were full of water. This habitat buffer to the east of Billy Button Drive was also inaccessible due to the deep water present in the drainage channel and impenetrable vegetation.

The buffer which ran between Centre Road and the Pakenham Railway line – which supported quadrats 11, 13, 15, 16 & 17 – was unable to be accessed due to the east side being impenetrable from dense vegetation, and the large swale drain that ran immediately alongside it on the western side being filled with water.

Even though the same methodology that was applied during previous assessments (quadrat survey including cover estimates) could not be applied during this site assessment, a qualitative assessment of these locations was undertaken from across the drains and photos taken to support the qualitative description of the condition of the vegetation at the sites.

4. Results

A qualitative assessment of the approximate quadrat locations was undertaken as none of the sixteen quadrats were able to be surveyed directly due to access constraints.

The current level of native vegetation was mostly very high, up to 90%, and was mostly attributable to Swamp Paperbark (which was heavily recruiting), Narrow-leaf Cumbungi, Common Reed and to a lesser extent, Slender Knotweed, Black Wattle and Rush.

Overall, weed cover was medium to high throughout the habitat buffers (20-50%) and was mostly attributable to the high threat species Blackberry and Flax-leaf Broom. Other high threat weeds included Hawthorn, Spear Thistle, Desert Ash and Montpelier Broom.

According to the site supervisor, recent weed spraying had occurred. This was evident along the southern edge of the drainage channel along Centre Road to the east of Billy Button Drive, as well as on the northern edge of the swale to the west of Billy Button Drive. This spraying appeared to be effective at killing herbaceous and grassy weeds in these areas. No other weed management was obvious.

A significant amount of hard rubbish was observed within or close to the buffer areas, including polystyrene, dumped timber, car tyres, general construction refuse and plastic bottles. This was both from construction within the site as well as from the public using the road to the south of the site. Habitat destruction was present in one location to the west of Billy Button Drive where several Swamp Paperbark plants had been knocked over. In addition, sediment fencing between the habitat buffers and swales had collapsed and fallen, and in many cases, was breaking up. In particular, where construction was currently occurring in the very west of the site, sediment fencing had collapsed under the weight of recent sediment runoff, and erosion channels had occurred underneath the existing sediment fence. This has resulted in sediment build-up in the water near the edge of the drain and amongst the native Common Reed.

Observations made within the general quadrat locations are provided in Table 1 and photos are provided in Appendix 1. In addition, general photos of the site are provided in Appendix 2.

Table 1: Qualitative vegetation quadrat data – Year 3

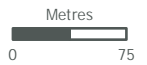
Quadrat No.	Vegetation Type	Description	Weed cover (estimated)	Native vegetation cover (estimated)
1	Swamp Scrub	Swamp Paperbark dominated. Blackberry present	30	60
2	Non-native	Co-dominated by Common Reed and Blackberry	50	50
3	Swamp Scrub	Co-dominated by Swamp Paperbark and Blackberry	50	40

Quadrat No.	Vegetation Type	Description	Weed cover (estimated)	Native vegetation cover (estimated)
4	Swamp Scrub	Very dense, dominated by Swamp Paperbark, with some Slender Knotweed and Rush on water's edge	0	80
5	Non-native	Co-dominated by Swamp Paperbark, Narrow-leaf Cumbungi and Slender Knotweed. Toowoomba Canary-grass and Drain Flat-sedge on water's edge	20	70
6	Swamp Scrub	Dominated by Swamp Paperbark	10	80
7	Swamp Scrub	Co-dominated by Swamp Paperbark and Blackberry	50	40
9	Swamp Scrub	Dominated by Swamp Paperbark. Blackberry and Hawthorn present	30	60
10	Swamp Scrub	Swamp Paperbark dominated. Some Blackberry present	20	60
11	Swampy Riparian Woodland	Very dense, dominated by Swamp Paperbark, high cover of Blackberry, with Hawthorn nearby	40	60
13	Non-native	Co-dominated by Swamp Paperbark and Black Wattle, high cover of Blackberry	40	60
15	Swampy Riparian Woodland	Very dense, dominated by Swamp Paperbark, with some Black Wattle	10	90
16	Swamp Scrub	Co-dominated by Swamp Paperbark and Black Wattle, moderate cover of Blackberry	30	70
17	Non-native	Dominated by Swamp Paperbark. Blackberry present	10	90
19	Swamp Scrub	Swamp Paperbark, Common Reed and Blackberry present	30	70
20	Swamp Scrub	Dominated by Swamp Paperbark, with a low cover of Common Reed	10	80

Figure 1: Site and monitoring locations

Project: 96-166 Centre Road, Narre Warren
Client: Narre Warren Central Pty Ltd
Date: 14/12/2020

- Property boundary
- Quadrat locations



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5. Discussion and recommendations

The following EPBC Benchmarks were to be met:

- Ensure that buffer areas are revegetated within 2 years of commencement of construction; and
- Less than 5% weed cover and at least 90% native vegetation cover 2 years from the commencement of construction.

