

Amendment C87, Golden Plains Planning Scheme Expert Witness Report

Contract No.: 20752-02

Prepared on behalf of: MinterEllison

Date: 16 March 2020

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1 Witness Statement & Qualifications

Name and Address

Name: Leigh Prossor
Company: CardnoTGM Pty Ltd
Level 1, 27 – 31 Myers Street
Geelong VIC 3220
Position: Civil Engineering Manager

Qualifications B. Eng (Hons)

- 1.1 I have 18 years' experience in civil engineering and urban development since graduating from Swinburne University with a Bachelor of Engineering in 2002.
- 1.2 I am currently employed as the Civil Engineering Manager of the CardnoTGM Geelong Office and have been employed with CardnoTGM since 2002. I am responsible for overseeing a team of approximately 30 professional staff undertaking master planning, project management, civil design and construction supervision roles on various project types for urban development and infrastructure projects within the Geelong and wider region.
- 1.3 I also work closely with CardnoTGM's survey and planning disciplines to provide civil design solutions for roads, drainage, sewerage, earthworks and water infrastructure for a variety of projects. These projects range from the initial, high level master planning, right through to the detailed design, project delivery and construction phases of projects.

Areas of Expertise

- 1.4 Managing the Civil Engineering unit of CardnoTGM Geelong office.
- 1.5 Engineering advice on infrastructure requirements for the planning, design and delivery on urban development and major infrastructure projects.
- 1.6 Provision of Civil Engineering design solutions to urban developments, Local and State Government projects.
- 1.7 Stormwater Investigations, Site Stormwater Management Plans (SSMP) and Stormwater system design to Authority requirements.
- 1.8 Preparation of development feasibility studies.
- 1.9 Provision and coordination of service authority infrastructure requirements for urban developments.
- 1.10 Contract administration and supervision.
- 1.11 Project management.

2 Introduction / Instructions

I have been engaged by MinterEllison to provide engineering assessment and expert witness advice to review the proposed Amendment C87 to the Golden Plains Planning Scheme. The Amendment relates to the introduction of a new Inverleigh Structure Plan 2019 (New ISP) for Inverleigh, which will replace the current Inverleigh Structure Plan 2005 (ISP 2005).

Relevant to this report The Amendment seeks to;

- (a) remove minimum subdivision sizes for LDRZ-zoned land within the Inverleigh town boundary. This has the effect of increasing density within "growth areas" in the town, reducing subdivision sizes in some instances from 2 hectares to 0.4 hectares, being the "default" position in the LDRZ. The rationale for this is based around housing demand in Inverleigh, with "moderate" population growth expectations set at approximately 4.4% per annum;
- (b) confirm infrastructure projects throughout Inverleigh which will be funded by developers as land is rezoned / developed. These include highway / intersection upgrades, bridge upgrades and the provision of "biolinks" between areas of public open space.

Minter Ellison have advised and requested that;

A number of submissions have been made to Council in respect of the Amendment, particularly and give evidence at the Panel hearing for this matter in relation to issues relating to the management of stormwater moving forward. In particular, we would like you to prepare evidence which addresses the following:

(a) the potential impact, if any, of reduced minimum subdivision sizes on:

- (i) stormwater flows; and*
- (ii) concentration and / or management of pollutants within stormwater, as these matters relate separately to:*
- (iii) the land controlled by Ramsey proximate to the Leigh River; and*
- (iv) the land controlled by Ramsey at the eastern edge of the township, along Hopes Plains Road;*

(b) what the options could be to treat stormwater in each of these areas. In this response, you should have regard to any stormwater management guidelines published by Golden Plains Shire Council; and

(c) when, in your view, would be an appropriate time to determine the most appropriate approach to treat stormwater in each case.

We also particularly draw to your attention Parks Victoria's submission (Submission 62) which raises potential impact of stormwater discharge on the Inverleigh Flora and Fauna Reserve. This submission is

available in the briefing materials provided to you. Your report should address those matters raised by Parks Victoria in addition to those other stormwater issues raised by other resident submitters to the Amendment.

