

Project: **Ballarat**
North

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1406165	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	Please see the link to APD's Submission: [REDACTED] [REDACTED]		2025-10-20 17:32:17

20 October 2025

Submitted via Engage Victoria

[REDACTED]
[REDACTED]
Department of Transport
[REDACTED]
[REDACTED]

Exhibition Submission Regarding Draft Ballarat North PSP and DCP (Amendment C256bal)

Dear [REDACTED],

APD Projects in support from Spiire is pleased to submit this formal response to the exhibition of Amendment C256bal, the draft Ballarat North Precinct Structure Plan (PSP) and Development Contributions Plan (DCP), on behalf of our client, [REDACTED] (comprising parcels 36, 37, 40, 43, and 44).

We commend the efforts of the Victorian Planning Authority (VPA) in reaching this significant milestone and the VPA's key role in the delivery of housing to support the State's Housing policy.

However, our technical review has identified several serious, fundamental flaws within the draft PSP and DCP that, if not rectified, will severely compromise the commercial viability, delivery feasibility, and timely investment required to unlock housing supply within the Ballarat region.

As we look forward, APD projects are committed to continuing to work collaboratively with the VPA to find workable solutions, so that key challenges can be overcome and genuine housing supply can be provided in a key location.

Sincerely,

[REDACTED]
[REDACTED]
[REDACTED]

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1 Submission Overview

1.1 Summary

APD Projects with the support from Spiire is pleased to make this submission to Amendment C256bal on behalf of [REDACTED] in relation to land at [REDACTED] (comprising parcels 36, 37, 40, 43 and 44 of the draft Ballarat North Precinct Structure Plan).

Exhibition of the draft PSP and DCP is a significant milestone, recognising the Victorian Government’s commitment in 2022 to prioritise completion of the PSP so as to unlock critically needed local housing supply. We recognise the considerable efforts of the VPA and partners in producing a draft PSP and DCP, and remain committed to working constructively with all parts of Government to facilitate their refinement and implementation.

It is concerning that our review of the draft material has identified a number of serious shortcomings within both the PSP and DCP, that could fundamentally challenge its feasible implementation. As the single largest landholder in the PSP precinct, we are committed to ensuring that the planning framework that is put in place enables development to be feasibly carried out and essential investment and activation of the precinct to be brought forward. As presently drafted, we have serious concerns that key cornerstone elements of the PSP and DCP in relation to Net Developable Area (NDA), staging, drainage, affordable housing and the expansion area, will seriously inhibit the deliverability of the PSP.

We have set out below an overview of what we believe are the highest priority issues for resolution in a revised PSP, that will ideally inform the preparation of the VPA’s Day 1 PSP revisions. To assist, we have appended a table setting out our initial proposals for redrafting key clauses of the PSP. We have focused our submission on the highest priority matters, but note we have a considerable number of secondary issues that are also set out in the latter part of our submission.

Our review of the draft PSP and DCP has been informed by a number of technical specialist advisers with expertise in drainage, biodiversity, planning, engineering and urban design. While we have not provided full technical peer reviews of the exhibited material within this submission, we are in a position to meet with VPA and its technical consultants immediately following exhibition to discuss the conclusions that have been reached by our experts.

We request that our submission be provided to the appointed Standing Advisory Committee (SAC) and reserve the right to make further submissions during the forthcoming SAC hearing.

1.2 Landholdings

[REDACTED] is the owner and intended developer of the following land parcels within the Ballarat North PSP and DCP area, comprising over 170ha.

Table 1: APD Land Holdings in Ballarat North

PSP Parcel ID	Property Address	Lot and Plan Number	Notes
42, 43, 44	[REDACTED]	[REDACTED]	Located within core area
40	[REDACTED]	[REDACTED]	Located within core area
37	[REDACTED]	[REDACTED]	Located within core area
36	[REDACTED]	[REDACTED]	Loacted within expansion area



Figure 1: APD land holdings in Ballarat North PSP (black & white annotation)

2 Critical Issues

We have identified the following highest order issues that we believe are most critical to the resolution of a more workable and deliverable planning framework for Ballarat North. These are as follows:-

1. **Net Developable Area** is critically low and is not justified by the technical evidence
2. **Staging Approach** is inequitable and unjustified
3. **DCP framework** is unsustainably high and has key flaws in its drafting
4. **Expansion Area** approach fails to establish planning certainty or support integrated planning
5. **Affordable Housing** requirements are unprecedented and inflexible

In our opinion these present the highest priority matters that must be addressed with urgency if the draft Ballarat North PSP is to be capable of delivering its primary objective to unlock new and affordable housing supply options for the Ballarat community. We consider that the development of the precinct is at risk if these matters are not comprehensively dealt with prior to the PSP's finalisation.

We have elaborated on our reasoning in further detail in the following sections.

In the latter part of the submission, we have also set out a range of further matters that require clarification or potential review. These matters are of a lower order significance as they do not specifically preclude the delivery of an operational PSP; however, they remain important to the PSP's overall effectiveness.

2.1 Net Developable Area (NDA)

Issue

The draft PSP is predicated on a Net Developable Area of 274 hectares, representing approx. 47.9% of the total PSP area. This is easily one of the lowest levels of NDA proposed in a PSP in recent history, and is particularly untenable given the regional location of the PSP and comparatively lower land values than found in metropolitan PSPs. Even if the Ballarat Town Common and Investigation area were excluded from the NDA calculation on the basis that they distort the developable outcome, the total NDA only increases to 58.5%, which remains below Ballarat West PSP (74%), and the recently gazetted Shepparton South East PSP (62%), which was heavily challenged by landowners for its poor deliverability.

This is not simply a matter impacting the efficient use and development of urban land that has been prioritised for housing growth, it puts at risk the viable development of the whole precinct given the fixed costs to unlock essential infrastructure must now be borne by a much lower developable area.

The low NDA results in a corresponding low level of urbanisation in the precinct, which is at odds with Objective O1 of the PSP which seeks to facilitate subdivision and development that contributes to delivery of higher density and diversity of housing options. The imperative for a diversity of housing focus is further implied through a target of 13% affordable housing across the PSP, which is well above the 10% sought by the Victorian Affordable Housing Strategy, itself a target that does not always reflect local conditions and is currently only applicable to residential proposals utilising DTP's Development Facilitation Pathway (via Clause 53.23). Coupled with high development infrastructure costs (see 2.4 below), APD considers that it is imperative that the NDA across the precinct is increased to underpin economic viability. Our initial technical advice suggests there are a number of ways in which the draft PSP's NDA provision could be materially increased, including:

Recommendations:

- a) **Revisit Drainage Strategy to address key flaws:** APD has commissioned Spiire to undertake a review of the SMEC drainage strategy informing the PSP, which has identified critical concerns relating to the use of overly conservative assumptions that have informed the design of wetland/retarding basins and the associated land take. Revised modelling undertaken by Spiire results in an optimisation of drainage assets which results in a total reduction of the retarding basin / wetland footprint of 14.1 hectares across the precinct. It is our recommendation the drainage strategy underpinning the draft PSP is comprehensively reviewed in light of the findings of the Spiire analysis (see Appendix B). As noted in more detail in Section 3.5.4 below, optimisation of drainage assets can be intrinsically linked to enhanced ecological outcomes and more efficient land use.
- b) **Revisit Seasonal Herbaceous Wetland (SHW) designation:** APD has commissioned Biosis to review the PSP's proposed quarantining of land for protection of a potential Seasonal Herbaceous Wetland. Biosis has firmly

concluded that due to extensive and ongoing cropping, the area does not support any perennial native species, and the potential for any development of ephemeral wetland species is limited to small areas (primarily drains) and long periods of inundation following unusually wet seasons. **These areas potentially accommodating ephemeral wetland do not meet the minimum size thresholds for the SHW community.**

The SHW identified by the PSP does not appear to regularly support significant ecological values that would lead to this area being considered a high priority area for reservation and protection. Based on recent rainfall patterns and the current hydrological conditions (including extensive drainage), the extent of DEECA mapped wetland is incorrect and should be reviewed. Development of the area for stormwater retention could lead to a more structurally complex and diverse wetland of higher ecological value. It would also improve the efficiency of the stormwater strategy and lead to an improved NDA outcome.

- c) **Interrogate further gains in NDA** by applying a critical lens over the draft PSP to maximise urban efficiency. The need to optimise development within the precinct is particularly critical in this case, where the low NDA is further impacted by staging challenges (see 2.3 below), high DCP rates (see 2.4 below) and high thresholds for affordable housing provision (see 2.6 below). Various opportunities for rationalising non-developable areas are considered in Further Matters (Section 3) below, including effectively utilising redundant road reserve (which alone would provide an additional 1.02 hectares of NDA); standardising areas of active space; and applying standard road reserve widths.

2.2 Proposed Staging

Issue

The proposed staging approach defers the whole of [REDACTED] landholdings to a future Stage 2, with no certainty around the circumstances in which development may be supported to be brought forward at any point prior to the exhaustion of supply in Stage 1. The Ballarat North PSP Background Report provides justification for the staging, noting the relatively limited Stage 1 area reduces the risk of spreading delivery agency resources too thinly across a larger geographical area (which could in turn dilute amenity creation for the precinct's earlier residents). Contradictorily, the report goes on to justify the Stage 1 boundary on the basis of providing early access to a town centre - which is actually within Stage 2. It also contends that the proposed Stage 1 will facilitate early access to open space, which is contrary to the Precinct Structure Community Infrastructure and Open Space Assessment (Section 8), which confirms that open space assets are based on anticipated population, and are not triggered until the precinct is fully developed. We do not accept the justification provided in support of the staging approach, and our expert analysis indicates there is ample capacity in the existing road network to unlock land earmarked within stage 2 on our landholdings immediately, supported by the proposed upgrades to Gillies Road.

We are gravely concerned with the staging proposal and believe it will prejudice the core objectives of the PSP to:

- Unlock a broader diversity of housing types beyond the very limited and homogenous dwelling stock currently available in the broader Ballarat market;
- Activate key precinct amenity early in the life of the PSP, including the town centre;
- Introduce competition into the local housing market, thus supporting the delivery of more accessibly priced housing by avoiding situations where a small number of developers can control supply and pricing.

Plan 10 (Infrastructure Development & Staging, shown in Figure 2) proposes a 2-stage approach to development, with upgrades to Gilles Road (RD-01, IN-01, RD-01-2) and Midland Highway all required as Stage 1 works.

Requirement R27 states 'staging of infrastructure and development must be generally in accordance with Plan 10 - Infrastructure Development and Staging and Table 19 - Precinct Infrastructure Plan, and must provide for the timely provision and delivery of the following infrastructure to the satisfaction of the responsible authority'.

As drafted, the PSP will sterilise the development of any part of our landholdings, with no certainty around the circumstances in which development may be supported to be brought forward. While the PSP indicates that out of sequence development may be considered subject to the views of authorities, there is no certainty or flexibility apparent to allow outcomes that are not generally in accordance with Plan 10.



Figure 2: Current PSP Staging

Critical precinct-accessing infrastructure such as Gillies Road should not be contingent upon the development of a limited Stage 1 area. Delays over the acquisition of land for the intersection, a lack of development imperative within the limited number of landowners in Stage 1, or issues that slow progress within that stage now have a PSP-mandated knock-on effect to Stage 2.

APD has commissioned Ratio Consultants to undertake a review of the draft PSP and proposed staging plan, to confirm how the delivery of key transport infrastructure to service the precinct should inform the efficient staging of development. In summary their assessment concluded that:-

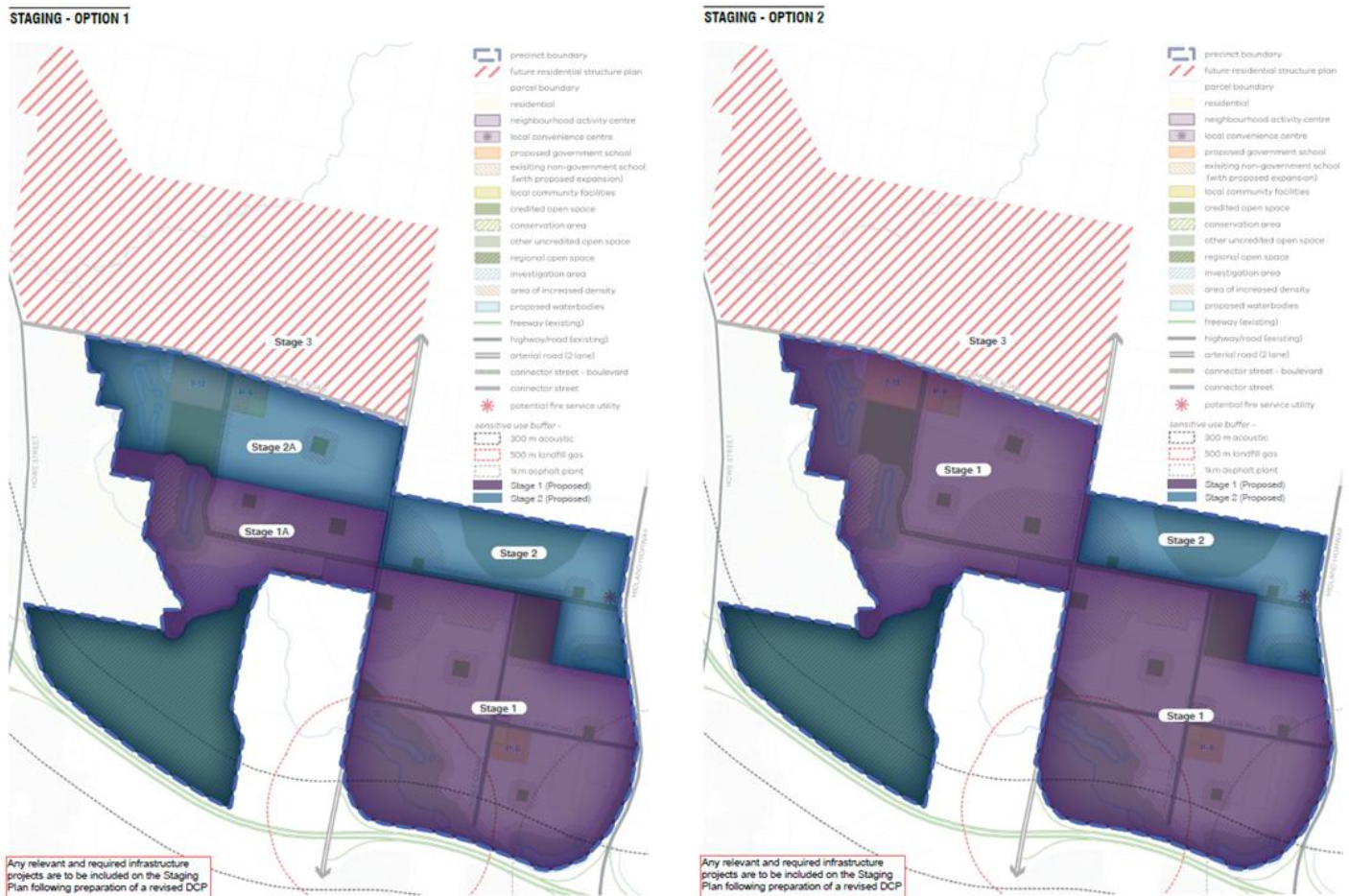
- The staging plan is considered unequitable and unnecessarily restrictive from a transport access perspective.
- The base traffic volumes adopted by Jacobs to inform the modelling in the Ballarat North PSP Strategic Transport Modelling Assessment Report are over inflated by at least 3000vpd, based on actual traffic counts conducted by Ratio Traffic Consultants This has precinct-wide impacts particularly as these volumes have been used to inform the staging strategy.
- All road projects are currently contained within existing road reserves and as such could be undertaken by developers in Stage 2 if development in Stage 1 had not triggered the upgrade.
- Existing traffic volumes on Gillies Road and Midland Highway (a state road) are low (6440vpd and 7700vpd, respectively) which means there is ample capacity to accommodate considerable growth prior to any works being required on either road.
- The PSP area has a strong existing network of roads that would allow any part of the PSP area to proceed immediately. From a transport perspective the proposed staging is completely unnecessary and can be controlled through permit conditions as development progresses.

Review of current drainage conditions indicates that Gillies Road operates effectively not only from a carriageway, but also in terms of flood risk. The PSP background reports provide no evidence that imminent works are needed to address flood risk on Gillies Road. As such we do not see the value in these works being tied to Stage 1.

Recommendation

- Clarification is provided as to the rationale of using the base traffic volumes in the Transport Modelling Assessment Report.
- APD has produced two revised staging options (refer Figures 3 and 4 below), both of which seek to expand Stage 1 to enable developers outside the existing Stage 1 to upgrade Gillies Road and initiate development to the west of Gillies Road.
- Both options would require an update to Plan 10, and corresponding notation that the development of Stage 1 to the west of Gillies Road requires the delivery of RD-01-2, IN-01 and RD-01-1 to the satisfaction of the Responsible Authority prior to SOC (wording to be confirmed). This would have the benefit of ensuring the early delivery of Gillies Road upgrades in an expedited manner.

- Both options also advance a proposed 'Stage 3' across the expanded area, which is discussed further in section 2.4 below.



Figures 3 & 4: Suggested alternative staging plans (see Appendix A for full plans)

2.3 Development Contributions

Issue

The draft Development Contributions Plan (DCP) stand at \$672,901.00 per NDA/ha, which we consider is untenable in a regional context and unsupportable given the very low NDA. It is well out of step with other regional DCPs that operate over growth areas. For comparison Wonthaggi North East PSP (Jan 2024 figures) has a DC rate of \$258,421 per NDA/ha; Shepparton South East PSP (Feb 2024) \$411,223; and Ballarat West PSP (July 2024): \$421,701.28, making it very difficult for development within the precinct to deliver affordability and compete on a level playing field. Our analysis of the draft DCP also reveals a number of significant anomalies, inconsistencies and funding gaps that need urgent clarification, including:

- Costings not reconciling:** Various DCP costs for key projects, including IN-01c (Gillies Road and Olliers Road Intersection) and IN-02c (Gillies Road and Sims Road Intersection) are based on item costs that significantly exceed VPA Benchmark figure for 25/26. This may be linked to non-standard intersection designs that appear to have been utilised in the PSP (see Section 3.4.5 and Appendix D for further detail). However, no explanation is provided for these discrepancies. At the very least, functional designs are required in order to evaluate the proposed costings.
- Unexplained gaps in infrastructure funding:** Various DCP projects including RD-03-01c, RD-03-2c and BR01, CL01, and CL02 are shown as 50% DCP contribution. No details are provided on where the balance of funding is to be sourced.
- Concerns over inclusions:** RD-02-1 (Midland Highway Duplication of Southern Section) is 100% apportioned to the DCP. This is a State Road and not the responsibility of local landowners to fund.

- **Unreasonable impacts of not integrating Expanded Area:** As the terminology indicates, the Ballarat North PSP anticipates a future expansion area, i.e. an area that is intrinsically linked to the Core Area. The Expanded Area will utilise the significant elements of strategic roading infrastructure that will be paid for by Stages 1 and 2 of the PSP, without having to contribute to the costs. Delays to the delivery of key infrastructure are also likely to materialise where they are dependent on the establishment of population in the expansion area, for which there is no certainty as to either the process or timing for urbanisation of this land. To tie the provision of core area infrastructure to a future unknown planning process for the expansion area is in our view a poor planning outcome.
- **Uncertainty of the Expanded Area:** Conversely the apportionment of costs for community infrastructure projects (CI-02, SR-01, and SP-01) includes the Expanded Area. The draft DCP does not apply DCs to the Expanded Area for works that enable its eventual access on the basis that it will only be delivered when a proven need exists (i.e. uncertainty of its need remains); but community infrastructure is to be part funded by this same area. Patently there is no justifiable logic in this approach.

Recommendation

- The VPA reviews the draft DCP and works with APD to resolve the issues identified above, before releasing an updated Day 1 version. It is imperative for transparency that an updated version includes functional designs and accurate and justified costings with details of how partially funded items are to be dealt with. State projects should be removed from the DCP and ideally the Expansion Area should be properly accounted for in the DCP.
- We further note there are discrepancies of costs for Gillies Road upgrade projects between the draft DCP and the VPA Benchmark, with figures in the DCP being considerably more inflated.

2.4 Role of the Expansion Area

Issue

The PSP outlines the extent of Ballarat's Northern Growth Area, which comprises of the Core Area (571 hectares) and the Expanded Area (272 hectares). An indicative Future Urban Structure plan for the Expanded Area is shown in Appendix 6, which is to be confirmed through a future structure plan/PSP process.

The inclusion of the indicative urban structure in Appendix 6 has no statutory effect and serves no purpose. It does not establish any measure of certainty that the future planning process for the expanded area will occur expeditiously or in a more streamlined manner than a typical PSP. An alternative means of dealing with the Expanded Area in the PSP is required to establish meaningful certainty that the future planning process will constitute a simple and logical future stage of the Ballarat North PSP. The required technical work has been funded by landowners and substantially completed, so the scope of the future framework plan process can be tailored accordingly.

Recommendation

We recommend that the PSP and draft Amendment C256bal are amended to:-

- a) Formally encompass the expanded area within the PSP boundaries
- b) Rezone the expanded area to the UGZ
- c) include new text within the PSP to require the completion of a Framework Plan for the expanded area prior to the use and development of the land for urban purposes.
- d) Confirm the status of the draft Urban Structure plan for the expanded area as forming the basis of the future Framework Plan
- e) Set out requirements within the UGZ schedule to guide the preparation and approval of a future Framework Plan.
- f) PSP to note that either an amendment to the Ballarat North DCP/new DCP will be required to provide for the delivery of infrastructure in the expanded area. .

2.5 Affordable Housing

Issue

The draft PSP (Objective O2) requires development to facilitate affordable housing generally in accordance with the Ballarat North Housing Needs Assessment. This includes meeting Table 5 – Affordable Housing Delivery Guidance, requiring 13% of all PSP housing to be affordable (2% subsidised market housing and 11% social housing).

It is understood that this target has been established using a model developed by SGS Consultants for the VPA, which relies upon a theoretical approach to the derivation of a local Social and affordable housing demand level. The model does not interrogate local housing need, rather it uses a distribution of state wide demand and then applies various ‘moderating factors’ to achieve a locally tailored demand level, which in this case has been calculated at 13%. In the absence of clear explanation around the model inputs and assumptions, it represents a theoretical ‘black box’ target that is difficult to accept in the context of other targets that apply in the Ballarat area, including:-

- Ballarat Planning Scheme (Clause 16.01-2S) does not set a target.
- The VPA and City of Ballarat Urban Renewal Plan for Bakery Hill and Bridge Mall sought a 5% affordable housing target.
- The Ballarat West PSP (Feb 2025) does not have a specific affordable housing target but notes affordable housing should be located in areas that have convenient access to public transport and commercial & community facilities.

The VPA is therefore seeking for the highest level of affordable housing in Ballarat to be in an area that is not serviced by rail and will be predominantly car-borne (as described by the Jacobs TIAR).

The target is also incongruous having regard to a number of recently prepared PSPs, which demonstrate the wide variation in social and affordable housing targets across metropolitan and regional locations:

Table 1: Social and Affordable Housing targets set in recent PSPs

PSP	Model/Strategy	SAH % target
Draft Devon Meadows and Casey Fields PSP (March 2025)	SGS AHNAM Model	10%
Draft Bannockburn South East PSP (April 2025)	Urbanxchange SAH Strategy	6.5%
Approved Officer South PSP (Nov 2024)	No background report provided	8%
Melton East PSP (February 2025)	SGS AHNAM Model	12%

The variation in SAH targets across these PSP areas raises questions around the inputs and assumptions adopted to derive these targets, and requires explanation as to why Ballarat is considered suitable for a significantly higher provision of affordable housing than other areas of Ballarat (including areas with greater public transport connectivity) or other regional growth areas.

Further, the term ‘subsidised housing’ is inconsistent with the terminology used in the Act and the VPPs and its meaning is unclear. No assessment seems to exist to justify a particular percentage of social housing, and no government agency has committed to funding the provision of, and operation of, that housing, even if the social housing is to be provided by a CHP rather than directly by government.

We consider that the current drafting of the PSP and UGZ essentially seek to mandate the provision of 13% affordable housing and require the provision of that housing to be generally in accordance with income ranges and dwelling typologies set out in Table 5 of the draft PSP. This approach is inconsistent with the voluntary nature of Section 173 Agreements, and is out of step with the approach adopted in other PSPs. We submit that any provision of affordable housing must be made on a voluntary basis, and recommend that the PSP and UGZ are amended accordingly.

Recommendation

- a) We strongly recommend the deletion of Table 5 in the draft PSP on the basis it has not been strategically justified.

- b) We recommend the UGZ schedule be amended to delete the mandatory requirement for a section 173 Agreement to be entered into to provide for the delivery of 13% SAH.
- c) References to 'must' to be amended to 'should' in the context of the provision of affordable housing.
- d) Reference to voluntary s173 agreement between landowners and council.
- e) Removal of Affordable Housing considerations within the Decision Guidelines.
- f) Corresponding changes to the requirements and decision guidelines of the zone should be made to ensure that the provision of SAH is made on a voluntary basis.

3 Further Matters

3.1 Overview

Many of the matters outlined are fundamentally interrelated, and cascade from the Critical Issues outlined in Section 2 above, however for the purposes of ease and clarity are separated into broad issues below, namely:

- General PSP Matters
- Housing
- Access & Movement
- Environment
- Proposed Facilities
- Planning Mechanisms.

3.2 General PSP Matters

3.2.1 Core and Expanded Areas – Consistency of Projections

Matter: Table 4 (Dwelling Yields) in the draft Ballarat North PSP anticipates a population for the Core Area of 15,467. The Integrated Transport Assessment Report (Jacobs) estimates a population for the Core Area of 18,726 (Table 5.1). The Economic and Retail Assessment (Urbis, 2024) is predicated on a Core Area population of 18,000-19,000 (Market Trends, Page 5).

Comment: Table 4 (Dwelling Yields) is based on achieving 2.8 persons per dwelling – itself a significant deviation from the Ballarat LGA average of 2.4 persons per dwelling in the 2021 Census (ABS, 2025), which would deliver a population of 13,255. Even assuming the housing product in the Core Area generates a significantly higher persons per household outcome than elsewhere in the City of Ballarat (for reasons not evidenced in the draft PSP), it is unclear why transport infrastructure and retail needs calculations are based on populations approximately 20% higher than the draft PSP anticipates the Core Area delivering.

Request: Confirmation that transport infrastructure and retail provision requirements in the draft PSP are based on PSP anticipated population figures and not estimates of 18,000+ persons.

3.2.2 Future Use of Investigation Area

Matter: Plan 2 (Place Based Plan) indicates a 9.64ha Investigation Area adjoining Ballarat Town Common and Burrumbeet Creek, which represents 3.52% of the PSP's NDA.

Comment: APD Projects sought for the Investigation Area designation to be applied whilst a Cultural Heritage Management Plan (CHMP) was finalised. Based on the findings of the CHMP investigations and the density of artefacts found, it is considered the Area will not be suitable for urban development. Therefore, it is proposed the area should be vested as a reserve for the purpose of conserving cultural significance, noting that a portion of the Area will also be utilised as a Wadawurrung keeping place.

Request: The Investigation Area land use is updated to reflect the CHMP findings and designated as a reserve.

3.2.3 Best Practice Implementation of PSP Guidelines

Matter: The draft Ballarat North PSP does not fully meet *PSP Guidelines: New Communities in Victoria 2021* standards for dwellings within 800m of active open space (AOS) or dwellings within 800m of a community hub; and does not place community facilities at the heart of future areas of urban growth.

Comment: A number of significant community facilities, including the local community facilities CI-01, sports reserve SR-01, and the future Government School (P-6 and 7-12) are located towards the north west of the PSP area, adjoining wetlands (WL-01 & WL-02) and waterways and drainage areas further west. To the north these facilities align with the potential open space and watercourse areas in the Expanded Area (as per the Framework Plan in Appendix 6). Consequently, these significant facilities severely limit their residential catchment by being fundamentally peripheral to the proposed urban structure, even after the development of the Expanded Area. The relationship between the Core Area and Expanded Area does not represent best practice in strategic planning.

Request: Consider a reconfiguration of key community facilities, including where potentially beneficial, the relocation of facilities to the southern boundary of the Expanded Area.

Request: Clarification of why the draft PSP indicates the location of Government School facilities on the north fringe of the Core Area when the *Ballarat North PSP Bushfire Development Report* (Terramatrix, August 2025) recommends it is placed in a more centralised area for safety purposes.

3.3 Housing

3.3.1 Densities – Balance Areas

Matter: The PSP outlines the concept of ‘Balance Areas’, land located outside of the nominated areas of Increased Density/s. Balance Areas have a target density of 17 dwellings or more per NDHa. Areas of Increased Density have a target of 25 dwellings per NDHa. With the respective areas assigned to Increased Density and Balance Areas, the draft PSP is effectively seeking a (minimum) average of 20.2 dwellings per NDHa.

Comment: Examination of the greenfield market shows the Ballarat median lot size is 33% larger than the Melbourne median lot size, a difference which is a broadly accepted occurrence, as it reflects the rural setting and the relative level of demand between the regional and metropolitan markets. Adopting a 20 dwelling per hectare target, the outcome would be approximately 13 years ahead of current market trends (and 6% smaller than Melbourne’s current density, see Research4 report, Appendix F). A regional market is unlikely to have a density that is greater than a metropolitan greenfield market, and if it does, then it is likely to experience a degree of market failure. At the same time, the intent of the PSP process is to deliver housing in a timely and affordable manner. The ability to achieve this objective is fundamentally linked to responding to the expectations of the market.

The draft PSP is not only seeking an average density that is outside the Ballarat market parameters, it provides decision guidance states higher density products ‘should’ be located in Balance Areas adjacent to areas of Increased Density. In effect it is seeking higher densities than the nominated target densities, in manner that is both oblique in terms of the application of decision guidelines and fundamentally lacking in commercial rigour based on prevailing market conditions.

Request: Remove reference to higher density products in Balance Areas. The reference is unclearly linked to any measurable target.

Request: Put greater emphasis on the ability of Small Lot Housing Code (SLHC) and similar medium density products to be located in areas adjoining areas of increased density and areas of increased amenity. Opportunities exist for the PSP to proactively support medium density in key desirable locations within Balance Areas such in proximity to areas of high amenity (e.g. adjoining open space) without recourse to ‘higher density’ products.

3.3.2 Densities – Use of ‘Higher Density’ Terminology

Matter: Objective O1 states the PSP is seeking ‘to facilitate subdivision and development that contributes to delivery of higher density and diversity of housing options’.

Comment: As noted in Section 3.3.1 above, the requirement to deliver high density options in the Ballarat market is misaligned with market expectations. The comparatively high yield targets in the PSP will force the delivery of housing products that are of metropolitan character and intensity, at the cost of a more contextual response that is attuned to local character and the PSP’s regional setting.

The PSP does not provide a definition of ‘higher density’ in its Glossary of Terms. DTP’s *Urban Design Guidelines for Victoria* refer to higher density residential precincts as areas within or adjoining activity centres and/or public transport nodes. Designs are predicated on significant pedestrian footfall, the use of communal open spaces, and residential lots with rear or side lane access for resident car parking and services. There is a disconnect between the density targets for majority of the Ballarat North PSP, the character of the area as defined by the degree of non-residential land uses, and particularly the low degree of developable land across the PSP, at around 47% - and an objective of encouraging ‘higher density’. The disconnect in intent is particularly acute in an objective that refers to the entire PSP area.

Request: A reconsideration of the use of ‘higher density’ terminology, which is neither effectively defined in the draft PSP, nor, if definitions are extrapolated from other DTP materials, suited to the local market. The wording of Objective O1 should read ‘to facilitate subdivision and development that contributes towards a diversity of housing options’ with the changes occurring alongside a review of NDA (as outlined in Section 2.1 above) to ensure the PSP’s overall dwelling yields remain achievable.

3.3.3 Number of Required Typologies

Matter: Table 3 (Housing Density and Diversity) and Guideline G1 of the draft PSP seek that residential subdivisions within areas nominated for increased density should demonstrate how a minimum of three housing typologies can be achieved.

Comment: The requirement for provision of a minimum of three housing typologies has been challenged in a number of recent SAC hearings and has subsequently been recommended for removal in at least one of these PSPs (Officer South). APD Projects supports the provision of housing diversity but do not agree it should be prescribed in this manner.

Request: Reword Table 3 to state:

To support delivery of diverse housing outcomes in areas of increased density, applicable planning applications should enable opportunities to deliver a mix of housing typologies. The mix of dwelling typologies should include, but is not limited to:

- Attached multi-unit developments or townhouse developments
- Semi-detached or duplex style developments; detached small lot housing code products;
- Retirement living.

3.3.4 Range of Typologies

Matter: Table 3 (Housing Density and Diversity) states 'higher density developments should be limited to activity centres. To ensure appropriate scales are achieved, these developments can be interspersed with other medium density products such as walk-up low-rise apartments and mixed use 'shop top' developments.

Comment: The guidance in Table 3 outlined below contradicts the guidance on location of higher density housing in certain parts of Balance Areas (see 3.3.1 above). The 'Decision Guidance' in Table 3 also expands upon detail of housing products that would be more correctly identified in 'Typologies'.

Request: Seek guidance from the VPA as to what studies have been undertaken that indicate highly specific product types such as low-rise apartments and shop top developments would prove economically viable in Ballarat North.

