Attachment - Item 9.3.1(a)

Policy No.:	HS008	HS008– ***Memorials Policy***
Review Date:	September 2017	
Revision No.:	0	
Policy Manual Version No.:	1	
Adopted by:		**Date: September 2014**

1. Purpose and Scope of the Policy

The Moorabool Shire Council ("Council") recognises that members of the community may wish to use public open space to commemorate a person or group of people through a memorial or plaque.

This policy has been established to provide guidance for the Council for memorials recognising people or groups of people within the Council's public open space/Local Government land.

The policy has been developed acknowledging that, whilst memorials can enrich public spaces and are important for particular individuals and groups of people, they also need to be carefully considered to ensure they do not negatively impact on these spaces.

2. Definitions

Applicant/Donor – A person or group who propose the installation of a memorial.

Local Government Land - Land owned by a council or under council's care, control and management.

Memorial – Park furniture (i.e. park bench, seat or picnic setting), garden, art works, artefacts, tree, stone/rock or etched paving designed to preserve the memory of a person or group. This may also include memorials in the interior of buildings i.e. Halls. Memorials may also include donations to build facilities (i.e. clubrooms) as a memorial to a community member.

Plaque – A flat tablet of metal or other durable material which includes text and/or images that commemorate a person or group of people.

Public Open Space – includes community land, road reserve and operational land owned by Council and any other land in Council's care, control and management.

Road – For the purposes of this policy, the definition of a "road" is as per Section 4 of the Local Government Act 1999, being:

"a public or private street, road or thoroughfare to which public access is available on a continuous or substantially continuous basis to vehicles or pedestrians or both and includes –

(a) a bridge, viaduct or subway; or
(b) an alley, laneway or walkway."

3. Process

3.1 All requests for memorials must be made in writing to the Chief Executive Officer in accordance with conditions in 3.5 below:

3.2 All applications must be relevant to the Moorabool community and where relevant be in accordance with a master plan

3.3 All applications and approvals must be considered in accordance with this policy.

3.4 Applications for new memorials should include:

- The type of memorial requested;
- Where possible, three feasible sites/locations for consideration;
- Explanation of the significance of these sites;
- Where relevant, provide evidence that the memorial has been approved by the appropriate Committee of Management
- Proposed text for the plaque (if appropriate);
- Any other pertinent information; and

3.5 An internal assessment panel will assess the applications and will include officers from Community Development and Infrastructure. Other relevant officers will be included on the panel when relevant, i.e. Recreation Officer for memorials on reserves. The internal assessment panel will provide a briefing to the Executive Group on the outcomes of the assessment for review and the Chief Executive Officer will provide the final approval.

3.6 Approvals must be sought and granted prior to the installation of memorials/plaques. Where a Memorial of less than $5,000 is to be installed in or at a Council facility managed by a Committee of Management, the Committee of Management can determine the project scope and cost. Where a Memorial of more than $5,000 is to be installed, the Council Infrastructure Department will determine the scope and cost. Once the scope of works and budget is confirmed, a written commitment to fully fund the project must be supplied by donor.

3.7 Approval or refusal of these applications will be made by the Chief Executive Officer

3.8 The applicant must make full payment upon approval of the application.

3.10 If the application falls outside these policy guidelines and the applicant wishes to pursue the matter then it may be referred to the Council for consideration.

3.11 If the application is not approved, reasons for this will be communicated to the applicant.

4. Costs

4.1 All costs incorporating supply and installation of the memorial are to be borne by the applicant.

4.2 All ordinary maintenance costs are at Councils expense however no additional maintenance will be undertaken outside of existing budget and service levels. Where Memorials are installed in or at Council facilities managed by a Committee of Management, the Committee may contribute in kind labour to maintain the Memorial.

5. Plaques

5.1 The size of plaques to be affixed to park infrastructure should fit appropriately on the infrastructure with the text and size of the plaque to be approved as part of the application process.

5.2 Plaques will be made of a durable material and be consistent across the municipality. Options available will be dependent on location of the memorial according to reserve hierarchy and other considerations such as exposure to the elements.

5.3 Any costs associated with any replacement plaque needed for the memorial item shall be the responsibility of the applicant/donor.

6. Lifespan

6.1 The Council cannot guarantee that a memorial will be preserved or remain at the site indefinitely. For park furniture or paving the life span of the memorial will be approximately 10 years. At this time, the Council will make every attempt to make contact with the original applicant as recorded in the register to discuss the possibility of a right of renewal. Consideration may be given to individual memorials that have a historical legacy beyond the ten years. These will be assessed on a case by case basis by the assessment panel.

6.2 If a reserve is to be redeveloped, then every attempt will be made to contact the applicant or family members to advise that the reserve is to be redeveloped. The life of the memorial will cease at the time of the reserve redevelopment no matter what the asset life/memorial age is and the family/applicant will have the option to install a new memorial in line with the policy and proposed design standards for the reserve.

6.3 If a memorial is removed due to reserve redevelopment and contact can be made with next of kin the family will be offered the removed memorial seat and/or plaque for their use.

6.4 Should a piece of park furniture housing the memorial be vandalised beyond repair it will be deemed to be at the end of its useful life and the Council will make every attempt to make contact with the applicant to inform them of this. If the applicant wishes to renew the memorial, they will need to lodge a new application.

6.5 Should the applicant wish to renew the memorial and this is acceptable to Council, then the asset and plaque (if required) will be replaced at the applicants cost.

6.6 In the case of a memorial tree, there will be no right to renewal should the tree die after one year. The applicant will need to lodge a new application for a new memorial tree after this time.

6.7 Plaques depending on their material will have varying life spans however the applicant/ donor will be responsible for their renewal.

6.8 All reserve Master Plans/Concept Designs will need to consider the memorials that exist within the reserve in redeveloping the reserve as per 6.2 above.

6.9 This Policy will be not be implemented retrospectively for permanent memorials already in the community, i.e. memorials in Federation Park.

7. Maintenance

7.1 The costs for the replacement of a plaque will be borne by the applicant if it needs replacement at any time.

7.2 Upon the completion of 10 years, should the applicant wish to pay for the renewal of a 'like' piece of park furniture and all associated costs, they can discuss this with Council staff at the time if appropriate for the setting.

7.3 Maintenance service levels in respect to memorials will be the same as the other assets of a similar nature across the Council area.

7.4 Council reserves the right to remove a memorial if it falls into a state of disrepair or remove a memorial after the expiry of 10 years.

8. Register

8.1 Upon adoption of this policy, the Council will keep a register of memorials including the type and detail of the memorial and contact details for next of kin. Once installed Council Officers are to ensure all databases/asset registers are up to date to ensure appropriate maintenance and management.

8.2 It will be the responsibility of the applicant/donor to update their contact details with the Council in order for the Council to make contact regarding the memorial if required.

9. Public Safety

9.1 The design and placement of a memorial should not present a safety risk to pedestrians, cyclists or vehicles.

9.2 Council may conduct a risk assessment where public safety issues are identified.

9.3 Council reserves the right to relocate memorials to suitable nearby locations where there is deemed to be a safety issue with the location and placement of the memorial. In doing so, every attempt will be made to do this in liaison with the applicant/donor of the memorial.

10. Other

10.1 In the instances of existing memorials installed prior to the date of this policy, which subsequently require removal, every effort will be made to contact next of kin prior to such removal. Replacement will not occur if no contact can be made with the initial donor.

10.2 All memorials existing within the Shire prior to the adoption of this policy will be subject to the provisions of this policy.

10.3 Memorials should be consistent with the Master or Strategic Plan for that location.

10.4 All memorials and plaques placed in Council owned and managed land will be under the care, control and management of Council.

10.5 Any paraphernalia or belongings such as flowers, photos, balloons, streamers or similar that may be placed in proximity of a memorial shall be removed after 30 days and disposed of by Council.

11. Review

This policy will be reviewed every three years.

12. References

(example)

Dept	Community Services
MSC	Moorabool Shire Council

Attachment - Item 9.3.1(b)

Attachment 2: Memorials Policy Community Engagement Feedback

Contact	Feedback	Officer Response
Submission from Maddingley Park Committee of Management	1. A general comment is that the policy is broad and decision making power of Section 86 committees has shifted. For COM to feel more included we recommend 3.1 is reworded to state "All requests for memorials must be made to the Chief Executive Officer, in accordance with conditions in 3.5 below." The addition of this wording would ensure committees of reserves are involved early in the process, and avoid applications being sent to the CEO without going through the appropriate process. 2. Memorials (as per definition) shouldn't be limited but should be anything that the community wants and interests the community. Needs to be broadened to accommodate substantial donation like paying for new clubrooms.\ 3. Memorial has to be useful i.e. for Maddingley Park it would have to be already identified in the Master Plan as something needed e.g. restoration of the sundial, or replacement fountain. 4. Plaques (point 4). Plaques can be affixed to more than furniture. For example, a newly planted tree could have a guard around it with the plaque affixed. When the tree grows to a certain size the plaque could be affixed to the tree. 5. Process (point 3.2). Committee recommend this point be removed. There should be no need to prove a significant contribution. 'Appropriateness' can be decided by the panel involved in the decision. Committee believes that a family wishing to make a financial contribution to the park should not be 'judged' on their contribution to the community.	1. Wording of 3.1 changed to reflect feedback. 2. Definition of memorials updated to reflect this feedback. 3. The definition of memorial includes park furniture etc, memorials may also be plaques etc. 4. Wording adjusted, only refers to infrastructure, not furniture. 5. Changed to reflect feedback 6. 4.2 and 3.6 updated to include Committee of Management involvement

	6. The 'tone' of 3.6 to 4.2 run the risk of discouraging and excluding volunteer labour so a balance is needed here. For example, FoMP raised funds through donations to replace two much needed seats in the park. Need and choice of seat were identified in the Master Plan. FoMP members coordinated the whole project in consultation with the Recreation Team. Current wording doesn't encourage or even permit volunteer involvement in reserves.	
Submission from - Joan Howells	• There are two points in the policy that I would like to comment on: 1. Purpose and Scope -"Memorial or plaque which enhance the wellbeing of the community" 2. All applications must demonstrate a significant contribution the deceased made to the wider community" **Point 1** Unless someone was building a park or play ground or building you would be hard pressed to say a Memorial or plaque enhances the wellbeing of the community. Therefore does this equate to only the very wealthy could have a memorial or plaque? **Point 2** What is a significant contribution to the wider community? How can this be me asured? Is it just a monetary? • <u>Suggestions</u> **Tier 1** Minor plaques, an example could be the type of plaque I am requesting., a small disc that can be placed on a plank on a park bench. **Tier 2** Intermediate, larger plaques, signs small statues etc **Tier 3** Major, statues, play grounds, parks, buildings etc	1. Wording removed as per feedback 2. Wording of 3.1 changed to reflect feedback.

	Minor Tier Family requests • Intermediate and Major The scope would obviously have to be more rigorous.	
Have your Say	This is an appropriate and useful draft policy. 6.9; I believe the non-replacement should be retrospective, although this could be addressed under section 10.2. 7.4; If the applicant has been advised of the disrepair within the 10year timeframe, with no action, then I believe that it still should be removed. 10.5; Terrific - I trust this section of the policy will apply to the inappropriate, recent memorial to a local person placed in Maddingley Park. It is an embarrassment to the BM community to have such a negative culture celebrated in an uplifting, positive public asset.	1. These comments have been reviewed and the point 6.9 in the final Policy will remain the same as Officers position is that the Policy should not be applied retrospectively. As stated there are other areas in the Policy that will address this issue. 2. Point 10.5 will be implemented appropriately and sensitively in consultation with relevant community members
Have Your Say	I support this policy, in particular the grounds for approval, which should be based on the contribution the deceased made to the wider community as set out in 3.2. However, there is no expansion on this point, so what would constitute a "significant contribution" how would this be measured/assessed.	Point 3.2 has been changed due to feedback about this wording.
Have Your Say	The draft Memorials Policy is a great document and allows the community to remember in an appropriate and tasteful manner while improving our parks and public spaces. I do however believe that 7 days is too short a period to remove flowers etc left by the community after the loss of a loved one. A more reasonable time frame would be minimum 30 days.	Point 10.5 has been changed to 30 days in response to this feedback.

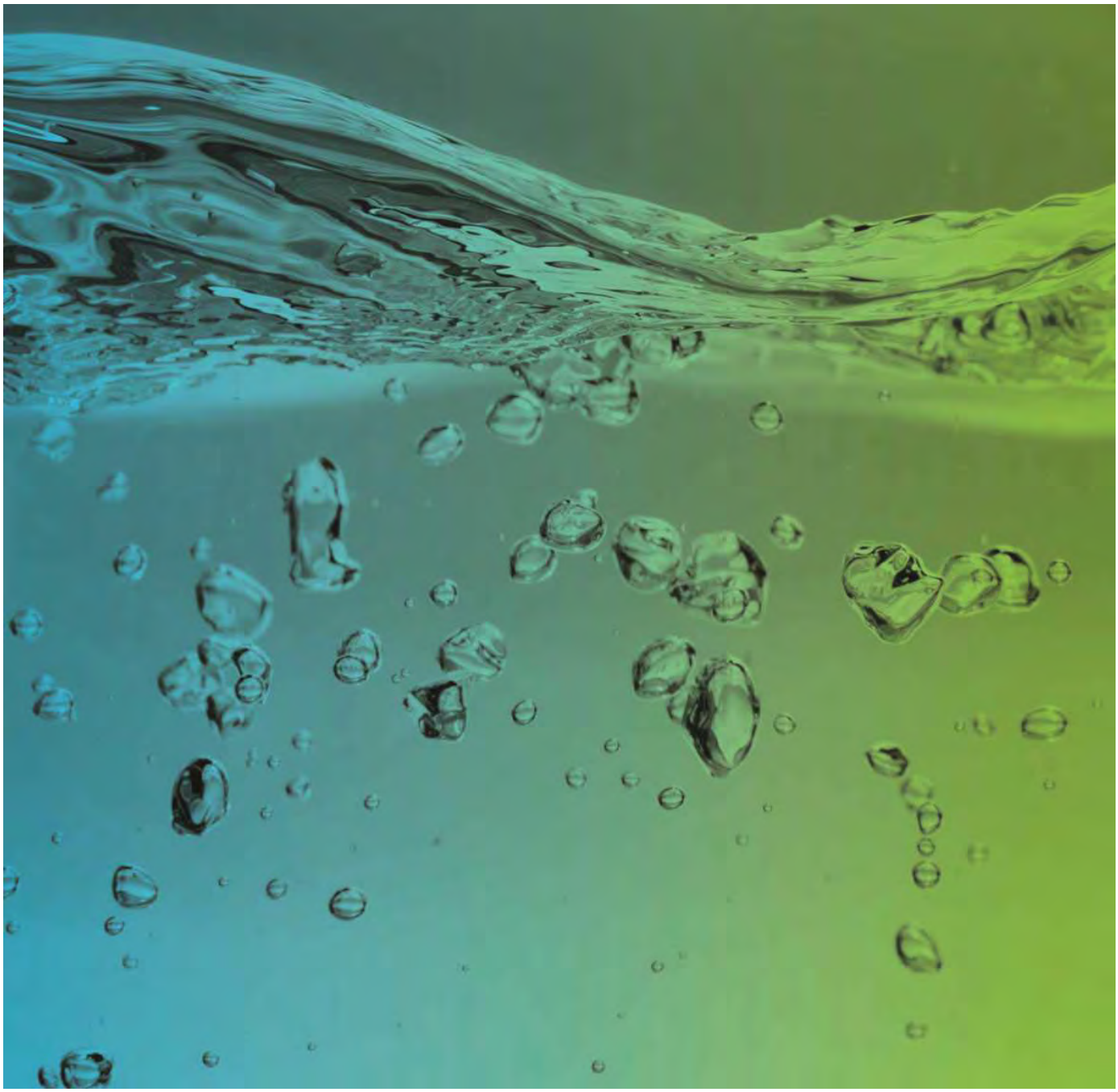
Attachment - Item 9.4.2

AECOM

Moorabool Shire Council
19-Sep-2014

Small Towns: Bungaree, Dunnstown and Wallace

Services Study



Small Towns: Bungaree, Dunnstown and Wallace

Services Study

Client: Moorabool Shire Council

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Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
D	02 July 2014	Draft for Client Review	N. Kerr Project Manager	
B	02/09/14	With Client Comments	N Kerr Project Manager	

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Executive Summary

Moorabool Shire Council (MSC) engaged AECOM to prepare a planning and engineering study to assess the opportunities, challenges and viability of providing reticulated utility services to the three townships of Bungaree, Wallace and Dunnstown in order to sustainably develop land. While the western portion of the MSC has historically struggled to attract significant growth, a number of townships are ideally positioned for future development due to their increasing proximity to Ballarat and Melbourne. Wallace and Bungaree in particular are positioned close to both the Western Highway and the Melbourne-Ballarat railway. The Regional Rail Link project is likely to provide another significant driver for growth in the near future.

Compromising the opportunities for growth are the location of these towns within the Lal Lal Water Supply catchment and the absence of reticulated sewerage which has prevented the subdivision of smaller and medium sized lots.

Dunnstown residents currently rely on rainwater tanks for their water supply and the close proximity of the township to Ballarat has resulted in the community wanting MSC to investigate the feasibility of connecting to a reticulated water supply.

A similar driver exists for the investigation of the provision of gas to Bungaree. Wallace currently has reticulated gas through the historical construction of a gas transfer main to service the old butter factory. The gas transfer main runs in close proximity to Bungaree and could potentially supply the township.

This report looks in detail at each of the servicing options with the selection of the preferred strategies based upon engineering analysis and costing to inform future funding applications (nominally DTF) and to enable detailed design of the preferred options as required.

The planning and engineering study includes the following items:

- Land Use Planning and Community Facility Analysis
- Desktop Geotechnical Study
- Stakeholder consultation
- Servicing options for sewer (Bungaree and Wallace), water (Dunnstown) and gas (Bungaree).
- Funding Options

The project explored multiple servicing options through a number of project stages, which were then refined into preferred options. Consultation was undertaken with Central Highlands Water in terms of existing infrastructure constraints including location and capacity restraints and agreement of reasonable growth limits. This significantly influenced the sewerage treatment servicing options due to current capacity restrictions in the Ballarat sewerage network.

A multi-criteria analysis and preliminary costing were then developed for the preferred options. Further refinement to represent a staging approach to development was applied and a proposed scope and capital expenditure with funding options produced. A summary of each of the preferred servicing options is included below in

Table 1.

Table 1 Summary of preferred servicing options

Item	Description	Approximate Cost
Sewer Option A Stage 1 – Bungaree 1,000 population		
Collection and Transfer	- 200 mm diameter rising main from Bungaree to Ballarat pump station. - Main pump station and storage tank in Bungaree - Gravity collection systems in Bungaree with local rising mains where required.	CAPEX *$6,773,302*
Disposal/ Reuse	It is proposed that the sewage will be conveyed to the Ballarat WWTP will it will be treated and disposed of/ reused.	
Sewer Option B Stage 1 – Bungaree 500 population allace 500 population		
Collection and Transfer	- 200 mm diameter rising main from Bungaree to Ballarat pump station. - Main pump station and storage tank in Bungaree - Gravity collection systems in Bungaree - Gravity collection systems in Wallace - Main pump station and storage tank in Wallace - Wallace to Bungaree transfer rising main	CAPEX *$9,212,452*
Disposal/ Reuse	It is proposed that the sewage will be conveyed to the Ballarat WWTP will it will be treated and disposed of/ reused.	
ater Dunnstown		
Gravity Transfer Main	Connect to the existing Central Highlands Water supply tank, located on Mahers Road, approximately 4 km north of Dunnstown.	CAPEX $1,739,000
Gas Bungaree		
SP AusNet Gas Network	Extension of existing SP AusNet gas infrastructure located to the east of Bungaree.	$4.1 – 4.5 million
Decentralised System	Feasibility of a decentralised alternative, such as supplying LPG gas to tanks located within the town.	$152,500 per year

This report provides a summary of the scope of works, options analysis and refinement, and costing. The background reports (including costing, assumptions and figures) which support these finding are included as Appendices.

1.0 Introduction

Moorabool Shire Council (MSC) engaged AECOM to prepare a planning and engineering study to assess the opportunities, challenges and viability of providing reticulated utility services in order to sustainably develop land in the three townships of Bungaree, Wallace and Dunnstown.

MSC is located between two major urban centres – Greater Melbourne which is approximately 85 km to the east and Greater Ballarat which is approximately 15 km to the west of the studied towns. Bungaree, Wallace and to a lesser extent Dunnstown are connected to these major cities via the Western Freeway. The populated areas of Wallace and Bungaree are approximately 4 – 5 km apart; Dunnstown and Bungaree are approximately 6 km apart and Wallace and Dunnstown are about 10 km apart.

Figure 1 shows the location of Bungaree, Wallace and Dunnstown within the MSC. It also illustrates the proximity of the study area to Melbourne and Ballarat, and the transport links between them.

Figure 1 MSC and sub ect towns

2.0 Scope of Works

The planning and engineering study includes the following items:

- Land Use Planning and Community Facility Analysis (refer to Section 3.0)
- Desktop Geotechnical Study (refer to Section 4.0)
- Stakeholder consultation (refer to Section 5.0)
- Servicing options for sewer, water and gas. The scope of servicing options considered as part of the project is summarised below in Table 2. Refer also to Sections 6.0, 7.0 and 8.0.
- Investigation of funding options (refer to Section 9.0)

Table 2 Scope of servicing study

Service	Bungaree	allace	Dunnstown
Sewer	✓	✓	
Water			✓
Gas	✓		

The overall study has been divided into a number of phases which include:

- **Stage 1A** - Preliminary Design of Options to "determine the most feasible servicing strategy options for each of the townships." Stage 1 tasks include:
  - Gather and review background data
  - Identify servicing constraints and opportunities
  - Planning and population review
  - Develop servicing concepts
  - Prepare and issue background, issues and options report
- **Stage 1B** - Stakeholder consultation
- **Stage 2** - Design and final reports

3.0 Land Use Planning and Community Facility Analysis

As part of the Small Town Services Study, AECOM prepared a land use planning and community facility analysis to identify the potential population capacity of Bungaree and Wallace based on the provision of existing community facilities. Using this information AECOM then developed an urban development scenario as a theoretical concept for urban growth to inform and assess the feasibility for providing reticulated sewerage infrastructure in Bungaree and Wallace.

The land use and community facility analysis considered:

- Community facilities and their capacity to support population growth
- Current demographics and future population projections
- State, regional and local planning policy and controls
- Land use constraints that influence opportunities for urban growth
- Land use opportunities where urban growth could be located.

The information and conclusions presented in the analysis are based on a desktop review of published information only, were prepared to only to inform the feasibility of providing reticulated sewerage in Bungaree and Wallace, and should be viewed as indicative only. They are not intended for use as a Structure Plans. We note that before urban growth occurs that further and more detailed targeted planning and community consultation, including (for example) a market analysis, environmental studies and land capability assessment and the like should be undertaken by Council.

Current State, regional and local planning policy state that the dwelling density in Declared Special Water Supply Catchment areas should not exceed 1 in 40 hectares, where land use for a dwelling, subdivision or development of land requires a planning permit. This policy has historically prevented the growth of Bungaree and Wallace. The exception to this rule is where an approved Domestic Waste Water Management Plan allows for interim urban development without the provision of reticulated sewerage. It is understood that Council and Central Highlands Water may reach an agreement to allow for some residential urban growth without reticulated sewerage in accordance with an approved Domestic Waste Water Management Plan, until such time that reticulated sewerage can be provided.

Council is seeking to encourage future residential urban growth in Bungaree and Wallace. Council is seeking to encourage growth to support the funding and viability of local community services and facilities. This planned growth is consistent with the vision set out in the recent Draft Central Highlands Regional Growth Plan, 2013.

The land use and community facility analysis identified the potential population capacity of each town based on existing community facilities, and it has identified potential areas where each town could grow based on available information. The analysis estimated that the community facilities in Bungaree and Wallace could support a combined population of approximately 8,000 people before Council will need to expand these facilities. However, it was agreed that within the confines of the design life of the proposed infrastructure it was unreasonable for this study to use such a high figure for the estimation of servicing option requirements and a figure of 6,000 population was agreed for use within the high level servicing comparison.

Council were also concerned that the proposed infrastructure should also not be limited in capacity should higher than normal growth rates be experienced. An additional criteria was therefore added to the multi criteria analysis to favour any option which could be easily scaled up to accommodate increased growth rates. Council further considered the shorter term population and population growth rates for Bungaree and Wallace. A more realistic population for Wallace and Bungaree short/medium term is 1,000 people per town, with the capacity to grow beyond this if demand was apparent. Council sees this as a two stage process reflecting likely growth scenarios for both towns. Stage 1 was designed to accommodate a total of 1,000 population either totally within Bungaree, or split equally between Bungaree and Wallace, and then subject to development uptake population growth would be encouraged to increase to 2,000 population (Stage 2) across both towns limited to 1,000 population per town. This aligns with CHW's current infrastructure constraints and future upgrades. Using a design horizon of 50 years it was agreed that the relevant sections of the sewer servicing infrastructure be sized as follows:

- Reticulation systems within each town – maximum 1,000 per town (to be upgraded by development should demand be there)

- Wallace to Bungaree rising main and pump station – 3,000 population
- Bungaree to Ballarat rising main and pump station – 6,000 population

To help inform the feasibility study for reticulated sewerage AECOM also identified the location of potential urban growth areas.

4.0 Desktop Geotechnical Study

A desktop study of available geological and geotechnical information was completed for the project. The study provides desktop geomorphological and geotechnical commentary regarding anticipated conditions and hazards that may influence sewerage, water supply and gas supply service decisions for input into the broader population growth constraints assessment.

This desktop geotechnical study (refer to Appendix B) was undertaken with reference to the following:

- Possible installation of a reticulated sewerage system for both towns. Two (2) options were considered as part of the study:
  1) Connect both towns into existing Ballarat sewage network (to the west/ northwest of the three towns).
  2) Construct a standalone sewage treatment plant immediately to the south of Bungaree.
- Possibly connect Dunnstown to the existing reticulated water supply pipeline which runs east/west, just south of Bungaree. Bungaree and Wallace are already serviced with reticulated water.
- Possibly connect Bungaree to existing mains gas supply.

The findings of this study were used to influence the costing of all pipelines of the recommended infrastructure.

5.0 Liaison with Stakeholders

A Project Control Group (PCG) was established upon the commencement of the project consisting of key stakeholders from MSC, Central Highlands Water and AECOM. The PCG met at several key points throughout the project including:

- Kick-Off Meeting – October 2013
- PCG Meeting to Review Constraints mapping Results – December 2013
- Presentation to Council – April 2014

  The presentation included an overview of the feasible servicing options and the Land Use Planning and Community Facility Analysis, including constraints and opportunities. The presentation highlighted that community facilities in Wallace and Bungaree could sustain 8,000 people before upgrade works by Council were required. However it was agreed that a population of 8,000 was unrealistic and therefore a population of 3,000 per town was agreed as an upper limit.
- Option review by CHW – May 2014

  CHW advised that their sewer infrastructure (e.g. rising main, pump station) located downstream of Bungaree did not have spare capacity to cater for a projected population of 3,000 in both Bungaree and Wallace. However, the downstream infrastructure has spare capacity to handle the projected dry weather flow for a total population of 1,000 in Bungaree. A storage tank is therefore proposed near the Bungaree main pump station for the purpose of storing wet weather flow for a period of up to three (3) days. This storage tank may prove redundant in the future when CHW infrastructure is upgraded.
- Clarification Meeting with CHW – June 2014

6.0 Sewer Strategy

6.1 Identification of Options

A number of options were identified and explored for servicing Bungaree and Wallace. The identification of options is summarised in the following section, however refer to Appendix C for a copy of the Identification of Options Memo in its entirety.

Servicing of Wallace and Bungaree resulted in a significant number and variety of options based upon 1) the collection of effluent, 2) treatment of effluent and 3) disposal of treated effluent. Some options were immediately ruled out due to high cost, technological complexity, maintenance requirements and compliance with regulatory requirements. A summary of the initial options reviewed and whether they were carried forward for further investigation is included in Table 3.

Table 3 Summary of preliminary options

Option	Comments
Collection	
Gravity Collection System	Carried forward for costing and further investigation also considered as base case
Septic Tank Effluent Disposal (STED) Scheme	Carried forward for costing and further investigation
Septic Tank Effluent Pumping (STEP) Scheme	Carried forward for costing and further investigation
Low Pressure Sewerage Scheme (LPSS)	Carried forward for costing and further investigation
Vacuum Sewerage Scheme	Eliminated based on fatal flaw
Treatment	
Advanced Onsite Wastewater Treatment	Eliminated based on fatal flaw
Packaged Treatment Plant (such as an IDEA or SBR Plant)	Carried forward for costing and further investigation
Lagoon Treatment	Carried forward for costing and further investigation
Transfer of Sewage to an existing treatment plant	Carried forward for costing and further investigation
Reuse	
Dual pipe reticulation for residential reuse	Eliminated based on fatal flaw
Irrigation of public open space	Carried forward for costing and further investigation
Disposal to land (tree lots or pasture land)	Carried forward for costing and further investigation
Reuse to waterway/wetland	Eliminated based on fatal flaw
Onsite treatment and reuse	Eliminated based on fatal flaw
Reuse/Disposal with treated sewerage by existing treatment plant	Carried forward for costing and further investigation

*Options based upon a population of 3,000 residents each in Wallace and Bungaree.

6.2 Preliminary Options Assessment

6.2.1 Multi Criteria Analysis

The options identified in Table 3 for costing and further analysis were assessed using a multi-criteria analysis (MCA). A copy of the MCA memo is summarised below and included in Appendix D.

The adopted MCA methodology is summarised as follows:

- Identify, agree and categorise a number of assessment criteria - categories include environmental, social, financial and technical.
- Assign weightings to each criterion (weightings agreed by MSC and CHW).
- Score each option against the criteria.
- Rank the options according to the relative scores.

Each option was scored in comparison to a base case on financial, environmental, social and technical criteria. In this assessment, the base case for the collection component of the works is gravity sewerage scheme and the base case for treatment and reuse is a packaged treatment plant and reuse for site irrigation. A score greater than zero indicated that the option was better than the base case and a score less than zero indicated that the option was worse than the base case. A summary of the results are included below in Table 4.

Table 4 Summary of Preliminary MCA results

Summary of Preliminary MCA Options	eighted Score	Ranking
Collection Options		
Base Case: Gravity Collection	0	1
STED Collection	-90	4
STEP Collection	-77.5	3
Low Pressure Collection	-45	2
Treatment and Reuse Options		
Class A - Package plant and dual pipe reuse	-120	5
Class B - Package Plant and land disposal (Base Case)	0	2
Class C - Lagoons and land disposal	-40	3
Transfer to existing treatment plant Ballarat	42.5	1
Transfer to existing treatment plant Gordon	-85	4

*Options based upon a population of 3,000 residents each in Wallace and Bungaree.

The preliminary analysis of collection options shows that in terms of the criteria and weightings adopted, a gravity scheme would provide the best overall outcome. Given the subjectivity of the analysis (typically associated with MCA) and the relative closeness of the scores, all collection options were carried forward for further analysis.

The analysis of the treatment and reuse options shows that the best option (based on the MCA) is to combine the sewerage from Wallace and Bungaree and transfer to existing WWTP in Ballarat. This option also provides the best outcome regarding issues associated with treatment and reuse within declared water supply catchment areas.

Based on the MCA, two options can be ruled out being significantly worse than the other alternatives; ‘Class A – Packaged Plant / dual pipe reuse’ and ‘Transfer to existing treatment plant in Gordon’. AECOM was advised by CHW that Gordon treatment plant does not have spare capacity to treat Wallace and Bungaree sewerage. So this

option has no advantage upon building a new local treatment plant and also can be ruled out comparing to transferring to Ballarat WWTP with available spare capacity.

Each of the options carried forward from the preliminary options assessment have been costed to further assist with further short-listing and options assessment.

6.2.2 Preliminary Cost Estimates

To further assist with the development of a wastewater scheme for Wallace and Bungaree, preliminary cost estimates have been prepared. These estimates consider capital, operating and whole of life costs (otherwise known as Net Present Cost or NPC) and are to be used as an input to the options selection process. These costs incorporate both developer and council costs for implementation of each scheme with council costs typically representing 10% of the total CAPEX in each option.

Please refer to Appendix D for a complete discussion of the preliminary cost estimates, including basis for estimates and assumptions. The estimated costs associated are shown in Table 5.

Table 5 Collection, treatment and reuse cost estimates

Option	CAPEX	OPEX	NPC
Collection Options			
Modified Gravity Collection	$ 62,180,000	$ 491,000	$68,859,000
STED Collection	$ 74,036,000	$ 987,000	$87,444,000
STEP Collection	$ 68,802,000	$ 1,799,000	$93,250,000
Low Pressure Collection	$ 67,478,000	$ 1,296,000	$85,092,000
Reuse/ Disposal Options			
Packaged Plant – collection by STEP/STED and reuse by irrigation within 5 km of townships	$14,714,000	$244,000	$18,030,000
Packaged Plant – collection by MCG/LPSS and reuse by irrigation within 5 km of townships	$15,488,000	$257,000	$18,979,000
Lagoons – collection by STEP/STED and reuse by irrigation within 5 km of townships	$18,436,000	$195,000	$21,081,000
Lagoons – collection by MCG/LPSS and reuse by irrigation within 5 km of townships	$19,406,000	$205,000	$22,191,000
Transfer to Existing WWTP in Ballarat	$8,945,000	$228,000	$12,437,000

*Options based upon a population of 3,000 residents each in Wallace and Bungaree.

From Table 5 it can be seen that the gravity collection system offers the lowest cost collection alternative in terms of both capital and life costs. It is also noted that the lowest cost solution in terms of capital cost and whole of life cost (NPC) for the treatment and reuse component is to transfer the sewerage to existing WWTP in Ballarat. It has slightly higher operation cost than lagoon treatment options but capital cost and NPC costs are significantly less than all options.

Based on the preliminary cost estimates the least cost solution is to adopt:

- A Modified Gravity Collection scheme for wastewater collection
- Transfer to Existing WWTP in Ballarat for treatment and reuse

This alternative has an estimated capital cost of around $71 million and whole of life costs equating to approximately $81 million.

Table 6 Total cost preferred option

Option	CAPEX	OPEX	NPC
Modified Gravity Collection	$ 62,180,000	$ 491,000	$ 68,859,000
Transfer to Existing WWTP in Ballarat	$ 8,945,000	$ 228,000	$12,437,000
SUM	*$71,125,000*	*$719,000*	*$81,296,000*

*Options based upon a population of 3,000 residents each in Wallace and Bungaree.

6.3 Refined Options Assessment

The initial MCA (refer to Sections 6.2.1 and 6.2.2) was undertaken at a high level without the use of detailed costs to assist with developing a shortlist for further options development. To ensure that the most appropriate option was selected moving forward, the MCA was refined based on the preliminary cost estimates. The same methodology and assessment criteria were adopted but costs were updated to match estimated life time costs. The refined MCA for treatment and reuse excluded “Class A & dual piping” and “transfer to Gordon” as these two options were ruled out after preliminary option assessment. The MCA is summarised below in Table 7 and can be found in its entirety in Appendix D.

Table 7 Refined MCA summary

Option	eighted Score	Ranking
Collection Options		
Base Case: Gravity Collection	0	1
STED Collection	-70	4
STEP Collection	-68	3
Low Pressure Collection	-25	2
Treatment and Reuse Options		
Base Case; Class B - Package Plant and land disposal	0	2
Class C - Lagoons and land disposal	-20	3
Transfer to existing treatment plant Ballarat	92.5	1

The refined MCA confirmed that the “Modified Gravity collection” option provides the best outcome and, the best option in terms of treatment and reuse is “transfer to existing Ballarat WWTP”. The scope is described in Section 6.4.

6.4 Detailed Scope of Preferred Option

The scope of the preferred option is summarised below.

6.4.1 Bungaree and allace Collection Systems

A gravity collection system is proposed for both Bungaree and Wallace. A high level concept design of the Bungaree and Wallace collection system (plan and longitudinal sections) has been completed and is included in Appendix F. Key aspects of the Bungaree system include the following:

- Primarily a gravity system with one local pump station and a short section of local rising main.
- The gravity system and local rising main feed into the Bungaree main pump station and off-line storage tank. The main pump station is located on the Wallace to Ballarat rising main.

6.4.2 allace to Ballarat Rising Main

A 13 km long 200 mm diameter rising main will connect Wallace to the existing Ballarat pump station, via Bungaree main pump station. It is anticipated that main pump stations will be required at both Wallace and Bungaree, and an off-line storage tank at Bungaree.

The main pump stations and rising main were sized for a combined future population of 6,000 so this infrastructure will not need to be upgraded when CHW completes improvements to their trunk downstream infrastructure from Ballarat pump station to Ballarat WWTP.

A high level concept plan and long section for the Wallace to Ballarat pump station rising main are included in Appendix F.

6.4.3 Bungaree Storage Tank

It is expected that the storage tank will be located in close proximity to the Bungaree main pump station. It has been sized to hold three days of wet weather flow while only releasing, at maximum, the dry weather flow based upon a population of 1,000 residents in Bungaree. The proposed storage tank volume, 855 m^3, equates to a size of approximately 4 m high x 16.5 m diameter. The tank will be located off-line from the rising main and used only for wet weather events. It is anticipated that it will be cleaned out following large storm events and that some odour control, such as a vent may be required. The storage volume and odour control measures will need to be refined as the project progresses into a more detailed design phase.

6.4.4 Treatment

The preferred treatment option is transfer of the sewage from Bungaree and Wallace to the Ballarat WWTP, via the Ballarat pump station. Refer to Section 5.0 for a discussion of the constraints of this infrastructure.

6.4.5 Reuse/ Disposal

It is proposed that the sewage will be conveyed to the Ballarat WWTP will it will be treated and disposed of/ reused.

6.5 Staging Approach to Preferred Option

Following consultation with stakeholders, including CHW and MSC (refer to Section 5.0) the projected population estimates were refined for the preferred option. It was agreed that the time period required for the combined population of both town to grow to 6,000 would be significantly in excess of the design life of some of the proposed infrastructure. It would also not be cost effective to construct such large scale infrastructure given the current populations of the town. Therefore, a more realistic projected population of 2,000 was used. Two options for the initial staging were then proposed for the sewer servicing of Wallace and Bungaree:

Stage 1

- Construct a collection system in **A** Bungaree (population 1,000) or **B** Bungaree and Wallace (500 each).
- Construct a main pump station in Bungaree to transfer the sewage to Ballarat (population 2,000 with capacity to upgrade to 6,000).
- Construct a 200 mm diameter rising main from Bungaree (main pump station) to Ballarat (pump station) catering for a combined population of 6,000.
- Construct an off-line sewer holding tank in close proximity to the Bungaree pump station to cater for wet weather flow (population 1,000).

  If the population is to be split between Bungaree and Wallace **B** the following additional infrastructure will be required:

- Construct a main pump station and 100mm rising main from Wallace to Bungaree catering for a 3,000 population

- **Stage 2 -** if not addressed as per **B**) above will entail the following infrastructure to accommodate a combined population of 2,000 and is constrained by infrastructure upgrades within the Ballart sewerage system.
- Construct a collection system in Wallace catering for a population of 1,000.
- Construct a 100 mm diameter rising main from Wallace (main pump station) to Bungaree (main pump station) catering for a population of 3,000.
- Construct a main pump station in Wallace (population 1,000 with capacity to upgrade to 3,000).

The proposed staging is illustrated on the figures included in Appendix F.

6.5.1 Revised Costing for the Preferred Option – Stage 1

Upon presentation of these results MSC requested a revised design, cost estimate and funding options for Stage 1 works. The costs are summarised in Table 8, with itemised costing for both sub-options included in Appendix G.

Table 8 Total cost preferred option – Stage 1

Option – A	CAPEX	OPEX	NPC
Modified Gravity Collection (Bungaree – 1,000)	$4,678,660	$30,994	$5,099,885
Rising main from Bungaree main pump station to Ballarat pump station, including pump station and off-line tank	$2,094,642	$46,047	$671,860
SUM	*$12,622,088*		

*Options based upon a population projections noted in Section 6.5.

Option – B	CAPEX	OPEX	NPC
Modified Gravity Collection (Bungaree & Wallace – 1,000 combined)	$5,614,070	$43,304	$6,035,295
Rising main from Bungaree main pump station to Ballarat pump station, including pump station and off-line tank	$2,094,642	$46,047	$671,860
Rising main from Wallace main pump station to Bungaree main pump station, including pump station.	$1,503,740	$53,898	$1,924,965
SUM	*$17,978,821*		

7.0 Water Strategy

7.1 Identification of Options

A number of options have been identified for servicing Dunnstown with reticulated water supply. All options involve connection to an existing water supply. The connection point nominated by CHW is the existing water supply tank located on Mahers Road, approximately 4 km north of Dunnstown.

CHW confirmed that the tank is currently oversized and is creating water quality issues due to the long turnover time. Adding the extra demand would actually improve water quality by reducing turnover time if the spare capacity is sufficient to meet the future requirements for Dunnstown.

A preliminary study indicates that the preferred pipe route between the existing tank the town has a local high point. Three options were identified to overcome the associated hydraulic issues:

1) Connect into the tank inlet or upstream pipe

2) Pumping from tank (or in combination with above)

3) Deep excavation or directional drilling through the high point

Available records from the GeoVicDatabase for Dunnstown indicate that the soil is likely to be volcanic clay and black basalt, and as a result any trenching may be slow and induce considerable over-break. Therefore the third option involving deep excavation or directional drilling is not considered viable.

7.2 Refined Options Assessment

A summary of the refined options assessment and costing is summarised below and included in its entirety in Appendix D.

The preferred pipe route between the existing tank and the town has a local high point at roughly 1.5 km from the supply tank. The concern is that the pipeline is likely to have a slight negative pressure at this point, which is generally not preferred.

In the option Identification stage, the options were identified to overcome the issue. However, during the investigations of options and using a map of 1m contours and levels provided by CHW it was established that if the concept and detailed design are done appropriately, there is enough deferential head between existing tank and the high point for a standard gravity supply main.

It was also established that the pressure on connection into existing water tank is not significantly higher than tank top water level and connection to tank inlet will not provide advantage. It will also add complication to operation of the supply system.

As a result, a gravity transfer main from the existing tank at Mahers Road was considered to be the obvious favoured options and preliminary cost estimation was carried out for this option only.

7.3 Preliminary Cost Estimate

Refer to Appendix D for a complete list of the assumptions used in developing the CAPEX, OPEX and NPC. These costs are summarised below in Table 9.

Table 9 Dunnstown ater Supply Scheme Costs

Dunnstown ater Supply Scheme Costs	Cost
CAPEX	$1,739,000
OPEX	$70200
NPC	$ 2,692,869

8.0 Gas Strategy

A gas servicing strategy was completed for Bungaree and is included in Appendix D in its entirety. Refer to the Appendix for a detailed explanation of the strategies and assumptions. A summary of the findings are described in the following sections.

The study considered two servicing options for Bungaree based upon a population of 3,000 residents:

1) Extension of existing SP AusNet gas infrastructure located to the east of Bungaree.

2) Feasibility of a decentralised alternative, such as supplying LPG gas to tanks located within the town.

8.1 Option 1 - SP AusNet Gas Network

The decision whether or not to provide gas service to Bungaree will depend on the cost of infrastructure and the return on investment for the service provider. SP AusNet does not have an obligation to provide gas service if there is insufficient return. Key aspects of connection to SP AusNet's existing infrastructure include:

- Provide Approximately 7.3 km of a 180 mm polyethylene pipe from the Wallace City Gate connection (to the Melbourne-Ballarat high capacity main) to the centre of Bungaree. Further reticulation within Bungaree would be located in shared trenches (telecommunications, electricity, etc.) if possible.
- SP AusNet has estimated that the extension from Wallace City Gate to Bungaree would cost $4.1 – 4.5 million and be estimated to take approximately 5 – 6 weeks to construct. This does not include the cost of the reticulation mains. Refer to Appendix D for a list of assumptions pertaining to the expected costing and construction timing.

8.2 Option 2 - Decentralised System

Key aspects of the proposed decentralised system include the following:

- Consideration has been given only to the costing of tanks and on-going re-fill. Reticulation infrastructure has not been considered as the pricing of this infrastructure may be significantly influenced by the location of the centralised tanks.
- It is estimated (from discussions with Kleenheat Gas) that the expected LPG requirements for the area would be approximately 240 kL per year. This corresponds to an annual LPG cost of $150,000 based upon June 2014 gas rates. It is suggested that two (2) 7.5 kL tanks, with a total storage capacity of 12,750 L, would best service the area. The annual rental for these units is approximately $2,500 per year.

9.0 Funding Options

This section considers the funding options for providing reticulated utility services to the townships of Bungaree, Wallace and Dunnstown. Possible options for funding include federal grants, state grants, developer contributions and special charges. Current (and recently expired) funding programs have been identified for each of these options below. Finally, the level of subsidy required for project viability is discussed at a high level.

9.1 Federal grants / subsidies

There are currently no federal grants or subsidies available to MSC that apply to providing reticulated services to Bungaree, Wallace and Dunnstown.

9.2 State grants / subsidies

Although a number of state grant programs have recently expired (see Section 9.3), some state programs remain in existence. These programs, and their applicability to providing utility services for Bungaree, Wallace and Dunnstown, are described below.

9.2.1 Regional Development Victoria

Regional Development Victoria (RDV) is a state agency with a focus on building regional communities through employment, infrastructure and investment. RDV delivers its function mainly through the eight year, $1 billion Regional Growth Fund.

The Regional Growth Fund is comprised of two components: strategic initiatives (60% of the fund) and local initiatives (40% of the fund). Funding allocation has been split into a 2011 – 2014 period and a second tranche of $500 million to be allocated in 2015-2018.

The Economic Infrastructure Program, shown in the diagram below, is the component of the Regional Growth Fund most applicable to developing reticulated utility services in MSC.

Source: Regional Growth Fund Information Booklet, RDV (2011)

Economic Infrastructure Program

The Economic Infrastructure Program has a number of funding streams within it[1]:

- Growing and sustaining regional industries and jobs
- Transforming and transitioning local economies
- Building strategic tourism and cultural assets
- Energy for the regions

Both the first and second sub-programs make funding available for enabling economic infrastructure. For each, there is a strong focus on improving access to markets, attracting investment, creating jobs and new business opportunities. For this high-level review, the likelihood of the MSC submitting a successful application to these funds has not been assessed. However, the funding evaluation criteria (related to how the project will achieve specific economic, social and environmental benefits) are listed in application guidelines[2].

The fourth sub-program, "Energy for the regions", is a $100 million fund available to energy businesses for specific locations. Unfortunately, MSCis not included within the funded area.

9.2.2 Office of Living Victoria

The Office of Living Victoria has established a $50 million Living Victoria Fund to help local communities across Victoria plan and implement local solutions that take advantage of all available water for fit-for-purpose use[3]. Two rounds of funding applications have been accepted, although the second round (of $15 million) is now closed. No further funding has been announced, and this fund is not available to MSC at present. However, if further rounds are announced, any additional funding may provide an opportunity for the Shire if the evaluation criteria can be met.

These criteria are related primarily to community-driven, whole-of-water-cycle management solutions. Also, in Round Two, the Fund did not contribute more than $1 million for individual regional projects.

The Office of Living Victoria has also spearheaded a Living Ballarat Project to develop a whole-of-water-cycle management strategy for the Ballarat Region[4]. There is no separate funding allocated specifically for capital work under the banner of the Living Ballarat Project. However, the draft document issued for consultation does relate to the Bungaree, Wallace and Dunnstown area.

Namely, Initiative 3.2.3 of the Living Ballarat project aims to "Improve the efficiency of servicing small towns". An excerpt of the document is reproduced below:

> *Small towns need to have water services supplied to support economic development and promote tourism. Traditionally, small towns in the region and across Victoria have had mass water servicing solutions applied, however, many have been inefficient and costly to implement and maintain. Instead, services for small towns should be developed using an innovative, place-based approach that matches the servicing option to the particular characteristics of the town, while optimising the balance between right water, local preference, cost and reliability[5].*

This initiative could be cited for strategic alignment in any funding applications made to the State of Victoria (whether for OLV funding or for other grant and subsidy programs).

[1] Source: http://www.rdv.vic.gov.au/infrastructure-programs/economic-infrastructure
[2] The application guidelines can be found here: http://www.rdv.vic.gov.au/__data/assets/pdf_file/0004/188014/RGF_APPGUIDES_EIP_D5.pdf
[3] Source: http://www.livingvictoria.vic.gov.au/fund
[4] More information can be found here: http://www.livingvictoria.vic.gov.au/ballarat-about.html
[5] Help shape our water future: Ballarat and region, Office of Living Victoria, 2014. http://www.livingvictoria.vic.gov.au/PDFs/Regions/Ballarat/BWF_consultation.pdf

9.2.3 Recently expired programs

A number of state programs to fund water infrastructure for small towns have recently expired. Although these options are no longer available to Moorabool Shire Council, a short description of each program is included below.

If new or similar funding programs are established by Victoria in the future[6], it is recommended that MSC review successful applications to these funds by comparable towns. This will provide insight on the likelihood of obtaining funds and sharpen the focus of any funding requests made by MSC.

Country Towns ater Supply and Sewerage Program

The Country Towns Water Supply and Sewerage Program was a $42 million fund announced in 2004 and closed in 2013[7]. The objective of this fund was to:

- Provide sustainable sewerage solutions to small towns where public health risks are high (e.g. from inadequate septic tank systems);
- Provide sustainable water supply solutions to small towns with poor quality water; and
- Assist local authorities to develop wastewater management plans.