3 Scope of Works

3.1 This evidence has been prepared by Leigh Prossor, at the request of MinterEllison to provide MinterEllison an independent assessment of the stormwater and other servicing elements of the Inverleigh township and the amendment C74 as instructed above in accordance with the assessment criteria listed.

4 Information Used and Relied Upon

4.1 In responding to my instructions. I have relied primarily on;

- > The Inverleigh Structure Plan 2019.
- > The Ramsey property Group Submission to Amendment C87 to the Golden Plains Shire Planning Scheme.
- > Local Government Infrastructure Design Manual (IDM)
- > Various public submissions to the Inverleigh Structure Plan
- > Inverleigh Possible Development Analysis map – RPG.
- > Clause 22.11 Golden Plains Planning Scheme
- > Flood Risk Management Study – Leigh and Barwon Rivers at Inverleigh, Water Technology

5 Discussion and Expert Opinion

5.0 The potential impact, if any, of reduced minimum subdivision sizes on (i) stormwater flows:

- 5.0.1 Very simplistically, stormwater flows generated from a specific area or site are dependent on a multitude of factors, with one of the key variables being the imperviousness of the surface.
- 5.0.2 It is noted that there are a multitude of other factors such as the rainfall intensity, terrain, soil infiltration capability and vegetation cover that also have impacts, however these are relatively fixed by the site location and by the design event adopted and are considered to be broadly similar in both the scenario of a 1.0Ha lot or a 0.4Ha Lot.
- 5.0.3 Areas with a lower imperviousness will typically allow greater infiltration into the underlying soil and thus have a reduced runoff from the site, while areas with a higher imperviousness will typically have a higher runoff from the given site.
- 5.0.4 The imperviousness of a site will be impacted by the lot size. Residential lots that are larger will typically have a smaller relative percentage of the total site covered by impervious or semi impervious surfaces than a smaller residential Lot. In the context of a low-density residential

allotment, the impervious and semi impervious surfaces include things like house and shed roofs and driveways and other hardstand areas.

- 5.0.5 As a general rule the Infrastructure Design Manual (IDM) outlines that a change in lot size from 1.0Ha to 0.4Ha would result in an increase in the total impervious area for the site from 30% of the site to 35% of the site. That is in effect a 5% increase in the impervious area. As a comparison a lot size of 0.045Ha (450m²) as typically adopted in a general residential development would have an impervious area of 75% of the total site area.
- 5.0.6 Given this, it would be expected that a minimum lot size of 0.4Ha would result in a minor increase in the peak stormwater flow rate and the total volume of stormwater runoff from a given site comparative to a larger lot size of nominally 1.0Ha.
- 5.0.7 However, the standard practise for all residential developments are governed by Clause 56.07-4 of the State planning Scheme, which stipulates that;

The stormwater management system must be: Designed to ensure that flows downstream of the subdivision site are restricted to pre-development levels unless increased flows are approved by the relevant drainage authority and there are no detrimental downstream impacts.

- 5.0.8 This in turn is replicated and detailed in more prescriptive and practical terms in the IDM which all developments within the Golden Plains must be designed to comply with. It is noted that the IDM has been adopted and is used by approximately 50 local governments within Victoria. The stormwater section of the IDM also is broadly in line with and relies upon on the nationwide stormwater guidelines being the Australian Rainfall and Runoff.
- 5.0.9 In summary it is my opinion that there will be an increase in stormwater runoff from the predevelopment levels to the developed level, and that this increase will typically be slightly higher if the lot sizes are smaller. However, this increase would typically be required to be mitigated to reduce the total site discharge back to the predevelopment flow rate to comply with the IDM and ultimately Clause 56.07. For medium and large-scale developments in a location such as Inverleigh, this reduction in flow rate is typically achieved by the design and construction of stormwater detention basins. If the lot sizes are smaller, relatively speaking there would be a marginal increase in the size of the stormwater detention basin.

5.1 The potential impact, if any, of reduced minimum subdivision sizes on (ii) concentration and / or management of pollutants within stormwater:

- 5.1.1 Similar to the stormwater flows, a reduction in the lot sizes and the subsequent increase in the impervious area will nominally increase the volume of pollutants generated within the stormwater.
- 5.1.2 Again, Clause 52.07-4 of the state planning scheme stipulates that;

The stormwater management system must be: Designed to meet the current best practice performance objectives for stormwater quality as contained in the Urban Stormwater - Best Practice Environmental Management Guidelines (Victorian Stormwater Committee, 1999).