3.4 Access & Movement

3.4.1 Status of Gillies Road

Matter: The Road Projects RD-01-1 and RD-01-2 include an allowance for land to enable the widening of Gillies Road.

Comment: The proposed cross section annotated 'Secondary Arterial 60kmh – 2 Lane – Gillies Road (existing 30-35m reservation)' states that Gillies Road will vary between 30-35m to fit within the existing road reserve, creating confusion on the intent of this road and the land required. The cross-section only provides a single lane in each direction with a shared path of 3.0m on both sides with no parking, no median and no indication as to how future duplication would occur or even demonstrating that it can occur. However, the Strategic Transport Modelling Assessment Report (Jacobs, 2025) assumes a 4-lane cross section.

Request: The VPA provides clarity on the role of Gillies Road. As per the Ratio Preliminary Review (Appendix D) APD Projects suggests the adoption of a standard 34m Secondary Arterial cross section which ensures that the road reserve has the ability to be duplicated to an ultimate 4-lane road corridor.

3.4.2 Validity of Traffic Modelling

Matter: The base traffic volumes adopted by Jacobs to inform the modelling in the Strategic Transport Modelling Assessment Report are significantly different to existing conditions. This matter, whilst of a specific technical nature, is also intrinsically related to our concerns regarding proposed staging (See Section 2.2 above).

Comment: Jacobs used DTP open-source data to determine existing traffic volumes on the PSP road network. DTP open-source data is a combination of historical data collected from the road network, which are then factored up annually based on an estimated growth rate. The majority of traffic volumes on open-source data are estimates made by DTP. Ratio undertook automatic tube counts in November 2024 (details provided in Table 3-2 of Appendix D). Based on actual traffic volumes recorded (more recently than any work undertaken by Jacobs) key observations in the Jacobs report are incorrect and/or outdated.

Request: Given the significance of the error and its impact on triggering road upgrades, it will be necessary to update the modelling accordingly.

3.4.3 Local Access Street Width

Matter: The proposed cross section for Local Access Streets has been increased from the standard 16m cross section to an 18m wide cross section. The difference is primarily in the increased verge width with a carriageway increase from 7.3m to 7.6m. This matter, whilst a specific technical query in itself, is also intrinsically related to concerns over NDA (see Section 2.1 above).

Comment: From a transport perspective the increased width provides no traffic benefit, with the additional carriageway width considered unnecessary and undesirable. The standard 7.3m pavement satisfies all CFA / emergency vehicle requirements, allows kerbside parking on both sides and an adequate width between parked cars for vehicles to pass through including Medium Rigid Vehicles (MRV) which are typically an 8.8m long garbage truck. The additional road width increases the amount of hard surface, noting that although only 300mm on a cross section, will apply to many kilometres of local road network.

Furthermore, increased road width encourages higher vehicle speeds, which is contrary to safer pedestrian friendly communities. The increased width also impacts overall NDA in a PSP with an already very low degree of developable land and increases pressure in meeting density targets.

From a developability perspective, wider local road reserves specifically impact areas of residential development. If a local road runs the length of hectare of developable land (i.e. 100m of carriageway), 18m wide roads utilise 2% (200m²) more land; whilst a standard grid pattern of local roads effectively doubles the loss. At an average of 20 lots per NDHa as the draft PSP seeks, each lot will lose approximately 20m², leading to a typical lot reduction from around 240m² to 220m². As Section 3.3.1 outlines the intended densities in the draft Ballarat North PSP are already creating lot sizes that misalign with market demand. Further reducing net developable land per hectare exacerbates the challenges.

Request: The draft PSP is modified to adopt standard dimensions for Local Access Streets.

3.4.4 Rail Line

Matter: Requirement R6 references a rail line in relation to pedestrian and cyclist crossings.

Comment: No rail lines run through the Core or Expanded Areas.

Request: Delete reference to rail line for clarity.

3.4.5 Intersection Extents

Matter: The extent of the intersection projects shown on Plan 12 (Precinct Infrastructure Plan) are excessive in the north south direction and misleading.

Comment: All intersections shown on Plan 12 scale at over 400m in length from the northern extent to the southern extent. Gillies Road is nominated as a 60kph road with Midland Highway at 80kph. For a 60kph road, the maximum extent of the intersection would be no more than 150m in total. It is noted that the full extent of an intersection is typically not included in most PSPs. If left as is, the DCP allocation between intersection project and road project will be significantly impacted. Please see Ratio Preliminary Traffic Assessment in Appendix D for further detail.

Request: Functional designs and costings should be provided with the exhibition material to enable reasonable analysis by submitters

3.5 Environment

3.5.1 Open Space Design

Matter: Plan 4 (Movement Network) and Plan 5 (Public Realm) do not show any clear form of interaction.

Comment: The draft PSP outlines open space provision with little evidence of connectivity. There is no consideration for linear open space to facilitate and enhance pedestrian connectivity and integrated WSUD principles. Allowance for this open space typology should be considered to convey the PSP vision and requirements (3.2 & 3.3.2 particularly noting G17/G19 considerations for alternative irrigation and wildlife corridors. Linear open space will be needed to service this).

Request: Further consideration of how the open space network functions in tandem with the broader movement network.

3.5.2 Sports Reserve 01 (SR-01) Size and Location

Matter: Plan 5 (Public Realm) shows Sports Reserve 01 (SR-01), with a total area of 9.59 hectares, located alongside a redundant road reserve (RR-01). No detail is provided as to why SR-01 could not encompass the redundant space and enhance net developable area.

Comment: Table 20 indicates the redundant road reserve is 1.02 hectares (0.37% of total NDA). The unlocking of greenfield land to deliver much needed residential development should be utilised as an opportunity to address redundant land uses in a pragmatic manner. The sizing of the SR-01 is based on Council strategy and appears unjustifiable given it is to be DCP-funded and not Council's capital budget.

Request: Shift SR-01 to encompass RR-01 and increase NDA by 0.37%.

Request: Reduce SR-01 to 8 hectares to increase NDA whilst providing a standard-sized sports reserve for a VPA-led PSP.

3.5.3 Ballarat Town Common

Matter: The DEECA-owned and Council managed Ballarat Town Common with a total area of 90.35 hectares (15% of the total PSP area) is included in the draft PSP.

Comment: The Ballarat North Precinct Structure Plan - Community Infrastructure and Open Space Needs Assessment (VPA) (October 2024) describes the Town Common as 'not fit for purpose' with a level of utilisation indicated at 'nil'. The Terramatrix Bushfire Study (August 2025) notes the Town Common will not directly interface with the developable area of the precinct.

With no development contributions allocated to the area and no detail of how the site is to be developed through the PSP, the justification for rezoning to UGZ and inclusion in the draft PSP is unclear. At the time of writing the VPA website notes: *'depending on the availability of funding through the Development Contributions Plan, the Town Commons may be improved to better recreational amenity and recognise the community and cultural values of the area'*. The inclusion appears to be an attempt to utilise Third Party Funding / other PSP resources to undertake technical investigations on a municipal facility that should not be the specific responsibility of landowners in the PSP.

Request: Remove the Ballarat Town Common from the draft PSP and deliver future upgrades via municipal resources in an equitable manner, recognising the wider population will be serviced by a regional-scale facility.

3.5.4 Biodiversity – Wetlands

Matter: Plan 2 (Place Based Plan) identifies a series of 'proposed waterbodies' across the Core Area. Section 1.8 of the PSP notes 'there are existing wetlands and Seasonal Herbaceous Wetland areas in the precinct, particularly in the west of the precinct near the Burrumbeet Creek and around the Ballarat Town Common'.

Comment: The Biodiversity Report produced for the draft Ballarat PSP by WSP in 2024 identified a potential wetland within 171 Gillies Street. The area is identified as a Department of Environment, Energy and Climate Action (DEECA) mapped wetland, and WSP indicated a section of the wetland corresponds with the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) definition of the threatened ecological community – Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (SHW). The WSP report recommended retention of all SHW. Biosis had undertaken a flora and fauna assessment of the subject site for APD in 2022 and confirmed that the floristic composition was not consistent with this threatened community. Biosis has since re-assessed the site in November 2024 and February 2025, with additional surveys undertaken in August and October 2025 to cover seasonal changes. Biosis determined that due to the extensive and ongoing cropping, the area does not support any perennial native species, and the potential for any development of ephemeral wetland species is limited to small areas (primarily drains) and long periods of inundation following unusually wet seasons. These areas do not meet the minimum thresholds for the SHW community.

Request: The VPA considers the findings of Biosis (Appendix C) and the Spiire Drainage Strategy Review (Appendix B), which indicate opportunities for flood mitigation measures to actively enhance ecological value.

Request: A coordinated outcome for enhancing ecological value of wetlands and maximising developable land is introduced into the draft PSP.

3.5.5 Biodiversity – Native Vegetation Precinct Plan (NVPP)

Matter: Amendment VC289 introduced Clause 52.37 on 15 September 2025 requiring a permit to remove, destroy or lop a canopy tree in various zones, including the General Residential Zone.

Comment: An NVPP provides specific, local guidance for native vegetation management, while Clause 52.37 provides a broader, statewide control for canopy trees in residential areas. The reading of the relationships between is that vegetation identified for removal in an NVPP would override Clause 52.37 if that vegetation met the meaning of terms as outlined in Clause 52.37-1.

Request: Clarification of the relationship between the proposed NVPP and Clause 52.37.

3.5.6 Bushfire

Matter: Plan 7 does not identify any 'bushfire hazard areas' these are assumed as the grassland and forest areas.

Comment: Plan 7 does not meet VPA guidelines to provide consistency and certainty for developers, referral authorities and decision-makers. The Plan is predicated on an assumption that all grassland and forest areas *are* the bushfire hazard without implicitly stating this or exhibiting any differentiation between areas that will not be managed in the PSP and areas of higher amenity value. Consequently, a reserve such as SR-01 is given the same status on Plan 7 as the unmanaged Ballarat Town Common. This fails to recognise the guidance provided in the Bushfire Development Report (Terramatrix, 2025) that

states 'grassland vegetation is considered hazardous, and therefore classifiable, when it is unmanaged, i.e. more than 100 mm tall. Settlement planning should apply a conservative and precautionary approach, and assume Grassland areas will be unmanaged and classifiable, unless there is reasonable assurance they will be managed in a low threat state.' The Bushfire Development Report and Risk Assessment (Ecology & Heritage Partners, 2024) confirms that sports reserves (amongst other managed assets) are 'very low bushfire risk' (section 4.2.2).

Various annotations, including the purpose of the light yellow areas and dark pink areas outside the precinct boundary, are not described in the legend and have to be assumed to be external extrapolation of grassland and forested areas. Setbacks are shown applied to road reserves in some location and not others.

Request: Plan 7 needs to be adjusted to provide both reader clarity and recognition that 'grassland' and similar bushfire hazards are differentiated by the levels of management

3.5.7 Bushfire - Personal Firefighting Water Provision

Matter: Guideline G27, in reference to Plan 7 (Bushfire), notes lot design adjoining the bushfire interface should allow for the provision of a static water supply of 2,500 litres for personal firefighting where practical.

Comment: The Ballarat North PSP - Bushfire Development Report (Terramatrix, August 2025) provides detailed design guidelines for settlement planning at bushfire interfaces (Section 7). The Ballarat North precinct is identified as a 'lower risk landscape' with development of the precinct with contemporary bushfire protection measures providing enhanced bushfire protection to the existing urban area. No clear nexus between "lot design" and provision of 2,500 litre water tanks for firefighting. The Report notes that Design Guidelines advocate for a residential lot size of 800-1,200 m² to be optimal on the bushfire interface, however no reference is made to provision of a static water supply of 2,500 litres.

Request: Clarification is provided for the rationale for Guideline G27's focus on water supply over optimal lot design considerations.

3.6 Proposed Facilities

3.6.1 Community Facilities

Matter: Guideline G32 states 'childcare centres and medical centres must be within or nearby community hubs or activity centres. Guideline G33 states 'social services that support the needs of the community, including educational, community or civic infrastructure, should be located within the catchment shown on Plan 8 (Community Infrastructure)'.

Comment: The use of 'nearby' as guidance for locating of childcare centres or medical centres in proximity to community hubs or activity centres lacks rigour and clarity. Furthermore, given the principal activity centre sits outside the community facility catchments shown on Plan 8, there is clear risk of contradiction between Guidelines G32 and G33.

Request: Modify language of Guidelines G32 and G33 to clarify preferred relationship of childcare and medical uses to the key activity centre.

3.6.2 Location of Schools

Matter: A proposed government school occupying 11.78 hectares is shown on Plan 8 (Community Infrastructure). Amongst other references, the draft PSP includes Objective O6, which seeks to establish strong, safe, well-designed and accessible connections to key destinations including schools; and Requirement R23, which states 'any lot created for a proposed government school site must be designed to ensure it is outside bushfire hazard areas to the satisfaction of the Department of Education'.

Comment: The *Community Infrastructure and Open Space Needs Assessment* (VPA, October 2024) notes anticipated requirement for future school capacity and that the Department of Education is generally supportive of provision of a secondary school in the precinct - 'noting the facility will offer capacity to service the future population in the Expanded Area'. The Assessment simultaneously notes that the 'no formal decision has yet been made on the inclusion of the Expanded Area, thus the report will focus on the Core Area only'. The *Community Infrastructure and Open Space Needs Assessment* further notes that the Ballarat North precinct is anticipated to accommodate 18,762 residents across 6,688 new dwellings.

Overall the justification for the inclusion of the schools in the Core Area is questionable for a number of key reasons:

- It is not clear how much weight the Department of Education has put on the servicing of the Expanded Area it specifically references when this area is acknowledged by the VPA as having no certainty of delivery.

- There is no explanation provided as to why the *Community Infrastructure Assessment* utilises a different dwelling (and thus population) yield than that anticipated in the draft PSP itself (approximately a 20% difference); or if the Department of Education has factored this changed yield into its needs assessment.
- The proposed school site is remote from the major of residential and activity centre development, with the proposed NAC being outside an 800m radius (10 minutes' walk).
- As noted in Section 3.4.2, bushfire recommendations indicate a school site should ideally not be located on the fringe of urban development.

The outcome is a clear indication that the Department of Education considers the school is necessitated in part by the Expanded Area being developed, and thus the school's indicative location has been based on it servicing both the Core and Expanded Areas equitably. Yet the planning mechanisms of the delivery of the Expanded Area are not in place, and the impact in terms of NDA is solely attributed to the Core Area landowners. There is a fundamental inconsistency in justifying strategic community infrastructure planning outcomes on an unconfirmed growth area.

Request: The school site (both parcels P-6 and 7-12) is relocated to the Expanded Area. Failing this, evidence is provided that the population yield anticipated by the draft PSP for the Core Area is sufficient for justifying the delivery of the school without any assumptions being that the Expanded Area will be delivered; and that the Department of Education confirms an urban fringe site meets expectations for best practice school planning.

3.6.3 Retail – Two Storey Built Form

Matter: In support of Objective O17, to ensure that retail and commercial focused facilities and spaces feature location and design qualities that make them inviting, attractive, and safe places to work and visit from adjacent residential neighbourhoods, Guideline G37 encourages two storey retail built form is where practical.

Comment: It is considered unlikely the Central Large NAC as detailed in the *Ballarat North PSP - Economic & Retail Assessments* (Urbis, June 2024) could sustain two storey built form, and the Retail Assessment makes no reference to this type of development. The NAC is also physically separated from other key uses – specifically education – which are noted in the *PSP Guidelines: New Communities in Victoria* (VPA, 2021) which could aid the creation of a multi-faceted activity centre.

Request: Delete Guideline G37.

3.6.4 Retail – Basis for Floorspace Calculations

Matter: The Household and Population Capacity Scenarios in the Ballarat North PSP Economic Retail Assessment (Urbis, 2024) indicate a proposed dwelling yield of 6,688 in the Core Area.

Comment: The draft PSP provides for the delivery of 5,523 dwellings, 82% of the figure utilised to calculate retail requirements. Whilst there are other matters of debate regarding the content of the Assessment (including the lack of a discount in demand factored in due to existing retail outlets) the most fundamental issue is the nearly 20% discrepancy in figures utilised to determine demand and the amount of floorspace proposed by the draft PSP.

The discrepancy is likely to have significant impacts on floorspace calculations and, in turn, retail outcomes. Analysis by Deep End (Appendix E) determining the reduction in population capacity will have material consequences for the number and size of supermarkets that might be supported within the PSP, with their findings casting doubt over the ability of the NAC to sustain two full-line supermarkets.

Request: Updating of retail floorspace assessment based on the actual dwelling yield in the PSP and not on superseded earlier figures.

3.7 Planning Mechanisms

3.7.1 Urban Growth Zone (UGZ) Schedule – Affordable Housing

Matter: The UGZ (3.0 Application Requirements) notes that a '*permit must not be granted to subdivide land to facilitate residential development until a Section 173 Agreement has been entered into*'.

Comment: DTP guidelines on the provision of affordable housing state that '*to ensure development feasibility and fairness, any affordable housing requirement secured through a planning permit condition for a Section 173 Agreement should be identified early and by agreement with the applicant*¹'. It is unclear how a mandated application requirement constitutes applicant agreement.

¹ <https://www.planning.vic.gov.au/guides-and-resources/strategies-and-initiatives/housing>

Guideline G2 within the draft PSP notes '*applications for residential subdivision and development should demonstrate how they contribute to the target of 13% minimum of affordable housing generally in accordance with the Ballarat North Housing Needs Assessment*'. The draft PSP is indicating an approach that is open to innovation that does not tally with the UGZ application requirement.

Request: The requirement to enter into a Section 173 Agreement is removed from the UGZ.

3.7.2 UGZ Schedule – Climate Change

Matter: The draft Schedule seeks the production of a Zero Carbon Operational Energy Plan.

Comment: All development will be electricity powered, and the subdivision itself cannot control specific residential outcomes such as solar panels, or energy batteries.

Request: Removal of the need to prepare a Zero Carbon Operational Energy Plan. Services and infrastructure will be implemented in accordance with the requirements of the relevant authority, and any additional measures can be undertaken at the discretion of the landowner/developer rather than being mandated.

3.7.3 UGZ Schedule – Decision Guidelines

Matter: Section 6.0 (Decision Guidelines) in Schedule 3 to Clause 37.03 states: The following decision guidelines apply to an application for a permit under Clause 37.07:

Before deciding on an application to develop or subdivide land for dwellings, the responsible authority must consider, as appropriate:

- Whether the application contributes towards Victoria's emission reduction targets.
- Whether the application responds appropriately to any significant impacts of climate change that can be reasonably anticipated.

Comment: Climate change must be an early consideration in the strategic planning process and amendments to the planning scheme. Following the amendments to the *Planning and Environment Act 1987* on 26 March 2025 s.12(2A) outlines that there is no direct impact of climate change on planning permit decision making. A planning permit is not required to consider these climate change matters, unless a planning scheme specifically provides for it. The Ballarat Planning Scheme does not include any local additions to the provisions of Clause 13.01 (Climate Change Impacts) that would justify the inclusion of climate change as a permit consideration.

Request: Remove the reference to Climate Change from Decision Guidelines.

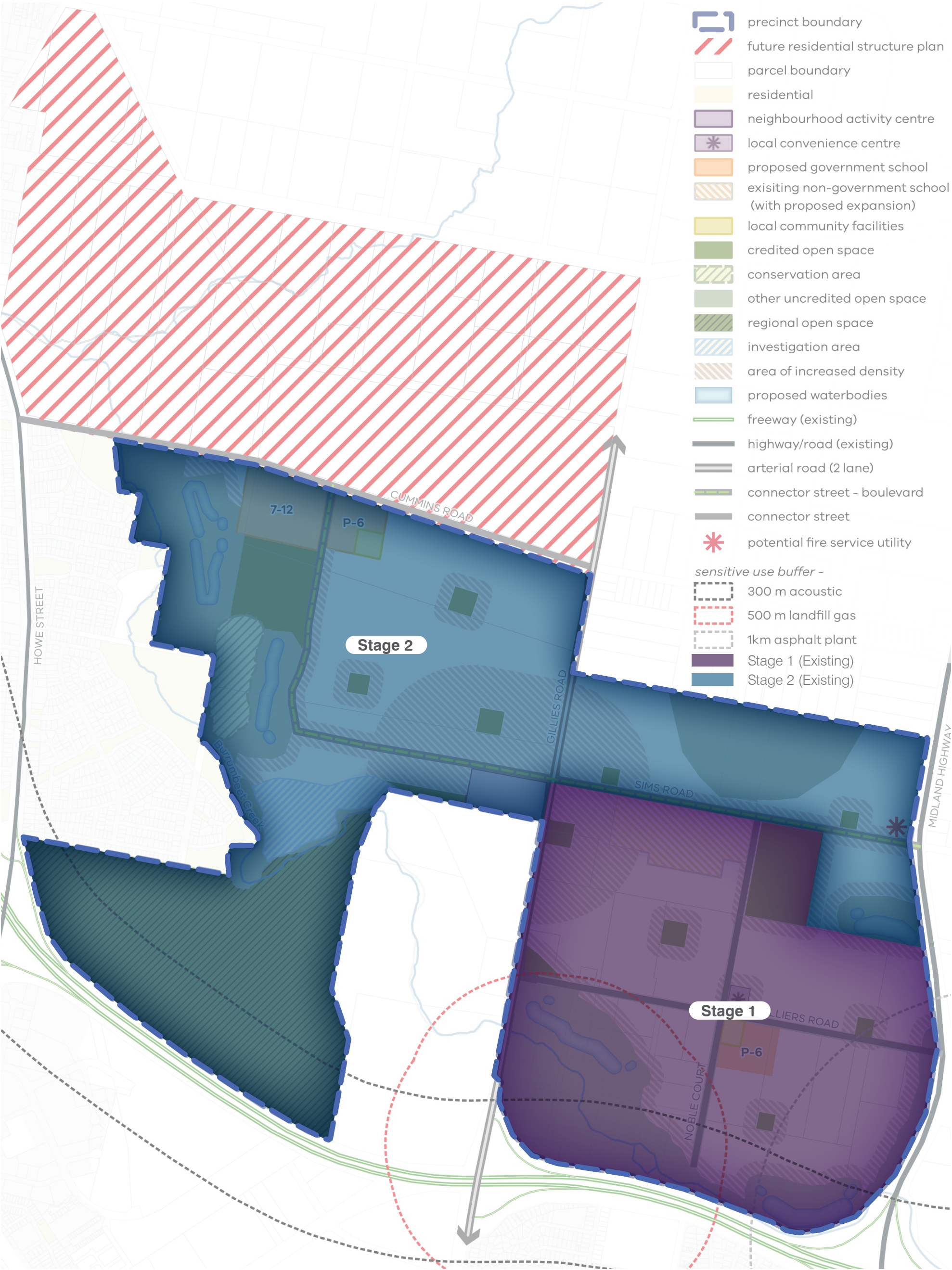
APPENDICES

The following reports have been utilised to support the arguments in APD Projects' submission on the draft Ballarat North Precinct Structure Plan, Infrastructure Contributions Plan, and ancillary technical and background documents released by the VPA for the consultation process in September & October 2025. These appended reports should be read in conjunction with the submission document.

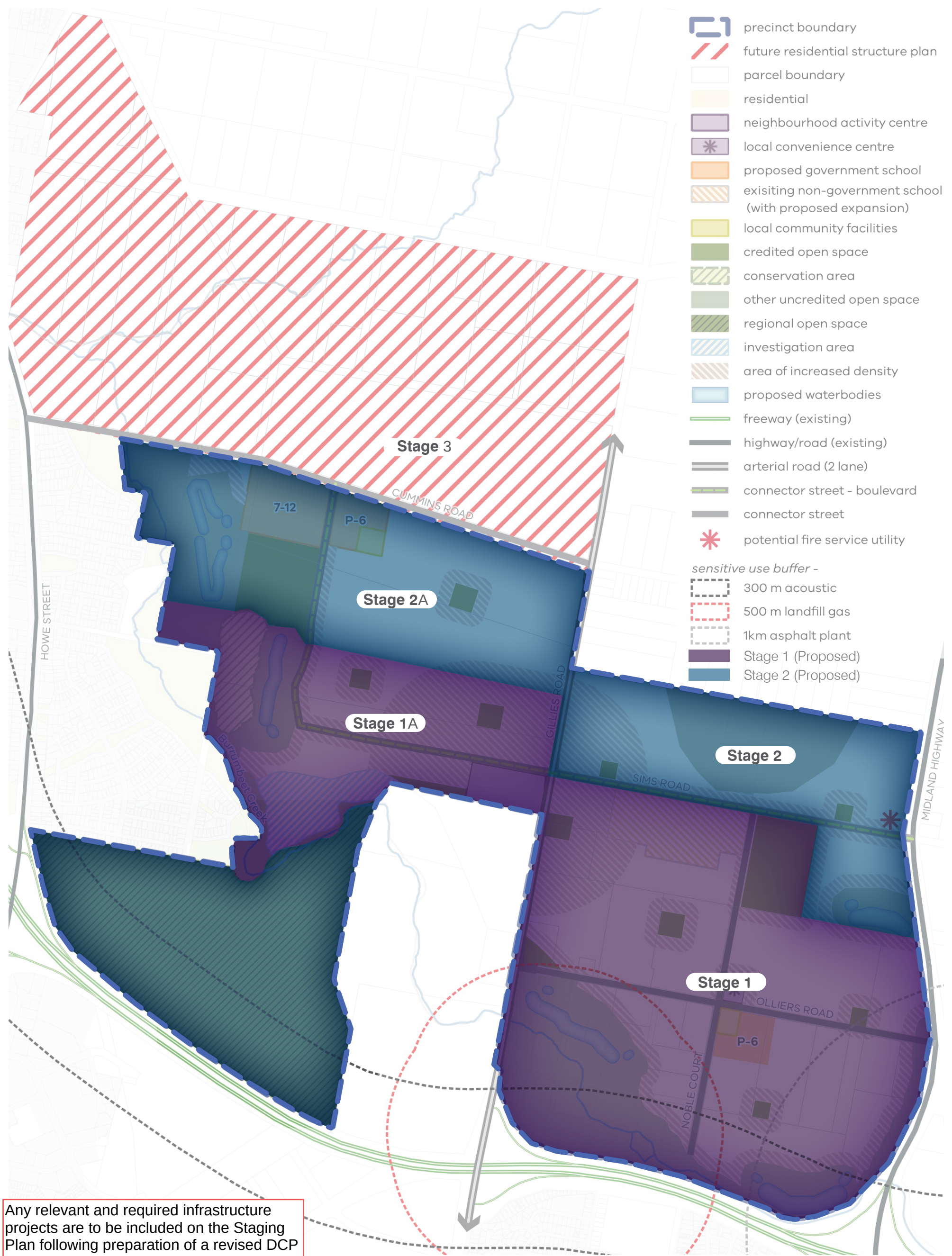
Appendix

A	Suggested Updated Staging Plan	Spiire, October 2025
B	Drainage Strategy Review	Spiire, October 2025
C	Wetland Advice	Biosis, October 2025
D	Traffic Assessment Review	Ratio, October 2025
E	Economic & Retail Review	Deep End, October 2025
F	Ballarat Lot Size Trends	Research4, October 2024

STAGING - EXISTING

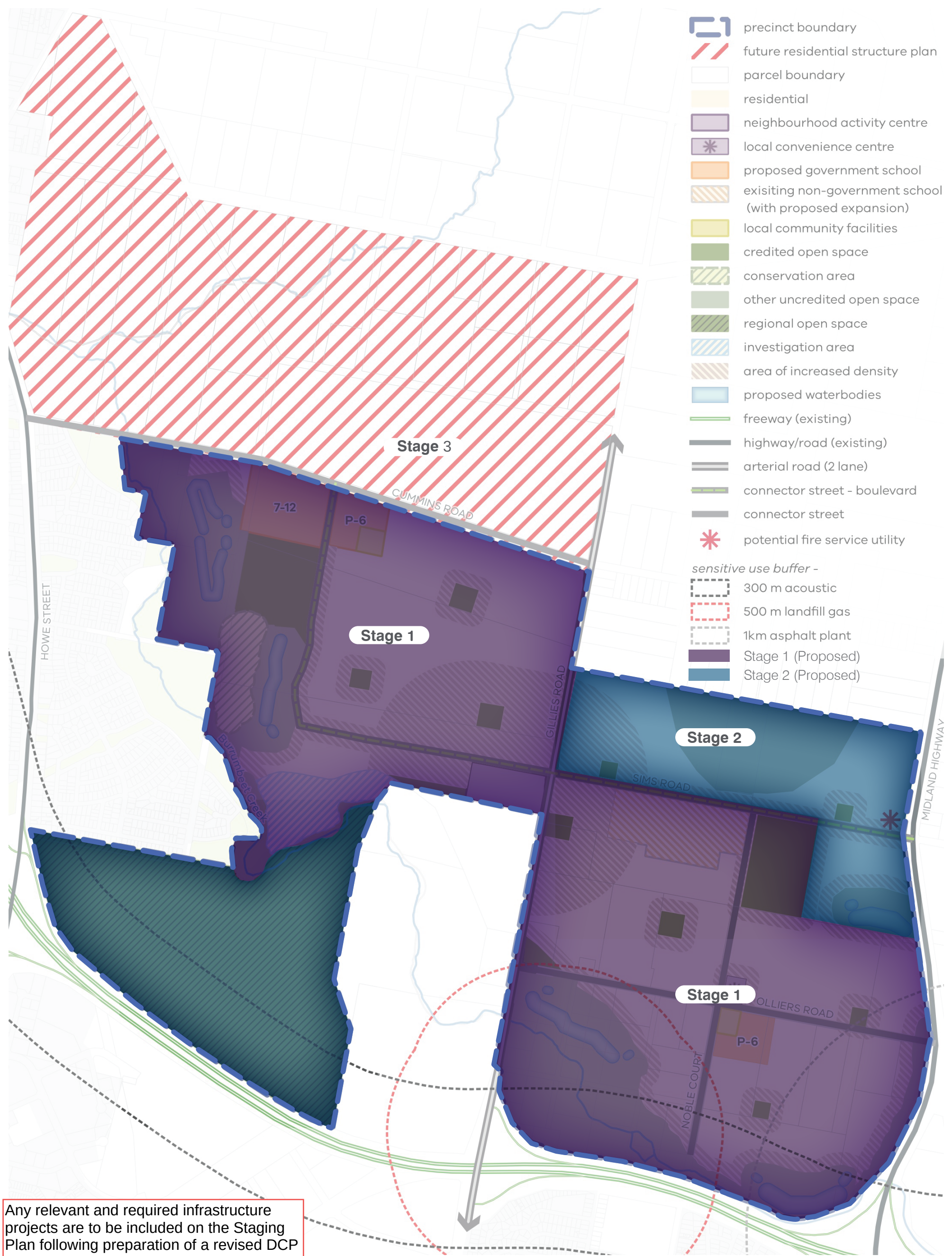


STAGING - OPTION 1



Any relevant and required infrastructure projects are to be included on the Staging Plan following preparation of a revised DCP

STAGING - OPTION 2



MEMO

To:	Victorian Planning Authority
From:	Kerry Wilkinson / Spiire
Date:	15 October 2025
Reference:	306623
Project name:	Ballarat North PSP
Subject:	Ballarat North PSP - Drainage Strategy Review and Amended Asset Configuration

The Victorian Planning Authority (VPA) is undertaking planning for the Ballarat North Precinct Structure Plan (PSP). The VPA is currently presenting the draft PSP for exhibition.

Spiire represents two major landowners within the PSP, namely [REDACTED] and [REDACTED] (with development manager APD). We have been requested to review the recently published (8 July 2025) Final Proof of Concept Ballarat North PSP – Stormwater Drainage report prepared by SMEC. As part of the overall review, we have also been tasked with providing an alternative drainage asset layout and sizing.

The proposed amended strategy is provided in the body of this memo with the Drainage report review provided as Appendix B.

1. EXECUTIVE SUMMARY

- ▶ A review of the SMEC Drainage Strategy shows that the strategy provides overly conservative retardation basin footprints with apparent errors / unsubstantiated anomalies within their modelling. The footprints and associated storage volumes documented appear to significantly over-retard stormwater runoff to rates well below pre-development rates. These include:
 - Developed flowrates retarded to levels significantly below pre-developed (refer Tables 6.1-6.4, 7.8-7.9 and A.1.4, A.1.5, A.1.8, A-1-10 – A1.13 in the SMEC report). For example, Catchment to CS WLRB retards 1% AEP developed peak flowrates to 1.7m³/s whereas pre-development peak flowrates re 10.6m³/s (Table 7.9).
 - Adoption of SSP8.5 for hydrological calculations across the precinct. This scenario represents a 4.5-degree temperature increase with increases of rainfall intensity up to 1.85x current. This is extremely conservative and provides a disproportionate risk profile to optimal design outcomes.
 - The City of Ballarat had not been consulted on with respect to specific requirements. The City of Ballarat is the drainage authority. The City of Ballarat has not resolved their position on climate change and drainage requirements since the release of the new Australian Rainfall and Runoff guidelines.
 - The SMEC RORB model routes outflow from WLRB SEN through to WLRB SES instead of directly into the tributary of Burrumbeet Creek. This results in flow from part of the SE catchment being retarded twice. This is in conflict with text in the SMEC report, Section 7.2.1.1: “*SEN has been sized for the eastern catchment of the future School (Ballarat*

Grammar Mount Rowan campus) and northern areas of Sims Road. The retarding basin is sized to attenuate no more than the existing conditions peak flow at the same location. Once the flows have been attenuated, it is intended to convey this flow via underground drainage pipe into the proposed constructed waterway”

- ▶ Spiire has focused on optimising drainage assets while meeting technical hydrological requirements. We have assessed stormwater retardation requirements using current climate rainfall data with sensitivity tests made on median climate change scenarios.
- ▶ Revised modelling undertaken by Spiire results in an optimisation of drainage assets which results in a total reduction in retardation basin / wetland footprint of 14.1 ha. Refer SMEC vs Spiire comparison below:

WLRB Name	SMEC Storage Volume (m ³)	Spiire Storage Volume (m ³)
SEN	24,200	17,900
SES	45,400	23,000
CS	50,000	29,100
NWS	35,000	29,900
NWN	58,300	38,300

Table 1: Storage Requirements for 1% AEP with Current Climate Rainfall Data

- ▶ We have promoted the use of the DEECA mapped wetland area to include one of the wetland / retardation basins which further optimises the location of drainage assets within suitable topographical environments. This location has been subject to an ecological advice assessment by Biosis and may require flood modelling to identify the wetting regime of the mapped wetland.
- ▶ Ecology to be enhanced with incorporation of construction wetland / retardation basins with consideration for ecological ponds within the floodplain to promote biodiversity including rakali and platypus.