Small Towns ater uality Fund

The Small Towns Water Quality Fund was a $16 million program announced in 2008 and closed in 2013[8]. The objective of this fund was again to minimise public health and environmental issues arising from water supply and wastewater management in small towns. Applications could be made under the following project categories:

- Water supply security improvements;
- Water supply quality improvements;
- New water services;
- Septic tank upgrades; and
- Small town wastewater solutions.

9.3 Developer contributions

A Ministerial Advisory Committee has been reviewing the development contributions system in Victoria. A number of reforms have recently been announced and the government aims for the reforms to take effect at 1 July 2015.

The implementation guidelines are still being finalised (e.g. schedule of direct developer provided infrastructure, among many other items). Given the emerging nature of these reforms, any impacts specific to this project have not been investigated in full. Rather, developer contributions as a source of funding are considered more generally below.

For water and sewerage networks, the developer is responsible for providing reticulation assets up to the point of the shared infrastructure network (e.g. headworks, treatment plants, pumping stations, trunk mains and sewers). Developers are also responsible for paying a one-off “New Customer Contribution” ($1,243.35 per lot for Central Highlands Water in 2013/14).

Developer contributions are typically used when new developments are planned in, for example, urban growth areas. However, for a scheme such as Bungaree, Wallace and Dunnstown, it is more likely that the scheme would be funded through special charges levied against landowners in the area of benefit.

Installation of a reticulated system is likely to be attractive to a developer when:

- The development contribution is less than the cost of an alternative servicing option (i.e., septic tank); or
- A house sold with a reticulated sewerage system commands a premium in the market (relative to a house with a septic tank), where the premium is greater than the development contribution; or

[6] For example, a one-off funding program to provide water security for Wangaratta was established in 2013. More information can be found here: http://www.depi.vic.gov.au/water/urban-water/regional-water-supply-programs/water-security-for-wangaratta
[7] Source: http://www.depi.vic.gov.au/water/urban-water/regional-water-supply-programs/country-towns-water-supply-and-sewerage-program
[8] Source: http://www.depi.vic.gov.au/water/urban-water/regional-water-supply-programs/small-towns-water-quality-fund

- Some combination of the two scenarios above.

The market premium commanded by houses sold with reticulated services has not been investigated in this study; however the cost to the developer of alternative servicing is discussed in more detail in Section **Error Reference source not found.** below.

9.4 Special charges

Where a community expresses a desire to have reticulated services, special charges can be levied to fund the development. These charges are applied to land parcels within area of benefit to cover the cost of infrastructure provision. To provide an example of how this could work for MSC, a recent case study from South Gippsland is presented below.

9.4.1 Alberton sewerage scheme

The Alberton Sewerage Scheme is a $2.2 million scheme to provide reticulation to a previously unserviced community consisting of 93 landowners. Funding was provided by:

- A grant from the State of Victoria for $1 million (Small town Water Quality Fund)
- Free access to the Tarraville Wastewater Treatment Plant owned by South Gippsland Water
- Balance of costs funded by landowners in Alberton within the scheme boundary (area of benefit)

Special charges levied against landowners in the area are currently estimated to be:

- $5,000 per vacant title allotment
- $10,000 per developed title allotment

To assist landowners, South Gippsland Water has offered finance to landowners for the special charge at an estimated interest rate of 6.9% and repayment periods of 5, 10, 15 or 20 years.

9.5 Pro ect viability – discussion and indicative costs

The viability of this project is dependent upon at least two key variables: the amount of grants and subsidies that can be secured, and the willingness of beneficiaries to contribute. The more landowners are willing to contribute, the less will be required in subsidies to make the project viable. In the extreme case where no grants or subsidies can be secured, private landowners will need to cover the entire cost of infrastructure provision[9].

Cost recovery principles will also need to be developed and agreed. For example, the reticulation schemes will be designed and built for a population much greater than currently exists. The benefits accruing to future landowners (e.g. subdivided land) need to be balanced against the cost of upfront infrastructure provision. This has not been investigated for this report. We also note that the Victorian Government has agreed to implement best practice urban water pricing principles as a signatory to the National Water Initiative (NWI). Those principles generally require full cost recovery via user charges.

Nonetheless, the following tables show indicative amounts that would need to be collected per property owner to fund the provision of reticulated services under a number of subsidy scenarios. The tables also show an indicative cost of the ‘status quo’ alternative (i.e. septic tanks and wells / rainwater tanks) for comparison. These figures are based on very high-level estimates of costs and the number of properties in the area of benefit (using figures in Section 6.5 for servicing existing properties in Bungaree and Wallace). They should only be used on an ‘order of magnitude’ basis to allow comparison with similar case studies (e.g. the Alberton scheme in South Gippsland referenced above).

[9] If the Shire of Moorabool deems there to be a wider area of economic benefit, it may be possible for some or all of the funding to be recovered through rates – either targeted to the broader area or from the entire ratepayer base of the Shire. This has not been included here, but may merit further consideration.

9.5.1 Sewerage scheme in Bungaree and allace

The indicative costs for each scheme in the table below assume no subsidy is provided.

Table 10 Sewerage cost per property Bungaree 1,000 and allace 1,000 – no subsidy

System component	Cost $	Design Capacity properties	Contribution / Property $
Gravity collection (Bungaree)	4,678,660	141	33,182
Gravity collection (Wallace)	2,981,720	126	23,664
Transfer to Ballarat	2,094,642	2,222	943
Total Contribution Per Property		**Bungaree**	**34,125**
		allace	**24,607**

** Assumes Bungaree is fully constructed as Stage one and Wallace at a later date as Stage 2.*

Table 11 Preferred Option B Sewerage cost per property Bungaree 500 and allace 500 – no subsidy

System component	Cost $	Design Capacity properties	Contribution / Property $
Gravity collection (Bungaree)	3,363,970	141	24,028
Gravity collection (Wallace)	3,754,840	126	29,800
Transfer to Ballarat	2,094,642	2,222	943
Total Contribution Per Property		**Bungaree**	**24,498**
		allace	**30,270**

***Assumes both Bungaree and Wallace are constructed simultaneously.*

If a subsidy is provided, then the cost per property will reduce accordingly as shown in the following table:

Table 12 Sewerage cost per property Bungaree and allace - subsidised

Pro ect Subsidy	Bungaree Contribution	allace Contribution
$0M	34,125	24,607
$1M	30,627	22,085
$2M	27,128	19,562
$3M	23,630	17,040
$4M	20,132	14,517
$5M	16,634	11,995

Table 13 Preferred Option B Sewerage cost per property Bungaree 500 and allace 500 – subsidised

Pro ect Subsidy	Bungaree Contribution	allace Contribution
$0M	24,498	30,270
$1M	30,627	22,085
$2M	27,128	19,562
$3M	23,630	17,040
$4M	20,132	14,517
$5M	16,634	11,995

Consultation with the community will determine whether existing property owners in the area consider the benefits derived from a reticulation scheme to be greater than the costs incurred.

The tables above show costs for existing properties in Bungaree and Wallace. The cost for a scheme that services new growth areas in these towns would be similar. For example, a scheme built to service 3,000 people each in Bungaree and Wallace (total of 2,222 properties) would cost approximately $62M – or $28,000 per property, Developers would similarly need to determine whether their contribution would be less than the cost of a septic tank (or otherwise recouped through higher sale prices).

9.5.2 ater scheme in Dunnstown

Similar to the sewerage scheme analysis above, the indicative costs for a water supply scheme in Dunnstown are shown in the table below.

Table 14 ater cost per property Dunnstown

Pro ect Subsidy	Subsidised Cost $	Design Capacity properties	Contribution / Property $
No subsidy	1,739,000	68	25,574
$200,000	1,539,000	68	22,632
$500,000	1,239,000	68	18,221
$1,000,000	739,000	68	10,868

Neither the likelihood of receiving a subsidy nor the landowner's willingness to pay have been analysed for this report. It is recommended that funding options are investigated in more detail should MSC wish to proceed to the next stage of this project.

Appendix A

Land Use Planning and Community Facility Analysis

Appendix A Land Use Planning and Community Facility Analysis

AECOM

Shire of Moorabool
27-Feb-2014
Doc No. 1

Small Towns: Bungaree, Dunnstown and Wallace

Land Use Planning and Community Facility Analysis

Small Towns: Bungaree, Dunnstown and Wallace

Client: Shire of Moorabool

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1	17/12/2013	Draft Report	Neal Kerr	Original Signed
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Table of Contents

1.0 Introduction

AECOM has been engaged by the Shire of Moorabool to prepare a planning and engineering study to assess the opportunities, challenges and viability of providing reticulated utility services to the three small townships of Bungaree, Wallace and Dunnstown in central Victoria in order that land can be developed sustainably .

The overall study has been divided into several phases. This report has been prepared for the first phase. It provides a desktop review and analysis of:

- Community facilities and their capacity to support population growth
- Current demographics and future population projections
- State, regional and local planning policy and controls
- Land use constraints that influence opportunities for urban growth
- Land use opportunities where urban growth could be located.

The information and conclusions presented below are based on a desktop review of published information only and should be viewed as indicative only. Specifically targeted site investigations are required before definitive conclusions can be determined regarding optimal land development options and infrastructure locations.

The purpose of this Study was to identify the potential population capacity of Bungaree and Wallace based on existing community facilities, and to then develop an urban development scenario to inform the theoretical design and feasibility assessment for providing reticulated sewerage infrastructure in Bungaree and Wallace. Council has stated that there are no plans to grow Dunnstown at this time, and as such this Study has not analysed the population capacity and potential urban growth opportunity for Dunnstown.

The urban development scenarios contained in this report are only to inform the feasibility of providing reticulated sewerage in Bungaree and Wallace. They are not intended for use as a Structure Plans. We note that before urban growth occurs that further and more detailed targeted planning and community consultation, including (for example) a market analysis, environmental studies and land capability assessment and the like should be undertaken by Council.

2.0 Subject Towns

Bungaree, Wallace and Dunnstown are small towns located in the Shire of Moorabool. The Shire of Moorabool is located between two major urban centres - Greater Melbourne which is approximately 85km to the east (a metropolis with a population of in excess of 4 million people) and Greater Ballarat which is approximately 15 km to the west (a key regional city in western Victoria of approximately 100,000 people). Other major towns in the Shire of Moorabool are Bacchus Marsh which is approximately 45km to the east (a smaller rural centre of some 15,000 people) and Ballan which is approximately 20km to the east (the administrative centre of Moorabool with a population of 2,744).

Bungaree, Wallace and to a lesser extent Dunnstown are connected to these major cities and provincial towns via the Western Freeway. Common to peri-urban areas, the proximity to Melbourne and Ballarat and excellent transport access has seen increasing demand for housing within the Shire. Within the Shire of Moorabool this type of peri-urban development has historically occurred in Bacchus Marsh. By comparison, areas like Bungaree, Wallace and Dunnstown have not experienced similar growth, in large part due to their location within the Proclaimed Water Catchment Areas.

Figure 1 shows the location of Bungaree, Wallace and Dunnstown within the Shire of Moorabool. It also shows the location of Ballan and Bacchus Marsh, the proximity of the study area to Melbourne and Ballarat, and the excellent transport links between them.

The towns of Bungaree, Wallace and Dunnstown are located in a significant agricultural region, which is particularly suitable for horticulture. Potatoes are a major agricultural output of the area. The populated areas of Wallace and Bungaree are approximately 4-5kms apart; Dunnstown and Bungaree are approximately 6kms apart; and Wallace and Dunnstown are about 10kms apart.

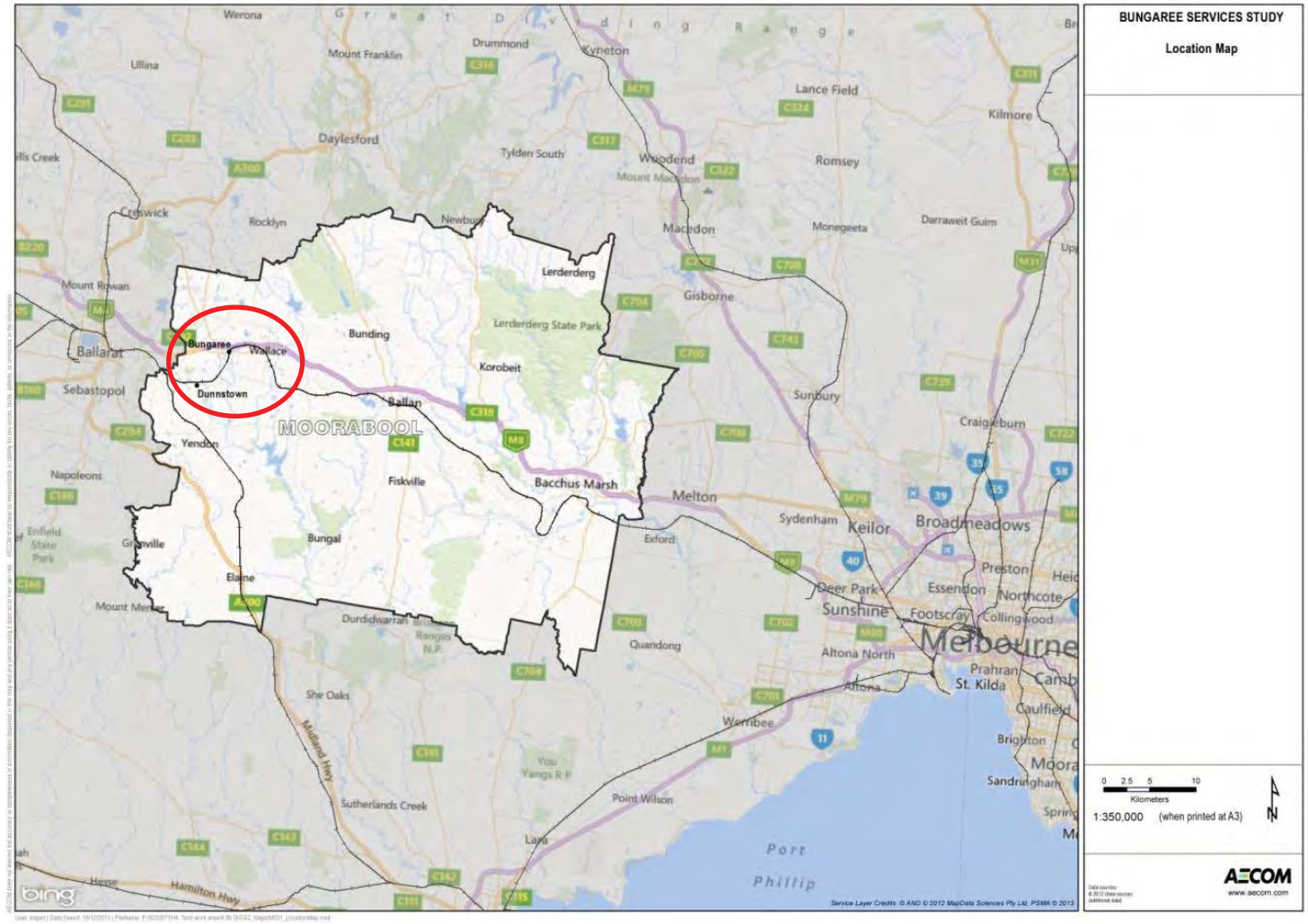


Figure 1: Shire of Moorabool and Sub ect Towns

2.1 Bungaree

Bungaree was first settled around 1860 and was never officially surveyed or proclaimed as a town. The township was established during Victoria's gold rush era when many migrants took up small land holdings outside of Ballarat for farming. The development of housing took further shape during the pre and post war eras. Bungaree was once a junction station and an important crossing loop on the Ballarat Rail Corridor. The station closed to passengers in 1982.

Bungaree has electricity, a general store (including petrol, post office and convenience shopping), a Maternal and Child Healthcare Centre, a Country Fire Authority and State Emergency Services station, churches, a community hall, a multi-purpose sports oval with surrounding parkland and public toilets, a primary school and a hotel Council has also invested significantly in the upgrade of the sports oval to AFL standard, with lights, change rooms and reception facilities. The town has reticulated water and there is a high pressure gas pipeline approximately 1.7kms south of Bungaree-Wallace Road.

The community of Bungaree is located in two areas along Bungaree-Wallace Road (running east-west) and these are divided by a water body (that is likely to flood the surrounding land), as follows:

- The majority of the community is clustered around the intersection of Bungaree-Wallace Road and Bungaree-Creswick Road, and
- A second smaller cluster of houses are located near the Ballarat Rail Corridor approximately 700 metres further to the east.

Property sizes within the township vary in size, from approximately 1,000-1500sqm in the centre of town (along Bungaree-Wallace Road) up to 1.6 hectares on the town fringes.

In addition to local employment opportunities, Bungaree has excellent access to Ballarat and Melbourne, making it an opportune location for dormitory housing where people reside in Bungaree and travel to a major city for work. Bungaree is located 12 kilometres (11 minutes) from central Ballarat via Bungaree-Wallace Road and Western Freeway. The connection to Ballarat is via Bungaree-Wallace Road to a T-intersection with the Western Freeway. It is located 87km (marginally less than 60 minutes by car) from the industrial growth areas in Truganina (western Melbourne). The connection to Melbourne is via the Wallace interchange.

Physical limitations to the growth of Bungaree are the Western Freeway (to the north), the Ballarat Rail Corridor (to the east), and other physical constraints (which are further discussed in Section 6.0) such as topography and potential flooding (subject to further investigation).

Photo 1: Bungaree, looking north and west from the intersection of Lesters Road and Bungaree- allace Road

Figure 2: Bungaree Aerial Image

2.2 allace

Wallace was originally called Gordon and was surveyed and proclaimed a town in 1858 on the east side of the Moorabool River. However the actual town never settled there and the majority of the community of Wallace has developed around the intersection of Westcotts Road (running north-south) and Old Western Highway (running east-west), on the southern side of the Western Freeway.

Wallace has electricity, a Maternal and Child Care Centre, a kindergarten, a church, a community hall, a neighbourhood house, a multi-purpose sports oval with surrounding parkland and public toilets. It is also serviced by reticulated water and gas. The former Butter Factory located within the town closed down in 1994.

Property sizes in Wallace commonly vary from approximately 1,000sqm in the centre of town (along Westcotts Road) to 1 hectare on the town fringes.

Wallace is approximately 4kms from Bungaree. It has excellent access to Ballarat and Melbourne. It is located 17 kilometres (13 minutes) from central Ballarat via Bungaree-Wallace Road and Western Freeway, with a transport interchange located directly to the north of the town. It is located 82km (55 minutes by car) from the industrial growth areas in Truganina (western Melbourne).

Physical limitations to the growth of Wallace are the Western Freeway (to the north), the Ballarat Rail Corridor which already bisects the town twice (to the west and to the south), and other constraints such as topography and flooding (subject to further investigation).

Photo 2: allace, looking north and west from the intersection of estcotts Road and Bungaree- allace Road

Figure 3: allace Aerial Image

2.3 Dunnstown

Dunnstown was first settled in early 1860's, but was never officially surveyed or proclaimed as a town. Dunnstown also dates back to the gold rush era and in the late 1800's Dunnstown was a major town with a sawmill and a distillery. The majority of the community of Dunnstown have located around the intersection of Old Melbourne Road (running east-west) and Dunnstown-Yendon Road (running north-south) on the southern side of the Ballarat Rail Corridor.

Dunnstown has electricity, a community hall, a multi-purpose sports oval with public toilets, a primary school and a hotel. The opportunity for reticulated water is under investigation as part of this Study.

Property sizes in Dunnstown vary from approximately 400sqm in the centre of town (along Ti-Tree Road) to 2.6 hectares on the town fringes.

Dunnstown has good access to Ballarat and fair access to Melbourne, making it an opportune location for dormitory housing. Dunnstown is located 12 kilometres (12 minutes) from central Ballarat via Old Melbourne

Road. It is located 93km (approximately 65 minutes by car) from the industrial growth areas in Truganina (western Melbourne), unlike Bungaree and Wallace it is further away from the Western Freeway.

Physical limitations to the growth of Dunnstown are the Ballarat Rail Corridor (to the north), and other constraints such as topography and potential flooding (subject to further investigation).

Photo 3: Dunnstown, looking west from the intersection of Ti Tree Road and Old Melbourne Road

Figure 4: Dunnstown Aerial Image

3.0 Planning Framework

This section provides a summary of relevant State, regional and local planning policy.

3.1 Proclaimed ater Catchment

Proclaimed water catchments supply water for domestic, irrigation or other purposes within Victoria and are protected under the *Catchment and Land Protection Act 1994*. Under this Act, catchments that are designated for potable water supply purposes are further protected as Declared Special Areas (Water Supply Catchments).

Approvals for activities conducted under a planning scheme must be referred to the responsible land management authority (Central Highlands Water, Corangamite Catchment Management Authority and/or Department of Environment and Primary Industry) for approval.

As shown in Figure 5, Bungaree, Wallace and Dunnstown are within a Declared Water Supply Catchment that forms part of the following Lal Lal Reservoir and Moorabool River catchments and adjacent to a Declared Special Area that forms part of the Ballarat catchment.

Three documents that are relevant to these catchments are:

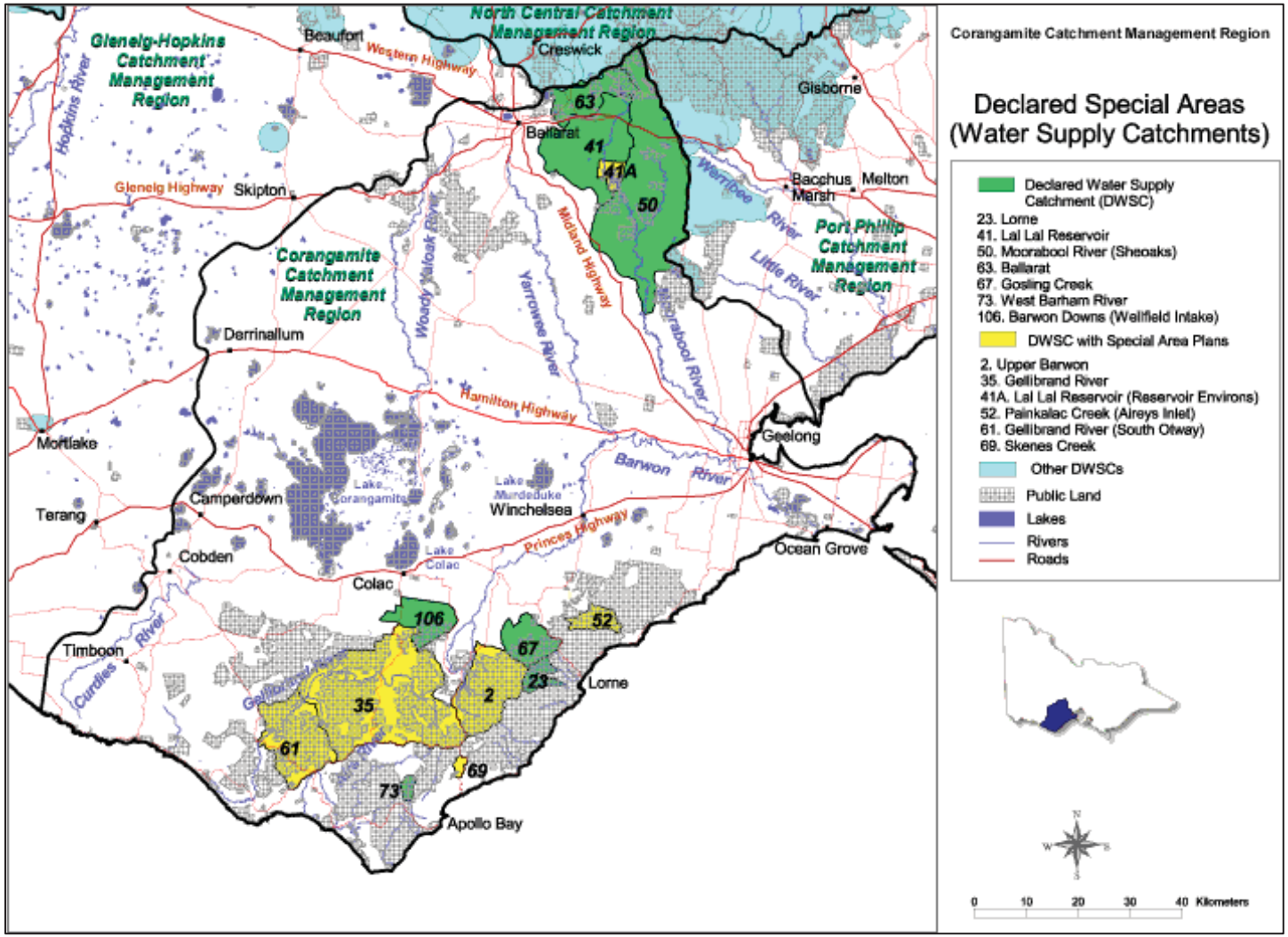
- *Report for a Proposed Land Use Determination in the Lal Lal Water Supply Catchment, Soil Conservation Authority, 1977*
- *Report on the Lal Lal Reservoir Water Supply Catchment (West Moorabool Water Board), Land Conservation Council, 1973*
- *Proposal for Proclamation Prepared for Consideration, Soil Conservation Authority, 1979.*

These reports seek to constrain the development of land within the proclaimed water catchments in order to maintain water quality. The reports identify water quality issues that could be exacerbated by further urban land use intensification. The one exception is support for urban development in Bungaree and Wallace in areas that could be sewered in the future. The *Proposal for Proclamation Prepared for Consideration, Soil Conservation Authority, 1979* seeks to prohibit industry within the study area, whilst the other reports seek to ensure compliance with EPA Guidelines.

The planning controls for the development of land uses within water supply catchments in summarised in the *Planning Permit Applications in Open, Potable Water Supply Catchment Areas, November 2012*. The document states:

- The density of dwellings should be no greater than one dwelling per 40 hectares, unless the Environmental Significance Overlay is applied and the proposed development will be connected to reticulated sewerage.
- Higher densities may be allowed where the site is not connected to reticulated sewerage where Central Highlands Water is satisfied that Council has prepared and is implementing a Domestic Wastewater Management Plan*, and the proposal does not present an unacceptable risk to the catchment.

*The Shire of Moorabool is currently preparing a draft Domestic Wastewater Management Plan at the time of preparing this report.



Source: Department of Environment and Primary Industries

Figure 5: Proclaimed ater Catchment

3.2 Moorabool Planning Scheme

3.2.1 State Planning Policy Framework

The State Planning Policy Framework seeks to encourage sustainable land use outcomes. The following clauses are considered to be directly relevant to the consideration of urban growth within Bungaree, Wallace and Dunnstown:

Clause 11: Settlement

Planning should anticipate and respond to the needs of existing and future communities. Planning for rural areas should consider the following policies contained in Clause 11:

- *Retain population and employment in rural areas to support rural communities.*
- *Guide the structure, functioning and character of each settlement taking into account municipal and regional contexts and frameworks.*
- *Balancing strategic objectives to achieve improved land-use and development outcomes at a regional, catchment and local level.*
- *Preserving and protecting features of rural land and natural resources and features to enhance their contribution to settlements and landscapes.*
- *Encouraging an integrated planning response between settlements within regions and in adjoining regions and states.*
- *Providing for appropriately located supplies of residential, commercial, and industrial land across a region, sufficient to meet community needs.*

Clause 13 Environmental risks

Planning should identify and manage the potential for the environmental risks and environmental changes. Strategic planning should consider and appropriately locate land uses with consideration to:

- Flooding
- Land contamination
- Erosion and landslip
- Salinity
- Noise and air emission impacts
- Bushfire.

Clause 14 Natural Resource Management

Planning is to assist in the conservation and wise use of natural resources. Land use planning should have consideration to:

- The protection of productive farmland which is of strategic significance in the local or regional context
- Protect farmland loss from unplanned land use changes
- Land use changes are to have consideration to agricultural activities contribution to the regional economy
- Compatibility of the proposed land use with agricultural activity.

Clause 19 Infrastructure

The development of social and utility infrastructure should be provided in an efficient, equitable, accessible and timely manner. Infrastructure should be planned to support the logical provision and roll-out of infrastructure in line with demographics and spatial planning. Planning should have regard to:

- The location and provision of health-related and education facilities to meet demographic trends
- The fair distribution of cultural and sporting facilities.
- The use of Development Contribution Plans to contribute to the financial cost of infrastructure

- The protection of water quality in water supply catchments from contamination by urban, industrial and agricultural land uses
- Stormwater management to protect wetlands and estuaries.

3.2.2 Local Planning Policy Framework

The Moorabool Planning Scheme sets out the planning framework for land use and development within the Shire.

Clause 21.03 Small Towns

Clause 21.03 identifies the need to prepare Structure Plans for Wallace and Dunnstown.

Clause 21.09 Small Towns

Clause 21.09 of the Moorabool Planning Scheme sets out the planning framework for land use in Small Towns, including Bungaree, Wallace and Dunnstown. The policy earmarks that Council will prepare a small town's strategy to review the constraints and opportunities for urban growth in the small towns, followed by the preparation of Structure Plans.

Key issues and influences are:

- Small towns, such as Bungaree, Dunnstown and Wallace provide a limited level of services and facilities to their residents and the surrounding rural areas.
- The towns have experienced limited growth.
- Wallace has a considerable infrastructure advantages including natural gas, the old butter factory and a full interchange to the Western freeway.
- The population has declined due to constraints within the water supply catchment and as a result of demographic changes
- Strategies are needed to achieve sustainable population sizes in small towns.
- The zones abutting small town boundaries need to be reviewed to identify where further sustainable residential development could occur.
- Small towns within Special Water Catchment Areas would need to be sewered in order to enable urban development.

The objective for these Small Towns contained in Clause 21.09 is to provide for their *'sustainable development'*. The strategies to achieve this objective are to:

- *Support limited development in small towns as an additional residential choice.*
- *Provide a clearly defined and compact urban form and character for the small towns with rearrangement of lot boundaries that demonstrate beneficial and sustainable use.*
- *Protect prominent view-lines in small towns particularly to and from the Western Freeway.*
- *Advocate for sewerage in the small towns.*

3.2.3 Planning Controls

Zones:

Township Zone

The Township Zone provides for residential development and a range of commercial, industrial and other uses. Lots greater than 300-500m^2 can be developed as of right provided that they are connected to reticulated sewerage, reticulated potable water supply and reticulated electricity supply, with the following exceptions:

- If reticulated sewerage does not exist, then all wastewater must be treated onsite in accordance with the State Environment Protection Policy (Waters of Victoria) under the Environment Protection Act 1970.
- If reticulated potable water and/or electricity do not exist then an appropriate solution to the satisfaction of Council.

A range of Retail, Office and Industry can be developed within the Township Zone subject to a planning permit.

Rural Living Zone

The Rural Living Zone provides for the development of dwellings and agricultural land uses in rural areas. Whilst Councils policy assigns a minimum lot size of 6 hectares for a dwelling on a property in the Rural Living Zone, a recent State Government announcement reduced the minimum lot size for a dwelling on a property in the Rural Living Zone down to 2 hectares where an amount is not already specified in the relevant Planning Scheme. A range of Rural Industry can be developed within the zone subject to a planning permit.

Farming Zone

Dwellings can be developed within the Farming Zone, but the standard minimum lot size is 40 hectares. There are areas where a dwelling can be developed on a 15 hectare lot, but the map in the Schedule to the Farming Zone does not have any town or street names that could be used to determine the location. Any subdivision less than 40 hectares would require approval by Central Highlands Water in accordance with the *Catchment and Land Protection Act 1994* (see Section 3.1).

Overlays:

Design and Development Overlay - Schedule 2 (DDO2)

The DDO2 seeks to ensure that the visual amenity of rural areas and townships is maintained through the management of building materials. The DDO2 is not directly relevant to the consideration of the growth of Bungaree, Wallace and Dunnstown and is not considered further in this Study.

Design and Development Overlay - Schedule 3 (DDO3)

The DDO3 seeks to ensure that sensitive land uses nearby to the Western Freeway/Highway are appropriately noise attenuated. This is relevant to the strategic planning of new growth areas in Bungaree and Wallace.

Environmental Significance Overlay - Schedule 1 (ESO1)

The ESO1 identifies the areas subject to the 'Proclaimed Water Catchment Areas' and restricts development within the subject area. The purpose of the ESO1 is to protect the quality and quantity of water produced within catchments and to allow for appropriate development of land.

In accordance with the ESO1, the construction of a dwelling in the Residential 1 Zone, Residential 2 Zone, Low Density Residential Zone, Township Zone or Rural Living Zone is permissible provided the dwelling is connected to reticulated sewerage, and no stormwater is discharged less than 100 metres from a waterway unless into an approved drainage system. If the dwelling is not connected to reticulated sewerage, then the use may be permissible provided:

- It has been demonstrated to the satisfaction of the responsible authority and the relevant water authority that the lot can contain effluent in accordance with the requirements and provisions of the State Environment Protection Policy (Waters of Victoria) and the provisions of the "Septic Tanks Code of Practice", and
- The building and its septic tank effluent absorption area are not located within 100 metres of a waterway or upstream of a dam or wetland, and
- No stormwater is discharged less than 100 metres from a waterway unless into an approved drainage system.

Heritage Overlay (HO33)

The Heritage Overlay 33 applies to the Former Brinds Distillery, located at 2830 Old Melbourne Road. The site is registered on the Victorian Heritage Register.

Bushfire Management Overlay (BMO)

The BMO seeks to identify areas at risk to bushfire hazard and to ensure appropriate land use planning to minimise risks to life and property. A permit is required to develop a range of uses, including community facilities, office, retail and dwellings. The BMO applies to land in Dunnstown, approximately 1,200 metres north of Ti-Tree Road in the vicinity of Mount Warrenheip.

3.3 Historical Council Plans and Strategies

Moorabool Shire Land Use and Development Strategy 1997

The Moorabool Shire Land Use and Development Strategy 1997 sets out a vision for the Shire. The Strategy includes land use frameworks concepts for Bungaree and Wallace that are based on the towns being sewered.

Bungaree and Wallace Structure Plans 1993

Local structure plans were prepared in 1993 for Bungaree and Wallace by the respective Shires of Buninyong and Bungaree. The Bungaree Structure Plan proposed a compact town based on an average lot size of 4,000 square metres. The Structure Plan envisaged 177 new lots and a total population of 511 persons.

Bungaree and Wallace Sewerage Plan

Lang Dames and Campbell Aust Pty Ltd prepared a report in 1990/91 that investigated the sewering of Bungaree and Wallace. It proposed a sewerage system that serviced controlled infill development along a route that connected the sewer to Ballarat.

3.4 Central Highlands Regional Growth Plan, June 2013

The Draft Central Highlands Regional Growth Plan, June 2013 was recently completed and is proceeding through the public exhibition phase. The Plan identifies Bungaree, Wallace and Dunnstown as located within a declared water supply catchment area, with highly productive land suitable for horticulture.

The Plan supports the development of land within the Declared Water Supply Catchment provided that it will have environmental benefits for the declared water catchment, and provided that such programs can be sustainably (environmentally, socially and economically) constructed and maintained.

The Plan identifies Bacchus Marsh, Ballan and Ballarat as the growth towns in the Melbourne-Ballarat Corridor. The Plan identifies Bungaree as a small town where planning should provide for *'ongoing sustainable growth and change'* and encourages the provision of *'services either within the town or within easy commuting distance'.* Whilst the Plan does not list any specific actions for Bungaree, Wallace or Dunnstown, it does make the following statements:

- *'The major transport corridors providing links to external regions should be viewed as key opportunities to facilitate growth and development in designated settlements along those routes',* and
- *'Other settlements* (that is, other than Bacchus Marsh, Ballan and Ballarat in the Melbourne-Ballarat Corridor) *will grow by smaller amounts but should be promoted as the most appropriate locations to manage urban development pressures and provide for a range of lifestyle opportunities across the region'.*

This indicates that the Plan is supportive of urban growth in Bungaree and Wallace.

In addition to supporting urban development, the Plan also highlights the importance of the area for agricultural production. The State Government is seeking to attract investment to the region to contribute to the goal to double Victoria's agricultural food and fibre production by 2030. The Plan therefore directs municipal planning schemes to promote investment in agriculture and to provide certainty for agriculture activities and their primacy over conflicting land uses in rural areas.

The Plan seeks to avoid the removal of productive agricultural land for conflicting land uses, such as rural residential uses. The Plan also recognises pressure for rural residential developments along major highways, such as the Western Highway corridor between Bacchus Marsh and Ballarat. The Plan sets out high level considerations for land use planning and encourages Council to undertake strategic planning to determine land use demand and site compatibility. The Plan seeks to ensure that rural residential development is located in appropriate and strategically justified locations that do not compromise agricultural activities, landscapes and environmental assets and values.

Key considerations are:

- An assessment in accordance with Practice Note 37 - Rural Residential Development, Nov 2013, DTPLI
- Avoiding natural hazards, including bushfire and flooding
- Whether residents live, work and recreate locally or travel outside the region and thus their contribution to the regional economy

- Residents' proximity and access to employment and higher order services
- Effects on the declared water supply catchment and any potential impacts on water quality or yield
- Consistency with the Central Highlands Regional Growth Plan and impact on regionally significant areas of agricultural production, tourism, landscape and environmental assets
- The existing supply and demand for rural residential lots in the area, including in neighbouring municipalities
- The need for further analysis to specifically locate where high quality agricultural land is located

The Plan supports the development of utility infrastructure, and specifically supports:

- The extension of reticulated gas to support industry and employment uses
- The supply of reticulated sewerage systems that can be sustainably constructed and maintained and which support the growth of smaller settlements where it will deliver environmental benefits within a Declared Water Supply Catchment.

With regards to the provision of sewerage infrastructure for small towns the Plan states *'the decision to provide a reticulated sewage system needs to be carefully considered, with business cases measured against environmental factors, anticipated growth and supported by planning policies concerning that settlement*'. It is therefore recommended that the Shire of Moorabool undertake additional market analysis to estimate realistic population expectations, determine the amount of higher density inner areas of the township that may be included in a future sewer district, and to inform where a boundary between the potential sewered urban areas and non-sewered rural residential areas should be located.

3.5 Planning Practice Note 37 – Rural Residential Development

Planning Practice Note 37 outlines key land use planning considerations for the planned growth of rural residential development. The Shire of Moorabool has advised that it would seek to apply the Township Zone (and not the Rural Living Zone) and thus this guideline is not directly relevant. However, this guideline highlights the types of land use planning considerations that should be taken into account when planning for new growth areas. Furthermore, it is not uncommon for zones that provide for the establishment of rural residential development to be applied in order to meet market demand. This type of situation can be seen in Ballan, Gordon and Yendon where the Township Zone is enveloped by the Rural Living Zone. If the Low Density Residential or Rural Living Zone were to be applied to Bungaree and Wallace in the future, then their application should have regard to the considerations below.

Where it is proposed to encourage the growth of rural residential land uses (Low Density Residential, Rural Living Zone or Green Wedge A Zone) in agricultural areas then an assessment must be undertaken that considers:

- Population projections, demographic and housing trends
- Supply and demand for housing types
- Site context and impacts to agricultural activities, environmental assets, community and utility infrastructure, and existing nearby land uses
- Consistency with State, regional and local planning policies and strategies
- Where there is no existing settlement strategy, the provision and cost of providing community and utility infrastructure for growth areas. The includes a description of:
    - Availability of existing infrastructure – eg. schools, public transport, roads and waste disposal.
    - Services that will need to be supplied / upgraded
    - Costs and options of providing the services / infrastructure.

Practice Note 37 also states that the location of rural residential land uses:

- Must not impede long term growth of fully serviced residential development at standard densities.
- Is inappropriate on land that is suitable for present or future residential use at urban densities.
- Is not appropriate on land that is in a special water supply catchment area.
- Must consider alternative locations within the host and neighbouring municipalities.

The size of properties within rural residential areas is generally to be:

- Low Density Residential:
    - At least 0.2 hectares where the land is sewered
    - At least 0.4 hectares where the land is not sewered.
- Rural Living Zone
    - At least 2 hectares where not specified in the schedule to the zone.
    - Any lot size as specified in the schedule to the zone.

4.0 Demographics

This section provides an overview of the existing population within the communities of Bungaree, Wallace and Dunnstown. The data is sourced from the 2011 Census (Australian Bureau of Statistics). Table 1, Table 2 and Table 3 provide the population (by age cohort), the total number of dwellings and the number of people per household. The purpose of this information is not only to characterise the community, but to also inform the need for certain types of services and likely future household composition based on growth scenarios.

The demographic data has been provided for the following (ABS defined) locations:

- Moorabool Local Government Area.
- Moorabool (S) - Bacchus Marsh SLA
- Moorabool (S) - Ballan SLA
- Moorabool (S) - West SLA
- Suburb - Bungaree
- Suburb - Dunnstown
- Suburb - Millbrook (incl. Wallace)

There are several data sets that are directly relevant to this study, and two that are indirectly relevant. The Moorabool Local Government Area is directly relevant as it provides the total population for the Shire. The Moorabool (S) - West SLA (Statistical Local Area) is directly relevant as it provides the total population for the geographic area that the three towns are location within. The Suburbs of Bungaree, Dunnstown and Millbrook are also directly relevant as they provide the population for each of the three towns and their surrounding communities.

The ABS includes Wallace within the catchment of Millbrook and is referred to in the tables below as 'Suburb - Millbrook (incl. Wallace)', however in the body of this report as we only use the term Wallace. The other Statistical Local Area of Bacchus Marsh and Ballan are included for comparative purposes only. As the ABS statistical boundaries do not necessarily align with the township boundaries, the data is limited to this extent.

Table 1 below shows that the enumerated[1] population of Moorabool was 26,997 people in the 2011 Census. The 'usual place of residence' population of Moorabool was 28,124 in the 2011 Census, indicating that on the night of the 2011 Census 1,127 people were away from what they identify as their usual place of residence in Moorabool.

The vast majority of Moorabool's residents live in the Bacchus Marsh (65%) and the Ballan (23%) catchments, and only a comparatively small percentage live in the West SLA catchment (12%). This reflects the strong support for urban growth around Bacchus Marsh (in the east of the Shire) as a major regional town and the limited opportunity for urban growth in the west of the Shire due to the Proclaimed Water Catchment Area, which applies to a vast area in Moorabool's western region and surrounds (see Figure 5).

The population for the West SLA is approximately 3,400 people. The data in Table 1 highlights that there is a relatively high percentage of young people within the SLA, which is likely to be reflective of young families. For example, 0-24 year old represent 32% of the population, with the vast majority being in the 0-14 age group (21%). There are only a small percentage of people in the 25-34 age group (7%), with each age cohort thereafter increasing as a percentage of the whole. This is reflective of an ageing population. This is likely to be reflective of people in the 15-24 and 25-34 age cohorts relocating to other locations for education and employment opportunities.

Table 1: Population Counted at Home on Census Night – Moorabool LGA, est SLAs - Bacchus Marsh, Ballan and est

Years	Moorabool LGA	Moorabool S - Bacchus Marsh SLA	Moorabool S - Ballan SLA	Moorabool S - est SLA
0-14	5,790	3,838	1,249	697 (21%)
15-24	3,362	2,304	676	380 (11%)
25-34	2,719	1,915	558	251 (7%)
35-44	3,944	2,600	905	436 (13%)

[1] Counted at home on Census Night.

Years	Moorabool LGA	Moorabool S - Bacchus Marsh SLA	Moorabool S - Ballan SLA	Moorabool S - est SLA
45-54	4,166	2,535	1,069	566 (17%
55-64	3,577	2,129	922	525 (16%)
65-74	2,048	1,196	525	325 (10%)
75-84	997	633	228	139 (4%)
>85	394	250	101	43 (1%)
Total	26,997	17,400	6,233	3,362 (100%)
As a % of people living in Moorabool	100%	65%	23%	12%
As a % of people living in West SLA				

Source: Australian Bureau of Statistics

Table 2 shows the population for the ABS Suburbs of Bungaree, Wallace and Dunnstown. As can be seen in Table 2, the populations of each town and its (ABS defined) catchment are Bungaree - 381 people, Dunnstown – 247 people, and Wallace – 339 people. The split between the age cohorts generally reflects the municipal profile of the Moorabool West SLA.

Table 2: Population Counted at Home on Census Night – Bungaree, Dunnstown and Millbrook incl. allace

Years	Suburb - Bungaree	Suburb - Dunnstown	Suburb - Millbrook incl. allace
0-14	72	56	88
15-24	45	28	38
25-34	38	16	24
35-44	56	27	38
45-54	49	45	60
55-64	61	27	40
65-74	42	29	29
75-84	13	16	14
>85	5	3	8
Total	381	247	339
As a % of people living in Moorabool	1.4%	0.9%	1.3%
As a % of people living in West SLA	11.3%	7.3%	10.1%

Source: Australian Bureau of Statistics

Table 3 shows the total number of dwellings and number of people per household. As can be seen in Table 3, the total number of dwellings in each town and its (ABS defined) catchment are Bungaree – 143 dwellings, Dunnstown – 93 dwellings, and Wallace – 116 dwellings. Using the population data above and the total number of dwellings, the municipal average household size is 2.68 people per household, which is generally consistent with the townships of Bungaree and Dunnstown at 2.66, but lower than Wallace at 2.92. Interestingly, the number of people per household is only slightly higher in the Bacchus Marsh SLA (2.73) where there has been considerable growth and there are many young families with children.

Table 3: Total occupied private dwellings

Location	Total dwellings	No. of people per household
Moorabool LGA	10,076	2.68
Moorabool (S) - Bacchus Marsh SLA	6,379	2.73
Moorabool (S) - Ballan SLA	2,433	2.56
Moorabool (S) - West SLA	1,266	2.66
Suburb - Bungaree	143	2.66
Suburb - Dunnstown	93	2.66
Suburb - Millbrook (incl. Wallace)	116	2.92

Source: Australian Bureau of Statistics

As shown in Table 4, there are 212 0-4 year olds in the Moorabool West SLA, and in Bungaree - 26, Dunnstown - 13, and Wallace - 19[2].

Table 4: 0-4 Age Cohort

Location	0-4 Years
Moorabool LGA	*1,860*
Moorabool (S) - Bacchus Marsh SLA	1,259
Moorabool (S) - Ballan SLA	385
Moorabool (S) - West SLA	212
Suburb - Bungaree	*26*
Suburb - Dunnstown	*13*
Suburb - Millbrook (incl. Wallace)	*19*

Source: Australian Bureau of Statistics

Table 5 shows the State Government projections for the population in Victoria and the Shire of Moorabool. The State projects an additional 1.5 million people in Victoria between 2011-2031. It also projects that the population of the Bacchus Marsh SLA catchment to almost double, the Ballan catchment to increase by 30% over the same period, and the Moorabool West SLA catchment to increase by 9% over the same period.

In the Moorabool West SLA, the population increase would equate to 127 new dwellings at 2.7 people per household. The Moorabool West SLA takes up a large geographical area consisting of in excess of 12 towns. Therefore expected growth in Bungaree, Wallace and Dunnstown is likely to equate to 10 additional households per town over the next 20 years, or one house per town every two years without sewer or a workable Domestic Waste Water Management Plan.

It is noted however, that the Victoria in Future statistics only consider demographic trends based of historical data, and do not take into account planning policies that may seek to implement change and population growth. As such, it is expected that policies to encourage population growth will result in a larger population by 2031.

Table 5: Victoria in Future Population Pro ections

SLA Name	2011	2016	2021	2026	2031
Victoria	5,621,210	6,067,702	6,500,653	6,924,141	7,326,564
Moorabool (S) - Bacchus Marsh	18,953	21,893	24,819	27,704	30,528
Moorabool (S) - Ballan	6,708	7,272	7,788	8,307	8,817
Moorabool (S) - West	3,748	3,842	3,924	4,008	4,092

Source: Victoria in Future, 2012

[2] The provision of child care facilities and services has been identified in this study as a potential infrastructure gap. For this reason, additional information about this age cohort has been provided.

5.0 Community Infrastructure

This section provides an overview of the process to identify and evaluate the provision of community infrastructure in each town. It relies on information provided to AECOM by the Shire of Moorabool about community infrastructure in each town. This information includes:

- *Sports Facility Demand Analysis and Strategy for Bacchus Marsh and Surrounds and Ballan, September 2012*
- *Comparative Services and Constraints Matrix – Moorabool Towns, Shire of Moorabool*
- *Correspondence from the Shire of Moorabool, 28 November 2013*
- *Moorabool Shire Council Social and Community Infrastructure (SCI) Gaps Analysis Final Report, June 2013*[3]

The *Guide to Social Infrastructure Planning*, *2009* has been used to provide the metrics against which to measure the provision and capacity of community infrastructure. This is consistent with Council's use of the Guide in the recently completed *Moorabool Shire Council Social and Community Infrastructure (SCI) Gaps Analysis Final Report, June 2013*.

The ratios in the *Guide to Social Infrastructure Planning*, *2009* are not statutory requirements, nor are they guidelines that State planning policy require adherence to. The ratios are only indicators that have been developed by industry to assist Councils and the Growth Areas Authority with the planning of community facilities in growing suburbs located on Melbourne's outer fringes.

The *Guide to Social Infrastructure Planning*, *2009* was prepared for suburban high growth communities on the fringe of Melbourne, a significantly different context to that found in Bungaree, Wallace and Dunnstown. However, there is limited other published reference material available to inform this type of assessment.