- 5.1.3 This in turn is replicated and detailed in more prescriptive and practical terms in the IDM which all developments within the Golden Plains need to be designed to comply with.
- 5.1.4 Essentially while there will be a minor increase in stormwater pollutant volumes if the lot sizes are smaller, under the design principles and the best practise management guidelines, this increase

would typically be required to be mitigated to the same effective level in both cases. For medium and large-scale developments in a location such as Inverleigh, this is typically achieved by the design and construction of stormwater treatment assets such as vegetated / grassed swales, rainwater tanks, sedimentation basins and wetlands. If the lot sizes are smaller, relatively speaking there would be a marginal increase in the size or quantum of these assets.

- 5.1.5 It is noted that due to the extensive lengths of vegetated / grassed swales that are typically constructed in Low Density Residential Developments, the best practise water quality requirements are typically well exceeded in these types of developments.

5.2 The potential impact, if any, as these matters relate separately to: (iii) the land controlled by Ramsey proximate to the Leigh River;

- 5.2.1 The land controlled by Ramsey proximate to the Leigh River and within the remainder of the Inverleigh Structure plan is detailed in Figure 1 below.

INVERLEIGH POSSIBLE DEVELOPMENT ANALYSIS

<p>LULLOTE GROWTH AREA 3 80ha (APPROX) 66ha DEVELOPABLE (APPROX) FARMING ZONE HERITAGE OVERLAY 33 LOTS - MINIMUM SIZE 1ha 117 LOTS - MINIMUM SIZE 0.4ha</p>	<p>BERTHON PARK (C75) DPO15 - APPROVED DD05 - ALL LAND NORTH OF RIVER PLANNING PERMIT - P19-008 LOW DENSITY RESIDENTIAL ZONE BUSHFIRE MANAGEMENT OVERLAY 85.54ha 137 LOTS - MINIMUM SIZE 0.4ha</p>	<p>BARRABOOL VIEWS (NORTH) GROWTH AREA 2 DPO16 LOW DENSITY RESIDENTIAL ZONE BUSHFIRE MANAGEMENT OVERLAY 40ha 30-40 LOTS - MINIMUM SIZE 1ha-2ha 70 LOTS - MINIMUM SIZE 0.4ha</p>	<p>BARRABOOL VIEWS DPO9 PLANNING PERMIT - P10-074 LOW DENSITY RESIDENTIAL ZONE 18ha (REMAINING) 7 LOTS - MINIMUM SIZE 2ha 29 LOTS - MINIMUM SIZE 0.45ha</p>	<p>BARRABOOL VIEWS (SOUTH) PART OF GROWTH AREA 1 73ha (APPROX) FARMING ZONE 57 LOTS - MINIMUM SIZE 1ha 122 LOTS - MINIMUM SIZE 0.4ha</p>
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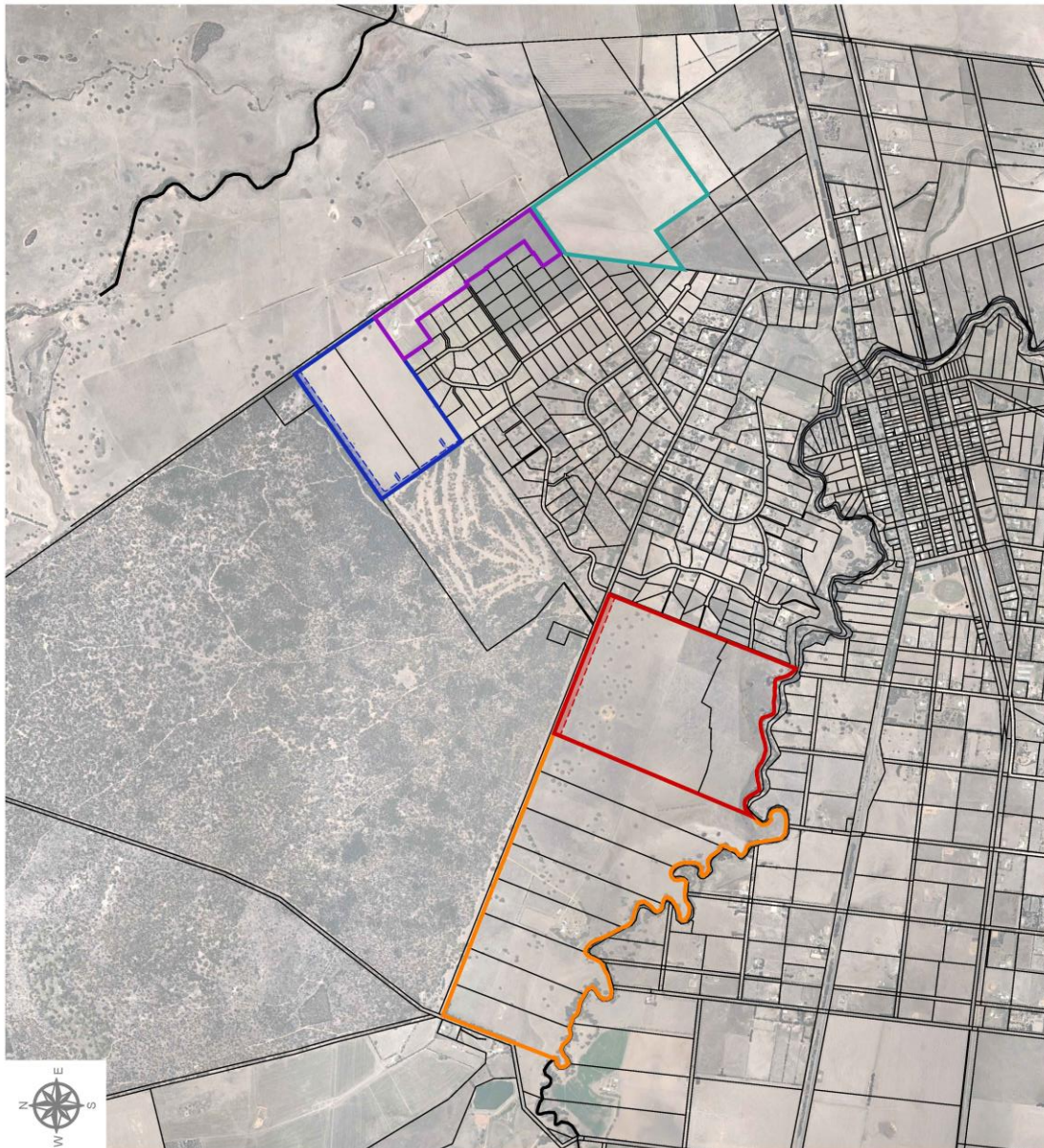