2. AUTHORITY REQUIREMENTS

2.1 Glenelg Hopkins Catchment Management Authority

Spiire and APD met online with the Glenelg Hopkins Catchment Management Authority on the 7th of October 2025. A summary of the meeting is below:

- ▶ GHCMA provided no direction to the VPA nor SMEC with respect to retardation requirements within the PSP.
- ▶ No discussions with respect to the 10% AEP were made.
- ▶ GHCMA require waterway health not to be impacted.

- ▶ Current GHCMA flood modelling guidance is to consider SSP8.5 long-term scenario. This is for waterway flooding. GHCMA does not provide advice on PSP and development stormwater drainage as GHCMA is not the drainage authority.
- ▶ GHCMA starting position is that no development, including constructed wetland basins, is to be located within the 1% AEP floodplain extent including the SSP8.5 event. Consideration of wetlands within the floodplain would be given subject to a review of impacts.
- ▶ GMCMA has not reviewed the SMEC flood model but had no issues with what was presented in the July Drainage Strategy.

A copy of the agreed position of the GHCMA is attached within Appendix D.

2.2 City of Ballarat

Spiire and APD met in person with staff from the City of Ballarat (Council) on the 10th of October 2025. A summary of the meeting is below:

- ▶ Council had not been consulted with respect to drainage requirements for concept design of the PSP.
- ▶ Council is currently in the process of developing guidelines with respect to climate change scenarios and drainage. Their current position is to retard to pre-development 1% AEP event rates.
- ▶ Council indicated that SSP8.5 would not be a scenario that they would look to include within guidelines.
- ▶ Council viewed the current basin footprints as excessive with Council harbouring views of unnecessary maintenance burdens due to the larger footprints.
- ▶ Council did not know why retardation of the 10% AEP event had been considered in the Drainage Strategy.
- ▶ Council would like to see definition in the PSP of integrated water management.
- ▶ Council would consider locations of wetland basins within floodplains subject to no adverse impacts of maintenance of the assets.

3. WETLAND / RETARDATION BASINS

Spiire has undertaken a review of the SMEC Drainage Strategy report prepared in July 2025. Refer to Appendix A for details of the strategy review.

The below extract is Figure 0-1-1 from the SMEC report. This figure shows five proposed wetland / retardation basins (WLRB) located across the PSP. Labels for each WLRB are added for context.

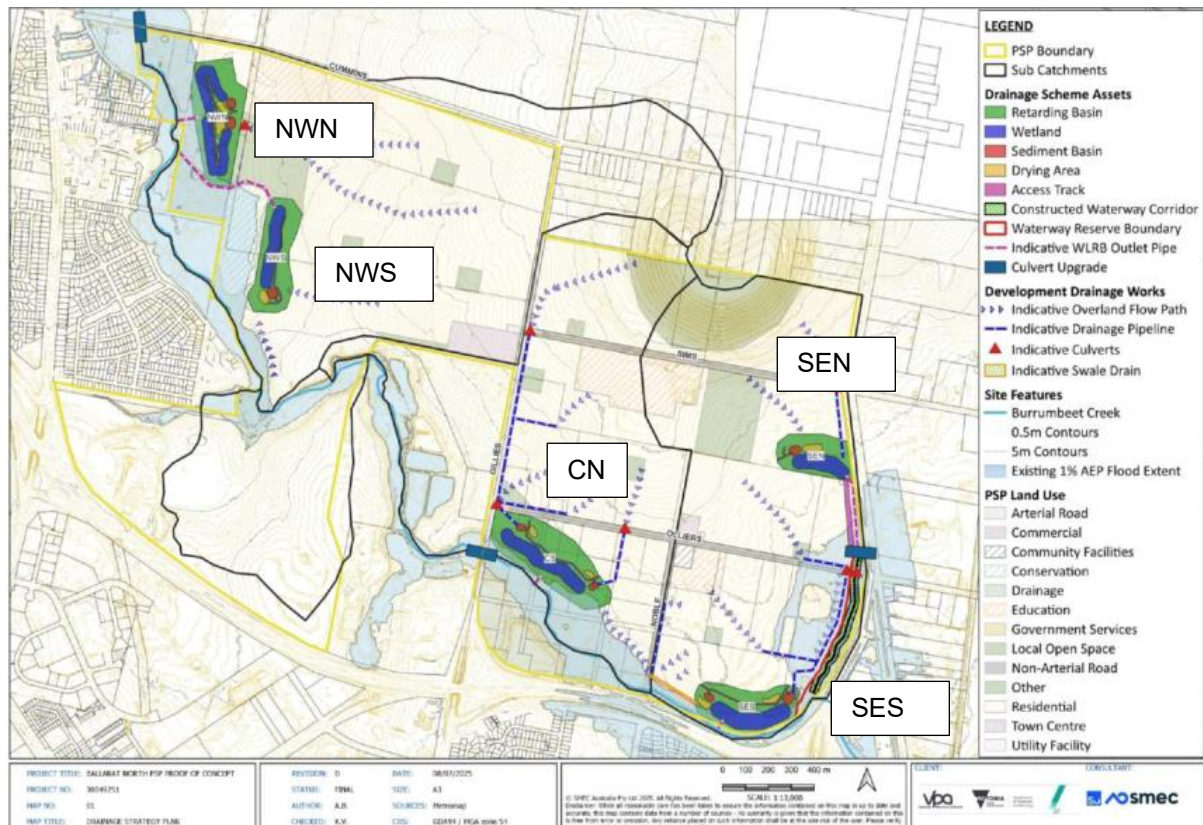


Figure 1: Figure 0-1-1 from the SMEC Drainage Strategy

WLRBs are located within three distinct sub-catchments (refer Figure 6 Appendix A). WLRBs SES and SEN are located in the “Southeast” sub-catchment, CS in the “Central” sub-catchment and NWN and NWS located in the “Northwest” sub-catchment.

3.1 Wetland Sizing

Wetland designs are generally in accordance with the wetland footprints provided in the SMEC Drainage Strategy. We have in some instances adjusted the wetland configurations to account for anticipated velocities and rearranged locations of sediment dry-out areas and access tracks.

There are further opportunities outside of this report to optimise and reduce wetland footprints. These include roadside swales, localised biofiltration, passive irrigation, rainwater tanks, and stormwater harvesting. These have not been presented within this memo but should be investigated further to realise a move away from conventional precinct treatment toward innovative practice (refer Innovation Pathways Pilot Projects).

3.2 RB Sizing

Retardation basin sizing has been revised by Spiire based on the following:

- ▶ Developed scenario to be retarded to pre-development peak flow rates for the 1% AEP and 10% AEP events for current day climatic rainfall data. This includes retardation for each sub-catchment at the outfalls to Burrumbeet Creek and confirmation that the developed peak flow-rate of Burrumbeet Creek at Cummins Road does not exceed pre-development levels.

- ▶ Sensitivity checks using Australian Rainfall and Runoff (ARR) socio-economic pathways (SSP) factor SSP2-4.5 Long-Term (temperature increase of 2.4 degrees Celsius). This scenario provides a sensitivity check that is in line with industry standard. For comparison, SMEC undertook a sensitivity check using SSP5-8.5 (refer Section 4) which we believe is too extreme and if this scenario were to be real would result in greater societal challenges beyond drainage assets within this PSP.

The following revisions have been made to the SMEC RORB model:

3.2.1 Current Day Parameters

- ▶ Initial Loss factors (IL) have been revised to 24.0mm in accordance with the ARR DataHub with Mount Rowan location (SMEC IL 17.25mm).
- ▶ Continuing Loss factors (CL) have been revised to 4.50 mm / hour in accordance with the ARR DataHub with Mount Rowan location. (SMEC CL 5.33mm/hr)

Data

Storm Losses

Note: Burst Loss = Storm Loss - Preburst

Note: These losses are only for rural use and are **NOT FOR DIRECT USE** in urban areas

Note: As this point is in Victoria the advice provided on losses and pre-burst in the VIC specific tab of the ARR Data Hub should be considered.

ID	15736.0
Storm Initial Losses (mm)	24.0
Storm Continuing Losses (mm/h)	4.5

Temporal Patterns | [Download \(.zip\)](#)

Figure 2: ARR DataHub Losses for Miners Rest

3.2.2 SSP2-4.5 Parameters

- ▶ Initial losses factored by 1.1 based on ARR climate change guidance for “Southern Slopes” areas
- ▶ Continuing losses factored by 1.22 based on ARR climate change guidance for “Southern Slopes” areas
- ▶ Rainfall intensity increased by 1.20 – 1.40 dependant on duration in accordance with recommended rates of change for climate change provide by ARR. For comparison, SSP5-8.5 for long term scenarios (modelled by SMEC) applies variable factors of 1.37-1.77. SMEC’s model had higher factors of between 1.40 and 1.85.

3.2.3 Modelling Results

It is noted in the SMEC report that the original Watertech RORB model was adopted and modified to include development sub-catchments throughout the PSP. The updated model was then calibrated (by adjusting kc factor) to try to replicate the flowrates determined in the Watertech model.

The revised modelling that Spiire has undertaken shows a reduction to existing flowrates and this is attributable to the revised initial and continuing losses detailed in Section 2.2.1. Spiire has not attempted to calibrate the revised model.

Based on revised RORB modelling the following pre-development and post-development rates have been calculated. These are based on reporting stations as shown in the figure below:

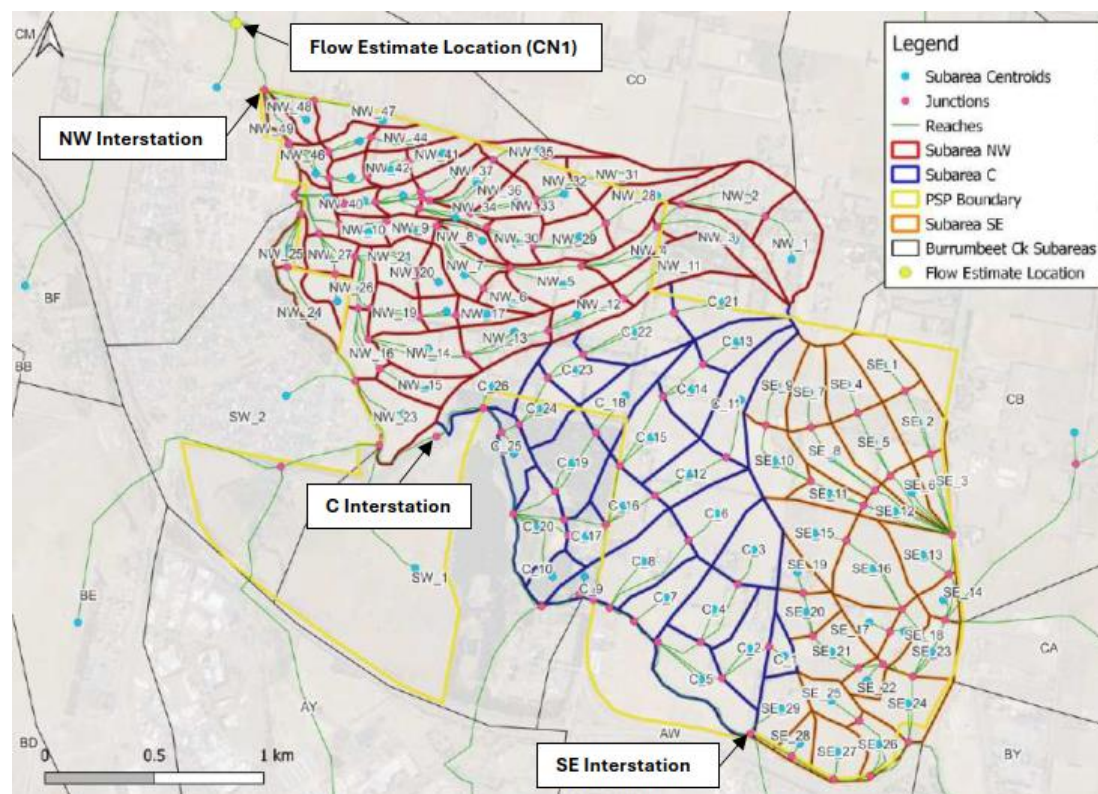


Figure 3: Location Identifiers for Model Outputs

	SMEC Existing Peak Flow (m ³ /s)		Spiire Existing Peak Flow (m ³ /s)	
Sub-catchment	10% AEP	1% AEP	10% AEP	1% AEP
CN	25.6	58.6	19.67	55.22

Table 2: Comparison of Existing Peak Flowrates

As noted earlier, there is an overall reduction in existing flowrates. We expect that this will be reviewed once the revised flood model or Burrumbeet Creek has been completed.

The below tables summarise the RORB modelling that Spiire has undertaken comparing pre-development (existing) and developed peak flow-rates under current day conditions and SSP2-4.5 climate change conditions. Note also that developed catchment contributing to basins has increased and been accounted for.

Time to peak for the CN recording station is significantly longer than the local sub-catchments within the PSP. Retardation is shown to only have a minimal impact on peak flow-rates at this location which is not unexpected.

Sub-catchment	Existing Peak Flow (m ³ /s)		Developed Peak Flow (m ³ /s)	
	10% AEP	1% AEP	10% AEP	1% AEP
SE	2.14	4.76	8.83	15.23
C	3.15	6.81	7.12	13.38
NW	1.41	3.89	7.87	14.43
CN	19.67	55.22	20.45	54.48

Table 3: Current Climate Peak Flowrates (No Retardation)

Sub-catchment	SSP2-4.5 Existing Peak Flow (m ³ /s)		SSP2-4.5 Developed Peak Flow (m ³ /s)	
	10% AEP	1% AEP	10% AEP	1% AEP
SE	3.83	7.11	13.25	23.40
C	5.51	10.03	11.19	20.46
NW	1.41	6.15	12.02	21.48
CN	19.67	82.84	33.93	81.05

Table 4: SSP2-4.5 Climate Change Peak Flowrates (No Retardation)

As noted earlier, retardation basins have been sized to reduce developed peak flow-rates to pre-development rates.

As part of the review, we have modelled the combined WLRBs using an existing surface model created from LiDAR data covering the PSP. Wetland footprints are designed with retardation storage to be provided above the normal water level of the wetlands

Sub-catchment	WLRB	Storage (m ³) Current Day Climate	Storage (m ³) SSP2-4.5
NW	NWS	29,900	46,900
NW	NWN	38,300	55,800
C	CS	29,100	33,900
SE	SES	23,000	29,500
SE	SEN	17,900	24,300

Table 5: Retardation Basin Storage

Sub-catchment	Existing Peak Flow (m ³ /s)		Retarded Peak Flow (m ³ /s)	
	10% AEP	1% AEP	10% AEP	1% AEP
SE	2.14	4.76	1.67	4.22
C	3.15	6.81	3.05	5.91
NW	1.41	3.89	0.89	2.09
CN	19.67	55.22	19.80	54.98

Table 6: Current Climate Peak Flowrates with Retardation

Sub-catchment	SSP2-4.5 Existing Peak Flow (m ³ /s)		SSP2-4.5 Retarded Peak Flow (m ³ /s)	
	10% AEP	1% AEP	10% AEP	1% AEP
SE	3.83	7.11	3.09	6.49
C	5.51	10.03	5.12	8.73
NW	2.79	6.15	1.66	3.30
CN	33.05	82.84	31.96	80.83

Table 7: SSP2-4.5 Climate Change Peak Flowrates with Retardation

3.3 WLRB Reserve Footprints

The below table summarises reserve footprints to be allocated to the WRLB assets with a comparison against reserve sizes denoted in the SMEC Drainage Strategy.

WLRB	Area (ha)	Area (ha) SMEC	Difference (ha)
SES	4.70	7.50	2.80
SEN	3.87	5.27	1.40
CS	5.88	11.34	5.45
NWS	4.40	7.38	2.98
NWN	8.27	9.75	1.49

WLRB	Area (ha)	Area (ha) SMEC	Difference (ha)
TOTAL	25.86	41.24	14.12

Table 8: WLRB Reserve Footprints

3.4 Locations

The location of WLRBs within floodplains is generally permitted provided that:

- ▶ WLRBs need to be designed appropriately to minimise reduction of floodplain storage and to avoid flood level afflux. Designs in this instance will need to be included in modelling of the Burrumbeet Creek to assess any impacts.
- ▶ Any assets are located within the 1% AEP flood extents is reviewed through flood modelling to ensure that risk to properties outside of the PSP is not adversely impacted and that designs of WLRBs are designed and constructed to be resilient to floodwater inundation.
- ▶ Maintenance requirements of the WLRBs are not unduly increased as a result of location within floodplains.
- ▶ Relevant ecological and CHMP requirements are included within designs.

We have proposed that encumbered floodplain land should be utilised further to optimise / reduce developable land across the PSP. Additional analysis will need to be undertaken to consider tail water impacts within designs.

The WLRB locations and proposed amendments are summarised below and further detailed in Appendix A:



Figure 4: Revised WLRB Footprints Total PSP*

*SMEC footprints shown for comparison (Spiire dark green, SMEC light green)

3.4.1 SEN

This location of the SEN WLRB is located to abut the Midland Highway to the north and upstream of the Burrumbeet Creek tributary. We suggest that this location is to be retained.

3.4.2 SES and CS

Both of these WLRBs are located at the downstream end of their respective sub-catchments adjacent to the Burrumbeet Creek. Locations partially overlap the Burrumbeet Creek and some optimisation should be undertaken during design. We suggest that these locations are to be retained. Extents of wetland encumbrance into the floodplain should be reviewed through modelling to assess impacts on flooding.



Figure 5: Revised WLRB Footprints – East side of PSP

3.4.3 NWN

The location of this WLRB at the downstream end of the NW sub-catchment. Some optimisation is provided in our revised assessment utilising the floodplain area further to the north-west. Extents of wetland encumbrance into the floodplain should be reviewed through modelling to assess impacts on flooding.

3.4.4 NWS

There is a DEECA mapped wetland located within the floodplain of the Burrumbeet Creek and the current location of the NWS RBWL. Extents of wetland encumbrance into the floodplain should be reviewed through modelling to assess impacts on flooding.

Refer to Section 3 for further detail regarding proposed enhancements to the ecology of the Burrumbeet Creek floodplain.



Figure 6: Revised WLRB Footprints – West side of PSP

4. ECOLOGICAL CONSIDERATIONS

We refer to both the Biosis letters dated 4 March 2025 and 8 October 2025 and also the WSP letter dated 1 April 2025 with respect to the DEECA mapped wetland located in the west of the Ballarat North PSP.

The floodplain area includes a DEECA mapped wetland with an area of approximately 4.64 hectares (citation: Biosis).

The mapped wetland is located with the mapped 1% AEP flood extents of the Burrumbeet Creek and would be considered part of the creek's floodplain.

Based on contours and aerial imagery, Spiire believes that the mapped wetland is periodically inundated by floodwaters spilling beyond the right bank of the Burrumbeet Creek into the mapped wetland. The mapped wetland is able to maintain a wetted footprint for some time as it is lower than the remainder of the floodplain.

Some runoff would be received from overland flow from catchment area between the mapped wetland area and Gillies Road. This catchment would be cut off from any potential seasonal herbaceous wetland if a constructed wetland was built to the east, thereby resulting in less frequent wetting to the conservation area proposed by the PSP.

Based on site observations and aerial imagery, the wetland is cultivated and exposed to regular grazing by cattle and horses and therefore protection of the mapped wetland is limited.

There is an opportunity to enhance the Burrumbeet Creek floodplain within the vicinity of and including the mapped wetland. We envisage a wetted corridor supportive of habitats for the successful and sustainable presence of native fauna. This would include the following:

- ▶ Constructed WLRB NWS as per Spiire revised drainage asset layout
- ▶ Permanent ponds allowing connectivity between ponds, wetland, creek and dry areas.
- ▶ Appropriate native planting
- ▶ Retention of overall floodplain functionality

Further flood modelling is required to inform the frequency of wetting of the mapped wetland.

APPENDIX A: REVISED WETLAND / RETARDATION BASIN ASSETS

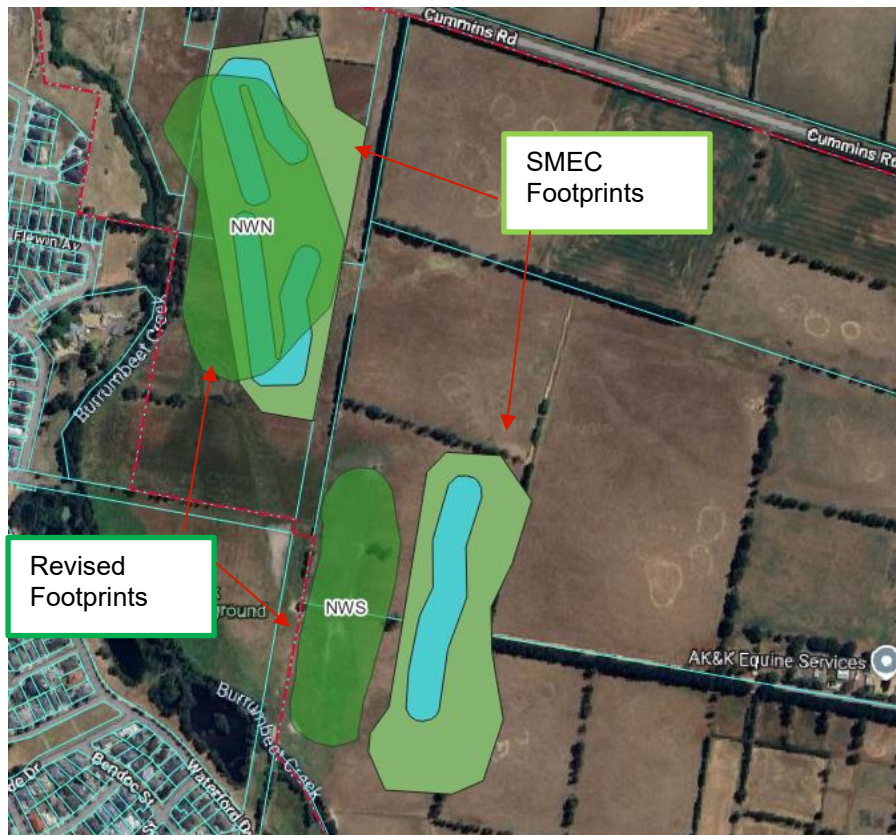


Figure 7: NWN and NWS WLRB Comparison

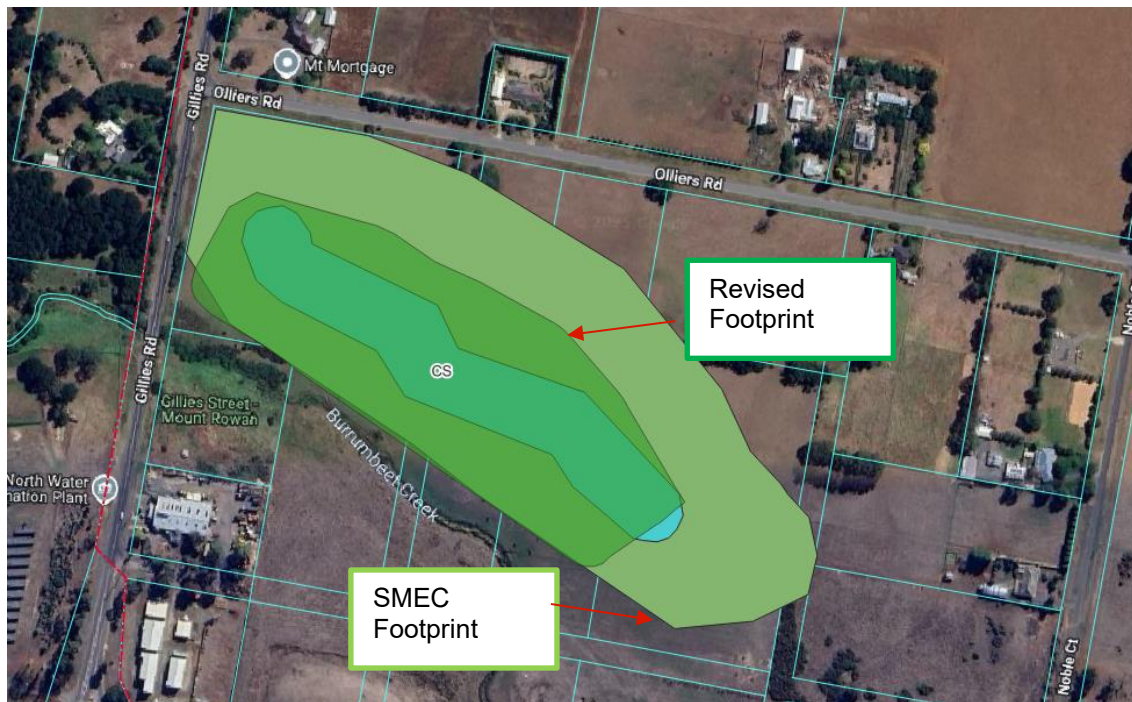


Figure 8: CS WLRB Comparison



Figure 9: SES WLRB Comparison



Figure 10: SEN WLRB Comparison

APPENDIX B: REVIEW OF SMEC REPORT

The Drainage Strategy report prepared by SMEC in July 2025 has been reviewed by Spiire. The review of the Strategy is provided below.

5. SMEC REPORT OVERVIEW

The Drainage Strategy:

- ▶ Summarised work undertaken previously to support progression of the PSP
- ▶ Updated previous background data to include within the strategy such as draft PSP layout
- ▶ Updated stormwater modelling parameters to account for climate change
- ▶ Modified end of line water wetland / retardation basin locations and catchments including location, sizing and layouts
- ▶ Coarsely updated flood modelling of Burrumbeet Creek as an interim step before commissioned flood modelling has been completed (by others)
- ▶ Updated flood impact assessment including proposed diversion of the tributary of Burrumbeet Creek in the eastern extent of the PSP
- ▶ Identified and sized culvert crossings
- ▶ Prescribed drainage / overland flow paths
- ▶ Touched on integrated water management with specific focus on stormwater harvesting and rainwater tanks

5.1 Standards Adopted and Spiire Commentary

The SMEC report has adopted standards nominated both by the VPA and other external authorities.

These include:

- ▶ Innovation Pathway Pilot Project for the VPA's PSP 2.0 Process. The Ballarat North PSP is a chosen VPA pilot project for the implementation of the PSP 2.0 Process and includes a series of key innovations.

While baseline requirements such as appropriate management of flooding is included in the report, sustainability and holistic integrated water management is only really touched on.

- ▶ The EPA Publications - Urban Stormwater Management Guidance (1739.1) (EPA, 2021) provides the guidance on the management of urban stormwater which includes guidelines on volume reduction targets. For Ballarat North PSP, where the average annual rainfall is around 600 mm the target is 29% harvesting and evapotranspiration, and 7% infiltration.

This is only touched on in the report with no detailed investigation into how these targets will be achieved.

- ▶ Integrated Water Management based off the 2023 Arup report for base case and recommended

Preferred portfolio of options	Base case (no IWM approach is taken)	Combined retarding basins and wetland to meet BPEM target and to control post development 1% AEP flows
		Stabilisation of Burrumbeet Creek
	Recommended IWM interventions	Recycled water to homes
		Precinct scale stormwater harvesting for open space irrigation
		Blue-green corridors in PSP
		Provide ecological refuge and resilience for flora and fauna residing within Burrumbeet Creek

Figure 11: Arup Integrated Water Management Framework

There is not a lot of detail in the SMEC Drainage Strategy that hadn't been prepared by Arup previously. Other standards relevant to IWM including the Central Highlands Region Strategic Directions Statement and Wadawurrung Traditional Owners Aboriginal Corporation advice have not been referred to.

- ▶ Retardation – the basis for retardation rates has been predicated on reducing developed peak flow rates to below existing peak flow rates at the sub-catchment boundary at Burrumbeet Creek at Cummins Road (downstream boundary of the PSP).
- ▶ ARR Climate Change: ARR has released a series of climate change scenarios for rainfall intensity. The SMEC Drainage Strategy had adopted the worst case / long term scenario of SSP5 8.5. This has been applied both flood mapping and internal hydrology.

SSP5 8.5 is the directive from Glenelg Hopkins Catchment Management Authority (GHCMA) for flood modelling. An extract from their flood modelling guidelines is provided below.

4. Climate change considerations must be factored into modelling.

Flood risk can no longer be considered as stationary in time. Climate change is increasing the frequency and altering the behaviour of floods. Increasing rainfall intensity and rising sea level are clearly understood as flood risk factors exacerbating flood risk now and are likely to continue worsening flood risk into the future. As a result, the CMA requires a minimum of two increased rainfall intensity scenarios to be modelled as standard. These scenarios should be in line with the worst-case scenario (SSP5 8.5) for both the present-day design flood scenario and design flood scenarios projected for the year 2100. The increased rainfall assumptions - which are tied to Global Warming Level (GWL) – must be consistent with the latest Climate Change assumption recommendations announced by Australian Rainfall and Runoff (ARR). This guidance is ultimately published in ARR Book 1, Chapter 6. However, given the non-stationary nature of flood risk that is now clear, the guidance is subject to review and the availability of guidance that is more recent than that which has been formally published must be checked.

Higher sea level considerations must be considered for coastal locations. Coastal locations may be prone to storm tide (ocean) flooding only, or in the case of estuary floodplains they may be subject to both storm tide or riverine flood events happening at different times or a combination of both types of event happening at the same time. If you are unsure whether a location is considered coastal, please contact Glenelg Hopkins CMA for confirmation.

Figure 12: Extract from GHCMA Flood Modelling Guidelines

The GHCMA guidelines however do not apply to sizing of drainage assets, network modelling, retardation basin sizing, etc. While the Australian Rainfall and Runoff updates refer to climate change scenarios (refer extract below), industry direction has not been prescribed. For other PSPs and large scale development, Victoria's largest drainage authority, Melbourne Water is suggesting that ARR climate change scenarios SSP2-4.5 and SSP3-7.0 are adopted.

Table 1.6.2. Global mean surface temperature projections (ΔT) for four socio-economic pathways relative to 1961-1990. The 90% uncertainty interval is provided in parentheses^a

Climate Scenario	SSP1-2.6	SSP2-4.5	SSP3-7.0	SSP5-8.5
Current and near-term (2021-2040) (°C)	1.2 (0.9-1.5)	1.2 (0.9-1.5)	1.2 (0.9-1.5)	1.3 (1.0-1.6)
Medium-term (2041-2060) (°C)	1.4 (1.0-1.9)	1.7 (1.3-2.2)	1.8 (1.4-2.3)	2.1 (1.6-2.7)
Long-term (2081-2100) (°C)	1.5 (1.0-2.1)	2.4 (1.8-3.2)	3.3 (2.5-4.3)	4.1 (3.0-5.4)

Figure 13: ARR Climate Change Rainfall Intensity Scenarios

The City of Ballarat has not prescribed a climate change scenario to adopt.

We therefore believe that the adoption of the most conservative scenario is not in accordance with other PSPs throughout the state and should be reconsidered. Typically, other authorities are adopting SSP2-4.5 or SSP3-7.0 for modelling of retardation basins

- ▶ Water quality modelling: Melbourne Water MUSIC water quality guidelines have been adopted and this is industry standard. However, City of Ballarat's requirements for water quality infrastructure are not as onerous as Melbourne Water's.

5.2 Flooding

Flood modelling has been updated by SMEC to consider existing and developed conditions with climate change factors applied. As noted earlier in this memo, the modelling is an interim update as the VPA with GHCA have engaged another consultant to undertake extensive modelling of the Burrumbeet Creek.

SMEC utilised the 2013 Water Technology TUFLOW flood model as basis for flood modelling. Model updates included:

- ▶ Climate change updates per GHCA requirements with a 100year time frame ('long term') adopted
- ▶ Incorporation of updated Intensity Frequency Duration (IFD) curves
- ▶ Updating of temporal patterns and initial losses
- ▶ Incorporation of draft PSP layout for developed scenario
- ▶ For the developed scenario, a diversion (constructed waterway channel) of the Burrumbeet Creek tributary immediately west / downstream of the Midlands Highway was simulated. Fill adjacent to the constructed waterway is also included
- ▶ Retardation basins prescribed in the Drainage Strategy have been included in post-development modelling

There are only minor changes to the modelled flood extents and we have no further comment on the modelling at this stage.