5.1 Community Facilities

Table 6 lists community, utility and other infrastructure in Bungaree, Wallace and Dunnstown (as supplied by Council). This data was taken from the *Comparative Services and Constraints Matrix – Moorabool Towns, Shire of Moorabool*. The data in Table 6 has been used to analyse the provision of community infrastructure in each community.

The legend accompanying Table 6 and Table 8 is:

- Y: This type of facility is located in the town.
- Y[1]: A high pressure gas pipeline is located 1.7kms to the south of the town centre.
- P[1]: Historical train station/siding exists but services do not stop at the town.
- P[2]: Waste Kerbside Services are provided.
- UI: Under investigation for provision of the service in the town.
- Blank cells: This type of facility does not exist within the town.

Table 6: Comparative Services and Constraints Matrix – Moorabool Towns, Shire of Moorabool

Facilities	Bungaree	Dunnstown	allace
Community Services			
Electricity	Y	Y	Y
Banks/ATMs	Y		
Library			
Post Office	Y		
Shire Office			
Court House			
Hospital			
Maternal & Child Health Centre			Y

[3] Provided by the Shire of Moorabool Planning Department

Facilities	Bungaree	Dunnstown	allace
Doctor/Medical Centre			
CFA	Y		Y
Police Station			
Ambulance			
SES	Y		
Church	Y	Y	Y
Railway (station/siding)	P[1]	P[1]	P[1]
Retirement Village			
Farmers Market			
Shire Managed Social Housing			
Community Facilities			
Halls and Community Centres	Y	Y	Y
Neighbourhood Houses			Y
Park and public toilet	Y	Y	Y
Sports Facilities (courts/oval)	Y	Y	Y
Art Galleries/Museums			
Education			
Childcare Centre/Pre School			Y
Primary school	Y	Y	Y
Secondary school			
Tertiary			
Other			
Pub/Hotel	Y	Y	Y
Pharmacy			
Visitor Information Centre/kiosk			
Café/Restaurant			
Accommodation	Y		Y
Fuel Sales	Y		
General Store	Y		
Retail precinct			
Utilities Connected			
Water	Y	UI	Y
Sewer	UI		UI
Gas	UI		Y
Waste Kerbside Service	P[2]	P[2]	P[2]

Source: Shire of Moorabool

5.2 Community Infrastructure Ratios

The community infrastructure ratios shown in Table 7 are sourced from the *Comparative Services and Constraints Matrix – Moorabool Towns, Shire of Moorabool*, which is a summary of the *Guide to Social Infrastructure Planning*, *2009.*

Table 7: Community Infrastructure Ratios

Service Type	Trigger
Early Years	
Four Year Old Kindergarten Facilities	*2.3 double 4 year old kindergarten facilities for every 10,000 people.* *3.8 double kindergarten facilities per 1,000 zero to four year olds.* *66 places per 1,000 zero to four years olds*
Maternal & Child Health Services	*8.7 centres per 100,000 total population, or 7.1 centres per 1000 births* *1.4 dual M&CH centres per 1,000 zero to four year olds.*
Playgroups	*40 playgroups for every 100,000 people* *6.5 playgroups per 1,000 zero to four year olds*
Occasional Child Care Centres	*3.2 centres per 100,000 people* *5.3 centres per 10,000 0-4 year olds* *1.7 places per 100 0-4 year olds*
Long Day Child Care Centres	*1.6 long day child care centre per 10,000 people.* *2.7 centres per 1,000 zero to four year olds* *23 places per 100 zero to four year olds*
Outside School Hours Care Centres	*21.4 places per 100 children aged 5-9 years*
Early Childhood Intervention Services	*1.6 centres per 10,000 children aged 0-6 years*
General Community Services	
Centre Based Libraries	*1 Library per 30,000-60,000 people*
Neighbourhood House Spaces	*1 Neighbourhood House per 20,000 people*
Community Meeting spaces - Small	*1 1-20 people venue per 4,000 people*
Community Meeting spaces - Small to Medium	*1 21-50 people venue per 8,000 people*
Community Meeting spaces - Medium	*1 51-100 people venue per 8,000 people*
Community Meeting spaces - Medium to Large	*1 101-200 people venue per 8,000 people*
Community Meeting spaces - Large	*1 200+ people venue per 20,000 people*
Youth Facilities/Youth Friendly Space	*Youth friendly spaces designed as part of Level 1 multi-purpose council community centres (1 Centre per 8,000 people)*
Youth Resource Centres	*1 youth resource centre incorporated within Level 3 multi-purpose Council community centres) per 30,000 – 60,000 people*
Multi-purpose Community Centres - Small	*1 Level 1 or 2 multi purpose community centre per 8,000 to 10,000 people*
Multi-purpose Community Centres - Medium	*1 per 40,000 to 50,000 people*
Planned Activity Groups	*1 PAG per 40,000 to 60,000 people*
Arts and Cultural Facilities	
Community Art Space - Flexible, Multipurpose, Shared Use	*Spaces to be provided within Level 1 Multi-Purpose Community Centre (1 per 8,000 to 10,000 people)*
Performing Art or Exhibition Facilities - Co-located, Dedicated Space	*1 co-located (e.g. government secondary college) performing arts facility per 40,000 to 60,000 people*
Community Arts Centre	*1 Level 3 community arts centre per 40,000 to 60,000 people*
Public Art	*1 Level 3 Public Art project per 40,000 to 60,000 people*

Service Type	Trigger
Education & Training	
Government Primary Schools	*1 government primary school per 8,000 to 10,000 people*
Government Secondary Schools	*1 government secondary school per 25,000 to 30,000 people*
Catholic Primary Schools	*1 Catholic primary school per 18,000 people*
Catholic Secondary Schools	*1 Catholic Secondary per 58,000 people*
Specialist School	*1 specialist school per 50,000 people*
Health and Community Services	
Community Based Health Care - Small to Medium	*1 per 10,000-50,000 people*
Indoor Recreation	
Council Indoor Aquatic/Fitness Centres or Leisure Centres	*1 per 40000 people*
Indoor Recreation Courts	*1 court per 10,000 people*
Active Outdoor Sport and Recreation and Passive Open Space	
Active Open Space Reserves - Small	*One Level 1 active open space reserve (8 ha per active open space reserve) per 6,000 people.*
Active Open Space Reserves - Medium to Large	*1 higher order active open space reserve (30 ha open space reserve) per 50,000 people.*
Neighbourhood Active Open Space Reserve - Pavilions (Small)	*1 per 6,000 people (or designated active recreation reserve)*
Neighbourhood Active Open Space Reserve - Pavilions (Medium)	*1 per 50,000 people*
Passive open space reserves - Including Playgrounds	*0.7 to 1 ha of passive open space per 1,000 people*
Tennis Courts	*1 court per 2,000 people*
Australian Rules Football Ovals	*1 oval per 4,000 people*
Lawn Bowls Facility	*1 lawn bowls facility (4 greens) per 40,000 people*
Cricket Ovals	*1 oval per 3,000 people*
Soccer Fields	*1 field per 5,000 people*
Netball Courts	*1 court per 2,000 people*
Emergency Services	
Integrated Emergency Service Precinct (Police, Fire, Ambulance, SES)	*1 per 37,000 people across all services*

1. Australian Social and Recreation Research (ASR), 2008 *Planning for Community Infrastructure in Growth Areas*
2. Recreation benchmarks are taken from *Sports Facility Demand Analysis and Strategy for Bacchus Marsh & Surrounds and Ballan*, 2012

5.3 Community Infrastructure Analysis

The list of community infrastructure in Table 6, the community infrastructure ratios in Table 7, in conjunction with the demographic data in Section 3.2 was used to analyse the capacity for population growth within each town. This has been used to create Table 8 which provides an analysis of the existing conditions in each town and the opportunities for and constraints on population growth. The assessment evaluates whether the level of existing community infrastructure in Bungaree, Wallace and Dunnstown is likely to be a constraint and given existing facilities, and what future population could be supported based on each facility type. The analysis assumes that the facilities within each town are part of a network – that provide services for the population located in any of the three towns and their surrounds. That is, a facility may only be located on one town, but it meets the needs of the three towns.

Table 8: Community Facilities Analysis

Facilities	B	D		Community Facility Ratios	Ratios for Study Area	Community Facility Context and Current Level of Service Provision within the Shire of Moorabool	Level of Constraint to urban growth and Implications
Community Services							
Banks/ATMs	Y			NA	NA	The nearest banks are located in Ballan.	The provision of banks is a market response. This is not a constraint for urban growth in Bungaree or Wallace.
Library				1:30,000-60,000 people	1 in the Shire	There is one library in Bacchus Marsh. The library provides an online ordering service with delivery to Bungaree, Wallace and a number of other towns in the area.	As the population grows there is likely to be increased demand for library services. However, changes in the way media is consumed (i.e. electronically) may see demand plateau. It is assumed that the mobile library service will continue to function in the future. This is not a constraint for urban growth in Bungaree or Wallace.
Post Office	Y			NA	NA	A postal service is provided from the General Store in Bungaree.	The provision of a post office is a market response. This is not a constraint for urban growth in Bungaree or Wallace.
Shire Office				NA	NA	The Shire office is located in Ballan.	This is not a constraint for urban growth in Bungaree or Wallace.
Court House				NA	NA	The nearest Court house is located in Ballan.	This is not a constraint for urban growth in Bungaree or Wallace.
Hospital				Provision for whole municipality or two municipalities	Up to 1 in the Shire	The nearest hospital is located in Ballan.	This is not a constraint for urban growth in Bungaree or Wallace.
Maternal & Child Health Centre	Y		Y	8.7 centres per 100,000 total population, or 7.1 centres per 1000 births 1.4 dual M&CH centres per 1,000 zero to four year olds.	2.3 in the Shire	Wallace MCHC is open 1 day per week. It is located at the Wallace & District Family Services Hub. Services include Kindergarten, Preschool, Three Year Old Group Maternal & Child Health centre.	The Wallace & District Family Services Hub and the MCHC service supports the development of the wider district, including Dunnstown and Bungaree. This facility could potentially support up to 1,000 zero-four years olds. This would equate to approximately 16,000 households (based on the existing ratio of 0-4 year olds to the adult population – see Section 3.2). Given the existing user capacity and space within the hub there is the potential to expand the number of days that the site operates. This is not a constraint for urban growth in Bungaree or Wallace.
Church	Y	Y	Y	NA	NA	There are 5 religious groups in Ballan, and 1 in Dunnstown	Religious affiliations provide a sense of community and a foundation for community support, arguably decreasing reliance on government support networks. This is not a constraint for urban growth in Bungaree or Wallace.
Retirement Village				NA	NA	Information not available.	It is likely that demand for retirement villages with varying levels of care will increase within the Shire over the coming decades. It is likely that such services would be provided in the major urban centres of Bacchus Marsh or Ballan. This is not a constraint for urban growth in Bungaree or Wallace.
Farmers Market				NA	NA	Information not available.	This is not a constraint for urban growth in Bungaree or Wallace.
Shire Managed Social Housing				Communities of up to 10,000 people to provide for social housing	A quantity is not specified	The Office of Housing manages 280 public housing properties in Moorabool Shire.	Emerging communities may require the need for additional social housing. Council should consult with the Office of Housing, Uniting Care (Ballarat), Child and Family Services (CAFS) and Loddon Mallee Housing Services to determine future demand. This is not a constraint for urban growth in Bungaree or Wallace.
Doctors/Medical Centre				Community Based Health Care - Small to Medium: 1 per 10,000-50,000 people	2.6 in the Shire	Nearest medical practitioner is in Ballan (~20kms) and Ballarat (~13kms)	This is not a constraint for urban growth in Bungaree or Wallace.
Emergency services:							
CFA	Y			1 per 37,000 people across all services (integrated emergency services precinct with police, fire, ambulance and SES)	1 in the Shire	There is a CFA and SES station in Bungaree. Insufficient information on Council website to identify the provision of emergency services elsewhere in the Shire.	It is the role of the State Government to respond to the need for emergency services. This is not a constraint for urban growth in Bungaree or Wallace.
Police Station				as above	as above	as above	as above
Ambulance				as above	as above	as above	as above
SES	Y			as above	as above	as above	as above

Facilities	B	D		Community Facility Ratios	Ratios for Study Area	Community Facility Context and Current Level of Service Provision within the Shire of Moorabool	Level of Constraint to urban growth and Implications
Community Facilities							
Halls and Community Centres	Y	Y	Y	Small: 1 1-20 people venue per 4,000 people	1 (small) in Moorabool SLA West	Halls and Community Centres are provided in in Bungaree, Wallace and Dunnstown. The following activities and services are provided: • Dance groups • Exercise classes e.g. Pilates • Sporting club social functions • Birthday parties • Community group committee meetings • Community social occasions, e.g. casserole nights • Rural library services • Community events • Aged and Disability Planned Activity Group sessions • Children's services events • Mothers groups meetings • Playgroups • Senior Citizens groups • Youth events and activities • Funerals • School concerts Venue size is unknown. We have assumed 20 people per venue.	This is not a constraint for urban growth in Bungaree or Wallace up to at least 4,000 people per town assuming that each venue in each town can accommodate 20 people.
				Small to Medium: 1 21-50 people venue per 8,000 people	3 in the Shire	NA	NA
				Medium: 1 51-100 people venue per 8,000 people	3 in the Shire	NA	NA
				Medium-large: 1 101-200 people venue per 8,000 people	3 in the Shire	NA	NA
				Large: 1 200+ people venue per 20,000 people	1 in the Shire	NA	NA
Neighbourhood Houses			Y	1 Neighbourhood House per 20,000 people	1.25 in the Shire	1 located in Darley (Bacchus Marsh)	The population of Bacchus March will soon exceed 20,000 people. It is recommended that Council explore the opportunity for an additional neighbourhood house in Ballan, which serves the Ballan and West catchments. If the West catchment is allowed to grow then as the population of the Ballan and West catchments nears 20,000 each then a third neighbourhood house should be considered in Bungaree. This is potential constraint for urban growth in Bungaree and Wallace (and Ballan) as the population of the Shire increases.
Park and public toilet	Y	Y	Y	Passive open space reserves - Including Playgrounds: 0.7 to 1 ha of passive open space per 1,000 people	1 passive POS with playgrounds between 0.7-1ha in each community of 1,000 people	The Bungaree Recreation Reserve includes areas that could be used for passive recreation, and it includes a playground and public toilets. The Wallace Recreation Reserve includes areas that could be used for passive recreation, and it includes a playground and public toilets. The Dunnstown Recreation Reserve does not specifically include areas for passive recreation and does not include a playground.	The Bungaree Recreational Reserve could potentially support a significantly larger population of up to approximately 1,000 people. The Wallace Recreational Reserve could potentially support a significantly larger population of up to approximately 1,000 people. The lack of formal passive public open space in Dunnstown could be accommodated within the Dunnstown Recreation Reserve in the future, and is therefore not considered to be a major constraint on the growth of the towns. It is likely that any future urban development would require the provision of Public Open Space in accordance with Clause 52.03 of the Moorabool Planning Scheme by the land developer. This is not a constraint for urban growth in Bungaree or Wallace.

Facilities	B	D		Community Facility Ratios	Ratios for Study Area	Community Facility Context and Current Level of Service Provision within the Shire of Moorabool	Level of Constraint to urban growth and Implications
				Active Open Space Reserves - Small: One Level 1 active open space reserve (8 ha per active open space reserve) per 6,000 people.	Less than 1 Active POS of 8ha in Moorabool SLA West.	Bungaree Recreation Reserve is ~5.9ha. It includes active recreation space and clubrooms for football/cricket (1) and netball (1). Wallace Recreation Reserve is ~5.8ha. It includes active recreation space and clubrooms for football (1), netball (1) and tennis (2). Dunnstown Recreation Reserve is ~4.6ha. It includes active recreation space and clubrooms for football (1), netball (1) and tennis (2).	The Bungaree Recreational Reserve could potentially support a significantly larger population of up to approximately 4,500 people. The Wallace Recreational Reserve could potentially support a significantly larger population of up to approximately 4,500 people. The Dunnstown Recreational Reserve could potentially support a significantly larger population of up to approximately 3,500 people. This is not a constraint for urban growth in Bungaree or Wallace up to approximately 3,500-4,500 people per town.
				Active Open Space Reserves - Medium to Large: 1 higher order active open space reserve (30 ha open space reserve) per 50,000 people.	Less than 1 in the Shire	See above	See above
				Neighbourhood Active Open Space Reserve - Pavilions (Small): 1 per 6,000 people (or designated active recreation reserve)	Less than 1 in the Moorabool SLA West	See above	See above
				Neighbourhood Active Open Space Reserve - Pavilions (Medium): 1 per 50,000 people	Less than 1 in the Shire	See above	See above
Sports Facilities (courts/oval)	Y	Y	Y	Tennis Courts: 1 court per 2,000 people	1 tennis court in Moorabool SLA West	Bungaree has 2 tennis courts Wallace has 2 tennis courts Dunnstown has 2 tennis courts	All towns could support up to 2,000 people. This is not a constraint for urban growth in Bungaree or Wallace
				Australian Rules Football Ovals: 1 oval per 4,000 people	1 Aussie Rules Football Oval in Moorabool SLA West	See description under Active Open Space	All towns could support up to 4,000 people. This is not a constraint for urban growth in Bungaree or Wallace.
				Lawn Bowls Facility: 1 lawn bowls facility (4 greens) per 40,000 people	1 Lawn Bowl Facility in Shire	The nearest lawn bowls facility is in Ballan.	This is not a constraint for urban growth in Bungaree or Wallace.
				Cricket Ovals: 1 oval per 3,000 people	1 Cricket Oval in Moorabool SLA West	See description under Active Open Space	All towns could support up to 3,000 people. This is not a constraint for urban growth in Bungaree or Wallace
				Soccer Fields: 1 field per 5,000 people	Less than 1 Soccer Field in Moorabool SLA West	The nearest soccer facility is in Bacchus Marsh.	This is not a constraint for urban growth in Bungaree or Wallace.
				Netball Courts: 1 court per 2,000 people	1 Netball Court in Moorabool SLA West	See description under Active Open Space	All towns could support up to 2,000 people
Art Galleries/Museums				Community Art Space - Flexible, Multipurpose, Shared Use: Spaces to be provided within Level 1 Multi-Purpose Community Centre (1 per 8,000 to 10,000 people)	3 Community Art space in Shire	There is no dedicated space in the Shire. Art is often exhibited in a small space in the Lerderderg Library, Bacchus Marsh. There is the opportunity to display art within Halls and Community Centres.	This is a potential constraint for urban growth in the Shire. This is unlikely to be a constraint for urban growth in Bungaree or Wallace. It is likely that the community hall could be used periodically as a community art space.
				Performing Art or Exhibition Facilities - Co-located, Dedicated Space: 1 co-located (e.g. government secondary college) performing arts facility per 40,000 to 60,000 people	Less than 1 in the Shire	See above	See above
				Community Arts Centre: 1 Level 3 community arts centre per 40,000 to 60,000 people	Less than 1 in the Shire	See above	See above
				Public Art : 1 Level 3 Public Art project per 40,000 to 60,000 people	Less than 1 in the Shire	See above	See above

Facilities	B	D		Community Facility Ratios	Ratios for Study Area	Community Facility Context and Current Level of Service Provision within the Shire of Moorabool	Level of Constraint to urban growth and Implications
Education							
Childcare Centre/Pre School			Y	Four Year Old Kindergarten Facilities 2.3 double 4 year old kindergarten facilities for every 10,000 people. 3.8 double kindergarten facilities per 1,000 zero to four year olds. 66 places per 1,000 zero to four years olds	Less than 1 kindergarten for Moorabool West SLA.	The Wallace & District Family Services Hub includes Kindergarten, Preschool, Three Year Old Group Maternal & Child Health centre	The Wallace Preschool has the capacity to increase services. The preschool room can accommodate 32 children with 24 children currently enrolled (75% enrolment). The Wallace Kindergarten has capacity to include an additional group of 30 children if required. It is also likely that many households will use services provided close to their place of employment, which in many cases is likely to be in Ballan, Ballarat, Bacchus Marsh and Melbourne. It is likely that the Wallace Preschool and Kindergarten would support 38 additional places, which equates to 500 0-4 years olds. This translates to 8,000 households (based on the existing ratio of 0-4 year olds to the adult population – see Section 3.2). The provision of kindergarten facilities and services has the potential to be a constraint if the facilities cannot be expanded.
				Playgroups 40 playgroups for every 100,000 people 6.5 playgroups per 1,000 zero to four year olds	Less than 1.3 playgroups in Moorabool West SLA	The nearest playgroups are in Millbrook and Lal Lal.	Wallace & District Family Services Hub has capacity to expand. As the population grows this type of service could be provided at existing Council facilities. It is also likely that many households will use services provided close to their place of employment, which in many cases is likely to be in Ballan, Ballarat, Bacchus Marsh and Melbourne. This is unlikely to be a constraint for the urban growth of Bungaree and Wallace.
				Occasional Child Care Centres 3.2 centres per 100,000 people 5.3 centres per 10,000 0-4 year olds 1.7 places per 100 0-4 year olds	2 Occasional Child Care Centres in the Shire	The nearest Occasional Care is in Darley (Bacchus Marsh)	Wallace & District Family Services Hub has capacity to expand. It is also likely that many households will use services provided close to their place of employment, which in many cases is likely to be in Ballan, Ballarat, Bacchus Marsh and Melbourne. The provision of occasional child care facilities and services has the potential to be a constraint.
				Long Day Child Care Centres 1.6 long day child care centre per 10,000 people. 2.7 centres per 1,000 zero to four year olds 23 places per 100 zero to four year olds	Less than 1 Long Day Child Care Centre in the Shire	Refer to comments under kindergartens	Wallace & District Family Services Hub has capacity to expand. It is also likely that many households will use services provided close to their place of employment, which in many cases is likely to be in Ballan, Ballarat, Bacchus Marsh and Melbourne. The provision of long day child care facilities and services has the potential to be a constraint.
				Outside School Hours Care Centres 21.4 places per 100 children aged 5-9 years	9 places for Outside School House Care Centres within the Moorabool West SLA	There were 178 Outside School Hours places across the municipality in Bacchus Marsh, Ballan and the Rural East. No services are provided in the Moorabool West SLA.	It is likely that demand for such a service would increase as the community grows. It is also noted that the Ballan Primary School ceased services in 2011 due to funding (the Age, August 15 2011). It is likely that the provision of such services will be constrained by future funding availability. However, it is unlikely that this is a constraint for urban growth as there is no statutory requirement to provide this service.
				Early Childhood Intervention Services 1.6 centres per 10,000 children aged 0-6 years	Less than 1 Early Childhood Intervention Services centre in the Shire	This service is provided within Shire.	This is not a constraint for urban growth in Bungaree or Wallace
Primary school	Y	Y		1:8,000-10,000 people (govt)	3 in the Shire	There are 19 primary schools in the Shire.	It is the role of the Department of Education to meet demand. It is the role of Council to inform the Department of strategic plans that will lead to demographic change. The *Guideline* recommends 1 Government School per 8,000-10,000 people

Facilities	B	D		Community Facility Ratios	Ratios for Study Area	Community Facility Context and Current Level of Service Provision within the Shire of Moorabool	Level of Constraint to urban growth and Implications
							and one Catholic School per 18,000 people. A key and use planning issue for the Primary Schools in Bungaree (Government, 26 enrolments) and Dunnstown (Catholic, 31 enrolments) is ensuring that long term opportunities to acquire adjacent land for the school are not lost due to other short term development opportunities. The provision of primary school facilities and services is not a constraint for urban growth in Bungaree and Wallace.
				1:18,000 people (private)	1.5 in the Shire	As above.	The provision of primary school facilities and services is not a constraint for urban growth in Bungaree and Wallace.
Secondary school				1:25,000-30,000 people (govt)	1 in the Shire	NA	It is the role of the Department of Education to meet demand. It is the role of Council to inform the department of strategic plans that will lead to demographic changes. The provision of secondary school facilities and services is not a constraint for urban growth in Bungaree and Wallace.
				1:58,000 people (private)	Less than 1 in the Shire	There are two secondary schools in Bacchus Marsh. There are also several secondary schools in Ballarat.	The provision of secondary school facilities and services is not a constraint for urban growth in Bungaree and Wallace.
Tertiary				NA	NA	NA	NA
Other							
Youth Resource Centre				1 youth resource centre incorporated within Level 3 multi-purpose Council community centres) per 30,000 – 60,000 people	Less than 1 in the Shire	There is no youth centre in Bacchus Marsh	Unlikely to be a constraint for urban growth
Planned Activity Groups				1 PAG per 40,000 to 60,000 people	Less than 1 in the Shire	A PAG is provided within the Shire	Unlikely to be a constraint for urban growth
Council Indoor Aquatic/Fitness Centres or Leisure Centres				1 per 40,000 people	Less than 1 in the Shire	The nearest (seasonal) aquatic centre is provided in Ballan	Unlikely to be a constraint for urban growth
Indoor Recreation Courts				1 court per 10,000 people	3 in the Shire	The Sports facility Demand Analysis and Strategy for Bacchus Marsh & Surrounds and Ballan identified that it is not currently viable for indoor recreation centres in Moorabool.	Unlikely to be a constraint for urban growth
Waste Kerbside Service	P^2	P^2	P^2	NA		Waste pick up services are provided once per month.	It is likely that the population increases that demand for pick up waste services will increase. For comparative purpose, Ballan is provided with a weekly service in the urban area. Unlikely to be a constraint for urban growth

5.4 Community Facilities and Population Thresholds

The community facilities and services that are most likely to influence the opportunity for urban growth in Bungaree and Wallace are the provision of:

- Childcare and preschool facilities
- Maternal Child and Health Care facilities
- Recreational facilities
- Halls and community facilities.

Childcare and preschool facilities

The Wallace and District Family Services Hub provides Kindergarten, Preschool, Three Year Old Group Maternal & Child Health Care services. The services are located at 729 Bungaree-Wallace Road, Wallace. The Kindergarten / preschool, Child Care and Day Program operate three days per week. The *Guide to Social Infrastructure Planning, 2009* estimates that 66 places can support 1,000, 0-4 year olds (a ratio of one 0-4 year old to every 15.15 people). There are 212 0-4 year olds in Moorabool West SLA and within a population of 3,362 people, equating to a ratio of one 0-4 year old to every 15.85 people. To reach a target population of 1,000 0-4 year olds there would need to be a population of approximately 15,850 people (5,960 households).

Council has advised that the Wallace Preschool has capacity to increase services (from 24 to 32) and the Wallace Kindergarten has capacity to provide an additional 30 spaces. As such, given the provision of existing facilities and assuming that the services can be expanded within the existing premises, it is likely that the facility could support approximately an additional 30 0-4 year olds.

Assuming that 30 additional 0-4 years childcare places can be provided within the community, then approximately an additional 500 0-4 year olds could be supported within the community. Based on the population ratios this equates to a total population of approximately 8,000 people (2,980 households) within the Moorabool West SLA.

Maternal Child and Health Care facilities

The MCHC facility operates one day per week, and is planned to increase to 1.5 days per week. The Wallace & District Family Services Hub and the MCHC service the wider district, including Wallace, Dunnstown and Bungaree. The *Guide to Social Infrastructure Planning, 2009* estimates that 1.4 dual centres can support 1,000 zero to four year olds. Therefore, it is estimated that one dual centre can support 714 0-4 year olds.

Assuming that the existing centre were to operate five days per week, then it is estimated that this facility could potentially support approximately 700 0-4 years' olds. Based on a ratio of one 0-4 year old to every 15.85 people, this would equate to a total population of approximately 11,095 people (4,100 households) within the Moorabool West SLA.

Recreational facilities

Within each town there is a football/cricket oval, netball courts and tennis courts. All facilities are in good condition. The *Guide to Social Infrastructure Planning, 2009* estimates that a tennis courts can support up to 2,000 people, and a football/cricket oval can support up to 4,000 people. The population capacity for each of these sporting facilities varies between 2,000-4,000 people. For the purposes of this study we have taken the highest capacity figure, which is 4,000 people to each football/cricket oval.

Both Bungaree and Wallace have football/cricket ovals, tennis courts and netball courts. As such, these facilities can support approximately 8,000 people across the two towns.

Halls and Community Facilities

Each town has a community hall which can be used as a community meeting space. The *Guide to Social Infrastructure Planning, 2009* estimates that a community meeting space with capacity for a minimum of 20 people can support approximately 8,000 people.

For the purposes of this study we have assumed that each meeting space in Bungaree and Wallace can accommodate a minimum of 20 people for events held at the facility. The population capacity for each facility is therefore estimated to be approximately 16,000 people across Bungaree and Wallace.

Summary

Based on this analysis the three towns can grow to a total population of 8,000 people across the Moorabool West SLA before Council would need to consider expanding the childcare and recreational facilities.

Table 9: Key Community Facilities Threshold Analyses

Facilities	Pro ected Population
Childcare/Preschool	Approximately 8,000 people across the Moorabool West SLA
MCHC	Approximately 11,200 people across the Moorabool West SLA
Recreational Facilities	Approximately 8,000 people across Bungaree and Wallace
Hall and Community Facilities	Approximately 16,000 people across Bungaree and Wallace

6.0 Land Use Opportunities and Constraints

This section provides a summary of the land use constraints and opportunities in Bungaree and Wallace. It also provides an urban growth scenario to inform the feasibility of providing reticulated sewerage in Bungaree and Wallace.

The purpose of the urban growth scenario is to informing the feasibility of providing reticulated sewerage to the towns of Bungaree and Wallace. Separate to this project, Council will complete a Structure Plan that identifies the type and location of land uses in Bungaree and Wallace. As such, the purpose of this section is purely to inform the sewer feasibility opportunities.

Figure 6 to Figure 7 show where there are residential urban growth opportunities within Bungaree and Wallace. The opportunities for urban development are subject to a detailed analysis of constraints.

6.1 Bungaree

Assets and Opportunities

The assets and opportunities in Bungaree are:

- Ample flat land in large land holdings that could be developed as part of planned subdivisions
- Existing public and open space facilities that can support a larger population
- Existing active recreational facilities that can support a larger population
- Existing hall and community centre facilities that can support a larger population
- Existing MCHC facilities that can support a larger population with expansion of services
- An existing Government School with ample surrounding land that could accommodate expansion (if needed) which could therefore support a larger population
- A network of streams that provide the opportunity for connecting the community via a network of open space pathways and nodes
- A rich heritage that provides the town with its own sense of place
- An excellent road network and proximity to the Western Freeway
- Proximity to the high pressure gas pipeline which means that the town could potentially be connected to reticulated gas in the future.
- A general store that provides an array of retail convenience goods.
- Local employment.
- Accessible to Ballan and Ballarat within a 20 minute commute, and
- The railway line through the town which could potentially provide for commuter services with a station at Bungaree.

Challenges and Physical Constraints

Summarised below are the challenges and physical constraints that will influence where and how land is used and developed in the future.

The physical constraints are:

- Environmental Significance Overlay 1 - Proclaimed Water Catchment Areas has been applied to all of Bungaree and its surrounds. This overlay requires that new subdivisions must either be provided with reticulated sewerage or be undertaken in accordance with an approved Domestic Wastewater Management Plan.
- Design and Development Overlay 3 – which requires noise sensitive developments (e.g. dwellings and child care centres) to be appropriately designed to mitigate noise impacts from the Western Freeway on the occupants of the building.

- Creeks and water bodies throughout the town that may be subject to localised flooding (subject to further investigation)
- Aboriginal Cultural Heritage Sensitivity along major creeks
- Aboriginal Cultural Heritage Place Surveys, and
- Physical infrastructure including the Western Freeway to the north, the Ballarat-Melbourne Rail Corridor to the east, the oil and gas high pressure pipeline to the south.

Conceptual growth scenario

Figure 6 shows a conceptual growth scenario for Bungaree. It should be noted that this is one way the town could grow in the future if sewer is provided, however the actual layout will be subject to provision of sewer, a strategic planning exercise and community engagement.

Subject to any further investigations, it is considered that future urban development is best located to the west of the Ballarat Rail Corridor, south of the Western Freeway, north of Triggs Road and generally west of Torpys Road in the short term. This will result in a consolidated urban structure that envelopes the existing community facilities and which will support sustainable transport modes, such as walking and cycling.

The inner core (400-800 metres from the town centre) should be developed more intensely than the outer fringes.

Infill development should be encouraged within the existing urban areas.

Where lower densities are desirable, then these should be encouraged in locations near to the Western Freeway and Ballarat Rail Corridor. Lower densities should only be provided where it is economically feasible to provide sewerage services to these sites. Otherwise this land should be held for future residential growth at standard residential densities.

Growth to the west of Bungaree, towards Torpys Road and beyond should be protected for future growth of standard residential densities. Consequently low density development should be avoided as it would be an impediment.

The land to the north of Bungaree Recreation Reserve could be land banked as a future District Community Hub where community facilities and commercial services could be encouraged to locate. The District Community Hub could service the broader Moorabool West SLA catchment. Alternative locations for a District Community Hub are along Bungaree-Wallace Road between Torpys Road and the existing urban area, or on the south-eastern corner of Bungaree-Wallace Road and Lester Road.

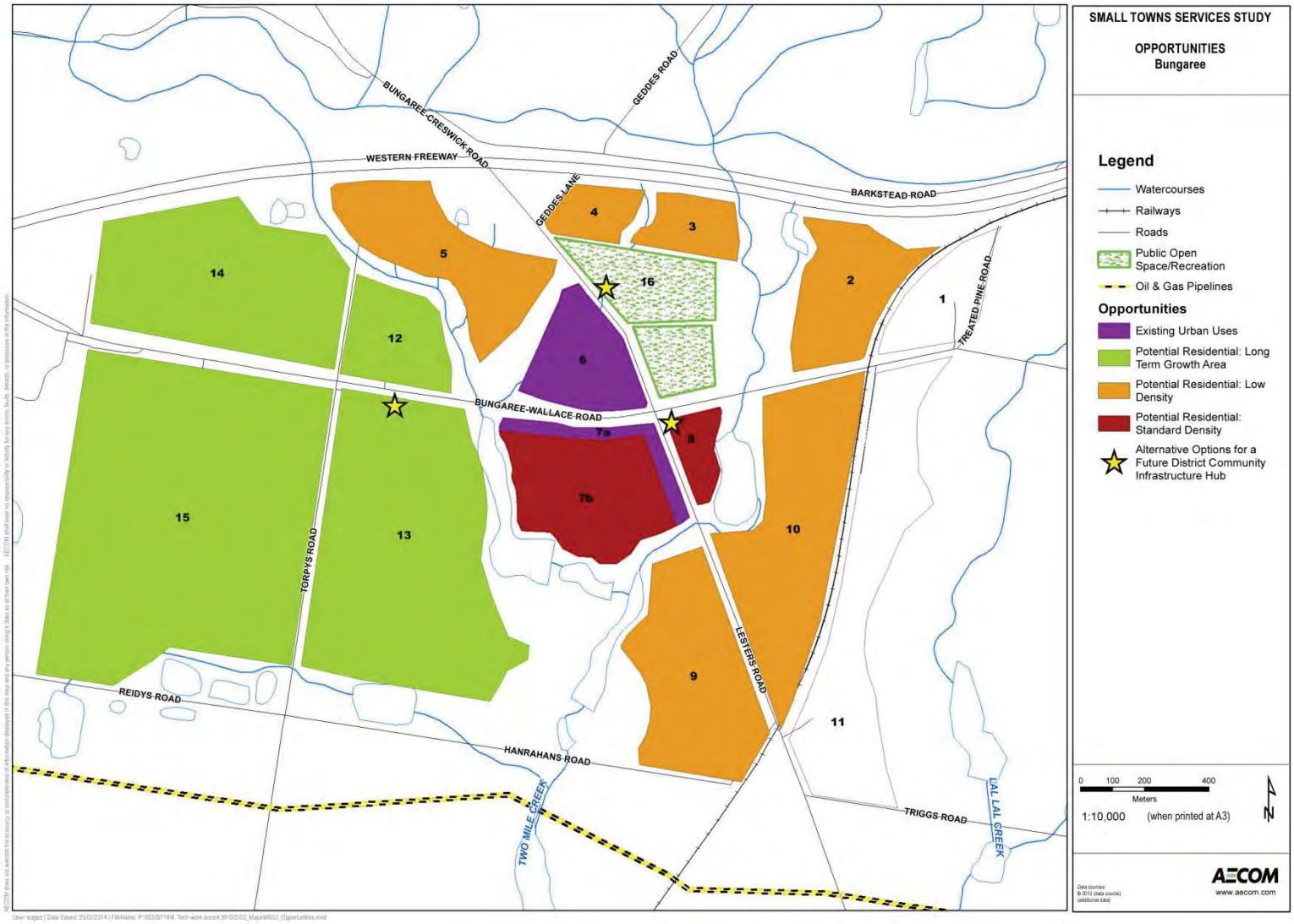


Figure 6: Bungaree Opportunities Map

6.2 allace

Assets and Opportunities

The assets and opportunities in Wallace:

- Ample flat land in large land holdings that could be developed as part of planned subdivisions
- Existing public and open space facilities that can support a larger population
- Existing active recreational facilities that can support a larger population
- Existing call and community centre facilities that can support a larger population
- An existing Catholic School
- A network of streams that provide the opportunity for connecting the community via a network of open space pathways and nodes
- A rich heritage that provides the town with its own sense of place
- Excellent road network and proximity to the Western Freeway
- Existing reticulated gas
- Local employment
- Accessible to Ballan and Ballarat within a 20 minute commute, and
- The railway line through the town which could potentially provide for commuter services with a station at Wallace.

Challenges and Physical Constraints

Summarised below are the challenges and physical constraints that will influence where and how land is used and developed in the future.

The constraints are:

- Environmental Significance Overlay 1 - Proclaimed Water Catchment Areas has been applied to all of Wallace and its surrounds.
- Design and Development Overlay 3 – which requires noise sensitive developments (eg. dwellings and child care centres) to be appropriately designed to mitigate noise impacts from the Western Freeway on the occupants of the building.
- Creeks and water bodies throughout the town that may be subject to localised flooding (subject to further investigation)
- Swamp and lagoon deposits in the vicinity of Wallace Railway Station
- Aboriginal Cultural Heritage Sensitivity along major creeks, and
- Physical infrastructure including the Western Freeway to the north, the Ballarat-Melbourne Rail Corridor which bisects the town, the oil and gas high pressure pipeline to the south.

Conceptual growth scenario

Figure 7 shows a conceptual growth scenario for Wallace. It should be noted that this is one way the town could grow in the future if sewer is provided, however the actual layout will be subject to provision of sewer, a strategic planning exercise and community engagement.

Subject to any further investigations, it is considered that future urban development be located to the south of the Western Freeway, west of Moorabool River West Branch, north of Hennessys road, and east of Murphys Road. This will result in a consolidated urban structure that envelopes the existing community facilities and which will support sustainable transport modes, such as walking and cycling.

The inner core (400-800 metres from the town centre) should be developed more intensely than the outer fringes.

Infill development should be encouraged within the existing urban areas. Where lower densities are desirable then these should be encouraged in the areas nearby to the Western Freeway nearby to the Moorabool River West Branch. Lower densities should only be provided where it is economically feasible to provide sewerage services to these sites. Otherwise this land should be held as for future residential growth at standard residential densities.

Growth to the west and south beyond the current existing urban areas should be protected for future growth of standard residential densities. Consequently low density development should be avoided as it would be an impediment.

Industrial land uses that have a low risk of impacting on water quality should be encouraged in the area to the north of Old Western Highway and east of Ormond Road, subject to discussions with the Central Highlands Water.

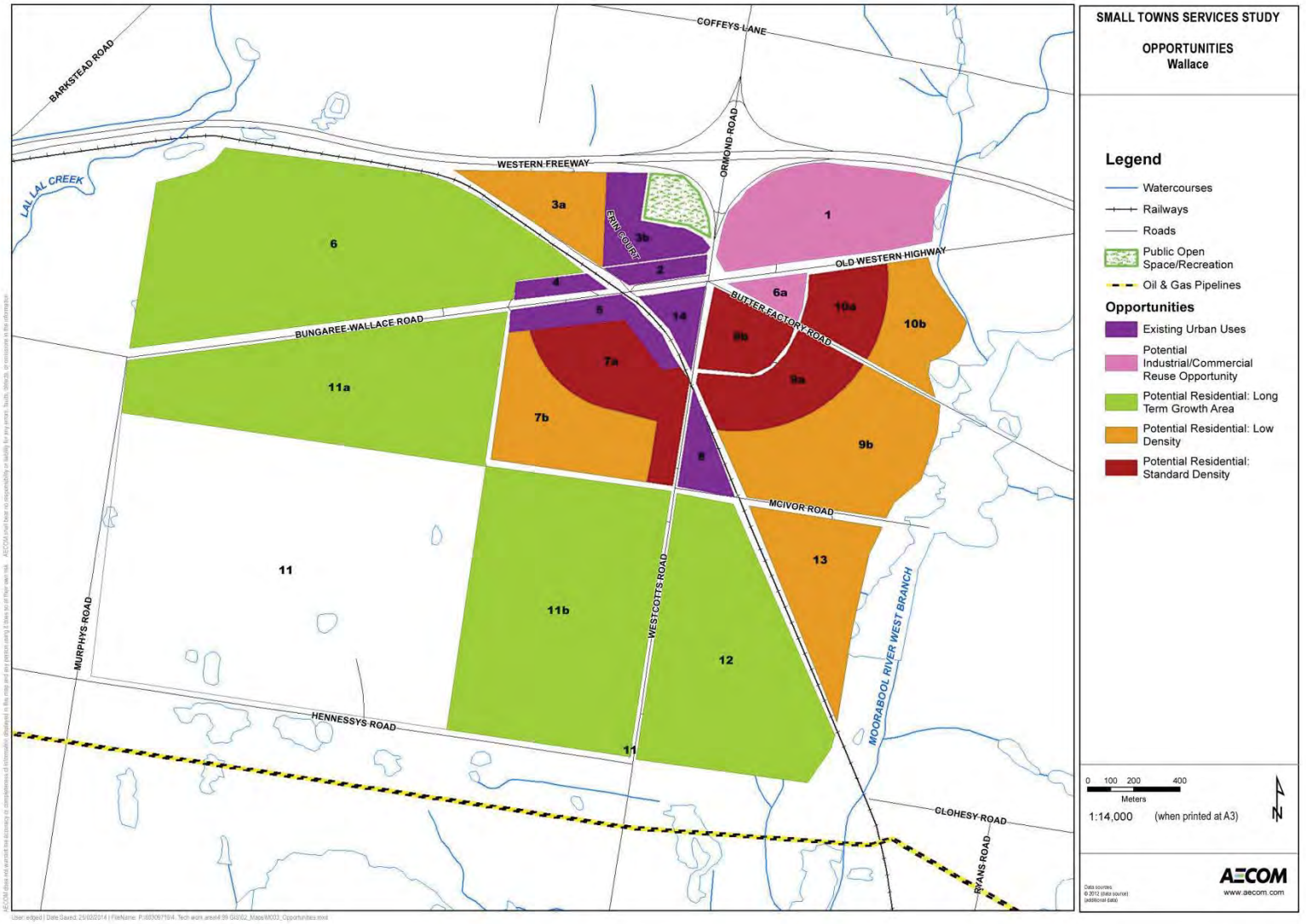


Figure 7: allace Opportunities Map

6.3 Urban Development and Yield

There are a range of factors that will influence peoples decision about where they will live, including, but not limited to planning policy and regulations, land availability, lifestyle, age, transport options, available services, price, proximity to family, property size and amenity.

The Draft Central Highlands Regional Growth Plan, June 2013 identifies areas along the Western Highway, such as Bungaree and Wallace, as locations where there is likely to be pressure for residential urban development as they provide excellent access to commute to Ballarat and Melbourne. It also identifies the region as a location in demand for "tree-change retirees" looking for large rural allotments.

Further investigation is required to determine the market opportunities for residential urban development in Bungaree and Wallace in light of the broader regional housing market and the comparative cost of establishing new subdivisions in rural and urban settings. The analysis needs to confirm what properties and housing type mix would be in successful in Bungaree and Wallace. External factors that are likely to influence this are local comparative options in areas outside of the Proclaimed Water Protection Catchment (for example to the south of Ballarat) and the release of land for the progressive development of 18,000 new households in Ballarat West.

To calculate how much land is required to meet future population growth we have conservatively assumed that the majority of property sizes will be 1,000sqm and the minority will be up to 2,000sqm. These property sizes reflect the common property sizes found within Bungaree, Wallace and other nearby small towns. By comparison property sizes in the growth areas of Bacchus Marsh, the largest growth town in the Shire of Moorabool, vary from approximately 400sqm to 2,000sqm.

Generally, reticulated sewerage networks are provided to residential developments with standard densities (less than 2,000 square metres), and on-site septic systems have been provided for Low Density Residential and Rural Residential areas (greater than 2,000 square metres). To enable the affordable provision of sewerage, it will be important to resolve how many existing and new households could be connected to the network. Higher densities will yield lower connection costs per household. Whilst higher densities will be financially attractive from the perspective of the infrastructure provider, the size of properties must take into account what is likely to be a marketable product in the local and regional context, especially when compared against with the cost of similar lot sizes in other rural and urban areas and the services available in those areas.

Further to the Opportunity Maps for Bungaree and Wallace, we have developed property yields and population projections for each town based on a property size of 1,000-2,000sqm, less 30% of land for roads, open space and infrastructure. The population yields are indicative only and are subject to a detailed assessment of constraints.

Table 10 below provides a summary of Table 11. Table 11 overleaf provides a detailed breakdown of population and property yields for each precinct. The precincts in Table 11 can be cross-referenced with the precincts shown in the Opportunity Maps (see Figure 6 and Figure 7).

For the purposes of this study we have identified more land than what is required to meet the population capacity target. As summarised in Table 10, if all of the precincts were to be developed then the combined population of existing and new areas would be 13,895 people. This is significantly more than the population capacity of the community facilities and services of Bungaree and Wallace. The benefit of this approach is that enables Council to use Figure 6, Figure 7 and Table 11 to select areas where it would prefer to see urban development and to then calculate the likely population yield for each precinct.

Table 10: Development Yields

Staging	Properties	People
Existing population	267	720
Short to mid-term development opportunities	1,136	3,067
Infill development opportunities	41	110
Long term future growth area opportunities	3,703	9,998
Total development yield	5,146	13,895

Land Devt - Standard Density								
Precinct	Available Hectares	Square metres	Less POS / Roads	Property Size	No. of Properties	Person p/house	Population	Staging
Bungaree								
1	5	50,000	35,000	1000	35	2.7	95	Further subdivision not recommended
2	10	100,000	70,000	2000	35	2.7	95	Short-mid term opportunity
3	5	50,000	35,000	2000	18	2.7	47	Short-mid term opportunity
4	4	40,000	28,000	2000	14	2.7	38	Short-mid term opportunity
5	16	160,000	112,000	2000	56	2.7	151	Short-mid term opportunity
6	2	20,000	14,000	1000	14	2.7	38	Infill development opportunities
7	17	170,000	119,000	1000	119	2.7	321	Short-mid term opportunity
8	3.3	33,000	23,100	1000	23	2.7	62	Short-mid term opportunity
9	21	210,000	147,000	2000	74	2.7	198	Short-mid term opportunity
10	26	260,000	182,000	2000	91	2.7	246	Short-mid term opportunity
11	25	250,000	175,000	1000	175	2.7	473	Further subdivision not recommended at this stage
12	9	90,000	63,000	1000	63	2.7	170	Long term future growth area
13	45	450,000	315,000	1000	315	2.7	851	Long term future growth area
14	73	730,000	511,000	1000	511	2.7	1,380	Long term future growth area
15	31	310,000	217,000	1000	217	2.7	586	Long term future growth area
16	10	100,000	70,000	1000	70			Potentail opportunity for community services hub for district
Sub-total: Bungaree					141		381	Existing Properties and Population within catchment
					429		1159	Short-mid term opportunity
					14		38	Infill development opportunities
					1106		2986	Long term future growth area
					35		95	Further subdivision not recommended
					70		0	Potentail opportunity for community services hub for district
allace								
1	34	340,000	238,000	10000	24	2.7	-	Industrial Precinct Opportunity
2	0.5	5,000	3,500	1000	4	2.7	9	Infill development opportunities
3	8	80,000	56,000	8000	7	2.7	19	Infill development opportunities
4	0.5	5,000	3,500	1000	4	2.7	9	Infill development opportunities
5	1	10,000	7,000	1000	7	2.7	19	Infill development opportunities
6	10	100,000	70,000	1000	70	2.7	189	Short-mid term opportunity
7a	24	240,000	168,000	1000	168	2.7	454	Short-mid term opportunity
7b	25	250,000	175,000	2000	88	2.7	236	Short-mid term opportunity
8	0	-	-		-	2.7	-	Built out
9a	20	200,000	140,000	1000	140	2.7	378	Short-mid term opportunity
9b	35	350,000	245,000	2000	123	2.7	331	Short-mid term opportunity
10a	8	80,000	56,000	1000	56	2.7	151	Short-mid term opportunity
10b	18	180,000	126,000	2000	63	2.7	170	Short-mid term opportunity
11a	80	800,000	560,000	1000	560	2.7	1,512	Long term future growth area
11b	100	1,000,000	700,000	1000	700	2.7	1,890	Long term future growth area
12	69	690,000	483,000	1000	483	2.7	1,304	Long term future growth area
13	24	240,000	168,000	2000	84	2.7	227	Long term future growth area
14	0.8	8,000	5,600	1000	6	2.7	15	Infill development opportunities
15	110	1,100,000	770,000	1000	770	2.7	2,079	Long term future growth area
Sub-total: allace					126		339	Existing Properties and Population within catchment
					707		1909	Short-mid term opportunity
					27		72	Infill development opportunities
					2597		7012	Long term future growth area
					0		0	Further subdivision not recommended
					24		0	Potentail opportunity for industrial precinct
Totals for Bungaree and allace					267		720	Existing Properties and Population within catchment
					1136		3067	Short-mid term opportunity
					41		110	Infill development opportunities
					3703		9998	Long term future growth area
					35		95	Further subdivision not recommended
					94		0	Potentail opportunity for community services hub and industry precinct
Total for Bungaree and Wallace					5146		13895	Total properties and population

Table 11: Development Yields by Precinct

7.0 Summary

State, regional and local planning policy prevent the subdivision of land within a Declared Water Supply Catchment that results in less than 1 dwelling per 40 hectares, unless the property(s) are connected to reticulated sewerage. This policy has historically prevented the growth of Bungaree, Wallace and Dunnstown as these towns do not have a reticulated sewerage system. This policy is implemented through the Moorabool Planning Scheme through the Environmental Significance Overlay 1.