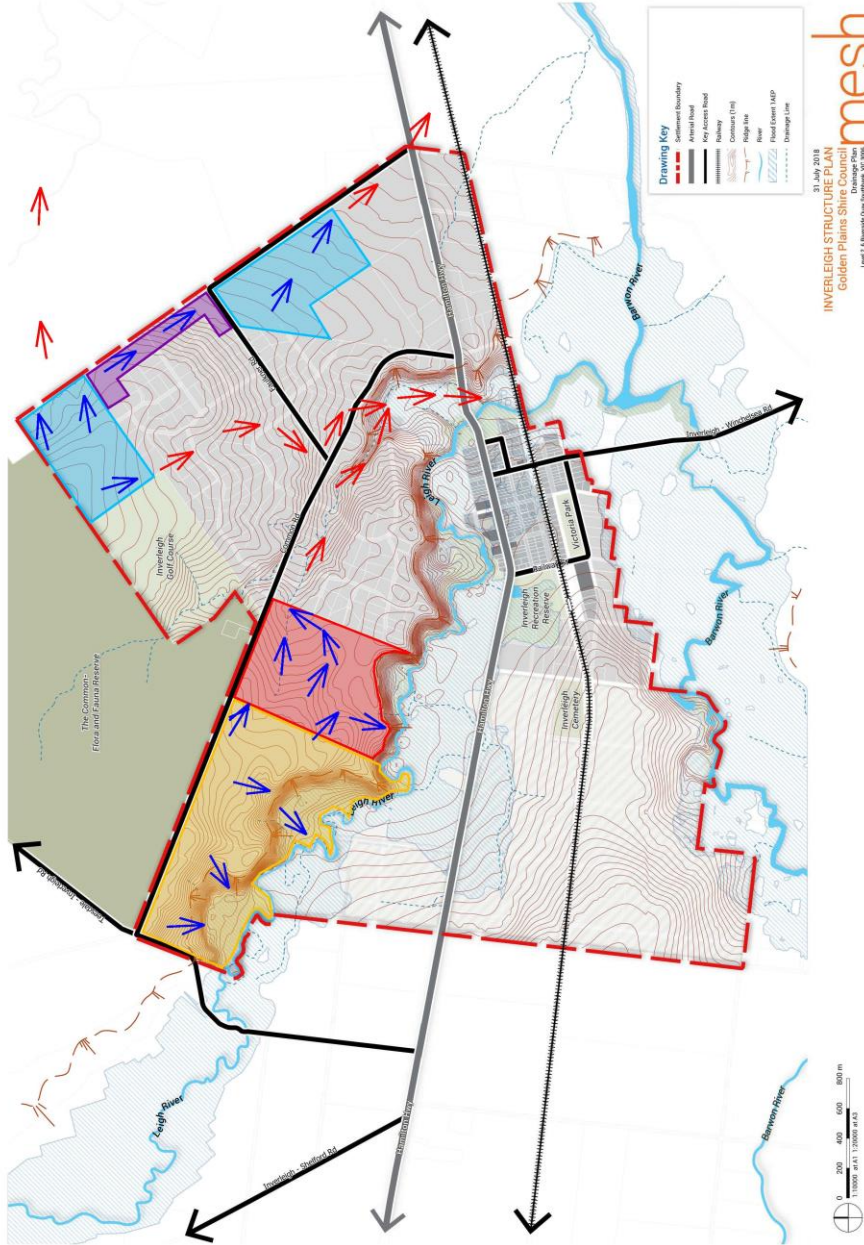
Figure 1: Potential Development Analysis Plan

- 5.2.2 The eastern section of the land controlled by Ramsey proximate to the Leigh River is named as 'Berthon Park' and is approximately 85Ha in size. This land has gently sloping grades generally falling to the east and south with a steep escarpment adjacent to the Leigh River along the southern edge of the site. This land has a DPO in place and the majority of this site also has a planning permit in place. It is noted that the lot sizes as detailed and approved in the planning permit are typically 0.45Ha.
- 5.2.3 The stormwater outfalls from the northern section of 'Berthon Park' outfall eastwards via easements, across River Gum Drive and into a waterway that flows eastwards and then southwards to ultimately discharge into the Leigh River through the existing residential area. As detailed in the DPO and planning permit this stormwater catchment will have a stormwater detention basin located immediately prior to the outfall to mitigate the flows back to the predevelopment levels. The general alignment of the stormwater flows is depicted in Figure 2 below.

**INVERLEIGH STRUCTURE PLAN
DRAINAGE PLAN
STORMWATER FLOW PATHS**

MARCH 2020
Rev. 00

LEGEND:
 STORMWATER FLOW DIRECTION WITHIN DEVELOPMENT AREAS 
 STORMWATER FLOW DIRECTION EXTERNAL TO DEVELOPMENT AREAS 



31 July 2019
INVERLEIGH STRUCTURE PLAN
 Golden Plains Shire Council
 mesh
 Lead & Manage Our Drainage Plan
 1800 5028 44 | goldenplains.vic.gov.au