5.3 Drainage

5.3.1 Catchments

PSP catchments have been logically separated into four distinct sub-catchments with topography noted to radially fall away from Mount Rowan in the north to Burrumbeet Creek to the west and south east (refer below extract of Figure 3-2). The 'SW' Catchment is not referred to further as this has no impact on drainage of the development side of the PSP.

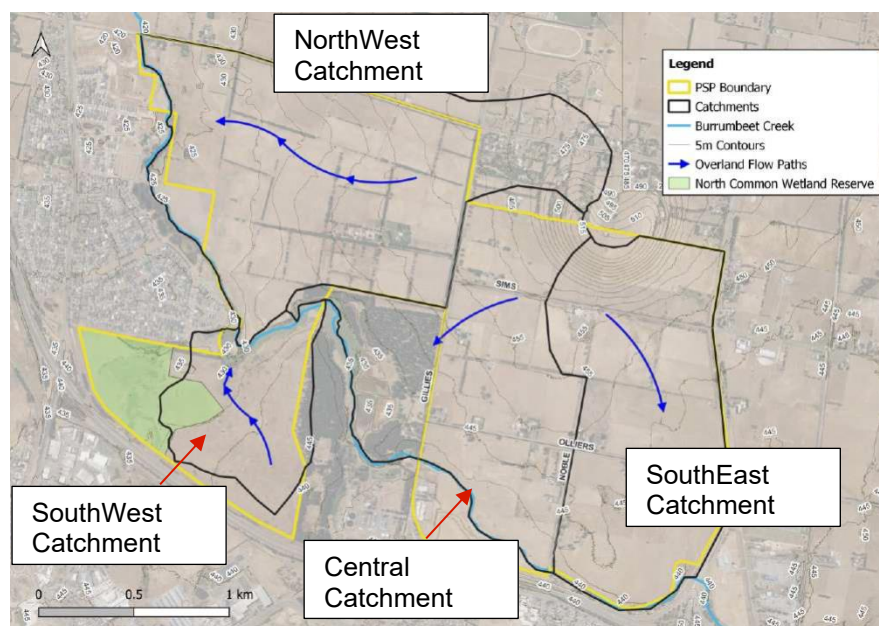


Figure 14: Extract of Figure 3-2 of the Drainage Strategy Showing Catchments of the PSP

There is an external catchment draining through the 'NW' (north west) catchment. This external catchment is located between Gillies Road and Mount Rowan.

Further analysis of this catchment should be made as Gillies Road may form a barrier to overland flow with table drains of Gillies Road taking any overland flow southwards. If the external catchment does drain through the NW catchment, consideration should be made to diverting flow around the NWN wetland / retardation basin.

Within the RORB model the outflows from SEN are directed into the SES wetland / retardation basis. We do not believe this practically mimics the drainage network as SEN should discharge to the Burrumbeet Creek tributary.

5.3.2 Conveyance

5.3.2.1 Flow paths

The active open space area in the NW catchment area is located within the two overland flow paths. See extract below. Flow paths should be ideally directed around the active open space.

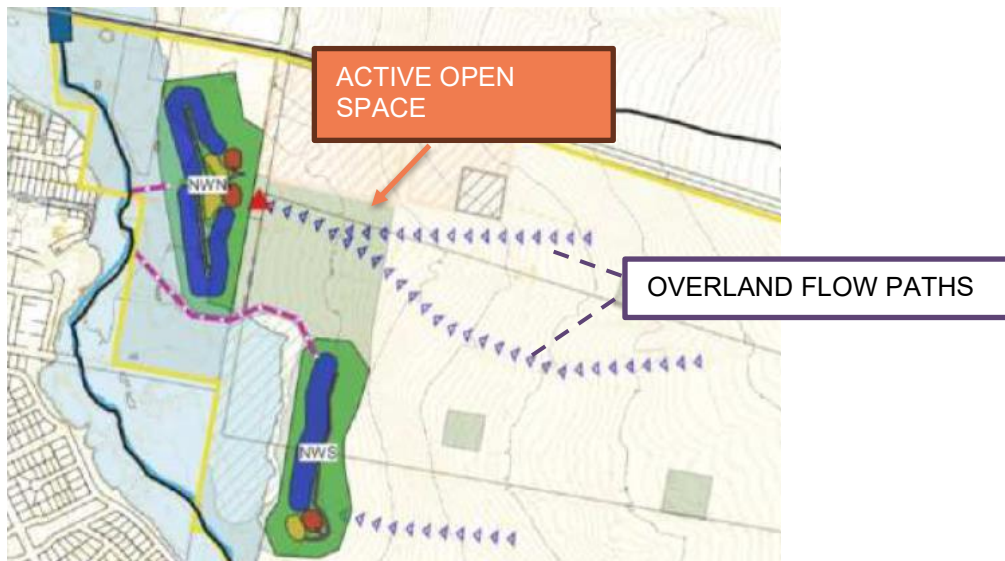
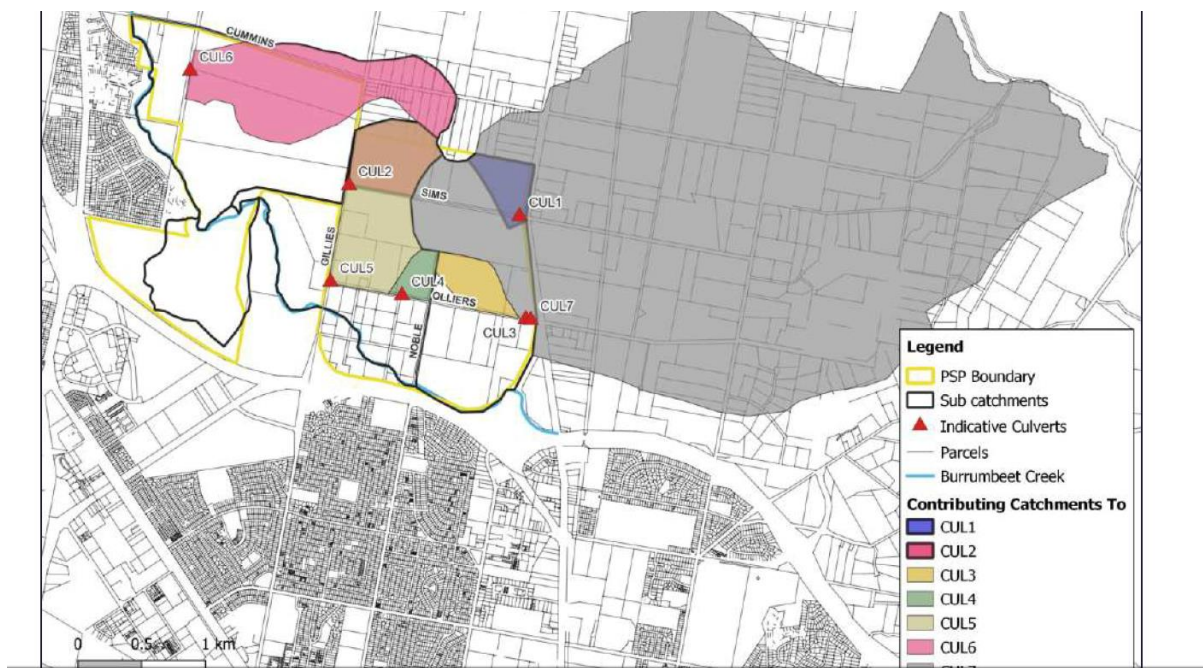


Figure 15: NW Catchment Active Open Space

5.3.2.2 Culverts



We believe that an additional culvert and / or main drain needs to be considered to adequately convey overland flow from the external catchment to the northeast of the NW catchment at Gillies Road.

It is assumed that culverts will need to convey 1% AEP stormwater flow. Road and drainage networks will need to be formed to allow for flow to reach the culverts. It is not clear if the current PSP plan allows for these networks.

Culvert CUL6 is shown immediately west of the active open space and upstream of the NWN wetland / retardation basin. Again, it is not clear that this is a practical location given drainage will need to be diverted around the active open space.

5.3.3 Main Drains

We would like to see clarification if the drain from Sims Road to Olliers Road is included in the Gillies Road road reserve or as a drainage easement in private property as areas encumbered by major drainage lines will need to be included within the PSP. We believe that if the drains can be located within road reserves then this provides a better outcome for the PSP.

5.3.4 Tributary Diversion

The Burrumbeet Creek tributary between the Midland Highway and Burrumbeet Creek confluence is proposed to be diverted and realigned closer to the Midland Highway. Lower lying areas of the tributary floodplain will be filled to provide adequate freeboard to allow for development.

While we agree with this diversion in principle, the Drainage Strategy has not addressed:

- ▶ How this will successfully be implemented including interface with future intersection works with Midland Highway.
- ▶ It is not clear if Olliers Road also needs to be lifted. Filling extents in the report show Olliers Road to be included for filling and it will be important to analyse how this can integrate with future development and the Midland Highway intersection.
- ▶ How costs for the diversion will be assigned. The strategy recommends that the property owner will pay for filling works and this should also be revisited.

5.3.5 Wetlands

Wetlands are co-located within retardation basin footprints. We have reviewed the water quality modelling and note that wetlands are the only prescribed method to treat stormwater runoff. Supplementary methods should be explored further to reduce footprints.

A comparison with raingarden treatment should also be made as these provide a smaller working footprint and may be more resilient to long term dry periods.

We have no comment to make on the modelling as models have not been provided.

5.3.6 Retardation Basins

5.3.6.1 Locations

Locations of retardation basins are generally in accordance with what would be expected with basins located at the bottom of the catchments and close to the Burrumbeet Creek for outfall connections.

Locations are generally outside of the modelled floodplains in an attempt to avoid the basins encumbering floodplain storage. This should be explored further with attempts to further co-located basins within the floodplains to assess if there is any negative impact. It also needs to be ensured that retardation basins have free draining outfalls and this does not appear to have been assessed or at least documented.

Internal drainage will need to be modelled to ensure piped drainage and overland flow can actually get to the basins. We are not seeing any major issues with this based on current level of detail.

The location of the NWN wetland / retardation basin is likely to present some challenges to the upstream catchment given the location of the active open space and location adjacent to the north-south road.

We are also not clear why a 50m buffer between the NWS wetland and herbaceous seasonal wetland is required.

5.3.6.2 Sizing

We have noted earlier the concerns regarding adoption of the SSP5-8.5 scenario.

Further to these concerns, the retardation basins appear to have been significantly oversized even taking into account the SSP5-8.5 scenario. Please refer to extracts below.

The tables for retardation basin sizing show the basins retarding developed flow to significantly below pre-development levels for all scenarios. Inflow and outflow comparisons are made for each retardation basin however it is more relevant to make the comparison on a per sub-catchment basin given this mimics catchments before and after development.

As an example, NWS retards 1% AEP post-development flowrates to 1.0m³/s for whereby the pre-development flowrate is 6.7m³/s under the climate change scenario. It is unclear why this approach has been made as it is a significant over-retardation of pre-development rates.

Table 7-8 Retarding Basin Outcomes (1% AEP)

Asset ID	Existing Condition Peak Flow (m ³ /s)	Inflow (m ³ /s)	Outflow (m ³ /s) (Duration)	Storage (m ³)	Outlet Configuration	Drainage Reserve Area (ha)
SEN	1.8	8.2	0.6 (9hr)	24,200	1 Ø1050mm	5.4
SES	4.7	10.3	1.4 (9hr)	45,400	1 Ø1350mm	7.6
CS	6.8	11.1	1.1 (9hr)	50,000	1 Ø1350mm	11.4
NWN	3.9	8.4	0.4 (9hr)	58,300	1 Ø600mm	9.8
NWS	1.4	6.3	0.6 (9hr)	35,000	1 Ø900mm	7.4

The assessment was repeated for the climate change scenario as shown in **Table 7-9**.

Table 7-9 Climate Change Results (1% AEP)

Asset ID	Existing Conditions Peak Flow (m ³ /s)	Inflow (m ³ /s)	Outflow (m ³ /s) (Duration)	Storage (m ³)
SEN	3.7	16.1	1.1 (4.5hr)	33,700
SES	8.7	21.2	2.4 (9hr)	66,600
CS	10.6	22.9	1.7 (9hr)	70,900
NWN	7.5	17.7	0.5 (9hr)	89,300
NWS	6.7	12.7	1.0 (9hr)	50,200

We would expect spillways to have minimal freeboard (~300mm) to stored 1% AEP levels within retardation basins, particularly given the conservative climate change scenario adopted. However spillways are set well above this freeboard level further increasing basin footprints.

Table A-1-9 Details of the Retarding Basins within the Ballarat north PSP

RB Name	1% AEP Flood Level (m AHD)	Spillway Level (m AHD)	Storage (m ³)
SEN	443.5	444.3	24,200
SES	441.0	441.5	45,400
CS	436.6	437.2	50,000
NWN	423.8	424.5	58,300
NWS	427.5	428.3	35,000

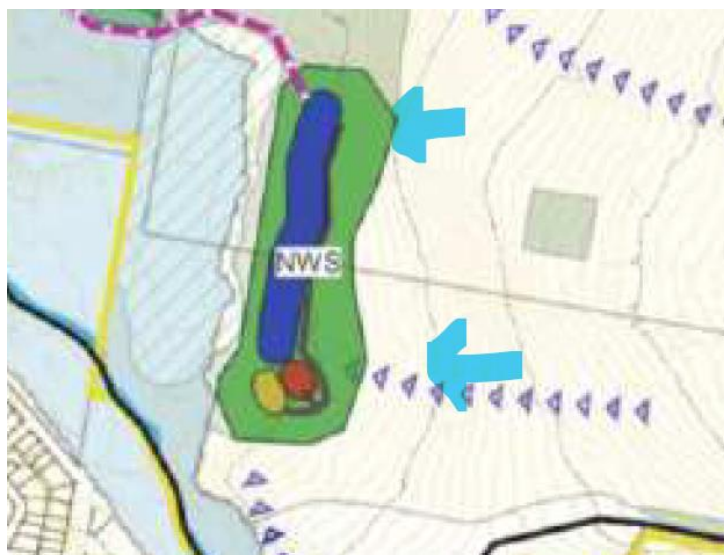
Figure 16: Extract from SMEC Drainage Strategy Showing Retardation Basin Spillway Levels

5.3.6.3 Footprints

It is acknowledged that comprehensive 3d modelling of the retardation basins is to be undertaken at a later date. Footprints of the retardation basins have been plotted.

We query the footprints of the basins for the following reasons:

- ▶ Basin reserves do not seem to align with existing contours. See example below of NWS where there is a significant misalignment (up to 2.5m) with existing contours.
- ▶ Basin reserves as a ratio of area to volume to not appear to optimise the area available. We would expect at least an average retardation depth of 1m but the Drainage Strategy shows a much lower average depth. As an example, NWN has an allocated drainage reserve area of 9.8ha and storage volume of 89,300m³ (average depth of 0.91m)



5.3.6.4 Requirements For Retardation

It is noted that throughout flood modelling of the Burrumbeet Creek and retardation basins that peak flow in the Burrumbeet Creek is actually reduced following implementation of the retardation basins. This suggests that the retardation basins are potentially significantly over-retarding development flow.

It is also noted that the critical storm events and times to peak for each of the retardation basin catchments for both existing and climate change scenarios is less than that of the Burrumbeet Creek.

There are numerous instances where developments with short time of concentrations do not require retardation as the body the developments discharge to are influenced mainly by a significant catchment beyond the development

We query whether full retardation to pre-development flowrates is required for the PSP.

Table 6-1 Existing Condition 10% AEP Results

Flow Estimate Location	Peak Flow (m ³ /s)	Critical Duration (hrs)
SE Interstation	2.5	1.5
C Interstation	3.6	1.5
NW Interstation	1.8	4.5
CN1	25.6	4.5

Table 6-2 Existing Condition 1% AEP Results

Flow Estimate Location	Peak Flow (m ³ /s)	Critical Duration (hrs)
SE Interstation	4.7	2
C Interstation	6.8	1.5
NW Interstation	4.1	4.5
CN1	58.6	9

Figure 17: Existing Conditions Peak Flow Events

Table 6-4 10% AEP Existing Flow Estimates Comparison with the Impact of Climate Change

Flow Estimate Location	Peak Flow (m ³ /s)	Critical Duration (hrs)
SE Interstation	4.6	1.5
C Interstation	6.8	1.5
NW Interstation	3.2	1.5
CN1	40.1	4.5

Table 6-5 1% AEP Existing Flow Estimates Comparison with the Impact of Climate Change

Flow Estimate Location	Peak Flow (m ³ /s)	Critical Duration (hrs)
SE Interstation	9.8	1
C Interstation	14.4	1
NW Interstation	7.8	2
CN1	107.6	4.5

Figure 18: Existing Conditions with Climate Change Factors Peak Flow Events

The above figures are extracts from the Drainage Strategy. As noted, in most instances the critical durations for the PSP catchments differ significantly from the Burrumbeet Creek (CS1) duration.

5.4 Integrated Water Management

An extract from the Stantec Utilities Assessment dated March 2025 is below. We understand that Central Highlands Water is keen to enable a recycled water network / dual reticulation, and this has not been explored further in the Drainage Strategy.

CHW have a Class A recycled water plant at the WRP. CHW is investigating the potential for a range of Integrated Water Management to be implemented within the precinct, including expanding the use of Class A water. CHW has also advised that the other IWM measures being considered include, tanks, passive irrigation of street trees, impervious surfaces and 'leaky wetlands', with the aim of reducing demand which aligns with the objective of the "Ballarat City Integrated Water Management Plan (2018)". The target for new urban development that CHW has set is a water use of 124 l/p/day.

The recycled water network would be similar to the water network and being developer led projects. Refer to Figure 9 below with a proposed recycled water network.

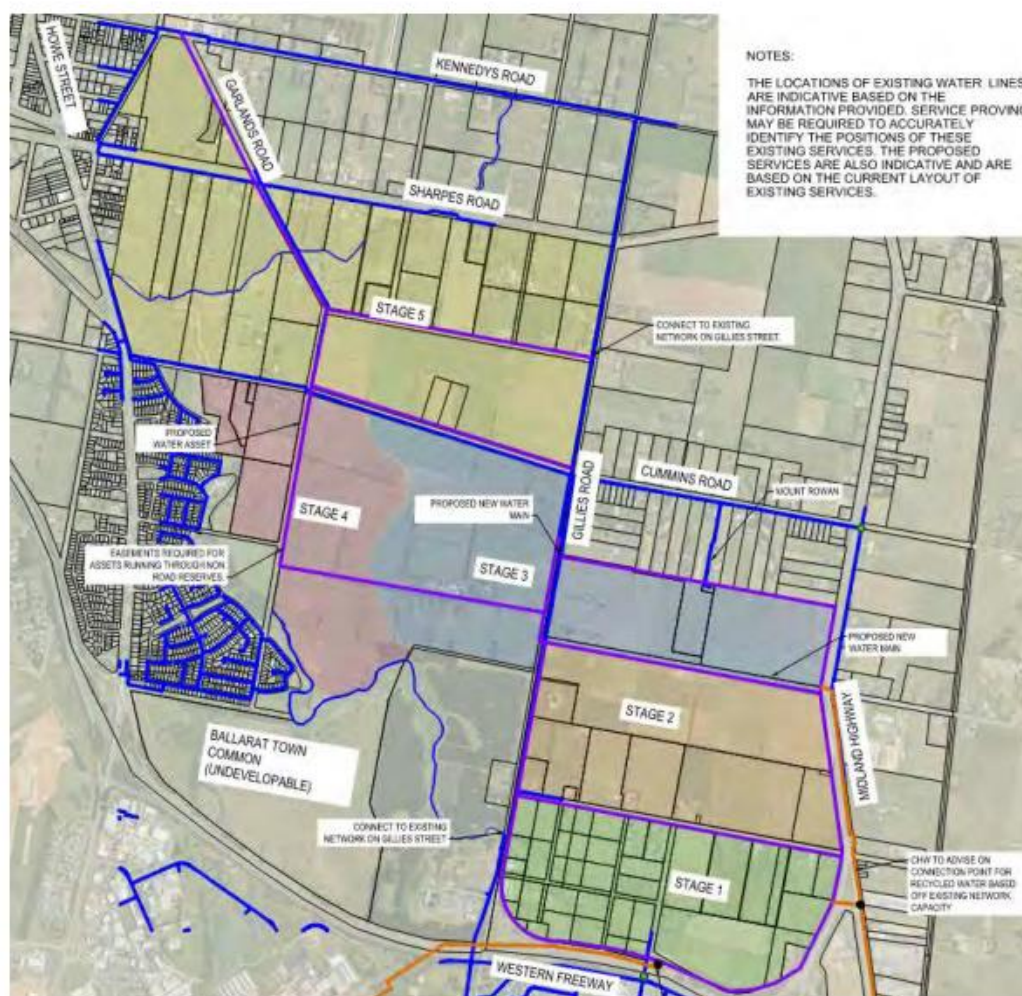


Figure 9 - Proposed Recycled Water Network

Figure 19: Extract from Stantec Utilities Assessment (March 2025)

Leaky wetlands, pervious paving, on-site detention, passive irrigation are other integrated water measures which do not appear to have been addressed in the Drainage Strategy. Environmental flows from stormwater harvesting to CHW reservoir outfalls has also not been explored.

Other options for integrated water measures that could be considered are summarised below.

Option	Targets	Value	Technical	Policy / Regulation	Risk	Recommendation	Discussion
1. Rainwater tanks for toilet flushing, laundry and irrigation							Explore. Potential conflict with dual reticulation.
2. Class A recycled water for toilet flushing, laundry and irrigation							Explore. Potential conflict with rainwater tanks and stormwater harvesting
3. Digital meters, with an app for real time water usage monitoring							Explore. Digital meter are BAU, app might be extra.
4. Smart control systems on rainwater tanks							Explore. Dependant on digital meters and rainwater tanks.
5. Passively irrigated street trees – roof catchment							Explore. Could be enhanced through smart control systems.
6. Passively irrigated street trees – road catchment							Explore.
7. Leaky Wetlands							Explore.
8. Class A recycled water for active and passive open space irrigation							Explore.
9. Stormwater for active and passive open space irrigation							Explore.
10. Kerb-cut outs disconnecting road imperviousness to open space							Explore. Will need council approved designs.
11. Class A recycled water supply for agriculture and horse industry							Explore with CHW and farming community
12. Stormwater harvesting to White Swan Res for Passing Flows/Env/TOs							Explore.

Option	Targets	Value	Technical	Policy / Regulation	Risk	Recommendation	Discussion
13. Biosolids Reuse for agriculture							Explore.

It is unclear what mechanisms could be adopted for supplying the seasonal herbaceous wetland with environmental flow. The NWS wetland / retardation basin essentially cuts off the overland flow catchment to this wetland. Further analysis is required.

5.5 Cultural Heritage

No meaningful reference or collaboration with the WTOAC.

WTOAC has provided an IWM to be applied by stakeholders to all water projects across Wadawurrung Country (refer Attachment).

5.6 Recommendations

Subject	Issue	Action
Retardation Basin Sizing	Adoption of SSP5 8.5 is not appropriate and results in oversized retardation basin assets	Revise retardation basin sizing on industry adopted climate change scenarios
Retardation Basin Sizing	Over-retardation reducing post-development flowrates to rates significantly below pre-development	Analysis to be re-undertaken and basin sizes revised down if level of retardation not required
SEN Retardation Basin Routing	The RORB model shows outflow from RB SEN being directed through to RB SES. This is unlikely to practically occur and these should become independent.	Amend RORB Model to divert SEN outflow away from SES
Road Reserve Sizing	Will road reserves have capacity for main drains	To be assessed
Olliers Road Culvert	Can lifting of Olliers Road and culvert interface with development and Midway	Review intersection requirements

Subject	Issue	Action
	Highway Intersection to allow for diversion of Burrumbeet Creek Tributary?	
Active Open Space Proximity to NWN wetland / retardation basin	Overland flows / major drainage is unlikely to be permitted to pass through active open space and reaching RB.	Review how drainage in this area will be managed
External Catchment to NW	We are not clear if the external catchment to the east of the NW catchment actually contributes to the NW catchment or if it is directed along Gillies Street somewhere else	Review impacts of external catchment on modelling and where this catchment drains to. Consider diverting flow from this catchment around treatment assets.
IWM	Volume reduction targets are not addressed. Infrastructure requirements for these will be included in a DCP with financial impacts to the PSP	To be addressed
IWM	It isn't clear if both stormwater harvesting and recycled water will be implemented.	To be advised
IWM	Consideration of sustainable initiatives is not adequately documented in the Drainage Strategy. How will initiatives be implemented at a site level if no framework is established at a PSP level	Formalise IWM guidance

APPENDIX C WADAWURRUNG TRADITIONAL OWNERS IWM STATEMENT

Dear IWM project leads,

Please see below Wadawurrung Traditional Owners Aboriginal Corporation statement and position on IWM projects and stormwater, recycled water and new water sources.

Wadawurrung people recognize the rivers and waterways on our Country as living entities and we, the Traditional Owners are the voices that speak for their health and well-being.

When we talk about Cultural water and Cultural flows, we are talking about all water that exists on country - because Water is life. Without water, life suffers and ultimately cannot exist.

Cultural flows are Water entitlements that are legally and beneficially owned by volume or by having agency over decisions made, by Indigenous Nations, of a sufficient and adequate quantity and quality to improve spiritual, cultural, environmental, social, and economic conditions of those Nations. Inherently, Cultural flows are for us to Heal Country and to enable us to undertake our obligations to care for country and to bring our lifeblood, water, back to its natural flowing state, so that it can continue to support Country, Culture & Community.

While treated storm water can be used to support environmental flows and systems, treated storm water must not be used as Cultural Water - it should be used as the re-allocation source for systems in place, freeing up licenses and reducing extraction from natural systems, allowing passing flow management and future water entitlements to be handed back to Traditional Owners.

Two years ago, Wadawurrung released "Paleert Tjaara Dja - Lets make country good together", 10-year Healthy Country Plan. Within this we have built our objectives, aspirations, and obligations for water on Wadawurrung Country.

Our role within the Gobata Dja - Caring for Country team as Aboriginal Water Officers, amongst tangible projects, is paramount to educating the importance of waters connection to Country, and why we must change the western understanding of water management.

Our Rivers and our water bodies are now highly modified and under threat from increased and incorrect usage. They are heavily over allocated and are suffering from everlasting extraction for irrigation, industry, and potable assets.

On Wadawurrung Country, there are no remaining water allocations within our systems. So, what does that leave for Wadawurrung People, our access and agency over Cultural Water?

Zero. Zero litres. Here in lies the challenge for Wadawurrung.

The majority of rivers on Wadawurrung Country are extensively licensed and over sold, while only receiving very small environmental entitlements and very limited passing flows, as a direct result of the building of weirs and barriers harvesting the natural flows and selling to industry.

From Wadawurrungs perspective, rather than continually extract and license water from natural flowing systems, new sources of water like storm water and recycled water, through IWM projects can be used as the asset for sale, on selling it to users like irrigators, golf courses and other major industry.

There is great need for investment into new water sources as we face increased pressure from urbanization, population growth and climate change. Our Rivers cannot support any further take.

We need to increase the confidence of users for alternative water sources so that our waterways can begin to heal, and our Mobs can regain agency over what has always been theirs. There was never Aqua Nullius and it was never an asset for sale.

People must understand that water that exists on Wadawurrung Country, must stay on Country as it is part of the holistic wellbeing of that landscape. It supports all aspects of life, from the deep water and the life within, to the banks with the river red gums, to the grass lands and bushland surrounding, the canopies and the birds that live above right through to the sky country that feeds the water back into the landscape.

When you turn your tap on in your kitchens, or you water your vegie gardens, or when the irrigators turn their sprinklers on, I want you to imagine the word, Wadawurrung, pouring from the taps and remember, that water is not just an asset for sale, water has its own spirit and its own connection to Country, it needs to be healthy to be able to support Country. Our water is our lifeblood of Country, without water life within Country cannot be.

Please take this statement as our formal and strategic direction with IWM related projects. If opportunities for water to be returned to Country and Wadawurrung are identified, we ask to be kept informed where needed and will engage further when required.

Please use this as a tool to help us mitigate resourcing requirements as we commit to other initiatives.

Thank you and take care.

APPENDIX D: GLENELG HOPKINS CATCHMENT MANAGEMENT AUTHORITY
CORRESPONDANCE

Kerry Wilkinson

From: Peter Robertson <p.robertson@ghcma.vic.gov.au>
Sent: Thursday, 9 October 2025 7:15 AM
To: Kerry Wilkinson; Sheree Kearns
Cc: Travis Hingston; Natasha Radford; Matt McCartney; Emerald Thompson
Subject: RE: [#306623] Summary of Spiire, APD, and GHCMA discussion regarding Ballarat North

Follow Up Flag: Follow up
Flag Status: Flagged

Thanks Kerry, we are happy with the summery below.

Thanks

Peter Robertson

Waterway Planning Manager | Waterways

03 5571 2526 | 0419 137 024 | 79 French St, Hamilton 3300 | PO Box 502, Hamilton 3300 | www.ghcma.vic.gov.au

I respectfully acknowledge the Traditional Owners of Country throughout Victoria and pay respect to their Elders past, present and future.

Glenelg Hopkins



CMA



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Please consider the environment before printing this email.

OFFICIAL

From: Kerry Wilkinson <Kerry.Wilkinson@spiire.com.au>
Sent: Tuesday, 7 October 2025 1:42 PM
To: Sheree Kearns <s.kearns@ghcma.vic.gov.au>; Peter Robertson <p.robertson@ghcma.vic.gov.au>
Cc: Travis Hingston <travis.hingston@apdprojects.com.au>; Natasha Radford <tash.radford@apdprojects.com.au>; Matt McCartney <Matthew.McCartney@spiire.com.au>; Emerald Thompson <Emerald.Thompson@spiire.com.au>
Subject: Summary of Spiire, APD, and GHCMA discussion regarding Ballarat North

Some people who received this message don't often get email from kerry.wilkinson@spiire.com.au. [Learn why this is important](#)

This email was received from a mailbox outside GHCMA.

Please exercise caution when opening web addresses and attachments, and replying with confidential or sensitive information.

Hi Sheree and Peter

Thankyou very much for taking the time to meet with both Travis and I yesterday to discuss the Ballarat North PSP

drainage and hydrology matters. I've prepared a quick summary below. Can you please confirm if this is your position or advise otherwise?

- No current flood model updates have been commissioned by the VPA for Burrumbeet Creek. The City of Ballarat is currently tendering for full flood modelling of the Creek independent of the PSP process. The latest endorsed modelling is therefore the 2013 Watertech model. SMEC has provided updated modelling based on the 2013 model. GHCMA is satisfied with the reporting but has not reviewed any models prepared by SMEC
- GHCMA's position is that no development, including drainage infrastructure wetlands/basins is to be located within the 1% AEP floodplain for the SSP8.5 2100 event
- No instruction / guidance has been prescribed by the GHCMA to the VPA requesting assessment of the 10% AEP events
- Outfalls to the Creek from the PSP are to maintain waterway health with target velocities under 1.5m/s and suitable erosion health
- GHCMA has not prescribed basin sizing requirements – this is a Council matter with Council being the stormwater drainage authority.

Regards

Kerry Wilkinson

Business Manager - Ballarat
Civil / Water Engineering



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 Call me on Teams

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8 October 2025

[REDACTED]
APD Projects
Suite 2, Level 8
412 St Kilda Road,
Melbourne Vic 3004

Dear [REDACTED]

171 Gillies Road Miners Rest – advice regarding mapped wetland

Our ref: Matter 41822

Biosis was commissioned by APD Projects to provide advice regarding the status of a potential wetland located within 171 Gillies St Miners Rest (the subject site), in an area considered for residential development as part of the Ballarat Northern Growth Area. The paddocks the mapped wetland are located in are used for grazing by horses, and have been subject to pasture improvement activities, including cultivation, re-seeding of pasture species and likely application of fertiliser.

We understand the wetland was subsequently identified by WSP in the biodiversity report produced for the Ballarat North Precinct Structure Plan (WSP 2024).

The area is identified as a Department of Environment, Energy and Climate Action (DEECA) mapped wetland, and WSP have indicated a section of the wetland corresponds with the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) definition of the threatened ecological community – Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (SHW). Biosis undertook a flora and fauna assessment of the subject site for APD in 2022 and confirmed that the floristic composition was not consistent with this threatened community (Biosis 2022). We understand APD Projects are seeking clarity on the status of the wetland and implications that the presence of the threatened ecological community may have to the development of the area.

The DEECA mapped wetland occupies an area of approximately 4.64 hectares within the subject site. The wetland ID is 37155, and it is identified as 'unknown type' with a freshwater, periodically inundated (episodic) water regime. In their 2024 report, WSP identified the majority of this wetland as meeting the definition of the SHW community, and assigned the area to the Plains Grassy Wetland EVC (EVC 125).

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*Biosis acknowledges the Aboriginal and Torres Strait Islander peoples as Traditional Custodians of the land on which we live and work.
We pay our respects to the Traditional Custodians and Elders past and present and honour their connection to Country and ongoing contribution to society.*

Previous studies and examination of aerial imagery

Previous ecological surveys of the subject site were as follows:

- The subject site was assessed by Biosis in 2022 (March) (Biosis 2022).
- The subject site was assessed by WSP (August 2023 – January 2024) (WSP 2024).