The exception to this is where an approved Domestic Waste Water Management Plan allows for urban development without the provision of reticulated sewerage. In this situation it would be expected that the Domestic Waste Water Management Plan would allow for interim urban development on the proviso that reticulated sewerage would ultimately be provided. It is understood that Council and Central Highlands Water may reach an agreement to allow for some residential urban growth without reticulated sewerage in accordance with an approved Domestic Waste Water Management Plan.

Council's planning policies highlight that there has been a period of population decline in Bungaree and Wallace due to demographic changes in the farming communities that surround the towns. The decline in population has made the funding and viability of community services and facilities more challenging. As such, Council is seeking to understand the capacity of existing community facilities and services in Bungaree and Wallace to service a larger population.

The recent Draft Central Highlands Regional Growth Plan, 2013 highlights that there is recent and growing pressure for new housing within communities located along the Western Highway between Melbourne and Ballarat, such as Bungaree and Wallace. The Regional Growth Plan supports urban development within the Declared Water Supply Catchment provided that it will have environmental benefits for the declared water catchment, and provided that such programs can be sustainably (environmentally, socially and economically) constructed and maintained. It also seeks to ensure that future urban growth does not result in the loss of high quality agricultural land. As such, Council is seeking to plan for the expected increase in demand for future residential urban growth in Bungaree and Wallace.

This Study has identified the potential population capacity of each town based on existing community facilities, and it has identified potential areas where each town could grow based on available information.

This study has estimated that the community facilities in Bungaree and Wallace could support a combined population of approximately 8,000 people before Council will need to expand these facilities. To inform the feasibility study for reticulated sewerage we have also identified where the population could potentially be located within Bungaree and Wallace. The purpose of this was not to develop Structure Plan to guide where the towns could grow, but only to establish an urban development scenario to inform the theoretical design and feasibility assessment for providing reticulated sewerage infrastructure in Bungaree and Wallace. Using this method we identified sufficient land to support a population of approximately 13,895 people in Bungaree and Wallace (subject to further analysis of constraints).

We note that before urban growth occur that further and more detailed targeted planning and community consultation, including (for example) a market analysis, environmental studies, land capability assessment and the like should be undertaken by Council.

Appendix B

Desktop Geotechnical Study

Appendix B Desktop Geotechnical Study

AECOM

Memorandum

To		Page	1
CC			
Subject	Bungaree, Wallace and Dunnstown Small Town Services Study - Desktop Geotechnical Study		
From	Stephen Martin		
File/Ref No.	60309716	Date	9-Dec-2013

1.0 Introduction

AECOM has conducted a desktop review of available geological and geotechnical information for the Bungaree, Wallace and Dunnstown Small Town Services Study which aims to develop a services assessment and strategy for the provision of reticulated sewer in the towns of Bungaree and Wallace, reticulated water for the town of Dunnstown and also gas for the town of Bungaree.

The purpose of this desktop review is to provide a qualitative commentary of known geological, geomorphic and geotechnical conditions in the study area and identification of geohazards and the potential implications these can have on the planning, design and construction of services.

This memorandum presents the findings of the geotechnical desktop review. The findings presented in this memorandum represent a broad assessment of potential geotechnical issues associated with sites in this geological setting. There may be site specific geotechnical factors or constraints on the project site that are not able to be identified in this review.

2.0 Summary of Reviewed Data

The following sources of data have been reviewed as part of this study:

- Geological Survey of Victoria 1:50,000 scale Ballarat map sheet
- Geological Survey of Victoria 1:50,000 scale Ballan map sheet
- Taylor et al (1996), *Geological Survey Report 101, Ballarat 1:100 000 Map Geological Report*. Geological Survey of Victoria
- Roberts (1986), *Geological Survey Report 76 – Explanatory notes on Bacchus Marsh and Ballan 1:50 000 Geological Maps*. Department of Minerals and Energy
- Department of Primary Industries, GeoVic database, Borehole records accessed 28/10/13
- *Corangamite Land Resource Assessment Project* (2003). Department of Primary Industries (DPI) PIRVic Division
- Jeffery, Costello & King (1979), *A Study of Land Capability in the Shire of Bungaree*. Soil Conservation Authority
- Jeffery & Costello (1979), *A Study of Land Capability in the Shire of Ballan*. Soil Conservation Authority
- Jeffrey (1980), *A Study of Land Capability in the Shire of Buninyong*. Soil Conservation Authority
- Provincial Geotechnical Pty Ltd (2010), *Land Capability Assessment Report – Wallace Community Hub, 729 Bungaree-Wallace Road, Wallace, VIC*
- Provincial Geotechnical Pty Ltd (2008) *Land Capability Assessment Report – Lot 1, No. 355 Bungaree-Wallace Road, Bungaree, VIC*
- Geoscience Australia - Landslide Database (http://www.ga.gov.au/landslides-web/landslips.htm)

- EPA Victoria - Priority Sites Register (http://www.epa.vic.gov.au/your-environment/land-and-groundwater/priority-sites-register)
- Boral Quarries, Dunnstown, Personal Communication (3/12/2013)
- *VicRoads*

2.1 Regional Geology

The Geological Survey of Victoria 1:50,000 scale Ballarat Map sheet (1996) and Ballan Map sheet (1986) indicates that the surficial geological unit across the majority of the study area is Tertiary Aged Newer Volcanics. This unit is well understood around Melbourne, central and western Victoria and typically is found to consist of 1 to 4m thick (but generally not more than 6m) layer of residual high plasticity clays overlying variably weathered basaltic rock. The clays have variable quantities of silt, sand and gravel and are generally of very stiff or hard consistency. The depth to rock is known to change sharply over very short distances, as are the characteristics of the rock layer which can rapidly transition from infrequent boulders (floater horizon) to tight interlocked large boulders to relatively massive intact rock.

Mount Warrenheip is located north of Dunnstown and is a composite breached scoria cone (QVS 1) and is one of the higher scoria cones in Victoria at around 170m. There is a deep, well-defined central crater which has been breached on the northern side. On the southern side, the cone rises abruptly above older weathered lava flows but the topography around the northern side is irregular as younger lava flows issued from here via the explosive breach of the cone large scoria cone developed on top of multiple lava flows. Road cuttings expose coarse volcanic agglomerate and thin pods of lava.

The above geological survey maps also indicate a number of minor units in the study area including:

- Recent Tertiary and Quaternary aged deposits. These post-basaltic sediments are associated with disruption of the deep lead drainage systems by the Newer Volcanics and the formation of new generations of drainage systems and associated sedimentation.
    - Older colluvium (Qpc) - Tertiary/Quaternary aged colluvial, alluvial and outwash fan deposits of the disrupted deep lead drainage systems comprising gravel, silt, clay and sand.
    - River alluvium (Qra) – stream alluvial and very low level terraces are present in most of the stream valleys in the area. The sediments are variable depending on source, ranging through clay silt, sand to gravel.
    - Swamps (Qrm) – swamp and lake deposits associated with disrupted drainage and generally occurring in slight depressions on basalt and alluvial plains, comprising silt, clay and sand.
    - Colluvium (Qrc) – colluvial deposits, active outwash fans, scree aprons and colluvium. These deposits are commonly present around hill bases and in gullies. The sediments are diverse, ranging through clay, silt, sand to gravel and are often poorly sorted.
- Devonian aged Mount Egerton Granodiorite (G280) which forms low hills of fresh to thoroughly kaolinised or weathered rock protruding through Newer Volcanics and granitic sandy colluvium.
- Carboniferous/Devonian aged Lal Lal granite which for the most part id deeply weathered. This unit includes associated acid dykes of quartz and feldspar porphyry.

The geology of the study area is shown is shown in Figure 1.

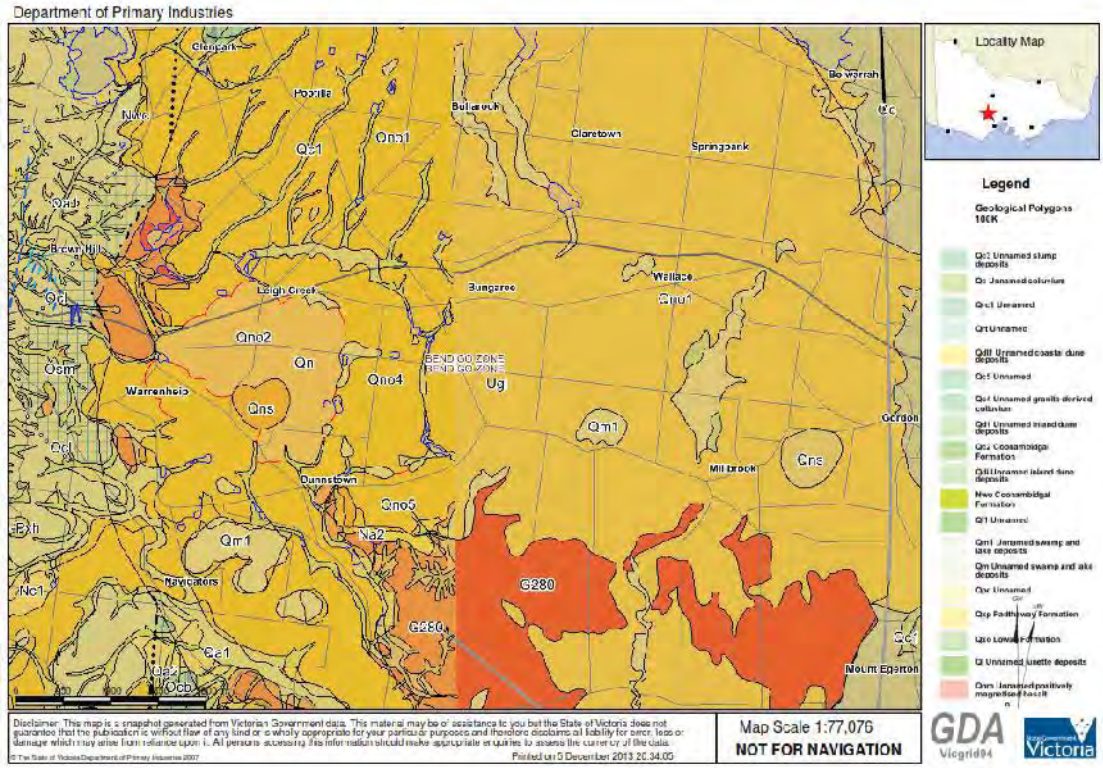


Figure 1 Regional Geology

2.2 Additional Geotechnical Data – GeoVic Database

The Department of Primary Industries online database (GeoVic) includes several borehole records within the study area. These borehole records support the information provided on the geological map and give an indication of the depth of soil cover which may be expected in the study area as summarised in the tables below. However, the level of detail is not sufficient to infer any engineering properties of the materials encountered.

Location	Site ID	Purpose	Geologists Log			
Bungaree	101513	Groundwater	0.0 – 1.0	1.0 - 4.0	4.0 - 56.0	56.0 – 56.69
			Topsoil	Clay & Stones	Basalt	Granite

Table 1 Borehole record from GeoVic Database - Bungaree

Location	Site ID	Purpose	Geologists Log		
Dunnstown	101523	Groundwater	0.0 – 0.61	0.61 – 2.13	2.13 – 17.99
			Topsoil volcanic red	Volcanic Clay	Black basalt

Table 2 Borehole record from GeoVic Database - Dunnstown

Location	Site ID	Purpose	Geologists Log							
Wallace	101486	Groundwater	0.0 - 0.61	0.61 – 8.84	8.84 – 53.04	53.04 – 54.56	54.56 – 54.86	54.86 – 56.08	56.08 – 59.44	59.44 – 75.59
			Top Soil	Basalt	Basalt with bands of	Basalt	Red clay	Fine Sand	Clay and coarse sand	Coarse sand

Location	Site ID	Purpose	Geologists Log							
					Scoria and Clay					

Table 3 Borehole record from GeoVic Database - allace

2.3 Additional Geotechnical Data - Land Capability Assessment Reports

Two land capability assessment reports by *Provincial Geotechnical Pty Ltd* which include site information and soil conditions are available for the study area. A summary of each investigation and the ground conditions encountered is given below. The findings of these investigations are considered to be generally consistent with the Newer Volcanics geological unit described above. Ground conditions have been classified in accordance with AS1547 – *On-site domestic-wastewater management.*

2.3.1 Land Capability Assessment Report – allace Community Hub, 729 Bungaree- allace Road, allace, VIC, 2010

- The site is predominantly flat with minor undulations.
- Subsoil investigations were undertaken at three locations to a depth of 1.5m using a 100mm diameter hydraulic auger.
- Ground conditions encountered are described as firm silty clay (Light Clay – Category 5) up to 1.1m thick overlying a stiff brown mottled clay (Medium Clay - Category 6). An undrained shear strength in excess of 130kPa has been recorded for the stiff clay.
- It is noted that there is no evidence of a shallow groundwater tables above 1.5m depth but evidence of possible perched water during extended wet periods.

2.3.2 Land Capability Assessment Report – Lot 1, No. 355 Bungaree- allace Road, Bungaree, VIC, 2008

- The local topography is described as flat basalt plains.
- The site geology is described as Quaternary Aged Volcanics.
- Subsoil investigations were undertaken at four locations to a depth of 1.5m using a 100mm diameter hydraulic auger.
- Ground conditions encountered are described as firm silty clay (Clay Loam - Category 4) up to 0.4m thick overlying a red brown firm slightly silty clay (Light Clay - Category 5). An undrained shear strength in excess of 130kPa has been recorded for the stiff clay. Weathered basalt fragments were recorded at depths ranging from 1.0 to 1.3m at all four locations.
- It is noted that there is no evidence of a shallow groundwater table above 1.5m depth.

2.4 Geomorphic and soil landform units

Geomorphic and soil landform maps have been developed by the Department of Primary Industries (DPI) PIRVic Division as part of the Corangamite Land Resource Assessment Project (2003). This project utilised existing surveys, remote sensing information and additional field work to develop an updated 1:100 000 scale soil/landform mapping coverage across the region.

Extracts from these maps showing the study area are given in Figures 2 and 3. The numbered areas represent soil landform units and the coloured areas represent the associated geomorphology. A summary of the geomorphic and soil landform units is given below and a detailed description and complete maps is included in Appendix A.

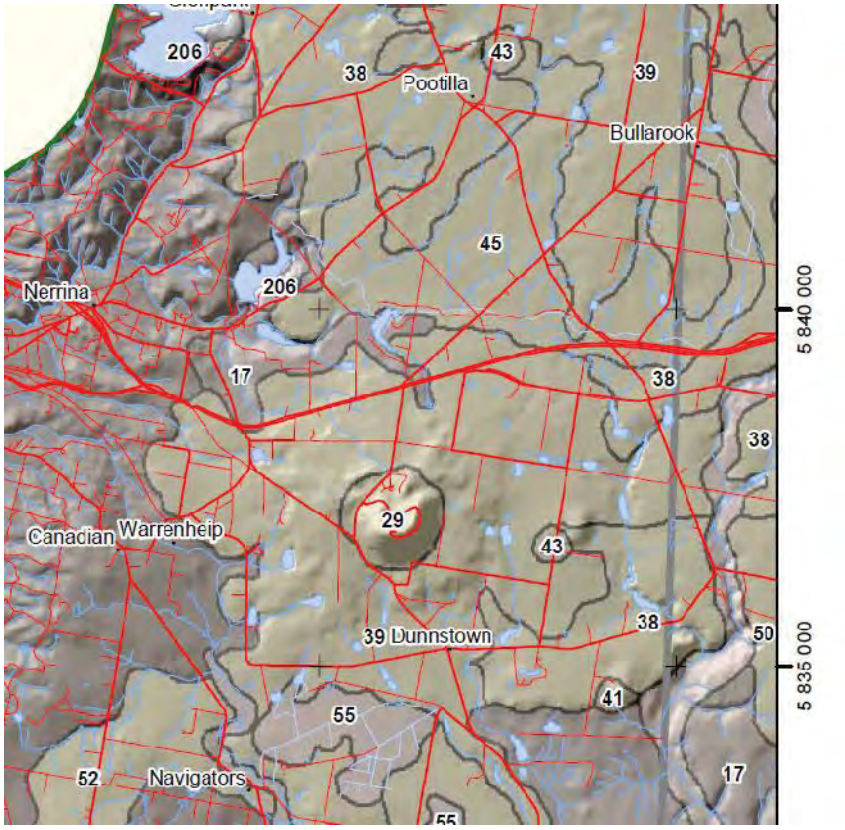


Figure 2 Geomorphic and landform units – Extract from T7622 - Ballarat

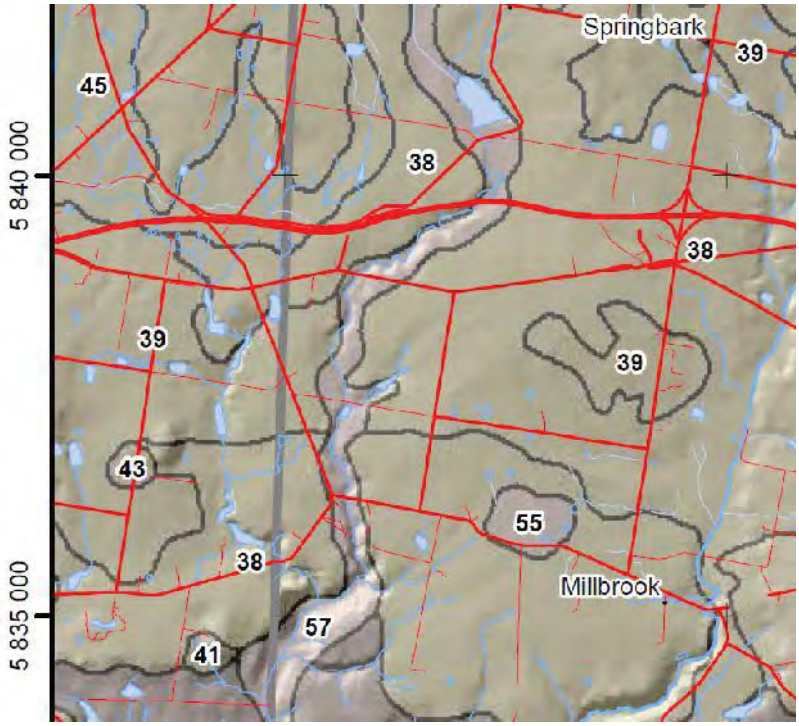


Figure 3 Geomorphic and landform units – Extract from T7722 – Bacchus Marsh

Unit 17 – Undulating rises				
Component	1	2	3	4

Unit 17 – Undulating rises				
Proportion of soil-landform unit	20%	55%	15%	10%
Geology	Devonian granite and granodiorite	Quaternary gravel, sand and clay	Pleistocene basalt	Quaternary gravel, sand and clay
Geomorphology	2.1.2 Dissected Western Uplands associated with granitic rocks and aureoles			
Topography	Undulating rises			
SOIL Parent material	In situ weathered granite	Unconsolidated wash	In situ weathered basalt	Unconsolidated gravel, sand, silt and clay
Depth m	1	1	1.5	2

Table 4 Landform Unit 17

Unit 29 - Moderately to steeply inclined high cones Mounts arrenheip and Buninyong				
Component	1	2	3	4
Proportion of soil-landform unit	9%	8%	8%	75%
Geology	Pleistocene basalt, scoria tuff			
Geomorphology	2.1.4 Dissected Western Uplands associated with volcanic landforms			
Topography	Moderately inclined low cones			
SOIL Parent material	In situ weathered basalt and scoria	In situ weathered basalt and scoria	In situ weathered basalt and scoria	In situ weathered basalt and scoria
Depth m	2	1.5	1.5	1

Unit 38 - Gently undulating rises Pootilla			
Component	1	2	3
Proportion of soil-landform unit	34%	33%	33%
Geology	Pleistocene, basalt and minor alluvium		
Geomorphology	2.1.4 Dissected Western Uplands associated with volcanic landforms		
Topography	Gently undulating rises		
SOIL Parent material	In situ weathered basalt	In situ weathered basalt	In situ weathered basalt
Depth m	2	1.5	1.5

Table 5 Landform Unit 29 and 38

Unit 39 - Gently undulating rises Springbank			
Component	1	2	3
Proportion of soil-landform unit	90%	5%	5%
Geology	Pleistocene; basalt and minor river deposits, gravels, sands and clays		
Geomorphology	2.1.4 Dissected Western Uplands associated with volcanic landforms		
Topography	Gently undulating rises		

Unit 39 - Gently undulating rises Springbank			
SOIL Parent material	In situ weathered rock	In situ weathered rock	Unconsolidated gravel, sand, silt and clay
Depth m	2	1.5	2

Table 6 Landform Unit 39

Unit 41 - Undulating rises south of Mount Buninyong				
Component	1	2	3	4
Proportion of soil-landform unit	22%	22%	22%	34%
Geology	Pleistocene basalt, scoria tuff, Orodivican marine sandstone and shale and minor Quaternary alluvium			
Geomorphology	2.1.4 Dissected Western Uplands associated with volcanic landforms			
Topography	Undulating rises			
SOIL Parent material	In situ weathered basalt	In situ weathered basalt	In situ weathered basalt	In situ weathered basalt
Depth m	2	1.5	1.5	1

Table 7 Landform Unit 41

Unit 43 - Moderately inclined low cones			
Component	1	2	3
Proportion of soil-landform unit	25%	30%	45%
Geology	Quaternary basalt and scoria		
Geomorphology	2.1.4 Dissected Western Uplands associated with volcanic landforms and 6.1.1 Eruption points of the Volcanic Western Plains		
Topography	Moderately inclined low cones		
SOIL Parent material	In situ basalt and scoria	In situ basalt and scoria	In situ basalt and scoria
Depth m	<0.7	<1	<1

Table 8 Landform Unit 43

The predominant geomorphology associated with the above landforms is *Dissected Western Uplands associated with volcanic landforms* (2.1.4) comprising basalts of the Newer Volcanics which fill many of the large ancient valleys to form elongated planar to undulating basalt plains which are usually fringed by streams of the displaced drainage. Occasional steep-sided gorges have developed where streams have cut into the basalt flows. The eruption points form prominent lava cones, composite cones and low shield volcanoes.

2.5 Land Capability Study

Three land capability studies were undertaken in the study area in the late 1970's and early 1980's to assess the capability of the different types of land to support various land uses – particularly subdivision, and were designed to be used as an aid to broad scale planning for the area. The reports relevant to the study area are listed below:

- A Study of Land Capability in the Shire of Bungaree, Jeffery, Costello & King, 1979, published by the Soil Conservation Authority

- A Study of Land Capability in the Shire of Ballan, Jeffery & Costello, 1979, published by the Soil Conservation Authority
- A Study of Land Capability in the Shire of Buninyong, Jeffrey, 1980, published by the Soil Conservation Authority

For the Shire of Bungaree the land components of each land system were rated for their ability to support four main types of subdivision:

- Urban
- Small farmlets (about 4 ha)
- Large farmlets (greater than 16 ha)
- Bush blocks

For the Shire's of Ballan and Buninyong the capability of the land to support three main activities was examined:

- Erosion risk associated with soil disturbance
- Constraints on construction (small building, secondary roads, etc)
- Effluent Disposal by soil absorption – risk of failure and difficulties of installation

The land capability classification used in these studies is given in Table 9 below.

Land Class	Capability/Level of special management required	Degree of Limitation	General Description
1	Very Good/None	None to very slight	Areas with high capability for subdivision. The limitations of long term instability, engineering difficulties or erosion hazard do not occur or they are very slight. Standard designs and installation techniques, normal site preparation and management should be satisfactory to minimize the impact on the environment.
2	Good/Low	Slight	Areas capable of being subdivided. Slight limitations are present in the form of engineering difficulties and/or erosion hazard. Careful planning and the use of standard specifications for site preparation, construction and follow up management should minimize developmental impact on the land.
3	Fair/Moderate	Moderate	Areas with fair capability for subdivision. Moderate engineering difficulties and/or high erosion hazard exist during construction. Specialized designs and techniques are required to minimize developmental impact on the environment.
4	Poor/High	High/Severe	Areas with poor capability for subdivision. There are considerable engineering difficulties during development and/or a high erosion hazard exist during and after construction. Extensively modified design and installation techniques exceptionally careful site preparation and management are necessary to minimize the impact on the environment.
5	Very Poor/Extremely	Severe/Very Severe	Areas with very poor capability subdivision. Limitations to development, either long term instability hazards, erosion or engineering difficulties cannot be practically overcome with current technology. Severe deterioration of the environment will probably occur if development is attempted in these areas.

Table 9 Land Capability Classification System

To rate these land uses, the activities which make up the subdivision (building houses, roads, shallow excavations etc) were rated based on a range of land features that will affect that activity. Typical land features considered in the assessment included:

- Boulders, surface stones and depth to hard rock
- Shrink-swell potential
- Load bearing capacity of soil and rock
- Soil drainage, percolation rates and seasonal variation
- Slopes and landslide risk
- Flooding
- Depth to water table

A detailed description of the assessment methodology is given in the above reports.

The ratings developed for Urban Uses (Shire of Bungaree) and General Construction (Shire of Ballan and Buninyong) are considered to be the most relevant to the construction activities associated with providing the services being considered in this study. Extracts from the three studies showing the assessment results across the study area are given in Figure 4-6.

Newer Volcanics and Mount Egerton Grandiorite which cover the majority of the study area are typically classified as Capability Class 1-3 (Very Good to Fair) while the more recent Quaternary deposits are typically classified as Class 4 -5 (Poor to Very Poor). These reports recommended that, as far as possible, the various forms of development be directed into appropriate areas which have a capability rating of classes 1-3 for that use.

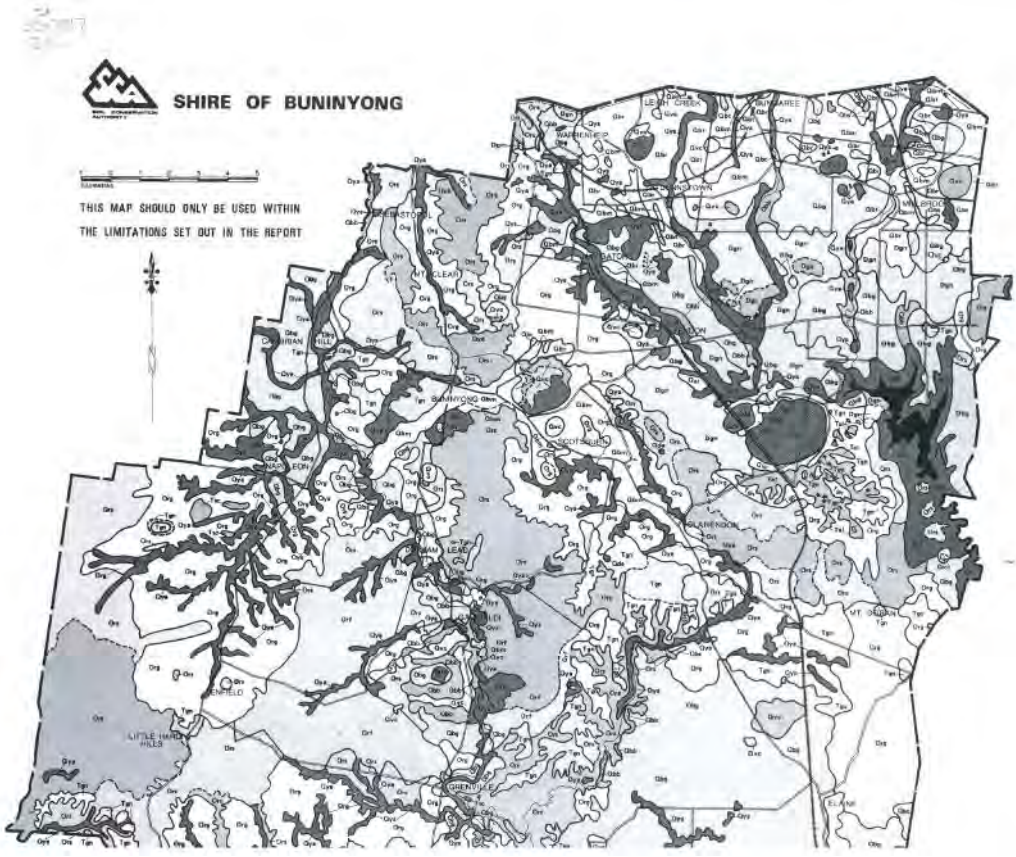


Figure 4 Shire of Buninyong – Land Capability for General Construction

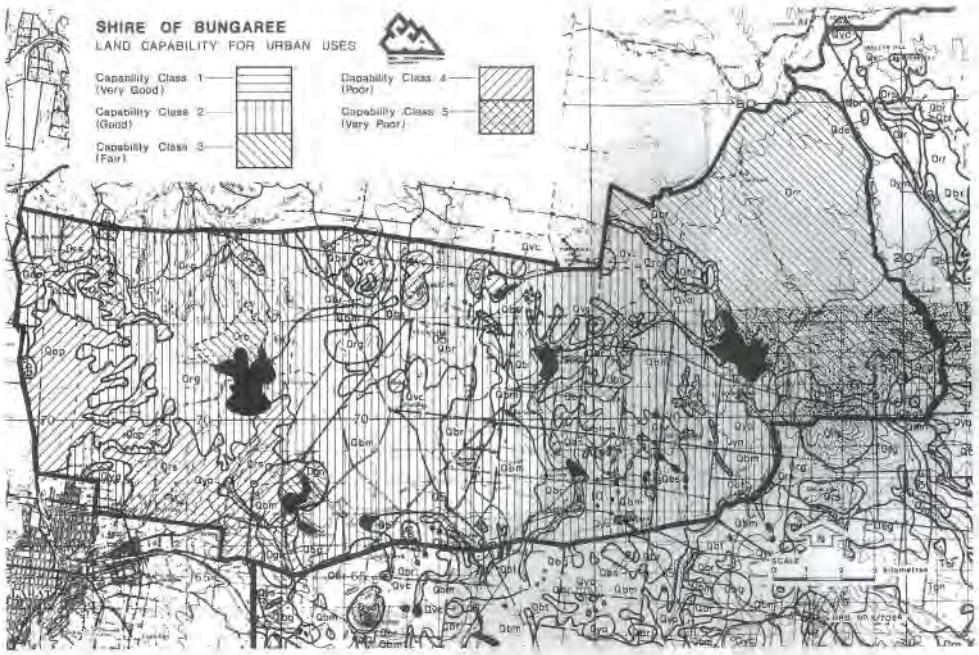


Figure 5 Shire of Bungaree – Land Capability for Urban Uses

Figure 6 Shire of Ballan – Land Capability for General Construction

2.6 Country Roads Board – estern Freeway – Geological Plans and Sections – Bill T to follow up

2.7 Boral uarry

Boral operate a basalt quarry approximately 3km south of Dunnstown. The depth of soil cover is understood to be in the order of 1-2m overlying weathered basalt to a depth of around 4m. The quarry floor is currently at a depth of 14m and has not encountered groundwater.

2.8 Regional Fast Rail Pro ect

The Regional Fast Rail project undertaken by the State Government of Victoria between 2000 and 2006 included sections of new track and associated structures and earthworks through the study area. It is understood that detailed geotechnical information exists along the rail corridor however this information is not in the public domain.

2.9 EPA Victoria - Priority Sites Register

Priority sites are sites for which EPA has issued a clean-up notice pursuant to section 62A or a pollution abatement notice pursuant to section 31A or 31B (relevant to land and/or groundwater) of the Environment Protection Act 1970. Typically these are sites where pollution of land and/or groundwater presents an unacceptable risk to human health or to the environment. Examples include current and former landfill sites, historical deposits of mine tailings and illegal dumping grounds.

There are no sites listed on the Priority Sites Register located within the study area.

2.10 Geoscience Australia Landslide Database

The Geoscience Australia Landslide Database includes details of landslide events across Australia that have been recorded by Geoscience Australia and contributing scientific organisations. The result of a search of the study area is given in Figure 7 which shows that no landslides have been recorded in the immediate study area.

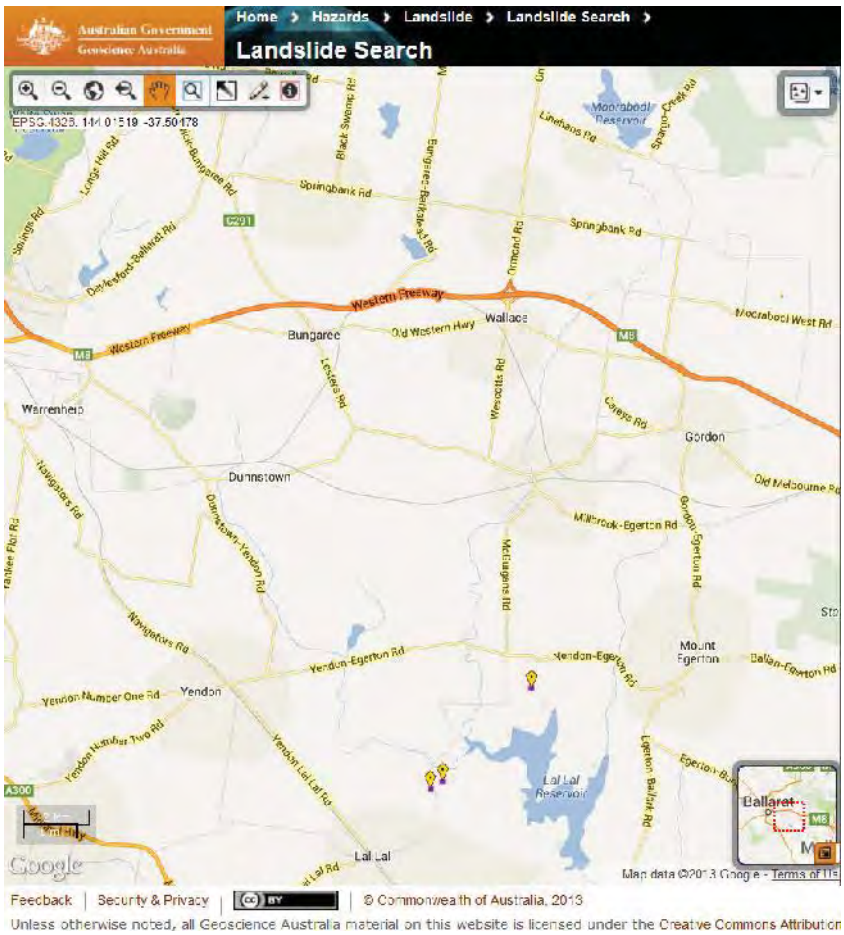


Figure 7 – Geoscience Australia Landslide Search Results

2.11 Summary of Ground Conditions

Based on the information reviewed the ground conditions across the study area are expected to comprise:

- Newer Volcanics which cover the majority of the study area. This unit typically comprises 1 to 4m of clay overlying basaltic rock of variable strength/weathering. This unit occurs across the dominant unit across the study area.

- Mount Egerton Granodiorite may be expected near Dunnstown.

- Areas of soft and potentially compressible soils associated with river alluvium, swamps and colluvial deposits.

- Occasional steep-sided gorges where streams have cut into the basalt flows.

3.0 Considerations for Design/ Potential geoha ards to be taken into consideration

Based on interpretation of the data reviewed above, the following is a summary of geotechnical design considerations for the study area:

3.1 Variable rock weathering profile

Potential geotechnical risk may be associated with the variation of thickness of the weathering profile of the underlying rock units within the study area. Where rock units have been subjected to a greater degree of weathering, this can result in variable depths to competent rock which can impact on such items as founding levels, basement and trench excavation conditions and excavation support.

3.2 Excavation Conditions

Based on the geological information available it is expected that the study area has the potential for a high rock levels, especially within the Newer Volcanics. Excavation through the soil horizon should be possible with conventional earthmoving equipment, although a breaker may be required to remove floaters where they are encountered within the residual soils.

Where large slightly weathered boulders are encountered or less fractured high strength (or greater) rock is encountered, trenching will not be possible without rippers, hydraulic breakers and possibly blasting. Where the rock horizon comprises a floater field, an allowance for considerable over-break should be made as trench walls are opened up. It possible that due to the presence of cobbles and boulder fragments, the trench spoil would need to be processed if it is to be re-used as trench backfill.

3.3 Shrink/Swell Potential

Where the underlying geology comprises Newer Volcanics the soil is likely to have a high seasonal shrink/swell potential. Pipelines and/or trenches should therefore be designed to accommodate or mitigate against this ground movement.

3.4 Post-basaltic deposits

Construction in recent river alluvium, swamp and colluvial deposits is expected to be more complex than in other areas and can be expected to encounter challenges related to:

- Possible perched groundwater;
- Soft and saturated soils;
- Excessive ground settlements
- Differential movement of the trench/pipe across different geological units.

3.5 Slope stability

There is potential slope stability risk associated with steep-sided gorges, where they have developed. Route alignments should be selected to avoid such areas where possible.

3.6 Groundwater

Groundwater levels in the study area are currently unknown due to the limited volume of publically available information.

Perched groundwater may be present in the near surface soils across the study area, and some water flow into excavations should be expected.

4.0 Recommended Further ork

Once preferred pipeline alignments and the location of other infrastructure have been established, the locations/routes should be reviewed alongside the information presented in this study.

It is anticipated that additional geotechnical investigation will be required which may comprise a site walkover, geomorphological mapping and geotechnical site investigation. The recommended number, type and location of investigation points will depend on the location, nature and proposed depth of the new infrastructure.

5.0 Data limitations

The sole purpose of this report is to assess the general geological and geotechnical site conditions within the study area.

AECOM derived the data in this report primarily from publicly available information. AECOM have not attempted to verify the accuracy or completeness of any supplied information. No warranty or guarantee, whether expressed or implied, is made with respect to the data reported or to the findings, observations and conclusions expressed in this report.

It should be noted no field assessment, visual or invasive, has been undertaken as part of this phase of the project. Prior to development of geological or geotechnical models, development of detailed designs or development of project costing a detailed and focussed site assessment by members of the engineering design team is considered essential.

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Appendix C

Servicing Options Analysis

Appendix C Servicing Options Analysis

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Memorandum

To	Neal Kerr	Page	1
CC			
Subject	Identification of options		
From	Abbas Hadian		
File/Ref No.		Date	14-Jan-2014

1.0 Executive Summary

This stage of the study attempts to identify all feasible servicing options for each town through review of the problem and identification of current industry standards and best practice solutions to that problem. Servicing of Dunnstown with water and Bungaree with gas results in a small amount of viable options, however servicing Wallace and Bungaree with sewerage services resulted in a significant variety of options based upon the:

- Collection of effluent
- Treatment of effluent
- Disposal of treated effluent

The combination of these three phases resulted in identification of 240 separate options, but several options were immediately ruled out due to their unsuitability as a result of high cost, technological complexity, significant maintenance requirements and compliance with regulatory requirements. This has reduced the options to a more manageable level of 84.

SUMMARY TABLE

Option	Comments
Collection	
Gravity Collection System	Carried forward for costing and further investigation also considered as base case
Septic Tank Effluent Disposal (STED) Scheme	Carried forward for costing and further investigation
Septic Tank Effluent Pumping (STEP) Scheme	Carried forward for costing and further investigation
Low Pressure Sewerage Scheme (LPSS)	Carried forward for costing and further investigation
Vacuum Sewerage Scheme	Eliminated based on fatal flaw
Treatment	
Advanced Onsite Wastewater Treatment	Eliminated based on fatal flaw
Packaged Treatment Plant (such as an IDEA or SBR Plant)	Carried forward for costing and further investigation
Lagoon Treatment	Carried forward for costing and further investigation
Transfer of Sewage to an existing treatment plant	Carried forward for costing and further investigation
Reuse	
Dual pipe reticulation for residential reuse	Eliminated based on fatal flaw

Option	Comments
Collection	
Irrigation of public open space	Carried forward for costing and further investigation
Disposal to land (tree lots or pasture land)	Carried forward for costing and further investigation
Reuse to waterway/wetland	Eliminated based on fatal flaw
Onsite treatment and reuse	Eliminated based on fatal flaw
Reuse/Disposal with treated sewerage by existing treatment plant	Carried forward for costing and further investigation

In accordance with the requirements of this project the next phase is to agree a framework for assessing the suitability of these options against a framework of set criteria and weightings to further reduce the number of viable options to a figure that can be easily assessed and compared.

A table containing this assessment criterion has been completed and is included in Appendix B of this document. We have completed this table based upon input from our engineering, environmental and planning professionals using our knowledge of the scheme and experience from other similar projects.

If acceptable we will use this table to inform the next phase of this study, to short list the servicing options. The remainder of this report identifies the current options and any decisions made in inclusion or removal from this study.

2.0 Identification of Options - Sewerage

A number of options have been identified for servicing of Bungaree and Wallace. These options can be divided into three components; collection, treatment and reuse. The options identified for each component are listed as follows:

Collection

- Gravity Collection System
- Septic Tank Effluent Disposal (STED) Scheme
- Septic Tank Effluent Pumping (STEP) Scheme
- Low Pressure Sewerage Scheme (LPSS)
- Vacuum Sewerage Scheme

Treatment

- Advanced Onsite Wastewater Treatment (such as the Biolytix System)
- Packaged Treatment Plant (such as an IDEA, MBR or SBR Plant)
- Lagoon Treatment
- Transfer of Sewage to Ballarat or Gordon WWTP

Reuse

- Dual pipe reticulation for residential reuse (Class A)
- Irrigation of public open space (Class B)
- Disposal to agricultural land (tree lots or pasture land) (Class C)
- Reuse to waterway/wetland
- Onsite treatment and reuse
- Reuse/Disposal with treated sewerage by ex. treatment plant (Ballarat or Gordon)

Each option has been discussed further in the following sections of the report. Different scheme components have been identified separately so that any combination of options can be considered.

2.1 Collection

2.1.1 Gravity Collection System

Description

Conventional gravity sewers transport wastewater from households, public facilities, and businesses to a central treatment facility. The pipes are generally sized with a minimum diameter of 150mm to carry the required flow. These systems are installed at grade to ensure that gravity flow can be maintained and minimum flow velocities can be achieved (preventing sedimentation within the pipes).

If the gravity sewers become excessively deep, expensive or are impractical for construction, pump stations can be used to lift the sewage. Conventional gravity sewers can have high capital costs, although this is largely dependent on ground conditions and topography.

Variation of the Gravity Scheme

Capital costs can be reduced by applying less conservative design parameters. Some possible changes may include; using smaller diameter pipes (system runs under induced gravity head under peak flows), increased spacing between manholes, less use of manholes and increased use of alternative access methods (maintenance shafts etc), reduced pipe cover, and adoption of flatter grades to minimise sewer depth. To modify design parameters appropriate engineering investigation is required to ensure design is not too minimalist.

Advantages and Disadvantages

The advantages of using a gravity collection system include:

- The system is well understood and considered to be low risk
- The Water Authority has the skills and equipment to maintain this system
- No maintenance or monitoring by the property owner is required

The disadvantages of using a gravity collection system can include:

- High capital cost
- A minimum velocity or grade is required to prevent excessive solids deposition in the pipes and excavations often need to be deep to maintain the necessary sewer grade
- Excavation and dewatering costs can be high where challenging construction conditions are present (i.e. sand, rock etc)
- May require additional pipe lengths compared to pressure systems
- Some sewers will need to be located within private property with landlord agreement
- When using traditional construction materials, are susceptible to infiltration and damage from tree roots.

Key Risks

The risks of implementing a sewerage system are reported to be low as they have been installed and operated for many years and are well understood.

Operation and Maintenance

Sewer pipes may need to be periodically flushed out to prevent solids accumulation, especially in unusual circumstances where there is a significant variation in seasonal flows. If pump stations are used, normal mechanical maintenance is required.

2.1.2 Septic Tank Effluent Disposal STED Schemes

Description

A Septic Tank Effluent Disposal (STED) collection system has primary treatment of sewage at the household (generally via the use of a septic tank) to reduce the solids loading of the wastewater. There could be a primary treatment unit on each property, a communal primary treatment unit serving a cluster of properties or a combination of both. After leaving the septic tank, the wastewater is transported by gravity to the secondary treatment plant.

Advantages and Disadvantages

A STED system has similar advantages and disadvantages to the traditional gravity systems when compared to pressure systems. In addition to those advantages and disadvantages, a modified STED system will also have the advantages and disadvantages described below:

- Capital cost savings compared with conventional gravity systems (due to smaller pipe diameters resulting from the separation of solids from the sewage)
- Primary treatment occurs in the septic tank, reducing the degree of final treatment required

The disadvantages of using a STED system include:

- Increased risk of wastewater leaks and overflows if the septic tanks are operated by the land owner
- Increased need for specialised operations staff if septic tanks are managed by the water authority
- Access to private properties is required for maintenance if managed by the water authority (approximately every 3 years)
- The cost of replacing septic existing tanks needs to be considered as many systems may be approaching the end of their useful life (an inspection of each system would be required to assess whether or not replacement is necessary)
- All new dwellings will require a septic tank in addition to paying water authority rates
- The collection system will still require manholes (or similar) which is significant cost component
- Septic tanks provide another point in the sewerage system that can overflow

Key Risks

Most of the risks associated with this system relate to the individual septic tanks and their ongoing operation. For the system to be effective, the following must occur:

- Defective and leaking septic tanks need to be identified and replaced
- Septic tanks must be properly maintained. If the septic tanks are poorly maintained, this can impact on treatment plant operation and performance and may pose a risk to public health and the environment
- Greater risk of blockages because pipes are not designed to accommodate solids
- The management responsibilities between landowner, council and the water authority must be defined

Operation and Maintenance

The ongoing operation and maintenance requirements for a STED scheme will be more intensive compared to a conventional or modified conventional gravity system. Septic tanks require ongoing maintenance to ensure that they are operating effectively and will need to be pumped out on a regular basis (generally every three years).

Issues can occur at the treatment plant (reduced performance and operational issues) and in the collection system (blockages and spills) if the septic tanks are not properly maintained and solids start to move through the collection system. For this reason it is important that the management responsibility of the septic tanks is carefully defined, to ensure that a regular inspection and maintenance program is implemented. It is expected that CHW prefers landowners to be responsible for the installation and maintenance of all on-property works. In two STEP systems CHW has operating at Enfield and Snake Valley landowners are responsible for the installation and maintenance of all on-property works.

Variation of the STED Scheme

The option of providing communal septic tanks for clusters of properties to reduce capital costs can also been considered. This option will not be considered further due to:

- Management issues – who would manage a communal septic tank, and how would individual owners be identified of faults
- The unpredicted growth pattern – efficiencies would be difficult to gain if township grows in unpredicted or scattered pattern

2.1.3 Septic Tank Effluent Pumping STEP Scheme

Description

This type of pressure system utilises septic tanks with small diameter pressure sewers. Traditional collection systems usually have pipes with a minimum diameter of 150mm and require relatively significant trenching and backfilling (mostly due to the depth and width of trenches). The pipe diameters in STEP schemes generally range from 50 to 100mm and can be laid at a much shallower depth as there is a pump installed at each property to convey effluent from the septic tank to treatment plant after the solids have settled out. In flat areas, the on-site pumps can often transfer the wastewater directly to the treatment plant eliminating the need for a large pumping

station. A filter is required before the pump to ensure that solids do not enter the pipework, this filter needs to be cleaned on a regular basis.

Advantages and Disadvantages

The advantages of using a STEP system include:

- Smaller diameter sewers and flatter grades allow faster construction and reduced costs compared to traditional sewers
- Minimises wet weather infiltration as pipelines are pressurised
- Peak dry weather flows are attenuated within the system due to the pump control system
- Depending on the location of the treatment plant, the need for a centralised pump station to transfer wastewater to the treatment plant may not be required
- Degree of final treatment is reduced due to primary treatment in the septic tank
- Reduced environmental impact as the sewer alignment becomes more flexible and trenches are smaller
- Ability to lay sewers in road reserves even in situations where the property is graded away from the road
- Less pumping requirements than a grinder pump system, as the solids do not need to be transported

The disadvantages of using a STEP system include:

- Issues with maintaining individual septic tanks (see discussion on STED systems)
- Additional capital and maintenance costs associated with installing filters and pumps at each property
- Increased risk to householder of backups in the plumbing due to power or pump failure, however some storage is provided by the septic tank
- Increased energy consumption and corresponding greenhouse gas production compared to a gravity system if the need for a centralised pump station cannot be avoided
- Landowner normally pays for electricity on top of sewerage rates
- Some land owners may need to update the electrical supply to their properties

Key Risks

A STEP system will have the same risks as STED systems with regards to management of septic tanks. Additionally, land owners may experience backups in the plumbing due to power or pump failure or filter blockages.