Figure 2: Stormwater Flow Paths

- 5.2.4 The southern portion of Berthon Park has a stormwater catchment that discharges directly into the Leigh River along the southern boundary of 'Berthon Park'. A narrow portion along the southern edge of this area is not able to be developed for residential lots as it is encumbered by the flood extent of the Leigh River and there are also some constraints along the steep escarpment adjacent to the Leigh River.
- 5.2.5 The best practise water quality requirements for 'Berthon Park' is predominantly proposed to be achieved via treatment in the grassed swales that convey the stormwater flows.
- 5.2.6 The western portion is known as 'Lullote' and is approximately 80 Ha in size. This land is characterised by flat to gentle slopes falling to the south, with a steep escarpment adjacent to the Leigh River along the southern edge of the site and has several external catchments discharging into the site from the Inverleigh Flora and Fauna Reserve. The entirety of this site discharges directly to the Leigh River.
- 5.2.7 The stormwater from this area predominantly falls southwards and outfalls directly into the Leigh River, however there is a small portion in the north east corner that outfalls eastwards into Berthon Park.
- 5.2.8 It is assessed that a portion of the site along the southern edge of this area is considered as being unlikely to be able to be developed for residential lots as it is encumbered by the flood extent of the Leigh River. There are also some constraints along the steep escarpment adjacent to the Leigh River. The extent and impact of these constraints would be further identified and defined as part of a rezoning process for this land when it is undertaken.

5.3 The potential impact, if any, as these matters relate separately to: (iv) the land controlled by Ramsey at the eastern edge of the township, along Hopes Plains Road;

- 5.3.1 The land controlled by Ramsey at the eastern edge of the township along the Hopes Plains Road is detailed in Figure 1 above. This land is split into three parts.
- 5.3.2 The northern part identified as 'Barrabool Views North' is approximately 40Ha in size and is covered by an existing DPO. This land is roughly evenly split into three stormwater catchments and is characterised by gentle slopes that are slightly steeper at the eastern edge. The southern part discharges southwards through the existing residential area via the existing stormwater network. The eastern two catchments discharge eastwards across Hopes Plains Road and ultimately discharge to Native Hut Creek. There is also an external catchment that drains into this land from the Inverleigh Flora and Fauna Reserve.
- 5.3.3 It is noted that The DPO for Barrabool Views North' stipulates that the peak flow rate for the western catchment that discharges southwards through the existing residential area be reduced to a rate below the predevelopment or existing rate. Whilst this approach is rare, there are some precedents in developments in other municipalities, where similar to this location, the downstream stormwater network has capacity constraints. Typically, as is the case here, the constraints are in areas that were developed a considerable time ago when the accepted standards and engineering practises adopted a lower standard of service to the community than is the case currently.
- 5.3.4 The central portion is identified as 'Barrabool Views' and is approximately 18Ha in size. There is a small stormwater catchment in the north east corner that outfalls eastwards along the same flow path as the 'Barrabool Views North', however the majority of this site discharges southwards and into the 'Barrabool Views South' parcel. The land has relatively gentle slopes and has an external

catchment from the previously developed area of 'Barrabool Views Estate' located to its east that drains into the site.

- 5.3.5 The southern part is identified as 'Barrabool Views South' and is approximately 73Ha in size. This land is gently sloping to the south and has relatively flat gradients and has an external catchment discharging to the site from 'Barrabool Views' to the North West. This land outfalls generally to the south east and due to the flat nature of the site, the existing stormwater flows are generally sheet flow with limited definition of the flow path.

5.4 (b) what the options could be to treat stormwater in each of these areas. In this response, you should have regard to any stormwater management guidelines published by Golden Plains Shire Council;

- 5.4.1 The Berthon Park, Barrabool Views North and Barrabool Views parcels are all covered by existing DPO's. In all of these cases the stormwater is detailed to be treated by a combination of vegetated / grassed swales for the water quality treatment and detention basins to limit the discharge rates to limit the peak flow rates back to pre-development levels, or to below this rate as noted above for a small catchment of the Barrabool Views North parcel. These are all outlined in varying levels of detail in the Site Stormwater Management Plans for the sites that were adopted in the DPO and planning permits. These have all been designed in accordance with the IDM as adopted by the Golden Plains Shire.

- 5.4.2 The Lullote and Barrabool Views South parcels do not have any current proposed stormwater treatment measures identified for their land, however it is considered reasonable to expect that they will also likely use a combination of vegetated swales and detention basins to achieve the required stormwater treatment. Although it is considered as unlikely in this context, it is possible that the planning and approvals process may also ultimately adopt other treatment assets such as rainwater tanks, sedimentation basins and wetlands for these areas.