Review of WSP report

The WSP report identifies two areas within the mapped wetland as EVC 125 Plains Grassy Wetland:

- Patch 6 – 1.570 hectares in area, with a vegetation quality score (site score) of 28/100.
- Patch 7 – 0.573 hectares in area, with a vegetation quality score (site score) of 28/100.

The exact timing of the mapping and vegetation quality assessment of these wetlands is not provided, however the surveys were completed between September 2023 and December 2023. Table D.2 of the WSP report indicates that these patches achieved an understorey score of 15, indicating that 50-90% of expected understorey life forms were present, and less than half of those present were 'modified'.

The WSP report provides a general description of plains grassy wetland across the precinct, but does not provide specific details or photographs of the wetlands within patches 6 and 7.

The general description provided states:

*EVC 125 occurs throughout agricultural land within the study area across seasonally wet depressions. Higher quality patches of EVC 125 include high coverage of White Purslane Montia australasica, Amphibious Water-milfoil Myriophyllum simulans, Common Swamp Wallaby-grass Amphibromus nervosus, River Buttercup Ranunculus inundatus, Red Pondweed Potamogeton ochreatus, Common Spike-sedge Eleocharis acuta, Common Nardoo Marsilea drummondii, and Mud Dock Rumex bidens. Weeds present include Wimmera Rye-grass *Lolium rigidum, Buck's-horn Plantain *Plantago coronopus, and Clustered Dock *Rumex conglomeratus.*

The WSP report provides a copy of the Key Diagnostic Characteristics and Condition Thresholds for the SHWTLP community, but does not provide details of how any of the wetlands within the study area meet the thresholds, other than to state that some patches did not meet the size and situation thresholds. It appears that WSP assigned all patches of Plains Grassy Wetland EVC to the SHWTLP community, provided the size and situation thresholds were satisfied. In total, seven patches were identified as SHWTLP across the WSP study area, comprising an area of 15.89 hectares, most of which (12.1 hectares) is located within an existing reserve (the Miners Rest Wetland Reserve).

The key condition threshold of relevance relates to the cover of native wetland species characteristic of the community:

- Is 50% or more of the total cover of plants in the ground layer of the wetland dominated by native species characteristic of the Seasonal Herbaceous Wetlands ecological community.

The WSP report does not include this information for the seven wetlands identified as SHWTLP.

Evidence of inundation within the DEECA mapped wetland area

Past aerial imagery available to be viewed within Google Earth Pro were examined, to inform our understanding of the regularity of inundation within the DEECA mapped wetland. These images, covering the area surrounding the wetland, are reproduced in Appendix 2, and summarised in Table 1.

Table 1 Summary of available aerial imagery

Image date	Season	Signs of inundation	Rainfall in the three months prior to the image date (mm)
15 February 2024	Late summer	NW Dam, NE depression	188
15 September 2023	Spring	NW Dam, NE depression	167
25 April 2023	Autumn	NW Dam, NE depression	146
17 December 2021	Summer	NW Dam, NE depression	211
19 February 2021	Late summer	NW Dam, NE depression	223
22 February 2019	Late summer	NW Dam	120
28 January 2019	Summer	NW Dam	150
24 January 2018	Summer	NW Dam	177
4 January 2017	Summer	NW Dam, NE depression	164
22 December 2016	Summer	NW Dam, NE depression	164
26 September 2015	Spring	NW Dam, NE depression	143
21 February 2015	Late summer	NW Dam, NE depression	141
21 January 2015	Summer	NW Dam, NE depression	130
1 November 2013	Late spring	NW Dam, NE depression	205
14 January 2013	Summer	NW Dam	97
10 January 2013	Summer	NW Dam	97
7 March 2012	Early autumn	NW Dam	135
7 November 2011	Late spring	NW Dam, NE depression. Much of wetland area appears "damp".	167
10 November 2004	Late spring	NW Dam, NE depression, southern section. Much of wetland area appears "damp".	184

Unfortunately, most of the imagery is from summer and autumn, which is when seasonal wetlands in the local area are least likely to be inundated.

The summer and autumn images generally show that water is limited to the constructed dam (Photo 7) in the north-west of the mapped wetland area. Several of these images (15 February 2024, 25 April 2023, 17 December 2021, 19 February 2021, 4 January 2017, 22 December 2016) also show a small area of inundation in the north-east of the wetland, corresponding with the depression shown in Photo 1. The lack of water in the broader wetland area indicates the installed drainage is effectively reducing the inundation period of the wetland, as intended.

A substantial area of inundation is shown in the oldest image available – 10 November 2004. Other imagery from spring generally shows a similar pattern to the summer imagery, with water mostly limited to the constructed dam (Photo 7) and the small depression (Photo 1). The image from 15 September 2023, which coincides with the WSP assessment, shows slightly more water around the constructed dam and within the depression to the south.

Examination of the imagery suggests that periods of inundation within the broader wetland area are relatively rare and short lived, potentially due to the network of drains through the area. When not inundated, the wetland is managed in the same manner as the surrounding paddock, subject to cultivation and grazing.

Site assessment and current condition – November 2024 to February 2025

A site assessment, specifically examining the wetland area, was undertaken by Senior Associate Ecologist Matthew Gibson on 21 November 2024 and 11 February 2025. This involved walking through the relevant paddocks, recording species present and taking photographs of current conditions (Appendix 1).

Current conditions – November 2024 to February 2025

During the November 2024 site assessment, the area was found to be cultivated and occupied by horses as part of the ongoing use of the land. A very small uncultivated area was observed in the northern paddock, occupying an area of approximately 0.02 hectares (approximate diameter of 15 metres). No native aquatic or semi-aquatic species were observed in this low-lying area.

Throughout the remainder of the mapped wetland area, native species were limited to scattered Rushes *Juncus* spp. (Photo 6), and other species that can tolerate long dry periods, such as Swamp Isotome *Isotoma fluviatilis* subsp. *australis*.

Photos 2 and 3 show the complete extent of cultivation with the area, and the drains that have been constructed to reduce the duration of standing water.

Limitations

- The assessment was undertaken during a dry period.

Implications

DEECA Mapped Wetland

Development applications within Victoria must consider Planning Scheme Clause 52.17 and Victoria's *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017) (the Guidelines). Under the Guidelines, wetlands included within the Current Wetlands Map are considered native patch vegetation and disturbance or development of these areas contributes to the extent of vegetation impact and offset requirements. Wetlands can be excluded from the mapping, or reduced in extent, if it can be demonstrated that the area (or portion of the area) is hydrologically unable to support wetland vegetation due to structural modifications such as earthworks or extensive drainage. The mapped wetland within the subject site appears to be considerably larger than the area ever likely to support wetland vegetation, and there is a network of maintained artificial drains in place to reduce the extent and depth of surface water. It is possible, however, that a portion of the area could be inundated for a period of time following wet conditions, and could develop some wetland values, such as emergent native semi-aquatic grasses and sedges. An application to reduce the size of the wetland within the Current Wetlands Map layer is warranted. This would require written approval from the Secretary of DEECA.

Plains Grassy Wetland EVC

No sign of native species typical of this Ecological Vegetation Class were observed within the area, and it is considered unlikely, given the ongoing cultivation and grazing of the site, that these species would be present. However, as noted above, there may be recolonisation of these species following long periods of inundation.

Seasonal Herbaceous Wetlands Community

The Key Diagnostic Characteristics and Condition Thresholds section of the SHW listing advice states that the '*National listing focuses legal protection on the remaining occurrences of the ecological community that are functional, relatively natural and in relatively good condition*' (TSSC 2012).

The national ecological community is limited to wetlands that meet the description, key diagnostic characteristics PLUS the condition thresholds (TSSC 2012). These are assessed in Table 2.

Table 2 SHW key diagnostic characteristics and condition thresholds

Item	Requirement (TSSC 2012)	Site conditions November 2024 to February 2025
Key Diagnostic Characteristics		
Landscape	- Limited to the temperate zone of mainland south-eastern Australia. The ecological community occurs in south-east SA, Victoria and southern NSW. - On flat plains grading into slopes, below 500 m asl. - Associated soils are generally fertile but poorly draining clays derived from a range of geologies. - Typically in rainfall zones with a Winter seasonal rainfall pattern, extending into a Uniform seasonal rainfall pattern at the edge of its range. The mean annual rainfall is usually 400 to 800 mm/year but can be lower at the northern edge of its range.	The site is within the appropriate landscape, topographic and climatic zone.
Hydrology	- On isolated drainage lines or depressions which are seasonally inundated (typically during winter-spring) and subsequently dry (typically by late summer). - Rainfall is the main water source. These wetlands are not dependent on overbank flooding from riverine systems. - Salinity of the water is fresh to slightly brackish. Salinity mostly lies within the range, 0 to 1000 mg/L but can be up to 3000 mg/L, typically exhibiting a progressive increase in salinity as wetlands dry.	- Drainage lines and minor depressions present. - Any water, if present, is likely due to rainfall and therefore relatively fresh.
Biota	- Trees and shrubs are sparse to absent. When present, they mostly occur as fringing or scattered individuals. The cover of woody species accounts for no more than 10% projective foliage cover across the wetland. - The vegetative cover of the ecological community is dominated by a ground layer of native wetland graminoids and/or native wetland forbs.	No sign of any of the specifically mentioned native wetland graminoids or forbs during the November 2024 assessment (annual rainfall in Ballarat was the lowest in 2024 compared to the preceding ten years, indicating sub-optimal survey conditions).

Item	Requirement (TSSC 2012)	Site conditions November 2024 to February 2025
	- A range of graminoids is often present and typically includes one or more of the following taxa: <i>Amphibromus</i> spp., <i>Carex tereticaulis</i>, <i>Deyeuxia</i> spp., <i>Glyceria</i> spp., <i>Lachnagrostis</i> spp., <i>Poa labillardieri</i>, and <i>Rytidosperma duttonianum</i>. - At least one native wetland forb species must be present (preferably more) after the ecological community is inundated. The suite of forbs that may occur within the ecological community's range is variable and potentially large. - Freshwater algae often are present when the wetland is, or recently has been, wet. The most evident representatives are green algae from the groups Charales (stoneworts) and Zygnematales (pond scums).	
Condition Thresholds		
Wet conditions	Is 50% or more of the total cover of plants in the ground layer of the wetland dominated by native species characteristic of the Seasonal Herbaceous Wetlands ecological community.	Unable to assess wetland plant cover as the assessment was undertaken in dry conditions.
Dry conditions	Involves investigation of the ability of the landscape to support a wetland, examination of any past studies that have documented wetland species present (known or inferred history) and nature of the surrounding land.	- The WSP report does not provide a specific description of the subject wetland, but rather provides a general description of wetlands within the entire precinct area. - The wetland, if present, is not surrounded by native vegetation, and forms part of an equine facility which is regularly cropped and grazed. - Cropping of the surrounding area indicates the ecological community is unlikely to be present, as the cropping has been long-term and ongoing.
Minimum Wetland Size	Isolated wetlands must be greater than 0.5 hectares in area.	It is considered highly unlikely that a wetland of greater than 0.5 hectares would develop following wet conditions, given the long term use of the land and ongoing cropping disturbance.

Site assessment and current condition: August and September 2025

Additional surveys were conducted by Biosis in August and October 2025, to examine the mapped wetland area following winter and early spring rainfall.

The objectives of the additional surveys were to:

- Examine the level of inundation of within the mapped wetland area, and relate this to winter rainfall.
- Map areas of inundation.
- Survey the area during wet conditions to assess the presence of native aquatic and semi-aquatic species.
- Provide an updated assessment, following the wet season survey, of the likelihood of presence and the extent of the SHW threatened ecological community.

Inspections were conducted on five occasions, over approximately a 10 week period:

- 1 August 2025
- 13 August 2025
- 27 August 2025
- 5 September 2025
- 7 October 2025

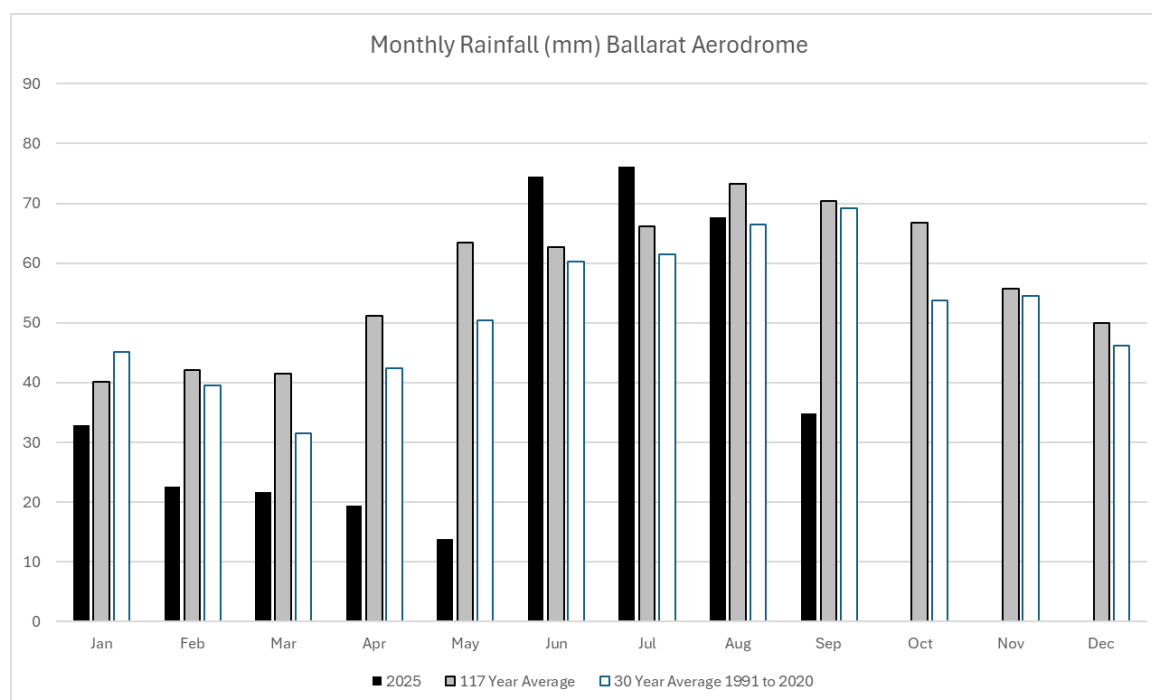
Within the northern and southern paddocks, the extent of surface water was mapped on each occasion, by walking around the inundated area using a GPS device. Within the western paddock, the extent of surface water was only mapped during the inspection on 5 September 2025. These inundated areas are shown on Figure 1, and photographs are provided in Photos 9-17. During the final inspection, undertaken on 7 October, the extent of water had receded in most areas, to levels similar to those mapped at the during the first (1 August 2025) assessment. The extent of water mapped during the final assessment is not shown on Figure 1.

Recent rainfall

Long term monthly average rainfall and year-to-date average monthly rainfall for 2025 is shown in Graph 1, recorded at the Ballarat Aerodrome monitoring station, and accessed via the Australian Government Bureau of Meteorology website (bom.gov.au). Two measures of average rainfall are shown, one using 117 years of data (1908-2025) and one using 30 years (1991-2020). Monthly averages have been lower within the recent 30 year period than the 117 year period, with the exception of January, which has received slightly higher average rainfall in the more recent period.

The rainfall data indicate below average rainfall for the first five months of 2025 (January to May), with a particularly dry autumn, where less than 50% of the long term-average rainfall was received. Early winter rainfall (June and July) was slightly above the long-term average, and August was slightly below. The second half of 2024 (August-December, not shown), also received below average rainfall. The seasonality of the survey, and the presence of surface water suggests the timing of the survey is appropriate for “wet conditions”, however the last few months are, in general, drier than the long-term average, and much

wetter conditions are possible in high rainfall years. September 2025 was particularly dry, receiving approximately half of the average annual rainfall for the month.



Graph 1. Average monthly rainfall for 2025 compared with long-term average monthly rainfall.

Observations of inundated areas

Surface water was observed to be accumulating in the following areas:

- Within the northern paddock, a low point was observed to support surface water during all site visits, with a maximum area recorded of approximately 0.07 hectares (approximately 40 x 20 m). Photo 1 (dry conditions) and Photo 9 (wet conditions).
- Several of the linear drains in the southern portion of the northern paddock were observed to hold surface water. Photo 3 (dry conditions) and Photos 10-11 (wet conditions).
- The drain in the northern portion of the southern paddock was observed to hold water, and this water also extended into surrounding low-lying areas, with the greatest extent of surface water recorded during the last survey, as shown on Figure 1. Photo 4-5 (dry conditions), and Photo 12-13 (wet conditions).
- The low-lying area in the south-western corner of the southern paddock, close to the adjacent Burrumbeet Creek. Approximate area 0.12 hectares, 50x25 m. Photo 14 (wet conditions).
- The inundated area in the eastern portion of the southern paddock, including the east-west drain. Approximate area 0.11 hectares. Photo 15 (wet conditions).
- The inundated area within the western paddock, approximately 0.30 hectares. Photo 14 (wet conditions).

Flora observations

All areas of the paddocks assessed, with the exception of the constructed drains, are subject regular cultivation and grazing, as is evident from the site photographs. As a result, no perennial terrestrial or emergent vegetation is present. Under periods of inundation, there is potential for aquatic and semi-aquatic

species to either recolonise, or to spread from underground material, or plants that may be protected from regular cultivation within the constructed drains.

The vegetation within the inundated areas was dominated by the pasture grasses and other introduced species that were present before inundation. In situations where the water was deeper, or had been inundated for longer, including the drains, there is some development of aquatic vegetation, including both native and introduced aquatic and semi-aquatic species. Many species could not be identified confidently to species level as key diagnostic material was not available, including emergent leaves or flowering and fruiting structures.

Species recorded include:

- Native species:
 - Water Milfoil *Myriophyllum* sp. (Photo 15).
 - Lesser Loosestrife *Lythrum hyssopifolia* (uncertain origin, possibly introduced or cosmopolitan).
 - Swamp Crassula *Crassula helmsii*
 - Mud Dock *Rumex bidens*
 - White-purslane *Montia australasica*
 - Austral Mudwort *Limosella australis*
 - Swamp Isotome *Isotoma fluviatilis*
 - Buttercup *Ranunculus* spp.
- Introduced species:
 - Common Water-starwort *Callitriche stagnalis* (Photo 17).

Non-aquatic species within the paddocks outside of the inundated areas were not recorded, as these areas are dominated by introduced species, and have been documented in the previous studies by Biosis and WSP.

Very little sign of emergent graminoid species (grasses and sedges) were observed, although there were some grasses within the inundated area in the south-western corner that could be a native *Amphibromus* species, such as *Amphibromus nervosus*, which was recorded by WSP. The maximum extent of this section of wetland is approximately 0.15 hectares.

Condition thresholds

Table 3 provides a reassessment of the key SHW condition thresholds, following the wet season survey.

Table 3 SHW condition thresholds (wet conditions)

Item	Requirement (TSSC 2012)	Site conditions August and September 2025
Condition Thresholds		
Wet conditions	• Is 50% or more of the total cover of plants in the ground layer of the wetland	• The Conservation Advice (TSSC 2012) specifies the community is supports a range of graminoids, including one or more of the following taxa: <i>Amphibromus</i> pp. <i>Carex</i>

Item	Requirement (TSSC 2012)	Site conditions August and September 2025
	dominated by native species characteristic of the Seasonal Herbaceous Wetlands ecological community.	<i>tereticaulis</i>, <i>Deyeuxia</i> spp., <i>Glyceria</i> spp. <i>Lachnagrostis</i> spp., <i>Poa labillardieri</i> and <i>Rytidosperma duttonianum</i>. - Large perennial tussock species, such as <i>Poa labillardieri</i> and <i>Carex tereticaulis</i> are clearly not present, due to the disturbance history (cultivation) of the site. It is also highly unlikely that other perennial species, including <i>Rytidosperma duttonianum</i>, have survived the cultivation regime. As of the September surveys there was no clear sign of <i>Deyeuxia</i> or <i>Glyceria</i> species, although it is possible these may persist in the drains that are protected from cultivation, and may hold water for longer periods. Some young grasses that may be <i>Amphibromus nervosus</i> were evident in the wetland in the south-west corner of the site. - No areas were observed where these characteristic wetland species comprised more than 50% of the plant cover, as the plant cover is dominated by introduced grasses.
Minimum Wetland Size	Isolated wetlands must be greater than 0.5 hectares in area.	None of the inundated areas were larger than 0.5 hectares during the September survey period.

Recommendations

Due to the history of regular cultivation, equine land use and construction of drains within the broader paddocks, the low lying areas within the DEECA mapped wetland have been depleted of any perennial native plants. Development of seasonal wetland values is only likely following unusually wet periods, and the species present will be limited to relatively common and easily dispersed species. The wetland area is highly unlikely to support any threatened wetland species, due to the disturbance history and the limited size of each isolated wetland observed during the surveys undertaken over the course of 2022 through to 2025.

There are opportunities to improve the ecological value of the mapped wetland, while using the area to contribute to flood mitigation requirements within the precinct. Potential enhancements include construction of a more structurally and floristically complex wetland area, including some flat areas where seasonal wetland values can develop in wet conditions, as well as deeper areas that may support permanent water and facilitate the establishment of perennial emergent species, such as tussock grasses and emergent sedges and rushes. Such an enhanced area would contribute to the other wetland values present along the Burrumbeet Creek, including the Macarthur Park Wetlands.

Summary

In summary, the study area is in the appropriate landscape for the SHW ecological community to occur and appears to meet the hydrological requirements. However, due to the extensive and ongoing cropping, the area does not support any perennial native species, and the potential for any development of ephemeral wetland species is limited to small areas (primarily drains) and long periods of inundation following unusually wet seasons. These areas do not meet the minimum size thresholds for the SHW community.

The wetland does not appear to regularly support significant ecological values that would lead to this area being considered a high priority area for reservation and protection. Based on recent rainfall patterns and the current hydrological conditions (including extensive drainage), the extent of DEECA mapped wetland is incorrect and should be reviewed. Development of the area for stormwater retention could lead to a more structurally complex and diverse wetland of higher ecological value.

Please contact me if you have any enquiries.

Yours sincerely



Matthew Gibson
Senior Associate Ecologist

References

Biosis 2022. 171 Gillies Road, Miners Rest: Flora and fauna assessment. Report for APD Projects, Author: E. Baldwin. Biosis Pty Ltd, Ballarat. Project no. 37117.

DELWP 2017. Guidelines for the removal, destruction or lopping of native vegetation. Department of Environment, Land, Water and Planning.

TSSC 2012. Advice to the Minister for Sustainability, Environment, Water Population and Communities from the Threatened Species Scientific Committee (the Committee) on an amendment to the list of threatened ecological communities under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Seasonal Herbaceous Wetlands (Freshwater) of Temperate Lowland Plains. Threatened Species Scientific Committee. Australian Government Department of the Environment and Energy, Canberra.

WSP 2024. Ballarat North Precinct Structure Plan Biodiversity Assessment Report. Report for Victorian Planning Authority. WSP, Level 11, 567 Collins St, Melbourne, VIC.

Appendix 1 – Photos of the study area

November 2024 to February 2025



Photo 1. Low point in the DEECA mapped wetland, showing a small uncultivated area (approximate area 0.02 ha).



Photo 2. Showing cultivated paddocks.



Photo 3. Drain constructed in cultivated paddock through the mapped wetland.



Photo 4. Southern paddock, showing exotic grassland and lower area grazed and cropped.



Photo 5. Southern paddock, showing constructed drain and signs of cropping.



Photo 6. Western paddock. Showing scattered rushes *Juncus* spp.



Photo 7. Constructed wetland (dam) in the western paddock.



Photo 8. Western paddock. Showing drainage and scattered rushes *Juncus* spp.

August to October 2025

All photos provided are from 5th September 2025, as this was the last survey period and the period of maximum inundation observed during the August, September and October site visits.



Photo 9. Inundated low point in the northern paddock.



Photo 10. Inundated drains in northern paddock, looking south.



Photo 11. Inundated drain in northern paddock, looking north.



Photo 12. Drain in northern paddock, looking north.



Photo 13. Inundated drain and surrounding areas in the southern paddock, looking north



Photo 14. Inundated area in the south-west corner of southern paddock, near Burrumbeet Creek



Photo 14. Inundated area in western paddock, looking north.



Photo 15. Inundated area in eastern section of southern paddock, looking south.



Photo 15. Emergence of aquatic native species in one of the inundated drains, including Water Milfoil *Myriophyllum* spp.



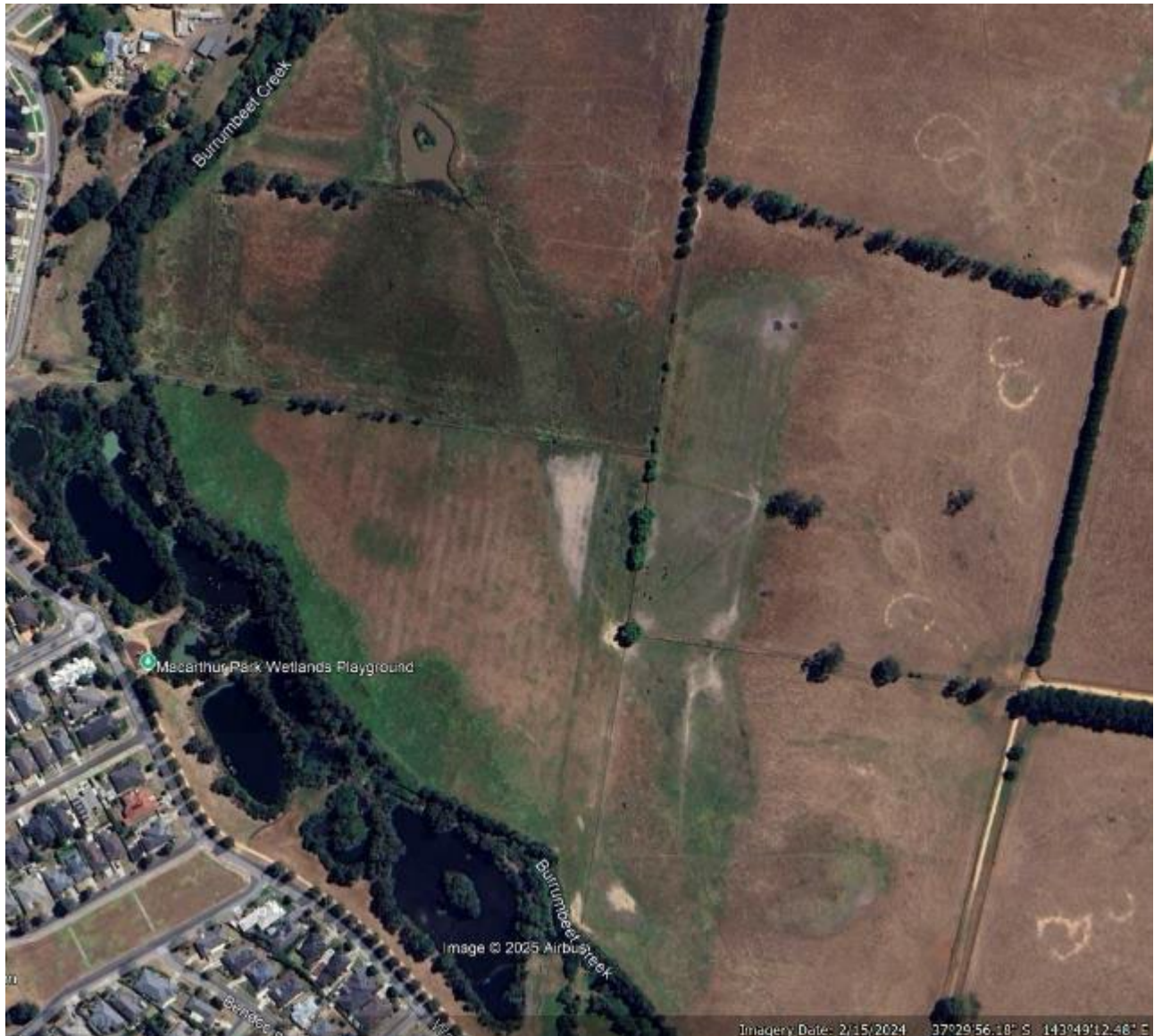
Photo 16. Emergence of semi-aquatic native species including Swamp Isotome *Isotoma fluviatilis*.



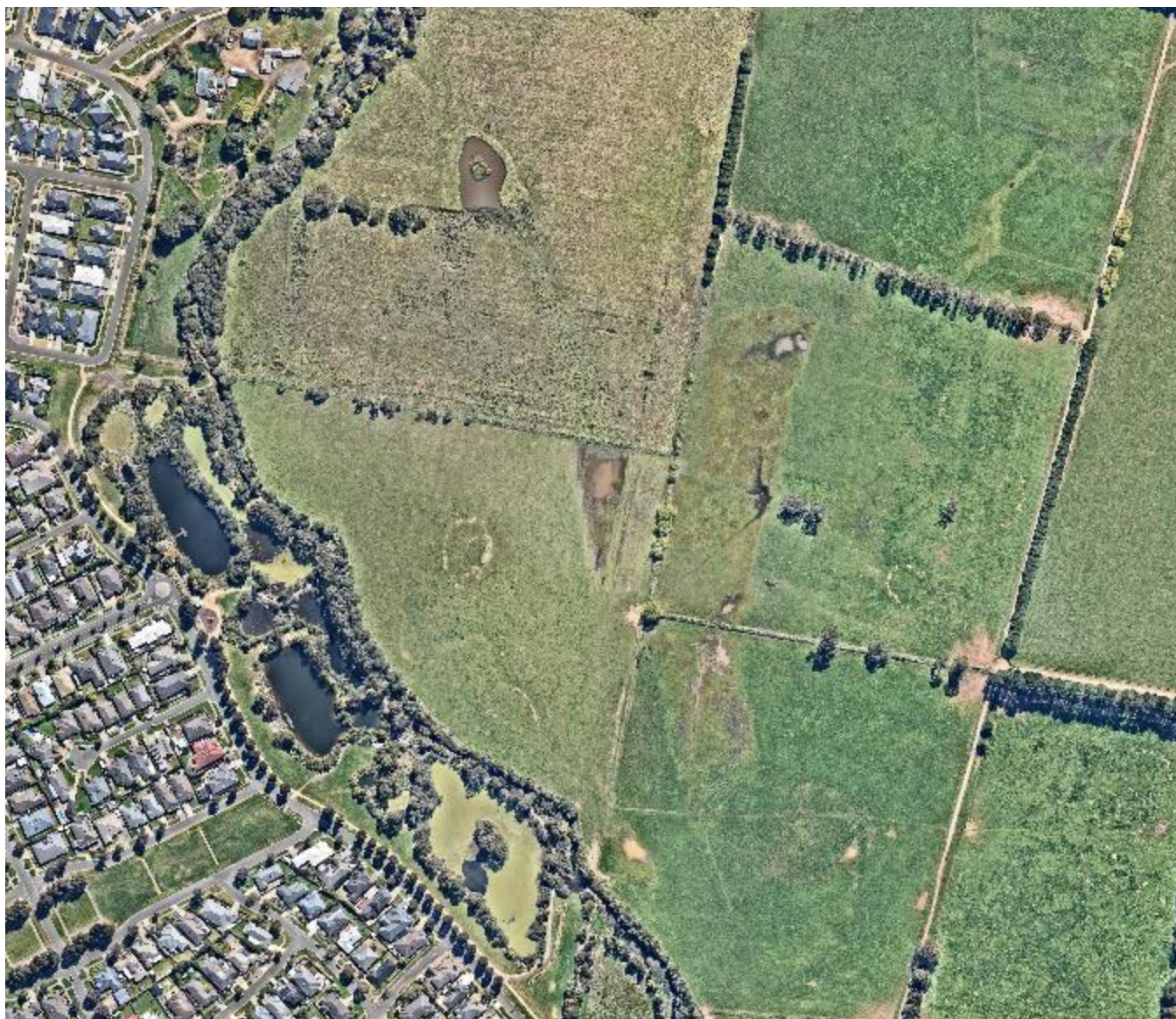
Photo 17. Emergence of introduced aquatic species including Common Water-starwort *Callitriche stagnalis*.