Central Highlands Water operates two STEP schemes at Enfield and snake valley.

Operation and Maintenance

The ongoing operation and maintenance requirements for a STEP scheme will be more intensive compared to a conventional gravity system. The STEP scheme will have the same issues as a STED scheme with regards to the maintenance and operation of septic tanks. In addition, the individual pumps on each property need to be maintained and the filters will require replacement every few years.

If a centralised pump station is avoided by installation of the individual pumps, then the operation and maintenance costs may be offset.

In the two STEP systems CHW has operating at Enfield and Snake Valley landowners are responsible for the installation and maintenance of all on-property works.

2.1.4 Low Pressure Sewer System LPSS

Description

Pressure systems use individual grinder pumps located within a tank at each property. The macerated sewage is then transported via small diameter pipes to the wastewater treatment plant either directly or via larger diameter transfer mains operating under gravity. Pump stations may be used to boost the pressure if necessary.

Generally a small collection tank is required on each property along with a control box that is installed on the outside of the home. Pressure systems offer significant advantages where topography, local conditions and technical challenges make conventional gravity sewerage systems difficult and expensive to construct.

Advantages and Disadvantages

The advantages associated with a pressure system include:

- Small, shallow sewers laid on flat grades allow faster construction and reduced costs compared to traditional sewers
- A large, centralised pump station to transfer wastewater to the treatment plant may not be required
- Septic tanks can be decommissioned
- Minimises wet weather infiltration as there are no gravity sewers
- Peak dry weather flows are attenuated within the system due to the pump control system
- WSAA standard exists for the design of these systems as they are more commonly installed that STEP/STED Schemes.

The disadvantages associated with a pressure system include:

- Maintenance of mechanical equipment is required at each property
- Landowner normally pays for electricity on top of sewerage rates
- Some land owners may need to update the electrical supply to their properties
- Power failures can cause backups in the plumbing
- Property access is required for pump unit maintenance
- Pumps have a limited life and will need to be replaced on failure, perhaps every 15 years
- Pumps are more expensive than STEP pumps as they need to transport solids

Key Risks

Land owners may experience backups in the plumbing due to power or pump failure or filter blockages.

Operation and Maintenance

More operation and maintenance will be required compared to a conventional gravity system as each household will have its own pump that needs to be serviced. It is expected that CHW prefers landowners to be responsible for the installation and maintenance of all on-property works. In two STEP systems CHW has operating at Enfield and Snake Valley landowners are responsible for the installation and maintenance of all on-property works.

2.1.5 Vacuum Sewerage System

Description

Vacuum systems include the collection and conveyance of wastewater by a vacuum to a central location. These systems have been adopted in some foreshore locations in Australia were terrain is flat and there may be a high water table. The technology has however not been widely or historically used.

Advantages and Disadvantages

The advantages associated with a vacuum system include:

- No access chambers are required for the system
- No power requirements at individual properties
- Smaller pipes can be used, which can follow natural grades
- Septic tanks can be decommissioned

The disadvantages that can be attributed to vacuum systems include:

- High risk of system failure if a network component is damaged
- High risk of failure associated with blockage
- Performance is not well documented
- Impact of failure of a vacuum collection system would be significant in a high water table region

Key Risks

If the vacuum line becomes damaged suction will be lost and the system will not operate properly. If a contractor were to maintain the system, response times may be slow.

Operation and Maintenance

In general the operation and maintenance of this type of system is undertaken by the supplier on the water authority's behalf. As CHW do not currently manage any vacuum schemes, if this responsibility were to be taken on, training of staff would be required.

2.1.6 Collection Options Discussion

As Vacuum Schemes are not well established and would need to be managed by a contractor/supplier they also are not recommended for further consideration.

The collection options to be carried forward into the preliminary options assessment include:

- Gravity Collection System
- Septic Tank Effluent Disposal (STED) Scheme
- Septic Tank Effluent Pumping (STEP) Scheme
- Low Pressure Sewerage Scheme (LPSS)

Variations and combinations of options have not been considered as this stage. Following preliminary option assessment and shortlisting the options to a manageable number, possible combinations of feasible options will be identified and assessed.

2.2 Treatment

2.2.1 Advanced On-site astewater Treatment

Description

As an alternative to the traditional concrete septic tanks, an on-site wastewater treatment unit could be used to provide primary and secondary treatment. The wastewater would be treated to a higher level than with the existing septic tanks and in some cases this may make on-site disposal of effluent suitable (as set back distances and disposal areas can be reduced). An example advanced on-site wastewater system is the Biolytix unit (further details can be seen at http://www.biolytix.com/index.php).

Advantages and Disadvantages

The advantages of advanced on-site wastewater treatment include:

- Relatively inexpensive and simple to operate
- Well understood technologies are available

Some of the disadvantages include:

- High risk of failure if operated by owners
- Increased need for specialised operations staff if systems are to be managed by the Water Authority
- Access to private properties is required for ongoing maintenance

Risks

The major risk is failure of the on-site systems. On-site treatment system for density of more than one dwelling per 40 hectares may be allowed if Council has prepared and implementing a Domestic Wastewater Management Plan (DWMP), satisfying that the proposed system does not present an unacceptable risk to the catchment. In absence of such a plan Moorabool Council confirmed that this option is considered unlikely to meet CHW, EPA and Catchment Management Authority requirements.

Operation and Maintenance

The performance of the systems needs to be monitored and the appropriate ongoing maintenance implemented. The responsibility has traditionally been undertaken by property owners with compliance enforced by Council. This has led to issues of failing tanks in the past and may not provide a suitable solution for this option.

2.2.2 Lagoon Treatment

Description

Facultative ponds (type of lagoon system) are large earthen lagoons often 1.2m to 2.4m in depth that are not mechanically mixed or aerated. Each lagoon consists of a number of layers that perform a specific function in the treatment of the wastewater. While the process has a significant land requirement, it provides a reliable and easy-to-operate process that is often seen as an attractive option for small rural communities.

Advantages and Disadvantages

The advantages of lagoon treatment systems include:

- Low whole of life cost
- Well understood technology that is relatively easy to operate
- Requires little energy with systems that are designed to flow under gravity
- Moderately effective in removing settleable solids, BOD, pathogens, faecal coliforms and ammonia
- Relatively easy to construct

The disadvantages include:

- Not favoured within catchment area, CHW, EPA and Catchment Management Authority to be satisfied that it does not present risk to catchment due to seepage or possible likely failures
- Lagoons must be sited with a sufficient buffer zone to houses and waterways, this can result in a location some distance from the township with a long connecting pipeline
- Potential for odours if plant is overloaded
- Purchase of land required for treatment, disposal and potentially for the buffer zone
- Winter storage is required to store water over the cooler, wetter months of the year when irrigation is not possible.

Risks

The major risk associated with a lagoon treatment system is polluting potable water supply in catchment area due to possible failures like seepage or structural failure of lagoon embankments. Other risk is finding suitable land to locate the treatment plant. A significant area is required to accommodate the process and it must be located an appropriate distance from houses to avoid odour issues. It must also be located out of floodplain zones.

Operation and Maintenance

Lagoon systems do not have intensive operation and maintenance requirements and are generally easier to maintain when compared with other treatment technologies.

2.2.3 Packaged Treatment Plant Class A, B, or C

Description

A number of proprietary small footprint treatment units are available. These treatment plants can include a wide variety of treatment technologies, with a few examples being:

- Intermittently Decanted Extended Aeration (IDEA)
- Sequencing Batch Reactors (SBR)
- Membrane Bio-Reactors (MBR)

These systems generally provide both primary and secondary treatment as a minimum, and are based on a modular design whereby additional units can be added to increase treatment capacity or increase the quality of sewage produced. Some treatment units can be installed entirely underground reducing visual intrusion of the landscape.

Advantages and Disadvantages

Some of the advantages of using a Packaged Treatment Plant are:

- Small footprint
- Modular design allows for growth
- Capital costs can be deferred by installing additional treatment modules in the future
- Possible to have an underground system, reducing the visual impact

Disadvantages include:

- Reuse site requires appropriate buffer distance to waterways
- If reuse site is to be located within a floodplain, measures will need to be implemented to mitigate risks (i.e. no irrigation during a flood event).
- Energy intensive
- Regular sludge disposal required
- Requires a management plan in event of failure - may require a holding tank.

Operation and Maintenance

Operators with the appropriate skills would be required to operate the system. However, with some proprietary systems, the operation and maintenance can be contracted out to the manufacturer.

2.2.4 Transfer of Sewage to the Ballarat or Gordon TP

Description

The transfer of sewage to a nearby wastewater treatment plant (WWTP) was identified as a potential treatment alternative. Two options can be put forward for the transfer, treatment and reuse of Bungaree and Wallace sewerage;

- Option A: Connection to existing Ballarat sewerage system
- Option B: Connection to Gordon WWTP

Option A involves sewerage from Wallace being pumped through a rising main to be combined with sewerage from Bungaree. The combined sewerage would then be pumped to Ballarat. It can be discharged into an existing pump station located in Warrenheip. Pump station upgrade and/or a balancing storage may be required if the existing pump station can't handle the extra load. Future upgrade of the WWTP may also be required; however future upgrade would be more likely driven by other large scale developments in Ballarat.

The concept plan for Option B involves sewerage from Bungaree being pumped through a rising main to be combined with sewerage from Wallace. The combined sewerage would then be pumped to Gordon, where it will be discharged into the Gordon WWTP. A significant capacity upgrade would be required at Gordon WWTP.

Advantages and Disadvantages

The advantages of transferring sewage to an existing treatment plant include:

- Maximise use of existing infrastructure.
- Reduction in the number of facilities that need to be managed by the water authority
- Efficiencies gained in treatment plant operation and maintenance
- Avoided or deferred land purchases
- Economies of scale

Some of the disadvantages include:

- Limited opportunity to reuse treated wastewater at the point of generation
- In some cases, high capital costs associated with extensive transfer infrastructure
- Reduction in redundant capacity where existing infrastructure is used
- In some cases, high energy consumption for pumping

Operation and Maintenance

Additional operation and maintenance will be required at the existing treatment plant; although due to economies of scale the costs associated with this are likely to be far less than if a dedicated treatment facility were to be developed.

2.2.5 Treatment Options Discussion

Due to the location of the townships within the Lal Lal water supply catchment, on-site treatment and use is considered to present high risk to potable water supply source. It is not recommended to pursue the option as there is no Domestic Wastewater Management Plan (DWMP) prepared and implementing by Council and as per Council's advice, it's unlikely that this option satisfies relevant Authorities requirements.

Lagoon treatment may also expose risk to the catchment unless proper risk assessment and risk management plan are adopted.

2.3 Disposal/Reuse

2.3.1 Disposal/Reuse to waterway/wetland

Description

Treated wastewater has historically been disposed into existing waterways. However being located within potable water catchment it is unlikely that EPA, Catchment Management Authority and/or CHW approve new outfalls into waterways. Even for non-catchment area the State Government has committed to reducing the number of outfalls. Release to waterways as environmental flows requires a high level of treatment to ensure appropriate nutrient removal to maintain stability of the receiving water ecosystem.

Advantages

- Improves environmental flows in waterways that may be experiencing water stress
- Provides a water body with water and can improve the visual amenity of the surrounding area
- Potential to provide environment for bird life and aquatic life

Disadvantages

- not likely to be accepted by EPA and Catchment Management Authority
- A high level of treated wastewater quality required, particularly with regards to nutrient levels
- Costly to establish and maintain required levels of treated wastewater quality
- Stringent regulatory approvals and auditing process
- State legislation only encourages this option as a last resort

Discussion

The Victorian EPA has confirmed that there is still a lack of guidelines and/or regulatory framework for approving "reuse" to a waterway. As a result, they are unable to provide exemptions from licensing requirements (works approvals and discharge licences) and the return of treated wastewater to the creek would be seen as a method of disposal. It is not recommended to pursue this option as this is not likely to be accepted by relevant Authorities.

2.3.2 Disposal/Reuse for Agriculture – Class C

Description

Agricultural uses can include irrigation of tree-lots or pasture. While the treated wastewater can be used for the same end purpose, it is generally viewed as:

- Reuse, when used for a beneficial purpose and economic gains are made due to the use of the water
- Disposal, if the water is irrigated simply to get rid of the water, and there is no perceivable economic gain due to the irrigation.

Treated wastewater of Class C or better is generally required. A Land Capability Assessment is required to maintain loading of nutrients and salinity at sustainable levels. Located within catchment area may require more sensitive investigation.

Traditional discharge options include irrigating tree-lots or pasture on lands surrounding the treatment plant. The effectiveness of this option is dependent on soil types in the vicinity of the treatment plant and the level of treatment undertaken.

Reuse is generally any agricultural activity not operated by the water authority.

Advantages

- Provides a supplementary water source for farmers who may be experiencing water shortages
- Provides economic benefits to the regional economy
- Is a well understood reuse activity

Disadvantages

- Requires a recognised agricultural demand to enable beneficial reuse
- Requires additional management and monitoring by the end-user
- Requires an alternative use if the event that full uptake of reuse supply is not achieved
- Requires a Land Capability Assessment to maintain loading of nutrients and salinity at sustainable levels

Discussion

Reuse option should only be considered further if there is scope to provide recycled water for agricultural reuse. Disposal to tree lots is a potential disposal option and will be considered further. This option has the advantage of reducing treatment complexity and costs.

2.3.3 Reuse as residential/commercial urban supply – Class A

Description

Treated wastewater may be used for non-potable purposes on residential and commercial properties. The treated water quality would have to meet and maintain regulatory standards and would require a dual-reticulation pipeline to transport the treated wastewater supply.

Advantages

- Provides an alternative water supply source to the community
- Strongly supported by the Victorian government.

Disadvantages

- Requires a residential and commercial non-potable water demand

- A treated wastewater quality of Class A would be required increasing treatment complexity and costs
- The costs of implementing a dual-reticulation pipeline would be borne by the service provider
- Community acceptance may vary
- The quantity and seasonality of non-potable water demand from the community may not match the continuous treated wastewater flows produced. Alternative measures would then need to be included.

Discussion

The costs of producing Class A water and implementing a dual-reticulation system may not be justified by the demand for non-potable water from the community. This option is not considered applicable for the town and has not been investigated further.

2.3.4 Reuse as municipal urban supply – Class B

Description

Treated wastewater may also be used for non-potable purposes as a municipal supply. This would typically include irrigation of open spaces, golf courses, reserves, nature strips and sports grounds.

Advantages

- Provides an alternative water supply source to the community
- Strongly supported by the Victorian government.

Disadvantages

- Requires a municipal non-potable water demand
- Depending on the class of treated water, control measures may be required such as restricted irrigation times, fencing or withholding periods.
- The costs of distribution may be borne by service provider.
- Community acceptance may vary
- Land Capability Assessment is required

Discussion

For this option to be viable potential reuse sites need to be identified. Two football ovals in Bungaree and Wallace are potential reuse sites but more demand may be required to receive full uptake of reuse supply.

Class D water may be approved by the EPA for municipal supply where sub surface irrigation methods are used. Otherwise, Class C or higher quality water can be used for spray irrigation having adopted appropriate public health management measures.

2.3.5 Disposal/Reuse Discussion

The options considered to be feasible for the disposal/reuse of treated wastewater include:

- Disposal/reuse for agriculture – Class C
- Reuse as municipal (urban) supply – Class B
- Reuse/Disposal with treated sewerage by existing treatment plant

There is a lack of guidelines and/or regulatory framework for approving "reuse" to a waterway. As a result, EPA is unable to provide exemptions from licensing requirements (works approvals and discharge licences) and the

return of treated wastewater to the creek would be seen as a method of disposal. Past experience has shown that it is difficult to obtain and maintain regulatory approval for discharge of treated wastewater to waterways. Locating within the catchment presents more risks and imposes higher sensitivity, so as a result this option has not been considered further.

3.0 Identification of Options- Water

A number of options have been identified for servicing of Dunnstown by reticulated water supply. All options involve connection to an existing water supply. The connection point nominated by CHW is the existing water supply tank located on Mahers Rd approximately 4km north of Dunnstown.

CHW confirms that the tank is currently oversized and is creating water quality issues due to the long turnover time. If the spare capacity is sufficient to meet the future requirements for Dunnstown and that adding the extra demand would actually improve water quality by reducing turnover time.

A preliminary study indicates that the preferred pipe route between the existing tank and the town has a local high point. Three options were identified to overcome the associated hydraulic issues;

- Connect into the tank inlet or upstream pipe
- Pumping from tank (or combination with above)
- Deep excavation or directional drilling through the high point

Available records from GeoVic Database for Dunnstown indicate that the soil is likely to be volcanic clay and black basalt and as a result any trenching may be slow and induce considerable over-break. So the third option involving deep excavation or directional drilling is not considered to be viable and therefore is not to be studied further.

4.0 Identification of Options- Gas

A number of options have been identified for servicing of Bungaree by Gas.

- Connect into existing Gas main
- Central LPG Gas tank with reticulation system
- Propane Gas tank at each property

Tapping into existing Gas main is the conventional option and similar system is in use for Wallace. The alternative option is a standalone bulk gas supply where a large LPG gas tank is installed in town with local gas pipe reticulation fed to each property. An additional option which is possibly already occurring is for property owners to purchase their own propane gas tanks via a supplier.

At this stage all the option are considered to be feasible and are to be studied further.

The identified options have been listed in the attached spreadsheet, Appendix A

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APPENDIX A

SWERAGE

Collection Options	***Advantage***	***Disadvantage***	***Is the option suitable***	***Comment***
• Gravity Collection System	low risk / low maintenance	high capital cost/ easement creation	Yes, as Base Case	base case
• Septic Tank Effluent Disposal (STED) Scheme	smaller pipe & less time/cost and treatment req.	operation risk & cost (maintaining septic tank)	Yes	
• Septic Tank Effluent Pumping (STEP) Scheme	smaller pipe & less time/cost and treatment req.	operation risk & cost (maintaining septic tank), power/pump failure	Yes	not CHW's favourite
• Low Pressure Sewerage Scheme (LPSS)	small pipe/suits steep topo, WSAA standard	operation risk & cost, power/pump failure, property access	Yes	
• Vacuum Sewerage Scheme	no access/power/tank at properties	significantly higher risk of failure	No, due to high risk and new to CHW	not used by CHW

Treatment Options	***Advantage***	***Disadvantage***	***further study***	***Comment***
• Advanced Onsite Wastewater Treatment (biolytix.com)	inexpensive, tech available	operating staff/access to properties, may not meet EPA req?	No, unlikely to be accepted	high risk to the catchment
• Packaged Treatment Plant (such as IDEA, SBR, MBR)	small foot print, modular growth possible	reuse site req. / req sludge disposal/ energy cost/	Yes, one plant each or one plant for both (4 options)	operation can be contracted out
• Lagoon Treatment	low cost/ low tech & easy maintenance	located further from township, odour, big land, winter storage	Yes, one plant for both	location within catchment presents risks
• Transfer of Sewage to an existing treatment plant	use of existing facilities/ no land	less reuse opp/ high cost/ reduction of ex capacities	Yes, two options, to Ballarat and to Gordon	check spare capacity

Reuse/disposal Options	***Advantage***	***Disadvantage***	***further study***	***Comment***
• Reuse for residential/commercial (Class A)	alt water source/ supported by Vic government	req. demand/ req. dual retc pipeline and Class A so costly	No, due to cost	costs are not justifiable
• Irrigation of public open space (Class B)	alt water source/ supported by Vic government	req. alternative use or storage for winter/ community acceptance	Yes	ex. Football ovalls/ req Land Capability Assessment
• Disposal to agricultural land (tree lots or pasture land) (Class C)	low maintenance/ supplementary water source	reuse site req./ req. alternative use or storage for winter	Yes	required demand and Land Capability Assessment
• Reuse to waterway/wetland	beneficial for water ways under stress	High level of treatment so costly/ stringent & unclear regulatory	No, difficult to maintain regulatory approval	
• Onsite treatment and reuse	inexpensive, tech available	req. reuse demand/ do not meet EPA req	No, unlikely to be accepted	high risk to the catchment
• Reuse/Disposal with treated sewerage by ex. treatment plant	use of existing facilities	req. demand or site/ less reuse opportunity for community	Yes	check with CHW re available capacity

GAS (for Bungaree)

Options	***Advantage***	***Disadvantage***	***further study***	***Comment***
Connect into ex Gas main	low maintenance/ similar to Wallace	risk of tapping into ex. main	Yes	SP AusNet
Central LPG Gas tank with retic system	Central system	refill req. / not common in Vic	Yes	Origin Energy
Propane Gas tank at each property	independent system/ low capital cost	less convenient for users	Yes	do nothing option

WATER (for Dunnstown)

Options	***Advantage***	***Disadvantage***	***further study***	***Comment***
Connect into ex. water supply tank in Maher's Rd at tank inlet	using ex pressure	future hydraulic issue due to high point	Yes	improve ex. water quality
Pumping from tank (or combination with above)	minimise hydraulic issue due to high point	power consumption, power failure risk	Yes	improve ex. water quality
Deep excavation of directional drilling through high point	efficient hydaulic performance	expensive, as it's rock	No , due to high cost of deep excavation in rock	cost not justifiable

APPENDIX B

Assessment Framework

Factor	Description	eight	
Economic			42%
Whole of Life Costs	Measured by Net Present Value (NPV) which incorporates both capital and operating costs.	100	42%
Environmental			17%
Impact on surface, ground and marine water quality	Wastewater discharge from the scheme impacting on receiving water quality Subsequent impacts on aquatic and terrestrial ecology from a loss of water quality	20	8%
Greenhouse gas impact	Increase or decrease in the overall magnitude of greenhouse gas emissions during operation	10	4%
Impact on terrestrial ecosystems	Impact on terrestial ecosystems during construction and ongoing maintenance of infrastructure	10	4%
Social			19%
Recreational amenity	Impact on the way people live, work and interact with the landscape. In particular: - Impact of providing a water source for recreational irrigation and the benefits that recreational facility provides the community	10	4%
Protection of public health	Public health and safety impacts resulting from the project	25	10%
Social acceptability	Public acceptance for the scheme, including: - Community understanding and acceptance of proposed water reuse - Ongoing maintenance input from the householder - Impacts during construction - Social equity i.e. does the scheme provide equal benefits to all sections of the community? - Visual and odour issues - Ability of the householder to afford the scheme (both capital and annual costs)	10	4%
Technical			23%
Ability to accommodate growth	How well can the scheme accommodate growth and expansion	25	10%
Level of maintenance required	Does the water authority have the skills and resources already within their organisation to maintain the system	10	4%
Reliability	Ability of the treatment system to produce the quality of water required Ability of the reuse scheme to provide security of supply	5	2%
Ease of implementation	Ability to get the scheme up and running. Includes the following considerations: - Constructability - Regulatory approval - Customer take up - Institutional issues	10	4%
No. of properties that can be serviced	Ability of the scheme to collect sewage from properties (is able to service difficult isolated areas)	5	2%
		240	**100**

eighting measured as importance score between 0 and 100, with 100 being most important

Appendix D

Preliminary Servicing Options and Costing

Appendix D Preliminary Servicing Options and Costing

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Memorandum

To	Neal Kerr	Page	1
CC			
Subject	Preliminary Options Assessment and Cost Estimate		
From	Abbas Hadian		
File/Ref No.		Date	01-Apr-2014

1.0 Preliminary Options Assessment Sewerage

1.1 Methodology

Preliminary options assessment was undertaken using Multi Criteria Analysis (MCA). The analysis methodology adopted is summarised as follows:

- Identify, agree and categorise a number of assessment criteria (categories include economic, environmental, social and technical)
- Assign weightings to each criteria (weightings agreed by MSC and CHW)
- Score each option against the criteria
- Rank the options according to the relative scores

1.2 Assessment Criteria and eightings

A number of assessment criteria were developed for the analysis of options. These criteria fall into four categories; environmental, social, financial and technical. The criteria and their assigned weightings were developed in conjunction with MSC and CHW and are listed in Table 1.

Table 1: MCA Assessment Criteria

Factor	Description	eight[1]	[2]
Economic			42%
Whole of Life Costs	Measured by Net Present Value (NPV) which incorporates both capital and operating costs.	100	42%
Environmental			17%
Impact on surface, ground and marine water quality	Wastewater discharge from the scheme impacting on receiving water quality Subsequent impacts on aquatic and terrestrial ecology from a loss of water quality.	20	8%
Greenhouse gas impact	Increase or decrease in the overall magnitude of greenhouse gas emissions during operation.	10	4%
Impact on terrestrial ecosystems	Impact on terrestial ecosystems during construction and ongoing maintenance of infrastructure.	10	4%

Social			19%
Recreational amenity	Impact on the way people live, work and interact with the landscape. In particular: - Impact of providing a water source for recreational irrigation and the benefits that recreational facility provides the community.	10	4%
Protection of public health	Public health and safety impacts resulting from the project	25	10%
Social acceptability	Public acceptance for the scheme, including: - Community understanding and acceptance of proposed water reuse - Ongoing maintenance input from the householder - Impacts during construction - Social equity i.e. does the scheme provide equal benefits to all sections of the community? - Visual and odour issues - Ability of the householder to afford the scheme (both capital and annual costs)	10	4%
Technical			23%
Ability to accommodate growth	How well can the scheme accommodate growth and expansion	25[3]	10%
Level of maintenance required	Does the water authority have the skills and resources already within their organisation to maintain the system	10	4%
Reliability	Ability of the treatment system to produce the quality of water required. Ability of the reuse scheme to provide security of supply	5	2%
Ease of implementation	Ability to get the scheme up and running. Includes the following considerations: - Constructability - Regulatory approval - Customer take up - Institutional issues	10	4%
No. of properties that can be serviced	Ability of the scheme to collect sewage from properties (is able to service difficult isolated areas)	5	2%
		240	**100**

[1] Weighting measured as importance (score between 0 and 100, with 100 being most important)

[2] Figures have been rounded up

[3] Figures have been increased as per MSC advice

1.3 Analysis

Each option was scored in comparison to a base case on the financial, environmental, social and technical criteria. In this assessment, the base case for the collection component of the works is gravity sewerage scheme and the base case for treatment and reuse is packaged treatment plant and reuse in irrigation site. A score

greater than zero indicated that the option was better than the base case and a score less than zero indicated that the option was worse than the base case.

The scoring system is presented in Table 2.

Table 2: Multi Criteria Analysis Scoring System

Impact	Score
Much better than the base case	3
Moderately better than the base case	2
A little better than the base case	1
No difference to the base case	0
A little worse than the base case	-1
Moderately worse than the base case	-2
Much worse than the base case	-3

1.4 Results

MCA was undertaken to compare the options for collection and treatment and reuse. The results are summarised in the following sections of this report. The full MCA can be seen in Appendix C.

1.4.1 Collection

The results from the MCA of collection options are provided in Table 3.

Table 3: Summary of Preliminary MCA – Collection Options

Option	eighted Score	Ranking
Base Case: Gravity Collection	0	1
STED Collection	-90	4
STEP Collection	-77.5	3
Low Pressure Collection	-45	2

1.4.2 Treatment and Reuse

The results from the treatment and reuse MCA are summarised as follows:

Table 4: Summary of Preliminary MCA – Treatment and Reuse Options

Option	eighted Score	Ranking
Class A - Package plant and dual pipe reuse	-120	5
Class B - Package Plant and land disposal (Base Case)	0	2
Class C - Lagoons and land disposal	-40	3
Transfer to existing treatment plant Ballarat	42.5	1
Transfer to existing treatment plant Gordon	-85	4

1.4.3 Summary of Results

The preliminary analysis of collection options shows that in terms of the criteria and weightings adopted, a gravity scheme would provide the best overall outcome. Given the subjectivity of the analysis (typically associated with MCA) and the relative closeness of the scores, all collection options will be carried forward for further analysis.

The analysis of the treatment and reuse options shows that the best option (based on the MCA) is to combine the sewerage from Wallace and Bungaree and transfer to existing WWTP in Ballarat. This option also provides the best outcome regarding issues associated with treatment and reuse within declared water supply catchment area.

Based on the MCA detailed above, two options can be ruled out being significantly worse than the other alternatives; 'Class A – Packaged Plant / dual pipe reuse' and 'Transfer to existing treatment plant in Gordon'. We have been also advised by CHW that Gordon treatment plant does not have spare capacity to treat Wallace and Bungaree sewerage. So this option has no advantage upon building a new local treatment plant and also can be ruled out comparing to transferring to Ballarat WWTP with available spare capacity.

Each of the options carried forward from the preliminary options assessment have been costed to further assist with further short-listing and options assessment.

2.0 Preliminary Cost Estimates

To further assist with the development of a wastewater scheme for Wallace and Bungaree, preliminary cost estimates have been prepared. These estimates consider capital, operating and whole of life costs (otherwise known as Net Present Cost or NPC) and are to be used as an input to the options selection process.

Detailed cost estimates can be seen as Appendix D.

2.1 Basis for Estimates

The following sources have been used as the basis for cost estimates:

- Previous estimates prepared by AECOM (Talbot, Snake Valley and Bemm River)
- Discussions with relevant contractors (Pipe Con, Pressure Sewer Services)
- Discussions with suppliers (Iplex etc)
- AECOM in-house expertise

2.2 Assumptions

2.2.1 CAPEX

The key assumptions made in the development of the CAPEX estimates include:

- There is not enough demand for class B treated sewerage (golf course or sport grounds) so same cost were allocated for reuse/irrigation in both packaged treatment options and Lagoon.
- New Treatment Plant, winter storage and irrigation site can be located within an area of 5km from midway between Bungaree and Wallace.
- Required land for treatment, storage and reuse are available and can be purchased at a rate of $15,000/ha approx. (as per advise from local real estate agents). Proper land capability assessment needs to be carried out if these options deemed to be favoured.
- It is assumed that the Ballarat WWTP has adequate spare capacity and no cost is allowed for augmentation of existing Ballarat WWTP facilities. CHW advised us that some trunk sewers upstream of the Wardenship pump station is currently over capacity so an allowance has been made for construction of a balance tank.
- 10% is allowed to cover contractor's preliminaries, supervision and margin.
- 30% contingency is added to the total cost and extra 31% to allow for; authority administration costs, design, project management, construction management, clerk of works administration, planning and approvals, legal, surveying and geotech.

2.2.2 OPEX

The key assumptions made in the development of the OPEX estimates include:

- Operation and Maintenance of a Gravity/STED scheme – 3.8 $/m
- Operation and Maintenance of a LPSS/STEP scheme – 5% of capital cost
- Annual power costs for STEP and LPSS pumps - $30 per annum each
- Cost to pump out a septic tank - $500 every 3years
- Operation and Maintenance of raising main to Ballarat WWTP – 4% of Capital cost
- Pump service for main transfer pump station to Ballarat WWTP – $30,000 per annum
- Operation and Maintenance of Irrigation infrastructure – 4% of Capital cost
- 30% contingency is added to the total cost

2.2.3 Net Present Cost NPC

The key assumptions made in the development of the NPC estimates include:

- Discount Rate – 6%
- Evaluation Period – 30 years
- Pump and Electrics at the Pump Station replaced after 15 years
- Septic Tank Pump Out Frequency – Every 3 Years
- 90 Pumps require servicing every year (STEP/LPSS)
- No revenue was considered for recycled waste water

2.3 Summary of Costs

2.3.1 Collection

The estimated costs associated with the design and construction of a sewage collection system is shown in Table 5.

Table 5: Collection Cost Estimates

Option	CAPEX	OPEX	NPC
Modified Gravity Collection	$ 62,180,000	$ 491,000	$ 68,859,000
STED Collection	$ 74,036,000	$ 987,000	$ 87,444,000
STEP Collection	$ 68,802,000	$ 1,799,000	$ 93,250,000
Low Pressure Collection	$ 67,478,000	$ 1,296,000	$ 85,092,000

From Table 5 it can be seen that the Gravity collection system offers the lowest cost collection alternative in terms of both capital and life costs.

2.3.2 Treatment and Reuse

The estimated costs associated with the treatment and reuse of wastewater are shown in Table 6.

Table 6: Reuse/Disposal Cost Estimates

Option	CAPEX	OPEX	NPC
Packaged Plant – collection by STEP/STED and Reuse by irrigation within 5km of townships	$14,714,000	$244,000	$18,030,000
Packaged Plant – collection by MCG/LPSS and Reuse by irrigation within 5km of townships	$15,488,000	$257,000	$18,979,000
Lagoons – collection by STEP/STED and Reuse by irrigation within 5km of townships	$18,436,000	$195,000	$21,081,000
Lagoons – collection by MCG/LPSS and Reuse by irrigation within 5km of townships	$19,406,000	$205,000	$22,191,000
Transfer to Existing WWTP in Ballarat	$8,945,000	$228,000	$12,437,000

From Table 6 it can be seen that the lowest cost solution in terms of capital cost and whole of life cost (NPC) for the treatment and reuse component is to transfer the sewerage to existing WWTP in Ballarat. It has slightly higher operation cost than lagoon treatment options but capital cost and NPC costs are significantly less than all options.

2.3.3 Summary

Based on the preliminary cost estimates the least cost solution is to adopt:

- A Modified Gravity Collection scheme for wastewater collection; and
- Transfer to Existing WWTP in Ballarat for treatment and reuse

Table 7: Total Cost preferred option

Option	CAPEX	OPEX	NPC
Modified Gravity Collection	$ 62,180,000	$ 491,000	$ 68,859,000
Transfer to Existing WWTP in Ballarat	$ 8,945,000	$ 228,000	$12,437,000
SUM	$71,125,000	$719,000	$ 81,296,000

This alternative has an estimated capital cost of around $71 million and whole of life costs equating to approximately $81 million.

3.0 Refined Options Assessment

3.1 Multi Criteria Analysis

The initial MCA was undertaken at a high level without the use of detailed costs to assist with developing a shortlist for further options development.

To ensure that the most appropriate option is selected moving forward, the MCA was refined based on the preliminary cost estimates. The same methodology and assessment criteria were adopted but costs were updated to match estimated life time costs. Refined MCA for treatment and reuse excluded "Class A & dual piping" and "transfer to Gordon" as these two options were ruled out after preliminary option assessment. The full MCA can be seen in Appendix E.

3.1.1 Results

The results of the refined MCA can be seen Table 8 and Table 9.

Table 8: Refined MCA Summary – Collection Options

Option	eighted Score	Ranking
Base Case: Gravity Collection	0	1
STED Collection	-70	4
STEP Collection	-68	3
Low Pressure Collection	-25	2

Table 9: Refined MCA Summary – Treatment and Reuse Options

Option	eighted Score	Ranking
Base Case; Class B - Package Plant and land disposal	0	2
Class C - Lagoons and land disposal	-20	3
Transfer to existing treatment plant Ballarat	92.5	1

3.1.2 Summary

The refined MCA confirmed that the "Modified Gravity collection" option provides the best outcome and, the best option in terms of treatment and reuse is "transfer to existing Ballarat WWTP".

AECOM

4.0 Options Assessment and Costing Water Supply to Dunnstown

4.1 Refined option identification and Option Assessment

The main identified option for providing water service to Dunnstown is to connect to the existing water supply tank located at Mahers Rd approximately 4km north of Dunnstown. The location of the existing tank and the alignment of the proposed transfer main can be seen on the map in Appendix B.

The preferred pipe route between the existing tank and the town has a local high point at roughly 1.5km from the supply tank. The concern is that the pipeline is likely to have a slight negative pressure at this point, which is generally not preferred.

In option Identification stage, the following options were identified to overcome the issue;

- Connect into ex. water supply tank in Maher's Rd at tank inlet
- Pumping from tank (or combination with above)
- Deep excavation or directional drilling through high point

However, during the investigations of options and using map of 1m contours and levels provided by CHW it was established that; if the concept and detailed design are done appropriately, there is enough deferential head between existing tank and the high point for a standard gravity supply main.

It was also established that the pressure on connection into ex. water tank is not significantly higher than tank top water level and connection to tank inlet will not provide advantage. It will also add complication to operation of the supply system.

As a result a gravity transfer main from the ex. tank at Mahers road was considered to be the obvious favoured options and preliminary cost estimation was carried out for this option only.

4.2 Preliminary Cost Estimate

4.2.1 CAPEX

The key assumptions made in the development of the CAPEX estimates include:

- Future growth of 1% per annum for a design life of 30 years. The number of lots in service area is currently 51, and assumed to increase to 68 by the end of the design life.
- The football oval has an average demand of 500 kL/year. A high level assumption has been made to convert this demand to an equivalent number of lots (4), based on an average lot demand of 350 L/lot/day.
- Water supply demand for the hotel has been calculated based on WSAA guidelines
- Existing properties in close proximately but outside of the township zone have been excluded.
- CHW have advised that the tank is currently oversized and the spare capacity is sufficient to meet the future requirements for Dunnstown.
- Chemical dosing currently occurs infrequently to offset the water quality issues. Adding the extra demand would improve water quality by reducing turnover time. As a result it has been assumed that additional disinfection will not be required for this system.
- The water supply network in the town is to be a conventional system, with pipes distributing water to each connected property site in the town. Costs for head works and transfer have not been considered at this stage.
- 10% was allowed to cover contractor's preliminaries, supervision and margin.
- 30% contingency was added to the total cost and extra 31% to allow for; authority administration costs, design, project management, construction management, clerk of works administration, planning and approvals, legal, surveying and geotech.

4.2.2 OPEX

The key assumptions made in the development of the OPEX estimates include:

- Operation and Maintenance of transfer main and reticulation system – 5% of Capital cost
- 30% contingency is added to the total cost

4.2.3 Net Present Cost NPC

The key assumptions made in the development of the NPC estimates include:

- Discount Rate – 6%
- Evaluation Period – 30 years

4.2.4 Cost Summary

The costs associated with providing a water supply network to Dunnstown are outlined in the following table. A summary of the costs associated with the potential township water and sewer projects is provided in the following table and Appendix D.

Table 10 Dunnstown ater Supply Scheme Costs

Dunnstown ater Supply Scheme Costs	$
CAPEX	$1,739,000
OPEX	$70200
NPC	$ 2,692,869

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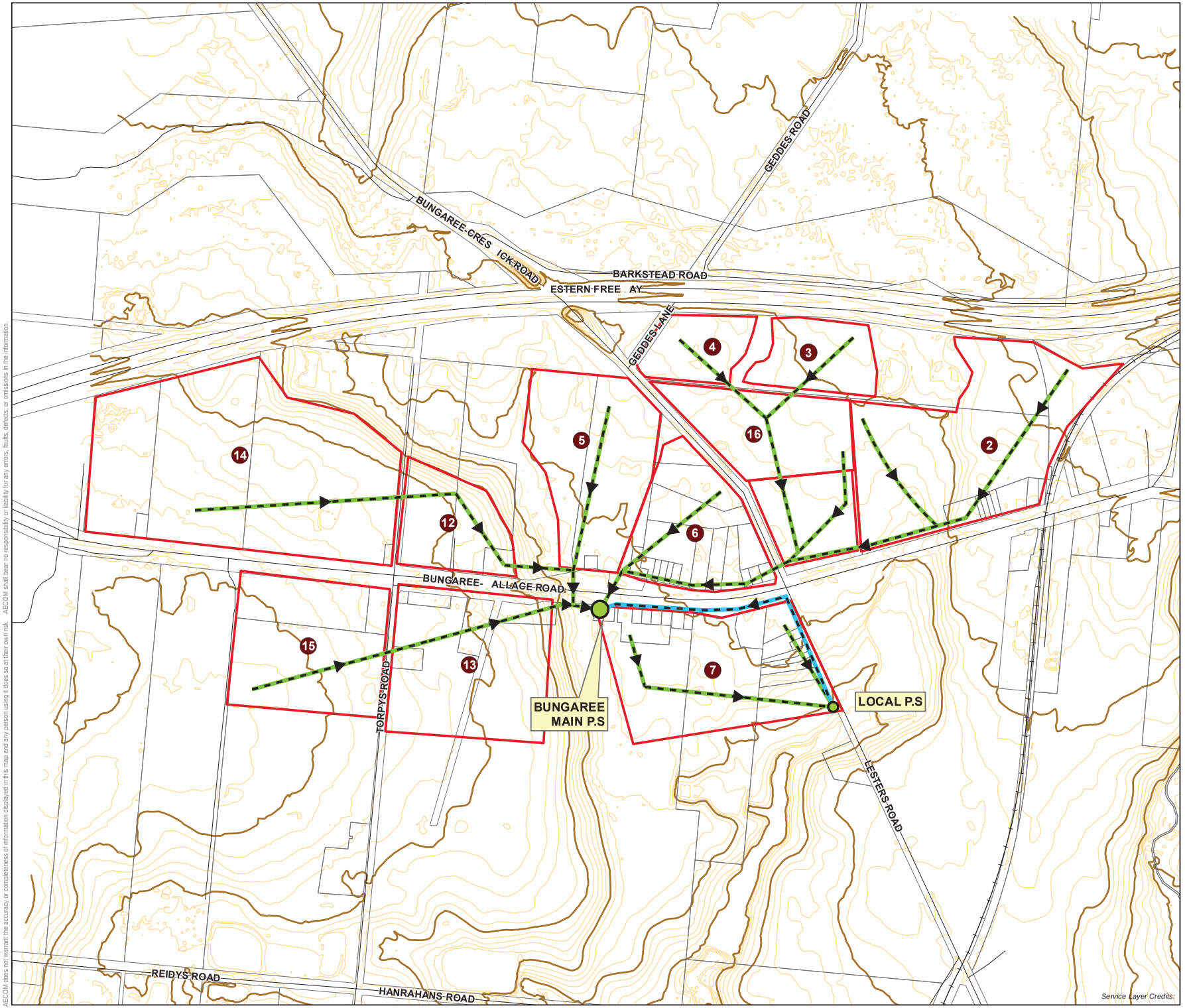

SMALL TOWNS SERVICES STUDY

COLLECTION OPTIONS
GRAVITY/STED
Bungaree

Legend

- Gravity sewer
- Pressure sewer
- Main Pump Station
- Local Pump Station
- Railways
- Roads
- Contour Minor
- Contour Major
- Development Boundaries

0 100 200 400
Meters

1:9,000 (when printed at A3)

N

Data sources:
© 2012 (data source)
(additional data)

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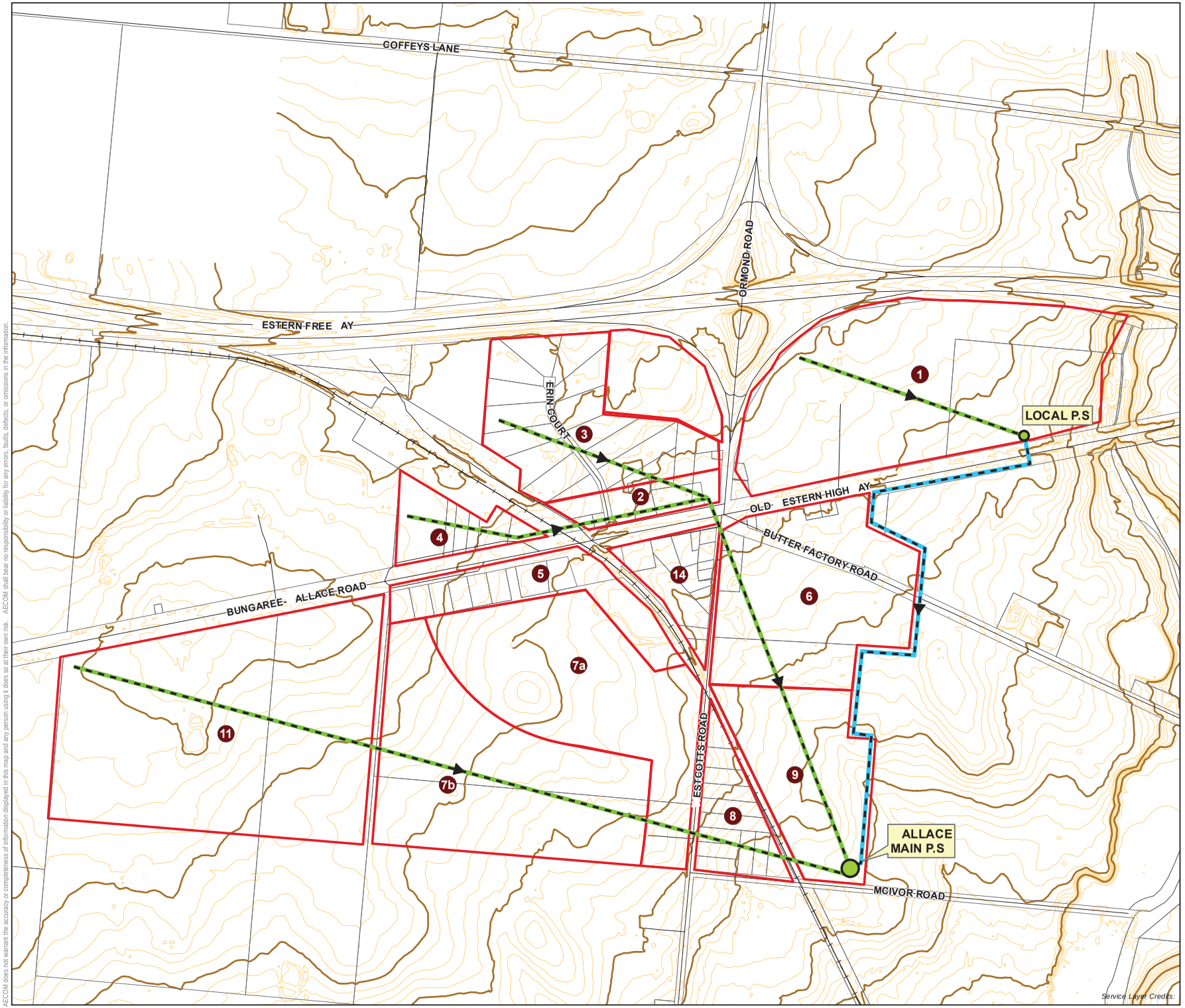

SMALL TOWNS SERVICES STUDY

COLLECTION OPTIONS
GRAVITY/STED
Wallace

Legend

- Gravity sewer
- Pressure sewer
- Main Pump Station
- Local Pump Station
- Railways
- Roads
- Contour Minor
- Contour Major
- Development Boundaries

0 100 200 400
Meters

1:9,000 (when printed at A3)

N

Data sources:
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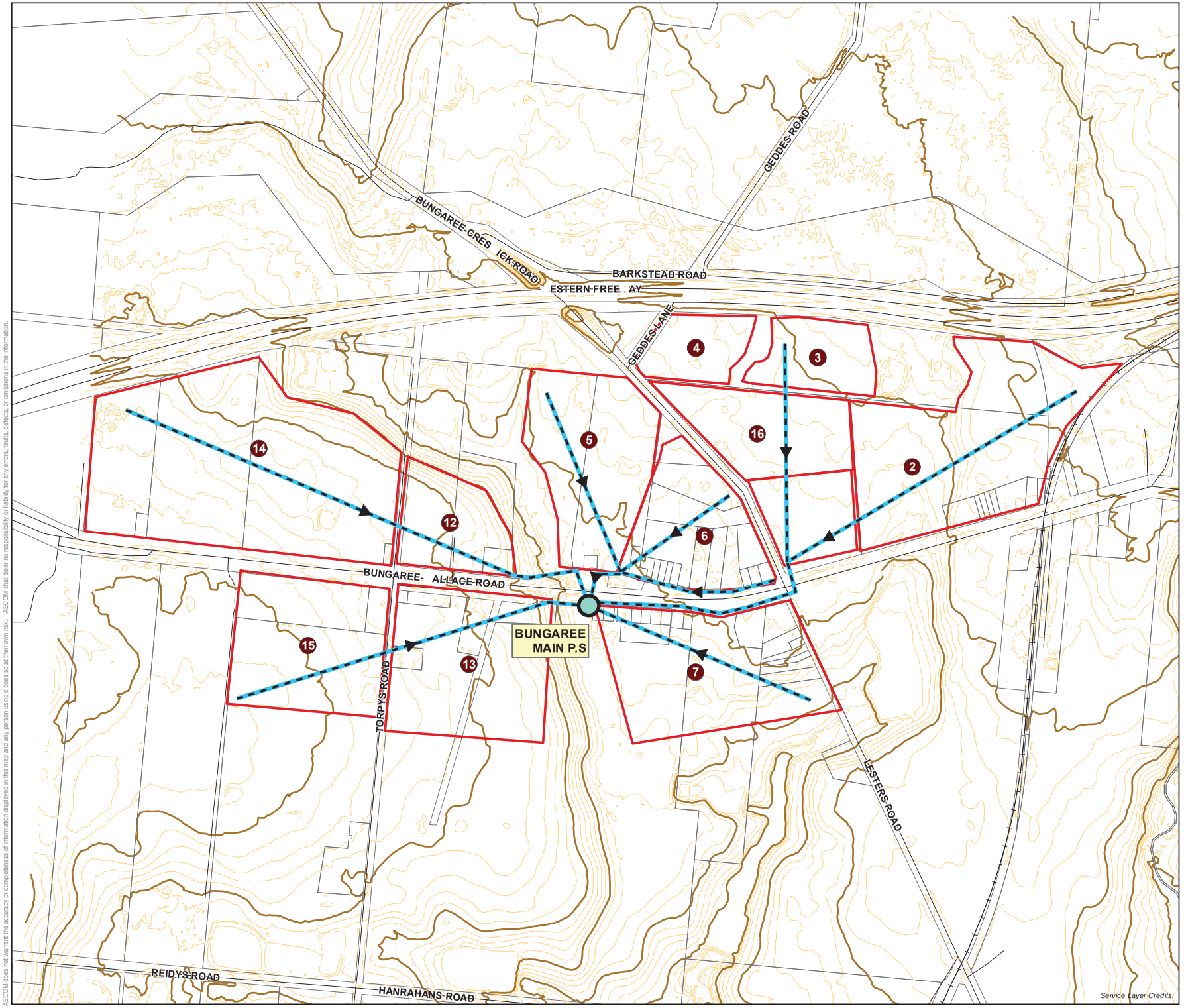