5.5 (c) when, in your view, would be an appropriate time to determine the most appropriate approach to treat stormwater in each case.

- 5.5.1 The typical approach to determine the general type of appropriate stormwater treatment for a development is an iterative approach through the whole of the planning process.

Typically, at the rezoning stage, a high-level Site Stormwater Management Plan (SSMP) is required to be prepared that details the existing stormwater conditions and outlines the proposed treatment measures to meet the relative treatment requirements. The SSMP would at this phase of the process typically outline the general treatment devices that would be used in the development and would require some high level or conceptual design to confirm that the requirements will be able to be met, but generally would not be overly prescriptive about the exact sizes and detail for the proposed treatment assets.

As the proposed subdivisions move through the DPO process and then planning permit application phases, the SSMP would evolve to progressively include more detail on the exact size location of the treatment assets. Typically, the concept treatment approach would stay the same as outlined

at the re-zoning stage, however flexibility is generally retained to allow minor changes to meet stakeholder inputs if required.

Ultimately the final details would be confirmed and documented during the detailed design phase. At this phase the full design details are confirmed and approved to allow the physical construction of the assets.

This approach allows the stormwater treatment system to be developed in conjunction with all other required planning inputs and constraints and not in isolation. For example, the location and or type of a stormwater treatment asset may need to be adjusted or relocated to reflect other site considerations such as cultural heritage or existing vegetation.

It is considered reasonable to expect that should the lot size and density be adjusted at some point in the planning process post the rezoning phase i.e. at the time of the DPO or planning permit, then an updated and amended SSMP would be required to be prepared and approved that addresses any changes from this alteration. It is considered that this iterative approach is the most appropriate to determine the exact stormwater treatment measures.

5.6 We also particularly draw to your attention Parks Victoria’s submission (Submission 62) which raises potential impact of stormwater discharge on the Inverleigh Flora and Fauna Reserve. This submission is available in the briefing materials provided to you. Your report should address those matters raised by Parks Victoria in addition to those other stormwater issues raised by other resident submitters to the Amendment.

- 5.6.1 The Parks Victoria submission is noted, and with particular respect to the stormwater. The general principles regarding the stormwater that they have noted in their submission are generally agreed with.
- 5.6.2 The external boundaries to the Inverleigh Flora and Fauna Reserve to currently undeveloped areas that are located within the Inverleigh Structure Plan are entirely bounded by the Berthon Park, Lullote and Barrabool Views North parcels as discussed above. In all cases, the topography of the land is such that no stormwater from any of these proposed development sites discharge into the Inverleigh Flora and Fauna Reserve in either the current situation, or in the developed situation. In all cases, the reverse is true, the stormwater flows from within the reserve outwards into the proposed development sites. As such, it is considered that there is effectively no way for stormwater from the proposed development areas within the Inverleigh Structure Plan to impact on the Inverleigh Flora and Fauna Reserve.
- 5.6.3 It is noted that there were a number of submissions from members of the public regarding stormwater. Generally, they raised issues with impacts from stormwater from past developments within Inverleigh. As outlined earlier in sections 5.1, 5.2, 5.0.25 and 5.5, these issues are considered to generally be within areas that were developed a considerable time ago when the accepted standards and engineering practises adopted a lower standard of service than is the case currently. It is considered that if the new developments are designed to best practise and in line with the IDM, then there should be no negative impact on downstream environment and residents.

It is also noted that the majority of the undeveloped areas within the structure plan that are not already identified by a DPO do not drain through existing residential areas.

6 Conclusion

It is my opinion that;

- > A reduction in minimum lot size from 1Ha to 0.4ha if appropriately mitigated will not have a detrimental impact on the stormwater flows or quality from the proposed developments.
- > That all developments within the Golden Plains Shire are required to be designed and constructed to comply with Clause 56.07 and the Infrastructure Design Manual.

7 Declaration

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

Yours sincerely,

A handwritten signature in black ink, appearing to read "Leigh Prossor".

Leigh Prossor
CardnoTGM
Manager – Civil Engineering