Active revegetation through planting was not undertaken due to the dense vegetation cover and difficulties in managing the blackberries. However, the current level of native vegetation was mostly very high, up to 90%, and was mostly attributable to Swamp Paperbark (which was heavily recruiting). In the western part of the site, Common Reed was successfully recruiting and dominating some areas. Further revegetation is not considered to be required along the habitat buffers as natural recruitment is considered to be successful and is likely to occur in areas where weeds are removed.

As described in the results, the current level of weeds on the site indicates that the EPBC Act approval benchmark has not been met as weed cover was as high as 50% in some areas of the habitat buffers. Some weed management has been undertaken and evidence on site shows treatment of herbaceous and grassy weeds along the edge of some sections of the drainage channels. Weed management within the buffer areas would be difficult to achieve given the access issues and weed management required to be undertaken by boat.

Nature Advisory recommends reconsidering whether this target is still viable for the site. This is mainly due to the high prevalence of Blackberry throughout the site. Unlike other woody weeds, Blackberry cannot be easily treated with herbicide via the cut and paste method, due to its scrambling habit and the fact that a single plant has many main stems. Although Blackberry can be sprayed with herbicide, this is not advised for the following reasons:

- The buffers are surrounded by a sensitive aquatic environment and the amount of herbicide that would need to be sprayed to effectively kill Blackberry could be harmful to aquatic and semi aquatic life, including Dwarf Galaxias.
- The Blackberry is intertwined with native vegetation and spraying it would cause a significant amount of off-target damage to native plants.
- The vegetation that the Blackberry is growing in is too dense and much of the Blackberry would not be able to be accessed.
- Blackberry provides protective habitat for wildlife, such as small birds and mammals, which is particularly important in heavily developed areas such as Narre Warren.

Alternatively, Nature Advisory recommend that weed control efforts should focus on the other woody weeds on the site, namely Montpelier Broom, Flax-leaf Broom, Hawthorn and Desert Ash, that can be easily treated via the cut and paint method, providing they can be

accessed. The high-threat herbaceous weed Spear Thistle, common throughout the site, should also be treated via spot-spraying.

All rubbish should be removed from the site as soon as possible. This is to be undertaken by the proponent within private land and by Council along Centre Road. Signage should be employed along the drainage channels to deter rubbish dumping.

Collapsed sediment fencing along the northern edge of the swale drain in the west of the site is to be repaired to prevent further sedimentation into the drains. Where required, sediment fencing must be replaced before construction begins. Any sediment fencing that is no longer serving its purpose it to be removed to avoid it becoming litter.

Appendix 1: Representative photos of general quadrat locations







Quadrat 16 (Swamp Scrub)



Quadrat 17



Quadrat 19 (Swamp Scrub)



Quadrat 20 (Swamp Scrub)

Appendix 2: General photos taken within the survey site



The drainage channel along Centre Road was full of water



Swamp Scrub vegetation along the southern bank of the drainage channel west of Billy Button Drive



Narrow-leaf Cumbungi and Rush present in the drainage channel



Common Reed dominating large areas along the drainage channel in the west



The high-threat weed species Spear Thistle was common along the southern bank of the drainage channel west of Billy Button Drive and must be controlled



Habitat destruction where Swamp Paperbark plants have been knocked over



Montpelier Broom at the very western end of the drainage channel is to be removed



Sediment fencing has collapsed, with erosion channels running beneath the fencing, along the northern edge of the swale in the west of the site. Sedimentation of the water can be seen.

This fencing must be rectified as soon as possible



Excessive amounts of hard rubbish were present throughout the survey site and is to be removed



Flax-leaf Broom was abundant along the western edge of the drainage channel running from Centre Road to the Pakenham Railway line. This is to be removed.