SMALL TOWNS SERVICES STUDY

COLLECTION OPTIONS
Low Pressure Sewerage System/STEP
Bungaree

Legend

- Main Pump Station
- Pressure sewer
- Railways
- Roads
- Contour Minor
- Contour Major
- Development Boundaries

0 100 200 400
Meters

1:9,000 (when printed at A3)

N

Data sources:
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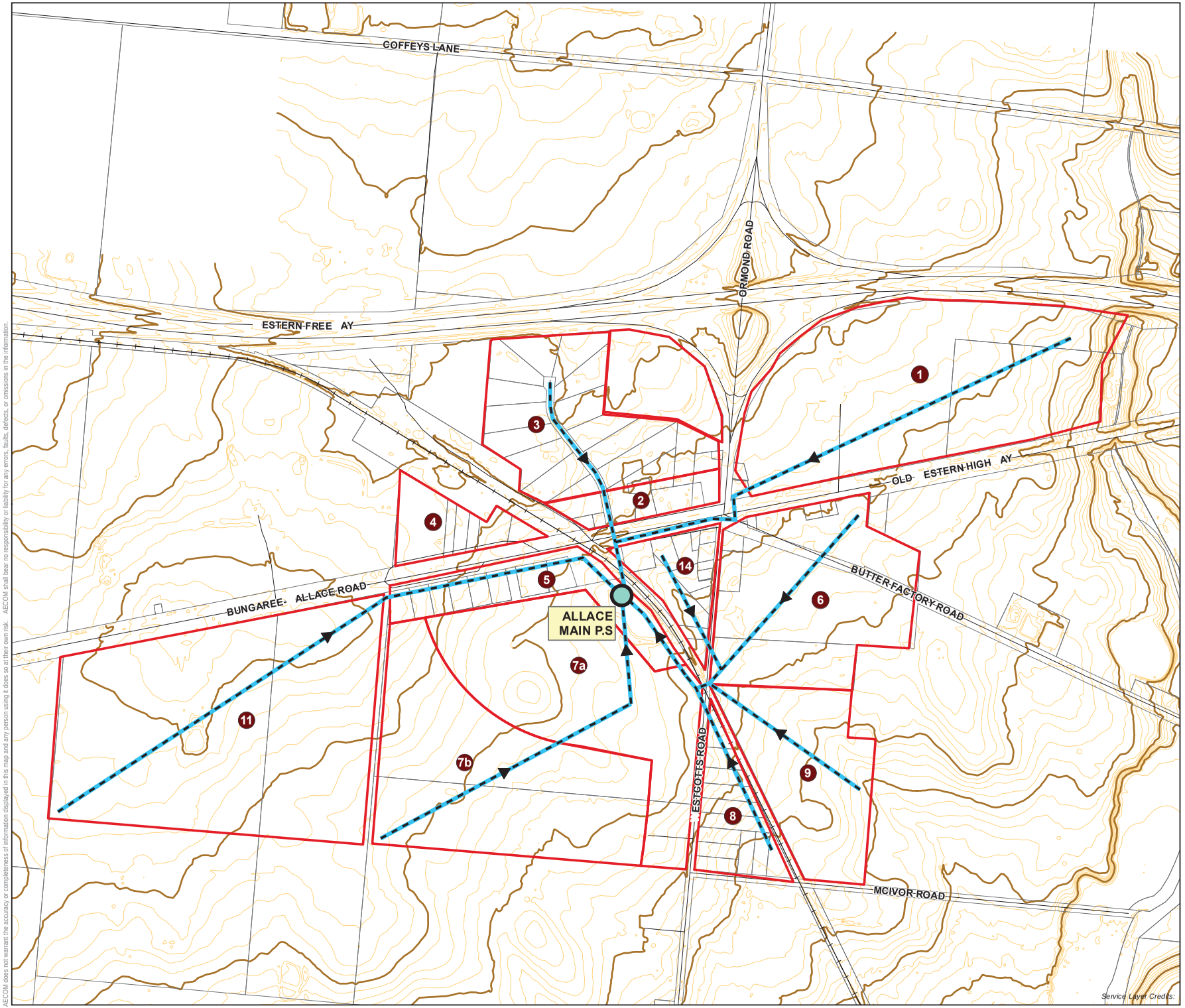

SMALL TOWNS SERVICES STUDY

COLLECTION OPTIONS
Low Pressure Sewerage System/STEP
Wallace

Legend

- Main Pump Station
- Pressure sewer
- Railways
- Roads
- Contour Minor
- Contour Major
- Development Boundaries

0 100 200 400
Meters

1:9,000 (when printed at A3)

N

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SMALL TOWNS SERVICES STUDY

TREATMENT/REUSE OPTIONS
LAGOON/IDEA TREATMENT
AND REUSE IN IRRIGATION

Legend

- Assumed Area for local sewerage treatment plant and irrigation site
- Declared Water Supply Catchments

0 500 1,000 2,000
Meters

1:50,000 (when printed at A3)

N

Data sources:
© 2012 (data source)
(additional data)

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SMALL TOWNS SERVICES STUDY

TREATMENT/REUSE OPTIONS
Transfer to Existing WWTP (Ballarat)

Legend

- Proposed Main Pump Station
- Proposed Rising Main

0 250 500 1,000
Meters

1:35,000 (when printed at A3)

N

Data sources:
© 2012 (data source)
(additional data)

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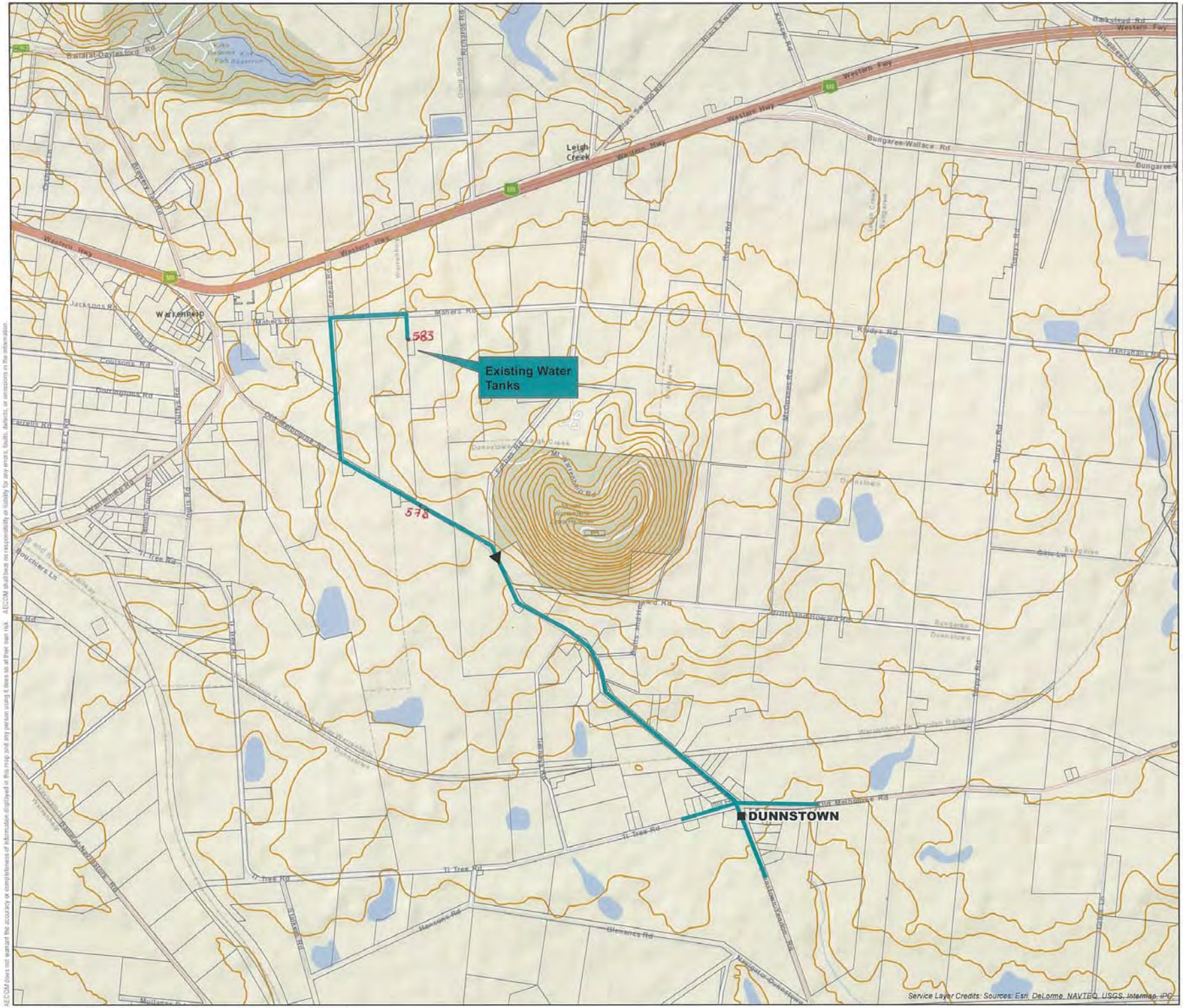

SMALL TOWNS SERVICES STUDY

WATER SUPPLY - DUNNSTOWN
GRAVITY FROM EXISTING
WATER TANKS

Legend

- Water Transfer Main
- Contours (10m)

0 250 500 1,000
Meters

1:20,000 (when printed at A3)

N

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Data sources:
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Multi Criteria Analysis –Preliminary Assessment

Collection System

Factor	eighting		Modified Gravity Collection		STED Collection		STEP Collection		Low Pressure Collection	
			Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score
Economic		42%								
Whole of Life Costs	100	42%	0	0	-0.5	-50.0	-0.5	-50	-0.5	-50
Environmental		17%								
Impact on surface, ground and marine water quality	20	8%	0	0	0	0.0	0.5	10	0.5	10
Greenhouse gas impact	10	4%	0	0		0.0	-1	-10	-1	-10
Impact on terrestrial ecosystems	10	4%	0	0	0.5	5.0	1	10	1	10
Social		19%								
Recreational amenity	10	4%	0	0	0	0.0	0	0	0	0
Protection of public health	25	10%	0	0	-0.5	-12.5	-0.5	-12.5	0	0
Social acceptability	10	4%	0	0	-2	-20.0	-2	-20	-1	-10
Technical		23%								
Ability to accommodate growth	25	10%	0	0	0	0.0	0	0	0	0
Level of maintenance required	10	4%	0	0	-1	-10.0	-2	-20	-1	-10
Reliability	5	2%	0	0	-0.5	-2.5	-1	-5	-1	-5
Ease of implementation	10	4%	0	0	0	0.0	1	10	1	10
No. of properties that can be serviced	5	2%	0	0	0	0.0	2	10	2	10
Total Score	**240**	**100**	0	0	-4	-90	-2.5	-77.5	0	-45
Ranking				**1**		**4**		**3**		**2**

Weighting measured as importance (score between 0 and 100, with 100 being most important)

Treatment Reuse

Factor	eighting		Class A - Package plant and dual pipe reuse		Class B - Package Plant and land disposal		Class C - Lagoons and land disposal		Transfer to existing treatment plant Ballarat		Transfer to existing treatment plant Gordon	
			Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score
Economic		42%										
Whole of Life Costs	100	42%	-2	-150	0	0	0	0	0	0	0	0
Environmental		17%										
Impact on surface, ground and marine water quality	20	8%	1	20	0	0	-1	-20	1	20	-1	-20
Greenhouse gas impact	10	4%	-1	-5	0	0	0	0	-0.5	-5	-0.5	-5
Impact on terrestrial ecosystems	10	4%	0	0	0	0	-1	-10	1	10	-1	-10
Social		19%										
Recreational amenity	10	4%	2	20	0	0	-1	-10	0	0	0	0
Protection of public health	25	10%	1	25	0	0	-1	-25	1	25	0	0
Social acceptability	10	4%	-1	-10	0	0	0	0	1	10	-2	-20
Technical		23%										
Ability to accommodate growth	25	10%	0	0	0	0	0	0	-0.5	-12.5	-1	-25
Level of maintenance required	10	4%	0	0	0	0	1	10	0	0	0	0
Reliability	5	2%	0	0	0	0	1	5	0	0	0	0
Ease of implementation	10	4%	-2	-20	0	0	1	10	-0.5	-5	-0.5	-5
No. of properties that can be serviced	5	2%	0	0	0	0	0	0	0	0	0	0
Total Score	**240**	**100**	-1	-120	0	0	-1	-40	2.5	42.5	-6	-85
Ranking				**5**		**2**		**3**		**1**		**4**

Weighting measured as importance (score between 0 and 100, with 100 being most important)

Summary of Cost Estimate, Wallace and Bungaree Sewerage Scheme

Sewerage Collection Cost Estimates

Option	CAPEX	OPEX	NPC
Modified Gravity Collection	$ 62,180,000	$ 491,000	$ 68,859,000
STED Collection	$ 74,036,000	$ 987,000	$ 87,444,000
STEP Collection	$ 68,802,000	$ 1,799,000	$ 93,250,000
Low Pressure Collection	$ 67,478,000	$ 1,296,000	$ 85,092,000

Sewerage Reuse/Disposal Cost Estimates

Option	CAPEX	OPEX	NPC
Packaged Plant – collection by STEP/STED and Reuse by irrigation within 5km of townships	$14,714,000	$244,000	$18,030,000
Packaged Plant – collection by MCG/LPSS and Reuse by irrigation within 5km of townships	$15,488,000	$257,000	$18,979,000
Lagoons – collection by STEP/STED and Reuse by irrigation within 5km of townships	$18,436,000	$195,000	$21,081,000
Lagoons – collection by MCG/LPSS and Reuse by irrigation within 5km of townships	$19,406,000	$205,000	$22,191,000
Transfer to Existing WWTP in Ballarat	$8,945,000	$228,000	$12,437,000

Summary of Cost Estimate, Dunnstown Water Supply

Dunnstown Water Supply Scheme Costs

Dunnstown Water Supply Scheme Costs	$
CAPEX	$1,739,000
OPEX	$70200
NPC	**$ 2,692,869**

Multi Criteria Analysis -Refined Assessment

Collection System

Factor	eighting		Modified Gravity Collection		STED Collection		STEP Collection		Low Pressure Collection	
			Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score
Economic		42%								
Whole of Life Costs	100	42%	0	0	-0.3	-30.0	-0.4	-40	-0.3	-30
Environmental		17%								
Impact on surface, ground and marine water quality	20	8%	0	0	0	0.0	0.5	10	0.5	10
Greenhouse gas impact	10	4%	0	0		0.0	-1	-10	-1	-10
Impact on terrestrial ecosystems	10	4%	0	0	0.5	5.0	1	10	1	10
Social		19%								
Recreational amenity	10	4%	0	0	0	0.0	0	0	0	0
Protection of public health	25	10%	0	0	-0.5	-12.5	-0.5	-12.5	0	0
Social acceptability	10	4%	0	0	-2	-20.0	-2	-20	-1	-10
Technical		23%								
Ability to accommodate growth	25	10%	0	0	0	0.0	0	0	0	0
Level of maintenance required	10	4%	0	0	-1	-10.0	-2	-20	-1	-10
Reliability	5	2%	0	0	-0.5	-2.5	-1	-5	-1	-5
Ease of implementation	10	4%	0	0	0	0.0	1	10	1	10
No. of properties that can be serviced	5	2%	0	0	0	0.0	2	10	2	10
Total Score	**240**	**100**	0	0	-3.8	-70	-2.4	-67.5	0.2	-25
Ranking				**1**		**4**		**3**		**2**

Weighting measured as importance (score between 0 and 100, with 100 being most important)

Treatment Reuse

Factor	eighting		Class B - Package Plant and land disposal		Class C - Lagoons and land disposal		Transfer to existing treatment plant Ballarat	
			Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score
Economic		42%						
Whole of Life Costs	100	42%	0	0	0.2	20	0.5	50
Environmental		17%						
Impact on surface, ground and marine water quality	20	8%	0	0	-1	-20	1	20
Greenhouse gas impact	10	4%	0	0	0	0	-0.5	-5
Impact on terrestrial ecosystems	10	4%	0	0	-1	-10	1	10
Social		19%						
Recreational amenity	10	4%	0	0	-1	-10	0	0
Protection of public health	25	10%	0	0	-1	-25	1	25
Social acceptability	10	4%	0	0	0	0	1	10
Technical		23%						
Ability to accommodate growth	25	10%	0	0	0	0	-0.5	-12.5
Level of maintenance required	10	4%	0	0	1	10	0	0
Reliability	5	2%	0	0	1	5	0	0
Ease of implementation	10	4%	0	0	1	10	-0.5	-5
No. of properties that can be serviced	5	2%	0	0	0	0	0	0
Total Score	**240**	**100**	0	0	-0.8	-20	3	92.5
Ranking				**2**		**3**		**1**

Weighting measured as importance (score between 0 and 100, with 100 being most important)

Appendix E

Gas Servicing

Appendix E Gas Servicing

Bungaree Gas Servicing

Bungaree Gas Servicing

Client: Moorabool Shire Council

ABN: 29 352 754 296

Prepared by

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07-Jun-2014

Job No.: 60309716

AECOM in Australia and New Zealand is certified to the latest version of ISO9001, ISO14001, AS/NZS4801 and OHSAS18001.

Quality Information

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	60309716
Ref	\\aumel1fp001\projects\60309716\6. draft docs\6.1 reports\final report\appendix-e_gas\gas servicing tech note_draft 110414.docx
Date	07-Jun-2014
Prepared by	Tom Warrell
Reviewed by	Neal Kerr

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	11-Apr-2014	Draft for client review	Neal Kerr Project Manager	

Table of Contents

1.0 Introduction

AECOM was commissioned on behalf of the Moorabool Shire Council to provide a study of gas infrastructure servicing strategy associated with the development of Bungaree for increasing population numbers.

1.1 The Bungaree Area

Bungaree is a town in Victoria, Australia. The town is located 100 kilometres west of the state capital, Melbourne and 14 kilometres east of the regional centre of Ballarat, on the Western Freeway and in the Shire of Moorabool local government area. The regional context of the Area is shown in Figure 1 below.

Figure 1 - Regional Context of Bungaree, Victoria Source: VicMap Lite

1.2 Report Framework

The report has been structured in the following sections:

- Section 2 – Gas Servicing

This is further supported by the following appendices:

- Appendix A – Utility Provider Contacts
- Appendix B – Gas Infrastructure
- Appendix C – Correspondence

2.0 Gas Servicing

Gas main development is not available within the Study Area although there is a nearby transmission line and some reticulation is Wallace, a town approximately 5kms east of Bungaree. This however does not mean that gas infrastructure can automatically be provided. The decision whether or not to reticulate the precinct will depend on the budget cost of infrastructure and the return on investment the service provider is likely to receive. There is no obligation to provide any service if there is insufficient return.

This study also considers the feasibility of a decentralised gas supply alternative, by supplying LPG gas to tanks in the town on a regular basis. From here, reticulation will be provided throughout the town. AECOM has consulted with Kleenheat for the purposes of investigating this alternative. Contact details for service providers can be found in Appendix A - Utility Provider Contacts.

It is assumed that, for the purposes of this study, connection to the centre of town should be the basis of design. Council do not have any further information around planned development areas that could further inform the design and costing at this stage.

2.1 Existing Gas Infrastructure

Currently there no gas infrastructure planned for the Bungaree town centre. Appendix B - Gas Infrastructure, shows high capacity mains running from Melbourne to Ballarat which could potentially be used to service Bungaree. However, since this approach would require a significant capital investment for a gas pressure reducing station, it is considered infeasible.

There is some reticulation is Wallace, a town approximately 5kms east of Bungaree as shown in Appendix B. From initial consultation with the gas distributor SP AusNet, it seems there is currently spare capacity. The feasibility of such a connection will depend on chosen pipeline diameter as well as future demand.

Similar infrastructure also exists to the west of Bungaree, but the diameter of the pipeline is deemed insufficient to supply adequate gas back to Bungaree.

2.2 Gas Network Demands

Supply of gas services is demand driven and the growth numbers for Bungaree have been provided by Council. The planned 3000 residents in Bungaree is an estimate only and form the basis of each of the layouts and costing in this study. It is assumed that this number is predominantly residential development with some commercial requirements.

Gas reticulation plans will be driven by clearer understanding of demand, particularly in the commercial and industrial contexts where demand is less capable of being predicted. As such limited information is available to inform the service provider of future demands and therefore the economic viability of the required extension works.

2.3 Gas Network Requirements

The gas utility SP AusNet provides the design and installation of infrastructure up to the point of connection at the property. However, due to the ambiguity around required connection points for future growth it has been requested that Council provide land (easements), pipe-work/reticulation system and meters. The costing received from SP AusNet for the reticulated connection from Wallace does not consider these costs and have been assumed for clarity.

The most likely gas main route has been considered and is shown in Appendix B – Gas Infrastructure. The new 180mm Polyethylene pipeline would join into the Wallace City Gate connection to Melbourne-Ballarat high capacity main. The line would then run along Old Melbourne Road then Lesters Road approximately 7.3km into the centre of Bungaree. Further gas reticulation within the town would be located in common services (telecommunications, power) if possible and clarified at a later point once the development aspirations of Council are made known.

For the decentralised option, only the costing of tanks and ongoing re-fill has been considered. Council would be required to provide the best location for the tanks, ideally on Council-owned land if costs wanted to be minimised. It should be noted that reticulation infrastructure has not been considered due to uncertainty of future requirements and that the distance of the tanks from the demand will influence the price of the pipe infrastructure.

2.4 Costing, Timing and Assumptions SP AusNet

SP AusNet has estimated that the 7.3km extension from Wallace City Gate to Bungaree would be between $4.1 million and $4.5 million. The installation of the works would depend on weather and ground conditions, but has been estimated to take around 5-6 weeks.

The items that could impact on the price and/or timing include:

1. Quantum of rock encountered along the alignment – SP AusNet would need to open cut trench rather than drill for all rock at a multiple 4-5 times the cost of drilling.
2. Roadway or road reserve placement – Significant numbers of trees in the road reserve could be problematic, impacting with the placement of the pipe. Placement within the road/road edge may be an option although reinstatement works including asphalting of the road surface is usually expensive.
3. Traffic management costs – Likely to be high given the nature of the roads.
4. A Cultural Heritage Management Plan (CHMP) is required – If indigenous artefacts are found or known to be in the area this could impact the route chosen.
5. An Environmental Management Plan (EMP) would need to be developed – This could include a full flora and fauna review to ensure compliance with the state based Flora and Fauna Guarantee (FFG) Act and compliance with the Federal Environmental Protection and Biodiversity Conservation (EPBC) Act.
6. Development of an offset plan (related to Number 2 above) – Calculates the amount of offset required for the vegetation damaged in installing the gas pipe.

It should be noted that the last 3 items could take up to 6 months to complete. It is anticipated that the offset purchase required for the alignment of the pipeline would be the most expensive item.

2.5 Costing, Timing and Assumptions Kleenheat Gas

From discussions with Kleenheat Gas, it has been estimated that the total annual LPG requirements for the area would be approximately 240 kilolitres per annum. Using the June 2014 gas rate of $0.63/litre (ex. GST) this corresponds to an annual cost of LPG of approximately $150,000.

Additionally, Kleenheat recommended that 2 x 7.5 kilolitre tanks (see Figure below) would be best for the site. This arrangement provides a net LPG storage of approximately 12,750ltrs. The annual rental for these units is $2,500 per annum.

Figure 2 - Example of the dual LPG tanks as proposed by Kleenheat Gas

Costs associated with the reticulation system, such as pipe-work, meters, regulators, design works and engineering would require input from a gas specialist such as WS Gas in Bacchus Marsh. As discussed in Section 2.3 the specifics of the development would influence the costs of these items and so has not been included in the assessment.

Appendix A

Utility Provider Contacts

Appendix A Utility Provider Contacts

Gas Services

SP AusNet

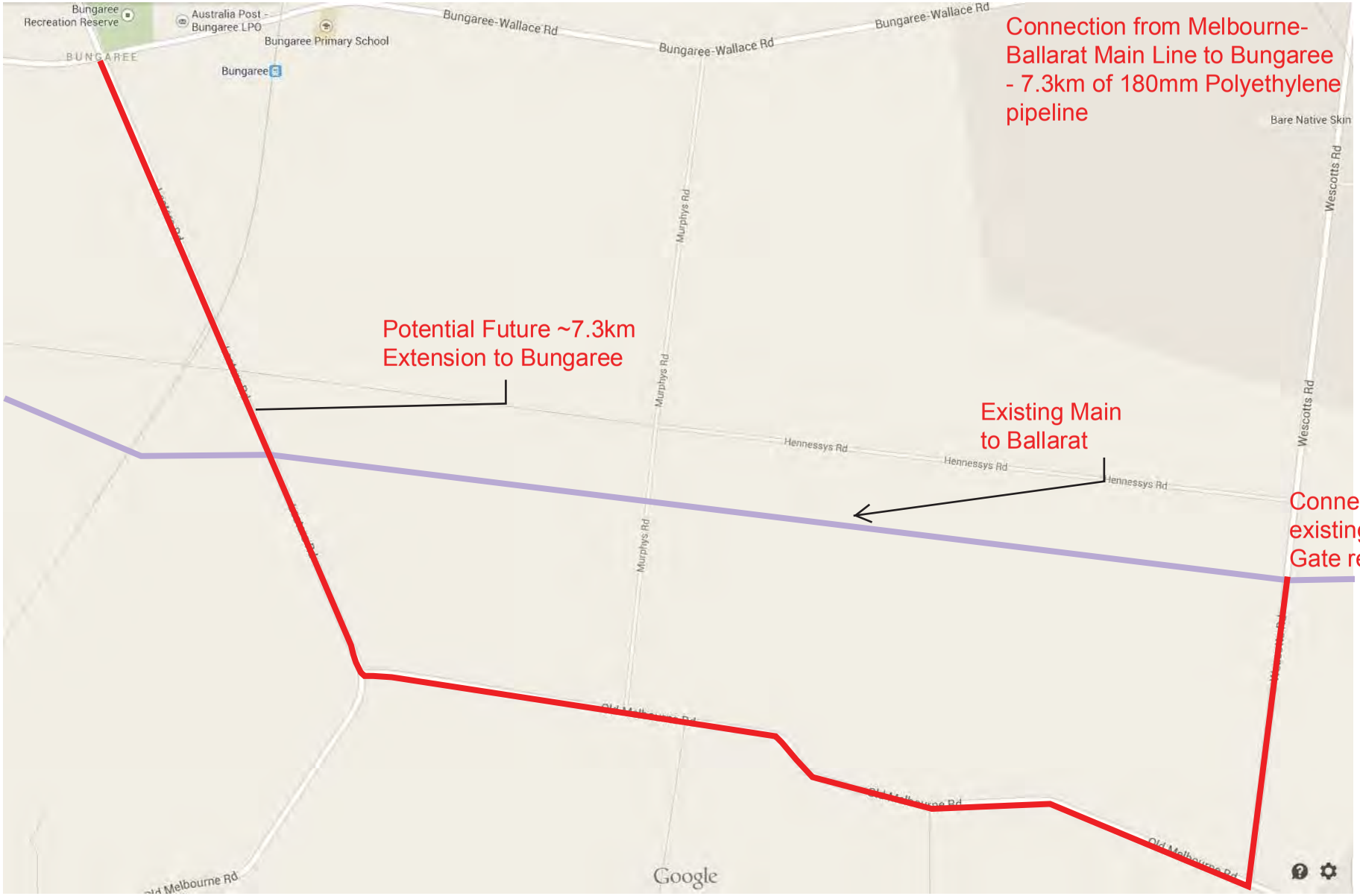
Geoff Thorn	Program Manager Energy for the Regions	03 9695 6631 0438 298 407

Kleenheat Gas

Dean Gray	Business Representative, South West Victoria	0438 954 558
David Thompson	Business Representative	0417 971 232

Appendix B

Gas Infrastructure


Connection from Melbourne-Ballarat Main Line to Bungaree - 7.3km of 180mm Polyethylene pipeline
Potential Future ~7.3km Extension to Bungaree
Existing Main to Ballarat
Connection through existing Wallace City Gate reduction
Bungaree Recreation Reserve
Australia Post - Bungaree LPO
Bungaree Primary School
BUNGAREE
Bungaree
Bungaree-Wallace Rd
Bungaree-Wallace Rd
Bungaree-Wallace Rd
Murphys Rd
Murphys Rd
Murphys Rd
Wescotts Rd
Wescotts Rd
Hennessys Rd
Hennessys Rd
Hennessys Rd
Old Melbourne Rd
Old Melbourne Rd
Old Melbourne Rd
Bare Native Skin
Google

Appendix C

Correspondence

From: Geoff Thorn <geoff.thorn@sp-ausnet.com.au>
Sent: Monday, 16 June 2014 4:23 PM
To: Warrell, Tom
Sub ect: RE: Extending gas to Bungaree

Hi Tom

You are right

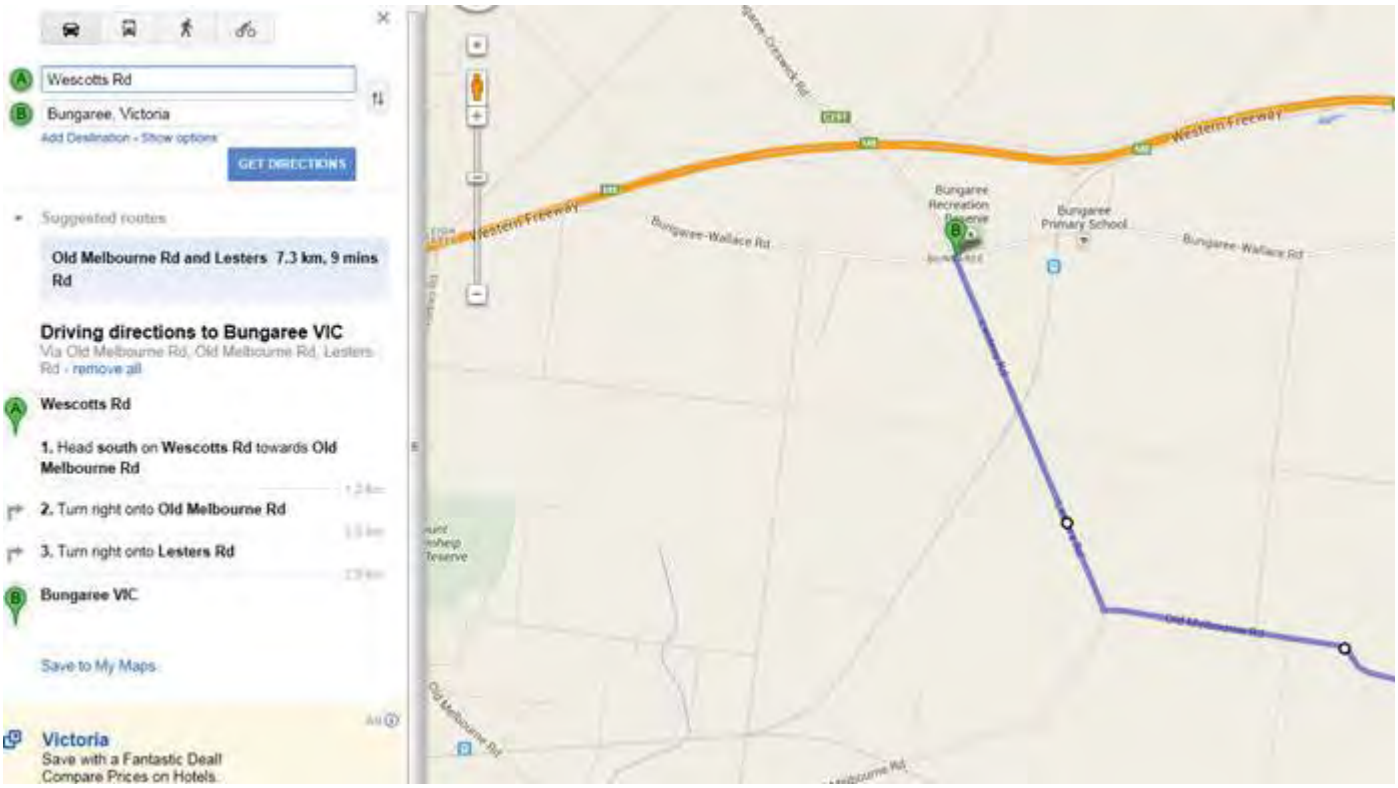
Clearly I tried to go through private property at the end of Hennessey's Road.

Google maps tells me the road route is 7.3km

On this revised distance my original estimate is about $1,000,000 out. The cost of going 7.3kms would be between $4.1M and $4.5M.

We would normally enter the capital cost into a contributions model that is driven by a range of factors including the number of connections, the timeframe for growth and the likely gas use per connection.

Sorry for the confusion.



Regards,

Geoff Thorn
Program Manager Energy for the Regions
Service Delivery Division I **SP AusNet**

Level 31, 2 Southbank Boulevard, Southbank VIC 3006
T: 61 3 9695 6631 I **F**: 61 3 8635 7618 I **M**: 0438 298 407
Email geoff.thorn@sp-ausnet.com.au I www.sp-ausnet.com.au

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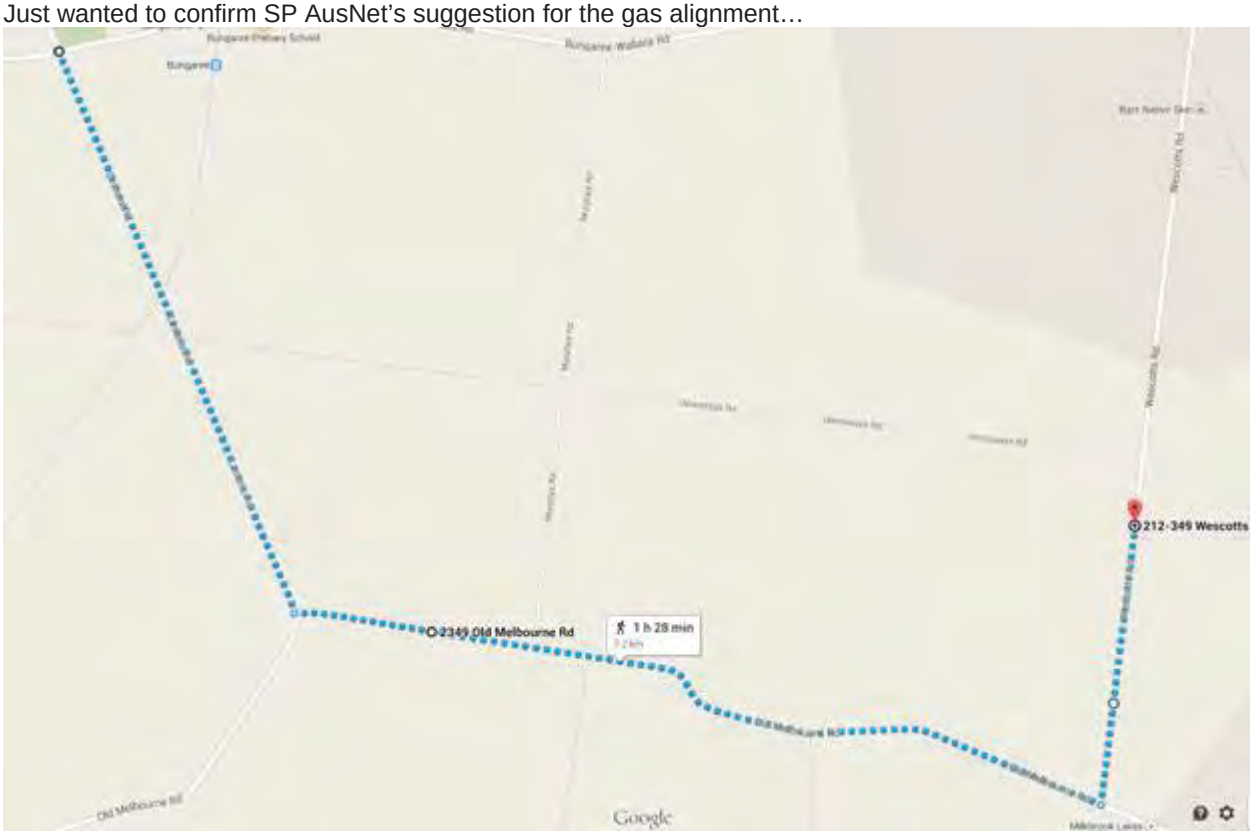
From: Warrell, Tom [mailto:Tom.Warrell@aecom.com]
Sent: Monday, 16 June 2014 11:51 AM
To: Geoff Thorn
Subject: RE: Extending gas to Bungaree

Morning Geoff,

Just wanted to confirm SP AusNet's suggestion for the gas alignment…



The route above follows Wescotts from the Wallace Gate, south to Old Melbourne Road and then NW along Lesters to Bungaree.
The distance seems to be ~7km as opposed to 5.4km?

Thanks for the clarification.

Tom arrell
Engineer
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Tom.Warrell@aecom.com

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From: Geoff Thorn [mailto:geoff.thorn@sp-ausnet.com.au]
Sent: Friday, 6 June 2014 7:53 AM
To: Warrell, Tom; Lydia Markovska
Cc: Hadian, Abbas; Adrian Donnan
Subject: RE: Extending gas to Bungaree

Hi Tom

I have done a desk top analysis for the cost of getting Gas to Bungaree.

We would connect into the line from the Wallace City Gate and run a 180mm Polyethylene pipe along Old Melbourne Road then Lesters Road approximately 5.4km into the centre of Bungaree.

The estimated cost of this would be between $3.1M and $3.5M and would take around 5-6 weeks to install depending on weather and ground conditions.

The items that could impact on the price and/or timing are:

- The amount of rock we encounter. We would need to open cut trench rather than drill for all rock. Trenching is about 4-5 times the cost of drilling.
- Roadway or road reserve. Significant numbers of trees could be problematic to get the pipe through and the road edge may be an option
- Reinstatement of the reserve or the road. Asphalting is expensive.
- Traffic management costs are likely to be high given the nature of the roads.
- A Cultural Heritage Management Plan (CHMP) is required. The cost of this manageable but if aboriginal artefacts are found or known to be in the area this could impact the route chosen
- An environmental Management plan would need to be developed. This could include a full flora and fauna review to ensure compliance with the state based Flora and Fauna Guarantee (FFG) Act and compliance with the federal Environmental Protection and Biodiversity Conservation (EPBC) Act federal
- Development of an offset plan to calculate the amount of offset required for the vegetation damaged in installing the gas pipe.

The last 3 items could take up to 6 months to complete with the offset purchase the most expensive item.

If you wish to proceed further and get a firm offer for undertaking this work please let me know and I will arrange for one of our project consultants to meet with you or a representative to confirm your exact requirements. There may be a small cost to obtain a firm quote.

Sorry for the delay in responding but I am happy to discuss my estimate in more detail if you require.

Regards,

Geoff Thorn
Program Manager Energy for the Regions
Service Delivery Division I **SP AusNet**

Level 31, 2 Southbank Boulevard, Southbank VIC 3006
T: 61 3 9695 6631 I **F**: 61 3 8635 7618 I **M**: 0438 298 407
Email geoff.thorn@sp-ausnet.com.au I www.sp-ausnet.com.au

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From: Warrell, Tom [mailto:Tom.Warrell@aecom.com]
Sent: Wednesday, 14 May 2014 11:21 AM
To: Lydia Markovska
Cc: Geoff Thorn; Hadian, Abbas
Subject: RE: Application Form

Hi Lydia,

I don't think we require an application form for the level of investigation I am after.
As discussed with Geoff, we are only after a high-level alignment and cost assessment for a line extension from Wallace to the centre of Bungaree. The council does not have plans of subdivision available as the study has not progressed to that stage.
I can tell you that they are looking to investigate requirements for an estimated population of 3,000 in Bungaree.

Please respond at your earliest convenience to ensure we are on the same page.

Kind Regards

Tom Warrell

Tom arrell
Engineer
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Tom.Warrell@aecom.com

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From: Lydia Markovska [mailto:lydia.markovska@sp-ausnet.com.au]
Sent: Thursday, 8 May 2014 12:13 PM
To: Warrell, Tom
Subject: Application Form

Hi Tom,

Geoff Thorn has been in contact with to send through a new estates application form.

Please fill the application and send it through to me tother with the council plans of subdivision and water plan.

Thank you
Regards
Lydia Markovska
orks Coordinator
T:03 9396 7625
: www.sp-ausnet.com.au
E:email:lydia.markovska@sp-ausnet.com.au

mission zero
zero injuries,to our people, contractors & visitors
zero compromise,on SAFETY
zero tolerance, of unsafe Behaviour & Acts
zero impacts,for our Families & Communities.

Safety is our way of life. Everybody is responsible for leading safety. Together we seek out and correct all unsafe behaviours and aim for zero injuries.

DRAFT

Kleenheat Gas

From: Dean Gray
To: Warrell, Tom
Subject: RE: Bungaree Vic LPG Storage
Date: Thursday, 12 June 2014 12:29:56 PM

Hi Tom,

Apologise for the delay.

I need to make it clear that after recent discussions with my Manager on this project, it is our intension to supply you only with costs associate with the installation of appropriate gas storage, based on information provided; and a gas rate that would apply for June 2014.

All are subject to change over time.

Costs associated with the reticulation system, such as pipe-work, meters, regulators, design works and engineering will need to be sourced elsewhere as it is not within my scope of work. I could suggest a gas specialist such as WS Gas in Bacchus Marsh who might be able to assist you with that information.

Our recommendation is you go with 2 x 7.5kl tanks (attached is an example of a 2 x 7.5kl set up). Providing a total LPG storage of approx 12,750ltrs.

We estimate a total pa usage of around 120T or 236,160ltrs of LPG per year.

Your costs would consist of a pa rental for both tanks of $2,500 (ex GST). The gas rate for June 2014 would be 63cpl (ex GST).

I hope this is of some help to you and I look forward to working with you into the future if you proceed with the project.

Kind Regards

Dean

From: Warrell, Tom [mailto:Tom.Warrell@aecom.com]
Sent: Wednesday, 28 May 2014 3:17 PM
To: Dean Gray
Subject: RE: Bungaree Vic LPG Storage

Thanks Dean,

Just wondering how the high-level costs are progressing.
Any idea when we'll start seeing some numbers?

Appreciate it,
Tom

Tom arrell
Engineer

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Tom.Warrell@aecom.com

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From: Dean Gray [mailto:dgray@kleenheat.com.au]
Sent: Wednesday, 30 April 2014 6:03 PM
To: Warrell, Tom
Subject: RE: Bungaree Vic LPG Storage

Hi Tom,

I'll seek further advice but we should be able to give you some indication on price from that.

Dean

From: Warrell, Tom [mailto:Tom.Warrell@aecom.com]
Sent: Wednesday, 30 April 2014 9:08 AM
To: Dean Gray
Subject: RE: Bungaree Vic LPG Storage

Dean –
It is a population of 3000, so it sounds as though your number are correct.
I believe the 20GJ may be per household/year for all electricity needs so I wouldn't pay too much heed to that number.

Can we progress these assumptions as likely demand towards a cost?

Thanks
Tom

Tom arrell
Engineer
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Tom.Warrell@aecom.com

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From: Dean Gray [mailto:dgray@kleenheat.com.au]
Sent: Tuesday, 29 April 2014 5:12 PM
To: Warrell, Tom
Subject: RE: Bungaree Vic LPG Storage

Hi Tom,

Just checking numbers. Is that 3000 people or 3000 households?

If it's based upon a expected 3000 population, then my initial thoughts are the energy consumption provided seems high.

For example, we take an average LPG user with 1 x 360ltr gas tank. They are likely to use anywhere between 500-2000ltrs of LPG per annum. Depending on whether the heating is LPG or not and of course their location. There is often a large difference between heating and non-heating LPG users. As you can see fairly big discrepancies and important to know with such a project.

Anyway, if we assume 85% are heating, based upon say an average of 4 people per household, that's around 600-650 houses on reasonable LPG usage.

650 houses x 1500ltrs of LPG pa = 975,000ltrs pa or 495T pa.

Converting this back to a total LPG energy consumption. 1 ltr of LPG equals 25.4mj.

975,000ltrs / 25.4ltrs of LPG per mj = 38,085mj/year or say 38GJ.

That's a fair way off the 60,000GJ mentioned. I may be mistaken and will get my initial numbers checked but thought I better check your end that the 3000 was a population number or household number.

Regards
Dean

From: Warrell, Tom [mailto:Tom.Warrell@aecom.com]
Sent: Tuesday, 29 April 2014 3:58 PM
To: Dean Gray
Subject: RE: Bungaree Vic LPG Storage

Hi Dean –
Just wondering if there is any other information I can provide?

Regards
Tom

Tom arrell
Engineer
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Tom.Warrell@aecom.com

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www.aecom.com

From: Warrell, Tom
Sent: Wednesday, 9 April 2014 3:47 PM
To: 'Dean Gray'
Subject: RE: Bungaree Vic LPG Storage

Hi Dean,
Thanks for looking after this for us. Yes – the majority would be domestic with the odd commercial connection.
In previous studies I've used the population numbers and a conversion rate of 20GJ/year to estimate the demand. In this case 3000 people would equate to ~60000GJ/year of energy or ~6510m3 of gas.
Council are happy for us to estimate demand requirements for such a high-level investigation. Can I leave it up to you to apply assumptions for number of LPG appliances per household.
I believe Council are providing the land/easements, but it would be great to get an understanding of pipework and meters, even if it is on a rates basis i.e. per meter of pipe and per household/appliance.

Does that give you enough information to progress with?

Thanks
Tom

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www.aecom.com

From: Dean Gray [mailto:dgray@kleenheat.com.au]
Sent: Wednesday, 9 April 2014 2:22 PM
To: Warrell, Tom
Subject: Bungaree Vic LPG Storage

Hi Tom,

I got your details from David Johnson, he mentioned you might be interested in a reticulated gas supply for Bungaree. I'm the representative for the area and would be happy to assist. I've seen your e-mail and the projected growth for the township. I'm guessing the majority of that volume would be in domestic consumption, with the odd commercial supply?

From our point of view we would be interested in supplying the bulk tank/s, LPG and some engineering support, however we would require from council, as accurate as possible, information on expected total mj/hr load. If for example, a housing or industrial estate were part of the projected growth, we would require number of LPG appliances per household, type of businesses on LPG, if any.

We would prefer that council provide land, pipe-work/reticulation system and meters.

If that information can be provided we can recommend an appropriate LPG set up and rate.