Appendix 2 – Historical aerial photographs of the study area

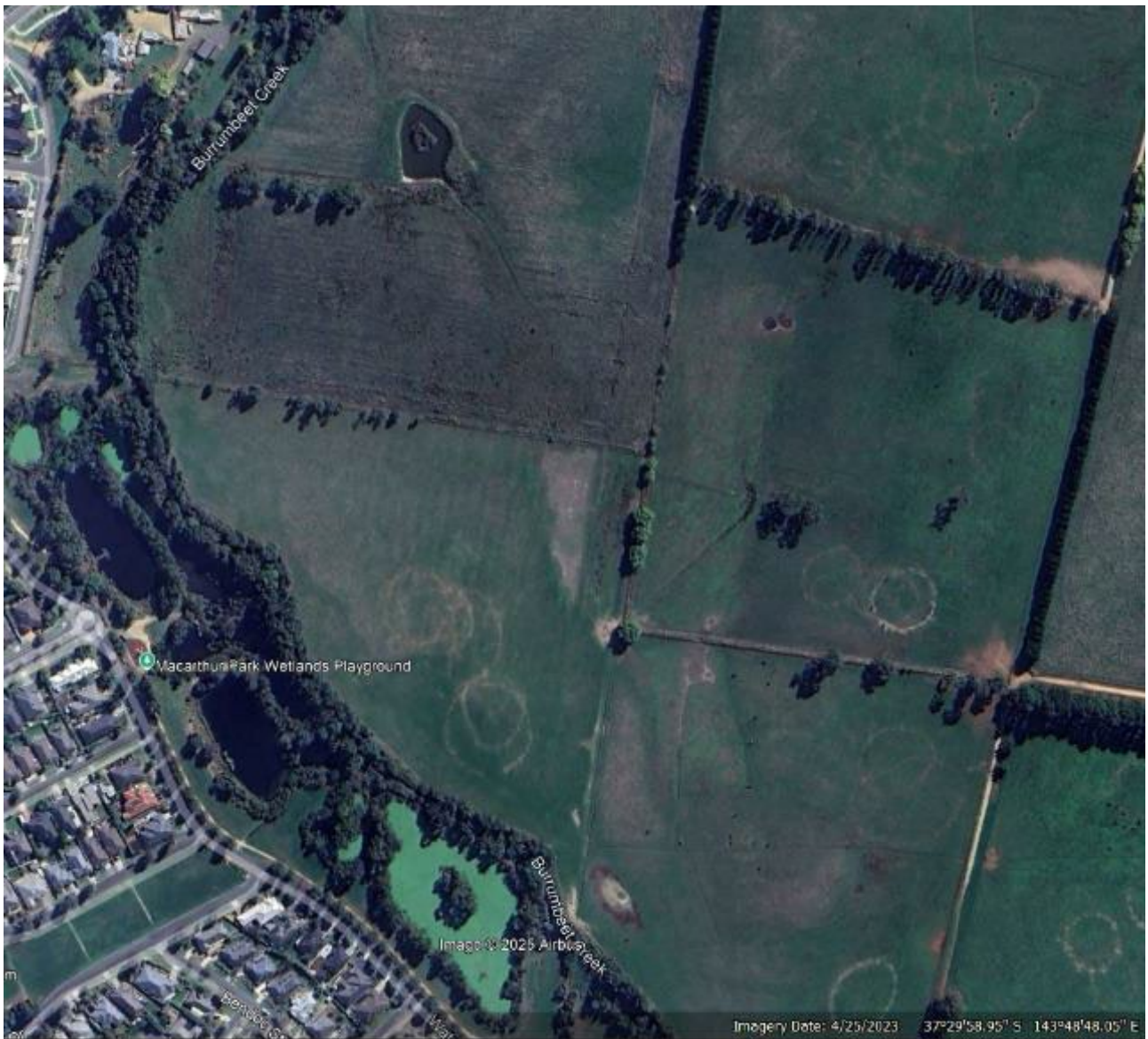
This appendix provides snapshots of aerial imagery available through Google Earth, covering the DEECA mapped wetland within the study area. Images are available over a 20 year period, from 2004 to 2024.



15 February 2024



15 September 2023



25 April 2023



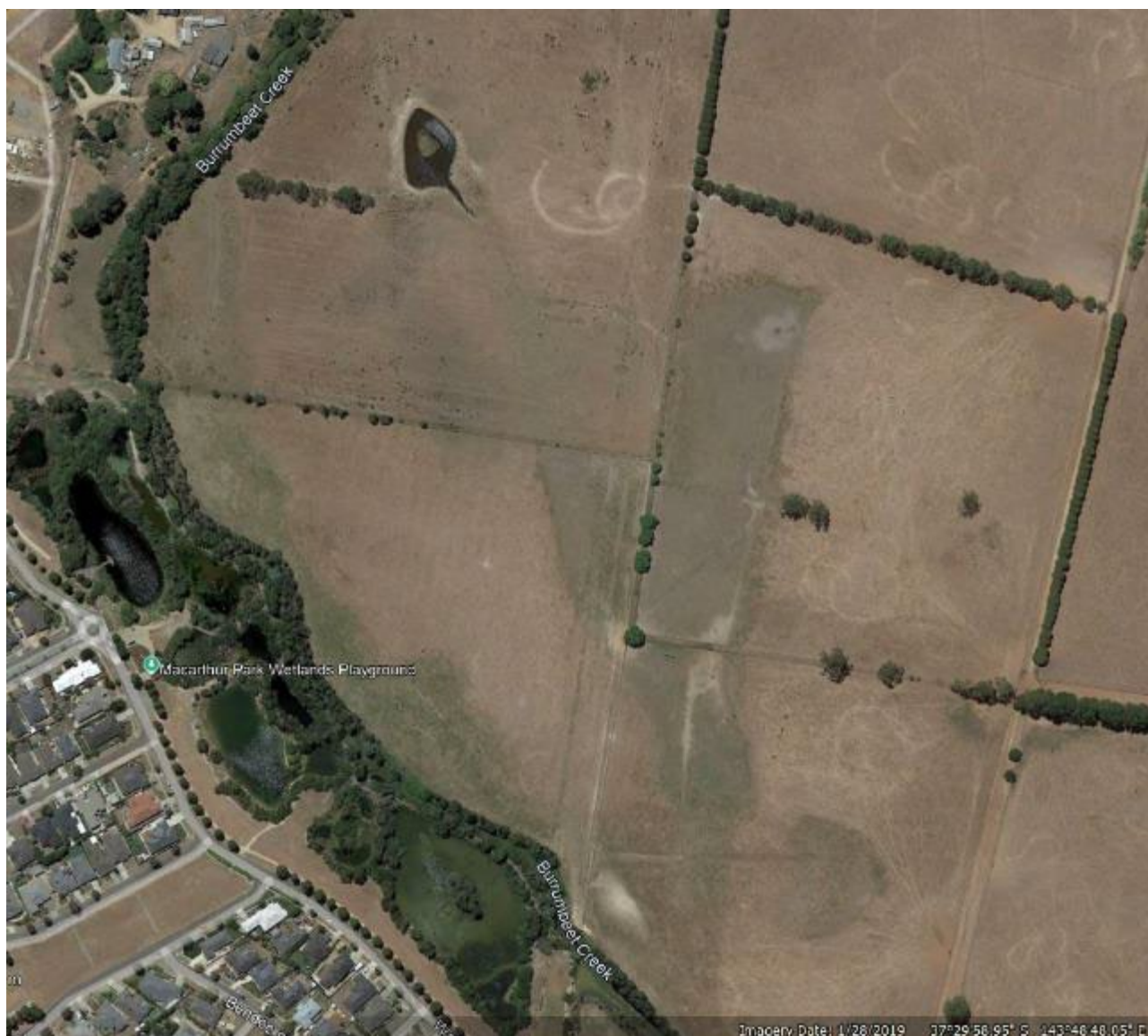
17 December 2021



19 February 2021



22 February 2019



28 January 2019



24 January 2018



4 January 2017



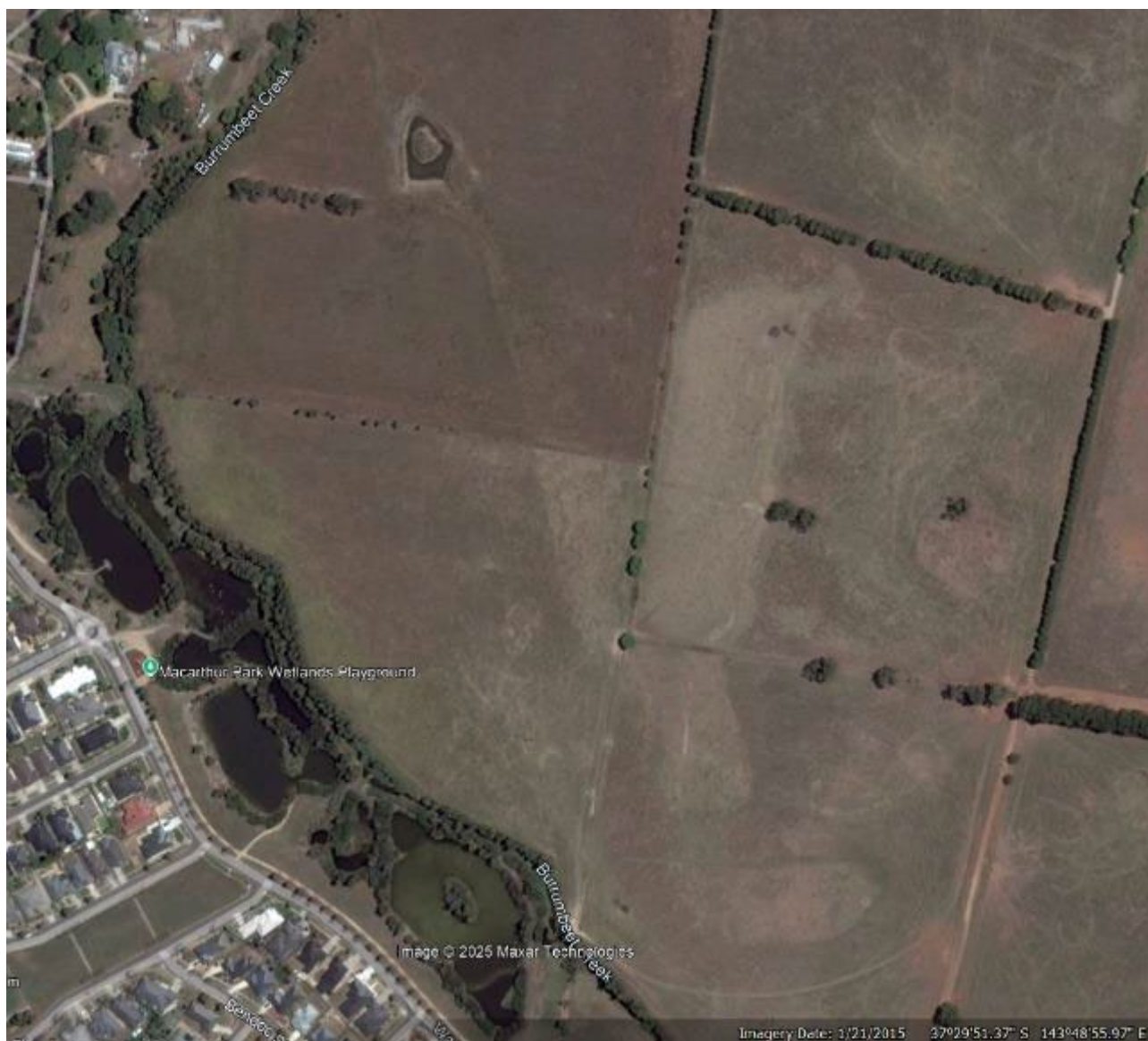
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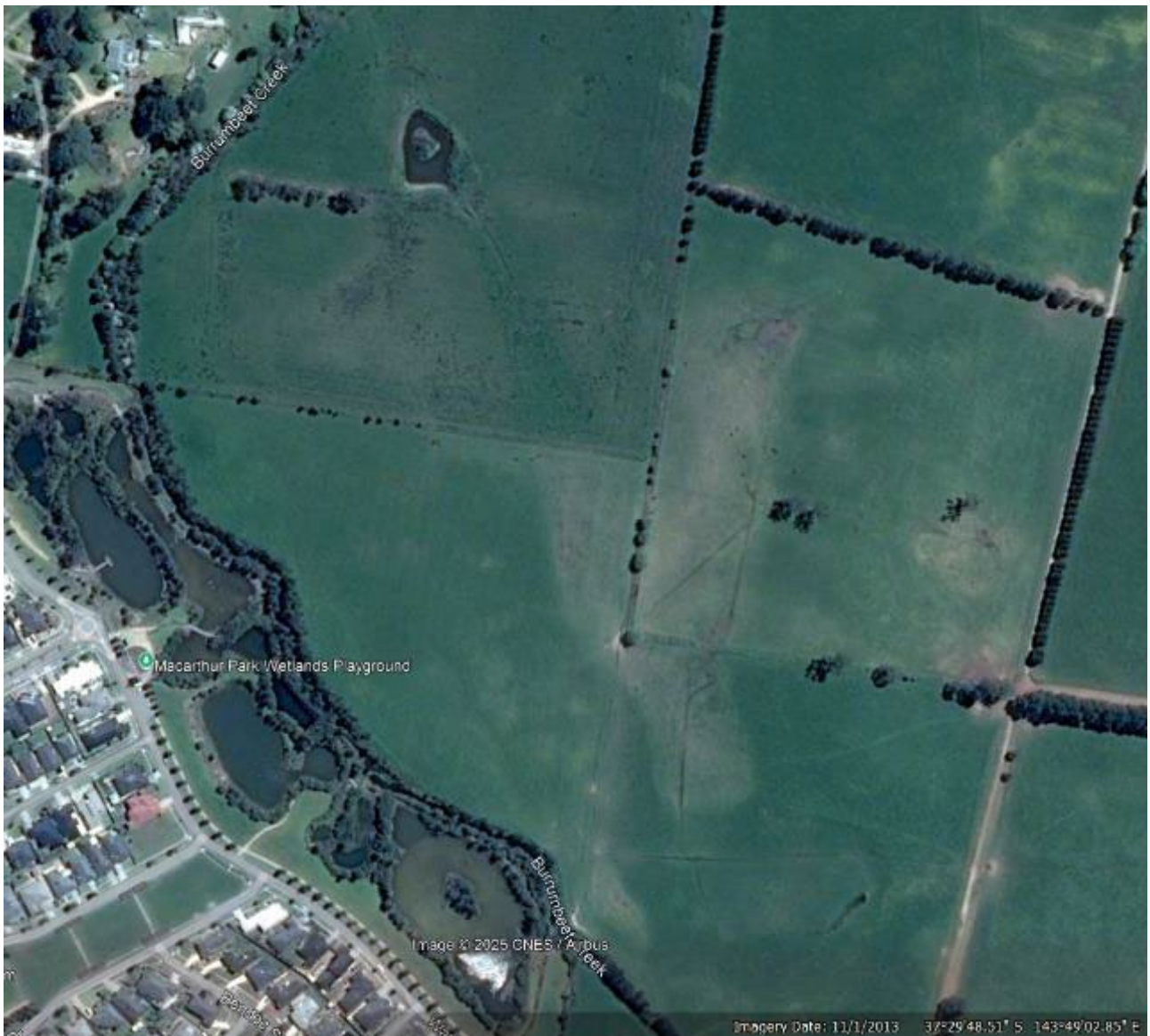
26 September 2015



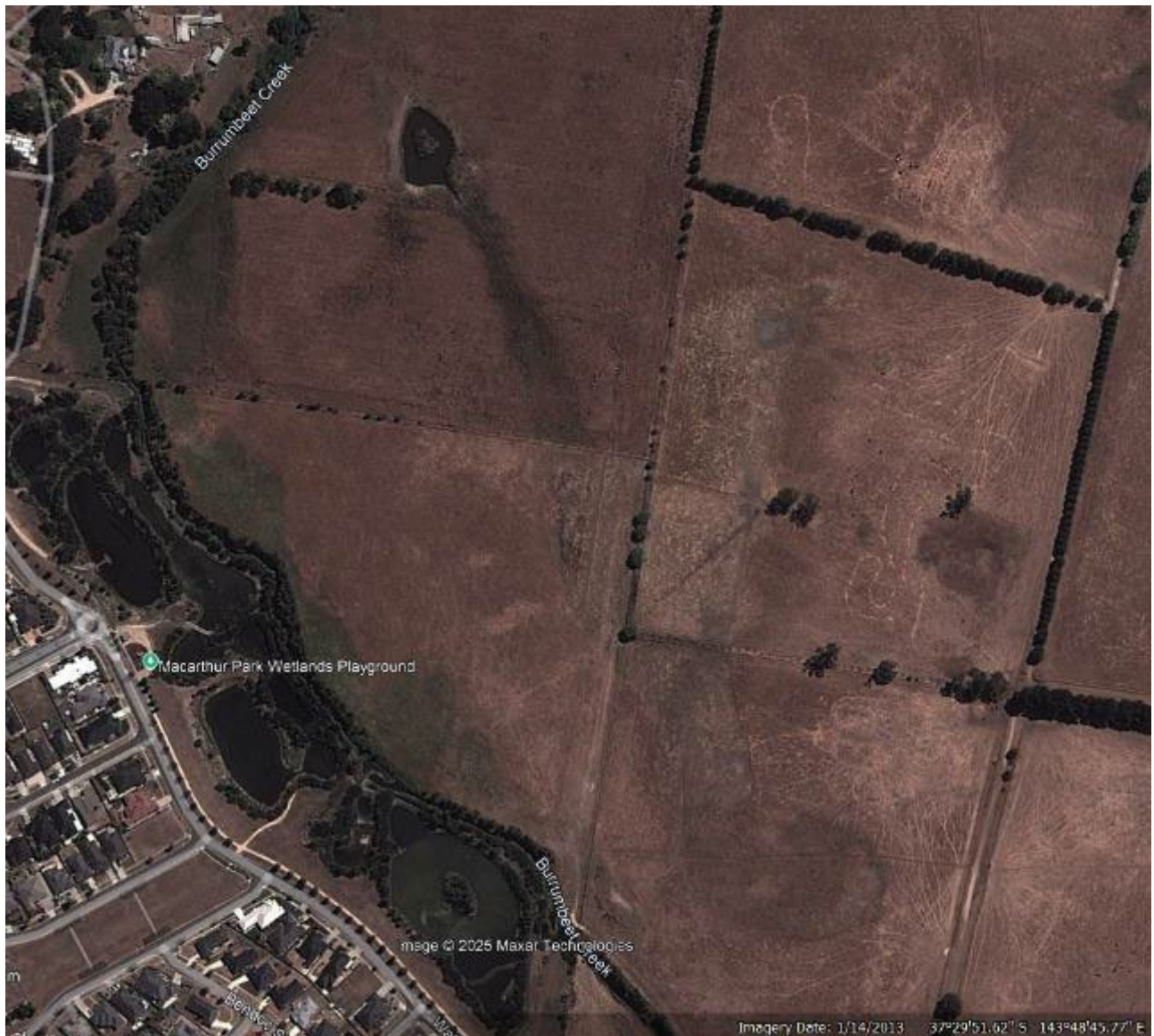
21 February 2015



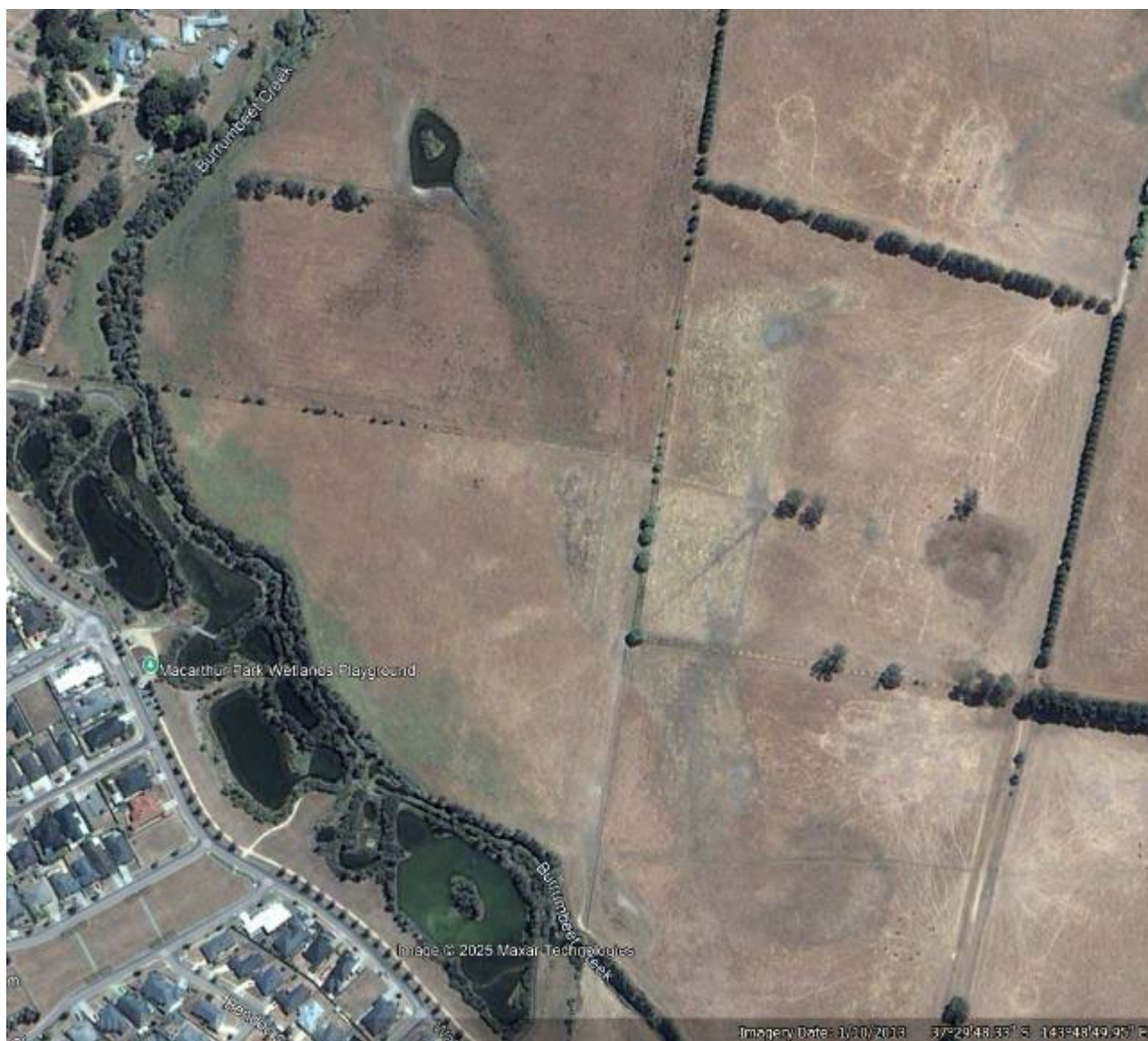
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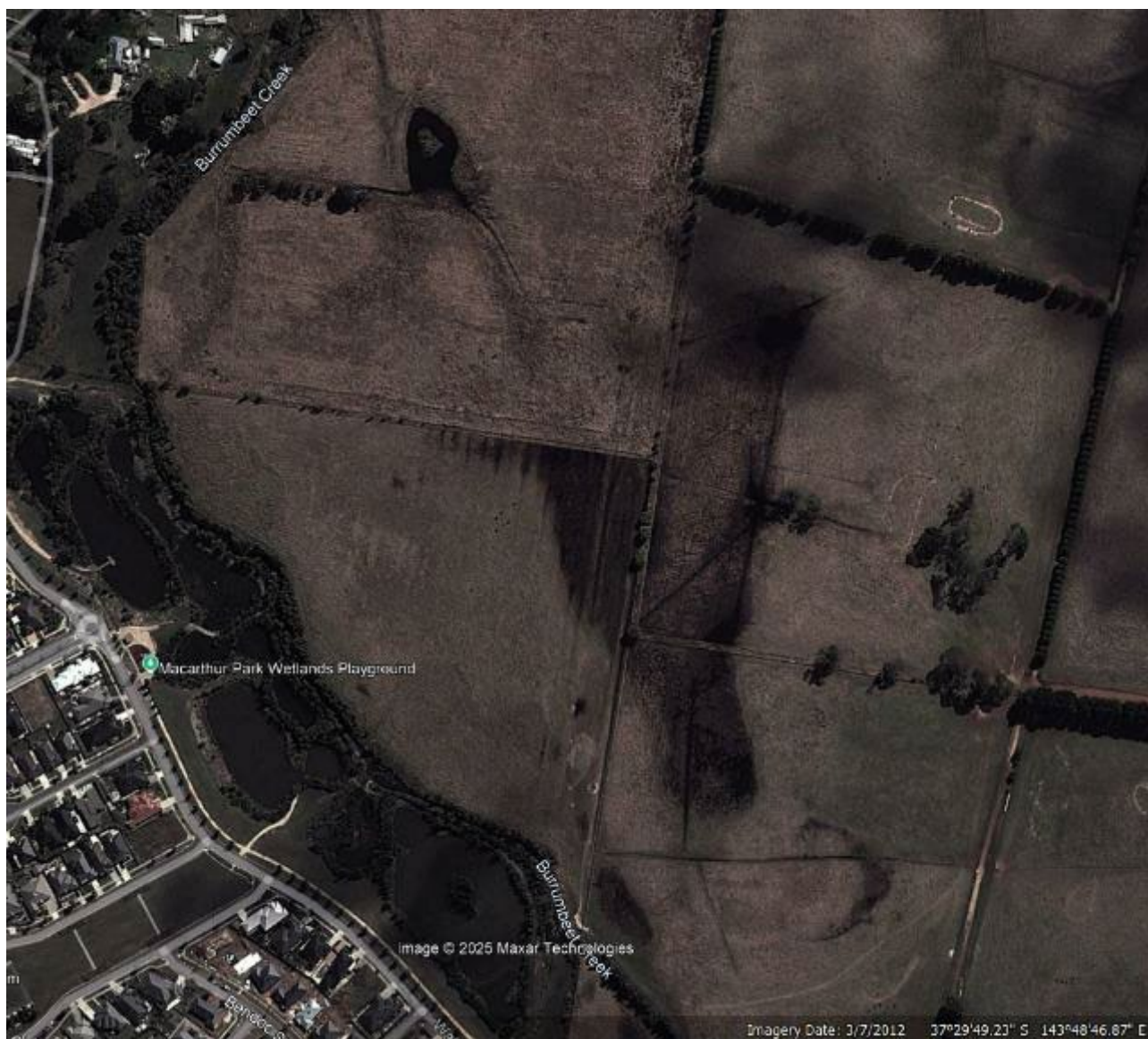
1 November 2013



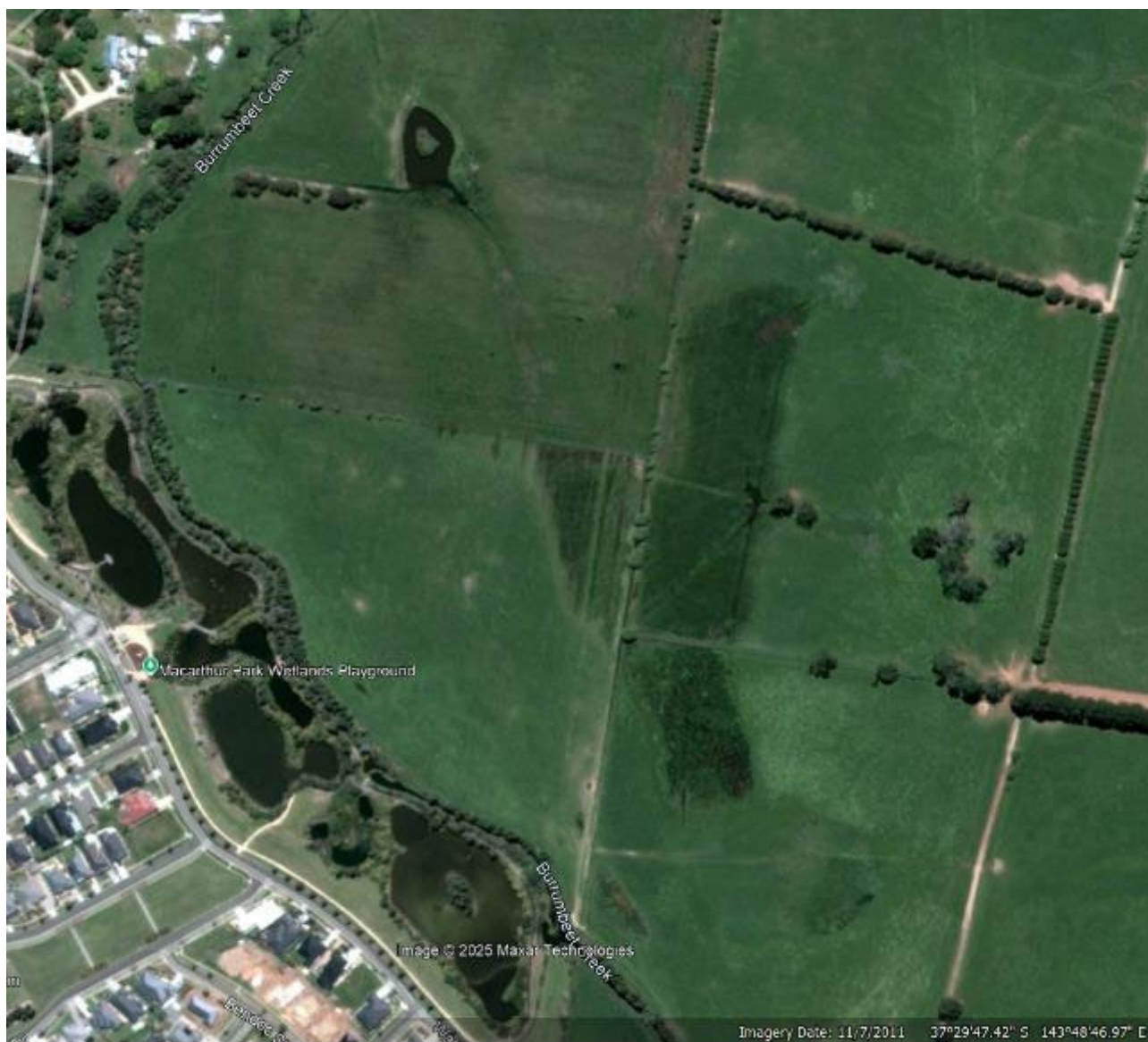
14 January 2013



10 January 2013



7 March 2012

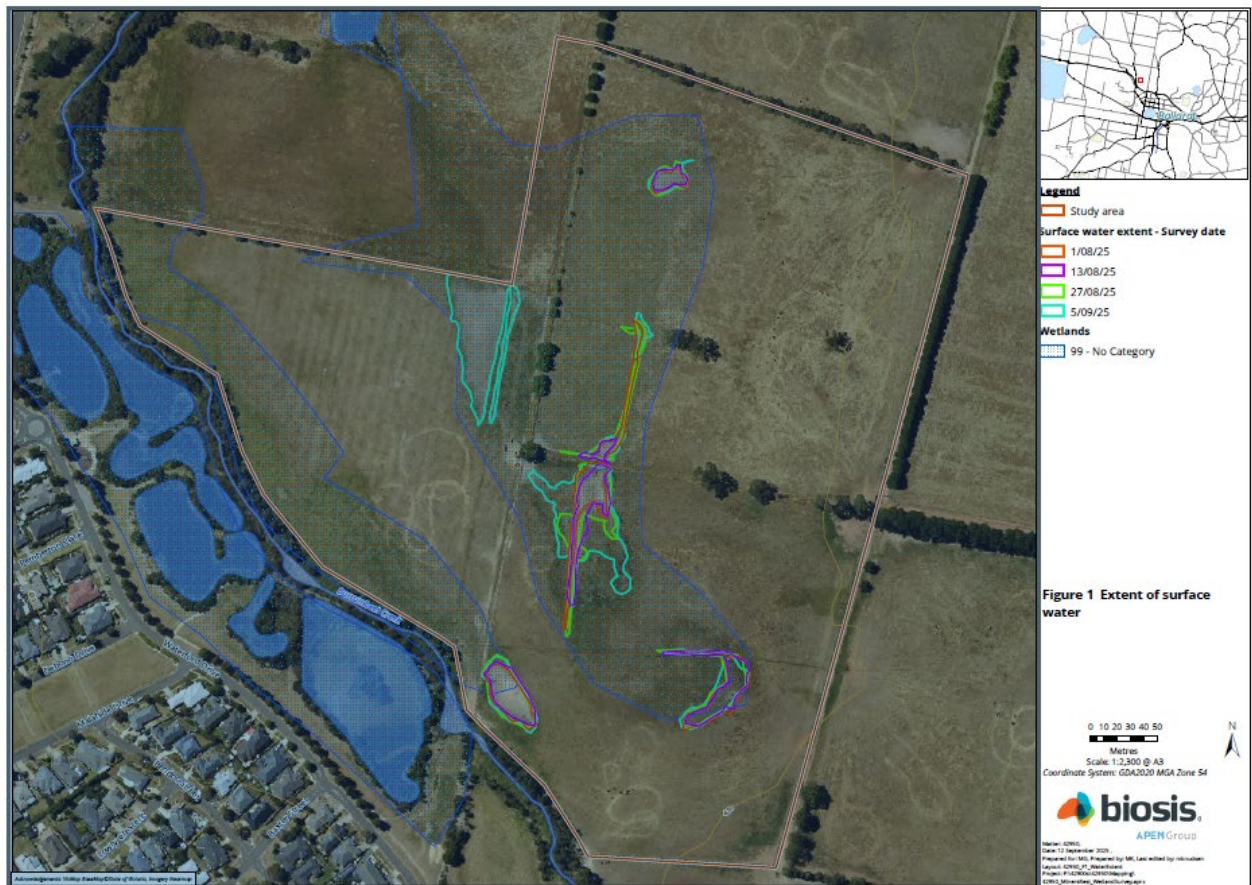


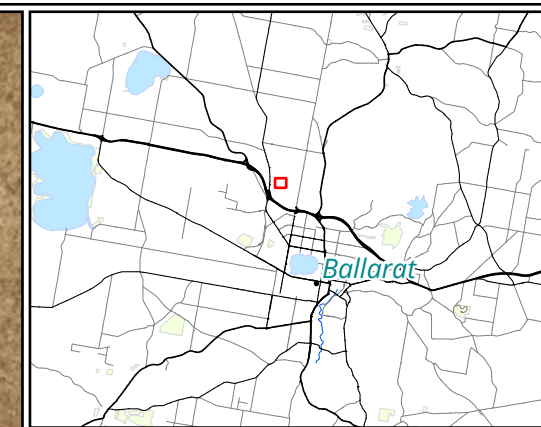
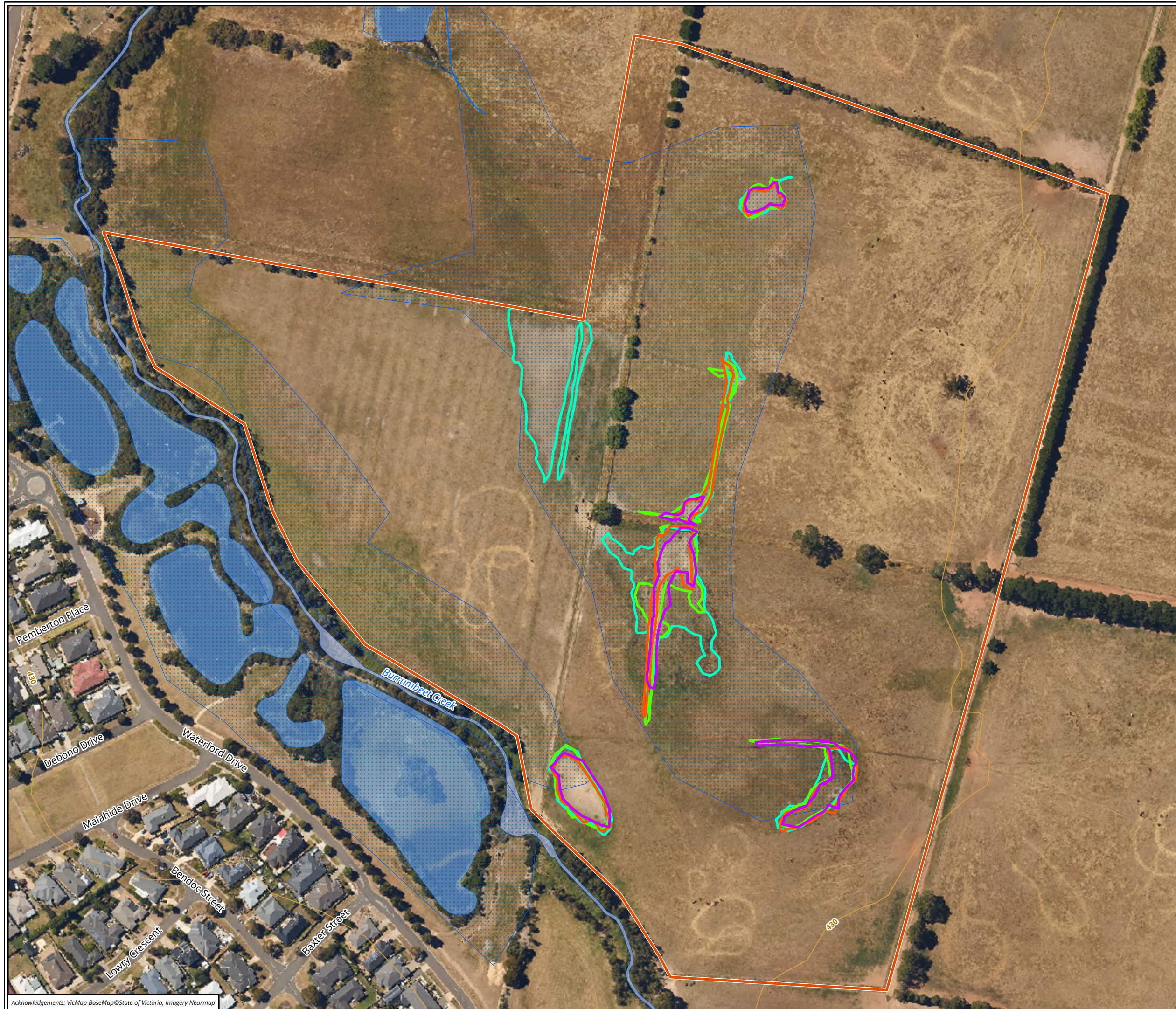
7 November 2011