Kind Regards

Dean Gray

Business Representative, South West Victoria
Kleenheat Gas
Wesfarmers Kleenheat Gas Pty Ltd
333 Keilor Rd, Niddrie VIC 3042
☎: **0438 954 558** 🖷: **1300 650 687**
✉: dgray kleenheat.com.au
🌎: http://www.kleenheat.com.au
Wesfarmers Chemicals, Energy & Fertilisers

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Appendix D

Site Photographs

Appendix D Site Photographs

Figure 3 - Bungaree, Victoria

Figure 4 - Bungaree community facilities

Figure 5 - local community facilities

Figure 6 - potential location for Bungaree LPG tanks

Appendix F

Figures

Appendix F Figures

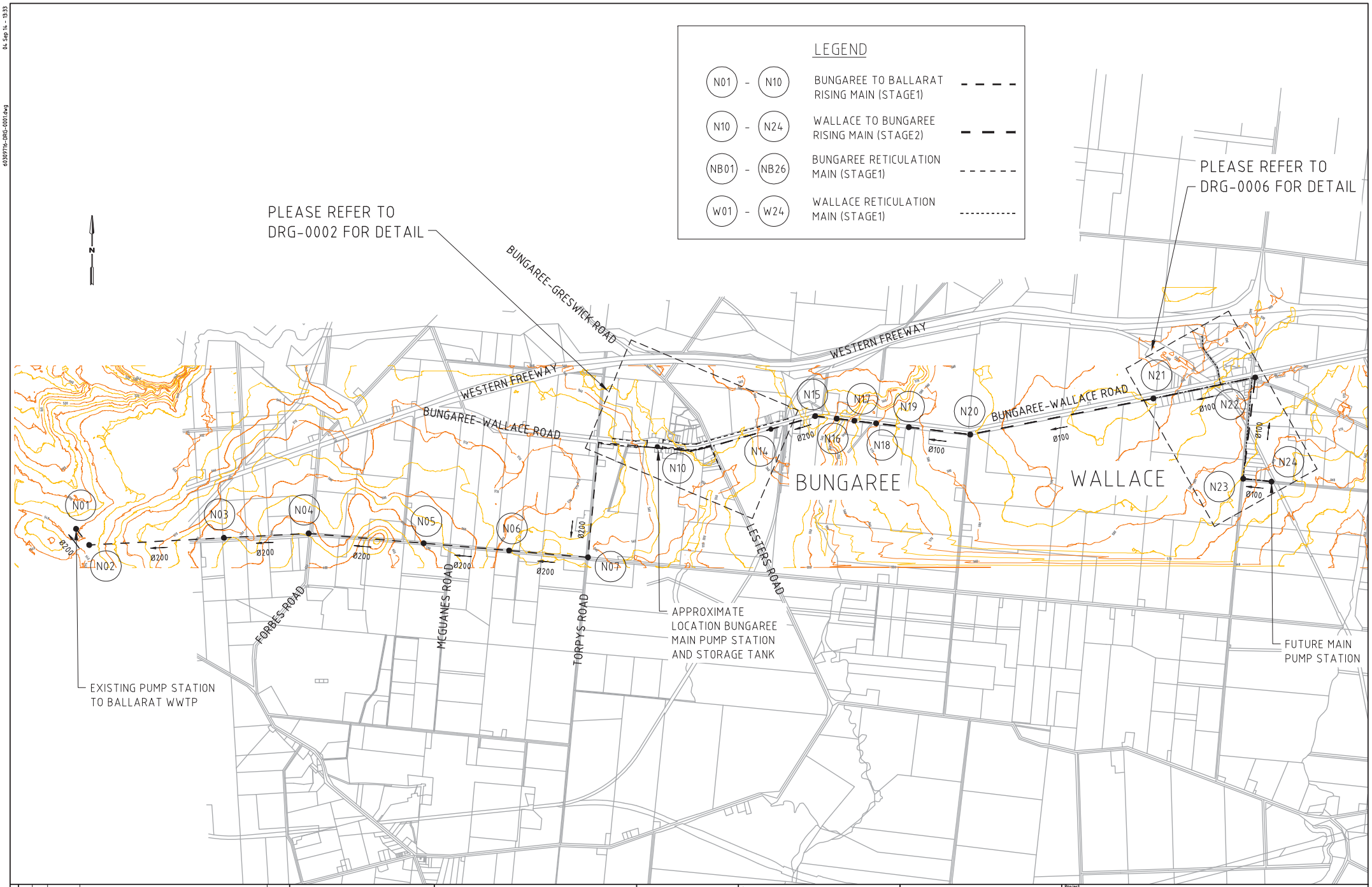
Figure 2 allace to Ballarat sewer rising main plan

Figure 3 Bungaree sewer reticulation plan

Figure 4 Bungaree sewer reticulation longitudinal section – sheet 1

Figure 5 Bungaree sewer reticulation longitudinal section – sheet 2

Figure 6 allace to Ballarat sewer rising main longitudinal section



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AC	A	2.7.14	ISSUED FOR CLIENT REVIEW	
No.	BY	DATE	DESCRIPTION	APPD

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Client : MOORABOOL SHIRE COUNCIL

Designer : AECOM

AECOM Australia Pty Ltd
A.B.N. 20 093 846 925

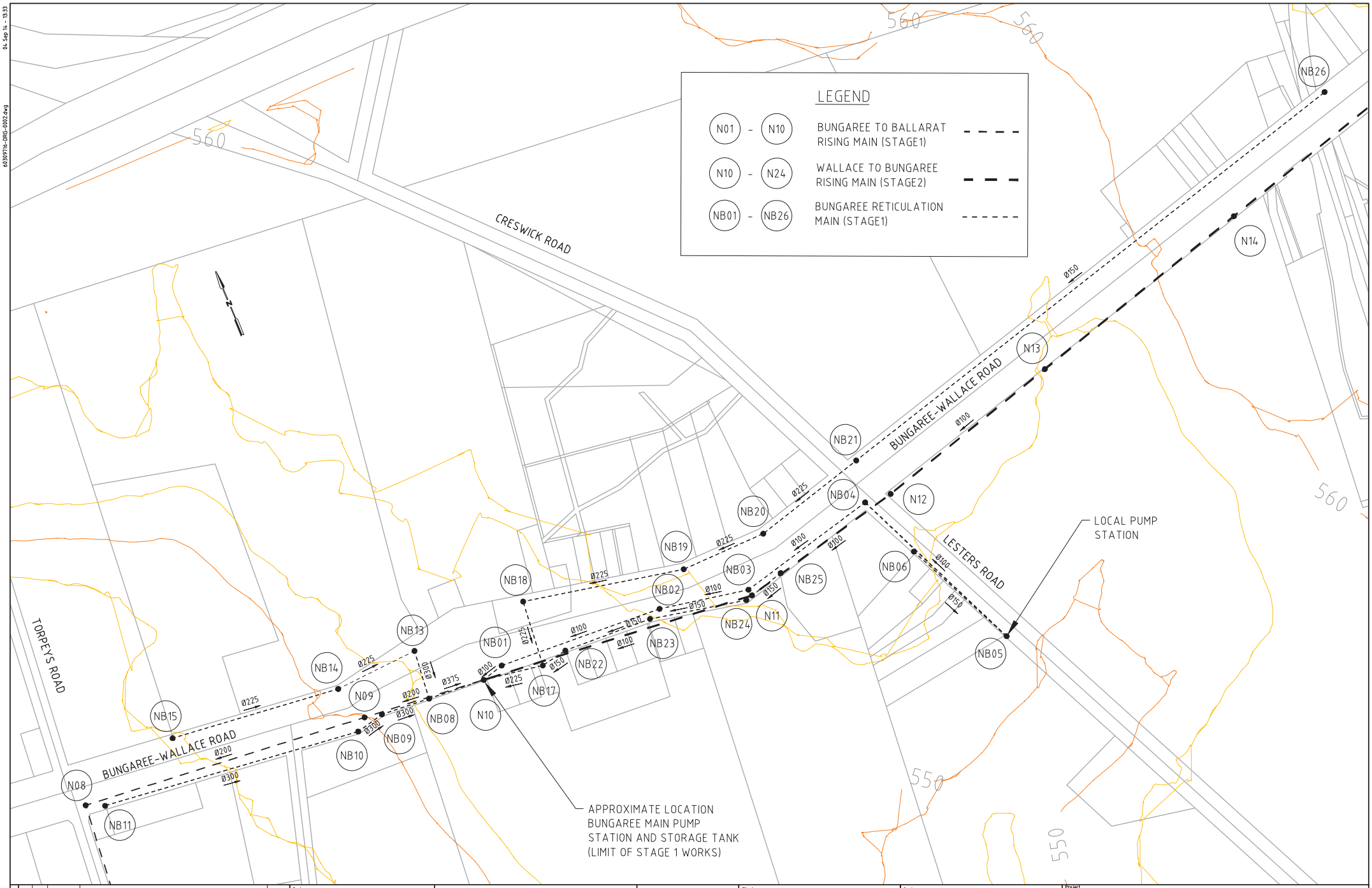
Project: SMALL TOWNS SERVICES STUDY

Title: WALLACE TO BALLARAT SEWER RISING MAIN VIA BUNGAREE PLAN

Status: CONCEPT

Drg No.: 60309716-DRG-0001

Rev.: B



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Designer: AECOM Australia Pty Ltd A.B.N. 20 093 846 925

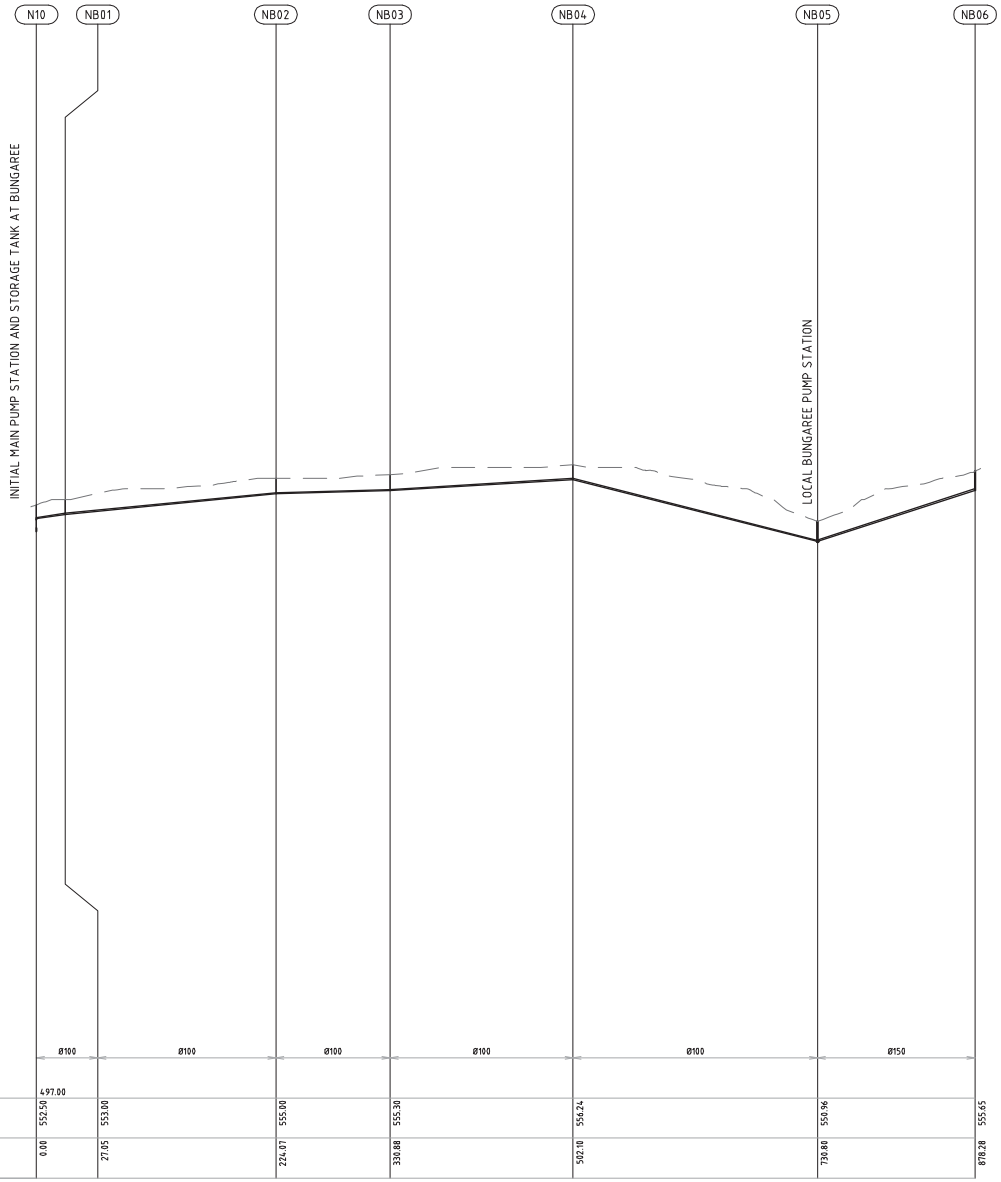
Project: SMALL TOWNS SERVICES STUDY

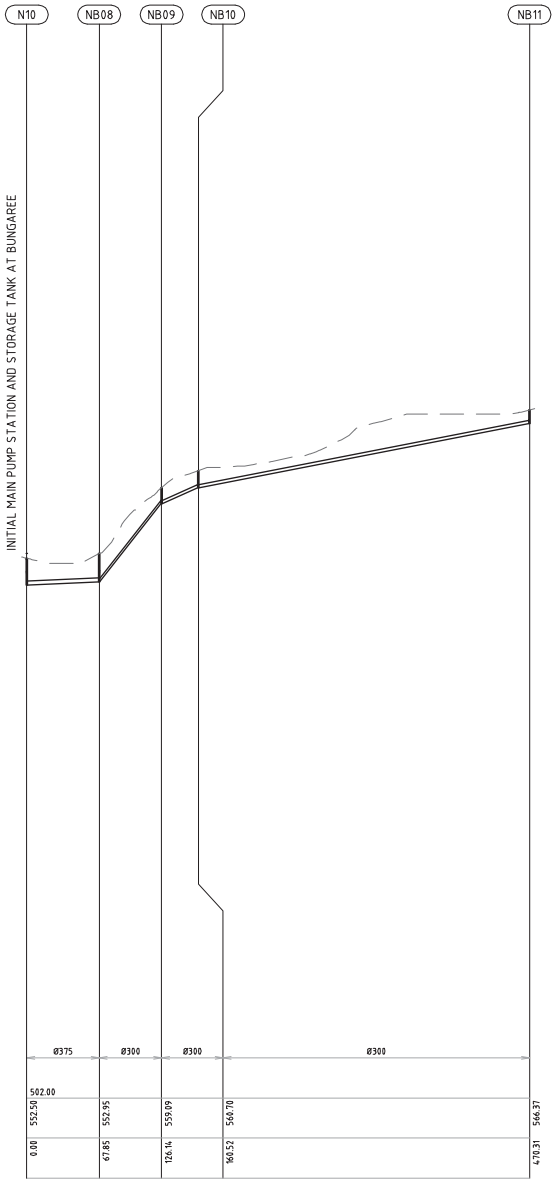
Title: BUNGAREE SEWER RETICULATION PLAN

Status: CONCEPT

Drg No.: 60309716-DRG-0002

Rev.: B





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VERT 1:500@A3 — 2.5 0 2.5 5 7.5 10m

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Client : MOORABOOL SHIRE COUNCIL

Designer : AECOM

AECOM Australia Pty Ltd
A.B.N. 20 093 846 925

Project: SMALL TOWNS SERVICES STUDY

Title: BUNGAREE
SEWER RETICULATION
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Status: CONCEPT

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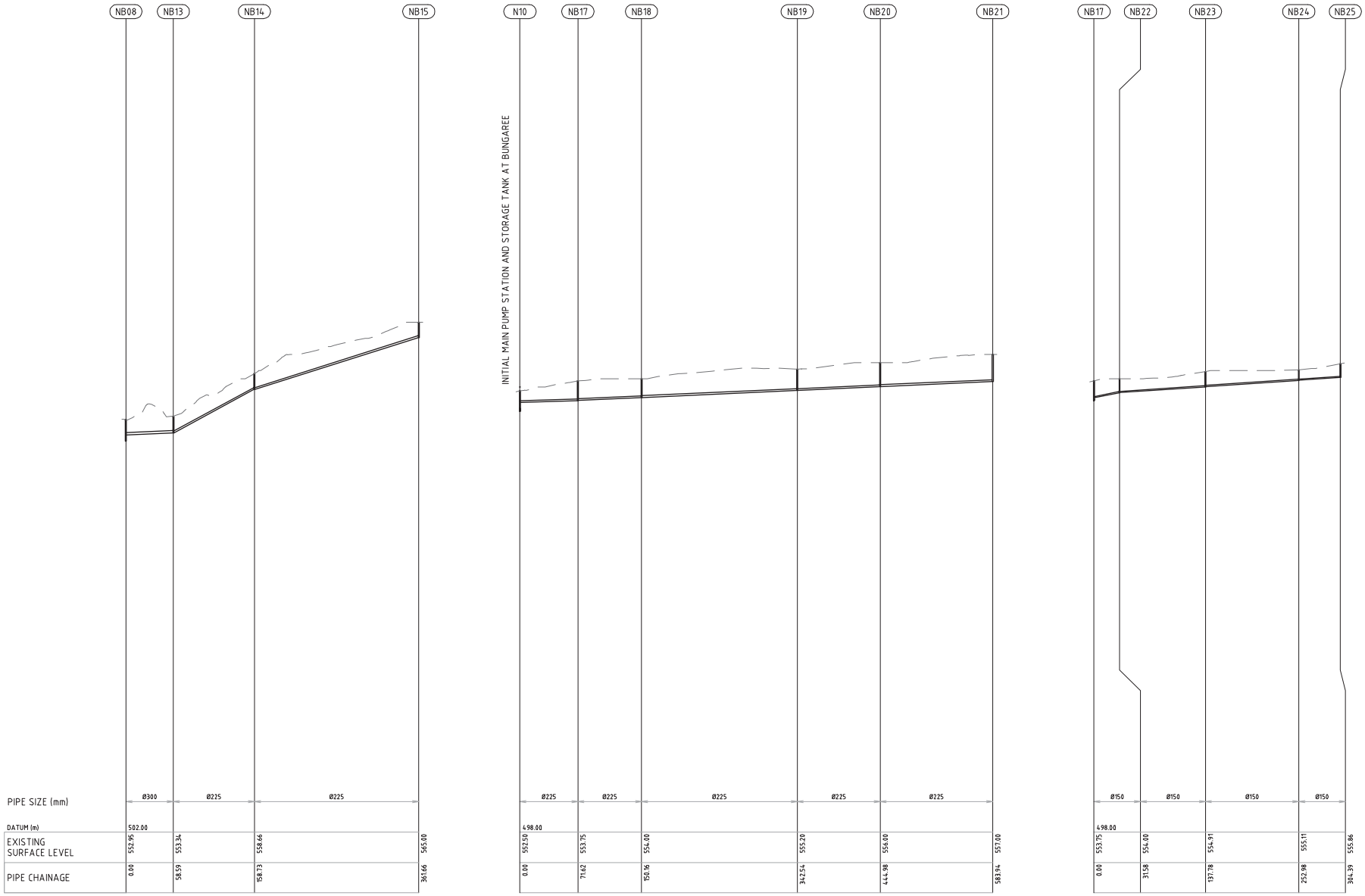
Rev.: A



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Scales:

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VERT 1:500@A3 2.5 0 2.5 5 7.5 10m

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DESIGNED	AH	CHECKED	JT
DRAWN	AC	CHECKED	KH
APPROVED	NK	DATE	2.7.14

Client : MOORABOOL SHIRE COUNCIL

Designer : AECOM

AECOM Australia Pty Ltd
A.B.N. 20 093 846 925

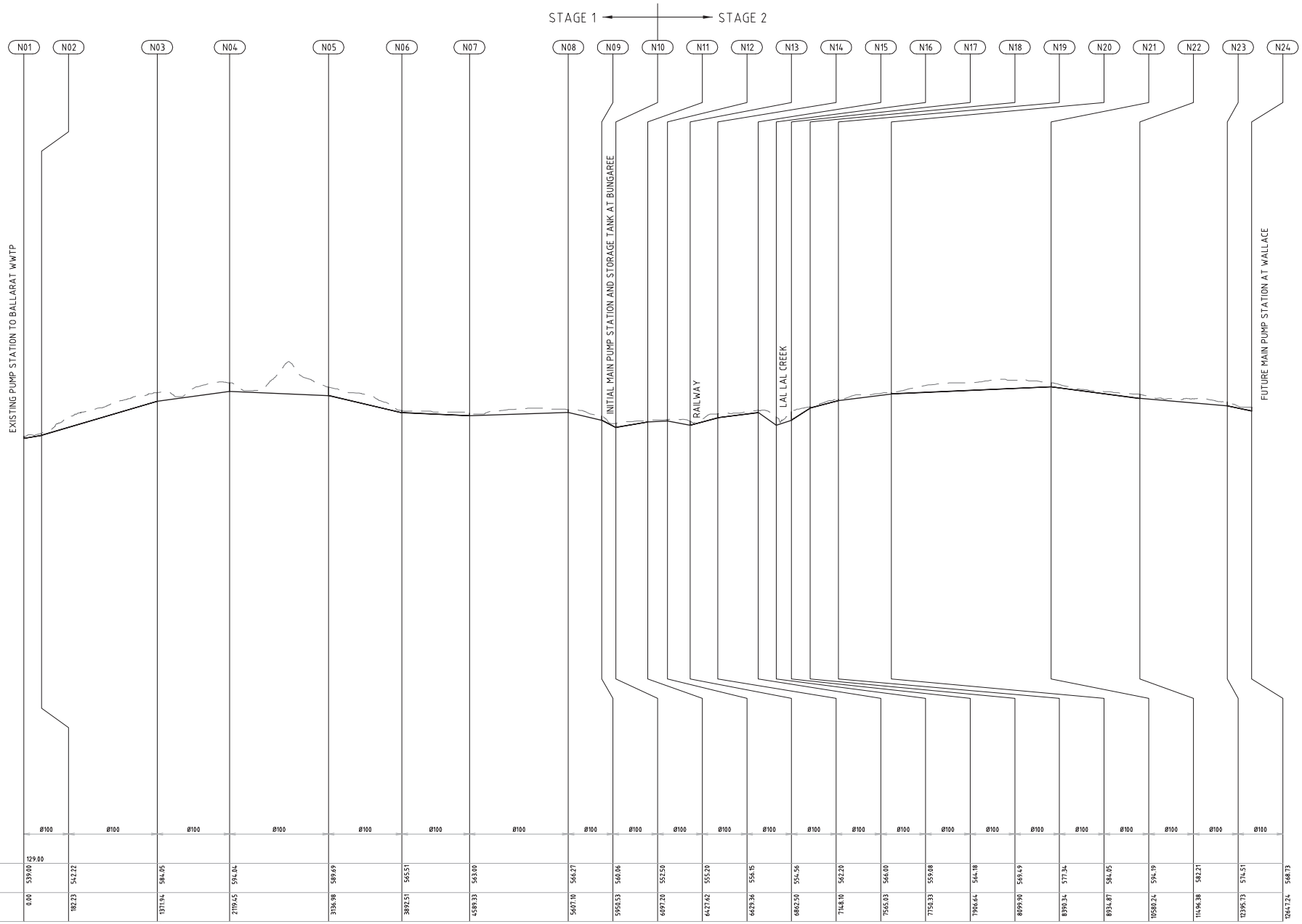
Project: SMALL TOWNS SERVICES STUDY

Title: BUNGAREE
SEWER RETICULATION
LONGITUDINAL SECTION - SHEET 2

Status: CONCEPT

Drg No.: 60309716-DRG-0004

Rev.: A



REVISIONS				
No.	BY	DATE	DESCRIPTION	APPD
AC	A	2.7.14	ISSUED FOR CLIENT REVIEW	

Scales:

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VERT 1:4.000@A3 20 0 20 40 60 80m

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DESIGNED	AH	CHECKED	JT
DRAWN	AC	CHECKED	KH
APPROVED	NK	DATE	2.7.14

Client : MOORABOOL SHIRE COUNCIL

Designer : AECOM

AECOM Australia Pty Ltd
A.B.N. 20 093 846 925

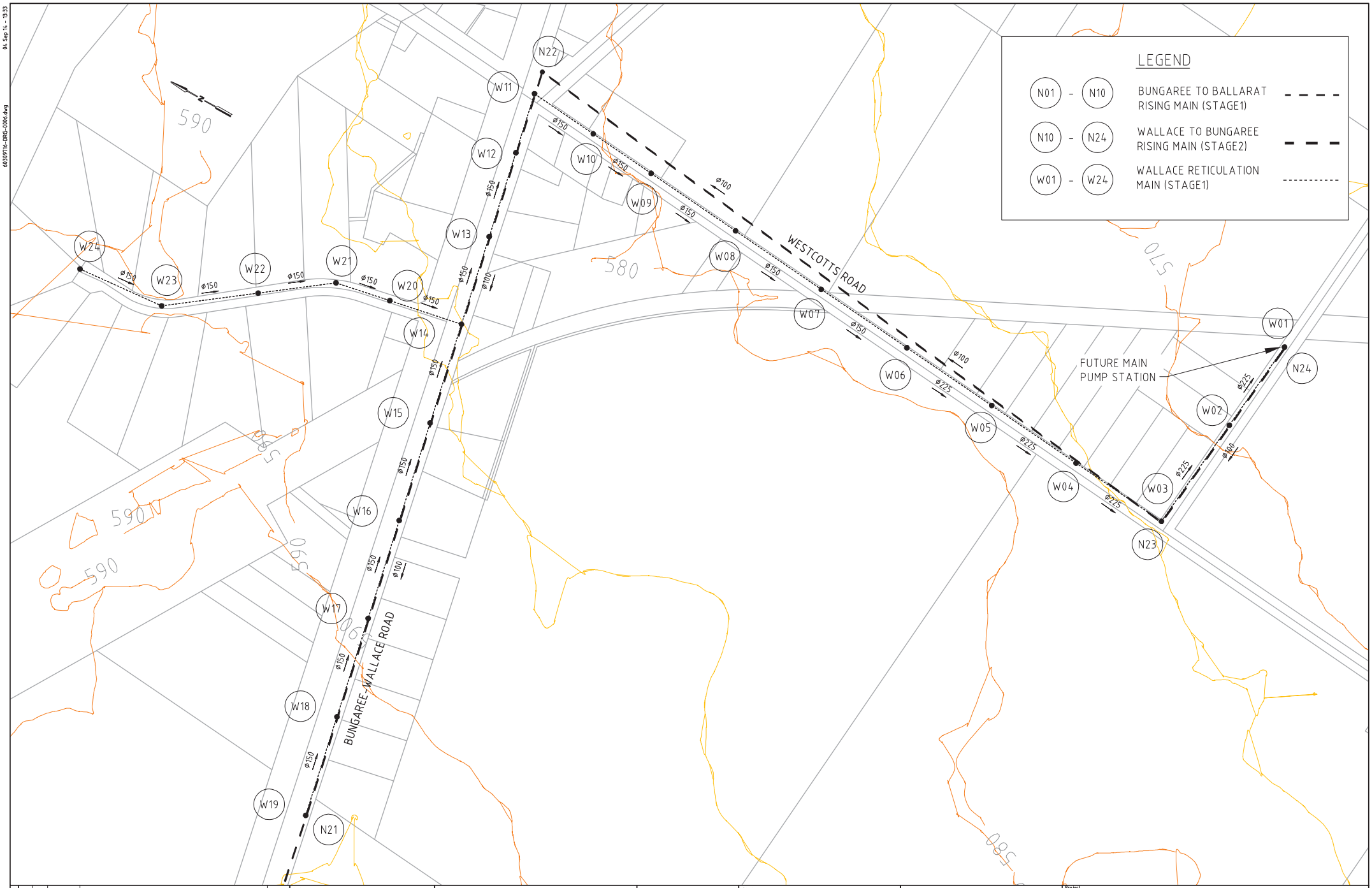
Project: SMALL TOWNS SERVICES STUDY

Title: WALLACE TO BALLARAT
SEWER RISING MAIN VIA BUNGAREE
LONGITUDINAL SECTION

Status: CONCEPT

Drg No.: 60309716-DRG-0005

Rev.: A



04 Sep 14 - 13:33

60309716-DRG-0006.dwg

REVISIONS				
AC	A	5.9.14	ISSUED FOR CLIENT REVIEW	
No.	BY	DATE	DESCRIPTION	APPD

Scales:

1:4000@A3

20 0 20 40 60 80m

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DESIGNED	AH	CHECKED	JT
DRAWN	AC	CHECKED	KH
APPROVED	NK	DATE	3.9.14

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Client : MOORABOOL SHIRE COUNCIL

Designer : AECOM

AECOM Australia Pty Ltd
A.B.N. 20 093 846 925

Project: SMALL TOWNS SERVICES STUDY

Title: WALLACE SEWER RETICULATION PLAN

Status: CONCEPT

Drg No.: 60309716-DRG-0006

Rev.: A

04 Sep 14 - 13:32

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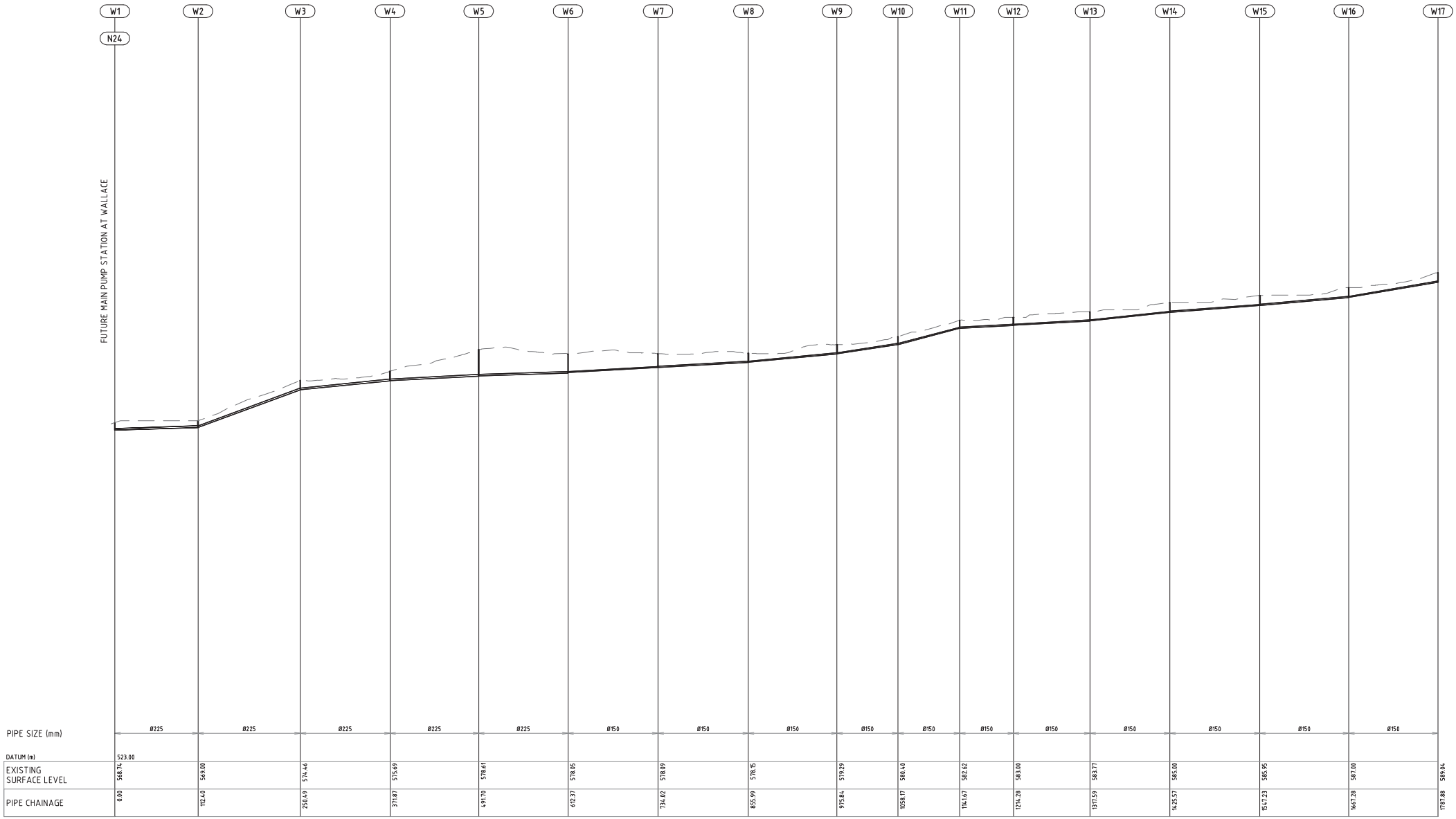


PIPE SIZE (mm)	Ø225	Ø225	Ø225	Ø225	Ø225	Ø150	Ø150	Ø150	Ø150	Ø150	Ø150	Ø150	Ø150	Ø150	Ø150	Ø150	
DATUM (m)	523.00																
EXISTING SURFACE LEVEL	568.74	569.00	574.46	575.69	578.61	578.95	578.89	578.15	579.29	580.40	582.62	583.00	583.77	585.00	585.95	587.00	589.04
PIPE CHAINAGE	0.00	112.40	256.49	371.87	491.70	612.37	734.02	855.99	975.84	1058.17	1141.67	1214.28	1317.59	1425.57	1547.23	1667.28	1787.88

REVISIONS

No.	BY	DATE	DESCRIPTION	APPD
AC	A	5.9.14	ISSUED FOR CLIENT REVIEW	

Scales:

HONZ 1:4000@A3 200 0 200 400 600 800m

VERT 1:4000@A3 20 0 20 40 60 80m

THE SIGNING OF THIS TITLE BLOCK CONFIRMS THE DESIGN AND DRAFTING OF THIS PROJECT HAVE BEEN PREPARED AND CHECKED IN ACCORDANCE WITH THE AECOM QUALITY ASSURANCE SYSTEM TO ISO 9001:2008

DESIGNED	AH	CHECKED	JT
DRAWN	AC	CHECKED	KH
APPROVED	NK	DATE	3.9.14

THIS DRAWING IS CONFIDENTIAL AND SHALL ONLY BE USED FOR THE PURPOSES OF THIS PROJECT.

Client : MOORABOOL SHIRE COUNCIL

Designer : AECOM

AECOM Australia Pty Ltd
A.B.N. 20 093 846 925

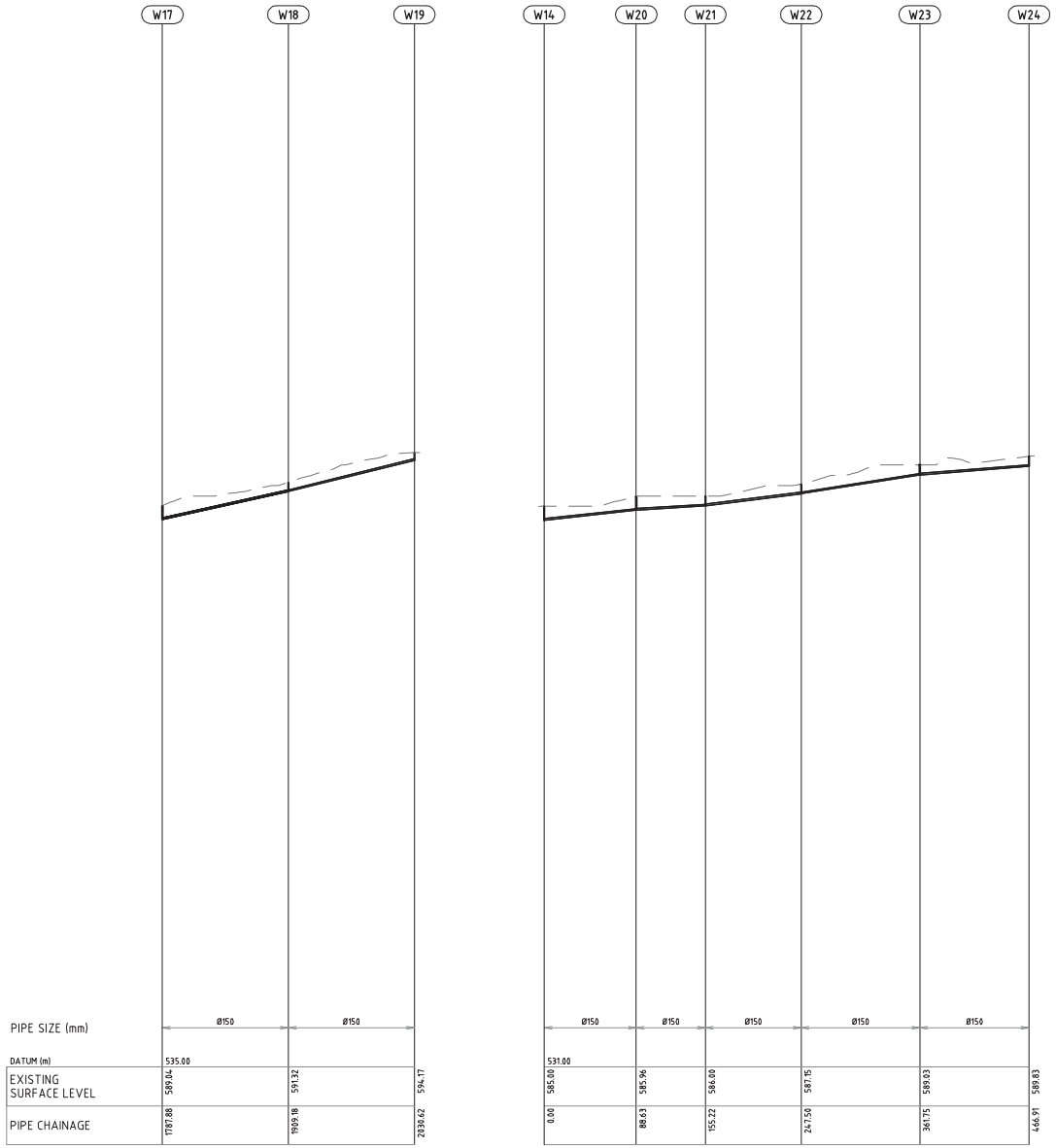
Project: SMALL TOWNS SERVICES STUDY

Title: WALLACE
SEWER RETICULATION
LONGITUDINAL SECTION - SHEET 1

Status: CONCEPT

Drg No.: 60309716-DRG-0007

Rev.: A



REVISIONS				
AC	A	5.9.14	ISSUED FOR CLIENT REVIEW	
No.	BY	DATE	DESCRIPTION	APPD

Scales:

HONZ 1:4000@A3 200 0 200 400 600 800m

VERT 1:4000@A3 20 0 20 40 60 80m

THE SIGNING OF THIS TITLE BLOCK CONFIRMS THE DESIGN AND DRAFTING OF THIS PROJECT HAVE BEEN PREPARED AND CHECKED IN ACCORDANCE WITH THE AECOM QUALITY ASSURANCE SYSTEM TO ISO 9001:2008

DESIGNED	AH	CHECKED	JT
DRAWN	AC	CHECKED	KH
APPROVED	NK	DATE	3.9.14

Client : MOORABOOL SHIRE COUNCIL

Designer : AECOM

AECOM Australia Pty Ltd
A.B.N. 20 093 846 925

Project: SMALL TOWNS SERVICES STUDY

Title: WALLACE
SEWER RETICULATION
LONGITUDINAL SECTION - SHEET 2

Status: CONCEPT

Drg No.: 60309716-DRG-0008

Rev.: A

Appendix G

Preferred Option Preliminary Costing

Appendix G Preferred Options Preliminary Costing

Three Towns Summary of Scheme Costs Existing township

Collection	Bungaree			allace		
Options	**CAPEX**	**OPEX**	**NPV**	**CAPEX**	**OPEX**	**NPV**
Modified Conventional Gravity	$ 4,679,000	$ 31,000	$ 5,100,000	$ 2,982,000	$ 12,000	$ 3,149,000
Treatment and Reuse	**Bungaree**					
Transfer to Ballarat WWTP	$ 2,094,642	$ 46,047	$ 2,720,000			
Total	$ 6,773,642	$ 77,047	$ 7,820,000			
By CHW/council	$ 2,094,642	$ 77,047	$ 3,141,000			
BY owner/developer	$ 4,679,000	0	$ 4,679,000			

Modified Conventional Gravity Collection - COMBINED OPTION B

NPV Discount rate	**6.0**
Evaluation period	**30 years**

Pro ect Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
	$	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Capital orks																														
Collection System	1,503,740																													
																				-										
Operation and Maintenance																														
Collection System		30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994
Cash Flow	1,503,740	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994
NPV	**1,924,965**																													

Operational Cost Estimate - COMBINED OPTION B

Pro ect :	Small Towns Wastwater Scheme
Pro ect No :	60309716
File :	http://vpo.au.aecomnet.com/projects/VSAB091416/4TechWorkArea/4.3 Engineering/Cost Estim
Option Description:	Transfer Sewage to existing WWTP (Ballarat)

Element	Units		Rate	uantity		Price
power	item	$	1,100.00	1	$	1,100
Operation and Maintenance of Pump Stations	item	$	3,000.00	1	$	3,000
Operation and Maintenance of Rising Main	item	$	37,360.00	1	$	37,360
					$	**41,460**
Sub-total					**$**	**41,460**
Contingency	30%				$	12,438
Total					**$**	**53,898**

In undertaking the preparation of our opinion of probable construction cost, AECOM advises that it has no control over the cost of labour, materials, equipment or services furnished by others, nor has it control over contractors' methods for determining prices, competitive bidding or market conditions. The opinion of probable construction cost that will be provided by AECOM will be made on the basis of its judgement as an experienced and qualified engineering consultant, familiar with the construction industry. As AECOM is not a qualified Quantity Surveyor, nor does it employ quantity surveyors, AECOM cannot and will not guarantee that tenders or actual construction costs will not vary from the opinion of probable construction cost.

Capital Cost Estimate - COMBINED OPTION B

Pro ect : Small Towns Wastwater Scheme
Pro ect No : 60309716
File : http://vpo.au.aecomnet.com/projects/VSAB091416/4TechWorkArea/4.3 Engineering/Cost Estimates/[Cost Estimate - MC(
Option Description: Modified Conventional Scheme

Element	Units	Rate	uantity	Price
Other Costs		$ m		
Operation and Maintenance of Reticulation Network	item	$ 3.80	8766	$ 33,311
Sub-total				**$ 33,311**
Contingency	30%			$ 9,993
Total				**$ 43,304**

In undertaking the preparation of our opinion of probable construction cost, AECOM advises that it has no control over the cost of labour, materials, equipment or services furnished by others, nor has it control over contractors' methods for determining prices, competitive bidding or market conditions. The opinion of probable construction cost that will be provided by AECOM will be made on the basis of its judgement as an experienced and qualified engineering consultant, familiar with the construction industry. As AECOM is not a qualified Quantity Surveyor, nor does it employ quantity surveyors, AECOM cannot and will not guarantee that tenders or actual construction costs will not vary from the opinion of probable construction cost.

Capital Cost Estimate Changed Items

Pro ect : Small Towns Wastwater Scheme
Pro ect No : 60309716
File : P:\60309716\4. Tech work area\Engineering and Planning\Design\Sewerage to Bungaree and Wallace\Final\[sewer
Option Description: Modified Conventional Gravity

Element	Units	Rate	uantity	Price
BUNGAREE 500		no of properties	141	
Collection System - Reticulation		Total length	6274	
Supply and install DN150 PVC sewer in material other than rock				
0-1.5 metres deep	$/m	$ 150.00	314	$ 47,055
1.5-2 metres deep	$/m	$ 165.00	1882	$ 310,563
2-3 metres deep	$/m	$ 190.00	2510	$ 476,824
> 3 metres deep	$/m	$ 220.00	941	$ 207,042
Supply and install DN225 PVC sewer in material other than rock				
2-3 metres deep	$/m	$ 270.00	627	$ 169,398
Extra trenching costs for construction in rock	$/m	$ 350.00	627.4	$ 219,590
Extra costs for boring under roads and creeks	no.	$ 6,000.00	2	$ 12,000
Extra trenching costs for crushed rock backfill	$/m	$ 215.00	941	$ 202,337
				$ 1,644,809
Collection System - Maintenance Holes				
Supply and install access chambers				
0-1.5 metres deep	no.	$ 2,000.00	4	$ 8,000
1.5-2 metres deep	no.	$ 2,750.00	19	$ 52,250
2-3 metres deep	no.	$ 3,500.00	26	$ 91,000
> 3 metres deep	no.	$ 4,500.00	10	$ 45,000
Access chamber covers	no.	$ 500.00	59	$ 29,500
Supply and install maintenance shafts				
0-1.5 metres deep	no.	$ 1,300.00	2	$ 2,600
1.5-2 metres deep	no.	$ 1,600.00	7	$ 11,200
2-3 metres deep	no.	$ 2,000.00	9	$ 18,000
> 3 metres deep	no.	$ 2,500.00	4	$ 10,000
Access maintenance shaft covers	no.	$ 500.00	22	$ 11,000
Supply and install inspection shafts				
0-1.5 metres deep	no.	$ 300.00	1	$ 300
1.5-2 metres deep	no.	$ 400.00	4	$ 1,400
2-3 metres deep	no.	$ 500.00	5	$ 2,250
> 3 metres deep	no.	$ 600.00	2	$ 1,200
Inspection shaft covers	no.	$ 185.00	11	$ 2,035
				$ 285,735
Property drain				
Pipe from house to sewer	$/m	$ 100.00	2115	$ 211,500
Minor Pump stations				
ALLACE 500		no of properties	126	
Collection System - Reticulation		Total length	2492	
Supply and install DN150 PVC sewer in material other than rock				
0-1.5 metres deep	$/m	$ 150.00	240	$ 36,000
1.5-2 metres deep	$/m	$ 165.00	465	$ 76,725
2-3 metres deep	$/m	$ 190.00	1015	$ 192,850
> 3 metres deep	$/m	$ 220.00	160	$ 35,200
Supply and install DN225 PVC sewer in material other than rock				
2-3 metres deep	$/m	$ 270.00	612	$ 165,240
Extra trenching costs for construction in rock	$/m	$ 350.00	249.2	$ 87,220
Extra costs for boring under roads and creeks	no.	$ 6,000.00	2	$ 12,000
Extra trenching costs for crushed rock backfill	$/m	$ 215.00	374	$ 80,367
				$ 897,102
Collection System - Maintenance Holes				
Supply and install access chambers				
0-1.5 metres deep	no.	$ 2,000.00	5	$ 10,000
1.5-2 metres deep	no.	$ 2,750.00	3	$ 8,250
2-3 metres deep	no.	$ 3,500.00	5	$ 17,500
> 3 metres deep	no.	$ 4,500.00	2	$ 9,000
Access chamber covers	no.	$ 500.00	17	$ 8,500
Supply and install maintenance shafts				
0-1.5 metres deep	no.	$ 1,300.00	0	$ -
1.5-2 metres deep	no.	$ 1,600.00	2	$ 3,200
2-3 metres deep	no.	$ 2,000.00	2	$ 4,000
> 3 metres deep	no.	$ 2,500.00	0	$ -
Access maintenance shaft covers	no.	$ 500.00	4	$ 2,000
Supply and install inspection shafts				
0-1.5 metres deep	no.	$ 300.00	0	$ -
1.5-2 metres deep	no.	$ 400.00	0	$ -
2-3 metres deep	no.	$ 500.00	1	$ 500
> 3 metres deep	no.	$ 600.00	2	$ 1,200
Inspection shaft covers	no.	$ 185.00	2	$ 370
				$ 64,520
Property drain				
Pipe from house to sewer	$/m	$ 100.00	1500	$ 150,000
Ma or Pump station - allace to Bungaree				
Pump station	no.	$ 200,000.00	1	$ 200,000
Pressure main (DN100)	$/m	$ 100.00	5840	$ 584,000
				$ 934,000
Contractor's Preliminaries	10%			**$ 383,000**
Sub-total				**$ 4,421,000**
Contingency	30%			$ 1,326,300
Authority Administration Costs	10%			$ 442,100
Design	5%			$ 221,050
Project Management	3%			$ 132,630
Construction management	5%			$ 221,050
Clerk of Works Administration	3%			$ 132,630
Planning and approvals	2%			$ 88,420
Legal	1%			$ 44,210
Surveying	1%			$ 44,210
Geotech	1%			$ 44,210
Total	**61**			**$ 7,117,810**

Capital Cost Estimate Changed Items

Pro ect : Small Towns Wastwater Scheme
Pro ect No : 60309716
File : P:\60309716\4. Tech work area\Engineering and Planning\Design\Sewerage to Bungaree and Wallace\Final\[se\
Option Description: Modified Conventional Gravity

Element	Units	Rate	uantity	Price
		no of properties	141	
Collection System - Reticulation		Total length	6274	
Supply and install DN150 PVC sewer in material other than rock				
0-1.5 metres deep	$/m	$ 150.00	314	$ 47,055
1.5-2 metres deep	$/m	$ 165.00	1882	$ 310,563
2-3 metres deep	$/m	$ 190.00	2510	$ 476,824
> 3 metres deep	$/m	$ 220.00	941	$ 207,042
Supply and install DN225 PVC sewer in material other than rock				
2-3 metres deep	$/m	$ 270.00	627	$ 169,398
Extra trenching costs for construction in rock	$/m	$ 350.00	627.4	$ 219,590
Extra costs for boring under roads and creeks	no.	$ 6,000.00	2	$ 12,000
Extra trenching costs for crushed rock backfill	$/m	$ 215.00	941	$ 202,337
				$ 1,644,809
Collection System - Maintenance Holes				
Supply and install access chambers				
0-1.5 metres deep	no.	$ 2,000.00	4	$ 8,000
1.5-2 metres deep	no.	$ 2,750.00	19	$ 52,250
2-3 metres deep	no.	$ 3,500.00	26	$ 91,000
> 3 metres deep	no.	$ 4,500.00	10	$ 45,000
Access chamber covers	no.	$ 500.00	59	$ 29,500
Supply and install maintenance shafts				
0-1.5 metres deep	no.	$ 1,300.00	2	$ 2,600
1.5-2 metres deep	no.	$ 1,600.00	7	$ 11,200
2-3 metres deep	no.	$ 2,000.00	9	$ 18,000
> 3 metres deep	no.	$ 2,500.00	4	$ 10,000
Access maintenance shaft covers	no.	$ 500.00	22	$ 11,000
Supply and install inspection shafts				
0-1.5 metres deep	no.	$ 300.00	1	$ 300
1.5-2 metres deep	no.	$ 400.00	4	$ 1,400
2-3 metres deep	no.	$ 500.00	5	$ 2,250
> 3 metres deep	no.	$ 600.00	2	$ 1,200
Inspection shaft covers	no.	$ 185.00	11	$ 2,035
				$ 285,735
Property drain				
Pipe from house to sewer	$/m	$ 100.00	2115	$ 211,500
Minor Pump stations				
Pump station	no.	$ 200,000.00	2	$ 400,000
Pressure main (DN100)	$/m	$ 100.00	1000	$ 100,000
Contractor's Preliminaries	10%			**$ 264,000**
Sub-total				**$ 2,906,000**
Contingency	30%			$ 871,800
Authority Administration Costs	10%			$ 290,600
Design	5%			$ 145,300
Project Management	3%			$ 87,180
Construction management	5%			$ 145,300
Clerk of Works Administration	3%			$ 87,180
Planning and approvals	2%			$ 58,120
Legal	1%			$ 29,060
Surveying	1%			$ 29,060
Geotech	1%			$ 29,060
Total	**61**			**$ 4,678,660**

In undertaking the preparation of our opinion of probable construction cost, AECOM advises that it has no control over the cost of labour, materials, equipment or services furnished by others, nor has it control over contractors' methods for determining prices, competitive bidding or market conditions. The opinion of probable construction cost that will be provided by AECOM will be made on the basis of its judgement as an experienced and qualified engineering consultant, familiar with the construction industry. As AECOM is not a qualified Quantity Surveyor, nor does it employ quantity surveyors, AECOM cannot and will not guarantee that tenders or actual construction costs will not vary from the opinion of probable construction cost.

Capital Cost Estimate

Pro ect : Small Towns Wastwater Scheme
Pro ect No : 60309716
File : http://vpo.au.aecomnet.com/projects/VSAB091416/4TechWorkArea/4.3 Engineering/Cost Estimates/[Cost Estimate - MC(
Option Description: Modified Conventional Scheme

Element	Units	Rate	uantity	Price
Other Costs		$ m		
Operation and Maintenance of Reticulation Network	item	$ 3.80	6274	$ 23,841
Sub-total				**$ 23,841**
Contingency	30%			$ 7,152
Total				**$ 30,994**

In undertaking the preparation of our opinion of probable construction cost, AECOM advises that it has no control over the cost of labour, materials, equipment or services furnished by others, nor has it control over contractors' methods for determining prices, competitive bidding or market conditions. The opinion of probable construction cost that will be provided by AECOM will be made on the basis of its judgement as an experienced and qualified engineering consultant, familiar with the construction industry. As AECOM is not a qualified Quantity Surveyor, nor does it employ quantity surveyors, AECOM cannot and will not guarantee that tenders or actual construction costs will not vary from the opinion of probable construction cost.

Modified Conventional Gravity Collection

NPV Discount rate	**6.0**
Evaluation period	**30 years**

Pro ect Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
	$	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Capital orks																														
Collection System	4,678,660																													
																				-										
Operation and Maintenance																														
Collection System		30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994
Cash Flow	4,678,660	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994	30,994
NPV	**5,099,885**																													

Capital Cost Estimate Changed Items

Pro ect : Small Towns Wastwater Scheme
Pro ect No : 60309716
File : P:\60309716\4. Tech work area\Engineering and Planning\Design\Sewerage to Bungaree and Wallace\Final\[se\
Option Description: Modified Conventional Gravity

Element	Units	Rate	uantity	Price
		no of properties	126	
Collection System - Reticulation		Total length	2492	
Supply and install DN150 PVC sewer in material other than rock				
0-1.5 metres deep	$/m	$ 150.00	240	$ 36,000
1.5-2 metres deep	$/m	$ 165.00	465	$ 76,725
2-3 metres deep	$/m	$ 190.00	1015	$ 192,850
> 3 metres deep	$/m	$ 220.00	160	$ 35,200
Supply and install DN225 PVC sewer in material other than rock				
2-3 metres deep	$/m	$ 270.00	612	$ 165,240
Extra trenching costs for construction in rock	$/m	$ 350.00	249.2	$ 87,220
Extra costs for boring under roads and creeks	no.	$ 6,000.00	2	$ 12,000
Extra trenching costs for crushed rock backfill	$/m	$ 215.00	374	$ 80,367
				$ 685,602
Collection System - Maintenance Holes				
Supply and install access chambers				
0-1.5 metres deep	no.	$ 2,000.00	5	$ 10,000
1.5-2 metres deep	no.	$ 2,750.00	3	$ 8,250
2-3 metres deep	no.	$ 3,500.00	5	$ 17,500
> 3 metres deep	no.	$ 4,500.00	2	$ 9,000
Access chamber covers	no.	$ 500.00	17	$ 8,500
Supply and install maintenance shafts				
0-1.5 metres deep	no.	$ 1,300.00	0	$ -
1.5-2 metres deep	no.	$ 1,600.00	2	$ 3,200
2-3 metres deep	no.	$ 2,000.00	2	$ 4,000
> 3 metres deep	no.	$ 2,500.00	0	$ -
Access maintenance shaft covers	no.	$ 500.00	4	$ 2,000
Supply and install inspection shafts				
0-1.5 metres deep	no.	$ 300.00	0	$ -
1.5-2 metres deep	no.	$ 400.00	0	$ -
2-3 metres deep	no.	$ 500.00	1	$ 500
> 3 metres deep	no.	$ 600.00	2	$ 1,200
Inspection shaft covers	no.	$ 185.00	2	$ 370
				$ 64,520
Property drain				
Pipe from house to sewer	$/m	$ 100.00	1500	$ 150,000
Minor Pump stations				
Pump station	no.	$ 200,000.00	1	$ 200,000
Pressure main (DN100)	$/m	$ 100.00	5840	$ 584,000
Contractor's Preliminaries	10%			**$ 168,000**
Sub-total				**$ 1,852,000**
Contingency	30%			$ 555,600
Authority Administration Costs	10%			$ 185,200
Design	5%			$ 92,600
Project Management	3%			$ 55,560
Construction management	5%			$ 92,600
Clerk of Works Administration	3%			$ 55,560
Planning and approvals	2%			$ 37,040
Legal	1%			$ 18,520
Surveying	1%			$ 18,520
Geotech	1%			$ 18,520
Total	**61**			**$ 2,981,720**

In undertaking the preparation of our opinion of probable construction cost, AECOM advises that it has no control over the cost of labour, materials, equipment or services furnished by others, nor has it control over contractors' methods for determining prices, competitive bidding or market conditions. The opinion of probable construction cost that will be provided by AECOM will be made on the basis of its judgement as an experienced and qualified engineering consultant, familiar with the construction industry. As AECOM is not a qualified Quantity Surveyor, nor does it employ quantity surveyors, AECOM cannot and will not guarantee that tenders or actual construction costs will not vary from the opinion of probable construction cost.

Capital Cost Estimate

Pro ect : Small Towns Wastwater Scheme
Pro ect No : 60309716
File : http://vpo.au.aecomnet.com/projects/VSAB091416/4TechWorkArea/4.3 Engineering/Cost Estimates/[Cost Estimate - MC(
Option Description: Modified Conventional Scheme

Element	Units	Rate	uantity	Price
Other Costs		$ m		
Operation and Maintenance of Reticulation Network	item	$ 3.80	2492	$ 9,470
Sub-total				**$ 9,470**
Contingency	30%			$ 2,841
Total				**$ 12,310**

In undertaking the preparation of our opinion of probable construction cost, AECOM advises that it has no control over the cost of labour, materials, equipment or services furnished by others, nor has it control over contractors' methods for determining prices, competitive bidding or market conditions. The opinion of probable construction cost that will be provided by AECOM will be made on the basis of its judgement as an experienced and qualified engineering consultant, familiar with the construction industry. As AECOM is not a qualified Quantity Surveyor, nor does it employ quantity surveyors, AECOM cannot and will not guarantee that tenders or actual construction costs will not vary from the opinion of probable construction cost.

Modified Conventional Gravity Collection

NPV Discount rate	**6.0**
Evaluation period	**30 years**

Pro ect Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
	$	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Capital orks																														
Collection System	2,981,720																													
																				-										
Operation and Maintenance																														
Collection System		12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310
Cash Flow	2,981,720	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310	12,310
NPV	**3,149,028**																													

Capital Cost Estimate

Pro ect : Small Towns Wastwater Scheme
Pro ect No : 60309716
File : P:\60309716\4. Tech work area\Engineering and Planning\Design\Sewerage to Bungaree and Wallace\Final\[sewerage
Option Description: Transfer Sewage to existing WWTP (Ballarat)

Element	Units		Rate	uantity		Price
Pump Stations						
Supply and install pump station	each	$	200,000.00	1	$	200,000
Chemical odour dosing	each	$	100,000.00	1	$	100,000
					$	**300,000**
Rising Mains						
Supply and install rising main from pump station to WWTP	$/m	$	100.00	6280	$	628,000
Extra over trenching costs for boring under roads and creeks	no.	$	10,000.00	2	$	20,000
Extra over trenching costs for crushed rock backfill	$/m	$	215.00	628	$	135,020
					$	**783,020**
Balance tank at Maher rd, Ballarat	Item	$	100,000.00	1	**$**	**100,000**
upgrade in EX. treatment plant		$	-			
Contractor's Preliminaries	10%				**$**	**118,000**
Sub-total					**$**	**1,301,020**
Contingency	30%				$	390,306
Authority Administration Costs	10%				$	130,102
Design	5%				$	65,051
Project Management	3%				$	39,031
Construction management	5%				$	65,051
Clerk of Works Administration	3%				$	39,031
Planning and approvals	2%				$	26,020
Legal	1%				$	13,010
Surveying	1%				$	13,010
Geotech	1%				$	13,010
Total	61%				**$**	**2,094,642**

In undertaking the preparation of our opinion of probable construction cost, AECOM advises that it has no control over the cost of labour, materials, equipment or services furnished by others, nor has it control over contractors' methods for determining prices, competitive bidding or market conditions. The opinion of probable construction cost that will be provided by AECOM will be made on the basis of its judgement as an experienced and qualified engineering consultant, familiar with the construction industry. As AECOM is not a qualified Quantity Surveyor, nor does it employ quantity surveyors, AECOM cannot and will not guarantee that tenders or actual construction costs will not vary from the opinion of probable construction cost.

Operational Cost Estimate

Pro ect :	Small Towns Wastwater Scheme
Pro ect No :	60309716
File :	http://vpo.au.aecomnet.com/projects/VSAB091416/4TechWorkArea/4.3 Engineering/Cost Estim
Option Description:	Transfer Sewage to existing WWTP (Ballarat)

Element	Units		Rate	uantity		Price
power	item	$	1,100.00	1	$	1,100
Operation and Maintenance of Pump Stations	item	$	3,000.00	1	$	3,000
Operation and Maintenance of Rising Main	item	$	31,320.80	1	$	31,321
					$	**35,421**
Sub-total					**$**	**35,421**
Contingency	30%				$	10,626
Total					**$**	**46,047**

In undertaking the preparation of our opinion of probable construction cost, AECOM advises that it has no control over the cost of labour, materials, equipment or services furnished by others, nor has it control over contractors' methods for determining prices, competitive bidding or market conditions. The opinion of probable construction cost that will be provided by AECOM will be made on the basis of its judgement as an experienced and qualified engineering consultant, familiar with the construction industry. As AECOM is not a qualified Quantity Surveyor, nor does it employ quantity surveyors, AECOM cannot and will not guarantee that tenders or actual construction costs will not vary from the opinion of probable construction cost.

Packaged Treatment Plant with land application

NPV Discount rate	6.0
Evaluation period	30 years

Project Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Capital Works																														
	2,094,642																													
																				-										
Operation and Maintenance																														
		46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047
Cash Flow	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047	46,047
NPV	671,860																													

Attachment - Item 9.5.1

61 Ingliston Drive
Ballan 3342

August 13, 2014.

Mr Rob Croxford
Chief Executive Officer
Moorabool Shire Council
P.O. Box 18
BALLAN 3342.

Re: Proposal to declare Ingliston Drive, Ingliston to be a Public Highway

Dear Rob,

In 1975 Ingliston Drive was created when a subdivision of eight lots were auctioned and sold to eight individuals. Being present at that auction, we were one of the purchasers. Ownership has since changed hands on many of the lots but all are still individually owned. Unless one of the lots has seceded, then eight lots still remain facing Ingliston Drive.

Council's recent notes (Minutes of Ordinary Meeting June 2014) indicate that only 7 lots exist and four owners have approached Council for their involvement in maintaining the road. If in fact eight lots exist, then four requests is not a majority. Council may consider correcting this situation.

Having said that, our submission and request for information is as follows:

- To bring the road surface to Council's acceptance and standard, obviously some costs will be involved.
- Being a '*No Through Road'* basically servicing residents who require only to travel a short section or require to travel the entire length, how will the costs (if any) be apportioned? Equally by eight or distance travelled or by some other formula?
- Will our general rates increase?
- Originally the entire road was sealed, will it be re-sealed or sheeted with an inferior product?
- Will the section of seal fronting our property be maintained as is? This section is necessary for dust control as the road is within a distance of approx. 20m from of our house.
- Will Council be responsible for mowing the sides and trimming the trees?

We and the other residents are predominantly in favour of Council taking over the road, and declaring it a public road, however, we are curious as to what future costs could be involved and the extent of maintenance and materials used in any works that are carried out.

We look forward to hearing from Council in due course.

Yours faithfully,

J & L Bowers

John & Linda Bowers.

MOORABOOL
SHIRE COUNCIL

Mr John and Mrs Linda Bowers
61 Ingliston Drive
BALLAN VIC 3342

26 August 2014
Ref: PJ:mm
RN: IN14/36E7CF49
File: 1553

Dear Mr and Mrs Bowers,

Submission to Proposal to declare Ingliston Drive, Ingliston to be a Public Highway

I am writing in response to your submission received by Council on 14 August 2014 regarding Council's proposal to declare Ingliston Drive, Ingliston to be a public highway and to address your concerns in relation to the road.

Regarding your reference to the Minutes of the Ordinary Meeting of June 2014 pertaining to the number of lots on the original plan of subdivision, I wish to confirm that as a result of your visit to Council's Ballan office and your conversation with Council's Business Coordinator, this matter was addressed in the report that was re-presented to Council at its Ordinary Meeting of Wednesday 2 July 2014.

In order to assist with clarifying the status of the road, the report presented to Council at its Ordinary Meeting of Wednesday 2 July 2014 sought to declare the road a 'public highway'. The proposed declaration essentially clears up years of ambiguity regarding the road status and establishes legal access for residents. If declared though, a public highway does not oblige Council to maintain, inspect or repair the road.

In relation to ongoing maintenance and associated costs, this will be addressed as part of the next report to Council and is done so by declaring the road a 'public road' in addition to including on Council's register of roads that is attached to the Road Management Plan. For Council to declare the road a public road there will be two main considerations:

1. Is the existing carriageway at an acceptable standard?
2. What is the cost to return the road to an acceptable standard

If the existing road is at an acceptable, Council would take over ongoing maintenance and capital renewal and this would be funded from existing maintenance and capital programs. There would be no increase in rates under this scenario over and above annual increases determined by Council. I note that the road is in a relatively poor state.

MOORABOOL
SHIRE COUNCIL

If it is determined that the road needs to be upgraded, Council may elect to take over maintenance only after the road is upgraded at a cost to adjoining land owners. Alternatively, it could take over the road in its existing condition and upgrade through the capital program at a later date. There could be a once off cost associated with this option but would be no ongoing increase in rates over and above annual increases determined by Council.

Specifically, your letter requested further information on a number of items and these are addressed below:

- *To bring the road surface to Council's acceptance and standard, obviously some costs will be involved.*

If it is determined to upgrade the road to an acceptable standard prior to taking over ongoing maintenance, there are two scenarios. Seal the road or resheet with gravel. To construct and seal would obviously be a larger cost and may be in the order of $70k to $100k. A gravel resheet would be in the order of $30k to $40k.

- *Being a 'No Through Road' basically servicing residents who require only to travel a short section or require to travel the entire length, how will the costs (if any) be apportioned? Equally by eight or distance travelled or by some other formula?*

There would be a number of ways of apportioning cost that would need to be considered but it is likely to be based on equity rather than distance travelled. This would be determined in the future.

- *Will our general rates increase?*

As previously outlined, there could be a once off cost associated with this option but would be no ongoing increase in rates over and above annual increases determined by Council.

- *Originally the entire road was sealed. Will it be resealed or resheeted with an inferior product?*

The outcome of the first dot point above would determine the road surface. If Council was to inherit without upgrades, the intent would be to maintain it as a gravel road.

- *Will the section of seal fronting our property be maintained as is? This section is necessary for dust control as the road is within a distance of approximately 20 metres from our house.*

MOORABOOL
SHIRE COUNCIL

Council would endeavour to retain the section of seal but notes that it is in poor condition and could not guarantee its ongoing status. Agreement to upgrade existing at a shared cost could be reached to ensure Council would maintain the seal on an ongoing basis.

- *Will the Council be responsible for mowing the sides and trimming the trees?*

Council would not be responsible for ongoing mowing of the roadsides. This would only occur if the road was determined to be a strategic fire break. In terms of tree maintenance, this would only be done on a reactive basis when it impacts safety. no amenity pruning or replacements would be undertaken.

I trust the information provided above addresses your enquiry in relation to Ingliston Drive. Should you require further assistance please contact my office on 5366 7100.

Yours sincerely,

Phil Jeffrey
General Manager Infrastructure

Postal Address PO Box 18, Ballan Victoria 3342 **Telephone** 03 5366 7100 **Facsimile** 03 5368 1757 **ABN** 29 352 754 296
Principal Office 15 Stead Street, Ballan Victoria 3342 **Bacchus Marsh Offices** 215 Main Street, Bacchus Marsh and 182 Halletts Way, Darley
Web www.moorabool.vic.gov.au **Email** info@moorabool.vic.gov.au

Attachment - Item 10.2(a)

Masons Lane Committee of Management

MINUTES May 26th 2014

1. **Welcome and meeting opened**: 8.00pm.
2. **Attendance**

2.1 Present Tonia Dudzik (Council Chairperson) :Dianne Lee (BMODC) Simon Joannidis (BMSC) Ben Hicks (BMCC) Chris Jackson (BMCC) Paul Wilson (BMBC)

2.2 Visitors:

2.3 Apologies

3. Previous Minutes:

Acceptance of the Minutes of Meeting held on 24th March 2014

Moved Tonia Dudzik Accepted Simon Joannidis Moved Y

3.1 After reading of the previous minutes it was noted by all Committee Members that many items remain pending for many months, awaiting answers from Council. It was unambitiously agreed to show these items at the beginning of the the monthly minutes showing time- frame they have been left outstanding unresolved.

3.2

Item	30 Days	60days	90 days Plus
4.7 Spoon Drain			Aug/Sept 2012
4.14 Sale of Land			01/05/13

Business arising from previous minutes.

4.0 **User Agreements** All agreements sent to winter tenants Dog Club the only one returned signed. Baseball. Cricket, Soccer to follow up where their agreements are at. Tonia to talk to Little Athletics.

Item Pending

4.1 Key List Tonia to obtain an updated key list for all users from Council for the next meeting.

Item Pending

4.2 Maintenance of Facilities. Tonia to ask Council for a list of Maintenance that has been performed and any outstanding. Also a list of plans for the playing surfaces to ensure work is performed and not to clash with user's programs etc.

\Item Pending

4.3 **Eastern Pavilion** Dog Club and Soccer working excellently together and a cleaner now employed with them sharing the cost which has been agreed. Dianne asked Chris to put same proposal to cricket and this will ensure the clubrooms and change room are kept in a pristine condition throughout the year.

Item Pending

4.4 Sewerage Plant A decision has been made between Council and Western Water, MLCOM have had no final confirmation of this project, verification needed on

1. When will the work commence and how will this impact Little Athletic and Baseball.
2. How does the transformer impact the users, what time will it come on and off.
3. When will Mason Lane access be effected and for how long.
4. MLCOM wish to see actual plans.

It is understood that Western Water will install 20 parking lanes per plan valued approx

50 thousand dollar.

Item Pending

4.5 Spoon Drain This has been agreed with Little Athletics input to be partly updated within the next 12 months.

Item Pending

4.6 Landscaping Plan It was agreed no further action as this should be incorporated with car parks etc.

Item Pending

4.7 Little Athletic Proposed addition to clubrooms. Council have been in meetings with BMLAC with regards to their addition. They agreed this is a high priority project for Recreation and Leisure provision in the Shire. It has been placed on the Council's Capital Improvement Program and will advise once it has been prioritised against all other capital improvements and will advise of at its possible start and completion.
Council as assessed the proposal of the temporary storage container and confirmed its support although they prefer a storage shed structure as opposed to a container.
They wish to organise a meeting on site to confirm exact location including power requirement and possible screening.
This item brought forward from March meeting due to no update from Little Athletics as their committee member not in attendance.

Item Pending

4.8 BM Primary School Request

1. **Use of reserve the other side of cricket nets for students at lunch time etc.**
2. **Use of entrance to the Baseball and Eastern Pavilion for drop off, pick up children near the Eastern Pavilion MORNING AND AFTERNOON.**

After a great deal of discussion committee and a vote taken it was agreed as below.

1. This is agreed on a 3 month trial providing a teacher in there to supervise and all rubbish is removed. Definitely no ovals to be used. Ground to be inspected after this period for damage etc.
2. This was unanimously voted as a definite **NO** this road is in poor repair with only the clubs using it. It is a danger for children to be dropped off and definitely not enough turning room for cars. This is surely a no brainer for the safety of children.
3. The committee agreed the use of the area for lunch only, a cost needs to be apply to the Education Dept. Tonia to confirm this.

Item Pending

4.9 Future of MLCOM Committee is not sustainable in its present form. A decision needed on future of the Committee whether it should be advisory, super committee or friends of the reserve.

. **Item Pending**

Sale of Land (along Young Street) the committee has removed its support for this proposed sale as stated on Master-Plan. this is previously noted in Committees May minutes. It is felt this need to be removed from Master-plan due to its impact on all future plans for car parking etc. on Western end of the reserve.
THIS ITEM HAS BEEN NOTED BY COUNCIL.
Item Pending

5. Correspondence:

Origin x 2
Western Water x 2
Email BM Cricket Club Letter re change of committee Member.

5.1 Outwards
Minutes of 24th March 2014
Acceptance of Correspondence:

Moved: Tonia Dudzik Seconded: Simon Joannidis Carried: Y

6. Reports
Treasurer
Council has all paperwork from Ben Hicks.
Dianne and Tayla paid urgent outstanding accounts for Origin.

7 General Business

Booking of Reserve Process Tonia sent link from Dianne for the booking site, invoices need to be raised and this income is separate from any money Council supply to ML,and is for the purpose of applying for grants etc.

Sponsorships Signs for Reserve This has been approved by Council providing the Recreation Reserve Advertising Sign-age Guidelines is followed. Dianne has a copy of this if required.

Resignation of Committee Members.

Ben Hicks Treasurer ï Chris Jackson replaced Ben as Representative for Cricket.

Dianne Lee Secretary ï to resign next meeting, will be replaced by Bernie Evertsen as a Committee Member for Dog Club. I will come with Bernie to introduce him to committee and also bring all relevant paperwork.

Please note neither of these members have put their hand up to take on the above position this will be decided at the next meeting.

. **Project**

Clubs asked to advise of any project they feel need done and MLCOM will get these ` costed and have them ready for any funding that comes available.

9. Next Meeting 28th July 2014 @ Eastern Pavilion

Change to clubroom holding all meetings, there are three people on the committee with a key to the Eastern Pavilion this will ensure meetings can commence on time without frantic phone calls.

Meeting Closed : 10.00 pm..

Attachment - Item 10.2(b)

Masons Lane Committee of Management

MINUTES August 4th 2014

1. **Welcome and meeting opened**: 7.30pm.
2. **Attendance**

2.1 Present Tonia Dudzik (Council Chairperson) :Dianne Lee (BMODC) Simon Joannidis (BMSC) Chris Jackson (BMCC) Paul Wilson (BMBC) Peter Dixon (LAC)

2.2 Damian DeGoldi (Council) Mick Runge Lt Athletics

2.3 Apologies

3. Previous Minutes:

Acceptance of the Minutes of Meeting held on 24th March 2014

Moved Chris Jackson Accepted Paul Wilson Moved Y

3.1 After reading of the previous minutes it was noted by all Committee Members that many items remain pending for many months, awaiting answers from Council. It was unambitiously agreed to show these items at the beginning of the the monthly minutes showing time- frame they have been left outstanding unresolved.

3.2

Item	30 Days	60days	90 days Plus
4.7 Spoon Drain			Aug/Sept 2012
4.14 Sale of Land			01/05/13

Business arising from previous minutes.

4.0 **User Agreements** All agreements sent to tenants Little Athletics only club not returned theirs yet, Tonia explained if not returned Council can discontinue their use of the rooms, if another club is looking for a clubroom allocate the clubroom to them.

Item Pending

4.1 Key List Tonia to obtain an updated key list for all users from Council for the next meeting.

Item Pending

4.2 Maintenance of Facilities. Damian presented a detailed list of upcoming work. $60,000 is the maintenance budget for ML with $2000 emergency funds to stay with ML Committee. He will send a copy to clubs via email.

Item Pending

4.3 **Eastern Pavilion Extension to commence approx Feb 2015.**

Item Pending

4.4 <u>Sewerage Plant</u> No answers from Council, Damian is to follow up again re these questions.

1. When will the work commence and how will this impact Little Athletic and Baseball.
2. How does the transformer impact the users, what time will it come on and off.
3. When will Mason Lane access be effected and for how long.
4. MLCOM wish to see actual plans.

It is understood that Western Water will install 20 parking lanes per plan valued approx

50 thousand dollar.

Item Pending

4.5 <u>Spoon Drain</u> This has been agreed with Little Athletics input to be partly updated within the next 12 months.

Item Pending

<u>4.6 Little Athletic Proposed addition to clubrooms</u>. Council have been in meetings with BMLAC with regards to their addition. They agreed this is a high priority project for Recreation and Leisure provision in the Shire. It has been placed on the Council's Capital Improvement Program and will advise once it has been prioritised against all other capital improvements and will advise of at its possible start and completion.
Council as assessed the proposal of the temporary storage container and confirmed its support although they prefer a storage shed structure as opposed to a container.
They wish to organise a meeting on site to confirm exact location including power requirement and possible screening.
This item brought forward from March meeting. .

Item Pending

4.8 <u>BM Primary School Request</u>

Primary School are using ML without the permission of ML or Council, Tonia to discuss with them re this, if agreed with ML Committee a cost must be applied.
Without a user agreement they are not covered by any insurance and there is a Hoc Health and Safety issue for the children. The 3 questions from May minutes need to be addressed and decided on. $550 for 3 months was proposed **if permission given.**

1. This is agreed on a 3 month trial providing a teacher is there to supervise and all rubbish is removed. Definitely no ovals to be used. Ground to be inspected after this period for damage etc.
2. This was unanimously voted as a definite **<u>NO</u>** this road is in poor repair with only the clubs using it. It is a danger for children to be dropped off and definitely not enough turning room for cars. This is surely a no brainer for the safety of children.
3. The committee agreed the use of the area for lunch only, a cost needs to be apply to the Education Dept. Tonia to confirm this.

<u>Item Pending</u>

4.9 Future of MLCOM Decision is is to be made by Council re the future of ML and if Super Committee to be formed, this item on the next Council Meeting.

. **Item Pending**

Sale of Land (along Young Street) the committee has removed its support for this proposed sale as stated on Master-Plan. this is previously noted in Committees May minutes. It is felt this need to be removed from Master-plan due to its impact on all future plans for car parking etc. on Western end of the reserve.
THIS ITEM HAS BEEN NOTED BY COUNCIL.

Item Pending

5. Correspondence:

Tonia informed committee all mail redirect to Council for 3 months.
Ensure Accounts for Electricity and Water, are paid due to disconnection.

5.1 Outwards

Minutes of 26th May 2014

Acceptance of Correspondence:

Moved: N/A Seconded: N/A Carried:

5.2 Nomination for Secretary and Treasurer

Peter Dixon informed committee he will be replaced with Mike Runge who was nominated and accepted Secretary position.
Chris Jackson nominated and accepted Treasurer position.
Bernie Everston will replace Dianne Lee as Dog Clubs ML Committee Member.

6. Reports

Treasurer

Council has all paperwork from Ben Hicks.
No Report presented.

7 General Business

Damian presented a very informative update re all issues effecting ML.
He presented draft copies of all items and once finalised will send copies to all committee members.
Stage 1 $280,000.00 to be spent on ML to deliver an irrigation system into oval 1, New storage Tank, building extension and car parking upgrade which all going well will be delivered this financial year. Irrigation to commence after Soccer finishes, Dog Club still are able to train avoiding affected areas. If any problems Paul advised okay for Dog Club to train in Baseball Area.

Stage 2. Lighting Updates ï concept plan to be completed this financial year from funded CIP.

Note: Water Storage tank is fractured and cheaper to get a new tank increasing size from. 280 to 300 litres

Request is made to Council for the road accesses to be maintain on a 4 to 6 week time frame due to extremely large increase in traffic. ML budget need to be increased to ensure this happens.

Old Junior Diamond needs crush rock to finish as it is being used as a car-park in the interim.

P**ower usage** will be applied to each club in the next few months.

Grants Tonia informed we can still apply for Community and Sporting Body Grants, she encourages each club to do this

Project

Clubs asked to advise of any project they feel need done and MLCOM will get these costed and have them ready for any funding that comes available.

`

9. Next Meeting 6th October 2014 @ Eastern Pavilion 7.30p.m.

Meeting Closed : 9.30 pm..

Attachment - Item 10.2(c)

Bacchus Marsh Public Hall Committee of Management

Committee Meeting Thursday 14th August 2014

Location: Supper Room, Main Street, Bacchus Marsh

MINUTES OF MEETING

1. Meeting opened:	4.00pm. J Spain in Chair.

2. Members present:	J Spain, G Treloar, J Wilson, K Currie, J Ginnane, C Young.

3. Apologies received:	D Williamson

4. Guests:	None.

5. Disclosure of Conflicts of Interest:	None disclosed.

6. Confirmation of Minutes	***Resolution:*** ***That the minutes of the Meeting of 10th July 2014 be confirmed.*** ***Moved: J Wilson Seconded: J Ginnane*** ***Carried***

7. Actions arising from previous meetings	
7.1 Cleaning Arrangements 0114	J Wilson will provide a temporary Cleaning Specification due to the refurbishment of the Kitchen and Toilet areas. GJK to be invited to next Committee of Management meeting so that they can be advised of the Committee's requirements. Maintenance of sanitary units to be included in quote.
7.2 Kitchen Refurbishment 0214	Council has submitted an expression of interest to the grant process and will submit a full application in line with the process. If grant application is successful then work commence early 2015

7.3 Master Key 0214	According to Council records D Mayor still has a master key. C Young to write to Dl Mayor requesting the return of the Master Key to Council. [***Post Meeting Update***: C Young has received Master Key from D Mayor] J Spain to email K Diamond-Keith for a list of all permanent Key holders.
7.4 Booking System Modules 0114	J Spain investigating available Booking Systems as the current spreadsheet is only temporary.
7.5 Cleaning Cupboard Key 0214	K Diamond-Keith has requested the Committee to supply a list of key combinations required. C Young to provide list to K Diamond-Keith.
7.6 Telstra Phone Line 0214	G Treloar has contacted various Carriers for the supply of a phone number for the venue. The Government auction off 1300 numbers and a phone word may be possible of 1300 BMHALL The rental would be $150 per month and an extra $50 for $79 worth of calls. ***Resolution*** ***G Treloar to bid for 1300 BMHALL at a cost of $42 registration and a bid of $250.00*** ***Moved J Wilson Seconded J Ginnane*** ***Carried.***
7.7 Signage on Windows 0214	To be carried over until we know the Booking Telephone number
7.8 Crockery 0314	J Wilson has purchased lock for crockery cupboard and fitted to door.. Current tea cups and saucers have been given away as follows: • Bacchus Marsh Tennis Club: 50 cups and saucers • Missionary of Peace and Love: Balance New crockery is in place for Hirers to use.
7.9 Maintenance Schedule 0414	No values have been put in Council column of Maintenance Agreement. J Spain to have a meeting with Council to get the Maintenance Agreement finalised. Operational grant should be as per last year plus CPI percentage. The Committee of Management needs to set a budget and come up with a Master Plan for the venue. G Treloar to look at presenting a budget for the September meeting. Committee members to come up with a wish list for this meeting.

7.10 Defibrillator 0514	***Resolution:*** ***That the Committee of Management through G Treloar and K Currie, apply for a community grant to cover the purchase of the defibrillator*** ***Moved: G Treloar Seconded J Ginnane*** ***Carried***
7.11 Hall Lighting 0514	J Spain to contact Council re Maintenance Schedule for replacement of lights.
7.12 Building Identification Sign 0414	J Wilson to contact J Hine for recommendations as to what would be appropriate for the building to fit on existing barge boards and to be removable. A sign is also required in the garden outside the Supper Room, similar to library sign, pointing to the venue J Ginnane has suggested that an established date be put at the top of the BM Hall.
7.14 Advertising of Facilities 0514	C Young to circulate the advertising flyer at shopping centres.
7.15 Painting of Hall 0514	J Wilson to obtain quotes from professional painters with the painting tentatively scheduled for March/April 2015. G Treloar and K Currie indicated the likelihood of Lions and Rotary participation in assistance.
7.16 Naming of Supper Room 0514	The suggested name “Captain Bacchus Room” for the Supper Room is already in use by a local business and should be considered as not available for use. Committee Members to put forward a list of names at the September meeting. Note that the Committee will need to engage with the local community in promoting a name change for the Supper Room.
7.17 History of Hall 0514	J Spain will put a brief history of the Public Hall on the website
7.18 RSL Gun Placement 0514	Concrete works have been completed and the gun will be placed soon. Some minor landscaping will be included in the works.
7.19 Emergency Exit Doors 0514	The side doors (emergency exits) of the Hall have been repaired however the job was not very satisfactory. J Spain noted that he found part of a door mechanism on the ground outside the Hall, indicating that there are still issues with the doors. J Spain will continue discussions with Council about these doors.
7.20 Stage Curtaining 0514	J Wilson and C Young will endeavour to repair curtains in the coming weeks. Slidable flats have been suggested to replace the side curtains but the Committee believes this needs more detailed consideration as part of any stage refurbishment..
7.21 Lighting in Foyer 0514	Light fitting & globe above door have been fixed. Upgrades to the lighting in the Hall foyer to be included in the Master Plan. One option to be considered will be the use of LED fittings.

7.22 Car Park between Hall and RSL 0514	Improvements to the space between the Soldiers Memorial Hall and the Public Hall need to be discussed with the RSL and incorporated into the Public Hall Master Plan. J Spain has had informal discussions with various people about this matter but proposals need to be documented.
7.23 Table Replacement in Supper Room 0513	Tables being delivered 15th August 2014 and should be in place to use immediately. Disposal of current tables – Historical Society x 2, Baptist Church x 2.
7.24 Kitchen Door 0714	Door lock has been repaired since the last meeting. This issue is closed.
7.25 Hand Driers 0714	G Treloar presented quotes from Dyson and HPM. ***Resolution:*** ***The purchase of 2 hand driers from Dyson at a cost of $3400 plus GST including installation is approved.*** ***Moved G Treloar Seconded J Ginnane*** ***Carried*** Council is to be contacted to see if we can be compensated for the cost of the hand driers as they may have been included in the refurbishment costs.
7.26 Wilsons Hardware Acc 0715	An account has been opened.

8. Chairperson's Report: Nil to report

9. Secretary's report	
9.1 Inwards correspondence	Wilsons Timber and Hardware – New Account Bendigo Bank – Various Bank Statements Various emails re bookings.
9.2 Outwards correspondence	Various emails re bookings
Resolution: That the Secretary's report be received. ***Moved: K Currie Seconded: J Ginnane*** ***Carried.***	

10. Treasurer's Report

BACCHUS MARSH PUBLIC HALL COMMITTEE

Treasurer's Report for the Month of July '14

Cheque Account

	Month July 2014	2014/15 YTD	2013/14 YTD
INCOME			
Hall Hire - Public hiring	2,247.26	2,247.26	
Hall Hire - Council	1,501.00	1,501.00	
Hall Hire - LFY	-	-	8,544.33
Cleaning/ Other Costs Recouped	245.45	245.45	
Public Liability Amounts Received	86.19	86.19	
GST on Income	257.90	257.90	
Total Income	**4,337.80**	**4,337.80**	**8,544.33**
EXPENDITURE			
Cleaning	45.45	45.45	
Secretarial Fees	420.00	420.00	
Maintenance:-			
furnishings (main hall clock)	81.15	81.15	
GST on Purchases	55.35	55.35	
Contra Account - Hall Hire Council	1,501.00	1,501.00	
Total Expenditure	**2,102.95**	**2,102.95**	**-**
Surplus/ Deficiency	**2,234.85**	**2,234.85**	**8,544.33**
Bank Account Balance B/Fwd	9,089.95	9,089.95	
BANK ACCOUNT BALANCE - 31st July 2014	**$ 11,324.80**	**$ 11,324.80**	

Accounts for Payment

Elms Bookkeeping	$462.00
Aspect Commercial Interiors	$3630.00

Resolution:

That the Treasurer's report be received.

Moved: G Treloar Seconded: J Wilson

Carried

11. Booking Officer's report

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Firm bookings received from the following:
Ready Set Go Kids – permanent booking Saturday mornings
John Spain
BM Soccer Club
My Industry Support Services
BM Basketball Club

Enquiries received from the following:
Pauline Boyle – Ready Set Go
Noel – BM Soccer Club
Keira – Fundraiser
Pina – Engagement
Victoria – Christmas Function
Leslie – Training Programme
Doris – Communion
Shayne – BM Golf Club
Rebecca – Aged Care Services
Kirsty – Confirmation
Joce – Horticultural Show

Hall Viewings:
Pauline Boyle – Ready Set Go

Resolution:

That the Booking Officer's report be received.

Moved: K Currie Seconded: J Wilson

Carried

12. Hall Keeper's report	Covered in previous business

13. General Business	
13.1 Fees	***Resolution:*** ***That fees remain the same with the exception of the Public Hall rate changing from $19 per hour to $22 per hour for Community Groups*** ***Moved K Currie Seconded J Wilson*** ***Carried.***

14. Next meeting	4 pm on Thursday 11th September 2014

15. Meeting closed:	5.43 pm.

Attachment - Item 10.2(d)

Millbrook Community Centre
Annual General Meeting

27th August 2014

Opened Meeting: 8.04

Present: Amanda Labbett, Mark Labbett, Georgie Reynolds, Sue Ketner, Rosie grey, Lyndsey Grey, Andrea Weigal

Apologies: Sue Labbett, Tom Reynolds

Minutes of previous meeting:
Moved: Georgie Reynolds
Second:Lyndsay Gray

Declare all positions open.

Mark Labbett nominated Georgie for President.
Georgie Accepted
Rosie Gray nominated Amanda for secretary/treasurer
Amanda accepted

Committee members 2014:
Georgie Reynolds, Amanda Labbett, Mark Labbett, Sue Ketner, Rosie grey, Lyndsey Grey, Andrea Weigal, Sue Labbett, Tom Reynolds

Treasurers Report:

Available funds as of 30/06/2014 $15,347

Meeting Closed
8.09

Millbrook Community Centre
General Meeting
27th August 2014

Meeting opened: 8.10

Present: Georgie Reynolds, Amanda Labbett, Mark Labbett, Sue Kettner, Andrea Weigall, Rosie Grey, Lyndsay Grey

Apologies: Sue Labbett

Minutes of previous meeting:

Moved Georgie Reynolds
Second Amanda Labbett

Treasurers Report:

Available Funds as at 30/06/2014 $15,347

Correspondence:
ANZ Bank Statements
Public Officer Form

General Business:

1. Toilets need a small veranda over door way. Flooding occurring around doorway. Amanda will call shire in regards to this, the leaking taps, the alarm sounding from the septic and the light that is out on the ramp. Also speak with someone about the concrete pathway going to the toilets. It is very broken and lifted. Tripping hazard

2. Notice board. Amanda will talk to Faye Parry about the notice board. Faye's husband built the original boards for the shire. Hopefully he will give us a quote. Amanda will also make some phone calls gaining quotes. Also spoke about making it a memorable board in honour of Dennis Alford. Will gain some quotes first.

3. Georgie organised the painting. Was done in August by Jason Farley. Total cost $3795.00. Very happy with job done. Luke and Georgie re-hung all the blinds and put all the trophy's back in their rightful place.

4. Mark fixed internal door. It had come off its runner.

5. Amanda organised a light to be installed under external veranda. This was done by Ballanee Electrical. Total cost $903.20. They also moved the light that was under the roof to the front of the building.

6. Lyndsey will spray the grounds for weeds and black berry bushes using Land care sprayer. Blackberry bushes are an issue around the tennis courts.

7. Tom has obtained a projector from the CFA. He mentioned the centre should purchase a screen. All agreed this would be great for CFA training and Land care presenters.
All agreed in purchasing a retractable screen. Georgie will gain quotes.

8. Amanda will enquire with the shire about an electric BBQ to place under new veranda. Andrea suggested using Adam Giles from Bungaree to gain a quote to do the electrical work required. Amanda will also speak to council about removing bubble taps from the building.

9. A date is set for a working bee. 5th October. Due to the CFA hosting the Fiskville cup in October we thought it would be good for a clean-up.

Meeting Closed: 8.58 pm

Attachment - Item 10.3 (a)

MINUTES
SECTION 86 SOCIAL DEVELOPMENT COMMITTEE

WEDNESDAY 13 AUGUST 2014
James Young Room, Lerderderg Library, Bacchus Marsh
3.30pm – 5.00pm

MEETING OPENING

Danny Colgan welcomed all and opened the meeting at 3.30pm.

ATTENDANCE

Cr Allan Comrie	Councillor – East Moorabool Ward
Cr Tonia Dudzik	Councillor – East Moorabool Ward
Mr Danny Colgan	General Manager – Community Services
Mr Shane Marr	General Manager – Corporate Services
Mr Troy Scoble	Manager – Recreation and Youth
Ms Robyn Willcox	Minute Taker

APOLOGIES

Cr David Edwards	Councillor – East Moorabool Ward

CONFLICT OF INTEREST

No conflicts of interest were declared at the meeting.

ELECTION OF THE MEETING CHAIR

Recommendation:

It is recommended that Cr Tonia Dudzik be appointed as Chairperson of the Social Development Committee.

TERMS OF REFERENCE

The Terms of Reference for the committee were noted by all present. It was agreed that the meeting be bi-monthly and additional meetings can be called by the Chairperson or two members of the Committee as outlined in the Terms of Reference.

STRATEGIC PROJECTS UPDATE

Danny Colgan provided the attached list of projects Community Services anticipated to be finalised in the coming twelve months, there was discussion around which projects would be required and be presented to a Section 86 Committee meeting prior to an Ordinary Meeting of Council.

Action: That the Strategic Project Update be listed as an ongoing agenda item.

COMMUNITY SERVICES REPORTS

Recreation and Leisure Strategy - Discussion Paper

Troy Scoble provided an overview of the background and content of the discussion paper.

Feedback was provided by the Councillors and Officers are to follow up with other Councillors to seek their feedback on the strategy.

Recommendation:

It is recommended to Council that the feedback be compiled to inform the development of the Draft Recreation and Leisure Strategy to be presented at a future Ordinary Meeting of Council for the purposes of community consultation.

DATE OF NEXT MEETING

Wednesday 28 October 2014
Council Chambers
Ballan

MEETING CLOSURE

The meeting closed at 4.30pm

Attachment - Item 10.3(b)

MINUTES
SECTION 86 PLACE MAKING COMMITTEE

WEDNESDAY 3 SEPTEMBER 2014
Ballan Meeting Room
11.00am – 12noon

MEETING OPENING

Phil Jeffrey welcomed all and opened the meeting at 11.18am.

ATTENDANCE

Cr Pat Toohey	Councillor – Woodlands Ward
Cr Tom Sullivan	Councillor – West Moorabool Ward
Cr David Edwards	Councillor – East Moorabool Ward
Mr Phil Jeffrey	General Manager Infrastructure
Ms Sam Romaszko	Manager Engineering Services
Mr Andrew Goodsell	Acting Manager Strategic & Sustainable Development
Ms Lace Daniel	Minute Taker
Ms Sharon Duff	Minute Taker

APOLOGIES

Mr Satwinder Sandhu	General Manager Growth & Development

CONFLICTS OF INTEREST

No conflicts of interest were declared at the meeting.

ELECTION OF THE MEETING CHAIR

Nominations were called for Chair of the Section 86 Place Making Committee, with one nomination put forward and accepted.

Resolution:

That Cr Pat Toohey be elected the Chair of the Section 86 Place Making Committee.

Moved: **Cr Sullivan**
Seconded: **Cr Edwards**

CARRIED.

TERMS OF REFERENCE

The Terms of Reference (TOR) for the committee were noted by all present. It was agreed that amendments to the Terms of Reference may be considered by the group as required.

Resolution:

That the Terms of Reference as attached to the 3 September 2014 Section 86 Place Making Committee agenda be accepted by the group.

Moved: **Cr Sullivan**
Seconded: **Cr Edwards**

CARRIED.

STRATEGIC PROJECTS UPDATE

Phil Jeffrey presented a draft Gantt chart to the group and provided summary in relation to the strategic projects that are anticipated to be presented to the committee from the Infrastructure directorate in the coming twelve months. The group discussed the priority of the projects currently included on the list, future projects for consideration, as well as strategic projects from the Growth & Development directorate to the committee.

INFRASTRUCTURE REPORTS

1. Draft Small Towns Services Study – Bungaree, Dunnstown & Wallace

Phil Jeffrey provided an overview of the background, content and progress of the study. It was agreed that the final report, incorporating feedback provided, would be presented to the S86 Committee meeting on Wednesday 24 September 2014.

2. Policy Review

Phil Jeffrey provided an overview of the review and requested feedback from Councillors on the issues/items that they wish to see each of the policies addressing. The following points were identified:

<u>Public Toilet Policy</u>

- Defining a 'public toilet'
- Responsibilities around toilet cleaning (public/committee use, Council/DEPI reserve etc)
- Responsibilities around toilet maintenance (public/committee use, Council/DEPI reserve etc)
- Levels of service for cleaning and maintenance, based on usage
- Strategy for the provision, siting and design of future toilets (where, when etc)
- Toilet signage

<u>Sealing of Unsealed Roads Policy</u>

- Ongoing maintenance/economic viability of sealing unsealed roads
- Use of Special Charge Schemes to advance projects
- Use of co-contributions on a cost neutral basis

Street Lighting Policy

- Energy efficient lighting
- Public place lighting
- Non-standard light poles
- Safety and category of lighting (pedestrians, motorists, public place etc)
- Financial implications

Resolution:

That officers commence the development of a Street Lighting Policy to ultimately be presented to Council for adoption.

Moved: **Cr Edwards**
Seconded: **Cr Sullivan**

CARRIED.

GROWTH & DEVELOPMENT REPORTS

Nil

OTHER BUSINESS

Nil

DATE OF THE NEXT MEETING

The date of the next meeting was confirmed as follows:

Wednesday 24 September 2014
3.30pm – 5.00pm
James Young Room, Lerderderg Library
Bacchus Marsh

MEETING CLOSURE

The Chair thanked all and closed the meeting at 12.33pm.

Attachment - Item 10.3(c)

MINUTES
SECTION 86 PLACE MAKING COMMITTEE

WEDNESDAY 24 SEPTEMBER 2014
Council Chambers, Ballan
3.30pm – 5.00pm

MEETING OPENING

The Chair welcomed all and opened the meeting at 4.10pm due to a prior event commencing at 3.30pm.

ATTENDANCE

Cr Pat Toohey	Councillor – Woodlands Ward
Cr Tom Sullivan	Councillor – West Moorabool Ward
Cr John Spain (proxy)	Councillor – East Moorabool Ward
Mr Phil Jeffrey	General Manager Infrastructure
Mr Glenn Townsend	Manager Operations
Mr Satwinder Sandhu	General Manager Growth & Development
Mr Andrew Goodsell	Acting Manager Strategic & Sustainable Development
Ms Lace Daniel	Minute Taker
Ms Sharon Duff	Minute Taker

APOLOGIES

Cr David Edwards	Councillor – East Moorabool Ward

CONFIRMATION OF THE PREVIOUS MINUTES

Resolution:

That the Minutes of the Section 86 Place Making Committee for 3 September 2014 be confirmed as a true and correct record.

Moved: **Cr Sullivan**
Seconded: **Cr Toohey**

CARRIED.

CONFLICTS OF INTEREST

No conflicts of interest were declared at the meeting.

INFRASTRUCTURE REPORTS

Small Towns Services Study – Bungaree, Dunnstown & Wallace

An updated version of the document, incorporating feedback from the 3 September 2014 meeting, was presented to the group for endorsement.

Resolution:

That the Section 86 Place Making Committee:

1. **Receives the Small Towns Services Study report.**
2. **Requests that the study be presented to the October Ordinary Meeting of Council.**
3. **Recommends to Council that the Small Towns Services Study be endorsed.**
4. **Recommends to Council that it advocate for funding to progress the projects identified in the study.**
5. **Recommends officers forward a copy of the final report to Central Highlands Water, thanking them for their input into the project.**
6. **Recommends that community engagement relating to the study be incorporated as part of Moorabool 2041 Rural Growth Strategy.**

Moved: **Cr Sullivan**
Seconded: **Cr Spain**

CARRIED.

GROWTH & DEVELOPMENT REPORTS

Nil

CLOSED SESSION OF THE MEETING

Resolution:

That pursuant to the provisions of the Local Government Act 1989, the meeting now be closed to members of the public to enable the meeting to discuss matters, which the Council may, pursuant to the provisions of Section 89(2) of the Local Government Act 1989 (the Act) resolve to be considered in Closed Session, being a matter contemplated by Section 89(2) of the Act as follows:

a. **Personnel matters;**
b. **The personal hardship of any resident or ratepayer;**
c. **Industrial matters;**
d. **Contractual matters;**
e. **Proposed developments;**
f. **Legal advice;**
g. **Matters affecting the security of Council property;**
h. **Any other matter which the Council or special committee considers would prejudice the Council or any person;**
i. **A resolution to close the meeting to members of the public.**

Moved: **Cr Sullivan**
Seconded: **Cr Spain**

CARRIED.

Confidential Report

Resolution:

That the meeting now return to open session.

Moved: **Cr Sullivan**
Seconded: **Cr Spain**

CARRIED.

OTHER BUSINESS

Nil

DATE OF THE NEXT MEETING

The date of the next meeting was confirmed as follows:

Wednesday 19 November 2014
3.30pm – 5.00pm
Council Chambers, Ballan

MEETING CLOSURE

The Chair thanked all and closed the meeting at 4.35pm.