10 November 2004

Figure 1 Observed extent of surface water





Legend

Study area

Surface water extent - Survey date

- 1/08/25
- 13/08/25
- 27/08/25
- 5/09/25

Wetlands

- 99 - No Category

Figure 1 Extent of surface water

0 10 20 30 40 50
Metres
Scale: 1:2,300 @ A3
Coordinate System: GDA2020 MGA Zone 54

biosis
APEM Group

Matter: 42950,
Date: 12 September 2025,
Prepared for: MG, Prepared by: MK, Last edited by: mknudsen
Layout: 42950_F1_WaterExtent
Project: P:\42900s\42950\Mapping\42950_MinersRest_WetlandSurvey.aprx

To	██████████ APD
From	██████████ Ratio Consultants
CC	
Regarding	Draft Ballarat North PSP Submission
Date	8/10/2025
Ref No.	19079T

Dear ████████,

As requested, we have undertaken a preliminary review of the draft documents currently on exhibition for the Ballarat North PSP and raise the following concerns.

We note that this is a preliminary review and that we reserve the right to provide further commentary and raise additional issues as they arise during the upcoming panel hearing if necessary.

The following submission has been prepared by Ratio Consultants on behalf of APD Projects and relates to traffic and transport related concerns only.

1. Midland Highway

1.1 The issue

The Draft PSP, Plan 12 and Table 19 include road projects on Midland Highway nominated as RD-02-01 and RD-02-2, which require duplication of Midland Highway, as per snip below.

Road	RD-02-1	Duplication of Midland Highway (Southern section)	Land and construction of Midland Highway duplication (Southern section)	Department of Transport and Planning	Yes	No	Yes	Short	Development	100%
Road	RD-02-2	Duplication of Midland Highway (Northern section)	Land and construction of Midland Highway duplication (Northern section)	Department of Transport and Planning	Yes	No	Yes	Medium	Development	100%

This inclusion is not appropriate and inconsistent with all DCP / ICP guidelines.

1.2 Discussion

Midland Highway is unambiguously a State Declared Road and zoned TRZ2 – Principal Road Network. The existing road reserve is approximately 60m in width.

The VicRoads (now DTP) *Guidance for Planning Road Networks in Growth Area*, Nov 2015, states the following:

Legislated Responsibilities

Road Development and Improvement Programs

VicRoads as the State road authority has responsibility to develop declared road network strategies, including preparing road improvement programs and proposals for budget submissions.

Note that the declared arterial road network is unambiguously State infrastructure. The Planning & Environment Act effectively prevents State infrastructure from being included in a DCP. Thus any additional required land beyond direct developer works (including for widening) should be included via a Planning Acquisition Overlay.

Further guidance is provided in the Ministerial Guidelines for Infrastructure Contribution Plans (ICPs), which states that:

*“A standard levy or supplementary levy **must not** be imposed in respect of the development of land within a GAIC contribution area to fund transport construction on an existing declared road. This does not include construction of road intersections required to connect a new or upgraded council road to a declared State road, or walking and cycling infrastructure alongside or crossing a declared State road.”*

Although Ballarat North is not in a GAIC contribution area and will be subject to a DCP, all reference to inclusion of state road upgrades in DCPs are consistent in the direction that they are not to be included in DCPs other than for the purpose of land (road widening) when strategically justified and intersections on state roads, which again are strategically justified by the modelling associated with the PSP and are proven to be basic, essential and clearly demonstrate a need and nexus between the development.

We note that the following recently considered and/or approved PSP's include intersections on arterial roads but do not include the adjacent declared road upgrades, even when traffic volumes demonstrate it is needed. Examples include:

- Melton East PSP does not include duplication of Melton Hwy or Western Fwy
- Mt Atkinson PSP does not include Hopkins Road
- Craigieburn West PSP does not include Mickleham Road
- Creamery Road PSP does not include Midland Highway

The Midland Highway road projects are the responsibility of the State, as recently identified in Creamery Road PSP, and all other PSPs before it and need to be removed entirely, noting that land is also not required due to the width of the existing road corridor (60m).

2. Gillies Road

2.1 The Issues

The following issues have been identified:

- The base traffic volumes are over inflated by at least 3000vpd
- Therefore, the future volume decreases from 16,000vpd to 13,000vpd

- The Jacobs modelling assumes a 4 lane cross section but the proposed cross section only includes only 2 lanes.
- The Road Projects RD-01-1 and RD-01-2 include an allowance for land, ie widening of Gillies Road, however the proposed cross section states that Gillies Road will vary between 30-35m to fit within the existing road reserve, creating confusion on the intent of this road and the land required.

2.2 Support

We support the inclusion of Gillies Road as a Secondary Arterial, which therefore, should have a consistent minimum 34m cross section to allow for potential future duplication to a 4 lane arterial without compromising the shared paths on both sides of the road.

We note that Gillies Road is approximately midway between Midland Highway and Howe Road, at approximately a one mile grid spacing, reinforcing the need to future proof this corridor as a potential 4 lane arterial in the future.

2.3 Discussion

The proposed cross section is labelled 'Secondary Arterial 60kmh - 2 Lane - Gillies Road (existing 30-35m reservation)' but only provides a single lane in each direction with a shared path of 3.0m on both sides with no parking, no median and no indication as to how future duplication would occur or even demonstrating that it can occur.

It is recommended that a Standard 34m Secondary Arterial cross section be adopted, ensuring that the road reserve has the ability to be duplicated to an ultimate 4 lane road corridor.

As a Secondary Arterial all road projects and intersections along Gillies Road need to be maintained as transport infrastructure in the DCP.

3. Jacobs Traffic Modelling

3.1 Issue

The base traffic volumes adopted by Jacobs to inform their modelling are significantly different to existing conditions.

Jacobs used DTP open source data to determine existing traffic volumes on the PSP road network, which they summarised in Table 3-2 reproduced below.

DTP open source data is a combination of historical data actually collected from the road network, which are then factored up annually based on an estimated growth rate. The majority of traffic volumes on Open Source Data are estimates made by DTP.

Ratio undertook automatic tube counts in November 2024, with the Weekday Average Daily Volume shown adjacent the Jacobs data on the table below.

Table 3-2. DTP traffic volume data (Source: DTP Open Data)

Road	2020 Open Data	2023 Open Data			Ratio Vols 2024
	Two-way AADT Total	Two-way AADT Total	Two-way AADT Trucks	Heavy vehicle %	Weekday avg (vpd)
Western Freeway (M8)	15,800	16,200	3,200	6%	N/A
Midland Highway (A300)	8,100	8,600	680	1%	7,700
Howe Street (C287)	6,900	7,300	550	1%	12,350
Gillies Road	9,600	TBC	TBC	TBC	6440

Jacobs make the observation that Gillies Road is carrying the greatest volume of traffic in a north south direction, north of Western Freeway. Based on actual volumes more recent than either set provided by Jacobs, this is clearly incorrect.

Furthermore, from an existing development and regional context this makes no sense and as demonstrated by actual traffic volumes, rather than DTP estimated volumes, Gillies Road in fact carries the least.

The difference in traffic volumes is important, particularly if traffic function is being used to determine staging of the PSP. The variation between Jacobs estimated data and actual traffic volumes is summarised as follows:

Road	Jacobs 2023	Ratio 2024	Difference	Percentage Difference
Midland Highway	8600	7700	+900	10% over
Howe Street	7300	12350	-5050	70% under
Gillies Road	9600*	6440	+3160	33% over

Note * - Jacobs estimated volume for 2020 adopted as no data for 2023 provided.

3.2 Discussion

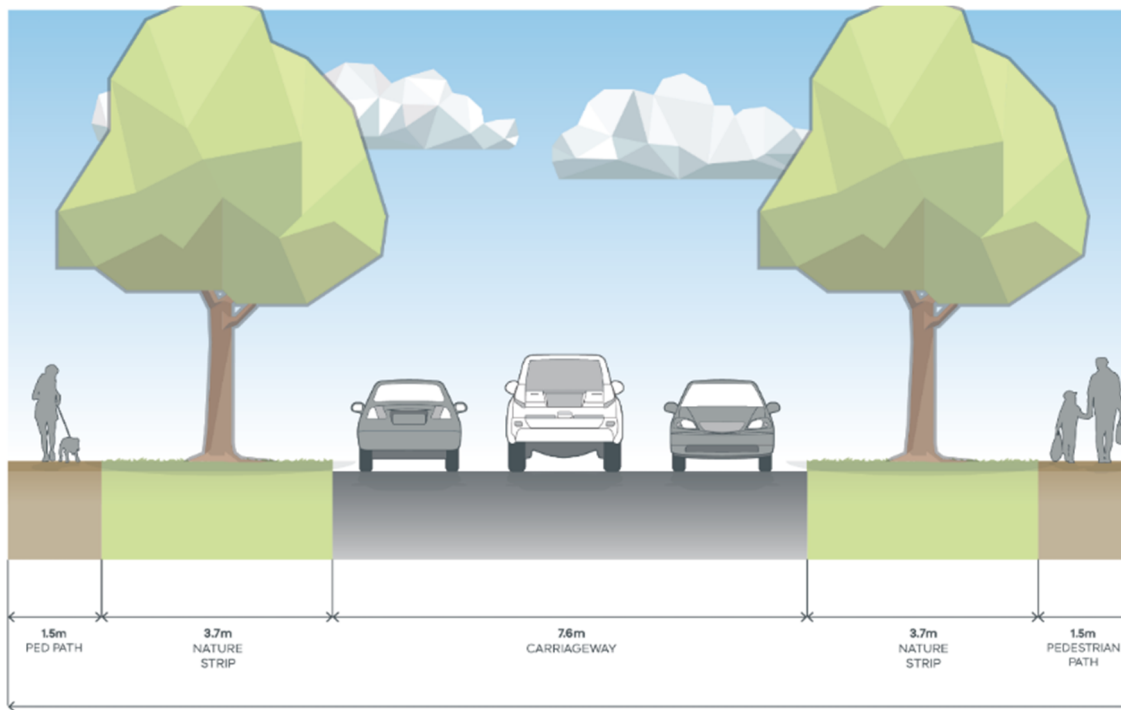
Given the significance of the error and its impact on triggering road upgrades, it will be necessary to update the modelling accordingly.

The proposed PSP Staging is discussed below, but obviously if the staging has been at all informed by the traffic modelling, then this will also need to be modified accordingly.

4. Local Access Street Cross Section (18m)

The proposed cross section for Local Access Streets, reproduced below, has been increased from the standard 16m cross section to an 18m wide cross section. The difference is primarily in the increased verge width, however the carriageway has also increased from 7.3m to 7.6m.

Figure 1: Proposed Local Access Street (18m)



From a transport perspective the increased width provides no traffic benefit, with the additional carriageway width considered unnecessary and undesirable. The standard 7.3m pavement satisfies all CFA / emergency vehicle requirements, allows kerbside parking on both sides and an adequate width between parked cars for vehicles to pass through including Medium Rigid Vehicles (MRV) which are typically an 8.8m long garbage truck.

The additional road width increases the amount of hard surface, noting that although only 300mm on a cross section, will apply to many kilometres of local road network.

Furthermore, increased road width encourages higher vehicle speeds, which is contrary to safer pedestrian friendly communities.

5. Intersection Extents

5.1 The Issue

The extent of the intersection projects shown on Plan 12 - Precinct Infrastructure Plan are excessive in the north south direction and misleading.

All intersections shown on Plan 12, reproduced below, scale at over 400m in length from the northern extent to the southern extent. Gillies Road is nominated as a 60kph road with Midland Highway at 80kph.

For a 60kph road, the maximum extent of the intersection would be no more than 150m in total. It is noted that the full extent of an intersection is typically not included in most PSPs.

Even for Midland Highway, the maximum extent of a new traffic signal would be no more than 230m.

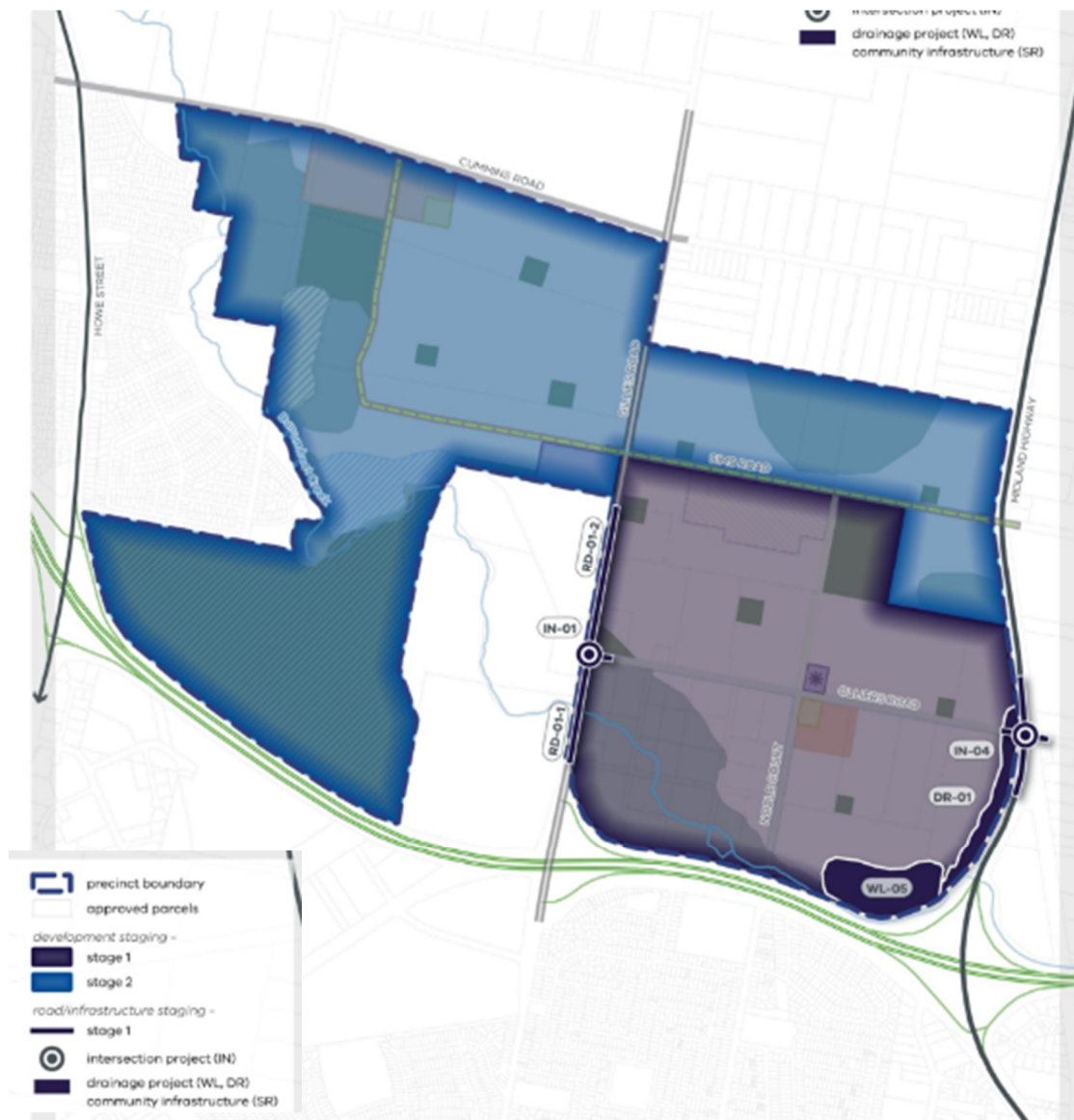
We suggest that the graphics and any associated calculations of intersection extents are modified to represent the actual dimensions required.

If left as is, the DCP allocation between intersection project and road project will be significantly impacted.

6.1 The Issue

ratio:

Figure 3: Proposed Staging Plan



The preceding staging diagram suggests that the road projects on Gillies Road (RD-01-1 and RD-01-2) as well as intersection IN-01 on Gillies Road and IN-04 on Midland Highway are required before the commencement of any land in the 'Stage 2' area.

In addition to the above, there are a number of requirements outlined in Table 18, which would need to be reviewed and modified / deleted in accordance with the discussion below.

6.2 Discussion

In the event that land within Stage 1 did not progress, there is no ability for any developer in Stage 2 to build an intersection abutting the Stage 1 land. This is not a detriment to the PSP as without development in Stage 1, neither IN-01 or IN-04 are required.

All road projects are currently contained within existing road reserves and as such could be undertaken by developers in Stage 2 if development in Stage 1 had not triggered the upgrade.

Existing traffic volumes on Gillies Road and Midland Highway are low, 6440vpd and 7700vpd, respectively.

At this level of traffic on roads that are already constructed to a relatively high standard as a rural road for Gillies Road and a Highway Standard for Midland Highway, there is ample capacity to accommodate considerable growth prior to any works being required on either road.

The PSP area has a strong existing network of roads that would allow any part of the PSP area to proceed immediately. From a transport perspective the proposed staging is completely unnecessary and can be controlled through permit conditions as development progresses.

It is also noted that this PSP does not trigger the need for any state funded infrastructure, including the duplication of Midland Highway, and as such any kind of staging from a transport perspective is unnecessary and considered inequitable.

We trust that the preceding discussion provides clarity on the changes sought that will benefit the development of the Ballarat North PSP.

Yours sincerely,

[Redacted Signature]

[Redacted Title]

[Redacted Name]

Ratio Consultants

Memo

To:	[REDACTED]
From:	[REDACTED]
CC:	[REDACTED]
Date:	13 October 2023
Subject:	Review of draft Ballarat North PSP Economic and Retail Assessment

Dear [REDACTED]

This memo has been prepared on your instruction to undertake a review of the draft Ballarat North Precinct Structure Plan (PSP) with respect to activity centre planning, with an emphasis on critically examining the *Economic & Retail Assessment* prepared by Urbis as a technical report.

Background

The draft Ballarat North PSP has been prepared in the context of strong recent population growth in Ballarat and the need to plan for additional zoned land to accommodate projected growth of approximately 40,000 new residents over the period 2025 to 2046 (according to .id forecasts prepared on behalf of the City of Ballarat), implying the need for more than 22,000 additional dwellings over that period.

The Ballarat Housing Strategy (adopted by Council but yet to be implemented through a planning scheme amendment) seeks to consolidate a large share of growth within the existing urban area. Nevertheless, much of the future growth will occur within the existing Ballarat West Growth Area and in Ballarat North.

Ballarat North is identified in *Victoria's Housing Statement – The decade ahead 2024-2034* as a priority project to support future housing supply in regional Victoria.

To accommodate long-term growth, greenfield investigation areas have been identified to the west of the urban area (as an expansion to Ballarat West and in Ballarat North-west) and as a northern extension to Ballarat North, which is identified as the '*Ballarat North Expanded Area*' within the PSP.

Deep End Services was involved in early planning for Ballarat North, and prepared a report in 2022 on behalf of Wyndholm Park Developer Pty Ltd which advised on activity centre requirements – noting that this work was undertaken for an area that incorporated the PSP's Expanded Area.

The work undertaken in the 2022 report provides a basis for this peer review of the activity centre assessment undertaken for the draft Ballarat North PSP.

Ballarat North PSP

The draft Ballarat North PSP applies to 571ha of land extending from Miners Rest to the Midland Highway, and from the Western Freeway north to Cummins Road and Mount Rowan (refer Figure 1 over the page which is an extract of the Place Based Plan).

The total net developable area (NDHa) is 274ha having regard to open space, transport infrastructure, community facilities and schools.

Viable densities

The potential housing yield is estimated at 5,523 dwellings, based on a target density of 25 dwellings per NDHa for 'housing catchment areas' around activity centres and along open space and transport corridors, and 17 dwellings/NDHa for the balance of the developable land (refer PSP, Tables 3 & 4).

It is relevant that R1 states that subdivisions are to be in accordance with Table 3 of the PSP which specifies that a mix of typologies be provided within housing catchment areas, including at least 3 of:

- Apartments developments
- Mixed-use developments
- Attached multi-unit developments or townhouse developments
- Semi-detached or duplex style developments
- Retirement living.

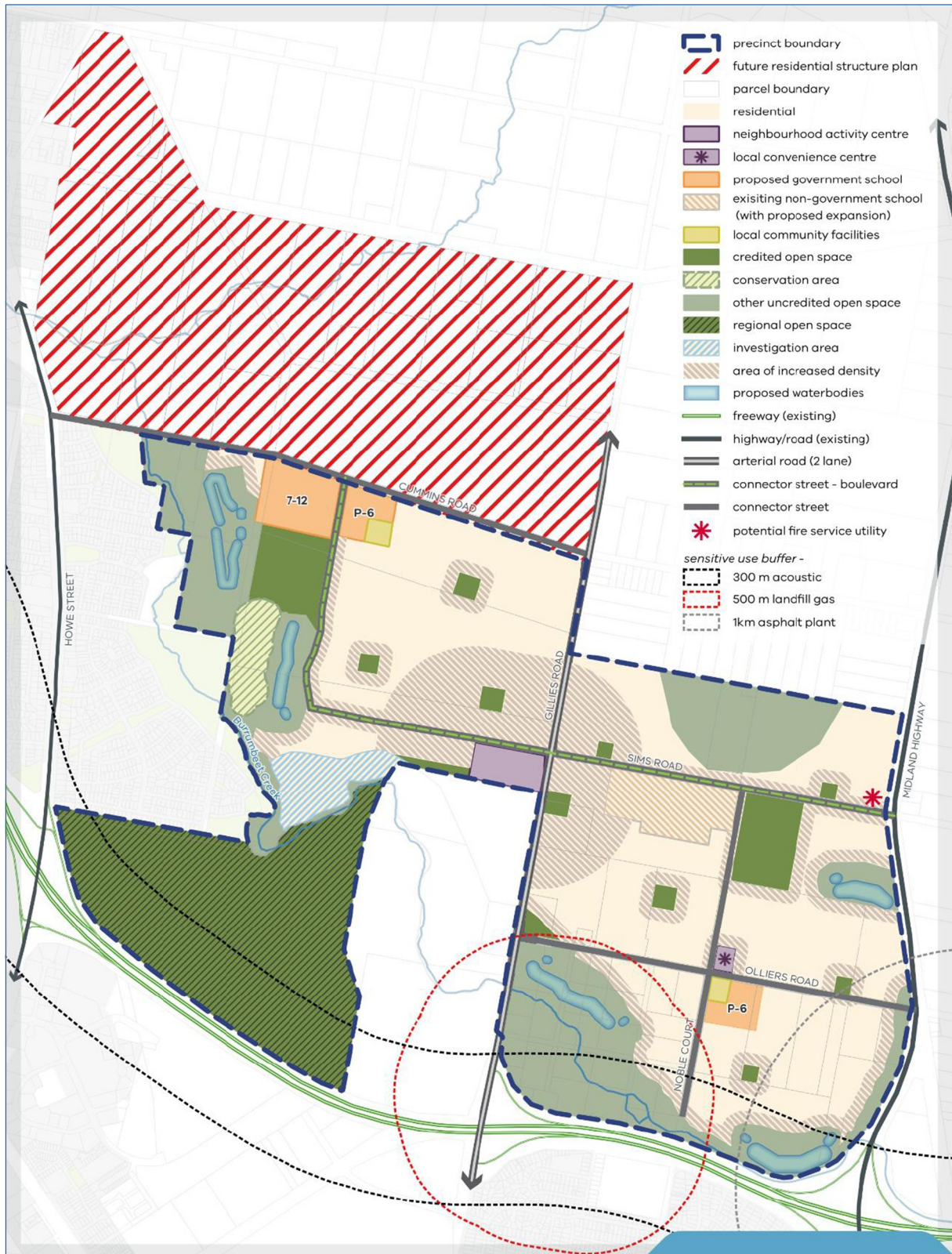
In this context it is relevant that detached houses make up 90% of all new dwelling approvals in the City of Ballarat since 2022, making it potentially challenging to deliver diverse housing options in greenfield areas like Ballarat North. It is noted that R1 provides some flexibility, with lower densities able to be considered *"if it can be demonstrated that the market for housing at the target density is not sufficiently mature"*. Clarification should be sought to ensure that this flexibility also extends to the recommendations in Table 3 with respect to housing typology diversity.

G2 states that applications should demonstrate contribution to the target of 13% minimum of affordable housing, including 11% for social housing. G3 encourages such housing to be delivered in *"high amenity areas close to services and community facilities and provide for a range of housing typologies to meet demonstrated local needs. Social and affordable rental housing can also be located across the balance area where appropriate"*. Detailed guidance is provided in Table 5 with respect to meeting the needs of segments of the affordable and social housing markets.

The expectation that a new greenfield growth area should have a prominent role in delivering affordable rental properties and social housing disregards the normal role that such growth areas play as a location for first home buyers and young families seeking an affordable way to enter the housing market.

Established suburbs in central Ballarat represent a much more appropriate and viable location in which to deliver supported accommodation, as residents in these areas have much better access to a range of health, social, community and other support services.

Figure 1—Draft Ballarat North PSP – Place Based Plan



Source: draft Ballarat North PSP Plan 2

Activity centres

R25 of the draft PSP, under the heading *Thriving local economies*, provides for activity centres to be developed generally in accordance with Plan 9 and Table 16.

Plan 9 identifies the locations of activity centres which consist of a central Neighbourhood Activity Centre (NAC) and a Local Convenience Centre (LCC) in the eastern part of the PSP.

Table 16 of the PSP provides details of land area provision and proposed components of each centre, as summarised below.

Neighbourhood Activity Centre

The NAC is to be located on the south-western corner of intersection of Gillies Road and the western extension of Sims Road, and is described as follows:

Located centrally within the precinct, the NAC is to service all residents within the precinct and meet their day-to day retail and community needs. The NAC will provide for two standard full-line supermarket and a third mid-sized supermarket, along with speciality retail and commercial floor space. Higher density residential and mixed-use development is envisaged to support the NAC.

The PSP states an indicative retail floorspace of 15,740 sqm along with 2,500 sqm of non-retail commercial space, with a land area of 4.6ha set aside to accommodate these uses. The floorspace allocations align with the bottom range of the Scenario 2 recommendations from the Economic & Retail Assessment.

Eastern Local Convenience Centre

The LCC is proposed to “*play an ancillary role to support the central NAC by providing convenience shopping and other services to their respective local population base*” with suggested use types including:

- retail specialty shops including food catering (café, restaurant, takeaway, etc.)
- small green grocers and other fresh food retailers (bakery, butcher, etc.)
- retail services (hairdresser, beauty salons)
- potentially convenience pharmacies
- non-retail specialties (real estate agents, lawyers, accountants) may also fill shopfront space.

Retail floorspace provision is set at 2,070 sqm with another 1,000 sqm of commercial floorspace, on a site of 0.8ha. These floorspace allocations also align with the bottom range under Scenario 2 from the Economic & Retail Assessment.

Economic & Retail Assessment

The Economic & Retail Assessment (Urbis, June 2024) is a technical report that provides the basis for the floorspace and land area requirements adopted in the draft PSP.

The methodology used in the report is sound, generally comprising the following sequential process:

1. Identify a catchment
2. Establish future housing supply
3. Estimate population at full development capacity
4. Examine the opportunity to establish key anchor retail uses – with this focussing on supermarkets as the population capacity is insufficient for higher order retailing such as a discount department store
5. Determine an appropriate number, size and spatial arrangement for the supermarkets
6. Provide advice on non-anchor retailing with reference to industry benchmarks and the role of the centres, and for non-retail uses
7. Provide advice on centre size (gross land area) based on typical floorspace ratios.

The report includes an assessment of the implication for activity centre planning if the Expanded Area is developed for housing, with this undertaken using two scenarios of dwelling density. However, the report states that a “*separate economic and retail assessment would be required to re-consider the size/scale and location of a future activity centre within that area in due course*” (p6).

Commentary on the various inputs and recommendations are provided in the following sections.

Catchment

The report adopts the PSP as the Primary sector served by new activity centres within the PSP.

A Secondary sector consists of the existing community to the west (Miners Rest) and rural areas surrounding the PSP including Mount Rowan. This population is forecast to be around 4,700 at 2051, which I presume to be based on local area projections with most growth occurring in Miners Rest.

It is logical to incorporate the Secondary sector to reflect the trading influence of new centres within the PSP, and especially those containing full-line supermarkets. Indeed, consideration should be given to the potential for incoming trade from Creswick given the ease of access via Midland Highway.

Housing supply

The Economic & Retail Assessment calculates the number of households living within the PSP by applying an average 20 dwellings/ha to an adopted NDA of 334ha (refer p29). On this basis the report calculates that a total of 6,688 dwellings would be constructed within the PSP area.

This is inconsistent with the draft PSP which provides details of NDA and dwelling yield at Table 4, specifying a total NDHa of 274hs for housing, and a total yield of 5,523 dwellings.

For the Expanded Area, calculations are based on a density of 20 dwellings/ha and 15 dwellings/ha, leading to an additional 2,622 to 3,496 dwellings.

It is unclear whether these calculations for the Expanded Area rely on accurate estimates of NDHA given the inconsistency identified above.

Population at capacity

Population outcomes at full development have been calculated by applying an average household size of 2.8 persons/household. This appears reasonable, although it is relevant that the Deep End Services report of 2022 adopted a slightly lower average household size of 2.75 pph which was an average of the two existing growth areas at Alfredton West and Delacombe.

The average household size in a growth area changes significantly over time as households move through the typical family lifecycle, and this may suggest that the adoption of 2.8 pph could over-estimate the peak population within the PSP, particularly as development is likely to occur over a 15-20 year timeframe.

Other factors that could reduce the peak population include the proposed inclusion of various housing formats and the lack of any allowance for dwellings to be vacant at any time due to the normal frictions in the housing market (normally this averages around 5-8% across Victoria).

When the assumed average household size is applied to the adopted dwelling capacity, this results in a population of 18,726 within the PSP area, and a projected population of 7,342 to 9,789 within the Expanded Area.

A further 4,700 people are assumed to be living within the Secondary sector, mainly in and around Miners Rest, bringing the total catchment population to 23,426 under Scenario 1 (ie no development within the Expanded Area).

As noted above, the calculations for the PSP area are based on an incorrect NDHa. A corrected set of projections is provided in Table 1 below, indicating a total population of 20,167 persons within the PSP area at full development: i.e. 3,259 lower than the figure used in the Economic & Retail Assessment.

Table 1—Amended population projections

Source: Deep End Services; draft PSP; Economic & Retail Assessment (Urbis)

Population	Sc1 (PSP only)	Sc2 (20 dwell/ha in Expanded Area)	Sc3 (15 dwell/ha in Expanded Area)
Core	15,467	15,467	15,467
Expanded	-	9,789	7,342
PSP total	15,467	25,256	22,809
Secondary north	4,700	4,700	4,700
Total catchment	20,167	29,956	27,509

Supermarket development opportunity

An examination of the potential number and size of supermarkets that could be accommodated within the Ballarat North PSP has been undertaken by applying an average supermarket floorspace provision rate to the population at capacity.

This is an accepted methodology which avoids having to forecast spending rates and market shares across long time periods, and is appropriate for assessing supportable supermarket provision in PSP processes.

The Economic & Retail Assessment adopts an average supermarket provision rate of 0.41 sqm/capita, which aligns with our own databases at the current time, and is slightly higher than the figure of 0.39 sqm/cap used in our 2022 assessment.

The report estimates demand for 7,753 sqm of supermarket floorspace generated by PSP residents. Their finding is that two full-line supermarket could be supportable, along with one smaller-format store.

With the inclusion of the Expanded Area, the report identifies demand for 10,792 sqm (Scenario 3) to 11,805 sqm (Scenario 2) of supermarket floorspace within the PSP, with another 1,946 sqm generated from Secondary north residents. This would support two full-line supermarkets and three small-format stores excluding the existing Ritchies IGA at Miners Rest (refer Table 8, p31).

The recommendation adopted in the PSP relates to Scenario 2 of the Urbis analysis, which assumes the inclusion of the Expanded Area at an average 20/dwellings/ha.

Under this scenario, the recommended distribution of supermarkets is presented in Table 11 of the Economic & Retail Assessment (p37) as follows:

- Central NAC: 8,500-9,200 sqm
- Eastern LCC: 1,200-1,500 sqm
- Northern LCC (TBD): 1,800-2,000 sqm.

The total supermarket provision is therefore 11,500 sqm to 12,700 sqm, consistent with the estimated demand for 11,805 sqm under Scenario 2.

However, this analysis has been undertaken for an assumed dwelling yield that is inconsistent with the PSP. As indicated in TAB below, the resulting supermarket floorspace demand using correct figures is 10,457 sqm under Scenario 2, excluding the Secondary North sector which is largely served by the existing Ritchies IGA (1,670 sqm according to the Economic & Retail Assessment).

This represents a reduction of 1,348 sqm in supportable supermarket floorspace compared to the Urbis analysis under Scenario 2.

Table 2—Projected supermarket floorspace demand

Source: Deep End Services; draft PSP; Economic & Retail Assessment (Urbis)

Supermarket demand	Sc1 (PSP only)	Sc2 (20 dwell/ha in Expanded Area)	Sc3 (15 dwell/ha in Expanded Area)
Core	6,404	6,404	6,404
Expanded	0	4,053	3,040
PSP total	6,404	10,457	9,444
Secondary north	1,946	1,946	1,946
Total catchment	8,350	12,403	11,390

The reduction in population capacity will have material consequences for the number and size of supermarkets that might be supported within the PSP.

For example, if 10,457 sqm of supermarket floorspace is supportable, this could potentially accommodate two full-line supermarkets, but it would be unlikely to also support a third mid-sized store within the NAC as well as one in each of the two other LCCs as indicated in Table 13 (p41).

Importantly, the proposed distribution and type of supermarkets to be provided across the PSP assumes that the size of full-line supermarkets would be 3,200-3,600 sqm for a 'standard' store, or 3,600-4,000 sqm for a 'larger' model. Scenario 2 assumes one of each type within the NAC.

Our experience is that new supermarkets delivered in growth areas are almost always larger than 3,600 sqm, and often close to 4,000 sqm or above. Local examples include:

- Woolworths Lucas: 3,900 sqm
- Woolworths Delacombe: 4,200 sqm.

Examples of recent developments in Melbourne's growth areas include:

- Coles Merrifield: 4,010 sqm
- Woolworths Kallo: 3,600 sqm
- Coles Woodlea: 3,690 sqm
- Coles Cobblebank: 3,600 sqm
- Woolworths Opalia: 3,800 sqm
- Coles Harpley: 4,500 sqm
- Coles Wyndham Vale: 3,800 sqm
- Coles Truganina: 4,000 sqm.

Two full-line stores would therefore more likely take up around 7,600-8,000 sqm of supportable supermarket floorspace, leaving around 2,450-2,850 sqm to be distributed across the three potential centres.

ALDI could be an opportunity within the NAC at a later stage under Scenario 2, absorbing around 1,600-1,700 sqm of the remaining supportable floorspace. This would leave a balance of only around 750-1,250 sqm for the two LCCs.

In summary, this analysis casts doubt on the ability for two full-line supermarkets to be attracted to the NAC while also ensuring that the community has good access to local shopping services by providing smaller-format stores within LCCs.

One potential eventuality is that the NAC will only attract interest from one of the major full-line supermarket operators, with the centre therefore likely to comprise one full-line supermarket and a mid-sized operator such as ALDI. Under this scenario the Eastern LCC may have a more significant role in serving the initial incoming population base given the expected staging of development.

An alternative is that the NAC will be able to support two full-line stores plus ALDI, but with the two LCCs likely to be much smaller, anchored by small-format stores of around 500-750 sqm.

Activity centre components

The potential to accommodate mini-majors and specialty stores has been examined with reference to Urbis Shopping Centre Benchmarks (2023) for shopping centres anchored by one or two supermarkets.

The benchmarks show that for single-supermarket centres the anchor supermarket typically accounts for around 60% of total centre floorspace, while for double-supermarket centres the anchor stores account for 52% of centre floorspace.

NAC floorspace recommendations

For the purposes of providing recommendations on the size of centres planned for the Ballarat North PSP it is assumed that 54% of centre floorspace at the NAC would be occupied by supermarkets under the adopted Scenario 2.

This translates to a recommendation provision for 6,300 sqm of mini-major and specialty retailing at the NAC, with another 940 sqm associated with “*non-retail specialties*”.

It should be acknowledged that these distributions refer to all such shopping centres across Australia, and therefore may not be relevant to an outer growth area within a regional centre context where a significant share of shopping on specialty goods is likely to be directed to Ballarat CBD and to Stockland Wendouree, both easily accessible from the PSP and likely to be close to location of work for many residents.

Based on our examination of Property Council of Australia shopping centre data, an appropriate allocation for specialty retailers within neighbourhood centres that contain two supermarkets is around 4,500 sqm.

This would represent an adequate provision in a market such as Ballarat North, especially given the limited mini-major opportunity which may comprise a large fresh food grocer, large-format liquor retailer or similar but is unlikely to attract interest from non-food mini-majors such as Best & Less or other apparel retailers.

The allocations shown in Table 11 of the Economic & Retail Assessment provide for the following distribution:

- Supermarket floorspace: 54%
- Mini-majors and retail specialties: 40%
- Non-retail specialties: 6%.

I note that it is unclear how the resulting recommendations are translated into the PSP which presents a recommended retail floorspace of 15,740 sqm: that is, the PSP guidance only relates to retail uses and should therefore exclude the non-retail specialty component identified in the Urbis report.

If the non-retail specialty component is excluded, the recommended retail floorspace would be 14,800 sqm rather than 15,740 sqm.

A further allocation of 2,500 sqm is recommended for other commercial uses (representing 14% of all recommended floorspace), some of which may be in the form of pad sites for convenience restaurants, service stations or car washes, or to

accommodate other types of uses such as medical services or childcare centres. This appears to be a suitable allowance, although actual floorspace outcomes will depend highly on the types of uses accommodated.

Assuming that the NAC attracts two full-line supermarkets (and possibly a third smaller supermarket) as per the Urbis analysis, a more appropriate distribution of floorspace is shown in Table 3 below.

I note my earlier comment that it may be challenging to substantiate this amount of supermarket floorspace, and therefore the total NAC size may be lower than indicated in the table if only one full-line store were to be secured.

Table 3—NAC modified centre components

Source: Deep End Services; Economic & Retail Assessment (Urbis)

NAC use type	Floorspace (sqm)	Retail %	Centre %	Total %
Supermarkets	8,500	65%	60%	51%
Other retail	4,500	35%	32%	27%
Total retail	13,000	100%	91%	78%
Non-retail uses – eg medical, gym etc	1,250		9%	7%
Total 'centre' uses	14,250		100%	85%
Commercial/pad sites/ etc	2,500			15%
Total activity centre	16,750			100%

The implication from the modified recommendations presented above is that the land area requirement for the NAC would be in the order of 4.0-4.2 ha rather than the 4.6 ha adopted in the PSP.

Eastern LCC

With respect to the Eastern LCC, the recommendation adopted in the PSP is for a centre containing 2.070 sqm of 'retail floorspace'

This is inconsistent with the Economic & Retail Assessment which provides for the following components:

- Supermarket: 1,200 sqm
- Mini-majors/specialties: 680 sqm
- **Total retail: 1,880 sqm**
- Non-retail specialties: 190 sqm
- **Total centre: 2,070 sqm**
- Other commercial uses: 1,000 sqm
- **Total activity centre: 3,070 sqm**

From the analysis and commentary presented earlier, the size of the Eastern LCC will be influenced by whether two full-line supermarkets can be supported within the NAC.

If the NAC were able to attract two full-line supermarkets, the opportunity within the Eastern LCC is likely to be lower than indicated in the PSP, likely comprising a smaller supermarket format of up to around 750 sqm, supported by a limited set of specialties (mainly in the form of convenience food and takeaway food) of around 500-750 sqm and some provision for other non-retail shopfront uses. A total allocation for retail floorspace would therefore be in the order of 1,500 sqm, plus (say) 500-1,000 sqm or so for a range of co-located non-retail and commercial uses.

A total centre size of 2,000-2,500 sqm would require in the order of 0.5-0.6 ha gross land area.

An alternative is for the Eastern LCC to play a greater role in providing early access to shopping services for people moving into the PSP, by retaining the designation of the centre as a location for a mid-sized supermarket of around 1,500-1,800 sqm. Under this scenario, the centre may also contain up to around 1,000 sqm of retail specialty floorspace, plus some co-located uses, with a total centre size of approximately 3,500 sqm requiring a land area of around 0.9 ha.

Northern LCC

The PSP is silent with regard to the potential Northern LCC, but nevertheless identifies it on an 'Expanded area framework plan' (PSP, Appendix 6), to be located at the intersection of Cummins Road and Garlands Road.

The Economic & Retail Assessment recommends, under Scenario 2, that the LCC provides for the following uses:

• Supermarket:	1,800 sqm
• Mini-majors/specialties:	1,070 sqm
• Total retail:	2,870 sqm
• Non-retail specialties:	280 sqm
• Total centre:	3,150 sqm
• Other commercial uses:	1,000 sqm
• Total activity centre:	4,150 sqm

Given the earlier commentary with respect to supportable supermarket floorspace across the PSP, and having regard to the proximity of Ritchies IGA at Miners Rest which is easily accessible via Sharpes Road/Garland Road, this appears to be an excessive allowance for the potential Northern LCC.

A scaled-back centre would be more suitable to this location, with a role in serving immediate day-to-day convenience purchases for people living east of Burrumbeet Creek.

An appropriate use mix would be a small-format supermarket of 500-750 sqm, supported by a limited set of specialties (mainly in the form of convenience food and takeaway food) of around 500 sqm and some provision for other non-retail shopfront uses. A total allocation for retail floorspace would therefore be in the order of 1,250 sqm, plus a small allowance of up to 1,000 sqm or so for a range of co-located non-retail and commercial uses such as medical centre, childcare, etc.

A total centre size of 2,000-2,500 sqm would require in the order of 0.5-0.6 ha gross land area.

The indicative framework plan should be adjusted to move the centre to a location along Muir Road, possibly opposite the identified community facility.

Summary

A summary of our concerns with regard to the PSP and the accompanying activity centre recommendations presented in the Economic & Retail Assessment are as follows:

- There is a requirement for a diversity of housing typologies which may not be easily achieved in a growth area context, especially in Ballarat where detached housing accounts for a large share of new development.
- The PSP adopts a significant affordable housing requirement including provision for social housing, without demonstrating that Ballarat North is an appropriate location at which to deliver housing for disadvantaged communities given the typical role that greenfield growth areas have in providing housing mainly for first home buyers, and the much wider array of support services available in established suburbs in central Ballarat.
- The analysis undertaken in the Economic & Retail Assessment is based on an incorrect NDHa and over-estimates population outcomes and total supportable supermarket floorspace.
- When correct population capacity analysis is undertaken, there is uncertainty about whether two full-line supermarkets plus a mid-sized format supermarket could be supportable within the NAC.
- The PSP identifies a recommended retail floorspace allocation of 15,740 sqm which is drawn from the Economic & Retail Assessment, but this figure includes allowance for non-retail uses and should be clarified/corrected.
- The report provides for mini-major and specialty floorspace within the NAC which is excessive given the centre's location in a growth area in regional Victoria and the likely flow of spending to Ballarat CBD and Wendouree.
- The land area allowance for the NAC could be excessive, and there should be flexibility built into the PSP to allow activity centre land to be converted into other more appropriate use if required (such as standard residential housing).
- Assuming that the NAC retains a large share of supportable supermarket development, the LCCs would have a lower-order role and their floorspace and land area allocation should be reduced.
- An alternative option (although not recommended) is for the Eastern LCC to be adopted as a location for early service delivery for people moving into the PSP, and expectations for the NAC lowered.
- Much of the Expanded Area is well served by the Ritchies IGA at Miners Rest, and the size and role of any centre in this location should be downgraded. The centre should be moved further east, and placed on the northern side of Muir Road to reflect the local community it will likely serve.

I trust that this commentary and analysis is useful at this stage, and I would be pleased to expand on any of these points if required.

Kind regards

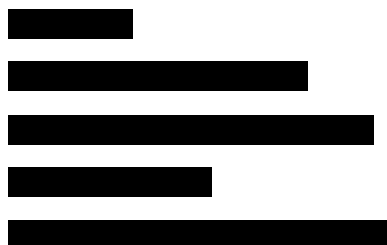
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Lot Size Trends – Greenfield

29/10/0224



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Greenfield Lot Size Trends- A focus on Ballarat

Introduction

This paper provides a summary of how lot sizes reduce in size over time for Greenfield markets. Findings are based on Greenfield data collected from the 5-Capital Greenfield markets from 2008 through to 2024.

5-Capital Greenfield market defined

The 5-Capital Greenfield market is the aggregate of Perth, Adelaide, Melbourne, Sydney and Southeast Queensland Greenfield markets. The 5-Capital data set will be used in this report to highlight headline trends regarding the rate of lot size consolidation.

Key Findings

1. The median lot size for a Greenfield market will reduce over time.
2. The average "normal" rate of consolidation for the median lot size is 2.3m² per quarter.
3. Accelerated rates of consolidation are generally in response to very strong market conditions.
4. Prolonged periods of higher-than-normal rates of consolidation will result in a prolonged period of minimal consolidation.
5. Forcing the market to adopt a higher rate of consolidation, will minimize the effectiveness of the product range to respond to future periods of affordability.
6. Ballarat's current median lot size is 460m².
7. Ballarat's rate of consolidation over the past 5-years has been 4.3m² per quarter, 255% higher than the national normal rate.
8. Ballarat's median lot size has on average been 33% bigger than the Melbourne median lot size.
9. If Ballarat is to adopt a 20 dwelling per hectare metric, this would be 13 years ahead of market trend and 6% smaller than Melbourne's current density.

Summary

The primary role of a Greenfield market is to respond to demand in a timely and affordable manner. A key component in achieving this objective is making sure the product range responds to the needs and expectations of the market.

It is understood that expectations and needs change over time, therefore the product range will also need to change. The important thing, is to understand at what speed or rate should the product range change? Is there an optimum rate of consolidation? What happens if the product range changes too quickly? Can you force the market to change quicker than normal?

Generally a new Greenfield market will begin its life employing a product range that aligns with the current market's expectations. Expectation is shaped by the profile of the established housing market [existing housing types and lot sizes], the types of homes being offered by the building sector, lifestyle choices [domestic urban, coastal, regional etc.], future supply levels and location of the supply [how far away from established stock, topography and trading life of zoned supply], to name a few.

Unless a Greenfield market is coming to the end of its life, the rate of consolidation should move in line with changing market expectations. The normal rate of consolidation that represents this changing expectation is 2.3m² per quarter. Ballarat's rate has been 4.3m² per quarter.

For Ballarat to adopt a 20 dwelling per hectare density [340m²], it would be fast tracking the density by 13 years i.e. it would be adopting a density target that is expected to be market acceptable by 2036. Additionally, it would be employing a density that is greater than the current Melbourne Greenfield density, which would be in opposition to the long standing relationship between Melbourne and Ballarat land sizing.

Metro Greenfield Lot Size Reduction Trends – 5 -Capital

As at Q4-2008 the median lot size for the 5-Capital was 543m². The current [Q3-24] median lot size for the 5-Capital Greenfield market is 393m².

The 5-Capital Greenfield median lot size has been reducing at a rate of 2.3m² per quarter. A consolidation rate of 2.3m² is considered to represent a “normal” rate of consolidation.

Figure 1 shows the actual median lot size, and the forecast median lot size based on the application of the “normal” consolidation rate of 2.3m² per quarter.

It is estimated that the median lot size for the 5-Capital Greenfield market will be 340m² by 2030 or 20 dwellings per hectare.

Figure 1: 5-Capital Greenfield median lot size [actual and forecast]

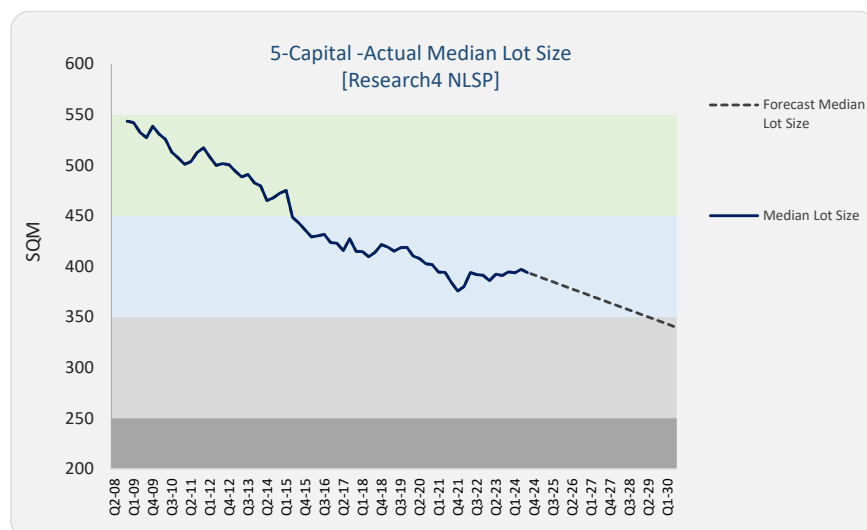
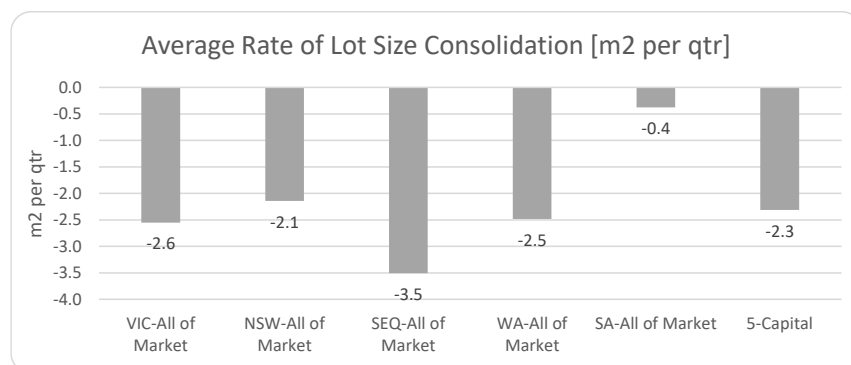


Figure 2: Average rates [2008-2024] of lot size consolidation by metro Greenfield market



Most metro Greenfield markets have recorded similar rates of consolidation.

The SEQ Greenfield’s high rate of 3.5m² per quarter was driven by the inclusion of the Logan submarket into the urban Greenfield supply plan in 2015. Prior to this it was a regional Greenfield market and now its SEQ’s largest Greenfield.

Adelaide’s low consolidation rate is a response to a prolonged period of weak demand.

Case Study – Accelerated Consolidation Rate [Perth Greenfield]

The Perth Greenfield market from 2012-2015 recorded strong levels of demand relative to supply which was triggered by the mining boom at the time.

This market setting triggered a rapid reduction in the markets median lot size in response to a loss of affordability and supply. The rate of consolidation over this period was to 5.5m² per quarter, 128% above the normal rate of consolidation.

Figure 3 compares the actual median lot size for Perth from 2008-2024 and the modelled median lot size [based on applying the national normal rate of consolidation to the Q4-2008 median lot size].

Figure 3: Perth median lot size [modeled and actual]

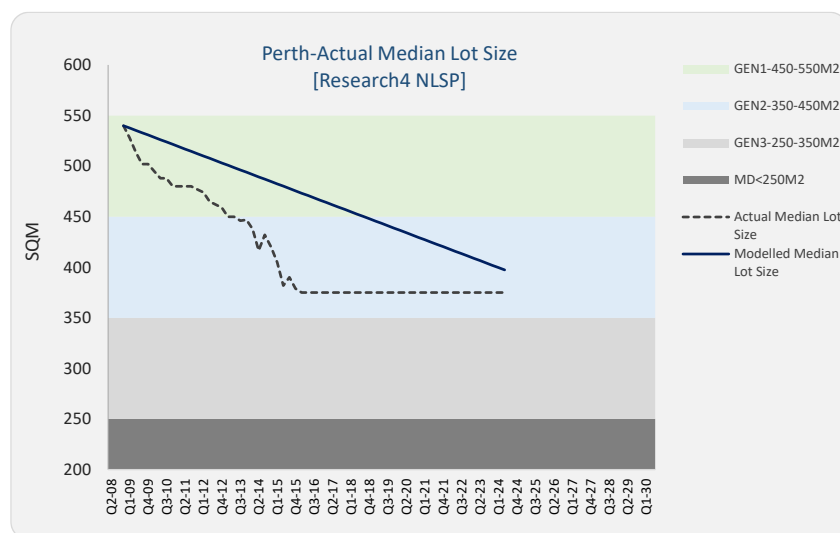


Figure 3 highlights the market reality that when the rate of consolidation is too aggressive, it will then need to experience a period of correction. The duration of this correction will depend on the margin between what the market should have done and what was actually done.

E.g. Perth median lot size as of 2016 was 375m², it should have been 473m². As a result it was technically 10.7 years ahead of market trend [473-372=98/2.3m² per qtr.=42 quarters or 10.7 years]. The fact that the median lot size has not moved for the past 8 years is evidence of this market reality, that you cannot fast track market expectations unless during a period market crisis.

A result from consolidating the product range ahead of trend is to minimize the potential to bring on smaller lots during future periods of higher demand. **Forcing the market to adopt a higher rate of consolidation, will minimize the effectiveness of the product range to respond to future periods of affordability.**

Smaller median = less affordable product

For a Greenfield market to successfully respond to the full spectrum of demand it needs a product range capable of delivering not only Core product, but affordable and premium product. This product range is often referred to as the “Supply line of Aspiration”

As a Greenfield’s median lot size reduces it narrows the product range, i.e. there is less stock positioned below the Core product offering. This narrowing of the supply line means that during periods of strong demand more affordable product cannot be brought on as the smaller land lots are already priced and positioned to meet Core demand.

Greenfield density changes in line with the overall total supply balance of the market. A Greenfield market will move into micro or townhome allotments when there is no further wholesale supply. If a Greenfield market has a wholesale supply of land, then the rate of consolidation needs to move in line with market expectations.

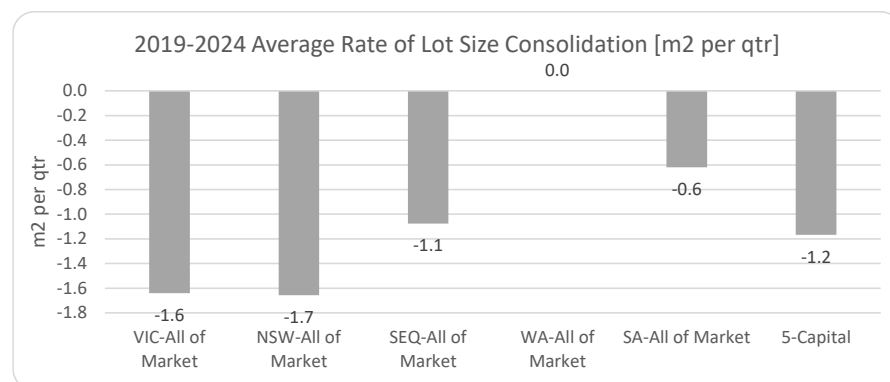
Ballarat median lot size and consolidation rates

Data pertaining to the Ballarat Greenfield market is limited to the past 5-years, due to the fact that this market was a late inclusion to the National Land Survey Program.

Since 2018, the median lot size for Ballarat has been reducing at a rate of 4.3m² per quarter. This is well above the 5-Capital normal national rate of 2.3m² per quarter.

Comparing the 5-Capital past 5-year average [1.2m² per qtr.], with the Ballarat past 5-year average of 4.3m² per quarter shows a dramatic fast tracking of consolidation across the Ballarat Greenfield market.

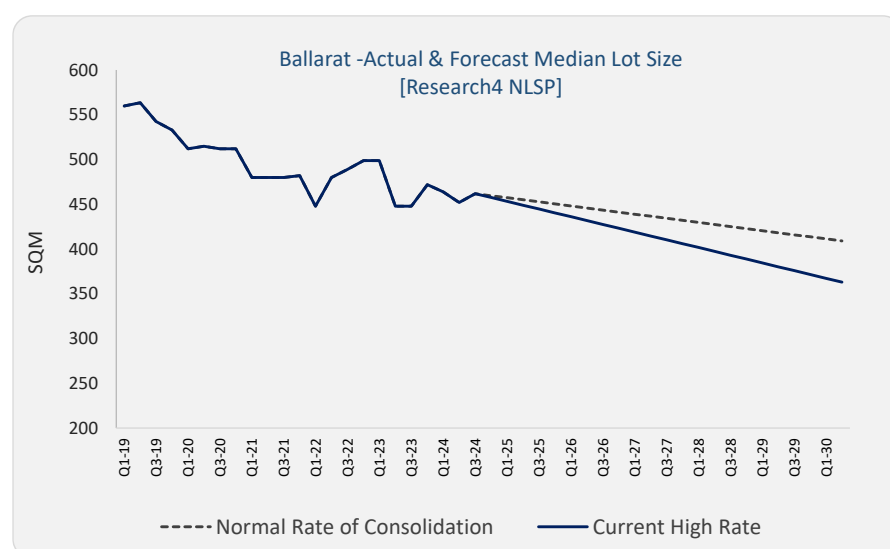
Figure 4: 2019-2024 Average rates of lot size consolidation [m² per Qtr.]



The fact that Ballarat's median lot size has been reducing at rate 255% times faster than the 5-Capital market rate, highlights the lack of supply relative to demand over the past 5-years, rather than the market having a greater preference for smaller lots. High rates of consolidation are symptomatic of low supply levels and a lack of affordability at a point in time. It is important not to confuse this with market desirability. Ideally, it is better to provide sufficient supply which in turn minimizes the impact of any spike in demand.

Figure 7 shows the actual median lot size for Ballarat since 2019, and the forecast median lot size based on applying the 5-Capital average consolidation rate of 2.3m² per quarter and the current Ballarat rate of 1.3m² per quarter.

Figure 5: Ballarat Median lot size actual & modelled run down



5-Capital “Normal” Rate: Employing the above logic which reflects market realities would see the current median lot size of 460m² reduce to 409m² by 2030.

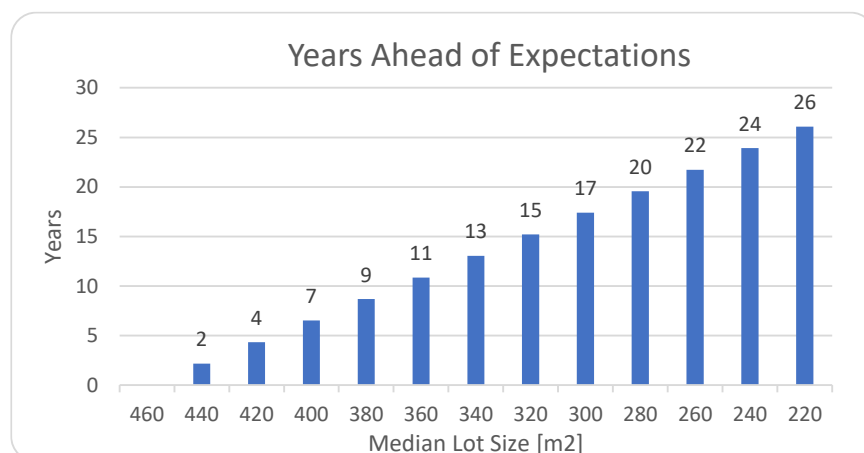
Ballarat's High Rate: Assuming Ballarat continues to consolidate at 4.3m² per quarter, by 2030 the median lot size would be 5-years ahead of market expectations.

The following chart [figure 6] shows the modelled number of years ahead of market expectations based on different median lot size scenarios as at Q3-2024.

The current median lot size is 460m² which represents current market expectations. If the median lot size was reduced to 340m², then the density would be 13 years ahead of Ballarat's current market expectations.

Another way at looking at Figure 6, is that a median lot size of 340m² is likely to best represent Ballarat's market expectation in the year 2037.

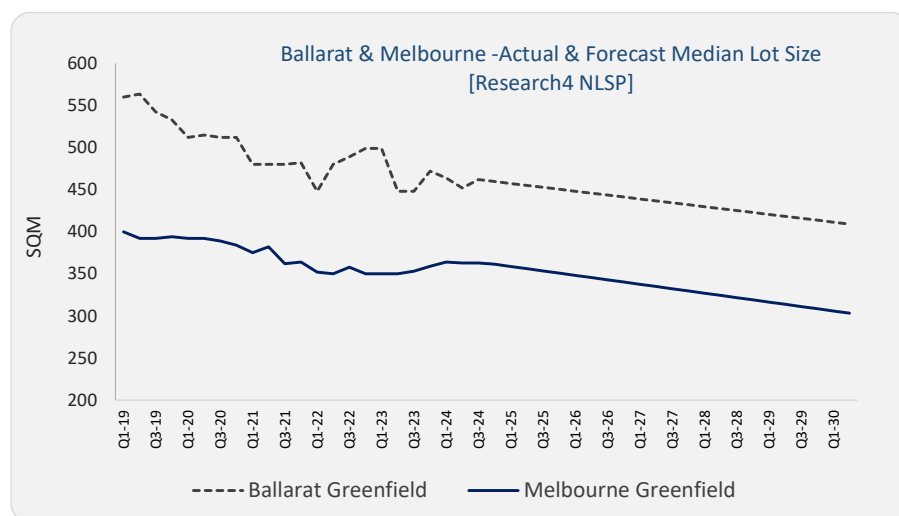
Figure 6: Sensitivity, based on median lot size as at Q3-2024 and Years ahead of expectations



Ballarat & Melbourne Greenfield median lot size comparison.

Since 2019, the Ballarat median lot size has been 33% larger than the Melbourne median lot size. Lot sizing is a factor of geography, with regional markets generally having a larger allotment when compared to the supporting metro Greenfield market. This difference is an accepted occurrence, as it reflects the rural setting and the relative level of demand between the two markets.

Figure 7: Ballarat & Melbourne median lot size and forecast



Melbourne has been reducing at a rate of 2.6m² per quarter since 2008. Figure 7 shows how the median lot size is likely to reduce assuming this rate continues. By 2030, the median lot size for Melbourne would be 305m². As of 2030, for Ballarat to be 33% larger than Melbourne, its median lot size would be 406m².

If Ballarat's median lot size was to reduce too 340m², then this would be equal to Ballarat lot sizing being 6% smaller than the Melbourne median lot size as at Q3-2024. The comparison with Melbourne provides a reasonableness test when it comes to setting density targets for any regional market. A regional market is unlikely to have a density that is greater than its supporting metropolitan Greenfield market, if it does, then it is likely to experience a degree of market failure.

[end of summary paper]